WAIMAKARIRI
DISTRICT COUNCIL

Council

Agenda

Tuesday 5 July 2022

1pm

Council Chamber
215 High Street
Rangiora

Members:

Mayor Dan Gordon (Chair)
Cr Neville Atkinson
Cr Kirstyn Barnett
Cr Al Blackie
Cr Robbie Brine
Cr Wendy Doody
Cr Niki Mealings
Cr Philip Redmond
Cr Sandra Stewart
Cr Joan Ward
Cr Paul Williams

The Mayor and Councillors

WAIMAKARIRI DISTRICT COUNCIL

A meeting of the **WAIMAKARIRI DISTRICT COUNCIL** will be held in **THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA**, on **TUESDAY 5 JULY 2022** commencing at **1pm.**

Sarah Nichols
GOVERNANCE MANAGER

Recommendations in reports are not to be construed as Council policy until adopted by the Council

BUSINESS

Page No

1. **APOLOGIES**

2. **CONFLICTS OF INTEREST**

Conflicts of interest (if any) to be reported for minuting.

3. **ACKNOWLEDGEMENTS**

4. **CONFIRMATION OF MINUTES**

4.1. **Minutes of an Extraordinary meeting of the Waimakariri District Council held on 31 May 2022** 8 - 10

RECOMMENDATION

THAT the Council:

(a) **Confirms,** as a true and correct record, the circulated minutes of an Extraordinary meeting of the Waimakariri District Council meeting held on 31 May 2022.

4.2. **Minutes of the Waimakariri District Council meeting held on 7 June 2022** 11 - 24

RECOMMENDATION

THAT the Council:

(a) **Confirms,** as a true and correct record, the circulated minutes of the Waimakariri District Council meeting held on 7 June 2022.

MATTERS ARISING (FROM MINUTES)

PUBLIC EXCLUDED MINUTES *(Refer to public excluded agenda)*

4.3. Minutes of the public excluded portion of a meeting of the Waimakariri District Council held on 7 June 2022

5. **DEPUTATIONS AND PRESENTATIONS**

Nil.

6. **ADJOURNED BUSINESS**

Nil.

7. **REPORTS**

7.1. **Facilities and Consents Fee Waiver Subcommittee** – S Markham (Manager Strategic Projects)

25 - 33

RECOMMENDATION

THAT the Council

(a) **Receives** Report No. 220622106352.

(b) **Approves** the Terms of Reference of the Community Facilities Fee Exemption Sub Committee being modified to be the body that makes discretionary decisions in granting reductions in otherwise payable resource and building consent fees.

(c) **Adopts** the Revised Terms of Reference attached to this report. Trim 220622106356.

(d) **Reappoints** Councillors Doody, Redmond and Brine to the Subcommittee.

7.2. **Waimakariri District Climate Change Scenario Technical Reports** – V Spittal (Senior Policy Analyst)

34 - 150

RECOMMENDATION

THAT the Council

(a) **Receives** Report No. 220616103176.

(b) **Receives** the Waimakariri Climate Change Scenarios Summary report No. 220608096135.

(c) **Receives** the Waimakariri Climate Change Scenarios Technical report No. 220601093286.

(d) **Adopts** the NIWA climate projections for the RCP 8.5 Scenario as its baseline evidence for corporate planning, including District planning and the 2024 LTP suite of corporate documents (LTP, activity management plans and infrastructure strategy).

(e) **Notes** a video is being produced that graphically illustrates the findings of the technical report and a link to this will be advised once this project is complete.

(f) **Notes** a programme to raise whole of community awareness of these reports and the video will be developed and incorporated into the reviewed 2022/23 climate change work programme.

(g) **Circulates** this report to the Community Boards and Mahi Tahi Committee for their information.

7.3. **Register of Interests –** S Nichols (Governance Manager)

151 - 169

RECOMMENDATION

THAT the Council

(a) **Receives** report No. 220622107248.

(b) **Reviews** the Register of Interests content, recording any amendments.

(c) **Notes** a Register of Interests will be republished in the August 2022 agenda and notes the Register of Interests is listed on the Council website.

(d) **Notes** amendments can be made at any time by notification to the Governance Manager.

(e) **Notes** the Register will be next reviewed with the new Council in November 2022, noting the Policy will be reviewed to better incorporate updated Local Government Act legislation related to Pecuniary Interests that comes into force on 20 November 2022.

8. MATTERS REFERRED FROM COMMITTEES AND COMMUNITY BOARDS

Nil

9. HEALTH, SAFETY AND WELLBEING

9.1. **Health, Safety and Wellbeing Report July 2022**– J Harland (Chief Executive)

170 - 182

RECOMMENDATION

THAT the Council:

(a) **Receives** Report No 220621105796

(b) **Notes** that there were no notifiable incidents this month. The organisation is, so far as is reasonably practicable, compliant with the duties of a person conducting a business or undertaking (PCBU) as required by the Health and Safety at work Act 2015.

(c) **Circulates** this information to Community Boards for their information.

10. COMMITTEE MINUTES FOR INFORMATION

10.1. Minutes of a meeting of the Utilities and Roading Committee of 17 May 2022

183 - 188

10.2. Minutes of a meeting of the Community and Recreation Committee of 31 May 2022

189 - 197

10.3. Minutes of a meeting of the District Planning and Regulation Committee of 21 June 2022

198 - 202

RECOMMENDATION

THAT Items 10.1 – 10.3 be received information.

11. **COMMUNITY BOARD MINUTES FOR INFORMATION**

11.1. Minutes of the Oxford-Ohoka Community Board meeting of 8 June 2022 203 - 214

11.2. Minutes of the Rangiora-Ashley Community Board meeting of 8 June 2022 215 - 223

11.3. Minutes of the Woodend-Sefton Community Board meeting of 13 June 2022 224 - 231

RECOMMENDATION

THAT Items 11.1– 11.3 be received for information.

12. **REPORTS FOR INFORMATION**

12.1. **May 2021, December 2021 and February 2022 Flood Events – Service Requests Update** – E Klopper (Flood Team Lead), C Fahey (Water Operations Team Leader), and K Simpson (3 Waters Manager)
(Refer to attached copy of report 220609098129 to the Utilities and Roading Committee meeting of 21 June 2022) 232 - 240

12.2. **Avian Botulism Management 2021-22 –** S Allen (Water Environment Advisor) and K Simpson (3 Waters Manager)
(Refer to attached copy of report 220420060318 to the Utilities and Roading Committee meeting of 21 June 2022) 241 - 263

RECOMMENDATION

THAT the Council:

(a) **Receives** Items 12.1 and 12.2 for information.

13. **MAYOR'S DIARY**

13.1 **Mayor's Diary Wednesday 1 June – Tuesday 28 June 2022**

RECOMMENDATION

THAT the Council:

(a) **Receives** report no 220630110829.

(The Mayors Diary will be circulated separately)

14. **COUNCIL PORTFOLIO UPDATES**

14.1. **Iwi Relationships** – Mayor Dan Gordon

14.2. **Greater Christchurch Partnership Update** – Mayor Dan Gordon

14.3. **Canterbury Water Management Strategy –** Councillor Sandra Stewart

14.4. **International Relationships** – Deputy Mayor Neville Atkinson

14.5. **Regeneration (Kaiapoi)** – Councillor Al Blackie

14.6. **Climate Change and Sustainability** – Councillor Niki Mealings

14.7. **Business, Promotion and Town Centres** – Councillor Joan Ward

15. **QUESTIONS**

(under Standing Orders)

16. **URGENT GENERAL BUSINESS**

(under Standing Orders)

17. **MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED**

Section 48, Local Government Official Information and Meetings Act 1987.

RECOMMENDATION

THAT the public be excluded from the following parts of the proceedings of this meeting.

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, are as follows:

Item No	Minutes/Report of	General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
17.1	Minutes of public excluded portion of Council meeting of 7 June 2022.	Confirmation of minutes	Good reason to withhold exists under Section 7	Section 48(1)(a)
REPORTS				
17.2	Report of J McBride (Roading and Transport Manager) and D Young (Senior Engineering Advisor)	Adopt Proposed Waimakariri District Council Speed Limits Bylaw 2022	Good reason to withhold exists under Section 7	Section 48(1)(a)
17.3	Report of C Johnson (Property Officer on secondment) and R Hawthorne (Property Manager)	Waikuku Beach Holiday Park Lease Negotiations	Good reason to withhold exists under Section 7	Section 48(1)(a)
17.4	M Bannister (Property Officer, on secondment) and R Hawthorne (Property Manager)	Ohoka Easement Surrender	Good reason to withhold exists under Section 7	Section 48(1)(a)
17.5	Report of D Young (Senior Engineering Advisor), R Hawthorne (Property Manager), K Simpson (3 Waters Manager) and J McBride (Roading and Transport Manager)	Cones Road Drainage Improvements – Approval of increased budget and land purchase	Good reason to withhold exists under Section 7	Section 48(1)(a)

This resolution is made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987, and the particular interest or interests protected by section 6 or section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public are as follows:

Item Nº	Reason for protection of interests	LGOIMA Part 1, Section 7
171 – 17.5	Protection of privacy of natural persons; To carry out commercial activities without prejudice; Maintain legal professional privilege; Enable Council to continue with (commercial) negotiation without prejudice or disadvantage Prevent the disclose of information for improper gain or advantage	Section 7 2(a) Section 7 2(b)ii Section 7 (g) Section 7 2(i) Section 7 (j)

CLOSED MEETING

See Public Excluded Agenda.

OPEN MEETING

18. **NEXT MEETING**

The next scheduled ordinary meeting of the Council will occur at 1pm on Tuesday 2 August 2022, to be held in the Council Chambers, Rangiora Service Centre, 215 High Street, Rangiora.

BRIEFING

At the conclusion of the meeting S Markham and C Brown will conduct a briefing to discuss and seek direction on the WHoW Aquasports Park Memorandum of Understanding Renewal/Progression.

MINUTES OF THE EXTRAORDINARY MEETING OF THE WAIMAKARIRI DISTRICT COUNCIL HELD IN THE COUNCIL CHAMBER, 215 HIGH STREET, RANGIORA ON TUESDAY 31 MAY 2022, COMMENCING AT 11AM.

PRESENT

Mayor D Gordon (Chairperson), Councillors K Barnett, A Blackie (virtual), W Doody, P Redmond, S Stewart and P Williams.

IN ATTENDANCE

J Harland (Chief Executive), J Millward (General Manager Finance and Business Support), M Bacon (Development Planning Manager), M Buckley (Principal Policy Planner), A Benbrook (Development Planning Administrator) and E Stubbs (Governance Support Officer).

There were 30 members of the public in attendance.

1. APOLOGIES

Moved: Mayor Gordon Seconded: Councillor Williams

Apologies for absence were received and sustained from Deputy Mayor Atkinson and Councillors N Mealings, R Brine and J Ward.

CARRIED

2. CONFLICTS OF INTEREST

Item 3.1 Deputy Mayor Atkinson and Councillor Mealings as Commissioners to the District Plan Committee. Hence they did not attend the Council meeting.

3. REPORT

3.1. Notification of Private Plan Change 31 – Rolleston Industrial Developments Ltd – M Buckley (Principal Policy Planner)

M Buckley spoke to the report which requested approval to notify Private Plan Change 31 to the operative Waimakariri District Plan. He explained Clause 25 of the First Schedule of the Resource Management Act, 1991 (RMA), which was an administrative decision to accept the plan change request for processing. The Council did not need to have a view on the merits of the request, nor did it need to agree with the independent expert assessment of the environmental effects or be satisfied that all possible information had been provided that would assist with a substantive decision on the Plan Change, which this application did not.

M Buckley outlined the decision-making choices in terms of Clause 25, and the three key aspects being; was the plan change frivolous or vexatious, had it been considered by the Council in the last two years and did the request accord with 'sound resource management practice'.

In conclusion, M Buckley noted that there were no clear and specific planning grounds to reject the request under Clause 25(4) of the First Schedule of the RMA.

Mayor Gordon commented that understanding the RMA processes could be daunting. Hence, he sought clarity on the 'Friend of the submitter' process and suggested that the Council could consider appointing 'Friend of the submitter' support to assist submitters. M Buckley explained that the ‘Friend of the submitter’ was usually an independent advisor who provided technical expertise and advice to people who wished to submit. However, the independent advisor did not write submissions.

Councillor Barnett noted that Plan Change 31 did not align with the Council's Rural Residential Strategy, which had gone through a public consultative process, and enquired if that would impact the notification of the decision. M Buckley advised that non-compliance with the Rural Residential Strategy would only be considered when Plan Change 31 was being evaluated, and it had no impact on whether the plan change should be notified.

In response to a question from Councillor Barnett, M Buckley confirmed that the fact that Plan Change 31 contravened the operative and proposed Waimakariri District Plans was not sufficient reason to deny notification.

Councillor Barnett further asked how high the bar was to reject an application for not complying with 'sound resource management practice'. M Buckley provided various examples of where that could apply. However, he noted that Plan Change 31 complied with 'sound resource management practice'.

Councillor Doody requested clarification of a creek name which appeared to be referred to as ‘Ohaka’ and ‘Ohoka’ concurrently. M Bacon noted that the Deed of Easement dated back to 1879, and it may be a spelling error from that time.

Moved: Councillor Barnett Seconded: Councillor Redmond

THAT the Council:

(a) **Receives** report No. 220315037010.

(b) **Accepts** the plan change request from Rolleston Industrial Development Ltd (as numbered PC 31) for processing in accordance with clause 25(2) (b) of Schedule 1 of the Resource Management Act 1991 as lodged on 14 December 2021, and superseded in response to further information requested (included information dated March 2022).

(c) **Directs** staff to notify Plan Change 31 at the first available opportunity.

(d) **Notes** that this decision was a procedural step and did not signal support or otherwise for Plan Change 31.

(e) **Circulates** this report to the Rangiora-Ashley, Oxford-Ohoka and Kaiapoi-Tuahiwi Community Boards for their information.

(f) **Approves** offering ‘Friend of the submitter’ technical support to people submitting on Plan Change 31.

CARRIED

Councillor Barnett thanked staff for the comprehensive report on the proposed plan change. It was clear that under the legislation, that the Council could not decline the plan change outright, and the Council, therefore, needed to direct staff to notify Plan Change 31 for public consultation. It was important to note that the decision was only a neutral procedural step. She was supportive of the suggestion from the Mayor that a 'Friend of the submitter' resource should be made available to support people wishing to make submissions.

Councillor Redmond commented that the Council was following the process under the RMA, and views on the merits of Plan Change 31 were not under consideration. The Council's options were limited, and as explained by the staff, there was a lack of grounds to reject the application. He, therefore, supported the motion to accept the plan change for notification. The matter would be dealt with as part of a public consultation process. He also endorsed providing 'Friend of submitter' support to potential submitters.

Mayor Gordon agreed with his colleagues' comments and noted that the Council was not required to make a merit-based decision but was requested to merely endorse a procedural process. The Council's decision, therefore, did not signal support or otherwise. The Council would need to consider if it wished to make a submission in the future, however that was a separate process. He believed the concept of providing a 'Friend of the submitter' was an excellent idea. He reiterated that the role was not to write submissions but rather to provide support to those wishing to submit.

4. NEXT MEETING

The next scheduled ordinary meeting of the Council would commence at 1pm on Tuesday 7 June 2022.

THERE BEING NO FURTHER BUSINESS, THE MEETING CLOSED AT 11.16AM.

CONFIRMED

_____

Chairperson
Mayor Dan Gordon

_____

Date

MINUTES OF A MEETING OF THE WAIMAKARIRI DISTRICT COUNCIL HELD IN THE COUNCIL CHAMBER, 215 HIGH STREET, RANGIORA ON TUESDAY 7 JUNE 2022, COMMENCING AT 1PM.

PRESENT

Mayor D Gordon (Chairperson), Deputy Mayor N Atkinson, Councillors K Barnett, A Blackie, R Brine, W Doody, N Mealings, P Redmond, S Stewart, J Ward and P Williams.

IN ATTENDANCE

J Harland (Chief Executive), J Millward (General Manager: Finance and Business Support Manager), T Tierney (General Manager: Planning and Regulation), S Hart (Business and Centres Manager), K LaValley (Project Development Manager), K Simpson (3 Waters Manager), L Beckingsale (Policy Analyst), J Dhakal (Project Engineer), V Thompson (Business and Centres Advisor), G Maxwell (Policy Technician), and E Stubbs (Governance Support Officer).

1 APOLOGIES

There were no apologies.

2. CONFLICTS OF INTEREST

No conflicts of interest were declared.

3. ACKNOWLEDGEMENTS

The Mayor led a moment's silence to commemorate the passing of Dame Aroha Reriti-Crofts (Ngai Tuahuriri, Ngai Tahu) and Kaiapoi-Tuahiwi Community Board member Christine Greengrass. He commented on the significant contribution that both ladies had made to the community.

The Mayor extended the Council's congratulations to Her Majesty Queen Elizabeth II on celebrating her Platinum Jubilee. In addition, he acknowledged the Queen's Service Medal presented to Christine Greengrass for services to the community and the New Zealand Order of Merit awarded to former Mayor David Ayers for services to local government and the community.

The Mayor also recognised the following recipients of the 2022 Community Services awards:

- Mayors Awards were presented to Kevin Felstead and Tony Hall.
- Inaugural Business Awards were presented to Mark Revis and Jedd Pearce.
- Community Service Awards were presented to Mary and Keith Morrison, Graham Godman, Jan and Dave Shelton, Ivan Campbell, Bryan Sulzberger, Gavin McGiffert, David Britten, and Scott and Tracey Bowman.

It was agreed that the Awards evening had been a very successful event.

4. CONFIRMATION OF MINUTES

4.1 **Minutes of the meeting of the Waimakariri District Council held on 3 May 2022**

Moved: Councillor Blackie Seconded: Councillor Ward

THAT the Council:

(a) **Confirms,** as a true and correct record, the circulated Minutes of the meeting of the Waimakariri District Council held on 3 May 2022.

CARRIED

MATTERS ARISING FROM THE MINUTES

There were no matters arising.

PUBLIC EXCLUDED MINUTES *(Refer to public excluded agenda)*

4.2 **Minutes of the Public Excluded portion of a meeting of the Waimakariri District Council held on 3 May 2022**

5. DEPUTATIONS AND PRESENTATIONS

Nil.

6. ADJOURNED BUSINESS

Nil.

7. SHOVEL READY PROJECTS

Nil.

8. REPORTS

8.1 **Gambling Venue Policy Review Board Venue Policy Review –** L Beckingsale (Policy Analyst) and T Tierney (General Manager Planning and Regulation)

L Beckingsale introduced the report, which sought approval to consult the community on reviewing the Council's Gambling Venue Policy and appoint Councillors to the hearing panel. She noted that the Gambling Venue Policy review had been discussed with the Council at a previous briefing.

There were no questions from elected members.

Moved: Mayor Gordon Seconded: Councillor Ward

THAT the Council:

(a) **Receives** Report No. 220309033892.

(b) **Approves** the Statement of Proposal for consultation.

(c) **Appoints** Councillors Doody, Redmond and Williams to the Hearing Panel.

CARRIED

Mayor Gordon thanked the Councillors for volunteering their time to serve on the hearing panel. He was looking forward to the feedback garnered through the public consultation process.

Councillor Ward noted that the hearing panel included members with knowledge of the matter.

Councillor Barnett hoped the public consultation would be well publicised, particularly to the business community and the community groups who received funding from gambling proceeds.

8.2 **Rangiora Wastewater Treatment Plant – Septage Facility Location Approval** – J Dhakal (Project Engineer) and K Simpson (3 Waters Manager)

K Simpson advised that approval was being sought for the location of the Septage Facility at the Rangiora Waste Water Treatment Plant (WWTP). There were several potential impacts on the site, such as the proposed Rangiora Eastern Link Roadway and the possible implications of the Three Waters' reform. Currently, the WWTP had a number of uses, including the dog pound and the Civil Defence compound. These facilities could potentially require relocation if the Three Waters' reform proceeded.

K Simpson further noted that staff were not currently seeking a decision on the broader Master Plan for the site, as the plan would be submitted to the Council for consideration in the future. However, he highlighted how the current short-term layout could be integrated with any future proposed site layout, including the reconfiguration for possible future changes.

Councillor Mealings referred to the possible need to relocate the other Council facilities housed at the WWTP and sought clarity on the ownership of the land under the Three Waters' reform. K Simpson explained that further clarification on land ownership under the reform was still required. Currently, the Council's understanding was that if the primary use of the land were for 3Waters, then ownership would be transferred to the new water service entity.

Councillor Barnett questioned if there would be any negative impact on residents, such as smell, as a result of the reconfiguration of the site. K Simpson advised that no changes to the wastewater treatment process were proposed. A key consideration in developing the Rangiora Eastern Link Road was the creation of a wide buffer between the proposed roadway and WWTP to aid with visual and odour effects. In addition, the Septage Facility itself was enclosed to the extent that all waste processing happened within a set unit. Hence, no negative impact on residents was anticipated.

In response to a question from Councillor Brine, K Simpson confirmed that the designation of the land would be protected if the ownership was transferred under the Three Waters' reforms. He noted two steps that the Council may consider - a designation which gave planning status for protection or the potential subdivision of the land to separate the core 3Waters' functions from the remainder of the land, which could then remain in Council ownership.

Councillor Brine asked if the designation was currently in place, and K Simpson advised that the designation was in process under the Proposed District Plan.

Moved: Councillor Williams Seconded: Councillor Brine

THAT the Council:

(a) **Receives** Report No. 211105178650[v02].

(b) **Approves** the proposed location and short-term layout of the Septage Facility, as shown on the Rangiora Wastewater Treatment Plant Potential Site Layout Plan (Trim 211026171717).

(c) **Notes** that the recommended location of the facility had been designed such that it, suited the current site layout, and allowed flexibility for future layout options on the site.

(d) **Notes** that this report did not include an estimate of the cost associated with the development of the site as per the Rangiora Wastewater Treatment Plant Potential Site Layout Plan. Aspects of the works required would need to be funded from project budgets associated with either the development of the Rangiora Eastern Link Road project, or the Three Waters Reform work.

(e) **Notes** that further development of the site layout plan into a Master Plan would be triggered by either the design of the Rangiora Eastern Link Road, or potentially the transfer of ownership of the Rangiora Waste Water Treatment Plant site to a new water service entity.

(f) **Notes** that the potential transfer of the Rangiora Wastewater Treatment Plant site to the water service entity was a matter for consideration by the Council in the future, and not a matter under consideration at this stage.

(g) **Notes** that a briefing on the wider Master Plan would occur at a future date.

(h) **Circulates** this report to the Utilities and Roading Committee for their information.

CARRIED

Councillor Brine thanked the staff for the comprehensive report.

Councillor Williams commented that a proposed Septage Facility at the Rangiora Waste Water Treatment Plant was essential for the community, as effluent was currently being transported to Christchurch.

9. MATTERS REFERRED FROM COMMITTEES AND COMMUNITY BOARDS

9.1 **Kaiapoi Town Centre Budget Reallocation May 2022 –** J McBride (Roading and Transport Manager) and V Thompson (Business and Centres Advisor)

(Refer to report no. 220504069966 from the Kaiapoi-Tuahiwi Community Board meeting of 16 May 2022)

V Thompson advised that approval was requested to reallocate the Kaiapoi Town Centre budget for two projects to proceed, namely the footpath improvements at the Williams and Charles Streets intersection and the replacement balustrade design for the Williams Street Bridge.

Moved: Councillor Atkinson Seconded: Councillor Blackie

THAT the Council:

(a) **Approves** the reallocation of budget as follows:

i. $55,000 for the footpath upgrade at the old BNZ Bank.
ii. $45,000 for the Williams Street Bridge Balustrade Replacement Design.

(b) **Notes** that a further report would be presented as part of the 2023/24 Annual Plan process requesting budget for the physical works associated with the Williams Street Bridge Balustrade Replacement, once the full costs had been confirmed.

CARRIED

Councillor Blackie noted that the Kaiapoi-Tuahiwi Community Board had extensively debated the budget reallocation.

9.2 **Williams Street Bridge Balustrade Upgrades –** V Thompson (Business and Centres Advisor)

(Refer to report no. 220412055487 from the Kaiapoi-Tuahiwi Community Board meeting of 16 May 2022).

V Thompson spoke to the report, which sought the Council's approval of preferred design Option H, which retained the concrete pillars, removed the degraded concrete balustrades, and replaced them with stainless steel infill panels that could be cut out with artistic designs or patterns. Option H had been Councillors' preferred option when discussed at a briefing in March 2022. Option H was also subsequently endorsed by the Kaiapoi-Tuahiwi Community Board at their May 2022 meeting.

V Thompson reported that the Kaiapoi-Tuahiwi Community Board had requested that the process of engaging an artist to design the panels be opened to the broader community.

Councillor Redmond questioned if the public consultation would include the option of retaining the status quo. V Thompson explained that the public consultation would be focused on the design elements, as staff do not believe that the Council should seek consultation on alternative options as money had already been spent on the design process.

Councillor Mealings referred to the proposed maintenance outlined in Option H and enquired why the pillars would only need repainting once or twice in 40 years, but the concrete would need to be repaired every five years. V Thompson advised that maintenance assessment had been completed by the structural engineer advising on the project. It was anticipated that the concrete would require painting every 15 to 20 years. The concrete would also need to be repainted after any repairs were complete.

Councillor Doody sought clarification of the proposed consultation on the artistic designs of the panels. V Thompson responded that it was envisaged that the process would involve a public call-out to artists to create the designs and would likely involve the Waimakariri Public Arts Trust selecting the artist. However, it was anticipated that the Council, the Kaiapoi-Tuahiwi Community Board and the Waimakariri Public Arts Trust, would select the design panels to be submitted to the community for public feedback. That process would follow other similar town centre design processes and could take up to six months.

Councillor Williams asked if public consultation on the design panels would not be premature. It would be better to consult first on whether the community wanted to retain the existing balustrades. He further questioned the historical background of the balustrades. V Thompson noted that the bridge did not have heritage status, however, she acknowledged that the community had strong emotional ties to the bridge.

S Hart advised that retaining the status quo was not an option as the current balustrades were below the required safety standard and would need to be capped to bring them up to the required height.

Moved: Councillor Atkinson Seconded: Councillor Ward

THAT the Council:

(a) **Approves** Option H as the preferred design option for the potential future replacement of the Williams Street Bridge balustrades that enabled a new architectural laser-cut stainless steel handrail and infill panels incorporating cut-out design motifs in consultation with Ngāi Tūāhuriri and the public, while retaining the existing concrete pillars and lamp posts.

Councillor Atkinson commented that the balustrades and the whole bridge had been replaced in the past. The community preferred the previous filigree cast-iron bridge, however, the bridge had to be replaced due to deterioration, and the current bridge had been the 'budget' option. He did not believe there was a tie-in with the BNZ Bank balustrade. Most of the community members he spoke to wanted the bridge to blend into the developments along the river bank and the rest of Kaiapoi.

Councillor Ward noted that the Council had held an in-depth discussion about Option H, and she believed that the preferred option was to retain the bridge's character. However, it would modernise and enhance the bridge. While it was not the most economical option, it would be the best option in the long term. She therefore supported public input on the design components of the bridge.

Councillor Blackie commented that the consultation with Ngāi Tūāhuriri and the public in the recommendation provided some flexibility on design.

Amendment:

Moved: Councillor Redmond Seconded: Councillor Williams

(b) **Approves** that public consultation included the option to retain the status quo.

LOST

DIVISION:
For: Councillors Williams, Redmond, Brine and Barnett.
Against: Mayor Gordon, Councillors Atkinson, Mealings, Stewart, Blackie, Ward and Doody.
Lost: 7:4

In his conversations with community members, Councillor Redmond became aware that the preferred option was to retain the existing balustrades, especially considering the $500,000 cost to replace them. He, therefore, believed that it was important for people to have an opportunity to express their views on whether the replacement of the balustrades was a good use of the Council's funds or whether the funding could be better utilised, for example, for lighting to create the desired 'wow' factor.

Councillor Williams commented that he was also aware that the community would prefer to retain the status quo. It was his opinion that the public should be aware of the cost of replacing the balustrades before making decisions on the design options. In the current challenging economic climate, he was not sure that the community would endorse spending $500,000 on the bridge. Councillor Williams therefore, believed consulting the public on retaining the status quo was the right democratic approach.

Councillor Atkinson noted that the bridge was deteriorating with reinforcing protruding through the concrete and three sections of the bridge required realignment. If the status quo was retained, the bridge would need high-level maintenance in the future and would remain a constant reminder of the earthquake. He believed that the capping of the existing balustrade would not be aesthetically pleasing and therefore supported the option that looked acceptable and would be long-lasting.

Councillor Barnett supported the amendment, noting that her concern was that after the earthquake, a large sum of money had been spent on the redevelopment of the bridge. If the bridge was now not fit for purpose and needed constant repairs, would it not be better to consider replacing the bridge. She was also concerned about using stainless steel on the bridge and highlighted the town entrance signs in Cust, which she believed were not visually pleasing. She felt more than one option should be put forward to the community, so they could decide how much more they wanted to spend on a predominantly vehicle bridge.

Councillor Redmond advised that his proposed amendment did not consider the merits of the various options, however, it did provide the public with the opportunity to express their opinion. He noted that the original report recommended painting the concrete and keeping the balustrades at their existing height. He commented that the bridge would not be the only infrastructure not to meet current design standards.

The amended motion was lost, and the original motion, therefore, became the substantive motion.

Moved: Councillor Atkinson Seconded: Councillor Ward

THAT the Council:

(a) **Approves** Option H as the preferred design option for the potential future replacement of the Williams Street Bridge balustrades that enabled a new architectural laser-cut stainless steel handrail and infill panels incorporating cut-out design motifs in consultation with Ngāi Tūāhuriri and the public, while retaining the existing concrete pillars and lamp posts.

CARRIED
Councillor Redmond and Williams Against

Councillor Mealings supported the motion, commenting that the option of retaining the status quo could not be considered as the bridge was currently not complying with safety standards and would cost a significant amount of ongoing maintenance. She, therefore, believed that providing the public with an option of keeping the status quo added no value.

Mayor Gordon noted the previous Council discussions about the various options for the bridge and the opportunity to turn the bridge into a visual focal point. There was a real opportunity to embrace creativity in the proposed design with Ngāi Tūāhuriri and community involvement. He believed alternative views would come through as part of the public consultation. There had been a clear recommendation from the Kaiapoi-Tuahiwi Community Board, and he, therefore, supported Option H, which would retain the integrity of the bridge's design by maintaining the supports and light fixtures. The bridge would link the two parts of Kaiapoi together and make Kaiapoi proud.

Councillor Williams could not support the motion without asserting the public's views on spending $500,000 on the bridge in the current economic climate. He did not endorse the random spending of public funding.

Councillor Redmond noted his concerns in supporting the motion. He commented that even if the motion was passed today, there was no funding in the current budget for the project, and it would therefore need to be included in the 2023/24 Annual Plan.

Councillor Doody explained that the endorsement of the Kaiapoi-Tuahiwi Community Board influenced her decision to support the motion, as it was the Board's role to listen to the community's preference.

Councillor Atkinson objected to a previous comment regarding random spending, as there was currently no funding for the project, and due consideration would be given to the project during the next budget process. He also challenged the assertion that it was purely a vehicle bridge, noting that since the bridge was built in 1948, it had catered for pedestrians. In fact, after the earthquake, the size of the footpath on the bridge doubled. However, he agreed that more comprehensive views would come through during the public consultation.

9.3 **Application to the Biodiversity Fund –** G Maxwell (Policy Technician) and **G MacLeod (Greenspace Manager)**
(Refer to report no. 220505071036 from the Land and Water Committee meeting of 17 May 2022).

G Maxwell presented the report, which requested $5,204.62 from the Council's Biodiversity Fund to assist with the installation of a fence to protect the biodiversity of the planting at 118 Yaxleys Road, Loburn. She noted that the current balance of the Fund was $67,000, and that no payments had been made for the Fund since its inception in 2019. She took the report as read.

In response to questions from Mayor Gordon, G Maxwell explained that the larger wetland stretched over four hectares and was identified as a Significant Natural Area (SNA) in the District Plan. The fund would allow for the fencing to be completed on the part of the wetland situated on the applicant's land. S Hart advised that the Land and Water Committee had requested that the neighbouring owners be made aware of the availability of Council's Biodiversity Fund.

Moved: Councillor Stewart Seconded: Councillor Doody

THAT the Council:

(a) **Approve** funding from the Biodiversity Fund of $5,204.62 for the application of Mia Hofsteede to fence the wetland, flax and cabbage trees located at 118 Yaxleys Road, Loburn.

CARRIED

Councillor Stewart encouraged all Councillors to support the application, as the fencing would protect part of a wetland with rare plants identified as an SNA in the operative District Plan. As part of the grant funding, support and advice would be provided to the landowner. She noted that there was less than one per cent of remnant indigenous vegetation in the Waimakariri. She hoped that the publicity around this grant funding would encourage others landowners who had SNAs to seek assistance and advice to help protect biodiversity.

Councillor Doody commended the landowners for the action taken to protect the wetlands and commented that she was very much in favour of the application.

Councillor Williams also supported the motion, noting that he would like the whole wetland to be fenced and protected from stock.

Councillor Mealings congratulated the owners for the care they had taken over time to protect the biodiversity on their land. She encouraged the neighbouring landowners to also apply to the Council's Biodiversity Fund for funding to fence their portions of the wetland.

10. HEALTH, SAFETY AND WELLBEING

10.1 **Health, Safety and Wellbeing Report June 2022**– J Harland (Chief Executive)

J Harland reported that 201 staff had taken up the opportunity to receive free flu vaccinations. He noted the increase in the damage to telecommunications cables. In some incidents, the cables were identified incorrectly on plans, and some cables were at the incorrect depth.

J Harland noted that Covid was still prevalent in the community and negatively impacted the Council's ability to deliver services. However, staff were doing everything they could to meet statutory timeframes. He encouraged everyone to adhere to Covid regulations.

Councillor Williams questioned the rumour of a person falling and fracturing their leg at the Butchers Road Bridge, and J Harland advised that the Council had not been informed of such an incident.

In response to a question from Councillor Atkinson, J Harland confirmed that the Council gate, on which the Water Unit employee had cut open his hand, had been repaired.

Moved: Councillor Redmond Seconded: Councillor Blackie

THAT the Council:

(a) **Receives** Report No. 220517078951.

(b) **Notes** that there were no notifiable incidents in June 2022. The organisation was, so far as it was reasonably practicable, compliant with the duties of a person conducting a business or undertaking (PCBU) as required by the Health and Safety at work Act 2015.

(c) **Circulates** this information to Community Boards for their information.

CARRIED

11. COMMITTEE MINUTES FOR INFORMATION

11.1 Minutes of the meeting of the District Planning and Regulation Committee of 26 April 2022.

11.2 Minutes of the meeting of the Utilities and Roading Committee of 26 April 2022

11.3 Minutes of the meeting of the Audit and Risk Committee of 17 May 2022

Moved: Councillor Williams Seconded: Councillor Doody

THAT the Council:

(a) **Receives** Items 11.1 to 11.3 for information.

CARRIED

12. COMMUNITY BOARD MINUTES FOR INFORMATION

12.1 Minutes of the meeting of the Oxford-Ohoka Community Board meeting of 4 May 2022

12.2 Minutes of the meeting of the Woodend-Sefton Community Board meeting of 9 May 2022

12.3 Minutes of the meeting of the Rangiora-Ashley Community Board meeting of 11 May 2022

12.4 Minutes of the meeting of the Kaiapoi-Tuahiwi Community Board meeting of 16 May 2022

Moved: Councillor Ward Seconded: Councillor Brine

THAT the Council:

(a) **Receives** Items 12.1 to 12.4 for information.

CARRIED

13. REPORTS FOR INFORMATION

13.1 **Zone Implementation Programme Addendum Capital Works Programme – 2022-23** – S Allen (Water Environment Advisor)

(Refer to report 220328045801 from the Land and Water Committee meeting of 17 May 2022)

Moved: Councillor Stewart Seconded: Councillor Blackie

THAT the Council:

(a) **Receives** Item 13.1 (Trim 220328045801) for information.

CARRIED

14. MAYOR'S DIARY

14.1 **Mayor's Diary Wednesday 27 April – Tuesday 31 May 2022**

Moved: Councillor Redmond Seconded: Councillor Atkinson

THAT the Council:

(a) **Receives** report no 220602093522.

CARRIED

15. COUNCIL PORTFOLIO UPDATES

15.1 **Iwi Relationships** – Mayor Dan Gordon

Mayor Gordon noted there had been good attendance from the Council at the memorial service for Dame Aroha Reriti-Crofts. In addition, the Council Waiata Group had been well received.

The Mahi Tahi Joint Development Committee would be holding a briefing in the coming weeks.

15.2 **Greater Christchurch Partnership Update** – Mayor Dan Gordon

Mayor Gordon advised that both Ministers M Woods and N Mahuta attended the recent meeting of the Greater Christchurch Partnership. To have two senior cabinet ministers attending was significant and showed the importance of developing the partnership. In addition, there was an upcoming briefing to the government on the Greater Christchurch 2050, and social planning work was underway behind the scenes.

15.3 **Canterbury Water Management Strategy –** Councillor Sandra Stewart

Councillor Stewart reported that $50,000 was allocated from the CWMS Action Plan Budget for CWMS Water Zone in the 2021/22 financial year. She had requested a list of the projects to be undertaken in the Waimakariri District, and was waiting for a response from Environmental Canterbury.

Councillor Stewart further advised that she was part of a working group established to create 'Top Ten Tips' for lifestyle blocks to assist in alleviating the water quality degradation arising from the district's 4,000 to 5,000 lifestyle blocks.

Councillor Stewart noted that the Waimakariri Landcare Trust continued developing the Spark Northbrook Trail proposal.

15.4 **International Relationships** – Deputy Mayor Neville Atkinson

Councillor Atkinson advised that there was no current update.

15.5 **Regeneration (Kaiapoi)** – Councillor Al Blackie

Councillor Blackie advised that the NZMCA Motorhome and Caravan Park was proceeding slowly, and the entranceway was currently being installed.

Councillor Blackie was pleased to report that the first football game was played at the Norman Kirk Park.

Te Kohaka o Tuhaitara Trust had adopted its Management Plan. There had been a large turnout to the Mahinga Kai planting day, with over 70 people planning 1,000 trees. Ngai Tūāhuriri was well represented on the day.

15.6 **Climate Change and Sustainability** – Councillor Niki Mealings

Councillor Mealings advised that she was also part of the working group established to create 'Top Ten Tips' for lifestyle blocks.

Councillor Mealings reported that, as previously discussed, the Council had submitted on the Draft National Adaptation Plan.

Councillor Mealings noted that the 3Waters' Team had scoped the brief for a risk assessment for their Water Assets Management Plan in response to the strategic change in climate change in the Council's Infrastructure Strategy.

V Spittal had replaced S Markham as the Council's representative on the ECan Climate Group. There had been a recent ECan survey on Canterbury Councils' climate change responses, and it was found that the larger Councils were more advanced in this process. Mayor Gordon noted he was Chair of the Climate Group, of which ECan was taking the lead. It was recommended that the Greater Christchurch Area take a more coordinated response to climate change.

Councillor Mealings advised that Kim Nutbrown had joined the Council's Communications Team. Her portfolio would include climate change and sustainability.

15.7 **Business, Promotion and Town Centres** – Councillor Joan Ward

Councillor Ward reported that the EV charger agreements had been signed for Woodend and Oxford, and the charging stations would be installed later this year. In addition, she noted that the NZMCA Motorhome and Caravan Park opening had been delayed.

Councillor Ward reminded Councillors of the upcoming Economic Development Strategy Review Workshop to be held in July 2022. She also noted the upcoming Rangiora Promotions Association Big Splash event for the Stroke Foundation. It was encouraging to see more events happening in the community.

16. QUESTIONS

Nil.

17. URGENT GENERAL BUSINESS

Nil.

18 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

Section 48, Local Government Official Information and Meetings Act 1987.

Moved: Councillor Atkinson Seconded: Councillor Blackie

THAT the public be excluded from the following parts of the proceedings of this meeting.

CARRIED

The general subject of each matter to be considered while the public was excluded, the reason for passing this resolution in relation to each matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, were as follows:

Item No	Minutes/Report of	General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
18.1	Minutes of public excluded portion of Council meeting of 3 May 2022.	Confirmation of minutes	Good reason to withhold exists under Section 7	Section 48(1)(a)
18.2	Minutes of public excluded portion of the Audit and Risk Committee meeting of 17 May 2022	Minutes for information	Good reason to withhold exists under Section 7	Section 48(1)(a)
REPORTS				
18.3	Report of R Kerr (Delivery Manager: Shovel Ready programme) and R Hawthorne (Property Manager)	Kaiapoi Stormwater and Flooding Improvements – disposal of properties	Good reason to withhold exists under Section 7	Section 48(1)(a)

18.4	Report of R Kerr (Delivery Manager) and K Simpson (3 Waters Manager)	Kaiapoi Stormwater and Flooding Improvements – Tranche Three Contracts	Good reason to withhold exists under Section 7	Section 48(1)(a)
18.5	Report of J Harland (Chief Executive)	Enterprise North Canterbury Trustee Appointment	Good reason to withhold exists under Section 7	Section 48(1)(a)
MATTER REFERRED FROM AUDIT AND RISK COMMITTEE MEETING 17 MAY				
18.6	Report of A Radford (Asset Information Management Team Leader) and P Christensen (Finance Manager)	Plant Replacement	Good reason to withhold exists under Section 7	Section 48(1)(a)

This resolution was made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987, and the particular interest or interests protected by section 6 or section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public are as follows:

Item Nº	**Reason for protection of interests**	**LGOIMA Part 1, Section 7**
18.1 – 18.6	Protection of privacy of natural persons; To carry out commercial activities without prejudice; Maintain legal professional privilege; Enable Council to continue with (commercial) negotiation without prejudice or disadvantage Prevent the disclose of information for improper gain or advantage	Section 7 2(a) Section 7 2(b)ii Section 7 (g) Section 7 2(i) Section 7 (j)

CLOSED MEETING

The public excluded portion of the meeting occurred from 2.30pm to 3.08pmpm.

Resolution to Resume in open meeting

Resolution to resume in Open Meeting

Moved: Councillor Atkinson Seconded: Councillor Barnett

18.1 **Confirmation of Minutes of the Public Excluded portion of the Council meeting held on Tuesday 3 May 2022**

Resolves that the Minutes remain public excluded.

18.2 **Minutes for information of the Public Excluded portion of the Audit and Risk Committee meeting held on Tuesday 17 May 2022**

Resolves that the minutes remain public excluded.

18.3 **Kaiapoi Stormwater and Flooding Improvements Authority to dispose of Residual Properties** – R Kerr (Delivery Manager: Shovel Ready Programme) and R Hawthorne (Property Manager)

Resolves that the report lay on the table until the next Council meeting to be held on 5 July 2022.

18.4 **Kaiapoi Stormwater and Flood Improvements Delegated Authority to enter into construction contracts –** R Kerr (Delivery Manager: Shovel Ready Programme) and K Simpson (3 Waters Manager)

Resolves that the resolutions were to remain public excluded until such a time as the project was fully completed to section 7(2) of the Local Government Official Information and Meetings Act 1987 because the report contained sensitive budget information for contracts which were to be subject to a competitive tender process.

18.5 **Enterprise North Canterbury Trustee Appointment** – J Harland (Chief Executive)

Resolves that the resolution be made public.

18.6 **Plant Replacement 2022** – A Radford (Asset Information Management Team Leader) and P Christensen (Finance Manager)

Resolves that the resolutions be made public and the balance of the report remain public excluded.

CARRIED

OPEN MEETING

19. NEXT MEETING

The next scheduled ordinary meeting of the Council will occur at 1pm on Tuesday 5 July 2022, to be held in the Council Chambers, Rangiora Service Centre, 215 High Street, Rangiora.

The 2022/23 Annual Plan adoption meeting was scheduled to occur on Tuesday 28 June 2022.

THERE BEING NO FURTHER BUSINESS, THE MEETING CLOSED AT 3.14PM.

CONFIRMED

_____
Chairperson
Mayor Dan Gordon

_____
Date

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	RES-02-01 / 220622106352
REPORT TO:	COUNCIL
DATE OF MEETING:	5 July 2022
AUTHOR(S):	Simon Markham, Manager Strategic Projects
SUBJECT:	Facilities and Consents Fee Waiver Subcommittee
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / Acting Chief Executive

1. SUMMARY

1.1. This report proposes revised terms of reference of an existing subcommittee to include exercising decision-making on applications for waiver of building and resource consents, as per budget provided in the Annual Plan. It follows from a Council Briefing on the matter.

1.2. It asks the Council as a first step in review and development of its community funding practice, to modify the Terms of Reference of the current Community and Recreation Fee Waiver Subcommittee. This would become the body that makes discretionary decisions in granting reductions in, otherwise payable, resource and building consent fees, based on criteria similar to those currently used for community facilities fee waivers.

1.3. This change normalises some existing practice in waivers, (as in effect being grants), to where the appropriate level of decision-making lies.

Attachments:

i. Facilities & Consents Fee waiver Sub-Committee Terms of Reference – proposed Doc. (220622106354)
ii. Facilities & Consents Fee waiver Sub-Committee Terms of Reference – proposed – clean copy Doc. (220622106356)

2. RECOMMENDATION

THAT the Council:

(a) **Receives** Report No. 220622106352.

(b) **Approves** the Terms of Reference of the Community Facilities Fee Exemption Sub Committee being modified to be the body that makes discretionary decisions in granting reductions in otherwise payable resource and building consent fees.

(c) **Adopts** the Revised Terms of Reference attached to this report. Doc. 220622106356

(d) **Reappoints** Councillors Doody, Redmond and Brine to the Subcommittee.

3. BACKGROUND

3.1. At a Briefing in November 2021 the Council gave initial consideration to issues and options raised in relation to the Council's community funding policy & practice. Among a number of discussion items was the observation that decision-making in relation to waivers of

building and resource consents was not subject to prescribed terms of reference to support good, consistent decision-making. In effect any part or total waiver of such fees is a grant that becomes a cost against the rates account.

3.2. The following is a summary of the 2021-22 Annual Plan budget provision that could be drawn on for such waivers and these items have been included in the 2022/23 Annual Plan.

Category	**$2021/22**	**Comment**
C&R Fees and Charges Waivers*	25,000	Generally granted; established process
Resource and Building Consent fee waivers	27,700 for RCs in Planning; $15,000 for RCs/BCs in Greenspace	Ad-hoc requests; no established criteria; no Building Unit budget for BC waivers; decisions by staff
* As at Nov. 2021 $22,000 in fee exemptions credited with a total of 32 applications since July 2021. In comparison in November 2020 sitting at a total amount of $41,486.85 with a total of 38 applicants.		

4. ISSUES AND OPTIONS

4.1 Council practice across fee waivers for community facilities hire is subject to defined criteria and decision-making by an appointed Subcommittee of Councillors. That for building and resource consent waivers based on the above observations and discussion is quite variable.

4.2 A first step in a process of improvement, as discussed by the Council, is to more clearly define the basis for decision-making and by whom in relation to resource and building consenting fee waivers. The terms of reference for the Sub-committee that administers community facilities fee waivers provides the basis of an appropriate body to extend coverage to in relation to building and resource consent fee waivers.

4.3 An expanded terms of reference (TOR), as a ‘tracked change’ and ‘clean’ version based on the existing TOR for the Community Facilities Fee Waiver Subcommittee are attached to this report. Approval of these modifications and therefore the revised TOR to guide building and resource consent fee waivers is recommended.

4.8 It is also recommended the current Community Facilities Subcommittee members (Councillors Doody, Redmond and Brine) be reappointed to the end of the Council term. The General Managers for Planning & Regulation, and Community & Recreation, would be responsible for ensuring support for the Subcommittee, including regular monitoring of waiver (grants) expenditure.

Implications for Community Wellbeing

There are implications for community wellbeing by the issues and options that are the subject matter of this report.

Community grants in the broadest sense contribute to all four elements of community wellbeing – social, cultural, environmental and economic. In part this is reflection of the amount of funding made available, but it is also affected by the existence of good policy and practice to guide granting.

4.10 The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report.

Te Ngāi Tūāhuriri hapū have an interest in grants made by the Council and engagement with hapū representatives is a matter for the Subcommittee to consider.

5.2. Groups and Organisations

There are groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

The Subcommittee should consider what additional application form for building and resource consent fee waivers should be used, and any revised practice communicated with relevant groups and organisations.

5.3. Wider Community

The wider community is likely to be affected by, or to have an interest in the subject matter of this report.

The wider community does have an indirect interest in this matter. It is suggested this interest in any revised processes or budget amounts can be accommodated by processes relating to annual and long term plan and budget setting.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

There are financial implications of the decisions sought by this report.

This budget is included in the Annual Plan/Long Term Plan.

6.2. Sustainability and Climate Change Impacts

The recommendations in this report do have sustainability and/or climate change impacts.

Individual small grants may not have significant such impacts, but overall granting may do.

6.3 Risk Management

There are risks arising from the adoption/implementation of the recommendations in this report.

Better granting processes consistent with the best practices identified in this report reduce reputational risk and maximise the effectiveness of granting in relation to Council's strategic objectives.

6.3 Health and Safety

There are not health and safety risks arising from the adoption/implementation of the recommendations in this report.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. Authorising Legislation

Local Government Act 2002.

7.3. **Consistency with Community Outcomes**

The Council's community outcomes are relevant to the actions arising from recommendations in this report.

Potentially many of the community outcomes that are sought by the Council are relevant considerations, to varying degrees.

7.4. **Authorising Delegations**

The proposed Terms of Reference is a matter for the Council to decide.

WAIMAKARIRI DISTRICT COUNCIL

220622106354

Date: ~~1 Sept 2020~~ 5 July 2022

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TERMS OF REFERENCE
COUNCIL AND COMMITTEES

~~Community and Recreation~~Facilities and Consents Fee Waiver Subcommittee

1. KEY ROLES OF THE ~~GROUP~~SUBCOMMITTEE

a. The ~~key~~ roles of the ~~Fee Waiver~~ Subcommittee in relation to community facilities are to:

- Review fee ~~exemption~~ reduction applications from hirers of community facilities.
- Have the right to waive/amend any community facilities hire fees.
- Be involved in the review of the community facilities hire fees as part of the Council's Annual Plan/Long Term Plan consultation.

The following is taken directly from the Community Facilities Fees and Charges Policy: (Trim 190821116945)

Waiver of Charges

The Community and Recreation Committee of Council have delegated authority to approve any fee waivers and this delegation is exercised through the Facilities and Consents Fee Waiver Subcommittee.

Waiving of fees is intended to provide affordable and equitable access to community facilities. It is designed to help community groups and organisations whose goals are aligned with Council's Community Outcomes.

Requests will be considered based on the following:

- *The hirer is a 'not for profit'/charitable organisation*
- *The required space is available*
- *The community value of the activity is clearly identified*
- *The financial position of the group identifies hardship*
- *Sufficient budgeted funds are available*
- *Whether circumstances exceptional to the above apply*

Fee Waiver Funding Process

The Community and Recreation Committee has limited budgetary provision to assist groups to pay the fees for the use of Council owned facilities. This assistance may be full payment of fees or partial payment depending on the group's ability to contribute. The Committee may consider multi-year applications.

b. The role of the Subcommittee in relation to building and resource consent fees are to:

- Review fee reduction applications from building or resource consent applicants .
- Have the right to waive/amend any building or resource consent fees.
- Be involved in the review of the building and resource consent fees as part of the Council's Annual Plan/Long Term Plan consultation

TERMS OF REFERENCE
COUNCIL AND COMMITTEES

~~Community and Recreation~~Facilities and Consents Fee Waiver Subcommittee

The Council has limited funding budgetary provision for consideration of reductions in building and resource consent fees by application on an exceptions basis. It delegates authority to approve any fee waivers to the Facilities and Consents Fee Waiver Subcommittee on a case by case basis.

Waiving of fees is intended to recognise exceptional circumstances. In part it is designed to help community groups and organisations whose goals are aligned with Council's Community Outcomes.

Requests will be considered based on the following:

- The applicant/intended purpose of the development is 'not for profit'
- Sufficient budgeted funds are available
- The community value of the activity is clearly identified
- The financial position of the applicant identifies hardship
- Whether circumstances exceptional to the above apply

2. COMPOSITION OF THE SUBCOMMITTEE

2.1 Membership will consist of:

- ~~Two members of the Community and Recreation Committee~~
- The Community Facilities Portfolio Holder
- ~~The Community and Green Space Manager (ex officio)~~
- The Regulation Portfolio Holder
- One other Councillor

2.2 A quorum will be ~~75% of~~two ~~-~~members for any meetings that are required.

2.3 A Chair will be appointed by the members of the Group (by a simple majority). The Chair will be appointed annually at a meeting to be held in August each year.

2.4 Appointments of the group will be made by the ~~Community and Recreation Committee~~Council.~~.~~

3. MEETING FREQUENCY

3.1 As this group is required as demand occurs, meetings and fee waiver approvals may be via electronic email or as and when required.

4. DECISION MAKING

4.1 Decisions will, in so far as it is possible, be reached by consensus. Where this is not achievable decisions will be made by voting with a simple majority being required. The

General Managers for Community and Recreation, and Planning and Regulation will ensure support for the Subcommittee.

4.2 The Group will have the option of referring any matter to the relevant Standing Committee of Council for a decision: either District Planning & ~~Manager Community and Recreation~~Regulation or the Community and Recreation Committee. ~~of Council for a decision~~.

~~4.3 Decisions on individual fee exemption applications is delegated from the Community and Recreation Committee to the Fee Waiver Subcommittee.~~

5. TERM OF GROUP

5.1 The role of the group, its membership and Terms of Reference shall be reviewed annually at the first ~~Community and Recreation~~Council meeting of the new financial year (or sooner as directed by ~~Community and Recreation Committee~~Council) to ensure that it is functioning as was intended.

5.2 Members will be appointed for a three year term to coincide with Local Body Elections.

WAIMAKARIRI DISTRICT COUNCIL

Date: 5 July 2022
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TERMS OF REFERENCE
COUNCIL AND COMMITTEES

Facilities and Consents Fee Waiver Subcommittee

1. KEY ROLES OF THE SUBCOMMITTEE

a. The roles of the Subcommittee in relation to community facilities are to:

- Review fee reduction applications from hirers of community facilities.
- Have the right to waive/amend any community facilities hire fees.
- Be involved in the review of the community facilities hire fees as part of the Council's Annual Plan/Long Term Plan consultation.

The following is taken directly from the Community Facilities Fees and Charges Policy: (Trim 190821116945)

Waiver of Charges

The Community and Recreation Committee of Council have delegated authority to approve any fee waivers and this delegation is exercised through the Facilities and Consents Fee Waiver Subcommittee.

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Requests will be considered based on the following:

- *The hirer is 'not for profit'/charitable organisation*
- *The required space is available*
- *The community value of the activity is clearly identified*
- *The financial position of the group identifies hardship*
- *Sufficient budgeted funds are available*
- *Whether circumstances exceptional to the above apply*

Fee Waiver Funding Process

The Community and Recreation Committee has limited budgetary provision to assist groups to pay the fees for the use of Council owned facilities. This assistance may be full payment of fees or partial payment depending on the group's ability to contribute. The Committee may consider multi-year applications.

b. The role of the Subcommittee in relation to building and resource consent fees are to:

- Review fee reduction applications from building or resource consent applicants.
- Have the right to waive/amend any building or resource consent fees.
- Be involved in the review of the building and resource consent fees as part of the Council's Annual Plan/Long Term Plan consultation

The Council has limited funding budgetary provision for consideration of reductions in building and resource consent fees by application on an exceptions basis. It delegates authority to approve any fee waivers to the Facilities and Consents Fee Waiver Subcommittee on a case by case basis.

WAIMAKARIRI DISTRICT COUNCIL

TERMS OF REFERENCE
COUNCIL AND COMMITTEES

Facilities and Consents Fee Waiver Subcommittee

Waiving of fees is intended to recognise exceptional circumstances. In part it is designed to help community groups and organisations whose goals are aligned with Council's Community Outcomes.

Requests will be considered based on the following:

- The applicant/intended purpose of the development is 'not for profit'/charitable organisation.
- Sufficient budgeted funds are available.
- The community value of the activity is clearly identified.
- The financial position of the applicant identifies hardship.
- Whether circumstances exceptional to the above apply.

2. COMPOSITION OF THE SUBCOMMITTEE

2.1 Membership will consist of:

- The Community Facilities Portfolio Holder
- The Regulation Portfolio Holder
- One other Councillor

2.2 A quorum will be two members for any meetings that are required.

2.3 A Chair will be appointed by the members of the Group (by a simple majority). The Chair will be appointed annually at a meeting to be held in August each year.

2.4 Appointments of the group will be made by the Council.

3. MEETING FREQUENCY

3.1 As this group is required as demand occurs, meetings and fee waiver approvals may be via electronic email or as and when required.

4. DECISION MAKING

4.1 Decisions will, in so far as it is possible, be reached by consensus. Where this is not achievable decisions will be made by voting with a simple majority being required. The General Managers for Community and Recreation, and Planning and Regulation will ensure support for the Subcommittee.

4.2 The Group will have the option of referring any matter to the relevant Standing Committee of Council for a decision: either District Planning & Regulation or the Community and Recreation Committee.

5. TERM OF GROUP

5.1 The role of the group, its membership and Terms of Reference shall be reviewed annually at the first Council meeting of the new financial year (or sooner as directed by Council) to ensure that it is functioning as was intended.

Members will be appointed for a three year term to coincide with Local Body Elections.

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	Pol-07-02/220616103176
REPORT TO:	COUNCIL
DATE OF MEETING:	5 July 2022
AUTHOR(S):	Veronica Spittal, Senior Policy Analyst
SUBJECT:	Waimakariri District Climate Change Scenario Technical Reports
ENDORSED BY: (for Reports to Council, Committees or Boards)	General Manager / Acting Chief Executive

1. SUMMARY

1.1. This report seeks the adoption of the Waimakariri Climate Change Scenarios Technical report prepared by the National Institute of Water and Atmospheric Research Limited (NIWA) as the corporate climate projections to inform the Council's forward planning. These projections would be applied in the same way as the corporate population projections which are updated every three years for inclusion in the LTP.

1.2. The NIWA report provides two different scenarios for mid and end of century. It is recommended the Council adopts the representation concentration pathway (RCP) 8.5 scenario for the corporate climate projections as this is considered to be the most realistic scenario given the findings of the International Panel Climate Change (IPCC) sixth assessment report (AR6) released in 2021. This is consistent with the approach taken with the development of the 2021 LTP and Infrastructure Strategy and the principles set out in the Council's Climate Change Policy.

1.3. The report highlights a number of likely impacts on the social, economic, environmental and cultural wellbeing of the District and the Council is required under the *Local Government Act 2002* to address this. The office of the Auditor General has recently outlined its expectations with regard to how climate change is dealt with in the 2024 LTPs. Overall it is expected that there will be a growing maturity in the climate change content that reflects the changing operating environment. For example:

- The underlying risks and assumptions should be more mature.
- Climate change should be holistically embedded in the document rather than separated out.
- Both mitigation and adaptation should be addressed.

The NIWA technical report will enable the underlying risks and assumptions to be more evidence-based.

1.4. The climate change science points to an urgent global mitigation response over the next ten years if the world's temperature increase is to be limited to 1.5°C. Failure to do so would indicate that the more catastrophic effects of climate change will be felt within our lifetimes. Adaptation responses will be required in the District over the short, medium and longer term with timeframes depending on location and identified risk. The Strategy and Business Unit has an identified climate change work programme covering both of these aspects which it will be prioritising prior to the start of the new financial year.

Attachments:

i. Waimakariri Climate Change Scenarios Summary report No: 220608096135
ii. Waimakariri Climate Change Scenarios Technical report No: 220601093286

2. RECOMMENDATION

THAT the Council:

(a) **Receives** Report No. 220616103176.

(b) **Receives** the Waimakariri Climate Change Scenarios Summary report No. 220608096135.

(c) **Receives** the Waimakariri Climate Change Scenarios Technical report No. 220601093286.

(d) **Adopts** the NIWA climate projections for the RCP 8.5 Scenario as its baseline evidence for corporate planning, including District planning and the 2024 LTP suite of corporate documents (LTP, activity management plans and infrastructure strategy).

(e) **Notes** a video is being produced that graphically illustrates the findings of the technical report and a link to this will be advised once this project is complete.

(f) **Notes** a programme to raise whole of community awareness of these reports and the video will be developed and incorporated into the reviewed 2022/23 climate change work programme.

(g) **Circulates** this report to the Community Boards and Mahi Tahi Committee for their information.

3. BACKGROUND

3.1. In December 2021 the Council entered into a contract with NIWA to deliver the following:

- Waimakariri Climate Change Scenarios Technical Report
- Waimakariri Climate Change Scenarios Summary Report
- Waimakariri Climate Change Scenarios Summary video.

3.2. The three products were designed to stand alone but also complement, rather than duplicate, an existing technical report prepared by NIWA in February 2020 called 'Climate Change Projections in the Canterbury Region'. The technical report was to highlight any changes in climate variables specific to settlements within the Waimakariri District, and any marked differences to those predicted for the greater Canterbury Region at large.

3.3. The objectives of the project were to provide:

- Credible climate change scenario technical information for the Waimakariri District to underpin Council's strategic planning, and in particular the planned District Climate Change Risk Assessment and District Climate Change Adaptation Strategy. Other applications include informing the Council's District planning, infrastructure planning, biodiversity programme and sustainable development work.

- A public-facing summary of the technical information sufficient to inform non-technical staff, Councillors, Community Boards, businesses, groups and organisations and the public of the most significant climate changes that the District could reasonably expect to experience over the next century, and the most likely broad brush impacts of these changes.

- A short (5 minute) video suitable for informing the general public of the expected changes in climate and likely impact of these on key District activities.

3.4. The first two products have been delivered by NIWA and are the subject of this report and the video is currently on track with a due date of 30 June 2022.

3.5. The NIWA technical report is one of a suite of projects included in the Council's climate change forward work programme. This was initially developed at the 15 June 2021 meeting of the Council's Climate Change Coordination Group and further refined by the Manager, Strategic Projects, Simon Markham. This work programme was presented to a Council briefing in March 2022 and is to be reviewed prior to the start of the 2022/23 financial year.

3.6. The work programme identifies the projects the Council will need to undertake in the immediate future if it is to deliver on the objectives of its Climate Change Policy. At a presentation to the recent Taituarā Local Government Climate Change Forum the Assistant Auditor General stated that the need for climate action was becoming urgent. There had been a marked increase in maturity in the 2021 LTPs climate change narrative compared with the 2018 LTPs. In 2018 most local authorities were deferring climate change work because there was too much uncertainty and assumed climate change would not be a risk during the life of the plan. In the 2021 LTPs climate change was given greater prominence with an increasing number of Councils including targets and measures. Audit will be assessing performance in more depth in their 2022/23 performance audit, for example, looking at how many Councils have climate action plans in place. The Assistant Auditor General said climate change must be addressed as it has a real impact on Council decisions and the investments it makes and there is an expectation that an appropriate climate change response will be embedded in 2024 LTPs across all operations rather than being considered as a separate item.

3.7. The Council's Climate Change Policy was adopted by the Council on 1 December 2020 and aims to:

- Enhance the Council's preparedness to respond to climate change challenges in an appropriate, coordinated, timely, cost-effective, and equitable way.
- Enable the Council to provide transformational leadership that will ensure the long-term wellbeing, sustainability and resilience of the District's communities and businesses.
- Provide for a planned approach to mitigating and reducing emissions, including minimising activities that contribute to climate change.

4. ISSUES AND OPTIONS

4.1. The NIWA technical report summarises projected changes for 13 different climate variables over two time periods. These are mid-century (2031-2050) and end-century (2081-2100). Future changes are relative to a historic baseline for the period 1986-2005. Climate variables include air temperature, rainfall, soil moisture and potential evaporation, snow and frost, humidity, radiation and wind speed.

4.2. As climate projections depend strongly on future greenhouse gas (GHG) concentrations, the changes have also been assessed under two plausible representation concentration pathways (RCPs). These are a moderate intensity scenario (RCP4.5) and high intensity scenario (RCP8.5). The RCP 4.5 scenario could be a realistic outcome if moderate action is taken towards mitigating greenhouse gas emissions. RCP 8.5 is a high-risk scenario, with greenhouse gas concentrations increasing at the current or an elevated future rate but consistent with testing climate change responses against reasonably foreseeable circumstances in alignment with the Council's Climate change Policy and the approach adopted for flood hazard modelling to date.

4.3. The NIWA technical report is based on the IPCC Fifth Assessment Report (AR5) released in 2014. The IPCC Sixth Assessment Report (AR6) from Working Group 1 (WG1) was published in August 2021 and provides the most up to date physical understanding of the climate system and climate change. While the WG1 report is predominantly a global assessment, it does contain some Australasia climate change information, but not generally at a scale useful to the District. More detailed information on New Zealand's regional climate will be provided in an AR6 downscaling project being led by NIWA and due in 2024.

4.4. The AR6 projections present a slight increase in global warming from the AR5 but as the uncertainty ranges overlap, the AR5 findings are still relevant to be applied. Importantly, the uncertainty ranges have decreased in the AR6 meaning there is more agreement on the range of likely warming associated with future GHG concentrations. Evidence of changes in extreme weather events has strengthened since the AR5 and the findings in the AR6 further increase NIWA's confidence that extreme climatic events like extreme precipitation, drought, tropical cyclones and fire weather (hot and dry events) will increase in New Zealand due to human activities and GHG warming.

4.5. The climate change scenarios have changed from representation concentration pathways (RCPs) in the IPCC Fifth Assessment Report to Shared Socio-Economic Pathways (SSPs) in the Sixth Assessment report and are not directly comparable. This is to allow the GHG concentration scenarios used in climate modelling to originate from a more realistic array of socio-economic drivers such as population growth, technological development and economic development. The SSP storylines are *sustainability* (SSP1), *middle of the road* (SSP2), *regional rivalry* (SSP3), *inequality* (SSP4) and *fossil-fuel intensive development* (SSP5). The Council currently bases its strategic planning on RCP 8.5 and it is not recommended that this is changed to the new IPCC scenario framework until after the release of the NIWA 2024 downscaling project report referred to in section 4.3.

4.6. Key findings of the NIWA technical report contain no surprises. Annual average temperatures are expected to increase with more extreme warm temperatures, less frost days and less snow. Mean annual rainfall is predicted to increase apart from in the higher-altitude areas to the west. Despite this, the District will be likely to be more drought prone in the future as increased temperatures and wind speed cause higher evaporation. Extreme rainfall is predicted to increase as a warmer atmosphere holds more moisture. With every 1ºC of global warming the frequency of extreme weather events is predicted to increase seven fold.

4.7. Some of the impacts of these changes include more heat-related illness especially for vulnerable residents and outdoor workers, increased heat stress and mortality for livestock, more pests and diseases, loss of biodiversity, changes to seasonal snowmelt affecting water supply and more pressure on supplies due to drought, sea level rise causing coastal erosion, sea water inundation and flooding, and increased risk of wildfire. Extreme weather events could result in widespread flooding, loss of life, crops and livestock, extended power outages and property damage. Insurance could become difficult to obtain for owners of affected properties.

Implications for Community Wellbeing

There are significant implications on community wellbeing by the issues and options that are the subject matter of this report as all aspects of life rely on a thriving natural environment including physical and mental health, food and water security, culture and economy.

The latest IPCC report (AR6) identifies a mean global temperature change from the preindustrial time period (1850-1900) of 1.09ºC. This means the planet is already quite close to the Paris agreement threshold of 1.5ºC. The AR6 shows we still have a narrow window of opportunity to limit warming to 1.5ºC but only if the entire world's emissions are halved by 2030 and reach net zero by 2050. Of the scenarios considered in the AR6 report only the aggressive GHG mitigation scenario (SSP1-1.9) will more than likely not result in end of century warming of less than 1.5ºC. This scenario involves extensive net CO_2 sequestration in the second half of this century and will require rapid development and deployment of these technologies.

The decisions we make now will determine the kind of future we have. As a small nation, New Zealand's biggest impact is in showing the world that immediate and dramatic action is not only possible, but achievable.

4.8. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report. Changes to the natural environment affect Māori cultural, economic and spiritual wellbeing. Culture and customs relating to mahinga kai and urupā could be impacted by climate change. The loss of vulnerable ecosystems and species will also disturb the relationships Maori have with these living taonga.

5.2. Groups and Organisations

There are groups and organisations likely to be affected by, or to have an interest in the subject matter of this report. Primary producers operating in the District are likely to have a particular interest in the NIWA climate change projections as it will assist with their future planning, particularly in the area of risk management and adaptation. Some producer groups have commissioned NIWA to prepare climate projection reports in the absence of any other readily available data, for example, the New Zealand Winegrowers Research Centre Ltd, but the costs of commissioning such reports can be prohibitive for small operators. For this reason it is recommended that the NIWA technical report be made widely available via the Council's website and key organisations such as Federated Farmers directly notified of its existence.

5.3. Wider Community

The wider community is likely to be affected by, or to have an interest in the subject matter of this report. While 35% of respondents to the 2019 Customer Satisfaction Survey were satisfied with the way Council was responding to climate change, 22% were dissatisfied and thought that Council needed to do more in this space. The NIWA technical report provides the baseline climatic data needed to inform Council's climate change response.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

There are no financial implications of the decisions sought by this report. The contract was funded out of the Strategy and Business Centres 2021/22 operating budget and project managed in-house.

6.2. Sustainability and Climate Change Impacts

The recommendations in this report do have sustainability and/or climate change impacts as referred to elsewhere in this report.

6.3 Risk Management

There are risks arising from the adoption/implementation of the recommendations in this report. There is uncertainty around all predictions and because of the correlation between greenhouse gas concentrations and climate change, the severity of the effects change in accordance with emission levels. However, NIWA is a reputable climate science contractor and has clearly stated the limitations of the report including any assumptions made. The author concludes 'A considerable research effort has been dedicated to validating simulated climate variables, and thus the projections provide a good basis for risk assessment and adaptation plans.'

There are also risks associated with the Council not factoring climate change into its decision-making. The Assistant Auditor General stated in the previously mentioned forum that action is required even if there isn't perfect knowledge otherwise Council will not be responding appropriately to the risk. He has given a clear message that Audit is expecting the bar to be raised as more and more is learnt about the impacts of climate change on local authorities and the communities they serve. Inaction would likely result in other negative financial, political, legal and social consequences further down the track.

6.3 Health and Safety

There are no direct health and safety risks arising from the adoption/implementation of the recommendations in this report.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. Authorising Legislation

Local Government Act 2022

Section 3(d) of this Act provides for local authorities to play a broad role in promoting the social, economic, environmental, and cultural wellbeing of their communities, by taking a sustainable development approach. Section 10 (1)(b) states the purpose of local government is to promote the social, economic, environmental, and cultural wellbeing of communities in the present and for the future.

Resource Management Act 1991

A 2004 amendment to this Act requires all persons exercising powers and functions under it, in relation to managing the use, development, and protection of natural and physical resources, to have particular regard to the effects of climate change (Section 7 (i)).

7.3. Consistency with Community Outcomes

As a healthy environment is essential for wellbeing all of the Council's community outcomes are relevant to the actions arising from recommendations in this report. Those specifically impacting on climate change mitigation and adaptation are as follows:

There is a safe environment for all

- Harm to people from natural and man-made hazards is minimised
- Our District has the capacity and resilience to quickly recover from natural disasters and adapt to the effects of climate change
- Climate change challenges are addressed in an appropriate, timely, cost-effective and equitable manner.

Transport is accessible, convenient, reliable and sustainable

- Public transport serves our District effectively
- Opportunities to increase the occupancy of commuter vehicles is actively encouraged.

Indigenous flora and fauna, and their habitats, especially Significant Natural Areas, are protected and restored

- Conservation, restoration and development of significant areas of indigenous vegetation and/or habitats is actively promoted.

Core utility services are sustainable, resilient, affordable; and provided in a timely manner

- Renewable energy technologies and their efficient use is encouraged
- Climate change considerations are incorporated into all infrastructure decision-making processes
- Good procurement practice and effective long-term planning ensures services are sustainable, affordable and value for money for the community
- Infrastructure services are managed in a way that reduces emissions over time.

There is a healthy and sustainable environment for all

- Harm to the environment from the impacts of land use, use of water resources and air emissions is minimised
- The demand for water is kept to a sustainable level
- Soils are protected from erosion and unsustainable land use practices
- Low carbon, climate-resilient development in the District is promoted to be compatible with a 1.5^{o}C national and global carbon budget
- People are actively encouraged to participate in improving the health and sustainability of our environment.

7.4. Authorising Delegations

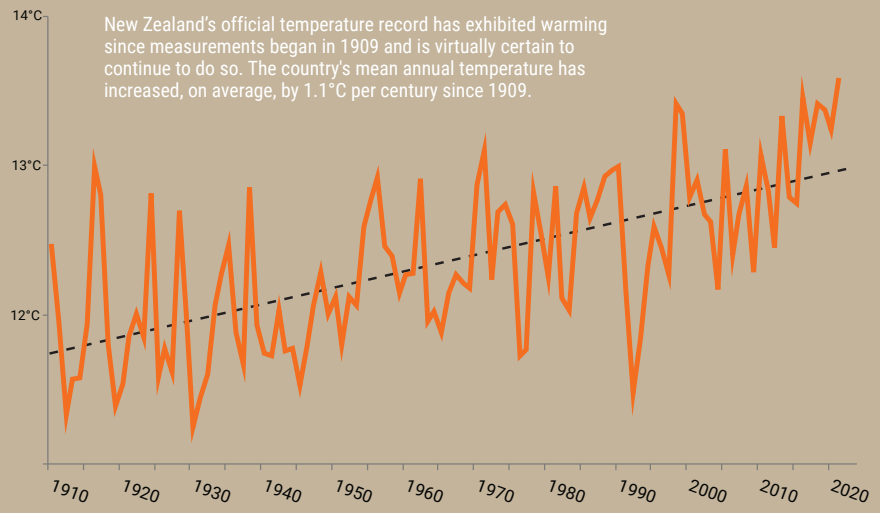
The Council has the discretion to receive/not receive the NIWA technical reports.

WAIMAKARIRI CLIMATE CHANGE SCENARIOS

From large forestry blocks, through productive farmlands, to extensive horticulture and viticulture sectors, Waimakariri District is dependent on the use of the natural environment.

As temperatures rise due to global warming, our wind, rainfall, and seasonal patterns will shift, and we will see more extreme events and unpredictability in our weather.

Climate change is already happening, and the current average temperature is about one degree higher than 100 years ago. As we head into the future it is critical to understand how our environment might change so we can prepare, find opportunities, adapt, and continue to prosper.



Assessing possible changes to the climate system is challenging because climate projections depend strongly on future greenhouse gas concentrations. Representation concentration pathways (RCPs) are scenarios that describe how greenhouse gas concentrations might change during the 21st Century. These two RCPs represent a plausible range for future global climate change.

MODERATE INTENSITY SCENARIO (RCP 4.5)

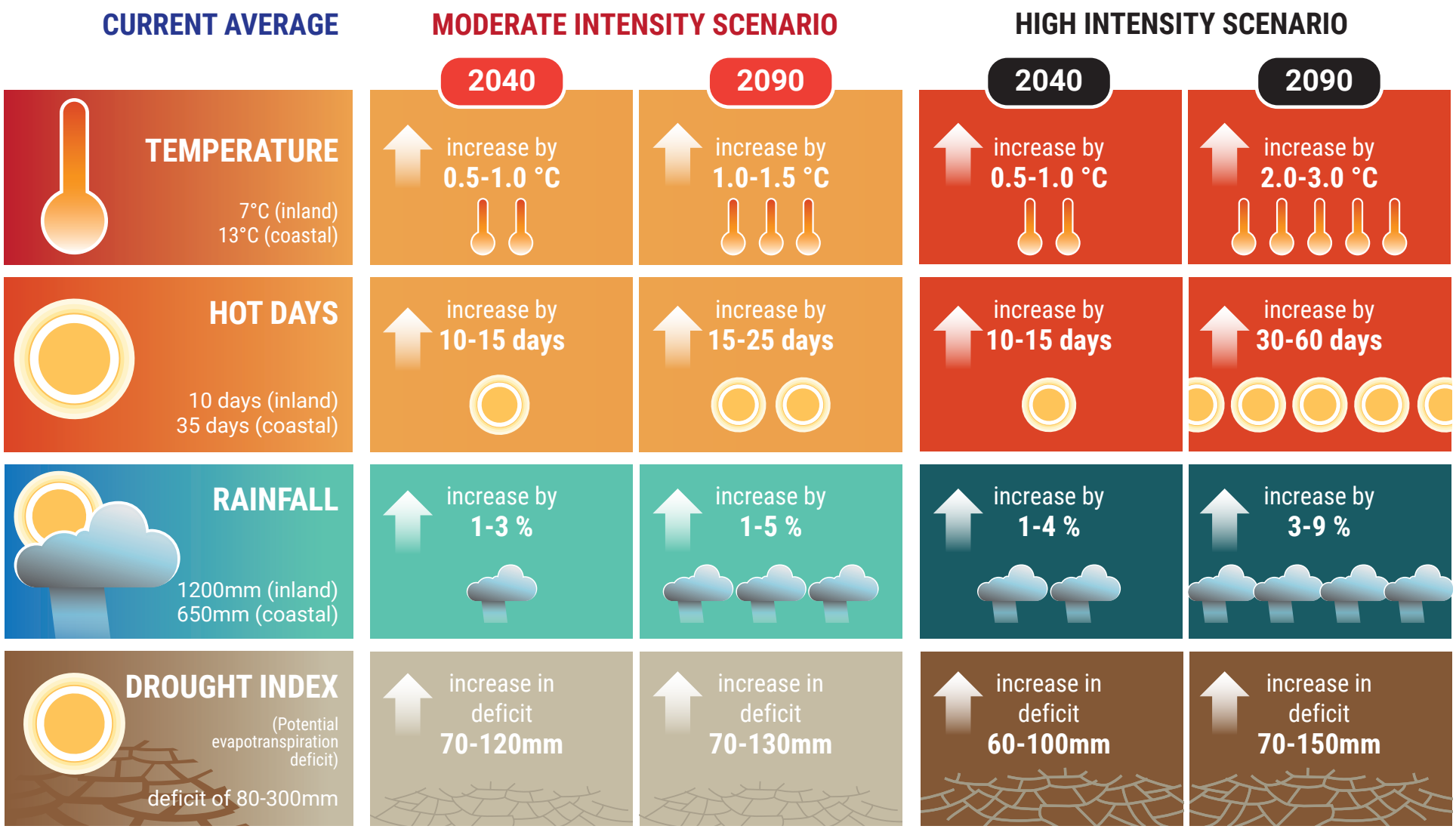
RCP4.5 is an intermediate concentration scenario that could be a realistic outcome if moderate global action is taken towards mitigating greenhouse gas emissions.

HIGH INTENSITY SCENARIO (RCP 8.5)

RCP8.5 is a high-risk scenario, with greenhouse gas concentrations increasing at the current or an elevated future rate.

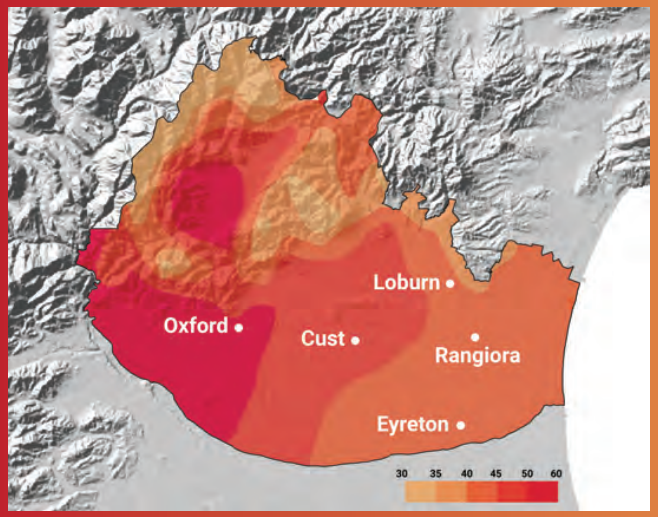
OVERVIEW

Waimakariri Climate Change Scenarios



TEMPERATURE

Increasing average temperatures means that extreme warm temperatures will be more common. By 2040, the difference in hot days (days with temperature > 25°C) between moderate and high intensity scenarios is small. However, by the end of the century, the difference between high and moderate scenarios is substantial with more than double the number of hot days under the high intensity scenario. The Lees Valley and western plains could see the largest surge in hot days by the end of century with upwards of 50 additional hot days projected per year.



Map showing the increase (compared to a recent average) in annual number of hot days expected by the end of the century under the high intensity scenario. At present inland areas experience around 10 hot days a year while coastal areas see around 35 hot days.

HOW DOES CHANGING TEMPERATURE AFFECT OUR DISTRICT?

Increase in heatwaves could bring more heat-related illness to residents of the district, especially vulnerable groups and outdoor workers. This could also cause increased heat stress and mortality for livestock animals

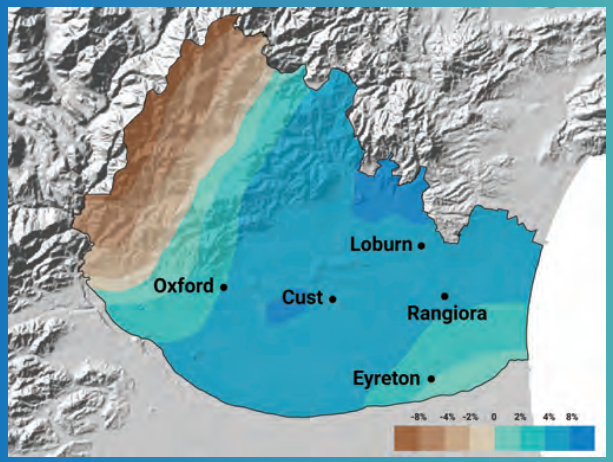
Warmer temperatures could also enhance the risk of pests and diseases that impact primary industries. Some pests and diseases normally wiped out by cooler winter temperatures may be able to persist and spread. Animals and plants living in higher elevation areas may be affected by new pests as temperatures warm and snowlines rise.

Projections suggest warming could be enhanced in the district's ecologically sensitive alpine areas and snow days will be reduced. Changes to the seasonal timing of snowmelt will likely affect water supply to downstream communities and use by the primary sector. Warmer temperatures could also adversely affect the district's sensitive waterways, such as Ashley/Rakahuri estuarine ecological area. These areas hold significant cultural and recreation value to local residents.

RAINFALL

Changes to yearly rainfall totals are expected to follow an east-to-west gradient, with increasing rainfall across the plains and coastal areas, and no change (or a slight decrease) in the high-altitude regions and Lees Valley. The southern edge of the district may experience 12% more rainfall annually under the high intensity scenario. Despite increased annual rainfall, drought intensity may increase throughout the district as a warmer atmosphere dries the land. Droughts are expected to become more severe and last for longer periods.

A warmer atmosphere can hold more moisture and therefore more frequent and intense rainfall events are expected in the future. It's likely that shorter duration extreme rainfall events (e.g., thunderstorms) will experience a greater intensity increase than longer-lived rainfall events. Historically, a 1-in-100 year rainfall event of 1 hour duration brings 33mm of rain in Rangiora. By the end of the century, under the high intensity scenario, this could increase to 44mm.



Map showing the change in annual number of dry days (days with less than 1mm of rain) expected by the end of the century under the high intensity scenario. Similar to the projected change to annual rainfall, changes in dry days will follow an east west gradient with slight increases in dry days in the upper high elevation areas and decreases in dry days in the lowland and coastal areas.

WAIMAKARIRI DISTRICT COUNCIL

NIWA Taihoro Nukurangi

HOW DOES CHANGING RAINFALL AFFECT OUR DISTRICT?

Flooding will continue to be an issue in the district particularly for primary sector activities located near the district's larger rivers, such as the Ashley/Rakahuri and Waimakariri or in areas experiencing considerable amounts of rainfall.

More frequent and intense storms could result in loss of life, crops, livestock, extended power outages and property damage. Insurance may increasingly become an issue for owners of affected properties.

Evaporation and transpiration are expected to increase throughout the Waimakariri District in the future, suggesting the district will likely become more drought prone. This will have an impact on water sensitive activities and industries. It could mean that there is more pressure on all freshwater uses, including irrigation.

Increased drought frequency, and associated increases in vegetation drying, more thunderstorms and lightning combined with warmer temperatures are expected to contribute to an increased fire risk in the future. Damaging wildfires that could negatively impact forestry, biodiversity, agriculture, and private property could become more prevalent across the district in future.

WAIMAKARIRI DISTRICT COUNCIL

NIWA Taihoro Nukurangi

NATURAL ENVIRONMENT IMPACTS

Many of Aotearoa New Zealand's indigenous plants and wildlife exist nowhere else on earth. Our ecosystems and species therefore make a significant contribution to global biodiversity. All aspects of life rely on a thriving natural environment including physical and mental health, food and water security, culture and economy. The natural environment also contributes to climate resilience by absorbing carbon.

The current biodiversity crisis and climate crisis have been acknowledged to be closely linked. Wetlands, native forest and rare species such as the Tawera mud fish and Canterbury Pink Broom are particularly at risk in the district.

CULTURAL IMPACTS

Changes to the natural environment affect Māori cultural, economic and spiritual wellbeing. Culture and customs relating to mahinga kai (food gathering) and urupā (burial grounds) could be impacted. The loss of vulnerable ecosystems and species will also disturb the relationships Māori have with these living taonga (treasure).

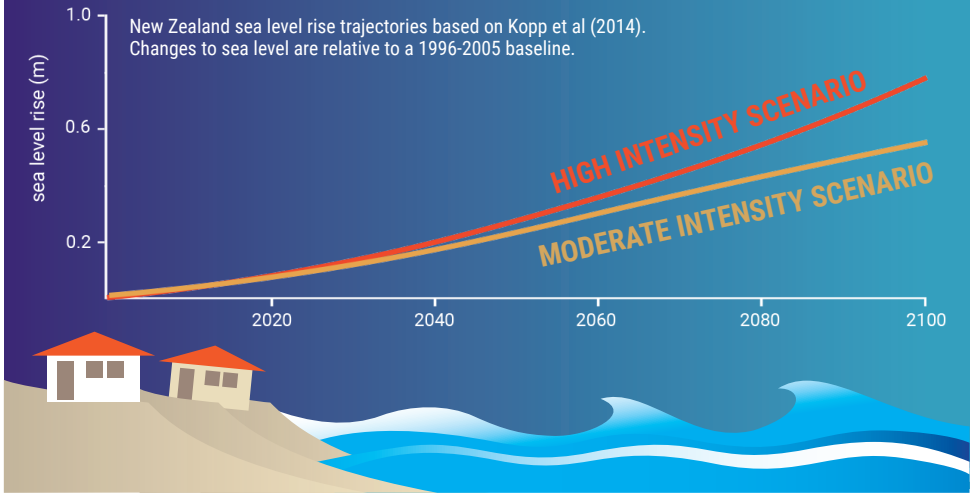
The information presented here is a summary of the "Climate Change Scenarios Technical Report". The report was prepared by NIWA for the Waimakariri District Council. A video summarising the findings and the full technical report can be found at: **www.waimakariri.govt.nz/climate**

Waimakariri Climate Change Scenarios

SEA-LEVEL RISE

Sea-level rise is triggered by melting of the polar ice caps, and the thermal expansion of ocean as water warms. In New Zealand, the sea may rise by up to a metre by the end of the century. There are several growing settlements located in the Waimakariri District that are located along the coastline, so sea-level rise could directly impact those living in the coastal zone.

Slow incremental changes will occur alongside an increased frequency and magnitude of extreme sea-level events. Coastal erosion and flooding can damage homes, roads and other infrastructure and affect access to coastal areas. Rising sea levels also threaten important coastal ecosystems such as the Ashley/Rakahuri estuarine system which is an important feeding, roosting and breeding ground for a large number of native birds, including threatened and critically endangered species.



NIWA
Taihoro Nukurangi

Waimakariri District Climate Change Scenario: Technical Report

Prepared for Waimakariri District Council

May 2022

Climate, Freshwater & Ocean Science

Prepared by:
Ashley Broadbent
Abha Sood
Stephen Stuart
Gregor Macara
Christian Zammit

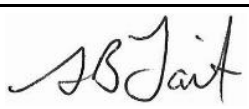
For any information regarding this report please contact:
Ashley Broadbent, PhD
+64-4-386 0383
ashley.broadbent@niwa.co.nz

National Institute
of Water & Atmospheric
Research Ltd (NIWA)

301 Evans Bay Parade
Hataitai
Wellington 6021
Private Bag 14901
Kilbirnie
Wellington 6241

Phone +64 4 386 0300

NIWA CLIENT REPORT No: 2022095WN
Report date: May 2022
NIWA Project: WDC22301

Quality Assurance Statement		
	Reviewed by:	Petra Pearce
	Formatting checked by:	Alex Quigley
	Approved for release by:	Andrew Tait Chief Scientist – Climate, Atmosphere and Hazards

Contents

Tables

Figures

Executive summary

It is widely accepted that human activities are the main cause of observable contemporary global climate change, and that further changes to the climate will occur during the 21st Century due to ongoing greenhouse gas emissions to the atmosphere. Waimakariri District Council has commissioned NIWA to analyse projected climate changes for the district and provide a summary of potential impacts of climate change for the region. This report summarises projected changes for 13 different climate variables for mid-century (2031-2050) and end-century (2081-2100) time slices. Future changes to climate variables are presented as changes relative to a historical baseline period (1986-2005) for two greenhouse gas (GHG) concentration scenarios: a moderate GHG scenario (RCP4.5) and a high GHG scenario (RCP8.5). Potential climate change impacts on important sectors in the district are discussed but a detailed climate impact assessment was not completed.

Future climate changes are likely to be significant and could impact the entire Waimakariri District. For the moderate GHG scenario, the district's average air temperature is expected to increase by 0.8 °C by the mid-century and 1.2 °C by the end-century. However, for a high GHG scenario, the district's average air temperature could increase by 0.9 °C by the mid-century and 2.4 °C by the end-century. The high GHG scenario causes twice as much end-century warming in the district than the moderate GHG scenario. This highlights the uncertainty generated by the differing impacts of GHG concentrations at the end of the century.

Changes to extreme temperatures are likely, with the number of hot days (days > 25°C) in the district projected to double by the end-century under a moderate GHG scenario and more than triple under a high concentration GHG scenario. The mean annual rainfall is projected to increase across most of the district under both GHG concentration scenarios. The general trend in precipitation change within the district will follow an east-to-west gradient, with projected increased rainfall across the lower altitude plains and coastal areas, and slight decreases (or no change) in rainfall in the western high-altitude regions east of the main divide. The lower elevations could experience 12% more rainfall annually under the high intensity GHG scenario. The district is projected to experience a relatively consistent increase in rainfall across all seasons, except spring when decreased rainfall is projected in some scenarios.

Extreme rainfall intensity is likely to increase in the Waimakariri District because a warmer atmosphere can hold more moisture. In addition, the district is projected to experience a widespread increase in potential evaporation deficit – a drought indicator – suggesting the district will likely become more drought prone in the future as temperatures increase and precipitation changes. Wind speed is generally projected to increase and relative humidity to decrease as the climate warms during the 21st century.

Climatic changes in the region will likely result in changes to river flow in the Ashley/Rakahuri and Waimakariri catchments with decreasing low flows and increasing high flows projected. Climate changes in the regions will likely have a broad range of impacts; the most relevant impacts based on the profile of the district and climate changes expected are possible increases in river flooding, drought, coastal inundation and flooding, and wildfire. In addition to these impacts, some possible effects on primary industries are explored given the importance of this sector for the district.

1 Introduction

According to the Intergovernmental Panel on Climate Change (IPCC) sixth Assessment Report (AR6), it is now unequivocal that human activities have warmed the atmosphere, ocean, and land.

Global climatic warming has accelerated in the last 50 years with each of the last four decades being successively warmer than any decade that preceded it since 1850 (IPCC, 2021). New Zealand's official temperature record has exhibited warming since measurements began in 1909 and is virtually certain to continue to do so. The country's mean annual temperature has increased, on average, by 1.1 °C per century since 1909 (Figure 1-1). In addition to rising average temperatures, climate change may increase the frequency and intensity of hot extremes, marine heatwaves, heavy precipitation, damaging storms, and droughts, as well as melting glaciers, ice, and snow cover, and causing sea level rise (IPCC, 2013; IPCC, 2021). Understanding the nature of New Zealand's changing climate and its potential impacts at local scales is critical to developing successful adaptation planning, policy, and interventions.

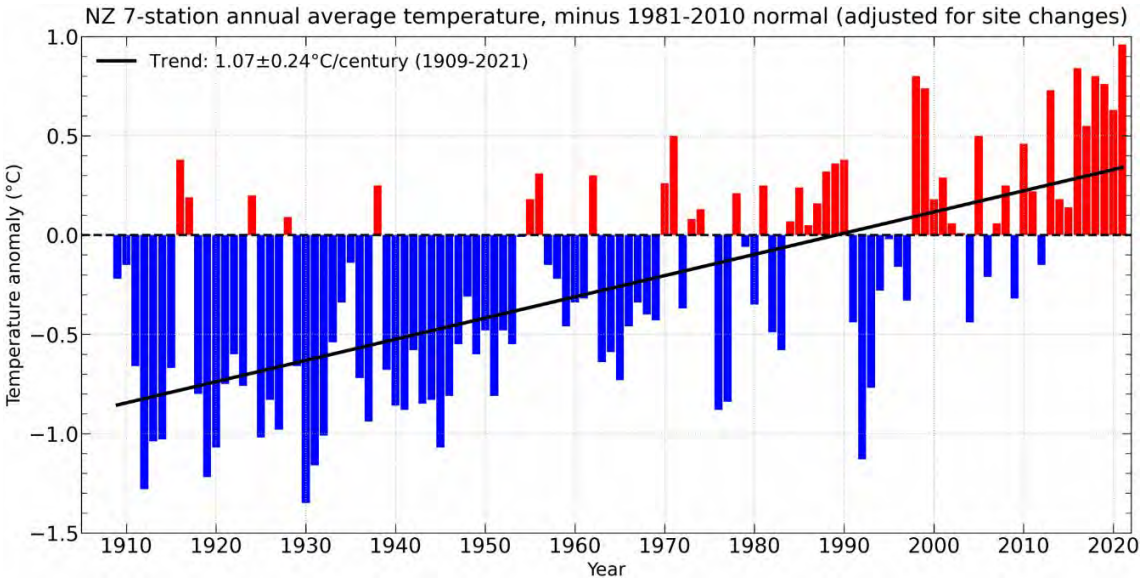


Figure 1-1: New Zealand temperature anomaly timeseries for 1909-2019. More information about the New Zealand seven-station temperature series can be found at https://niwa.co.nz/seven-stations.

Waimakariri District Council (WDC) has commissioned the National Institute of Water and Atmospheric Research (NIWA) to undertake a climate change technical report for the Waimakariri District. The report will underpin WDC's strategic planning, including a forthcoming Climate Change Risk Assessment and Climate Change Adaptation Strategy. This report is based on an earlier NIWA report examining climate change projections and impacts for the greater Canterbury Region (Macara et al., 2020). Following the publication of that report, WDC has requested an additional condensed report focussing exclusively on the climate change projections for the district. This work follows the IPCC AR6, which was published in 2021. However, NIWA has not completed regional climate projections for the AR6 and the climate projections used here are based on the IPCC Fifth Assessment Report (AR5) (IPCC, 2014). The contents of this report include analysis of climate projections for the Waimakariri District in greater detail than the Canterbury regional scale analysis.

District-scale climate projection maps have been provided for 13 different climate variables and indices. This report focuses on the changes that are likely to occur over the 21st Century to the climate of the Waimakariri District. Climatic variables covered here include air temperature, rainfall, soil moisture deficit, potential evapotranspiration deficit (a measure of drought), wind speed, solar radiation, and relative humidity. A brief commentary on climate change impacts and possible implications for the district is provided, but no formal impact and risk analyses were conducted. The report was prepared with consideration given to how findings of the report can be directly applied to a forthcoming WDC risk assessment. For more information about the wider Canterbury Region and a detailed summary of historical and future climate please see the Environment Canterbury Climate Change report (Macara et al., 2020; available here).

2 Methodology

This section outlines abridged methodological information intended to contextualise the information provided in the report. This section will outline the following: 1) representative concentration pathways, 2) modelling methodology overview, 3) how the climate maps and tabulated climate projections in this report were derived, and 4) limitations on the data presented. For a more detailed summary of climate projections and associated limitations, refer to the Ministry for the Environment climate change projections summary report (MfE, 2018; accessible here).

2.1 Representative Concentration Pathways

Assessing changes to climate due to human activity is challenging because climate projections depend strongly on future greenhouse gas concentrations. Representative concentration pathways (RCPs) are scenarios (used by the IPCC and climate scientists) that describe how atmospheric greenhouse gas (GHG) concentrations might change during the 21st Century. In this report, for brevity, we present climate projections for two commonly used RCPs: the RCP4.5 and RCP8.5 scenarios. RCP4.5 represents a moderate scenario with some stabilisation (mitigation) of GHG concentrations during the 21st Century, whereas RCP8.5 is a high-intensity scenario with no stabilisation of future GHG concentrations. RCP8.5 is a high-risk scenario, with GHG concentrations increasing at the current or an elevated future rate. The RCP8.5 projections serve the purpose of defining the likely "upper limit" of future climate warming, representing high-risk climate changes and impacts. RCP4.5 is an intermediate concentration scenario that could be a realistic outcome if global action is taken towards mitigating greenhouse gas emissions during the 21st Century. These two RCPs represent a plausible range for future global climate change. For a full summary of climate changes resulting from four separate RCPs see the full Environment Canterbury Climate Change report (Macara et al., 2020). Table 2-1 summarises IPCC AR5 projections of global mean surface air temperature change for four separate RCPs including the two covered in this report.

Note that the most recent IPCC report (AR6) has adopted Shared Socio-Economic Pathways (SSPs), which are narratives describing different global-scale socio-economic development paths that could occur. Regional climate change projections of New Zealand using the AR6 SSPs have not yet been completed but work on these is underway at NIWA (due for completion in 2024). The AR6 SSP2-4.5 and SSP5-8.5 scenarios are broadly comparable with AR5 RCP4.5 and RCP8.5 scenarios. A short commentary on the implications of AR6 for the district are provided in Section 9.

Table 2-1: Projected change in global mean surface air temperature for the mid- and late- 21st Century relative to the reference period of 1986-2005 for different RCPs. After IPCC (2014).

Scenario	2046-2065 (mid-century)		2081-2100 (end-century)	
	Mean	Likely range	Mean	Likely range
RCP2.6	1.0 °C	0.4 to 1.6 °C	1.0 °C	0.3 to 1.7 °C
RCP4.5	1.4 °C	0.9 to 2.0 °C	1.8 °C	1.1 to 2.6 °C
RCP6.0	1.3 °C	0.8 to 1.8 °C	2.2 °C	1.4 to 3.1 °C
RCP8.5	2.0 °C	1.4 to 2.6 °C	3.7 °C	2.6 to 4.0 °C

2.2 Modelling methodology

Climate information specific to the Waimakariri District is based on national scale climate modelling first published in 2016 by NIWA (MfE, 2018). These data were generated by "dynamic downscaling" of global climate model simulations referenced in the IPCC AR5. Dynamic downscaling is the process of running Regional Climate Models (RCM) on the "regional scale" (e.g., 30 km horizontal) using lateral boundary conditions taken from global climate projections at coarse resolution (e.g., 200 km). NIWA's regional climate projections of air temperature and rainfall have subsequently been bias-corrected (Sood, 2014) and all climate variables have been further downscaled to the Virtual Climate Station Network (VCSN) resolution of 5 km using physics-based semi-empirical methods (See Figure 2-1 for a graphical summary of the modelling methodology).

This dynamical downscaling method was completed with six different global climate models from the IPCC AR5. All projections presented in this report are the ensemble average of the six downscaled models. Although we focus on ensemble averages in this report, it is important to understand the uncertainty associated with dynamically downscaling different global climate model simulations and we have provided a discussion of model spread and uncertainty in Section 5. Finally, for more information on modelling methodology, please refer to NIWA's regional climate projections summary report prepared for the Ministry of the Environment (MfE, 2018).

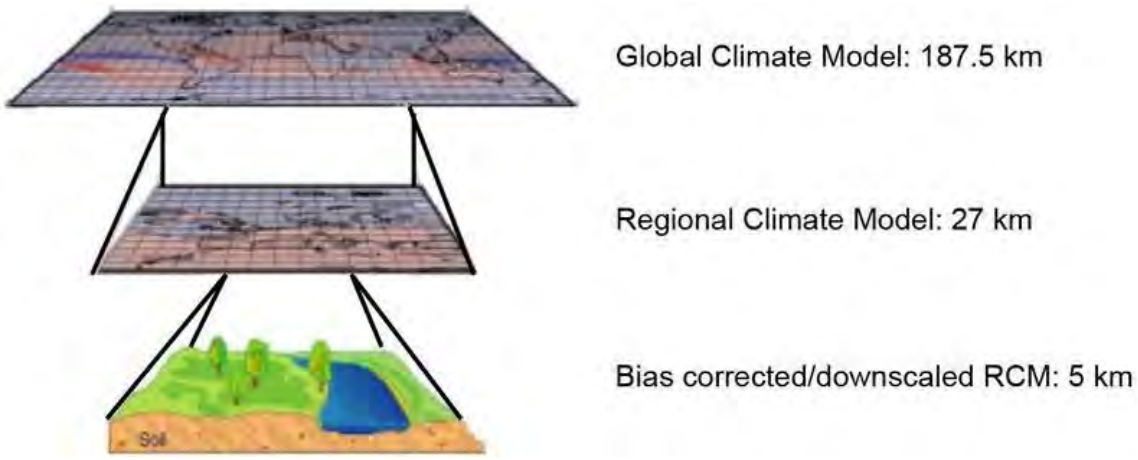


Figure 2-1: Summary of NIWA regional climate modelling methodology (Pearce et al., 2018).

2.3 Climate maps and data tabulation

The climate projections presented here are based on the same model data that were presented in the Environment Canterbury commissioned report entitled Climate Change projections for the Canterbury Region (Macara et al., 2020). This report focusses on the Waimakariri District, with climate maps produced in a way which improves visualisation of relevant variables for the district. Dynamically downscaled climate projection data are presented as 5 km x 5 km grid squares over New Zealand's land area. In some instances, where grid squares cover land and ocean, NIWA has undertaken interpolation to extend the climate projections to the coast. Nearest neighbour interpolation method was used to do this, meaning that the value of the empty coastal grid square was calculated using the value of the nearest neighbouring cells. The values at these locations are estimates generated simply for presentation purposes (i.e. not a direct output of the climate change model).

For each climate variable, we have provided summary tables to present an overview of the projected changes across sub-districts within the Waimakariri District. Additionally, in Appendix C, we provide seasonal breakdowns of projected changes in each climate variable. Changes in climate variables are calculated for two time periods – referred to as "mid-century" (2031-2050) and "end-century" (2081-2100) – relative to the 1986-2005 baseline period. These time periods are consistent with those used in the IPCC AR5. The mean changes in climate variables across three sub-district zones (shown in Figure 2-2) are provided. These sub-district scale zones include upper high elevation regions (referred to as "Upper"), lower elevation inland plains (referred to as "Inland"), and the coastal zone (referred to as "Coastal")**.** Readers of this report are referred to the limitations associated with the interpretation of data in this report found in Section 2.4. Finally, please note that the legend increments for many of the maps presented in this report are not linear. This was done to ensure the variability across the district is clearly shown.

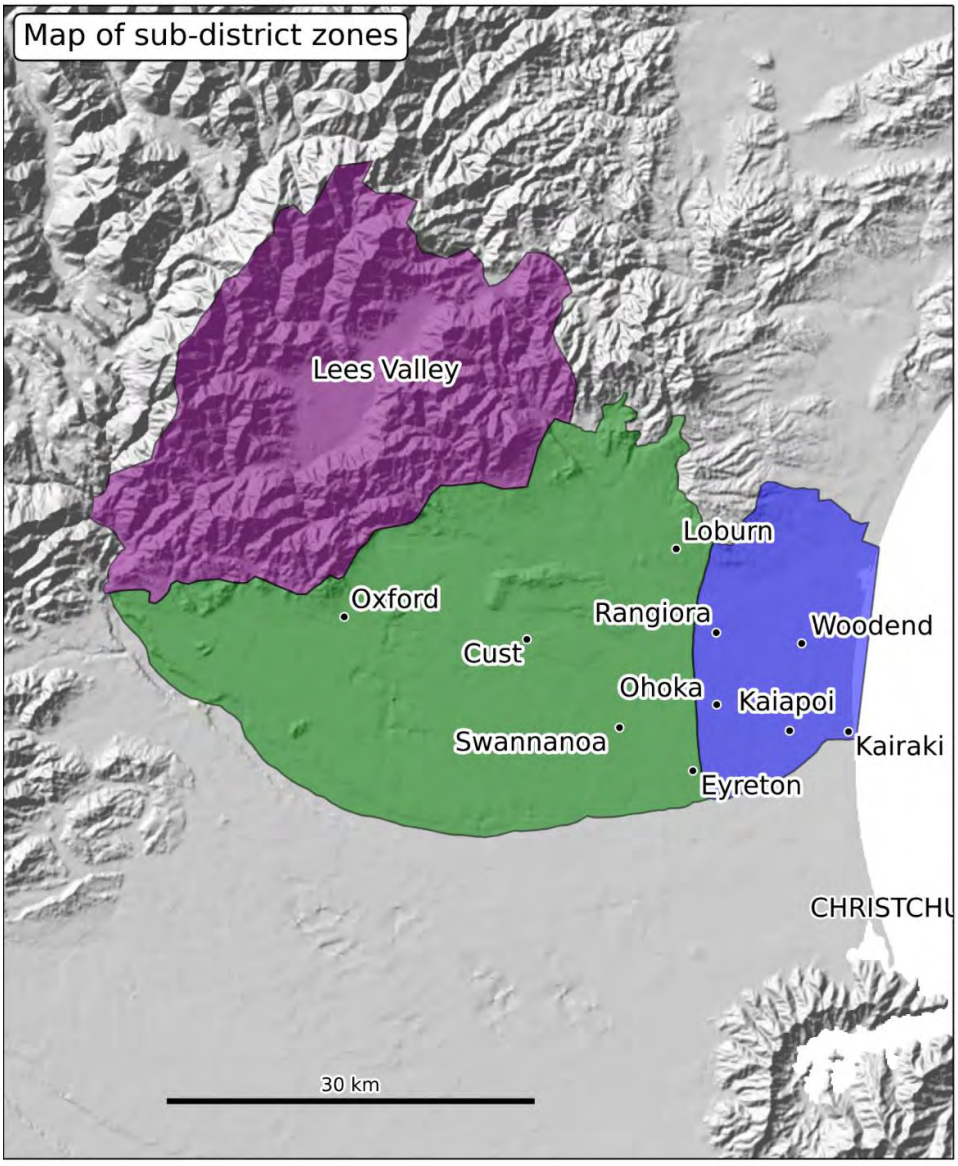


Figure 2-2: Map of sub-regional zones in Waimakariri District. Purple = "Upper", Green = "Inland", and blue = "Coastal".

2.4 Limitations

The reader should consider the following limitations and caveats when interpreting and using this report. Regional climate simulations were derived from a relatively small subset (6) of AR5 global climate model simulations due to the large computing resources required to run climate simulations. However, these six global models were carefully selected such that the historic New Zealand climate is well represented, and they span a wide range of future outcomes. The average of the six downscaled global models is used in this report; however, data from individual models is available for further assessment if required.

The time slices chosen for historical and future periods in this report are 20-years in length; this is a relatively short timeframe from a climate perspective, to capture climatologically representative conditions in the historic period and in the future periods, as there is likely an influence of underlying climate variability (e.g. decadal scale signals from climate drivers like the Interdecadal Pacific Oscillation). However, as climate data is subject to significant trends, a short period is more homogenous and representative. Moreover, the IPCC uses 20-year periods, so we have followed that approach for consistency.

Care needs to be taken when interpreting grid-point-scale projections. The data have been bias-corrected, downscaled and interpolated from the 30 km regional climate model grid to the 5 km VCSN grid across New Zealand using physically based models and interpolation (Sood, 2014). **The regional climate model bias correction and further downscaling can broadly represent the role of the Southern Alps in blocking rainfall from the Tasman Sea, and the maritime influence of the sea on temperature indices**.

Additionally, when interpreting model outputs, it is more appropriate to consider relative patterns rather than absolute values, e.g. the magnitude of change at different time periods is primarily referred to in this report. Although there are some limitations and caveats in the approach used here, considerable effort has been made to generate physically consistent climate change projections for the Waimakariri District at unprecedented temporal and spatial resolutions. **A considerable research effort has also been dedicated to validating simulated climate variables, and thus the projections provide a good basis for risk assessments and adaptation plans.**

3 Climate of Waimakariri District

Here we provide a short summary of the historical climate of the Waimakariri District. The purpose of this summary is to provide contextual information for the following technical report. For more detailed information on the historical climate of Canterbury please see the Environment Canterbury Report (Macara et al., 2020) or NIWA's summary report on the Climate and Weather of Canterbury (Macara, 2016; see here).

The Waimakariri District's climate can be broadly classified as a *Temperate Oceanic Climate,* meaning that the climate is temperate, with no dry season and a relatively warm summer. The high-altitude regions in the western parts of the district are cooler than the inland and coastal plains. These high elevation regions also receive more rainfall, snow, and frosts than the lower elevation plains of the district. Summary maps of historical climate data from model simulations are provided in Appendix A.

The district receives year-round precipitation with no strong seasonal trends. However, there is a notable difference in annual rainfall totals recorded throughout the region, with coastal areas (~680 mm annual rainfall) drier than the inland (~860 mm annual rainfall) and upper (~1020 mm annual rainfall) areas. The wetter upper part of the district also receives fewer dry days (~219 dry days per year) than the coastal zone (~263 dry days).

Weather within the district is influenced by the presence of the Southern Alps and the ocean. For example, the Southern Alps form a barrier to rain-bearing systems arriving from the west. During such events, there can be spill over rainfall that reaches western parts of the Waimakariri District region, but eastern areas towards the coast typically remain dry. The Southern Alps contribute to the development of Foehn winds. In the Waimakariri District, these winds are characterised by moderate to strong northwest winds and warm temperatures, and they are often accompanied by a *Norwest Arch* lenticular cloud formation overhead.

The ocean acts as a moderating influence on the intensity of air temperatures observed in the Waimakariri District. As a result, average winter daily minimum temperatures at coastal areas (~2.3°C) are higher than those at inland areas (~1.2°C). This is also reflected in average annual frost days, where coastal areas observe approximately 26 frost days, compared to 35 frost days at inland areas. The average summer daily maximum temperature for much of the Waimakariri District is 22.0°C, with inland and coastal areas averaging 30-32 hot days annually, while high elevation regions experience far fewer hot days (~16 hot days annually).

4 Future climate of the Waimakariri District

In this section we focus on the projected changes in a range of climate variables. Projected changes will be given for the mid-century (2031-2050) and end-century (2081-2100) time periods relative to the historical period (1986-2005). Each sub-section is structured around four key questions:

- *How much will [climate variable] change in the district?*
- *What parts of the district can expect the largest changes in [climate variable]?*
- *What is the difference in projected [climate variable] for the high concentration and moderate concentration GHG scenarios?*
- *Are there any noteworthy seasonal changes in [climate variable]?*

4.1 Air temperature

This report will consider four separate measures of air temperature:

1. The *mean air temperature* (the average temperature of air during a given time period).
2. The *mean minimum temperature*, which is the average of the daily minimum temperatures ("mean daily low").
3. The *mean maximum temperature,* which is the average of the daily maximum temperatures ("mean daily high").
4. "Hot days" defined as days where the maximum air temperature exceeds 25 °C.

4.1.1 Mean air temperature

- Mid-century mean air temperature is projected to increase by 0.8 °C (RCP4.5) to 0.9 °C (RCP8.5).
- End-century mean air temperature is projected to increase by 1.2 °C (RCP4.5) to 2.4 °C (RCP8.5) – end-century air temperature will strongly depend on GHG scenario.
- Largest increase in mean air temperature is projected in high-elevation regions.
- Changes in mean temperature are projected to be uniform across seasons.

How much will mean air temperature change in the district?

The mean mid-century air temperature in the district is predicted to increase by 0.8 °C for the moderate GHG concentration scenario and 0.9 °C for the high concentration GHG scenario. By the end of the century, mean air temperature in the district is predicted to increase by 1.2 °C for the moderate GHG concentration scenario and 2.4 °C for the high concentration GHG scenario (see district average changes in bottom row of Table 4-1).

Table 4-1: Overview of projected changes in daily mean temperature (°C) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	**0.8**	**1.3**	**0.5**	**0.9**	**2.5**	**1.6**	**0.1**	**1.3**
COAST	**0.7**	**1.2**	**0.4**	**0.8**	**2.4**	**1.5**	**0.1**	**1.2**
INLAND	**0.7**	**1.2**	**0.4**	**0.8**	**2.4**	**1.5**	**0.1**	**1.2**
DISTRICT	**0.8**	**1.2**	**0.4**	**0.9**	**2.4**	**1.6**	**0.1**	**1.2**

† = "50-yr change" is the projected change in average daily mean temperature for a given GHG scenario between end-century and mid-century time periods (i.e., how will average daily mean temperature change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected average daily mean temperature between high and moderate GHG concentration scenarios (what is the difference in projected average daily mean temperature for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in mean air temperature?

Shown in Table 4-1 are the projected changes in mean air temperature for the three sub-district zones. The projected increase in mean air temperature (°C) is spatially consistent within the Waimakariri District for the future time periods/GHG concentration scenarios (see Figure 4-1). Meaning that regions and settlements within the district are expected to see very similar changes in mean air temperature. These changes are consistent at the annual and seasonal time scales implying that **approximately uniform changes in air temperature are predicted across the district** and throughout the year (see Table C-1 for a seasonal summary of projected changes in air temperature). The only regional pattern worth mentioning here is that **the highest altitude regions of the district are predicted to see the largest air temperature increase with 0.5 °C more warming predicted in the mountains than the lowland plains for the high GHGs scenario**. This high-altitude warming is broadly consistent with enhanced warming trends expected throughout New Zealand's high elevation regions due to reduced snow cover.

What is the difference in projected mean temperature for the high concentration and moderate concentration GHG scenarios?

Predicted temperature changes for moderate vs. high GHG concentrations are comparable at mid-century – meaning **decision-makers can be more confident in mid-century temperature predictions**, regardless of the profile of future GHG concentration. However, this is not the case for end-of-century wherein the difference in predicted mean temperature due to high and low GHG concentration scenarios could become large. For example, **by the end of century, the district could expect an additional 1.2 ˚C of warming under the high GHG concentration scenario as compared to moderate GHG emissions** (as shown by the difference between the two right-hand panels in Figure 4-1).

Are there any noteworthy seasonal changes in mean air temperature?

The projected changes in mean air temperature in the Waimakariri District are consistent across all seasons and GHG concentration scenarios. See Table C-1 for a full breakdown.

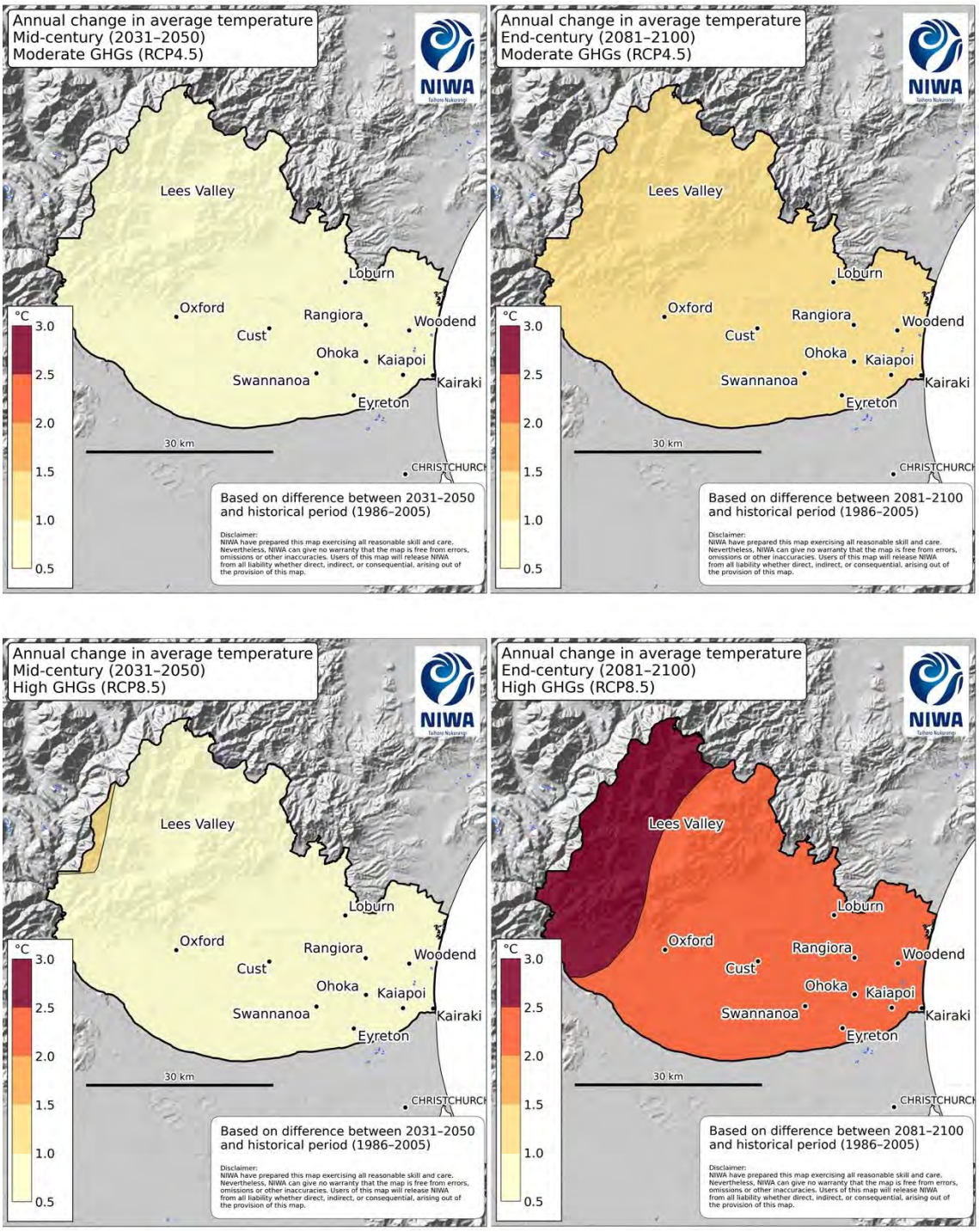


Figure 4-1: Projected changes in average daily mean air temperature (°C) for Waimakariri District.
Projected changes are relative to the historic period (1986-2005).

4.1.2 Mean minimum air temperature

- Mid-century mean minimum air temperature is projected to increase by 0.5 °C for both GHG concentration scenarios.
- End-century mean minimum air temperature is projected to increase by 0.8 °C (RCP4.5) to 1.6 °C (RCP8.5).
- Changes in mean minimum air temperature are largely uniform across the district.

How much will mean minimum air temperature change in the district?

The mean minimum mid-century air temperature in the district is likely to increase in the future but by less than the mean air temperature. Warmer mean minimum air temperature suggests night-time temperatures in the district will increase as the climate warms. The district mean minimum mid-century air temperature is projected to increase by 0.5 °C for the moderate GHG concentration scenario and also 0.5 °C for the high concentration GHG scenario. By the end of the century, mean minimum air temperature in the district is predicted to increase by 0.8 °C for the moderate GHG concentration scenario and 1.6 °C for the high concentration GHG scenario (Table 4-2).

Table 4-2: Overview of projected changes in average daily minimum temperature (°C) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	**0.5**	**0.8**	**0.3**	**0.5**	**1.5**	**1.0**	**0.1**	**0.7**
COAST	**0.5**	**0.8**	**0.3**	**0.6**	**1.7**	**1.1**	**0.1**	**0.8**
INLAND	**0.5**	**0.8**	**0.3**	**0.6**	**1.6**	**1.0**	**0.1**	**0.8**
DISTRICT	**0.5**	**0.8**	**0.3**	**0.6**	**1.6**	**1.0**	**0.1**	**0.8**

† = "50-yr change" is the projected change in average daily minimum temperature for a given GHG scenario between end-century and mid-century time periods (i.e., how will average daily minimum temperature change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected average daily minimum temperature between high and moderate GHG concentration scenarios (what is the difference in projected average daily minimum temperature for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in mean minimum air temperature?

The projected increase in mean minimum air temperature (°C) is essentially consistent across the Waimakariri District (Figure B-1 in Appendix B).

What is the difference in projected daily mean minimum temperature for the high concentration and moderate concentration GHG scenarios?

Much like the mean air temperature the mean minimum air temperature changes for moderate vs. high GHG concentrations are similar for the mid-century time period. Yet, this is not the case for end-of-century wherein the difference in projected mean minimum air temperature due to high and low GHG concentration scenarios could be up to 0.8 °C for the district (see Table 4-2).

Are there any noteworthy seasonal changes in mean minimum air temperature?

The projected changes in mean minimum air temperature are consistent across the seasons.

4.1.3 Mean maximum air temperature

- Mid-century mean maximum air temperature is projected to increase by 1.0 °C (RCP4.5) to 1.2 °C (RCP8.5).
- End-century mean maximum air temperature is projected to increase by 1.6 °C (RCP4.5) to 3.3 °C (RCP8.5).
- The upper high elevation regions could experience the largest increase in maximum air temperature in the district.
- Changes in mean maximum air temperature are projected to be uniform across seasons.

How much will mean maximum air temperature change in the district?

The mean maximum air temperature is projected to increase by more than the mean and minimum air temperature**. This implies that the largest absolute change to the daily profile of air temperature could be reflected in higher daytime temperatures in the district**. The mean maximum mid-century air temperature in the district is predicted to increase by 1.0 °C for the moderate GHG concentration scenario and 1.2 °C for the high concentration GHG scenario. By the end of the century, mean maximum air temperature in the district is predicted to increase by 1.6 °C for the moderate GHG concentration scenario and 3.3 °C for the high concentration GHG scenario (see bottom row of Table 4-3 for district results).

What parts of the district can expect the largest changes in mean maximum air temperature?

The projected increase in mean maximum air temperature is consistent across the Waimakariri District (Figure B-2 in Appendix B). Much like the mean air temperature, regions and settlements within the district are expected to see similar changes in mean maximum air temperature during the 21st Century. **The upper high elevation regions could experience the largest increase in maximum air temperature,** with maximum temperatures projected to increase by 0.5 °C more than lowland plains under the high GHG scenario.

Table 4-3: Overview of projected changes in average daily maximum temperature (°C) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	**1.1**	**1.7**	**0.6**	**1.3**	**3.5**	**2.3**	**0.1**	**1.8**
COAST	**1.0**	**1.5**	**0.5**	**1.1**	**3.0**	**2.0**	**0.1**	**1.6**
INLAND	**1.0**	**1.6**	**0.6**	**1.1**	**3.2**	**2.1**	**0.1**	**1.6**
DISTRICT	**1.0**	**1.6**	**0.6**	**1.2**	**3.3**	**2.1**	**0.1**	**1.7**

† = "50-yr change" is the projected change in average daily maximum temperature for a given GHG scenario between end-century and mid-century time periods (i.e., how will average daily maximum temperature change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected average daily maximum temperature between high and moderate GHG concentration scenarios (what is the difference in projected average daily maximum temperature for the RCP4.5 and RCP8.5 scenarios?).*

What is the difference in projected daily mean maximum temperature for the high concentration and moderate concentration GHG scenarios?

Much like the mean air temperature, the mean maximum air temperature changes for moderate vs. high GHG concentrations are comparable for the mid-century time period, and quite different by the end of the century. For example, **by the end of century, the district could expect an additional 1.7 °C of warming to the mean maximum air temperature under the high GHG concentration scenario as compared to moderate GHG emissions (as shown in Table 4-3 and Figure B-2, Appendix B).**

Are there any noteworthy seasonal changes in mean air temperature?

The projected changes in mean maximum air temperature in the Waimakariri District are consistent across all seasons and GHG concentration scenarios. See Table C-3 for a full summary.

4.1.4 Hot days

Hot days are defined as any day when the maximum air temperature exceeds 25 °C. This threshold has been used historically in New Zealand to define conditions when humans and livestock may experience heat stress.

- Mid-century hot days are projected to increase by 13 (RCP4.5) to 15 (RCP8.5) days per year.
- End-century hot days are expected to increase by 20 (RCP4.5) to 44 (RCP8.5) days per year.
- 44 additional hot days would represent a tripling of historical hot days for the district on average.
- Hot days in the Lees Valley and western plains could see the largest increase by the end of century with upwards of 50 additional hot days projected per year.

How much will hot days change in the district?

By the mid-century the district is projected to experience an additional 13 to 15 hot days per year for moderate and high GHG concentration scenarios, respectively. **Therefore, mid-century hot days are projected to double from historical levels. End-century hot days are projected to increase by 20 and 44 days for the moderate and high GHG concentration scenarios, respectively** (Table 4-4); 44 additional hot days would represent a threefold increase in hot days for the district on average.

Table 4-4: Overview of projected changes in hot days (> 25 °C) per year for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	12	18	6	13	43	30	1	25
COAST	13	20	7	15	41	26	2	21
INLAND	15	22	7	17	46	29	2	24
DISTRICT	13	20	7	15	44	29	1	24

† = "50-yr change" is the projected change in hot days for a given GHG scenario between end-century and mid-century time periods (i.e., how will hot days change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected hot days between high and moderate GHG concentration scenarios (what is the difference in projected hot days for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in hot days?

The number of hot days mirrors the mean temperature changes outlined above in the sense that hot days are projected to increase relatively consistently across the district (see Figure 4-2). **The Lees Valley and western and central areas near Oxford could see the largest increase in hot days by the end of century with upwards of 50 additional hot days projected per year.**

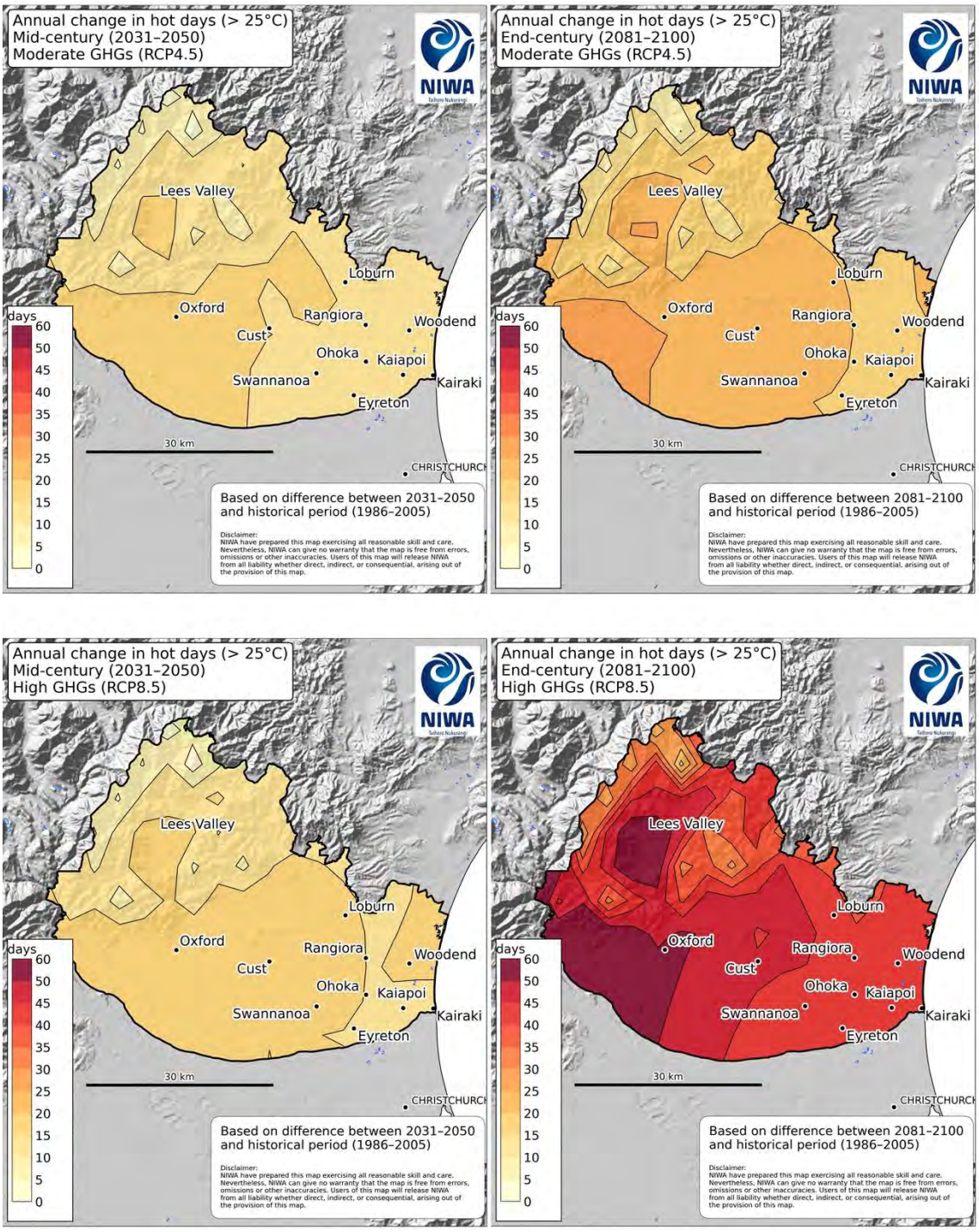


Figure 4-2: Projected changes in hot days (> 25 °C) per year for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

What is the difference in projected hot days for the high concentration and moderate concentration GHG scenarios?

For the mid-century period the difference in hot days between moderate and high GHG concentration scenarios is negligible. However, by the end of the century, the difference between high and moderate GHG scenarios is substantial with more than double the number of additional hot days under the high GHG concentration scenario. This finding emphasises that different concentration pathways could produce *quite different climatic outcomes* in the district, especially towards the end of the 21st Century. For projecting hot days, the impact of GHG concentration uncertainty becomes a lot larger towards the end of century.

Are there any noteworthy seasonal changes in hot days?

The majority (~75%) of projected additional hot days (i.e., the projected increase) are likely occur in summer (see Table C-4 for seasonal breakdown). Hot days in autumn and spring are relatively rare in the district with ~6 per year in spring and autumn, historically. Projections suggest spring and autumn hot days could become much more frequent with upwards of ~20 spring and autumn hot days per year by the end of century expected under the high concentration GHG scenario.

4.2 Rainfall

4.2.1 Mean rainfall

- Mid-century rainfall is projected to increase for both RCP 4.5 and RCP 8.5.
- Increased rainfall is projected across the lower altitude plains and coastal areas, and *no change (or slight decreases)* in annual rainfall are projected in the western high-altitude zones.
- Seasonal trends in projected rainfall change are broadly consistent with the annual change, except spring which has inconsistencies in spatial pattern and the ± change signal.

Rising global temperatures are expected to increase average annual precipitation, according to the AR6 IPCC report: "*The average annual global land precipitation is projected to increase by 0–5% under the very low GHG emissions scenario (SSP1-1.9), 1.5–8% for the intermediate GHG emissions scenario (SSP2-4.5) and 1–13% under the very high GHG emissions scenario (SSP5-8.5) by 2081–2100 relative to 1995–2014 (likely ranges)".*

How much will mean annual rainfall change in the district?

Rainfall is projected to increase across much of the district in the mid-century and end-century time periods for both GHG concentration scenarios (Table 4-5). However, the upper regions are projected to experience a smaller increase (or decrease) in annual rainfall than the lower elevation regions.

Table 4-5: Overview of projected changes in mean annual rainfall for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	**1.6%**	**0.8%**	**-0.8%**	**1.3%**	**3.0%**	**1.7%**	**-0.3%**	**2.2%**
COAST	**2.6%**	**4.2%**	**1.5%**	**3.4%**	**8.2%**	**4.9%**	**0.7%**	**4.1%**
INLAND	**2.5%**	**3.1%**	**0.6%**	**3.0%**	**7.6%**	**4.6%**	**0.5%**	**4.5%**
DISTRICT	**2.2%**	**2.4%**	**0.2%**	**2.4%**	**5.9%**	**3.5%**	**-0.2%**	**1.8%**

† = "50-yr change" is the projected change in mean annual rainfall for a given GHG scenario between end-century and mid-century time periods (i.e., how will mean annual rainfall change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected mean annual rainfall between high and moderate GHG concentration scenarios (what is the difference in projected mean annual rainfall for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in mean annual rainfall?

The general trend in annual precipitation change follows an east-to-west gradient, with projected increased rainfall across the lower altitude plains and coastal areas (shown by the green colours in Figure 4-3), and *no change (or slight decreases)* in rainfall in the western high-altitude regions and Lees Valley (show by the brown and absence of colour in Figure 4-3). **The largest increases in mean annual rainfall of +12% or more are projected under the end-century, high GHG scenario along the southern edge of the district (west of Swannanoa) and along the north-east edge of the district (near Loburn).**

What is the difference in projected rainfall for the high concentration and moderate concentration GHG scenarios?

In general, the district can expect more annual precipitation under the high GHG concentration scenario than the moderate scenario (Table 4-5). This is consistent with IPCC guidance (outlined pg. 51) as warmer oceans can evaporate more moisture into the atmosphere, and NIWA's AR5 regional climate modelling that showed a possible strengthening of southern hemisphere storm tracks. **This trend of increasing rainfall for the higher concentration GHG scenario is also apparent in the seasonal rainfall change projections, with increased total rainfall projected in the future for nearly all instances except notably spring** (see seasonal data in Table C-5). End-century spring rainfall is projected to *decrease* under the moderate GHG concentration scenario.

Are there any noteworthy seasonal changes in rainfall?

As mentioned above predicted changes to mean spring rainfall are inconsistent in spatial pattern and signal (i.e., positive vs. negative changes) when comparing across GHG concentration scenarios and time periods (observe that the top right panel in Figure B-6 is different to the other panels). Further investigation of the model spread (i.e., not just the 6-model ensemble mean rainfall) could be worthwhile in order to better understand the uncertainties associated with changing seasonal precipitation in the district (this issue is discussed further in Section 5).

The aforementioned east-west gradient of projected rainfall change is most apparent in autumn and summer (see Figure B-3-B.6 for seasonal maps of projected rainfall changes). Finally, for winter

rainfall, projections suggest an increase in rain across the upper and coastal regions – while the central parts of the district (near Cust) may see a decrease in winter rainfall (Figure B-5).

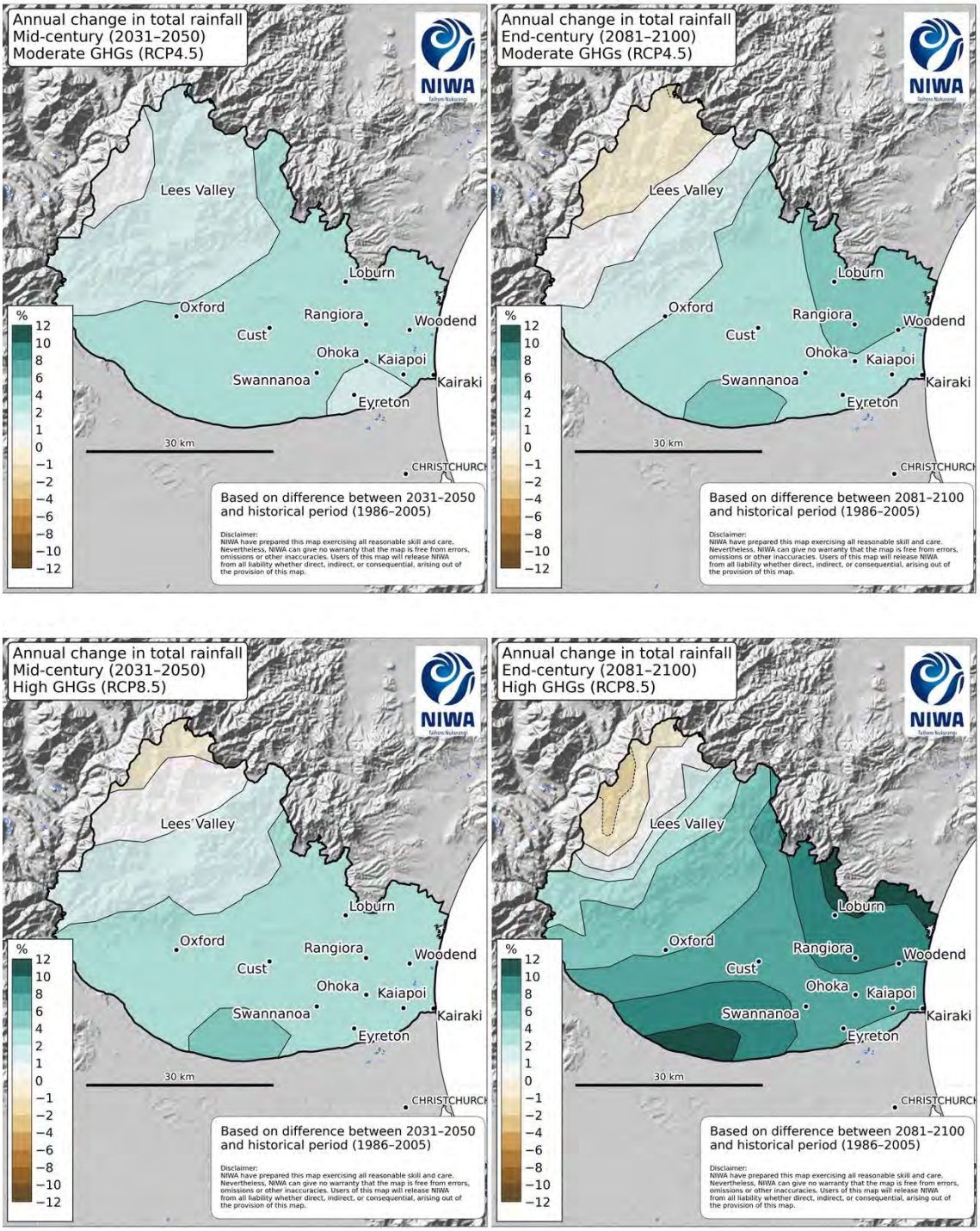


Figure 4-3: Projected changes in mean annual rainfall (%) for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

4.2.2 Dry days

- Dry days are projected to increase slightly in the upper elevations and decrease in the coastal regions and inland plains.
- Inland and coastal areas are projected to experience the largest decreases in dry days – under the high GHG scenario those areas are projected to experience 4 to 5 fewer dry days per year by the end of the century.
- Under the high GHG scenario, the projected reductions in dry days will primarily occur in summer and autumn.

Another metric for evaluating changes in rainfall are "dry days", which are defined as any day where less than 1 mm of rainfall occurs.

What parts of the district can expect the largest changes in dry days?

Similar to the projected change to total annual rainfall, changes in dry days throughout the district will likely follow the east-west gradient with slight *increases* in dry days in the upper high elevation areas and decreases in dry days in the lowland and coastal areas (Figure 4-4). Inland and coastal areas are projected to see the largest decreases in dry days under the high GHG concentrations scenario with 4 to 5 fewer dry days per year by the end of the century.

Table 4-6: Overview of projected changes in dry days (< 1 mm rain) per year for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	1	2	2	1	1	0	0	-1
COAST	-1	-2	-1	-2	-4	-2	-1	-3
INLAND	-2	-1	0	-3	-5	-3	-1	-4
DISTRICT	-1	0	1	-1	-3	-1	-1	-3

† = "50-yr change" is the projected change in dry days for a given GHG scenario between end-century and mid-century time periods (i.e., how will dry days change between 2040 and 2090 for a given GHG scenario?).

** The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected dry days between high and moderate GHG concentration scenarios (what is the difference in projected dry days for the RCP4.5 and RCP8.5 scenarios?).*

What is the difference in projected dry days for the high concentration and moderate concentration GHG scenarios?

Overall, the projections show there will be slightly more dry days per year under the under high GHG scenario than the low GHG scenario, especially at the end of century (as shown by a larger decrease in dry days under high GHG concentrations than low GHG concentrations).

Are there any noteworthy seasonal changes in dry days?

The modest reduction in dry days across the district is primarily projected to occur in summer and autumn (see Table C-6 for seasonal breakdown of projected changes in dry days).

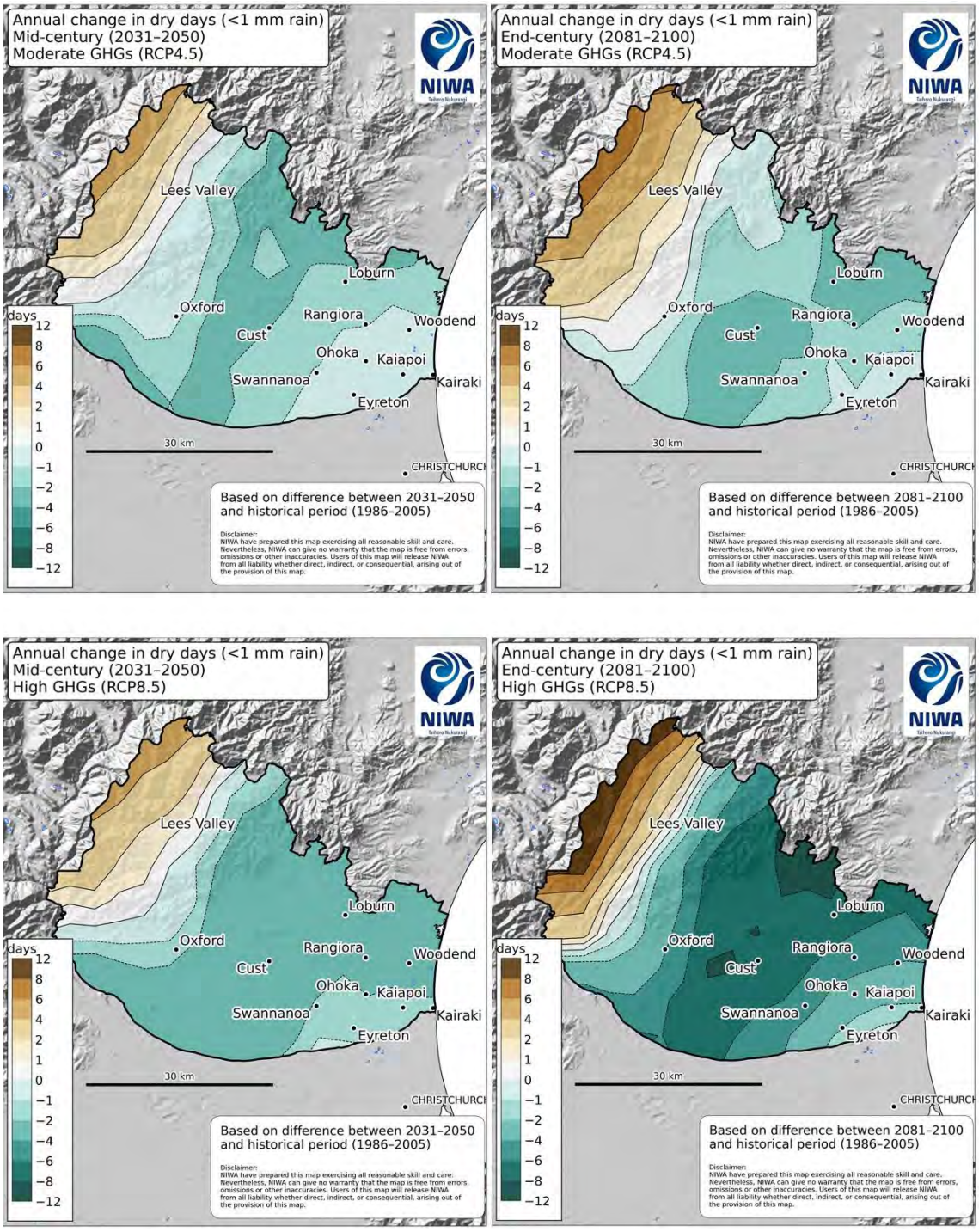


Figure 4-4: Projected changes in dry days for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

4.2.3 Extreme heavy rainfall

- Extreme rainfall will likely increase by approximately 7% per 1 °C of climate warming.
- However, shorter duration rainfall events (e.g., hourly) could increase by as much as 15% per 1 °C of climate warming.
- Further research and modelling are needed to further explain the impacts of climate change on extreme precipitation.

The impacts of climate change on rare meteorological events such as extreme rainfall is extremely challenging for climate scientists to characterise. For this reason, this report (and the Canterbury Region Report) primarily focus on the projected average changes in climatic means rather than changes to the extreme events. Nevertheless, extreme rainfall can result in significant hazards such as flooding and landslides. A full analysis of the implications of climate change for extreme rainfall is outside the scope of this report. However, given the importance of extreme rainfall and potential flooding to the district some high-level findings from NIWA's High-intensity Rainfall Design System (HIRDS; Carey-Smith, et al. 2018, see full report here) are provided Appendix E to give an indication of how extreme precipitation could change in the Waimakariri District.

As noted above in Section 4.2.1 there is likely to be an increase in rainfall across New Zealand and in the Waimakariri District overall. However, the extent to which extreme precipitation will change due to climate change in New Zealand and globally is a matter of ongoing research. According to the AR6, there is "high confidence" that extreme precipitation will increase in intensity by about 7% per 1 °C of climatic warming. However, there is growing evidence the most extreme precipitation events, including sub-daily (i.e., less than 24 hrs) events, could increase by more than 7% per 1 °C of warming.

Figure 4-5 shows the possible change in rainfall across New Zealand per 1 °C of climatic warming associated with 50-year events of different durations. The Figure shows that a 1-in-50-year event of duration 1 hr could increase in intensity by ~10-15% per 1 °C of warming; and that a 1-in-50-year event of duration 24 hrs might increase by ~5-10% per 1 °C of warming. **Overall, it is likely that extreme events in the district will intensify by at least 7% per 1 °C of warming, but it also quite possible that damaging short duration storm events will intensify by more than 7% per 1 °C in future.** Projections of future extreme precipitation for the district can be accessed through the HIRDS online portal (https://hirds.niwa.co.nz/) and summary tables for locations of interest are provided in Appendix E.

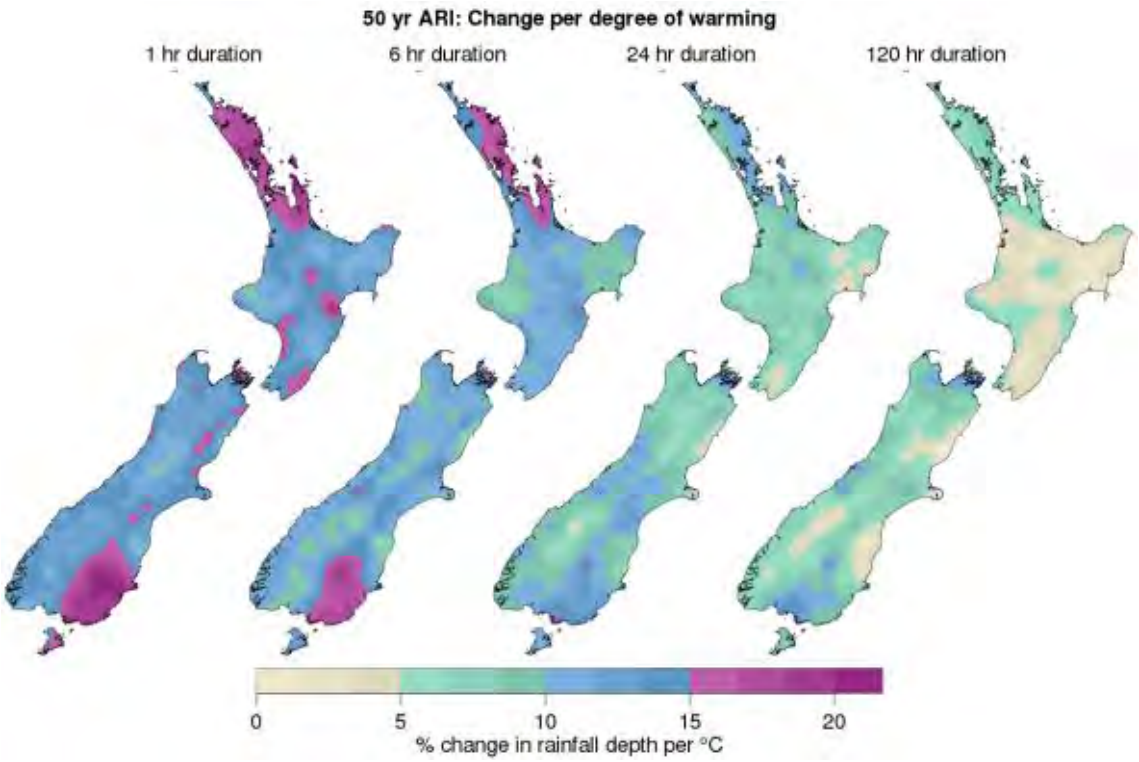


Figure 4-5: Percentage changes in the 50-year event magnitude for four different event durations. Each map combines all 24 different RCM simulations and shows the change per degree of warming. ARI indicates the average time between events of given duration (source: Carey-Smith et al., 2018).

4.3 Soil moisture and potential evaporation

4.3.1 Soil moisture deficit days

- Mid-century soil moisture deficit days are projected to *decrease* by 2 (RCP8.5) to 5 (RCP4.5) days per year.
- End-century soil moisture deficit days are expected to *increase* by 3 (RCP4.5) to 2 (RCP8.5) days per year.
- Mid-century soil moisture deficit days will likely decrease consistently across the district.
- End-century soil moisture deficit days will likely increase consistently across the district, except in the coastal zone and higher elevation regions.

Soil moisture deficit is calculated based on incoming daily rainfall (mm), outgoing daily potential evapotranspiration (mm), and a fixed available water capacity (the amount of water in the soil 'reservoir' that plants can use). Soil moisture deficit days are days when a moisture deficit occurs, and it is a commonly used indicator of days when plants are water-stressed.

How much will soil moisture deficit days change in the district?

Soil moisture deficit days are projected to decrease by mid-century across the district with net changes of -5 and -2 days for the moderate and high GHG concentration scenarios, respectively (Table 4-7). By contrast, projections suggest there will be more soil moisture deficit days in the district by the end of the century with +3 and +2 soil moisture deficit days for moderate and high GHG scenarios, respectively. **These results imply that for both GHG concentration scenarios the Waimakariri District is projected on average to have moister soil conditions in the mid-century and drier soil conditions by the end-century, but the changes are quite small.**

Table 4-7: Overview of projected changes in soil moisture deficit days per year for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	**-4**	**4**	**8**	**-2**	**5**	**7**	**2**	**1**
COAST	**-6**	**3**	**9**	**-2**	**-1**	**1**	**4**	**-4**
INLAND	**-5**	**2**	**7**	**-3**	**2**	**5**	**2**	**-1**
DISTRICT	**-5**	**3**	**8**	**-2**	**2**	**5**	**2**	**-1**

† = "50-yr change" is the projected change in soil moisture deficit days for a given GHG scenario between end-century and mid-century time periods (i.e., how will soil moisture deficit days change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected soil moisture deficit days between high and moderate GHG concentration scenarios (what is the difference in projected soil moisture deficit days for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in soil moisture deficit days?

The spatial patterns of changing soil moisture deficit days are quite consistent across the district for mid-century and end of century time periods (see Figure 4-6). The two panels on the left show decreasing (green) soil deficit moisture days for the mid-century, and the right panels show increasing (brown) soil moisture deficit days across most of the district at the end of the century.

What is the difference in projected soil moisture deficit days for the high concentration and moderate concentration GHG scenarios?

As mentioned above, the projected change in soil moisture deficit days is comparable when comparing GHG concentration scenarios.

Are there any noteworthy seasonal changes in soil moisture deficit?

For mid-century, there is no clear seasonal pattern and projected reductions in soil moisture deficit days will occur throughout the year. At the end of the century, soil moisture deficit days will likely increase in the winter and spring seasons (see Table C-7 for seasonal breakdown of soil moisture deficit days).

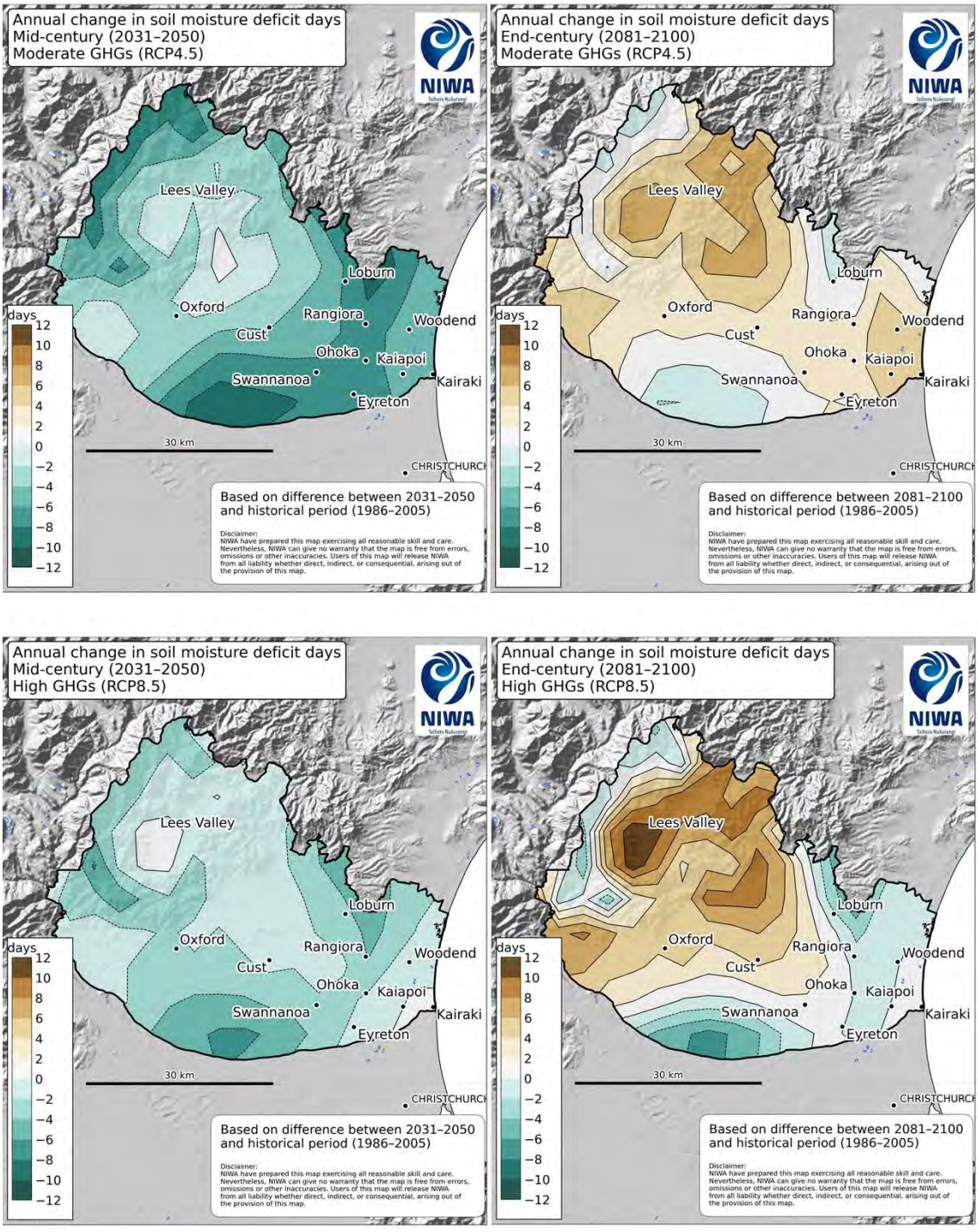


Figure 4-6: Projected changes in soil moisture deficit days for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

4.3.2 Potential evapotranspiration deficit

- Mid-century accumulated potential evaporation deficit is projected to increase by 75.7 mm (RCP8.5) to 91.2 mm (RCP4.5).
- End-century accumulated potential evaporation deficit is expected to increase by 88.9 mm (RCP4.5) to 97.6 mm (RCP8.5).
- Upper mountainous regions and the Lees valley may see an increase in PED of approximately 15-30 mm greater than the lowland plains

Potential evapotranspiration (PET) is the anticipated amount of water that will evaporate and/or be transpired if a sufficient water source is available. The difference between potential evapotranspiration (PET) and actual evapotranspiration is called the Potential Evapotranspiration Deficit (PED). In practice, PED characterizes the amount of water required for irrigation, or that needs to be replenished by rainfall, to maintain plant growth at levels unimpeded by soil water shortage. Therefore, PED estimates provide a robust measure of drought intensity and duration. The accumulated PED is the sum of daily PED values throughout the year.

How much will potential evapotranspiration deficit change in the district?

PED is projected to increase across the district regardless of location within the district, GHG concentration scenario, and time period. The mid-century time period will see district average PED increase by 91.2 mm and 75.7 mm for the GHG scenarios, and end-century PED will increase by 88.9 mm and 97.6 mm (Table 4-8). **Increased PED across the entire Waimakariri District suggests the district will likely become more drought prone in the future as temperatures increase and precipitation changes.**

Increased PED across the district implies that increased temperatures and associated increased evapotranspiration will not be offset by increased rainfall across the district, meaning that demand for irrigation may increase in the district despite an overall increase in annual rainfall projected.

What parts of the district can expect the largest changes in potential evapotranspiration deficit?

Overall, the predicted increase in PED across the district is spatially consistent, however, the upper mountainous regions and the Lees valley may see an increase in PED of approximately 15-30 mm greater than the in lowland plains (Figure B-7).

Table 4-8: Overview of projected changes in potential evapotranspiration deficit accumulated (mm) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	**101.4**	**104.5**	**3.1**	**85.4**	**120.1**	**34.7**	**-15.9**	**15.6**
COAST	**86.8**	**77.8**	**-9.1**	**73.3**	**87.7**	**14.5**	**-13.6**	**9.9**
INLAND	**82.7**	**77.2**	**-5.4**	**66.9**	**78.4**	**11.6**	**-15.8**	**1.2**
DISTRICT	**91.2**	**88.9**	**-2.3**	**75.7**	**97.6**	**21.9**	**-15.5**	**8.8**

† = "50-yr change" is the projected change in potential evapotranspiration deficit accumulated for a given GHG scenario between end-century and mid-century time periods (i.e., how will potential evapotranspiration deficit accumulated change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in potential evapotranspiration deficit accumulated between high and moderate GHG concentration scenarios (what is the difference in potential evapotranspiration deficit accumulated for the RCP4.5 and RCP8.5 scenarios?).*

What is the difference in projected potential evapotranspiration deficit for the high concentration and moderate concentration GHG scenarios?

There is not a large difference in projected PED when comparing moderate and high concentration scenarios (see Table 4-8 and Figure B-7).

4.4 Snow and frost

- Mid-century frost days are projected to decrease by 9 (RCP4.5) to 14 (RCP8.5) days per year.
- End-century frost days are projected to decrease by 10 (RCP4.5) to 26 (RCP8.5) days per year.
- Frost days will likely reduce across the district but the largest reductions in total days are projected in the upper high-altitude regions and Lees Valley.
- For the high GHG scenario end-of century snow days in the mountainous regions could be nearly eliminated according to projections.

4.4.1 Frost

Frost days are defined as days when minimum air temperature is equal to or lower than 0 °C.

How much will frost days change in the district?

Mid-century frost days are projected to decrease by 9 and 14 days per year across the district for moderate and high GHG concentration scenarios, respectively. While, end-century frost days could decrease by 10 and 26 days for moderate and high GHGs, respectively (Table 4-9).

Table 4-9: Overview of projected changes in frost days for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	-12	-18	-6	-13	-34	-21	-1	-16
COAST	-6	-8	-2	-7	-16	-9	-1	-7
INLAND	-8	-12	-4	-9	-21	-12	-1	-10
DISTRICT	-9	-14	-5	-10	-26	-15	-1	-12

† = "50-yr change" is the projected change in frost days for a given GHG scenario between end-century and mid-century time periods (i.e., how will frost days change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in frost days between high and moderate GHG concentration scenarios (what is the difference in projected frost days for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in frost days?

Frost days are projected to reduce across the district but the largest reductions in total days are projected to occur in the upper high-altitude regions and Lees Valley (Figure 4-7). For the moderate GHG scenario, projections suggest that up to 33% of historical frost days may no longer occur in the inland parts of the district. For the high concentration GHG scenarios upwards of ~43% of historical frost days in the high elevation region could no longer happen, and 60% of historical frost days in the low elevation regions could no longer happen.

What is the difference in projected frost days for the high concentration and moderate concentration GHG scenarios?

For the mid-century period the difference in frost days between moderate and high GHG concentration scenarios is relatively small (5 days); however, this represents a larger mid-century difference than other variables (e.g., air temperature) when comparing high vs low GHG scenarios. This implies that a threshold driven metric like frost days could be more sensitive to subtle temperature changes - meaning that relatively large differences in projected frost could occur even if the mean temperature does not change substantively.

By the end of the century, the difference between high and moderate GHG scenarios could be substantial with a more than a twofold reduction in the number of frost days under the high GHG concentration scenario. This finding emphasises that different concentration pathways could produce *quite different climatic outcomes* across the district, especially towards the end of the 21st Century. When projecting frost days, the effect of GHG concentration uncertainty becomes a lot larger towards the end of century.

Are there any noteworthy seasonal changes to frost days?

At the seasonal level, 66% of the district's projected lost frost days (i.e., the projected decrease) are projected to be during winter. The other absent frost days are projected to be during Autumn (19%) and Spring (15%).

4.4.2 Snow

Snow days are defined in these projections as days when the air temperature is below zero and precipitation occurs.

Snow days will likely decrease substantially (upwards of 20 fewer days per year) across the higher elevation regions of the district (Figure 4-8). For the high concentration GHG scenario, end-of century snow days in the mountainous regions could be nearly eliminated according to projections. However, it is important to note that snow day projections are simply reported as days when temperature is below zero and precipitation occurs, but snow can fall when temperature is above zero so there is likely some underestimation of snow days. Also, it is important to note that the metric "snow days" is not the same as "snow amount" – snow amount could increase due to increasing precipitation in mountainous areas. Nevertheless, despite these caveats, it is very likely that rising temperatures will decrease snowpack across the mountainous regions of the district.

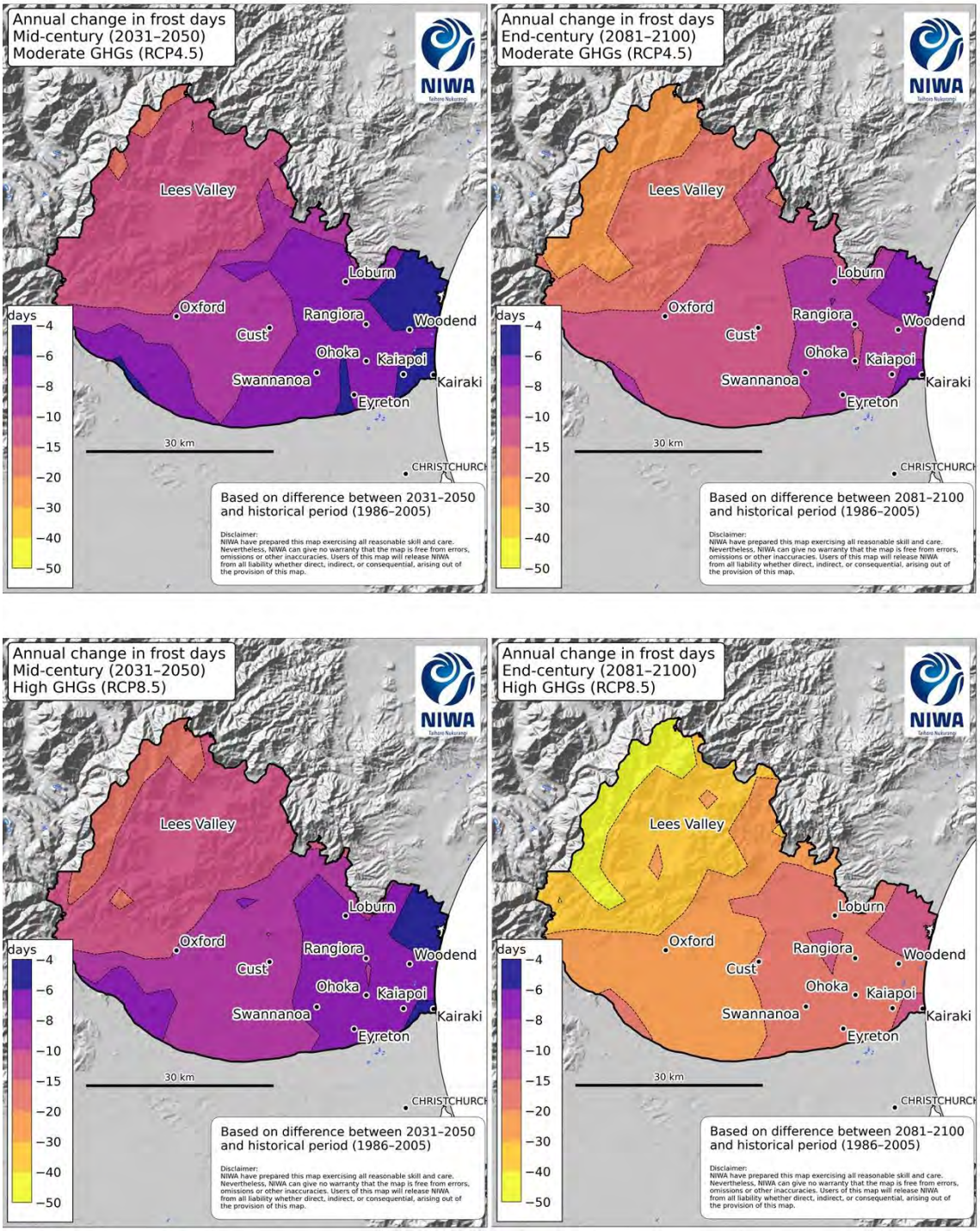


Figure 4-7: Projected changes in frost days for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

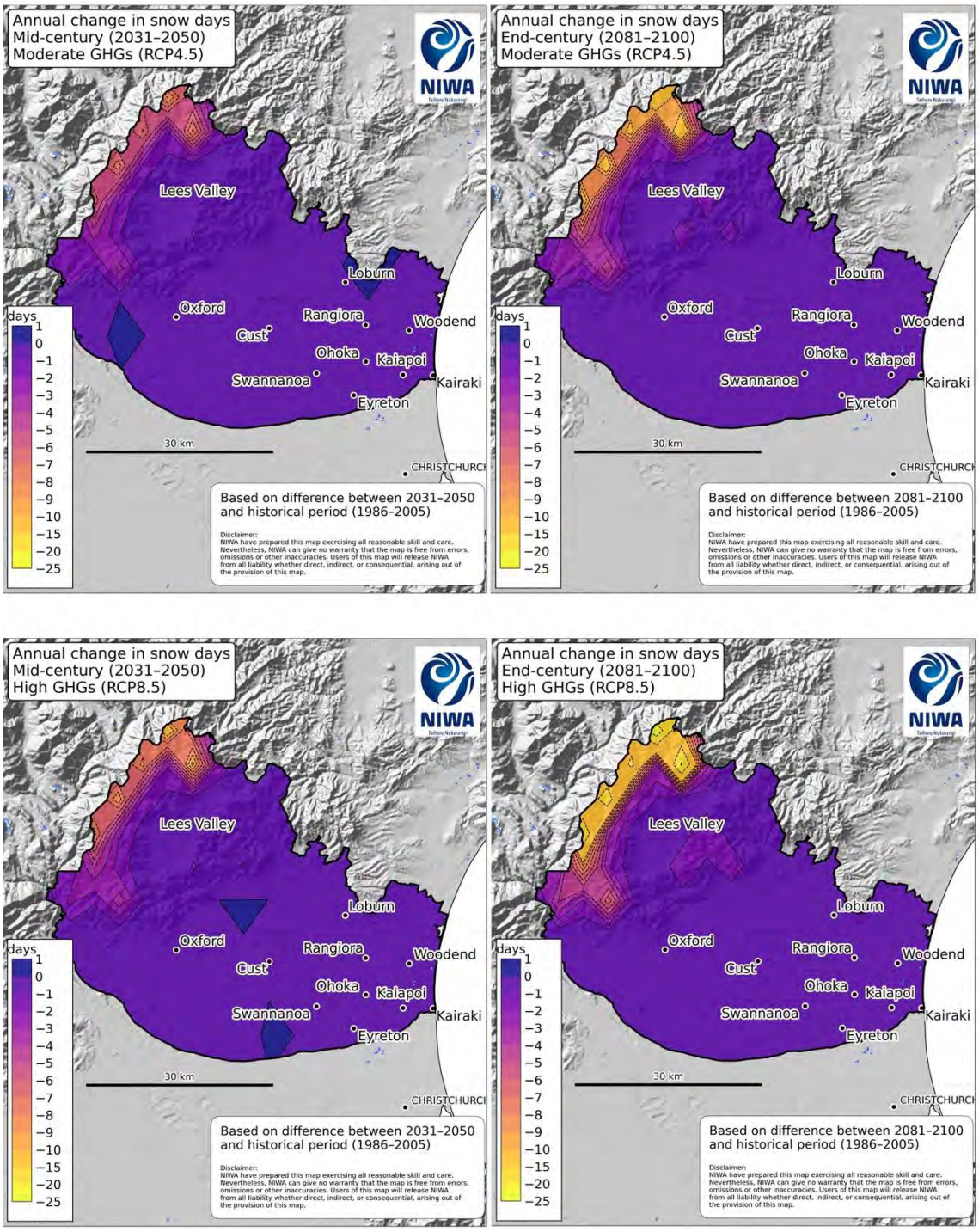


Figure 4-8: Projected changes in snow days for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

4.5 Humidity, radiation, and wind speed

4.5.1 Relative Humidity

Relative humidity is a function of both water vapor (moisture) in the atmosphere and air temperature – as air warms it expands, meaning it can hold more water. Therefore, if air warms but water vapour remains constant the relative humidity will *decrease*.

- Mid-century relative humidity is projected to *decrease* by 0.8% (RCP4.5) to 0.9% (RCP8.5).
- End-century relative humidity is expected to *decrease* by 1.1% (RCP4.5) to 2.2% (RCP8.5).
- The largest reductions in relative humidity are projected to occur in the Lees Valley region and the higher elevation areas, with generally smaller reductions projected near the coast.
- Relative humidity will decrease most notably during winter and spring.

How much will relative humidity change in the district?

Relative humidity is projected to decrease across the Waimakariri District in the future. For the mid-century time period, average relative humidity could decrease by 0.8% and 0.9% for moderate and high GHG scenarios, respectively (Table 4-10). By the end of the century the average relative humidity is projected to decrease by 1.1% for moderate GHGs and 2.4% for high GHGs.

Table 4-10: Overview of projected changes in relative humidity (%) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			***high GHGs***			***difference between GHG scenarios****	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	-1.0%	-1.5%	-0.5%	-1.1%	-3.1%	-2.0%	-0.1%	-1.6%
COAST	-0.4%	-0.7%	-0.3%	-0.6%	-1.4%	-0.8%	-0.1%	-0.7%
INLAND	-0.7%	-1.0%	-0.3%	-0.8%	-2.1%	-1.3%	-0.1%	-1.1%
DISTRICT	-0.8%	-1.1%	-0.4%	-0.9%	-2.4%	-1.5%	-0.1%	-1.3%

† = "50-yr change" is the projected change in relative humidity for a given GHG scenario between end-century and mid-century time periods (i.e., how will relative humidity change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in relative humidity between high and moderate GHG concentration scenarios (what is the difference in projected relative humidity for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in relative humidity?

The largest reductions in relative humidity are projected to occur in the higher elevation regions of the district, while lowland coastal areas are projected to see minimal changes in relative humidity (see Figure B-8).

What is the difference in projected relative humidity for the high concentration and moderate concentration GHG scenarios?

For the mid-century there is not a difference in the projected change in relative humidity between high and moderate GHG concentration scenarios. However, by the end of century the high concentration scenario suggests that average relative humidity could be 1.3% lower than the moderate GHG scenario.

Are there any noteworthy seasonal changes in relative humidity?

The largest reductions in relative humidity are projected to occur in winter and spring, while relative humidity in summer and autumn is not projected to change substantially (see Table C-9 for seasonal summary).

4.5.2 Solar radiation

- Mid-century solar radiation is projected to decrease approximately 1.0 (RCP4.5) to 1.6 Wm^{-2} (RCP8.5).
- End-century relative humidity is expected to decrease by 1.1 Wm^{-2} (RCP4.5) to 2.6 Wm^{-2} (RCP8.5).
- The projected changes in absolute solar radiation are small and likely to be of second order importance for primary industries relative to other meteorological variables.

Solar radiation is essentially sunlight that passes through the earth's atmosphere and reaches the surface of the earth. We typically measure solar radiation in the unit "Watts per square-meter (Wm^{-2})" – this reveals the average amount of solar energy reaching 1 m^2 of the earth's surface every second. The primary driver of changing solar radiation in the future will be changing types and amounts of clouds that move over the district.

How much will solar radiation change in the district?

For the mid-century time period, average solar radiation could decrease by approximately 1.0 Wm^{-2} to 1.6 Wm^{-2} for both the moderate and high GHG scenarios. By the end of the century the average solar radiation is projected to decrease by 1.1 Wm^{-2} for moderate GHGs and decrease by 2.6 Wm^{-2} for the high GHG scenarios (Table 4-11). These reductions in solar radiation are broadly consistent with increased cloud cover and precipitation. However, the projected changes in absolute solar radiation are small and likely to be of second order importance for primary industries relative to changes in other meteorological variables such as precipitation, temperature, and soil moisture.

What parts of the district can expect the largest changes in solar radiation?

Solar radiation is projected to decrease most notably in the lower altitude coastal zone and to change negligibly in the upper high-altitude regions (Figure B-9). End of century solar radiation in the coastal zone could see an average decrease of 4.4 Wm^{-2} under the high concentration GHGs scenarios.

Table 4-11: Overview of projected changes in incoming solar radiation (Wm-2) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	-0.6	-0.6	0.0	-1.1	-1.2	-0.1	-0.5	-0.6
COAST	-1.4	-1.8	-0.4	-2.3	-4.4	-2.1	-0.9	-2.5
INLAND	-1.1	-1.3	-0.2	-1.8	-3.2	-1.4	-0.7	-1.9
DISTRICT	-1.0	-1.1	-0.2	-1.6	-2.6	-1.0	-0.6	-1.4

† = "50-yr change" is the projected change in solar radiation for a given GHG scenario between end-century and mid-century time periods (i.e., how will solar radiation change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in solar radiation between high and moderate GHG concentration scenarios (what is the difference in projected solar radiation for the RCP4.5 and RCP8.5 scenarios?).*

What is the difference in projected solar radiation for the high concentration and moderate concentration GHG scenarios?

For the mid-century there is not a substantial difference in the projected change in solar radiation between high and moderate GHG concentration scenarios. By the end of century, the high concentration scenario suggests that average solar radiation could be 1.5 Wm^{-2} lower than for the moderate GHG scenario.

Are there any noteworthy seasonal changes in solar radiation?

For moderate GHG concentrations, solar radiation is projected to decrease consistently during summer, winter, and spring (see Table C-10). However, for the high GHG concentration scenario, the largest reductions in solar radiation are projected during summer, followed by autumn and then winter.

4.5.3 Wind speed

The wind speed presented here is the average simulated wind speed at the earth's surface (approximately 10 m above the ground).

- Mid-century wind speed is projected to increase by approximately 1.8% (RCP4.5) to 2.2% (RCP8.5).
- End-century wind speed is projected to increase by approximately 2.8% (RCP4.5) to 6.5% (RCP8.5).
- Winter wind speed in the high elevation regions could increase by 16.4% by the end of the century under a high GHG concertation scenario.

How much will wind speed change in the district?

For the mid-century time period, average wind speed could increase by approximately 1.8% for the moderate GHG scenario and 2.2% for the high GHG scenario (Table 4-12). By the end of the century, the average wind speed is projected to increase by 2.8% for the moderate GHG scenario and 6.5% for the high GHG scenario.

Table 4-12: Overview of projected changes in wind speed (%) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*difference between GHG scenarios**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	**2.6%**	**3.7%**	**1.1%**	**2.8%**	**8.8%**	**6.0%**	**0.1%**	**5.0%**
COAST	**0.6%**	**1.2%**	**0.7%**	**1.2%**	**2.5%**	**1.3%**	**0.6%**	**1.3%**
INLAND	**1.6%**	**2.4%**	**0.8%**	**2.0%**	**5.8%**	**3.8%**	**0.4%**	**3.4%**
DISTRICT	**1.8%**	**2.8%**	**0.9%**	**2.2%**	**6.5%**	**4.3%**	**0.3%**	**3.7%**

† = "50-yr change" is the projected change in wind speed for a given GHG scenario between end-century and mid-century time periods (i.e., how will wind speed change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in wind speed between high and moderate GHG concentration scenarios (what is the difference in projected wind speed for the RCP4.5 and RCP8.5 scenarios?).*

What parts of the district can expect the largest changes in wind speed?

Wind speed is predicted to increase more in the high elevation regions than the lower elevation plains and coastal regions of the district (Figure B-10).

What is the difference in projected wind speed for the high concentration and moderate concentration GHG scenarios?

For the mid-century there is not a substantial difference in the projected increase in wind speed between high and moderate GHG concentration scenarios. However, by the end of century, the high concentration scenario suggests that average wind speed could be 3.7% higher than the moderate GHG scenario.

Are there any noteworthy seasonal changes in wind speed?

Winter wind speed is projected to increase notably more than the other seasons; winter wind speed in the upper region of the district could increase by 16.4% by the end of the century under a high GHG concentration scenario. Spring wind speed is also projected to increase more notably than other seasons, while summer and autumn wind speed changes are projected to be negligible (see Table C-11 for seasonal wind speed projections).

4.5.4 Extreme winds

As noted in Section 4.2.3 the focus of this report is the projected changes in climatic means rather than changes to the extreme events. Nevertheless, changes to extreme wind and storm events are highly relevant for the district's economy, ecosystems, and communities. Generally, the AR6 suggests that New Zealand's regional wind patterns are projected to become more north-easterly in summer, and westerlies are projected to become stronger in winter (with *low confidence*). This is consistent with findings from the AR5 regional climate modelling, which suggested a strengthening of the southern hemisphere storm tracks and increased extreme wind speeds across the South Island (see MfE, 2018). Overall, the evidence broadly suggests that future extreme wind speeds and storm events may increase in the district, but more research is needed in this area.

5 Model spread and uncertainty

There are three main sources of uncertainty in projections of climate:

1. Uncertainty due to future emissions (e.g., RCPs).
2. Uncertainty due to internal climate variability – natural variations in climate can occur over annual to decadal timescales.
3. Uncertainty due to inter-model differences – different models represent the climate system with differing methods and assumptions.

This report has partially addressed the first two sources of uncertainty by analysing two different RCPs and taking averages of climate variables over 20-year time periods. However, the third source of uncertainty has not yet been discussed in this report. All climate variables in the report are calculated by taking the ensemble mean of six simulations (per GHG scenario) driven by independent global climate models. It is possible to examine one aspect of model uncertainty by exploring the spread of ensemble members in the regional climate simulations and not simply the ensemble mean.

Analysing the spread of model predictions is most important for projections of rainfall where model uncertainty can be relatively large. For example, see Figure 5-1, which shows the spread of projected changes in rainfall for Christchurch for each RCP at the end-century. The coloured vertical bars, and inset (black, dynamical simulations) stars, show all the individual models, so a range of model uncertainty associated with different global climate models is displayed. The average of all the models generally project an increase in rainfall, as indicated by the horizontal black line on each bar in Figure 5-1. However, not all models predict an increase in precipitation, some project decreased precipitation. In this report we have provided ensemble means as a best estimate of the likely change in climatic variables.

However, readers should be aware of model uncertainty when interpreting this report. A positive signal showing increased precipitation does not imply that all six models represented a positive trend. Additional analyses of the NIWA's climate data to reveal the model spread for the Waimakariri District could be a useful exercise. Further information on model uncertainty can be found in the Ministry for Environment report on New Zealand's regional climate projections (MfE 2018; see here).

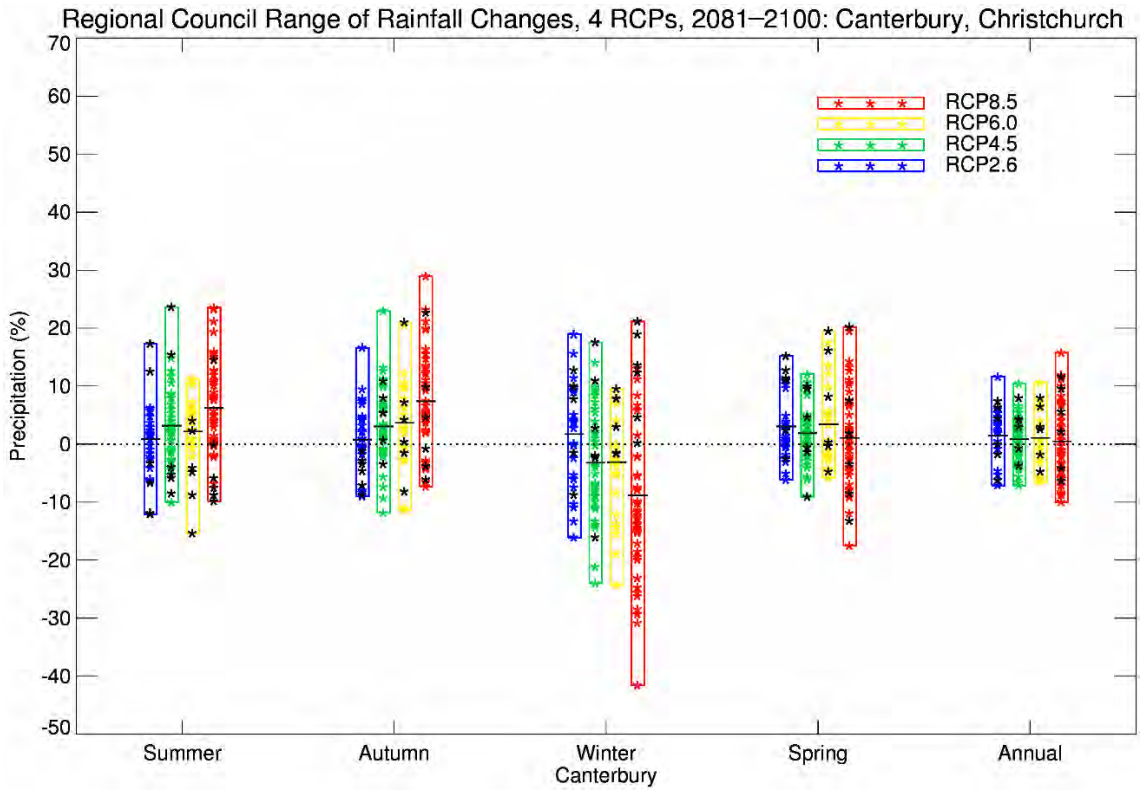


Figure 5-1: Projected seasonal and annual rainfall change for Christchurch by 2090 (2081-2100). Coloured stars represent all models as derived by statistical downscaling. Black stars correspond to the six-model RCM downscaling, and the horizontal bars are the average over all downscaled results (statistical and RCM) (source: MfE, 2018).

6 Coastal Erosion and Sea Water Inundation (Jacobs report)

In 2018 Jacobs prepared a report for the Waimakariri District council entitled "Coastal Erosion and Sea Water Inundation Assessment". NIWA was asked to identify whether the underlying assumptions of Jacob's report are consistent with, or differ from, the findings of this report. The key assumptions to evaluate from NIWA's perspective is the assumed level of sea level rise (SLR) as it relates to future climate change scenarios (i.e., RCPs).

The Jacobs report used New Zealand SLR estimates taken from the Ministry for the Environment 2017 report entitled *Coastal Hazards and Climate Change: Guidance for Local Government* (MfE, 2017) but the authors slightly updated the projections to align SLR change relative to a 2015 baseline. These SLR figures come from Kopp et al. (2014) who used AR5 global climate models in combination with various other models and data sources (see Figure 6-1 below) to derive global scale probabilistic estimates of SLR through the 21st and 22nd Centuries. NIWA's regional climate modelling utilises sea ice and sea surface temperature fields from six different AR5 GCMs and four RCPs to derive regional climate predictions for New Zealand through a combination of dynamical downscaling and bias-correction methods (see Section 2.2 for more details), whereas the Kopp et al. (2014) SLR projections are based on the full ensemble of CMIP5 models, three RCPs, and various other data sources and modelling techniques.

Overall, the Kopp et al. (2014) and subsequent MfE (2017) SLR figures are widely used in New Zealand, including by NIWA in the Canterbury Regional climate assessment. The underlying assumptions that are used to generate the projections in the two reports (NIWA and Jacobs) are by NIWA's judgment compatible.

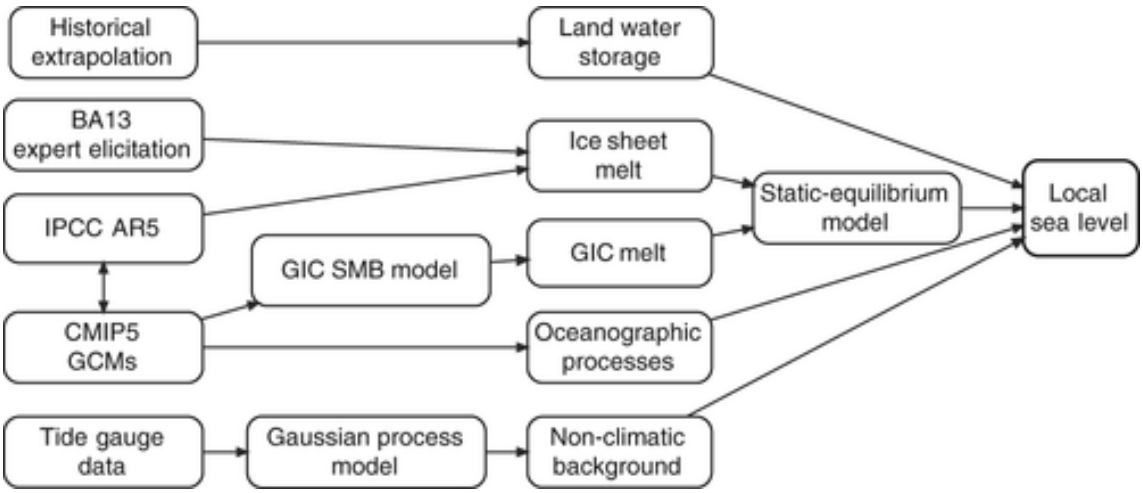


Figure 6-1: Logical flow of sources of information used in Kopp et al., 2014 local sea-level projections. GCMs=global climate models; GIC= glaciers and ice caps; SMB- surface mass balance (from Kopp et al., 2014).

7 Climate change impacts for the district

Climate change impacts can be extremely wide-ranging and complex. The changing climate can impact many inter-related sectors of society. A full assessment of the impacts of climate change on the Waimakariri District is outside the scope of this report. However, here we provide a broad summary of possible impacts of climate change most relevant for the district given the projected changes outlined in this report and the nature of the district.

7.1 Hydrological impacts

The Waimakariri District contains two major river catchments: The Waimakariri River catchment and the Ashley/Rakahuri River catchment. Understanding the impacts of climate change on the district's freshwater resources is extremely important for a range of reasons. Freshwater ecosystems support important native flora and fauna; rivers and lakes are critical sources of fresh water for consumption and irrigation; and flooding causes millions of dollars of damage to infrastructure in New Zealand every year. The recent 2021 Canterbury Region floods – which were driven by 1-in-200-year rainfall in some areas – highlight the importance of understanding the impacts of climate change on the district's rivers.

While a full hydrological assessment of the impacts of climate change on the district is outside the scope of this report, this section will provide a brief summary of the hydrological modelling analyses presented in the Climate change projections for the Canterbury Region report (Macara et al., 2020). Hydrological statistics between the baseline period (1986-2005) and two future periods are presented. The mid-century (2036-2056) and end-century (2086-2099) time periods are slightly different to the time periods used in the climate modelling.

7.1.1 Mean flow

The Waimakariri District is marked in Figure D-1-D.4, and the two major river catchments in the district can also be seen. Hydrological simulations suggest that mid-century mean flow could remain largely unchanged in the Ashley/Rakahuri and Waimakariri River catchments (Figure D-1, top row). For the end-century period mean flow will likely remain largely unchanged under the moderate GHG scenario and slightly increase by 5-10% under the high emissions scenario in the southern Waimakariri river basin and coastal Ashley/Rakahuri river catchment.

7.1.2 Mean annual low flow

Mean annual low flow is defined as the mean of the lowest seven-day average flows in each hydrological year of a simulation period. Mean annual low flow does not necessary characterise low flow conditions during the summer season as snow affected catchments tend to exhibit low flow conditions during winter. Mean annual low flow in the district is generally projected to decrease by mid-century under both GHG concentration scenarios (Figure D-2, top row), likely due to reduced seasonal snow fall/melt and longer periods of low rainfall (i.e., drought).

The moderate GHG concentration scenario produces a larger decrease in the mean annual low flow than the high GHG concentration scenario with mid-century decreases of upwards of 20% projected in some parts of the district. By the end-century, mean annual low flow could decrease by 20-50% across the district (Figure D-2, bottom row). **These projections suggest that although average annual rainfall is projected to increase, the district's freshwater waterways may become more prone to periods of very low flow and hydrological drought conditions.**

7.1.3 Mean high flows

The mean high flow characteristics a**re** **r**epresented by Q5% flow and the mean annual flood cha**r**acte**r**istics.

The Q5% flow – which represents the top 5% of flows – is not projected to change by mid-century under the moderate GHG scenario. However, under the high GHG scenario mid-century Q5% is projected to increase by 10-20% in parts of the Ashley/Rakahuri River catchment. For the end-century, Q5% flows could similarly increase by ~10-20% under moderate GHGs and upwards of 50% under the high GHG concentration scenario.

Finally, the mean annual flood is the average of the annual maximum discharge occurring in a river over the simulation period, which typically has a recurrence interval of once every 2.33 years. **Note that mean annual flood is a relatively low threshold for engineering purposes.** The mean annual flood is projected to increase by 50% or more in the Ashley/Rakahuri and Waimakariri Rivers for both time periods and GHG scenarios. The signal is most apparent in the end-century high GHG concentration scenario where an increased mean annual flood is projected widely across both catchments in the district. However, as noted in The Canterbury Regional climate change report (Macara et al., 2020), the mean annual flood "should not be considered a comprehensive metric for the possible impact of climate change on New Zealand flooding".

Nevertheless, the **increasing mean annual flood and Q5% flows are consistent with projected increases to extreme rainfall, which is expected to occur as the planet warms. It is increasingly likely that more frequent and extreme rainfall will cause increased severe flooding risk in the district** with damaging implications for primary industries, infrastructure, private property, human life, and native ecosystems.

7.2 Sea level rise

Sea-level rise is triggered by melting of the polar ice caps and the thermal expansion of the ocean as water warms. In New Zealand, the sea may rise by up to a metre by the end of the century, and this rising sea level is associated with a range of potential broad impacts:

- increased frequency of damaging coastal flooding events,
- exacerbated coastal erosion of shorelines and unconsolidated cliffs,
- increased incursion of saltwater in rivers and nearby groundwater aquifers, potentially rising water tables in tidal groundwater systems.

There are several settlements situated in the Waimakariri District that are located within 5 km of the coastline, **and sea-level rise could directly impact those living in the coastal zone. This sea level rise will likely increase coastal erosion and flooding, which will damage homes and infrastructure such as pipes and roads**. Coastal erosion and inundation impacts have not been directly evaluated by NIWA but are described in the Jacobs Report on this topic previously commissioned by the Council. For a broad indication of the possible timing of sea-level rise impacts, the time window when various SLR levels could be reached is shown for three GHG concentration scenarios in Table 7-1. Please also refer to the NZ SeaRise tool for additional information about SLR in the Waimakariri District (https://www.searise.nz/).

Table 7-1: Approximate years, from possible earliest to latest, when specific SLR increments (metres above 1986-2005 baseline) could be reached for various projections. Table is from Pearce et al., (2018) after Stephens et al. (2014).

Sea-level rise (m)	Year achieved for RCP8.5 (83%ile)	Year achieved for RCP8.5 (median)	Year achieved for RCP4.5 (median)	Year achieved for RCP2.6 (median)
0.3	2045	2050	2060	2070
0.4	2055	2065	2075	2090
0.5	2060	2075	2090	2110
0.6	2070	2085	2110	2130
0.7	2075	2090	2125	2155
0.8	2085	2100	2140	2175
0.9	2090	2110	2155	2220
1.0	2100	2115	2170	>2200
1.2	2110	2130	2200	>2200
1.5	2130	2160	>2200	>2200
1.8	2145	2180	>2200	>2200
1.9	2150	2195	>2200	>2200

7.3 Wildfire

Fire risk in New Zealand is projected to increase in the future, due to a range of reasons (Pearce et al., 2011):

- warmer air temperature and stronger winds;
- increased drought frequency, and associated increases in fuel (vegetation) drying;
- a potentially longer fire season;
- more thunderstorms and lightning;
- drier and possibly windier conditions would cause faster fire spread and larger areas to be burned.

Many of the above factors are projected to occur in the Waimakariri District including increased temperatures, stronger winds, and more drought prone conditions (i.e., increased PED). **For these reasons damaging wildfires that could negatively impact forestry, agriculture, and private property could become more prevalent across the district in future.**

7.4 Impacts on primary industries

The primary sector makes up a large part of the district's economy. While many of the climate impacts listed above can have an indirect effect on primary industries it is worth describing how climate change could directly impact this sector given its importance in the region.

Primary industries are at risk from more frequent extreme weather events, in particular drought and flood. Drought and lack of reliable rain can negatively impact the productivity of land and present challenges to many primary industries, particularly those that are water intensive. **PED is projected to increase essentially everywhere throughout the Waimakariri District in the future, suggesting**

the region will likely become more drought prone. More water could be needed for irrigation across the district as PED is projected to increase in the future regardless of GHG concentration scenario. Increased PED implies that increased temperature and increased evapotranspiration will not be offset by increased total rainfall across the district, meaning that soils will likely be drier despite an increase in annual rainfall.

Flooding will continue to be an issue in the district particularly for primary sector activities located near the district's larger rivers, such as the Ashley/Rakahuri and Waimakariri, or in areas experiencing high amounts of rainfall.

Increased temperatures may cause increased heat stress for livestock animals, resulting in increased animal mortality during heatwaves. Higher temperatures could also enhance the risk of pests and diseases that impact primary industries. Potential invasive species, like the Queensland fruit fly, may be able to live in wider parts of New Zealand as our climate warms, increasing the risk of outbreak and contamination.

7.5 Impacts on people

The health and wellbeing of many people living in the Waimakariri District could be affected by a changing climate. Higher temperatures could bring more heat-related illnesses to residents of the district. Vulnerable groups such as the elderly, disabled people, infants, and outdoor workers (e.g., labourers and farmers) are particularly susceptible to potential health impacts from climatic warming.

More frequent and intense weather events such as flooding, storms, and forest fire are also likely to directly impact people's health and wellbeing. Climate change may also have a negative effect on many people's mental health. Various communities are already anxious about the implications of climate change and as impacts become more severe, anxieties could get worse.

The northern Pegasus Bay coastal area is culturally significant to Ngāi Tahu and Ngāi Tūāhuriri including Fenton Reserves and entitlements used to access waterways for mahinga kai purposes. Changes to the coastal environment could therefore also have cultural impacts on Māori communities in the district.

Additionally, the district should expect social and economic impacts and disruption caused by communities retreating from the coast due to sea-level rise and coastal flooding. Protecting coastal properties (including insurance) in the coastal zone may become increasingly difficult with economic and wellbeing implications for communities in flood prone coastal regions.

7.6 Impacts on species and ecosystems

Ecosystems are complex interconnected communities of different plants, animals, and other organisms. In an ecosystem, when one animal or plant is affected by a change in the environment (e.g., rising temperatures), all the species within the ecosystem are potentially affected. The implications of climate change for ecosystems in the Waimakariri District will require careful expert analysis. However, broadly speaking some important ecosystems in the district include alpine, freshwater (lakes, rivers, and wetlands), coastal, and forests.

7.6.1 Alpine ecosystems

Projections suggest warming could be enhanced in the district's alpine areas and snow days will be reduced. Organisms living in higher elevation areas are adapted to survive in cold and often freezing environments. Snowlines will move to higher elevations and species living in these environments may also have to move upslope**.** This may cause a habitat "squeeze" on alpine ecosystems in the Waimakariri District. For example, the hills around the Lees Valley are listed in Council's proposed District Plan as an "outstanding natural landscape" and the Okuku Triassic Monotis geo-preservation site. These significant landscapes and associated alpine ecosystems could come under significant threat as the climate changes. It is also possible that alpine ecosystems will increasingly be affected by pest species such as rats and hedgehogs as higher temperatures allow them to survive at higher elevations.

7.6.2 Freshwater ecosystems

Higher temperatures will cause water in the district's rivers, lakes, and wetlands to become warmer. Warmer waters will likely impact the range – the habitat in which animals can comfortably live – of many aquatic species, as well as nutrient cycling and primary productivity. Warming of waterways could lead to the proliferation of invasive species (e.g., water hyacinth). Additionally, weather patterns (especially changing wind and temperature) could increase the likelihood of algal blooms occurring in the district's rivers and lakes. These changes could have serious implications for human and animal health and impact on recreational activities in the region.

7.6.3 Coastal ecosystems

The district's coastal ecosystems will likely experience rising seas and increased coastal erosion with implications for all coastal dwelling species. These processes will create a habitat 'squeeze' between coastal ecosystems and developed land.

The internationally significant Ashley/Rakahuri estuarine ecological area is an important feeding, roosting, and breeding ground for many native birds including some critically endangered species and climatic changes to this environment could endanger these delicate ecosystems further.

7.6.4 Terrestrial ecosystems

Numerous native birds and insects could be affected by climate change. Increasing temperatures will likely make New Zealand a more suitable habitat for invasive flora and fauna. Invasive species from warmer climates may outcompete native species. The timing of seasonal activities like breeding, flowering, growth and migration may alter as the climate changes, disrupting relationships between species.

Warmer and drier winters in the district could extend the breeding seasons of some mammalian predators (e.g. rats, mice, goats, pigs and possums). As the climate warms, it is possible that more of these mammalian predators will survive the winter months, with negative implications for native terrestrial species.

8 Sixth Assessment Report Considerations

The IPCC Sixth Assessment Report (AR6) from Working Group 1 (WG1) was published in August 2021. The WG1 report uses data from a suite of updated GCMs to provide "…the most up-to-date physical understanding of the climate system and climate change…". The models are collated and managed by the World Climate Research Programme (WCRP) in the Coupled Model Intercomparison Project Phase 6 (CMIP6). While the WG1 report is predominantly a global assessment, it does include some global-regional (e.g., Australasia) climate change summary information. However, the WG1 report provides limited information on projected climate change at the scale useful for the Waimakariri District (i.e. to a spatial resolution of a few kilometres). **Since the findings of this report are based on the AR5 global climate modelling we will provide a brief summary of New Zealand relevant information from the AR6** (see Bodeker et al., 2022 for more details)**.** It must be noted that all information and conclusions given here are based on interpretation of AR6 model data and related publications only. More detailed information on New Zealand's regional climate will come with the forthcoming AR6 downscaling effort, which is being led by NIWA and is expected in 2024.

With regards to historical climate warming, the AR6 states that the mean global temperature change from the preindustrial time period (1850-1900) up to 2011-2020 is 1.09°C, meaning the planet is already quite close to the Paris Agreement thresholds of 1.5 and 2°C. The AR5 reported a 0.78 °C increase in temperature up to 2003-2012. The reasons for the 0.31°C increase in global warming include methodological changes, the calculated global-mean temperature of the preindustrial period (1850-1900) decreasing, and significant ongoing warming since 2003-2012 of around 0.19°C in the last decade.

As mentioned previously in this report the AR6 modelling uses SSPs rather than the RCPs used in AR5. The SSPs developed for the IPCC AR6 were designed so that the GHG concentration scenarios used in climate modelling originate from a wider and more realistic array of socioeconomic drivers. These factors include population growth, technological development, and economic development. The resulting emissions scenarios represent narratives for energy use, air pollution control, land use and GHG emissions. The SSP storylines are "sustainability: (SSP1), "middle of the road" (SSP2), "regional rivalry" (SSP3), "inequality" (SSP4) and "fossil-fuel intensive development" (SSP5). The AR6 SSPs and AR5 RCPs are not directly comparable, however, for reference a comparison of AR5 and AR6 projected global mean temperature changes are provided in Table 8-1.

Table 8-1: Projected global mean warming in 2081-2100, relative to 1850-1900, in AR5 and AR6. The AR5 values are originally relative to the mean temperature of 1986-2005. Following AR5, 0.6°C has been added to represent warming between 1850-1900 and 1986-2005. 'SPM' refers to the WG1 Summary for Policymakers reports for AR5 and AR6 (source: Bodeker et al. 2022).

End-of-century nominal radiative forcing (Wm-2)	Warming in 2081-2100 (°C) under RCP scenarios (likely range; AR5 table SPM.2)	Warming in 2081-2100 (°C) under SSP scenarios (very likely range; AR6 SPM table B.1.2)
1.9	-	1.4 (1.0-1.8)
2.6	1.6 (0.9-2.3)	1.8 (1.3-2.4)
4.5	2.4 (1.7-3.2)	2.7 (2.1-3.5)
7.0	-	3.6 (2.8-4.6)
8.5	4.3 (3.2-5.4)	4.4 (3.3-5.7)

Table 8-1 shows that AR6 projections present a slight increase in global warming, but the uncertainty ranges overlap with those from AR5. Importantly, the uncertainty ranges have decreased under AR6 meaning there is more agreement on the range of likely warming associated with future GHG concentrations. Of the scenarios considered in AR6, only the aggressive GHG mitigation scenario SSP1-1.9 will *more likely than not* result in end-of-century warming of less than 1.5°C. The SSP1-1.9 scenario involves extensive net CO_2 sequestration in the second half of this century and will require rapid development and deployment of these technologies.

Evidence of changes in extreme weather events and their attribution to GHG induced warming has strengthened since the AR5. The large number of event attribution studies that have been published since AR5 have contributed to a growing body of evidence that changes in individual weather events can be attributed to increased GHG concentrations. We can generally be more confident attributing large-scale heatwaves and longer duration extreme precipitation events (e.g., 2021 Canterbury Floods) have higher confidence than shorter and more localised events.

Though attribution is difficult, especially in a complex climate like New Zealand, the findings in AR6 further increase our confidence that extreme climatic events like extreme precipitation, drought, tropical cyclones and compound extremes (including dry/hot events and fire weather) will increase throughout New Zealand due to human activities and GHG warming.

9 Glossary of abbreviations and terms

IPCC	Intergovernmental Panel on Climate Change
AR5	IPCC Fifth Assessment Report
AR6	IPCC Sixth Assessment Report
WDC	Waimakariri District Council
NIWA	National Institute of Weather and Atmospheric Research
RCP	Representative concentration pathway
GHG	Greenhouse gas
SSP	Shared Socio-Economic Pathways
VCSN	Virtual Climate Station Network
SLR	Sea-level rise
PED	Potential evaporation deficit
PET	Potential evapotranspiration
WG1	IPCC Working Group 1
WCRP	World Climate Research Programme
CMIP6	Coupled Model Intercomparison Project Phase 6

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Appendix A Historical Climate Maps

The following figures are historical climate maps of the Waimakariri District. These data are derived from modelled historical climate simulations.

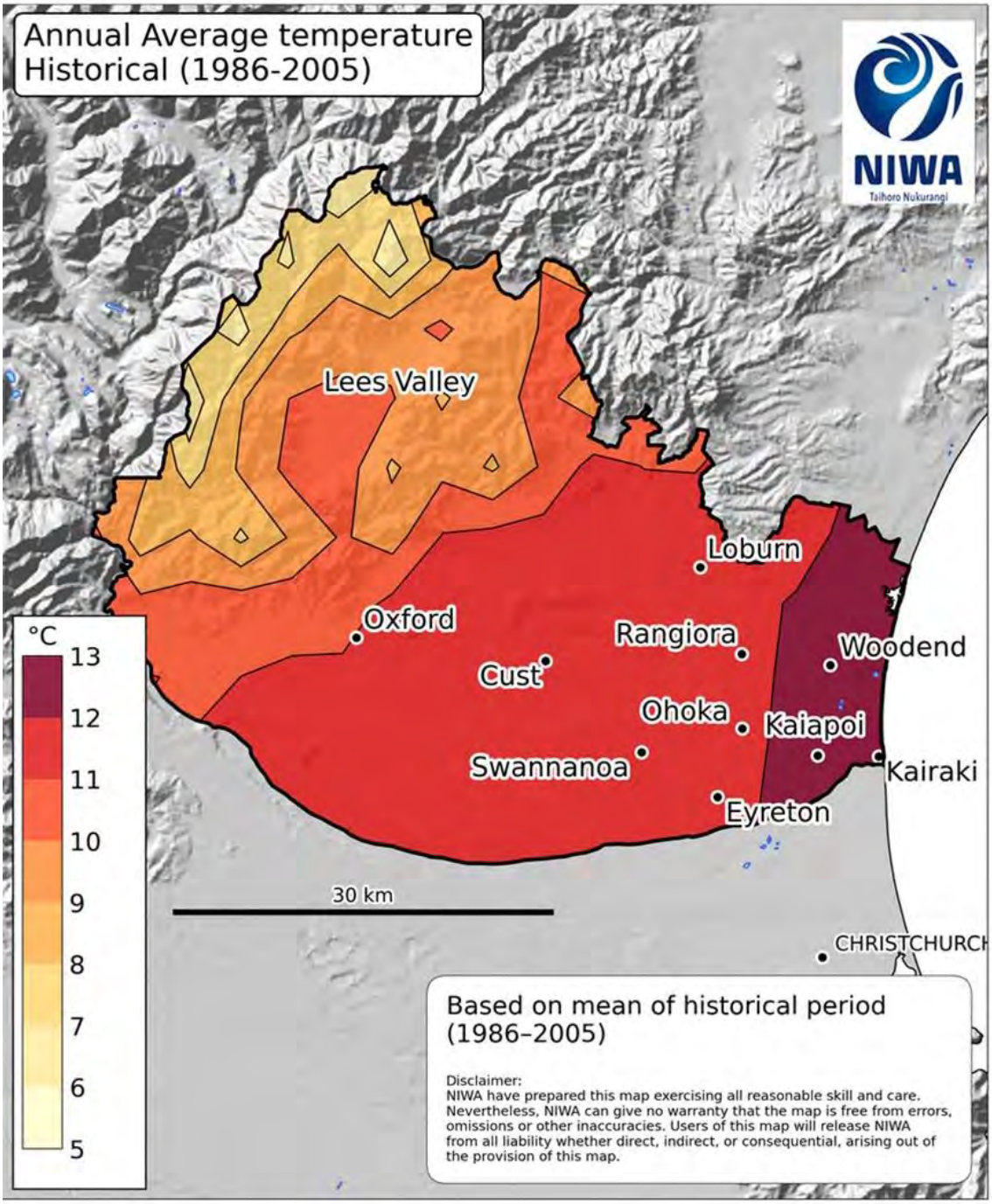


Figure A-1: Daily mean air temperature (°C) for Waimakariri District for the historic period (1986-2005).

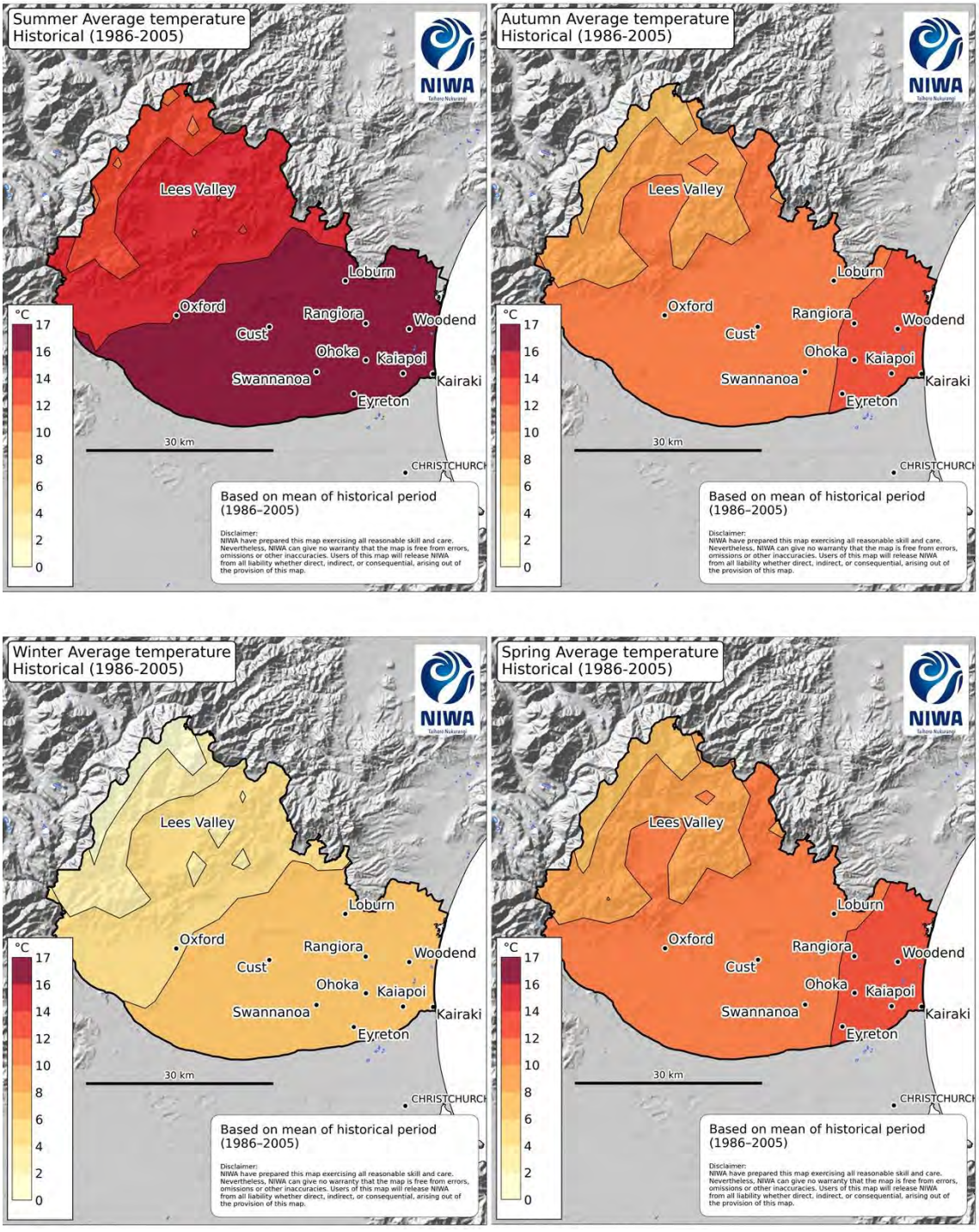


Figure A-2: Daily mean air temperature (°C) by season in the Waimakariri District for the historic period (1986-2005).

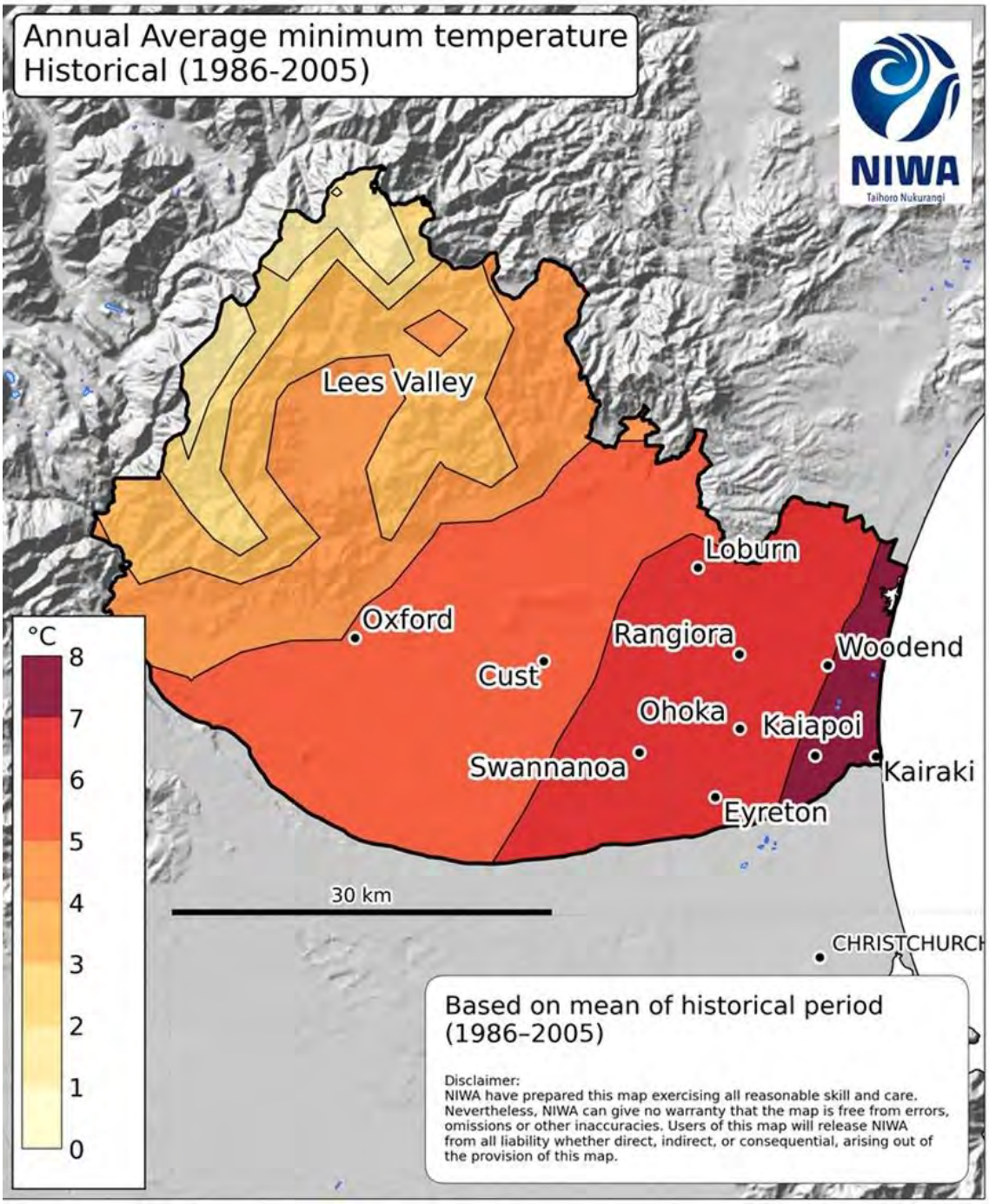


Figure A-3: Average daily minimum air temperature (°C) for Waimakariri District for the historic period (1986-2005).

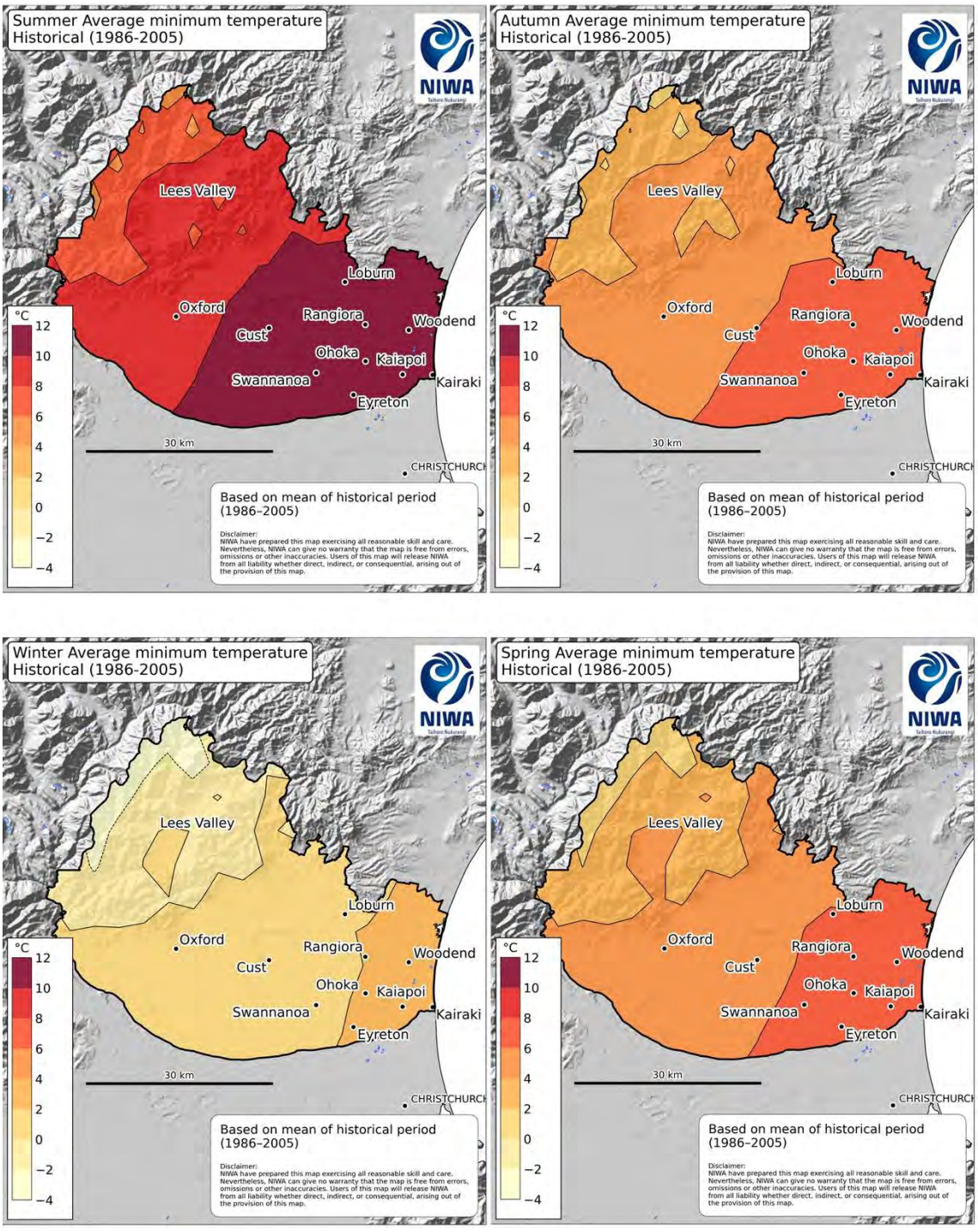


Figure A-4: Average daily minimum air temperature (°C) by season in the Waimakariri District for the historic period (1986-2005).

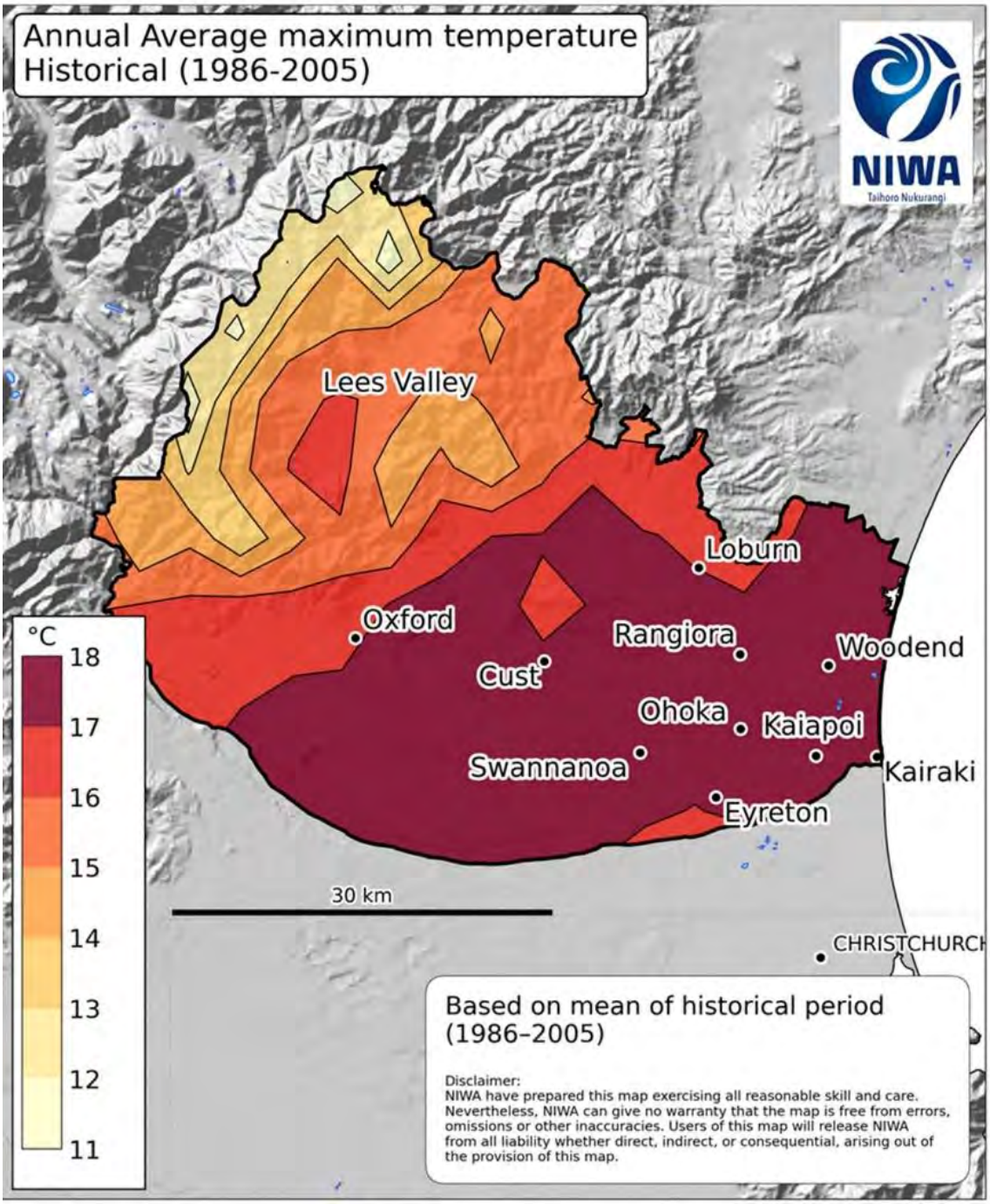


Figure A-5: Average daily maximum air temperature (°C) for Waimakariri District for the historic period (1986-2005).

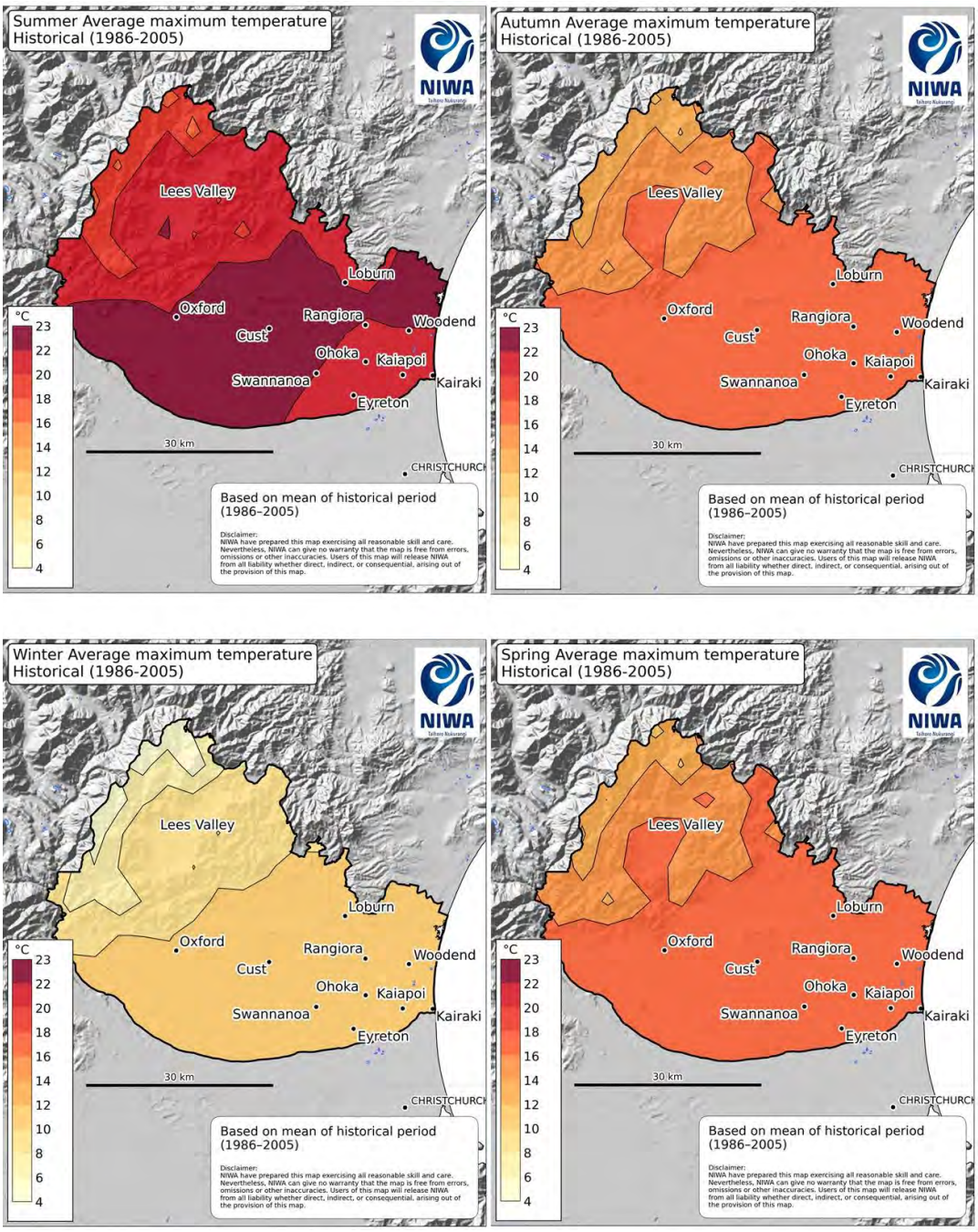


Figure A-6: Average daily maximum air temperature (°C) by season for Waimakariri District for the historic period (1986-2005).

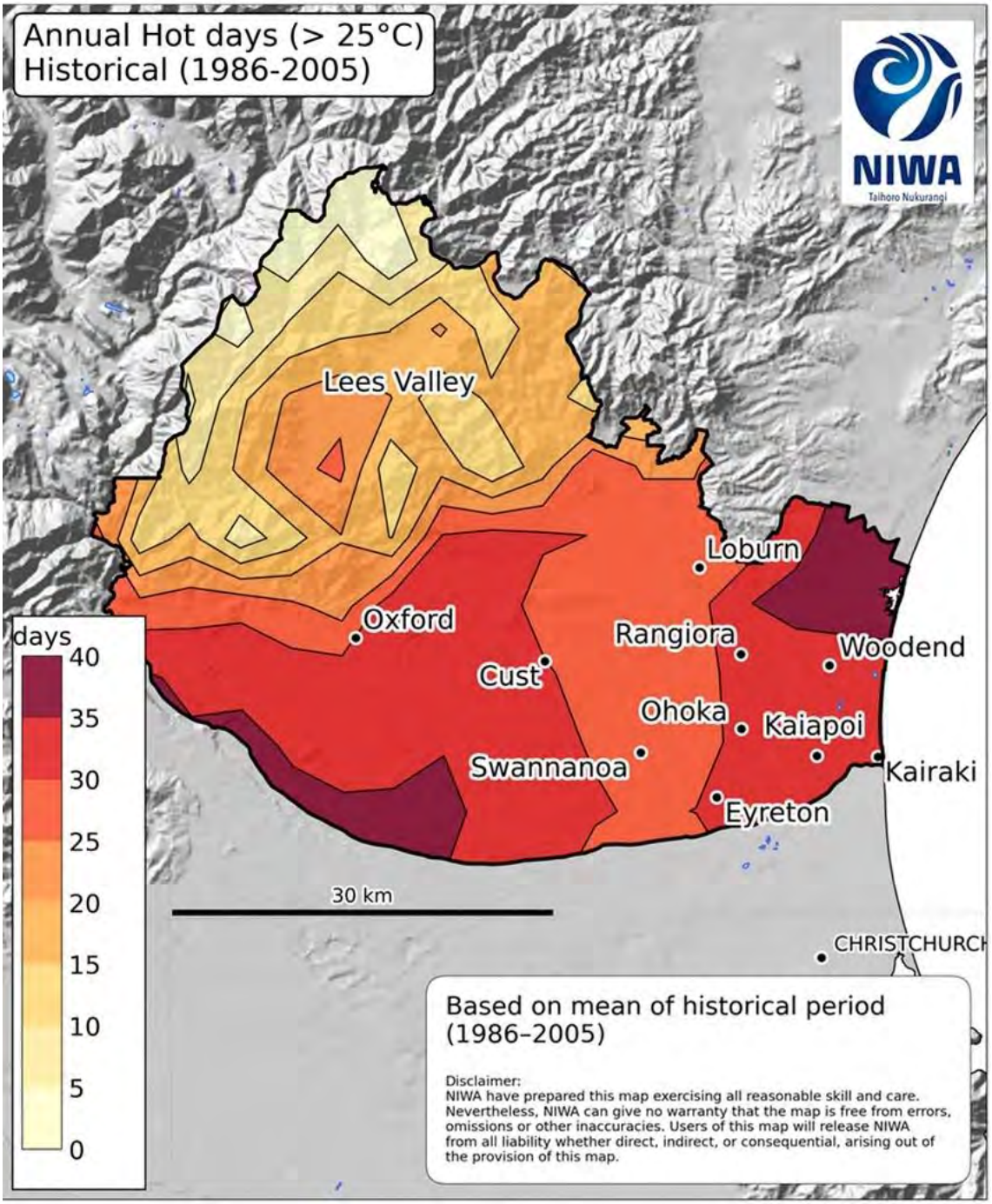


Figure A-7: Average number of hot days per year for Waimakariri District for the historic period (1986-2005).

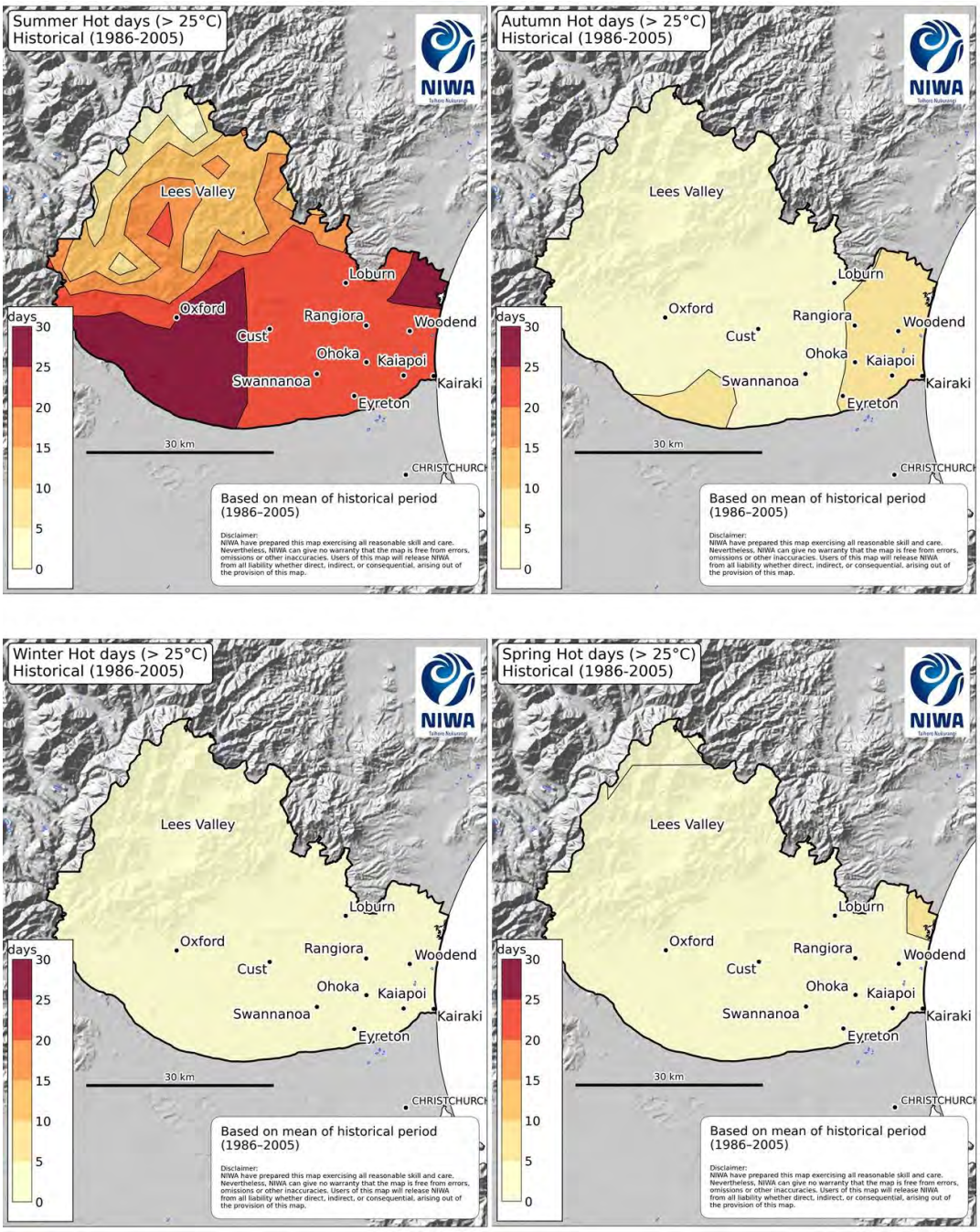


Figure A-8: Average number of hot days per year by season for Waimakariri District for the historic period (1986-2005).

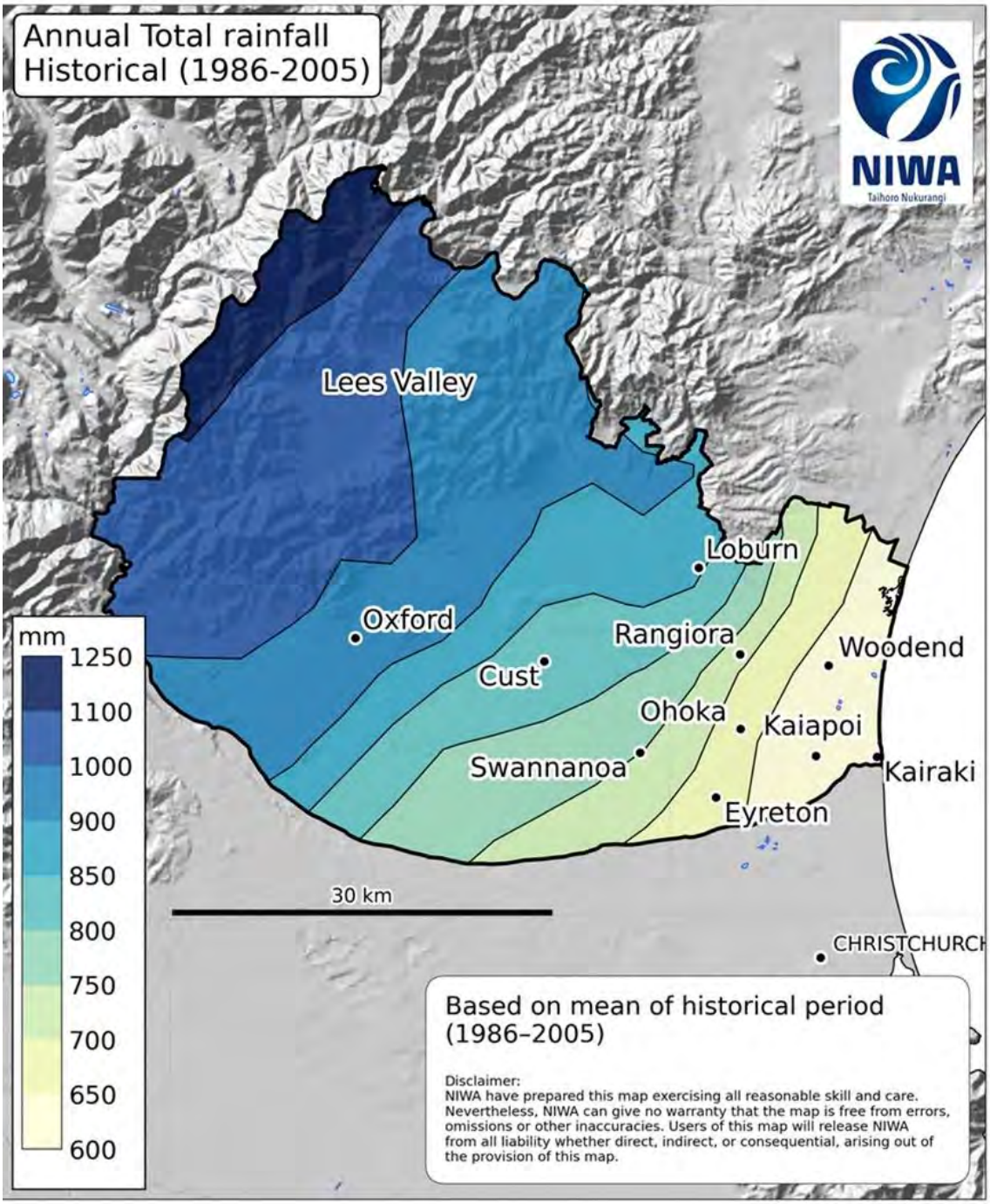


Figure A-9: Average rainfall for Waimakariri District for the historic period (1986-2005).

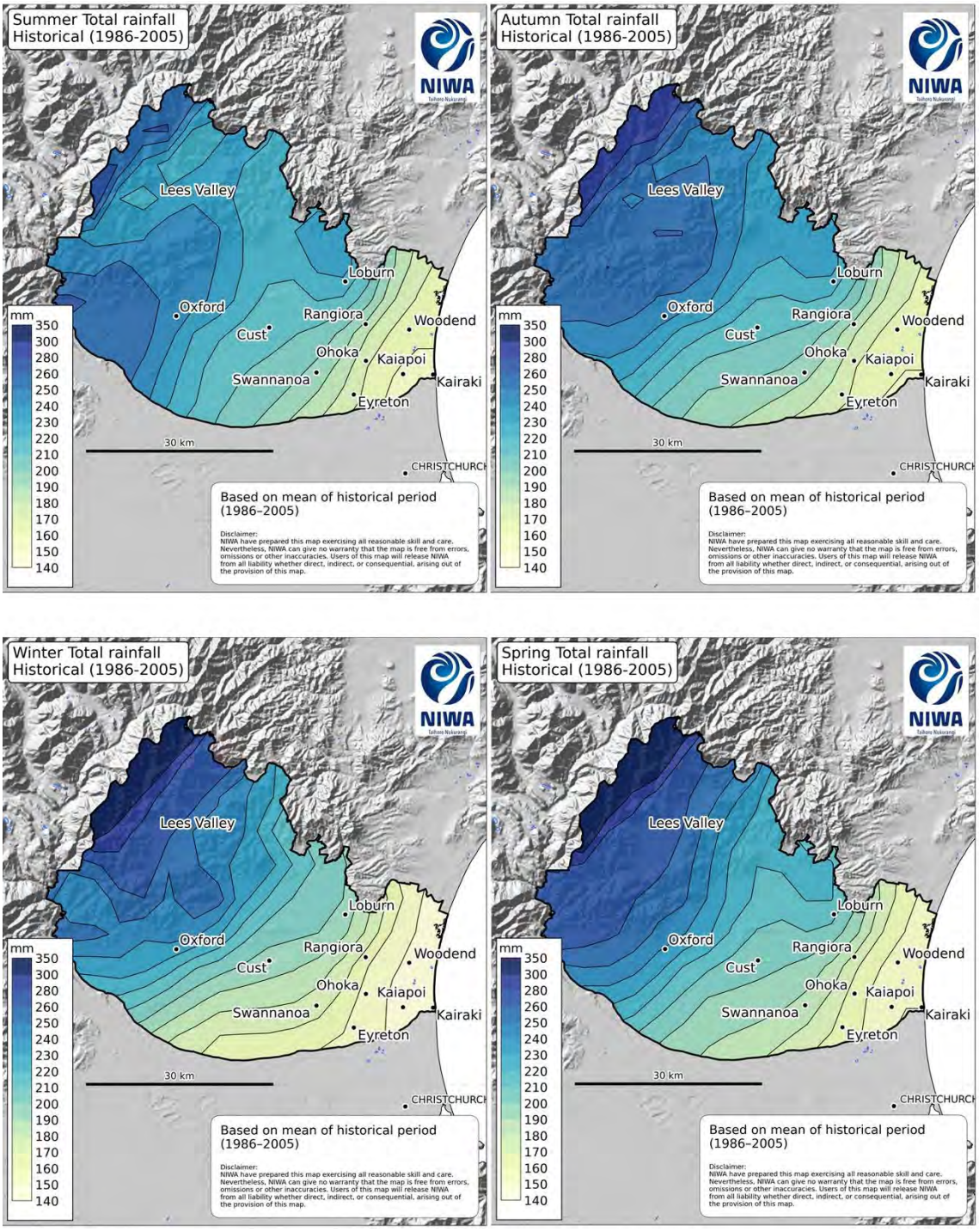


Figure A-10: Average rainfall for Waimakariri District by season for the historic period (1986-2005).

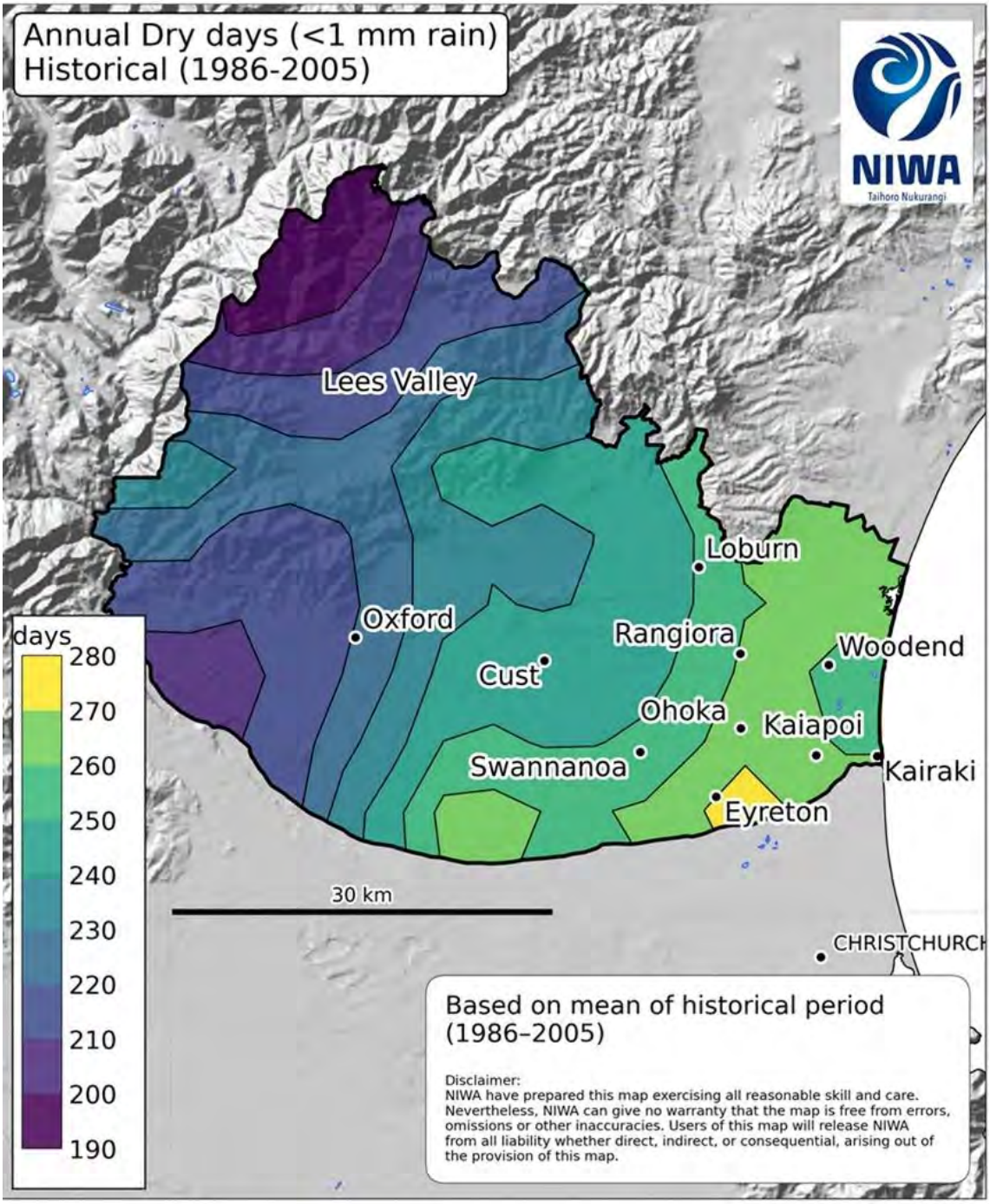


Figure A-11: Average number of dry days per year for Waimakariri District for the historic period (1986-2005).

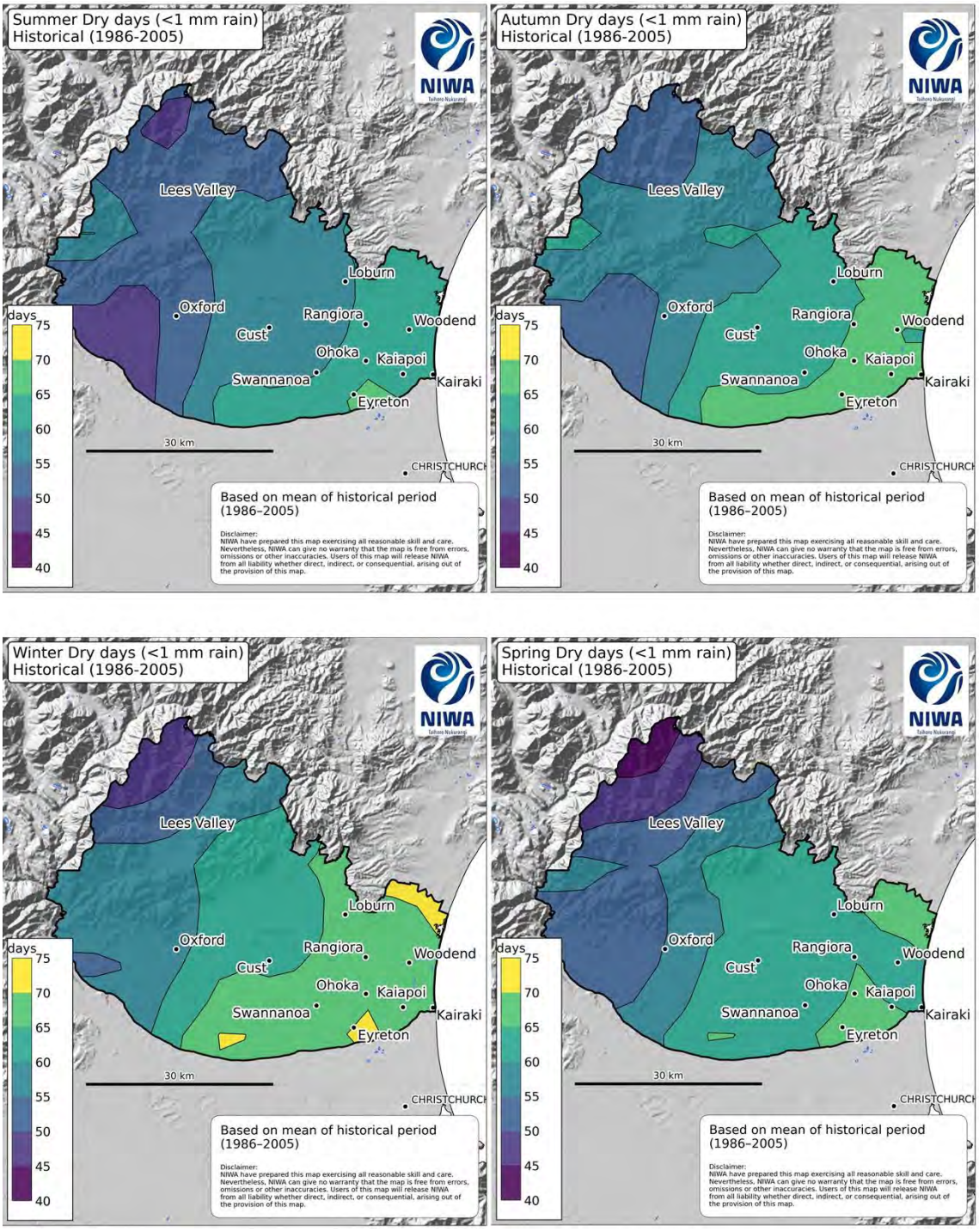


Figure A-12: Average number of dry days per year for Waimakariri District by season for the historic period (1986-2005).

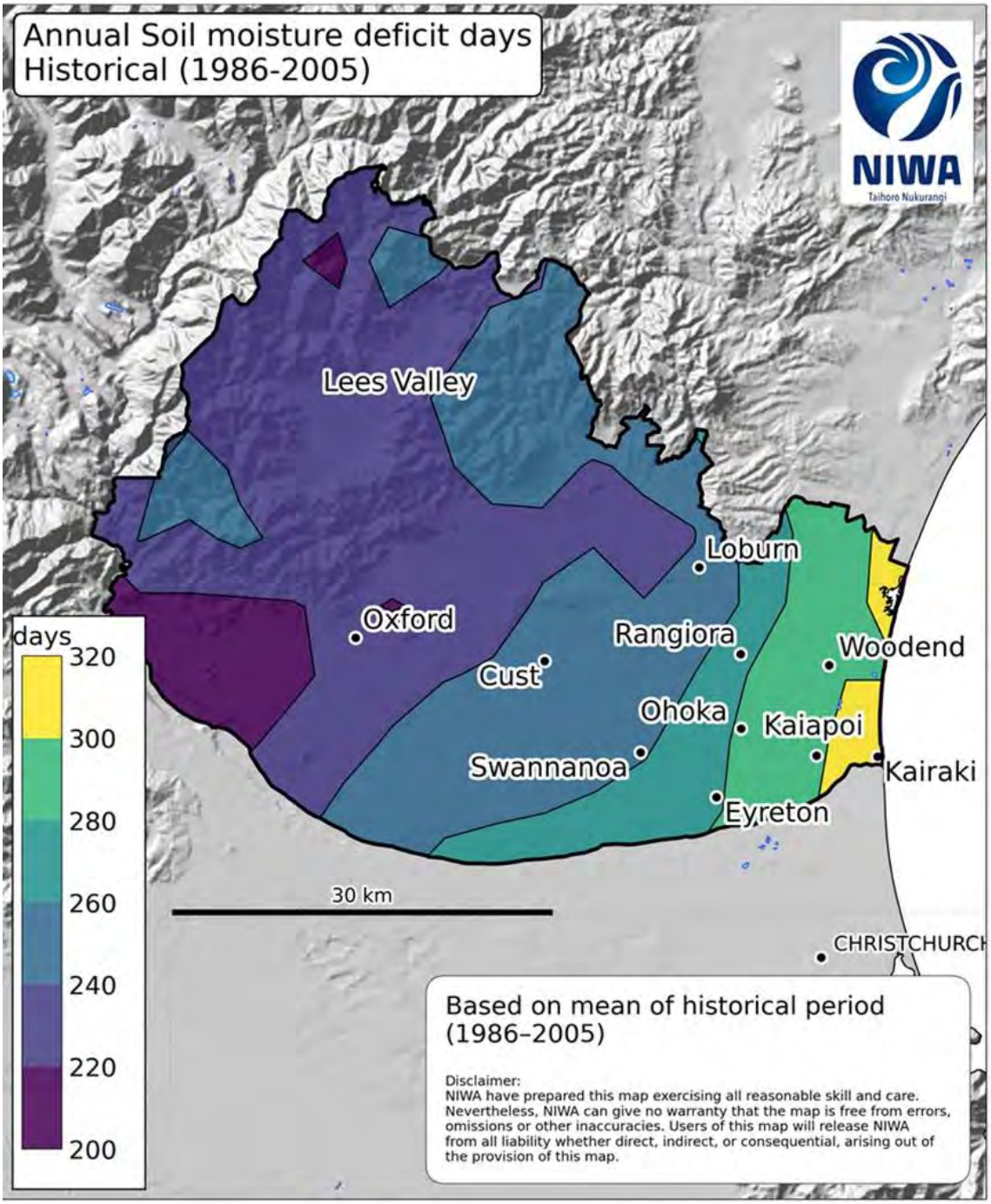


Figure A-13: Average number of soil moisture deficit days per year for Waimakariri District for the historic period (1986-2005).

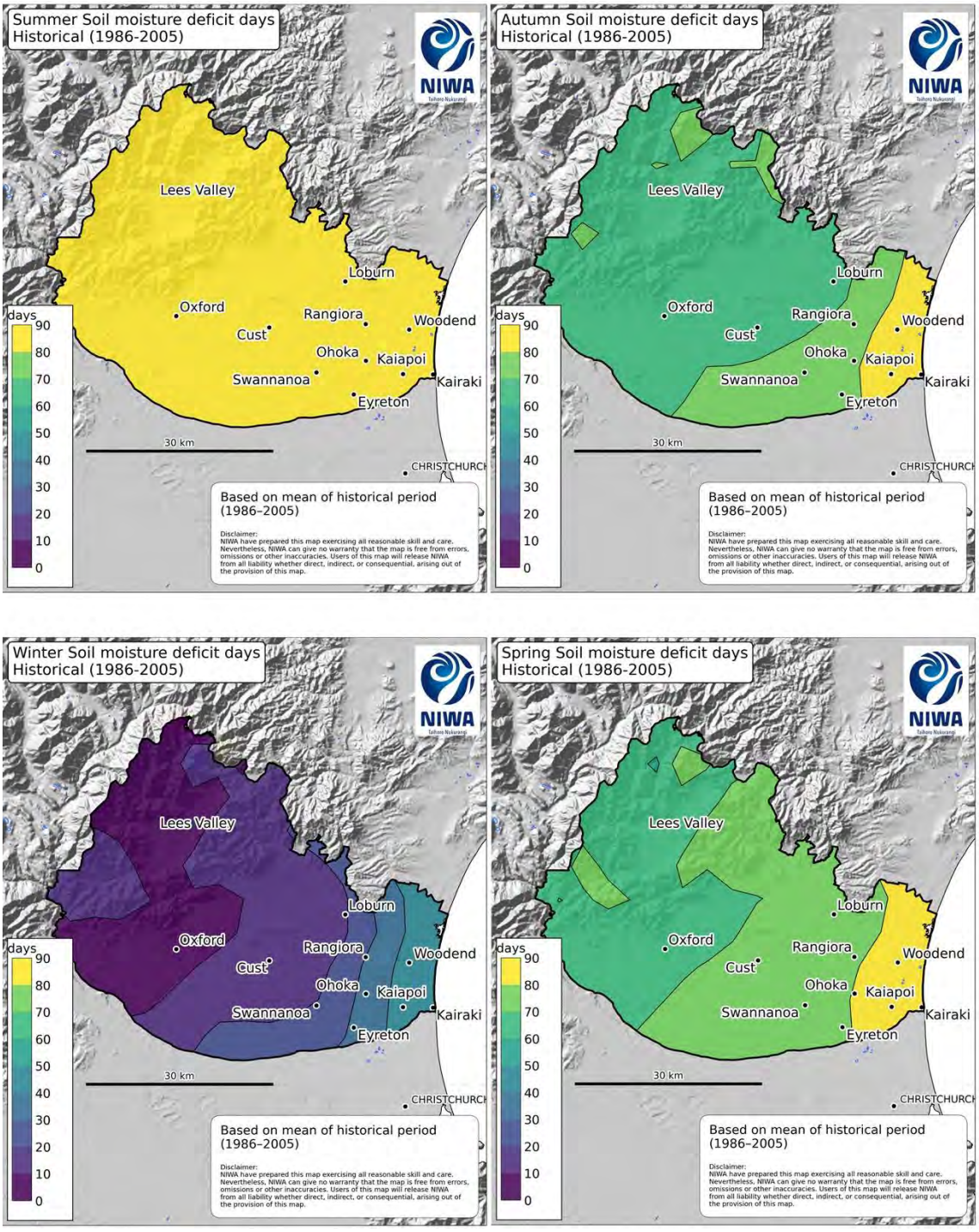


Figure A-14: Average number of soil moisture deficit days per year by season for Waimakariri District for the historic period (1986-2005).

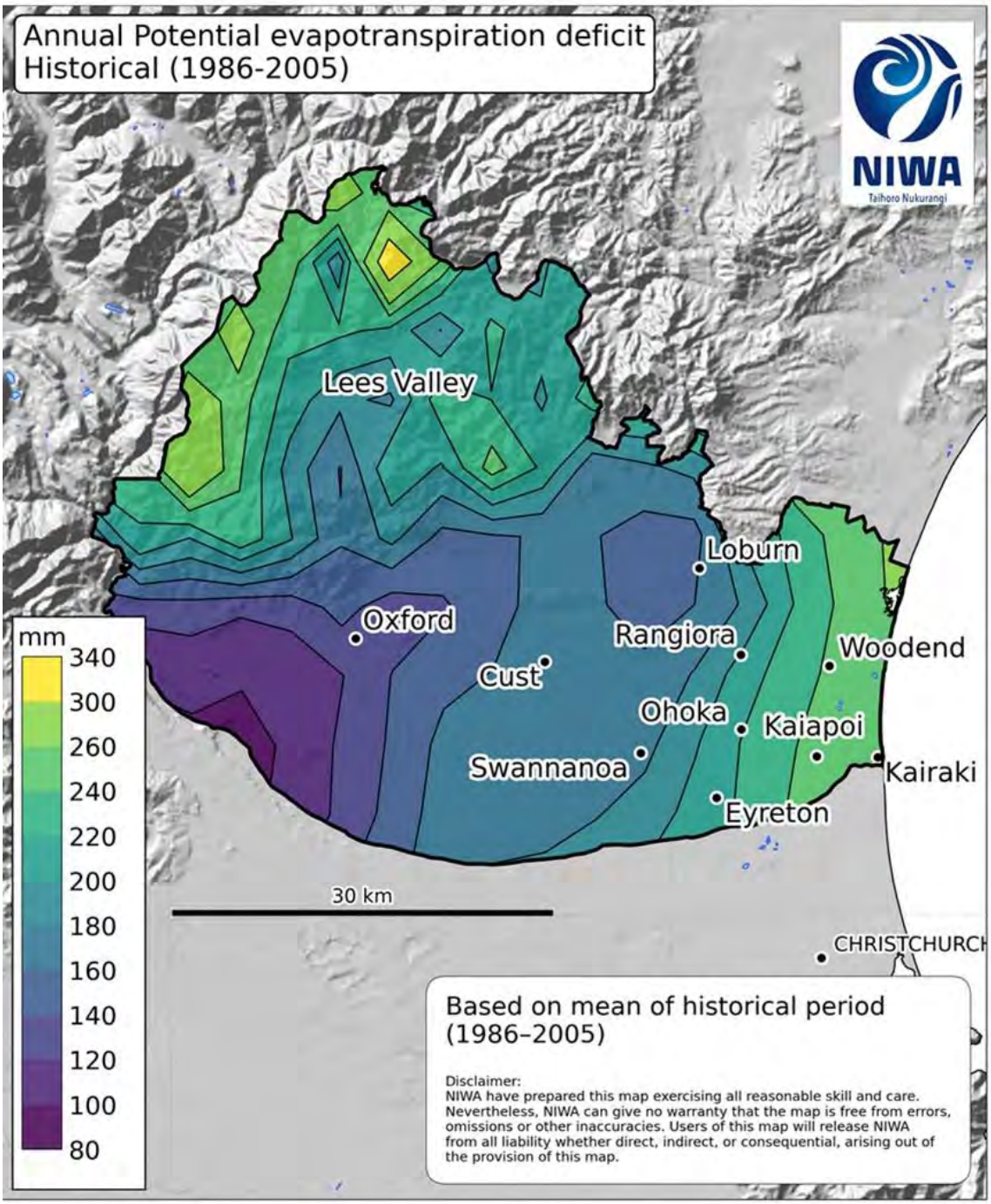


Figure A-15: Average annual potential evaporation deficit for Waimakariri District for the historic period (1986-2005).

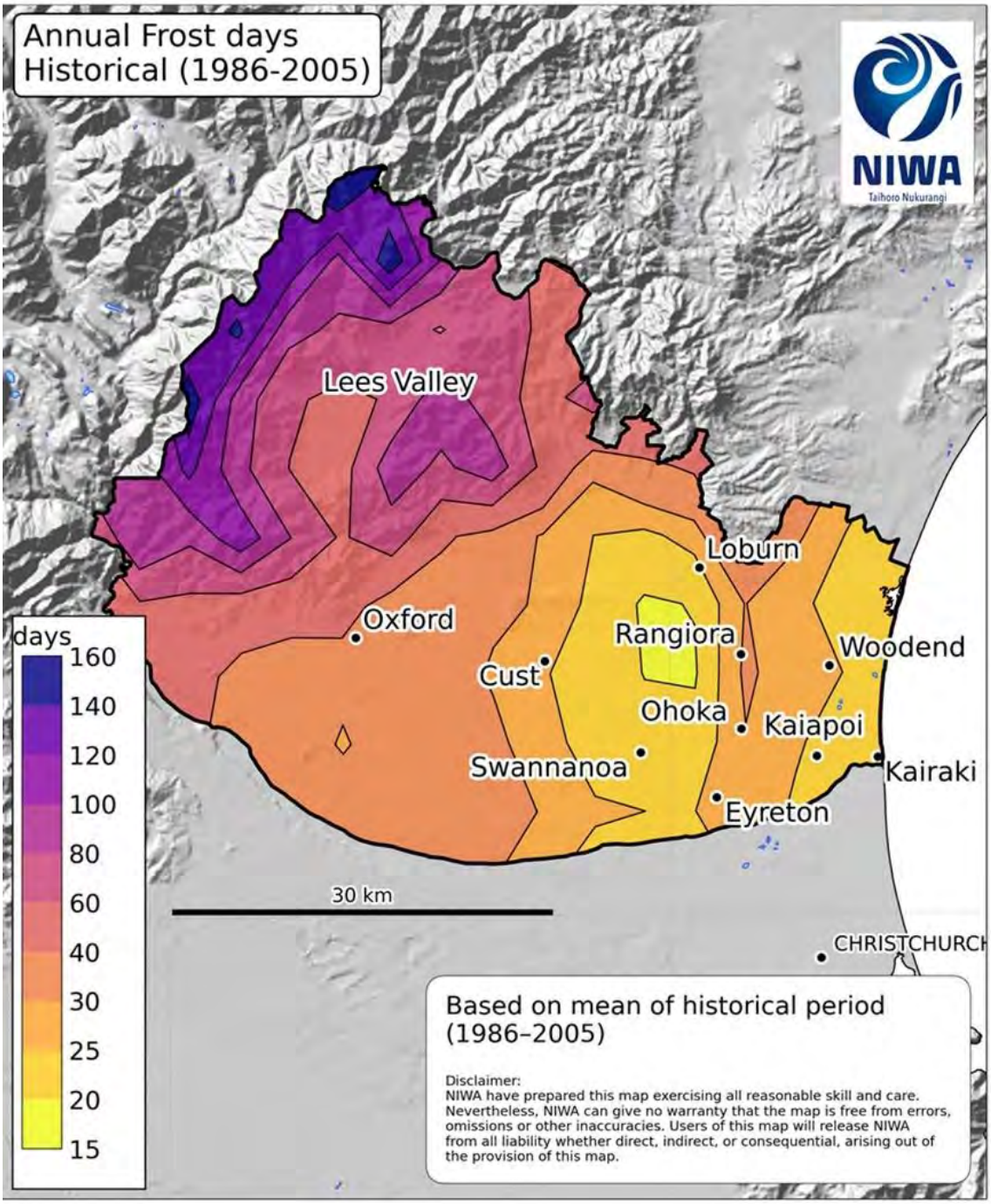


Figure A-16: Average number of frost days per year for Waimakariri District for the historic period (1986-2005).

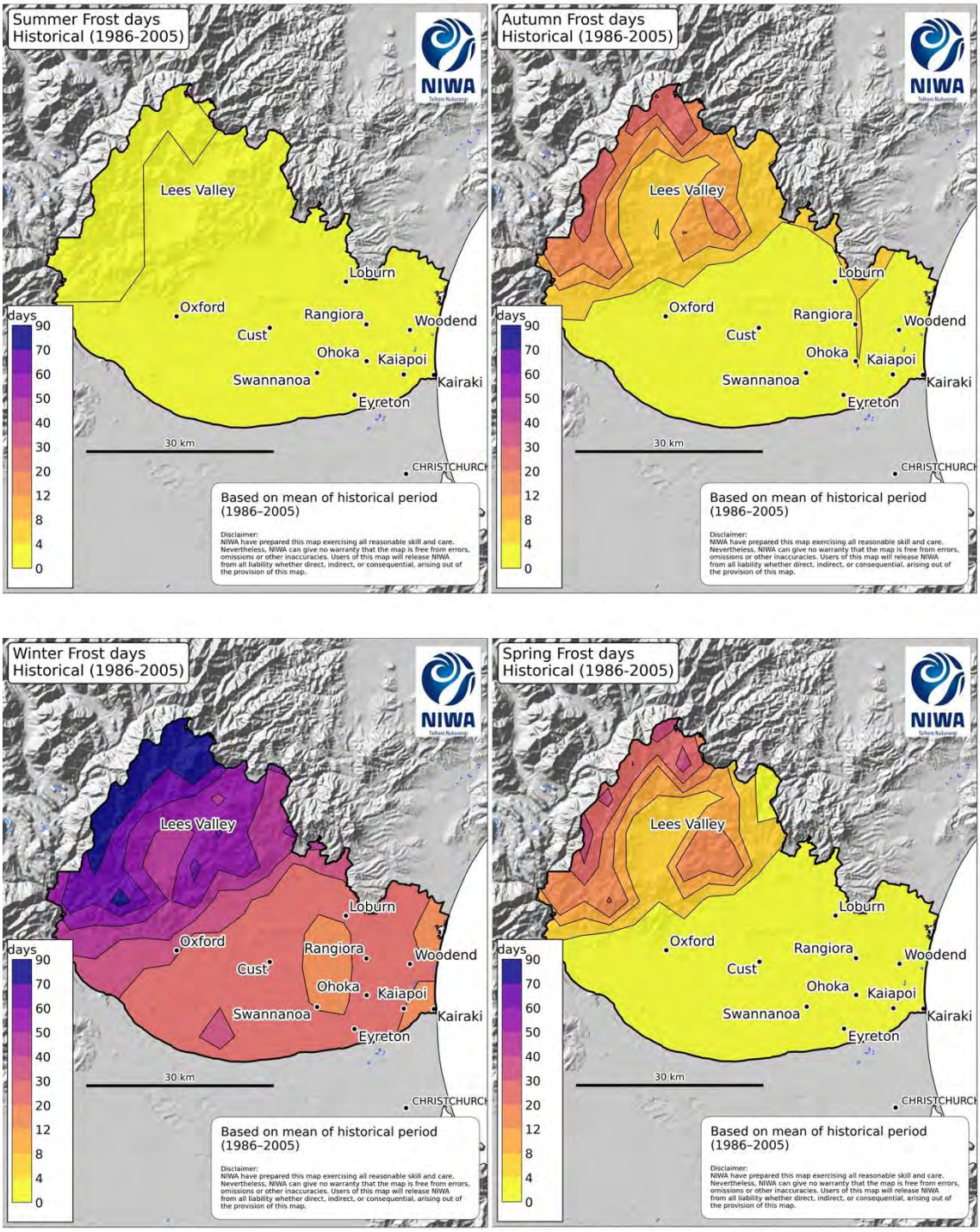


Figure A-17: Average number of frost days per year by season for Waimakariri District for the historic period (1986-2005).

Appendix B Supplementary Climate Change Projection Maps

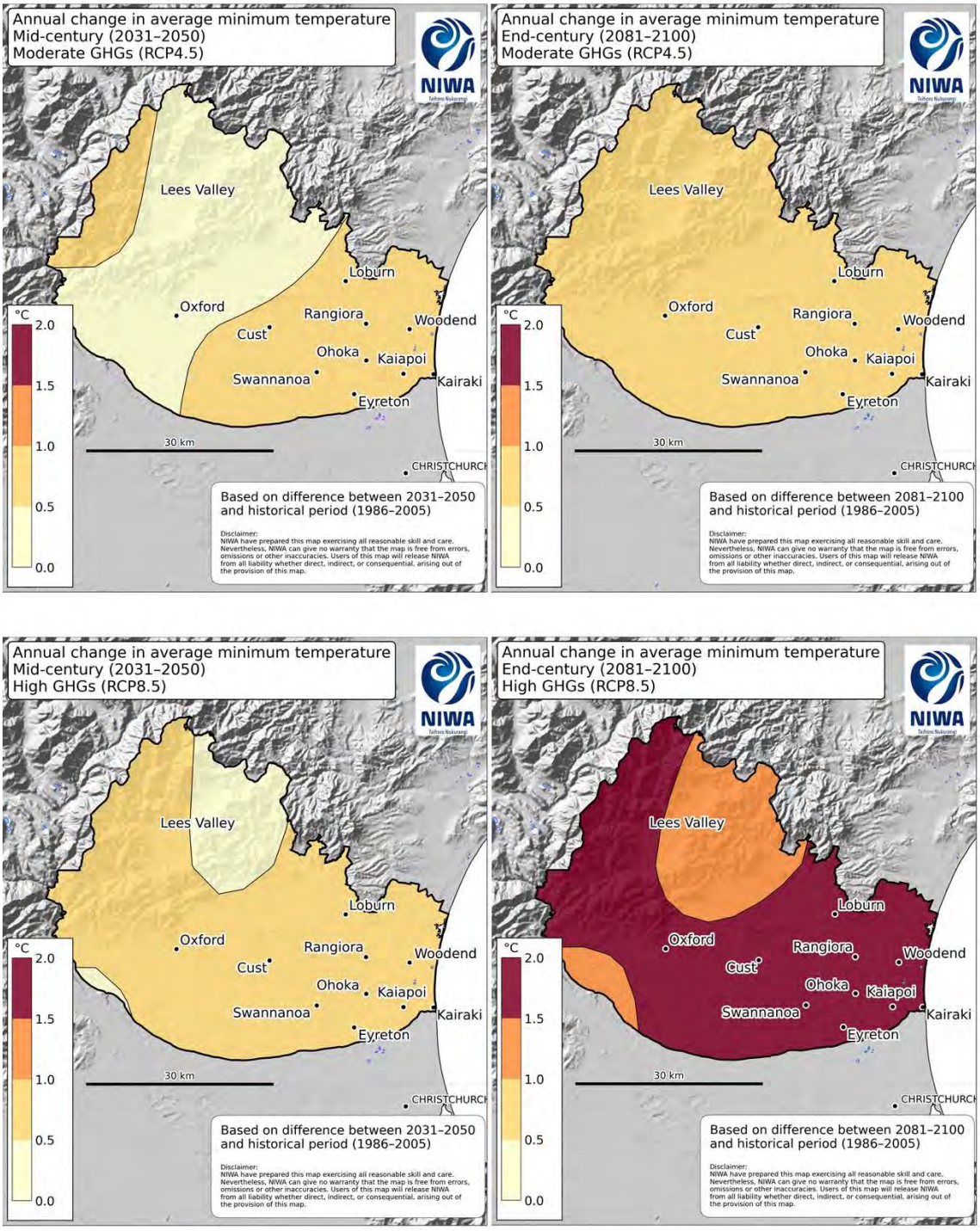


Figure B-1: Projected changes in average daily mean minimum air temperature (°C) for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

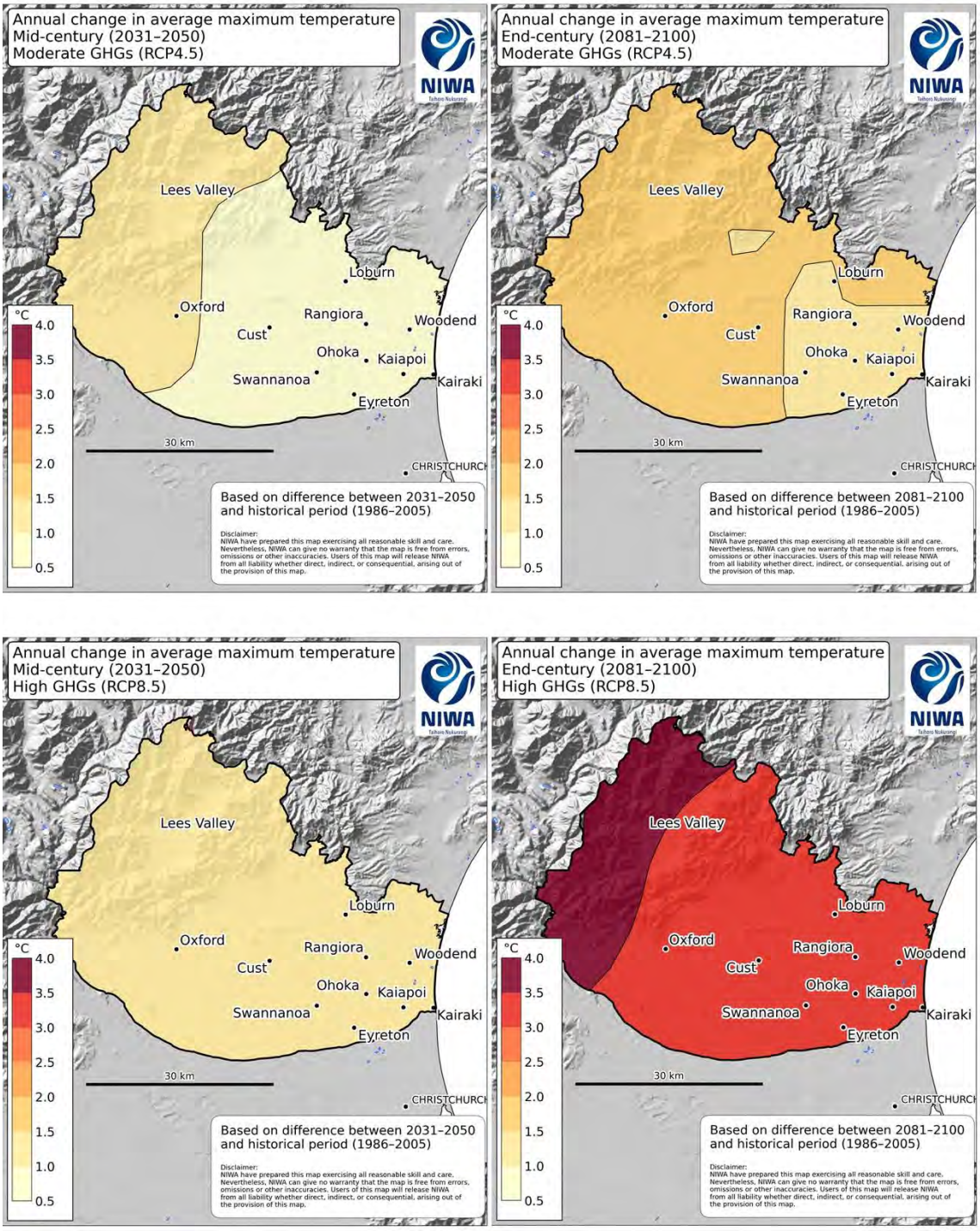


Figure B-2: Projected changes in average daily mean maximum air temperature (°C) for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

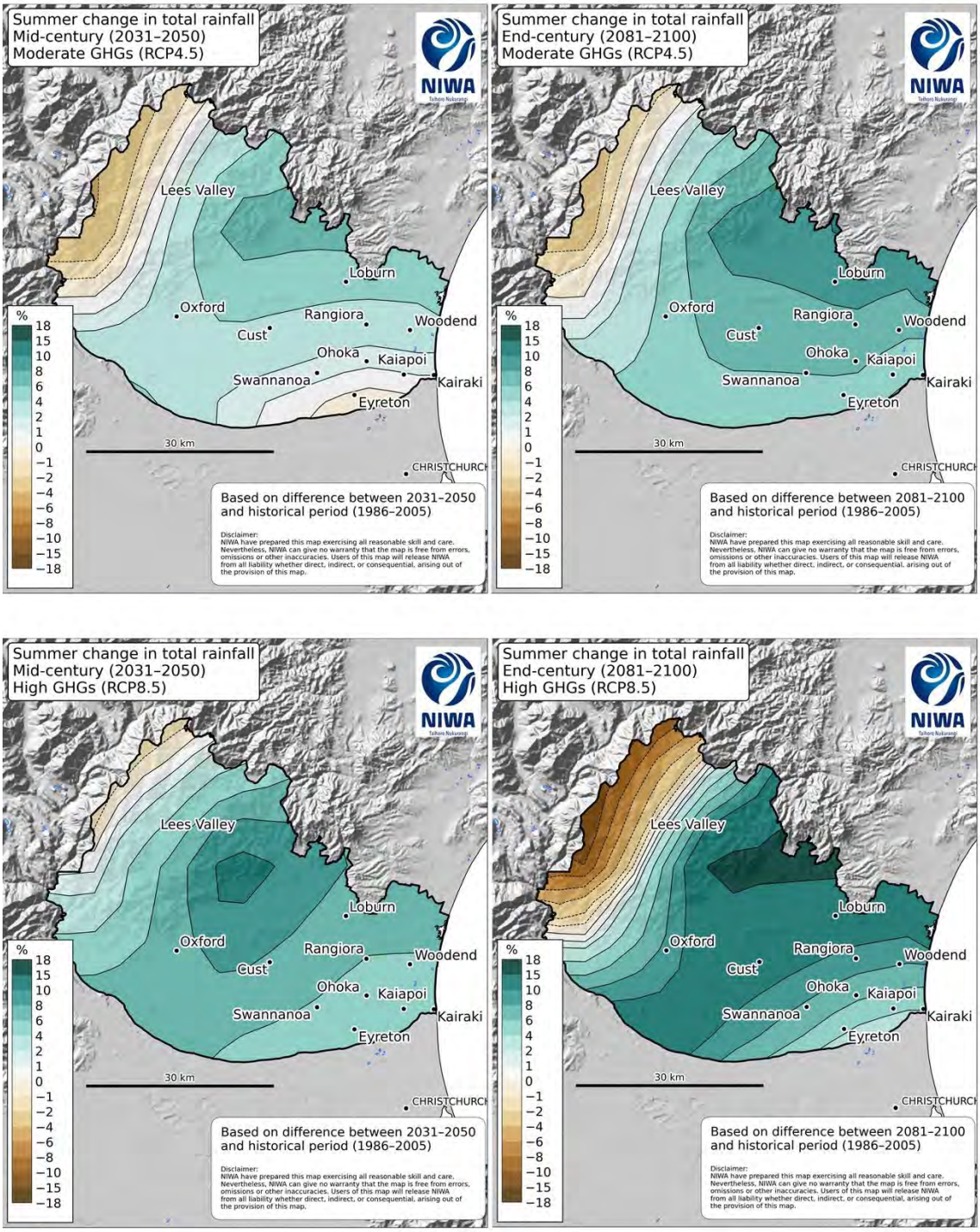


Figure B-3: Projected changes in summer total rainfall for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

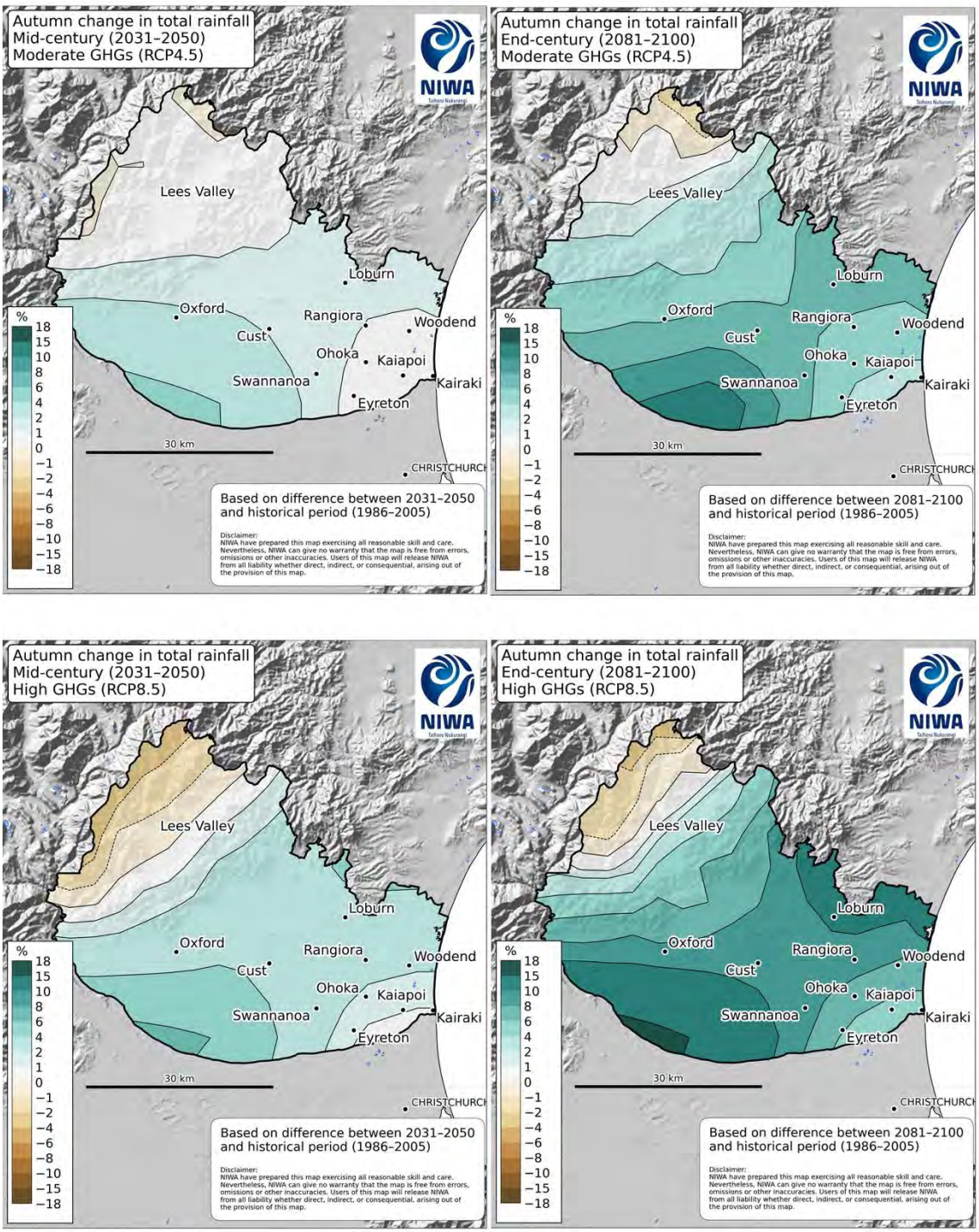


Figure B-4: Projected changes in autumn total rainfall for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

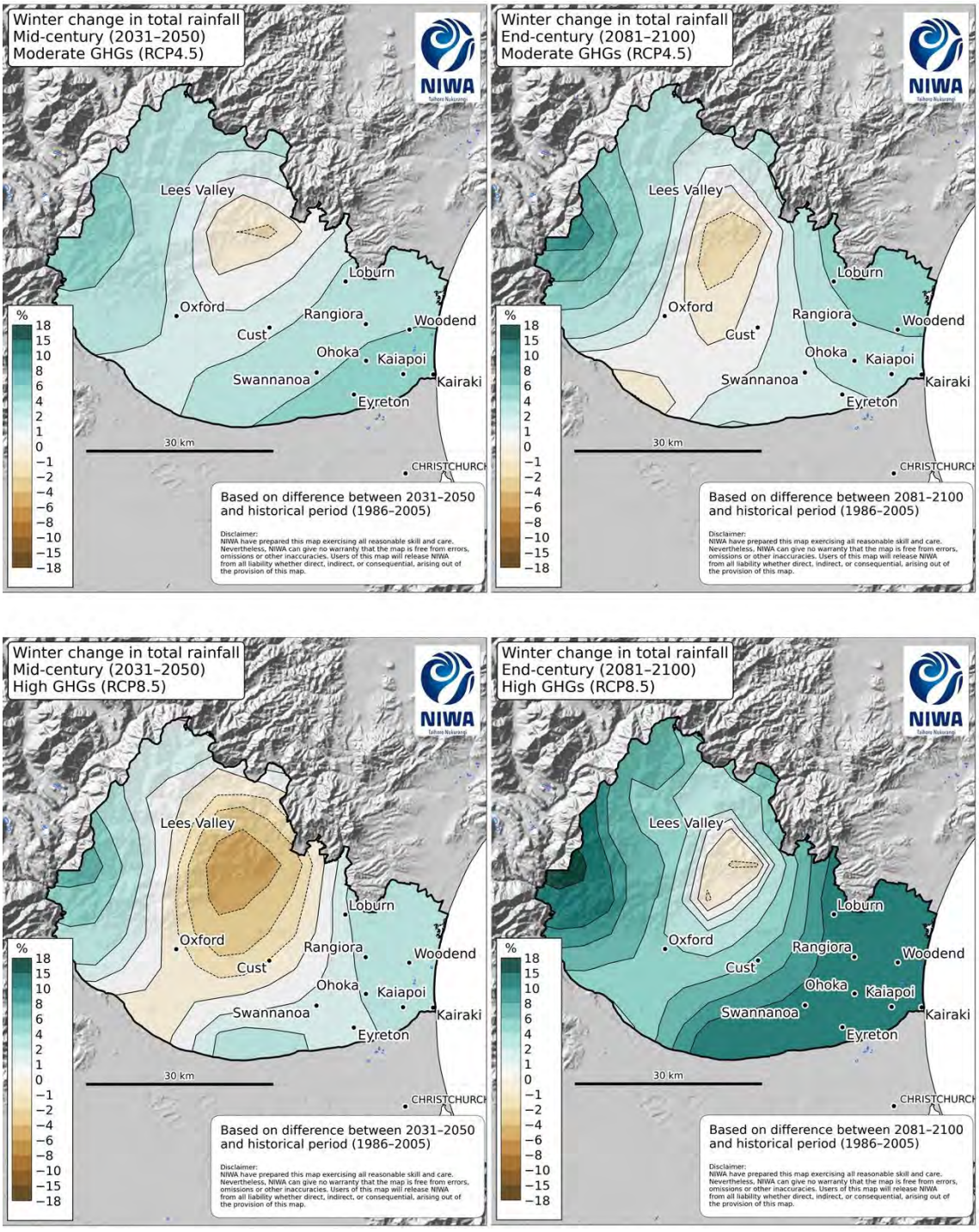


Figure B-5: Projected changes in winter total rainfall for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

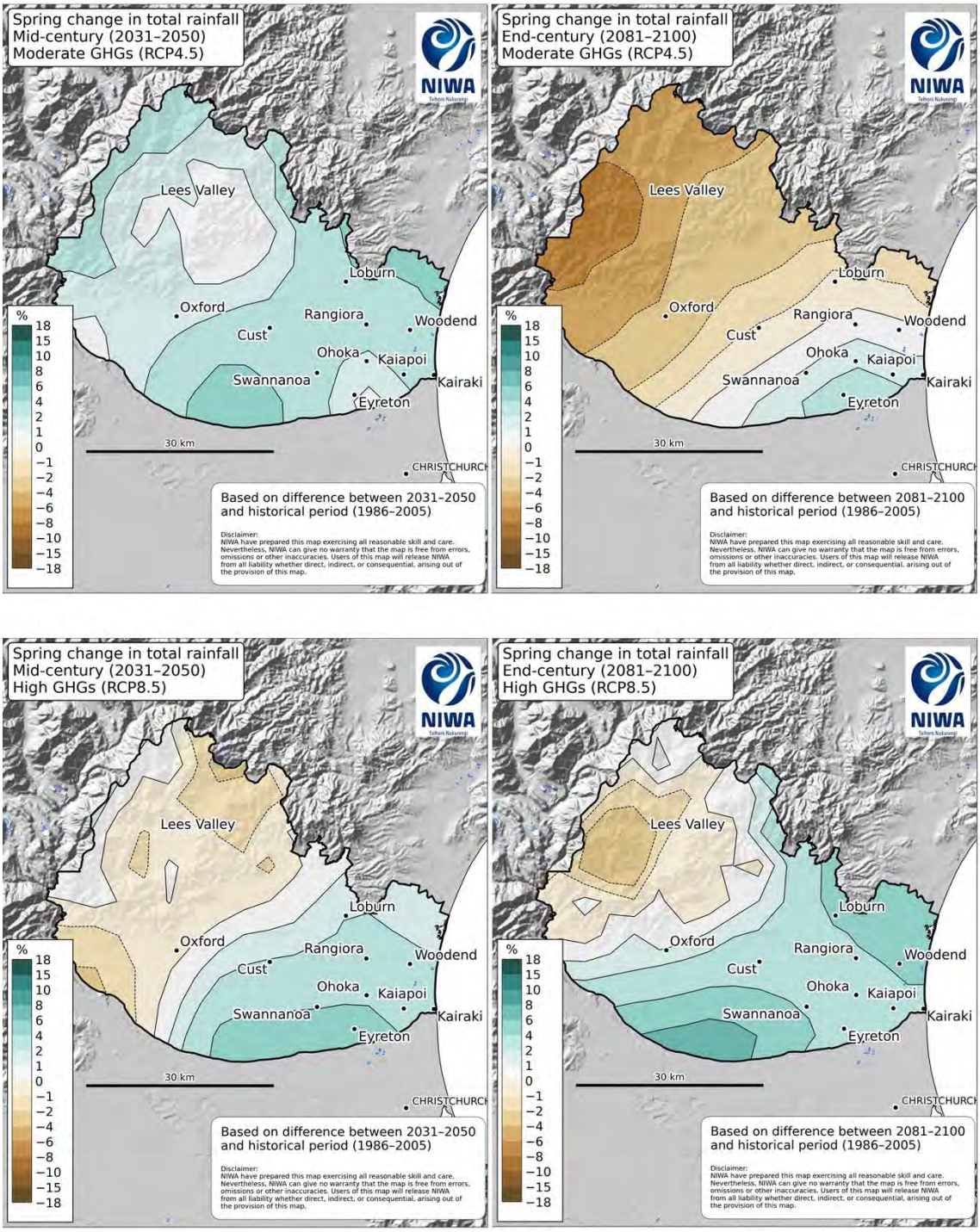


Figure B-6: Projected changes in spring total rainfall for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

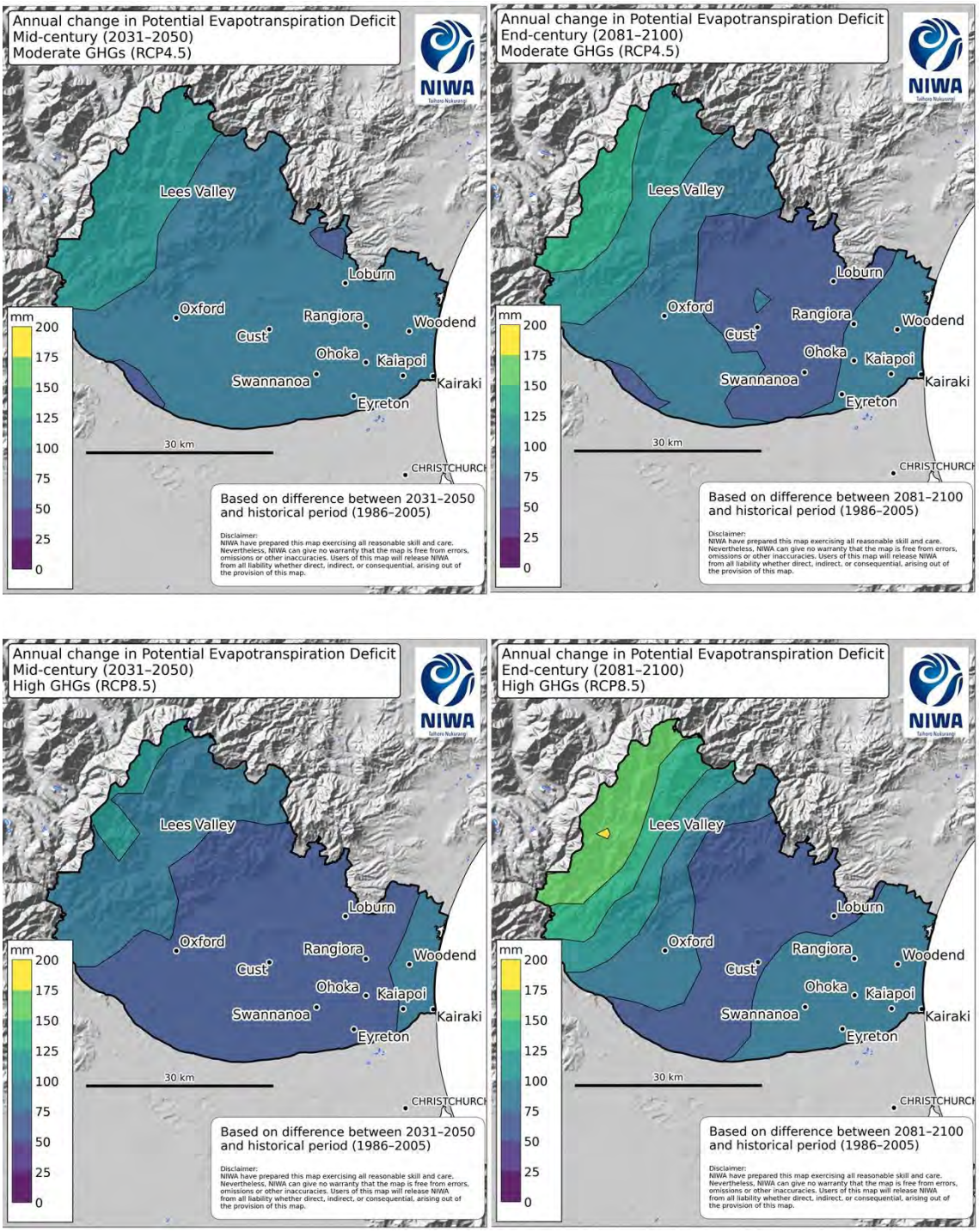


Figure B-7: Projected changes in potential evaporation deficit (mm) for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

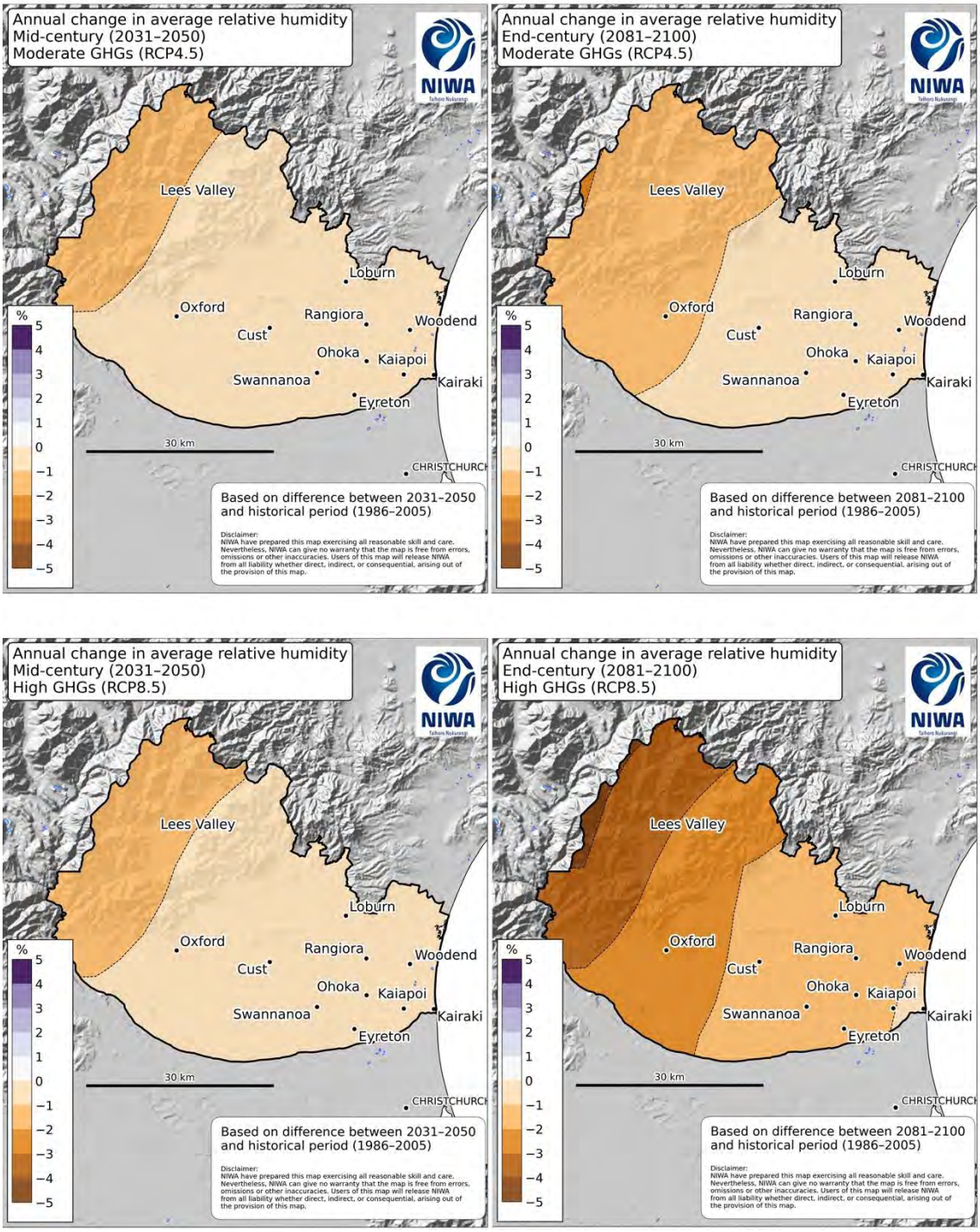


Figure B-8: Projected changes in relative humidity (%) for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

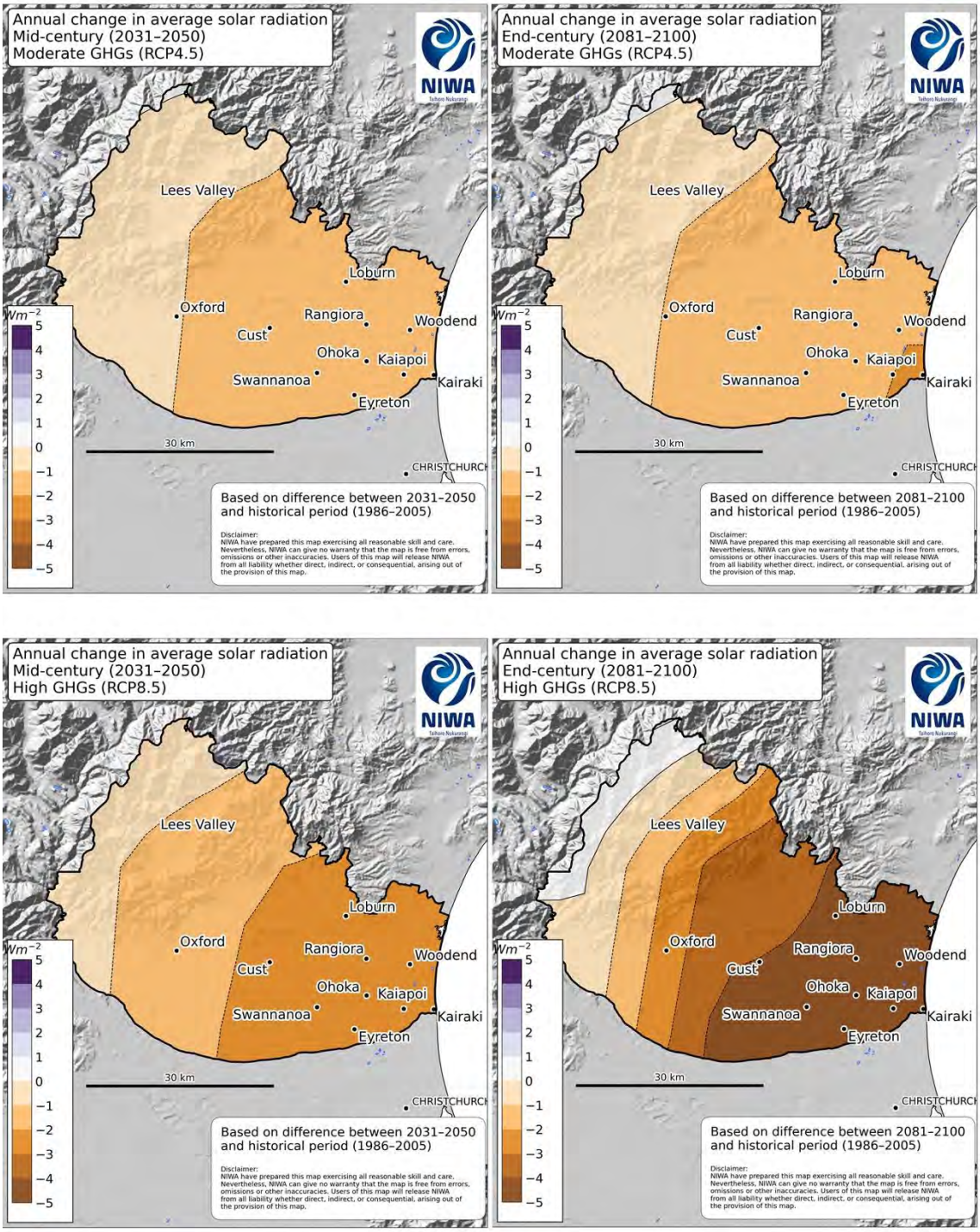


Figure B-9: Projected changes in solar radiation (Wm-2) for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

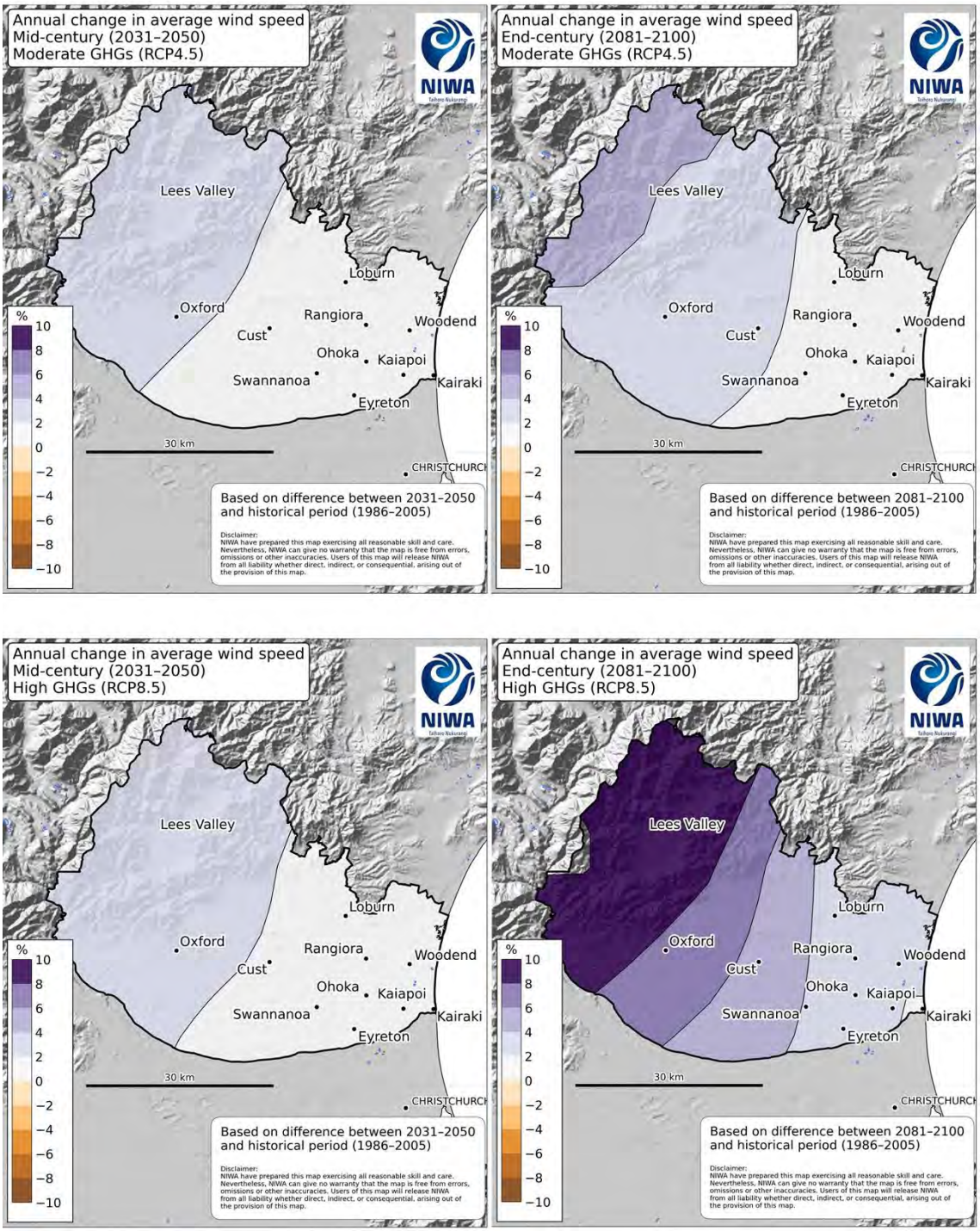


Figure B-10: Projected changes in wind speed (%) for Waimakariri District. Projected changes are relative to the historic period (1986-2005).

Appendix C Supplementary Tables

The following tables show the projected changes in climatic variables for different GHG scenarios. The tables include the projected annual and seasonal averages for different parts of the Waimakariri District. See Figure 2-2 for a map of sub-regional zones.

Table C-1: Overview of projected changes in daily mean temperature (°C) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	0.8	1.3	0.5	0.9	2.5	1.6	0.1	1.3
COAST	0.7	1.2	0.4	0.8	2.4	1.5	0.1	1.2
INLAND	0.7	1.2	0.4	0.8	2.4	1.5	0.1	1.2
LEES VALLEY	0.8	1.2	0.5	0.9	2.5	1.6	0.1	1.2
DISTRICT	0.8	1.2	0.4	0.9	2.4	1.6	0.1	1.2
SUMMER								
UPPER	0.8	1.2	0.4	0.8	2.5	1.7	0.0	1.3
COAST	0.6	1.0	0.4	0.7	2.0	1.3	0.1	1.0
INLAND	0.7	1.0	0.4	0.7	2.1	1.4	0.0	1.1
LEES VALLEY	0.8	1.2	0.4	0.8	2.4	1.6	0.0	1.2
DISTRICT	0.7	1.1	0.4	0.8	2.2	1.5	0.0	1.1
AUTUMN								
UPPER	0.9	1.3	0.5	0.9	2.7	1.7	0.1	1.4
COAST	0.8	1.3	0.4	0.9	2.6	1.7	0.1	1.3
INLAND	0.8	1.3	0.4	0.9	2.6	1.7	0.1	1.3
LEES VALLEY	0.8	1.3	0.4	0.9	2.6	1.7	0.1	1.3
DISTRICT	0.8	1.3	0.5	0.9	2.6	1.7	0.1	1.3
WINTER								
UPPER	0.7	1.2	0.5	0.8	2.5	1.6	0.1	1.3
COAST	0.8	1.2	0.4	0.9	2.5	1.7	0.1	1.3
INLAND	0.7	1.2	0.4	0.8	2.5	1.7	0.1	1.3
LEES VALLEY	0.7	1.1	0.5	0.8	2.4	1.6	0.1	1.3
DISTRICT	0.7	1.2	0.5	0.8	2.5	1.7	0.1	1.3
SPRING								
UPPER	0.7	1.2	0.5	0.9	2.4	1.5	0.2	1.2
COAST	0.7	1.1	0.4	0.8	2.3	1.5	0.1	1.2
INLAND	0.7	1.1	0.5	0.8	2.3	1.5	0.1	1.2
LEES VALLEY	0.7	1.2	0.5	0.9	2.4	1.5	0.2	1.2
DISTRICT	0.7	1.2	0.5	0.8	2.3	1.5	0.1	1.2

† = "50-yr change" is the projected change in average daily mean temperature for a given GHG scenario between end-century and mid-century time periods (i.e., how will average daily mean temperature change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected average daily mean temperature between high and moderate GHG concentration scenarios (what is the difference in projected average daily mean temperature for the RCP4.5 and RCP8.5 scenarios?).*

Table C-2: Overview of projected changes in average daily minimum temperature (°C) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	0.5	0.8	0.3	0.5	1.5	1.0	0.1	0.7
COAST	0.5	0.8	0.3	0.6	1.7	1.1	0.1	0.8
INLAND	0.5	0.8	0.3	0.6	1.6	1.0	0.1	0.8
LEES VALLEY	0.5	0.7	0.3	0.5	1.5	1.0	0.0	0.7
DISTRICT	0.5	0.8	0.3	0.5	1.6	1.0	0.1	0.8
SUMMER								
UPPER	0.4	0.7	0.3	0.4	1.3	0.9	0.0	0.7
COAST	0.4	0.7	0.3	0.5	1.3	0.8	0.0	0.6
INLAND	0.4	0.7	0.3	0.4	1.3	0.9	0.0	0.6
LEES VALLEY	0.4	0.7	0.3	0.4	1.3	0.9	0.0	0.6
DISTRICT	0.4	0.7	0.3	0.4	1.3	0.9	0.0	0.6
AUTUMN								
UPPER	0.6	0.9	0.3	0.6	1.9	1.2	0.1	1.0
COAST	0.7	1.1	0.4	0.8	2.3	1.5	0.1	1.2
INLAND	0.6	1.0	0.4	0.7	2.1	1.4	0.1	1.1
LEES VALLEY	0.6	0.9	0.3	0.6	1.8	1.2	0.0	0.9
DISTRICT	0.6	1.0	0.4	0.7	2.1	1.3	0.1	1.1
WINTER								
UPPER	0.4	0.7	0.2	0.5	1.3	0.9	0.0	0.7
COAST	0.5	0.7	0.2	0.5	1.5	0.9	0.0	0.8
INLAND	0.5	0.7	0.2	0.5	1.4	0.9	0.0	0.7
LEES VALLEY	0.4	0.6	0.2	0.4	1.3	0.8	0.0	0.6
DISTRICT	0.4	0.7	0.2	0.5	1.4	0.9	0.0	0.7
SPRING								
UPPER	0.4	0.8	0.3	0.5	1.5	1.0	0.1	0.7
COAST	0.5	0.8	0.3	0.5	1.6	1.0	0.1	0.8
INLAND	0.4	0.7	0.3	0.5	1.5	1.0	0.1	0.7
LEES VALLEY	0.4	0.7	0.3	0.5	1.4	0.9	0.1	0.7
DISTRICT	0.4	0.8	0.3	0.5	1.5	1.0	0.1	0.7

† = "50-yr change" is the projected change in average daily minimum temperature for a given GHG scenario between end-century and mid-century time periods (i.e., how will average daily minimum temperature change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected average daily minimum temperature between high and moderate GHG concentration scenarios (what is the difference in projected average daily minimum temperature for the RCP4.5 and RCP8.5 scenarios?).*

Table C-3: Overview of projected changes in average daily maximum temperature (°C) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			***high GHGs***			***high - moderate GHGs****	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	1.1	1.7	0.6	1.3	3.5	2.3	0.1	1.8
COAST	1.0	1.5	0.5	1.1	3.0	2.0	0.1	1.6
INLAND	1.0	1.6	0.6	1.1	3.2	2.1	0.1	1.6
LEES VALLEY	1.1	1.7	0.6	1.2	3.5	2.2	0.1	1.8
DISTRICT	1.0	1.6	0.6	1.2	3.3	2.1	0.1	1.7
SUMMER								
UPPER	1.2	1.7	0.5	1.2	3.7	2.4	0.1	1.9
COAST	0.9	1.3	0.4	0.9	2.6	1.7	0.1	1.3
INLAND	1.0	1.4	0.4	1.0	2.9	1.9	0.0	1.5
LEES VALLEY	1.1	1.7	0.5	1.2	3.5	2.3	0.1	1.9
DISTRICT	1.0	1.5	0.5	1.1	3.2	2.1	0.1	1.7
AUTUMN								
UPPER	1.1	1.7	0.6	1.2	3.5	2.2	0.1	1.7
COAST	1.0	1.5	0.5	1.1	2.9	1.8	0.1	1.4
INLAND	1.0	1.5	0.5	1.1	3.0	1.9	0.1	1.5
LEES VALLEY	1.1	1.7	0.6	1.2	3.4	2.2	0.1	1.7
DISTRICT	1.0	1.6	0.5	1.1	3.2	2.0	0.1	1.6
WINTER								
UPPER	1.0	1.7	0.7	1.2	3.6	2.4	0.2	1.9
COAST	1.0	1.7	0.7	1.2	3.6	2.4	0.2	1.9
INLAND	1.0	1.7	0.7	1.2	3.6	2.4	0.2	1.9
LEES VALLEY	1.0	1.7	0.7	1.2	3.5	2.4	0.2	1.9
DISTRICT	1.0	1.7	0.7	1.2	3.6	2.4	0.2	1.9
SPRING								
UPPER	1.0	1.7	0.7	1.2	3.3	2.1	0.2	1.6
COAST	0.9	1.4	0.5	1.0	3.0	1.9	0.2	1.6
INLAND	0.9	1.5	0.6	1.1	3.1	2.0	0.2	1.6
LEES VALLEY	1.0	1.7	0.7	1.2	3.3	2.1	0.2	1.6
DISTRICT	0.9	1.6	0.6	1.1	3.2	2.0	0.2	1.6

† = "50-yr change" is the projected change in average daily maximum temperature for a given GHG scenario between end-century and mid-century time periods (i.e., how will average daily maximum temperature change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected average daily maximum temperature between high and moderate GHG concentration scenarios (what is the difference in projected average daily maximum temperature for the RCP4.5 and RCP8.5 scenarios?).*

Table C-4: Overview of projected changes in hot days (> 25 °C) per year for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	12	18	6	13	43	30	1	25
COAST	13	20	7	15	41	26	2	21
INLAND	15	22	7	17	46	29	2	24
LEES VALLEY	14	21	7	15	47	33	1	26
DISTRICT	13	20	7	15	44	29	1	24
SUMMER								
UPPER	9	13	4	9	29	19	0	15
COAST	8	11	3	8	19	11	0	9
INLAND	9	12	3	10	23	14	0	11
LEES VALLEY	11	15	4	11	31	20	0	16
DISTRICT	9	12	3	9	25	16	0	12
AUTUMN								
UPPER	2	3	1	2	8	6	1	5
COAST	3	4	2	3	10	6	1	5
INLAND	3	5	2	4	11	7	1	6
LEES VALLEY	2	3	1	3	9	7	1	6
DISTRICT	2	4	2	3	9	6	1	5
WINTER								
UPPER	0	0	0	0	0	0	0	0
COAST	0	0	0	0	0	0	0	0
INLAND	0	0	0	0	0	0	0	0
LEES VALLEY	0	0	0	0	0	0	0	0
DISTRICT	0	0	0	0	0	0	0	0
SPRING								
UPPER	1	2	1	1	6	5	0	4
COAST	3	5	2	4	12	8	1	7
INLAND	3	5	2	3	12	9	1	7
LEES VALLEY	1	2	1	1	7	6	0	5
DISTRICT	2	4	2	2	10	7	1	6

† = "50-yr change" is the projected change in hot days for a given GHG scenario between end-century and mid-century time periods (i.e., how will hot days change between 2040 and 2090 for a given GHG scenario?).

** The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected hot days between high and moderate GHG concentration scenarios (what is the difference in projected hot days for the RCP4.5 and RCP8.5 scenarios?).*

Table C-5: Overview of projected changes in percentage of rainfall for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	1.6%	0.8%	-0.8%	1.3%	3.0%	1.7%	-0.3%	2.2%
COAST	2.6%	4.2%	1.5%	3.4%	8.2%	4.9%	0.7%	4.1%
INLAND	2.5%	3.1%	0.6%	3.0%	7.6%	4.6%	0.5%	4.5%
LEES VALLEY	1.4%	0.7%	-0.7%	1.2%	2.4%	1.3%	-0.2%	1.8%
DISTRICT	2.2%	2.4%	0.2%	2.4%	5.9%	3.5%	-0.2%	1.8%
SUMMER								
UPPER	1.4%	2.6%	1.2%	4.5%	3.0%	-1.5%	3.0%	0.3%
COAST	3.0%	7.0%	4.0%	5.9%	8.2%	2.3%	2.9%	1.3%
INLAND	3.3%	5.9%	2.6%	7.0%	7.6%	0.6%	3.7%	1.8%
LEES VALLEY	2.3%	3.5%	1.2%	5.9%	2.4%	-3.5%	3.7%	-1.1%
DISTRICT	2.4%	4.6%	2.2%	5.6%	6.3%	0.7%	3.3%	1.7%
AUTUMN								
UPPER	0.7%	2.3%	1.6%	0.4%	3.4%	3.0%	-0.3%	1.1%
COAST	0.9%	5.4%	4.5%	2.4%	8.3%	5.8%	1.5%	2.9%
INLAND	2.2%	6.8%	4.6%	3.7%	10.1%	6.4%	1.5%	3.3%
LEES VALLEY	0.4%	1.7%	1.3%	0.2%	2.5%	2.3%	-0.2%	0.8%
DISTRICT	1.4%	4.9%	3.4%	2.2%	7.2%	5.0%	0.7%	2.3%
WINTER								
UPPER	2.5%	3.1%	0.6%	0.7%	6.4%	5.7%	-1.8%	3.4%
COAST	3.7%	4.0%	0.3%	2.6%	12.0%	9.4%	-1.1%	8.0%
INLAND	2.2%	1.4%	-0.8%	0.1%	7.3%	7.2%	-2.0%	5.9%
LEES VALLEY	2.0%	2.2%	0.2%	-0.5%	4.6%	5.2%	-2.6%	2.4%
DISTRICT	2.6%	2.6%	-0.1%	0.9%	8.0%	7.0%	-1.7%	5.4%
SPRING								
UPPER	1.6%	-4.8%	-6.5%	-0.5%	-0.2%	0.3%	-2.1%	4.7%
COAST	3.0%	0.3%	-2.7%	2.6%	4.0%	1.5%	-0.4%	3.7%
INLAND	2.5%	-1.5%	-4.0%	1.4%	3.2%	1.8%	-1.1%	4.7%
LEES VALLEY	0.9%	-4.9%	-5.7%	-0.8%	-1.3%	-0.4%	-1.7%	3.6%
DISTRICT	2.37%	-2.53%	-4.89%	0.90%	2.14%	1.24%	-1.46%	4.67%

† = "50-yr change" is the projected change in rainfall for a given GHG scenario between end-century and mid-century time periods (i.e., how will rainfall change between 2040 and 2090 for a given GHG scenario?).

** The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected rainfall between high and moderate GHG concentration scenarios (what is the difference in projected rainfall for the RCP4.5 and RCP8.5 scenarios?).*

Table C-6: Overview of projected changes in dry days (< 1 mm rain) per year for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			***high GHGs***			***high - moderate GHGs****	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	1	2	2	1	1	0	0	-1
COAST	-1	-2	-1	-2	-4	-2	-1	-3
INLAND	-2	-1	0	-3	-5	-3	-1	-4
LEES VALLEY	0	2	2	0	-1	-1	0	-2
DISTRICT	-1	0	1	-1	-3	-1	-1	-3
SUMMER								
UPPER	1	0	-1	0	0	-1	-1	-1
COAST	1	0	-1	0	-1	-1	0	-1
INLAND	0	-1	0	-1	-2	-2	-1	-2
LEES VALLEY	1	0	-1	0	-1	-1	-1	-1
DISTRICT	0	0	-1	0	-1	-1	-1	-1
AUTUMN								
UPPER	0	0	0	-1	-1	-1	0	-1
COAST	0	-1	-1	-1	-2	-1	-1	-1
INLAND	-1	-1	0	-2	-3	-2	-1	-2
LEES VALLEY	0	0	0	-1	-2	-1	0	-2
DISTRICT	0	-1	0	-1	-2	-1	-1	-2
WINTER								
UPPER	0	0	1	0	1	1	0	0
COAST	-1	-1	0	-1	-1	0	0	0
INLAND	0	0	1	0	0	0	0	0
LEES VALLEY	0	0	1	0	1	1	1	0
DISTRICT	0	0	0	0	0	1	0	0
SPRING								
UPPER	0	2	1	1	2	1	1	0
COAST	-1	0	1	0	0	0	0	-1
INLAND	0	0	1	0	0	0	0	0
LEES VALLEY	0	2	1	1	2	1	1	0
DISTRICT	0	1	1	0	1	0	1	0

† = "50-yr change" is the projected change in dry days for a given GHG scenario between end-century and mid-century time periods (i.e., how will dry days change between 2040 and 2090 for a given GHG scenario?).

** The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected dry days between high and moderate GHG concentration scenarios (what is the difference in projected dry days for the RCP4.5 and RCP8.5 scenarios?).*

Table C-7: Overview of projected changes in soil moisture deficit days per year for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	-4	4	8	-2	5	7	2	1
COAST	-6	3	9	-2	-1	1	4	-4
INLAND	-5	2	7	-3	2	5	2	-1
LEES VALLEY	-2	6	8	0	9	9	2	2
DISTRICT	-5	3	8	-2	2	5	2	-1
SUMMER								
UPPER	-1	-1	0	-1	-1	0	0	0
COAST	-1	-1	0	0	-1	0	0	0
INLAND	-1	-1	0	-1	-1	0	0	-1
LEES VALLEY	-1	-1	0	-1	-1	0	0	0
DISTRICT	-1	-1	0	-1	-1	0	0	0
AUTUMN								
UPPER	0	0	0	-1	1	1	0	0
COAST	0	0	0	-1	-2	-1	-1	-2
INLAND	-1	-1	0	-2	-3	-2	-1	-2
LEES VALLEY	0	1	1	0	2	2	-1	1
DISTRICT	-1	-1	0	-1	-2	0	0	-1
WINTER								
UPPER	-1	3	3	0	3	3	1	1
COAST	-4	3	7	0	1	1	4	-2
INLAND	-1	3	4	0	4	3	2	1
LEES VALLEY	0	4	4	1	5	3	1	1
DISTRICT	-2	3	4	0	3	3	2	0
SPRING								
UPPER	-2	2	3	-1	2	2	1	0
COAST	-1	1	2	0	1	1	1	0
INLAND	-1	2	3	0	3	3	0	1
LEES VALLEY	-1	2	3	0	3	3	1	1
DISTRICT	-1	2	3	0	2	3	1	0

† = "50-yr change" is the projected change in soil moisture deficit days for a given GHG scenario between end-century and mid-century time periods (i.e., how will soil moisture deficit days change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected soil moisture deficit days between high and moderate GHG concentration scenarios (what is the difference in projected soil moisture deficit days for the RCP4.5 and RCP8.5 scenarios?).*

Table C-8: Overview of projected changes in number of frost days for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			***high GHGs***			***high - moderate GHGs****	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	-12	-18	-6	-13	-34	-21	-1	-16
COAST	-6	-8	-2	-7	-16	-9	-1	-7
INLAND	-8	-12	-4	-9	-21	-12	-1	-10
LEES VALLEY	-12	-18	-6	-13	-32	-19	-1	-15
DISTRICT	-9	-14	-5	-10	-26	-15	-1	-12
SUMMER								
UPPER	0	0	0	0	0	0	0	0
COAST	0	0	0	0	0	0	0	0
INLAND	0	0	0	0	0	0	0	0
LEES VALLEY	0	0	0	0	0	0	0	0
DISTRICT	0	0	0	0	0	0	0	0
AUTUMN								
UPPER	-3	-4	-1	-3	-7	-4	0	-3
COAST	-1	-2	-1	-2	-3	-1	0	-1
INLAND	-1	-2	-1	-1	-3	-1	0	-1
LEES VALLEY	-2	-3	-1	-2	-5	-3	0	-2
DISTRICT	-2	-3	-1	-2	-4	-3	0	-2
WINTER								
UPPER	-7	-10	-4	-7	-20	-13	-1	-10
COAST	-4	-6	-2	-5	-12	-7	0	-6
INLAND	-6	-9	-3	-7	-17	-10	0	-8
LEES VALLEY	-8	-12	-4	-9	-22	-13	-1	-11
DISTRICT	-6	-9	-3	-7	-17	-11	0	-8
SPRING								
UPPER	-2	-4	-2	-3	-7	-4	-1	-3
COAST	0	-1	0	-1	-1	0	0	0
INLAND	-1	-1	0	-1	-2	-1	0	-1
LEES VALLEY	-2	-3	-1	-2	-5	-3	0	-2
DISTRICT	-1	-2	-1	-2	-4	-2	0	-1

† = "50-yr change" is the projected change in number of frost days for a given GHG scenario between end-century and mid-century time periods (i.e., how will the number of frost days change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected number of frost days between high and moderate GHG concentration scenarios (what is the difference in projected number of frost days for the RCP4.5 and RCP8.5 scenarios?).*

Table C-9: Overview of projected changes in relative humidity (%) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	-1.0%	-1.5%	-0.5%	-1.1%	-3.1%	-2.0%	-0.1%	-1.6%
COAST	-0.4%	-0.7%	-0.3%	-0.6%	-1.4%	-0.8%	-0.1%	-0.7%
INLAND	-0.7%	-1.0%	-0.3%	-0.8%	-2.1%	-1.3%	-0.1%	-1.1%
LEES VALLEY	-1.0%	-1.5%	-0.5%	-1.1%	-3.0%	-1.9%	-0.1%	-1.5%
DISTRICT	-0.8%	-1.1%	-0.4%	-0.9%	-2.4%	-1.5%	-0.1%	-1.3%
SUMMER								
UPPER	-1.0%	-1.1%	-0.1%	-0.5%	-1.8%	-1.3%	0.5%	-0.7%
COAST	-0.1%	-0.1%	-0.2%	0.2%	0.5%	0.3%	0.2%	0.7%
INLAND	-0.4%	-0.6%	-0.2%	0.0%	-0.4%	-0.4%	0.4%	0.2%
LEES VALLEY	-0.9%	-1.0%	-0.1%	-0.4%	-1.5%	-1.1%	0.5%	-0.5%
DISTRICT	-0.6%	-0.8%	-0.2%	-0.2%	-0.9%	-0.7%	0.4%	-0.1%
AUTUMN								
UPPER	-0.8%	-1.1%	-0.3%	-0.6%	-1.3%	-0.7%	0.2%	-0.2%
COAST	-0.3%	-0.4%	-0.1%	-0.1%	-0.1%	0.0%	0.2%	0.4%
INLAND	-0.5%	-0.7%	-0.2%	-0.3%	-0.5%	-0.3%	0.2%	0.1%
LEES VALLEY	-0.8%	-1.1%	-0.3%	-0.6%	-1.2%	-0.6%	0.2%	-0.1%
DISTRICT	-0.6%	-0.8%	-0.2%	-0.4%	-0.8%	-0.4%	0.2%	0.0%
WINTER								
UPPER	-1.1%	-2.0%	-0.9%	-1.4%	-4.8%	-3.4%	-0.3%	-2.7%
COAST	-0.6%	-1.1%	-0.5%	-0.8%	-2.8%	-1.9%	-0.3%	-1.7%
INLAND	-0.7%	-1.4%	-0.6%	-1.0%	-3.6%	-2.6%	-0.3%	-2.2%
LEES VALLEY	-1.1%	-2.0%	-0.9%	-1.4%	-4.8%	-3.4%	-0.3%	-2.8%
DISTRICT	-0.8%	-1.6%	-0.7%	-1.1%	-3.9%	-2.8%	-0.3%	-2.3%
SPRING								
UPPER	-1.1%	-1.7%	-0.6%	-1.9%	-4.5%	-2.6%	-0.8%	-2.7%
COAST	-0.7%	-0.9%	-0.2%	-1.5%	-3.0%	-1.6%	-0.7%	-2.2%
INLAND	-1.0%	-1.3%	-0.3%	-1.7%	-3.9%	-2.2%	-0.7%	-2.6%
LEES VALLEY	-1.1%	-1.7%	-0.6%	-1.9%	-4.4%	-2.6%	-0.7%	-2.7%
DISTRICT	-1.0%	-1.4%	-0.4%	-1.7%	-4.0%	-2.2%	-0.8%	-2.6%

† = "50-yr change" is the projected change in relative humidity for a given GHG scenario between end-century and mid-century time periods (i.e., how will relative humidity change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected relative humidity between high and moderate GHG concentration scenarios (what is the difference in projected relative humidity for the RCP4.5 and RCP8.5 scenarios?).*

Table C-10: Overview of projected changes in incoming solar radiation (Wm-2) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	-0.6	-0.6	0.0	-1.1	-1.2	-0.1	-0.5	-0.6
COAST	-1.4	-1.8	-0.4	-2.3	-4.4	-2.1	-0.9	-2.5
INLAND	-1.1	-1.3	-0.2	-1.8	-3.2	-1.4	-0.7	-1.9
LEES VALLEY	-0.7	-0.7	0.0	-1.3	-1.6	-0.3	-0.5	-0.8
DISTRICT	-1.0	-1.1	-0.2	-1.6	-2.6	-1.0	-0.6	-1.4
SUMMER								
UPPER	0.1	-0.4	-0.5	-1.7	-1.3	0.5	-1.8	-0.9
COAST	-2.6	-3.5	-0.8	-4.8	-8.4	-3.7	-2.1	-5.0
INLAND	-1.9	-2.3	-0.5	-3.7	-6.9	-3.2	-1.9	-4.6
LEES VALLEY	-0.4	-0.9	-0.5	-2.2	-2.6	-0.3	-1.8	-1.7
DISTRICT	-1.1	-1.7	-0.5	-3.0	-4.8	-1.7	-1.9	-3.1
AUTUMN								
UPPER	0.1	-0.1	-0.1	-1.5	-2.5	-1.0	-1.5	-2.4
COAST	-0.4	-0.5	-0.2	-2.1	-4.0	-1.9	-1.7	-3.5
INLAND	-0.1	-0.3	-0.2	-2.0	-3.7	-1.7	-1.9	-3.5
LEES VALLEY	-0.1	-0.2	-0.2	-1.7	-3.0	-1.3	-1.6	-2.8
DISTRICT	-0.1	-0.2	-0.2	-1.8	-3.2	-1.5	-1.7	-3.0
WINTER								
UPPER	-1.8	-1.7	0.1	-2.3	-2.4	-0.2	-0.5	-0.7
COAST	-1.2	-0.8	0.4	-1.5	-1.6	-0.1	-0.3	-0.8
INLAND	-1.3	-0.8	0.4	-1.5	-1.1	0.4	-0.3	-0.3
LEES VALLEY	-1.6	-1.4	0.2	-2.0	-1.9	0.1	-0.4	-0.6
DISTRICT	-1.5	-1.2	0.3	-1.8	-1.8	0.1	-0.4	-0.6
SPRING								
UPPER	-0.9	-0.4	0.4	1.0	1.4	0.4	1.9	1.8
COAST	-1.5	-2.5	-1.1	-0.8	-3.4	-2.6	0.7	-0.8
INLAND	-1.3	-1.8	-0.6	0.0	-1.2	-1.2	1.3	0.7
LEES VALLEY	-0.9	-0.5	0.4	0.9	1.2	0.3	1.8	1.7
DISTRICT	-1.1	-1.4	-0.2	0.3	-0.5	-0.8	1.4	0.9

† = "50-yr change" is the projected change in solar radiation for a given GHG scenario between end-century and mid-century time periods (i.e., how will solar radiation change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected solar radiation between high and moderate GHG concentration scenarios (what is the difference in projected solar radiation for the RCP4.5 and RCP8.5 scenarios?).*

Table C-11: Overview of projected changes in wind speed (% change) for different parts of the Waimakariri District. Mid-century = 2031-2050, end-century = 2081-2100, moderate GHGs = RCP4.5, high GHGs = RCP8.5. Note that the coloured bars are representative of the magnitude of change.

	moderate GHGs			*high GHGs*			*high - moderate GHGs**	
ANNUAL	*mid-century*	*end-century*	*50-yr change †*	*mid-century*	*end-century*	*50-yr change†*	*mid-century*	*end-century*
UPPER	2.6%	3.7%	1.1%	2.8%	8.8%	6.0%	0.1%	5.0%
COAST	0.6%	1.2%	0.7%	1.2%	2.5%	1.3%	0.6%	1.3%
INLAND	1.6%	2.4%	0.8%	2.0%	5.8%	3.8%	0.4%	3.4%
LEES VALLEY	2.7%	3.9%	1.2%	2.9%	9.2%	6.3%	0.2%	5.2%
DISTRICT	1.8%	2.8%	0.9%	2.2%	6.5%	4.3%	0.3%	3.7%
SUMMER								
UPPER	1.2%	2.4%	1.1%	-0.1%	1.4%	1.5%	-1.3%	-0.9%
COAST	-0.4%	1.1%	1.5%	-0.1%	-0.2%	-0.1%	0.3%	-1.3%
INLAND	0.3%	1.7%	1.4%	-0.3%	0.3%	0.6%	-0.6%	-1.3%
LEES VALLEY	1.2%	2.4%	1.1%	-0.2%	1.4%	1.5%	-1.4%	-1.0%
DISTRICT	0.6%	1.9%	1.3%	-0.2%	0.7%	0.9%	-0.8%	-1.2%
AUTUMN								
UPPER	2.0%	3.2%	1.3%	0.8%	2.6%	1.8%	-1.1%	-0.6%
COAST	0.2%	1.6%	1.4%	-0.7%	-0.6%	0.0%	-0.9%	-2.3%
INLAND	1.0%	2.2%	1.2%	0.0%	0.5%	0.5%	-1.0%	-1.7%
LEES VALLEY	2.1%	3.3%	1.3%	0.9%	2.8%	1.9%	-1.2%	-0.5%
DISTRICT	1.3%	2.6%	1.3%	0.3%	1.2%	0.9%	-1.0%	-1.4%
WINTER								
UPPER	4.1%	7.1%	2.9%	4.4%	20.8%	16.4%	0.3%	13.7%
COAST	1.8%	1.9%	0.2%	2.1%	6.3%	4.2%	0.3%	4.3%
INLAND	2.4%	3.9%	1.5%	2.7%	13.5%	10.9%	0.3%	9.6%
LEES VALLEY	4.4%	7.5%	3.1%	4.8%	21.8%	17.0%	0.4%	14.3%
DISTRICT	3.0%	4.8%	1.9%	3.2%	15.2%	12.0%	0.3%	10.4%
SPRING								
UPPER	3.1%	2.4%	-0.7%	5.9%	10.3%	4.5%	2.8%	8.0%
COAST	0.7%	0.2%	-0.5%	3.5%	4.7%	1.2%	2.8%	4.5%
INLAND	2.7%	1.9%	-0.8%	5.5%	8.8%	3.3%	2.8%	6.9%
LEES VALLEY	3.2%	2.5%	-0.7%	6.1%	10.7%	4.6%	2.9%	8.2%
DISTRICT	2.6%	1.8%	-0.7%	5.3%	8.8%	3.5%	2.8%	7.0%

† = "50-yr change" is the projected change in wind speed for a given GHG scenario between end-century and mid-century time periods (i.e., how will wind speed change between 2040 and 2090 for a given GHG scenario?).

**The two columns on the right-hand side ("high – moderate GHGs") show the difference in projected wind speed between high and moderate GHG concentration scenarios (what is the difference in projected wind speed for the RCP4.5 and RCP8.5 scenarios?).*

Appendix D Hydrological Modelling Maps

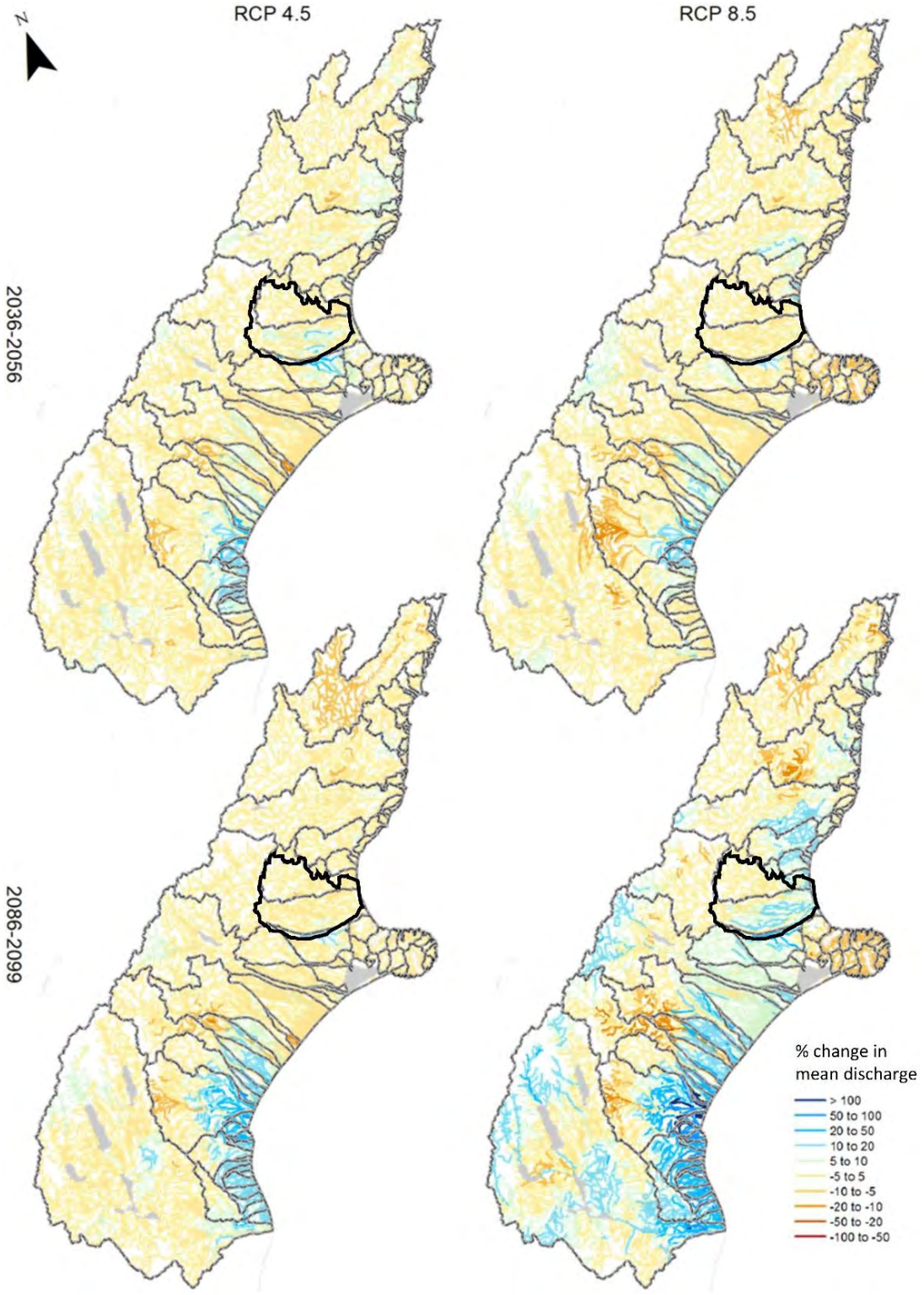


Figure D-1: Percent changes in multi-model median of the mean discharge across Canterbury for mid (top) and late century (bottom). Climate change scenarios: RCP4.5 (left panels) and RCP8.5 (right panels). Time periods: mid-century (2036-2056) and end-century (2086-2099) (source: Macara et al., 2020).

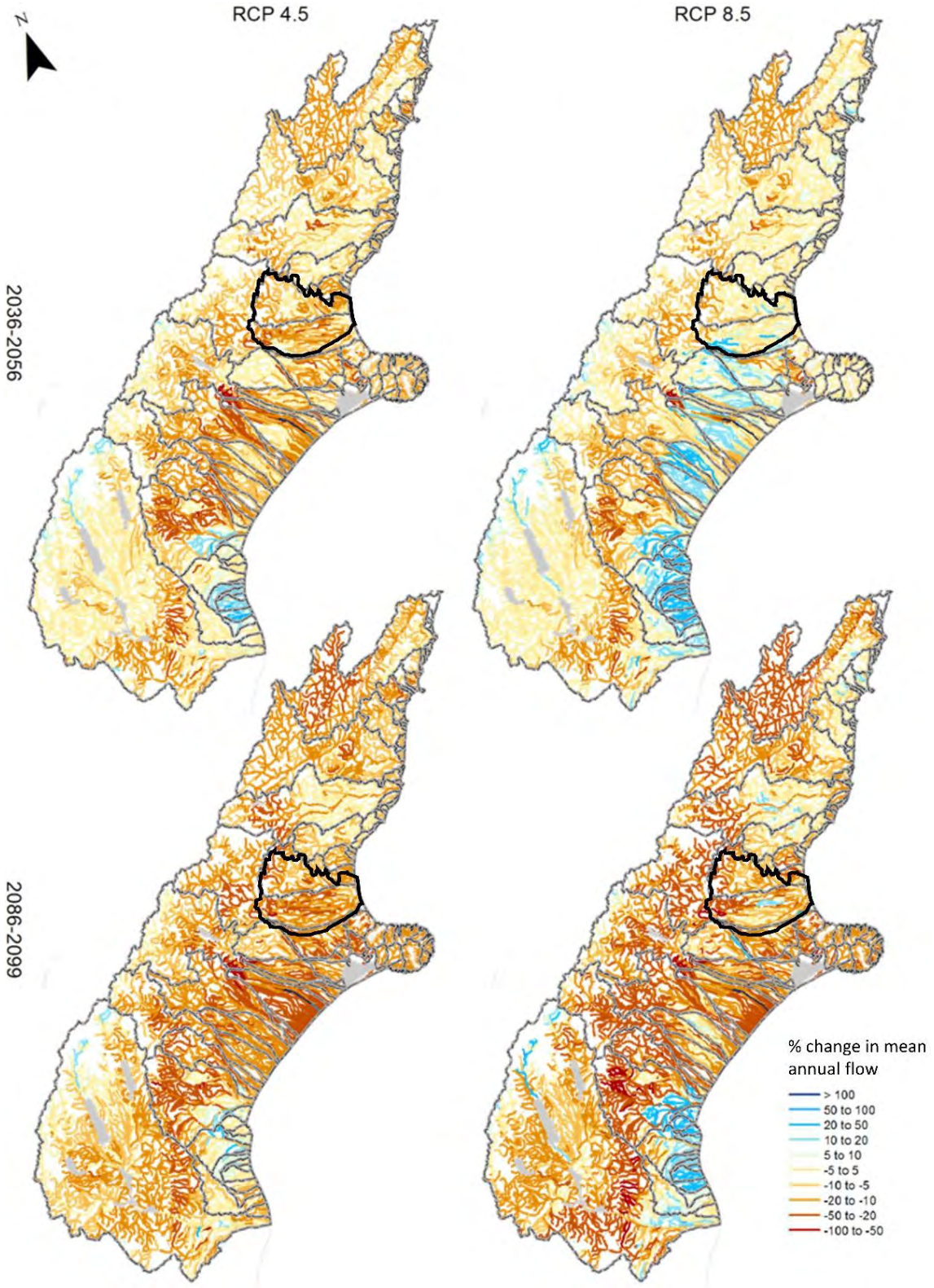


Figure D-2: Percent changes in multi-model median of the mean annual low flow across Canterbury for mid(top) and late-century (bottom). Climate change scenarios: RCP4.5 (left panels) and RCP8.5 (right panels). Time periods: mid-century (2036-2056) and end-century (2086-2099) (source: Macara et al., 2020).

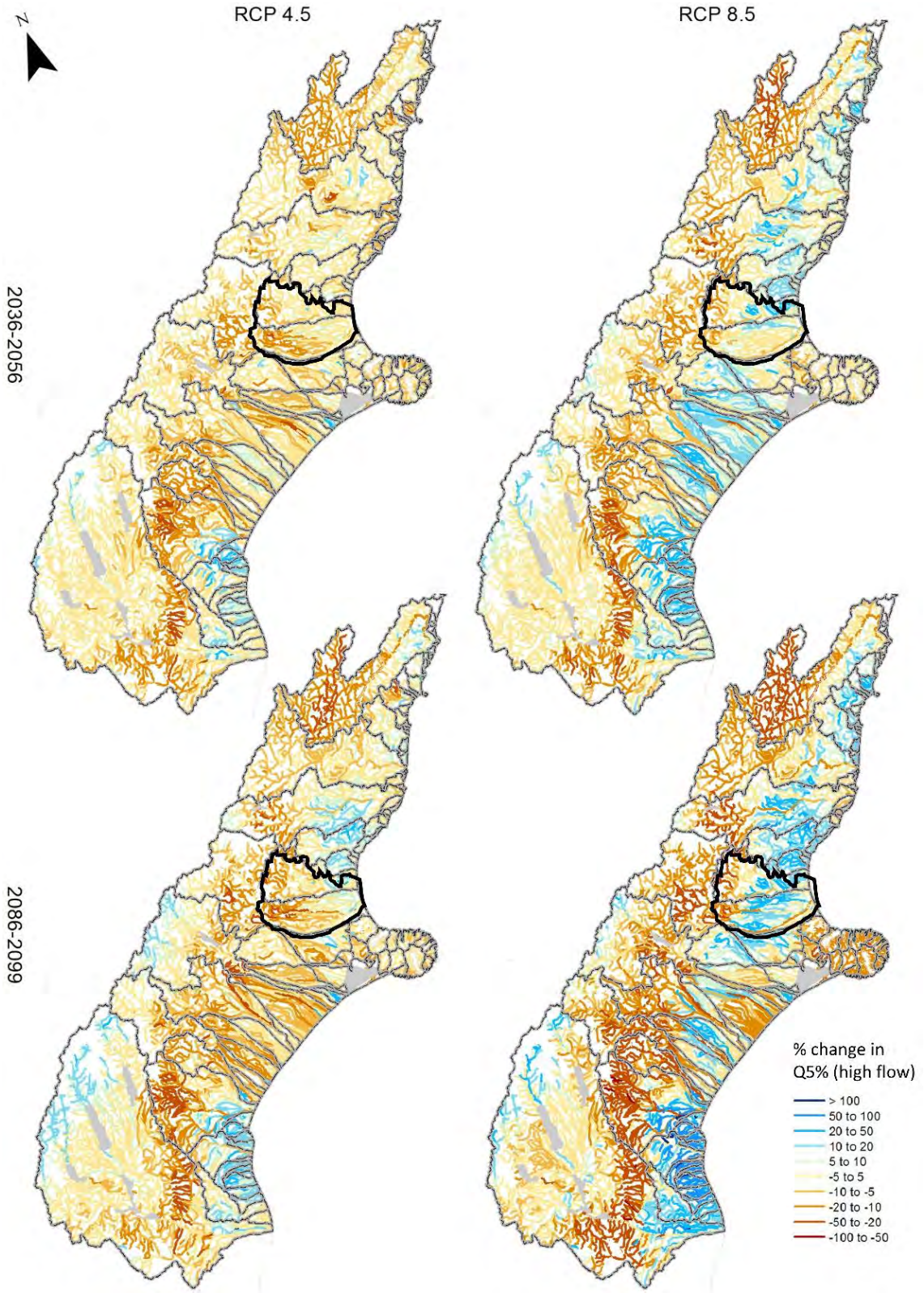


Figure D-3: Percent changes in multi-model median Q5% across Canterbury for mid (top) and end of century (bottom). Climate change scenarios: RCP4.5 (left panels) and RCP8.5 (right panels). Time periods: mid-century (2036-2056) and end-century (2086-2099) (source: Macara et al., 2020).

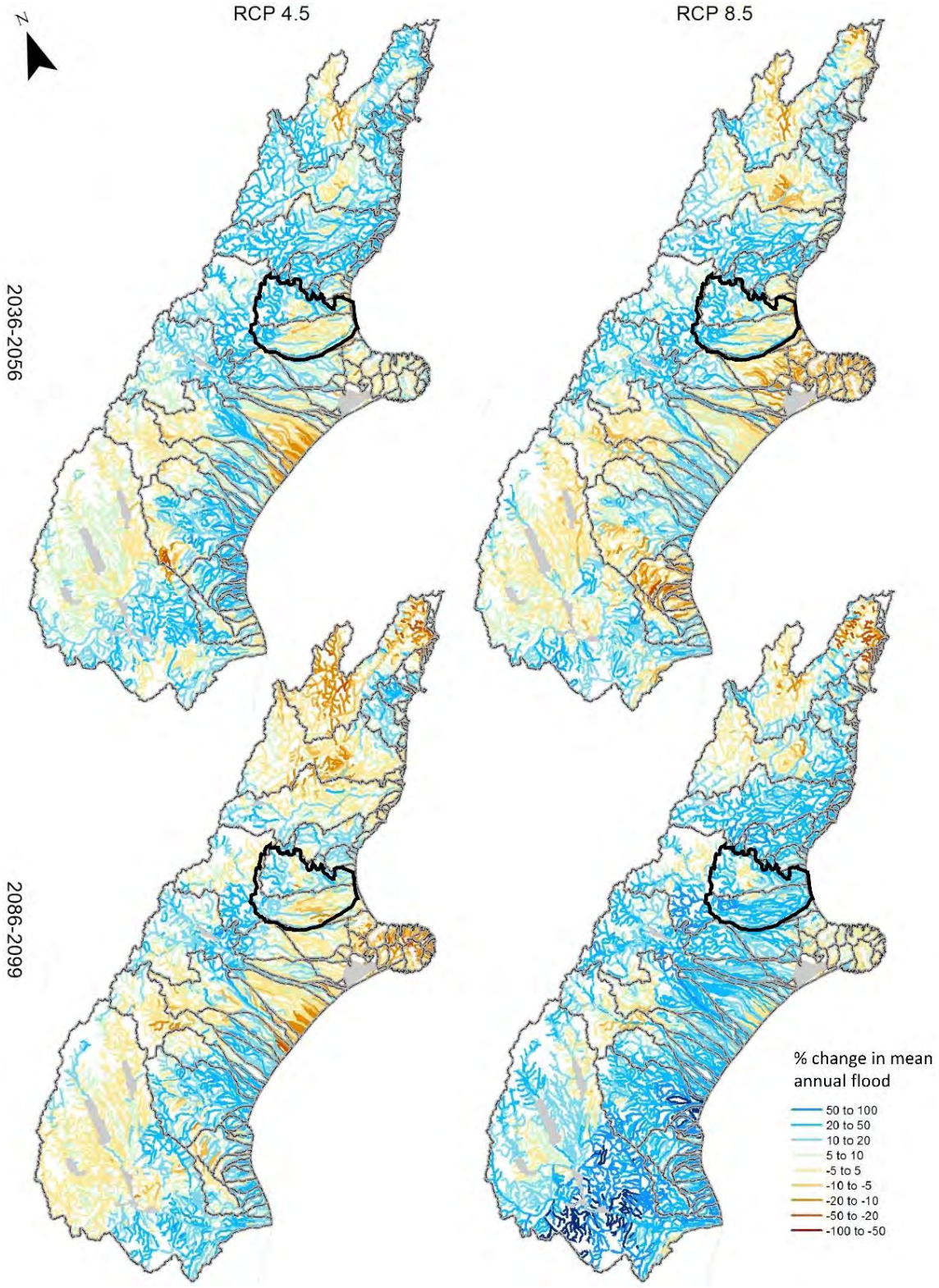


Figure D-4: Percent changes in multi-model median of mean annual flood across Canterbury for mid (top) and end of century (bottom). Climate change scenarios: RCP2.6 (left panels) and RCP4.5 (right panels). Time periods: mid-century (2036-2056) and end-century (2086-2099) (source: Macara et al., 2020).

Appendix E Extreme Rainfall Projections

Extreme rainfall events are often considered in the context of return periods (e.g. 1-in-100-year rainfall events). A return period, also known as an average recurrence interval (ARI), is an estimate of the likelihood of an event. It is a statistical measure typically based on historical data and probability distributions which calculate how often an event of a certain magnitude may occur. Return periods are often used in risk analysis and infrastructure design.

The theoretical return period is the inverse of the probability that the event will be exceeded in any one year. For example, a 1-in-10-year rainfall event has a 1/10 = 0.1 or 10% chance of being exceeded in any one year, and a 1-in-100-year rainfall event has a 1/100 = 0.01 or 1% chance of being exceeded in any one year. However, this does not mean that a 1-in-100-year rainfall event will happen regularly every 100 years, or only once in 100 years. With a changing climate, the return periods used below should be thought of only within the 20-year period in which they are defined. For instance, if extreme heavy rainfall events are becoming a lot more frequent under climate change then the 1-in-100-year rainfall event for 2040 as defined as the 2031-2050 period will be less than the 1-in-100-year rainfall event when defined under 2001-2080, because the latter is dominated by the more frequent heavy events during the 2070s. The events with larger return periods (i.e. 1-in-100-year events) have larger rainfall amounts for the same duration as events with smaller return periods (i.e. 1-in-2-year events) because larger events occur less frequently (on average).

NIWA's High Intensity Rainfall Design System (HIRDS version 4) allows rainfall event totals (depth; measured in mm) at various recurrence intervals to be calculated for any location in New Zealand (Carey-Smith et al., 2018). The rainfall event durations presented in HIRDS range from 10 minutes to 120 hours. HIRDS calculates historic rainfall event totals for given recurrence intervals as well as future potential rainfall event totals for given recurrence intervals based on climate change scenarios. The future rainfall increases calculated by the HIRDS v4 tool are based on a per cent change per degree of warming, which is averaged across New Zealand. The short duration, rare events have the largest relative increases of around 14% per degree of warming, while the longest duration events increase by about 5 to 6%. HIRDS v4 can be accessed at https://hirds.niwa.co.nz/, and more background information to the HIRDS methodology can be found at https://www.niwa.co.nz/informationservices/hirds/help.

HIRDS rainfall projections for selected sites in the Waimakairi District are presented in this section. For each site there are two tables; the first table presents data for 1-in-50-year rainfall events, and the second table presents data for 1-in-100-year rainfall events, with each of these tables listing the modelled historical and projected rainfall depths for one to 48-hour rain events. The results for the district are presented in Tables E-1 to E-22.

For each of the selected locations, rainfall depths are projected to increase across all the future scenarios, and both return periods. For example, Table E-1 shows that the projected rainfall depth for a 12-hour rainfall event a location in the Lees Valley site (50-year ARI) is projected to increase under RCP4.5 from 140m (historical depth) to 150 mm by 2040, and 157 mm by 2090. Under RCP8.5 and for the same rainfall event duration, the projected amounts are 152 mm by 2040, and 176 mm by 2090, which indicate a 17 mm and 36 mm rise respectively compared with historical depth.

Table E-1: Modelled historical and projected rainfall depths (mm) for Ashley at Townshend, Lees Valley (Longitude: 172.0673, Latitude: -43.1917) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	33.1	36.4	36.9	38.5	44.7
6-hour	97.2	105.0	107.0	111.0	126.0
12-hour	140.0	150.0	152.0	157.0	176.0
24-hour	191.0	203.0	205.0	211.0	233.0
48-hour	246.0	259.0	261.0	268.0	293.0

Table E-2: Modelled historical and projected rainfall depths (mm) for Ashley at Townshend, Lees Valley (Longitude: 172.0673, Latitude: -43.1917) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	38.5	42.4	42.9	44.8	52.0
6-hour	112.0	121.0	123.0	127.0	145.0
12-hour	160.0	172.0	174.0	180.0	202.0
24-hour	218.0	232.0	234.0	241.0	267.0
48-hour	279.0	295.0	297.0	304.0	333.0

Table E-3: Modelled historical and projected rainfall depths (mm) for View Hill (Longitude: 172.034, Latitude: -43.298) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	31.5	34.7	35.2	36.7	42.5
6-hour	82.9	89.9	90.9	94.3	107.0
12-hour	116.0	124.0	125.0	129.0	145.0
24-hour	154.0	164.0	165.0	170.0	188.0
48-hour	195.0	206.0	207.0	212.0	232.0

Table E-4: Modelled historical and projected rainfall depths (mm) for View Hill (Longitude: 172.034, Latitude: -43.298) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	36.8	40.5	41.0	42.8	49.7
6-hour	95.9	104.0	105.0	109.0	124.0
12-hour	133.0	143.0	145.0	150.0	168.0
24-hour	177.0	189.0	190.0	196.0	217.0
48-hour	223.0	236.0	237.0	243.0	266.0

Table E-5: Modelled historical and projected rainfall depths (mm) for Wharfdale, Lees Valley (Longitude: 172.203, Latitude: -43.15) for different event durations with a 50-year return period (ARI). Source: HIRDS v4..

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	34.8	38.2	38.7	40.4	46.9
6-hour	96.9	105.0	106.0	110.0	125.0
12-hour	136.0	146.0	147.0	152.0	171.0
24-hour	181.0	192.0	194.0	199.0	220.0
48-hour	225.0	238.0	239.0	245.0	268.0

Table E-6: Modelled historical and projected rainfall depths (mm) for Wharfdale, Lees Valley (Longitude: 172.203, Latitude: -43.15) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	40.4	44.4	45.0	47.0	54.5
6-hour	112.0	121.0	123.0	127.0	145.0
12-hour	156.0	168.0	170.0	175.0	197.0
24-hour	207.0	220.0	222.0	229.0	253.0
48-hour	257.0	272.0	274.0	281.0	307.0

Table E-7: Modelled historical and projected rainfall depths (mm) for Loburn (Longitude: 172.49, Latitude: -43.194) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	31.3	34.4	34.9	36.4	42.2
6-hour	87.0	94.3	95.4	98.9	112.0
12-hour	125.0	134.0	135.0	140.0	156.0
24-hour	171.0	182.0	184.0	189.0	209.0
48-hour	224.0	236.0	238.0	244.0	266.0

Table E-8: Modelled historical and projected rainfall depths (mm) for Loburn (Longitude: 172.49, Latitude: -43.194) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	36.2	39.9	40.4	42.2	49.0
6-hour	100.0	109.0	110.0	114.0	130.0
12-hour	143.0	154.0	155.0	160.0	180.0
24-hour	196.0	208.0	210.0	216.0	239.0
48-hour	255.0	269.0	271.0	278.0	304.0

Table E-9: Modelled historical and projected rainfall depths (mm) for Oxford (Longitude: 172.193, Latitude: -43.277) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	33.0	36.3	36.8	38.4	44.5
6-hour	80.7	87.5	88.5	91.8	104.0
12-hour	112.0	120.0	122.0	126.0	141.0
24-hour	151.0	161.0	162.0	167.0	184.0
48-hour	196.0	207.0	208.0	213.0	233.0

Table E-10: Modelled historical and projected rainfall depths (mm) for Oxford (Longitude: 172.193, Latitude: -43.277) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	38.5	42.3	42.9	44.8	52.0
6-hour	93.3	101.0	102.0	106.0	121.0
12-hour	129.0	139.0	140.0	145.0	163.0
24-hour	174.0	185.0	186.0	192.0	212.0
48-hour	224.0	236.0	238.0	244.0	267.0

Table E-11: Modelled historical and projected rainfall depths (mm) for Okuku (Longitude: 172.4483, Latitude: -43.2383) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	29.5	32.4	32.9	34.3	39.7
6-hour	74.5	80.7	81.7	84.7	96.2
12-hour	102.0	110.0	111.0	115.0	129.0
24-hour	135.0	143.0	144.0	149.0	164.0
48-hour	168.0	177.0	179.0	183.0	200.0

Table E-12: Modelled historical and projected rainfall depths (mm) for Okuku (Longitude: 172.4483, Latitude: -43.2383) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	34.4	37.9	38.4	40.1	46.5
6-hour	85.8	93.2	94.2	97.8	111.0
12-hour	117.0	126.0	127.0	132.0	148.0
24-hour	154.0	164.0	165.0	170.0	188.0
48-hour	191.0	201.0	203.0	208.0	227.0

Table E-13: Modelled historical and projected rainfall depths (mm) for Kaiapoi (Longitude: 172.6518, Latitude: -43.3849) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	23.4	25.7	26.1	27.2	31.5
6-hour	61.2	66.4	67.1	69.6	79.1
12-hour	85.9	92.2	93.2	96.2	108.0
24-hour	116.0	123.0	124.0	128.0	141.0
48-hour	149.0	157.0	158.0	162.0	177.0

Table E-14: Modelled historical and projected rainfall depths (mm) Kaiapoi (Longitude: 172.6518, Latitude: -43.3849) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	27.3	30	30.5	31.8	36.9
6-hour	70.4	76.4	77.3	80.2	91.3
12-hour	98.2	106	107	110	124
24-hour	132	140	141	145	161
48-hour	168	177	179	183	201

Table E-15: Modelled historical and projected rainfall depths (mm) for Rangiora (Longitude: 172.583, Latitude: -43.299) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	28.4	31.2	31.6	33.0	38.3
6-hour	73.5	79.7	80.6	83.6	95.0
12-hour	103.0	111.0	112.0	115.0	129.0
24-hour	139.0	148.0	149.0	154.0	170.0
48-hour	179.0	189.0	191.0	195.0	214.0

Table E-16: Modelled historical and projected rainfall depths (mm) Rangiora (Longitude: 172.583, Latitude: -43.299) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	32.8	36.1	36.6	38.2	44.4
6-hour	84.3	91.5	92.5	96.0	109.0
12-hour	118.0	127.0	128.0	132.0	148.0
24-hour	159.0	169.0	170.0	175.0	194.0
48-hour	203.0	215.0	216.0	222.0	243.0

Table E-17: Modelled historical and projected rainfall depths (mm) for Kairaki (Longitude: 172.7087, Latitude: -43.3837) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	24.7	25.8	27.6	28.8	33.3
6-hour	62.1	64.1	68.1	70.6	80.2
12-hour	85.0	87.2	92.2	95.2	107.0
24-hour	112.0	114.0	120.0	124.0	137.0
48-hour	142.0	144.0	151.0	155.0	169.0

Table E-18: Modelled historical and projected rainfall depths (mm) Kairaki (Longitude: 172.7087, Latitude: -43.3837) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	28.9	31.8	32.2	33.6	39.0
6-hour	71.4	77.5	78.4	81.3	92.6
12-hour	97.2	104.0	106.0	109.0	123.0
24-hour	128.0	136.0	137.0	141.0	156.0
48-hour	161.0	170.0	171.0	175.0	192.0

Table E-19: Modelled historical and projected rainfall depths (mm) for Waikuku (Longitude: 172.6897, Latitude: -43.2912) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	25.7	28.3	28.6	29.9	33.4
6-hour	65.0	70.4	71.2	73.8	82.1
12-hour	90.2	96.8	97.8	101.0	112.0
24-hour	121.0	128.0	129.0	133.0	148.0
48-hour	154.0	162.0	163.0	168.0	185.0

Table E-20: Modelled historical and projected rainfall depths (mm) for Waikuku (Longitude: 172.6897, Latitude: -43.2912) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	30.0	33.0	34.6	34.9	40.5
6-hour	74.8	81.1	83.9	85.2	96.9
12-hour	103.0	111.0	113.0	116.0	130.0
24-hour	138.0	146.0	147.0	152.0	168.0
48-hour	174.0	184.0	183.0	190.0	208.0

Table E-21: Modelled historical and projected rainfall depths (mm) for Woodend (Longitude: 172.68, Latitude: -43.323) for different event durations with a 50-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	26.8	29.5	29.9	31.2	36.2
6-hour	70.1	75.9	76.8	79.6	90.5
12-hour	96.2	103.0	104.0	108.0	121.0
24-hour	126.0	134.0	135.0	139.0	153.0
48-hour	154.0	163.0	164.0	168.0	184.0

Table E-22: Modelled historical and projected rainfall depths (mm) for Woodend (Longitude: 172.68, Latitude: -43.323) for different event durations with a 100-year return period (ARI). Source: HIRDS v4.

Rainfall event duration	Historical depth (mm)	Projected depth (mm)			
		Mid-century (2031-2050)		Late-century (2081-2100)	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
1-hour	31.0	34.1	34.6	36.1	41.9
6-hour	80.2	87.0	88.0	91.3	104.0
12-hour	110.0	118.0	119.0	123.0	138.0
24-hour	143.0	152.0	153.0	158.0	174.0
48-hour	175.0	184.0	186.0	190.0	208.0

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	GOV-01-11 / 220622107248
REPORT TO:	COUNCIL
DATE OF MEETING:	5 July 2022
AUTHOR(S)	Sarah Nichols, Governance Manager
SUBJECT:	Register of Interests
SIGNED BY: (for Reports to Council, Committees or Boards)	General Manager / Acting Chief Executive

1. SUMMARY

1.1 This report seeks to formally review the Register of Interests for the Mayor and Councillors as a matter of best practice and as per Council resolution of 5 June 2018.

1.2 Whilst the Policy states the Register would be reviewed at least annually (from every December), it is prudent that as the pre-election period has commenced, that the Register be reviewed and updated if required for reasons of transparency and best practice.

1.3 The Register was last formally reviewed and updated in December 2021 and the Council resolution was for the Register to be reviewed mid-year 2022.

Attachments:

i. Current Register of Interests (December 2021) (Trim 211129190322)
ii. Register of Interests Policy (Trim 180419043038)
iii Local Government (Pecuniary Interests Register) Amendment Act 2022

RECOMMENDATION

THAT the Council:

(a) **Receives** report No. 220622107248.

(b) **Reviews** the Register of Interests content, recording any amendments.

(c) **Notes** a Register of Interests will be republished in the August 2022 agenda and notes the Register of Interests is listed on the Council website.

(d) **Notes** amendments can be made at any time by notification to the Governance Manager.

(e) **Notes** the Register will be next reviewed with the new Council in November 2022, noting the Policy will be reviewed to better incorporate updated Local Government Act legislation related to Pecuniary Interests that comes into force on 20 November 2022.

3. BACKGROUND

3.1 Elected members of the Council are required to operate in a transparent and unbiased manner, and it is important to be seen to be operating in this manner by the community. The Auditor-General states elected member decision-making should be guided by the principles of integrity, honesty, transparency, openness, independence, good faith and service to the public.

3.2 The Council, Standing Committees and Community Boards, at the beginning of each meeting, ask for any conflicts of interest to be declared and this is duly recorded in the meeting minutes. It is recommended best practice to have a more formal disclosure of members' interests where pecuniary (financial) interest may arise. The register is not designed to be a 'register of wealth' but only record fact of a personal financial interest in matters that intersect with the Council business.

3.3 The Code of Conduct describes conflicts of interests in general terms using the Office of the Auditor General's Good Practice Guide. Local Government NZ, the Auditor General and Deloitte's recommended that the Council should establish a Register of Members' Interests. The Council subsequently adopted a Policy and Register which is reviewable every December and June. It is recommended by the Auditor-General that the Council have a Register of Members Interests to help ensure that any conflicts of interest (both pecuniary and non-pecuniary) that arise are identified and managed before they cause issues. Such a disclosure signals openness, transparency and reduces the potential for false allegations of improper behaviour.

4. ISSUES AND OPTIONS

4.1 A conflict of interest, in any matter before the Council, must be declared to the meeting, recorded in the minutes and members refrain from discussing or voting on the matter, as is this Council's present practice. The Local Authorities (Members' Interests Act 1968) applies to the pecuniary interests of members of local authorities, and the Auditor-General recommends that the same procedure be followed for non-pecuniary interests.

4.2 In the Auditor-General's Best Practice Guide a conflict of interest is defined as "where a member's or official's duties or responsibilities to a public entity could be affected by some other interest or duty that the member or official may have".

4.3 A pecuniary interest is not defined in the Act but the recommended test to use is: Whether, if the matter were dealt with in a particular way, discussing or voting on that matter could reasonably give rise to an expectation or a gain or loss of money for the member concerned. Would a reasonable, informed observer think that your impartiality might have been affected?

4.4 The current Interests Register also applies to any business activities/contracts with the Council undertaken by the spouses or partners or immediate family (including children/siblings), of any elected or externally appointed members. It should be noted that declarations associated with an election fall outside the intention of the Interests' Register and are subject to the Local Electoral Act 2001.

4.5 While the Council has adopted to establish a register of interests, whether a member wishes to make a declaration, and the extent of such a declaration, is a matter for each member. The Council cannot require a member to make a disclosure.

4.6 The Local Government (Pecuniary Interests Register) Amendment Act 2022 was given assent on 20 May 2022 and will commence on 20 November 2022. The purpose of the Act is to improve transparency and strengthen public trust and confidence in decision-making of local authorities. The Act better aligns transparency requirements of members of local authorities with members of Parliament and the Executive Council. The Act aims for consistency of information and proposes local authorities maintain and publish a register of pecuniary and other specified interests for members of local authorities, such as directorships, business interests, employment, or property. It would also require members of local authorities to disclose gifts and payments they receive. Members will also be required to make pecuniary interest returns annually. It is also an offence for members who fail to meet their responsibilities

4.7 There is a separate Register of Interests for the Community Boards which is also published on the Council website. The Community Board Register will also be updated in November 2022.

4.8 There are implications to community wellbeing by the issues and options that are the subject matter of this report.

4.9 The Management Team have reviewed this report.

5. COMMUNITY VIEWS

5.1 **Mana whenua**

Taking into consideration the provisions of the Memorandum of Understanding between Te Ngāi Tūāhuriri Rūnanga and the Council, Te Ngāi Tūāhuriri hapū are not likely to be affected by, or have an interest in the subject matter of this report.

5.2 **Groups and Organisations**

There are no other groups and organisations, which are likely to be affected by, or to have an interest in the subject matter of this report.

5.3 **Wider Community**

The wider community is not likely to be affected by, or to have an interest in, the subject matter of this report. However, the community has a right to assurance that decisions made by elected members are transparent and in the public interest. Perceived conflict of interest could be viewed as undemocratic, and appropriate best practices should be upheld to guard against a loss of confidence from the community if a breach occurs.

6. IMPLICATIONS AND RISKS

6.1 **Financial Implications**

6.1.1 Under section 3 (Disqualifying contracts between local authorities and their members) of 'the Act', no person shall be capable of being elected as or appointed to be or of being a member of a local authority or of any committee of a local authority, if the total of all payments made or to be made by or on behalf of the local authority in respect of all contracts made by it in which that person is concerned or interested exceeds $25,000 in any financial year. This is applicable unless approval from the Auditor-General is obtained (section 3(3)).

6.1.2 Any elected member that commits an offence under 'the Act' is liable on conviction to a fine not exceeding $200.

6.1.3 No cost is associated with maintaining a Register of Members Interests, which would be maintained by the Governance Manager.

6.2 **Sustainability and Climate Change Impacts**

The recommendations in this report do not have sustainability and/or climate change impacts.

6.3 **Risk Management**

By having a Register of Interests, and reviewing at least annually, elected members are aware of their responsibilities and minimal risk to the organisation due to best practices and appropriate declarations. All Council, Committee and Community Board agendas will continue to list "conflicts of interest" for recording at each decision meeting.

6.4 **Health and Safety**

There are no health and safety issues arising from the adoption/implementation of the recommendations in this report.

7. CONTEXT

7.1 **Consistency with Policy**

This matter is a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2 **Authorising Legislation**

7.2.1 Local Authorities (Members' Interests Act 1968)

(i) ensuring that members are not affected by personal motives when they participate in decisions of their local authority, and
(ii) preventing members, in contracting situations, from using their position to obtain preferential treatment from the authority.
(iii) controls the making of contracts worth more than $25,000 in a financial year between members and their authority, and
(iv) prohibits members from participating in matters before the authority in which they have a pecuniary interest, other than an interest in common with the public.

7.2.2 Local Government Act 2002

7.2.3 Code of Conduct (adopted by the Council October 2019).

7.3 **Consistency with Community Outcomes**

The Council's community outcomes are relevant to the actions arising from recommendations in this report.

People are friendly and caring, creating a strong sense of community in our District.

There are wide-ranging opportunities for people of different ages and cultures to participate in community life and recreational activities.

7.4 **Authorising Delegations**

The Council has the authority to approve or amend any Policy at any time.

ATTACHMENT I

Waimakariri District Council

Register of Interests – as at 29 November 2021 - Mayor and Councillors

Elected Member	Date of Update from Member	Member Declared Interest (Business/Patron/ Club/Partnership)	Council Appointments	Spouse/Partner Declared Interest	OAG approval status
Mayor Dan Gordon	29 November 2021	Member – Rotary Club of Rangiora Committee Member – Waimakariri Community Arts Council Committee Member – Friends of Rangiora Town Hall Member – Waimakariri Arts Trust Member - Rangiora Museum Patron – North Canterbury Musicals	Deputy Chair Waitaha Primary Health Organisation Trustee – Enterprise North Canterbury	Nil.	n/a
Councillor Neville Atkinson	4 December 2020	Kaiapoi Community Care and Employment Trust (KCC&ET)(Tag Busters) Kaiapoi Railway Station Trust (Chair)		Nil.	Approved (KCC&ET) June 2020
Councillor Kirstyn Barnett	17 November 2020	2nd Vice President Rangiora Lions Club	Member Cust Community Centre Advisory Group	Nil.	n/a

Elected Member	Date of Update from Member	Member Declared Interest (Business/Patron/ Club/Partnership)	Council Appointments	Spouse/Partner Declared Interest	OAG approval status
Councillor Alistair Blackie	4 December 2020	Nothing to declare	Trustee – Te Kohaka O Tuhaitara Trust Waimakariri Art Collection Trust Trustee - Waimakariri Public Arts Trust	Nil.	n/a
Councillor Robbie Brine	4 December 2020	Serving NZ Police Officer	Canterbury Regional Landfill Joint Committee	Nil.	n/a
Councillor Wendy Doody	4 December 2020	Nothing to declare	Trustee - North Canterbury Sport and Recreation Trust	Nil.	n/a
Councillor Niki Mealings	4 December 2020	Nothing to declare		Nil.	n/a
Councillor Philip Redmond	4 December 2020	Rotary Club of Rangiora including Charitable Trust Patron of Coastguard North Canterbury and Life Member Kaiapoi Promotions Assoc Life Member Trustee Kaiapoi Maritime Heritage Trust Trustee Big Brothers Big Sisters of North Canterbury	Trustee - North Canterbury Sport & Recreation Trust Waimakariri Health Advisory Group	Nil.	n/a

Elected Member	Date of Update from Member	Member Declared Interest (Business/Patron/ Club/Partnership)	Council Appointments	Spouse/Partner Declared Interest	OAG approval status
Councillor Sandra Stewart	4 December 2020	Self-employed journalist, owner four hectare property Springbank (near Cust)		Nil.	n/a
Councillor Joan Ward	4 December 2020	Nothing to declare	Canterbury Museum Trust Board Standing Committee	Nil.	n/a
Councillor Paul Williams	4 December 2020	Nothing to declare		Nil.	n/a

This document was last reviewed at the Council meeting of 7 December 2021.

This document supersedes the previous documents Trim 201204165141 4 December 2020, T rim 201120156893 Dated 19 November 2020, 191024149079 Dated 3 December 2019, 190624088464 Dated June 2019, Trim 190311031245 Dated 11 March 2019 and Trim 181205143166 Dated 5 December 2018.

ATTACHMENT II

WAIMAKARIRI DISTRICT COUNCIL

POLICY

S-CP 1045
Issue: 2
Date: 05/11/2019
Page: 1 of 5

REGISTER OF INTERESTS POLICY

1 Introduction

Elected members of the Council have a number of professional and personal interests and roles. Conflicts of interest sometimes cannot be avoided but they need not cause problems when promptly disclosed and well managed. Disclosure by an elected member is voluntary.

This policy is intended to reflect best practice, and will generally be applied by the Council (ie Councillors).

Examples of conflicts include paid outside employment, company directors or commercial relationships that interface with the Council or a Community Board.

2 Policy Context

This policy applies to all elected members, including committees and hearing panels. A disclosure of interest policy is already in place for Council employees.

A conflict of interest occurs when:

- the activities of an elected member leads, or could lead, to material benefit for that elected member concerned or to an external entity, either directly or indirectly, to the detriment, or potential detriment, of the Council.
- the activities of an elected member interfere, or could interfere, with that elected member's fulfilment of their obligations.

If elected members are unclear about the application of this policy to specific circumstances or situations they should seek clarification from the Governance Manager or Chief Executive.

3 Policy Objective

The objective of this policy is to:

- provide best practice guidance to Council members so that such decisions are seen to be transparent and unbiased and without giving rise to any perception of conflict of interest;
- set rules around disclosing actual, potential and perceived conflicts and accepting gifts and other benefits; and
- set out Council's expectations for its members to ensure compliance with the provisions of the legislation and good practice guides listed below;
- preserve public trust in Council by avoiding actual, perceived or potential bias.

4 Policy Statement

Elected members must carry out their duties in an efficient and competent manner and avoid any behaviour which might impair their effectiveness, or damage the integrity or standing of the Council. Thus it is fundamental to the protection of the reputation of Waimakariri District Council that no elected members have, or are perceived to have, a conflict between their official responsibilities and their personal interests.

A conflict of interest can arise where two different interests overlap, i.e. in any situation where an elected member has a financial interest, a private or personal interest or business interest

sufficient to influence or appear to influence the impartial exercise of their official duties or professional judgment.

Members must at all times avoid situations where their integrity might be questioned or where they may appear to favour one party, supplier or customer over another. In addition, members must act honestly and impartially and in no circumstances reveal or make private use of personal, confidential or other non-public information obtained as a result of their employment by the Council.

The existence of a conflict of interest may not necessarily mean that the elected member concerned has done anything wrong or that the interests of Council or the public have been compromised. For an elected member a conflict of interest that creates risks may be where their duties or responsibilities to Council could be affected by some other interest or duty that they may have. For example, other interests or duties might exist for an elected member because of their own financial affairs; a relationship (private or personal interest) or other role (business interest) that the elected member has; or something the elected member has said or done.

Disclosure provides transparency and protects those concerned from allegations of duplicity and enables the avoidance of being unwittingly placed in situations that may lead to a conflict of interest.

5 Policy Actions

Council members are to conduct themselves at all times under the above principles, ensuring that:

- self-interest or personal factors are not permitted to influence their decision making;
- financial, family, personal or business relationships or interests do not in fact, nor appear to, unfairly advantage or disadvantage the Council, elected members or other individuals or organisations;
- they are not involved in the appointment process of people with whom they have a close personal or family relationship;
- they do not take part in discussions, deliberations, decision-making or voting on a matter in which he/she (or a member of his/her immediate family or a dependent) has a material interest;
- they observe the highest standards of behaviour in accepting gifts or rewards. Any gift that might attract the suspicion of improper motive, or which obligates the individual should not be accepted. In any event all gifts offered (received or not) are to be declared (refer to WDC Gifts & Hospitality Policy and Elected Members' Code of Conduct);
- Council's name, resources, information and time are not used for private or personal benefit without prior written consent of an authorised person;
- any conflict of interest identified is declared as soon as possible;

As part of the induction process, new Council members will receive advice on how to identify, report, and manage conflicts of interest.

Council members must monitor any business interactions between the Council and any company or organisation in which the member has a material interest and ensure that such business does not exceed $NZ25,000 (including GST) in value without the prior approval of the Auditor-General.

Elected Members shall:

- declare any interests in contracts in the Council's Interest Register;
- discuss any proposed interest in contracts (of whatever value) in advance with the Chief Executive and/or the OAG and follow the advice that they are given;
- not participate in decision-making relating to any contract in which they have an interest;
- not accept any gifts (including hospitality, entertainment) from tendering parties where the Council or community board/committee will be part of the decision-making process.

6 Interests Register

The Governance Manager will maintain an elected member Interests Registers which is to be updated at least annually (1st December) and as required when an elected member declares a conflict of interest at any time during the year.

The Elected Members Interests Register will be published on the Council website and in the Council agenda each December and following any amendment.

7 Links to legislation, other policies and community outcomes

- Local Authorities (Members Interests) Act 1968
- Managing Conflicts of Interest: Guidance for Public Entities (Office of the Auditor-General)
- Guidance for Members of Local Authorities about the Local Authorities (Members' Interests) Act 1968
- Purchasing Policy (including Tendering) 2017
- Elected Members Code of Conduct.

8 Guidance Notes relating to the making of returns:

The following explanatory notes are intended to assist members in preparing their returns for the register but a final judgment on interpreting the requirements in the responsibility of the members themselves.

- You may have financial interests that are not covered by the requirements for the register but do need to be declared orally to a committee before you participate in debate relating to that interest. This might include an interest you have acquired but is not due for registration until several months later, or it may relate to an interest of a family member. If in any doubt, you should consider making an oral declaration to the committee before participating in consideration of a related item of business, regardless of any written registration.
- There is no formal requirement to register any change in your interests 1st December each year (or any other date required for an initial return) until the next return is required. However the requirements for an oral declaration will apply to any interests that have not been registered.
- At no stage are you required to state the actual value or extent of any interest. You simply need to register its existence.
- If any interest is held jointly with another person or persons, you should indicate the interest. You can list it as jointly owned but do not need to name the other owner(s).

REGISTER OF INTERESTS POLICY

9 Definitions

Business entity	means anybody or organisation, whether incorporated or unincorporated, that carries on any profession, trade, manufacture, or undertaking for pecuniary profit, and includes a business activity carried on by a sole proprietor.
Company means:	a) A company registered under Part 2 of the Companies Act 1993, or b) A body corporate that is incorporated outside New Zealand
Relevant Interest	is when an elected member has a business, financial or personal interest in a company, trust, or community organisation that is likely to do business with council at any time.
Conflict of Interest	means any situation when a person has a financial, personal or business interest sufficient to influence or appear to influence the impartial exercise of their official Council duties or professional judgement.
Matter	means the Council's performance of its functions or the exercise of its powers, or an arrangement, agreement or contract the Council has entered into or proposes to enter.
Member	means elected members of Waimakariri District Council and Community Boards.
Business Interest	An elected member will have a business interest in an enterprise seeking to do business with the Council if they: • are a director of the enterprise; • are an owner of or partner in the enterprise; • have a shareholding in the enterprise; • have a close personal or familial relationship with a person who is an owner or partner or significant shareholder in the enterprise. • Holds a significant managerial role that trades with Waimakariri District Council.
Declarations of a Conflict:	is a reference to a real, perceived or potential conflict and is valid for Council, Committees and Community Boards.
Financial Interest	means anything of monetary value, including but not limited to: • Salary or payments for service, e.g. consulting fees and honoraria; • Equity interests, e.g. stocks, stock options and other ownership interests; • Gifts; • Allowances, forgiveness of debts, interests in real estate or personal property, dividends, rents, capital gains; and • Intellectual property rights, e.g. patents, copyrights and royalties from these rights. • The term does not include salary or other remuneration received from or approved by Council.
Pecuniary Interest:	An interest that involves money.
Personal Interest	An elected member has a personal interest in a matter if their spouse or partner, or other person in their family with whom there is a close friendship or relationship, could be advantaged or disadvantaged by any decision that the

	staff or elected member either can make, or does make, or is in a position to influence.
Relevant Interest	is when an elected member has a business, financial or personal interest in a company, trust, or community organisation that is likely to do business with council at any time.
Spouse/Partner/ Family:	Under the various Acts pertaining to Conflict or Pecuniary Interests it is also relevant to the elected member if the conflict of interest pertains to their spouse, partner or close family member (ie brother/sister, son/daughter, parent).

10 Adopted by and date

This Policy was considered and adopted by the Council at its meeting of 1 May 2018.

11 Review

The Policy was reviewed in November 2019, and will be every six years thereafter, or sooner on request.

ATTACHMENT iii

Local Government (Pecuniary Interests Register) Amendment Act 2022

Public Act	2022 No 24
Date of assent	20 May 2022
Commencement	see section 2

Contents

The Parliament of New Zealand enacts as follows:

1 Title

This Act is the Local Government (Pecuniary Interests Register) Amendment Act 2022.

2 Commencement

This Act comes into force on the day that is 6 months after the date on which it receives Royal assent.

3 Principal Act

This Act amends the Local Government Act 2002.

Part 1
Register of members' pecuniary interests

4 New subpart 3 of Part 4 inserted

After section 54, insert:

Subpart 3—Register of members' pecuniary interests

54A Register of members' pecuniary interests

(1) A local authority must keep a register of the pecuniary interests of—

(a) members of the local authority; and

(b) members who have been elected under the Local Electoral Act 2001 to a community board that is part of the local authority; and

(c) members who have been elected under the Local Electoral Act 2001 to a local board that is part of the local authority.

(2) The register must comprise the pecuniary interest returns that—

(a) are made by members under section 54C; and

(b) contain all information in any pecuniary interest return that is required to be disclosed under sections 54E and 54F, and include any notifications made under section 54D of errors or omissions in those returns.

(3) The local authority must—

(a) make a summary of the information contained in the register publicly available; and

(b) ensure that information contained in the register—

(i) is only used or disclosed in accordance with the purpose of the register; and

(ii) is retained for 7 years after the date on which a member provides the information, and is then removed from the register.

54B Purpose of register

The purpose of the register of members' pecuniary interests is to record members' interests so as to provide transparency and to strengthen public trust and confidence in local government processes and decision-making.

54C Members to make pecuniary interest returns

(1) A member described in section 54A(1)(a), (b), or (c) must make a pecuniary interest return containing the information specified in sections 54E and 54F in respect of the 12-month period that ended on the day that is 1 month before each date specified for the return in subsection (2).

(2) The member must make the pecuniary interest return by the following dates:

(a) the day that is 120 days after the date on which the member comes into office under section 115 of the Local Electoral Act 2001:

(b) the last day of February in each subsequent year.

(3) The member must make the return by providing it to the Registrar.

54D Accuracy of information included in pecuniary interest return

(1) When making a pecuniary interest return under section 54C, a member must ensure that the information contained in the return is accurate.

(2) However, if a member becomes aware of an error or omission in any return that the member has made, the member must advise the Registrar of that error or omission as soon as practicable after becoming aware of it.

(3) When advised of an error or omission in a pecuniary interest return, the Registrar must correct the register of members' pecuniary interests accordingly.

54E Contents of pecuniary interest return relating to member's position

(1) Every pecuniary interest return must contain the following information:

(a) the name of each company of which the member is a director or holds or controls more than 10% of the voting rights and a description of the main business activities of each of those companies:

(b) the name of every other company or business entity in which the member has a pecuniary interest, other than as an investor in a managed investment scheme, and a description of the main business activities of each of those companies or business entities:

(c) if the member is employed, the name of each employer of the member and a description of the main business activities of each of those employers:

(d) the name of each trust in which the member has a beneficial interest:

(e) the name of any organisation or trust and a description of the main activities of that organisation or trust if—

(i) the member is a member of the organisation, a member of the governing body of the organisation, or a trustee of the trust (as applicable); and

(ii) the organisation or trust receives funding from, or has applied to receive funding from, the local authority, local board, or community board to which the member has been elected:

(f) the title and description of any organisation in which the member holds an appointment by virtue of being an elected member:

(g) the location of real property in which the member has a legal interest, other than an interest as a trustee, and a description of the nature of the real property:

(h) the location of real property, and a description of the nature of the real property, held by a trust to which the following apply:

(i) the member is a beneficiary of the trust; and

(ii) the member knows or ought reasonably to know that the member is a beneficiary of the trust; and

(iii) it is not a unit trust whose name is disclosed under subclause (1)(d); and

(iv) it is not a retirement scheme whose membership is open to the public.

(2) For the purposes of subsection (1)(b), a member does not have a pecuniary interest in a company or business entity (**entity A**) merely because the member has a pecuniary interest in another company or business entity that has a pecuniary interest in entity A.

(3) For the purposes of subsection (1)(e), a member is not required to disclose the name and a description of the main activities of an organisation that is a council-controlled organisation.

(4) For the purposes of subsection (1)(g) and (h), a member is not required to disclose the street address of the real property, but must provide the general location (for example, the suburb and city in which it is located).

(5) For the purposes of this section,—

business entity means any body or organisation, whether incorporated or unincorporated, that carries on any profession, trade, manufacture, or undertaking for pecuniary profit, and includes a business activity carried on by a sole proprietor, but does not include any blind trust

company has the same meaning as in section 2(1) of the Companies Act 1993, and includes—

(a) a body corporate that is incorporated outside of New Zealand:

(b) a society incorporated under the Industrial and Provident Societies Act 1908 or any former Industrial and Provident Societies Act

employed—

(a) means employed under a contract of service; but

(b) does not include holding—

(i) the position of an elected member of a local authority, local board, or community board (as applicable); or

(ii) any other position for which the person in question would not be qualified unless he or she had been elected a member of a local authority, local board, or community board (as applicable)

managed investment scheme has the same meaning as in section 9(1), (2), and (4) of the Financial Markets Conduct Act 2013.

54F Contents of pecuniary interest return relating to member's activities

(1) Every pecuniary interest return must also contain the following information:

(a) for each country (other than New Zealand) that the member travelled to,—

(i) the name of the country; and

(ii) the purpose of travelling to the country; and

(iii) the name of each person who contributed (in whole or in part) to the costs of the travel to and from the country; and

(iv) the name of each person who contributed (in whole or in part) to the accommodation costs incurred by the member while in the country:

(b) a description of each gift (including hospitality and donations in cash or kind but excluding any donation made to cover expenses in an electoral campaign) received by the member and the name of the donor of each of those gifts (if known or reasonably ascertainable by the member) if—

(i) the gift has an estimated market value in New Zealand of more than $500; or

(ii) the combined estimated market value in New Zealand of all gifts from the donor is more than $500:

(c) a description of each payment received by the member for activities in which the member is involved other than—

(i) the salary or allowances paid to that person under the Remuneration Authority Act 1977 or this Act; and

(ii) any payment the member received from an interest required to be disclosed under section 54E; and

(iii) any payment made in respect of any activity the member ceased to be involved in before becoming a member.

(2) The information referred to in subsection (1)(a) does not have to be included in the pecuniary interest return if the travel costs and accommodation costs were paid in full by the following or any combination of the following:

(a) the member:

(b) a member of the member's family.

(3) The information referred to in subsection (1)(b) does not have to be included in the pecuniary interest return if the gift was from a member of the member's family unless the member, taking the purpose of the register into account (*see* section 54B), considers the information should be included.

(4) For the purposes of this section, **member of the member's family** means the member's spouse, partner, parent, grandparent, child, stepchild, foster child, grandchild, or sibling.

54G Registrar

(1) A local authority must appoint a Registrar to—

(a) compile and maintain the register of members' pecuniary interests; and

(b) provide advice and guidance to members in connection with their obligations under this subpart.

(2) The chief executive of a local authority may be the Registrar under subsection (1).

54H Responsibility of members

(1) It is the responsibility of each member to ensure that they fulfil the obligations imposed on them under this subpart.

(2) A Registrar is not required to—

(a) notify any member of—

(i) that member's failure to make a pecuniary interest return by the due date; or

(ii) any error or omission in that member's pecuniary interest return; or

(b) obtain any pecuniary interest return for a member.

(3) To avoid doubt,—

(a) a member's obligations under this subpart are in addition to any obligations under, and do not affect the application of, the Local Authorities (Members' Interests) Act 1968; and

(b) a pecuniary interest that a member has declared under this subpart is not necessarily an interest for the purposes of the Local Authorities (Members' Interests) Act 1968.

54I Definition of Registrar

In this subpart, **Registrar** means the Registrar appointed under section 54G.

Part 2
Other amendments

5 Section 5 amended (Interpretation)

In section 5(1), in their appropriate alphabetical order, insert:

pecuniary interest, in relation to a member, means a matter or activity of financial benefit to the member

pecuniary interest return means the return required to be made under section 54C

6 Section 235 amended (Offences by members of local authorities and local boards)

(1) In section 235(1), after "contravenes", insert "section 54C or 54D(1) or (2) or".

(2) In section 235(2), after "instituted under", insert "section 54C or 54D(1) or (2) or".

Legislative history

1 July 2021	Introduction (Bill 51–1)
22 September 2021	First reading and referral to Governance and Administration Committee
22 March 2022	Reported from Governance and Administration Committee (Bill 51–2)
6 April 2022	Second reading
13 April 2022	Committee of the whole House (Bill 51–3)
18 May 2022	Third reading
20 May 2022	Royal assent

This Act is administered by the Department of Internal Affairs.

Wellington, New Zealand:

Published under the authority of the New Zealand Government—2022

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	EXC-57 / 220621105796
REPORT TO:	COUNCIL
DATE OF MEETING:	5 July 2022
AUTHOR(S):	Jim Harland – Chief Executive
SUBJECT:	Health, Safety & Wellbeing Report – July 2022
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / Acting Chief Executive

1. SUMMARY

1.1. This report provides an update to the Council on Health, Safety & Wellbeing matters for June 2022. The dashboard reporting in this report is trending from May 2022 to mid-June 2022.

1.2. There were 14 incidents which occurred from May to 20 June 2022 which resulted in 56 hours lost time to the organisation. Ongoing lost time from historic incidents is reported in Appendix A.

1.3. The organisation is currently experiencing a reasonably high rate in staff turnover. Since Covid this has steadily increased to 17.41%. There creates an inherent risk until new staff are trained and fully competent in their roles.

1.4. Due to the rise of Covid within the organisation there has been a rise in Covid-19 related absences and therefore subsidies claimed by WDC.

1.5. There is currently a short term work programme underway to focus on immediate staff wellbeing initiatives pending the development of a longer term wellbeing strategy. These initiatives are being jointly developed between the Wellbeing working group and the MAD Committee.

Attachments:

i. Appendix A: March-April Incidents, Accidents, Near-misses reporting
ii. Appendix B: Contractor Health and Safety Capability Pre-qualification Assessment (drawn from the Site Wise database)
iii. Appendix C: Health, Safety & Wellbeing Dashboard Reports

2. RECOMMENDATION

THAT the Council

(a) **Receives** Report No 220621105796

(b) **Notes** that there were no notifiable incidents this month. The organisation is, so far as is reasonably practicable, compliant with the duties of a person conducting a business or undertaking (PCBU) as required by the Health and Safety at work Act 2015.

(c) **Circulates** this information to Community Boards for their information.

3. BACKGROUND

3.1. The Health and Safety at Work Act 2015 requires that Officers must exercise due diligence to make sure that the organisation complies with its health and safety duties.

3.2. An officer under the Health and Safety at Work Act 2015 is a person who occupies a specified position or who occupies a position that allows them to exercise a significant influence over the management of the business or undertaking. Councillors and the Chief Executive are considered to be the Officers of the Waimakariri District Council.

3.3. The World Health Organisation has declared a pandemic as a result of the transmission of the COVID-19 virus across the world. This report continues to provide the Council with a summary of activities which are underway to support our organisations response to the pandemic.

4. ISSUES AND OPTIONS

4.1. Incidents and accidents

4.1.1. May and June have shown a trend in increasing vehicle incidents due to poor weather and ground conditions. These incidents are being investigated further in collaboration with the Water Unit. Vehicle types, towing capacity and weight are being considered for future fleet purchases. The issue of vehicle weight, size and ground conditions are contributing to the incidents. The Water Unit staff have been asked to report all incidents involving vehicles being stuck and towed to ensure we are measuring time, budget and risk involved with the occurrences.

4.2. Staff training and competencies

4.2.1. With the current increase in staff turnover and Covid restrictions/guidelines, there is an inherent risk with low competencies and task familiarisation in our high risk departments until new staff are trained. Covid has precluded a significant amount of face to face training over the previous 24 months to occur, creating a gap in competencies. As Covid restrictions have eased the training implementation is currently being scoped and coordinated to ensure new staff are compliant in their roles and existing staff are able to renew outdated training as soon as possible.

4.3. Covid-19 subsidy overview

4.3.1. The government announced a subsidy for employees required to self-isolate and unable to work from home or unwell with Covid-19. It was determined that the Waimakariri District Council is eligible to apply for the subsidy scheme.

4.3.2. The COVID-19 Leave Support Scheme is available to employers to help pay employees who have been advised to self-isolate because of COVID-19 or are unwell with Covid-19 and can't work from home. The Ministry of Health has indicated that the Flu season this year could continue to impact on people's wellbeing over the winter season even though Covid-19 cases are starting to decline.

4.3.3. To date, the Council has made two bulk claims for the subsidy following receipt of subsidy application forms from 53 employees who have been unwell with Covid-19 and/or were required to self-isolate due to being a household contact and unable to work from home. The total value of the subsidy claimed by the Council is $29,631.00. All of the money has been passed on to respective employees who have claimed the subsidy and has been offset against (sick) leave entitlements they would have otherwise used.

4.4. Wellbeing Correlation

4.4.1. The Wellbeing Working Group and The MAD Committee have come together to deliver a short term programme of events, activities and opportunities for staff, with the aim of increasing individual, team and organisational wellbeing.

4.4.2. The collective group agreed to get some initiatives underway in the interim period particularly focused on the 'Connect' and 'Give' elements of Five Ways to Wellbeing. Once the new manager for Health, Safety and Wellbeing is appointed (the recruitment process is currently underway) the development of a comprehensive wellbeing strategy will be a priority.

Implications for Community Wellbeing

There are implications for community wellbeing by the issues and options that are the subject matter of this report.

4.5. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be affected by, or have an interest in the subject matter of this report.

5.2. Groups and Organisations

There are no external groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

5.3. Wider Community

The wider community is likely to be affected by, or to have an interest in the subject matter of this report.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

There are no financial implications of the decisions sought by this report.

6.2. Sustainability and Climate Change Impacts

The recommendations in this report do not have sustainability and/or climate change impacts.

6.3 Risk Management

The organisation has reviewed its health and safety risk and developed an action plan. Failure to address these risks could result in incidents, accidents or other physical or psychological harm to staff or the public.

The regular review of risks is an essential part of good safety leadership.

6.4 Health and Safety

There are health and safety risks arising from the adoption/implementation of the recommendations in this report. Continuous improvement, monitoring, and reporting of Health and Safety activities are a key focus of the health and safety management system.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Authorising Legislation**

The key legislation is the Health and Safety at Work Act 2015.

The Council has a number of Human Resources policies, including those related to Health and Safety at Work.

The Council has an obligation under the Local Government Act to be a good employer.

7.3. **Consistency with Community Outcomes**

The Council's community outcomes are relevant to the actions arising from recommendations in this report.

- There is a safe environment for all.
- Harm to people from natural and man-made hazards is minimised.
- Our District has the capacity and resilience to quickly recover from natural disasters and adapt to the effects of climate change.

The Health, Safety and Wellbeing of the organisation, its employees and volunteers ensures that Community Outcomes are delivered in a manner which is legislatively compliant and culturally aligned to our organisational principles.

7.4. **Authorising Delegations**

An officer under the Health and Safety at Work Act 2015 is a person who occupies a specified position or who occupies a position that allows them to exercise a significant influence over the management of the business or undertaking. Councillors and Chief Executive are considered to be the Officers of WDC.

Appendix A

Date	Person type	Occurrence	Event description	Response
16/05/2022	Employee/ Volunteer	Near Miss	Water Unit truck left right wheel got stuck on the grass on the side of an unsealed road. Had to be towed out.	No damage caused. Vehicle fleet being looked at for towing purposes.
16/05/2022	Non-Employee	Property and Vehicle Damage	Member of the public was on an electric bike when they fell off going over the tiles beside the Kaiapoi Library (car park entrance on Raven Quay) The tiles are very slippery when it is raining. His electric bike was damaged and he was bruised by the incident.	The Person needed no medical attention. Greenspace is in the process of looking at mitigation measures for the slippery tiles outside of the Kaiapoi Library. Investigation ongoing.
1/06/2022	Non-Employee	Injury	Contractor was hit on the thumb by a water pipe bomb cap. As per the contractors statement "While undertaking a connection to an existing 100mm water pipe, I had to remove a bomb cap to allow for the connection. In order to do so, WDC Water Unit staff member had to shut off the water main. After he had done this, I asked him if I could remove the concrete block and he replied "Yes, good to go" indicating the water was shut off and depressurised, as I began loosening the bolts the cap shot off the pipe with a boom hitting my thumb and hand on its way passed. I told the WDC Water Unit staff member it is not shut and still under pressure after telling me it was "residual" pressure and waiting half an hour, he walked across the road and shut a 50mm gate valve that was feeding the line.	Upon investigation it was found that the 50mm gate valve that was “shut off” in the first instance was initially in the off position, so the WDC Water Unit staff member has opened this valve instead of isolating it. The pressure from this pipe is approximately 400kpi and could have been a significant incident. Key findings so far is that there is no isolation checklist signed by the isolator and the person working on the line. This is being established for future tasks to ensure isolations are double checked and documents to ensure no source of pressure is missed. This incident is still under investigation. An action plan and incident report is currently being collated.
2/06/2022	Non-Employee	Near Miss	A resident was driving out his driveway early in the morning and struck a small concrete base of a power box. Works for the East Interceptor Pipeline are happening over there - diverting driveway access. The contractor left 2.8 metres between the corner of the power box and the fencing.	All damage was completed by the contractor assigned to the East Interceptor Pipeline works. (Shovel Ready Project)
8/06/2022	Employee/ Volunteer	Near Miss	WU Truck loss of traction and was unable to move while towing the digger.	We are currently seeing more Water Unit vehicles being stuck in berms etc due to the

				wet weather we have been having. Staff are trying to utilise harder ground where possible to avoid towing situations and damage to grass areas.
10/06/2022	Employee/ Volunteer	Injury	A staff member felt pain in their hand while lifting bucket full of soil.	Swollen area on the hand but no medical attention required. Lifting techniques revisited.
14/06/2022	Non-Employee	Property and Vehicle Damage	An excavator operator was reversing (using his camera) to place a pipe into a welding crate. A ute that belongs to a subcontractor was parked on site. The excavator operator did not notice the tail gate glass. As a result, he bumped into the glass tail door breaking it.	All damage and reports completed by the contractor (Shovel Ready Project)
15/06/2022	Employee/ Volunteer	Injury	A staff member in the driver's seat of their truck when they turned and lent over to pick a bag up and felt a click in their lower back.	Staff member sought medical attention. The medical certificate suggested 11 days off work to recover from his back injury. This resulted in 7 working days off (56 hours lost time) Staff member has returned to work fully fit.
15/06/2022	Employee/ Volunteer	Property and Vehicle Damage	Staff member looked left and right to make sure there were no oncoming vehicles and backed into a parked car. No damage to the sewer truck and superficial damage to the parked car. Owner of the car has been contacted.	Investigation ongoing. No further details.
15/06/2022	Employee/ Volunteer	Near Miss	Truck 939 stuck	Water Unit truck stuck in grassed area. Towed free. We are currently seeing more Water Unit vehicles being stuck in berms etc due to the wet weather.
17/06/2022	Employee /Volunteer	Near Miss	Truck 939 stuck	Water Unit truck stuck in grassed area. Towed free. We are currently seeing more Water Unit vehicles being stuck in berms etc due to the wet weather.
17/06/2022	Employee/ Volunteer	Near Miss	Truck 939 stuck	Water Unit truck stuck in grassed area. Towed free. We are currently seeing more Water Unit vehicles being stuck in berms etc due to the wet weather. to grass areas.

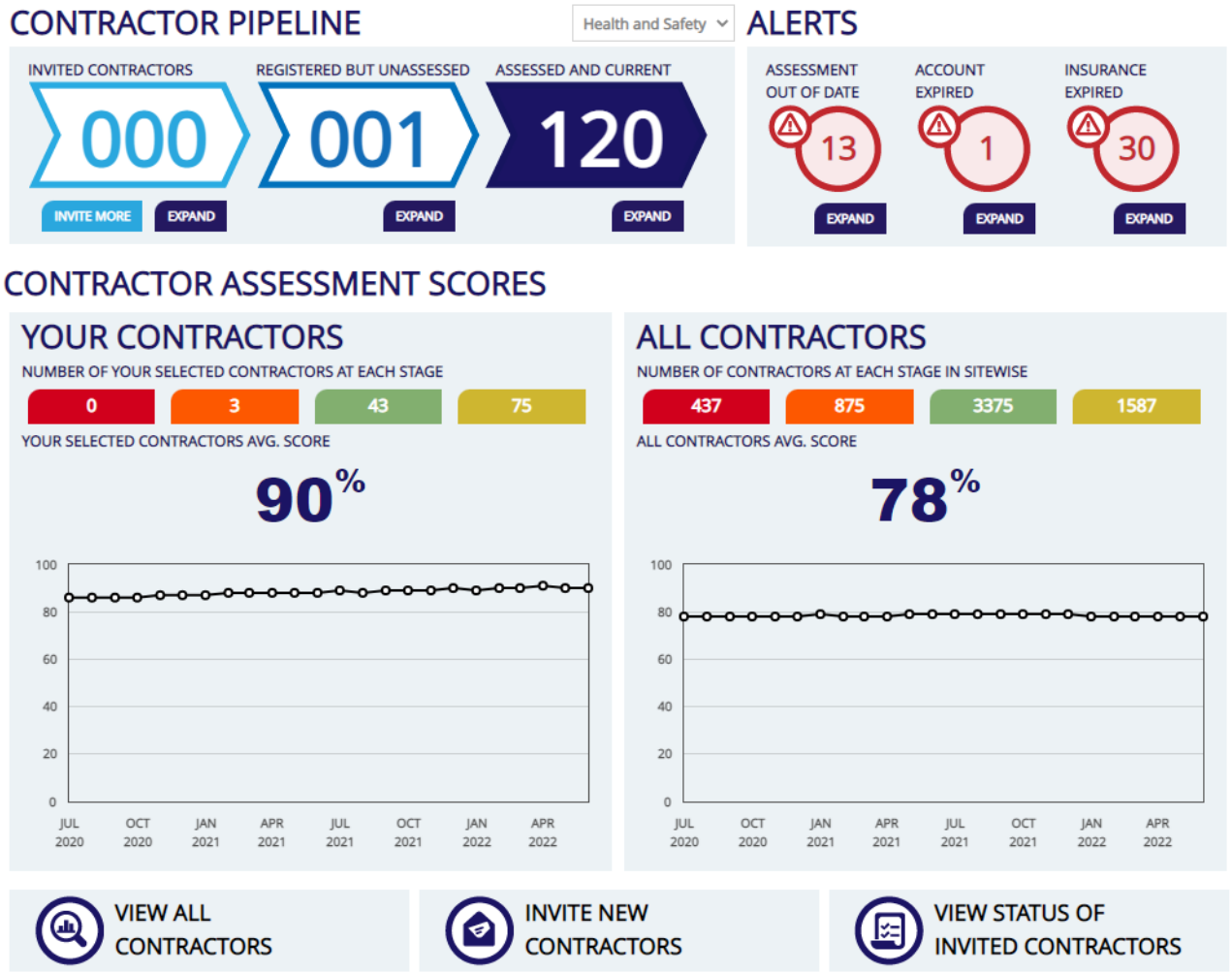
17/06/2022	Employee/ Volunteer	Property and Vehicle Damage	A telecom cable dug through with the digger. Locator picked up larger cable (marked as per take 5 photos) which was potholed and located. It was marked with shovel then dug away hitting a smaller cable 300mm away that was not picked up by locator.	No injury incurred. Currently under investigation.
20/06/2022	Employee/ Volunteer	Property and Vehicle Damage	Upon a routine generator inspection, the Generator started to smoulder and caught fire.	Staff members were able extinguisher this with their fire extinguisher. There was no need for emergency services. The generator supplier/maintenance contractor was called to come and inspect. Currently under investigation. No injuries incurred.

Lost Time Injuries - Aquatics:	2019 to current	**Injury one:** Currently partially unfit, on RTW plan 3hrsx4days Date of injury 28 June 2019 Weekly contracted hours = 30 3646 hrs lost to date **Injury two:** Currently Fully unfit, Date of injury 27 May 2022 Weekly contracted hours = 38.75 124 hrs lost to date
Lost Time Injuries - Water Unit:	2021 to current	**Injury one:** Date of injury – 27 April 2021 (RTW hrs 30hrs/wk. currently) Weekly contracted hours = 40 1076 hrs lost to date **Injury two:** Date of injury – 15th Feb 2022 (RTW July 2022) Weekly contracted hours = 40 696hrs lost to date
Lost Time Injuries - RSC	2022 To current	**Injury two:** Date of injury – 15th June 2022 (RTW June 2022) Weekly contracted hours = 40 56hrs lost to date (closed and returned)

Lead Indicators

Safety Inspections Completed (Workplace Walkarounds)	2022	Workplace Walkarounds being restructured per team. Roll out for new areas in progress as HSR placements finalised and new zone template is being created
Training Delivered	2021/2022	People Trained: Nil in house training coordinated this month. Training analysis is underway to begin in house training post Covid. Role specific training still ongoing through departments.

Appendix B


CONTRACTOR PIPELINE
Health and Safety
ALERTS
INVITED CONTRACTORS
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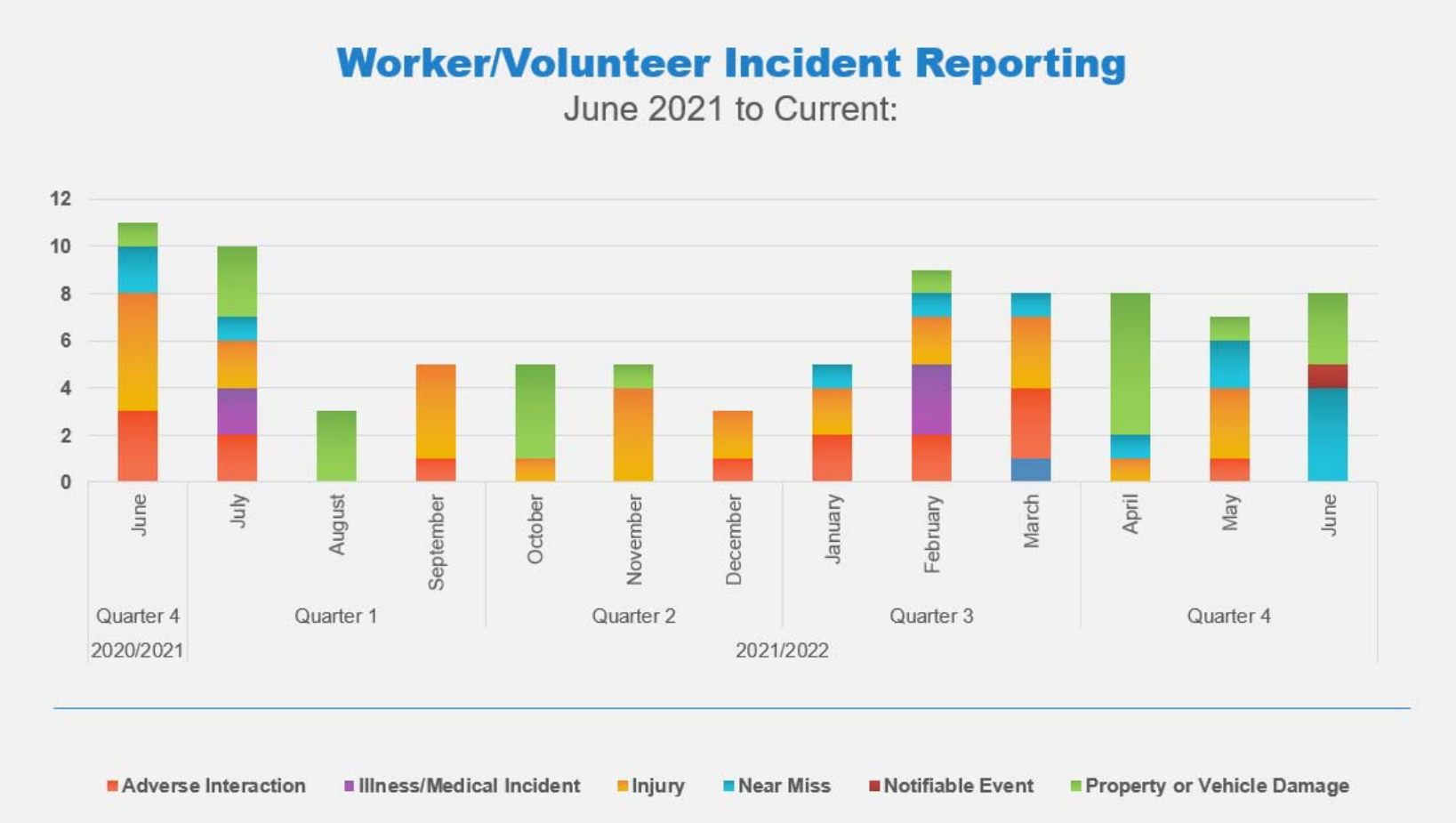
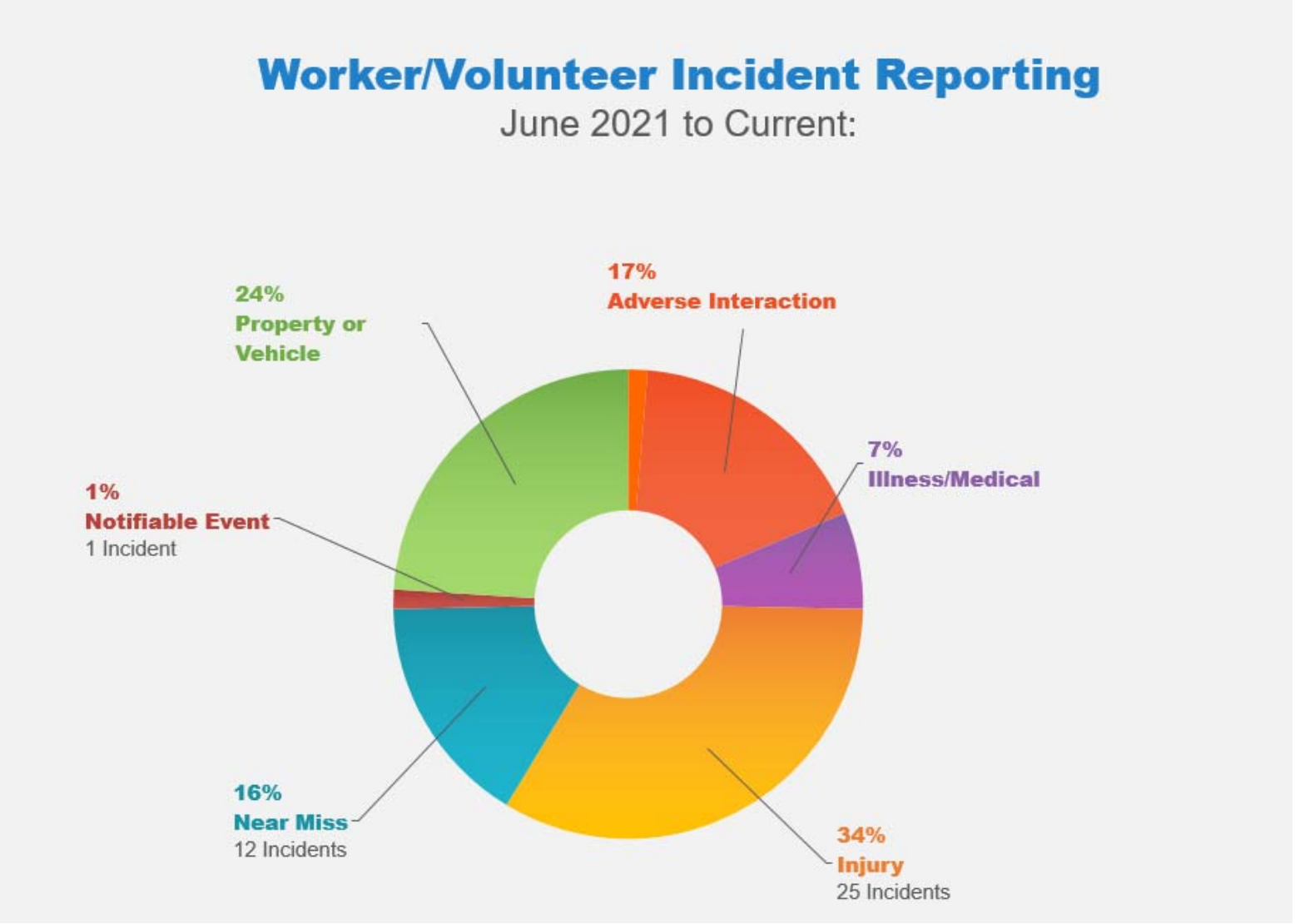
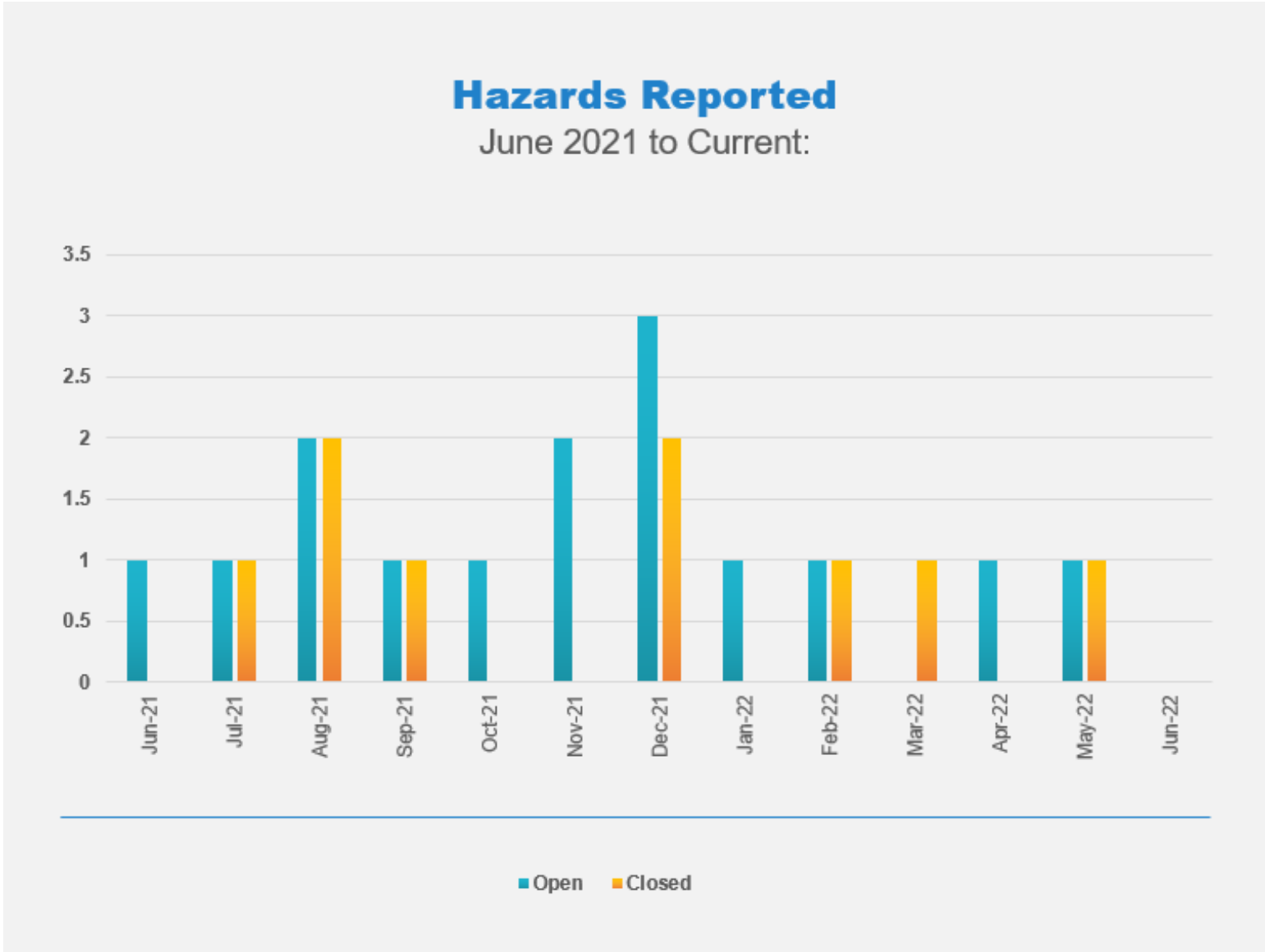
INVITE MORE
EXPAND
REGISTERED BUT UNASSESSED
001
EXPAND
ASSESSED AND CURRENT
120
EXPAND
ASSESSMENT OUT OF DATE
13
EXPAND
ACCOUNT EXPIRED
1
EXPAND
INSURANCE EXPIRED
30
EXPAND
CONTRACTOR ASSESSMENT SCORES
YOUR CONTRACTORS
NUMBER OF YOUR SELECTED CONTRACTORS AT EACH STAGE
0
3
43
75
YOUR SELECTED CONTRACTORS AVG. SCORE
90%
100
80
60
40
20
0
JUL 2020
OCT 2020
JAN 2021
APR 2021
JUL 2021
OCT 2021
JAN 2022
APR 2022
ALL CONTRACTORS
NUMBER OF CONTRACTORS AT EACH STAGE IN SITEWISE
437
875
3375
1587
ALL CONTRACTORS AVG. SCORE
78%
100
80
60
40
20
0
JUL 2020
OCT 2020
JAN 2021
APR 2021
JUL 2021
OCT 2021
JAN 2022
APR 2022
VIEW ALL CONTRACTORS
INVITE NEW CONTRACTORS
VIEW STATUS OF INVITED CONTRACTORS

Appendix C


Worker/Volunteer Incident Reporting
June 2021 to Current:
12
10
8
6
4
2
0
June
July
August
September
October
November
December
January
February
March
April
May
June
Quarter 4
2020/2021
Quarter 1
Quarter 2
Quarter 3
Quarter 4
2021/2022
Adverse Interaction
Illness/Medical Incident
Injury
Near Miss
Notifiable Event
Property or Vehicle Damage


Worker/Volunteer Incident Reporting
June 2021 to Current:
17%
Adverse Interaction
24%
Property or
Vehicle
7%
Illness/Medical
1%
Notifiable Event
1 Incident
16%
Near Miss
12 Incidents
34%
Injury
25 Incidents


Hazards Reported
June 2021 to Current:
3.5
3
2.5
2
1.5
1
0.5
0
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Open
Closed

WAIMAKARIRI DISTRICT COUNCIL

MINUTES OF THE MEETING OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY 17 MAY 2022 COMMENCING AT 3.30PM.

PRESENT

Councillor P Williams (Chairperson), Mayor D Gordon, Councillors A Blackie, S Stewart and J Ward

IN ATTENDANCE

Councillors P Redmond and W Doody
G Cleary (Manager Utilities and Roading), K Simpson (3 Waters Manager), D Lewis (Land Drainage Engineer), E Klopper (Flood Team Lead) and A Smith (Governance Coordinator)

1 APOLOGIES

Moved Councillor Blackie Seconded Councillor Ward

THAT an apology for absence be received and sustained from Councillor Brine.

CARRIED

2 CONFLICTS OF INTEREST

There were no conflicts of interested recorded.

3 CONFIRMATION OF MINUTES

3.1 Minutes of a meeting of the Utilities and Roading Committee held on Tuesday 26 April 2022

Moved Councillor Blackie Seconded Councillor Ward

THAT the Utilities and Roading Committee:

(a) **Confirms** the circulated Minutes of a meeting of the Utilities and Roading Committee held on 26 April 2022, as a true and accurate record.

CARRIED

3.2 Matters arising

There were no matters arising.

4 DEPUTATION/PRESENTATIONS

There were no deputations or presentations.

5 REPORTS

5.1 May 2021, December 2021 & February 2022 Flood Events – Service Requests Update – Emile Klopper (Flood Team Lead), Caroline Fahey (Water Operations Team Leader) and Kalley Simpson (3 Waters Manager)

K Simpson presented this report, providing an update on the status of the flood team work. The weekly updates are also being provided to Councillors to provide regular information. The work being undertaken has included CCTV work, survey work and maintenance work which has meant that the work had progressed quicker than originally expected.

Some of the key areas highlighted were:

Broadway – there was now an identified solution and a request for additional budget for these works would be included as part of the Drainage submission to the Draft Annual Plan. Council staff would be seeking input from landowners regarding the design.

Swindells Road – work was currently underway on a report looking at short, medium and long term solutions. The report would initially go to the Community Board, and there would also be a request for additional budget in the Draft Annual Plan.

Fuller Street, Kaiapoi – there was ongoing CCTV work and survey work being undertaken.

Ranui Mews – Onsite investigation had now been completed at this site which had indicated there was an issue with venting. As a trial, a vent was being installed at one of the units and the test would be repeated to see if this addressed the issue

K Simpson pointed out that there are now 60 projects as a result of the flood events, with some not yet started. These projects had been a focus of the flood team and would all be commenced by the next report. It was also planned to have all the flood team work completed by the end of June and for continued work to implement the solutions to be included as part of business as usual in either 3 Waters or the Project Delivery Unit.

Regarding Swindells Road, Councillor Stewart noted that it had been suggested by members of the Woodend-Sefton Community Board, that it may be appropriate to host another public meeting to update the community on this matter. G Cleary advised that staff have been undertaking some targeted consultation, which was planned to continue and it was agreed that a memo will go to the next meeting of the Community Board providing an update.

Councillor Williams asked if there was contractors ready for the venting work at Ranui Mews. K Simpson advised that the contractor involved in the testing, would provide a price to retro-fit a vent to the toilets. It was confirmed that this project was a priority. There were other undertakings in place at this site as a back-up, should this be necessary in any future weather event.

Moved Mayor Gordon Seconded Councillor Blackie

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 220505070890.

(b) **Notes** that 598 drainage service requests were received related to the significant rainfall events in May 2021, December 2021 and February 2022,

which have all been responded to although approximately 138 requests require further maintenance or investigation work.

(c) **Notes** that there are currently 59 drainage assessments identified and this is likely to increase as the service requests are worked through. Progress made since the previous Utilities & Roading Committee meeting is set out in Section 4 and is supported by the weekly update memos.

(d) **Notes** that background information in regards to the recent flooding event can be viewed in report No. 220310034384 entitled: "*February 2022 Flood Event - Update on Service Requests*".

(e) **Notes** that a webpage has been set up on the Council's website to provide updates on the status of drainage works underway and targeted information will be sent out to the Waikuku Beach and Kaiapoi communities.

URL:https://www.waimakariri.govt.nz/services/waterservices/stormwater/drainage-works

(f) **Notes** that if further budgets are required for any capital works identified as part of the drainage assessment work, that these will be sought as part of the 2022/23 Annual Plan process.

(g) **Circulates** this report to the Council and community boards for information.

CARRIED

Mayor Gordon thanked staff for the work being undertaking and the regular updates now being provided to Councillors. It is appreciated that the work undertaken at Ranui Mews was being given priority.

6 CORRESPONDENCE

There was no correspondence.

7 PORTFOLIO UPDATES

7.1 Roading – Councillor Paul Williams

Councillor Williams nothing to add.

Councillor Redmond noted there he had observed a number of small potholes around the District and was there a strategy to address these, taking into account that it is not winter season yet. G Cleary responded that there is work planned for these, noting the extreme wet weather events that the district has endured in the past 12 months. A more detailed briefing will be provided to elected members on how Council deals with maintenance.

7.2 Drainage and Stockwater – Councillor Sandra Stewart

Councillor Stewart's main point referred to the Mill Road stormwater management area consent which had been requested that to be put on hold, because Ecan have advised that their staff recommendation is to decline this application. This was due to the work intercepting with groundwater being considered a take and use of groundwater which is prohibited activity in an over allocated groundwater zone, which this zone is. This is a significant issue across the region for all Councils, that Ecan is interpreting any work with stormwater management, digging into or touch the groundwater, is considered a take and in conflict with Plan Change 7. G Cleary advised that staff have asked Environment

Canterbury that this consent application be put on hold. This is potentially a significant issue with all councils in Canterbury as it means that any activities that a Council carries out that intercepts groundwater, that could result in an inadvertent take, would be a prohibited activity under Plan Change 7. A forum is being brought forward regarding this, and also be taking this issue up directly with Environment Canterbury. In this case, it would mean that the Council could not delivery the capital project for this financial year and this could have an impact on the immediate community and property owners in the vicinity.

7.3 Utilities (Water Supplies and Sewer) – Councillor Paul Williams

Councillors Williams advised of a power outage in Ohoka and the water station has tripped because of this.

Sewerline from Loburn Lea was approximately two thirds completed and progressing well with no major road disruptions.

7.4 Solid Waste– Councillor Robbie Brine

Councillor Brine was not present.

7.5 Transport – Mayor Dan Gordon

Regarding the matter of reducing the speed threshold in Oxford, there had been a direction from the Government which appears to allow greater flexibility on this matter, without it being a significant cost. Mayor Gordon was awaiting to receive confirmation of this in writing.

At a recent meeting of the Regional Transport Committee there was a presentation from Charlotte French from Waka Kotahi on the challenges that Council's have in setting speed limits. Mayor Gordon considered this to be a beneficial presentation and for staff to arrange it to be presented to the Council in the near future.

It is now three years since the safety improvements were promised from Waka Kotahi for Woodend. A meeting is scheduled at which the Mayor is seeking a commitment from Waka Kotahi that these improvements will be provided and a timeline for this.

8 QUESTIONS UNDER STANDING ORDERS

There were no questions under standing orders.

9 URGENT GENERAL BUSINESS

There was no urgent general business.

10 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

Section 48, Local Government Official Information and Meetings Act 1987

Moved Councillor Ward Seconded Councillor Blackie

THAT the public be excluded from the following parts of the proceedings of this meeting.

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, are as follows:

Item No	Minutes/Report of:	General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
10.1 – 10.3	Reports from Management Team meetings	Reports for information	Good reason to withhold exists under Section 7	Section 48(1)(a)

This resolution is made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987, and the particular interest or interests protected by section 6 or section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public are as follows:

Item Nº	Reason for protection of interests	Ref NZS 9202:2003 Appendix A
10.1 – 10.3	Protection of privacy of natural persons To carry out commercial activities without prejudice	A2(a) A2(b)ii

CARRIED

CLOSED MEETING

Resolution to resume in Open Meeting

Moved Mayor Gordon Seconded Councillor Blackie

THAT open meeting resumes and that the resolution(s) made with the public excluded be made public.

CARRIED

OPEN MEETING

NEXT MEETING

The next meeting of the Utilities and Roading Committee is scheduled for 3.30pm, on Tuesday 21 June 2022.

There being no further business, the meeting closed at 3.58pm.

CONFIRMED

_____
Chairperson
Councilor R Brine

21 June 2022
Date

BRIEFING

At the conclusion of the meeting Kalley Simpson (3 Waters Manager), D Lewis and C Fahey provided an overview on 3 Waters staff's management of drainage maintenance within the Waimakariri district. A summary of the current status of maintenance work was also presented.

WAIMAKARIRI DISTRICT COUNCIL

MINUTES OF THE MEETING OF THE COMMUNITY AND RECREATION COMMITTEE HELD IN THE COUNCIL CHAMBER, 215 HIGH STREET, RANGIORA, ON TUESDAY 31 MAY 2022, AT 3:30PM.

PRESENT

Councillor Mealings (Chairperson), Mayor Gordon, Councillor Blackie, Councillor Brine, Councillor Doody and Councillor Redmond.

IN ATTENDANCE

C Brown (Manager Community and Recreation), G MacLeod (Community Greenspace Manager), M Greenwood (Aquatic Facilities Manager), P Eskett (District Libraries Manager), T Sturley (Community Team Manager), M Burton (Age-Friendly Community Facilitator), G Maxwell (Policy Technician), M Kwant (Community Projects Officer), V Spittal (Senior Policy Analyst) and C Fowler-Jenkins (Governance Support Officer).

1 APOLOGIES

Moved: Councillor Doody Seconded: Councillor Blackie

THAT an apology for early departure be received and sustained from Councillor A Blackie.

CARRIED

2 CONFLICTS OF INTEREST

There were no conflicts declared.

3 CONFIRMATION OF MINUTES

3.1 Minutes of the meeting of the Community and Recreation Committee held on 15 March 2022

Moved: Councillor Blackie Seconded: Councillor Redmond

THAT the Community and Recreation Committee:

(a) **Confirms** the circulated Minutes of a meeting of the Community and Recreation Committee, held on 15 March 2022, as a true and accurate record.

CARRIED

4 MATTERS ARISING

There were no matters arising.

5 DEPUTATIONS

5.1 The Hope Trust (the Trust)

T Sturley introduced Tracy Pirie, the Manager of the Trust, one of the Council's key partners in supporting the community by providing a range of services and support, particularly to those who were more vulnerable.

T Pirie reported that the Trust formally started in July 2012, however, in reality, it was born after the 2010 earthquakes. The mission of the Trust was to

restore hope in families and individuals, and there were no barriers to people wishing to access their services. At the Trust, they believed in wrap-around services that included the physical, the emotional, the spiritual and the family. They did this by educating, upskilling, and empowering. In addition, they provided support and advocacy when and where needed depending on the people's circumstances and what the Trust could offer.

T Pirie advised that the Trust provided professional counselling and ran a community garden, a food bank, and an affordable Opshop. The community garden was open five days a week, and there was a room where people in need could take food, clothing, bedding etc. There was always a Friday barbeque at the community garden, which allowed people to meet each other. The community garden had about 115 regular patrons, and 70% of these individuals had physical or mental health issues. In March 2022, 665 people benefitted from337 parcels provided by the Food Bank.

T Pirie explained that the Trust also ran other groups, such as a men's breakfast and a painting crew funded through Creative Communities. They also hosted Community Kai, which was a community meal for about 70 people that had to be stopped due to Covid-19. In addition, the Trust visited the Lehmans Road Campground twice a week and distributed food. Until recently, there were 26 families or individuals they supported, which had now increased to about 48 people. The Trust also ran a Fruit and Vege Co-operative providing fruit and vegetables for $15. They also had a foot clinic every six weeks where people could get their toenails cut when they could not do it themselves.

In conclusion, T Pirie noted that the Trust had 170 volunteers who worked 13,740 hours and 6,300 people attended the Trust's activities last year. She further indicated that February 2022 had been a quiet month because people were isolating due to Covid. However, activities had slowly picked up through March, and the Trust had been very busy during April. She found this quite concerning because there seemed to be a greater need in the community than last year.

Councillor Doody sought clarity on the Lighthouse Programme. T Pirie explained that the programme was aimed at children with behaviour issues. , The children were given the opportunity to assist in the community garden and were provided counselling, guidance and empowerment along the way.

Councillor Doody further asked if the people that came to the Trust for assistance became members of the Rangiora Baptist Church. T Pirie responded that the church was separate from the activities of the Trust.

Mayor Gordon commended the Trust for the amazing work they were doing. The Trust was highly valued in the community, and he had referred many people in need to the Trust. The Trust had always been very adaptive to supporting them and finding solutions, housing and food. He believed that the faith-based values they instilled were important, and some came to the Trust because of these values. He did not consider faith-based values as a barrier in his dealings with the church.

Councillor Mealings thanked T Pirie for the work being done by the Trust and for coming and presenting to the Committee.

5.2 **Age-Friendly Waimakariri Advisory Group** (the Group)

J Gumbrell acknowledged the help and support the Group had enjoyed from the Council over the past three years and the valued mahi that M Burton had provided to the Group. She extended their appreciation for the contribution and wisdom of Councillor Doody, who was a member of the Group. She noted that they were seeking approval to continue the Council and the Group's work, as there was more to be done to improve our community to enable older

people to stay connected, healthy, active and respected. They were also seeking approval for some changes and refinements in the Group's role as a result of the review they carried out in late 2021, called 'Looking to the Future'. They were confident these changes would make the Group more effective.

J Gumbrell provided the Committee with a brief overview of the Group. She explained that the Council initiated the development of an Age-Friendly Plan in 2018. The Committee received annual reports on progress against the objectives set in the Plan. Because of the impact of the Covid-19 pandemic, the Group narrowed its focus from eight to four areas: community support, health services, respect and social inclusion, communication and social participation. The current Age-friendly Plan had a three-year time frame 2019-2021. She highlighted the future roles that the Group had clarified as part of its review:

- advising on planning,
- Monitoring
- Support and Endorsing
- Advocacy and Accountability
- Networking

The Group had proposed a work programme to give effects to these roles, which specified outcomes that specified what success would look like for each age-friendly seam. The work programme also signalled whom the Group would partner or work with to collect data and information to assist future planning. In addition, the Group would initiate ongoing consultation with older people in the organisations that worked with and for them across the district to inform planning and support for the mahi with the Council staff to ensure the delivery of age-friendly outcomes.

Councillor Mealings thanked J Gumbrell for her presentation and the work of the Group.

6 REPORTS

6.1 Age-Friendly Plan Progress Report – T Sturley (Community Team Manager) and M Burton (Age-Friendly Community Facilitator)

T Sturley presented the final review of the Age-friendly Waimakariri Plan, which the Council approved in December 2019. It included recommendations from the Age-friendly Advisory Group to ensure the sustainability of the Group, which the Community Team could comfortably support. She highlighted the evidence-based approach to the development and delivery of the Plan, which was very broad-reaching and had been an excellent mechanism for making the Council and the community think more clearly about the implications of our ageing population. The Age-friendly Waimakariri Plan had been adopted by the Office for Seniors as an exemplar for other communities seeking age-friendly status which was to be commended.

T Sturley thanked M Burton for her thorough and professional approach in researching and developing the Plan and ensuring its delivery. She also acknowledged the work that M Burton had done in picking up the Accessibility Strategy and supporting the Waimakariri Access Group to increase its capability, capacity and reach across the community and starting to facilitate a review of that strategy.

Moved: Councillor Doody Seconded: Mayor Gordon

THAT the Community and Recreation Committee:

(a) **Receives** report No. 220513077076.

(b) **Notes** the role of the Age-friendly Facilitator and Advisory Group in overseeing, facilitating and supporting the delivery of the Age-friendly Plan, via the various networks and service providers across the District, and the various teams within the Council.

(c) **Notes** the proactive role of the Age-friendly Advisory Group in identifying initiatives that facilitate positive outcomes for local senior adults.

(d) **Notes** the role of the Age-friendly Advisory Group and its partners in the ongoing COVID-19 response and social recovery planning.

(e) **Notes** the significant work undertaken by the Age-friendly Facilitator to ensure delivery of the Plan and champion the needs and aspirations of local older people.

(f) **Notes** that, while the Age-friendly facilitator fixed-term contract expired at the end of June 2022, community development support for the Advisory Group could be maintained as part of business as usual under the Community Team's Inclusion and Connection Portfolio.

(g) **Notes** the aspirations of the Age-friendly Advisory Group to continue working collaboratively with the Council, to represent the collective voices of senior adults in the District.

(h) **Approves** the continuation of the Age-friendly Advisory Group, with appropriate Community Development staff support provided, as part of business as usual, under the Community Team's Connection and Inclusion Portfolio.

CARRIED

Councillor Doody thanked J Gumbrell and J Mather for their presentation and thanked M Burton for all her work in getting the Age-friendly Plan up and running. Councillor Doody commended the other members of the Group for the work being done.

Mayor Gordon supported the motion and acknowledged the work being done by J Gumbrell. He noted that he enjoyed J Gumbrell's regular columns in the newspaper that were a source of keeping the issues she raised at the forefront of people's minds. He believed that J Gumbrell and M Burton's most outstanding was the integration of the age-friendly into the Council's business as usual. He acknowledged the great work done by M Burton for many years, noting that the community was hugely indebted to her for her work. She showed great aroha for our community, and it showed through.

Councillor Redmond thanked the Age-friendly Advisory Group for the work they were doing, he thought the work was essential. He noted that in the next 26-years, 30% of the district's population would be over 65, so it was important to look after people in that age group. He also recognised M Burton's assistance with all the projects she had been involved in.

Councillor Mealings thanked the Age-friendly Advisory Group and noted that M Burton had been a champion of the people, and she would be missed.

In her right of reply, Councillor Doody thanked M Burton for her work and noted it had been lovely working with her and the Age-friendly team. She appreciated the effort and dedication she put into the Age-friendly Plan.

6.2 **2021 Beach User Survey – Northern Pegasus Bay Bylaw – G Maxwell (Policy Technician)**

G Maxwell took the report as read, advising that the 2021 Beach User Survey surveyed approximately 300 randomly selected beach users to measure the respondent's awareness of the Northern Pegasus Bay Bylaw, 2016. This document was a factual representation of the views of those surveyed on the beach between November 2021 and February 2022. The survey was one data source that would be interpreted and collated with other sources to inform the Pegasus Bay Bylaw Review, which the Council was undertaking.

Moved: Councillor Blackie Seconded: Councillor Doody

THAT the Community and Recreation Committee:

(a) **Receives** Report No. 220321040969.

(b) **Receives** the results of the 2021 Beach User Survey (TRIM No: 220303030303).

(c) **Notes** that there has been significant improvement in the public response between the two surveys and we are about to embark in the bylaw review and its effectiveness where this data will be used.

(d) **Circulates** the 2021 Beach User Survey and 2021 Beach User Survey Infographic, to the Kaiapoi-Tuahiwi and Woodend-Sefton Community Boards, and the Northern Pegasus Bay Advisory Group for their information.

CARRIED

Councillor Blackie thanked staff for the report. He noted that the awareness of the Bylaw seemed to be increasing. Accessibility, safety and uncrowdedness were the three main factors that attracted people to the district's beaches, and mainly walkers and water sport enthusiasts were the main participants.

Councillor Doody appreciated what staff had done, it was a very important Bylaw and was interesting to see people's thoughts on this matter.

Mayor Gordon commented that he was on the first hearings for this Bylaw and was pleased with its implementation and progress, as it had not been an easy process in the early days. He commended the excellent work done by staff, especially the work being done by the Rangers. He thanked Councillor Blackie for his work on this.

6.3 **Library Update to 6 May 2022 – P Eskett (District Libraries Manager)**

P Eskett provided the Committee with an update on the usage and activities of the district's libraries. She explained that since the pandemic, Borrow Box was the largest digital platform that libraries subscribed to, and their growth had been phenomenal in many public libraries worldwide. The libraries had recently gained access to a world language collection and had been able to enhance their digital collection significantly by adding over 800 titles in six different languages. They had also purchased a small collection of language learning materials, and plans were underway to promote this collection to borrowers for whom English was not their first language. Staff had also reached out to the G.L.O.W Group (Global Locals of Waimakariri) to advise them of the new collection and would welcome them to Rangiora Library soon for a morning tea, question and answer and to showcase the language collections. .

P Eskett noted that Storywalks® was a new initiative for Waimakariri and was a partnership between the Greenspace and Libraries Teams. Libraries throughout Aotearoa had been creating Storywalks® with great success. Examples included Gore District Libraries, Hastings District Libraries, and Napier Libraries. With the assistance of a very willing Greenspace Team, Storywalks® would be live at the Northbrook Wetlands next month. The wetlands had been chosen because they offered an inclusive track that had wheelchair access as well as suitable for buggies and prams for whanau and tamariki who may be on bikes. The abundance of wildlife and native trees tied in beautifully with the story of the 2016 award-winning book, 'Little Kiwi's Matariki', which the Council would be using. The project would be launched during Matariki, and boards would be installed along the walkway with icons and language depicting the story.

P Eskett updated the Committee on the Rangatahi Engagement role, which the Committee gave permission for in 2021, and the Council subsequently appointed R Morland in February 2022. She spent the first few months understanding the culture of libraries, establishing and beginning mahi on her core goals for the role, which included lifting the numbers of Rangatahi using the library spaces, building the confidence of the Libraries Team regarding behaviour management and strategies, and building relationships with the local Rūnanga and Rangatahi focused groups. In addition, Eskett elaborated on the work being done by the Rangatahi Engagement Co-ordinator.

Moved: Councillor Doody Seconded: Councillor Blackie

THAT the Community and Recreation Committee:

(a) **Receives** Report No. 220511075545.

(b) **Notes** the customer service improvements, community feedback, events, and use of New Zealand Libraries Partnership Programme funding to contribute positively to community outcomes by Waimakariri Libraries, from 3 March to 6 May 2022.

(c) **Circulates** the report to the Community Boards for their information.

CARRIED

Councillor Doody thanked P Eskett for her comprehensive report, noting that she was very interested in the Storywalks® at the Northbrook Wetlands as she believed it was a wonderful initiative.

Councillor Redmond thanked P Eskett for her support of Creative Communities New Zealand.

Councillor Mealings also thanked P Eskett for her report, she noted that she was continually inspired by the initiatives the Libraries Team employed to get people into the libraries. She could not wait to look at the Storywalks® and loved the idea of being a tourist in your own town.

6.4 Aquatics March Update – Matthew Greenwood (Aquatics Manager)

M Greenwood spoke to the report noting the purpose was to update the Committee on aquatics year to date progress across a number of their key performance areas. He took the report as read, however, acknowledged the hard work of the Aquatics Team, who had kept the facilities operating with only minor impacts to operating hours over the last few challenging months. He advised that recruitment continued to progress well, and the Kaiapoi Aquatic Facility would be returning to full weekend hours this week.

Councillor Redmond questioned if staff recruitment had been successful and, if so, how many new staff had been employed. M Greenwood reported that this was the third recruitment drive they had done since December 2021. In the most recent drive, they had appointed six lifeguards. Staff were also looking at the possible employment of three learn to swim tutors, some casual customer services staff and lifeguard supervisors. Unfortunately, since the last recruitment process, there had been a couple more resignations, so staffing remained challenging.

Moved: Mayor Gordon Seconded: Councillor Redmond

THAT the Community and Recreation Committee:

(a) **Receives** Report No. 220509072485.

(b) **Notes** Aquatic Facilities progress against key performance indicators including Financial Results, Water Quality and Customer Satisfaction.

(c) **Notes** the impact of Covid on facility attendance across the Council's network.

(d) **Notes** the efforts taken to maintain service levels with the ongoing impacts of Covid isolation and staffing limitations.

CARRIED

Mayor Gordon thanked M Greenwood, on behalf of the community, for his leadership in this incredibly difficult time. He commended the Aquatic Facilities Team for the outstanding work they had been doing to keep the pools open to the public.

Councillor Doody concurred with the Mayor and expressed her for the work done by M Greenwood and his team.

Councillor Mealings commented that M Greenwood had done an exceptional job under extraordinary circumstances, and the Council appreciated his optimism and determination to keep the Aquatic Facilities open to the public.

7 PORTFOLIO UPDATES

7.1 Greenspace (Parks, Reserves and Sports Grounds) – Councillor Robbie Brine.

- Organised a meeting for staff with Future Post, which was an exciting opportunity to look at posts manufactured from various plastics. Staff were following this up to ascertain if the Council could utilise these posts for an upcoming project.
- Winter sports had started and seemed to be going well with no restriction under the Covid orange traffic light setting.
- The Welcome Market had reached out to the Council's Greenspace Team to enquire if there was a possible public option for them to operate a market, this was the early stages of a conversation.
- Staff were looking at timelines for the next 18 months as the main Parks and Reserves Contract was due for retender. The key aspects of this process would be worked through to understand what was needed to ensure the continuity of service through to the end of the contract period.
- Several planting days had been scheduled to plan the 25,000 plants that needed to be planted this season.
- The Victoria Park toilets were again vandalised.
- The Rangiora Airfield was an area of focus, and there were several important meetings coming up.

- The Operations Team had been functioning in the absence of a team leader, however, this role would be advertised in the coming weeks.

Councillor Mealings sought clarity on the proposed location of the Welcome Market. C Brown noted that G MacLeod was meeting with the market representatives, they used to be located the Rangiora Showgrounds, however, for various reasons this location was no longer suitable. Staff would therefore work with them to ascertain if they could be accommodated on Council land. The Market operated on Thursdays from 2pm till late, which was not ideal due to the lack of car parks in central Rangiora, which was where they wanted to be located.

7.2 **Community Facilities (including Aquatic Centres, Multi-use Sports Stadium, Libraries/Service Centres, Town Halls, Museums and Community Housing) – Councillor Wendy Doody.**

- She thanked all the staff, noting that she appreciated being able to talk with them face to face.
- Mainpower Stadium – She appreciated the Council's Community Facilities Team Leader's, A Coker, assistance. There had been problems with rain coming into the stadium, which A Coker was dealing with. Another issue that he was hoping to fix was the condensation after having a sports evening that quite a number of people attended. They had also had trouble with sunstrike.
- It was wonderful to see the Stadium growing with the number of people wanting to use the facility. The Stadium would be hosting the New Zealand Under 19 Basketball Tournament, which would be televised live to a number of other countries.
- The hockey turf – They had to do a deep clean due to the build-up of dirt on the surface, and the premier teams had stopped playing there because they were slipping on it too much.
- The Kaiapoi Museum held its Annual General Meeting, and they had a great team that worked very hard.
- The Aquatic Facilities would be returning to full capacity this weekend.

Mayor Gordon reported that the Stadium won gold at the New Zealand Commercial Project Awards. He acknowledged the team involved and the Sport and Recreation Trust, Council and Councillor Doody as Chair of the project.

7.3 **Community Development and Wellbeing – Councillor Wendy Doody.**

- Oxford Promotions Action Committee were running a weeklong Lights Festival and Matariki event.

7.4 **Arts and Culture – Councillor Al Blackie.**

- Waimakariri Public Arts Trust had various projects in the pipeline.
- Kaiapoi Art Expo would again be held in July 2022.
- The Council's Greenspace Team were working on a Public Arts Strategy to guide art installation in public spaces The Council's Community Team was also working on an overarching strategy for the Arts and Culture Portfolio.

8 QUESTIONS

Nil.

9 URGENT GENERAL BUSINESS

Nil.

10 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

Section 48, Local Government Official Information and Meetings Act 1987

Moved: Councillor Blackie Seconded: Councillor Doody

THAT the public be excluded from the following parts of the proceedings of this meeting.

CARRIED

The general subject of the matter to be considered while the public was excluded, the reason for passing this resolution in relation to the matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, were as follows:

Item Nº	Report for Information:	General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
10.1 to 10.2	Report from MTO	Report for Information	Good reason to withhold exists under Section 7	Section 48(1)(a)

This resolution was made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987, and the particular interest or interests protected by Section 6 or Section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public weer as follows:

Item Nº	Reason for protection of interests	Ref NZS 9202:2003 Appendix A
10.1 to 10.2	Protection of privacy of natural persons To carry out commercial activities without prejudice	A2(a) A2(b)ii

CLOSED MEETING

The public excluded portion of the meeting commenced at 4.45pm until 4.50pm.

11 NEXT MEETING

The next scheduled ordinary meeting of the Council would occur at 1pm on Tuesday 19 July 2022.

THERE BEING NO FURTHER BUSINESS THE MEETING CONCLUDED AT 4.54pm.

CONFIRMED

_____
Chairperson

_____

Date

WAIMAKARIRI DISTRICT COUNCIL

MINUTES OF THE MEETING OF THE DISTRICT PLANNING AND REGULATION COMMITTEE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA, ON TUESDAY 21 JUNE 2022 AT 1PM

PRESENT:

Deputy Mayor N Atkinson (Chairperson), Councillors, W Doody, N Mealings, P Redmond and Mayor D Gordon (ex officio).

IN ATTENDANCE

Councillor J Ward,

J Millward (Acting Chief Executive), T Tierney (Manager Planning and Regulation) (via Zoom), V Thompson (Business and Centres Adviser), M Bacon (Development Planning Manager), B Charlton (Environmental Services Manager), R McClung (Policy Planner), S Hart (Recovery Manager), I Carstens (Senor Resource Management Planner), B Wiremu (Emergency Management Adviser), and A Smith (Governance Coordinator).

1 APOLOGIES

Moved Mayor Gordon Seconded Councillor Redmond

THAT an apology for absence be received and sustained from Councillor Barnett.

CARRIED

2 CONFLICTS OF INTEREST

There were no conflicts of interest recorded.

3 CONFIRMATION OF MINUTES

3.1 Minutes of a meeting of the District Planning and Regulation Committee held on 26 April 2022

Moved Councillor Doody Seconded Councillor Redmond

THAT the District Planning and Regulation Committee:

(a) **Confirms** the circulated Minutes of a meeting of the District Planning and Regulation Committee, held on 26 April 2022, as a true and accurate record.

CARRIED

4 MATTERS ARISING

There were no matters arising.

5 DEPUTATIONS

There were no deputations.

6 REPORTS

6.1 Kaiapoi Parking Restrictions Changes – Vanessa Thompson (Business & Centres Advisor) and Shane Binder (Transportation Engineer)

V Thompson presented this report, seeking approval to implement six parking restriction changes in the Kaiapoi town centre, which were previously endorsed by the Kaiapoi-Tuahiwi Community Board in February 2022. There had been initial consultation undertaken in November and December 2021, and then, following the April DP&R committee meeting, additional engagement with businesses and residences was conducted in May. Approximately 70 flyers were circulated to businesses and some residences in the areas of the proposed changes and there had been no additional feedback received to indicate that the consulted parties felt they would be impacted by the proposed changes.

There were no questions.

Moved Mayor Gordon Seconded Councillor Redmond

THAT the District Planning and Regulation Committee:

(a) **Receives** Report No. TRIM number. 220608096127.

(b) **Notes** the original three week community/affected business consultation period that was undertaken to solicit feedback related to the proposed parking restriction changes.

(c) **Notes** the additional select business/residences consultation period in May 2022 (for 2.5 weeks) at the request of the District Plan and Regulation Committee.

(d) **Notes** that public feedback was generally supportive of the changes, as evidenced in the 'Let's Talk Waimakariri' summary public engagement report.

(e) **Notes** that the proposed changes better reflect current utilisation and seek to respond more appropriately to parking demand in the identified areas.

(f) **Approves** the six parking restrictions changes, as follows:

ITEM	TOWN	STREET	LOCATION	SIDE OF STREET	RESTRICTION	QUALIFYING REMARKS
1.	KAIAPOI	WILLIAMS STREET	CAREW ST TO OHOKA RD	WEST	P15	ADD 1X PARK, NEXT TO THE DAIRY ON THE CORNER OF OHOKA RD/WILLIAMS ST
2.	KAIAPOI	WILLIAMS STREET	HILTON ST TO RAVEN QUAY	BOTH	P60 / P15	P60 FOR ALL PARKS EXCEPT 1X P15 PARK IN FRONT OF THE DAIRY
3.	KAIAPOI	WILLIAMS STREET	RAVEN QUAY TO CHARLES ST	WEST	P60	CHANGE THE CURRENT P15 PARKS DIRECTLY IN FRONT OF 137 WILLIAMS STREET
4.	KAIAPOI	WILLIAMS STREET	CHARLES ST TO SEWELL ST	EAST	P120	CHANGE THE CURRENT P15 PARKS IN FRONT OF THE SHOPPING COMPLEX
5.	KAIAPOI	CHARLES STREET	DAVIE ST TO WILLIAMS ST	SOUTH	P60	
6.	KAIAPOI	RAVEN QUAY	BLACK ST TO WILLIAMS ST	BOTH	P60	

CARRIED

6.2 **Application to the Heritage Fund - Recommendations of Staff – Gina Maxwell (Policy Technician) and Ian Carstens (Senior Resource Management Planner)**

I Carstens presented this report, which seeks consideration of the Heritage Funding application from the Ashley Community Church. The church building was built in 1871 and required repair work on electrical wiring and fittings. A quote had been received for the required work for $3,129.50. The building had a high cultural and structural significance as one of the first churches built in Ashley township and meets the criteria required. The church had a Heritage Place 2 category rating and the community had undertaken fundraising for some of the required repair work.

Staff support the application, noting the importance of updating older wiring and electrical fittings and the installation of entrance lighting necessary for visitor safety. Having electrical wiring and fittings upgraded will also reduce the risk of fire in the building and meet required insurance standards.

Moved Councillor Redmond Seconded Councillor Atkinson

THAT the District Planning and Regulation Committee:

(a) **Receives** Report No. TRIM number. 220608096255.

(b) **Notes** the accumulated amount available in The Heritage Fund is $35,749.84.

(c) **Approves** from The Heritage Fund of $3,139.50 for the application received from The Ashley Community Church.

(d) **Notes** the balance of the Heritage fund will be $32,610.34.

CARRIED

Councillor Redmond supports this funding request, noting that there was still a reasonable amount available in the fund.

Mayor Gordon supports this application and also noted there may be financial support requested in the future through the Heritage Fund, for St Stephens Church in Tuahiwi. This is also a significant historical church in the district.

6.3 **Appointment of Second Recovery Manager – Brennan Wiremu (Emergency Management Advisor)**

B Wiremu presented this report, recommending the appointment of Alistair Gray as a second Recovery Manager for the District. It would be a real benefit to the Council to have two staff to provide more depth to this role.

Moved Councillor Atkinson Seconded Mayor Gordon

THAT the District Planning and Regulation Committee:

(a) **Receives** Report No. CDE-21/ 220518079864.

(b) **Appoints** Alistair Gray as a Recovery Manager for Waimakariri District Council.

CARRIED

Councillor Atkinson believes that Alistair Gray is the right person for this job. Mayor Gordon endorsed the comments of Councillor Atkinson.

6.4 **Development Planning Unit Update – Matthew Bacon (Development Planning Manager)**

M Bacon presented this report, which was taken as read. Rachel McClung, who recently re-joined the Council staff, as a Policy Planner, was introduced to the Committee members.

Councillor Mealings enquired if it was known when the NPS's were being presented. M Bacon advised that there was no definite dates when these are going to be released.

Moved Councillor Atkinson Seconded Councillor Doody

THAT the District Planning and Regulation Committee:

(a) **Receives** Report No. 220525085078.

(b) **Notes** the current activities and operations of the Development Planning Unit.

CARRIED

7 CORRESPONDENCE

There was no correspondence.

8 PORTFOLIO UPDATES

8.1 **District Planning Development – Councillor Kirstyn Barnett**

Councillor Barnett was an apology.

8.2 **Regulation and Civil Defence – Councillor Philip Redmond**

The Building Unit staff remain under significant pressure due to the volume of applications, and staff absences related to Covid and the flu. There had been some issues with building consents needing to be varied due to changes in building materials. There had been a slow but steady increase in complaints relating to heat pump noise, some of these breaching the District Plan rules and relating to faulty units that need to be repaired.

Civil Defence – noted a new initiative in the establishment of community emergency hubs, to enhance community resilience. It is hoped to pilot four of these hubs initially. These will be in the form of a cupboard space to increase capability of existing facilities in the community and supporting already established community groups. This space would hold equipment for administration to be used during an emergency.

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A new CDEM Educator in Schools had been employed on a casual employment contract, April Lander. It was noted that there was still 16 Cadets, and the Cadet programme only lost three cadets when the programme was suspended during Covid, which was a good outcome. Thanks were extended to the two Council staff who had been volunteering their own time to support this Cadet Programme – Sherrianne Nation and Lauren Anson. As they will both soon be on extended leave from the Council, there was a need to find replacements for these roles. It was

agreed that Sherrianne and Lauren would both be acknowledged by the Management Team for the work they had undertaken in these voluntary roles.

9 QUESTIONS UNDER STANDING ORDERS

There were no questions.

10 URGENT GENERAL BUSINESS

There was no urgent general business.

NEXT MEETING

The next meeting of the District Planning and Regulation Committee is scheduled for 1pm, on Tuesday 23 August 2022.

As there was no further business, the meeting concluded at 1.24pm.

CONFIRMED

_____
Chairperson
Deputy Mayor Neville Atkinson

_____
23 August 2022

MINUTES FOR THE MEETING OF THE OXFORD-OHOKA COMMUNITY BOARD HELD IN THE A&P ROOM, OXFORD TOWN HALL, OXFORD, ON WEDNESDAY 8 JUNE 2022 AT 7PM.

PRESENT

D Nicholl (Chairperson), T Robson (Deputy Chairperson), S Barkle, W Doody, S Farrell, R Harpur and N Mealings.

IN ATTENDANCE

T Tierney (Manager Planning and Regulation), J McBride (Roading and Transport Manager), G Stephens (Greenspace Design and Planning Team Leader), T Kunkel (Governance Team Leader) and A Connor (Governance Support Officer).

Six members of the public attended the meeting.

1. APOLOGIES

Moved: T Robson Seconded: R Harper

THAT an apology for absence be received and sustained from M Brown.

CARRIED

2. PUBLIC FORUM

2.1. Anemika Dion

A Dion expressed concern about Local Government New Zealand's (LGNZ) position on the proposed Three Waters reform. She felt that the LGNZ was not representing the community as it should and therefore requested the Board to convey the community's concern to the Council.

T Tierney explained that the Council had been very proactive about its opposition against the proposed reform and was currently part of the High Court action taking place against the Government regarding the ownership of assets. The Council was also a key player in Communities for Local Democracy.

A Dion acknowledged the Council's efforts to oppose the reform, however, she questioned why the Council was still a member of LGNZ when they were not adequately representing the Waimakariri district.

T Tierney advised that the matter would be brought to the Council's attention.

3. CONFLICTS OF INTEREST

Item 7.1 - As an Oxford Promotions Action Committee Inc member, S Farrell declared a conflict of interest.

Item 7.4 - S Barkle declared a conflict of interest in applications (i) and (ii) as a member of the Standardbred Stable to Stirrup Charitable Trust and applications (iii) and (i) as a parent of students in Swannanoa School.

S Farrell declared a conflict of interest in application (vi) as a member of the Oxford Historical Records Society Inc and application (vii) as a member of the Oxford Promotions Action Committee Inc.

W Doody declared a conflict of interest in application (vii) as an Oxford Promotions Action Committee Inc. member.
R Harper declared a conflict of interest in application (viii) as a grandparent to children in the Swannanoa Preschool.

4. CONFIRMATION OF MINUTES

4.1. Minutes of the Oxford-Ohoka Community Board – 4 May 2022

Moved: S Barkle Seconded: S Farrell

THAT the Oxford-Ohoka Community Board:

(a) **Confirms** the circulated Minutes of the Oxford-Ohoka Community Board meeting, held on 4 May 2022, as a true and accurate record.

CARRIED

4.2. Matters Arising

D Nicholl asked if there was an update on the additional information requested at the previous meeting about the Oxford Sewer Rates. T Kunkel noted that she had lodged a request for information with the 3 Waters Team, however, she was yet to receive feedback.

S Barkle questioned if the Board could submit on the Council's Walking and Cycling Network Plan, which was out for public consultation. T Kunkel confirmed that the Board was entitled to make a submission.

5. DEPUTATIONS AND PRESENTATIONS

Nil.

6. ADJOURNED BUSINESS

Nil.

7. REPORTS

7.1. Oxford Main Street Public Toilets Mural – G Stephens (Greenspace Design and Planning Team Leader)

G Stephens noted that this report had been a long time coming. The Waimakariri Public Arts Trust had endorsed the proposed design of the mural, and the final step in the process was for the Board to approve the design. The Greenspace Team and the Waimakariri Public Arts Trust both believed that the proposed design was in keeping with the aesthetics of the local area, as the proposed design depicted native flora and fauna. In addition, the Rūnanga had confirmed that they were satisfied that the design did not cross cultural-lines.

G Stephens confirmed that the artwork would be owned and maintained by the Oxford Promotions and Action Committee and Keep Oxford Beautiful. The mural would also be covered with an anti-graffiti top coat making any tagging easy to clean off.

W Doody questioned whether the anti-graffiti coating would preserve the painting sufficiently. G Stephens responded that the coating would not protect the mural against extensive vandalism, such as the scrapping of the paint. However, the mural would be safeguarded against spray-painting.

W Doody further enquired if the anti-graffiti coating would assist the mural in retaining its colour. G Stephens was unsure if it would keep the mural from fading. He noted that the mural was on a south-facing wall, so it was not anticipated that there would be significant colour fading. The five-year review process was in place to deal with any required maintenance.

T Robson asked if the process of installing public art could be streamlined to ensure that people were not deterred from taking part in such projects. G Stephens acknowledged that this had been a drawn-out process. Therefore, the Greenspace Team looked at a strategy to refine this process.

T Robson suggested the five year review of the mural should be done in conjunction with Oxford Promotions and Action Committee and Keep Oxford Beautiful.

Moved: W Doody Seconded: S Barkle

THAT the Oxford-Ohoka Community Board:

(a) **Receives** report No. 220526085770.

(b) **Notes** that the selection process had been jointly led by the Oxford Promotions and Action Committee (OPAC) and Keep Oxford Beautiful.

(c) **Notes** the proposed design had been approved by the Waimakariri Public Arts Trust.

(d) **Notes** that the Mural would be externally funded by the Oxford Promotions and Action Committee.

(e) **Approve** the proposed Mural Design to be located on the Oxford Main Street Public Toilet.

(f) **Approves** a five year review cycle, in conjunction with Oxford Promotions and Action Committee (OPAC) and Keep Oxford Beautiful, for this mural as an opportunity to identify any ongoing maintenance/operational issues as well as formally review the state of the mural and whether a replacement or refresh is required.

CARRIED

W Doody thanked S Farrell for the hard work she did in conjunction with Oxford Promotions and Action Committee and Keep Oxford Beautiful to get the mural approved. She commented that this mural would be beautiful.

7.2. Approval to install two cattle stops on Carleton Road, between Harewood Road and Woodstock Road – S Maxwell (Roading Compliance Officer) and J McBride (Roading and Transport Manager)

J McBride explained that the owner of Carlton Dairies approached the Council and requested approval to install cattle stops on Carleton Road, between Harewood Road and Woodstock Road. There would be two stops on either side of the crossing with a sealed area in between for ease of maintenance. Currently, the location was a permitted crossing location, and the owner was

pulling electric tape across the road, marking the new cattle stops to improve visibility.

T Robson questioned if having asphalt thresholds on either side of the cattle stop was now standard. J McBride confirmed that this was a standard requirement as the graders were having trouble accessing the unsealed road to grade the section between the cattle stops.

T Robson noted that this section of Carlton Road was in poor condition and questioned if further work would be done to the road after the property owner had installed the cattle stops. J McBride was unsure, however, she would confirm if there were any works in the programme.

Moved: T Robson Seconded: N Mealings

THAT the Oxford-Ohoka Community Board:

(a) **Receives** report No. 220526085607.

(b) **Approves** the construction of two cattle stops and associated fences on Carleton Road at the location shown on the attached diagram (Trim no. 220526085662) for the purpose of enabling the efficient movement of livestock across Carleton Road while at the same time keeping the road safe and accessible for road users.

(c) **Approves** the attached Draft Licence to Occupy Agreement (Trim no. 220526085664).

(d) **Notes** that all costs associated with the construction, maintenance and removal of the cattle stops, fences, gates and sealing of the road and up to and between the stops would be met by the property owner.

(e) **Notes** that the property owner would be required to remove the cattle stops, fences and gates if and when they cease dairy farming operations or if they change their method of operation that did not require the regular movement of cows across Carleton Road.

(f) **Circulates** this report to the Utilities and Roading Committee for information.

CARRIED

T Robson commented that this was a busy cattle crossing and commended the property owner for showing the initiative of installing cattle stops.

7.3. **Proposed Roading Capital Works Programme for 2022/23 – J McBride (Roading and Transport Manager)**

J McBride explained the proposed programme was a general budget allocation in the Council's Ten Year Plan (LTP), for areas such as curb and channel renewals, footpath renewals, new footpaths, bus shelters and minor safety. The roading network was managed as a total network across the whole district and as such projects were prioritised district wide.

In response to questions, J McBride advised that curb and channel renewals, as well as footpath renewals, undergo a biannual condition rating which assisted in setting the programme meaning only poor condition curb, channels and footpaths were being replaced. Waka Kotahi did not fund the new footpath programme, however, it had been previously prioritised.

S Barkle asked if the Walking and Cycling Network Plan was part of this programme. J McBride clarified that the walking and cycling projects within minor safety projects were only minimal and low-cost interventions. The Walking and Cycling Network Plan had a separate budget.

N Mealings sought clarity on the budget for the Oxford lighting deficiencies. J McBride advised that when the street lighting in Oxford was converted to LED, it was found that the long-distance between streetlights caused inadequate lighting. Therefore, the funding would be used to try and alleviate this problem.

N Mealings questioned the annual $25,000 budget for Main Street Oxford Signage. She also asked where the funding to be carried over for Main Street Oxford pedestrian crossings stemmed from. J McBride clarified that the funding for signage would only be allocated for the first year and was therefore not an annual budget. She further noted that the carry-over funding was for upgrading three pedestrian crossings, however, the projects would not commence until the speed limit changes were finalised.

S Barkle noted that in the Walking and Cycling Network Plan, there was a proposed footpath in the Mandeville Village and enquired if this footpath had been taken into consideration when looking at the Mandeville Road improvements. J McBride confirmed that the information contained in the Walking and Cycling Network Plan would be taken into consideration before any roading work commenced in the district.

N Mealings asked what the Mandeville Road Improvements at Village entailed. J McBride responded that it would be mostly curb and channel improvements as well as organising and formalising the parking on Mandeville Road.

S Farrell noted that many roads in the area had deteriorated, and she did not believe that "the standard of our District's roads was keeping pace with increasing traffic numbers", as stated in the report. J McBride commented that that statement was a community outcome and was what the Council was striving to achieve..

T Robson commented that there were many locations in Oxford where the footpaths were damaged, such as the entrance to Pearson Park. He questioned the process of determining which footpaths needed to be renewed. J McBride advised that footpath renewals were undertaken when a whole section required replacement. Footpath maintenance referred to more minor repairs and was a separate budget not covered in the Roading Capital Works Programme.

Moved: W Doody Seconded: S Farrell

THAT the Oxford-Ohoka Community Board:

(a) **Receives** Report No. 220526086495.

(b) **Notes** that feedback could be provided on the Draft Programme to the Roading and Transport Manager at the Board meeting.

CARRIED

W Doody acknowledged that there had been some problems with implementing the Capital Works Programme as the Council had been short-staffed. However, she thanked the staff for the work that had been achieved during this challenging time.

T Robson admitted that the programme seemed to cover the district's infrastructure well. However, he believed that the Harewood Road section from Burnt Hill Road to the Oxford Hospital should be included in the new footpaths programme.

7.4. **Application to the Oxford-Ohoka Community Board's Discretionary Grant Fund 2021/22– T Kunkel (Governance Team Leader)**

It was agreed that the applications would be considered separately due to various members' declared conflicts of interest.

S Barkle noted that the Trust trained and rehomed Standardbred racehorses when they retired from harness racing. These horses did not fetch much money at resale, and the Trust struggled to secure funding from the New Zealand Racing Board. The Trust used the Eyreton Pony Club for most of their training and as a venue for their training videos.

S Farrell sought clarity on to whom the Trust paid the membership fee. T Kunkel confirmed that a family membership of $400 per annum was paid to the Eyreton Pony Club.

Moved: W Doody Seconded: N Mealings

THAT the Oxford-Ohoka Community Board:

(a) **Receives** report No. 220428064617.

(b) **Approves** a grant of $400 to the Standardbred Stable to Stirrup Charitable Trust towards its membership renewal with the Eyreton Pony Club.

CARRIED
S Barkle abstained

N Mealings commented it was a local organisation supporting a local club and that $400 for a family membership seemed outstanding value.

Moved: S Farrell Seconded: T Robson

(c) **Approves** a grant of $500 to the Standardbred Stable to Stirrup Charitable Trust towards the cost of uniforms for the trainers and riders.

CARRIED
Against: W Doody
S Barkle abstained

Moved: T Robson Seconded: N Mealings

(d) **Approves** a grant of $500 to the Swannanoa Home and School Committee towards the cost of Kapa Haka uniforms for students.

(e) **Approves** a grant of $500 to the Swannanoa Home and School Committee towards the cost of purchasing football t-shirts for Twilight Football teams.

CARRIED
S Barkle abstained

N Mealings commented that Covid had made the past two years difficult for schools to raise additional funding and that Swannanoa School had not been able to hold their primary fundraiser.

In response to a question from R Harper, T Kunkel confirmed that the Tasman Young Farmers had only applied to the Oxford-Ohoka Community Board for funding.

Moved: W Doody Seconded: S Barkle

(f) **Approves** a grant of $500 to the Tasman Young Farmers towards the cost of hosting a Community Ball.

CARRIED
Against: T Robson, S Farrell and R Harper

T Robson commented that he did not support the motion because he believed it did not meet the Discretionary Grant criteria as the ball would be held outside the Board's area and would not primarily benefit residents of the ward.

S Farrell and R Harper agreed with T Robson, and they, therefore, also did not support the motion. S Farrell felt that not many people from the Board's area would be attending the ball.

S Barkle noted that the Oxford-Ohoka Ward included a large rural community, including many young farmers. In the past, the Board had supported other events that were not held in its geographical area but would directly benefit its residents. She believed the ball would be an excellent opportunity to support the mental health of young farmers in the Board's area.

W Doody was sure that many young farmers from the Oxford-Ohoka ward would attend the ball. She noted that this had been a challenging time for the rural community, and several young farmers struggled with stress and mental health, and the ball would be a fantastic way to support them.

Moved: W Doody Seconded: N Mealings

(g) **Approves** a grant of $697 to the Oxford Historical Records Society Inc. towards securing the medal cabinets in the Oxford Museum.

CARRIED
S Ferrell abstained

S Barkle questioned what the book actually entailed and if it would be distributed to everyone. T Kunkel explained that it was an activities book with puzzles and games that would be handed out to everyone at the Matariki event. It was envisaged that the book would be a fun way to assist people in understanding some of the Māori language and culture.

Moved: N Mealings Seconded: W Doody

(h) **Approves** a grant of $404 to the Oxford Promotions Action Committee Inc. towards the cost of producing a Te Papa Matariki Activity Book.

CARRIED
W Doody and S Ferrell abstained

N Mealings noted that this would be the first celebration of Matariki as a public holiday, and it was exciting to see the community planning something special for it.

W Doody was pleased that the event would be hosted despite the Covid still being common in the community.

Moved: T Robson Seconded: N Mealings

(i) **Approves** a grant of $461 to the Swannanoa Preschool towards the cost of providing storage for their new nursery.

CARRIED
R Harper abstained

8. CORRESPONDENCE

8.1. Thank you card from Clarkville Playcentre (Trim 220531092305)

8.2. Memo on the Waimakariri Economic Development Strategy Review (Trim 220524083775)

The Council's Business and Centres Advisor, V Thompson, had requested the Oxford-Ohoka Community Board to appoint a representative to attend the Waimakariri Economic Development Strategy Workshops.

Moved: T Robson Seconded: D Nicholl

THAT the Oxford-Ohoka Community Board:

(a) **Receives** the card for the Clarkville Playcentre (Trim 220428064556).

(b) **Receives** the memo on the Waimakariri Economic Development Strategy Review (Trim 220524083775) and elects R Harpur to represent the Board at the Waimakariri Economic Development Strategy Workshops.

CARRIED

9. CHAIRPERSON'S REPORT

9.1. **Chair's Diary for May 2022**

- Attended the Community Board Chairpersons and Deputy Chairpersons' meeting with the Mayor.
- Attended a public excluded Council Briefing on proposed Plan Change 31.
- Attended a meeting with the Mayor and the Ohoka Residents Association about proposed Plan Change 31

Moved: T Robson Seconded: S Barkle

THAT the Oxford-Ohoka Community Board:

(a) **Receives** the verbal report from the Oxford-Ohoka Community Board Chairperson.

CARRIED

10. MATTERS FOR INFORMATION

10.1. Rangiora-Ashley Community Board Meeting Minutes 11 May 2022
10.2. Woodend-Sefton Community Board Meeting Minutes 9 May 2022
10.3. Kaiapoi-Tuahiwi Community Board Meeting Minutes 16 May 2022

10.4. Roading Service Requests and Flood Budget – Report to Council Meeting 3 May 2022 – Circulates to all Boards.

10.5. Health Safety and Wellbeing Report May 2022 – Report to Council Meeting 3 May 2022 – Circulates to all Boards.

10.6. May 2021, December 2021 and February 2022 Flood Events – Service Requests Update – Report to Utilities and Roading Committee Meeting 17 May 2022 – Circulates to all Boards.

10.7. Zone Implementation Programme Addendum Capital Works Programme – 2022/23 – Report to Land and Water Committee Meeting 17 May 2022 – Circulates to all Boards.

10.8. Water Supply Utilities and Roading Staff Submission to Draft Annual Plan – Report to Council 24 May 2022 – Circulates to all Boards.

10.9. Drainage – Utilities and Roading Department Staff Submission to the Draft Annual Plan – Report to Council 24 May 2022 – Circulates to all Boards.

10.10. Wastewater – Utilities and Roading Department Staff Submission to the Draft 2022-23 Annual Plan– Report to Council 24 May 2022 – Circulates to all Boards.

10.11. Roading Staff Submission May 2022 - Request changes to the Roading Capital Works Budget– Report to Council 24 May 2022 – Circulates to all Boards.

10.12. Notification of Private Plan Change 31 – Rolleston Industrial Developments Ltd– Report to Council 31 May 2022 – Circulates to all Boards.

10.13. Library Update to May 6th, 2022 – Report to Community and Recreation Committee 31 May 2022 – Circulates to all Boards.

Moved: S Farrell Seconded: T Robson

THAT the Oxford-Ohoka Community Board:

(a) **Receives** the information in Items.10.1 to 10.13.

CARRIED

11. MEMBERS' INFORMATION EXCHANGE

S Barkle

- Attended the All Boards Briefing.
- The Waimakariri Health Advisory Group meeting was cancelled, and the next meeting would be held in August 2022.
- The concrete slabs had been installed at the Mandeville Village Reserve, and the picnic tables were secured to them.
- Walking and Cycling Network Plan was out for consultation, and she encouraged the Board members to make submissions. She also recommended that the Board should make a submission.
- She questioned if it was possible for the Board to be updated on the proposed Plan Change 31 (Ohoka).

R Harper

- Attended Ohoka Drainage Advisory Group – It had been an extraordinary wet summer resulting in the group being over budget.
- Attended All Boards Briefing.
- Attended Grey Power North Canterbury Meeting. The Hurunui District was hosting online banking seminars for the elderly, and he believed that the Waimakariri should look into holding something similar. Oxford Hospital would be reopening this month.

- Attended Mandeville Sports Centre meeting - Looked at working with a sponsor on a Sponsorship Plan with naming rights for the sports centre. Looked at constructing a separate building to use as a Club House.

S Farrell

- Attended the Annual General meeting and another meeting for the Oxford Historical Society. The society had received a letter from Te Papa stating they would be able to receive up to $25,000 funding for a project.
- Attended the All Boards Briefing.
- Submitted numerous Snap Send and Solves requests concerning leaves blocking drains in Oxford.
- Had not received any complaints about the lowered speed limits implemented on Main Street, Oxford.

T Robson

- He was approached by the Men's Shed to discuss a proposal for a container to be placed at the end of their building for extra storage. The Council's Community Facilities Team Leader, A Coker, had been appointed as a representative for Pearson Park.
- Ashley Gorge Reserve Advisory Group meeting was cancelled.
- Attended the Community Board Chairpersons and Deputy Chairpersons' meeting with the Mayor.
- Acknowledge the passing of Chris Greengrass, and he was pleased to see that she was presented with the Queen's Service Medal for services to the community. He also noted that the New Zealand Order of Merit was awarded to former Mayor David Ayers for services to local government and the community.

W Doody

- Attended the Road Safety meeting where they spoke with CORDE regarding the foliage on the bank from Glentui to the Ashley Gorge Bridge. Staff were working on signage to encourage visitors to park in the reserve.
- Commended staff at the Aquatic Facilities for working hard to keep the doors open despite Covid.
- The Community Team was working with Waghorn Builders and North Canterbury Rural Support to promote men's mental health. They had been planning for an expert in trauma, mental health and suicide, Lance Burdett, to speak to local tradespeople and framers about mental health.
- The new Speed Limit Rule 2022 had been introduced, which would provide more opportunities for Road Controlling Authorities to set lower speed limits than previously.
- Main Street Oxford had been discussed with Waka Kotahi staff, including possible consideration of a lower speed limit without the need for investment infrastructure.
- The Council had been granted a subsidy to build a public toilet at the West Oxford Reserve.

N Mealings

- Attended LGNZ 5/6 Zone Conference, where attendees were provided updates on all the various reforms.
- Attended a meeting with the Engagement and Planning Manager from Spark to discuss the connectivity issues at the Mandeville Sports Club.

- Attended a meeting with members of the Water Zone Committee, the New Zealand Landcare Trust and ECan and discussed better ways to reach people with lifestyle blocks and their environmental impact.
- Attended the Land and Water Committee meeting, where an application to the Biodiversity Fund was approved for fencing to protect part of a wetland in Loburn.
- Acknowledge the passing of Dame Aroha Reriti-Crofts.
- Attended the Annual Plan Deliberations meeting. All levels of service were unchanged as adopted in the 2021/31 Long Term Plan. She noted that the Council had the lowest rate increase in Canterbury and the seventh-lowest in the country.
- Attended the Community Service Awards, where four of the 11 awards presented were to members of the Oxford community.
- The Youth Council bid farewell to Ellie Tizzard as Co-Chair and would be electing a new Co-Chair next month.

12. CONSULTATION PROJECTS

12.1. **Walking and Cycling Network Plan**
https://letstalk.waimakariri.govt.nz/walking-and-cycling-network-plan
Consultation closes on Thursday 30 June 2022.

The Board noted the consultation project.

13. BOARD FUNDING UPDATE

13.1. **Board Discretionary Grant**
Balance as at 31 May 2022: $4,011.

13.2. **General Landscaping Fund**
Balance as at 31 May 2022: $300.

The Board noted the funding update.

14. MEDIA ITEMS

Nil.

15. QUESTIONS UNDER STANDING ORDERS

Nil.

16. URGENT GENERAL BUSINESS UNDER STANDING ORDERS

Nil.

NEXT MEETING

The next meeting of the Oxford-Ohoka Community Board would be held at the Oxford Town Hall on Wednesday 6 July 2022 at 7pm.

THERE BEING NO FURTHER BUSINESS, THE MEETING WAS CLOSED AT 8.42pm.

Workshop *(8.42pm to 9.10pm)*

- *Members Forum*
  - *It was agreed that the Board would attend a joint End-of-term function hosted by the Mayor.*
  - *It was agreed that a tree should be planted in either The Oaks Reserve, Oxford or the Oaks Reserve, West Eyreton, to celebrate Her Majesty Queen Elizabeth II's Platinum Jubilee. The Greenspace Team would be requested to advice on the best option.*
  - *It was agreed that the Board would make a submission on the Council's Walking and Cycling Network Plan.*
  - *It was agreed that a message of well-wishes should be send to Gerard Cleary.*

MINUTES OF THE MEETING OF THE RANGIORA-ASHLEY COMMUNITY BOARD HELD IN THE COUNCIL CHAMBER, 215 HIGH STREET, RANGIORA ON WEDNESDAY, 8 JUNE 2022 AT 7.00PM.

PRESENT:

J Gerard (Chairperson), D Lundy (Deputy Chairperson), K Barnett, R Brine, M Clarke, M Fleming, J Goldsworthy, M Harris, S Lewis, J Ward, A Wells and P Williams.

IN ATTENDANCE

J Millward (Manager Finance and Business Support), G MacLeod (Greenspace Manager), K Straw (Civil Projects Team Leader), S Morrow (Rates Officer – Property Specialist) and E Stubbs (Governance Support Officer).

1. APOLOGIES

There were no apologies.

2. CONFLICTS OF INTEREST

Item 6.4 - A Wells declared a conflict of interest as a member of the North Loburn School Board of Trustees.

3. CONFIRMATION OF MINUTES

3.1. Minutes of the Rangiora-Ashley Community Board – 11 May 2022

Moved: D Lundy Seconded: J Goldsworthy

THAT the Rangiora-Ashley Community Board:

(a) **Confirms,** as a true and accurate record, the circulated Minutes of the Rangiora-Ashley Community Board meeting, held on 11 May 2022.

CARRIED

3.2. Matters Arising

There were no matters arising.

4. DEPUTATIONS AND PRESENTATIONS

Nil.

5. ADJOURNED BUSINESS

Nil.

6. REPORTS

6.1. Matariki StoryWalk Northbrook Wetlands – A Paterson (Community Connections Coordinator) and T Stableford (Landscape Architect)

G MacLeod noted that Storywalks® was a new initiative for Waimakariri and was a partnership between the Greenspace and Libraries Teams to combine a story with a nature walk. The library Team had been granted permission for the rights to the story 'The Little Kiwi's Matariki', and enlarged pages from the picture book would be placed through Northbrook Wetlands creating an immersive play experience. Funding was made available for the project as a way to celebrate Matariki.

G MacLeod noted that the Storywalks® would be temporary, and the cost of creating, installing and removing the panels would be approximately $1,500. Staff would monitor the success of the Storywalks® before committing to any future or permanent Storywalks®. He confirmed that the Board would be invited to the project's opening.

P Williams asked if any consideration had been given to asking organisations such as sporting groups to install the panels as a fundraising opportunity. G MacLeod replied that consideration could be given to such an initiative in future, however, the timeline for this project did not allow for it.

Moved: J Ward Seconded: A Wells

THAT the Rangiora-Ashley Community Board:

(a) **Receives** Report No. TRIM 220527086987.

(b) **Approves** the installation of a Storywalks® of 'The Little Kiwi's Matariki' at Northbrook Wetlands, Rangiora.

(c) **Notes** that the costs involved for the proposed Storywalks® at Northbrook Wetlands would be paid for by Waimakariri Libraries and Greenspace budgets.

(d) **Notes** that the 'The Little Kiwi's Matariki' Storywalks® would be a temporary installation.

CARRIED

J Ward considered it a unique and special initiative, which she hoped young children and families would enjoy.

A Wells believed it was a fantastic initiative commenting on the importance of exposing children to literature.

P Williams supported the project and hoped that it would promote activity, appreciation and awareness of the Northbrook Wetland which was a great reserve.

M Fleming appreciated that the panels would be relocatable for future use.

J Gerard agreed that the reserve was a beautiful area that was currently underutilised, and he therefore supported the project.

6.2. **Proposed Roading Capital Works Programme for 2022/23 – J McBride (Roading and Transport Manager)**

K Straw spoke to the report on behalf of J McBride, which invited feedback on the proposed 2022/23 Roading Capital Works Programme. A general allocation of the budget was provided in the Council's 2021/31 Long Term Plan (LTP). The programme was for kerb and channel renewal, footpath renewal, minor improvements and new footpaths. The programmes were developed taking into account several factors, including condition rating, service requests and road safety audits from a prioritised database. Also, co-funding requirements under Waka Kotahi needed to be met. The new footpath programme did not receive Waka Kotahi funding.

J Gerard noted the shortfall in the Minor Improvements Budget as Waka Kotahi had not agreed to co-fund this programme. He asked if the Council had decided to fully fund the shortfall through the 2022/23 Annual Plan. Staff noted that this would be confirmed following the Council's adoption of the Annual Plan at the end of June 2022.

In reference to prioritisation, P Williams enquired if it would be possible to have a workshop with the Board to enable members to provide some input from the community before the programme was finalised. J Gerard and K Straw commented that the process followed Council policy regarding condition rating, and as such, those programmes had less flexibility.

K Barnett questioned if funding for gravel road improvements was included in the budget. K Straw explained that gravel road improvements were not included as maintenance work had a separate budget. K Barnett further asked if the Board could be advised on the amount spent on gravel road maintenance in its area. K Straw undertook to follow-up on this matter and report back to the Board.

A Wells supported K Barnett's request and enquired if there was an Asset Register and Capital Maintenance Programme schedule for gravel roads that could also be submitted to the Board for information.

K Barnett referred to the condition rating of footpaths and enquired if there was a prioritisation schedule that extended for more than three years. As this would enable the Board to ascertain where other paths were scheduled in the programme. K Straw advised he was not aware of an extended schedule, however, if Board members did have an area of concern, they could raise that with Roading and Transport Manager for further consideration.

J Gerard referred to the Good Street kerb channel, and footpath work and sought clarity on the provision street trees. K Straw noted that the project had not been scoped in detail. However, the aim was to reinstate street trees when they were replanted or removed, therefore when the first section of the redevelopment of Good Street was completed the trees were replaced.

D Lundy enquired about the process if a Board member wished to submit a footpath for possible renewal, such as the path to Rangiora Showgrounds. K Straw advised there was flexibility in the programme to move projects up or delay projects. He noted that the Walking and Cycling Plan was up for consultation and was the sort of feedback staff was seeking.

Moved: A Wells Seconded: M Fleming

THAT the Rangiora-Ashley Community Board:

(a) **Receives** Report No. 220526086494.

(b) **Notes** that feedback could be provided on the Draft Programme to the Roading and Transport Manager.

CARRIED

K Barnett commented that roading was critical in the Board's area, and members received many complaints regarding the District's roads. She suggested that in the future, it may be more beneficial if Board members could provide feedback to staff in a more informal manner before the programme came to the Board for consideration.

J Gerard agreed with K Barnett that a workshop including maps would be helpful for input and discussion. J Gerard reminded the Board that their submissions to the 2022/23 Annual Plan also included their displeasure regarding the state of gravel roads in the District.

P Williams concurred that a workshop was required to discuss roading matters. He did not believe that Board needed to wait for the Annual Plan process to bring any projects forward, as the budget should be flexible.

D Lundy agreed with the previous comments and noted that the Board had previously requested further information regarding gravel road maintenance. He referred to categories such as "unsealed road re-metalling", which was not included in the programmes as they were developed *'…purely on technical grounds and for asset condition reasons. As these decisions are made on a technical base, they are not subject to Board discretion.'* He also highlighted that the report noted the need for consistency with community outcomes which included that *'the standard for our District's roads is keeping pace with increasing traffic numbers.'*

6.3. **Change of Road Name in Townsend Fields Subdivision Stage 3 – S Morrow (Rates Officer Land Information)**

S Morrow explained the background to the report, which was to update a road name type following a new Road Layout Plan being prepared for the Townsend Fields Subdivision. He noted that in 2018 the Rangiora-Ashley Road Naming Committee had agreed on the name Lusk Place for an enclosed thoroughfare. However, the new road layout now meant that the thoroughfare was no longer enclosed and 'Street' would therefore, be more accurate representation.

There were no questions from Board members.

Moved: D Lundy Seconded: M Harris

THAT the Rangiora-Ashley Community Board:

(a) **Receives** report No. 220530091047.

(b) **Rescinds** its decision of 25 October 2018 to approve Road “6” as Lusk Place marked as on the original plan (Trim 220530091186).

(c) **Approves** changing the road name type of Lusk Place to Lusk Street as shown in the new road layout (Trim 220530091176).

CARRIED

D Lundy commented that it was a straightforward administrative decision.

6.4. **Application to the Rangiora-Ashley Community Board's 2021/22 Discretionary Grant Fund – K Rabe (Governance Adviser)**

J Millward spoke to the report on behalf of K Rabe, commenting that the Garden to Table was a school programme not funded by the Ministry of Education. The school had previously received Board funding and was up to date on its accountability reporting.

J Millward noted that the Board had a substantial amount remaining in its Discretionary Grant fund. The Board could consider allocating some of that funding to groups who have applied during the financial year or request that the Council carry the funds forward to the following year. There was general agreement that the funds should be carried forward to the next financial year.

Moved: M Harris Seconded: M Fleming

THAT the Rangiora-Ashley Community Board:

(a) **Receives** report No. 220519080902.

(b) **Approves** a grant of $486 to North Loburn School towards the purchase of soil and equipment required for its 'Garden to Table' Programme.

CARRIED
A Wells abstained

M Harris believed the skills the programme taught children around produce were valuable.

M Fleming noted that it was an important project beautifully presented in the application.

7. CORRESPONDENCE

Nil.

8. CHAIRPERSON'S REPORT

8.1. **Chair's Diary for May 2022**

Moved: J Gerard Seconded: D Lundy

THAT the Rangiora-Ashley Community Board:

(a) **Receives** report No. 220530090771.

CARRIED

9. MATTERS FOR INFORMATION

9.1. Oxford-Ohoka Community Board Meeting Minutes 4 May 2022
9.2. Woodend-Sefton Community Board Meeting Minutes 9 May 2022
9.3. Kaiapoi-Tuahiwi Community Board Meeting Minutes 16 May 2022
9.4. Roading Service Requests and Flood Budget – Report to Council Meeting 3 May 2022 – Circulates to all Boards.
9.5. Health Safety and Wellbeing Report May 2022 – Report to Council Meeting 3 May 2022 – Circulates to all Boards.

9.6. May 2021, December 2021 and February 2022 Flood Events – Service Requests Update – Report to Utilities and Roading Committee Meeting 17 May 2022 – Circulates to all Boards.

9.7. Zone Implementation Programme Addendum Capital Works Programme – 2022/23 – Report to Land and Water Committee Meeting 17 May 2022 – Circulates to all Boards.

9.8. Water Supply Utilities and Roading Staff Submission to Draft Annual Plan – Report to Council 24 May 2022 – Circulates to all Boards.

9.9. Drainage – Utilities and Roading Department Staff Submission to the Draft Annual Plan – Report to Council 24 May 2022 – Circulates to all Boards.

9.10. Wastewater – Utilities and Roading Department Staff Submission to the Draft 2022-23 Annual Plan– Report to Council 24 May 2022 – Circulates to all Boards.

9.11. Roading Staff Submission May 2022 - Request changes to the Roading Capital Works Budget– Report to Council 24 May 2022 – Circulates to all Boards.

9.12. Notification of Private Plan Change 31 – Rolleston Industrial Developments Ltd– Report to Council 31 May 2022 – Circulates to all Boards.

9.13. Library Update to May 6th, 2022 – Report to Community and Recreation Committee 31 May 2022 – Circulates to all Boards.

Moved: J Ward Seconded: J Goldsworthy

THAT the Rangiora-Ashley Community Board:

(a) **Receives** the information in Items 9.1 to 9.13.

CARRIED

10. MEMBERS' INFORMATION EXCHANGE

P Williams

- A lot of activity on Rangiora Airport matters.
- Residents were consistently raising issues regarding gravel roads and last week, 12 residents contacted him about roads, it was clear that the matter required drastic action. Grader operators complained they had nothing to grade, and effective maintenance needed more equipment, including a roller.

A Wells

- Believed the appalling state of gravel roads was the number one issue. As one of the Districts major assets, he suggested there should be a comprehensive Roading Asset Management Plan that included a Maintenance Programme for asset life. He requested that the Board be updated as he was not convinced ratepayers were being looked after in terms of maintenance and expenditure on gravel roads.

J Ward

- The Council had been busy with the 2022/23 draft Annual Plan, it was getting ready for final approval in June 2022.
- The town centre promotions organisations were looking forward to hosting events again, including the upcoming Oxford Matariki Lights Celebration, Rangiora Big Splash event for Stroke Foundation fundraising and the Rangiora Spring Ball.
- Attended the Audit and Risk and Utilities and Roading meetings.
- Rangiora Airfield was making good progress on its Management Plan.
- Attended Community Service Awards, and it was a great evening.
- Noted the upcoming first workshop for the Economic Development Strategy Review and commented that she believed the District was in great shape.

It was agreed that the Board would like to visit the Rangiora Airport to build an understanding of what was an important strategic asset in their Ward.

S Lewis

- Commented that many events were now happening in the area, including the production 'Annie' at the Rangiora Town Hall and an '80's night at the RSA, both of which she attended. .

M Harris

- Attended a further meeting regarding a local flooding issue and believed there may now be a resolution.
- Attended the Rangiora Museum's AGM, members were still passionate about another building.
- Agreed with comments regarding the state of shingle roads and the inadequacy of current grading maintenance to resolve issues.

J Goldsworthy

- Attended All Boards briefing.

M Fleming

- Assisting Keep Rangiora Beautiful with the maintenance of planting at Rangiora Hospital.

M Clarke

- Noted concerns regarding low water pressure in Southbrook.
- Attended Greypower meeting where concern was raised regarding cut down of footpaths and drives for scooters.
- Medical facilities were overburdened with two-three week waiting lists, and the Health Hub was proceeding slowly.

R Brine

- Organised a meeting for staff with Future Post, which was an exciting opportunity to look at posts manufactured from various plastics. Staff were following this up to ascertain if the Council could utilise these posts for an upcoming project.
- The Hockey turf maintenance issues had been resolved.
- Noted the upsurge in vandalism and graffiti in the District.
- Attended a meeting regarding the future of Southbrook Park and was elected Chairperson. The external report clearly indicated the building was not fit for purpose, and the park currently required outside funding support to continue.

K Barnett

- Expressed sadness at the passing of Dame Aroha Reriti-Crofts, who was the kaumātua of Tuahiwi Marae and the Council and an amazing lady.
- Commented on the Annual Plan process which had required going through the entire plan and re-prioritising projects again due to the current socio-economic environment. Pushing out Capital Works Projects would have an impact on future financial years.
- The District Plan was being pushed out again due to extra legislation from Central Government which needed to be addressed in the Plan, and at the same time, there was pressure from private Plan Change requests. It was a time of transition, including significant legislative changes for the country. It was important for the Council to focus on priorities and what was achievable at this time.

D Lundy

- Attended the All Boards meeting.
- Attended the Community Service Awards and was impressed at the calibre of recipients, including Ivan Campbell from Okuku, who organised the flyovers on Anzac Day.

11. CONSULTATION PROJECTS

11.1. **Walking and Cycling Network Plan**
https://letstalk.waimakariri.govt.nz/walking-and-cycling-network-plan
Consultation closes on Thursday 30 June 2022.

The Board noted the consultation project.

12. BOARD FUNDING UPDATE

12.1. **Board Discretionary Grant**
Balance as at 31 May 2022: $9,047.

12.2. **General Landscaping Fund**
Carryover from 2020/21: $1,580.
Allocation for 2021/22: $25,430.
Balance as at 31 May 2022: $27,010.

The Board noted the updated funding balances.

13. MEDIA ITEMS

Nil.

14. QUESTIONS UNDER STANDING ORDERS

Nil.

15. URGENT GENERAL BUSINESS UNDER STANDING ORDERS

Nil.

NEXT MEETING

The next meeting of the Rangiora-Ashley Community Board is scheduled for 7pm, Wednesday 13 July 2022.

THERE BEING NO FURTHER BUSINESS, THE MEETING CLOSED AT 7.50PM.

CONFIRMED

_____
Chairperson

_____
Date

Workshop

- *Greenspace update (Grant MacLeod, Greenspace Manager)*
  - *Progress on Millton Memorial Reserve*
  - *Community feedback on Townsend Fields Reserve*
  - *Kippenberger Avenue beautification*
  - *Ballarat Road tree removal*
  - *Rangiora Museum accommodation*
  - *Upcoming Capex workshop*
  - *Upcoming Airfield briefing*
- *Members Forum*
  - *Request for update on the Health Hub, including utilisation and potential use for respite care.*

MINUTES FOR THE MEETING OF THE WOODEND-SEFTON COMMUNITY BOARD HELD IN ROOM A, WOODEND COMMUNITY CENTRE, SCHOOL ROAD, WOODEND, ON MONDAY 13 JUNE 2022 AT 6.00PM.

PRESENT

S Powell (Chairperson), A Thompson (Deputy Chairperson), A Allen and J Archer.

IN ATTENDANCE

S Markham (Manager Strategic Projects), J McBride (Roading and Transport Manager), K Simpson (3 Waters Manager), T Kunkel (Governance Team Leader) and C Fowler-Jenkins (Governance Support Officer).

There were two members of the public present.

1 APOLOGIES

Moved: S Powell Seconded: A Allen

THAT apologies for absence be received and sustained from P Redmond, M Paterson and S Stewart.

CARRIED

2 ACKNOWLEDGMENTS

The Chairperson acknowledged the passing of Dame Aroha Reriti-Crofts (Ngai Tuahuriri, Ngai Tahu) and Kaiapoi-Tuahiwi Community Board member Christine Greengrass. In addition, she acknowledged the Queen's Service Medal presented to Christine Greengrass for services to the community and the New Zealand Order of Merit awarded to former Mayor David Ayers for services to local government and the community.

3 CONFLICTS OF INTEREST

There were no conflicts declared.

4 CONFIRMATION MINUTES

4.1 Minutes of the Woodend-Sefton Community Board – 9 May 2022

Moved: J Archer Seconded: A Thompson

THAT the Woodend-Sefton Community Board:

(a) **Confirms,** as a true and accurate record, the circulated Minutes of the Woodend-Sefton Community Board meeting held on 9 May 2022.

CARRIED

4.2 Matters Arising

Nil.

5 DEPUTATIONS AND PRESENTATIONS FROM THE COMMUNITY

Nil.

6 ADJOURNED BUSINESS

Nil.

7 REPORTS

7.1 Waikuku Beach Drainage Investigations Update – K Simpson (3 Waters Manager)

K Simpson provided the Board with an update on the status of the drainage investigation work in Waikuku Beach. He explained there were eight areas under investigation, many of which were initiated following the May 2021 flood event, however, further additions to the list had been made after the 15 December 2021 and February 2022 flood events. He highlighted the following:

- The work at the Waikuku Beach Campground after the Ashley River flooding had been completed. However, further work was underway looking at the impact of groundwater and localised flooding on the campground to assist with a decision on the long-term future of the campground.

- Maintenance works to clean pipes and culverts at Swindells Road had been undertaken. The existing system was identified as inadequate, and an options report was being prepared. Council had recently approved an additional budget of $450,000.

- Work on Broadway Avenue had progressed to the concept design stage with the solution of installing a pipe behind the properties on Broadway Avenue. There was $120,000 included in the 2022/2023 Annual Plan, and the Council was currently engaging with the affected property owners. The next stage would be commencing the detailed design and getting the property agreements in place.

- Collins Drive appeared to be a simple project, however, it became more complex when installing a secondary flap valve on the outlet into the Ashley River. The work had now been tendered, and the flap valve would be installed in early July 2022.

- During the May 2021 flood event, water had flowed over Waikuku Beach Road, however, Council staff were not recommending any work being done currently in this area. If flooding did occur over the road, the maintenance contractor would put out the road warning signs. If further issues arose, investigations into installing a culvert under the road would be carried out.

S Powell noted that Kaiapoi Pa Road could be used as a detour if Waikuku Beach Road was impassable. She asked if Kaiapoi Pa Road was passable during the flood events. K Simpson confirmed that the road had been passable during the May 2021 event, however, there were parts of the road that were prone to flooding.

K Simpson advised that the next area to be addressed was the Waikuku Beach Domain adjacent to the flying fox. However, work on this investigation had been delayed due to internal resourcing constraints. Currently, the Council's Project Delivery Unit was investigating if there was some additional drainage the Council could install to help drain the area. Another option was to plant it out as a wetland. A report on this would be submitted to the Board in due course.

The final two areas were Reserve Road/Broadway Avenue and Kiwi Avenue, where the roadside soak pits did not appear to be functioning as well as they should. The Council was therefore employing contractors to rejuvenate them effectively.

A Thompson noted that he was delighted to see that the Council held a public meeting in 2021 to enable the community to raise their concerns. He thought it was interesting that some of the issues in Waikuku Beach were similar to those in Woodend Beach and other coastal areas. K Simpson commented that drainage problems were different from water and wastewater challenges as the Council had to rely on the problems occurring during a flood to figure out the issues.

In response to a question from J Archer, K Simpson explained that raising groundwater levels were taken into account to a certain extent when dealing with flooding challenges. However, it came more into play during the design phase. Some of the possible design solutions that the Council was investigating included the installation of a pipe from the low point in the reserve through to the Park Terrace drain at the Kiwi Avenue Reserve. One of the challenges at Waikuku Beach was the areas that relied on soakage. There were several locations where sumps connected to soak pits worked well, provided the groundwater level was low. However, if there were an increase in periods of high groundwater level, there would be a correlating increase in periods when these systems were not going to function.

A Thompson noted that the maintenance of the draining system should be done routinely. He asked if K Simpson was comfortable that the Council's Drainage Team had the systems and processes in place to resolve the challenges identified and maintain the system as required. K Simpson advised that technology allowed the Council to record when a drain was last inspected or cleaned or when flood gates and soak pits were last maintained. In addition, the Council now had a pre-storm inspection list for flap gates.

A Allen questioned if Council staff had regular interactions with Hurunui District Council to share their resources and findings to avoid double handling. K Simpson explained that the Council co-operated on several levels with other Councils, including asset management. In addition, council staff held quarterly collaboration meetings with counterparts from Hurunui, Selwyn and Kaikoura District Councils. From an operational perspective, it was more on a case-by-case basis, however, there was a good working relationship with neighbouring councils.

S Powell enquired if the Taranaki Stream flood gates were operating efficiently. K Simpson noted that they were as far as he was aware, and the only thing he believed was still in question was the fish passage within the gate itself and its effectiveness.

Moved: A Allen Seconded: A Thompson

THAT the Woodend-Sefton Community Board:

(a) **Receives** Report No. 220602094304.

(b) **Notes** the following progress on the eight areas identified for further investigation in Waikuku Beach:
- Waikuku Beach Campground – Complete
- Swindells Road – Options assessment underway and funding approved
- Collins Drive – Works awarded
- Waikuku Beach Road – Investigation complete
- Kiwi Avenue Reserve / Broadway Avenue – Solution identified, and funding approved

- Waikuku Beach Domain – Investigation recommenced
- Reserve Road / Broadway Avenue – Remedial works proposed
- Kiwi Avenue – Remedial works proposed

(c) **Notes** that further reports would be brought to the Woodend-Sefton Community Board for feedback on the proposed upgrading works in the Swindells Road and Broadway Avenue areas in the future.

(d) **Notes** that the All Boards briefing on 22 August 2022 would provide an update on flooding matters.

(e) **Circulates** this report to the Utilities and Roading Committee for their information.

CARRIED

S Powell thanked K Simpson for all the work he had done, acknowledging that residents at Waikuku Beach appreciated the ongoing work.

7.2 **Proposed Roading Capital Works Programme for 2022/23 – J McBride (Roading and Transport Manager)**

J McBride spoke to the report, which invited feedback on the proposed 2022/23 Roading Capital Works Programme. A general allocation of the budget was provided in the Council's 2021/31 Long Term Plan (LTP). The programme was for kerb and channel renewal, footpath renewal, minor improvements and new footpaths. The programmes were developed taking into account several factors, including condition rating, service requests and road safety audits from a prioritised database. Also, co-funding requirements under Waka Kotahi needed to be met. The new footpath programme did not receive Waka Kotahi funding.

A Allen noted that the new sites assessed and prioritised in the 2022/33 Footpath Programme did not include any paths in the Boards area. She highlighted the non-existent footpath from the Pegasus roundabout to Woodend, which the Board had raised several times. She challenged the footpath prioritisation process, believing this path met the criteria due to safety concerns and high traffic volumes. J McBride explained that the Minor Safety Programme only dealt with low-cost interventions which could be done relatively easily with a low budget. The area under discussion had been included in the Council's Walking and Cycling Network Plan and, if accepted, would be funded through that Walking and Cycling Network budget.

S Powell enquired if the school variable speed signs were included in the programme, particularly the Sefton School signs. J McBride noted that the new Setting of Speed Limit Rule, introduced in May 2022, required the Council to address speeding at all of the schools in the district within ten years. It was anticipated that speeds near urban schools would be reduced to either 30 or 40km/h and or 60km/h in rural areas. Reassessment of the infrastructure around the district's schools would therefore need to be undertaken before being added to the Council's Long Term Plan. S Powell noted that Sefton School was a priority because it was very close to the change in speed limit from 100km/h to 60km/h.

S Powell noted the possible Waka Kotahi funding for safety improvements through Woodend and the proposal to feed traffic up Woodend Road to enable traffic turning onto State Highway One to utilise the proposed lights. However, there was no indication when this work may commence. She inquired if there was any funding in the programme for work on Woodend Road, a wide road with extremely narrow footpaths with power poles in the middle. J McBride responded that this work was not included in the programme, however, there

was a line item in the Long Term Plan specifically for safety improvements in conjunction with Woodend Road work.

S Powell noted that she had been working with K Graham regarding the possibility of rerouting busses into Ravenswood because there was currently no safe crossing point across State Highway One. J McBride noted that S Binder had been working with Environment Canterbury on the public transport in Ravenswood and how it may look in the future, including from an infrastructure perspective.

Moved: S Powell Seconded: A Thompson

THAT the Woodend-Sefton Community Board:

(a) **Receives** Report No. 220601092955.

(b) **Notes** that feedback could be provided on the Draft Programme to the Roading and Transport Manager.

CARRIED

7.3 **Application to the Woodend-Sefton Community Board's 2021/22 Discretionary Grant Fund – K Rabe (Governance Advisor)**

T Kunkel spoke to the report noting that the Board had received two applications for funding, one from St Barnabas Anglican Church in Woodend. They were seeking funding to relevel and reseed their lawn cemetery, where the graves had started to sink due to heavy rain events. The second application was received from the Good Night Sleep Tight Trust, which provided blankets, pyjamas and anything a child could need to have a good night's sleep for children in need, and they were asking for funding to continue their work.

Moved: A Allen Seconded: S Powell

THAT the Woodend-Sefton Community Board:

(a) **Receives** report No. 220519081397.

(b) **Approves** a grant of $690 to St Barnabas Anglican Church towards levelling and reseeding the cemetery on the Church grounds.

CARRIED

A Allen commented that she was pleased that the Church had requested funding and would support the motion, as the Church gave a lot back to the community.

S Powell also supported the motion because St Barnabas Church's cemetery was one of the few cemeteries in North Canterbury that the Council did not maintain. She commented that it was an interesting historic place to visit and was very happy to support the application.

Moved: J Archer Seconded: A Allen

THAT the Woodend-Sefton Community Board:

(c) **Approves** a grant of $500 to the Good Night Sleep Tight Charitable Trust towards winter night packs.

LOST

J Archer thought it was a wonderful initiative supporting needy young children.

Amendment:

Moved: S Powell Seconded: A Thompson

THAT the Woodend-Sefton Community Board:

(a) **Approves** a grant of $810 to the Good Night Sleep Tight Charitable Trust towards winter night packs.

CARRIED

A Allen commented that many people took it for granted that every child had pyjamas, and things needed to go to bed at night, however, this was not the case. She knew that there were several agencies out there that did help children. However, children could not always ask for help, and she believed they should receive all the assistance they could. She noted that this was a fantastic initiative, as small things make a difference. S Powell concurred with A Allen's comments.

7.4 **Appointment of a new Board Representative to North Canterbury Neighbourhood Support – K Rabe (Governance Advisor)**

T Kunkel spoke to the report, which requested the Board to appoint a new representative to North Canterbury Neighbourhood Support (NCNS), an organisation with a long history with Community Boards and the Council. A Allen, the Board's current representative, could no longer continue to represent the Board. The Board, therefore, needed to nominate a new representative until the end of the term in October 2022.
Moved: S Powell Seconded: J Archer

THAT the Woodend-Sefton Community Board:

(a) **Receives** report No. 220506071265.

(b) **Acknowledges** the resignation of Andrea Allen as the Board's representative to North Canterbury Neighbourhood Support from 13 June 2021.

(c) **Approves** the appointment of Board Member M Paterson as the Board's representative and liaison person to North Canterbury Neighbourhood Support, to take immediate effect from 14 June 2022 until the end of the 2019-22 triennial term, being 7 October 2022.

(d) **Acknowledges** Andrea Allen's excellent service during her time as Board's representative to North Canterbury Neighbourhood Support.

CARRIED

S Powell thanked A Allen for the work that she had done as part of NCNS, both as the Board's representative and as Chair of NCNS. She had raised the profile of the group across the district, which was a credit to the work she had done.

8 CORRESPONDENCE

Nil.

9 CHAIRPERSON'S REPORT

9.1 Chairperson's Report for May 2022

Moved: S Powell Seconded: A Thompson

THAT the Woodend-Sefton Community Board:

(a) **Receives** the report for May 2022 from the Woodend-Sefton Community Board Chairperson (Trim: 220607095497).

CARRIED

10 MATTERS FOR INFORMATION

10.1 Oxford-Ohoka Community Board Meeting Minutes 4 May 2022

10.2 Rangiora-Ashley Community Board Meeting Minutes 11 May 2022

10.3 Kaiapoi-Tuahiwi Community Board Meeting Minutes 16 May 2022

10.4 Roading Service Requests and Flood Budget – Report to Council Meeting 3 May 2022 – Circulates to all Boards.

10.5 Health Safety and Wellbeing Report May 2022 – Report to Council Meeting 3 May 2022 – Circulates to all Boards.

10.6 May 2021, December 2021 and February 2022 Flood Events – Service Requests Update – Report to Utilities and Roading Committee Meeting 17 May 2022 – Circulates to all Boards.

10.7 Zone Implementation Programme Addendum Capital Works Programme – 2022/23 – Report to Land and Water Committee Meeting 17 May 2022 – Circulates to all Boards.

10.8 Water Supply Utilities and Roading Staff Submission to Draft Annual Plan – Report to Council 24 May 2022 – Circulates to all Boards.

10.9 Drainage – Utilities and Roading Department Staff Submission to the Draft Annual Plan – Report to Council 24 May 2022 – Circulates to all Boards.

10.10 Wastewater – Utilities and Roading Department Staff Submission to the Draft 2022-23 Annual Plan– Report to Council 24 May 2022 – Circulates to all Boards.

10.11 Roading Staff Submission May 2022 - Request changes to the Roading Capital Works Budget– Report to Council 24 May 2022 – Circulates to all Boards.

10.12 Notification of Private Plan Change 31 – Rolleston Industrial Developments Ltd– Report to Council 31 May 2022 – Circulates to all Boards.

10.13 2021 Beach User Survey – Northern Pegasus Bay Bylaw – Report to Community and Recreation Committee 31 May 2022 – Circulates to all Woodend-Sefton Community Board and Kaiapoi-Tuahiwi Community Board.

10.14 Library Update to May 6th, 2022 – Report to Community and Recreation Committee 31 May 2022 – Circulates to all Boards.

Moved: A Allen Seconded: A Thompson

THAT the Woodend-Sefton Community Board:

(a) **Receives** the information in Items 9.1 to 9.14

CARRIED

11 MEMBERS' INFORMATION EXCHANGE

Nil.

12 CONSULTATION PROJECTS

12.1 Walking and Cycling Network Plan

https://letstalk.waimakariri.govt.nz/walking-and-cycling-network-plan
Consultation closes on Thursday 30 June 2022.

S Powell noted that it was a good summary document. The Woodend drop-in session was held on Wednesday, 8 June 2022, and about twenty-five people attended and gave valuable feedback. There was a drop-in session scheduled in Pegasus on 23 June 2022 at the community centre. She encouraged people to go along and get their feedback in.

13 BOARD FUNDING UPDATE

13.1 Board Discretionary Grant

Balance as at 31 May 2022: $3,845.

13.2 General Landscaping Fund

Balance as at 31 May 2022: $12,710.

The Board noted the funding update.

14 MEDIA ITEMS

- The Discretionary Grant applications.
- Flooding update.
- Walking and Cycling Network Plan.

15 QUESTIONS UNDER STANDING ORDERS

Nil.

16 URGENT GENERAL BUSINESS UNDER STANDING ORDERS

Nil.

NEXT MEETING

The next meeting of the Woodend-Sefton Community Board would be held at the Woodend Community Centre, School Road, Woodend on Monday 11 July 2022 at 6pm.

THERE BEING NO FURTHER BUSINESS THE MEETING CONCLUDED AT 7.09pm.

CONFIRMED

_____
Chairperson

_____
Date

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	DRA-16-03 / 220609098129
REPORT TO:	UTILITIES AND ROADING
DATE OF MEETING:	21 June 2022
AUTHOR(S):	Emile Klopper, Flood Team Lead Caroline Fahey, Water Operations Team Leader Kalley Simpson, 3 Waters Manager
SUBJECT:	May 2021, December 2021 & February 2022 Flood Events – Service Requests Update
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / pp Chief Executive

1. SUMMARY

1.1 The purpose of this report is to update the Utilities & Roading Committee on the status of the drainage service requests received related to the significant rainfall events that occurred over the 29th to 31st May 2021, 15th December 2021 and 12th February 2022.

1.2 A total of 598 drainage service requests were received related to these rainfall events and total of 61 areas have been identified for further assessment.

1.3 The focus of this report is to provide feedback on the 61 areas identified and progress made on their investigation since the previous Utilities and Roading Committee meeting held on 17 May 2022.

Attachments

i. Progress and status of the 61 Focus Areas

2. RECOMMENDATION

THAT the Utilities & Roading Committee:

(a) **Receives** report No. 220609098129.

(b) **Notes** that 598 drainage service requests were received related to the significant rainfall events in May 2021, December 2021 and February 2022, which have all been responded to although approximately 138 requests require further maintenance or investigation work.

(c) **Notes** that there are currently 61 drainage assessments identified and this is likely to increase as the service requests are worked through. Progress made since the previous Utilities & Roading Committee meeting is set out in Section 4 and is supported by the weekly update memos.

(d) **Notes** that background information in regards to the recent flooding event can be viewed in report No. 220310034384 entitled: "*February 2022 Flood Event - Update on Service Requests*".

(e) **Notes** that a webpage has been set up on the Council's website to provide updates on the status of drainage works underway and targeted information will be sent out to the Waikuku Beach and Kaiapoi communities.

URL:https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works

(f) **Notes** that additional budgets for the Swindells Road Drainage Upgrade and Broadway Ave Drainage Upgrade projects in Waikuku Beach and High Street Drainage Upgrade project in Oxford have been approved for inclusion in the 2022/23 Annual Plan.

(g) **Circulates** this report to the Council and community boards for information.

3. PROGRESS SINCE PREVIOUS REPORT

3.1. Attachment I provides a snapshot of each of the 61 Focus Areas' status and whether CCTV, Maintenance and/or Survey is required.

3.2. In addition to Attachment I, three separate projects were compiled to consolidate the remaining focus areas' works into separate packages of maintenance, CCTV and survey works.

3.3. Since the previous U&R Committee update meeting, the Flood Team have continued to focus their attention on investigating the below 5 key focus areas, with the addition of the aforementioned "consolidation projects". These key Focus Areas and their progress will be briefly discussed in Section 4 of this report.

- Broadway Avenue, Waikuku Beach
- Swindells Road, Waikuku Beach
- Fuller Street, Kaiapoi
- Cust Road, Cust
- Ranui Mews, Kaiapoi
- Consolidation Projects
  - Maintenance
  - CCTV & Jetting
  - Surveying

3.4. **Table 1** below provides a breakdown/summary of all the focus areas per drainage scheme.

Table 1: 61 Focus Areas Breakdown

Scheme	Total	Status			Planned		
		Allocated	Started	Complete / BAU	Maintenance	CCTV & Jet	Survey
Rangiora	3	3	3	0	0	1	0
Kaiapoi	17	17	15	1	2	7	0
Woodend	3	3	3	0	0	1	0
Waikuku Beach	4	4	3	1	1	1	0
Pines Kairaki	3	3	2	0	1	0	0
Pegasus	1	1	1	0	0	1	0
Oxford Urban	7	7	3	3	2	1	0

Ohoka Rural	4	4	3	0	0	0	0
Oxford Rural	1	1	1	0	0	0	0
Coastal Rural	4	4	2	1	0	0	0
Rural Central	1	1	1	0	0	0	0
Cust Rural	2	2	2	0	1	0	0
District Drainage	9	9	5	1	0	0	0
Other	2	2	1	1	0	0	0
Total	**61**	**61**	**45**	**8**	**7**	**12**	**0**

3.5. Of the 61 areas identified for further investigation 8 are complete, 45 are underway and the remaining areas have maintenance and/or CCTV and jetting works planned.

4. KEY FOCUS AREAS

4.1. Progress on the 5 key focus areas is summarised below as well as the "Consolidation Projects" (Maintenance, CCTV and Survey packages):

4.1.1. Broadway Avenue, Waikuku Beach

- The Flood Team have progressed the 31 Broadway Avenue project to a point that the 3 Waters team can take it over to manage, procure and construct as part of their ongoing business as usual projects.
- The final design includes a proposed piped primary system with a new proposed scruffy dome inlet in the Kiwi Ave Reserve. The piped primary system flows from the reserve via the shared driveway of 33A and 33B Broadway Ave to the nearby drain via a new proposed pipe alignment. The new alignment will enable sufficient drainage within the reserve for the nuisance events. As part of the proposed design, a formalised overland flowpath will be constructed following the same flow route as the primary network.
- An onsite meeting was held between the Flood Team, 3 Waters team and some of the affected property owners to discuss the project's drivers and timelines. Consultation with the affected property owners is still underway.
- An additional budget of $120,000 in 2022/23 for these works has been approved as part of Drainage Staff Submission to 2022/23 Annual Plan.

4.1.2. Swindells Road, Waikuku Beach

- The driveway culverts and swales along both sides of Swindells Road are partially silted up and is programmed to be cleaned out by CORDE.
- Optioneering workshop was held to discuss potential solutions.
- Options memo is currently being progressed covering the following potential options:
    - Localised upgrades of driveway culverts, pipes and swale to provide a functional improvement to the existing system (expected 2 year capacity).
    - System wide upgrades and extension to provide a 5 year level of service capacity in the primary system.
    - Provision of pump chamber to enable efficient and effective deployment of a temporary pump.
    - Installation of a permanent pump station.
    - Use of the adjacent reserve to provide a stormwater retention basin.
- An additional budget of $450,000, comprising of $50,000 in 2022/23 for design and $400,000 in 2023/24 for construction, has been approved as part of Drainage Staff Submission to 2022/23 Annual Plan.

- This budget will enable the system to be upgrade and extended along the toe of the stopbank, and also for a pump chamber to be installed for a temporary pump. The next steps are to finalise the options memo before seeking feedback on the proposed solution.

4.1.3. Fuller Street, Kaiapoi

- Topographical survey was done by PDU and survey results were sent through to the Flood Team for assessment.
- Onsite CCTV connectivity surveys were requested from Clyne and Bennie and completed. Results to be sent through shortly.
- Potential solution is a bund/barrier along the rear boundary and flapgates on the stormwater outlets to prevent water from the drain entering the property and onsite improvements to drain rainwater from the property to the drain.
- A memo will be prepared with advice to the landowners in terms of onsite improvements and concept design and cost estimate for the bund/barrier along the rear boundary once CCTV connectivity results have been obtained.
- The works to implement the proposed solution will be undertaken from the existing Kaiapoi Minor Stormwater Improvements budget in 2022/23.

4.1.4. Cust Road, Cust

- Desktop and onsite investigations were carried out to determine the extent of the problems and their root cause.
- Various options were developed as part of the preliminary design, all of which require some level of input from the Roading team. Meetings have been held to discuss the options with the team.
    - As part of the options analysis it was recommended to utilise new machinery and equipment recently purchased by the Roading Maintenance Contractor that will enable the team to easily install soak pits up to 6m deep. It was recommended that these soak pits should be installed on a trial basis to determine their efficiency.
- Flood Team compiled a pros and cons list of the various options complete with high level cost estimate to assist the Roading Team in the selection of a most appropriate option.
- Maintenance tasks have been scoped up and programmed to be undertaken by the maintenance Contractors within the stock race.
- The abovementioned maintenance tasks include:
    - Cleaning and removing overgrown vegetation within the stockwater race from 1689 Cust Road through to and including the crossing under Earlys Road.
    - Jetting and cleaning the relevant culverts within the above route.

4.1.1. Ranui Mews, Kaiapoi

- The venting investigation work undertaken in May has confirmed that the onsite sewer system is prone to experiencing venting issues even if the public system has minor surcharging.
- It has therefore been decided to progress with installing a vent on Unit 20 and then undertaking the venting test again to confirm the issue is resolved for this unit. If successful additional venting will be installed on the other units.
- Loggers have been installed in a manhole at Ranui Mews and also in a manhole in Ohoka Road. The loggers will provide valuable information on any remaining issues with the public sewer system.
- The loggers have been programmed to send out email/text alerts if the manhole surcharges. This will give an early warning that there may be an issue with the sewer system for staff to respond to. If necessary sucker trucks will be deployed to the Ohoka Road area and the Property team have portable toilets that can be supplied for use within the bathrooms.

- It is intended that the loggers will remain in place for a period of time to confirm that the maintenance works on the public system (to remove the fat build up) and works on the onsite sewer system to improve the venting has resolved the issue.

4.2. Further programme and progress updates will be reported to the Utilities and Roading Committee at future meetings as this work progresses.

Implications for Community Wellbeing

Some of the locations of flooding have had flooding in the past and some residents have had to make insurance claims for flood related damage. This has a potential implication on community wellbeing for these residents.

4.3. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be directly affected by this work. However they will have an interest in any future proposed works that may have an impact on waterways and rivers. Staff will update the Runanga at the executive meetings and where relevant on specific projects engage with MKT.

5.2. Groups and Organisations

Directly affected property owners will be consulted with on the proposed upgrades.

Community boards and drainage advisory groups will be updated on the investigation works and any specific future proposed works that come out of the assessment.

5.3. Wider Community

The wider community will be kept informed via the Council's website. A dedicated webpage has been set up for the recent flood events across the wider district, refer:

https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works

A community meeting was held for Waikuku Beach residents on 6 July 2021, however not all investigation work has been completed in this area. If necessary, a targeted update to the Waikuku Beach community, either via a local newsletter flyer or dedicated flyer will be delivered to all addresses in the village.

Target consultation has been undertaken for the Kaiapoi Community via the Shovel Ready programme of works which will address most of the issues experienced in the Dudley Drain, Feldwick Drain and McIntosh Drain catchments.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

The costs associated with this investigation work will be charged to existing Drainage asset management and operations budgets. Any physical inspection work such as pipe maintenance and CCTV inspection work will be charged to the maintenance budget for the relevant Drainage scheme.

The following budgets were recently approved by Council for inclusion in the final 2022-23 Annual Plan (refer TRIM 220505071056):

- Broadway Ave Drainage Upgrade – $120,000 (in 2022/23).
- Swindells Road Drainage Upgrade – $450,000 (comprising of $50,000 in 2022/23 for design and $400,000 in 2023/24 for construction).
- High Street Drainage Upgrade - $200,000 (in 2022/23).

All other investigation and maintenance works is being undertaken from existing operational budgets.

6.2. **Sustainability and Climate Change Impacts**

The recommendations in this report do not have sustainability and/or climate change impacts.

Any proposed upgrading works will consider the potential impacts of climate change in terms of higher rainfall intensities and sea level rise. The procurement of any physical works will use sustainable procurement practices.

6.3 **Risk Management**

There are no additional risks arising from the adoption/implementation of the recommendations in this report. The improvements implemented as a result of the drainage assessment identified will reduce the overall risk profile to Council and the community.

Health and Safety

The health and safety risks associated with undertaking this investigation work will be managed by standard Council processes.

7. CONTEXT

7.1. **Consistency with Policy**

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Authorising Legislation**

The Local Government Act 2002 sets out the power and responsibility of local authorities, including the Council's role in providing drainage services.

7.3. **Consistency with Community Outcomes**

The Council's community outcomes listed below are relevant to the actions arising from recommendations in this report.

- *There is a safe environment for all*
- *Core utility services are provided in a timely and sustainable manner*

7.4. **Authorising Delegations**

The Utilities and Roading Committee is responsible for activities related to stormwater drainage.

Appendix I – Progress and status of the 61 Focus Areas

Scheme	Location	Allocated	Progress	Maintenance	CCTV & Jet	Survey
Rangiora	Newnham Street	Flood Team - Consolidation Projects	Underway		Planned	
	Ivory Street	Roading	Underway			
	Strachan Place	3 Waters	Underway	Planned	Complete	
Kaiapoi	310 Beach Road	3 Waters	Underway	Complete	Planned	TBD
	34 Mansfield Drive	Flood Team - Consolidation Projects	Underway		Planned	
	364B Williams Street	Roading	Underway	Planned		
	44 Bracebridge Street	Flood Team - Consolidation Projects	Underway		Planned	
	46 A Fuller Street	Flood Team	Underway	Complete	Complete	Complete
	52 Feldwick Drive	Roading	Underway			
	59 Main North Road	3 Waters	Underway	Complete		
	68 Sovereign Boulevard	3 Waters	Underway	Planned		
	69 Old North Road	3 Waters	Underway			
	Dale Street	Roading	Underway		Planned	
	1 Wesley Street	Flood Team - Consolidation Projects	Underway		Planned	
	Porter Place	3 Waters	Complete/BAU	Complete		
	14 Kalmia Place	Flood Team - Consolidation Projects	Underway		Planned	
	15 Cridland Street West	Flood Team	Underway			TBD
	169 Williams Street	Flood Team - Consolidation Projects	Underway		Planned	
	26 Hamel Lane	3 Waters	Not yet started			
	30 Williams Street	Roading	Underway			

Woodend	39 Woodglen Drive	Flood Team - Consolidation Projects	Underway		Planned	
	5 B Norton Place	PDU	Underway		Complete	Complete
	189 Rangiora Woodend Road	Roading	Underway			
Waikuku Beach	31 Broadway Avenue	Flood Team	Complete/BAU	Complete	Complete	Complete
	12 Reserve Road	Flood Team	Underway	Planned	Complete	Complete
	14 Kiwi Avenue	Flood Team	Underway	Planned	Complete	Complete
	4 Swindells Road	PDU	Underway	Planned	Planned	Complete
Pines Kairaki	Beach Road	PDU	Underway			
	Batten Grove	Flood Team - Consolidation Projects	Underway	Planned		TBD
	56 Featherstone Avenue	3 Waters	Not yet started			
Pegasus	31 Pegasus Main Street	Flood Team - Consolidation Projects	Underway		Planned	
Oxford Urban	12 - 16 Kowhai Street	Flood Team - Consolidation Projects	Underway	Planned	Planned	
	6 Weka Street	PDU	Underway		Complete	
	Bay Road	3 Waters	Underway	Complete		
	13 Queen Street	3 Waters	Complete/BAU	Complete		
	23 Burnett Street	PDU	Not yet started	Planned		TBD
	189 High Street	PDU	Complete/BAU			
	Pearson Drain	3 Waters	Underway			
Ohoka Rural	494 Mill Road	3 Waters	Underway		Complete	
	175 Mill Road	3 Waters	Underway			
	181 McHughs Road	PDU	Underway			
	Wilson Drive	3 Waters	Not yet started			
Oxford Rural	31 Victoria Street	3 Waters	Underway			
Coastal Rural	SH1	Roading	Not yet started			TBD
	4 MacDonalds Lane	Flood Team	Underway			
	11 Stalkers Road	Flood Team	Underway			
	820 Main North Road	3 Waters	Complete/BAU			
Rural Central	Skewbridge	Roading	Underway			

Cust Rural	1649 Cust Road	Flood Team	Underway	Planned		
	1689 Cust Road	Flood Team	Underway	Planned		
	1838, 1840 & 1842 Cust Road	Flood Team	Underway	Planned		
District Drainage	105 Taaffes Glen Road	PDU	Complete/BAU			
	231/217 Toppings Road	3 Waters	Underway			
	51 Smarts Road	PDU	Underway			
	556 Steffens Road	Roading	Not yet started			
	730 Depot Road	Roading	Not yet started			
	951 Upper Sefton Road	Roading	Not yet started			
	Dixons Road	Roading	Underway			
	Hodgsons Road	Roading	Underway			
	Mt Thomas Road	3 Waters	Underway			
Other	Ranui Mews	3 Waters	Underway		Complete	
	Kairaki PS	3 Waters	Complete/BAU		Complete	

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	SEW-03-01-04-13.01 / 220420060318
REPORT TO:	UTILITIES AND ROADING COMMITTEE
DATE OF MEETING:	21 June 2022
AUTHOR(S):	Sophie Allen – Water Environment Advisor Kalley Simpson – 3 Waters Manager
SUBJECT:	Avian Botulism Management 2021-22
ENDORSED BY: (for Reports to Council, Committees or Boards)	Department Manager / pp Chief Executive

1. SUMMARY

1.1 This report summarises the occurrence, costs and management of avian botulism during the 2021-22 season at the Waimakariri District Council Wastewater Treatment Plants (WWTP).

1.2 This report outlines Version 2 of the WDC Avian Botulism Management Plan; a document that collates current management practices and adds in changes from an SPCA review.

1.3 This report discusses options for management such as water level management within ponds, and discusses a Christchurch City Council outbreak this past summer in relation to potential effects on the Waimakariri District in future.

Attachments:

i. WDC Avian Botulism Management Plan (Version 2): TRIM 201103147380

2. RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 220420060318.

(b) **Notes** the low bird death numbers (48 birds) for the 2021-22 season at coastal Waimakariri District Council wastewater treatment plants (WWTPs), as collected by contractors to check for and contain any avian botulism, with no avian botulism outbreak detected.

(c) **Notes** the production of an updated WDC Avian Botulism Management Plan Version 2, which outlines current management practices, and adds changes from an SPCA review.

(d) **Notes** that Christchurch City Council responded to an avian botulism outbreak at the Bromley Wastewater Treatment Plant in the summer of 2021-22.

(e) **Circulates** this report to the Council, the Waimakariri Water Zone Committee, and the Community Boards for information.

3. BACKGROUND

3.1 An update on avian botulism and its management was presented to Council on 24 September 2019, (190905124322[v2]), 21 August 2018 (180719080426) and December 2015 (160301016953). These reports detailed the identification and management response of the disease at the Kaiapoi, Woodend, Rangiora and Waikuku WWTPs, and surrounding waterbodies.

3.2 Avian botulism is a paralytic disease of waterfowl, caused when toxin is released by bacteria commonly found in the substrates of lake and pond beds, including wastewater oxidation ponds. This toxin accumulates in aquatic invertebrates, which are then consumed by birds. The bacterium *Clostridium botulinum* is widespread in soil and requires warm temperatures, a protein source and an anaerobic (i.e. no oxygen) environment in order to become active and produce toxin. Decomposing vegetation and invertebrates combined with warm temperatures can provide ideal conditions for the botulism bacteria to activate and produce toxin.

3.3 Botulism is an intoxication (i.e. food poisoning) rather than an infectious disease. The affected birds show a number of consistent symptoms including weakness, lethargy and a progressive paralysis, which initially affects the legs and neck. Walking becomes difficult and paralysis of the neck means birds cannot hold their heads erect. For birds sitting on the water this inevitably leads to death by drowning.

3.4 Carcasses of dead birds are subsequently fed on by flies and their larvae, which then concentrates the botulinum toxin within the larvae and the bird-toxic maggot cycle commences. This leads to the deaths of subsequent waves of birds as they feed on the maggots in, and around, the dead bird carcasses.

3.5 Providing mildly affected birds with fresh water, shade and protection from predators may help them recover from the intoxication. Avian botulism antitoxin is available (potentially only overseas, such as in the USA), but requires special handling and must be given early in the intoxication. Birds that survive a botulism outbreak are not immune to future exposure to botulism toxin.

3.6 Avian botulism Type C, as identified at the Kaiapoi Wastewater Treatment plant, is not thought to be a risk to human health. Avian botulism Type E, which has not been identified in the Waimakariri District, does affect humans in rare cases.

4. ISSUES AND OPTIONS

Overview of avian botulism 2013-22

4.1. Figure 1 shows bird carcass numbers that have been collected by contractors at WWTPs and sometimes other ponds managed by WDC from 2013-22. In 2021-22 48 birds in total were collected from four WWTPs, primarily mallards and paradise shelducks, but also species such as cormorants (shags), Canada geese, New Zealand scaup, black-backed gull and black swans also collected. Note that cause of death is not confirmed by autopsy. However, avian botulism is thought to have caused significant number of deaths in Waimakariri District (i.e. defined as an outbreak) in 2013/14, 2014/15, 2017/18 and 2018/19.

4.2. The species of each carcass collected is recorded by Keystone Ecology Ltd, who are experienced in bird identification. No species that are listed as rare or threatened by the Department of Conservation threat classification system were collected in 2021/22 or in previous year since species records have been made.

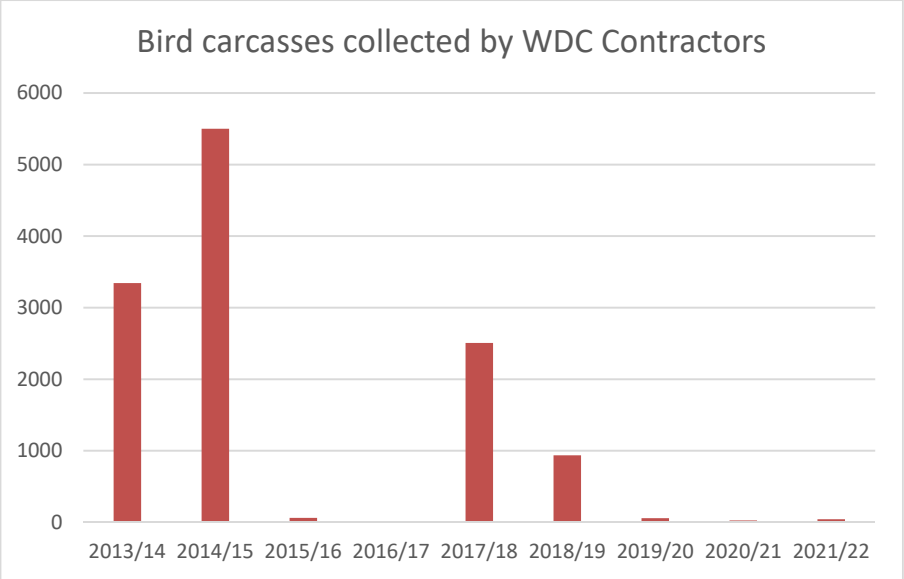

Figure 1: Bird carcasses collected 2013-22 by WDC contractors at all sites. NB data value may be slightly incorrect for the 2015-16 year, due to varying reports.

4.3. The first noted outbreak in the Waimakariri District was at the Kaiapoi Wastewater Treatment Plant (WWTP) in the summer of 2013/14. In total there were 3,336 birds that died at the Kaiapoi WWTP and 7 at Woodend WWTP. The majority of the dead birds were paradise shelducks and mallards. The second outbreak in the summer of 2014/15 was more significant with a total of 5,499 dead birds over the summer period. The incidence of avian botulism was also more widespread with birds affected at the Kaiapoi, Woodend, Rangiora and Waikuku Beach treatment plants, at the Kaiapoi Lakes public area, the Pegasus wetlands and the Tūhaitara Coastal Park wetlands (Tutaepatu Lagoon). In 2017/18 there were an estimated 2505 bird carcasses collected by Council contractors. Any outbreaks in the summers of 2015/16, 2016/17, 2019/20, 2020/21 and 2021/22 were negligible, due to likely factors such as weather (temperature and wind direction for example) that have not be analysed (see Figure 1).

SPCA Review of the WDC Avian Botulism Management Plan

4.4. An offer from the SPCA to review the WDC Avian Botulism Management Plan was accepted. The SPCA submitted their review report in October 2020. Most recommendations where accepted, and used to update the WDC Avian Botulism Management Plan (i.e. Version 2 – see Attachment 1).

4.5. The SPCA recommended improved monitoring and management of sick and dying birds. Due to the technical and health and safety difficulties of capturing sick and dying birds for rehabilitation or euthanasia, WDC did not incorporate the SPCA recommendation to capture and rehabilitate or euthanise sick and dying birds, unless they are a rare or threatened species listed by the Department of Conservation Threat Classification System. The WDC management plan focuses primarily on the prevention of spread of the disease to other birds.

Avian Botulism outbreak at Bromley Wastewater Treatment Plant

4.6. Over the summer of 2021-22, Christchurch City Council has confirmed that approximately 1350 dead waterfowl were collected from Bromley Wastewater Treatment Plant wetlands in response to an avian botulism outbreak. Due to difficultly of accessing islands in the wetlands, some bird carcasses were not able to be collected, therefore the total number of deceased birds, primarily thought to have died from avian botulism causes is in excess of 1,500.

4.7. Since the summer of 2011/12, there have sometimes been avian botulism Type C outbreaks in the Bromley Wastewater ponds in Christchurch. In summer 2012 there was a large outbreak with 6,300 birds collected, with death attributed to avian botulism within the Bromley Oxidation ponds. The actual estimated number of bird deaths was over 7,000 due to a number unable to be recovered.

4.8. In 2013/14, two years after the Bromley WWTP outbreak, WDC experienced the first noted avian botulism outbreak for the District at Kaiapoi WWTP. It was speculated that the avian botulism outbreak at the Kaiapoi WWTP was related to the outbreak at Bromley spreading to the wider area, such as through the movement of sick waterfowl between the two locations.

4.9. The bacterium that causes avian botulism is naturally occurring and is likely always present at all WWTP wetland sites at low levels in sediments, so is not necessarily a new infection that is spread between sites. It is rather that an outbreak at one site, such as Bromley WWTP, leads to concentrated toxins being passed on via the 'carcass-maggot cycle'. This cycle is where birds eat the maggots of a carcass that has passed away from avian botulism, where the toxin has accumulated then moves to another site before dying and also producing maggots with the accumulated toxin.

Water level management in WWTP wetland ponds

4.10. Water levels are able to be raised during summer time in WWTP wetlands with the use of weirs. In January 2022 the Kaiapoi infiltration wetlands water level was raised to cover cyanobacterial mats that had accumulated on the western shore and were decomposing exposed to the air, causing odour issues.

4.11. The maintenance of high water levels or slow raising of water levels is also recommended in the WDC Avian Botulism Management Plan, therefore odour management and avian botulism management options are compatible. However is should be noted that a slow increase in the water levels is recommended for avian botulism management, to not create a mass die-off event of food for waterfowl, which anecdotally is thought that could trigger an avian botulism outbreak. The water level in the Kaiapoi infiltration wetlands was gradually raised over a period of about a week, which was not found to cause any issues for avian botulism.

Implications for Community Wellbeing

There are not implications on community wellbeing by the issues and options that are the subject matter of this report. An information pamphlet on Avian Botulism has previously been prepared (refer TRIM 190204012544) to address the community's concerns regarding the disease.

4.12. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report, as some waterfowl are taonga species, collected for mahinga kai.

5.2. Groups and Organisations

There are groups and organisations likely to be affected by, or to have an interest in the subject matter of this report such as Te Kōhaka o Tūhaitara Trust, North Canterbury Fish and Game, the SPCA, Community and Public Health, Department of Conservation, Templeton Group and Christchurch City Council. Email updates have been sent out to a list of key stakeholders during the summer of 2021-22.

5.3. Wider Community

5.3.1. Although there is no legislative requirement, there is a social expectation of the Council to prevent outbreaks spreading to other wetland and lake areas, such as

in the Selwyn District and Hurunui District (e.g. Lake Forsyth/Wairewa, Te Waihora/ Lake Ellesmere).

5.3.2. Gamebird hunters i.e. duck shooters may have reduced opportunities for hunting, and require clear communication on the severity and locations of outbreaks.

5.3.3. Bird-watchers, bird lovers and the general public could be saddened to see sick and dead birds at public locations. Rare or threatened birds could be affected, though no rare or threatened bird deaths have been recorded to date.

5.3.4. Opportunities for mahinga kai (customary food gathering) of waterfowl and tuna (eel) may be reduced. Clear communication is needed with appointed Tangata Tiaki (customary fisheries officers).

5.3.5. The wider community is not likely to be affected by, or to have an interest in the subject matter of this report.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

6.1.1. There are no financial implications of the decisions sought by this report. This report is for information only.

6.1.2. This budget is an existing budget included in the Annual Plan for the operational cost of the wastewater treatment plants.

6.1.3. The cost of avian botulism management for 2021-22 was $19,525 excl GST, however this amount also includes a minimal cost of midge emergence trap monitoring, which is carried out by the contractor Keystone Ecology in the same visit. The cost in 2018-19 was $45,829 excl. GST. The cost in 2017-18 was $41,980 excl. GST for the bird collection by an ecology contractor. The variation is cost per year relates generally to an increase number of visits and/or hours required to retrieve bird carcasses.

6.1.4. The cost for bin rental, collection and disposal in 2021-22 was $1,070 (up to 30 April 2022) excl GST. The cost in 2018-19 for the waste disposal contractor was $3,081 excl. GST, and $5,773 excl. GST for 2017-18.

6.1.5. Costs to-date have come from within WDC Wastewater budgets, including for areas such as stormwater ponds and reserve areas. This may need to be re-evaluated if significant costs arise from outside of WWTP areas.

6.1.6. The cost of management is thought to be reduced by efficient monitoring, quick response and a coordinated response with other parties, such as the Christchurch City Council.

6.2. Sustainability and Climate Change Impacts

6.2.1. The recommendations in this report do not have sustainability and/or climate change impacts. However, climate change will have a likely effect on avian botulism outbreaks in the future if there are warmer temperatures for longer durations for example.

6.2.2. WDC staff monitor for weather predictions of warmer winters and summers, to enact management options early, and reduce risk of a larger or widely-dispersed outbreak.

6.3 Risk Management

6.2.3. There are no risks directly arising from the adoption/implementation of the recommendations in this report.

6.3 **Health and Safety**

6.2.4. There are no specific health and safety risks directly arising from the adoption/implementation of the recommendations in this report.

6.2.5. Health and Safety documentation and practices such as a Site Specific Safety Plan will continue to be in place and reviewed when appropriate for WDC staff and contractors.

6.2.6. Risks to human health can be minimised by clear communication of risks to staff i.e. promoting the use of gloves when in contact with bird carcasses and implementation of contractors' Health and Safety Plans.

6.2.7. In 2014/15 eels in Tutaepatu Lagoon are thought to have consumed some of the carcasses, which led to over 20 observed eels deaths. This raises a potential health and safety issue, due to the fact eels are gathered as a food source.

6.2.8. Collection of bird carcasses from wetlands is restricted to retrieval of wind-blown birds from the water's edge due to the risk for humans to enter the wetlands with treated effluent. This can reduce the efficiency and timeliness of bird carcass collection, with some areas are unable to be safely accessed for carcass removal.

6.2.9. Outbreaks should be re-confirmed to be avian botulism Type C by the Ministry of Primary Industries at regular intervals, particularly if symptoms presented are atypical.

7. CONTEXT

7.1. **Consistency with Policy**

7.1.1. This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Authorising Legislation**

7.2.1. The Local Government Act 2002 sets out the power and responsibility of local authorities, including the Council's role in providing wastewater services.

7.3. **Consistency with Community Outcomes**

7.3.1. The Council's community outcomes are relevant to the actions arising from recommendations in this report.

- There is a healthy and sustainable environment for all

7.4. **Authorising Delegations**

7.4.1. This report is for information only. No delegations apply.

Avian Botulism Management Plan 2020

Prepared by Sophie Allen – Water Environment Advisor
Waimakariri District Council
Version 2.0 (21 October 2020)

TRIM 201103147380

Prepared for: 3 Waters, Waimakariri District Council

Prepared by: Sophie Allen – Water Environment Advisor

File / Record Number: SEW-03-01-04-13.01 / 201103147380

Version Number	Prepared By	Comments	Date
1.0	Sophie Allen	First version	30 October 2019
1.1	Sophie Allen	Living document – to be continually reviewed and updated	19 February 2019
1.2	Sophie Allen	Reviewed by Kalley Simpson – 3 Waters Manager	18 March 2019
1.3	Sophie Allen	Feedback from MTO meeting 16 September 2019	17 September 2019
2.0	Sophie Allen	Incorporating selected recommendations from the SPCA review	21 October 2020

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1. Objectives

The objectives of this management plan are to:

- Minimise bird deaths from avian botulism, particularly of rare or threatened species within the Waimakariri District.
- Minimise spread of an avian botulism outbreak to other areas within the District and Canterbury region.
- Minimise any real or perceived health risk from avian botulism to our community, and minimise further bird deaths.

2. Background

2.1. The Disease

Avian botulism is a paralytic disease of waterfowl, caused when toxin is released by bacteria commonly found in the substrates of lake and pond beds, including wastewater oxidation ponds and wetlands. This toxin accumulates in aquatic invertebrates, which are then consumed by birds. The bacterium Clostridium botulinum is widespread in soil and requires warm temperatures, a protein source and an anaerobic (i.e. no oxygen) environment in order to become active and produce toxin. Decomposing vegetation and invertebrates combined with warm temperatures can provide ideal conditions for the botulism bacteria to activate and produce toxin.

Botulism is an intoxication (i.e. food poisoning) rather than an infectious disease. The affected birds show a number of consistent symptoms including weakness, lethargy and a progressive paralysis, which initially affects the legs and neck. Walking becomes difficult and paralysis of the neck means birds cannot hold their heads erect. For birds sitting on the water this inevitably leads to death by drowning.

3. Introduction

3.1. Summary of Avian Botulism Outbreaks

3.1.1. Wider Canterbury

Since the summer of 2011/12, there have been avian botulism Type C outbreaks in the Bromley Wastewater ponds in Christchurch. In summer 2012 there were 6,300 birds collected, with death attributed to avian botulism within the Bromley Oxidation ponds. The actual estimated number of bird deaths is over 7,000 due to a number unable to be recovered. Since then there have been outbreaks at the Christchurch City Council ponds every summer. The general noted pattern is that there is a reduction in dead birds after approximately 3 to 4 years.

3.1.2. Waimakariri District

The first outbreak in the Waimakariri District was at the Kaiapoi Wastewater Treatment Plant (WWTP) in the summer of 2013/14. In total there were approximately 3,336 birds that died at the Kaiapoi WWTP and 7 at Woodend WWTP. The majority of the dead birds were paradise shelducks and mallards. The second outbreak in the summer of 2014/15 was more significant with a total of 5,499 dead birds over the summer period. The

spread of avian botulism was also more widespread with birds affected at the Kaiapoi, Woodend, Rangiora and Waikuku Beach treatment plants, at the Kaiapoi Lakes public area, the Pegasus wetlands and the Tūhaitara Coastal Park wetlands (Tutaepatu Lagoon). The outbreaks in the summers of 2015/16 and 2016/17 and 2019/20 were negligible (see Figure 1). This was potentially due to seasonal factors, such as rainfall and temperature, with no direct factors such as WDC management confirmed.

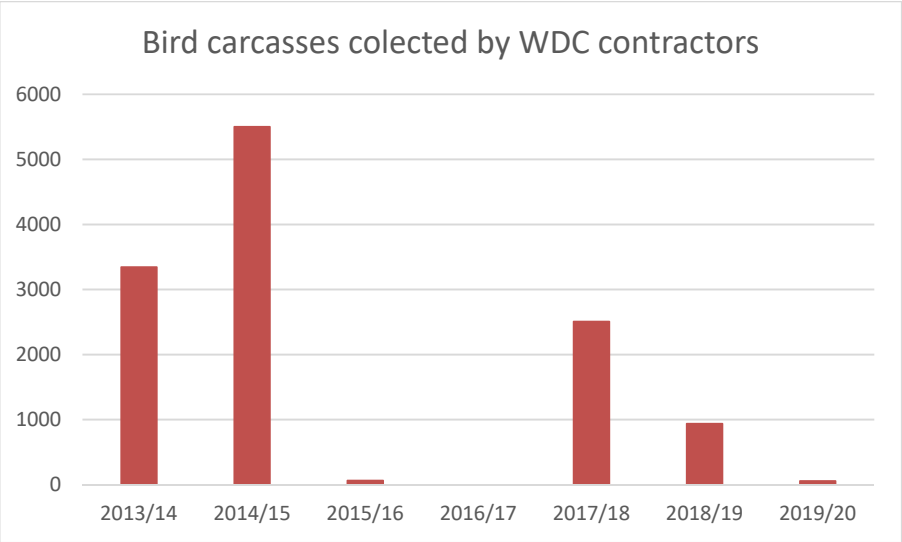

Figure 1: Bird carcasses collected 2013-20 by WDC contractors at all sites. NB data value may be incorrect for the 2015-16 year, due to varying reports.

3.2. Rare or threatened bird species

No rare or threatened bird species (as defined by the Department of Conservation Threat Classification System) have been found during bird carcass collection by Keystone Ecology Ltd, who are experienced in bird identification.

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3.3. Avian botulism toxic cycle

Birds initially consume invertebrates that contain the naturally-occurring botulism toxin. Carcasses of dead birds are subsequently fed on by flies and their larvae, which then concentrates the botulinum toxin within the larvae and the carcass-toxic maggot cycle commences (see Figure 2). This leads to the deaths of subsequent waves of birds as they feed on the maggots in, and around, the dead bird carcasses.

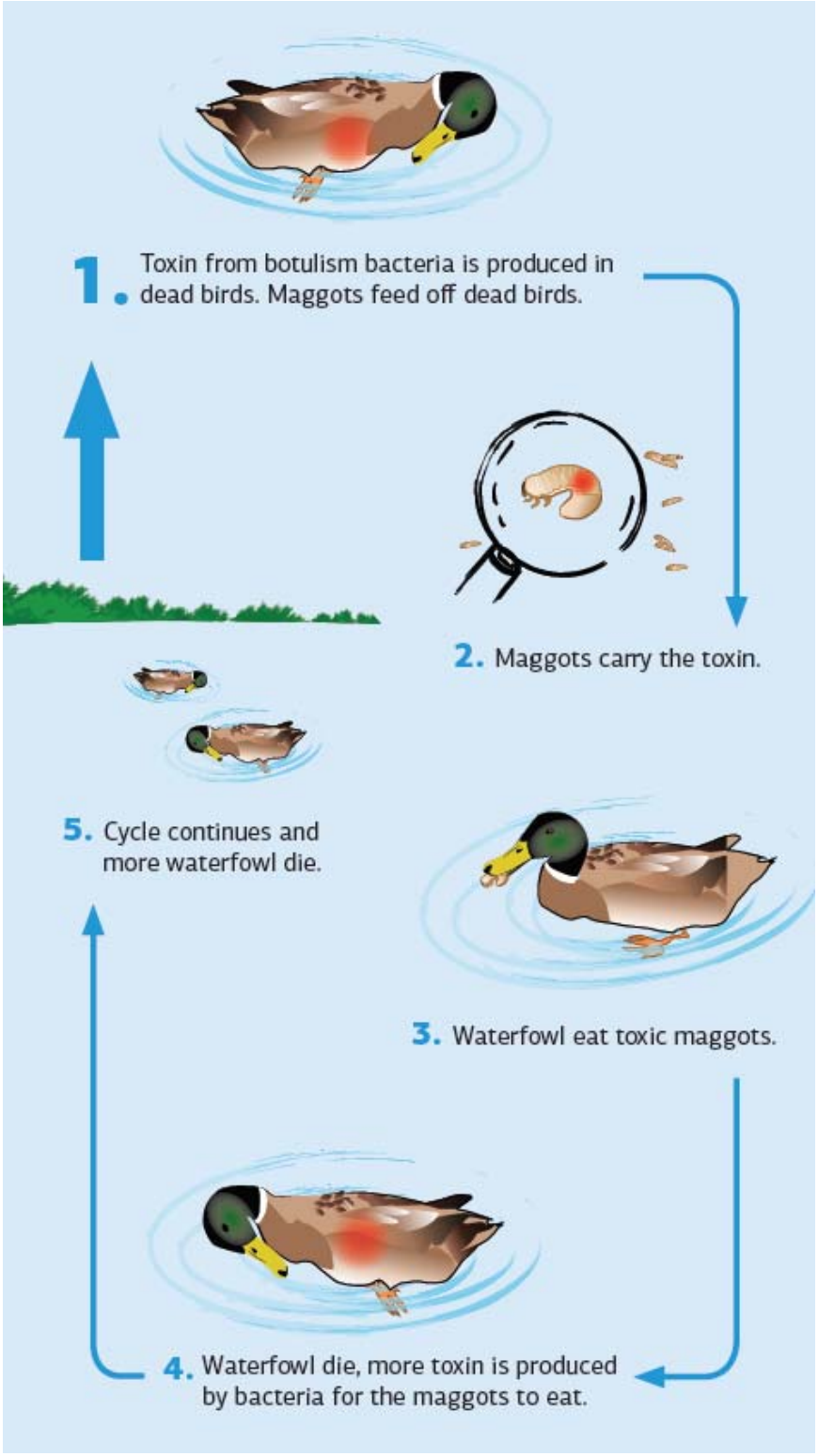

Figure 2: The 'carcass - maggot cycle', which perpetuates avian botulism.

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3.4. Treatment

Providing mildly affected birds with fresh water, shade and protection from predators may help them recover from the intoxication. Avian botulism antitoxin is available (potentially only overseas, such as in the USA), but requires special handling and must be given early in the intoxication. Birds that survive a botulism outbreak are not immune to future exposure to botulism toxin.

3.5. Risk to other species

Avian botulism Type C, as identified at the Kaiapoi Wastewater Treatment plant, is not a risk to human health. Avian botulism Type E, which has not been identified in the Waimakariri District, does affect humans in rare cases.

Fish, such as eels in Tutaepatu Lagoon in the Tuhaitara Coastal Park, have anecdotally died due to consuming birds containing the toxins. Dogs have also been anecdotally reported to have been affected overseas, though not within the Waimakariri District.

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4. Management options

Documented management options of avian botulism include bird carcass removal, bird deterrents (such as canons), barley straw bale installation, maintenance of water levels, and avoiding removal of macrophytes (water plants). Other management options may arise from further research and trials, therefore WDC should keep up-to-date with developments.

Management follows a seasonal pattern with an example of a typical year in Table 1.

Table 1: Overview example of the seasonal management cycle

Time of year	**Management Action**
July	Commence a new year for carcass removal data. Compile data for the previous year.
September	Annual report to Council / Utilities and Roading committee with data from the previous year and any new management options. Update of Management Plan if necessary. Preparatory discussions/meeting with stakeholders prior to the commencement of the summer season.
October	Review of any contracts for services and health and safety documentation.
November	Mow grass at Kaiapoi Wastewater Treatment Plant and other sites if required to enable ease of carcass spotting and collection. Installation of waste disposal bins, if not already kept on site all year.
On-going, particularly in summer and autumn	Review of bird carcass collection frequency. Contact and updates with stakeholder groups. Media release at the advent of an outbreak. Repeat of mowing grass at Kaiapoi Wastewater Treatment Plant and other sites to enable ease of carcass spotting and collection.

4.1. Carcass Removal

Carcass removal of dead birds is carried out on an as-required basis, with removal frequency increasing in proportion to bird death numbers. The frequency of carcass removal could range from every day during the peak of an outbreak, down to weekly. Early installation of collection bins by a hazardous waste collection company, such as Interwaste Ltd, is effective, to ensure a quick response for an outbreak (see Figures 3 to 5 for locations). Ensure collected birds are disposed of safely, as biohazard waste. Pre-emptive grass mowing by WDC around the Kaiapoi Wastewater Plant waterline and any other site with long grass in early summer aids easier spotting and collection of bird carcasses.

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Figure 3: Recommended location of waste disposal bin location (purple dot) at Kaiapoi Wastewater Treatment Plant, near the entrance gate for ease of collection.

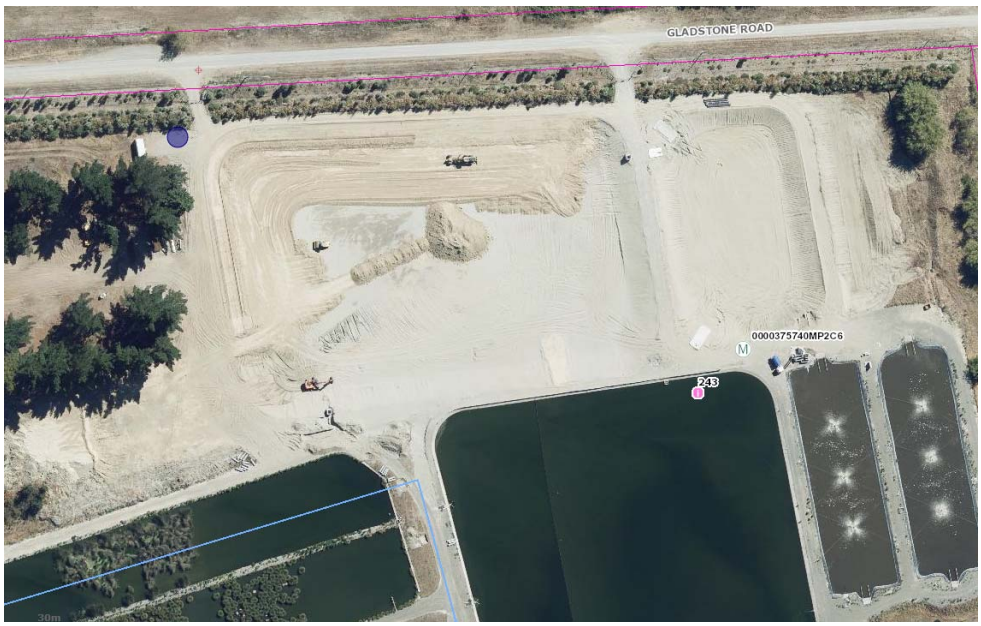

Figure 4: Recommended location of waste disposal bin location (purple dot) at Woodend Wastewater Treatment Plant, near the entrance gate for ease of collection.

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Figure 5: Recommended location of waste disposal bin location (purple dot) at Rangiora Wastewater Treatment Plant.

4.2. Preferred contractors and record keeping

Use of experienced contractors with ecological knowledge of bird species, such as Keystone Ecology Ltd are preferred by WDC for bird carcass removal. Bird carcass disposal should be carried out by an experienced hazardous waste disposal company.

A standardised bird carcass recording sheet has been set up (for example 2017-18 data spreadsheet TRIM 180723081684), which should be replicated for each year (from 1 July – 30 June) on-going as required. Standardisation of data captured will allow comparisons between years, and potentially assessment of effectiveness of any novel management option.

4.3. Rehabilitation of rare and threatened birds

Rare or threatened species (as defined by the New Zealand Species Classification System, Department of Conservation) that are found sick will be rehabilitated where this is feasible. The New Zealand Bird Rescue Charitable Trust has a facility in Christchurch, run by Jackie Stevenson, which is suitable for this rehabilitation. Bird capture may be by grabbing a bird, if too sick to move, or more complex methods, such as the use of net guns. Capture of any bird must first consider and protect the health and safety of humans. Therefore there may be occasions where bird capture is not recommended. For transportation of birds, the New Zealand Bird Rescue Charitable Trust recommends to not feed the bird or give it water but simply place it in a box lined with paper towels and tissues and close the box to reduce stress for the bird. Keep it in a quiet environment until it reaches the rescue centre.

4.4. Stable water levels and water temperature

Maintenance of a stable water level has been recommended by the Department of Conservation to WDC, as fluctuating water levels may increase invertebrate and fish die-offs, creating a protein source for the avian

botulism bacteria. This management option is not recommended at wastewater treatment plants due to the priority to maintain operating capacity, but could be employed in other waterbodies. It could be feasible to install an additional water supply at the Kaiapoi WWTP (i.e. from groundwater) during summer months when water levels drop due to high evaporation rates, if operating capacity was not significantly reduced. This could also help to cool water temperatures to be less suitable habitat for the botulism bacteria. However, an alternative water supply option is not currently available at this site.

4.5. Preventing rotting vegetation and algal mats

Rotting vegetation can also contribute to an outbreak. Therefore WDC should avoid spraying/cutting of macrophytes (water plants) before or during an outbreak, i.e. in the cut-off drain surrounding the Kaiapoi Wastewater Treatment Plant, if feasible. Additionally, it has been suggested that removal of algal mats should be considered for feasibility, with safe disposal from the site. However, removal may be difficult, as the algae tend to disintegrate. Removal of algal mats has not been trialled by WDC, and there were no records found of algal mat removal trials elsewhere. This possible management option is therefore considered as experimental, and should only be pursued with caution.

4.6. Management options not recommended

Barley straw bale installation has been trialled by Auckland Council and other organisations to contain algal/organic material mats that harbour the botulism spores. This management option is not recommended as feasible for effective implementation in WDC wastewater treatment plants, due to disintegration of the bales causing potential problems such as blockages or failure of UV treatment downstream and the large number of bales (several thousand) that would be required. Bird deterrents, such as the use of canons to produce noise, have anecdotally been reported by the ecological contractor providing ornithological advice to WDC to not be effective over a the longer term, as birds become accustomed to the deterrent, and ignore it. WDC staff report that historically LPG gas canons have been previously deployed at Kaiapoi Wastewater Treatment Plant, for reasons other than avian botulism management. The waterfowl however, became accustomed to the sound of the canons, and complaints were received from neighbours.

4.7. Future Management Options

Bird deterrents for temporary relocation of waterfowl, other than LPG gas sound canons, could be evaluated, as recommended by the SPCA review of the WDC Avian Botulism Management Plan (TRIM 201014137227). To-date, however, suitable bird deterrent methods have not be found by previous WDC staff.

Euthanasia of birds could be carried out, via methods recommended by the SPCA review of the WDC Avian Botulism Management Plan.

According to the American Veterinary Medical Association (as of 2019) preferred methods of euthanasing wild birds include:

- Inhaled agents such as anaesthetic, CO_2, and inert gases such as nitrogen and argon. However, these may not be appropriate for birds that can dive unless given at high concentration and for extended period of time. These also require access to proper equipment and trained staff.

- Physical methods such as cervical dislocation, decapitation, exsanguination, and blunt force trauma. When performed by a trained person, these methods are more humane because they lead to rapid death, are safer for workers because they avoid human interaction with toxins in the animal, and are more feasible because they can be performed with equipment that is readily available

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- Injectable agents such as injectable anaesthetic, barbiturates, or T-61. These methods require access to agents and skilled personnel, and may not be feasible for large numbers of animals.

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5. Monitoring and Reporting

WDC Wastewater Treatment Plants are monitored regularly by the visiting Water Unit and WDC staff (1-3 times per week) for signs of an outbreak during the summer season. In addition, WDC staff are recommended to monitor long-term weather forecasts for ideal outbreak conditions (i.e. long hot summers and/or warm winters with few frosts).

Records are kept of bird species numbers that are removed, as well as observation notes on i.e. sick birds following the reporting spreadsheet (see example at TRIM 180723081684). The reporting year follows the financial year of 1 July – 30 June.

Reporting of bird species, location, numbers and comments from the contractors will be forwarded, at least weekly, to WDC staff to manage any avian botulism response measures, distribute a weekly update to stakeholders during higher bird death periods, and compiled into an annual summary to be submitted to Council.

WDC staff will report incidences of unusual bird deaths to the Ministry for Primary Industries- Biosecurity New Zealand. WDC staff will advocate to MPI to repeat testing of bird carcasses to confirm avian botulism Type C or another disease, if there is any cause for concern.

6. Health and Safety

- Occupational Health and Safety Management Plan - Keystone Ecology (TRIM 160115002665)
- Draft Site Specific Safety Management Plan and Job Specific Analysis (JSA) for bird carcass collection and wading – Keystone Ecology (TRIM 190204012536)

7. Collaboration and Communication

7.1. Communication plan

There will be clear communication with the public, such as a media release at the advent of an outbreak (see example TRIM 150126009655), and community guides (a pamphlet and Q&A sheet, see Appendix A). The community guides advise the public on the level of risk, and how to report sick and dead birds. Communications within WDC 3 Waters, Water Unit and Greenspace and with contractors will ensure continued sharing of information, such as Health and Safety documents, will continue to be conveyed to WDC staff and contractors.

7.2. Collaborative management

It is recommended to facilitate a joint response to outbreaks with Community Public Health, Christchurch City Council, North Canterbury Fish and Game, Te Rūnanga o Ngāi Tūāhuriri, Te Kōhaka o Tūhaitara Trust, the SPCA, and the management of Pegasus Town.

Te Kōhaka o Tūhaitara Trust (TKoT): The spread of avian botulism to Tūhaitara Coastal Park wetlands in 2014/15 had negative consequences for carcass control, due to the difficulty in recovering the carcasses from this area. Tutaepatu Lagoon in Tūhaitara Coastal Park had 1,000 birds estimated to have died in 2014/15 with only wings remaining, indicating collection was carried out too late. Eels in Tutaepatu Lagoon are thought to have consumed some of the carcasses, which led to over 20 observed eels deaths. This raises a potential

health and safety issue, due to the collection of eels as a food source. An offer of bird carcass disposal in WDC-hired bins is recommended to be offered to TKoT on an as required basis.

Te Rūnanga o Ngāi Tūāhuriri: Outbreaks of avian botulism could restrict the ability to carry out mahinga kai (customary food-gathering) of both waterfowl and eels.

Community Public Health: Consumption of waterfowl and eels could be an unknown human health risk.

North Canterbury Fish and Game: Hold a role to protect the quality of waterfowl game for hunters, and to protect hunters from any potential illness.

Templeton Group - managers of Pegasus Town: own land wetlands around Pegasus between the Kaiapoi and Woodend Wastewater Treatment Plants, which may be effected by an outbreak.

Department of Conservation: Have a responsibility to care for native biodiversity, particularly if rare or threatened.

Christchurch City Council: The Council has had large outbreaks at Bromley Wastewater Treatment Plant in the recent decade, with significant waterfowl deaths.

SPCA: The SPCA has offered support with outbreak management and bird rehabilitation advice.

8. Budget

An indicative future costs for management of avian botulism if there is a significant outbreak is $50,000 per year, based on the cost of bird carcass removal for 2017-18, however costs will fluctuate significantly dependent on the level of outbreak.

2017-18 Costs
$41,980 (excl. GST) for the bird collection by Keystone Ecology Ltd, an ecological services contractor.
$5,773 (excl. GST) for bin rental, collection and disposal in 2017-18 for the waste disposal contractor San I Pak Ltd.

Costs to-date have come from within WDC Wastewater budgets, including for areas such as stormwater ponds and reserve areas. This may need to be re-evaluated if significant costs arise from outside of WWTP areas.

A minimal new cost in the form of a donation to the New Zealand Bird Rescue Charitable Trust, is proposed in the case of required rehabilitation of a rare or threatened bird. This donation is set at the discretion of WDC. To date, no sick birds that are rare or threatened have been sighted by the ecological contractor. The cost of management is reduced by efficient monitoring, quick response and a coordinated response with other parties, such as the Christchurch City Council.

TRIM 201103147380

APPENDIX A. Public communications materials

Information pamphlet (TRIM 190204012544)

Avian Botulism

Is avian botulism a threat to me?

Avian botulism cannot be contracted by humans but take the following procautions:

- Don't let pets eat dead birds/waterfowl (or fish)
- Don't handle dead birds/waterfowl (or fish) with bare hands
- Don't harvest sick or dying birds/waterfowl (or fish).

What if i see a sick bird?

If you discover an unwell bird you can take it to Bird Rescue Christchurch. Please follow the safety precautions above when handling sick waterfoul.

Bird Rescue Christchurch
2A Glen Place Parklands, Christchurch
Phone: (03) 383 1488
Email: gary.stevenson@xtra.co.nz

For more information go to:
waimakariri.govt.nz - search "avian botulism".

WAIMAKARIRI DISTRICT COUNCIL waimakariri.govt.nz

What is avian botulism?

- It is a disease causing lethargy, paralysis and can lead to death in birds (most commonly waterfowl). It cannot be contracted by humans
- Toxins produced by the *Clostridium botulinum* bacteria infect birds – even a small amount of the toxin can harm birds
- *Clostridium botulinum* is naturally occurring in soils present in ponds and wetlands. It's harmless until triggering environmental factors occur simultaneously – such as hot and humid weather
- Avian botulism proves to be very stubborn and difficult to eliminate because of the naturally occurring bacteria that produces the toxin. However, there are ways to mitigate its spread.

How does avian botulism spread?

The majority of outbreaks are caused by ducks eating maggots that have fed off dead birds. This diagram illustrates the lifecycle of the disease.

Dead bird - maggot cycle

Our mitigation measures

- Swift removal of dead birds/waterfowl. This helps break the infection cycle
- Providing waste bins and bags for pet waste at select local parks.

How you can help reduce avian botulism?

- Avoid feeding the ducks. It's best if they forage naturally
- Don't feed bread to ducks. If it's not eaten, it can rot in the pond and promote growth of botulism bacteria
- If you do feed the birds/waterfowl, please feed them on land and with seeds and grains. These are also best for them
- Pick up and properly dispose of your pet's waste
- Contact the Council if you see a sick or dead duck *(if you think it may have avian botulism)*. If you live rurally, please bury any dead birds
- Share what you now know about the topic with family and friends so they can help to reduce its spread.

TRIM 201103147380

Q&A Infosheet (TRIM 190204012546)

FREQUENTLY ASKED QUESTIONS

Avian Botulism

What is avian botulism?

- It is a disease causing lethargy, paralysis and can lead to death in birds (most commonly waterfowl). It cannot be contracted by humans
- Toxins produced by the Clostridium botulinum bacteria infect birds – even a small amount of the toxin can harm birds
- Clostridium botulinum is naturally occurring in soils present in ponds and wetlands. It's harmless until triggering environmental factors occur simultaneously – such as hot and humid weather
- Avian botulism proves to be very stubborn and difficult to eliminate because of the naturally occurring bacteria that produces the toxin. However, there are ways to mitigate its spread.

How does avian botulism spread?

- The majority of outbreaks are caused by ducks eating maggots that have fed off dead birds.

What are the Council's mitigation measures?

- Swift removal of dead birds/waterfowl, helping break the infection cycle
- Providing waste bins and bags for pet waste at selected local parks.

How can I help reduce avian botulism?

There are a number of things you can do:

- Avoid feeding the ducks. It's best if they forage naturally
- Don't feed bread to ducks. If it's not eaten, it can rot in the pond and promote growth of botulism bacteria
- If you do feed the birds/waterfowl, please feed them on land and with seeds and grains. These are also best for them
- Pick up and properly dispose of your pet's waste
- Contact the Council if you see a sick or dead duck *(if you think it may have avian botulism)*. If you live rurally, please bury any dead birds
- Share what you now know about the topic with family and friends so they can help to reduce its spread.

Is avian botulism a threat to me?

Avian botulism cannot be contracted by humans so the risk to humans is considered very small. But it's still important to protect your health and the health of your pets. Here's how:

- Don't let pets eat birds/waterfowl (or dead fish)
- Don't handle birds/waterfowl (or dead fish) with bare hands
- Don't harvest sick or dying birds/waterfowl.

What if i see a sick bird?

If you discover an unwell bird you can take it to **Bird Rescue Christchurch**. Please follow the safety precautions above when handling sick waterfoul.

Bird Rescue Christchurch can be found at:
2A Glen Place Parklands, Christchurch
Tel: (03) 383 1488 and Email: gary.stevenson@xtra.co.nz

For more information go to: waimakariri.govt.nz - search "avian botulism".

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