Te Uru Kahika Regional and Unitary Councils Aotearoa

CRITICAL DATASETS FOR ADAPTATION TO CLIMATE-RELATED NATURAL HAZARDS

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INTRODUCTION

1. Te Uru Kahika represents the sixteen regional councils and unitary authorities comprising Aotearoa New Zealand's regional sector. The name Te Uru Kahika reflects the work and vision of the regional sector: *thriving environments and thriving communities*.
2. Regional and unitary councils have wide-ranging statutory functions. These include: integrated management of land, air, coasts, and water resources; supporting biodiversity and biosecurity; providing for regional transport services; and building more resilient communities in the face of climate change and natural hazards.
3. Our statutory functions are grounded in place and people. Our work is informed by relationships with communities, iwi/Māori, and stakeholders, and by long-term observation of local environments. These enable us to respond to emerging issues and generate insights highly relevant to decision-making for on-the-ground action.
4. **This document provides a *prioritised list of datasets* identified by the regional sector as critical for New Zealand's adaptation to climate-related natural hazards.**
5. To develop this list, we build on previous work undertaken by the regional sector[1] and focus on:
    a. datasets that presently exist but need to be made more accessible or improved, and
    b. datasets that don't presently exist but are urgently needed.
6. In providing this list of critical datasets, we aim to make a constructive contribution to current, data-dependent work programmes, including:
    a. Delivering the regional sector's climate adaptation programme, which builds resilient communities and safeguards the well-being of people, the environment, and the economy.
    b. Developing a National Adaptation Framework, which aims to strengthen how New Zealand prepares for the effects of climate change.
    c. Reforming the Resource Management System, which will update legislation and national direction for land use planning, with consideration of natural hazards and climate change.
    d. Improving national emergency management legislation and supporting systems, which aim to ensure a whole-of-society approach to emergency management
    e. Enhancing key datasets for resilience and climate change, which aims to support decision-making for emergency management.
    f. Refocusing of the national science, innovation and technology system, which aims to clarify research priorities and improve outcomes from Government's SI&T investments.

[1] For example, see BECA (2023), Data Collation Gap Analysis for the Wellington Regional Climate Change Impact Assessment and Urban Intelligence (2025), Hawke's Bay Regional Climate Change Risk Assessment.

OVERARCHING COMMENTS ON INFORMATION-SHARING

7. We highlight the following overarching matters which should be borne in mind and communicated when prioritising investment into critical datasets and information-sharing initiatives:

    a. The 16 regional and unitary authorities collectively employ around 700 science and technical staff who work on environmental monitoring, research, modelling, and investigations. These professionals generate, manage, and apply complex datasets that underpin regional and national risk assessments, planning, and policy decisions.

    b. Despite funding pressures, **regional government continues its investment** into environmental data. Our stewardship reflects both our statutory responsibilities and our understanding of the long-term value of environmental intelligence.

    c. Regional authorities **are already collaborating** on substantial, long-term initiatives to improve the robustness, accessibility and interpretability of key environmental datasets. Programmes such as LAWA and NEMS exemplify this.

    d. **Further funding is essential**. Central government co-investment into federation of regional sector data would help to unlock its full use in national-scale climate adaptation and environmental decision-making.

    e. **Improving system integration** is one of the nation's greatest opportunities. While some datasets are best coordinated nationally (e.g., rain radar), others are best delivered locally (e.g., assessing flood hazards). Integrating local and national datasets is challenging but essential, as local insights improve the relevance and accuracy of national models.

    f. Effective system integration requires the **ability to merge and evaluate data from different sources**, for specific decision-making contexts. In addition to sufficient funding, this requires standards (for producing, describing, accessing and federating datasets), system level governance, social buy-in, and political support.

    g. **Criticality should be assessed in terms of the solutions the datasets enable** (e.g. flood forecasting, adaptation planning). Avoid siloed assessments of individual datasets that might overlook interdependencies or gaps across the data landscape as a whole.

    h. The most **valuable datasets support multiple functions and organisations**, e.g.:

        i. Managing more than one hazard type, such as both droughts and floods.

        ii. Supporting both emergency management readiness, response, recovery and climate adaptation planning, particularly for compounding impacts.

        iii. Supporting a range of functions such as climate risk assessments, plan changes, property buy-outs, assessing plan effectiveness, or processing consent applications and monitoring of their compliance.

        iv. Supporting other functions in addition to climate adaptation, e.g. management of land, freshwater, other types of natural hazards, etc.

        v. Having sufficient resolution and coverage to be applied nationally, regionally or locally.

    i. **Transparency and consistency in data sharing** are vital. Legislative solutions may be needed to overcome barriers that inhibit public benefit such as permissions, liability concerns and inconsistent data availability. A clear mandate for minimum data standards and accessibility expectations would support better outcomes.

PRIORITISED CRITICAL DATASETS

8. **Table 1** lists the critical datasets that would aid the regional sector's decision-making in relation to climate-related natural hazards. **Annex 1** provides more detail on each dataset.

9. These datasets cover four categories based on Government guidance, all of which are important for understanding of risk (Figure 1):

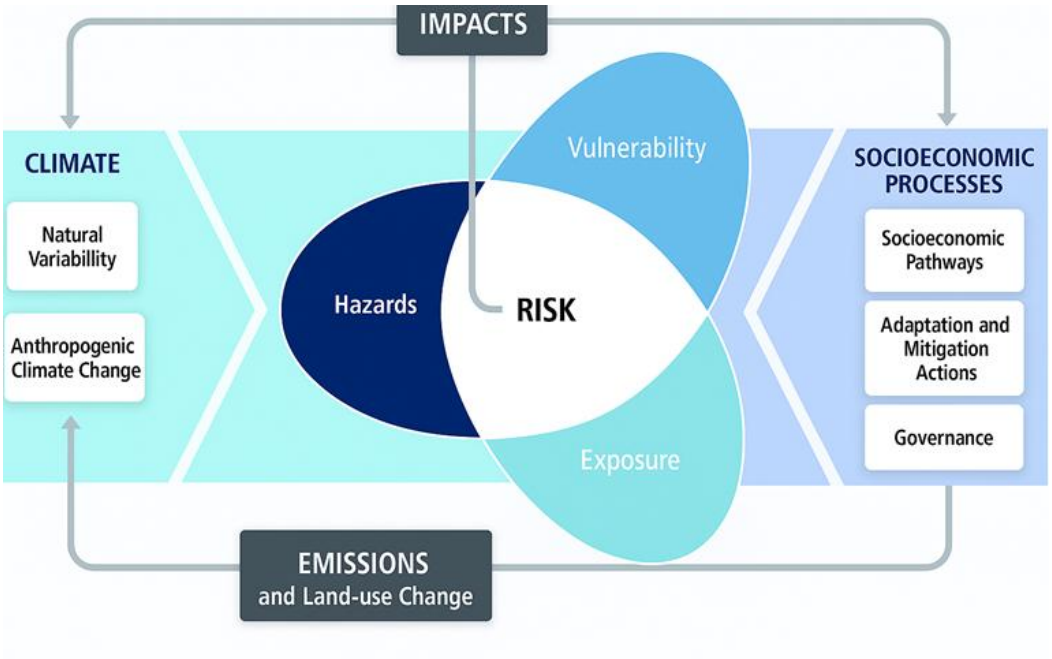
    a. ***Hazard*** – the potential for occurrence of a particular type and intensity of natural hazard event over a given time period, at a location of interest.

    b. ***Exposure*** – the presence of people, livelihoods, species or ecosystems, or built assets (i.e., things we value) that might be affected by a natural hazard event.

    c. ***Vulnerability*** – the propensity or predisposition to being adversely affected.

    d. ***Mitigations*** – Human interventions or adaptation actions intended to reduce the impact(s) of natural hazard events.

Figure 1: Climate-related risk as the interaction of hazards with the exposure and vulnerability of human (built, societal) and natural systems (Source: MfE, 2021, after Oppenheimer et al. 2014).



10. We evaluated the 'criticality' of each dataset using the rubric presented in **Annex 2**, in which:

    a. ***Urgency*** describes

        i. how directly and significantly the item (dataset, tool, model, portal, etc.) supports climate adaptation initiatives, and

        ii. how critically an investment in it is needed in the next 1-3 years to support regional sector functions, including short- and longer-term decision-making, on average across all regions.

    b. ***Cost*** describes the estimated additional funding and/or time equivalent, beyond what we're aware has already been committed (e.g. by MfE, regional authorities), required to bring the item (dataset, tool, model, portal, etc.) up to usable level in terms of robustness, accessibility, etc, as needed for it to adequately support our functions and decision-making.

Table 1 - Te Uru Kahika's **CRITICAL DATA NEEDS** for adaptation to climate-related natural hazards, by **urgency of need*** (next 1-3 years) and **estimated cost*** to bring dataset to useable level in terms of robustness, availability.

- **Abbreviations** indicate the components of the risk framework that the dataset helps to understand: **A** = All, **E** = Exposure, **V** = Vulnerability, **M** = Mitigation, **H** = Hazard.
- **Numbers** in square brackets correspond to Row # in Annex 1.
- **Fill colour** indicates role of regional authorities in producing, maintaining and providing access to these datasets: **green** = major/lead role, **blue** = significant contributing role.

	Low cost (estimated <$100k)	Moderate cost (estimated $100-500k)	High cost (estimated $500k-1m)	Very high cost (estimated >$1m)
Very high urgency		**V** Buildings: Age, design standard (e.g. floor level) [8] **H** Update High Intensity Rain Design System [30] **H** Federated climate data (e.g. rain, temp, wind) [31] **H** Probable maximum precipitation [32] **H** Flood maps (inundation) @ 1% AEP [44]	**A** Aerial imagery [2] **M** Flood Management Asset Registry [4]	**A** Satellite imagery (e.g. visual, SAR) [3] **H** River flow forecasts (minutes to days) [50]
High urgency		**A** Damage records: Direct, indirect, intangibles [20] **M** Adaptation plans and adaptation options [5] **M** Buildings: Asset management plans [9] **H** Fire Risk Projections [35] **H** Drought Projections (PED, SPI) [38] **H** Hydro. projections (river, gw flow), yrs-decade [49]	**E** Critical infrastructure: Asset locations, types [10] **V** Critical infrastructure: Age, design standard [11] **V** Natural environ't sensitivity to climate events [24] **H** Erosion potential, landslide susceptibility [27] **H** Flood Maps (velocity, depth, erosion potential) [45] **H** Flood maps (inundation) @ 0.2% & 0.5% AEP [46] **H** Hydro. forecasts (river, gw flow), days-months [51]	**H** Rain radar [33] **H** Rain monitoring telemetry upgrades [55] **H** Soil maps (e.g. types, properties) [26]
Moderate urgency	**H** Vertical land motion [29] **H** Historic climate data (e.g. rain, temp, wind) [43]	**A** Guidance on climate scenario selection [1] **E** Businesses: locations, types, sizes [16] **E** Critical infrastructure: asset value [12] **M** Critical infrastructure: asset managem't plans [13] **M** Zoning: managed retreat areas [22] **H** Guidance on snow melt & cover [34] **H** Lightning and fire impact projections [36] **H** Heat stress index [40] **H** Upgrade LAWA for water quantity data [42]	**A** Damage records: insurance coverage, claims [18] **H** Drought forecasts (days-months) [37] **H** Flood maps (inundation) @ 2% & 5% AEP [47] **H** Landcover and land use [28]	**H** Digital elevation models (LiDAR) [25]
Low urgency *Need largely met at present*	**A** Emerg. resp. records (e.g. dates, locations) [19] **E** Buildings: Outlines, types [6] **E** Population: Distribution and projections [14] **E** Zoning: land use [21] **E** Ecosystems, SNAs, threatened species, etc. [23] **V** Population: Vulnerability (e.g. age, deprivation) [15] **H** Relative sea level rise, and RSLR projections [52] **H** Tide levels [53] **H** Coastal erosion [54]*	**E** Buildings: market value [7] **H** Drought projections (months-years) [39]	**E** Businesses: Climate financial risk [17] **H** Flood maps (inundation) @ other AEPs [48]	**H** Downscaled climate projections [41]

*Urgency and cost are estimated on average across all regions. Any dataset may have different urgency and/or cost for certain parts of the country, e.g. for particular regions, for urban areas, etc.

ANNEX 1 – CRITICAL DATASETS REQUIRED FOR THE REGIONAL SECTOR'S CLIMATE-RELATED NATURAL HAZARD DECISION-MAKING

- **Category** (Cat) indicates whether the dataset describes hazard (H), exposure (E), vulnerability (V), mitigation (M) or all (A) of these.
- **Urgency** and **Cost** are evaluated according to the rubric provided in Annex 2 of this memo.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
1	A	All	Dataset	Climate scenario guidance		Moderate	Moderate	Guidance is needed on which SSPs and timeframes (30y, 100y) to use for which purposes. While we are presently using climate SSPs from the IPCC AR6 report, the AR7 report will be published in 2029, at which point the climate SSPs may be updated.
2	A	All	Dataset	Aerial imagery	LINZ, LG councils	Very High	Moderate	Aerial imagery is an underpinning dataset that supports pre-event planning, event response and post-event recovery. While imagery is already collected in a collaboration between regional councils and LINZ, it does not have baseline funding nor is there a well-scheduled programme for its collection and updating. Modest investment could rectify this situation.
3	All	All	Dataset	Remote sensing	LINZ, NIWA, MWLR, LG Councils, others	Very High	Very High	Like aerial imagery, remote sensing imagery (many forms, including visual, SAR, etc.) is vital for pre-event planning, event response and post-event recovery (e.g. real-time flood inundation mapping). Experience in the North Island Extreme Weather Events showed that there is presently no coordinated, on-tap system for accessing these vital datasets in NZ. This needs to be rectified with urgency.
4	M	All	Dataset	Flood Management Asset Registry: location, type, age, design, asset management plans	Regional Councils	Very High	High	This Registry is currently in development and will include information on e.g. location, condition and ability of current flood management interventions to reduce flood risk. This information is vital for assessing residual risk, designing enhancements to flood management infrastructure where needed, and building the business cases for funding and on-going investment in maintenance.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
5	M	All	Dataset/portal	Adaptation plans and adaptation options	LG councils	High	Moderate	LG adaptation plans, and the adaptation options they consider and prioritise, constitute a key mitigation for exposure and vulnerability to multiple hazards, so need to be considered when evaluating risk. While many LG councils have developed adaptation plans, effort is needed to make them readily inter-comparable and accessible, e.g. for spatial planning and other adaptation purposes.
6	E	Built	Dataset	Buildings: Outlines and types (e.g. residential, commercial, marae, etc.)	LINZ	Low	Low	Building outlines, locations and types are essential for assessing exposure, but the currently available LINZ dataset is largely fit for purpose and is being augmented, e.g. to link building outlines to other data – e.g. property information from Councils, height from DEMs, etc. A key opportunity for improvement is to speed up the processing so that updated information appears in datasets as soon as possible after imagery capture.
7	E	Built	Dataset	Buildings: Market value	QV, Property Value	Low	Moderate	Market value data is essential for estimating exposure and potential economic losses in hazard scenarios. Recent reports have demonstrated its integration into hazard assessments. Making these data more accessible may attract moderate costs due to licensing and harmonisation needs
8	V	Built	Dataset	Buildings: Age, design standard (e.g. floor level)	TLAs, StatsNZ, NHC, NIWA (see Table 1 here)	Very High	Moderate	There is no standardised, nationally available dataset of building design, floor levels or hazard vulnerabilities -- yet this information is key to evaluating natural hazard risk e.g. from flooding, winds, etc. We understand that LINZ is working on addressing this issue.
9	M	Built	Dataset	Buildings: Asset management plans	?	High	Moderate	Asset management plans serve as a mitigation against vulnerability to climate-related hazards (and to other non-climate-related hazards that are important in some regions). Many councils have plans, but national consistency and accessibility are lacking. Moderate cost reflects assumed coordination and digitisation needs.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
10	E	Built	Dataset	Critical infrastructure: Asset locations and types (e.g. transport, electricity, communications, food, water/sanitation etc)	NZ Lifelines Council	High	High	Knowing where critical infrastructure is located is essential for risk assessment and emergency planning. The road network is a case in point. While some data exists, it is incomplete and siloed. High urgency and cost reflect the need for national integration. Note that flood management infrastructure is covered under Dataset 4.
11	V	Built	Dataset	Critical infrastructure: Age, design standard	NZ Lifelines Council	High	High	While recent evaluations have been completed (2023), there is no standardised, nationally available, cross-sector dataset of critical infrastructure vulnerabilities to climate-related natural hazard vulnerabilities. The road network is just one example. Note that flood management infrastructure is covered under Dataset 4.
12	E	Built	Dataset	Critical infrastructure: Asset value, replacement value	?	Moderate	Moderate	These provide $ estimates of the cost to replace an asset, or the cost to deliver the services some other way. This information supports cost-benefit analyses and funding decisions. While some valuation frameworks exist, coverage is uneven. Moderate cost reflects assumed data harmonisation effort. Note that flood management infrastructure is covered under Dataset 4.
13	M	Built	Dataset	Critical infrastructure: Asset management plans	?	Moderate	Moderate	Asset management plans serve as a mitigation against vulnerability to climate-related hazards (and to other non-climate-related hazards that are important in some regions). Many agencies have plans (e.g. NZTA), but national coordination is needed. Moderate cost reflects assumed data harmonisation effort
14	E	Societal	Dataset	Population: Distribution and projections (where people are and will be living)	StatsNZ	Low	Low	Currently available population datasets and projections are adequate for LG climate adaptation planning.
15	V	Societal	Dataset	Population: Vulnerability (e.g. age, employment, deprivation index)	StatsNZ, SIA	Low	Low	Population vulnerability metrics express the potential impacts on communities exposed to natural hazard events. We consider the currently avaialble information largely fit-for-purpose for near-term decision making. We also note that SIA developed population vulnerability geospatial mapping approaches to aid NISWE response.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
16	E	Societal	Dataset	Businesses: Locations and types (e.g. sector, size)	NZBN?	Moderate	Moderate	Data on business location, type, size, sector (e.g. manufacturing, hort, dairy, forestry), etc are essential for economic exposure analysis. NZBN provides bulk data access, but to our knowledge this dataset is not geospatially referenced, limiting its current usefulness.
17	V	Societal	Dataset	Businesses: Climate financial risk	?	Low	High	Climate financial risk data is of increasing importance due to mandatory disclosures. However, coverage is limited to large entities. We expect the need for this information to increase in urgency over the next decade; high cost reflects data development needs.
18	A	Built, Societal	Dataset	Damage records: Insurance coverage and claims data	Insurers, NZ Insurance Council	Moderate	High	Insurance claims data is vital for understanding combined hazard-exposure-vulnerability-mitigation. But it is currently difficult to access at anything other than amalgamated high level due to in commercial sensitivities - we therefore assume costs for access would be high.
19	A	Built, Societal	Dataset	Damage records: Emergency response dates, locations, types, severity	FENZ?	Low	Low	Information on emergency services call-outs could be useful to complement damage records from other sources (e.g. insurers). We consider this a 'nice-to-have' for the future so have rated this low urgency and low cost.
20	A	Built, Societal	Dataset	Damage records: Uninsured, indirect and intangible losses	?	High	Moderate	Insurance claims data only provides info on damage to insured assets. NZ also needs info on damage to uninsured assets, plus info on indirect losses and intangible impacts. Current research is limited (NZIER has estimated that indirect and intangible damage from floods amounts to 1.1x and 1.2x the direct damage, respectively). Ideally should consider cascading impacts
21	E	Built	Dataset	Zoning: land use	LINZ, LG councils	Low	Low	LG councils have access to land use zoning information for their own jurisdictions, and LINZ compiles some information nationally.
22	M	Built, Societal	Dataset	Zoning: managed retreat areas	LG councils	Moderate	Moderate	Understanding the location of designated managed retreat areas is a key mitigation for exposure of societal and built assets. To our knowledge, there is no nationally standardised dataset showing the locations of these zones.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
23	E	Natural	Dataset	Ecosystems, SNAs, ONFLs, threatened species: Locations, types	LG councils, MfE, DOC	Low	Low	LG agencies already have access to maps of ecosystems, SNAs, ONFLs, etc. MfE has been working on standardisation and improved accessibility through its ecosystems typology project, which we understand will continue to be funded in the current FY and offer opportunities for LG collaboration -- hence we consider further investment unnecessary at this point in time
24	V	Natural	Dataset	Sensitivity to CC and climate-related hazard events	LG councils, MfE, DOC, research organisations	High	High	LG councils have responsibilty for environmental management, which requires consideration of impacts of climate change and climate-related hazard events. Also, impacts on the natural environment can have flow-on impacts on people and built environrment (drought, flooding severity etc). While research has been conducted into the effects of climate change on selected species and habitats, to our knowledge there is no standardised framework translatable to all of NZ.
25	H	Land	Dataset	Digital Elevation Models (LiDAR)	LINZ	Moderate	Very High	DEMs based on the most recently collected LiDAR data are available from LINZ's Elevation Aotearoa: Experience Builder Site, but regular updates of terrestrial LiDAR are important. Coastal bathymetric LiDAR is also needed, and is presently being collected by LINZ. The need is to secure guaranteed funding for a pipeline of future LiDAR updates.
26	H	Land	Dataset	Soil types and properties	MWLR (S-Map)	High	Very High	Soil and land properties e.g. imperviousness, hydrophobicity (which vary spatially and temporally) influence runoff and erosion, so affect landslide and flood risk. Some data are available e.g. S-MAP, but they aren't optimised for flood modelling, making large rain-on-grid model calibration very difficult.
27	H	Land	Dataset	Erosion potential, slope stability, landslide susceptibility	MWLR (SedNet), NIWA (Clues), Massey (RULSE) GNS (Landslide database)	High	High	There are several erosion datasets and models available, but we lack clear guidance on which to use for which purposes. Landslide susceptibility mapping is improving but not yet available for all regions. Use of inappropriate models can be costly and undermine the usefulness of such tools especially if applied in regulation or climate adaptation initiatives. Regional councils have an Envirolink project underway, due for completion in July, to provide guidance on 'right model, right place'. This may reveal a need for further work and investment, building on e.g. StatsNZ's Highly Erodible Land indicator.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
28	H	Land	Dataset	Landcover and land use	MfE	Low	Low	Affects runoff/infiltration, wildfire risk, etc.
29	H	Land	Dataset	Vertical land motion	NIWA, GNS	Moderate	Low	Both VUW/GNS (NZSeaRise) and NIWA have produced national VLM estimates, but they differ slightly in approach and therefore in results obtained. Investment to rationalise their differences and provide one source of truth would be helpful.
30	H	Weather, Climate	Tool	HIRDS	NIWA	Very High	Moderate	The current version of HIRDS is at risk of being no longer fit for purpose. It doesn't take account of the last 8 years of rainfall data, which includes many extreme weather events. As well as 100-year events, HIRDS needs to be expanded to provide 200-year and 500-year ARI rainfall design depths. It also needs to be updated to use the latest CMIP6 downscaled climate projections.
31	H	Weather, Climate	Dataset	Rainfall & Climate (e.g. temperature, wind, humidity, etc) Data	NIWA, LAWA, MetService	Very High	Moderate	Precipitation data are a crucial input for flood/drought modelling, forecasting and management. Regional councils, NIWA and MetService collect this data, but there is no single portal for access. A unified portal would standardise data formats, unlike the current situation where each organisation uses its own website. (Note that LAWA does provide regional council data in a consistent format, but only on a site-by-site basis, without any regional or national maps.)
32	H	Weather, Climate	Dataset	Probable Maximum Precipitation	NIWA	Very High	Moderate	Probable Maximum Precipitation information is needed for a range of purposes, along with guidance for determining Probable Maximum Flood flows under different climate change scenarios and ARIs.
33	H	Weather, Climate	Dataset	Rain Radar	MetService	High	Very High	MetService's rain radar data is only available to regional authorities that purchase it. Additional radar sites are needed in some areas.
34	H	Weather, Climate	Guidance	Snow Cover & Melt Guidance	NIWA	Moderate	Moderate	Current snow cover information and guidance on expected melting during forecast rainfall events.
35	H	Weather, Climate	Projections	Fire Risk Projections (FWI)	Scion	High	Moderate	Projections of Fire Warning Index (FWI) under various climate change scenarios will help with spatial planning and climate adaptation.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
36	H	Weather, Climate	Projections	Lightning & Fire Impact Projections	Scion, NIWA	Moderate	Moderate	Projections of the likelihood of lightning under various climate change scenarios could help to understand and manage fire risks from harder-to-ignite fuels like large logs and branches. Beyond estimating fire risk, projections should be expanded to quantify potential impacts on communities, infrastructure and natural and built environments.
37	H	Weather, Climate	Forecasts	Drought forecasts (weeks to months in advance	NIWA	Moderate	High	NIWA produces 35-day in advance drought forecasts, though to our understanding these are not based on climate or hydrological data collected by local government organisations, nor are the forecasts made freely available to local government organisations.
38	H	Weather, Climate	Projections	Drought Projections (PED, SPI)	NIWA, Regional Councils	High	Moderate	The currently available projections of Potential Evapotranspiration Deficit should serve the immediate needs of most regional authorities (especially if projections of FWI are developed). In future, it will be helpful to have access to projections of the Standardised Precipitation Index (SPI) because it's more sensitive as conditions become drier.
39	H	Weather, Climate	Projections	Drought Projections (NZDI, other variables)	NIWA, Regional Councils	Low	Moderate	Projections for other drought-related variables, or NZDI, can be added in due course.
40	H	Weather, Climate	Dataset	Heat Stress Index	MetService	Moderate	Moderate	Spatial planning could be assisted by developing projections of heat stress (e.g. wet-bulb globe temperature) under various climate change scenarios. We see this as a longer-term need.
41	H	Weather, Climate	Projections	Downscaled climate projections		Low	Very High	Downscaled CMIP6 projections have just been produced and made available. These will need to be updated when the next IPCC report is released, due late 2029.
42	H	Weather, Climate Hydrology	Portal	Expanded Portal for Precipitation, River Flow, Groundwater levels	NIWA, LAWA	Moderate	Moderate	Expand the portal to display precipitation data from NIWA and MetService. Expand the portal so that it can display current/recent data on relative river flows and groundwater levels, as well as rainfall, based on measurements made by regional councils and NIWA.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
43	H	Weather, Climate, Hydrology	Portal	Historical Rainfall, Climate, River Flow, Groundwater Level, Soil Moisture measurements	NIWA, LAWA	Moderate	Low	Enable download of regional sector's historical rainfall, river flow and groundwater level data, in addition to the current/recent data. Ideally, NIWA's VCSN and/or Reanalysis archives would also be made available. Such historical datasets are key inputs to several of the other datasets listed in this table (e.g. HIRDS, flood maps, drought indices).
44	H	Hydrology, Coastal	Dataset	Flood Maps, Inundation @ 1% AEP	NIWA, Regional Councils	Very High	Moderate	Update national 1%AEP river/coast flood maps to incorporate regional sector modelling where available. This will reduce contestation and ensure the maps reflect local knowledge. Redevelop the existing national-scale 1%AEP flood maps to reflect the latest flood resilience works planned or underway. This will ensure the maps reflect current infrastructure developments. Add uncertainty to the existing 1%AEP flood maps, e.g. by displaying 90% confidence intervals. This will enhance flood resilience planning, because the uncertainty in modelled flood extent likely varies across the country based on local data availability.
45	H	Hydrology, Coastal	Dataset	Flood Maps, Velocity, Depth, Erosion Potential	NIWA, Regional Councils	High	High	Develop estimates of water velocity, depth and erosion potential – to understand of flood hazards, not just extent. Consistent flood hazard categories are needed, to define appropriate vs inappropriate uses or developments in any area.
46	H	Hydrology, Coastal	Dataset	Flood Maps, Inundation @ 0.2% / 0.5% AEP	NIWA, Regional Councils	High	High	Make 0.2%AEP and/or 0.5%AEP flood maps freely available (including uncertainty and showing flood hazards), to help councils plan for less frequent but larger events.
47	H	Hydrology, Coastal	Dataset	Flood Maps, Inundation @ 2% / 5% AEP	NIWA, Regional Councils	Moderate	High	Make 5%AEP and/or 2%AEP flood maps freely available (including uncertainty and showing flood hazards), to help councils plan for commonly occurring smaller events.
48	H	Hydrology, Coastal	Dataset	Flood Maps, Inundation @ Other AEPs	NIWA, Regional Councils	Low	High	Make other AEP maps available.

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
49	H	Hydrology	Projections	River Flow, Groundwater Level, Soil Moisture - Future Projections (years to decades)	NIWA	High	Moderate	Regional authorities need updated projections of surface water availability under various climate change scenarios. This need was highlighted by a recent Envirolink Tools proposal, which narrowly missed being progressed for funding. In the interim, regional authorities will use projected rainfall and drought indicators (based on CMIP6) to manage water resources under medium- and low-flow conditions. Note that projections of high-flow conditions were not included in the Envirolink proposal due funding limitations viz. the complexity of the science. Our immediate needs for flood data are discussed above.
50	H	Hydrology	Forecasts	River Flow - Future Forecasts (minutes to days/months)	NIWA, Regional Councils	Very High	Very High	Regional councils operate flood forecasting systems (monitoring stations, models) for key catchments across NZ. NIWA provides national river flow forecasts for the whole country. There is need to improve and standardise the flood forecasting approaches to provide best information for decision-making. Several councils are already investing and there is intent to do more, with Flood Warning Steering Group coordinating.
51	H	Hydrology	Forecasts	Groundwater Level, Soil Moisture - Future Forecasts (days to months)	NIWA, Regional Councils	High	High	Forecasts of river flow, e.g. for flood warnings, are not influenced only by rainfall amount but also by the groundwater and soil moisture conditions. Including information on groundwater and soil moisture will improve these river flow forecasts and also be useful for other purposes, such as water allocation planning and assessing potential for rainfall-induced landslides.
52	H	Coastal	Projections	Relative Sea Level Rise, and RSLR Projections	NIWA, VUW, Regional Councils	Low	Low	NZ SeaRise currently presets inter-seismic data that is not representative of the post-quake situation in some parts of the country, such as Canterbury. As evidenced by this report - https://ccc.govt.nz/assets/Documents/Environment/Coast/Seismic-Rates-of-Vertical-Land-Movement-in-the-Christchurch-District.pdf

#	Cat	Domain	Type	Name	Source(s)	Urgency	Cost	Justification
53	H	Coastal	Dataset	Tide levels	LINZ, NIWA	Low	Low	The main data gap here is observed / measured tide levels. We need this to measure storm surge for coastal hazard models, update tide level components for base water levels of hazard modelling and simply for recording long term sea level rise. A beneficial improvement would be to take better account of groundwater levels for forecasting coastal inundation risks.
54	H	Coastal	Dataset	Coastal erosion	Coastal change	Low	Low	A national map of average coastal erosion/depostion rates was released in 2024. Studies post-Gabrielle provided insights into the effects of extreme weather (i.e. non-average) conditions. Further work on extreme weather event impacts on coastal erosion is currently being funded by the National Hazards & Resilience Research Platform
55	H	Weather/ Climate	Infrastructure	Rain/river monitoring telemetry upgrades	Regional Councils	High	Very High	Telemetered monitoring infrastructure for rainfall and riverflows is vital for the flood warning systems operated by regional councils. Upgrades are urgently needed in several catchments.

ANNEX 2 – RUBRIC FOR EVALUATING THE CRITICALITY OF DATASETS

Rating	**Urgency** a) how directly and significantly the item (dataset, tool, model, portal, etc) supports the regional sector's climate adaptation initiatives, and b) how critically investment in it is needed in the next 1-3 years to support regional sector functions and short- and longer-term decision-making.			**Cost** Estimated additional $ and/or time equivalent, **beyond what we're aware has already been committed** (e.g. by MfE, regional councils) required to bring the item (dataset, tool, model, portal, etc) up to usable level in terms of robustness, accessibility, etc, as needed for it to adequately support regional sector functions and decision-making
	Guiding questions			
	How impactful is the lack of access to this item (dataset, tool, model, portal, etc.)?	How many councils are affected?	What is the magnitude of damage or lost opportunity (social, cultural, economic, environmental)?	
Very High	Its absence critically undermines several key functions or decision-making processes	Almost all	>$1b	>$1m
High	Its absence critically undermines a few key functions or decision-making processes	Around half	$100m-$1b	$500k - $1m
Moderate	Its absence moderately impedes a few important functions or decision-making processes	Around 10%	$10-100m	$100k - $500k
Low	Its absence moderately impedes one or two important functions or decision-making processes	Less than 10%	$1-10m	<$100k