



MODULE 5

MODULE 5: Spatial Data Discovery and Access

Building capacity to implement natural resources information management systems.

www.nlwra.gov.au

Table of Contents

Guide for managers	ii
Context	ii
Actions	ii
Acknowledgements	iii
Guide to symbols	iv
5.1 Background	1
5.2 Access to consistent Australia-wide natural resource data	2
5.3 What data and information exists	3
5.4 Finding data for natural resource management	3
5.4.1 Australian Spatial Data Directory	5
5.4.2 Australian Natural Resources Atlas	8
5.4.3 Australian Natural Resources Data Library	12
5.4.4 Australia's Resources Online	13
5.4.5 Australian Agriculture and Natural Resources Online	13
5.4.6 Discover Information Geographically	13
5.4.7 Environmental Reporting Tool	14
5.4.8 State/territory based initiatives	14
5.5 Additional support	15

Product Number: PN21205

ISBN: 978-0-642-37155-3

Guide for managers

Context

One of the prerequisites for natural resources management (NRM) involves the establishment and maintenance of a good database of information in digital format. Access to reliable and up-to-date information reduces the uncertainty in planning and management by helping identify and analyse situations and issues. Strategies to overcome them may then be prepared and implemented, with the impacts monitored as part of an overall system. The value of the information and the effectiveness of the decision-making/planning processes are very closely related to the quality and completeness of the information and the manner in which it is made available. In this respect data access, management, integration, analysis and communication are key components.

In recent times best practices have evolved to assist data-related tasks in NRM projects. Successful projects have generally adopted an integrated information management solution combining leadership, people, technology, applications and data within a framework that ensures tools and procedures are in place to maintain and transform data into useful information products that support operations and the decision-making process. A key component of an integrated management solution (and the development of a data infrastructure) involves the development of clearing house or dissemination mechanisms to enable searching, viewing and accessing of data.

The combination of an increasing number of agencies, universities and other groups developing spatial data in GIS-ready formats, coupled with the development of simple desktop spatial visualisation applications and improvements in information technology, is enabling an increasingly larger audience to distribute, publish, share and use datasets that were previously only available to specialists.

Worldwide, the demand for easy and timely access to accurate data is increasing as more NRM organisations and agencies begin to appreciate the value of using spatial information to solve their problems. The intent of this guideline is to provide background information on what data and information currently exist, and the issues involved in discovering and accessing them.

Actions

Important elements in capacity building activities to assist in the improved management of natural resources involve the following:

- establishment of networks of people
- process of data gap analysis
- training in the assessment of 'fitness for purpose' for existing datasets and the identification of 'point of truth' or authoritative datasets.

Managers need to be aware that services are available for finding data for use in NRM, and that the same services are often available for publishing and disseminating the results of data collection activities. The philosophy underpinning the creation of a number of these services (e.g. the **Australian Natural Resources Data Library**, the **Australian Natural Resources Atlas**, and

Australia's Resources Online) is that the development of datasets is a very expensive activity, and datasets accrue far greater value if they can be readily accessible to a very wide range of users.

In addition, managers should be aware that accessing and publishing data is carried out within a controlled framework to protect the rights and responsibilities of data providers and data receivers. A number of model frameworks exist for regional groups to develop similar protocols, etc. In this respect, managers should also be aware of the '**Policy Statement on Spatial Data Agreement**' and the '**Model Data Access and Management Agreement**' prepared under the sponsorship of ANZLIC. These can be accessed at: <http://www.anzlic.org.au/>.

Acknowledgements

This module draws heavily on material produced by the Audit, Environment Australia, Bureau of Rural Science, Geoscience Australia, and ANZLIC. These sources are duly acknowledged.

Guide to symbols

The following symbols are used throughout the Toolkit as a guide to users, and draw attention to important issues and information.



Information which readers should take particular note of



Best practice information



Tips for readers—based on experience and aimed at saving time and resources



Caution—readers are advised that particular care should be taken or that the subject issue may be complex



Additional information



Capability raising—used to show a signpost to a higher capability level

**Bold
Text**

Used to highlight a particular issue

**Boxed
Text**

Highlighting of issues specifically related to ANZLIC or the Audit

5.1 Background

Access to data and information in a timely fashion, and in a suitable format is critical to decision-making processes related to NRM.

A review of requirements to support regional and local project planning carried out in 2000 produced the following findings.

GIS users were struggling to:

- find appropriate GIS groups in order to get access to their data
- do their own work and efficiently develop their own databases and spatial datasets—consistency and interoperability were also identified as issues requiring attention
- edit existing data to make them more accurate—based on local knowledge.

Regional staff members seek access to spatial datasets and information to:

- undertake their own GIS analysis
- develop their own capacity for printing and overlay work
- develop a sound understanding of what data and information exist and their limitations
- have an input into what data are collected and the level of accuracy and scale.

Regional staff members also requested to know:

- what data and information are available—what they are, how appropriate are they, scale, resolution, etc.
- which agency/organisation has the data
- if they have to pay for the data
- how they feed back local edits and new information into datasets held at a corporate level.

Source: Caroline Michalski (2000), Evaluation of Regional GIS Needs – Workshop and Feasibility Study Overview Information Support for Regional and Local Project Planning. Report for PISA, Land Information Group.

5.2 Access to consistent Australia-wide natural resource data

In recent times, considerable resources have been devoted by governments, education groups and private industry to improve community access to data and information, and the development of consistent Australia-wide natural resource data. As an example, the Audit adopted the following principles to improve community access to data and information products, and increase their usefulness for integration into the decision-making process.



To ensure data from Audit projects remain comparable and consistent where required, all data are:

- developed and maintained to **meet agreed international or national guidelines or standards** for the management of information as endorsed by ANZLIC or through national coordination arrangements.

To help users easily find access to the data from Audit projects, all data are:

- **documented** in the Australian Spatial Data Directory—the documentation provides enough information for users to determine whether the data are suitable for their purpose
- **easily accessible** to all sectors of the community in formats, location, cost and under conditions that promote their wide use.

To protect the rights of all contributors to the data, all data are:

- accompanied by a licence, when transferred, which clearly sets out the conditions under which the data may be used, the rights and responsibilities of the data provider, and the rights and responsibilities of the data receiver. Licence arrangements ensure map information is accessible, while still protecting copyright, intellectual property, privacy and confidentiality. Rights relate to both individuals and governments.



Individuals have the capacity to know where to look for existing spatial data either within their own organisation, NRM group or from external organisations, including clearing houses and peer-support networks.

1 ► 2



User groups and stakeholder reference panels provide structured feedback mechanisms to ensure organisations' or NRM regional bodies' spatial information systems are accessible and align with business drivers across NRM regions.

3 ► 4

5.3 What data and information exists

A wide range of data and information products that support NRM are currently easily available, viz spatial GIS datasets and imagery, reports, documents, tables, videos, posters, photos, and maps.



The Audit has been involved in the development of a suite of products to meet a broad range of requirements. These include:

- assessment reports providing national summaries of natural resource issues
- summaries of the assessment reports outlining key findings
- compact discs with map data, technical reports and documentation
- paper maps
- online information services—the Australian Natural Resources Atlas, the Australian Natural Resources Data Library, Australian Resources Online—which provide access to national and regional scale data and information products.

5.4 Finding data for natural resource management

The process of acquiring data (often referred to as data discovery) involves a number of steps carried out within a controlled framework, e.g. searching to determine the data actually exist, viewing and assessing their fitness for use, accessing licence agreements, and supply or delivery. This process is illustrated in more detail in a flow diagram at Figure 5–1: parts (i) and (ii).

Figure 5–1(i) Flow chart for discovering and accessing spatial data and information: a user's perspective.

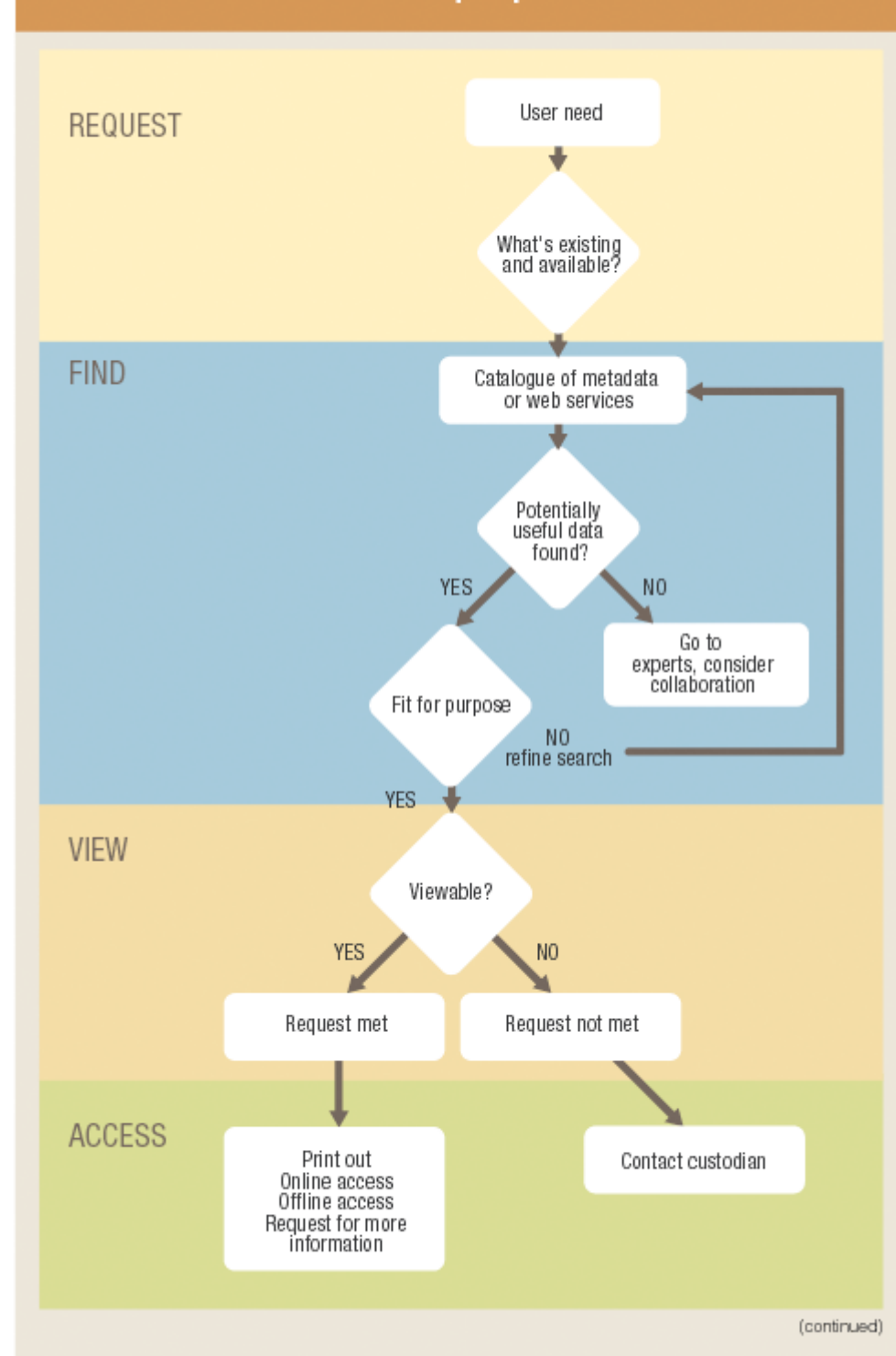
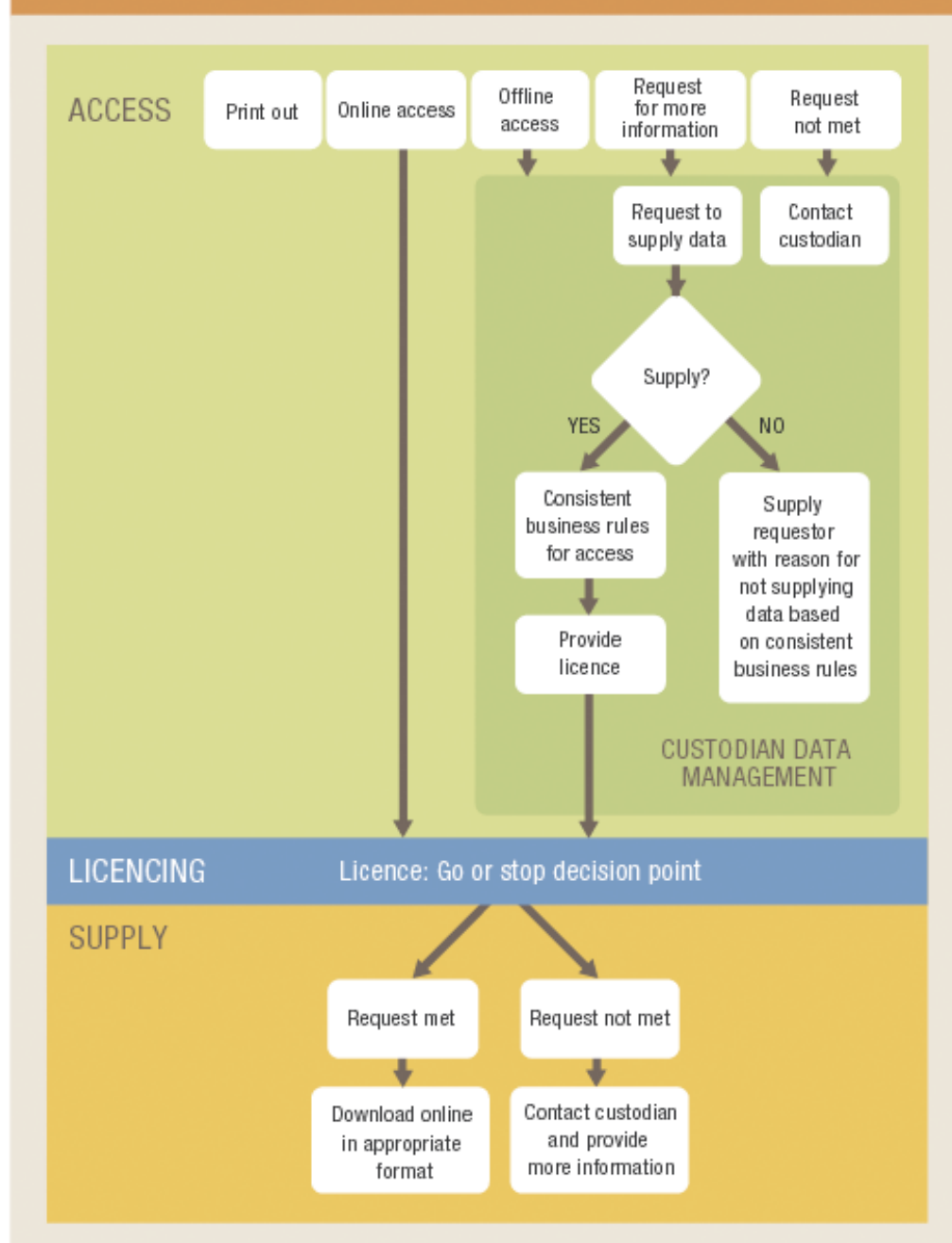


Figure 5–1(ii) Flow chart for discovering and accessing spatial data and information: a user's perspective.



5.4.1 Australian Spatial Data Directory

The Australian Spatial Data Directory (ASDD) is a national initiative that was launched in 1998. It is supported by all governments under the auspices of ANZLIC. **The aim of the ASDD is to improve access to spatial data for the benefit of the wider community— industry, government, education, and general users—through effective documentation, advertisement and distribution.** The directory comprises government and commercial nodes in each state/territory, and spatial data from agencies within the Commonwealth Government.



A key objective of the ANZLIC Strategic Plan is to promote the development of the Australian Spatial Data Infrastructure (ASDI) which will improve access to, and the availability of, nationally consistent spatial datasets. The ASDD is an essential component of the ASDI and incorporates information about datasets (metadata) from all jurisdictions.



To assist users in searching for and assessing the 'fitness for purpose' of datasets, and to ensure that the existence of data producers is widely promoted, all data contain summary documentation or 'metadata'.

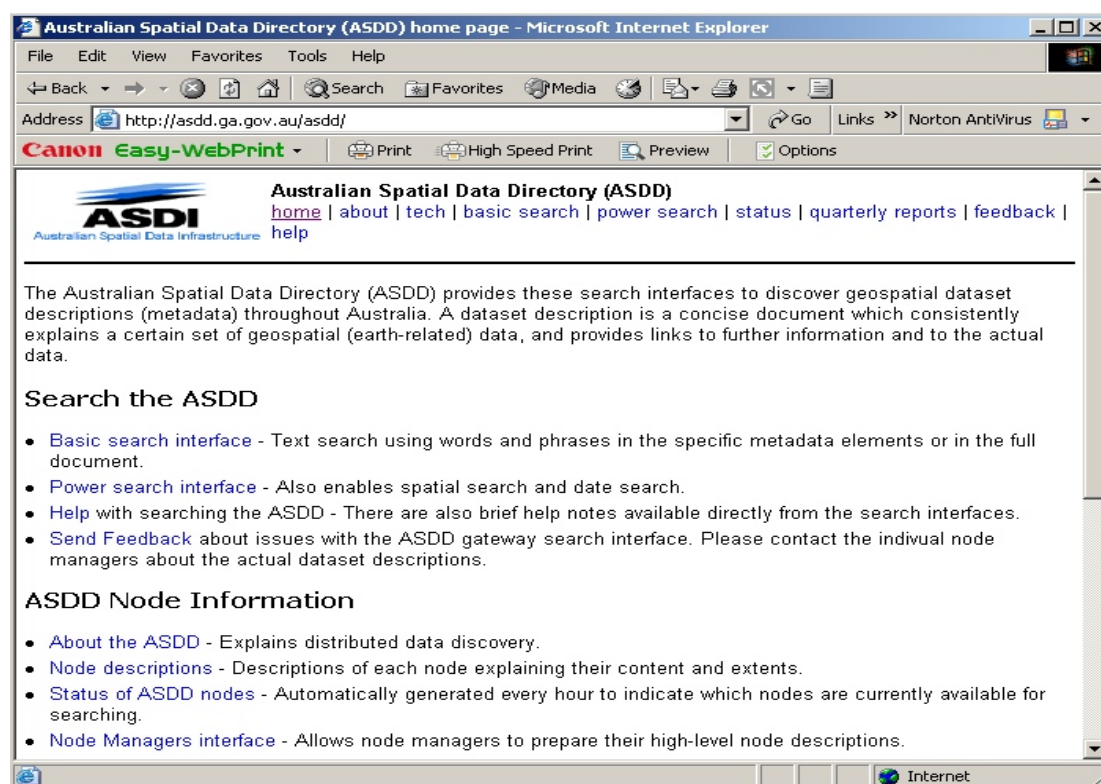
The following information is provided as part of the metadata documentation for each dataset in the ASDD:

- a description of the data
- the location of the data
- details of quality including accuracy and currency
- how the data were developed and any modifications—lineage
- who to contact to obtain access to the data
- conditions of access.

The gateway to the ASDD is maintained by Geoscience Australia on behalf of ANZLIC.

Figure 5–2 Homepage for the Australian Spatial Data Directory

<http://asdd.ga.gov.au/asdd/>



Additional information about the ASDD, metadata management and standards and protocols is available on the ASDD website at: <http://asdd.ga.gov.au/asdd/tech/#metadata>.

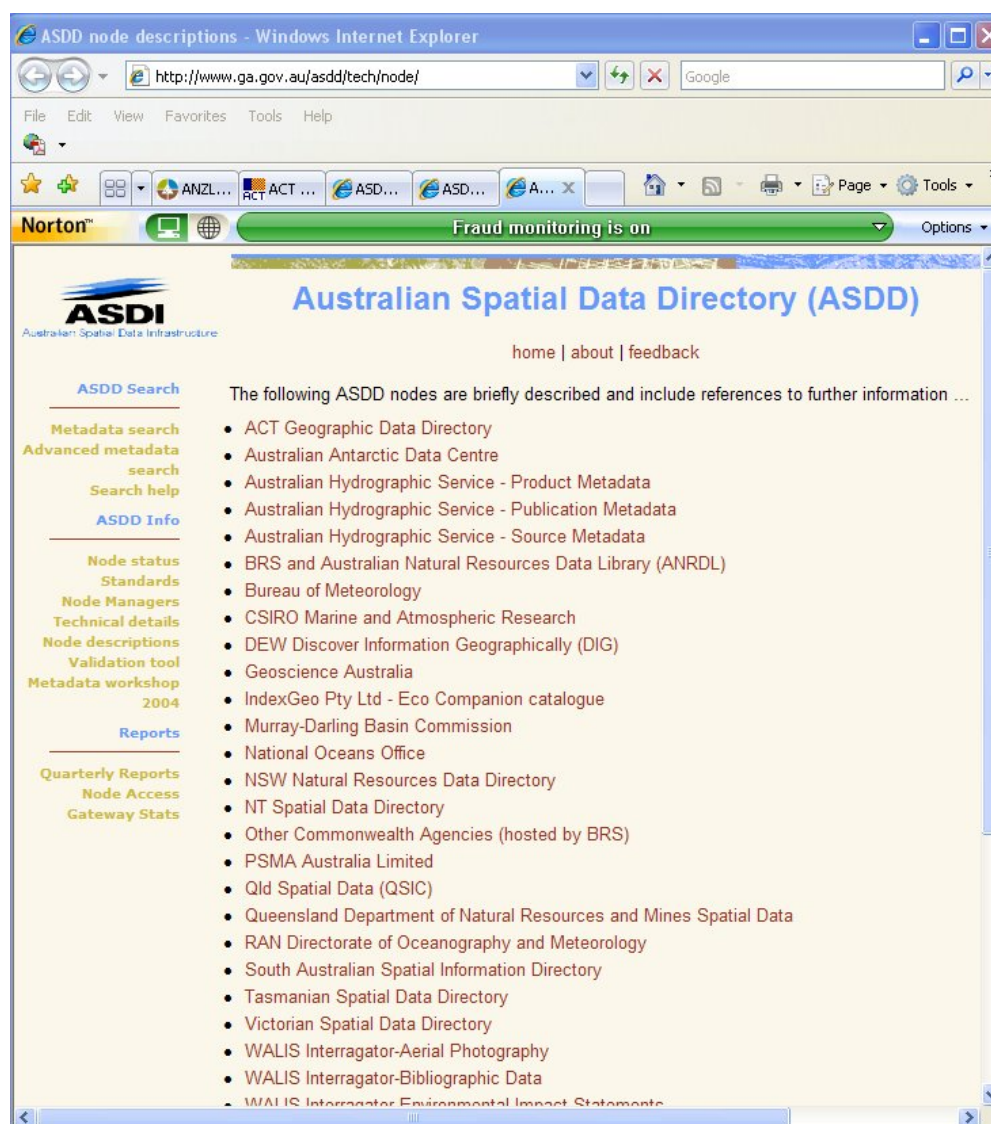


In addition to the ASDD website, further information is also available on the ANZLIC website at: http://www.anzlic.org.au/infrastructure_ASDD.html#connect.

Responsibility for the maintenance of the individual nodes lies with the relevant government and commercial organisations. Anyone can establish a node on the ASDD, but agencies with small holdings are encouraged to use the hosting services of one of the existing nodes.

There are now very good coordination mechanisms between state/territory spatial data systems throughout the Australian Spatial Data Directory, as outlined in Section 5.4.7. The current list is shown below.

Figure 5–3 ASDD node descriptions: <http://asdd.ga.gov.au/asdd/tech/node/>



5.4.2 Australian Natural Resources Atlas

Governments and the Australian public are able to access a comprehensive range of data and information about Australia's natural resources through the web-based 'Australian Natural Resources Atlas' (ANRA) or 'the Atlas'.



The Atlas provides an interface to the data and information prepared by the Audit and its partners, and serves the following functions:

- providing ready access to data and information about the status and trends in Australia's natural resources
- linking and integrating data and information by geography and topics—users of the Atlas can navigate through the Audit's data and information by selecting a topic (e.g. surface water quantity) and geography (e.g. river basin)
- providing a dynamic query and mapping facility for the preparation of user-constructed reports and map-based products
- linking to data and information services to ensure that users have easy access to the most up-to-date data and information.

An overview of Australia's natural resources information is presented in the Audit's report 'Australian Natural Resources Information 2002', and a copy is available on the Atlas website: <http://www.anra.gov.au/topics/publications/national/index.html>.

This report provides useful information on '**Finding Data for use in Natural Resource Assessments**', '**Community Access to Information**', and the development of a '**Consistent Australia-wide database for Natural Resources Management**'.

Note: A flow diagram for accessing data within a distributed network of natural resource information systems taken from the above report is shown at Figure 5–4.

Figure 5-4 A distributed network of natural resources information systems

(Source: Australian Natural Resources Information 2002):
http://audit.ea.gov.au/anra/data/docs/national/Data_Contents.html

A distributed network of natural resource information systems.

The red arrows indicate the many ways of getting access to information products available from the Audit.

The black arrows indicate the linkages within the Australian Natural Resources Atlas and Data Library and from these services to other natural resources information available over the Internet.

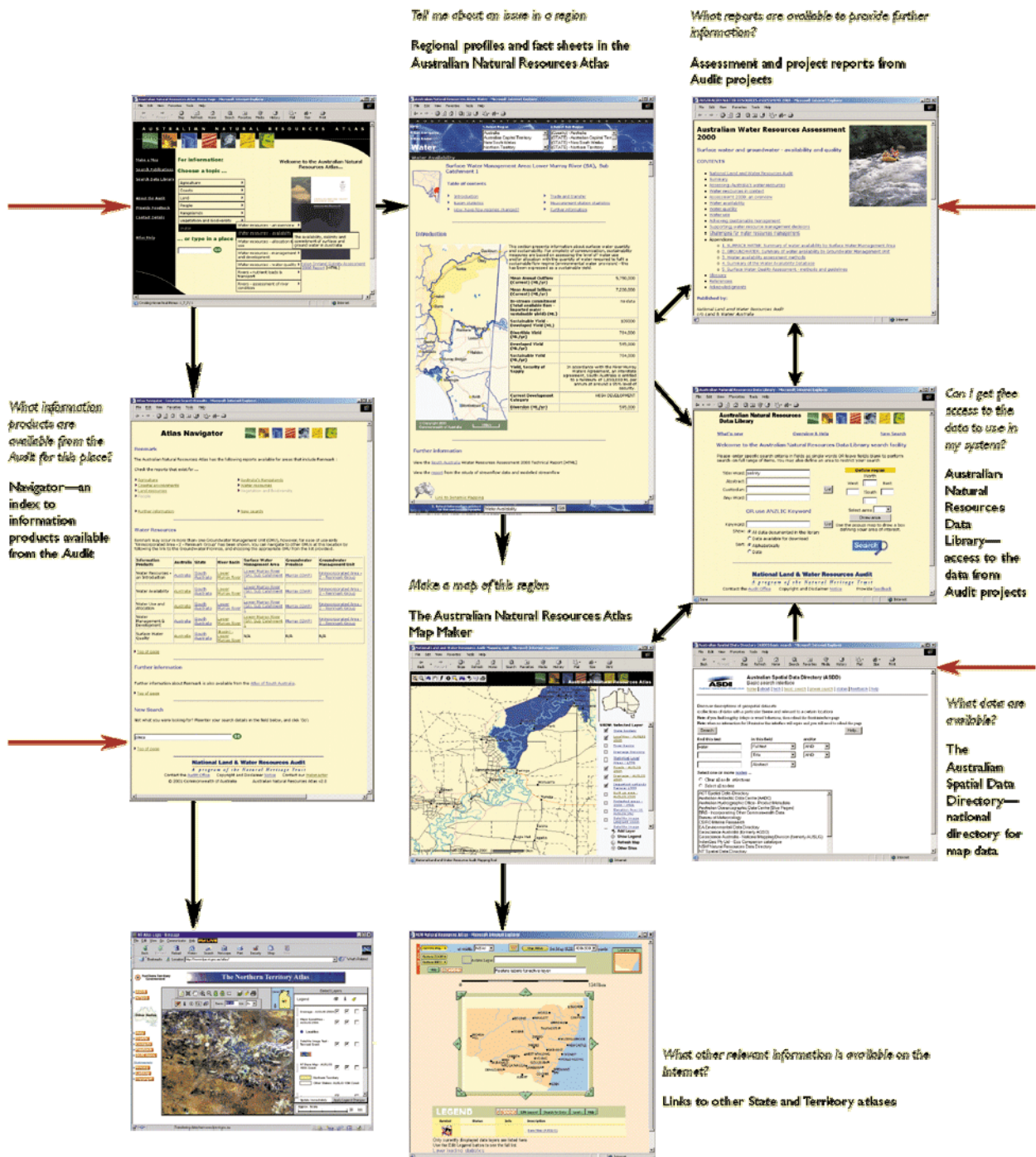


Figure 5–5 Homepage for the Australian Natural Resources Atlas

<http://www.anra.gov.au/index.html>



5.4.3 Australian Natural Resources Data Library

The Australian Natural Resources Data Library, (ANRDL) or 'the Data Library', provides a mechanism for searching and downloading digital data products for free.

The Data Library (a node of the ASDD), involves a broad cross-section of government and private sector groups interested and working in NRM issues. **The Data Library is currently being enhanced to support the full range of data and information products, viz spatial datasets (in GIS format), documents, reports, posters, photos, video material, etc.**



The philosophy underpinning the creation of the Data Library is that datasets, developed by projects carried out under the various themes of the Audit, accrue far greater value if they can be readily accessible to a very wide range of users.

The Data Library can be accessed and used by managers, community groups, students and academics to help in their planning, management and research activities. Additional enhancements, such as simple viewing tools to assist in determining whether a dataset is appropriate for users' needs, are also currently being developed for inclusion.

Figure 5–6 Homepage for the Australian Natural Resources Data Library
<http://adl.brs.gov.au>

Australian Natural Resources Data Library Home Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links >> Go

Address http://adl.brs.gov.au/anrdl/php/basic_search.php

AUSTRALIAN NATURAL RESOURCES DATA LIBRARY

Australian Government

ANRDL - Simple Query
Somewhere to look for data and information about that data

Title Search:
Find records with the exact phrase anywhere within the title

Catalogue Search

☐ Search catalogues

☐ Publicly available DAFF data or information product

☐ Other Information product managed by BRS

☐ Communication product (Reports, Posters, Postcards etc)

Text Search

Search for exact phrase/word anywhere within the text:

ANZLIC Keyword Search

Search for word in keywords: Optional search words

Search word qualifiers: Optional qualifier words

Every effort has been made to ensure this site works appropriately. If you do discover deficiencies we would appreciate your comments.
email: dataman@brs.gov.au

Data custodians are encouraged to make data from Audit assessments available online free of charge.



The Data Library includes large amounts of natural resources data and information collected through Audit projects. Integrated with this documentation are data distribution services and management tools. Much of the data in the library are an extension of that portrayed in the Atlas, often providing additional detailed technical information. Interfaces provide functions to securely download, manage and distribute data.



Spatial data in the Data Library can be used in GIS and spatial modelling tools.

Public Access to Data

The Data Library provides free and direct access to data from Audit projects. This allows users to:

- find Audit data and information products
- find out detailed technical information about Audit data and information products
- download Audit data for use in their own systems where permitted by owners/custodians of the data.

The internet provides direct access to data and information and the marginal cost of transfer is effectively zero, however, there are limitations for groups without access to a broadband connection.

5.4.4 Australia's Resources Online

The Australia's Resources Online (ARO) is a dynamic application enabling generation of a custom report on the condition and trend of the land, water and biological resources in Australia against the Natural Resource Management Monitoring and Evaluation Framework indicators. Reports can be generated for national, state or NRM regional level.

Refer: <http://www.anra.gov.au/aro/>

The intent of ARO is to provide up-to-date information to accompany the comprehensive theme assessment reports which are still available through the Atlas via the Natural Resource Topics.

5.4.5 Australian Agriculture and Natural Resources Online

The Australian Agriculture and Natural Resources Online (AANRO) is an integrated knowledge discovery tool containing agriculture and natural resources data and information including research, publications and web resources.

Refer: <http://www.aanro.net>

5.4.6 Discover Information Geographically

The Discover Information Geographically (DIG) is a tool which provides a mechanism for discovering data within the Australian Government Department of the Environment and Water

Resources (DEW). Current entries cover data and publications, but are to be extended to incorporate map services and printed maps. All DIG entries are related to a geographical location, and most of the data are available for download and use within a GIS. Data are mostly available at a national (rather than regional) scale, though they do contain many useful holdings such as protected areas, etc.

How to Use DIG

A search is conducted using keywords, categories or by defining a geographical area. A brief overview of each entry matching the criteria is displayed with links to the full entry and a simple map displaying the approximate geographic location of the data. Alternatively, it is possible to use a 'Browse' tab to navigate through all the metadata entries which are organised in topic folders. Note: Some datasets may not be available for download due to access/use constraints, however, relevant contact details are included with every entry. Where datasets are available for download a simple licence agreement is included. Refer:

<http://www.environment.gov.au/metadataexplorer/explorer.jsp>

5.4.7 Environmental Reporting Tool

The Environmental Reporting Tool (ERT) is a system developed by the Environmental Resources Information Network (ERIN) within the Australian Government Department of the Environment and Water Resources (DEW). It provides a mechanism for generating custom reports containing information on threatened species, important wetlands, heritage sites, pollutant emissions and other environmental themes based on user-defined areas or NRM regions, NAP regions, local government areas and postcodes.

Refer <http://www.environment.gov.au/erin/ert/index.html>

5.4.8 State/territory based initiatives

In addition to the services mentioned above, it is possible to access a considerable range of spatial data from nodes and natural resource sites hosted at a state and territory level. Often these data may be at a more detailed scale than those available from a national dataset and are therefore potentially more appropriate for use in analysis at a regional scale.



When searching for data (especially for NRM programs) it is recommended that users contact their state or territory facilitators and coordinators. A listing is maintained on the NRM website: <http://www.nrm.gov.au/do/facilitator.html>

Additional state/territory contacts (for spatial digital data) are available on the websites below. These contacts should also be able to assist in providing support in the process of assessing 'fitness for purpose' and location of 'point of truth' or 'authoritative data sources'.

Information on State/territory ASDD and Atlas sites

Queensland: <http://www.qsiis.qld.gov.au> and <http://www.information.qld.gov.au/>

Western Australia: <http://www.walis.wa.gov.au/> and <http://www.atlas.wa.gov.au/>

New South Wales: <http://canri.nsw.gov.au/nrdd/> and
<http://www.nratlas.nsw.gov.au/wmc/savedapps/nratlas>

Tasmania: <http://www.thelist.tas.gov.au/>

ACT: <http://asdd.ga.gov.au/asdd/tech/node/act-1.html> and
<http://www.gim.act.gov.au/actLocate/index.dwt>

Victoria: <http://www.land.vic.gov.au> and
<http://www.dpi.vic.gov.au/dpi/vro/vrosite.nsf/pages/vrohome>

Northern Territory: <http://www.ntlis.nt.gov.au/> and
http://www.ntlis.nt.gov.au/imfPublic/imf.jsp?site=nt_atlas

South Australia: <http://www.asdd.sa.gov.au/> and <http://www.atlas.sa.gov.au/>

5.5 Additional support

A number of additional websites are available which contain spatial data and information. By way of example the following is provided to assist regional groups.

The Australian Government NRM Site <http://www.nrm.gov.au/data/index.html> has **links to numerous atlases, sources of spatial data and reporting tools.**

The Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA), Environmental Resources Information Network (ERIN) site <http://www.ea.gov.au/erin/> contains an **information services section for decision making** with numerous links to various information service sites on the internet. For example:

- the Land Cover Change and Condition Database
- the Australian Heritage Database
- the Australian Wetlands Database
- the Collaborative Australian Protected Areas Database

Refer: <http://www.environment.gov.au/erin/index.html>



Geoscience Australia's: **GIS Data and Imagery**—free downloads:
<http://www.ga.gov.au/products/>

Free satellite imagery (from 1990 and 2000) is also available for the whole of Australia from the NASA Global Landcover Project at:
https://zulu.ssc.nasa.gov/mrsid/docs/GeoCover_circa_2000_Product_Description.pdf

Image downloads available from <https://zulu.ssc.nasa.gov/mrsid/mrsid.pl> Note: You may receive a certificate of trust warning to enter this site.



Datasets are often updated. It is recommended that users always check to ensure 'point of truth' or 'authoritative data sources' are being used.