

Key Datasets for Resilience and Climate Change

Data Improvement Plan 2020/21



Acceptance

Role	Name	Signed	Date
Deputy Chief Executive, Location, Policy and Overseas Investment	Jan Pierce	https://linzone /id:A4201044	14 September 2020

Reference documents

Location	Description
https://www.linz.govt.nz/about-linz/publications/strategy/outcomes-framework	LINZ Outcomes Framework
https://arcg.is/mib49	Key Datasets for Resilience and Climate Change survey
https://linzone/id:A3614757	Metadata Content Guidance
https://www.linz.govt.nz/sites/default/files/media/doc/key_datasets_for_resilience_and_climate_change_-_data_improvement_plan_2019_20.pdf	Key Datasets for Resilience and Climate Change Data Improvement Plan 2019/20

Revision history

Date	Version	Author	Description
22/07/2020	0.1	Susan Shaw	Draft priority improvements for 2020/21
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Executive Summary

Key datasets to support those working in emergency management and climate change have been identified and their fitness for purpose assessed. Consultation with the user community, and collaboration with the key dataset lead agencies, identified the following data improvements which can be progressed over 2020/21:

Key data priority improvements 2020/21



LINZ to provide a more comprehensive national coverage of **addresses** by June 2021



LINZ to work with all regions to coordinate the acquisition and release of **LiDAR** data into open national datasets by June 2023



NZTA to build the internal value proposition to improve access to **road** data, including closed roads and attribution, by June 2021



Stats NZ to investigate the feasibility of providing small geography **population** count information by June 2022



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KiwiRail to update metadata for **rail** data, provide access to closed tracks during an emergency by June 2021

Introduction

Land Information New Zealand (LINZ) published its strategic direction for the next ten years in the 2017 Outcomes Framework. The aim of the Outcomes Framework is to direct LINZ's effort and resources on the things which really matter for our customers.

The Outcomes Framework identified three challenges: Water, Urban Development, and Resilience and Climate Change. These three challenges provide a focus for LINZ to consider the big picture and identify where we can work with other organisations to deliver the most value to New Zealand.



West Coast storm event, March 2019

Copyright Wayne Costello

The aim of the Resilience and Climate Change challenge is to support efforts to prepare for, mitigate and adapt to the impacts on land and sea of climate change and one-off events (natural and man-made).

One of the results of applying this resilience and climate change lens to our work has been to engage with our customers to identify and improve 12 national key datasets.

Purpose

The purpose of this document is to review improvements made to the 12 national key datasets for resilience and climate change during 2019/20, and to establish the priority data improvements for 2020/21.

Key Datasets for Resilience and Climate Change

How were the key datasets chosen?

The first step to identify the key datasets was to define 'resilience and climate change'. The '4Rs' of Emergency Management - Reduction, Readiness, Response and Recovery - were agreed as a useful definition of resilience, plus climate change. Organisations to represent each of these five areas were identified and a literature review determined their data requirements ([Appendix A](#)).

Information about how these data requirements were then assessed and prioritised, can be found in the 2019/20 Key Data for Resilience and Climate Change Improvement Plan (<https://tinyurl.com/KeyDataImprovementPlan201920>)

What are the key datasets?

The 12 key data themes focus on people, property, transport, rivers and land.



Address
Building
Property
Population



Road
Rail



Imagery
Elevation
Coastline
Topo maps



River network
Water catchments

Who is responsible for the key datasets?

National datasets have been identified to represent each of the data themes, and the lead agency for each dataset has been identified and confirmed by our customers. As a result, the five lead agencies LINZ is collaborating with are Fire and Emergency NZ, KiwiRail, NZ Transport Agency, NIWA and Stats NZ.



12 national key datasets and the lead agency responsible:

Theme	Key Dataset	Lead Agency
Population	Statistical Area 1 Boundaries	Stats NZ
Building	NZ Building Outlines	LINZ
Address	NZ Street Address	LINZ
	NZ Localities / Suburbs	Fire and Emergency NZ
Property	NZ Primary Parcels	LINZ
Road	National Road Centreline	NZ Transport Agency
Rail	NZ Railway Network	KiwiRail
Rivers	River Lines	NIWA
Water Catchments	Watersheds	NIWA
Imagery	NZ Imagery Basemap and Index	LINZ
Elevation	LiDAR and LiDAR Index	LINZ
Topo50	Topo50 and Topo250	LINZ
Coastline	NZ Coastlines and Islands Polygons	LINZ

Who are our customers?

[NZGIS4EM](#) (New Zealand GIS for Emergency Management) represents geospatial practitioners in central government, local government, the National Emergency Management Agency and Civil Defence Emergency Management groups who are working together to make GIS integral to emergency management within New Zealand.

LINZ works with NZGIS4EM as an organisation well placed to represent the resilience and climate change data user community. NZGIS4EM validated the 12 key datasets in 2018 and helped determine the data improvement priorities for 2019/20. A workshop was held with the NZGIS4EM community in August 2020 to provide an update on progress to date, and to share the draft data improvement priorities for 2020/21.

Most recently, LINZ has engaged with the Local Government Geospatial Alliance ([LGGA](#)) who bring together local government to enable geospatial collaboration, capability and communication. Two workshops were run in August 2020 where LGGA reviewed the data improvement priorities for 2020/21 and confirmed the criteria assessment ([Appendix C](#)).

LINZ has also engaged with others in central government, local government, Crown Research Institutes, academia, private consultancies, the National Lifelines Council, Regional Councils' River Managers, Regional Hazard Risk Managers special interest groups, and Water NZ to better understand our customers data issues.

Why are national key datasets important?

It is clear that many of our customers, particularly in local government, have already done a great deal of work to capture data for their local area. As an example, many councils have developed their own detailed river network and water catchment boundaries. These councils are likely to continue to invest in their own data for emergency management risk reduction, readiness, response and recovery.

During a major emergency event, such as the 2016 Kaikoura earthquake or the 2020 COVID-19 pandemic, multiple local authorities are impacted, and a multi-agency response is required. Under these circumstances it can be difficult to access and combine data from multiple local sources. National datasets, which are consistently available across the country from a single source, are critical to ensure effective planning and disaster risk reduction, an efficient emergency response and managed recovery.

It is acknowledged that collaboration between local authorities and the lead agencies will be vital to ensure the national datasets are accurate, reliable and fit for purpose.

Review of Key Data Improvements 2019/20

A customer survey in early 2019 identified data improvements required to ensure the 12 key datasets were fit for purpose for resilience and climate change. A data improvement plan was developed, which considered this customer feedback plus the existing commitments of the lead agencies. The final data improvement plan was signed off in June 2019. Over the last 12 months, a quarterly report has been prepared for the NZGIS4EM Committee and the National Emergency Management Agency to highlight data improvements.

At 30th June 2020, at least one improvement was recorded for each of the 12 key datasets, and significant improvements were recorded to improve population, rail, river, water catchment, imagery and elevation data. In addition, LINZ key datasets were published as [Esri REST services](#). Unfortunately the COVID-19 pandemic has meant that some of the planned improvements have been delayed. A one page summary of the data improvement is available ([Appendix B](#)).



Population Stats NZ understands the importance of providing small geography population count information for use in responding to emergency events and will explore options with LINZ on how best this could be achieved

Update: Stats NZ published a [population dashboard](#) to provide easy access to the 2018 census data. This includes information on population counts, age,

labour force status, income, gender, ethnicity, religion and deprivation index. Stats NZ also updated the metadata for Statistical Area 1 boundaries to the agreed standard and published the data as OGC WFS and Esri REST services.

Buildings LINZ to complete national coverage of building outlines by June 2020

Update: LINZ added buildings outlines for Taranaki, Marlborough, Bay of Plenty and Gisborne, bringing the national coverage up to 90% of New Zealand. NZ Building Outlines was published as an Esri REST service. As part of the LINZ contribution to the COVID-19 all of government response, supermarkets were located and are now accessible from the NZ Building Outline dataset.

Address LINZ to provide a more comprehensive national coverage of addresses by June 2021

Update: NZ Street Address was published as an Esri REST service. In 2019/20 62,707 addresses were improved by LINZ, including new addresses, changes to existing addresses, and the retiring of previously used addresses.

Address Fire and Emergency New Zealand understands the importance of the suburbs dataset and is working with LINZ to establish options regarding the dataset

Update: Fire and Emergency NZ updated the metadata for NZ Localities to ensure it is compliant with the agreed standard. In addition Fire and Emergency NZ and LINZ have worked together to respond to a number of Official Information Act requests relating to the publication of NZ Localities.

Property LINZ to improve access to parcel attribution by June 2020 and investigate the feasibility of creating a property boundary layer by June 2021.

Update: NZ Primary Parcels was published as an Esri REST service. Options for improving access to parcel attribution are being assessed, considering both the value of releasing personal information to the resilience and climate change community and LINZ's obligations to manage this data under the Privacy Act. LINZ has made progress with creating a national dataset of District Valuation Role data, which it is planned to use in future to create a property boundary layer based on district rating unit.



Road

NZ Transport Agency understands the importance of providing easy access to road closure data, but currently is unable to commit to an improvement plan

Update: NZ Transport Agency has improved the discoverability of the State Highways road closures data on the NZTA data portal and data.govt.nz

Rail

KiwiRail to improve access to rail network data by June 2020

Update: KiwiRail has added a Territorial Authority attribute to its larger datasets to improve ease of filtering, and published all rail datasets as OGC Web Feature Services.



Rivers and Water Catchments

NIWA to improve the availability of river network and water catchment data by releasing under Creative Commons license and publishing scale dependant webservice by June 2020.

Update: NIWA published the latest versions of River Lines and Watersheds under Creative Commons licensing and improved the discoverability of both datasets on data.govt.nz. NIWA also developed a scale dependant [webmap](#) to enable the display of rivers at multiple scales.

LINZ released river names (line and polygon) pilot datasets to help learn about the benefits of combining river names and location.



Imagery

LINZ to establish a process for coordinating the capture and delivery of imagery and LiDAR during an event by June 2020

Update: Processes have been developed at LINZ to activate our geospatial support for an emergency event, based on the Coordinated Incident Management System (CIMS). LINZ staff took part in an emergency exercise in March. Geospatial support for imagery was provided during the Southland Flood in February 2020.

Aerial photography was published for Bay of Plenty, Dunedin, Hamilton, Manawatu, Nelson, Tasman, Central Otago, Dunedin, Queenstown Lakes and Waikato, plus a 10 metre imagery covering the whole of New Zealand and satellite imagery for the Chatham Islands was made available under Creative Commons licensing.

Elevation LINZ to work with all regions to coordinate the acquisition and release of LiDAR data into open national datasets by June 2023.

Update: Eight Regional Councils took up Provisional Growth Funding to capture LiDAR data in their region.

LiDAR data was published for Marlborough, Manawatu-Whanganui, Waikato, Northland, Palmerston North, Christchurch, Waikato and Auckland South. A new elevation index layer was created to make it easier to source data.

Tutorials on [how to generate a DEM](#) from Open Topography and how to [convert LiDAR to NZ Vertical Datum 2016](#) have been released.

Topo50 LINZ to create a national topographic basemap by June 2022

Update: A national imagery basemap has been developed and is due to be released in August 2020. The next basemap to be developed will be a topographic basemap.

Coastline LINZ to create and maintain a national coastline dataset based on the best available data by June 2020

Update: A national Mean High Water coastline with attributes sourced from Topo map sheets and hydrographic charts has been prepared and is due to be released by December 2020.

Data Improvement Priorities 2020/21

Draft data improvement priorities for 2020/21 were shared with customers during August 2020 in a series of workshops, and this feedback was considered alongside existing lead agency work plans. The result is the agreed key data improvement priorities for 2020/21:

Key data priority improvements 2020/21



LINZ to provide a more comprehensive national coverage of **addresses** by June 2021



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How will data improvements be measured?

It is acknowledged that things change, and it is understood that the commitment of the lead agency to these priority improvements is based on current known resourcing and organisational priorities. The data improvements will be measured against the data assessment criteria ([Appendix C](#))

Over the next 12 months, a quarterly progress report will be prepared in collaboration with the lead agencies and reported to the LINZ Location Information Leadership Team, LINZ Executive Leadership Team, Minister Sage as Minister for LINZ, the NZGIS4EM Committee, National Emergency Management Agency and LGGC Committee.

An annual report reviewing the data improvements over the last 12 months will be prepared in July 2021 and published on the LINZ website.

How can LINZ contribute?

LINZ understands the vital importance of having datasets which are fit for purpose to inform those working in resilience and climate change. This is why LINZ is investing in improving the national key datasets where it is the lead agency.

The importance of national key datasets maintained by other lead agencies, and their contribution to resilience and climate change is also clear. The lead agency workshop in June 2020 identified a number of ways in which LINZ can continue to collaborate with lead agencies to ensure the successful outcome for resilience and climate change data improvements.

LINZ will keep in regular contact with all lead agencies over the next 12 months, in order to prepare quarterly progress updates and publish an annual review of the project.

LINZ will also identify opportunities to promote the key datasets as the national single source of truth, which can be relied upon and easily accessed during an emergency response, both with data users, lead agency senior managers and with Ministers.

In addition, LINZ is able to support lead agencies with drafting business cases and communications relating to the key datasets for resilience and climate change project. LINZ is committed to facilitating any queries and supporting any government agency in regard to datasets which play a role in resilience and climate change.

The LINZ Resilience Team will also continue to work with the Department of Internal Affairs to improve the data.govt.nz interface to ensure it is user friendly and to encourage agencies to publish relevant datasets, which will be curated into data groups.

LINZ looks forward to working with the lead agencies and the data users to make a real difference to resilience and climate change.

Appendix A – Definition of Resilience and Climate Change

Resilience was defined as the 4Rs of emergency management. Organisations were identified to represent risk reduction, readiness, response and recovery, plus climate change. A literature review was carried out to identify the data requirements of each of these organisations.

Definition	Representative Organisation	Source of Literature Review
Reduction	Riskscape	Riskscape 2017, Layers list in Riskscape Wiki https://wiki.riskscape.org.nz/index.php/Layers_List
	Tonkin + Taylor	Tonkin + Taylor 2018, Method to calculate Annual Average Damage from flooding. Supplied by Jon Rix
Readiness	Lifelines	Lifelines 2017, New Zealand Lifelines Infrastructure Vulnerability Assessment: Stage 1 https://www.civildefence.govt.nz/assets/Uploads/lifelines/National-Vulnerability-Assessment-Stage-1-September-2017.pdf
Response	Emergency Services	Emergency Services 2016, Emergency Services GIS Contract. Supplied by GEOINT, New Zealand Defence Force
Recovery	Local Government	Wellington City Council 2017, Wellington City Council Resilience Strategy https://wellington.govt.nz/~media/about-wellington/resilient-wellington/files/strategy/resilience-strategyj001767-100-web.pdf?la=en Statistics NZ Open Data Office 2018, Datasets required for recovery
Climate Change	UK Committee on Climate Change	Committee on Climate Change 2017, UK Climate Change Risk Assessment 2017 Evidence Report https://www.theccc.org.uk/tackling-climate-change/preparing-for-climate-change/uk-climate-change-risk-assessment-2017/

Appendix B –Summary of Data Improvements 2019/20



Key Datasets for Resilience and Climate Change

Data Improvement Plan Review 2019/20

Resilience and Climate Change Key Challenge identifies where LINZ can work with others to deliver the most value to New Zealand over the next 10 years
<https://tinyurl.com/Resilience-Key-Data>

Are the 12 key datasets fit for purpose?



Overall measure of the 12 key datasets being fit for purpose has increased 12% in 2019/20

Data Improvement Highlights



Stats NZ launched a **population** dashboard

LINZ published key data as **Esri REST services**

Buildings were released for Taranaki, Marlborough, Bay of Plenty and Gisborne

Fire and Emergency NZ improved **metadata**



NIWA published **rivers and catchments** under a Creative Commons license and prepared scale dependent webmap



KiwiRail published **rail data** in OGC WFS format and improved attribution

NZ Transport Agency published **State Highway closed roads** on data.govt.nz

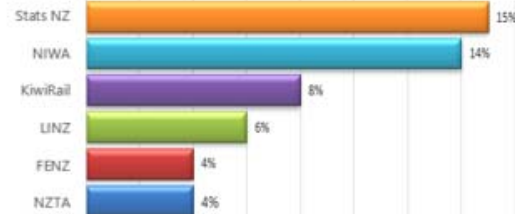


LINZ progressed **LiDAR** capture under Provisional Growth Fund, and published **index layers** for LiDAR and imagery

Additional **imagery** and **LiDAR** data made available on the LINZ Data Service

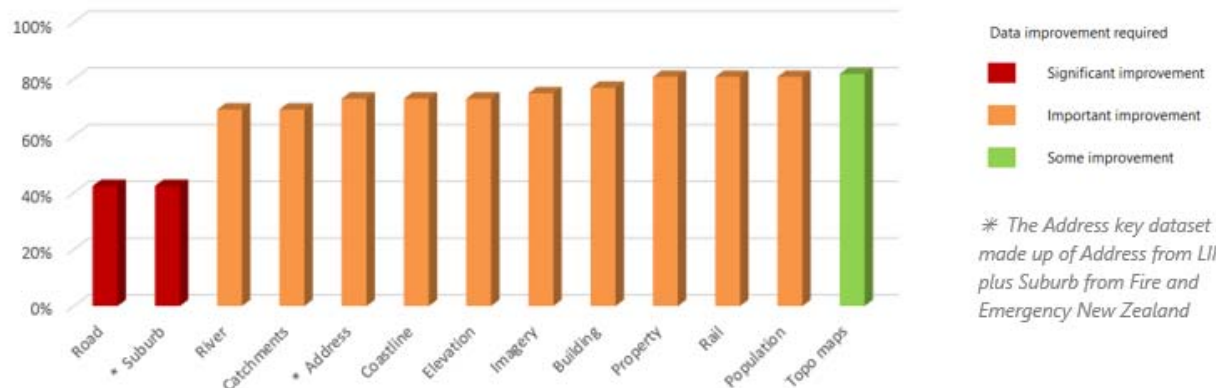
Emergency support data group established on **data.govt.nz**

Key data improvements by lead agency



Average recorded data improvements 2019/20

Overview of key datasets at June 2020



Appendix C – Key dataset assessment criteria at June 2020

Lead Agency	Stats NZ	LINZ	LINZ	FENZ	LINZ	NZTA	KiwiRail	NIWA	NIWA	LINZ	LINZ	LINZ	LINZ
As at 30 June 2020 , does the lead agency provide the key dataset ...	Population	Building	Address	Suburb	Property	Road	Rail	River	Water Catchment	Aerial	Elevation	Coastline	Topo
as a complete national coverage	Yes	Partly	Partly	Yes	Yes	Partly	Yes	Partly	Partly	Partly	PARTLY	Yes	Yes
with relevant attribution	YES	Partly	Partly	Partly	Partly	Partly	YES	No	Partly	YES	YES	Partly	n/a
at an adequate level of accuracy	Partly	Yes	Partly	Yes	Partly	Partly	Yes	Partly	Partly	Partly	Yes	Partly	Yes
with an acceptable update programme	Partly	Partly	Partly	Partly	Yes	Partly	Partly	Partly	Partly	Partly	No	Partly	Partly
with suitable vector topology	Yes	Yes	Yes	Partly	Partly	No	Yes	Yes	Yes	n/a	Yes	Yes	n/a
free of charge	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
with a Creative Commons License CC BY	Yes	Yes	Yes	No	Yes	No	Yes	YES	YES	PARTLY	Yes	Yes	Yes
for download in multiple formats	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
as an OGC and Esri webservice	YES	YES	YES	No	YES	No	YES	Yes	Yes	Yes	Partly	YES	Partly
with appropriate metadata	YES	Yes	Yes	YES	Yes	Partly	Partly	Partly	Partly	YES	Yes	Yes	Yes
discoverable on data.govt.nz	Partly	Yes	Yes	No	Yes	PARTLY	Yes	YES	YES	YES	Partly	YES	YES
ready to respond to an event	PARTLY	No	No	No	No	Partly	No	PARTLY	No	PARTLY	PARTLY	No	No
recognised as the national single source of truth	Partly	PARTLY	Partly	No	Yes	No	Partly	Partly	Partly	Partly	Partly	No	Yes

Highlighted squares indicate a data improvement was made between June 2019 – June 2020