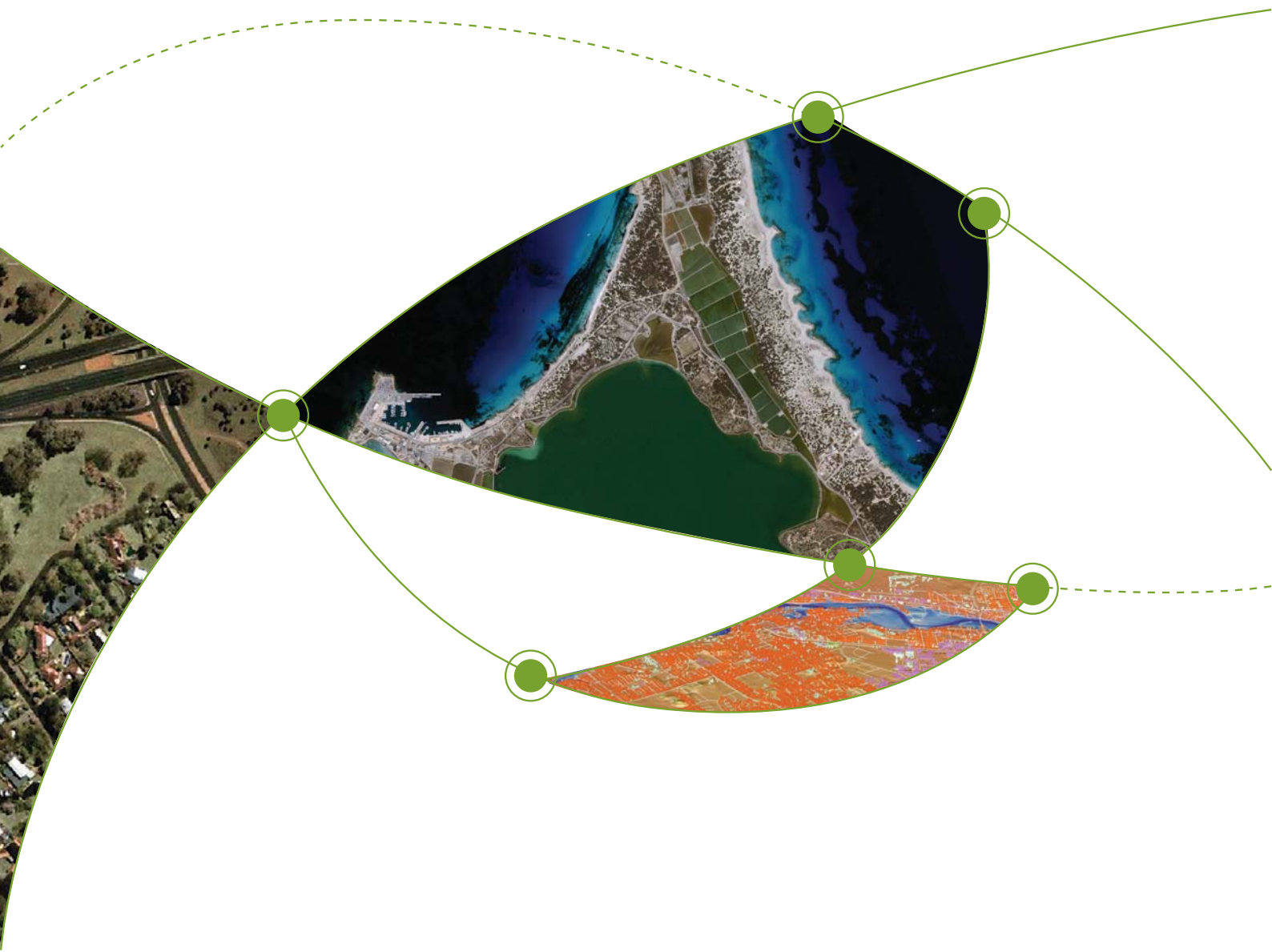
ANZLIC SPATIAL RESOURCE DISCOVERY AND ACCESS PROGRAM

Metadata Education PowerPoint Presentation – Research

Version 1.0, June 2009



Contents

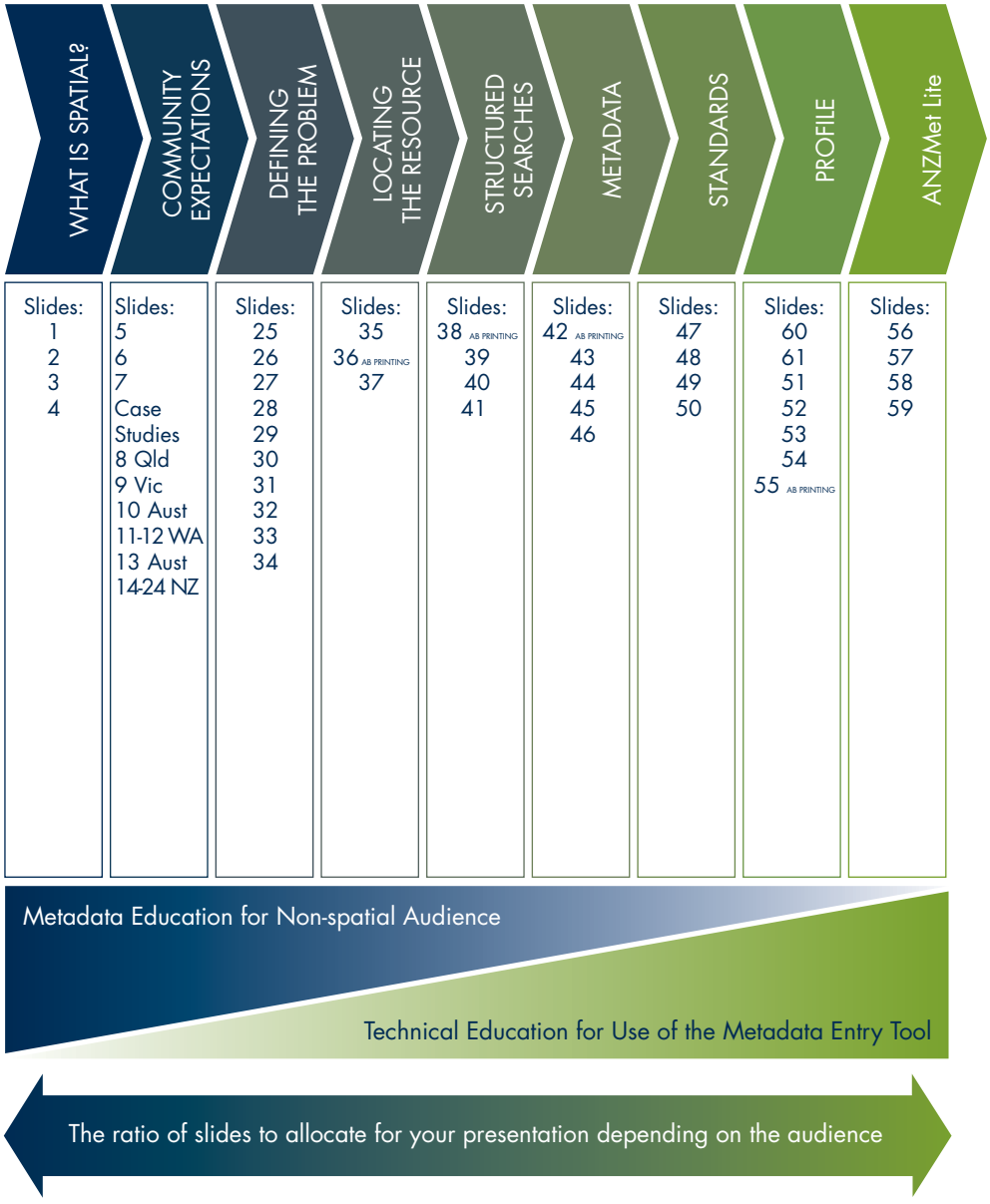
Introduction

The following dot points provide a wealth of information and/or research examples to give some background or context to the *Introducing Metadata* library of slides.

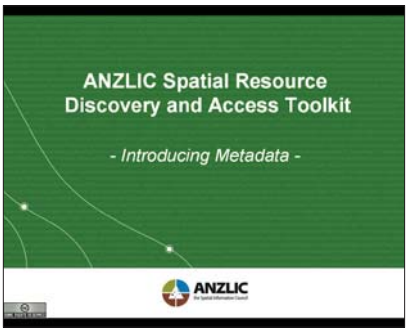
Like the slides themselves, it is **not expected that every piece of information will be used**. Local examples, if known, should be the preferred background information for presentations in your jurisdiction. If local examples are able to be viewed by the wider audience, ANZLIC would appreciate being sent copies of these for inclusion in the on-line toolkit.

All the slides represented in this document are found in the ANZLIC SRDaAP Toolkit – Education Library slide presentation.

This first slide (below) outlines the presentation slides contained in the library and the broad headings under which they have been included. THIS IS NOT A PRESENTATION IN ITSELF; this is a suggested way of selecting slides for a presentation tailored to a particular audience.



What is Spatial?

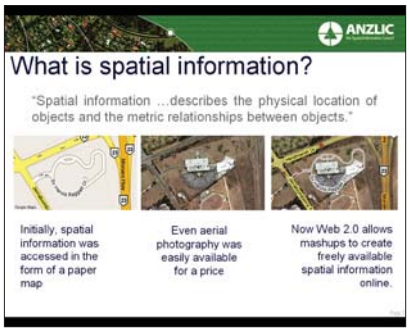


ANZLIC

- In 2004 ANZLIC ran a project that established a resource discovery and access program to provide better resource access for Australia and New Zealand. The online Web Services (e.g. WhereiS®, Sentinel) and the validation capability of the Web 2.0 (e.g. social-networking sites, video sharing sites, wikis, blogs, and folksonomies [collaborative tagging, social classification, social indexing and social tagging]) make resource discovery and access an imperative.
- ANZLIC's role is to facilitate easy and cost effective access to the wealth of spatial data and services provided by a wide range of organisations in the public and private sectors through the use of the ANZLIC Metadata Profile.
- Widespread use of this Profile will facilitate sharing of data within and between agencies and jurisdictions, both within the region and internationally, by providing a consistent basis for communicating information about resources.

Office of Spatial Data Management

- OSDM was set up to promote efficient use of Australian Government spatial data assets and to represent the Australian Government's interests in spatial data coordination and access arrangements with the States and Territories. Under the Spatial Data Management Group Metadata Working Group, OSDM were tasked with progressing the Discovery and Access Program.



Spa•tial [1913] (\'spā-shəl\) *adjective*: relating to the location, area and size of things[1]

So we have a convergence of:

Technology

- Increasing computing power: the Internet, WEB 2.0, Social Networking etc.

User knowledge and expectations

- Generation Y+ has "the toys" (mobile phone, computer, Facebook etc) and they have difficulty without them because they have not known anything different in their lives to date.

Complex national drivers

- Issues such as climate change, water security, biosecurity and social inclusion. These issues are no longer portfolio specific.
  - Dealing with climate change involves not just consideration of water resources and land management but also the social impacts of water policy on employment, community health and a range of other services – it has to be approached in a multi-departmental way.
  - Avian/swine/horse influenza have all had major economic impacts on Australia. In regard to the Equine Influenza outbreak, "Respondents estimated that they have experienced losses at $522 million between August and December 2007."[2]

With recognition of:

- The power of '**place**'
  - GOOGLE Earth, in-car navigation. When generation Y+ think of a street map they are not thinking of a Gregory's or UBD – they either look up the white pages on-line and print off a map OR they follow their personal Satnav OR they look it up on the phone.
  - Geotagging digital photos as you take them
- Common wisdom is that an estimated 70-80% of all local government transactions have a location component[3]
  - eg a Medicare Number has home address and contact details and almost everyone has a Medicare record.

Community expectations

Why this Community expectation?

- 3G phones have access to Google Earth, GPS and other web services. The question asked on this slide could just as easily be: "Where is my closest Medicare shopfront?" or "Where is the nearest Centrelink Office?" or "What does that rental property look like?"
- In 2008 Nokia purchased the Chicago-based digital map company Navteq (NVT) as well as releasing a phone which has an inbuilt GPS-navigation device. They also have excellent resolution cameras and video recorders. The iPhone even has a functional spirit level built in!
- So the technology is allowing mashing up very portable IT tools at an affordable price which in turn is fuelling the community expectation of being able to use this technology – not understand it. A good example of this is the GE E1050 Digital Camera which has built-in geotagging. It has been possible to use Google Earth or Flikr to attach the location manually to the photos etcetera after the fact but this process has just been streamlined.

Images:

The map of London shows the areas of high violent assaults.

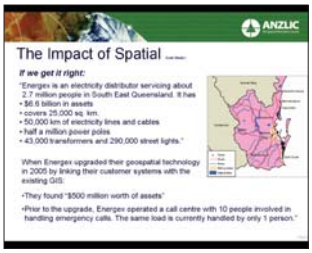
Microsoft image of freeway with green belt.

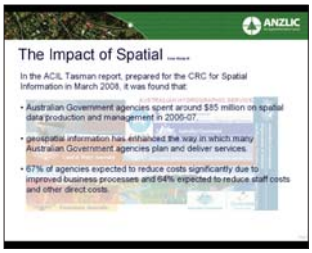
The SUNA webshot is of "realtime" traffic information that is available through in-car navigation or phone in Melbourne.

- "It is conservatively estimated that Industry revenue in 2006-07 could have been in the order of $137 billion annually and (the) industry gross value added around $682 million."[4] This would have come from:
  - a gain in GDP contributing to a cumulative gain of between $6.43 billion provable and $12.57 billion estimated but considered accurate in GDP [equivalent to 0.6% - 1.2% of GDP respectively
  - increased household consumption by between $3.57 billion and $6.87 billion on a cumulative basis
  - increased investment of between $1.73 billion and $3.69 billion on a cumulative basis
  - exports were between $1.26 billion and $2.30 billion higher than they would have been and imports were between $1.18 billion and $2.23 billion higher than they would have been
  - real wages were between 0.60% and 1.12% higher than they would otherwise have been.

Community expectations

Case Studies





Case Study I[5]

Case Study II

http://www.justice.vic.gov.au/wps/wcm/connect/Road+Safety/Home/Traffic+Cameras/RSAFETY+-+Interactive+Map+-+Fixed+Camera+Locations

Earlier in 2008 the Victorian Department of Justice was servicing an increasing number of requests to challenge fines due to an urban myth around the technical aspects of the camera – ie, if the certification of the camera was out of date, then the fine would not have to be paid.

A dedicated website was set up at a cost of $7000. They placed the location of each speed camera in Victoria on a "map" and a PDF of the certificate for each camera could be downloaded at will.

There was an 80% reduction in the number of enquiries around speed camera registration after this service was made available.[6]

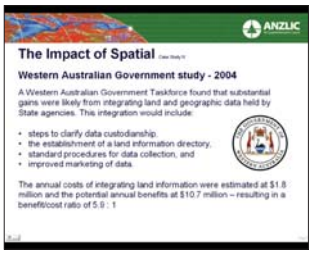
Case Study III

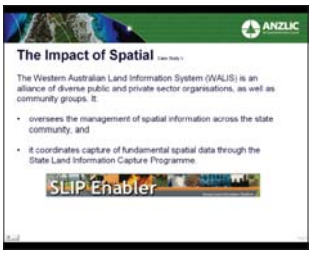
The 2005-06 Annual Report of the Spatial Data Policy Executive reported that Australian Government is a significant user of spatial information. Significant users included:

- Geoscience Australia
- The Australian Hydrographic Service
- The Bureau of Resource Sciences
- The Defence Imagery and Geospatial Organisation
- The Department of Agriculture Fisheries and Forestry
- The Australian Fisheries Management Authority
- CSIRO
- Land and Water Australia
- The Department of Environment and Water
- The Murray Darling Basin Commission
- Centrelink.

- Geospatial information supported decision making and policy formulation in areas such as natural resources management and program planning through its ability to present economic, environmental and social data by geographic area.

- In a 2002 study by the National Office for the Information Economy for AGIMO estimated agency benefits from e-government across 24 programmes, these agencies expected to reduce annual costs by $100 million (AGIMO, 2002) at a capital cost of around $108 million.
- The case studies and discussion in this report show that there are potentially very significant economic, social and environmental benefits already accruing in areas such as geoscience, biosecurity, defence and emergency services and in the efficiency of Australian Government administration and services generally.





Case study IV and V

- Established by the Western Australian Government in 1981, WALIS has served as the state's prime spatial information coordination body.
- WALIS also adds value because it enables a more efficient collection and production of spatial data. This is adjudged to have an annual value of at least one million dollars a year, through its development of the geographic data infrastructure, and providing the means by which government agencies coordinate their work on geographic data.
- Shared Land Information Platform (SLIP), a ground-breaking cross-government technology initiative, has been awarded top honours at this year's (2008) WA Spatial Excellence in Public Sector Management Awards.
- It was the winner of the 2008 Asia Pacific Spatial Excellence Awards: Industry award – Spatially enabling Government.
- Directions Magazine Article: http://www.directionsmag.com/article.php?article_id=2843&trv=1 explains it quite well.
- Landgate is the Statutory Authority responsible for Western Australia's land and property information. Landgate's transition from the Department of Land Information came into effect on 1 January 2007. As an Authority, Landgate maintains the State's official register of land ownership and survey information and is responsible for valuing the State's land and property for government interest.

Case Study VI

ACIL Tasman Report pg.152

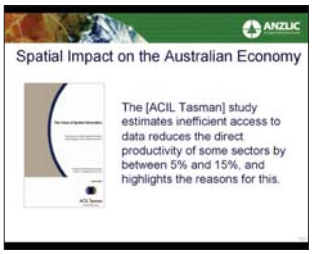
- As a case in point one might take the costs of asthma, in which it may be possible that more accurate spatial information may help resolve some outstanding research questions (e.g. links with air pollution and other possible factors such as childhood exposure to swimming pools). Any intervention or measure that could claim, say, a 10% reduction in these figures would therefore be worth at least $370 million per year. Considering that asthma accounted for only 0.3% of YLLs and 4.4% of YLDs in 2003, the potential value of improving health outcomes in general is therefore very high.

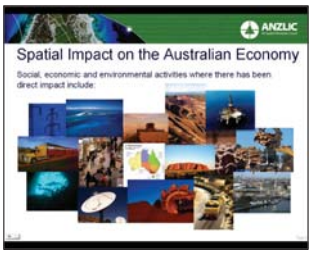
- **Health incident monitoring**
  The Tropical Public Health Unit (TPHU) within Queensland Health has responsibility for implementing strategies to protect the public health of North Queensland from Sarina to the Torres Strait, in total covering just over 750,000 km^2.
  - The TPHU has used spatial technologies and imagery for the last 5 years and have been able to derive great efficiencies by altering existing practice to incorporate some of the products that are available in the spatial information marketplace. TPHU primarily use aerial photography to determine the likelihood of potential malarial mosquito breeding habitat near malaria cases. Another emerging use of spatial imagery has been with Environmental Health Officers administering Strychnine permit applications.
  - For malaria case notifications, the benefits of Queensland Health's application of spatial imagery are reductions in the numbers of field inspections and field studies. The reduction in case responses has meant that travel, dry ice and Octenol requirements have all been reduced significantly and this has also freed up time for dengue fever control efforts. Each response not required would save Queensland Health over $1,000 per response.
  - The benefits of using spatial imagery for the strychnine assessment process have been far more wide-reaching, as ground verification of applications was time consuming and arbitrary at best and, as such, frequently did not occur. Spatial imagery has been essential to demonstrate the dangers of strychnine use within the communities and assisted in preventing the misapplication of strychnine, which could lead to potentially fatal consequences (QSIIS, 2004).

This is a jurisdictional example. Contact the ANZLIC Contact officer for New Zealand for more information about these case studies.

Defining the problem

So what impact has there been?





The following statistics are found in the ACIL Tasman report (March 2008)

- Agriculture: eg controlled traffic farming (the real-time positioning technology for equipment guidance in agriculture). CSIRO estimates the benefits of adopting new spatial technologies at $14 to $30 per hectare.
- Forestry and fisheries: eg A large commercial plantation used a spatially based forestry management system that increased the area managed by each manager by around 50%.
- Mining and petroleum: eg improvements in the efficiency of mining and petroleum operations led to verifiable savings of $66.8 million in 2007.
- Property and business services: e.g. the benefits in terms of faster and more accurate planning and approvals.
- Transport and storage: e.g. By 2012, it is estimated that additional community and economic benefits of at least $3.8 billion per annum, excluding export income, will be produced if intelligent transport systems are implemented.
- Utilities: this sector – electricity, gas and water – are significant users of spatial information. The main benefits are improved asset management, better management of supply and demand and in planning and construction of infrastructure. e.g. Energex (This is given as Case Study I, slide 8 in the Education Library .ppt)
- Communications: e.g. Evidence from New Zealand (ESRI, 2007), for example suggests that due to the adoption of a GIS server, New Zealand Post now save up to 10% on the processing cost of a standard mail item.
- Retail, Trade and Tourism: Online hotel and holiday applications employ mapping technologies allowing users to specify, in broad terms, their preferences (including geographical variables and price) and the software recommends appropriate options. In addition to the online mapping search facilities, basic GIS applications and spatial information are backing up some of the search criteria. Electronic navigators and maps are often an important component of making travel plans, and are used while travelling.

Key areas of use and impacts of spatial at state and territory level include the following:

1. urban planning
2. service planning and delivery
3. land management and planning
4. crime prevention and response
5. emergency management, for police, fire and ambulance services

The following are predominantly examples taken from the ACIL Tasman report but should be replaced with up to date jurisdictional examples where possible:

1. Urban Planning

- population distribution and movements; demographics; performance monitoring
- The benefits in terms of faster and more accurate planning and approvals, better route alignment of roads and infrastructure and better record keeping for maintenance and upgrades are recorded in the case studies. The productivity improvements included:
  - a 50% to 100% productivity improvement in surveying
  - a 25% improvement in engineering and architectural design
  - significant improvement in environmental planning in route selection
  - improvement in regulatory approvals processes.

2. Service Planning and Delivery

- E.g. The EastLink project in Melbourne involves construction of a 45 km freeway-standard road connecting the city's eastern and south-eastern suburbs. Total project costs were estimated at $2.5 billion. It was suggested that in terms of concrete alone, 0.5 cm of extra paving over the length of the road has been avoided by using accurate spatial information. Estimated at approximately $100 per square metre of concrete, a reduction of 0.5 centimetres translates into a saving of about $20 per square metre. The EastLink involved laying 2 million square metres of paved road, so on this account alone a saving of $40 million can be estimated for this project. http://eastlink.com.au/TrafficCong.aspx

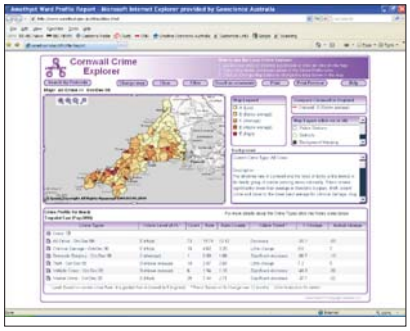
3. Natural resources management, environment and climate change

- E.g. The Queensland Department of Natural Resources, Mines and Energy administers the Land Act 1994, Vegetation Management Act 1999 and the new provisions under the Vegetation Management and Other Legislation Amendment Bill 2004. This responsibility includes monitoring vegetation clearing throughout the state to determine whether it has been legally undertaken or not. In the event that clearing is illegal then court proceedings may ensue. Remotely sensed imagery provides invaluable historical evidence of the presence of vegetation where it has later been cleared.
- E.g. Murray-Darling Basin Commission; ' to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.' They use and share spatial data obtained from Australian agencies and jurisdictions to build up a picture of the basin past through to present.

4. Crime prevention and response

- spatial analysis of crime statistics can reveal patterns that assist in crime prevention through, for example, where to patrol or where to increase surveillance activities

- the emerging use of satellite tracked transponders can result in the recovery of stolen property, and provide a disincentive for theft
- An example of what may come to Australia in the future: Cornwall Crime Explorer (www.amethyst.gov.uk/Atlas/atlas.html)

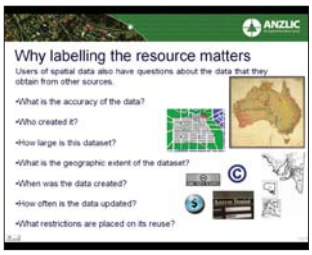


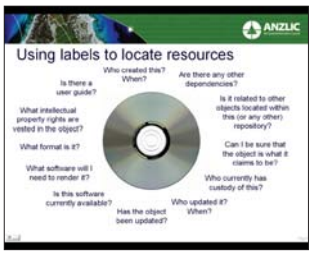
is one example of an increasing number of government sites in the United Kingdom and the United States of America that spatially track crime reports in 'real-time'.

5. Emergency management, for police, fire and ambulance services

- spatial information and GIS assists in effectively planning for response, priorities, analysing historical events, and predict future events
- it is has been suggested that the use of GPS alone have reduced emergency response times in transport related emergencies by 20% (House of Representatives Standing Committee on Transport and Regional Services, 2002).
- in WA spatial information is readily used by a number of key agencies through SLIP for emergency management purposes. SLIP assists cross-agency planning and communication by providing a platform that can provide customised information to support the specific operational needs of WA emergency management sector as and when required.

The problem is in the resource labelling, or lack of…





What is on this and is it what I want? If I am sending out this information, am I completely happy with everything that is on it?

- What do you know about the resource?
- What don't you know about the resource?
- What should you know about the resource?

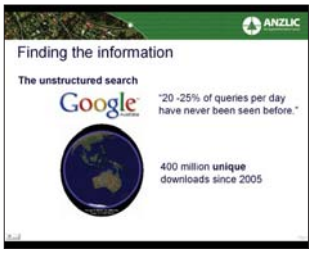
Metadata is a declaration of:

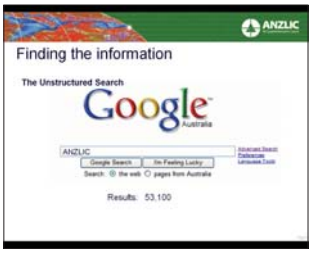
- What to do…and
- What not to do…

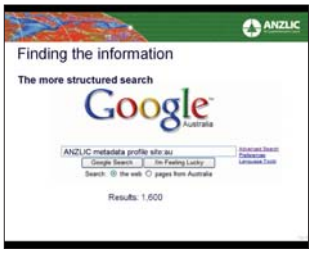
- Valuing your data as a business asset
  - Only 20% of enterprise documentation may exist in paper format.[7]
  - "Information workers spend up to 30% of their working day just looking for data they need to complete a task…"[8] This is equivalent to 2.2hrs per day or $15,000 of a $50,000 annual salary (based on a 36.75hr week) In other words, for an organisation with 1,000 staff at this pay level, ≈ **$15 million** a year is spent looking for company information out of existing systems.
- Being able to locate the data "Collect once, use many times."
  - The ANZLIC Profile is intended to facilitate efficient access to descriptions of information resources and in particular spatial data (e.g. a geocoded street address), thereby enhancing the reuse and sharing of these resources.
- Fitness for purpose
  - Across Australia, almost 50% of employees find the greatest obstacle to how they make decisions at work is the lack of accurate, consistent and complete information. If you combine this with the fact that 32% claimed they did not have the right tools in place to help find information to make decisions then it is little wonder that managers across Australia are experiencing a growing frustration with enterprise information management systems and processes.[9]
- Effective risk mitigation tool
  - There is the story of an Architect who designed a building complex based on the wrong data. He used the curb data instead of the block boundaries because he could locate curbs on the ground. When the jurisdiction told the builder that the complex had to be moved, they sued the architect who in turn tried to sue that jurisdiction's Planning Office. The curbs were out +-2m but because the metadata attached to the resource clearly identified what the architect had actually downloaded he had no legal basis to blame the planning office and his complex had to be "moved".

Locating the resources

Finding the (Spatial) Information







Unstructured Search…

- Google search on "ANZLIC" produced 53,100 results
- the Google search for "metadata" produced 42,300,000 results and even restricting it to only sites that end in 'gov.au' produced 427,000 results
- the Google search for "cancer" produced 277,000,000 results
- Google says that since it launched "Google Earth for the desktop in 2005, [it has] had over 400 million unique downloads, and people from around the world have used it to view their house, research travel destinations, learn how to make the world a better place, find local businesses, and view geo-located photos."[10]

Google's VP of Engineering, Udi Manber says that Search is a hard problem.

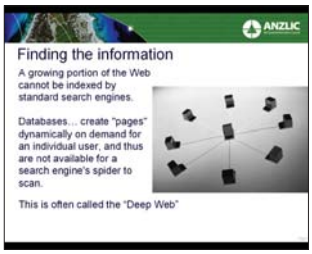
"Search is hard, very hard, because

- the scale and diversity are almost beyond comprehension;
- expectations and needs will continue to grow;
- 20-25% of the queries we will see today, we've never seen before."[11]

Finding the information

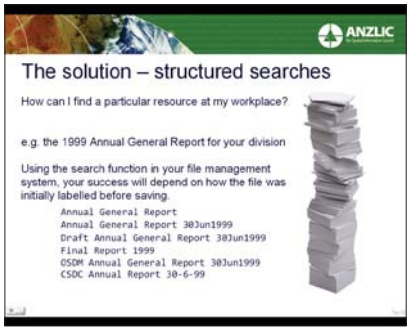
A search engine's spiders often cannot index graphics, CGI scripts, PDF files, and information in online databases. Databases are a particular problem for search engines, since they create "pages" dynamically on demand for an individual user, and thus are not available for a search engine's spider to scan. But since these databases are so versatile at providing customized content for users, more sites are putting content into online databases rather than on static pages. Thus, a growing portion of the Web cannot be indexed by standard search engines.

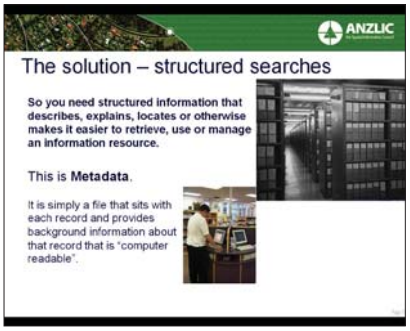
This includes contents of phone directories, dictionaries, manipulatable maps, online catalogues, and much more. There are, however, directories which help you find online databases and other sources for finding information that a search engine could not retrieve. Typically, the directories allow you to search or browse for a general topic to find a list of databases likely to contain specific information.[12]



Structured Searches

Structured Search… Metadata





- How can I find a particular resource at my workplace?

  e.g. the 1999 Annual General Report for your division

  Using the search function in your file management system, your success will depend on how the file was initially labelled before saving:

  - Annual Report
  - Annual General Report
  - Annual General Report 30Jun1999
  - Draft Annual General Report 30Jun1999
  - Final Report 1999
  - CSDC Annual Report 30-06-99 [the CSDC is now the OSDM – would a new recruit realise this?]

  And so on.

- So you need structured information that describes, explains, locates or otherwise makes it easier to retrieve, use or manage an information resource.

Metadata

- "Metadata applied in a standard way ensures that a minimum amount of consistent information is given about each dataset.
- … it documents the procedures that were used to create and update the dataset and, more importantly, is an opportunity to state what the data are not. It also provides contact information, so that questions associated with the data can be fielded appropriately.
- Metadata can be used to describe an object so that it can be located when needed. It can help organize electronic records, facilitate interoperability across systems, provide digital identification, and support both archiving and preservation."[13]

Discovery

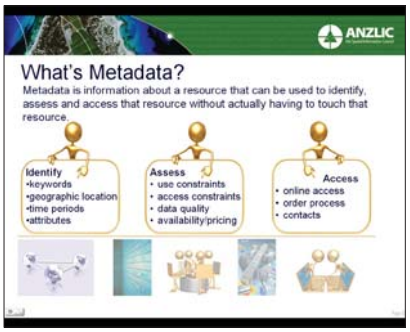
- Metadata is the starting point for access as it provides the means for 'discovery' of spatial information.
  - For example, in the Australian Government node of the Australian Spatial Data Directory (ASDD), hosted by GA on behalf of ANZLIC, it is possible to search approximately 39,000 ANZLIC metadata records on 25 ASDD nodes located around Australia.[14]
  - However, advice to ACIL Tasman from industry interviews suggests that the metadata remains in many formats and is currently not completely valid. For example, a recent study of 5,141 metadata records of NSW natural resource sectors confirmed that the records were out of date and could not be automatically upgraded to fit the ANZLIC 19115 profile.

> Incomplete knowledge about the quality of data is a fundamental issue that has yet to be properly addressed.

- Users of spatial data must be able to easily ascertain the quality of their information and its ability to meet their requirements. Users need to know:
  - where quality varies throughout a dataset;
  - the degree of uncertainty that is associated with any of their derived information products;
  - for non-experts in particular, there needs to be an improved way of communicating data quality, especially in the context of web-based metadata.[15]

> Constraints on access to data are estimated to have reduced the direct productivity impacts in certain sectors by between 5% and 15%. It is estimated that this could have resulted in GDP and consumption being around 7% lower in 2006-07 (around $0.5 billion) than it might otherwise have been.[16]

Metadata

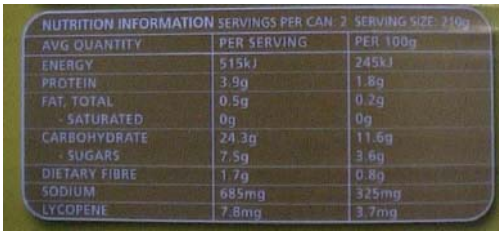


This is Metadata - a file that sits with each record (or on a catalogue) and provides background information about that record that is "computer readable".

- Metadata can be used to describe an object so that it can be located when needed by a database search engine. It can help organize electronic records, facilitate interoperability across systems, provide digital identification, and support both archiving and preservation.[17]
- You can share metadata with others, without sharing the actual resource described by the metadata.
- Metadata applied in a standard way ensures that a minimum amount of consistent information is given about each dataset.
- As metadata documents the procedures that were used to create and update the dataset and, more importantly, is an opportunity to state what the data are not. It also provides contact information, so that questions associated with the data can be fielded appropriately.
- "Metadata serves data discovery at multiple levels:
  - initial identification by query of keywords, location, time, and attributes
  - assessment once located by use and access constraints; data quality measures of positional and attribute accuracy and sources used; and statements as to data availability, format and pricing
  - access the data, once deemed useful, using distribution URLs, standard order process instructions and individuals to contact . This is very useful when dealing with very large resources – e.g. ABS Census data for Australia or the Bathemetry of Australia."[18]

Using labels (metadata) to locate resources

Slide 46, The Tin Can label:	
Title	
Abstract	
Lineage information Point of contact	
Fitness for Purpose	

Quality information	
Use constraint (fitness for purpose)	
Quality information	
Unique identifier	
Use constraint (allergies) Content	
Size	

Standards

"In 2003, the International Organization for Standardization (ISO) promulgated ISO 19115 (Geographic Information - Metadata) as an 'international standard'. The adoption of this international standard by various geospatial organisations around the world has meant that it is now essential that the Australian and New Zealand geospatial communities also re-state their metadata needs in terms of ISO 19115:2003. The standard was reviewed in 2005."[19]

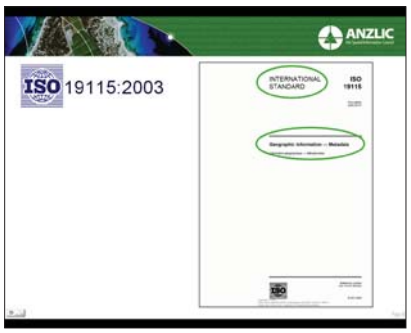
Standards are used to provide the following benefits:

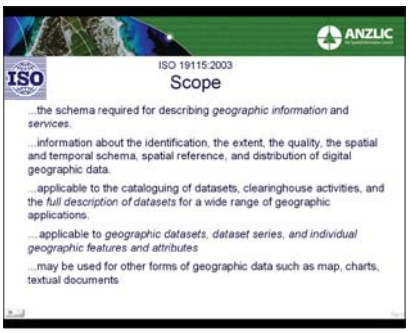
- Standardisation of screw threads helps to keep chairs, children's bicycles and aircraft together and solves the repair and maintenance problems caused by a lack of standardisation that were once a major headache for manufacturers and product users.
- Standards establishing an international consensus on terminology make technology transfer easier and safer. They are an important stage in the advancement of new technologies and dissemination of innovation.
- Without the standardised dimensions of freight containers, international trade would be slower and more expensive.
- Without the standardisation of telephone and banking cards, life would be more complicated and international commerce would be reduced.
- A lack of standardisation may even affect the quality of life itself: for the disabled, for example, when they are barred access to consumer products, public transport and buildings because the dimensions of wheel-chairs and entrances are not standardised.
- Standardised symbols provide danger warnings and information across linguistic frontiers.
- Consensus on grades of various materials gives a common reference for suppliers and clients in business dealings.
- Agreement on a sufficient number of variations of a product to meet most current applications allows economies of scale with cost benefits for both producers and consumers. An example is the standardisation of paper sizes.
- Standardisation of performance or safety requirements of diverse equipment makes sure that users' needs are met while allowing individual manufacturers the freedom to design their own solution on how to meet those needs.
- Standardised computer protocols allow products from different vendors to "talk" to each other.
- Standardised documents speed up the transit of goods, or identify sensitive or dangerous cargoes that may be handled by people speaking different languages.

- Standardisation of connections and interfaces of all types ensures the compatibility of equipment of diverse origins and the interoperability of different technologies.
- Agreement on test methods allows meaningful comparisons of products, or plays an important part in controlling pollution - whether by noise, vibration or emissions.
- Safety standards for machinery protect people at work, at play, at sea... and at the dentist's.
- Without the international agreement contained in ISO standards on metric quantities and units, shopping and trade would be haphazard, science would be unscientific and technological development would be handicapped.

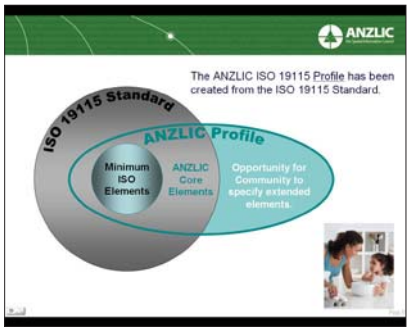
"Two Teams, Two Measures Equalled One Lost Spacecraft[20]

Profile

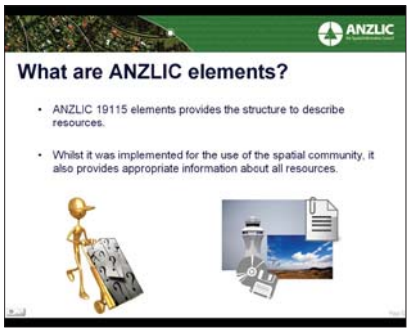


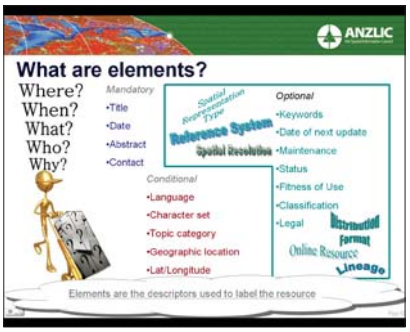


A popular international geographic standard, ISO19115, contains over 300 metadata elements, most of which are optional.



- The ANZLIC 19115 profile is made up of 24 of the ISO 19115 elements.
- Another commonly used archival standard is Dublin Core and the Australian Government Locator Service (AGLS) was derived from a hybrid of this and ISO19115.
- The AGLS and ANZLIC profile are regularly reviewed and a mapping from ANZLIC profile metadata elements to AGLS is available.





The ANZLIC Metadata Profile[21] provides the structure to describe resources by defining metadata elements and establishing a common set of metadata terminology, definitions and extension procedures, assisting organisations to access and share its data and being compliant to the ISO 19100 series.

Further implementation of the ANZLIC Metadata Profile will promote interoperability between information communities in Australia and New Zealand, as well as the rest of the world.

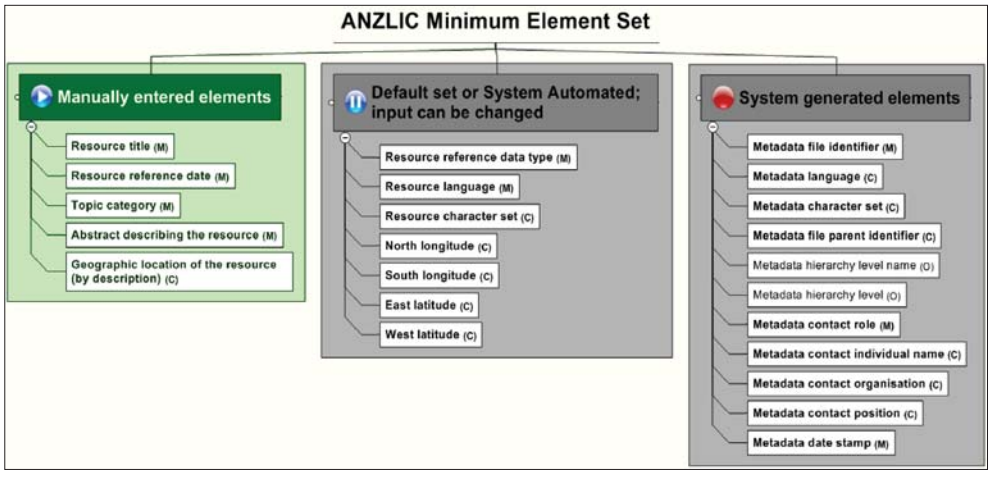
This will:

- Provide data producers with appropriate information to characterise their geographic data and associated resources.
- Facilitate the organisation and management of metadata for geographic data and associated resources.
- Enable users to apply geographic data in the most efficient way by knowing its basic characteristics.
- Facilitate data discovery, retrieval and re-use. Users and applications will be better able to locate, access, evaluate, purchase and utilise geographic data.
- Enable users to assess whether geographic data are suitable for their intended purpose.
- Leverage off existing software developed by major vendors and the global spatial community.
- Enable transactions by web services using metadata about specific feature types, features, attribute types or specific attributes.

In addition to the core, the Profile encompasses a large number of other elements that may be used to describe resources in more detail. Completing these elements can aid a range of uses including evaluation of the resource's fitness for purpose, and enabling applications to discover and transact directly with a resource. ANZLIC encourages completion of as many metadata elements as possible in order to better describe the resource.

Obligations/conditions

An obligation/condition is a descriptor indicating whether a metadata entity or metadata element shall always be documented in the metadata or sometimes be documented (i.e. contains value(s)). This descriptor may have the following values: M (mandatory), C (conditional) or O (optional). The following definitions for these values have been sourced from B.1.5 Obligation/Condition (Annex B, AS/NZS ISO 19115:2005).[22]

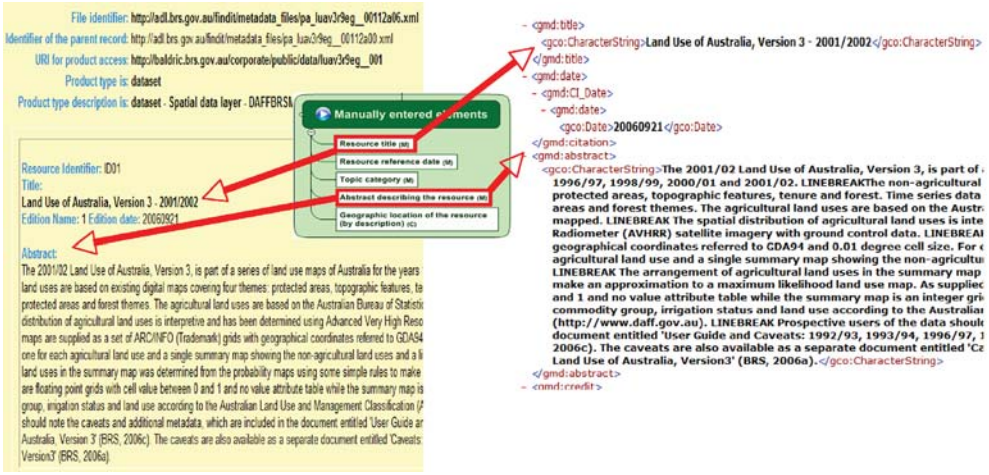


This information is covered extensively in the *ANZLIC Metadata Profile Short User Guide* – ANZLIC SRDaAP Toolkit.

Providing relevant information for each of the elements provides a machine searchable label (metadata) for your resource which in turn allows for greater Web 2.0 applications.

"People readable" version

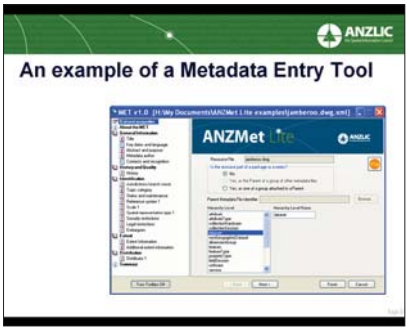
"Machine searchable" version



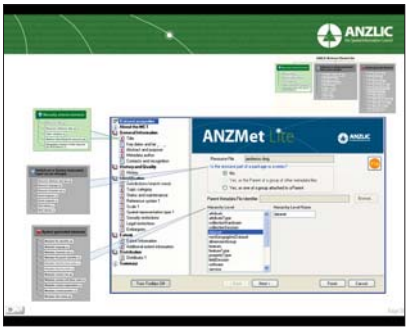
ANZMet lite

How will you apply the label to your resource

You will need software to create the label and the type of software will be determined by the amount of data/resources that your agency deals with.



For example, the ANZMET Lite. This Metadata Entry Tool is:

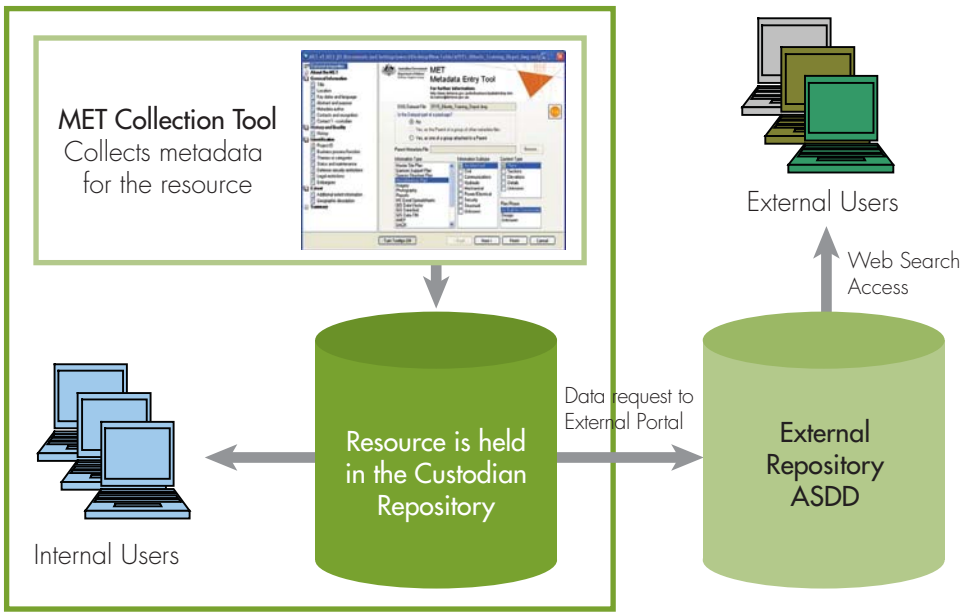


- stand alone;
- open source; can be supplied with data capture contracts on a disc; and
- is aimed at smaller organisations with resources/datasets that do not change regularly.

Using a Metadata Entry Tool, you will be able to create labels for your resources

This Tool conforms to the Minimum elements talked about previously. It would be ideal for organisations that contract out data collection. This software could be provided to the contractor (making them responsible for the labelling of the resource) and required for completion of the contract.

Publishing your data



Metadata collected using the MET is stored locally, usually in the same directory structure as the resource itself.

Internal staff can access the metadata using local searches on the intranet, providing that suitable search facilities have been provided.

External users of the resource can't see the Custodian Repository unless it publishes outside the organisation to an external repository such as the ASDD.

Publishing to the ASDD enables:

- internal staff to discover and access resources held by other organisations
- external users / clients to be able to discover and access your resources in an efficient manner

Example of an External Repository

The Australian Spatial Data Directory: http://www.ga.gov.au/asdd/

- is a national initiative.
- provides a search interface to find resource descriptions (metadata).
- Nodes are implemented by State/Territory jurisdictions, Australian Government agencies and commercial organisations.
- The ASDD is an essential component of the Australian Spatial Data Infrastructure (ASDI). A gateway to the ASDD is maintained by Geoscience Australia on behalf of ANZLIC - the Spatial Information Council, as part of its broader Australian Government responsibility for the ASDI.
- The individual ASDD nodes are implemented by State/Territory jurisdictions, Australian Government agencies, and commercial organisations (for details see all node descriptions).

- It is the responsibility of individual nodes to maintain their own metadata and nodes in accordance with the ANZLIC Metadata Guidelines and the ASDD Requirements and Standards.

The following ASDD repositories are briefly described and include references to further information…

ACT Geographic Data Directory

Australian Antarctic Data Centre

Australian Hydrographic Office

BRS and Australian Natural Resources Data Library (ANRDL)

Bureau of Meteorology

CSIRO Marine and Atmospheric Research

DEWHA Discover Information Geographically (DIG)

Geoscience Australia

IndexGeo Pty Ltd - Eco Companion catalogue

Murray-Darling Basin Commission

National Oceans Office

NSW Natural Resources Data Directory

NT Spatial Data Directory

Other Commonwealth Agencies (hosted by BRS)

PSMA Australia Limited

Qld Spatial Data (QSIC)

Queensland Department of Natural Resources and Water Data

RAN Directorate of Oceanography and Meteorology

South Australian Spatial Information Directory

Tasmanian Spatial Data Directory

Victorian Spatial Data Directory

WALIS

Other nodes currently available for publishing are BlueNET and BRS.

How to start

Go to the ANZLIC website http://www.anzlic.org.au to download the ANZMet Lite metadata entry tool.

You can also ask to be invited to participate in the Spatial Resources Wiki to engage with the ANZMet Lite and Education community users for help with using the toolkit.

ANZLIC Jurisdictional Metadata contact officers are listed at
http://www.anzlic.org.au/contactus_metadata.html

ANZLIC Contact Officers are listed at
http://www.anzlic.org.au/contactus_officers.html

and for further information and assistance:

Email: info@anzlic.org.au
Phone: +61 (0)2 6257 0734
Fax: +61 (0)2 6257 0719
Post: GPO Box 337, Canberra ACT 2601
Street: Suite 2, McKay Professional Centre, 5 McKay Gardens, Turner ACT 2612

Appendix A

"Sit in an oil conference today and you will hear about digital technology and software: cloud computing, remote servers, bandwidth constraints, high-speed wireless, terabytes of storage, GPS, laser mapping, virtualization, 3D mapping, virtual-reality caves, satellite imaging, smart sensors, and robotics. You'd be hard-pressed to know whether it was a meeting for Google or Exxon."

– Mark P. Mills writing in the Nov 2008 issue of The American Spectator (http://spectator.org/archives/2009/01/14/will-exxon-get-googled) . The article is titled: "Will Exxon Get Googled?"

"If you look at the media's coverage of GIS and online mapping in the past month or two you'll see a crime wave. No, there's not necessarily more crime everywhere (though in many areas, it is up); there are just more crime maps online and more discussions about them. Here in the U.S. it seems a great many small towns, counties and large cities have, or will have, some type of online crime map in the coming months.

Finally, let's jump to the United Kingdom, where the Home Office mandated (http://www.homeoffice.gov.uk/rds/ia/atlas.html) that each of the 43 Police Authorities (http://www.police.uk/forces.htm) in England and Wales make their crime data available on online maps. In West Yorkshire the tools (http://www.beatcrime.info/force.asp) for querying an area for a specific type of crime are easy to use. However, the Authority has not confirmed that posting locations on a map maintains privacy in burglary situations, and thus offers just a list. London's Metropolitan Police serve their maps (http://maps.met.police.uk/) via a Google Maps application."

– Adena Schutzberg writing in the January 15, 2009 edition of Directions Magazine (http://www.directionsmag.com/article.php?article_id=2986&trv=1). The article is titled: "Crime Mapping Wave."

Appendix B

Acronyms and Definitions

AGLS	Australian Government Locator Service is a metadata standard based on the international Dublin Core ISO 15836.
ANZLIC	Previously the Australian and New Zealand Land Information Council now referred to as ANZLIC - the Spatial Information Council www.anzlic.org.au
ANZLIC Profile	A subset of elements taken from the ISO 19115 International Standard for Geographic Metadata for use in Australia and New Zealand. http://www.anzlic.org.au/metadata/index.html
ANZLIC SRDaAP	ANZLIC Spatial Resource Discovery and Access Program www.anzlic.org.au/metadata
ASDD	Australian Spatial Data Directory provides a search interface to discover geospatial dataset descriptions (metadata) through Australia. http://asdd.ga.gov.au/
ASDI	The Australian Spatial Data Infrastructure (ASDI) is a national framework for linking users with providers of spatial information.
Deep Web	The terms Deep Web, Hidden Web, Invisible web and Deep Net describe the portion of the World Wide Web that is not visible to the public or has not been indexed by the search engines. Some portions of the deep web consist of dynamic pages accessible only via a form or submitted query. Web pages that are not linked to other pages or sites that require registration prior to access are also part of the deep web. They are, in effect, invisible; search engine crawlers will not be able to find them since they have no backlinks or inbound links.
GDP	The gross domestic product (GDP) or gross domestic income (GDI), a basic measure of an economy's economic performance, is the market value of all final goods and services made within the borders of a nation in a year
Geotagging	The process of adding geographical identification metadata to various media such as photographs, video, websites, or RSS feeds and is a form of geospatial metadata. These data usually consist of latitude and longitude coordinates, though they can also include altitude, bearing, accuracy data, and place names.
GIS	Geographic information system or service
GPS	Global positioning system
ISO	International Organisation for Standardization www.iso.org
ISO 19115	International Standard for Geographic Metadata
MET	Metadata entry tool
Metadata	Frequently described as "data about data." Metadata is additional information (besides the spatial and tabular data) that is required to make the data useful. It is information you need to know in order to use the data. Metadata represents a set of characteristics about the data that are normally not contained within the data itself.
OSDM	Office of Spatial Data Management www.osdm.gov.au

SLIP	Shared Land Information Platform https://www2.landgate.wa.gov.au/slip/portal/home/home.html
TPHU	Tropical Public Health Unit (Queensland Government) http://www.health.qld.gov.au/dengue/contacts/tphun.asp
WALIS	Western Australian Land Information System www.walis.wa.gov.au
Web 2.0	Referring to a second generation of the World Wide Web (WWW) as an enabling platform for Web-based communities of interest, collaboration, and hosted services.Web 2.0 supports mashing, which is a process of building new services from reusable components of other services. Applications include social bookmarking, calendaring, and VoIP. Really Simple Syndication (RSS) is one of the most popular tools associated with Web 2.0.
Web services	a software system designed to support interoperable machine-to-machine interaction over a network
YLDs	Years of life with a disability
YLLs	Years of life lost

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