Days with extreme temperatures

This report presents indicators of extreme temperature (hot days and cold days) in Aotearoa New Zealand. It comments on the current overlap in where temperature extremes occur and the geographical distribution of populations that are more vulnerable to heat.

Key facts

- Since the year 2000, nearly every year has had more than the average number of hot days and fewer than average cold days for the 1991–2020 climate normal period.
- New Zealand experienced an average of 35.1 hot days, where maximum temperatures exceeded 25°C and 17.7 cold days, where minimum temperatures were below 0°C in 2024.
- In 2024, hot days were most common in the east and west of the North Island.
- In 2024, cold days were most common in much of the South Island and the North Island's central plateau.
- Higher concentrations of vulnerable populations live in areas prone to hot days, particularly Māori, young children and people living in higher levels of deprivation.

New Zealand's climate is expected to keep warming

It is very likely that climate change will increase the number of hot days (where the maximum temperature exceeds 25°C), particularly in the north of the North Island. Additionally, there will be a decrease in the number of cold days (where minimum temperatures fall below 0°C), particularly in the South Island (Ministry for the Environment 2018; Royal Society Te Apārangi 2017).

Since 1909 **+1.13°C (±0.27)**	The annual average temperature in New Zealand has risen by 1.13°C since 1909 (Ministry for the Environment & Stats NZ 2020).
By 2040: **+0.7–1.0°C**	Climate scientists predict that relative to 1986–2005, New Zealand will continue to warm by 0.7–1.0°C by the year 2040 (Ministry for the Environment 2018).
By 2090: **+0.7–3.0°C**	Climate scientists predict that relative to 1986–2005, New Zealand will continue to warm by 0.7–3.0°C by the year 2090 (Ministry for the Environment 2018).

A hotter climate will have consequences for health

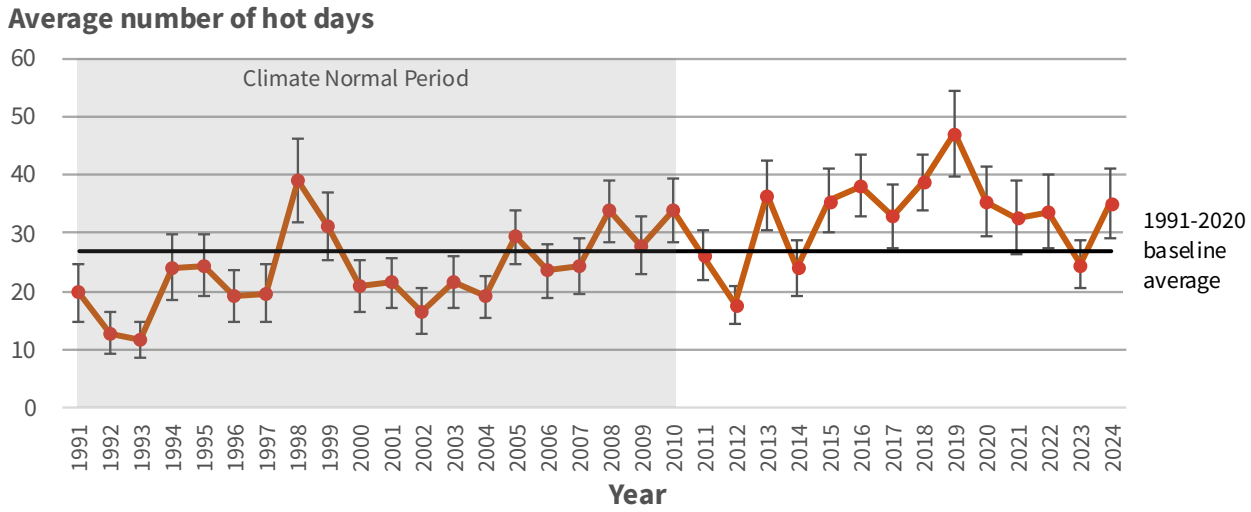
A hotter climate will alter biological processes in our environment that can affect our health. Increased temperatures can affect health in several ways.

- Research suggests that periods of higher temperatures are linked to an increase in salmonellosis and other gastrointestinal diseases (Lal et al 2016).
- Increasing temperatures can change the geographical distribution of some mosquitoes, which may carry infectious diseases (Smith et al 2014).
- Increasing temperatures bring a longer pollen season and increased fire risk, which is associated with increases in respiratory problems.
- Heat is linked to worsening heart problems and an increase in overall death rates (Hales et al 2007; McMichael et al 2003).

Since 1991, hot days have become more common and cold days rarer

During the Climate Normal Period (1991–2020), which sets a baseline for climate variables, the average number of hot days was 26.9. In 2024, the average was 35.1, continuing a steady increase beginning before the start of the Normal Period (Figure 1).

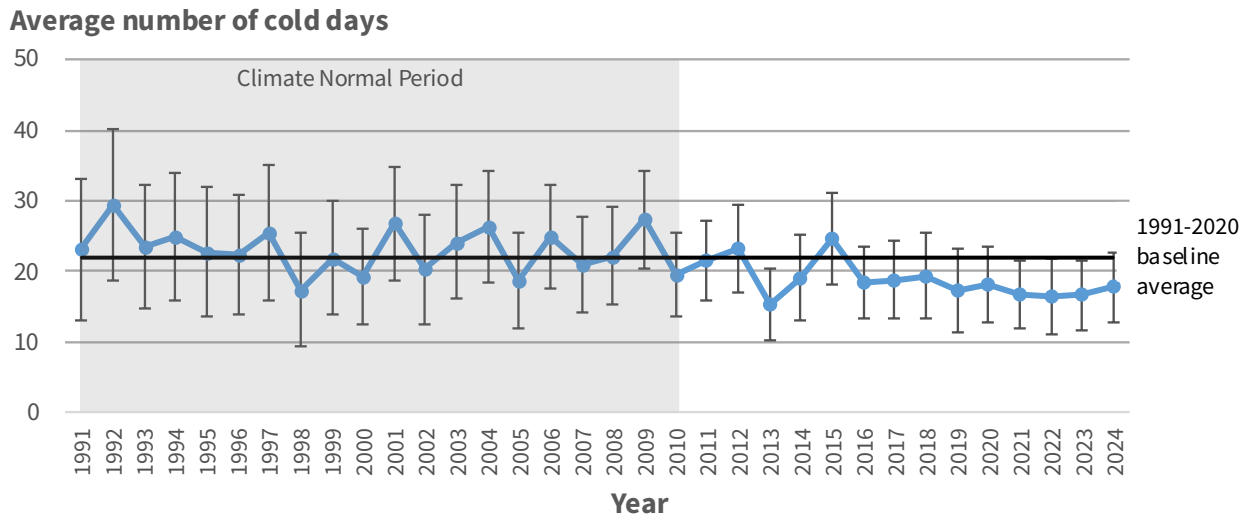
Figure 1: Average number of days with maximum temperatures above 25°C, 1991–2024



Note: 95% confidence intervals have been presented as error bars. The baseline refers to the most recent Climate Normal Period, 1991–2020 (WMO 2025). Thirty years of data were averaged to act as a benchmark against which current or recent observations can be compared. The New Zealand average is calculated based on the data taken from each climate station with valid data for a given year.
Source: NIWA

During the Climate Normal Period (1991-2020), the average number of cold days was 21.8. In 2024, there were 17.1 cold days on average, close to the fewest on record. The number of cold days each year has been in steady decline for some time, even during the Normal Period (Figure 2).

Figure 2: Average number of days with minimum temperatures below 0°C, 1991–2024



Note: 95% confidence intervals have been presented as vertical bars. The baseline refers to the most recent Climate Normal Period, 1991–2020 (WMO 2025). Thirty years of data were averaged to act as a benchmark against which current or recent observations can be compared. The New Zealand average is calculated based on the data taken from each climate station with valid data for a given year.

Source: NIWA

Hot days were more common in the north and east

In 2024, New Zealand experienced an average of 35.1 days where maximum temperatures exceeded 25°C. Hot days were most common in the north and east of the North Island and isolated pockets of the South Island. The Territorial Authorities (TAs) with the most hot days (Figure 3) were:

- Kawerau (Bay of Plenty) – 114 days
- Wairoa (Hawke's Bay) – 80 days
- Hastings (Hawke's Bay) / Central Otago (Southland) – 72 days each

This indicator examines records for 59 climate stations dating back to 1981. For any of these stations to record more than 100 hot days a year is extremely rare, having happened only twice, at Wairoa in 2021 (103 days) and at Kawerau again in 2018 (102 days).

Kawerau has historically recorded high numbers of hot days, averaging 78.1 during the 1991-2020 Normal Period, making it the warmest TA in the country during that time by a margin of ten hot days per year.

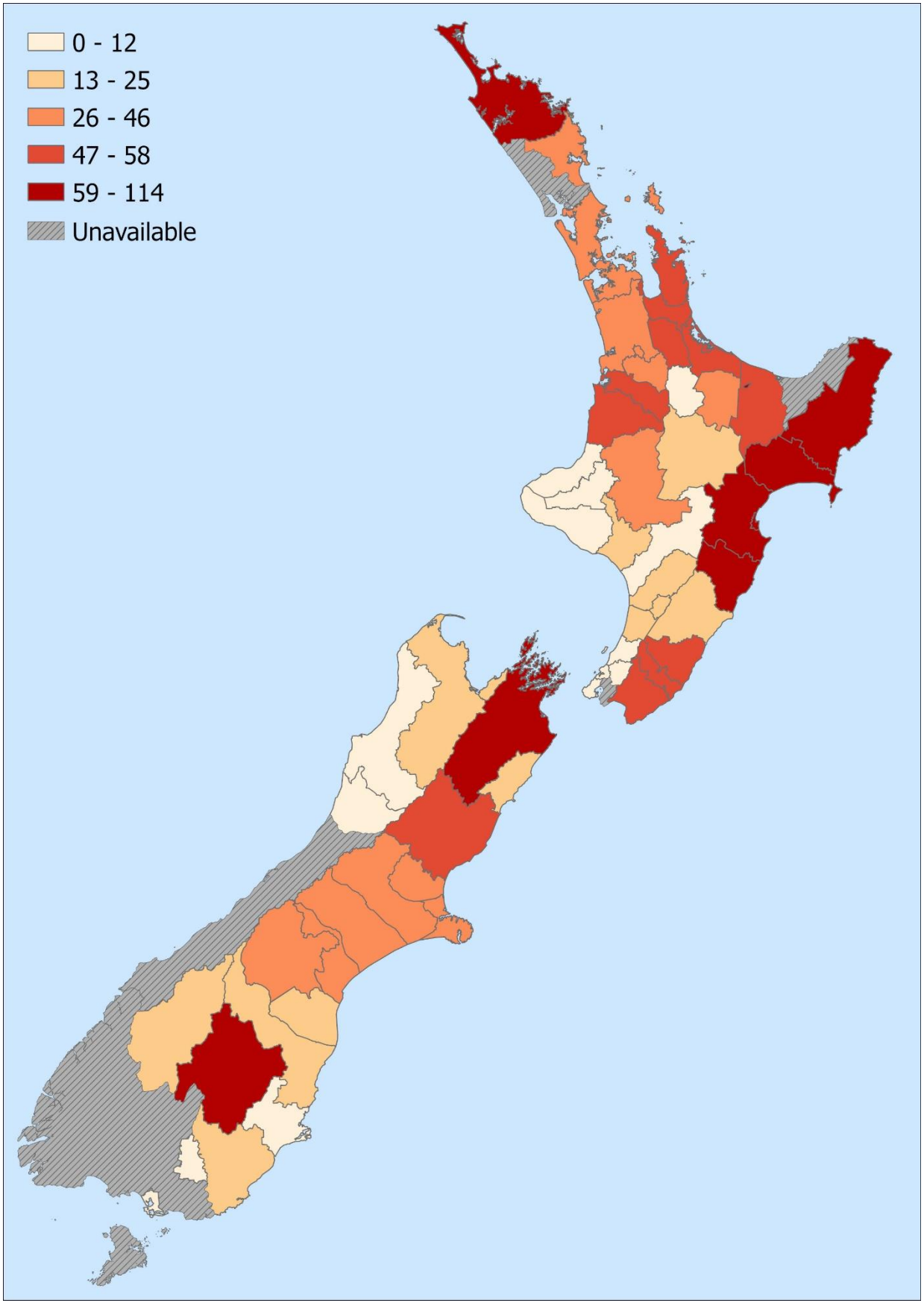
Cold days were most common in the south

In 2024, New Zealand experienced an average of 17.7 days where minimum temperatures were below 0°C. Cold days were most common in much of the South Island and the North Island's central plateau. The TAs with the most cold days (Figure 4) were all in the lower South Island:

- MacKenzie (South Canterbury) – 125 days
- Central Otago (Southland) – 93 days
- Queenstown-Lakes (Otago) – 69 days

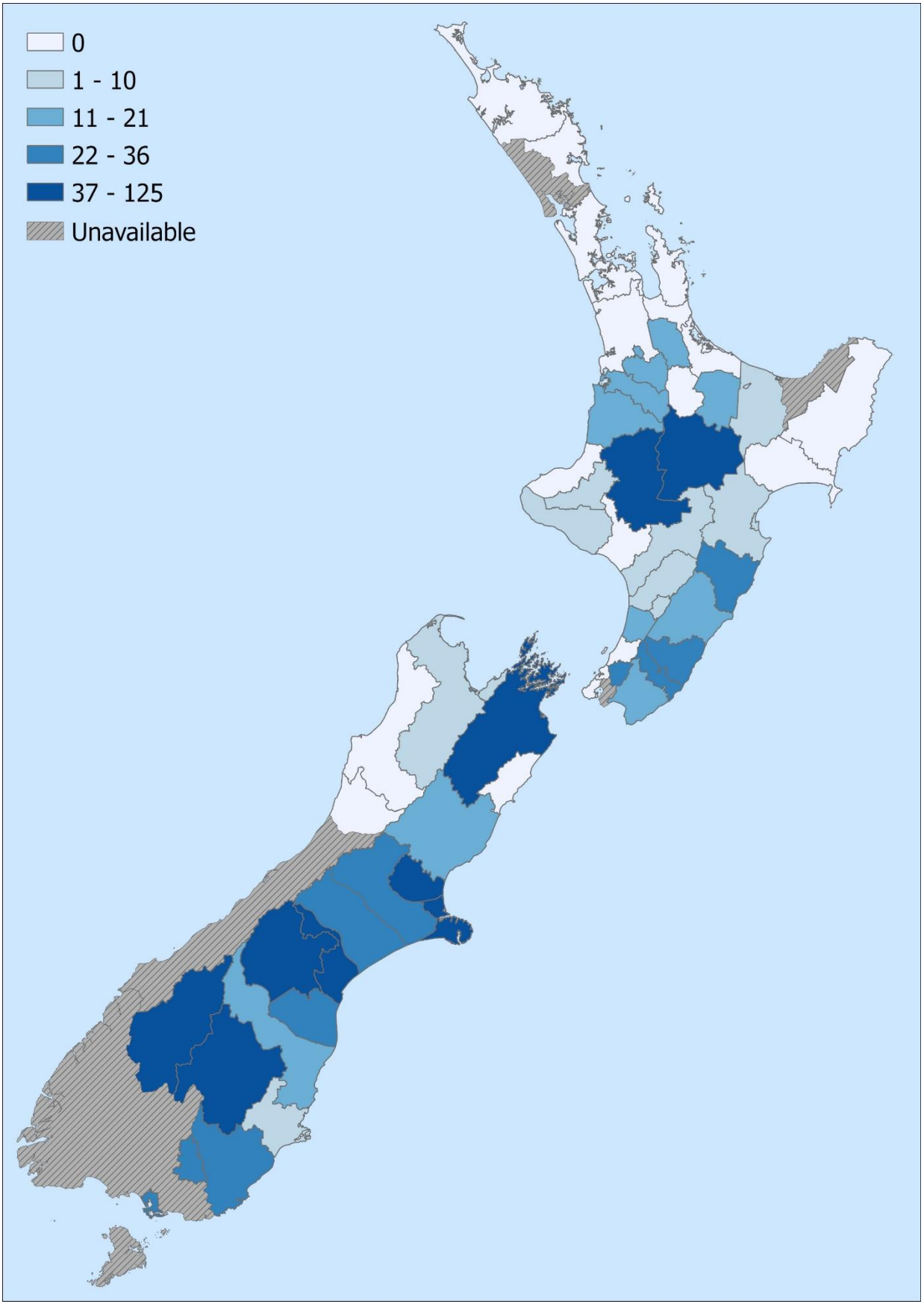
Central Otago experiences both ends of the extreme temperature scale, regularly hosting high numbers of both hot and cold days.

Figure 3: Average number of days with maximum temperatures above 25°C, 2024



Source: NIWA

Figure 4: Average number of days with minimum temperatures below 0°C, 2024



Source: NIWA

Many in New Zealand are vulnerable to high temperatures

Populations more vulnerable to temperature-related health effects are:

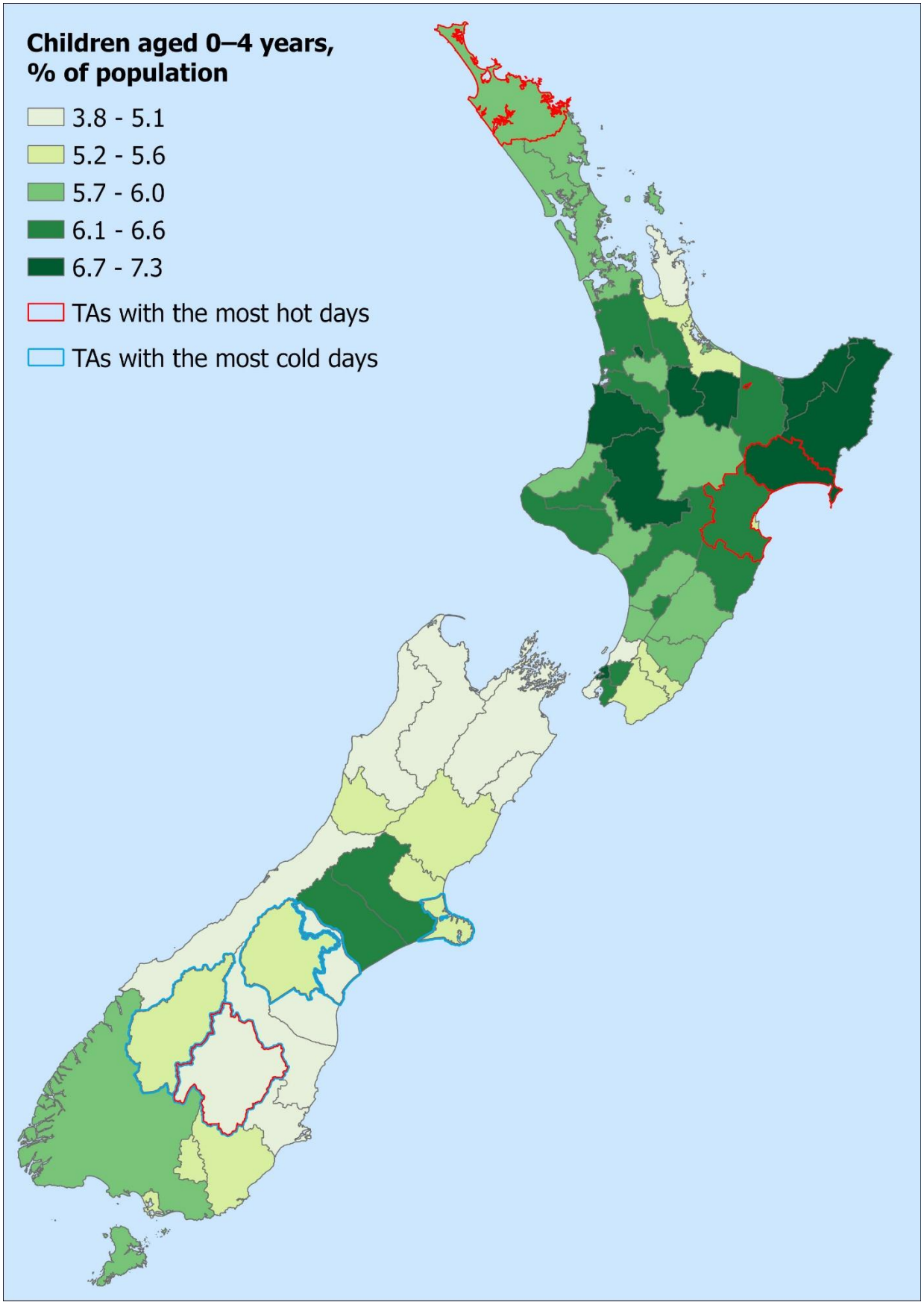
- Young children aged 0–4 years, through having fewer sweat glands than adults and being more quickly dehydrated from 'tummy bugs') (Smith et al 2014; Gamble et al 2016).
- Older people 85 years and over, through taking medications that cause water loss and being more quickly dehydrated from 'tummy bugs') (Smith et al 2014).
- Māori communities, who often have high employment rates in outdoor occupations and primary industries (Te Puni Kōkiri 2007).
- People employed in primary industries. Working in primary industries (and other outdoor occupations) increases a person's exposure to the potential health effects of elevated temperatures (e.g. hyperthermia or occupational heat stress) (Royal Society Te Apārangi 2017).
- Those on low incomes (for instance, if someone lacks money for transport, it can be hard to get to a swimming pool or beach to cool down) (Smith et al 2014).
- Those with chronic disease or disability (eg, cardiovascular diseases or mental illness).

Areas prone to hot days overlap with concentrations of vulnerable people

Combining temperature and population data shows that Northland, the east coast of the North Island, and parts of the Bay of Plenty are likely to be regions where people will be particularly affected by the direct health effects of temperature increases. For example, many Māori live in the north and east of New Zealand, where hot days are projected to increase (Ministry for the Environment 2018).

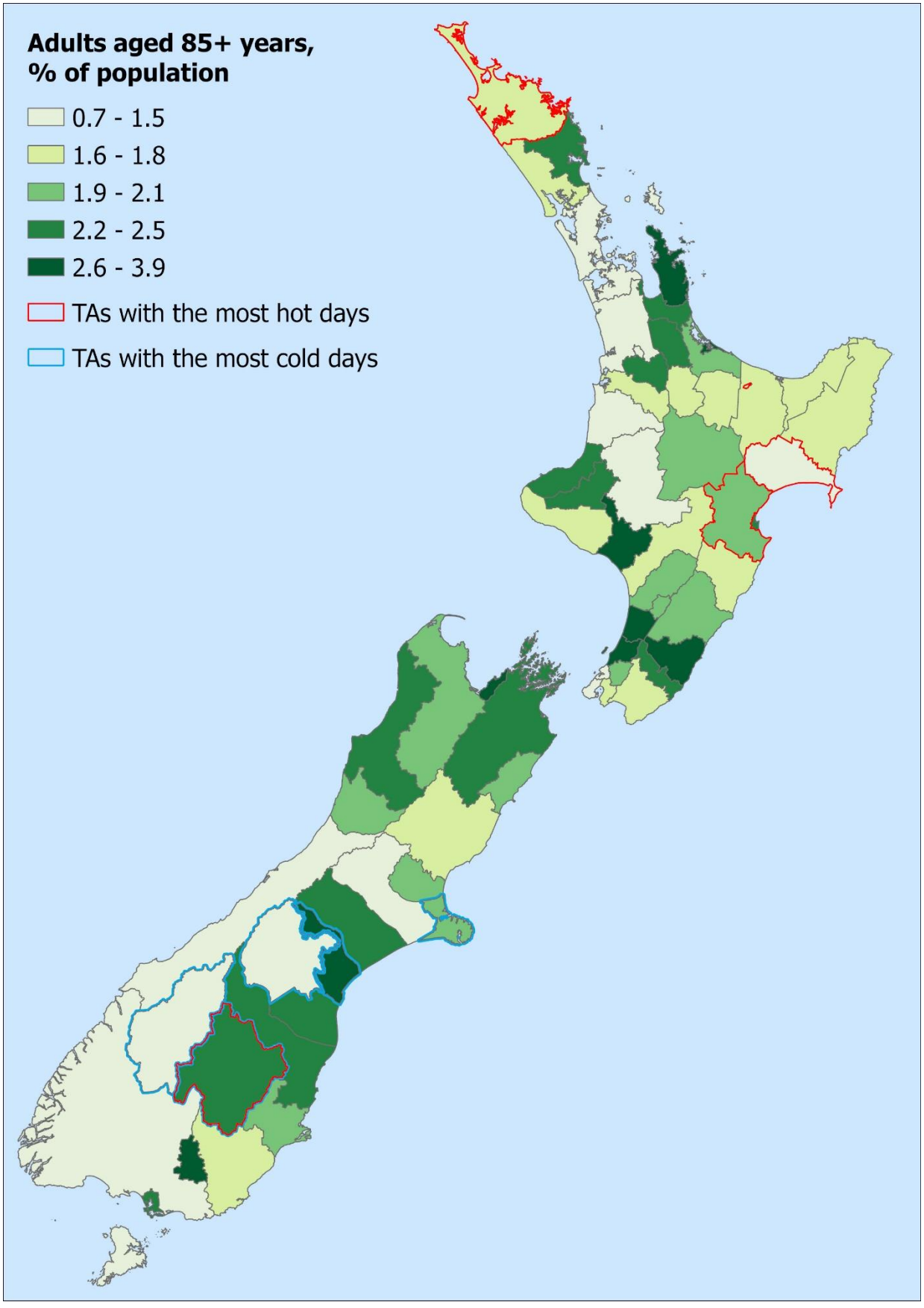
Figures 5a – 5e below show the TAs with the most hot and cold days in 2024, in relation to the distribution of these vulnerable populations as of the 2023 Census.

Figure 5a: Children aged 0–4 years old, by TA (% of total population)



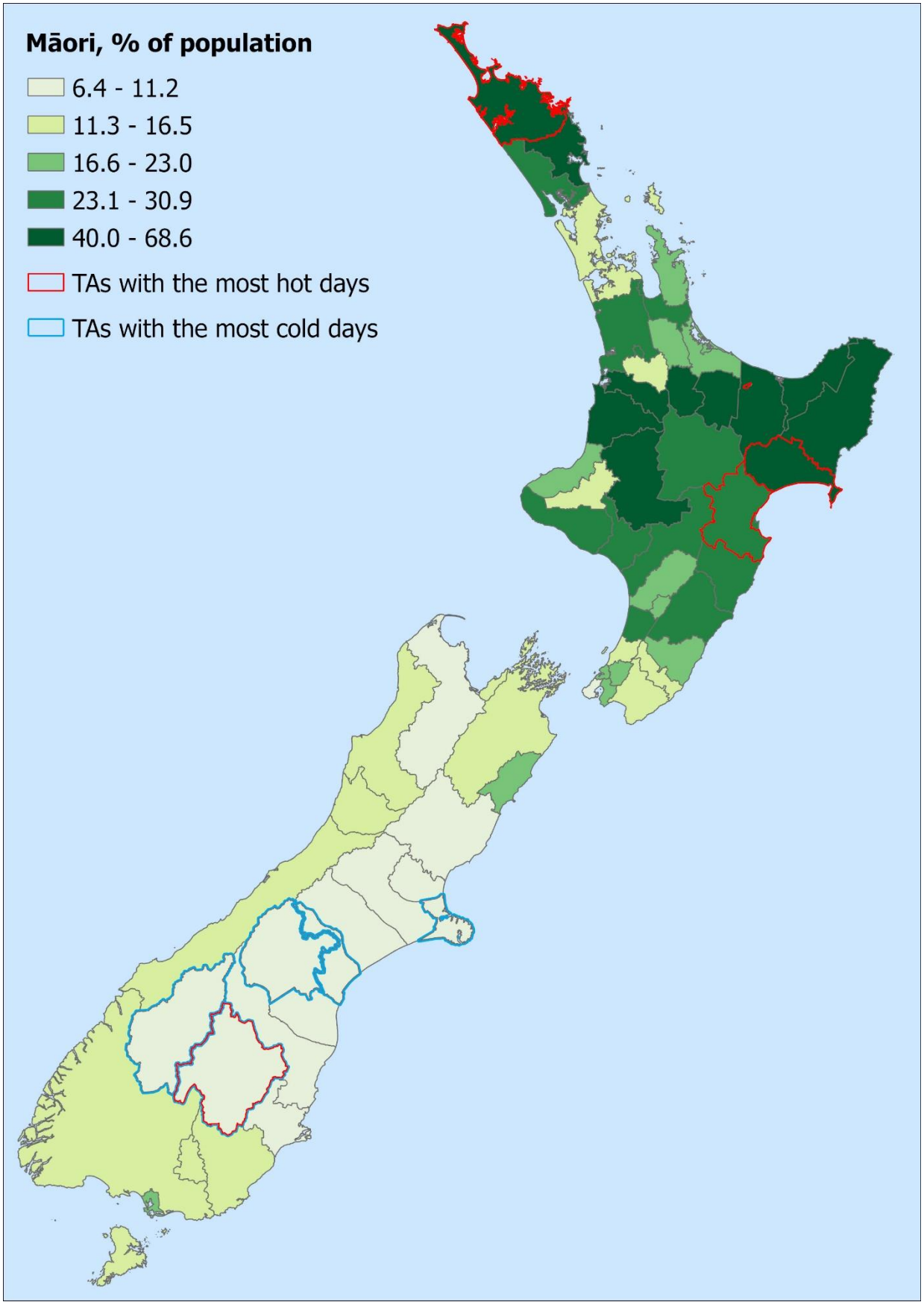
Source: NIWA, Statistics New Zealand

Figure 5b: Older adults aged 85+ years, by TA (% of total population)



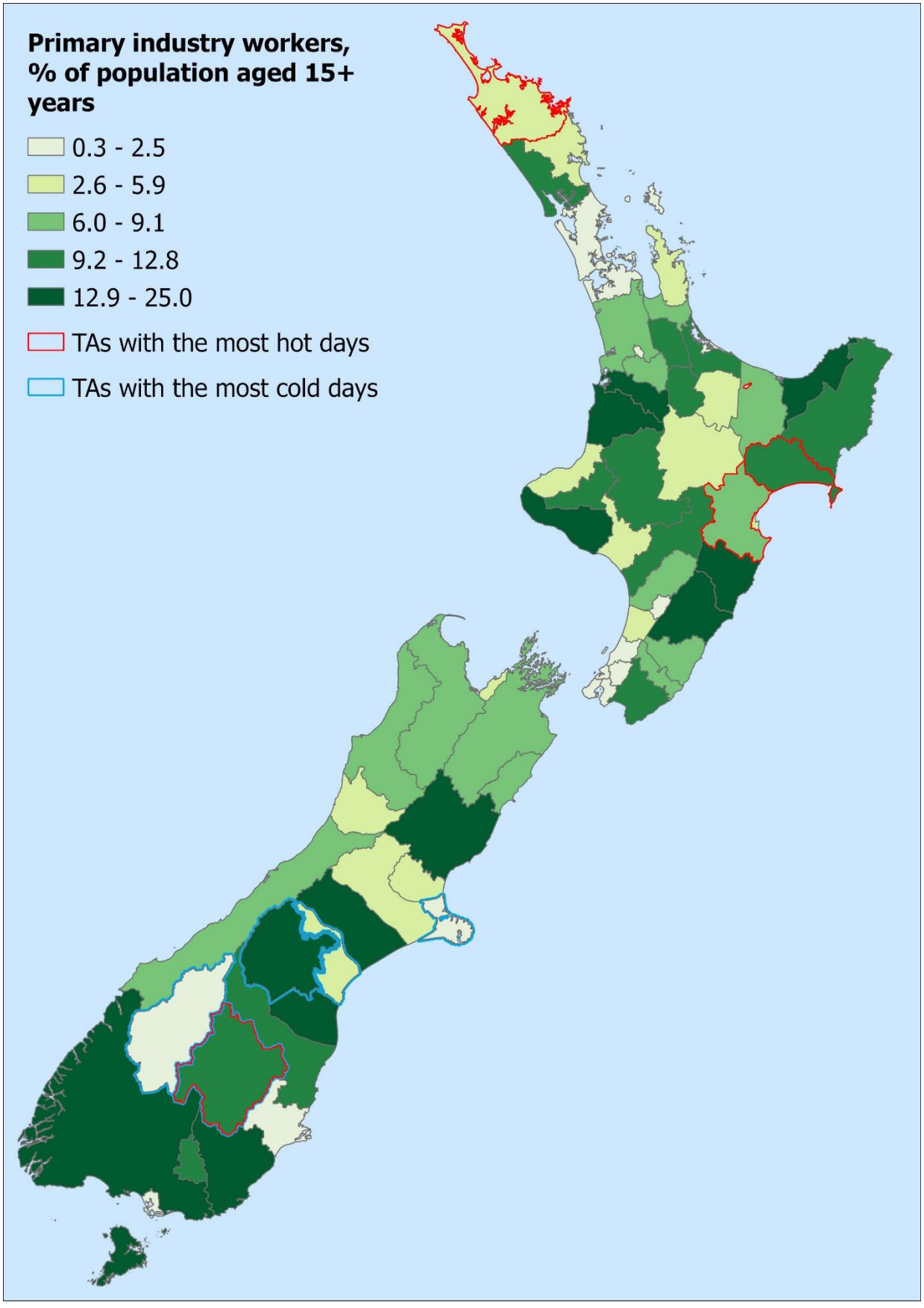
Source: NIWA, Statistics New Zealand

Figure 5c: Māori population, by TA (% of total population)



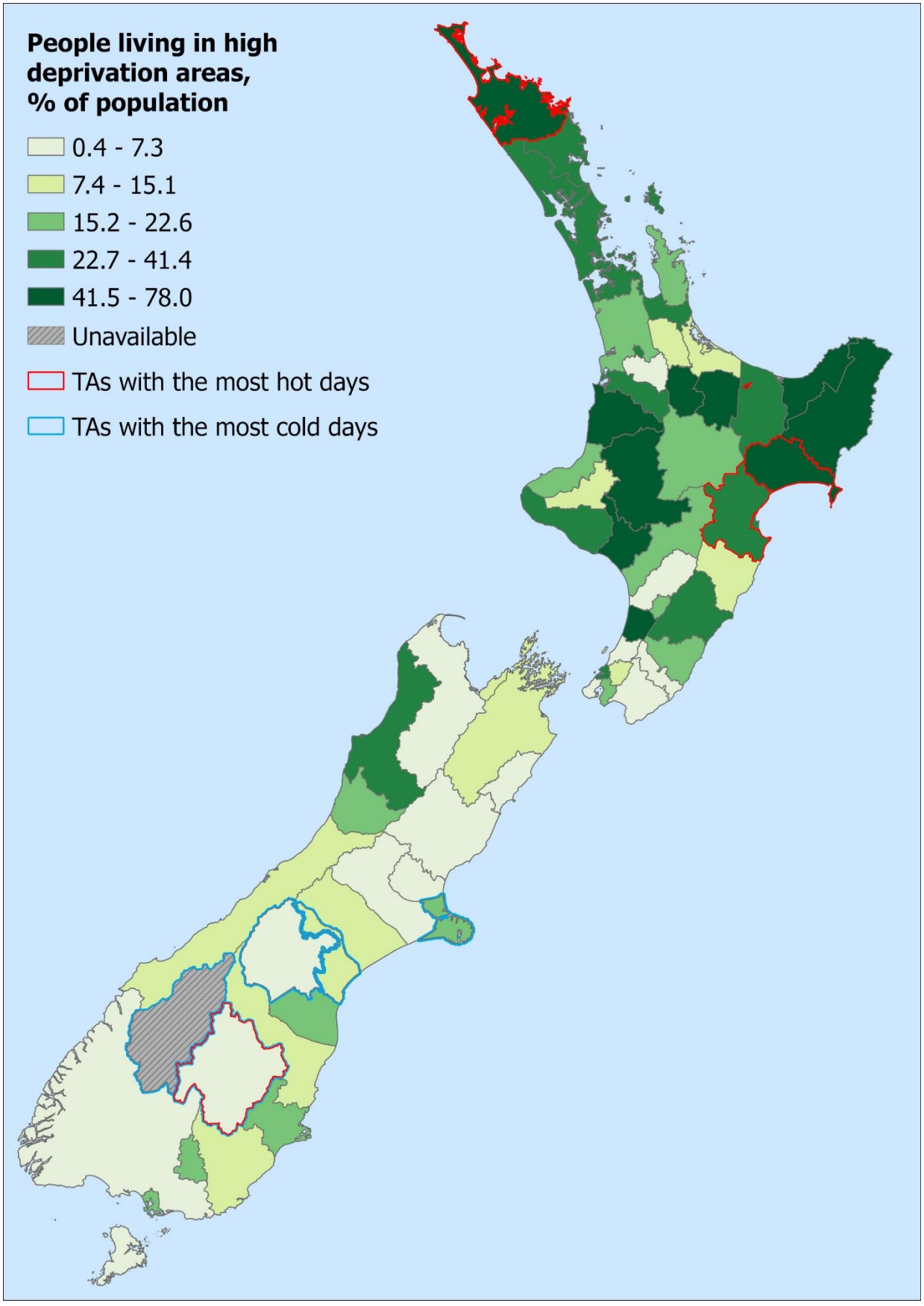
Source: NIWA, Statistics New Zealand

Figure 5d: People working in primary industries, by TA (% of population aged 15+ years)



Source: NIWA, Statistics New Zealand

Figure 5e: People living in areas of high deprivation (NZDep2023 deciles 9 & 10), by TA



Source: NIWA, Statistics New Zealand

Data for this indicator

This indicator analyses climate station records of the daily maximum and minimum temperatures around New Zealand, sourced from the Datahub web service provided by the National Institute of Water and Atmospheric Research (NIWA). One climate station was selected per Territorial Authority, based on their proximity to each TA's population-weighted centroid (2018 Census data).

The number of hot days (days with a maximum air temperature above 25°C) and the number of cold days (days with a minimum temperature below 0 °C) were counted for each year by TA. Only years with data for 90% of all days or more were counted. Data was compared to the most recent Climate Normal Period, 1991–2020, where the 30-year average acts as a benchmark against which more recent observations can be compared.

All 95% confidence intervals have been presented as error bars on graphs. For additional information, see the Metadata sheet.

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Citation

Environmental Health Intelligence. 2025. *Days with extreme temperatures*. [Surveillance Report]. Wellington: Environmental Health Intelligence NZ, Massey University.

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