

Foreword

The Natural Resources Information Management Toolkit (the Toolkit) has been prepared by the National Land & Water Resources Audit (the Audit) and ANZLIC – the Spatial Information Council (ANZLIC), to assist regional natural resources management groups to discover, access, visualise and manage their data and information. The Toolkit has been developed in close cooperation with all jurisdictions and has been targeted at regional groups to build capacity and facilitate the two-way flow of data and information. It can be used as a textbook document, teaching aid or as a series of stand-alone modules.

The Toolkit has three components:

1. Executive Summary

Information on high-level issues for managers to consider and build into business processes.

2. Concise Guide for Technical Managers

A short version guide containing essential checklists.

3. Technical Modules

The how-to guide, comprising eleven modules, for natural resources management (NRM) regional groups involved with natural resources data and information management. Each module is a stand-alone document and ordered hierarchically, from general principles to detailed practices.

It is acknowledged that when dealing with capacity building and the issue of data and information management at a regional level, there can be no one-size-fits-all product. It is also important to recognise that in many cases each state and territory may have its own initiatives including governance guidelines and protocols related to data and information management. In this respect, the Toolkit has been designed to complement activities being carried out by respective state and territory jurisdictions.

Following the strong support received for Version 1.0 of the Toolkit, the Natural Resources Information Management Toolkit Version 2.0 project was undertaken to build on the lessons learnt from the earlier version, and incorporate new material identified during a user review of Toolkit Version 1.0 and specific focus sessions with selected user groups.

Toolkit users are encouraged to communicate with their respective state and territory coordination contacts to ensure they obtain the correct information for their jurisdiction—this includes point-of-truth and authoritative datasets, and any additional detailed information on methodologies for data

collection, such as classification schemes and data content standards, in addition to material on data access and licensing agreements.

A handwritten signature in black ink, reading "Geoff Gorrie". The script is fluid and cursive, with the first name and last name clearly distinguishable.

Geoff Gorrie

Chair

National Land & Water Resources Audit
Advisory Council

A handwritten signature in black ink, reading "Warwick Watkins". The script is fluid and cursive, with the first name and last name clearly distinguishable.

Warwick Watkins

Chair

ANZLIC – the Spatial Information Council

Background

The Natural Resources Information Management Toolkit Version 2.0 project was implemented under the joint sponsorship of the Audit and ANZLIC, as part of a strategy aimed at building capacity at regional level to implement natural resources information management solutions.

Development was carried out in close cooperation with state and territory jurisdictions and several regional groups. In doing so, an attempt has been made to complement existing initiatives and look for common approaches to achieve best practice in spatial data and information management.

The Toolkit will assist project managers, staff, and participating parties at national and state/territory levels, and more specifically at regional levels, to obtain full value from the investment in collection, management and use of data to fulfil project requirements.

The aim of the Toolkit is to compile a resource that:

- assists in building capacity at regional and local levels to manage, utilise and share natural resources data and information more effectively
- increases the awareness, understanding and skills of individuals responsible for data and information management
- facilitates the development and adoption of internationally accepted standards and guidelines for information management, and thereby promotes best practices in information management
- gives participants in NRM projects access to practical information management tools to reduce set up costs and duplication of effort
- supports the development of community networks through open and efficient sharing of information resources and knowledge, and assists the establishment of information loops between regional, state/territory and national levels
- ensures the sustainable management of data used or created in projects
- allows others to fully and appropriately exploit the information generated from NRM projects.

Throughout the development of the Toolkit, effort has been made to provide general material that will assist NRM regional groups. It is acknowledged that each state and territory has its own initiatives related to data and information management, including governance guidelines and protocols. It is recommended that users of this Toolkit establish contact with their respective state/territory jurisdiction representatives to ensure that they obtain the latest information related to data standards, collection procedures and other information regarding protocols, including access and licensing arrangements.

Following feedback from lessons learnt during the collation of Toolkit Version 1.0, plus results of a user survey and specific focus sessions, Version 2.0 of the Toolkit has recently been completed. Changes include:

- additional case study material
- a specific module on partnerships and working together
- material on project justification and risk management —included within the project management module
- development of a 'Local Tab' section to guide users to contacts and information at jurisdictional level
- inclusion of a capacity building road map to enable NRM regional bodies to determine where they fit on a capability spectrum. (To this end, signposts have been incorporated into each module to provide a guide to raising capacity in relation to various components in the development of an integrated information management solution and spatial data infrastructure).

In addition, the Toolkit has been re-formatted so that material can be downloaded as a Word or PDF document, thereby enabling users to print hard copies and copy material for use in other documents. Finally, given the importance of promoting cooperation and partnerships to enhance capacity and improve efficiencies, an additional module has been included to address the specific issues of *partnerships and working together*.

Please report any issues or feedback relating to the Toolkit to the National Land & Water Resources Audit, Data & Information Coordinator (email: info@nlwra.gov.au) or the ANZLIC National Project Manager (email: info@anzlic.org.au).

Toolkit Version 2.0 is available online from the Audit web site at www.nlwra.gov.au/toolkit.

Capacity building

A major goal of the Audit is to strengthen the capacity of regional NRM bodies to access and manage the data they need to address their natural resources issues.

The intention is to build networks of people and technology to share information and improve its usefulness and accessibility.

Release of the Toolkit Version 2.0 is well timed to help support regional NRM bodies faced with the challenge of how best to efficiently and effectively manage information assets as part of their core business.

Executive summary

One of the prerequisites for NRM involves the establishment and maintenance of a database of relevant information in digital format. Access to reliable and up-to-date information reduces the uncertainty in planning and management by helping identify, model 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 and planning processes are closely linked to the quality and completeness of the information and the manner in which it is made available; for which issues relating to 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 into a framework that ensures tools and procedures are in place to maintain and transform data into useful information products that support core business operations and the decision-making process.

Under current arrangements, funding for NRM projects is increasingly being channelled from government agencies to NRM regional groups (including catchment management authorities and resource information centres) via specific investment strategies. Activities carried out by these groups often involve gaining access to data, developing new data, and processing existing data. It is important these data become part of the national resource base and, following completion of the initial project, are made available to the broader community. Managers should concentrate on the need to achieve the goal of developing an integrated information management solution in which the acquisition, processing and dissemination of data and information is carried out within a collaborative framework. This can be achieved through the establishment of a spatial data infrastructure, involving the creation of guidelines, standards and procedures within a framework that is supported by a scientifically based and technically competent distributed group of data custodians and related agencies.

The Australian, state and territory governments are all currently involved in the development of the Australian Spatial Data Infrastructure (ASDI).

Whenever possible, managers of regional projects should facilitate the development and implementation of data policies at a local level which are based on best practice principles, such as those outlined in the **ANZLIC Policy Statement on Spatial Data Management**. For example:

- creation of an easily accessible, distributed data network to manage and disseminate data collected as part of project and other activities in support of corporate objectives
- development of core datasets as standard or base-line products, and a range of other products and services as needed to support economic, ecological and social development
- provision of best practice quality assurance mechanisms and procedures to create validated, well-documented datasets to meet priority information needs

- establishment of partnerships with industry, government and others (e.g. educational institutions) to develop skills and maximise use
- where possible avoidance of duplication in data capture and expenditure on system development
- archiving of data to ensure their availability for multiple use and safeguard for future generations.

Achievement of the above principles requires adoption of best practice in data and information management for data collectors, owners, custodians and groups or agencies that generate information.

Roles, responsibilities and multi-level interactions

Further to the above, it is important to appreciate the complexity and loops or interactions that are involved in the development of an integrated information management solution, and the extent of multi-level relationships.

Within the current paradigm for NRM programs, activities are being undertaken at a number of levels, namely national, state/territory and regional (and in many cases sub-regional). Different decisions and policies are taken at each level, where different issues of management and planning are being addressed.

At each level there is a requirement for the following:

- strategy
- policy development
- action planning or project activities that tackle priorities
- operational planning to undertake the work
- monitoring and evaluation
- reporting and review.

Based on results of recent experiences it has been found that the greater the interaction between the various levels, the better the result. This involves the development of procedures that support the flow of data and information in both directions.



As a general principle, the level of detail increases with progress from the national to the local level, with a corresponding increase in user engagement at the local level.

National level responsibilities

These are concerned with national coordination, standards, development of nationally consistent datasets, funding initiatives and allocation of resources. In many cases national actions relate to the development of national priorities. National policy decisions and fiscal measures affect many people and wide areas.

State/territory level responsibilities

State/territory level responsibilities include coordination, fostering and development of partnerships, data production and maintenance and determination of priorities in consultation with regions.

The state/territory is the next level of policy development below national. When policies are initiated nationally, priorities have to be translated into programs and projects at the state/territory level.

In many cases activities at a state or territory level are carried out to fulfil requirements of a regulatory act. Often this means that states and territories have overarching policies, guidelines and protocols that determine the methodologies and standards used in data collection and management.

Regional level responsibilities

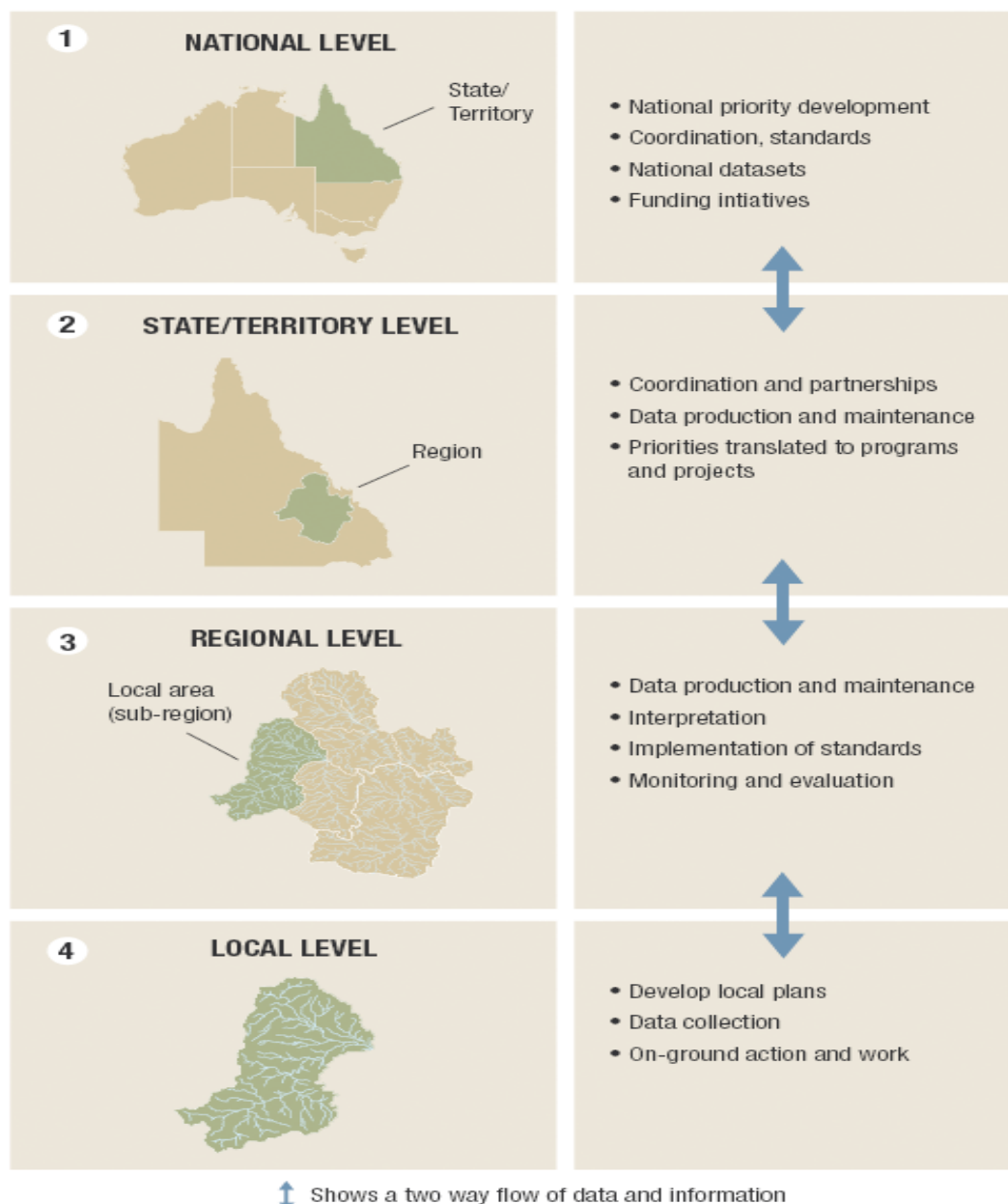
These could include some source data production and maintenance, interpretation and implementation of standards and policies, and delivery of local plans and monitoring to the community.

Prior to commencing any data collection activities, regional groups are encouraged to contact their state/territory coordinators to obtain information related to standards and recommended methodologies.

An example of the various levels of interaction, roles and responsibilities is illustrated at Figure A.

Figure A Examples of roles, responsibilities and multi-level interactions for natural resources management.

There's nothing we need more right now than **teamwork among national, State/Territory and local governments and regional groups**. It doesn't come naturally.



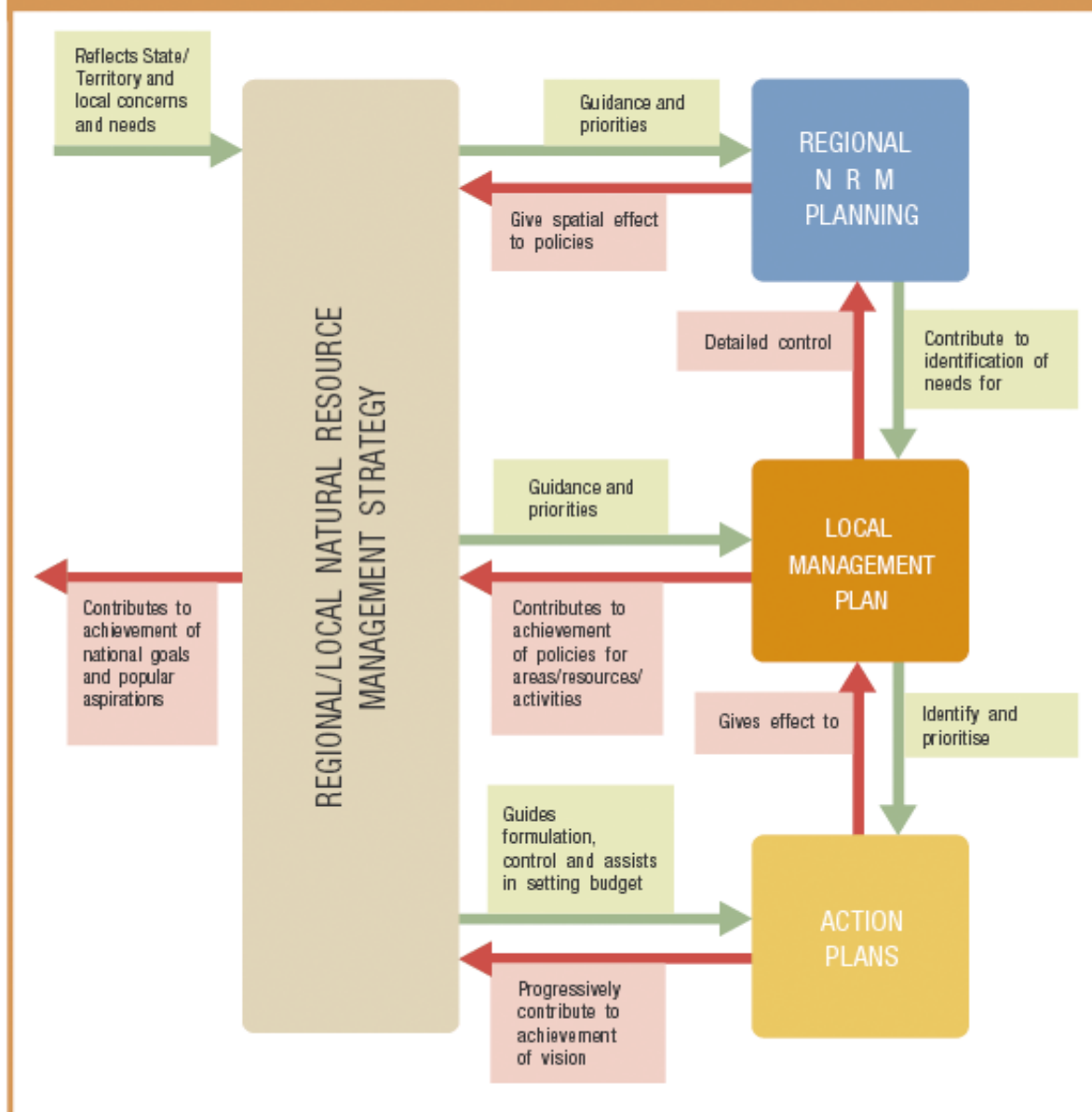
Practical results

The major results obtained from adoption of the current paradigm of funding for NRM project activities are:

- establishment of agreed directions and expected outcomes for NRM projects
- establishment of a clear basis for organisation, control, communication of planning and implementation
- development of a consistent, coherent and integrated basis for decision making in support of other planning and management activities and business interests.

An example of the practical benefits of such an approach is illustrated at Figure B.

Figure B – The practical effects of a regional natural resources strategy.



Summary

The successful development of an integrated information management solution requires careful planning and dedicated resources. This involves the development and acceptance of standards through the use of common data, systems and a participatory information management structure, i.e. networks of people sharing information, resources and knowledge. This is also the basis of the Australian Spatial Data Infrastructure development.

Best practice elements

Leadership

Leadership is required to ensure that activities in the development of an integrated information management solution remain coordinated and focused. When involved in collaboration with other agencies the designation of a lead agency among the partners, with dedicated resources to be able to provide coordinating mechanisms, is a key ingredient to facilitation of successful implementation. In other words, someone has to bear the responsibility for coordination, outputs and thus outcomes.

Steering committee/board of directors

Adoption of an integrated information management solution and establishment of a data infrastructure often involves the creation of organisational responses such as a data utility and policy/standards group. To be effective some formal arrangement is required to oversee implementation and provide vision, direction and approval of resources. Typical roles for such a committee involve:

- partnership development and policy framework
- communication/participation
- data standards
- system requirement priorities
- data collection and maintenance priorities
- training.

Training and expertise

The development of an integrated information management solution and data infrastructure needs to be accompanied by a training strategy to build and sustain capacity. One of the key lessons learnt from past initiatives is that not enough attention has been given to capacity building and the development of corporate knowledge bases that enable data and information to be readily available to all partners and stakeholders. The following key issues should be considered:

- identification of skills and training needs
- recognition that specific training in spatial information systems and other software packages (e.g. databases) may be required along with training in application development, system and network administration and program management.

Focal point

A key component to the successful implementation of an integrated information management solution involves having a focal point for the development and implementation of a number of component activities. The use of local resource information centres is one such method of establishing a focal point that has proven successful in some areas. Under this scenario the centre often facilitates the following tasks:

- communication (providing and disseminating information among partners)
- technology support, planning and implementation
- support to the management/steering committee
- development of information products and services
- training and capacity building
- independent and important advice to the community.

Information policy

Access to accurate and up-to-date data and information in a timely fashion is critical to the successful management of natural resources. A number of key information policy issues need addressing, and include:

- cost
- format
- system design
- copyright
- privacy
- liability.

Partnerships and working together

The development of an integrated information management solution and data infrastructure presents many opportunities for partnerships. Information access enables groups and partners to do things in new ways, provide new services and information products, and reduce the reliance on traditional approaches. A single agency is unlikely to have all the resources, skills and knowledge required to undertake the development of all aspects involved in developing an integrated management solution and data infrastructure. Having organisations and partners working together from the outset is vital to ensure activities occur in a way that supports all the partners in their use of data.

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