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INVITED PAPERS

INTERNATIONAL CASE STUDY DEVELOPMENT AND DATA INTEGRATION
ACTIVITIES IN AUSTRALIA

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International Case Study Development and Data Integration Activities in Australia

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Introduction

The ability to deliver sustainable development is a significant issue for countries world-wide and the use of correct, current and integrated spatial information about the built and natural environments is paramount to this. SDIs have become crucial tools in facilitating how spatial data and spatial information are used. Initially SDIs were implemented as a mechanism to facilitate access and sharing of spatial data hosted in distributed GISs. Users now however require precise spatial information in real time about real world objects and the ability to develop and implement cross-jurisdictional and inter-agency solution to priorities such as emergency management, natural resource management, water rights and animal, pest and disease control. In order to achieve this, the concept of an SDI is moving to a new business paradigm, where SDI is emerging as an enabling platform to promote partnerships of spatial information organisations and data sharing.

The benefits of SDI in enabling this sharing of spatial information have been documented, however an SDI does not necessarily break down the barriers between jurisdictions. Just because different information can be gained about an area from different jurisdictional levels, does not necessarily mean that the information will be integratable or compatible. There is now a need to create policies and technical frameworks that allow built and environmental information to be integratable across jurisdictions. The PCGIAP project “Integration of Built and Natural Environmental Datasets within National SDI Initiative” aims to create such integration, through the use of a case study approach across countries within the Asia-Pacific region. This will help to advance knowledge of National SDIs to deliver sustainable development objectives and in the creation of a Regional SDI for the Asia-Pacific Region.

International Case Studies

International case studies have been designed as part of the project, in order to leverage off the work being undertaken within the PCGIAP and to develop best practice in terms of integration tools and techniques within the Asia and Pacific Region. The international case study is designed to gain access to both developed and transitional countries in order to broaden the focus of research and enable a comparison between individual countries. Countries in the Asia-Pacific region are still developing their institutional arrangements and technological strategies to achieve collection and interaction of data, though developed countries are testing strategies on a project basis. The development of National SDIs varies from country to country, with policy creation and technical development generally being higher priorities for research (especially in transitional countries) than institutional arrangements and data interoperability. A considerable amount of research into developing a national framework for automation of updating and integrating datasets is needed.

Research requires diagnosis of the benefits of and capacity for integration of two different forms of data (built and natural environment) in countries of variable national capacity, from developing economies to developed economies in the Asia-Pacific region. The varying degrees of development of SDIs within these nations requires a case study approach. The approach is justified when topics must be defined broadly, when contextual conditions (and not just the phenomenon of the studies) are relevant, and when multiple and not singular sources of evidence are relied on. The case studies will assist analysis of

historical, policy and institutional comparisons. Comprehensive analysis of the results will identify a cross-section of problems, methods and levels of integration within existing National SDI initiatives.

The countries of Thailand, New Zealand, Malaysia, Brunei Darussalam, Indonesia, Australia and Japan are participating in the case studies through Working Group 3 of the PCGIAP (Figure 1). The case studies are currently investigating the problems associated with the integration of built and natural environmental datasets within the context of National SDI from a technical, institutional and land policy perspective. It has been found that a lack of understanding of the importance and necessity for access and interoperability between the two forms of data remains among policy makers within case study countries. Lack of understanding is a universal problem as identified by United Nations resolutions, and also identified as a major barrier to achieving sustainable development within a National SDI initiative.

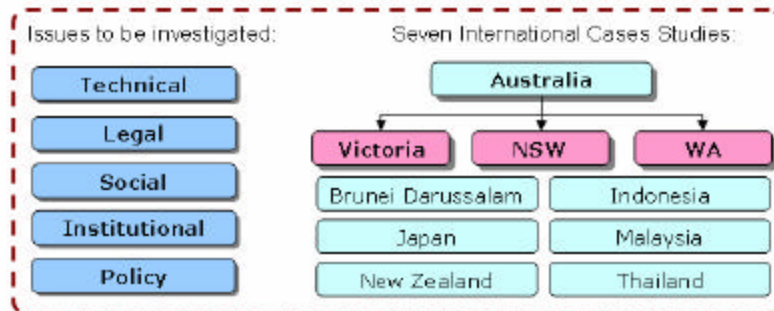


Figure 1 – Overview of international case study countries and issues to be investigated

Case Study Outcomes

The research will develop a framework for data integration and national implementation of SDI capable of servicing needs of both developed and transitional countries. The framework models, technologies and strategies used for collection, manipulation and access of data will all constitute significant outputs. Increasingly, cadastres and SDIs use the latest information and communications technology (ICT). If this is combined with natural environmental datasets, SDIs will be able to deliver integrated data to a wider range of users across various communities of practice including land administration, natural resource management, emergency management, counter terrorism and coastal and marine development.

The technical, institutional and policy issues concerned with integrating framework datasets are recognised internationally as a major priority by UN conferences in Asia-Pacific and the Americas. The outcomes of the project will therefore aim to address these concerns through the creation of a solid technical foundation for data sharing and a strategic policy position upon which sustainable development initiatives can be based. This includes:

- Streamlining data capture, storage, and access processes
- Need for interoperable environment for data integration
- Facilitating data sharing
- Creating an holistic framework for data stakeholders to communicate with each other
- Align SI and related strategies amongst jurisdictional agencies
- Integrating the built and natural environments to create a comprehensive (holistic) view of the world
- Meeting “triple bottom line” objectives of governments

Case Study Methodology

The development of case studies is based on a number of other activities which aimed to collect data and information from specific countries to compare and contrast systems and infrastructure. These have mainly been undertaken by the International Federation of Surveyors (FIG) and the UN Economic

Commission for Europe (UN-ECE), covering a large range of mainly land administration issues, with their own specific objectives (Available at <http://www.swisstopo.ch/fig-wg71/> or <http://www.unece.org/env/hs/wpla/>). It has been found however, that most studies undertaken fail to effectively take into account particular socio-economic, cultural and temporal contexts. The development of the cadastral template (<http://www.cadastraltemplate.org>) and marine administration template (<http://www.marineadministration.org>) by PCGIAP Working Group 3 attempted to overcome this problem through discovering the basic social, conceptual, cultural and institutional context of countries cadastral and marine administration systems as a whole. These templates have been used as the basis for this project, in which an 'Integration Template' has been created in order to collect information from each of the case study countries in a standardized form.

Integration Template

The integration template has been designed as a standardized generic proforma to enable the discovery of information, including matters concerned with member countries' spatial information policies, laws and regulations, infrastructure implementation, institutional arrangements, technology, and integration issues as well as human resource and capacity.

The template aids the research team to better understand and describe:

- *History of integration of built and natural environmental datasets and related National SDI initiatives.*
- *Capacity for and policies relating to data integration of cadastral and topographic datasets.*
- *Institutional support for and barriers against data integration of cadastral and topographic datasets.*
- *The technical, jurisdictional, institutional, legal and land policy perspective surrounding cadastral and topographic datasets in a National SDI.*
- *Other countries experiences and initiatives in integrating data in order to identify best practice.*

The basic principles of the design of the template included that:

- it had to suit and serve the purposes of the mainly Asian PCGIAP member countries;
- it had to be easy to fill out;
- it had to have a simple structure, but the results should reflect the main issue of data integration;
- it had to be easily understood in order to have a significant enough response rate; and
- respondents would not be asked for precise figures or statistics, with estimates being good enough.

The first section of the template contained a descriptive report of the national spatial information infrastructure of the country relevant to data integration, and was split into five main areas for easier comparison, as listed in Table 1.

Country Context	<ul style="list-style-type: none"> • Geographical and historical context • Current political and administrative structures
National SDI Context	<ul style="list-style-type: none"> • History and status of National SDI Initiatives • Historical outline and development of built and natural environmental datasets • Current administration of built and natural environmental datasets
Institutional Framework – Data Provider	<ul style="list-style-type: none"> • Spatial information management • Tools used for spatial information management • Scale of built and natural environmental datasets

Institutional Framework – Data User	<ul style="list-style-type: none"> • Description of the major data users • Description of the current services and products available
Integration Issues	<ul style="list-style-type: none"> • Justification and need for integration • Issues in integrating built and natural environmental datasets • Description of major integration initiatives

Table 1 – Overview of Integration Template

A short questionnaire follows the descriptive section of the template and aims to identify basic policy, institutional, technical, legal and social principles in relation to National SDIs and data integration. The questions have been kept to a minimum with relative responses asked for in relation to if a principle is very important, important, neither, not very important, and not important at all. The questions can be seen in Table 2 below.

Policy Principles	<ul style="list-style-type: none"> • Current issues that policy must address in regards to spatial information development? • What policies have been developed in regards to spatial information?
Institutional Principles	<ul style="list-style-type: none"> • What are the institutional issues hindering data integration? • How is spatial information accessed? • How is spatial information managed? • How are spatial data initiatives funded?
Technical Principles	<ul style="list-style-type: none"> • What are the technical issues hindering data integration? • To what standards organisations or bodies does your jurisdiction subscribe?
Legal Principles	<ul style="list-style-type: none"> • What are the legal issues hindering data integration?
Social Principles	<ul style="list-style-type: none"> • Who are the major users of cadastral and topographic data? • What capacity building initiatives are currently underway?
Spatial Data Infrastructure	<ul style="list-style-type: none"> • What are the main datasets available within your National SDI? • What is the cost for data available through the SDI?

Table 2 – Overview of Questionnaire Section of Integration Template

An initial investigation of each of the case study countries has been undertaken through the completion of the integration template, and is the basis for countries to prepare a report on their National SDI and data integration issues and activates. The development of the template will also enable the project to be expanded to other countries within the region in the future.

Future Activities

The aim of the integration template is to provide a description of the status of National SDI initiatives as a basis for improving them. In simple terms, if you do not understand the existing systems, you cannot improve them. The template also aims to provide detailed information on integration activates within case study countries for comparison and analysis. This analysis will enable research to be conducted on similar issues and problems found across the Asia-Pacific region, as well as the ability to share integration initiatives and experiences occurring within individual jurisdictions. This will lead to the development of a model and framework for integration of these two forms of data capable of being used in diverse jurisdictions in support of sustainable development. It is intended to compile all the replies in a report by the end of the year and this will also provide a good basis for comparing and identifying good practice among participating countries in the area of National SDI implementation and data integration.

Country Report – Australia

The following section of this paper focuses on one of the case study countries, Australia. This section is based on the integration template that has been developed as part of the international case studies and gives a brief outline of the history and geography of Australia (including current political and administration structures), a National SDI context, describes the institutional framework for data integration and describes the issues and barriers to the effective integration of the built and natural environmental datasets.

A. Country Context

Geographical and Historical Context

Australia is the largest island continent in the world, with a total area of over 7,600,000 sq km, lying south of the Equator between the Indian and South Pacific Oceans. The population is approximately 19.5 million, with a growth rate of about 1%. The majority of the population (85%) resides in urban areas along the east and southeast coastline and fertile plains.

Much of the interior of the country is flat, barren and sparsely populated. The highest point, Mt Kosciuszko reaching 2,229m, is within an extensive mountain range running north south along the eastern seaboard. Australia also lays claim to the third largest marine jurisdiction in the world and has a coastline extending more than 36,700km.

Australia was colonized in 1788, although was inhabited for over 40,000 years by the indigenous Aboriginal peoples. Australia has been an independent member of the British Commonwealth since 1901 when it became a Federation of States. A referendum to change Australia's status from a Commonwealth headed by the British monarch to a republic, was defeated in 1999 and hence Queen Elizabeth II of England remains the Head of State.

Current Political and Administrative Structures

The constitution vests in the Governor-General, representing the Head of State exercised by tradition on behalf of the elected government. The Government is based on a bicameral Federal Parliament headed by an elected Prime Minister consisting of a Senate which has proportional representation among the States. The Federal Government has powers over defence, foreign affairs, trade and commerce, taxation, customs and excise duties, pensions, immigration and postal services. Other powers are left with the 8 State and Territory Governments, such as health, education, state transport networks, town and rural planning and land administration (cadastral system, land registration).

The federated system of governance provides significant difficulties in attempting to create a national overview of spatial information for use within land administration and other communities of practice such as environmental management, emergency management and counter terrorism operations.

B. National SDI Context

History and Status of National SDI Initiative

Description of the origins and the development of National SDI Initiatives

A National SDI is being implemented in Australia through ANZLIC – Australia's spatial information council. This council'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. This is done through the development of the Australian SDI (ASDI) which comprises the people, policies and technologies

necessary to enable the use of spatially referenced data through all levels of government, the private sector, non-profit organisations and academia (ANZLIC 2006). ANZLIC's main role is to set national leadership through the creation of national policies and guidelines for data custodianship, data access and metadata. It collaborates with the 8 state and territory governments of Australia to implement the ASDI on a cooperative basis – the implementation of the ASDI is not legislated. The ASDI is actually made up of 8 State and Territory SDIs.

Due to Australia's federated system of government, the State and Territory governments have power over land administration, which has seen each State government built its own SDI. Each State creates its own policies in regards to data access and discovery, with harmonisation and cooperation between states made possible through ANZLIC. The ANZLIC Council is made up of a representative of each of the State governments and the Federal Government, which enables promotion of nationally consistent standards and policies to be implemented within each jurisdiction. Figure 2 below shows the linkages between Australia's States and Federal Government in spatial information coordination and the role that ANZLIC plays within this.

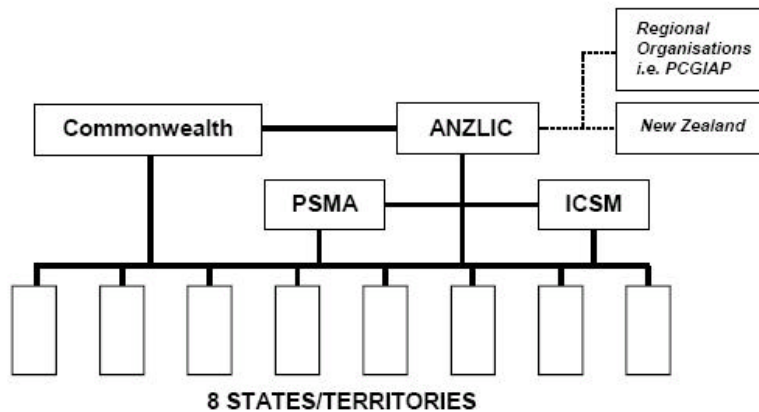


Figure 2 - Australia's state and federal government agencies and administrators of spatial data

ANZLIC has three standing committees responsible for developing plans to address the Council's implementation of the ASDI and these include:

- Standing Committee on Land Administration
- All-Hazards (Emergency Management, Counter Terrorism, CIP) Standing Committee
- Intergovernmental Committee on Surveying and Mapping.

As the development of the ASDI is not legislated, it must be stressed that ANZLIC's strength lies in the creation of partnerships with all government jurisdictions, professional and commercial groups and users of spatial information. This is a very important factor in the ability to implement an SDI across all jurisdictional levels in Australia. The structure of ANZLIC is shown in Figure 3.

Local governments also play a role in SDI development, although mainly through the production of data, and less through policy development. Within Australia, local governments are the custodians of built environmental data such as the cadastre, and in order to create a state-wide or even Australia-wide picture of cadastral data, partnerships between the local and state based governments are essential.

Australia also plays a role in regional SDI development through the PCGIAP and through the creation of National wide data standards that are consistent with international standards such as the International Standards Organisation (ISO). ANZLIC also has representation on the committee from New Zealand, creating a close link between the two countries in terms of spatial information policy and infrastructure development.

ANZLIC Structure 2005-06

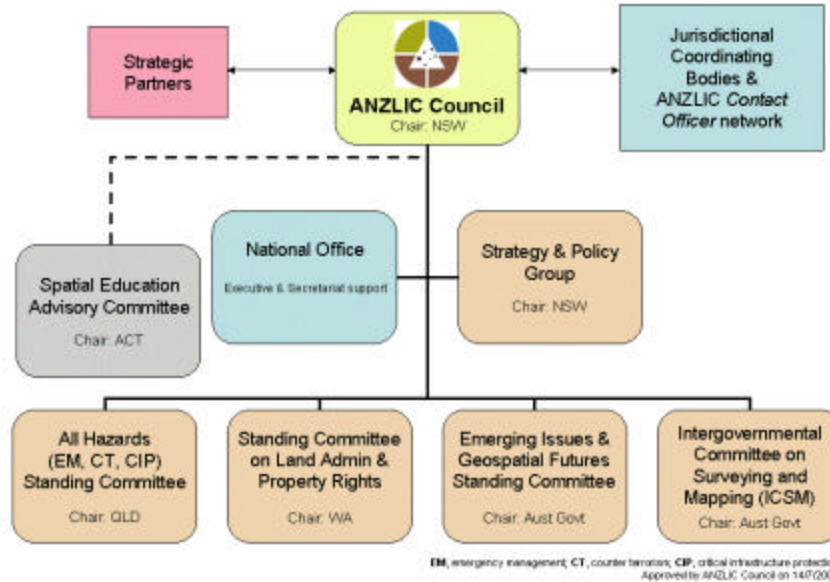


Figure 3 – Structure of ANZLIC – Australia’s peak spatial information body (ANZLIC, 2006)

Have Core Datasets been defined within the SDI structure?

Fundamental or core datasets have been defined within the structure of the ASDI at an individual jurisdictional level. For example each of the 8 state and territories have defined fundamental datasets within their SDI initiatives, however the datasets are not the same. In Victoria, 8 fundamental datasets have been defined, however in WA, there are many more defined fundamental datasets. The same can be said for the development of custodianship guidelines concerning maintenance and control of these fundamental datasets. Each jurisdiction will have different levels of accuracy and maintenance cycles which are not necessarily compatible across jurisdictions. The federal government has also defined custodianship guidelines for the use of spatial data within the Federal government through ANZLIC, however as the states already have such guidelines, they are not implemented nation-wide. Each state has defined a set of guidelines that achieve this for their jurisdiction along with the National government creating guidelines for national government data producers. These are all well documented and accessible and contain the guiding principles of custodianship, however are not standardized across all jurisdictions.

As mentioned, whilst fundamental datasets vary from state to state, most core spatial data sets organised in layers include: Cadastre; Topographic; Imagery; Elevation; Transport Network; Geodetic Network; Administrative Boundaries; Property Addressing; and Geographic Names.

Describe the data acquisition and access mechanisms within the SDI

Accessing data within the ASDI is once again done at a jurisdictional level. As the states are each custodians of data relating to their jurisdiction, they each have separate data dissemination mechanisms in place. Most of the state governments major dissemination mechanisms are through the internet, with each state attempting to create a single web portal for customers to access and find spatial information. As the major focus point for the states is land administration, most of the spatial information available relates to land, and the names of many of the web portals demonstrate this (eg. Land Victoria, Land Gate etc).

Each jurisdiction has its own standardized and documented update cycles for spatial information, mainly relating to fundamental datasets, however some states have set standards for non-fundamental datasets as well. Pricing of data is also done at jurisdictional level with differing price structures being prevalent

across Australia. Victoria for example, has moved to a “full-cost recovery” policy for spatial information, whilst Western Australia has a “cost of extraction and delivery” policy. This creates different environments within Australia for spatial information growth and development.

There is however, a national portal containing metadata records and information relating to most of the spatial datasets that can be found at all jurisdictional levels in Australia. The Australian Spatial Data Directory (ASDD) lists and provides search interfaces to discover spatial dataset descriptions (metadata) throughout Australia. It is an essential component of the ASDI and incorporates information about datasets (metadata) from all jurisdictions. Links to further information and possibly to the actual data itself are provided within each metadata record. The directory comprises government and commercial nodes in each State/Territory and spatial data agencies within the Australian Government. The individual ASDD nodes are implemented by State/Territory jurisdictions, Australian Government agencies, and commercial organisations and 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. Whilst this creates uniform and consistent national metadata records, many agencies at all jurisdictional levels (especially local government level) continue to use different metadata standards, based on either a State or agency standard for non-fundamental datasets. Many agencies also do not use or keep metadata records, and hence there is still duplication of effort in creating data as no metadata record makes it difficult to locate specific datasets.

The ASDD was launched in 1998 and has since steadily grown in content to become the key source of spatial information in Australia. Geoscience Australia (Federal Government Agency) maintains the gateway on behalf of ANZLIC, as part of its broader Australian Government responsibility for the Australian Spatial Data Infrastructure.

Historical and Current Outline of Built and Natural Environmental Data Development

Describe the origins and current development and institutional arrangements of both cadastral and topographic data, along with other built and natural environmental datasets.

Natural Environmental Data

Natural environmental data was originally created in Australia through the Bureau of Mineral Resources, Geology and Geophysics (BMR) which undertook the systematic mapping of Australia from 1950 to the 1970s. A National Geoscience Mapping Accord set up between BMR and State (and Territory) governments in the early 1990s, combined with new scientific approaches and emerging technologies, gave rise to airborne datasets, digitized databases and state-of-the art processing techniques. This led to the second generation of geological maps for onshore Australia. These maps were digital and included many layers of information, making them ideal for use in geographic information systems (GIS).

The BMR became the Australian Geological Survey Organisation (AGSO) in 1992 and in 2001, the current name of Geoscience Australia was adopted with the creation of the National Mapping Division (NMD) within Geoscience Australia. The NMD was formerly the Australian Surveying and Land Information Group (AUSLIG), whose history includes the functions of the Australian Survey Office and the Division of National Mapping (DNM) which merged in 1987 and held responsibility for the large scale mapping of Australia’s Territories. The DNM was tasked with mapping the entire country to facilitate national development in the post-war period, initially at a scale of 1:125000 and subsequently at a scale of 1:100000. DNM, together with its successors, has been the Australian Governments key civilian mapping and land information agency. Since 1992 the 1:25000 scale series has been progressively released as a digital product (GEODATA) and updated using satellite imagery.

At a National level, the National Mapping Division (NMD) and Geo-hazards Divisions of Geoscience Australia were merged in 2005 to reflect a global trend in dealing with an increasing range of real world

phenomena. Under the new Geospatial and Earth Monitoring Division (GEMD), the maintenance of standard small scale national topographic mapping remains a major responsibility.

Separate state based jurisdictions also manage small-scale topographic data sets built up over the past 20 years. These datasets have been incorporated into state based SDI initiatives, as they fall under policies relating to whole-of-government spatial information management. The datasets however are not always compatible with those on a national level, with different scales, symbology and update cycles used.

Built Environment Data

Large scale built environmental data (especially cadastral data) is the domain of State and Territory governments in Australia. The states are responsible for land administration (including land registration, planning and development) and this has seen the development of data such as cadastral data and transportation data at a state level.

As a Federation of States, Australia maintains land administration offices in each jurisdiction, where the majority of large scale built data exists. There is no prescribed organizational structure common to all states; land administration is a state government responsibility performed under a range of government departments such as Environment, Planning, Lands or Land Administration. Embedded in these departments are the State's digital cadastral map, land registry and titles office, Crown lands management office, Surveyors Board, and business units for land information and resources. Combinations of these services can be found in each state, integrated through sharing agreements. Each state operates separate cadastral systems. Even though there is considerable commonality, each state and territory has significant idiosyncrasies and complexities in its law governing land and the cadastral system.

The present day cadastre is now digitised throughout the country with all jurisdictions having completed the digitisation process for all land parcels. A seamless cadastral database, called 'Cadastral Lite' integrated from each of the jurisdictional data sets and co-ordinated on the national reference datum, is available from the Public Sector Mapping Agency Ltd. The Australian cadastre covers approximately 10.2 million parcels including freehold, state owned land, strata titles and a very small number of native title parcels. The Victorian dataset series for example, as is common to most jurisdictions, contains data primarily representing land parcels and properties and is used extensively in Geographic Information Systems (GIS) by the public and private sectors. The content includes parcel polygons, proposed parcels (future development), parcel identifiers, municipal council reference numbers, road centre-lines, road easements and Crown and freehold land differentiation. Each of the data features is date stamped and uniquely identified.

Cadastral mapping is typically at scales of 1:2,000 - 4,000 in urban areas and 1:10,000 - 50,000 in rural areas. At a national level, surveying and mapping coordination and cooperation is provided by the Inter-governmental Committee on Surveying and Mapping (ICSM) represented by Australia's Commonwealth, State, Territory and Defence surveying and mapping agencies.

Data quality and accuracy for built and natural environmental datasets are generally defined across application areas at a state level, however on more of an ad hoc basis. Cadastre for example has been defined by each state, however other areas have not (eg. some states have defined road updates, others have not). Framework datasets however are usually defined.

Describe the metadata arrangements for built and natural environmental datasets

In order to receive high quality and consistent spatial data it is necessary to standardize the procedure and steps of the data capture and update, thus ensuring that the same rules are applied for every area or region. In Australia, National metadata management tools have been put in place by ANZLIC which are based on ISO 9001. Each state has also created metadata management tools which conform to international standards, however these are not consistent across all jurisdictions. All these tools however are well documented, accessible and searchable, as described in the section above on the ASDD.

Describe the data format or conceptual model for built and environmental datasets, especially topographic and cadastral datasets.

For the integration of data from heterogeneous sources it is necessary to provide a neutral format or conceptual description which guarantees the possibility of exchange. In order to know the relationship and hierarchical structure of a spatial data set, a conceptual model is needed.

Depending on the application, there are common format and conceptual models at national as well as state level in Australia, however no standardized format or conceptual model exists across all jurisdictions. There is however an attempt at a National level to create a National Cadastral data model by the Intergovernmental Committee on Surveying and Mapping (ICSM) under ANZLIC – the spatial information council.

C. Institutional Framework for Integration – Data Provider

Provide information on how spatial information is managed from a data provider perspective

Government management of spatial information is done separately by each jurisdiction, however there are similarities in policy and administration. Data sets (especially fundamental datasets) are updated on a regular basis within each jurisdiction, often by private sector companies in consultation with Government. These private sector companies have contracts with Government to deliver regular and accurate update cycles for spatial data.

Policy is developed to guide agencies and government departments in managing their spatial data, however there is no overarching legislation dealing with management of spatial information. Agencies generally interact through the creation of partnerships or via licensing agreements. This creates an often ad hoc method of sharing spatial data between agencies.

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Depending on the application, there are common format and conceptual models at national as well as state level in Australia, however no standardized format or conceptual model exists across all jurisdictions. There is however an attempt at a National level to create a National Cadastral data model by the Intergovernmental Committee on Surveying and Mapping (ICSM) under ANZLIC. Tools used in each state are generally based on commercial off the shelf software, however some states are attempting to provide some tools which are open source.

Jurisdictions offer data users specific datasets for use, through licensing agreements. Data is disseminated generally through the web, although CD and paper format is also available. Some states, such as Victoria, offer users a suite of fundamental data products (eg. Cadastral dataset, topographic dataset, road network dataset etc). The datasets are not vertically integratable and natural boundaries such as rivers or coastlines which tend to be frozen in time in the cadastre, float in the topographic dataset.

D. Institutional Framework for Integration – Data User

Describe the major data uses.

The major data users within Australia are the public sector, through the management and development of land administration activities and the running of an efficient and effective land market in each state. The cadastre is the most highly used of the spatial datasets, as its primary use is in helping to spatially record the description of private land. Other major datasets utilized in Australia are generally in line with those described as fundamental or core (as listed above).

Data is made available to the private sector through value added resellers and data take up by the private sector continues to increase in Australia, although not to the point that all costs for creation, updating and deliver of data are recovered.

Describe current services and products that are available to data users and customers.

Jurisdictions offer data users specific datasets for use, through licensing agreements. Data is disseminated generally through the web, although CD and paper format is also available. Some states, such as Victoria, offer users a suite of fundamental data products (eg. Cadastral dataset, topographic dataset, road network dataset etc) although these are only available as separate datasets and not as an integrated package. The datasets are not vertically integratable and natural boundaries such as rivers or coastlines which tend to be frozen in time in the cadastre, float in the topographic dataset.

E. Issues in the Integration of Built and Natural Environmental Datasets

Need for Integration

Data integration is a priority for Australia, especially due to the Federated system of government. The integration of built and natural environmental datasets has the potential to transform everyday functions within government and society, for example how tax is collected, how health services are delivered, how the environment and cities are managed, how responses to emergencies and terrorism are organised, how wars are fought, and how elections are run. These drivers are especially relevant in terms of creating information that is useable and available across communities of practice.

Major Issues in attempting to integrate built and natural environmental datasets

What are the major issues hindering the ability to integrate multi-source datasets on a national level?

Australia's federated system of governance means that integrating multi-sourced built and natural environmental datasets is problematic. Not only are these two types of data often managed and maintained separately within each jurisdiction, there are also up to 8 different jurisdictional sources for these types of datasets, based on different data models with different policy created in order to manage the updating and availability criteria for the data.

Within Australia, there are solutions to this problem being developed, however they are generally based on technical requirements for integration. This is not necessarily a bad thing, with the development of a common cadastral data model being a possible outcome of this technical development. However, as previously mentioned, legislation is not used to enforce standards or technical developments on the different jurisdictions within Australia, so that even if a common data model is created, jurisdictions are not bound to implement this. This creates the need for an investigation into the institutional, legal and policy perspectives surrounding the integration of data, something which is not being investigated to a high degree (although ANZLIC, Australian peak spatial information body is attempting to investigate some of these issues).

List and describe the outcomes of any attempts to integrate built and natural environmental datasets at a national or state type level.

Within Australia, the Public Sector Mapping Agency (PSMA) has been set up to create national level datasets from the various state level jurisdictional datasets. Harmonisation for the cadastre for example has been completed, however actual integration of datasets has not. PSMA are also looking at the issue of vertical topology of datasets, however once again this is a technical solution. Institutional and policy issues associated with integration within National SDI initiatives are not being directly researched.

Conclusion

Research in Australia into the technical integration of built and natural environmental datasets is being undertaken within various jurisdictions, however more work needs to be done in relation to the

institutional, policy and legal perspective surrounding data integration. In Australia, the states are the custodians of large to medium built and natural datasets while the Federal Government is the custodian of small scale natural datasets. Merging of these datasets at a local level has been achieved to some degree, however, attempts to integrate the datasets at a national level, even where Australia's SDI is well developed, has been hampered by jurisdictional, institutional, administrative and legal issues. Hence there is a need to investigate the differences in these forms of data and the justification and policy framework to integrate them within Australia's National SDI.

BIOGRAPHICAL NOTES

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