DECEMBER 2000 NEWSLETTER

DIRECTIONS

MAPPING THE WAY FOR NATION BUILDING

Whether it's planning transportation and communication networks, protecting our shores from illegal entry, providing emergency services during fires and floods, managing our environment and natural resources, exploring for minerals, or determining locations to establish essential services — maps lay the groundwork for nation building.

In the nineteenth century, Australia's explorers and their quest for knowledge about the unknown inland, paved the way for expansion of the early colonial coastal settlements. But much of Australia remained unmapped until relatively recently. The original national topographic map coverage was initiated in the late 1940s by the Department of Post-War Reconstruction, which recognised that surveying and mapping Australia needed to be undertaken as a basis for national development.

That first full coverage was completed in 1968. It was a preliminary mapping phase at 1:250 000 (250K) scale and most of the 540 maps were not contoured. Mapping at 1:100 000 (100K) scale commenced in 1965 and was completed in 1989, though only about half of the resulting 3000 map sheets were actually printed.

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When the Federal Government introduced the Diesel and Alternative Fuels Grants Scheme as part of its tax reform package, it faced a problem. The scheme applied to roads outside metropolitan areas, but how do you define where these start and stop? The Australian Taxation Office used AUSLIG's digital data to create maps such as this one of the Gold Coast, which were distributed to potential claimants. The result was a clear distinction between areas where the scheme did and did not apply — meaning few disputes and better management.
Map courtesy of Australian Taxation Office.

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The digital revolution presented the next challenge for Australia's national mapping agency, AUSLIG. Government agencies and private businesses relying on maps for planning and decision-making needed map information in a form they could use with geographic information system (GIS) software to undertake sophisticated modelling and analysis.

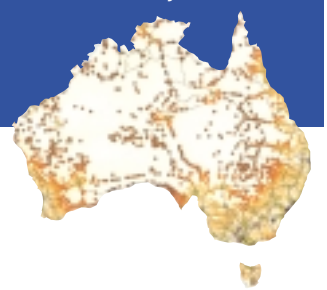
By dedicating its mapping resources to the task, AUSLIG completed the conversion of main features in the 250K scale mapping series to computer-readable format by the end of 1994. For the first time, Australia had national coverage of topographic map information suitable for immediate use with GIS software.

The TOPO-250K data product was an instant success. It became a key dataset in the development of many "smart" uses, often through AUSLIG's value added resellers. Through these partnerships, business, government and academics have been licensed to use TOPO-250K as the basis for creating maps for geological and mineral exploration; market research; vehicle routing and scheduling; land title management; water quality management; an Internet hotel reservation system; coverage of STD and mobile phone areas for telecommunications companies; and atlases and maps for tourism and recreation.

Mapping the nation, however, is an ongoing job. The landscape represented by maps may change significantly over time — forests may be cleared, new roads, fences and communication links may be built, the spread of urbanisation continues. These changes need to be reflected in maps and related data products otherwise the value of the mapping to the nation declines. It's like painting the Harbour Bridge. You start at one end and by the time you get to the other, it's time to start again. Keeping maps up-to-date, however, can sometimes be vital for saving lives as well as property.

AUSLIG is improving the currency of its map information as well as responding to the evolving technological needs of map users. TOPO-250K Series 2 has now been released, providing even more high quality data for mapping and GIS professionals. Approximately one third of the national coverage has been updated and is available in this form, with many new features captured. Within a few years, the average age of maps in the 250K series will be four to five years. Some are being updated more frequently but others, in areas of little change, less so.

How far is the nearest doctor? Using AUSLIG's 1:250K dataset as a base, the Department of Health and Aged Care created this map to show where people live and how far they are from a range of health services. Working with the National Key Centre for Social Applications of Geographical Information Systems at the University of Adelaide, they produced a "remoteness index" and a database of road, locality and service information. *Image courtesy Federal Department of Health and Aged Care and University of Adelaide.*



AUSLIG has recently released another spin-off from the 250K mapping program — RASTER-250K — all maps in the series on two CDs, priced at only $99. It satisfies demand for an Australian map data product suitable for small business, libraries, schools, home users and for use as a background layer in GIS.

For many parts of Australia the level of detail available in 250K maps is insufficient for the needs of many map users. Instead, they require the detail provided at 100K scale. In the 1990s, however, the drive to provide national digital coverage quickly was paramount, so 250K scale mapping took precedence.

AUSLIG commenced the huge task of updating maps in the 100K series two years ago by targeting priority areas in rural and regional Australia. Some 40 updated maps will be available by end of 2000.

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Emergency services workers depend on maps to save lives and property. Printed maps may not have the sophistication of their digital cousins, but they are durable and highly portable. Photograph by Jeff Schultz.

WHAT IS SMALL AND MEDIUM SCALE MAPPING?

Topographic maps are like snapshots of the Earth from space. They use contour lines and symbols to show the lay of the land and man-made features.

As the national mapping agency, AUSLIG specialises in small to medium scale topographic maps and has the only national coverage of the continent.

Small scale maps show the features of the Earth as small on the map. A one to 10 million scale map (written as 1:10 million) shows the whole of Australia, so only major features like State borders and the Great Dividing Range are shown. One centimetre on the map represents 100km (10 million cm) on the ground.

In contrast, a large scale map at the one to 25 thousand (1:25 000) scale zooms in on the Earth and shows the features large. A suburban street directory is a typical example of this scale of map. At an even larger scale, a cadastral map at 1:10 000 scale shows the boundaries of individual plots of land.

Because AUSLIG specialises in medium scale topographic maps at 1:100 000 and 1:250 000 scales, its maps are ideal for uses such as planning transport routes or power lines over long distances or fighting bushfires across a broad front.

In the outback, AUSLIG's maps are often the only ones available because State governments and private industry generally concentrate on producing larger scale maps for populated areas.

"In an emergency, knowing where you are, or being able to find others in a hurry is vital — and for that, the combination of an AUSLIG map and GPS is unbeatable," says an ACT emergency services volunteer.

"A world-class service and lower costs for surveyors in rural Australia," says Warren Entsch, Parliamentary Secretary to the Minister for Industry, Science and Resources, of AUSLIG's Online GPS Processing Service.

A surveyor at work. Precise positioning using geodetic GPS equipment of this type is routine in regional Australia for many surveying purposes. The new online service will reduce costs for surveyors and provide accurate GPS coordinates within minutes.
Photograph: Jeff Schultz, Agena

NEW ONLINE GPS PROCESSING SERVICE **REDUCES COSTS FOR SURVEYORS**

Life for surveyors in Australia just got better according to Parliamentary Secretary to the Minister for Industry, Science and Resources, Warren Entsch, who recently launched an online GPS processing service that will reduce surveying costs in Australia.

This free Commonwealth service will benefit anyone who needs accurate coordinates for a location.

Mr Entsch said the service, available from AUSLIG, automatically computes accurate coordinates to international standard from GPS data files submitted over the Internet.

"It's the only Australian service that does this and the only one in the world providing coordinates on the Geocentric Datum of Australia," he said. "For surveyors, expected to be the main users, the service will represent significant cost reductions, enabling them to get highly accurate relative positions using just one GPS receiver.

"It is capable of delivering results accurate to centimetres, depending upon the observation span and quality of data supplied."

The service is simple to use, available 24 hours a day, seven days a week, to anyone with Internet access and delivers results within minutes by email.

It can provide social benefits to our regional neighbours as well as providing direct benefits to Australia, says Mr Entsch, because the service can provide coordinates for any part of the world.

Developing nations with limited capacity to establish and maintain their own geodetic infrastructure can access AUSLIG's processing service to obtain accurate coordinate data for their geodetic networks.

The GPS Processing Service is easily accessed through the Geodesy page of the AUSLIG web site.

www.auslig.gov.au

A **COMMUNITY** EFFORT

Off the beaten track north of Cairns and at other isolated areas around Australia's vast coastline, Customs Officers are helping protect Australia from illegal entry and traffic of drugs, wildlife, flora and even people. They use AUSLIG maps to help locate areas of interest and, while they're on the spot, they also note any changes to local roads and features on their map.

Now that it uses satellite imagery to revise maps instead of sending surveyors out in the field, AUSLIG relies on a wide variety of people to "ground truth" the accuracy of its maps. And there is no substitute for local knowledge — what looks like a track on a satellite image may turn out to be a powerline in reality.

"Using satellite imagery to update maps reduces the cost of revision dramatically," said AUSLIG General Manager Peter Holland, "but we rely upon cooperation from other government agencies and the community to check our interpretation of the imagery."

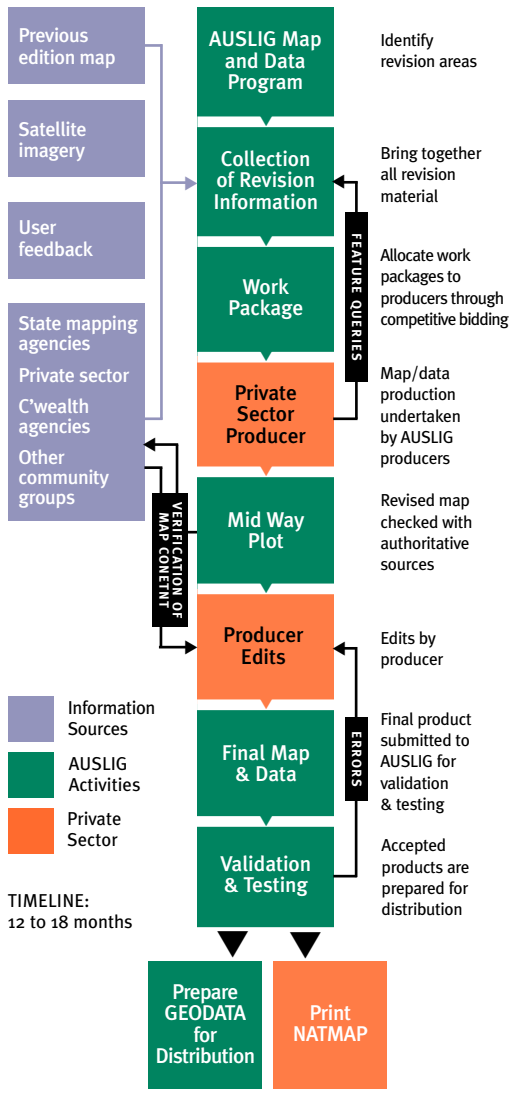
That help comes from all corners of the country, and from all sorts of government agencies, organisations and local communities. AUSLIG has agreements for the exchange of map information with the Department of Defence, the Australian Automobile Association of Australia and State and Territory government agencies.

Then there's the people like the Customs officers who provide information based on their local knowledge. Officers in various government agencies using AUSLIG maps as part of their daily field activities, provide feedback to AUSLIG on any discrepancies or new features.

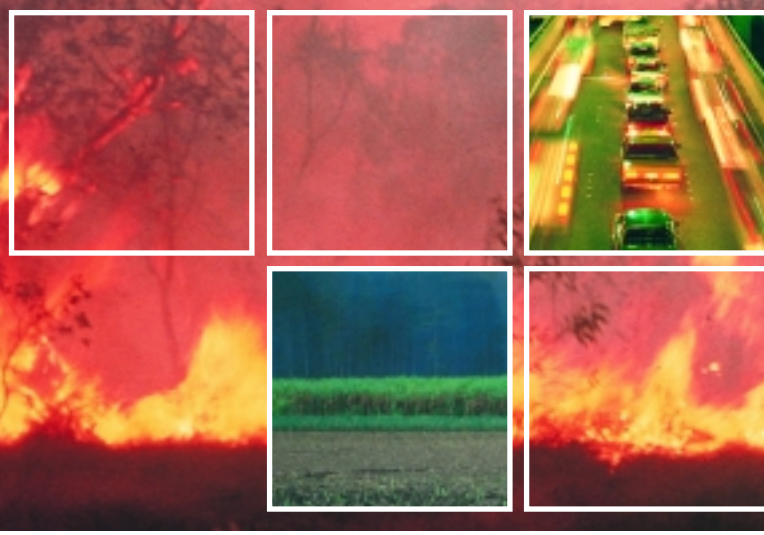
"These people, and the many locals in rural and outback communities, are *our* heroes," said Peter Holland. "Their willingness to take the time and trouble to tell us about changes is invaluable."

Cairns Customs Officers check an AUSLIG map for local accuracy. AUSLIG has an arrangement with a number of government agencies, such as the Australian Customs Service, to help check its maps. Photograph by Yon Ivanovic.

THE AUSLIG MAP AND DATA REVISION PROCESS



GETTING **YOUR DATA** TOGETHER



With the prolific growth in digital mapping technology, it is important that spatial data — the information maps are made of — is consistent. Through the Australian Spatial Data Infrastructure (ASDI), AUSLIG leads the way in applying common standards so that information stored in a variety of databases can be used by others.

The primary objective of the ASDI is to make sure users of spatial data can acquire consistent datasets to meet their requirements, even though the data is held and maintained by different authorities and businesses across Australia.

The ASDI is not a centralised database, but is made up of data held on independent systems linked by common standards and policies. Access to these datasets is supported through the online Australian Spatial Data Directory. See **www.auslig.gov.au** for details.

To help the process along, the Commonwealth is investing in projects that will help business and government to develop and use common data standards. Through the ASDI Partnerships Grants Program, about $0.5 million has been invested over two years to encourage partnerships between industry, research institutions and Government and to identify and release existing, but currently unavailable, geospatial data holdings into the public arena.

Four projects are underway this year at the University of Melbourne, the Hawkesbury-Nepean Catchment Management Trust, the Queensland Surveyors Board and with Landinfo, a business unit of Sinclair Knight Merz.

Five projects completed in 1999 have made a significant contribution to economic and social development at local, regional and national levels:

In northern Australia, bushfires have a major impact on the environment, with potentially catastrophic effects on fire-sensitive flora and fauna. The Tropical Savannahs Cooperative Research Centre uses satellite imagery to study bushfire activity in the north, providing a record of fire scars for those responsible for managing the area.

The Sydney Information Highway project, led by the Inner Metropolitan Regional Organisation of Councils (IMROC), integrates planning information from State and local governments along the length of Parramatta Road.

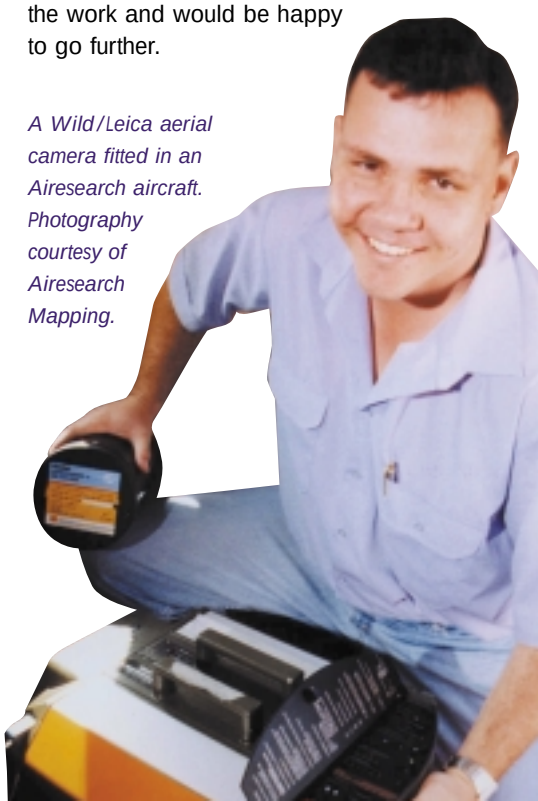
This online map not only zooms before your eyes, it also displays masses of detailed information from topography to watercourses and property boundaries. The map also lets you 'move' around to see information about neighbouring districts.

This project demonstrates the potential of combining digital mapping with other data about land use, and as such promises a single integrated source of information for land management.

The shape of the land where it meets the sea and the contours of the ocean floor are of great interest to the fishing industry. CSIRO Marine Research and the Fisheries Research and Development Corporation created digital images of the ocean floor to help understand the ecological basis of the deep-water stocks fished on the continental slope in Tasmanian waters.

In its first three years of operation, the Herbert Resource Information Centre (HRIC) demonstrated the success of community-based cooperative GIS Centres. The project showed that routine, successful and collaborative use of spatial data by the full range of local resource users is possible. These users include farmers, small business people, national companies and local government. HRIC is a collaborative joint venture between CSR Ltd, Hinchinbrook Shire Council, cane growers, the Herbert Cane Production and Productivity Board, Queensland Department of Natural Resources and CSIRO.

AUSLIG worked with a private company, Airesearch, to create an environment where the data holdings of a private company can be made available to the public. These data holdings have many and varied uses and will be an asset to many in the mapping industry. Among the project's objectives was the development of common inter-operable solutions for discovery, access and use of geospatial data in response to industry, environmental and socio-cultural needs. Airesearch says it has benefited from the work and would be happy to go further.



A Wild/Leica aerial camera fitted in an Airesearch aircraft. Photography courtesy of Airesearch Mapping.

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It's a start and AUSLIG is investigating ways of continuing the program to meet user demand. It is also developing a strategy for updating 100K maps over selected areas while maintaining national coverage of 250K maps. It's an holistic approach recognising that different areas need to be mapped at different scales, at the same time ensuring that consistent, quality GIS datasets are available nationally. It's no longer a matter of focusing on one series to the detriment of the other. New technology facilitates the migration of information so 100K mapping revision helps with the maintenance of 250K maps.

It takes resources but nation building continues and will need good maps if it's to be done effectively.

CONTACTS

For more information about any item in *AUSLIG Directions*, call AUSLIG on **1800 800 173** or visit our website at **www.auslig.gov.au**

Tel +61 2 6201 4201
Fax +61 2 6201 4366
Email auslig@auslig.gov.au
Internet www.auslig.gov.au

Editors Louise Elliott, Barry Leigh, Jo Lilley
Journalist Richard Upton
Design Communication Company, Canberra
Printing Paragon Printers
ISSN 1037 - 44X

Published by AUSLIG,
Australian Surveying and Land Information Group,
Commonwealth Department of Industry, Science and Resources

Scrivener Building,
BRUCE ACT 2617

PO Box 2, BELCONNEN
ACT 2616
Australia

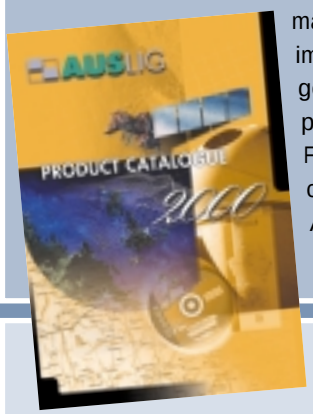
AUSLIG NEWS IN BRIEF

AUSTRALIA UNFOLDED A 'BEST BUY'

A great tool for viewing and making your own maps, version 2 of AUSLIG's interactive mapping software now features a new interface, improved layer control, more custom options, multiple maps and many other innovations. At a recommended retail price of $69.95, this product was rated a "Best Buy" by the AUSTRALIAN PC User's School PC feature in its November 2000 edition.

NEW PRODUCT CATALOGUE

AUSLIG's comprehensive new catalogue lists printed and digital map, satellite image and geodetic products. For a free copy call AUSLIG.



EMAIL NEWS SERVICE

AUSLIG has launched a new email service aimed at providing you with the latest news, events and information about AUSLIG's products and services. The weekly emails are short and to the point with links to get more information if you need it. Register at the AUSLIG Internet home page.

NEW GAZETTEER OF AUSTRALIA FREE ONLINE

Now you can find almost any place in Australia on AUSLIG's revised "online" Gazetteer, which contains more than 240 000 authorised geographical names covering the length and breadth of the nation. The Intergovernmental Committee on Surveying and Mapping, of which AUSLIG is a member, compiled it from place names held by relevant State, Territory and Defence agencies. If you want the full dataset for commercial purposes, a licence to use the data starts at $540.