

*MSIA report to ICA  
Moscow, 2007*



**Mapping Sciences Institute, Australia**  
**Report to the International Cartographic Association**  
**Moscow, August 2007**

Editor: William E. Cartwright  
MSIA International Program Manager  
Australian Delegate to ICA  
[william.cartwright@rmit.edu.au](mailto:william.cartwright@rmit.edu.au)

Contributions from: Keith Smith Honorary Secretary, MSIA, Ron Furness  
Chair, ICA Commission on Marine Cartography, and Trevor Menzies, President, MSIA.

**Mapping Sciences Institute, Australia**

The Mapping Sciences Institute, Australia, is an incorporated company representing Australian cartographers and geographic information technologists. Its forerunner, the Australian Institute of Cartographers, was formed in 1952 and the name-change was registered in 1995. The purpose of the change of name was to recognize the emergence of the disparate disciplines involved in the management of geospatial information.

Mapping sciences are defined as those disciplines that deal with acquisition, management and communication of geospatial information and the MSIA promotes the theory, practice and understanding of all facets of these sciences through the collegiate expertise of its members. Membership is available to all persons engaged in the mapping sciences, admitted at grades commensurate with relevant academic qualifications and experience.

**Management** of the MSIA is effected at national level through the National Council which comprises a President, Secretary, Treasurer and Chairman of an Executive Committee, together with representatives from the States. MSIA is financially accountable to the Australian Securities and Investments Commission and in this regard, the Treasurer, Secretary and Chairman are the Company Directors. All office-bearers serve in an honorary capacity.

The current President is Trevor Menzies, pictured in figure 1, National Secretary Keith Smith and National Treasurer Alan Armitage.



Figure 1. Trevor Menzies, MSIA President.

Source: <http://www.nt.gov.au/lant/parlhouse/whatson/admiralty/html/menzies.shtml>

**Publications** of MSIA include the *Journal of Spatial Science*, produced jointly with the Spatial Science Institute, and *Mapping Sciences National*, a newsletter / magazine published independently. A website, [www.mappingsciences.org.au](http://www.mappingsciences.org.au), is maintained.

**msia**  
mapping sciences institute, australia

Membership | Company Membership | Careers | What's Happening Around The Nation

National Page | The Organization | Corporate Plan | National Programs | Journal of Spatial Science

Mapping Sciences are the disciplines that deal with acquisition, management and communication of geospatial information.

Mapping Sciences Institute, Australia is a learned society established in 1952 to engender the professional development of individuals and organisations involved in the many facets of the mapping sciences.

Mapping Sciences Institute, Australia is a Non-Government Organisation (NIGO) established in 1952 to engender the professional development of individuals and organisations involved.

*Keith Smith*  
National Secretary  
msia@gil.com.au  
Mapping Sciences Institute,  
Australia  
GPO Box 18 17 BRISBANE  
QUEENSLAND 4000

- Journal of Spatial Science - June, 2007 Abstract **New!**
- ICA News December 2006
- MSIA Conference 400 Years of Mapping Australia 23-25 August 2006 - Photo Gallery
- What's NEW
- Careers in the Mapping Sciences
- Maps and Charts for Sale online

Friday 6 July 2007

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Figure 2. MSIA Web site. [www.mappingsciences.org.au](http://www.mappingsciences.org.au)

**Conferences** are planned to be conducted every two years with the most recent, *400 Years of Mapping Australia*, held in Darwin in 2006. Conferences are scheduled for 2008 and 2010.

The MSIA cooperates with **kindred bodies** such as the Geospatial Information & Technology Association, the Spatial Science Institute, the Australian Map Circle and the Institution of Surveyors, Australia. As part of the MSIA **Heritage Program** a joint project involving most of these organizations has been initiated with a view to recognizing Australia's mapping and surveying heritage.

MSIA has established and maintains liaison with the British Cartographic Society, but the major focus of the **International Program** is on the International Cartographic Association.

### **The MSIA and the ICA**

Australia is a member of the ICA. MSIA representatives have contributed at general Assemblies and through with formal conference papers and Commission activities. Ron Furness and William Cartwright were the Australian representatives at A Coruña, Durban, Ottawa and Beijing. The photograph in figures 3 and 4 show Australian national representatives Ron Furness and William Cartwright at the General Assembly held in Durban, South Africa in 2003.



Figure 3. Australian delegates Ron Furness and William Cartwright at the ICA General Assembly, Durban, South Africa, 2003.



Figure 4. Australian delegates at the ICA General Assembly, Durban, South Africa, 2003.

As well:

- Professor William Cartwright is vice-President of the ICA and the liaison vice-President for the Commissions on Visualization and Virtual Environments Commission, Maps and the Internet and Maps for the Blind and Visually Impaired. He has also been given the task to manage the 'Art' elements of Cartography and Geographic Information across all Commissions and Working Groups and the day-to-day activities of the ICA.
- Professor Graciela Metternicht is the editor of the ICA Newsletter and Chair of the Commission on Mapping from Satellite Imagery.



Figure 5. Professor Graciela Metternicht.

- Ron Furness chairs the Commission on Marine Cartography.



Figure 6. Ron Furness at 6th International Symposium  
Computer Mapping and GIS for Coastal Zone Management, CoastGIS 2005.  
Source: <http://www.abdn.ac.uk/~geo466/IMAGE1.jpg>

- Dr. David Fraser is co-chair of the Commission on Education and Training.



Figure 7. Dr. David Fraser.

- As well, Dorothy Prescott has contributed over many years to the Commission on the History of Cartography and Abbas Rajabifard is a member of the Commission on Spatial Data Standards.



Figure 8. Dorothy Prescott (left) and Abbas Rajabifard (right).

Sources: <http://australianmapcircle.org.au/images/amc2003/amc2003-dorothyrobert.jpg>  
<http://www.crcsi.com.au/pages/project.aspx?projectid=68>

- In former times, Don Pearce (Australia) was Secretary-General of the ICA for many years.



Figure 9. Don Pearce.

Source: <http://www.promaco.com.au/geodraft/pics/donpe.gif>

The MSIA is also well-represented on Commissions and Working Groups. The following positions have been held:

- Commission on Marine Cartography - Chair: Ron Furness (-2007)
- Commission on Education and Training - Vice-Chair: David Fraser (-2007 and proposed Chair of the Commission for 2007-2011)
- Commission on Geographical Visualization and Virtual Landscapes - Members: Michael Black, Amy Griffin and William Cartwright
- Commission on Maps and the Internet - Members: Michael Black, Amy Griffin and William Cartwright
- Commission on Cartography and Children - Members; William Cartwright and Rod Gerber.
- Commission on mapping from Satellite Imagery -Commission Chair: Graciela Metternicht (and proposed Chair of the Commission for 2007-2011)
- Commission on Maps and Graphics for Blind and Visually Impaired People – ICA Executive Liaison: William Cartwright (AUS)

- Commission on Spatial Data Standards - Members: Graham Baker and Abbas Rajabifard
- Working Group on Use and usability - Member: Karen Wealands

In his activity as Vice-president, Professor Cartwright has attended Executive Committee meetings and conducted site visits and outreach programmes on behalf of ICA Commissions. In 2005 Professor Cartwright visited Santiago, Chile and met with the 2009 conference organizers and visited proposed conference venues (figure 10).



Figure 10. ICA vice-President William Cartwright with ICC 2009 Conference committee members. Santiago, Chile, 2005.

In October 2006, as an adjunct to the 2006 New Zealand Cartographic Conference, GeoCart2006, a workshop was held on Maps and the Internet in October 2006. The programme was conducted by Professor Georg Gartner, vice-Chair of the Commission on Maps and the Internet and Professor William Cartwright, vice-President of the ICA. The photograph below was taken during the workshop.



Figure 11. Workshop on Interactive Mapping, Auckland, 2006. Commission on Maps and the Internet

## ICA Conferences

Looking back over a number of years, to the 1984 Perth, Australia conference, it can be seen that these contributions have been continuous. A complete list of authors, papers and affiliations for papers presented in the last two ICA conferences (2003 and 2005) is provided in the Appendix.

## Journal of Spatial Sciences

The editor of the Journal is Professor Graeme Wright ( [g.l.wright@curtin.edu.au](mailto:g.l.wright@curtin.edu.au)).



Figure 12. Professor Graeme Wright.

Source: [http://resenv.curtin.edu.au/local/images/pic\\_graeme\\_wright.jpg](http://resenv.curtin.edu.au/local/images/pic_graeme_wright.jpg)

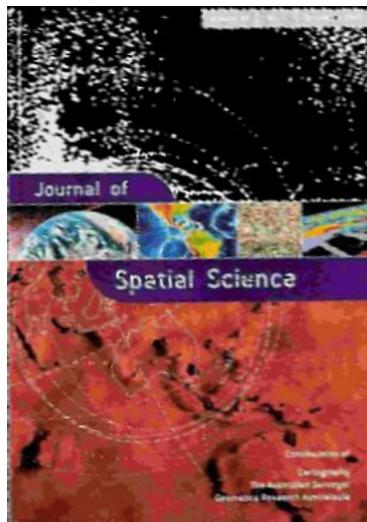


Figure 13. Journal of Spatial Sciences.

The contents of the most recent edition of the Journal, June 2007, are provided below:

### Refereed Papers

Huang, Z. & Lees, B. G. (2007) Assessing a Single Classification Accuracy Measure to Deal With the Imprecision of Location and Class: Fuzzy Weighted Kappa Versus Kappa, Journal of Spatial Science, Vol. 52, No. 1.

- Miliaresis, G. C. (2007) An Upland Object Based Modelling of the Vertical Accuracy of the SRTM-1 Elevation Dataset, *Journal of Spatial Science*, Vol. 52, No. 1.
- Park, M. M. & Williamson, I. P. (2007) Writ on Water: Closing the Traverse in the Tri-State Area of New South Wales, South Australia, and Victoria, *Journal of Spatial Science*, Vol. 52, No. 1.
- Janssen, V. (2007) Volcano Deformation Monitoring Using GPS, *Journal of Spatial Science*, Vol. 52, No. 1.

Abidin, H. Z., Andreas, H., Gamal, M., Sadarviana, V., Darmawan, D., Surono, Hendrasto, M. & Suganda, O. K. (2007) *Studying Landslide Displacements in the Ciloto Area (Indonesia) Using GPS Surveys*, *Journal of Spatial Science*, Vol. 52, No. 1.

#### Special Feature – Coastal GIS

##### Refereed Papers

- Yamano, H. (2007) The Use of Multi-Temporal Satellite Images to Estimate Intertidal Reef-Flat Topography, *Journal of Spatial Science*, Vol. 52, No. 1.
- Lucieer, V. L. (2007) The Application of Automated Segmentation Methods and Fragmentation Statistics to Characterise Rocky Reef Habitat, *Journal of Spatial Science*, Vol. 52, No. 1.
- Ierodiaconou, D., Laurenson, L. Burq, S. & Reston, M. (2007) *Marine Benthic Habitat Mapping Using Multibeam Data, Georeferenced Video and Image Classification Techniques in Victoria, Australia*. *Journal of Spatial Science*, Vol. 52, No. 1.
- Mount, R. E. (2007) *Rapid Monitoring of Extent And Condition of Seagrass Habitats With Aerial Photography “Mega-Quadrats”*, *Journal of Spatial Science*, Vol. 52, No. 1.

#### Special Feature – Coastal GIS

##### Professional Papers

- Smith, K. D. & Cox, G. J. (2007) *Improving Hydrographic Information - Zones of Confidence (ZOC) for New Zealand*, *Journal of Spatial Science*, Vol. 52, No. 1.
- Coffey, J., Beard, D. J. & Ryan D. A. (2007) Visualising Coastal Seabed Characteristics: Using VrmL Models to Present Three Dimensional Spatial Data Via The Web, *Journal of Spatial Science*, Vol. 52, No. 1.

##### Professional Papers

- Lau, C-P. & Whitlow, R. (2007) *Regional Activity Centre Surveys - Gold Coast, Queensland*, *Journal of Spatial Science*, Vol. 52, No. 1.
- Von Hagen, C. (2007) *Towards a Spatial Data Infrastructure for Somalia using Open Source standards*, *Journal of Spatial Science*, Vol. 52, No. 1.
- Kazemi, S. & Lim, S. (2007) *Deriving Multi-Scale GEODATA from TOPO-250K Road Network Data*, *Journal of Spatial Science*, Vol. 52, No. 1.
- Filmer, M. & Sandford, G. (2007) *An Investigation into the Displacement of Permanent Survey Marks in the Hillcrest Area Resulting from Reactive Soils*, *Journal of Spatial Science*, Vol. 52, No. 1.

## **Mapping Sciences National**

*Mapping Sciences National* is a newsletter devoted to informing members about more immediate events. The editor is Greg Heron, from the Northern Territory Division.

## **Australian Cartographic Industry**

To provide a complete picture of the Australian cartographic industry is impossible in a report like this. Therefore, examples of Australian cartographic mapping agencies and companies are provided.

## **National Mapping**

### Geoscience Australia

Within the portfolio of Industry, Tourism and Resources, Geoscience Australia plays a critical role by producing first-class geoscientific information and knowledge. This can enable the government and the community to make informed decisions about the exploration of resources, the management of the environment, the safety of critical infrastructure and the resultant wellbeing of all Australians.

Key priorities for Geoscience Australia in 2007-08 are to:

1. Deliver the Year 3 geoscience component of the Australian Tsunami Warning System.
2. Promote the petroleum prospectivity of Australia. In particular, provide scientific and technical support to Government for the 2008 offshore petroleum acreage release.
3. As part of the Offshore Energy Security Program, acquire seismic data to assess the hydrocarbon potential of the Mentelle and Perth basins in south west Western Australia.
4. As part of the Offshore Energy Security Program, assess the petroleum potential of remote eastern frontier basins.
5. Under the Onshore Energy Security Program, provide technical advice to Government in relation to uranium, thorium, petroleum and geothermal energy.
6. Provide marine and coastal geoscience inputs for the Department of the Environment and Water Resources for the development of regional marine plans in the northern, eastern and south-western planning areas and in estuaries of northern Australia.
7. Develop a carbon dioxide capture and storage (CCS) program, including criteria for CCS acreage release and assessment
8. Deliver the first full year of the five year Onshore Energy Security Program, including acquisition and interpretation of geophysical datasets, regional geology investigations and integrated commodity studies.
9. Deliver an operational capability to support critical infrastructure protection in Australia.
10. Deliver natural hazard risk assessment methods, databases and decision support tools in support of the Disaster Mitigation Australia Package.
11. Develop the technical and administrative framework for a new national high resolution Digital Elevation Model of Australia in collaboration with Government and industry partners.

12. Promote opportunities for investment in mineral exploration through new pre competitive geoscience information from syntheses of Australia's Phanerozoic-era geological provinces in Eastern Australia.

13. Undertake large-scale topographic mapping and revision in new targeted areas identified in collaboration with all states and the Northern Territory to support emergency management.

14. As part of the Offshore Energy Security Program, complete Phase 1 of a new Petroleum Data Access Facility for the petroleum industry.

15. Improve discoverability and access to Geoscience Australia's information assets via the internet.

Geoscience Australia is the national organisation that coordinates Australia's mapping, maritime boundary, remote sensing and geodesy programs. The organisation is the national provider of paper and digital mapping products, aerial photography and remotely sensed satellite imagery.

#### Paper maps

- 1:50 000 Scale: Topographic maps of northern Australia
- 1:100 000 Scale: For select areas of Australia
- 1:250 000 Scale: Comprises 513 maps with full coverage of Australia
- 1:1 Million Scale: Covers all of Australia in 49 maps

The Digital Map Data available is described below.

- Gazetteer: CD ROM of Australian place names
- Topographic and Thematic Products: Information about maps and data
- NATMAP Raster: 1:250 000 scale digital maps
- GEODATA: Vector data for GIS applications
- Digital Elevation Model: Point elevation data
- Topographic (GIS) Data: Data for GIS applications

Digital topographically-related map products made available on-line are:

- MapConnect: Make your own topographic map
- Free downloads: Data for free download
- Gazetteer: More than 322 000 Australian place names
- 1:2.5 Million scale scanned Topographic Map of Australia
- Browse Australia at 1:2.5 million scale.
- A4 size map of Australia showing capital cities, state border, elevation etc.
- Maritime boundaries map of Australia, created from the Australian Maritime Boundaries Information System (AMBIS). The map depicts the various

jurisdictional limits and zones which exist within Australia's maritime jurisdiction. More maps of Australia's Maritime Boundaries are available.

- Australia's public lands at 1:5 million scale. This includes State Crown lands and Commonwealth-owned lands. More details are at the Land Tenure product page.
- Australian Region Bathymetry and Topography Image of the Australian Region
- Full resolution image Basic Outline of Australia. These basic outline maps of Australia are useful for projects and simple mapping exercises. Versions available include:

Coastline

Basic outline with state borders

Basic outline with state borders and capital city locations

- Compare digital 1:250 000 scale Topographic Maps with a Satellite Image
- Public Lands 2004 Map. Australia's public lands at 1:5 million scale. The public lands include State Crown lands and Commonwealth-owned lands which are 50 hectares or greater in area.

Source: <http://www.ga.gov.au/>

The type of map information available can be seen in figure 14.

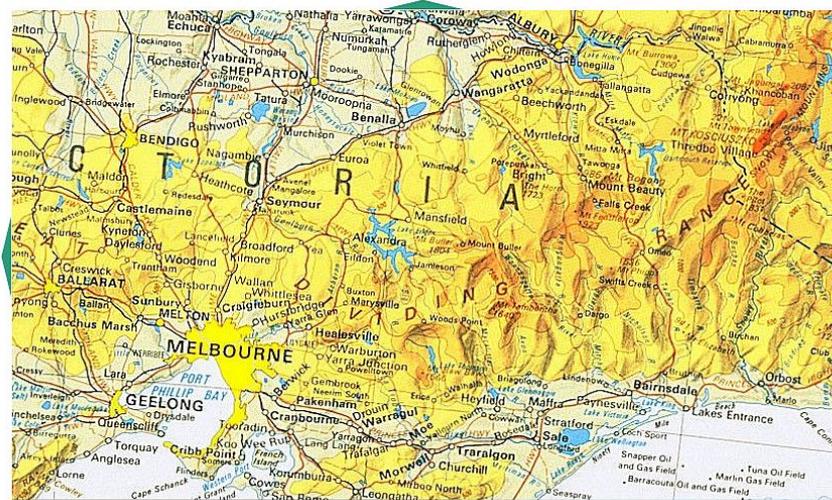


Figure 14. Sample Web-delivered map.

Geoscience Australia is also responsible for Commonwealth vertical and oblique aerial photography, a programme that was begun in 1928. The photos are an important adjunct to Geoscience Australia maps because they provide an accurate historical record of the land. Pre -1950 photos may be viewed at the National Library of Australia.

## National charting

### RAN Australian Hydrographic Service

The RAN Australian Hydrographic Service is the Commonwealth Government agency responsible for the publication and distribution of nautical charts and other information required for the safety of ships navigating in Australian waters. It is also the Australian Defence Force (ADF) agency responsible for the provision of operational surveying support and maritime Military Geographic Information (MGI) for ADF operations and exercises.

The Australian Hydrographic Service has its origins in the British Admiralty Hydrographic Office, which was established in 1795. The Admiralty carried out surveys and published charts of the Australian coast throughout the 19th century in support of the defence and commercial development of the colonies. The RAN assumed responsibility for hydrographic surveys in 1920, and for the publication of charts in 1942. In 1946 the Federal Cabinet made the Commonwealth Naval Board responsible for the surveying and charting of Australian waters. This responsibility was confirmed in 1988 after a review of Commonwealth mapping activities.

Source: <http://www.hydro.gov.au/aboutus/aboutus.htm>

Typical products (figure 15) and the National Bathymetric Map Series 1:250 000 index (figure 16) are illustrated below.



Figure 15. Sample RAN Australian Hydrographic Service products.

Source: <http://www.hydro.gov.au/>

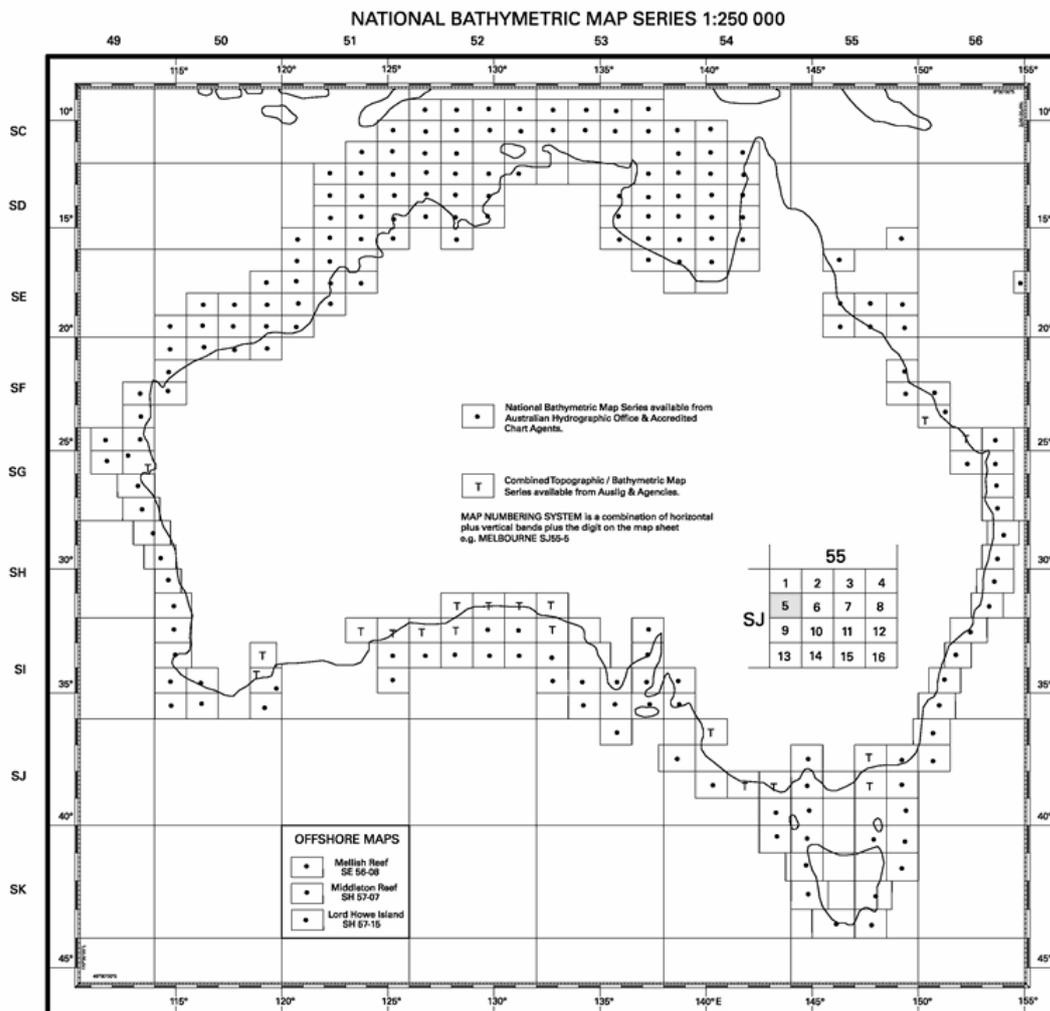


Figure 16. National Bathymetric Map Series 1:250 000 index  
 Source: <http://www.hydro.gov.au/prodserv/charts/bathy.htm>

## State Mapping

Each State of Australia has its own mapping programme. To illustrate these programs, one authority is illustrated, The Department of Lands, New South Wales. <http://www.maps.nsw.gov.au/>

Under direction from the Surveyor General, the Surveying and Mapping group plays a vital role in supporting the survey industry in NSW by collecting and maintaining official survey data. This important data underpins the State's land information and mapping systems and is used to produce a range of digital and hardcopy mapping products and services.

As the main source of land information for NSW, LPI is responsible for maintaining:

- a digital cadastral database of the State, which shows legal and other approved boundaries applying to land
- a digital topographic database, which shows the physical and surface features of the landscape and
- a library of aerial photographs of the State.

It also provides satellite imagery, parish and other historic maps and a unique customised mapping service that tailors spatial information to meet specific user needs. These products and services support a vast range of community, business and government activities - everything from tourism and land management to electoral boundaries and bush fire control.

Through the Spatial Information eXchange (SIX), collaborative working space established by the NSW Department of Lands for use by government, business and the community. The SIX Gateway provides a single entry point through which to search, access and utilise the wealth of geospatial services and data managed by Lands, in many cases free of charge. It also provides opportunities for users to contribute to this state-wide resource. As the official source of NSW's geospatial information, Lands possesses the most comprehensive, accurate and reliable spatial data for the State and we currently service the needs of many sectors within the spatial data community. The SIX Gateway contains a wide range of property and topographic features as well as cadastral (land tenure) and address information that can be searched against.

Key spatial datasets held include:

- Cadastre.
- Land Titles.
- Street Addresses.
- Current and Historic Topographic Maps.
- Satellite Imagery.
- Current and Historic Aerial Photography.

Source: [http://www.lands.nsw.gov.au/survey\\_mapping](http://www.lands.nsw.gov.au/survey_mapping)

## Private Mapping Companies

A number of private mapping companies operate in Australia. A sample of these companies is provided in this section of the report.

Hema Maps Pty Ltd, Brisbane, Queensland.

<http://www.hemamaps.com.au>

Hema Maps began distributing maps in 1984 and began producing maps in 1989. Since then they have developed a range of over 100 maps that are distributed for resale throughout Australia and overseas. Along with maps of Australia, its States and Capital cities, they produce a range of detailed tourist maps for Australia's most popular regions. Hema Maps is a private company incorporating three main areas of Administration, Production and Sales, with a total of about 20 employees.

Samples of their products are shown in figure 17.

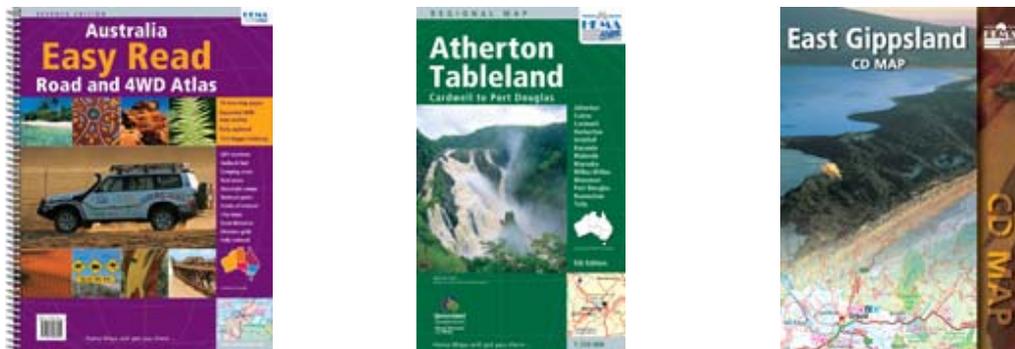


Figure 17. Sample Hema maps.

## Sensis

<http://www.whereis.com.au>

Melbourne-based Sensis publish their *Whereis* Street Atlas (<http://www.whereis.com.au/>). Users gain access to a set of street maps by typing-in a street address for. A map, sometimes with supporting satellite imagery is returned. The user is able to navigate to adjoining maps by clicking hot spots on the edges of the displayed maps. Sensis also publish paper and Web versions of the Australian *White Pages*<sup>TM</sup> directory and *Yellow Pages*<sup>®</sup> directory web sites and the *Whereis* geographical search functionality is built into these sites. Fully interactive *Whereis* Street Atlas maps can be embedded within Australian corporate web sites.

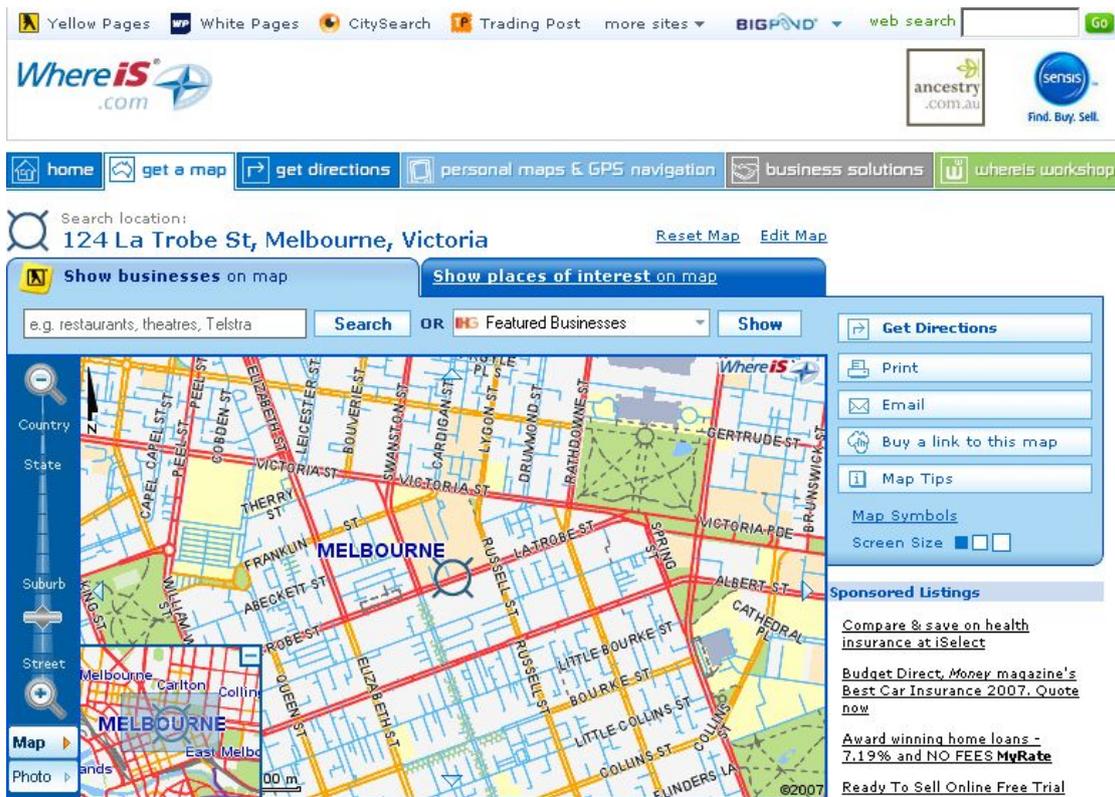


Figure 18. Page from the Whereis Street Atlas.

Ausway

<http://www.ausway.com.au/>

Ausway Group of Companies, publishers of *Melway*, *Sydney* and *Brisway* street directories and CitySearch also make available their street directories information on-line.

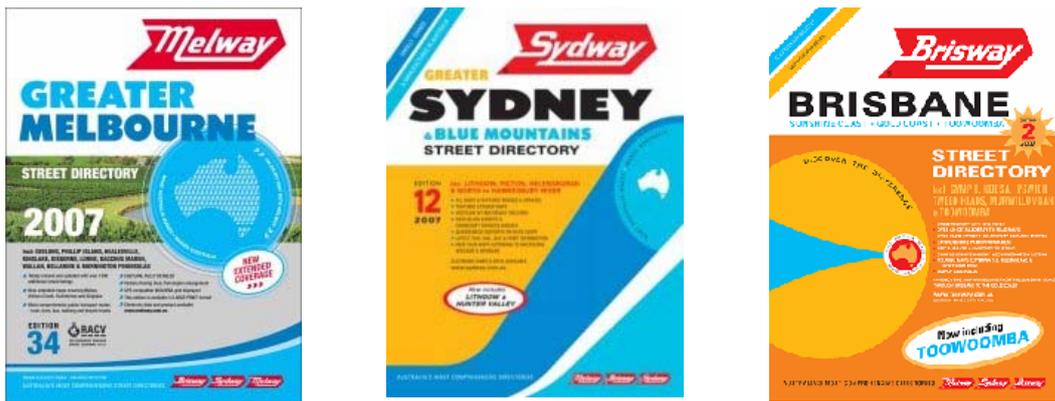


Figure 19. Ausway products.

## Meridian Maps

Meridian Maps arose from a mutual love of bush walking and cartography by the founding partners, Craig Molyneux and Simon Spivak. They saw the need for detailed park maps that were not only extremely functional and easy to read, but also looked great. Craig brought to the business his cartographic expertise and Simon his knowledge of the map industry and experience in sales and marketing. So, with twenty years of experience between them in the cartographic map making industry, they embarked on a project to design and produce the first Meridian Map; a Map Guide to the Hattah-Kulkyne National Park. Rave reviews and a demand for more maps immediately followed, and Meridian have been producing quality mapping products ever since.

Meridian Maps key goal is to provide excellence in recreational and wall mapping to our customers. Craig and the small team of professional cartographers are based in Melbourne and Geelong. Our maps are produced primarily in Adobe Illustrator, utilizing Avenza's MAPublisher plug-ins.

Source: <http://www.meridianmaps.com.au/about.asp>

At the ICA Mapping Excellence Awards at ICC2005, in A Coruña, Spain, Australian mapping company, Meridian Maps received one of the awards. The photograph below shows Meridian Maps's principals Craig Molyneux and Simon Spivak being presented their award at the 2005 Spatial Sciences Conference in Melbourne, Australia. At right is the winning map.

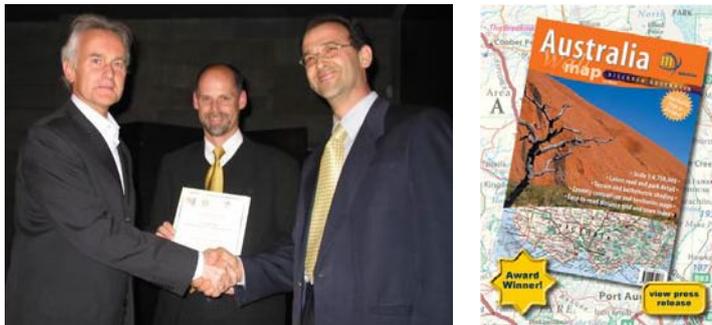


Figure 20. Meridian Maps and their award-winning map. Images: Meridian maps. Used with permission.

## Australian Cartographic Education

Australia has university programmes (undergraduate to PhD) in cartography at Curtin University in Perth and at RMIT in Melbourne. Para-professional (TAFE or VET) programmes are offered in many States. Cartography components are also taught as part of surveying or geomatics programmes in all States.

### RMIT University

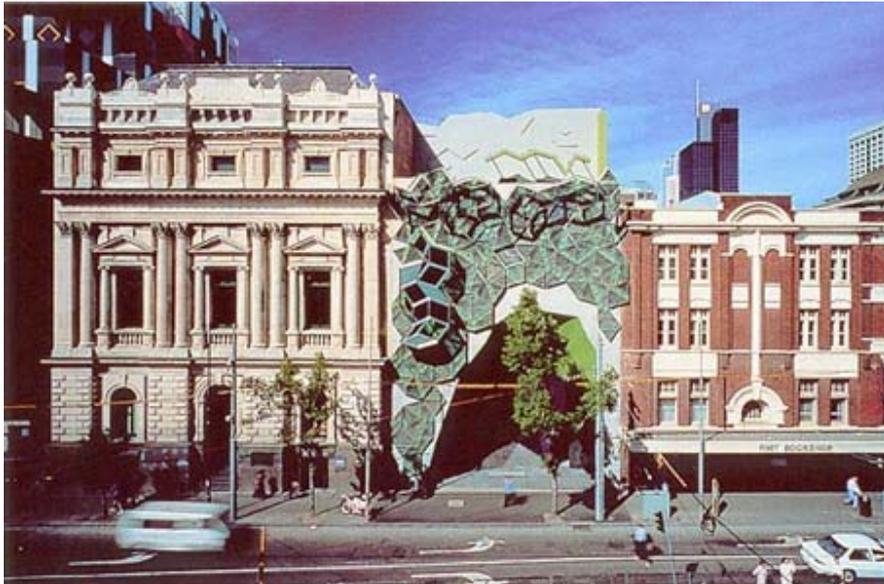


Figure 21. Part of RMIT University, Melbourne, Australia.  
Source: [http://www.ranke-heinemann.de/bilder/uni\\_foto/rmit.jpg](http://www.ranke-heinemann.de/bilder/uni_foto/rmit.jpg)

The School of Mathematical and Geospatial Sciences at RMIT University (formerly the Department of Geospatial Science) is the largest academic group in Australia involved in education relating to geospatial information at the tertiary level. It is well equipped, boasting an enthusiastic staff with a diverse range of experience. In accord with the university's Strategic Plan the School's operations are governed by a strategy plan which identifies three core business areas – teaching and learning, research and development, and appropriate commercial enterprises encouraging world-class scholarship and academic excellence. Within the Geospatial discipline area the major research themes are measurement science (including the traditional discipline of surveying), mapping science (including multimedia cartography and visualisation), geographic information systems and remote sensing, and geospatial applications of regional sustainable development. These research focus areas feed and complement the academic programs, from bachelor degree level to PhD. The School's suite of undergraduate programs currently comprises four distinct Bachelor of Applied Science degrees: Surveying (4 years full time duration), Geomatics (4 years), Cartography and Geographical Visualization (3 years), and a Geomatics/Computer Science double degree (5 years). It is worthy of note that, with judicious selection of elective courses, a student undertaking the RMIT Geomatics program may complete the same studies as does a surveying graduate. A Geomatics

graduate in this category is acceptable to the Surveyors Board of Victoria as an entrant into a training agreement for registration with cadastral endorsement.

The Bachelor of Applied Science in Cartography and Geographical Visualization is a three-year degree that focuses on the use of New Media for mapping and its related professions. It has been designed to enable students who are interested in multimedia, information technology, design, electronic publishing and geography to undertake a program that combines all of these skill areas and to provide a program focusing on innovation and unique solutions that enable better visualizations of geospatial information. A number of courses in the first year are common with the degrees in Surveying and Geomatics, but later years provide essentially a unique range of courses, some of which are available as electives to Surveying undergraduates. The degree leads in to a one-year Bachelor of Geospatial Science (Honours) program that will prepare students who are interested in continuing with more focussed, higher level studies.

### **Curtin University of Technology**

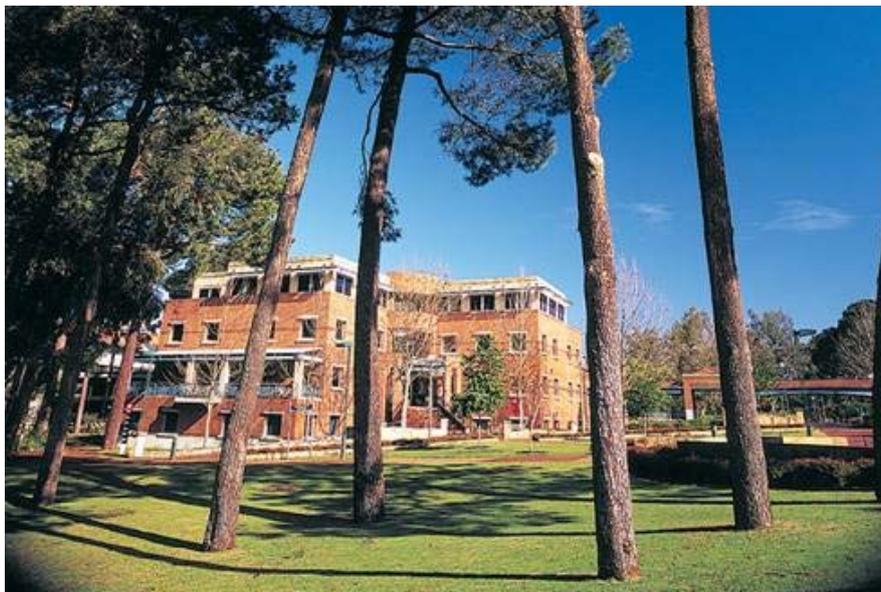


Figure 22. Curtin University of Technology, Perth, Western Australia.  
Source: [http://www.atn.edu.au/about/history\\_files/image002.jpg](http://www.atn.edu.au/about/history_files/image002.jpg)

The Cartography programme is conducted in the Department of Spatial Sciences. The Cartography programme focuses on the representation, analysis and management of spatial data. It includes areas such as topographic and thematic mapping, photogrammetric mapping and remote sensing, Web mapping, computer assisted mapping, and geographic information systems. Students gain expertise from a range of areas such as computing, environmental science, film and print technology, geography, management, mathematics and physics as well as the more creative aspects such as art and design.

The course takes a very modern approach to cartography, incorporating aspects of map design and production, as well as leading-edge techniques of data analysis and

management using remote sensing and geographic information systems and spatial databases.

The first year of the course begins with basic studies in mathematics, sciences and computing, with an introduction to surveying and mapping subjects. The second year expands the student's knowledge into more specialised areas of cartography using a range of advanced equipment and modern computing and image processing facilities. The final year of the course includes business and management subjects, as well as introducing students to professional requirements in the cartography area. Students are also required to complete a major project in a chosen subject area. Flexible learning approaches are a feature of the Cartography degree with extensive use of online learning.

See: [http://www.spatial.curtin.edu.au/bsc\\_cart.html](http://www.spatial.curtin.edu.au/bsc_cart.html)

Curtin also offers other degrees, viz:

- Bachelor of Surveying
- Bachelor of Surveying, Bachelor of Commerce (Entrepreneurship)
- Bachelor of Surveying, Bachelor of Commerce (Property)
- Bachelor of Science (Geographic Information Science)
- Bachelor of Science (Geographic Information Science), Bachelor of Science (Applied Geology)
- Bachelor of Science (Geographic Information Science), Bachelor of Social Science (Geography)
- Bachelor of Science (Geographic Information Science), Bachelor of Commerce (Property)

### **Technical and Further Education**

As programmes in cartography are offered at both a university level and at TAFE (Technical and Further Education) it has been necessary to design 'articulation' programmes that allows graduates of the TAFE Diploma to undertake the degree programme with credit given to prior studies. It can be considered that the TAFE programmes offer 'Cartographic Technology' content that complements the 'Cartographic Science' focus of degree programmes. Figure 23 illustrates this.

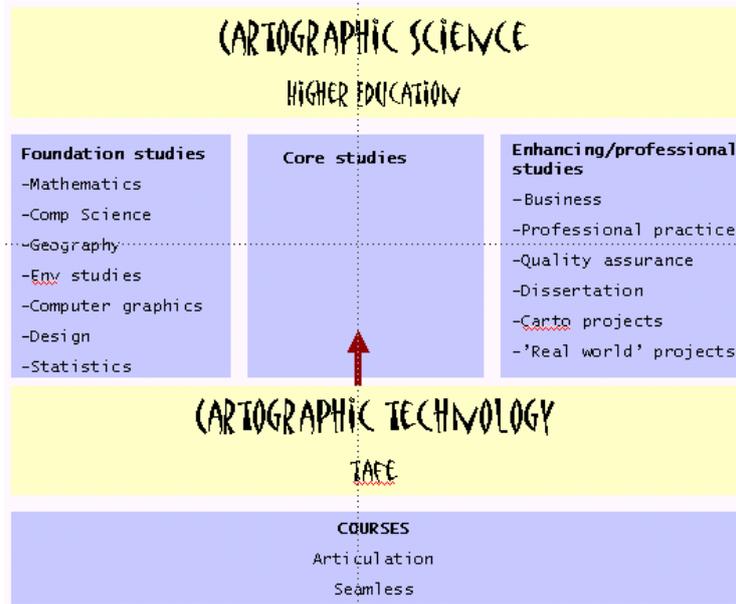


Figure 23. Articulation - TAFE to University

## Conferences

### *CoastGIS 2006, Wollongong and Sydney, NSW, Australia, 12 – 16 July 2006*

In July 2006, approximately 150 delegates, drawn from all inhabited continents (we think from 18 countries including Iran and Peru), converged on Sydney Olympic Park and Wollongong University in New South Wales, Australia, for the 7th International CoastGIS meeting. CoastGIS, the International Symposium on GIS and Computer Mapping for Coastal Management, is a series of conferences that began in Cork, Ireland, in 1995 as a collaboration between the Commission on Coastal Systems of the International Geographical Union and the Commission on Marine Cartography of the International Cartographic Association of which Ron Furness is presently Chair.



Figure 24. Ron Furness (International Cartographic Association) outlines the history of CoastGIS

Although that meeting was planned as a one-off, it was such a success that CoastGIS has now evolved into a regular, two-yearly event. Subsequent CoastGIS meetings have now been held in Aberdeen, Scotland (1997); Brest, France (1999); Halifax, Nova Scotia, Canada (2001); Genoa, Italy (2003); and Aberdeen again (2005). And now, in 2006, CoastGIS came to the Southern Hemisphere for the first time, and the meeting just held in Australia. The opening ceremony participants are shown in figure 25.



Figure 25. Opening of 2006CoastGIS 2006. From left to right, the Vice-Chancellor –Professor Gerard Sutton, the Hydrographer –Captain Rod Nairn, Professor Colin Woodroffe (UOW –local organiser), Dr Marji Puotinen (UOW –local organiser), Dr Neil Williams, CEO of Geoscience Australia, Ron Furness (International Cartographic Association).

Fully in keeping with the CoastGIS tradition, the latest meeting was a great success on all fronts. Before the Symposium itself, a pre-conference visit and workshop was held at the Sydney Olympic Park, co-hosted by the Sydney Olympic Park Authority, SOPA, and the Department of Geography at Sydney University. In the morning of the Workshop, delegates were treated to a fascinating guided tour of the entire site, and learned about the history, current management and future plans for SOPA. Of particular interest and focus, of course, were detailed overviews and descriptions of the role GIS plays in the process. This was followed, in the afternoon, by a choice of half-day workshops on “Fuzzy Logic in Coastal GIS”, “Modelling of Marine and Coastal Oil and Chemical Spills in Australia” and “Developments in Mapping of Australian Coastal Seabed Habitats”, before the delegates travelled on to Wollongong in the evening.

The conference proper offered three days of papers and poster presentations, on topics as diverse as technologies for capturing and managing data for on- and off-shore environments; the challenges inherent in joining up marine and terrestrial data into integrated seamless databases; institutional aspects of designing and implementing spatial data infrastructures; and GIS-based modelling of coastal processes and activities; as well as a broad diversity of applications of the techniques for coastal zone planning, management and administration.

In all, more than 80 presentations were delivered. While the majority of papers were understandably and inevitably concerned with aspects of the Australian coast, a much broader geographical reach was ensured, with other papers focusing on coasts from China to Europe, Kenya, the United States, Brazil, and even the lakeshores of Azerbaijan and

northern Iran. One particularly satisfying aspect of the conference programme was the balance achieved between the technical and the more theoretical or conceptual papers, and also the mix of presentations from academics and those from practitioners in a wide diversity of coastal science and management agencies and disciplines. As regards the academic presentations, particular mention should also be made of the number of extremely high-quality papers presented by postgraduate (and, in at least one case, undergraduate) students, describing research work undertaken in the course of their thesis projects. If this particular sample is indicative of the current status of graduate research and training, then it seems clear there is a dynamic new generation of very able, engaged and GIS-committed coastal managers and scientists working their way up through the system, and about to emerge into the professional arena.

Two other interesting trends were also evident, particularly to those participants who have attended a number of CoastGIS meetings over the years. The first of these concerns a clear gradual shift of geographic focus, from mainly land-based coastal issues that were discussed in early CoastGIS meetings, particularly Cork, Aberdeen and Brest, to a progressively greater marine and deep-sea focus seen at the conferences in Halifax and Genoa. Now, at the 2006 meeting in Wollongong, the pendulum seems to be starting to shift back again, with increasing attention being devoted to the not inconsiderable challenges of integrating and linking the landward and seaward elements of the coast into truly unified, seamless 3- and 4-dimensional geospatial databases.

The second observation worthy of note relates to the evolution of coastal GIS applications presented at successive CoastGIS meetings. In part this clearly reflects the emergence, development and availability of new technologies, but to my mind it also indicates a more deep-seated and growing maturity of the field of Coastal GIS itself, with a correspondingly greater degree of confidence and innovation on the part of the practitioner community. At early CoastGIS meetings, most presentations focused on issues relating to the creation of geospatial databases for mapping, resource inventory and relatively simple (from our present-day perspective) analytical operations such as buffering and overlay techniques. Over successive meetings, this focus has gradually shifted to more advanced and computationally-intensive analyses, including integration of GIS with an ever-greater diversity of Earth Observation and positioning technologies (GPS, sonar, LIDAR, orbiting and airborne remote sensing instruments, etc.); connection of GIS with numerical modelling techniques (hydrodynamics, climatic, sediment transport, etc.); greater use of geo-statistical and related methods of quantitative analysis; increased use of dynamic and animated visualisations, including fly-throughs; and, inevitably perhaps, a greater use of internet technologies for integrating databases, publishing data and information, connecting up stakeholders and user-groups from various provenances, etc. Finally, in Wollongong especially, we see an increasing attention being given to the technical and organisational / human-related contributions that emergent spatial data infrastructures might make in assisting integrated and sustainable coastal zone management.

Those full papers that were received by the conference organisers in time were compiled and distributed to delegates on CD-ROM, and it is also intended that they will be posted

on the CoastGIS website ([www.coastgis.org](http://www.coastgis.org)) in due course. In addition, it is planned that an edited and fully peer-reviewed selection of papers will also appear in a special issue of the *Journal of Spatial Science* shortly. Copies of the latest *Journal* were also inserted in delegates' satchels and were very well received by delegates, especially the international delegates. MSIA promotional material also was inserted.

Post-conference saw a well attend field trip take place along the south coast which included a boat trip down the Shoalhaven River estuary, while we were educated on geomorphology and history by Professor Colon Woodroffe, while Mick, the boat operator, regaled us with anecdotal history!

It is expected that the conference will make a small surplus and the ICA share of this will be applied to the work of the Commission on Marine Cartography, specifically for the travel of the Greek ICA member of the FIG/IHO/ICA Advisory Board.

#### **400 Years Mapping of Australia Seminar, August 23 – 25, 2006, Darwin, Northern Territory.**

The Mapping Sciences Institute, Australia, held the 400 Years of Mapping Australia Conference in Darwin from 23 to 25 August as an event under the Australia on the Map 1606-2006 commemoration. It was scheduled to coincide with arrival of the *Duyfken* replica and other events.



Figure 26. The replica Duyfken sets sail from Fremantle, Australia.

Source: [http://news.bbc.co.uk/nol/shared/spl/hi/pop\\_ups/06/europe\\_enl\\_1144316633/img/laun.jpg](http://news.bbc.co.uk/nol/shared/spl/hi/pop_ups/06/europe_enl_1144316633/img/laun.jpg)

Registrations totalled 170 including 42 accompanying persons and comprised a good mix of people with interests in cartography, hydrography, surveying and history. About two-thirds of delegates were visitors to Darwin. The conference organiser was Trevor Menzies, the current MSIA President.

The conference was opened by the Honourable Ted Egan AO, Administrator of the Northern Territory who is Patron for the Northern Territory of the Australia on the Map 1606-2006 commemoration. Dorothy Prescott presented the introductory paper and set a high standard for the 18 papers that followed. The overall standard of presentation was high and the speakers proved to be entertaining as well as informative. This was evident from the fact that all sessions were well attended despite the number of other things that visitors to Darwin can do during the ideal weather of the Dry Season.

The welcome reception was hosted in Parliament House by the Honourable Claire Martin MLA, Chief Minister of the Northern Territory. At this function the Chief Minister also opened an exhibition on 400 Years of Surveying and Mapping the Northern Territory organised by the Northern Territory Library, the NT Department of Planning and Infrastructure and the NT Division of the Institution of Surveyors. . The exhibition contained 122 items including maps, photographs and surveying & drafting equipment that were arranged to give a chronology of the history of the Northern Territory from pre European times to the present day. Other social functions included a sunset cruise on Darwin Harbour, a visit to the Mindil Beach sunset markets and the conference dinner. The Honourable Gary Nairn MP, Special Minister for State, Commonwealth of Australia, and a former Northern Territory surveyor addressed the dinner.

Typical of the presenters was Bob *Forsyth*, the co-author of the book *Sweers Islands Unveiled*. Bob is pictured in figure 27 and the book cover in figure 28.



Figure 27. Conference presenter *Bob Forsyth*, co-author of the book *Sweers Islands Unveiled*. Source: [http://www.winnem.com/siec/nsweers\\_island.htm](http://www.winnem.com/siec/nsweers_island.htm)

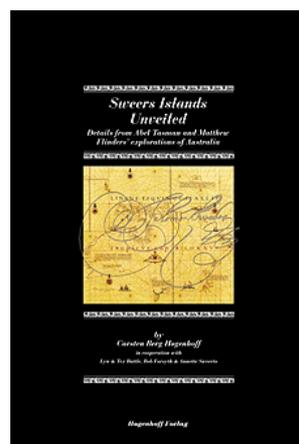


Figure 28. *Sweers Islands Unveiled*. Source: [http://www.winnem.com/siec/nsweers\\_island.htm](http://www.winnem.com/siec/nsweers_island.htm)

A discussion was held in the closing session on the merit of forming a group to focus on issues relating to historical cartography in Australia. The discussion was widened to include surveying and hydrography given that the audience included many members from organisations with an interest these areas. After good discussion a motion was adopted by those present at the discussion.

## Resolution

### Recognising:

- The importance and extent of the experiences and achievements of Australian explorers, surveyors, hydrographers and cartographers;
- the level of interest within and beyond the spatial sciences community as demonstrated at this MSIA 400 Years of Mapping Australia event (the Conference);
- the inestimable value of heritage maps, plans, artefacts and journals to future generations;
- the fragility of all records, some relatively recent, and the reality of lost records being lost forever;
- not overlooking the thought that a community unaware of its heritage is unlikely to be confident of its journey; and
- further recognising that interest in mapping heritage extends to groups beyond the surveying / mapping professional societies

Those present at the Conference plenary session resolve that:

- Steps be taken to create a permanent organisation to take up the issues raised here.

The MSIA was delighted with the success of the conference as evidenced by the better than expected attendance and good feedback from delegates. The interest in the history of Australian cartography is high and the MSIA intends to incorporate historical content into future conferences.

## Conclusion

The MSIA continues to contribute to the activities of the ICA. The Institute and its members have supported the ICA through its Executive Committee, Commissions and Working Groups and by editing the ICA newsletter. Continued association with this international body is essential for providing an Australian voice and an Australian viewpoint in the international cartographic community.

Author	Year	Title	University/Company
William Cartwright	2005	DEVELOPING THE ILLUSTRATED WORLD ATLAS	RMIT University
Sarah Anderson			Weldon Owen Publishing and
David Fraser	2005	DEVELOPMENT OF THE ICA-SPONSORED INTERNET CARTOGRAPHY TEACHING PROGRAMME	RMIT University
Graciela Metternicht	2005	A SEMI-AUTOMATED APPROACH FOR GIS BASED GENERATION OF TOPOGRAPHIC ATTRIBUTES FOR LANDFORM CLASSIFICATION	Curtin University of Technology
Maree Platt	2005	SUSTAINABLE FUTURES THROUGH INTEGRATED DATA MANAGEMENT	Department of Sustainability & Environment
Hayley Rokahr			Department of Sustainability & Environment
Graciela Metternicht	2005	MULTI-TEMPORAL SPATIAL MODELLING OF NOXIOUS WEED DISTRIBUTION USING HISTORICAL REMOTE SENSING IMAGERY	Curtin University of Technology
T.P. Robinson			
David (Hyun Jong) Lee	2005	DEVELOPMENT OF A 3D GEO-REFERENCED GROUNDWATER MODEL FOR SALINITY MANAGEMENT	RMIT University
David Fraser			
Craig Feuerherdt	2005	MAPPING WATER RESOURCE DATA	Department of Sustainability & Environment
Michael Black	2005	WEB CARTOGRAPHY & WEB-ENABLED GEOGRAPHIC INFORMATION SYSTEMS (GIS) NEW POSSIBILITIES, NEW CHALLENGES	RMIT University
William Cartwright			
Karen Wealands	2005	USER ASSESSMENT FOR DEVELOPING OPTIMAL CARTOGRAPHIC REPRESENTATION MODELS WITHIN AN AUSTRALIAN MOBILE LOCATION-BASED SERVICES TRAVEL APPLICATION	RMIT University
William Cartwright			RMIT University
Suzette Miller			RMIT University
Peter Benda			Telstra
William Cartwright	2005	COMMUNITY COLLABORATIVE DECISION-MAKING TOOLS: DETERMINING THE EXTENT OF 'GEOGRAPHICAL DIRTINESS' FOR EFFECTIVE DISPLAYS	RMIT University
Chris Pettit	2005		Department of Primary Industries, VIC
Anitra Nelson	2005		RMIT University
Mike Berry	2005		RMIT University
Amy L. Griffin	2005	CAN YOU SEE WHAT I SEE? HELPING INDIVIDUALS BENEFIT FROM THE INSIGHTS OF INTERDISCIPLINARY COLLABORATION	University of New South Wales
Xiaogang Chen	2005	EXPLORATION OR COMMUNICATION: DEFINING EFFECTIVE VISUALISATIONS FOR SPATIAL DATA	University of Melbourne
Ian Bishop			University of Melbourne
Mingzheng Shi			University of Melbourne

Craig Feuerherdt	2005	EXPLORING FUTURE LANDSCAPES USING VIRTUAL ENVIRONMENTS	RMIT University
William Cartwright	2005		RMIT University
Michael Black	2005		RMIT University
Tim Germanchis	2005	USING COMPUTER GAMING TECHNOLOGY TO EXPLORE HUMAN WAYFINDING AND NAVIGATION ABILITIES WITHIN A BUILT ENVIRONMENT	RMIT University
William Cartwright	2005		RMIT University
Chris Pettit	2005		Department of Primary Industries, VIC
Fatima Basic	2005	COMMUNICATING FLOOD RISKS TO THE PUBLIC THROUGH VISUALIZATION IN SCIENTIFIC COMPUTING	RMIT University
William Cartwright	2005		RMIT University
John Handmer	2005		RMIT University
Dorothy F. Prescott	2005	AUSTRALIAN PLATES IN JOHN ARROWSMITH'S LONDON ATLAS OF UNIVERSAL GEOGRAPHY	University of Melbourne
Cristhiane da Silva Ramos	2005	EXPANDING MAP ACCESS FOR BRAZILIAN CHILDREN: AN OPEN SOURCE TEMPLATE FOR PUBLISHING SCHOOL ATLASES ON THE WEB	RMIT University
William Cartwright	2005		RMIT University
Judith Scurfield	2005	AUSTRALIA ON THE MAP 1606 - 2006	State Library of Victoria
Dane Harkin	2005	DESCOMPOSING THE MAP: USING HEAD-UP DISPLAY FOR VEHICLE NAVIGATION	RMIT University
William Cartwright	2005		RMIT University
Michael Black	2005		RMIT University
Lihua Zhao	2005	CENSUS MAPPING FOR MARKET RESEARCH AND PRODUCTS ADVERTISEMENT	University of New South Wales
William Cartwright	2003	EXPLORATION OF THE POTENTIAL OF USING THE CONCEPT OF THE GEOEXPLORATIRIUM FOR FACILITATING ACQUISITION OF GEOGRAPHICAL KNOWLEDGE: FIRST CUT	RMIT University
Bob Williams	2003		Defence Science and Technology Organisation
David Fraser	2003	CARTOGRAPHIC VISUALIZATION AND MODELING OF NATURAL DISASTERS	RMIT University
Tim Germanchis	2003	THE POTENTIAL TO USE GAMES ENGINES AND GAMES SOFTWARE TO DEVELOP INTERACTIVE, THREE-DIMENSIONAL VISUALIZATIONS OF GEOGRAPHY	RMIT University
William Cartwright	2003		RMIT University
Russel Hay	2003	VISUALISATION AND PRESENTATION OF THREE DIMENSIONAL GEOSCIENCE INFORMATION	Geoscience Australia

Metternicht, G.	2003	EXPANDING DISTANCE EDUCATION IN THE SPATIAL SCIENCES	Curtin University of Technology	
Feuerherdt, C.	2003	DISTRIBUTING CATCHMENT INFORMATION: AN AUSTRALIAN PERSPECTIVE	Department of Primary Industries, Bendigo, Victoria	
Platt, M.	2003		Department of Primary Industries, Bendigo, Victoria	
Metternicht, G.	2003	FARM SCALE SOIL CARTOGRAPHY USING ASTER DATA AND GIS TECHNOLOGY	Curtin University of Technology	
Arnold, L.	2003	A SCALE-INDEPENDENT DATABASE FOR DYNAMIC SPATIAL UPDATING OF NON-STANDARD MAP PUBLICATIONS	Curtin University of Technology	
Wright, G.	2003		Curtin University of Technology	
Chhetri, P.	2003	MAPPING THE POTENTIAL OF SCENIC VIEWS FOR THE GRAMPAINS NATIONAL PARK	RMIT University	
Arrowsmith, C.	2003		RMIT University	
Fatima Basic	2003	GEOGRAPHIC VISUALIZATION TOOLS FOR COMMUNICATING THE RISK OF FLOODS	RMIT University	
William Cartwright	2003		RMIT University	
John Handmer	2003		RMIT University	
Metternicht, G.	2003	TRIVARIATE SPECTRAL ENCODING: A PROTOTYPE SYSTEM FOR AUTOMATED SELECTION OF COLOURS FOR SOIL MAPS BASED ON SOIL TEXTURAL COMPOSITION	Curtin University of Technology	
Stott, J.	2003		Curtin University of Technology	
Metternicht, G.	2003	CARTOGRAPHIC TOOLS FOR IMPROVED SPATIAL PLANNING OF RURAL AREAS: MULTI-CRITERIA DECISION MAKING TECHNIQUES AND GEOGRAPHIC INFORMATION SYSTEMS	Curtin University of Technology	
Suhaedi, E.	2003		Curtin University of Technology	
Metternicht, G.	2003		Curtin University of Technology	
Gonzalez, S.	2003		Curtin University of Technology	
Honey, F.	2003		Curtin University of Technology	
Beeston, G.	2003		Department of Agriculture of Western Australia	
Delfos, J.	2003		SpecTerra Services Pty Ltd	
Platt, M.	2003		CATCHMENT ACTIVITY MANAGEMENT SYSTEM	Centre for Land Protection Research - DPI - VIC
Urquhart, K.	2003		ENSURING USEFUL CARTOGRAPHIC REPRESENTATIONS IN LOCATION-BASED SERVICES	RMIT University
William Cartwright	2003			RMIT University
Miller, S.	2003	RMIT University		
Mitchell, K.	2003	Webraska Mobile Technologies SA		
Quirion, C.	2003	Webraska Mobile Technologies SA		
Benda, P.	2003	Sensis Pty		