



# Future directions for mapping in Geoscience Australia

## *Demand for more intelligent and specific data*

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Geoscience Australia's former National Mapping Information Group has undertaken a significant strategic review of its operations over the last year. The review covered many areas of operations with the focus on:

- maximising the group's potential to serve its stakeholders and clients
- improving workflows and processes
- creating more opportunities for staff
- improving flexibility and responsiveness

The Group has emerged from the review with a clear focus on its role in Australia's contemporary spatial environment. From 1 July 2010 the Group implemented a transition to a new structure, with an immediate restructure of work units and a fresh new name – National Geographic Information Group (NGIG).

The new name better represents the changing role that the group has as a steward of national authoritative geographic information. It positions NGIG to assist the Australian Government to get the most value and benefit from geographic data, including building upon the 'capture once, use many' approach, and providing improved access to up-to-date geographic databases for government and the community.

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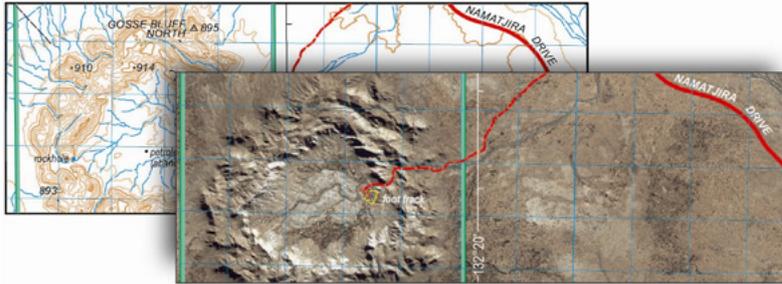
### **Benefits for stakeholders and users of spatial information**

Geoscience Australia's role as the authoritative custodian of topographic data continues. The organisation's traditional role as a mapping agency is strengthened by focussing on the needs of the community through assisting government agency programs (that benefit by using spatial data) to deliver their outcomes.

Non-government producers of spatial information have not been neglected either. They benefit from a focus on government-driven needs which is shown by the reality that previously, mapping might not be undertaken in many remote areas because of limited budgets and such a large area to map—onshore Australia has an area of around 7.7 million square kilometres.

A recent example is the release by Geoscience Australia of maps of Australia's iconic Red Centre. These maps would not have been published had it not been for the policy needs of government. They were part of the National Landscapes initiative—a partnership between Tourism Australia and Parks Australia—which identifies and promotes distinctive and inspirational destinations to domestic and international visitors. The area is experiencing increasing visitor numbers and the new maps will enhance visitor safety in this remote and rugged area.

Geoscience Australia produced four multi-purpose maps with more reliable and relevant information for the experience seeker visiting the Red Centre (figure 1). They were compiled in consultation with Australian Government and Northern



**Figure 1.** A section of a National Landscapes map (West MacDonnell National Park) which includes a topographic map and satellite image of the area. While these maps are useful for visitors to the area they are also invaluable for emergency managers.

Territory government agencies including Parks Australia, Department of Resources, Energy and Tourism, and the Northern Territory Parks & Wildlife Service.

These maps also provide police, fire fighters, medical and other emergency services as well as natural resource managers, with relevant and up-to-date geographical information for these areas. This is particularly important for the coordination of search and rescue missions or dealing with bushfires and other natural disasters in such a remote area.

The data compiled from the National Landscapes and other mapping projects has been incorporated into the national topographic database and eventually becomes updated GEODATA. This data is commonly acquired by industry as base data for many of the tourist and other maps that this sector produces.

## A collaborative approach

However, Geoscience Australia's role goes beyond data custodians and map makers. It is also responsible for managing or chairing a number of national spatial information bodies and is an advocate for the introduction of new technologies to allow the sharing and broad dissemination of spatial information.

The Intergovernmental Committee on Surveying & Mapping (ICSM) secretariat is part of the National Geographic Information Group. Under the umbrella of ICSM, the Group is responsible for chairing a relatively unknown but important government consortium—the Permanent Committee for Topographic Information (PCTI). Its members are officials from Australian Government, state and territory spatial agencies as well as the Department of Defence. This committee is also responsible for the National Topographic Information Co-ordination Initiative (NTICI).

The NTICI is a successful framework which ensures a collegiate approach to the topographic mapping of Australia. The Initiative's role is to take a whole-of-government approach to the collection,

integration, dissemination and maintenance of topographic and related information to meet the needs of government and the public.

This initiative has ensured significant coverage of new and revised topographic data. In some cases new datasets have been created for areas previously devoid of GIS data while in other instances, information up to 30 years old has been significantly updated. Geoscience Australia has funded many of these data capture and revision programs under NTICI, but it is a partnership—neither the state and territory jurisdictions nor Geoscience Australia would have had the ability to capture such data themes alone.

Applying this collaborative approach to future topographic mapping would incorporate a distributed data sharing arrangement. Such an arrangement would have multiple benefits including: leveraging smart enabling technologies, improving turnaround times, harmonised specifications, a continuing focus on maintenance of priority themes and areas, and integration of NTICI data into jurisdictional and Geoscience Australia databases as 'single point of truth'. In contrast a 'stovepipe' approach to data management within agencies denies users and themselves the opportunity to benefit from all the available data.

## New horizons

NGIG's mission to 'provide authoritative geographic information services and products to inform evidence-based decision making, government policy, industry development needs and community wellbeing' might seem a broad mandate. However the agency is clear about the boundaries of its role and influence. Geoscience Australia does not undertake cadastral or state-type mapping nor does it compete with private enterprise. Geoscience Australia's focus is to fill the national 'public good' geographic information space. It aims to stimulate and promote the value and use of spatial data and provide support for the growth of private organisations working in the spatial information arena.

Geoscience Australia also has a role as advocate for the integration of spatial information into government programs, through collaboration with government agencies, providing technical expertise and business acumen to underpin policy analysis, service delivery and informed decision making.

Technology has totally changed people's thinking and is now a capability that is not only relied on, but is expected to provide answers to problems in the future. There is wide recognition of the need to produce data and cartographic products much more easily from a single database. In addition, geographic information is now more mobile, with data and user-generated content at the fingertips of users and being harnessed as social networks are built in a growing consumer-led environment. Although simple, these services are extremely effective in delivering content to the broader community.

## Spatial data supporting government

Australian governments are increasingly demanding more efficient and effective service delivery, policy monitoring and evaluation, all underpinned by a strong evidence base to enable better informed decisions. The spatial environment is becoming increasingly more valuable and relevant to government agencies and the community. However, many government agencies do not effectively use spatial data, technologies and services to support their business or policy evidence base. Geoscience Australia is recognised as the Australian Government's 'spatial agency', and the realisation of the benefits of spatial technologies is growing, bringing with it greater expectation that we will be able to readily support and deliver on such technologies.

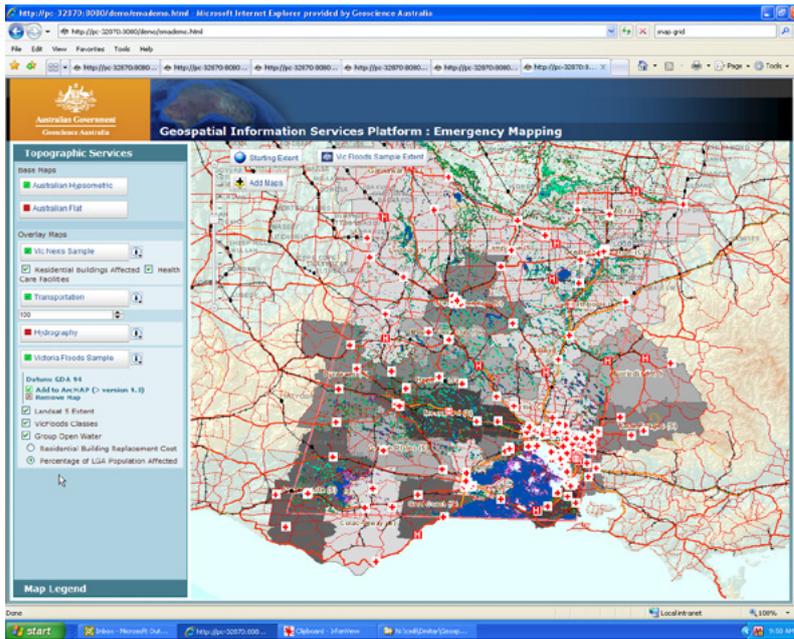
The last 12 to 18 months in particular have seen an increasing trend in requests to Geoscience Australia from a diverse portfolio of government departments for the development of spatial product and service delivery (figure 2). These requests cover the areas of water resources, climate change, social inclusion, energy, defence, health, transport, information management, and emissions trading.

The majority of these spatial products are underpinned by fundamental spatial information, including topography-related themes. However, this is changing as we are now seeing a requirement for this fundamental data to be more intelligent and specific (figure 2). Thus for water-related data the national water networks now need to be represented as connected hydrological networks that flow, with every segment of stream assigned to a catchment hierarchy (figure 3). These same requirements are producing data that is more detailed, authoritative, and temporal. There are increasing requirements for 'scalable' data, from the national to the local level.

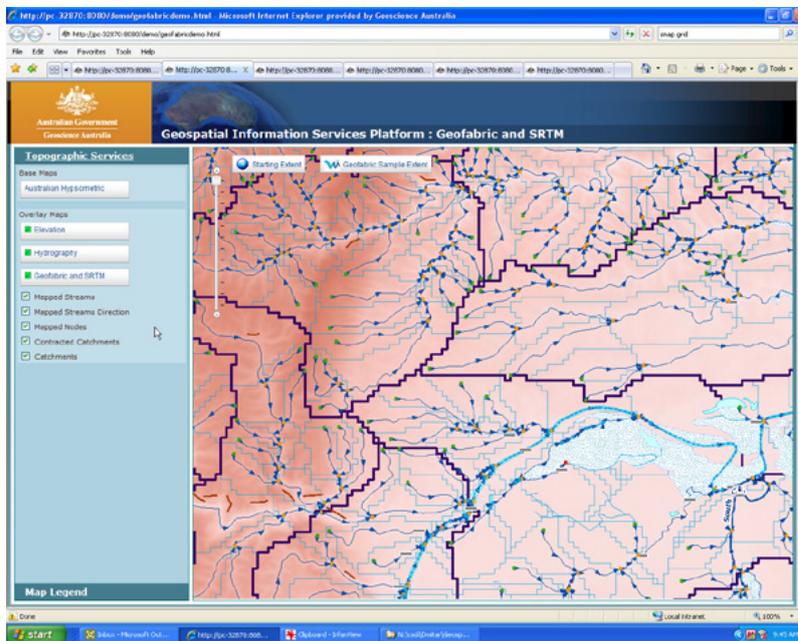
## Conclusion

The major need is for mechanisms to acquire and grow data availability and visibility, and to 'capture once, use many'. We must utilise and leverage the existing strengths and recognise the advantages of data custodianship, especially in the state jurisdictions where we have national spatially embedded data.

The NTICI should continue to be the most effective mechanism for maintaining and improving the existing investment in Australia's topographic mapping. There is now an increasing reliance by all government mapping agencies on data produced through this collaboration. With the expected continuation of this



**Figure 2.** An example of emergency mapping showing flooding in central Victoria. Fundamental spatial data is overlain with maps showing the extent of flooded areas, location of health care facilities and information on affected residential dwellings (from Geoscience Australia's NEXIS database) by local government area.



**Figure 3.** Geoscience Australia is developing spatial products for an increasingly diverse range of government agencies. This map depicts the water networks as connected hydrological networks, includes the direction of flow and assigns each segment of stream to a catchment hierarchy.

successful initiative into the future, it is envisaged that over time, data maintenance across all scales rather than base data capture, will become the focus for mapping authorities in all jurisdictions. However, this cooperation and coordination needs to be efficient and effective, rather than be seen as a data maintenance burden.

There is an additional benefit that the greater the level of participation and cooperation, the greater the potential for a coordinated approach to value-adding of the national spatial framework.

The NGIG is optimistic about the role it can play in promoting the value of spatial information. Maintaining a sustainable topographic mapping program in Australia requires a cultural shift from provider of data and products to a geographic information content integrator, provider and enduring custodian.

Three main factors needed to achieve this shift include:

- a program of partnerships through collaboration with other agencies and businesses
- improvements in and leveraging of technology
- changes in the way that governments do business.

**For more information**

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