From:	Susan Shaw
To:	"Juriss, Chris"; Donaldson, Matt; "Kirsten O"Neil"; Gill Nightingale; Jochen Schmidt; Sarah Cowell; "Kirsten Nissen"; Andrew Ferrel; Ben P. Jones; Chris Kane; Melissa West; Rachel Gabara; Trent Gulliver; Rob Deakin; Kasey Oomen; "Tilmann Steinmetz"; Jennifer Coppola; Kelly Tither; Charlotte Dawson
Cc:	".@.." ; Jonathan Ball; Elise Bridson
Subject:	Key Datasets for Resilience and Climate Change - Progress Update - June to September 2019
Date:	Monday, 21 October 2019 11:21:00 AM
Attachments:	image001.png image002.png

Hi there

We are looking forward to seeing you at the key datasets for resilience and climate change progress update meeting tomorrow.

Please sign in at the LINZ reception on the 7th floor of Radio New Zealand House, 155 The Terrace. Instructions to connect to the conference call are included in the original meeting appointment.

Here's the draft agenda. If you have any additional items you would like to discuss please let me know.

9:50 Coffee available ready for 10am start

10:00 Welcome and Introductions - Susan
10:15 Resilience and Climate Change Update – Rob
10:20 Key datasets for resilience and climate change summary - Susan

10:25 Key dataset update
5 minutes from each agency on the following:

- What has been achieved this quarter
- What are the milestones for the next quarter
- Any additional good news stories
- Risk rating – green for on track, amber for ongoing issues, red for serious showstopers

Proposed order of reporting

- Elevation - Andrew
- Rivers & Catchments – Jochen & Tilmann
- Coastline – Rachel & Jennifer
- Topo – Melissa & Charlotte

- Rail – Kirsten
- Road – Gill
- Population - Sarah
- Building – Ben

- Address – Kelly

- Suburbs – Chris J & Matt
- Property – Chris K
- Aerial – Andrew

11:30 Key dataset update – information sharing

11:40 Promoting the key datasets as the national single source of truth

11:50 Any other business

12:00 Close

Thanks,

Susan

Susan Shaw
Senior Resilience Advisor

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http://www.linz.govt.nz/sites/default/files/images/email-signature-v2.png

From: Susan Shaw
Sent: Thursday, 31 October 2019 12:58 PM
To: 'Juriss, Chris'; 'Donaldson, Matt'; 'Kirsten O'Neil'; 'Gill Nightingale'; 'Jeremy.Gulson@nzta.govt.nz'; Jochen Schmidt; 'Tilmann Steinmetz'; Sarah Cowell; 'Kirsten Nissen'; Andrew Ferrel; Ben P. Jones; Chris Kane; Jonathan Ball; Kelly Tither; Melissa West; Rachel Gabara; Trent Gulliver; Rob Deakin; Kasey Oomen
Cc: Jennifer Coppola; Charlotte Dawson
Subject: Key Datasets for Resilience and Climate Change - Progress Update - Quarter 1 June to September 2019
Attachments: Key Datasets for Resilience & Climate Change - Quarterley Progress Update Minutes- October 2019.docx; Key Datasets for Resilience & Climate Change - Quarterly Progress Update - October 2019.docx; Metadata Content Guidance.docx

Hi there

A big thank you to everyone who attended the key datasets for resilience and climate change progress update last week. Please find attached the minutes, plus the draft Quarterly Progress Update for your review.

Please approve or amend the Quarterly Progress Update by Friday 8th November.

Once confirmed this update will be shared with the NZGIS4EM Committee representing our customers, and Ministry of Civil Defence and Emergency Management to align with their Essential Elements of Information work.

To prepare the next quarterly update I'll meet with you individually in December 2019, and schedule our next lead agency meeting for March 2020.

In the meantime, best of luck with your anticipated milestones. Metadata improvements are planned for a number of agencies before Christmas, and so the Metadata Content Guidelines are attached.

Please do not hesitate to contact the LINZ Resilience Team if there is anything we can do to help.

Thanks, Susan

Susan Shaw
Senior Resilience Advisor

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Key Datasets for Resilience and Climate Change
Quarterly progress update: September 2019

Date: 22nd October 2019

Attendees: Matt Donaldson (Fire and Emergency New Zealand)
Gill Nightingale (New Zealand Transport Agency)
Jochen Schmidt and Tilman Steinmetz (NIWA)
Andrew Ferrel, Ben Jones, Melissa West (LINZ Topography)
Chris Kane and Kelly Tither (LINZ Addressing and Property)
Rachel Gabara (LINZ Hydrography)
Kasey Oomen, Rob Deakin, Susan Shaw (LINZ Resilience Team)

Apologies: Chris Juriss (Fire and Emergency NZ)
Kirsten Nissen and Sarah Cowell (Stats NZ)
Kirsten O'Neil (KiwiRail)
Jeremy Gulson (New Zealand Transport Agency)
Jonathan Ball (LINZ Data Services) and Trent Gulliver (LINZ Addressing)

DISCUSSION

Rob began with an outline of the strategic context for this work and its importance in supporting current key national initiatives such as the National Climate Change Risk Assessment, the National Disaster Resilience Strategy and its pending roadmap, and the work between central and local government to establish a Community Resilience Work Programme within which the Information workstream is considered foundational.

Each lead agency provided an update on progress in previous quarter (July to September 2019) and set out their milestones for the next quarter (October to December 2019). Refer to the Quarterly Progress Update for September 2019. In addition to the updates, further discussion covered coastline definition and changes at NIWA.

LINZ Hydro team are not clear which coastline is important for resilience and climate change work. Topo50 uses Mean High Water, and navigational charts use Mean High Water Springs. Longer term, the LINZ Coastal Mapping Project will define and generate multiple coastlines. Until this detailed data is available the group were unanimous that amalgamating the coastlines from Topo50 and navigational charts into the best available coastline was valuable.

NIWA noted a significant organisational change to their internal data management. Tilmann's role as GIS Data Analyst and Administrator will oversee this work, and Esri has been adopted. Current focus is on improved delivery of large datasets, an issue which will be faced by all the lead agencies.

ACTIONS

1. Susan to share the LINZ basemap specifications with the group, as requested by Matt Donaldson, Fire and Emergency NZ.

2. Susan to confirm whether public access to the new LINZ basemaps will require authentication via an API key, as requested by Tilmann Steinmetz, NIWA.

3. Sarah and Kirsten from Stats NZ to provide an update on population data supplied by Data Ventures at next face to face meeting in March.

NEXT MEETING

4. Share individual progress reports with all lead agencies via Objective Connect folder.
5. Arrange individual meetings with each lead agency during December 2019.
6. Prepare a quarterly progress update in January 2020.
7. Arrange a face to face with all lead agencies for an update in March 2020.
8. Prepare a quarterly progress update in April 2020.

Key Datasets for Resilience and Climate Change Data Improvements

Quarterly Progress Update: September 2019

Introduction

LINZ understands the vital importance of having reliable, accessible information to inform those working in emergency management and climate change. This is why LINZ is investing in working with other lead agencies to improve the key datasets.

A key dataset improvement plan was approved in June 2019. Quarterly updates will be shared with the NZGIS4EM Committee as our customer representative and with Ministry of Civil Defence and Emergency Management to inform its related work on Essential Elements of Information. Next update due January 2019.

Data Improvement Highlights: Quarter 1

- NIWA updated the Rivers and Catchments data and released the data under Creative Commons license CC-BY 4.0 Read more
- Stats NZ launched census 2018 data. Read more
- LINZ released river name datasets (line and polygon) as a pilot to help understand the benefit of combining river names and location. Read more
- Eight Regional Councils have assessed the LiDAR tender submissions and are in the process of identifying a preferred supplier.
- LiDAR data for Marlborough and Manawatu-Whanganui has been released plus a tutorial for creating DEMs from Open Topography.
- Building outlines for Taranaki have been added to the national dataset. Read more
- 10m imagery has been update on LINZ Data Service. Read more.
- All lead agencies remain engaged with the resilience and climate change key dataset improvement project.

Priority Improvements Update: Quarter 1

Key datasets to support those working in resilience 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 the next 12 months.

Below is an update on progress during Quarter 1 (June to September 2019) and planned milestones for Quarter 2 (October – December 2019).

- Lead agency is on track to deliver priority improvement to agreed timeframe
- Lead agency has delivered data improvements to the public this quarter.
- Lead agency is obtaining organisational buy in to deliver priority improvement.

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

   Q1 Gained agreement from some Territorial Authorities to share their complete address datasets, rather than just recent changes, and recently gained access to an address validation tool.

   Q2 Understand the value of the validation process, with the intention of having some sample additional addresses to assess for quality and validity. Plan for stakeholder engagements in the new year.

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

   Q1 LINZ has issued a Request for Tender to procure LiDAR capture services on behalf of the 8 Regional Councils. Submissions due 4 September 2019. LiDAR for Marlborough and Manawatu-Whanganui has been released.

   Q2 Evaluate tenders and identify preferred supplier. Release additional data to continue to build national height dataset and publish blog on converting LiDAR data to NZVD2016 datum.

3. NZTA understands the importance of providing easy access to **road closure** data, but currently is unable to commit to an improvement plan.

   Q1 Road closure network has not progressed due to recent restructure at NZTA.

   Q2 NZTA to create high level understanding of the work required to develop a road closure network of state highways and local roads. This improvement is also being discussed with Ministry of Civil Defence and Emergency Management.

4. 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.

   Q1 First release of 2018 Census data is now available at SA2 level (area unit replacement) attributed with population count, age sex and ethnicity, and also available as Esri REST services.

   https://www.stats.govt.nz/information-releases/2018-census-population-and-dwelling-counts-nz-stat-tables

   https://s3-stats.cloud.eaglegis.co.nz/arcgis/rest/services/Census2018

   Q2 Publish SA1 (meshblock replacement) dataset with population counts and a variety of attributes. Provide further information to Senior Managers about small geography population counts.

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

   Q1 Publishing the parcel data as an Esri REST service is the first step towards improving access to the attribution. Project Brief for publishing key datasets as Esri REST services has been approved.

   Q2 Publish Parcels as an Esri REST service. Opening up the District Valuation Role is the key to generate a property boundary. Aim to provide restricted access to some individual Council District Valuation Roll data for testing. Release the Property Data Management Framework for expert review.

6. LINZ to complete national coverage of **building outlines** by June 2020.

   Q1 Taranaki buildings published in September. Buildings in Bay of Plenty, Gisborne and Marlborough have been captured and are currently being verified.

   Q2 Aim to publish buildings for Marlborough (already completed Q2), Bay of Plenty, Gisborne and investigate capturing buildings in areas where there is no aerial imagery e.g. Southland.

7. Fire and Emergency New Zealand understands the importance of the **suburbs** dataset and is working with LINZ to establish options regarding the dataset by December 2019.

   Q1 Fire and Emergency and LINZ shared the key dataset initiative with the Fire and Emergency Communication Centres environment manager. High level options were discussed alongside Emergency Services sector requirements. There are concerns about the amount of work required when resources have to remain focused on organisational priorities.

   Q2 Fire and Emergency legal team will be engaged to provide an opinion on the implications of Creative Commons licensing in light of Emergency Services sector requirements for the dataset.

8. LINZ to create a national **topographic basemap** by June 2022.

Q1 High level design and business case approved for basemaps project. Beginning with aerial imagery basemap. Topo basemap has been reprioritised and will be second basemap to be built.

Q2 Aiming to develop aerial imagery basemap and test inhouse by February 2020. Update website to provide information about Topo50 and Topo250 update schedule and link to update history.

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

Q1 LINZ has developed internal processes to establish roles and responsibilities during an emergency response to coordinate data capture. Discussions with flying companies during LiDAR tender helps understand capacity. Learnt more about Geospatial Intelligence Centre offering https://geointel.org

Q2 LINZ to run staff exercise to test the emergency response processes. Draft specification for aerial imagery capture during an emergency response to ensure timely data delivery. Plan user requirements workshop for March 2020. Publish new imagery.

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

Q1 Initiated engagement with Councils via LGGA. Recruitment of a summer student to work on LINZ data is in progress.

Q2 Approve Project Brief. Start Stage 1 to bring together the best available LINZ coastline data. Meet with key Councils.

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

Q1 Rivers Lines and Watersheds are now available as CC BY 4.0
https://catalogue.data.govt.nz/dataset/river-lines1
https://catalogue.data.govt.nz/dataset/watersheds1

Q2 Improve metadata and test options for improved data delivery at a national and regional scale.

12. LINZ to publish key datasets as **Esri REST services** by June 2020.

Q1 Project Brief has been approved.

Q2 Publish LINZ key datasets as Esri REST services

13. KiwiRail to improve access to **rail** network data by June 2020.

Q1 Recent focus has been on GIS team structure changes at KiwiRail.

Q2 Improve attribution and metadata for all public datasets.

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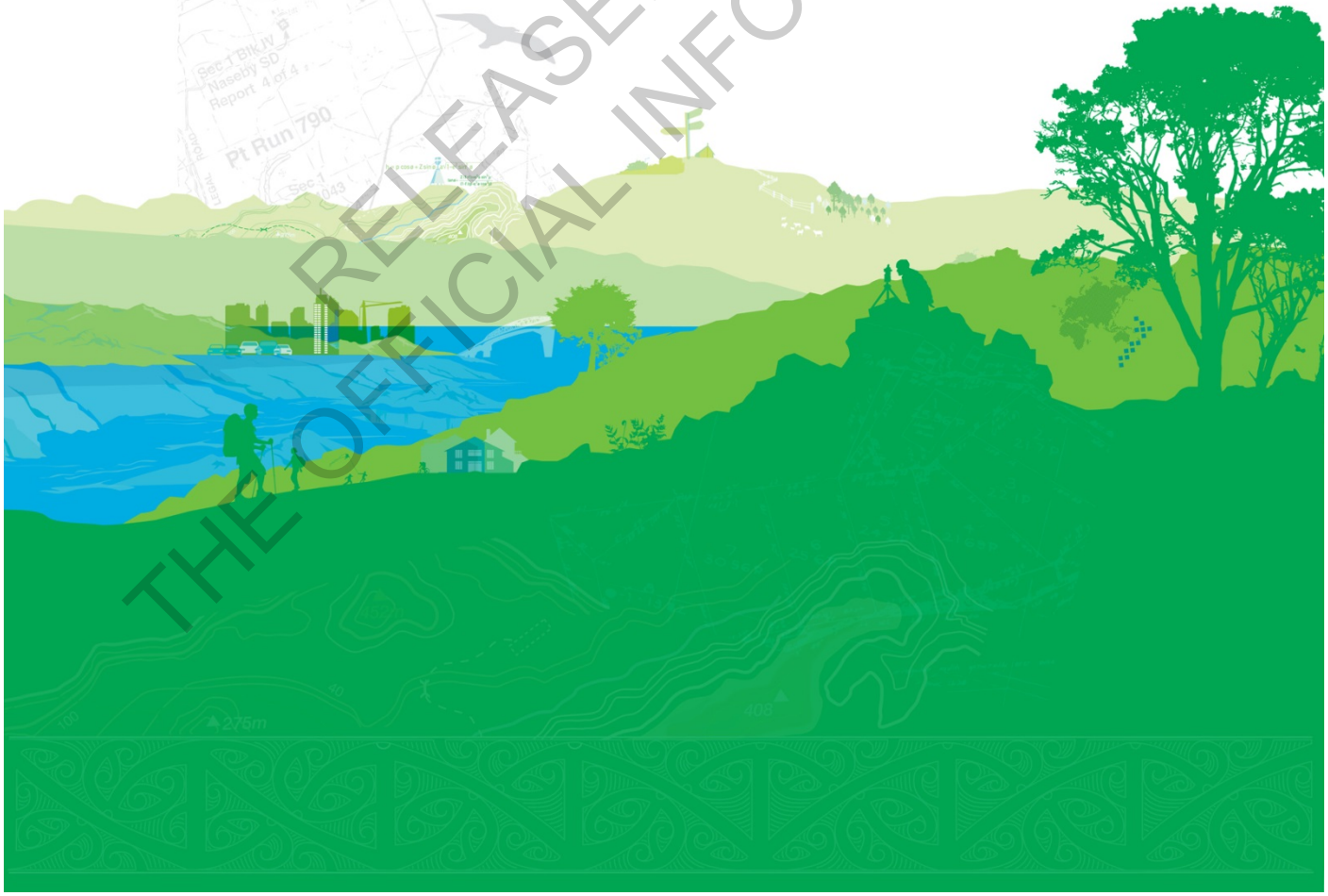
Metadata Content Guidance

For key resilience and climate change datasets

Objective ID: A3614757

Location Information

7 May, 2019



Note: delete this page if you do not require these tables

Acceptance

Role	Name	Signed	Date

Revision History

Date	Version	Revision	Author	Description
15/5/2019	0.1		R Deakin	1st draft

Contents Heading Style

Introduction

Metadata is "data that describes data". It is most commonly used to help make data discoverable, usable and understandable. It can also be used as a tool to help manage datasets throughout their lifecycle: from design, through ongoing management and maintenance, to retirement and archiving.

This document provides guidance on to dataset managers for put in place the minimum amount of metadata to enable potential users to:

- discover key datasets,
- assess their fitness-for-purpose, and
- have confidence that the data is being used or analyzed appropriately.

It is aimed specifically at lead agencies that have data improvement plans in place for key resilience and climate change datasets identified by LINZ, as part of LINZ's Resilience and Climate Change work programme.

It provides guidance specifically on what items of metadata (metadata elements) should be recorded as a minimum requirement to allow potential users to assess the fitness-for-purpose for their particular uses. Achievement of this minimum requirement is used as assessment measure and target in creating the improvement plan.

For fuller introductions to, and explanations of, metadata and its use there are already numerous resources available on-line that provide this. Some of these are listed in the final section of this document, and we recommend reviewing these, particularly those that relate to the ISO 19115 suite of metadata standards for geographic information.

What is metadata?

Within the context of data and information management, metadata is often used to document and describe resources that contain or provide access to data, such as dataset or web-services.

Different domains, such as medicine, education, publishing and statistics have developed specific formats for the ways in which they describe data and information resources. Perhaps the most widely known systems are library catalogue systems, where each resource is tagged with information that tells the would-be user about its:

- title
- subject
- author
- publisher
- publication date
- edition number

- ISBN number (unique ID)
- where it can be found

All of this information is provided as a summary, a metadata record, to anyone who may be interested in tracking down a particular publication, or books on a particular topic, or works by a specific author published between set dates.

For geographic datasets, we have an interest in knowing similar things. If we wanted to discover whether there was building outline dataset available for Christchurch, it would be useful if we could search a single data catalogue to find it.

Approaches could be to search by:

- title
- subject
- the source organisation
- the spatial extent (area of interest)

If were identified one or more datasets of interest, we would want to find out whether they were fit-for-purpose for our particular use. To do this we may want to know:

- Why the data was originally captured?
- What organisation created the data?
- How was the data captured?
- When was it captured?
- When was it published?
- How often is updated?
- Is it a complete record covering the whole of Christchurch?
- How accurate is the data?
- Does the dataset include particular fields we are interested in? (e.g. building use, value, age, construction type, ownership.)
- Are their licensing restrictions on how the data can be used?
- Is there a cost to using the data?
- What formats is it available in?

If we want to analyse the data with confidence, can we determine:

- What units of measure are used for key attributes? (e.g. is "value" given as NZ$, or NZ$ '000?; is area in m^2, ft^2 or ha?)
- If an ID field is present, is it unique for each record, and is it persistent?
- If code lists are used to describe building material, what do the codes mean?

- If a value is given to five decimal points, is that degree of precision reliable?

As you can see, different levels of metadata detail are required to support:

- Discovery (requiring relatively high-level metadata only)
- Assessing fitness-for-purpose (detail relating to content, accuracy and quality is needed)
- Appropriate use (unambiguous definition of the data and what it represents is needed)

Metadata standards for geographic information

The use of common ways to record metadata, using a standard structure with common fields used to record metadata "elements", is something that is seen in different disciplines and domains.

Geographic information is distinct from other forms of information; it inherently has some unique characteristics e.g. its spatial extent, the geographic / map projection system used to define location, positional accuracy and precision of coordinates.

To accommodate these, specific metadata standards for geographic information have developed over the years.

In 1994 the Federal Geographic Data Committee (FGDC) first published a "Content Standard for Digital Geospatial Metadata". This gained wide use, particularly within the USA, but others also developed with the growth in use of digital geospatial data.

The International Standards Organisation (ISO) Technical Committee 211 – Geographic information / Geomatics (TC211) undertook work to harmonise a number of these "*de facto*" standards, and in 2003 released the ISO 19115 standard for "Geographic Information – Metadata".

This ISO standard has since been actively managed and revised by TC211, and is widely recognised in many countries as the national standard to be used for recording metadata for geographic information:

- ISO 19115 is the official standard adopted by Standards New Zealand and Standards Australia (AS/NZS ISO 19115.1:2015 is the current joint standard);
- the FGDC has retired its content standard in favour of ISO 19115;
- the International Hydrographic Organization's S-100 metadata standard for hydrographic, marine and related geographic data is based on the ISO 19000 series.

Current state

ISO metadata

The latest AS/NZS ISO 19115 standard was published in 2015 (superseded the previous 2005 standard AS/NZS ISO standard and 2007 regional profile a.k.a. the "ANZLIC Metadata Standard" (named after the Australia New Zealand Spatial Information Council which adapted an ANZ regional profile from the core ISO standard)).

Creating metadata records can be a complex and time-consuming business, and generally requires supporting software tools to be in place.

While tools were put in place to support the use of the 2007 ANZLIC profile of the standard, tools and best practices have yet to emerge to support the use of the 2015 version (there is currently an ANZLIC Metadata Working Group looking at this).

The result is that there is a lag in the adoption and use of the new standard. This means that in addition to the legacy metadata already created to the 2007 standard, metadata for new dataset is still being created to the 2007 profile.

This is not a significant practical problem; the 2007 standard is forwardly compatible, and generally still fit-for-purpose.

This situation (lack of tools and best practice guidance) makes it difficult to recommend use of the current standard. For that reason, until such a time when tools are in place to support the newer standard, we recommend that users work with the tools to hand and create metadata using the previous version.

General metadata

We want to make the key datasets for resilience and climate change easy to find, and freely and openly available. The place to publish details of public data is data.govt.nz, the New Zealand Government's open data catalogue.

Any data published through data.govt.nz has to be described by an accompanying metadata record. The scope of the content for these metadata is much less extensive than the full scope of the ISO standard allows. However, it still covers much of the most critical information.

Additionally, the data.govt.nz team provides tools and support to make the process of publishing data easy (https://data.govt.nz/manage-data/).

Because the data.govt.nz metadata format does not explicitly allow for the provision of information on data attributes, and is limited in how other critical elements of information specific to geospatial data can be represented, we recommend that metadata is created using the ISO standard. A version of this can then easily be brought in, in a cut down form, to the data.govt.nz catalogue.

Minimum requirements

Table 1 shows the minimum set of metadata elements for key resilience geospatial datasets that we consider necessary to enable users to assess a dataset's fitness-for-purpose. It lists the metadata element required, a brief definition and guidance as to what is expected to be recorded. It also references the name and description of the corresponding metadata element used by the ANZMet Lite tool.

This software tool was developed by ANZLIC to enable users to easily record the most essential metadata elements using to the 2007 ISO metadata profile. The tool is available to download, and though it is no longer supported, its guidance documentation provides a very good, easy to understand and more expansive explanation of what each metadata element should contain.

We highly recommend that you refer to this resource:

https://www.anzlic.gov.au/sites/default/files/files/03d_anzlic_metadata_prof_shortuserguide_anzmetlite.pdf (last visited 6/5/2019).

ESRI Australia also provide a Metadata Editing Tool that supports the use of the 2007 profile for ArcGIS / ArcCatalog users. It can be downloaded from their website: https://esriaustralia.com.au/products-metadata-editing-tool

Table 2 provides an example of how the minimum metadata elements can be represented using the ISO:19115:2007 (ANZLIC) standard.

Table 3 compares the ability of each of the three metadata standards (ISO 19115:2007 (ANZLIC), ISO 19115:2015 and Data.govt.nz schema) to represent these metadata elements.

It is important to note that this document only considers representation of the elements that we have deemed necessary to allow users to assess fitness-for-purpose. These are really are the bare bones of what is required

The ISO 19115 standard itself has a number of metadata elements it considers mandatory that are not included amongst these (e.g. Topic Category). It also has a number of elements the requirement for which is "conditional".

We recommend that in addition to fitness-for–purpose elements, the mandatory ISO 19115 elements are completed, along with the conditional elements where necessary.

Also there are other very useful metadata elements that may be appropriate to your data, such as "Scale" or "Resolution" or explicit "Use Limitations" based on know fitness-for-purpose for particular purposes. If these are known and easy to record then it is good practice to do so. The ANZMet Lite Short User Guide provides a very good summary and explanation of these elements and we recommend that it is used as a reference to assist you in preparing your metadata records.

Mandatory ISO requirements

In addition to the minimum requirements that we have identified to enable users to assess fitness-for-purpose, the ISO standard has a subset of mandatory metadata elements for each record. There is significant overlap between these and those we have deemed a minimum requirement to assess fitness-for-purpose.

Table 1 in the ANZMet Lite Tool, Short User Guide (last visited 7/5/2019) identifies the mandatory elements for the ANZLIC metadata profile v1.1. Although these relate to the 2007 standard we recommend that they completed for each metadata record.

New and additional mandatory fields are present in the 2015 version of the ISO standard. However, as best practice guidance and supporting tools have yet to emerge for that version we recommend, for practical and pragmatic reasons, that the 2007 mandatory fields are used.

Table 1 – Minimum elements of metadata necessary to allow users to assess a dataset's fitness-for-purpose. Examples of the metatdata elements are taken from the metadata record for the "NZ Property Titles" dataset, published through the LINZ Data Service. https://data.linz.govt.nz/layer/50804-nz-property-titles/metadata/ (last visited 6/5/19)

Metadata element required	Definition	Guidance
Dataset name (Often referred to as "Title") ANZMet Lite name: "Resource Title"	Name by which the cited resource is known.	Use a meaningful, plain language phrase for that resource (note: do not use the file name). To facilitate discovery, consistent title naming conventions should be used for related resources. To discriminate between duplicate titles, a reference to the version should be included in the title. For identification purposes, it is important to carefully complete this element. **Example: NZ Property Titles**
Unique identifier (Often referred to as "File Identifier" or "Identifier") ANZMet Lite name: "Metadata File Identifier"	Unique reference ID specific to the metadata record.	This is a unique ID fro the metadata record. It is often automatically assigned by the tool used to create to metadata record or catalogue within which it is stored. **Example: 2d28e0af-c177-628b-d667-22b15b648d55**
Source (Often referred to as "Responsible Party" or "Creator") ANZMet Lite name: "Metadata Contact Organisation"	Name of party (organisation) responsible for the metadata information. The metadata point of contact provides the details to enable communication with persons and organisations associated with the metadata regarding the resource.	This is typically the name of the organisation responsible for publishing the data. **Example: LINZ - Land Information New Zealand**

Metadata element required	Definition	Guidance
Source contact information (Often referred to as "Contact Info") ANZMet Lite name: “Metadata Point of Contact”	Contact details for enquiries relating to the dataset.	Provide a named contact point, telephone number or email address (ideally both) for queries about the dataset, both at source. The ISO 19115 standard allows a number of contact methods to be recorded e.g. telephone, email etc. **Example: customersupport@linz.govt.nz**
Date created - dataset ANZMet Lite name: “Reference Date” + “Reference Date Type”	Date at which the dataset was first created.	Within the ISO 19115 standard “Date Stamps” can be assigned to a number of different metadata elements. The basic ones we are concerned with are: the original date the dataset was created and the date it was last updated. Also it’s very useful for users to know the date the metadata record was created / last updated, and the update frequency for the dataset **Example: 2018-11-20**
Date created – metadata record ANZMet Lite name: “Metadata Date Stamp”	Date at which the metadata record was created / last updated.	
Last updated - dataset (Often referred to as "Updated") ANZMet Lite name: “Reference Date” + “Reference Date Type”	Date the resource was last updated.	
Description (Often referred to as "abstract") ANZMet Lite name: “Abstract”	The abstract is a free text entry that provides additional information about the content of the resource.	The abstract should provide sufficient information, such as key words, to adequately describe the content of the resource. Careful consideration should be given when preparing an abstract as it is an important element used when assessing the usefulness of a resource. **Example: This dataset provides title information (excluding ownership) where there is a relationship to one or more primary parcels.** **A Record of Title is a record of a property's owners, legal**

Metadata element required	Definition	Guidance
		description and the rights and responsibilities registered against the title. **This dataset does not contain any ownership information so that it can be freely distributed. If ownership information is required, see the [NZ Property Title Including Owners](https://data.linz.govt.nz/layer/50805) and [NZ Property Title Owners](https://data.linz.govt.nz/layer/50806) datasets. Note: these are restricted access datasets and require you to agree to the [LINZ Licence for Personal Data](https://www.linz.govt.nz/data/licensing-and-using-data/linz-licence-for-personal-data).** **There can be multiple parcels associated with a title, and a title may only have a part share in a parcel. This means the shape representing the title will be an aggregation of all parcels that the title is associated with. The 'spatial extents shared' attribute when equal to 'false' will indicate that title has exclusive interest over all of the shape (this will be case for the vast majority).** **The originating data for parcel/title associations includes some non-official sources where the official data does not support a link. For more information see the [LINZ website](http://www.linz.govt.nz/about-linz/linz-data-service/dataset-information/cadastral-titles-data)**
Extent ANZMet Lite name: "Geographic Bounding Box" + "West Bounding Longitude" + "East Bounding Longitude" + "South Bounding Latitude" + "North Bounding Latitude"	The geographic location that the data applies to.	This can often be defined by the coordinates of the 4 corners of the bounding box that covers the geographic extent on the dataset. **Example: 166.688755883-175.833301833-47.2899925167-34.12963565**
Coordinate (reference) system (Often referred to as "reference system Info")	Name or identification code for the coordinate reference system to which the	Geospatial data is generally defined within a geographic (e.g. lat : long based) or projected (e.g. easting : northing

Metadata element required	Definition	Guidance
ANZMet Lite name: “Reference System Identified”	data is associated.	based) coordinate system. It is important that users know which system is being used so that the data can be corrected portrayed, analysed, transformed and correlated to other geospatial datasets. ANZLIC recommends the use of “EPSG” codes (maintained by the European Petroleum Survey Group). These identify particular coordinate reference systems. The registry of these codes is can be found at: http://www.epsg.org/ E.g. The code for New Zealand Geodetic Datum (NZGD) 2000 coordinate reference system is: 4167 **Example: 4167**
Spatial representation type ANZMet Lite name: “Spatial Representation Type”	The method used to spatially represent geographic information e.g. vector.	Use only for spatial datasets. Typical values include: point, line, polygon, polyline, raster, vector, TIN (Triangulated Irregular Network). **Example: vector**
Method of collection (Often referred to as "lineage") ANZMet Lite name: “Lineage”	Description of the sources and production processes used in producing the resource.	General explanation of the data producer’s knowledge about the lineage (or history) of the resource. **Example: The function of the Registrar-General of Land is to provide a system, whereby the ownership of land can be legally evidenced, under which dealings with it can be effected and recorded.** **From the earliest days of colonisation, offices have existed in New Zealand for the registration of instruments affecting land. To enable a record of ownership of land to be kept the Land**

Metadata element required	Definition	Guidance
		Registration Ordinance was passed by the Legislative Council of New Zealand on 28th December 1841. This provided for the setting up of Deeds Registry Offices and prescribed the method of registering Crown Grants and other Private Deeds relating to Land. The system is generally known as Deeds Registration System or Deeds System for short. **The Deeds System with modifications continued until the Land Registry Act 1860 was promulgated. After a number of amendments it was replaced by the Land Transfer System (LT Act 1870 and subsequent acts). This is sometimes called the Torrens System, after its originator in South Australia. Since the 1870 all registration takes place under the Land Transfer System. The Land Transfer System provides a simple method of registration and in addition, titles issued under it are guaranteed by the State. The first digital data was created by the Land Titles Office (a division of the Justice Department) in the late 1980s - early 90s. This data formed the electronic land transfer journal and a titles index (Land Title Link). The LTO was amalgamated with DOSLI and finally LINZ. As Landonline was rolled out, the paper titles were converted into digital computer registers. The titles conversion project converted 1.8 million "live" titles and imaged 2 million instruments. Certificate of Titles were replaced by Computer Registers. Both have since been replaced by Record of Title, with the commencement of the Land Transfer Act 2017.**
Purpose Not included in ANZMet Lite name, could be captured in its "Statement" field	Summary of the intended use(s) for which the resource was created.	General explanation of the data producer's reason for generating the data and the uses it has been designed for. This should help inform other users in making their own assessment of whether it will be suitable for use for their own purposes. **Example: This layer provides title information (excluding ownership) where there is a data link to one or more primary**

Metadata element required	Definition	Guidance
		parcels.
Dataset attribution Not included in ANZMet Lite	Description of dataset attributes, described by the measurement value (where appropriate)	A full description of each attribute within the dataset should be given. This should enable users to match the attribute (table column) name to a clear description of what the values within it represent, and where appropriate: what units of measure are uses, what category code lists / vocabularies and classifications are used and what the given values represent. **Example: This information is provided in the accompanying document: property-and-ownership-simplified-tables-data-dictionary.pdf**
License (Often referred to as "Legal restrictions") ANZMet Lite name: "Legal Restrictions – Use"	Access and use constraints applied to the data e.g. to protect privacy or intellectual property.	Users need to know if data access and use is governed by license conditions, and if so, what these are. Often a reference can be provided to the particular license used e.g. Creative Commons Attribution 4.0 International (CC BY 4.0). **Example: Released under Creative Commons Attribution 4.0 International with:** **Following Disclaimers:** **1. This data is made available through the LINZ Data Service and is based on information contained with Landonline (New Zealand's Official Title and Cadastral System)** **2. Not to be used for defining legal parcel boundaries or**

Metadata element required	Definition	Guidance
		transacting land **Following Attribution:** **If you publish, distribute or otherwise disseminate this work to the public without adapting it, the following attribution to Land Information New Zealand should be used:** **'CC BY 4.0 Land Information New Zealand'** **If you adapt this work in any way or include it in a collection, and publish, distribute or otherwise disseminate that adaptation or collection to the public, the following attribution to Land Information New Zealand should be used:** **'Contains data sourced from the LINZ Data Service and licensed for reuse under CC BY 4.0.'** **If "attribution stacking" problems exist then the requirement to display the above attribution statements is waived and in lieu the attribution statement is to be made in any terms or conditions associated with the work/ product/ application/ etc.**

Table 2 – Example of an ISO:19115:2007 (ANZLIC) format metadata record, showing just the required minimum elements. The table shows the hierarchy of the metadata elements within the ISO schema and values recorded against these for the record that describes the "NZ Property Titles" dataset, published through the LINZ Data Service.

https://data.linz.govt.nz/layer/50804-nz-property-titles/metadata/ (last visited 6/5/19)

Metadata element required	**Example: NZ Property Titles (**recorded value in **bold** text**)**
Dataset name (Often referred to as "Title")	Identification Info Data Identification Citation Citation Title **NZ Property Titles**
Unique identifier (Often referred to as "File Identifier" or "Identifier")	Metadata File Identifier **2d28e0af-c177-628b-d667-22b15b648d55**
Source (Often referred to as "Responsible Party" or "Creator")	Contact Responsible Party Organisation Name **LINZ - Land Information New Zealand**
Source contact information (Often referred to as "Contact Info")	Contact Info Contact Phone Telephone Voice **04 4600110** Address Address Delivery Point **155 The Terrace** City

Metadata element required	Example: NZ Property Titles (recorded value in **bold** text)
	Wellington Postal Code **6011** Country **New Zealand** Electronic Mail Address **customersupport@linz.govt.nz**
Date created - dataset	Identification Info Data Identification Citation Citation Date Not given (not specified in record, but detailed history of the development of the dataset is given in the "Lineage" statement)
Date created – metadata record	Metadata Date Stamp Date **2018-11-20**
Last updated - dataset (Often referred to as "Updated")	Resource Maintenance Maintenance Information Maintenance And Update Frequency Maintenance Frequency Code **weekly**
Description (Often referred to as "abstract")	Identification Info Data Identification Citation Abstract

Metadata element required	Example: NZ Property Titles (recorded value in **bold** text)
	This dataset provides title information (excluding ownership) where there is a relationship to one or more primary parcels. **A Record of Title is a record of a property's owners, legal description and the rights and responsibilities registered against the title.** **This dataset does not contain any ownership information so that it can be freely distributed. If ownership information is required, see the [NZ Property Title Including Owners](https://data.linz.govt.nz/layer/50805) and [NZ Property Title Owners](https://data.linz.govt.nz/layer/50806) datasets. Note: these are restricted access datasets and require you to agree to the [LINZ Licence for Personal Data](https://www.linz.govt.nz/data/licensing-and-using-data/linz-licence-for-personal-data).** **There can be multiple parcels associated with a title, and a title may only have a part share in a parcel. This means the shape representing the title will be an aggregation of all parcels that the title is associated with. The 'spatial extents shared' attribute when equal to 'false' will indicate that title has exclusive interest over all of the shape (this will be case for the vast majority).** **The originating data for parcel/title associations includes some non-official sources where the official data does not support a link. For more information see the [LINZ website](http://www.linz.govt.nz/about-linz/linz-data-service/dataset-information/cadastral-titles-data)**
Extent	Identification Info Extent EX _ Extent Geographic Element EX _ Geographic Bounding Box

Metadata element required	Example: NZ Property Titles (recorded value in **bold** text)
	166.688755883-175.833301833-47.2899925167-34.12963565
Coordinate (reference) system (Often referred to as "reference system Info")	Reference System Info Reference System Reference System Identifier Identifier Code **4167**
Spatial representation type	Identification Info Data Identification Spatial Representation Type Code **vector**
Method of collection (Often referred to as "lineage")	Data Quality Info DQ _ Data Quality Scope Lineage LI _ Lineage Statement **The function of the Registrar-General of Land is to provide a system, whereby the ownership of land can be legally evidenced, under which dealings with it can be effected and recorded.** **From the earliest days of colonisation, offices have existed in New Zealand for the registration of instruments affecting land. To enable a record of ownership of land to be kept the Land Registration Ordinance was passed by the Legislative Council of New Zealand on 28th December 1841. This provided for the setting up of Deeds Registry Offices and prescribed the method of registering Crown Grants and other Private Deeds relating to Land. The system is generally known as Deeds Registration System or Deeds System for short.**

Metadata element required	Example: NZ Property Titles (recorded value in **bold** text)
	The Deeds System with modifications continued until the Land Registry Act 1860 was promulgated. After a number of amendments it was replaced by the Land Transfer System (LT Act 1870 and subsequent acts). This is sometimes called the Torrens System, after its originator in South Australia. Since the 1870 all registration takes place under the Land Transfer System. The Land Transfer System provides a simple method of registration and in addition, titles issued under it are guaranteed by the State. The first digital data was created by the Land Titles Office (a division of the Justice Department) in the late 1980s - early 90s. This data formed the electronic land transfer journal and a titles index (Land Title Link). The LTO was amalgamated with DOSLI and finally LINZ. As Landonline was rolled out, the paper titles were converted into digital computer registers. The titles conversion project converted 1.8 million "live" titles and imaged 2 million instruments. Certificate of Titles were replaced by Computer Registers. Both have since been replaced by Record of Title, with the commencement of the Land Transfer Act 2017.
Purpose	Identification Info Data Identification Citation Purpose **This layer provides title information (excluding ownership) where there is a data link to one or more primary parcels**
Dataset attribution	Provided in separate document linked to the metadata record: property-and-ownership-simplified-tables-data-dictionary.pdf

Metadata element required	Example: NZ Property Titles (recorded value in **bold** text)
License (Often referred to as “Legal restrictions”)	Identification Info Data Identification Resource Constraints Legal Constraints Use Limitation **Released under Creative Commons Attribution 4.0 International with:** **Following Disclaimers:** **1. This data is made available through the LINZ Data Service and is based on information contained with Landonline (New Zealand's Official Title and Cadastral System)** **2. Not to be used for defining legal parcel boundaries or transacting land** **Following Attribution:** **If you publish, distribute or otherwise disseminate this work to the public without adapting it, the following attribution to Land Information New Zealand should be used:** **'CC BY 4.0 Land Information New Zealand’** **If you adapt this work in any way or include it in a collection, and publish, distribute or otherwise disseminate that adaptation or collection to the public, the following attribution to Land Information New Zealand should be used:** **'Contains data sourced from the LINZ Data Service and licensed for reuse under CC BY 4.0.'** **If "attribution stacking" problems exist then the requirement to display the above attribution statements is waived and in lieu the attribution statement is to be made in any terms or conditions associated with the work/ product/**

Metadata element required	Example: NZ Property Titles (recorded value in **bold** text)
	application/ etc.

Table 3 – Comparison of baseline metadata elements necessary to enable assessment of whether data is fit-for-purpose, and these are represented in the 3 existing metadata schema

Metadata elements required	ISO 19115:2007 ANZLIC Profile	ISO19115:2015	Data.govt.nz schema	Comments
Dataset name (Often referred to as "Title")	Yes	Yes	Yes	
Unique identifier (Often referred to as "File Identifier" or "Identifier")	Yes	Yes	Yes	
Date created - dataset (Often referred to as "Date Stamp")	Yes	Yes	Yes	Metadata is often recorded for a number of key dates e.g. creation and last update of the dataset, publication of the metadata.
Date created – metadata record (Often referred to as "Date Stamp")	Yes	Yes	Yes	
Source (Often referred to as "Responsible Party" or "Creator")	Yes	Yes	Yes	
Source contact info (Often referred to as "Contact Info")	Yes	Yes	Yes	
Last updated (Often referred to as "Updated")	Yes	Yes	Yes	
Description (Often referred to as "abstract")	Yes	Yes	Yes	

Metadata elements required	ISO 19115:2007 ANZLIC Profile	ISO19115:2015	Data.govt.nz schema	Comments
Extent	Yes	Yes	Yes	
Coordinate (reference) system (Often referred to as "reference system Info")	Yes	Yes	Maybe	Could be detailed as part of "description" but does not make specific use of the opportunity to reference standard reference definitions
Spatial representation type code (e.g. point, line, polygon, polyline, raster, vector)	Yes	Yes	Maybe	Could be detailed as part of "description"
Method of collection (Often referred to as "lineage")	Yes	Yes	Maybe	Could be detailed as part of "description"
Purpose	Yes	Yes	Yes	
Dataset attribution	Yes	Yes	No	ISO 19115 can accommodate data attribution details; for data.govt.nz this has to be provided as a separate resource
License	Yes	Yes	Yes	

Useful references and resources

The following on-line resources provide useful information on using the ISO 19115 metadata standard and general background information.

Reference is also given to the data.govt.nz metadata guidelines and technical specification.

ISO 19115 references

ANZMet Lite Tool, Short User Guide

https://www.anzlic.gov.au/sites/default/files/files/03d_anzlic_metadata_prof_shortuserguide_anzmetlite.pdf (last visited 7/5/2019)

ANZMet Lite Tool

https://www.anzlic.gov.au/resources/metadata#ProdYourMetadata (last visited 7/5/2019)

ANZLIC metadata documentation and guidance for the superseded ANZLIC metadata standard:

https://www.anzlic.gov.au/resources/asnzs-iso-1911512015-metadata (last visited 7/5/2019)

ESRI Australia Metadata Editing Tool for ArcGIS / ArcCatalog users:
https://esriaustralia.com.au/products-metadata-editing-tool (last visited 7/5/2019)

Data Documentation Initiative (DDI) – summary of current ISO:19115 fundamentals:

https://ddi-alliance.atlassian.net/wiki/spaces/DDI4/pages/548405259/ISO+19115+Geographic+Information+--+Metadata#ISO19115GeographicInformation--Metadata-Temporalaspects (last visited 7/5/2019)

NOAA metadata resources (introduction and training resources:

https://www.ncddc.noaa.gov/metadata-standards/ (last visited 7/5/2019)

The Association for Geographic Information introduction to metadata (plus information on the UK ISO 19115 profile "GEMINI"):

https://www.agi.org.uk/agi-groups/standards-committee/uk-gemini/40-gemini/1052-metadata-guidelines-for-geospatial-data-resources-part-1 (last visited 7/5/2019)

Data.govt.nz references

Data.govt.nz metadata guidance:

https://www.data.govt.nz/manage-data/releasing-data-on-data-govt-nz/what-metadata-should-i-include-with-my-dataset/ (last visited 7/5/2019)

Data.govt.nz metadata schema documentation:

https://github.com/data-govt-nz/schema (last visited 7/5/2019)