

ICSM MDWG Report

25 March 2019

*“Everything is related to everything else, but near things are more related than distant things.”* - Waldo Tobler’s First Law of Geography

Spatial relationships are an important method by which we understand and make decisions about the world. Making these locational relationships clear is a primary purpose of spatial data and to build these relationships successfully and efficiently requires cooperation and integration of often disparate spatial data across agency boundaries. To help bring this data together effectively requires quality metadata.

# Summary

At the ICSM Meeting in Canberra on 14 - 15 November 2017, it was proposed that a new standing committee be established in ICSM that would focus on metadata issues. These issues have hindered data discovery and interoperability in several detailed use cases. As a result desired costs savings and improved decision making have not reached their potential. The formation of the Metadata Working Group (MDWG) is a result of that action.

This is a report on our progress of the road map of work that aims to provide clarity and best practice for using the previously endorsed ISO 19115-1 and its XML implementation (ISO 19115-3) in Australia and New Zealand. The first step in this road map, and the focus of this report, is to identify and standardise those high-level common metadata elements in ISO 19115-1 that provide the most value to the most users. While those elements being identified are necessary for broad discoverability and compatibility of metadata, we do not claim them to be sufficient to provide a comprehensive metadata standard or profile for any specific domain of user communities. Further work is needed by each domain to determine adequate profiles of metadata standards for themselves.

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# Background

The ANZLIC Metadata Profile was showing its age as a consequence of inheriting the weaknesses of its parent standard (ISO 19115:2003) and was not providing the solution required by the Australian and New Zealand user community. As a consequence in 2015 ANZLIC made the decision to adopt the new ISO standard (19115-1:2014) as the formal standard and within the ANZ jurisdictions is known as: AS/NZS 19115:2015. This will be referred to as the AS/NZS Standard within this document.

Furthermore, it was recognised that the ANZLIC Profile from the earlier standard was simultaneously too simple and too complicated an approach. The profile is too simple in that it assumed a common core set of elements could be apply to any dataset. In this instance, the “one size fits all” concept does not work. The Profile is also too complicated in that the large number of elements in the ANZLIC Profile were difficult for many users to understand and see the relevance to their needs.

The ANZLIC Profile also proved to be difficult to support in vendor software. While successful efforts were made by companies like ESRI and the ANZMet Lite tool, maintenance of these proved difficult to sustain. This illustrates the overarching problem that the ANZLIC Profile was viewed as “Job Done” rather than something that needed ongoing maintenance and support.

The adoption of the new AS/NZS Standard has provided a range of improvements including:

* Metadata for services – covering metadata for both the data and web services with the same standard
* Bi-directional linking of services and datasets – enabling services to link with data and data to link with services
* Better options for linking to external documents and data (Including Parent records)
* Improved usage constraints information (IP, Security, Privacy)
* Identifiers and Keywords improvements – following semantic web protocols
* Data quality elements (completeness, accuracy, etc.) moved into another standard - ISO 19157
* Better Citation options
* Improved date and time options

## What is the Problem?

The new AS/NZS Standard was adopted in part to overcome the overheads that resulted from using a specific profile of the previous international standard. Additionally, the AS/NZS Standard was adopted because it was assumed that authoritative guidance would be developed elsewhere in the world that the Australian / New Zealand community could use.

Unfortunately, this guidance has failed to materialise, partly because the rest of the world has been slow to adopt this improved standard. This has left our community in a difficult position. We can no longer recommend the previous and now deprecated ANZLIC Profile and those that have been implementing the new AS/NZS Standard have been doing so without guidance which has resulted in differing and incompatible implementations.

The impacts of these issues become most visible when combining metadata from different sources as is done by the higher-level catalogue data.gov.au and the EM-Link emergency management data tool. Because of the current lack of standardised implementation guidance and published common vocabularies, special mappings of metadata elements need be made for each source – sometimes in in less than fully informed ways. This can create serious issues for those who need to discover, share and use these data.

## **The Proposed Solution and Road Map**

The ongoing support for the Australian and New Zealand geospatial community in the implementation and use of the AS/NZS Standard is an essential endeavour for ANZLIC. In taking on this role ANZLIC will become world leaders in this space. The ISCM MDWG, with support from Geosciences Australia, is envisioned as the group that will be responsible for providing this ongoing support on behalf of ANZLIC. The initial work, reflected in this report, is to establish a set of high-level common metadata elements.

The creation of these agreed high-level common elements will provide the platform for the development of domain specific profiles. Additionally, the agreed high-level common elements will provide a range of benefits to both the data custodian and the end user. Some of these benefits are described below.

**Custodian**

* Reduced cost and time in data collection, management & delivery - through the use of new technologies enabling collaboration·
* Greater number of users and re-uses of the data - through consistent web services·
* Supporting the building of governed and managed federated supply chains - through active working groups·
* Consistent application of standards - through the best practice guides and managed change projects·
* Communities of subject matter experts to enable information sharing - through active working groups

**End User**

* Reduction in cost and time to locate and access relevant data – through discoverable data download or web service·
* Fast and easy access to the data – through improved metadata and linked vocabularies·
* Reduced complexity in the application of disparate data sets - through consistent web services and data access.
* Increased interoperability with other datasets - through consistent web services·
* Improved decision making by using authenticated and trusted data - through actively governed supply chains·
* Transparency in how the data was made and what is planned for the datasets future - through consistent and maintained metadata

# Approach

We view Metadata standards as being like a language with grammar and vocabulary. It is not necessary to use all the words and sentence structure to communicate, but it is important they are there when you need them.

## Principles for Effective Metadata

#### First do no harm to the (meta)data

Most systems have been developed over time to meet real world business needs. We must take care when suggesting change that we leave the practitioners with systems at operate at least as well as they previously had. This is often accomplished by focusing on exchange standards for metadata and data.

####  Seamless interoperability

We are aiming for near seamless interoperability of data regardless of source and custodianship. In practice this is best achieved by agencies working in close collaboration with clear governance in place. Good and consistent metadata is also essential to support this ambition.

#### The right metadata to the right audience.

All metadata elements are important, but not all elements are needed for all users. Unlike the old ANZLIC Profile we are not mandating a minimal metadata collection standard that all domains use. Rather, we recommend certain fields to be populated using common language so that high level metadata is consistent and easily understood by a broad audience and also in ‘machine to machine’ interactions. These identified fields are deemed necessary but may not be sufficient for all users. The use of these recommended high-level common elements will enable broad access to all documented data sets. However, each domain will need to determine what additional fields are required to support their domain specific requirements.

#### Address the needs of your nearest community of users

The earliest and often most significant benefits of data sharing usually arises from a community of professionals within the same or similar domains. Metadata for each domain needs to be useful to these communities to support the governance and processes necessary to achieve these benefits.

#### Ensure high-level common elements are understandable to a general audience

Data, especially authoritative data, is often useful outside the domain for which it was intended. Each domain must ensure that the high-level common metadata elements, enumerated later in this document, can be understood by a broad audience.

## The Way Forward

Our starting point in determining the high-level common metadata fields was the Geoscience Australia profile of ISO 19115-1. This is a rather mature implementation of the AS/NZS Standard that is well documented and contains specialised code-lists for numerous elements. While it was found to provide a good framework on which to build our recommendations, it was also found to be somewhat too specialised, focussed on GA’s needs and not widely applicable for general adoption. The incorporation of input from other MDWG participating organisations such as ABARES, AADN, Defence, etc. was valuable to gain a deeper more complete understanding of these broader needs.

### High Use for a General Audience

The high-level common metadata elements were selected by applying the simple matrix below:

|  |  |
| --- | --- |
|  | AudienceSpecific General |
| UtilityLow High |  |  |
|  |  |

Those elements that all data managers and custodians should populate in their ‘domain’ specific profiles are those that are of the most use to the most general audiences. These elements should also be populated using common, agreed vocabularies.

The choice of these elements is also influenced by the need to support higher-level catalogues such as data.gov.au that capture and store their metadata in less detailed standards meant for a more general audience. These catalogues harvest large portions of their metadata from ISO 19115-1 sources using specialised crosswalks. MDWG has in its mandate the development of these crosswalks, review of their utility and provision of guidance in their use.

## Background to MDWG Approach

### Vocabularies

Agreed upon vocabularies and definitions of term included in the AS/NZS Standard is central to the MDWG work. In this first tranche of MDWG work we focus on recommended high-level common metadata fields.

To determine suitable vocabularies, it was important to come to a common understanding of the meanings and definitions of the metadata elements. This was complicated in part by the XML nesting structure where the meaning of the element may be changed by the location in the XML tree. For instance, the value and importance of a CI\_ResponsibleParty element may vary if that were referring to the source data, a particular distribution of the data or the metadata record itself. Clarity of meaning is critical in ensuring compatibility of metadata records.

The process to reach agreement involved collecting definitions from the various parties. Particular weight was given to the Official ISO 19115-1 definitions, but these often, due to the nested nature of the elements or other reasons, left room for interpretation. Our goal is to minimise this variance and reduce any potential for different interpretations. Decisions are made by consensus

Once agreed upon, these definitions will be made available in such a way that machine to machine communication will insure a minimum of variance in interpretation. Registries will hold these agreed upon definitions and where appropriate, possible values and example entries. These can then be made available to tools for metadata population and validation.

### Element Recommendation

Often in the ISO 19115-1 metadata standard there are multiple ways that an agency may record information important to the record. For instance, the Primary Point of Contact could be captured in a number of places. The choice of who this person is and the appropriate role to fill this function will vary according of the business processes of each organisation. What should not vary is the specific metadata field used to hold the primary contact information. Otherwise, automatic harvesting between catalogues – especially top-level catalogues such as data.gov.au – becomes very difficult and requires manual intervention. In this work we have reached agreement on common element use for many of the most general and useful elements.

### Crosswalks

In order to combine metadata from different sources as is done in the data.gov.au catalogue and the EM-Link emergency management data tool, some effort has been made to develop crosswalks between the various organisations from which these catalogues harvest metadata. Preliminary work has been done by MDWG to capture these mappings of alignments.

For those organisations whose catalogues store and harvest their metadata to the AS/NZS Standard (e.g. EM-Link), these crosswalks will become less necessary as the MDWG work progresses. For those whose catalogues store their metadata in other standards, such as Dublin Core or DCAT (e.g. data.gov.au), crosswalks will still be necessary. These will be developed and provided by MDWG and made available at a later time, together with detailed supporting documents.

There is a great deal of work occurring concurrently, both nationally and internationally, with the W3C DCAT standard through the Data eXchange Working Group ([DXWG](https://www.w3.org/2017/dxwg/wiki/Main_Page)). The DCAT standard promises, amongst other things, to provide for better metadata exchange mechanisms, better data linking support, improved discoverability by search engines and the ability to receive metadata in the profile the user needs. MDWG is in close contact with W3C efforts in this area.

### Cardinality

Agreement on the number of times a particular XML element can appear in a metadata record is an important consideration for ensuring compatibility of metadata sources. When cross-walking between profiles, this can be a difficult task. Because of the orderless nature of XML elements, putting the most important first does not also achieve the desired result. Methods to address this problem are under discussion.

The metadata elements recommended by the WG are provided in Annex 1

# Benefits of Good Metadata

## What is Metadata for?

*“Metadata without data is a shame, data without metadata is garbage.”* Paul van Genuchten – GeoCat BV

At its most basic, metadata provides documentary information about digital resources, much of which cannot be derived easily from the data itself, e.g. abstract, data custodian. Metadata provides a record of a data set that can facilitate management, discovery and identify fitness for use while providing contact information by which one can find out more or directly access the data. The process of searching for data differs from that of searching for information in that data is by its nature mostly unintelligible in its raw form. Some processing is generally needed to turn data into the information that an end user may need to make decisions or create products.

It is recognised by the MDWG that the highest value of good metadata is its role in supporting the interoperability of authoritative data. This interoperability reduces costly duplication of effort and the metadata provides information on the reliability and authoritative nature of data that when used leads to more informed and thus better decision making.

But while metadata is necessary to support effective interoperability, by itself is insufficient to this task. Governance arrangements are critical. These metadata provide the documentation that underpin the necessary governance arrangements on which sustainable interoperability depend. No agency is going to risk their business on data over which they have no sense of reliability or control.

It is also recognised that there is value in metadata to promote open data access which in turn can uncover new as of yet undiscovered uses of data. By the very nature of the unknowns in this use case, we can only hope to provide high level metadata, such as might be held in Data.gov.au, for these unidentified users and their unknown use cases. It is the belief of the MDWG that the best approach for these users is to direct them from an abbreviated and general metadata record to a more complete one where they can “find out more”. From this point they can more easily determine the fitness of the data to their need and also how they may make arrangements to use these data most effectively.

## Who is Metadata For?

“*When I wrote this code, only God and I understood what it does. Now only God knows.”* – Anonymous

It might be considered that there are four distinct groups involved directly or indirectly in metadata. These are:

* Data producers – expert users
* Domain Data Users– educated users
* Non-Domain Data Users – non expert users
* Organisational Managers and Senior Executives – non users

### Data Producers

Data producers are the group that create data and may or may not be the primary users of that data. However, the data producers are the best placed to understand all aspects of the data they produce and therefore are best placed to establish the relevant metadata for this data.

Unfortunately, data producers are often pressured to release new data sets quickly and to move on to create another data set. There is generally no organisational imperative for the data producers to spend the additional time documenting the data. Often this information about how the data was created, its accuracy, what instruments were used, how the data was processed and most importantly where the data is located. is only present in associated documents, intuitional knowledge, or the minds of these data creators. In general terms this group does not need metadata since it is part of their existing knowledge base.

An analogy is that of computer programmers. Often a programmer may have not bother with documenting their code. They knew it intimately. But as programs became more complex and others worked on the code organisations realised the need for effective documentation so that others could correct or modify the code. The spatial community has not reached this organisational awareness. Data creators need to be encouraged or in fact mandated to effectively document their data sets. With proper metadata the creators of these data, their teammates or successors, can reliably build on these data in the future. An organisation needs to appreciate this will take more time, but the longer-term benefits of effectively documented data will repay that time investment many times.

### Domain Data Users

This group of data users comes from the same or similar domain to the data creators. They have an understanding of the data even if they did not collect the data. They could be considered expert users of that data and fully understand the terms and other details concerning the data. These users require at a minimum simple (high) level of metadata to help easily locate the data and understand the resource. They may also require lower level metadata to determine its currency, accuracy and fitness for purpose.

For these users, domain specific standardised metadata formats and vocabularies are of high importance. Once accessed and determined suitable, conversations about governance arrangements can be had that will provide suitable levels of reliability of delivery. Support of this second group is where most of the efficiency and performance improvements are to be found.

### Non-Domain Data Users

A third group of users are those outside the domain for which the data were collected and these users may lack the ability to understand the vocabularies used by those in the domain specific to the data creation. For instance, a marine biologist may have use for data about the shape of the seabed but may not understand the terminologies used in the hydrographic community. Public open data users also fall in this category.

For these users, metadata written using common terms and vocabularies is important. These users may need enough information to make initial evaluation of the data and to give comfort and sufficient level of confidence. It may be enough to know that the data is well maintained with high availability and good provenance from a reputable supplier. For datasets of high authority and trust the level of further involvement with the custodians may be low. In other cases it may be that to make best, ongoing, use of discovered data it may be necessary for these non-domain data users to gain sufficient understanding to converse with the data custodians and be informed enough to evaluate fitness for their use and engage in suitable governance arrangements. It is always good practice to let the provider know what use you are making of their data.

### Organisational Managers and Senior Executives

The fourth group consists of managers and executive level personnel within organisations. This group is focussed on ensuring organisational outcomes are achieved and ensuring that costs are minimised, and they may not see the value and/or importance of metadata within their organisations. This group has control and influence over the organisation and organisational culture and have the ability to change work processes and practices – including the application of metadata.

While this group most likely has no direct use for metadata, they are possibly the most important group within an organisation for metadata. If the previous analogy of software development is used again here, it is the senior management that can dictate that the developers document their code effectively. It is this metadata that will provide the documented answers managers at times need when they require information regarding a resource. Mangers today understand the value in this activity. It is essential that they also be made to understand that the situation is similar with spatial data and associated metadata. There are considerable on-going cost benefits from having the data effectively documented (metadata). This ‘value’ needs to be raised with group four so that adequate resources are applied to ensuring metadata is applied at source (creation) within their organisations.

What is necessary is a flexible approach that deliveries the right metadata to the right customers. That is what we are aiming for in the MDWG.

# Annex 1

## Recommended Metadata - High-Level Common Elements – Table

Note: This work will be followed by a more complete breakdown of elements in the ISO 19115-1 standard. (Plus related standards such as 19157 for Data Quality.) Ongoing work in cardinality whether an element is mandatory, conditional or optional will be ion more detailed documents to be completed.

|  |  |  |
| --- | --- | --- |
| **Package** | **ISO element** | **Description** |
| **Metadata Record** |  | Information about the metadata record itself |
| MD\_Metadata |  |  |
|  | Identifier: code | The unique alphanumeric identifier for the metadata record that describes a resource |
|  | Metadata Linkage | Records a link to the metadata record |
|  | Date | A named and dated event associated with the metadata record. (ISO 8601) |
|  | Responsible party | Name and contact information about the organisation, role and/or individual who is responsible for the metadata record |
|  | Locale | Language and character set used in this metadata record (ISO 639-2 3 letter code) |
|  | Metadata Scope: Scope Code | The scope (type) of resource for which this metadata is provided specified using an ontology of information classes. |
|  | Legal Constraints | Legal restrictions on the access and use of this metadata record e.g. copyright |
|  | Reference for Legal | Name (primary and alternate) and version by which this security restriction on the access and use of this metadata record is known. |
|  | Security Constraints | Handling restrictions imposed on this metadata record for national security or similar concerns e.g. commercial sensitivity, privacy considerations. |
|  | Reference for Security | Name (primary and alternate) and version by which this security restriction on the access and use of this metadata record is known. |
|  | Parent Metadata | Link to the parent metadata record |
| **Resource** |  | Information about a resource |
| MD\_DataIdentification |  | Information required to identify a resource |
|  | Locale | Designation of the language used within the cited resource. |
|  | Abstract | A brief narrative summary of the cited resource |
|  | Purpose | A brief summary of the intentions with which the resource was developed |
|  | Status | The status of the resource populated from a domain of values - MD\_ProgressCode |
|  | Topic Category | The main themes of the resource populated from a domain of values - MD\_TopicCategoryCode |
|  | Point of contact | The name and contact information for the organisation, role and/or individual that serves as the point of contact for the cited resource. |
|  | Spatial resolution | Spatial resolution expressed as a scale factor or a distance |
|  | Extent: geographic description | Textual description of the geographic location of the resource (e.g. Australia, Sydney, Mt Isa) |
|  | Extent: bounding box | The western-, eastern-, southern-, and northern-most longitude/latitude coordinates of the geographic position of the resource expressed in decimal degrees (e.g. in WGS 84 - EPSG 4326) |
|  | Extent: vertical | Provides vertical component of the extent of the referring object |
|  | Extent: temporal | The start (and optionally end) of the time-period for this resource (e.g. time of data collection during a survey). |
|  | Spatial Representation | Mechanism used to represent spatial information (e.g. number of dimensions, raster or vector data, grid cell information, vector elements information) |
|  | Spatial and/or Temporal Reference System | Information of reference system used to define spatial or temporal extents |
| Identification | Additional documentation | Other documentation associated with the resource. EXAMPLE Related articles, publications, user guides, data dictionaries |
|  | Type | The type of reference system used in this cited resource. From a code list - MD\_ReferenceSystemTypeCode (28 options) |
|  | Code | The identifier for the authority and the particular code for the reference system used in this cited resource. |
|  | Authority | Information about the party responsible for the spatial or temporal reference system used in this cited resource. |
| Citation |  | Standardised resource reference |
|  | Title | Common name by which the citation for this resource is known. |
|  | Identifier (uri) | Alphanumeric identifier uniquely identifying this cited resource. |
|  | Date | A named and dated event associated with this cited resource. |
|  | Cited Responsible party | Name, role, and instructions for contacting the organisation, role and/or individual responsible for the cited resource. Includes all citable parties (e.g. author, publisher, editor) |
|  | Edition | Citation of the version of the cited resource. |
|  | Series | Information about the series, or aggregate resource, of which the cited resource belongs |
| Keywords |  | Grouped keywords (commonly used or formalised) for this cited resource. |
|  | ABS Field of Research | Terms defined in the ABS Field of Research Vocabulary |
|  | ABARES Keyword | Terms defined in the ABARES Vocabulary |
|  | AGIFT Keyword | Terms defined in the AGIFT Vocabulary |
|  | Other keywords | Any other keywords |
| Format |  | Description of the computer language construct that specifies the representation of the data objects in a record, file, message, storage device, or transmission channel |
| Maintenance |  | Information about the frequency of resource updates, and the scope of those updates |
|  | Frequency of Update | The frequency by which the cited resource is maintained or updated. |
|  | Scope for Maintenance | Scope to which the maintenance information applies |
| Browse Graphic |  | Graphic that provides an illustration of a resource; citation graphic or logo for the cited resource (e.g. a dataset, an organisation logo, security constraint or citation graphic) |
| Lineage |  | Information about how the resource (e.g. dataset)was created and/or modified or lack of knowledge about it |
|  | Statement | General explanation of the data producer’s knowledge about the lineage of a resource |
|  | Source | Information about the source data used in creating the data |
| Constraints |  | Restrictions on the access and use of a resource |
|  | Use Limitations | Limitation affecting the fitness for use of the resource (e.g. “Not to be used for navigation.”) |
|  | Legal | Legal restrictions on the access and use of this cited resource e.g. copyright |
|  | Reference for Legal | Name (primary and alternate) and version by which this restriction on the access and use of this cited resource is known. |
|  | Security | Handling restrictions imposed on this cited resource for national security or similar concerns e.g. commercial sensitivity, privacy considerations. |
|  | Reference for Security | Name (primary and alternate) and version by which this security classification or framework on the access and use of this cited resource is known. |
|  | Releasability | Information to whom the resource can or cannot be released |
|  | Other Constraints | Other restrictions and legal prerequisites for accessing and using the resource |
| Distribution |  | Information about the distributor of and options for obtaining the resource(s) |
|  | Format | Name (primary and alternate) and version by which this security restriction on the access and use of this cited resource is known |
|  | Distributor | Name, contact information, and role of the organisation from which this distribution of this cited resource may be obtained |
|  | Online Resource | Information about online sources from which this cited resource can be obtained electronically from the distributor |
|  | Offline Resource | Information about offline media on which the resource can be obtained |
| Associated Resource |  | Associated resource information |

# Annex 2

## Use Cases

### Use Case 1 - FSDF “the LINK”

At the Canberra ICSM Meeting of November 2017, Andrew Whiting presented on the successes of the Foundation Spatial Data Framework (FSDF) and the LINK platform as well as the future strategy of this tool. The future strategy is focused on data Consumability, including access and discovery. It was determined that continued success of theLINK would be dependent on complete and consistent metadata that reliably complies to the AS/NZS Standard. To support consumability the ease of use of metadata and catalogue systems is paramount.

Major identified issues included lack of consistency in implementation of ISO 19115-1 by various data custodians. While expert users are rapidly gaining comfort with the new standard, more general users are struggling to use and understand it. The challenge is how to make data capture autonomous that is also metadata standard compliant, discoverable and accessible and fit for ingestion in FSDF.

**Support through the New MDWG**

It is recognised that there is a disconnect within jurisdictions between data managers and catalogue managers. The MDWG was created as a new working group and permanent committee within ICSM to concentrate on metadata and standards. An objective of the MDWG being to assist jurisdictions to adopt a more standard and uniform approach to metadata that is usable by a broad audience while maintaining the ability to support high value expert users. The MDWG now brings together data managers and the catalogue managers that previously have not been included in these metadata processes.

### Use Case 2 - EMSINA EM-Link

Good quality consistent metadata is of high importance to the Emergency Management Sector. This is due to an ever-increasing reliance upon authoritative ‘live’ spatial material (webservices) for hazard/event awareness, analysis and critical decision making. ENSINA data consumers expect the authoritative spatial data to be properly documented.

Like other infrastructure, when everything goes right nobody thinks twice about accessing metadata. But when things don’t go right, inappropriate data is used or the right data is unavailable due to lack of metadata, these issues can lead to real world failures become scrutinised in Sector Inquiries, Government Inquiries, Royal Commission’s, Coroner Reports and the Media.

The Emergency Management Sector wants to be on the front foot with Metadata compliance through the EM-Link. The EM-Link is an independent implementation of FSDF theLINK technology for the Emergency Management sector. The EM-Link provides a Catalogue of Australia’s 120 authoritative EM webservices. EM-Link provides:

* Instant access information
* Consistent data usage
* 100% Custodian driven
* Communication device to share changes
* Backbone to the Australian Govt. ‘live’ National EM picture
* Gap analysis tool

The EM-LINK Gap Analysis has helped EMSINA review existing capabilities and identify ‘weak links’ that hinder EM operations. For instance, it has found 47 of 120 webservice metadata are ‘ISO’ compliant. This low number complicates the ability of EM personnel to combine data from different jurisdictions, reduces efficiency, increases workload and increases time to provide integrated EM products.

Furthermore, many spatial users do not have clear, easily understandable documentation, validation tools, examples, authoritative support about implementing, publishing, or maintaining a standards compliant metadata statement in a timely fashion. Improvement of this situation is critical for the EM community.

### Use Case 3 - Cadastre

An excellent example of metadata related problems we face was cited at the Nov 2017 Meeting of the ISCM in Canberra. This was captured in the minutes of that meeting:

*“An example was the inconsistencies of data when viewed through National Map, in order to see NT cadastre, 3D has to be turned on, but then can’t see other jurisdictions that are in 2D and vice versa. There are many other such examples of data not being seamless or even easily joined.”*

This example actually illustrates several issues by conflating them. First is the confusion between inconsistencies in data vs those in metadata. The inconsistency here are in the data. But most importantly, it is an inconsistency that is preventing interoperability between state cadastre. This is a huge cost to society that proper metadata could provide guidance to solutions that may exist. This example illustrates a professional domain that is likely not working closely enough and lacks the proper governance to do so.

We can be sure that NT is rightly quite proud of their 3d cadastre and would not take well to the suggestion that they downgrade their system to 2d so that it plays well with other cadastres. Nor can we expect other states to upgrade. What is needed is to provide options which allow for common data exchange formats that have minimal impact an agency’s ability to do their jobs as they best see fit. Metadata can advertise multiple formats for data. Data exchange by schema, a technology the MDWG is supporting, also provides a way through this issue.

Once again, good governance regimes are required to support resolution to these issues. Good consistent community metadata practices are prerequisite to this.