Spatial Information Day 2008

Program and Abstract Book

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Primary Industries and Resources SA

8:00 – 8:45am	REGISTRATION

	Hickinbotham Hall, Chair: Penny Baldock
8:45 – 9:05am	OFFICIAL OPENING Andrew Mills – SA Government Chief Information Officer *ICT in Government – the Path Ahead for GIS*
9:05 – 9:35am	KEYNOTE SPEAKER Dr Renee Bartolo – Spatial Sciences Institute *Future Directions in the Spatial Industry*
9:35 – 10:05am	KEYNOTE SPEAKER Dr Marnie Leybourne – WALIS *Achieving Excellence in the Spatial Information Industry through Partnerships: the Western Australian Phenomenon*

10:05 10:30am	MORNING TEA

	Ecological Planning in Urban and Regional Landscapes Hickinbotham Hall, Chair: Susana Valdivia	Spatial Business Solutions Exhibition Hall, Chair: David Coombe	Generation Y: The Future of the Industry The Vines, Chair: Mettina Barrington
10:30 – 11:00am	1. Analysing Landscape Futures for Dryland Agricultural Areas: A Case Study in the Lower Murray Region of Southern Australia Dr Brett Bryan, CSIRO Sustainable Ecosystems	2. Unlocking the "Where" in Business Intelligence David McDonald and Dave Gerner, Tonkin Consulting	3. Launch of the Spatial Sciences Institute Young Professionals Mentoring Program Overcoming Generational Issues in the Workplace - a Spatial Industry Perspective Jason Dreimanis, Simon Callaghan and Bronwen Bowskill, Spatial Sciences Institute Young Professionals
11:00 – 11:30am	4. Ecological Mapping of the City of Tea Tree Gully Catherine Miles and Angela London, Rural Solutions SA	5. Spatial Delineation of Residential Real Estate Submarket Boundaries Tony Lockwood, University of South Australia	
11:30 – 12:00pm	6. Achieving Multiple Benefit from Irrigation Landscape Reconfiguration in the Murray Darling Basin Dr Neville Crossman, CSIRO Sustainable Ecosystems	7. PIRSA Geological Survey GIS and 3D Geological Models Laszlo Katona, Primary Industries and Resources SA	8. Designing a Course in Surveying and Spatial Information for Generation Y Dr Craig Roberts, University of New South Wales

12:00 12:45pm	LUNCH

	Imagery: Issues, Applications & Technology Hickinbotham Hall, Chair: Simon Callaghan	Indigenous Applications – Australia and Beyond Exhibition Hall, Chair: Paul Corcoran	Government Data Directions The Vines, Chair: Daniel Kruimel
12:45 – 1:15pm	9. Objective Unsupervised Classification of Gamma Radiometrics and Topography for Mapping Clay Content Ramesh Raja Segaran, University of Adelaide	10. Provision of First Nations Land and Resource Information Gateway Dugald Smith, Integrated Land Management Bureau, British Columbia	11. Rural Property Addressing - A Sign of Things to Come Jeff Laubsch, Department for Transport, Energy and Infrastructure
1:15 – 1:45pm	12. The Unexpected Demise of High-resolution Satellite Imagery Mark Deuter, AEROmetrex Pty Ltd	13. Aboriginal Remote Community Assets - Capture and Communicate Greg Wilkins, Department for Families and Communities	14. Toward a Survey Accurate Cadastre: Land Services Group - Spatial Enablement Project Peter Kentish & Dr Colin East, Department for Transport, Energy and Infrastructure
1:45 – 2:15pm	15. Hyperspectral Analysis for Environmental Applications Dr Megan Lewis, University of Adelaide	16. The COSI (Checking of Site Information) Project: Participative Management of Aboriginal Heritage Information Nukunu Peoples' Council Peter Birt and Rita Kucera, Department of the Premier and Cabinet	17. Updating SA Native Vegetation Mapping using Landsat Imagery Classification Felicity Smith, Department for Environment and Heritage

2:15 – 2:45pm	AFTERNOON TEA			
	Web-based Data Delivery Hickinbotham Hall, Chair: David Floreani	**Spatial Data from the User Perspective** Exhibition Hall, Chair: Caroline Jackman	**Spatial Industry Directions** The Vines, Chair: Sarah Crossman	**Surveying** The Gallery, Chair: Michael Grear
2:45 – 3:15pm	18. Proposed Project Overview of the Implementation of a Public GIS Portal for Members of the Community Adrian Ballestrin, City of Tea Tree Gully	19. Geographic Based Information from the Australian Bureau of Statistics Website Pam Balfour, Australian Bureau of Statistics	20. Geospatial Data Initiatives from the Bureau of Meteorology John Nairn, Bureau of Meteorology	21. Water Sensitive Urban Design Professor Simon Beecham, University of South Australia
3:15 – 3:45pm	22. MapIQ - Integrating Spatial and Business Knowledge for Improved Customer Service Nick Weinmann, Department for Families and Communities	23. Spatial Information Technologies and Multi-Disciplinary Research in Urban Studies Dr Sadasivam Karuppannan, University of South Australia	24. Place Names - A State, National and International Perspective Bill Watt, Department for Transport, Energy and Infrastructure	25. South Australia Well Placed for a New CORS Infrastructure Dr Craig Roberts, University of New South Wales
3:45 – 4:15pm	26. Mashups: What are they and how can I benefit? Phil Punter, ESRI Australia	27. The Analyst's Detection Support System - An Overview Peter Perry, Sydac Pty Ltd	28. SSI and ASIBA Industry Directions SSI & ASIBA	29. Lane Cove Tunnel – Surveying the Collapse Recovery Michelle Grose
	Hickinbotham Hall, Chair: Penny Baldock			
4:20 – 4:50pm	KEYNOTE SPEAKER Professor Chris Daniels – University of South Australia *"Mummy there is a baby crocodile in our shed" – A Foray into Citizen Science*			
4:50 – 5:00pm	Closing Ceremony – ASIBA SA President			
5:00 – 6:00pm	HAPPY HOUR - Pod 3 SPONSORED BY GISJOBS AUSTRALIA Spatial Recruitment Solutions GUARANTEED!			
7:00 – 11:30pm	SOUTH AUSTRALIAN SPATIAL EXCELLENCE AWARDS DINNER			

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Official Opening

ICT in Government – the Path Ahead for GIS

Andrew Mills – Office of the Chief Information Officer

Andrew Mills

Chief Information Officer
Office of the Chief Information Officer

Andrew Mills has worked in the public sector for 30 years, for both the South Australian and the Australian Government. Andrew is currently Director ICT Strategic Sourcing, accountable for central Information and Communications Technology (ICT) sourcing support, procurement projects for a range of ICT products and services and the strategic management of the vendors responsible for ICT infrastructure delivery on behalf of the government.

He has been an executive for the SA Government since 1998 and in that capacity, worked on a range of projects including an innovative spatial information industry facilitation project, an ICT infrastructure project for the Parliament of South Australia and an Aboriginal Heritage project. He has also fulfilled a number of operational roles within the government's central ICT business unit and Department for Aboriginal Affairs & Reconciliation. In his most recent role he was responsible for the delivery of the Future ICT Program, the implementation of the second generation of across government ICT infrastructure contracts.

Before joining the SA Government he undertook a broad range of roles in the Defence Department, including operational management, procurement and contract management, training and lecturing, ICT strategy and policy development, systems engineering and personnel management.

Andrew has a BSc from the University of New South Wales and a Master of Science in Electronic Systems from Cranfield University in the UK.

Keynote Presentations

Future Directions in the Spatial Industry

Dr Renee Bartolo – President, Spatial Sciences Institute

The use of spatial information and spatial applications has moved into the mainstream. For many users this has become integrated seamlessly into their daily activities. In car navigation systems are standard in many modern cars and mobile phones now come equipped with GPS or other location technology. IT companies with a web presence such as Google, Yahoo and Microsoft have incorporated spatial information into their services so completely that many users are producing spatial information without even knowing it. But location based search, geotagging of photos and turn by turn directions are just the tip of the iceberg. This paper will present some of the more unique and innovative spatial based applications that exist and the implications of these applications for everyday life.

Renee Bartolo

President
Spatial Sciences Institute

Renee is currently the Spatial Sciences Institute President. She has been involved in the SSI Young Professionals and is an active member of the Remote Sensing and Photogrammetry Commission.

Her day job is working as a Spatial Scientist for the Australian Government's

Department of the Environment, Water, Heritage and the Arts, in the Supervising Scientist Division based in Darwin. Renee's most recent work has involved using spatial technologies to conduct an ecological risk assessment for Australia's tropical rivers.

She has a PhD in remote sensing and has worked in academia, private industry and government. Renee is passionate about spatial and has been involved in promoting it to the wider community through novel means such as the Where It's At podcast. She has been recognised in the past nationally as an innovator and business woman.

Achieving Excellence in the Spatial Information Industry through Partnerships: the Western Australian Phenomenon

Dr Marnie Leybourne – Director Western Australian Land Information System (WALIS)

For 27 years, spatial information has been formally coordinated across government in Western Australia. In 1981, the forerunner to what is now known as the Western Australian Land Information System (WALIS) was created with the major objective of ensuring effective coordination of land information to reduce duplication and increase efficiency of data use.

A major outcome of the past 27 years has been the building of a culture that encourages collaboration rather than the "silo mentality" that permeates across so many areas of government business.

The excellence of the WA spatial information industry can be partly attributed to the success of WALIS. Through WALIS, Western Australia has had data standards and policies relating to data pricing, access and custodianship that has provided greater certainty to data users relative to other Australian jurisdictions. Applications such as the WA Atlas and WALIS Interragator have offered viewing access to data and metadata relating to datasets held by agencies.

It is recognised that challenges still exist – otherwise WALIS would no longer be relevant. In 2008 major questions facing WALIS include a need to review and revise the data pricing and access policy and considerable work is being done on this. A couple of years ago, the Australian Federal Government changed its policy to provide access to significant amounts of data for free and this, coupled with the introduction of Creative Commons for data licence agreements, will influence the way in which WALIS will revise its own policy.

The WALIS culture of collaboration has certainly assisted in the successful development and implementation of the Shared Land Information Platform (SLIP). The SLIP Program was initiated by Landgate (then the Department of Land Information) in 2004. Its goal was to provide on-line real-time access to government spatial information; to, in effect, operationalise a spatial data infrastructure (SDI) for Western Australia.

Where to from here? It is felt in WA that the partnering approach in the spatial information industry is providing an edge and it is expected that this will continue. It is my hope that WALIS will continue to provide the cooperative bridge across government and the private sector into the future.

Marnie Leybourne

Director

Western Australian Land Information System (WALIS)

Marnie Leybourne is Director of the Western Australian Land Information System (WALIS). She has worked for the WA Government for 12 years, mostly in the area of natural resource management.

Marnie has a PhD in Geography from the University of Lyon II, France; a diploma and research diploma in development studies from Geneva University, Switzerland; and a Diploma in Business and Administration (Management) from Massey University. For both her research diploma and PhD, she spent three years working with the semi-nomadic Bedouin society in Syria. She has also undertaken research on agricultural and pastoral societies in Australia, New Zealand and Switzerland.

Marnie was inaugural chair of Women in Geographic Information Technology (WinGIT) and is currently chair of the WA Region of the Spatial Sciences Institute (SSI) and President Elect for SSI nationally.

"Mummy there is a baby crocodile in our shed" – A Foray into Citizen Science

Professor Chris Daniels - University of South Australia

Federal and State governments are now expressing an eagerness to support research projects that involve the general public in data collection and in the implementation of the results. Hence research can be observed to materially advance the community wellbeing. We chose to attempt a Citizen Science research project by working with the general community through ABC 891 radio to gain a State wide snapshot of the biology of the bluetongue lizards. In the process we wanted/needed to gain insights into the community attitudes to these lizards and hence better understand to develop conservation actions. This type of research was novel for us and for the ABC. Here Chris will present the research and some surprising conclusions form the study.

Chris Daniels

Professor of Urban Ecology, School of Natural and Built Environments
University of South Australia

Chris Daniels is Professor of Urban Ecology in the School of Natural and Built Environments at the University of South Australia. He is head of the discipline of Geospatial and Environmental Management, and is Director of BioCity@UniSA the major research centre in the School of Natural and Built Environments. Chris was educated at the University of Adelaide and the University of New England. Chris has held academic positions at the University of California and Flinders University before moving to the University of Adelaide and now UniSA. He is married with 2 children and lives in Belair. Chris has always had an abiding interest in reptiles, particularly lizards, and is a passionate communicator to the general community, about science and the environment. Chris has a regular session on 891 ABC Radio. He won the premiers science award for communication and education in 2007.

In 2002 Chris, with Tim Flannery, and scientists from the SA Museum, Botanical Gardens, Royal Zoological Society, SARDI and Department for Environment and Heritage, formed BioCity. This organisation has since grown into BioCity@UniSA, a partnership of over 140 members from over 40 institutions in the State focusing on education, communication and research into the urban environment of Adelaide. He recently edited the Book Adelaide Nature of a City: Ecology which won the Whitley Award, and is in the process of writing 3 more in the series, on water, fire and climate change.

Concurrent Sessions

1. Analysing Landscape Futures for Dryland Agricultural Areas: A Case Study in the Lower Murray Region of Southern Australia

Dr Brett Bryan – CSIRO Sustainable Ecosystems

There is an urgent need to reverse the declining environmental condition of rural landscapes across southern Australia. Current approaches focus on natural resources management planning, policy and decision making at the regional level. Regional plans and associated on ground investment have the potential to have widespread and long-lasting environmental, economic and social impacts. However, rarely are these impacts quantified and clearly understood.

In this presentation we describe the spatially integrated project called the Lower Murray Landscape Futures (LMLF) which aimed to assess the impact of regional plans for the Lower Murray on selected environmental and socioeconomic indicators under alternative future landscape scenarios. The dryland component of the LMLF is a large-scale integrated regional planning and landscape futures analysis focusing on issues such as:

agricultural production including food, fibre and bio-energy production; soil erosion; loss of terrestrial biodiversity; rising water tables; and the salinisation of the land and waterways. The spatial data and model intensive project aimed to provide useful evidence-based natural resource management planning advice to regional agencies.

Landscape futures are plausible spatial arrangements of management actions (vegetation management, ecological restoration, conservation farming, deep-rooted perennials, biomass, and biofuels) that achieve regional natural resource management targets, assessed under six policy options and five climatic and economic scenarios. The triple bottom line impacts of landscape futures under each scenario and policy option were assessed and visualised. The costs and benefits of landscape futures were compared and the trade-offs assessed to inform regional planning in the Lower Murray. The study demonstrates that good planning and policy and targeted approaches for locating natural resource management actions can increase the economic value of a region by many millions of dollars while at the same time improving the condition of natural resources.

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2. Unlocking the "Where" in Business Intelligence

David McDonald and Dave Gerner, Tonkin Consulting

Business Intelligence (BI) is essentially the use of software solutions for gathering, storing, analyzing and providing access to data to drive and support decision making across an organisation. The purpose of BI is to enable users to make better decisions by providing relevant information to users that allows them to answer questions about their particular business problems. BI allows users to gain a better understanding of the information held in an organisations database. BI can be, and is often deployed into every department of an organisation and for almost any area where data needs to be delivered to users as information. The use of BI often supports mission-critical applications providing the organisation with decision making tools. BI solutions are deployed in many ways including pdf-based reports, interactive reports, graphical reports, performance management scorecards and dashboards. More recently there has been an increasing need to further the presentation and analysis of business information from a BI into a spatial environment, where users can not only extend their understanding of critical business information, but can disseminate this information across an organisation in a visual and interactive environment.

A Location Intelligence Component (LIC) can be incorporated into a BI solution as a means of spatially-enabling critical business information and allowing the analysis of this data in a spatial environment. Incorporating location-based functionality extends and increases the capabilities of a BI platform. Importantly, a LIC is a means of leveraging off established BI platforms for enhanced information viewing and analysis, and enables users to combine and integrate their BI reporting, query and analysis environments with a geographic visualisation and analysis capabilities. As well as furthering the capacity of information and the level of analysis, location intelligence allows BI users to easily distribute sophisticated reports together with highly functional, bi-directional geographic querying and visualisation tools, across their enterprise.

A critical factor facing many organisations is the secure management of data. Embedding a LIC inside a BI platform allows the organisation to securely manage data within a single environment, whilst maintaining data integrity. Importantly as data is spatially-enabled at the user level, it can be disseminated with a spatial context. At an enterprise level, applications and data can be managed with the security of a BI system, whilst users gain access to valuable spatial tools that enhance and enrich their use of data.

This presentation provides an overview of the Pitney Bowes MapInfo Location Intelligence Component as a means of unlocking the power of spatial analysis from Business Intelligence platforms. We will present some examples of how LIC has been incorporated into Cognos, Business Objects and MicroStrategy Business Intelligence platforms, highlighting the value of being able to spatially-analyse business information across an entire government agency or corporate enterprise.

3. Launch of the Spatial Sciences Institute Young Professionals Mentoring Program & Overcoming Generational Issues in the Workplace - a Spatial Industry Perspective

Jason Dreimanis, Simon Callaghan and Bronwen Bowskill, Spatial Sciences Institute Young Professionals

At the inaugural workshop of SSI YP's in 2004, a number of activities and services were brainstormed that could provide new members with additional value on top of the tangible aspects that come with membership of the SSI.

One of the key services identified for young professionals was the provision of a Mentor Program. Such programs in industry are regarded highly by those who have had the opportunity to participate, either as a Mentor or Mentee.

The South Australian SSI Young Professionals have committed to launching this program in 2008. This workshop will outline the fundamental aspects of the Mentoring Program, provide information for those who are interested or have already applied, and outline some of the critical success factors to those taking part in the program.

The second part of this workshop will review some of the challenges faced by Young Professionals when entering the workplace, as well as those faced by employers in offering value to this new generation of spatial professional. This discussion will highlight some of the more innovative approaches that employers are taking in order to cater for this generation's needs, and some of the pressing needs of young professionals as employees, critical for businesses to understand and foster the future of the industry.

4. Ecological Mapping of the City of Tea Tree Gully

Catherine Miles and Angela London, Rural Solutions SA

This project was undertaken to provide the City of Tea Tree Gully (CTTG) with a tool to enable them to take into consideration the ecological value of open space in making planning and development decisions. Studies have shown that the response of native fauna to habitat modifications differs significantly in urban areas compared to rural areas. While ecological planning principles are well developed for application in rural landscapes, urban areas have received much less attention, both in Australia and internationally. CTTG includes both rural and urban landscapes. It was therefore necessary for this project to draw on the findings of recent urban ecological studies to develop a new model suitable for CTTG.

Existing GIS data sets in conjunction with high resolution 4-band remotely sensed imagery were utilised to identify areas of open space within CTTG. This enabled the resulting map to more accurately represent the open space within CTTG than would classification based on land use or cadastral details. In particular, the use of imagery enabled the identification of significant areas of open space in private gardens, especially along watercourses and in the foothills area. Because of the structural complexity of private gardens, it is likely that these areas contain important habitat for native urban fauna.

Each open space was then classified and scored for

- Size of site (using GIS calculation of total contiguous open space)
- Habitat richness (on-ground surveys and imagery)
- Water availability (using Euclidean distance modelling technique)
- Edge to area ratio (calculated from total contiguous open space).
- Distance to core habitat (using Euclidean distance modelling)
- Proportion of open space within a 100m radius (calculated programmatically)
- Proportion of actively growing vegetation within a 500m radius (based on remotely sensed classification of vegetation)
- Proportion of roads within a 500m radius (based on road densities).

The first four features were combined to give an indication of the ecological value of each site based on the features of the site, while the latter four combine to give a value based on the spatial arrangement of sites. By combining the site characteristics and site relationships, the resulting map depicts the potential ecological value of all open spaces within CTTG.

The resulting map enables the CTTG to take into consideration the ecological value of all open space when making decisions regarding changes of land use, subdivisions, tree clearance, biodiversity planning, strategic planning and other issues.

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5. Spatial Delineation of Residential Real Estate Submarket Boundaries

Tony Lockwood, University of South Australia

While it is generally accepted that residential submarkets exist, this is not the case for either their definition or delineation. The literature demonstrates the many submarket delineation criteria used and discusses some important issues to consider when attempting to delineate their spatial dimensions. These include basing such delineation on:

- data analysis and not on a priori knowledge.
- a recognition that a submarket may be composed of both structural and spatial components simultaneously.
- the underlying residential structure of the study area.
- the concept of substitutability constrained by price as submarkets are an economic entity and therefore should be defined with reference to the marketplace.

The first basic premise of the thesis is that when a dwelling is sold, the commodity traded is a piece of real estate geography comprising a complex bundle of both spatial and structural attributes. The second basic premise is the recognition in the methodology of the importance of 'location'. The price of the real estate geography varies across geographical space in a continuous fashion and it is this price variability that is defined, in this study, to be the geospatial submarket identifier.

The objective of this study was to develop and assess a methodology for deriving the geospatial dimensions of residential real estate submarkets based on the behaviour of the marketplace with respect to the underlying dimensions of the residential real estate living structure (RLS). Importantly, the methodology makes no prior assumptions about where the spatial boundaries might be. They were empirically derived from the data alone with the efficacy of the methodology being demonstrated by applying it to the metropolitan area of Adelaide.

The study adopts a two-stage methodology reflecting the two basic premises outlined in the introduction. Firstly, a complex bundle of attributes (both spatial and structural) is collected for every property in the study area and distilled into its underlying dimensions using principal component analysis. The resulting components are used in the second stage as independent variables in a hedonic geographically weighted regression model (GWR) to determine the price variability across geographical space of the underlying residential real estate structure. The submarket identifier is price. In particular it is the similarity in the price pattern of the continuously changing hedonic parameter estimates of the underlying residential structure components across geographic space that is the basis for the geospatial submarket delineation. GWR was run across a regular 300m grid for the entire study area (9,075 regression points) each generating a set of hedonic parameter estimates that were clustered using Ward's hierarchical algorithm and when spatially plotted were deemed to represent the geospatial submarket boundaries.

<u>Stage 1</u>

The spatial distribution of the individual components of the underlying real estate geography

<u>Stage 2</u>

Various geospatial submarket boundary plots representing different levels of homogeneity of the hedonic parameter estimates nominated by the user.

The study represents a new approach to the delineation of geospatial submarket boundaries and is yet to be fully assessed by the two major identified users (the planning profession and the valuation profession). However, initial feedback indicates that the ability of the methodology to describe the geospatial submarket boundaries in terms of 'how' and 'where' location affects the market price of the underlying real estate geography, gives the land professional a better understanding of the submarket structure in which they are working.

6. Achieving Multiple Benefit from Irrigation Landscape Reconfiguration in the Murray Darling Basin

Dr Neville Crossman, CSIRO Sustainable Ecosystems

The Prime Minister's $12.9 billion Water for the Future 10-year water plan aimed at 'fixing the Murray' provides a once-in-a-lifetime opportunity to redesign and reconfigure irrigation districts in the Murray Darling Basin (MDB). Irrigated agriculture and natural ecosystems in the MDB are in decline due to over-allocation of water resources and historical accidents of development, which has been compounded by the recent extended dry period. There is not enough water to meet the needs of irrigators and the environment. Government investment is currently earmarked for modernisation of old irrigation infrastructure that is inefficient at delivering water. Water savings can be expected from the replacement of open channels to piped water delivery infrastructure. Governments are also purchasing water that will be 'the environment's share'. But where are the locations to modernise irrigation infrastructure and purchase water that provide greatest economic and environmental benefits?

This presentation aims to answer this question through the use of a spatial data and analyses to identify locations for irrigation infrastructure modernisation, and conversely, locations in which changes from irrigated to non-irrigated land uses provide greatest environmental, economic and water savings benefits. This study focuses on the Torrumbarry Irrigation District in north western Victoria. We model a series of cost and benefit spatial layers, including delivery cost of water, land suitability for irrigation, agricultural profitability, carbon sequestration potential, amenity and lifestyle value, downstream salinity benefit, and water ecosystem benefit. We use a decision-tree and participatory approach for identifying spatial priorities.

We identify locations in the study area for conversion of irrigation to dryland agriculture, tree-based ecological restoration for climate change and ecosystem benefits, and irrigation development and modernisation of irrigation infrastructure. We demonstrate via a cost-benefit analysis that the net economic returns to the region could increase significantly for the same or lower levels of water use and there could be other significant environmental and economic benefits.

7. PIRSA Geological Survey GIS and 3D Geological Models

Laszlo Katona, Primary Industries and Resources SA

The presentation will showcase the Geological Survey of South Australia's use of GIS in mapping, mineral exploration and 3D modelling. The 3D geological modelling program is an emerging program for the survey and will be the main focus of the presentation.

GIS has a central role in the Geological Survey's data, products and methodologies. With advances in desktop computing power and 3D modelling software, 3D models are now becoming a common vehicle for delivering the results of mineral exploration and modelling projects. The Geological Survey's 3D modelling team have been constructing province scale 3D geological models for about three years. The software platforms and workflow for constructing, validating and distributing 3D models have matured during that time. This presentation will showcase the use of GIS and 3D within the survey and illustrate its framework for constructing, validating and distributing 3D models. Several models will be presented as examples of the process. Of particular interest is the use of kriging to interpolate a 3D model and the use of geophysical inversion and Monte-Carlo simulation in tuning models to honour geophysical data.

The objectives of the project are to:

- Highlight the ways that GIS is improving PIRSA's ability to manufacture and deliver a range of information products to the exploration industry.
- Demonstrate how 3D geological models and the modelling process can increase our understanding of the configuration of lithologies buried beneath cover.

The GIS datasets, products, 3D models and increased the understanding of geology below cover.

GIS and the emerging use of 3D modelling have provided unprecedented ability to view, manage and analyse spatial data from multiple sources. This has led to informed decision making, resulting in significant exploration growth in South Australia.

8. Designing a Course in Surveying and Spatial Information for Generation Y

Dr Craig Roberts, University of New South Wales

The lack of Commonwealth Government funding to higher education over the last decade has caused Universities to respond by rationalizing courses, teaching larger classes and reducing face-to-face teaching hours. The challenge for academics is to provide the same standard of education in less time, to more students and cater to the perceived needs of a predominantly Gen Y student cohort. But all is not lost! Gen Y are IT savvy, flexible, want engagement, freedom, respect and good education. Can we meet this challenge?

This presentation gives a brief overview of the structure of the Bachelor of Engineering (Surveying and Spatial Information Systems) program at the University of New South Wales, Sydney in order to provide context for a new first year course offered to all Engineering students. A new flexible first year option requires the course to cater for up to 200 students. The movie “Pulp Fiction” is used as an analogy and informs the order in which material is presented. The aim of the course is for students to appreciate spatial data quality – where does it come from, can I rely on it, how could I acquire data to the required accuracy and precision for a given task?

Some examples of student feedback from previous years are presented as well as some comments on how the course appeals to a Gen Y audience. This theme is extended to ask how to structure a Degree program to appeal to Gen Y and indeed how should the Surveying/ Spatial profession be promoted to Gen Y. How will recent developments in national education such as the new 3 + 2 model at Melbourne University and the University of South Australia as well as the distance option at University of Southern Queensland appeal to Gen Y?

Educators have a responsibility to provide a high standard of education to support their respective professions whilst catering to the desires of a modern student cohort. Good education appeals to all generations.

9. Objective Unsupervised Classification of Gamma Radiometrics and Topography for Mapping Clay Content

Ramesh Raja Segaran, University of Adelaide

This paper presents an approach to mapping surface soil properties developed for an integrated water management model of the Angas-Bremer region, one of South Australia’s premier viticultural districts. The model required detailed mapping of groundwater recharge potential across the region, information not provided by existing soil class mapping.

The project aimed to predict the distribution of surface soil textures from airborne radiometric and digital elevation data, while developing automated mapping methods that could be applied more widely. An unsupervised classification procedure was developed utilising a combination of airborne gamma radiometric and digital terrain data. Variables used in the classification included interpolated data for Total Count, Uranium, Thorium and Potassium and DEM derivatives representing elevation, slope, solar irradiation, profile and planar curvatures. Previously delineated landsystems were used to stratify the analysis, allowing distinct terrain/radiometric ‘signatures’ to be identified and the variability within them to be considered separately. Variation within landsystems was identified through classification into a large number of classes, followed by aggregation into two and three classes using hierarchical clustering. Final classifications were compared to - existing soil survey data: there were clear relationships between the unsupervised classes and low (<10%) medium (10-30%) and high (>30%) surface clay content, where clay content did not exceed 50%. The variables contributing most to the classifications were elevation, Total Count, Thorium and Potassium.

The validation was limited by inaccuracies inherent in the soil survey data; a thorough ground-truthing survey is required. However, the classification procedure mapped the probable distribution of surface clay content at a resolution suitable for regional recharge modelling, and beyond the scale of prior soil mapping. The method provides an objective approach to the use of gamma radiometric and digital elevation data for mapping the distribution of soil properties, and has potential for further refinement and wider application.

10. Provision of First Nations Land and Resource Information Gateway

Dugald Smith, Integrated Land Management Bureau, British Columbia

British Columbia (BC) is a natural resource based economy; industry such as Forestry, Mining, Fishing, Tourism and Oil and Gas fuel the economic engine. BC is also rich in ecological diversity and is home to a broader cross-section of flora and fauna than any other jurisdiction in Canada. Many of these species and their ecosystems are endangered. Development and conservation create major opposing forces in the management of the land base.

BC also has a large population of Aboriginal Canadians, representing over 100 First Nations (Indian bands, tribal councils, and traditional aboriginal governments). The Canadian courts have recognized title and rights exist over the land bases and instructed the province and federal governments to negotiate modern treaties with First Nation governments to clarify the geographic extent and terms of such rights and title. Such resolution will bring certainty to the land base and facilitate planning to ensure a broad spectrum of values is recognized and allowed to coexist.

ILMB is a shared service organisation within the provincial public sector with a mandate to provide client-focused, high quality, integrated Crown land and resource management and information services to British Columbians.

ILMB is responsible for GeoBC, which provides a single window to data and information provided by natural resource sector agencies from across BC. The GeoBC Land and Resource Gateway's focus is spatial and attribute data and the associated applications that allow for the viewing, interaction and access to this data.

ILMB has developed this gateway as a first step towards making information accessible to clients in one place in a manner that is intuitive and simple for all citizens to access. Understanding how the province organizes itself and its information assets is not necessary for successful access to this information for a range of users with varying technical skills.

First Nation's in BC, whether participating in treaties or otherwise working to improve services or infrastructure within their communities, recognize the important role information and technology can play in facilitating decision-making. To this end the First Nations of BC have collaborated under the First Nations Summit to form a Technology Council (the FNTC) in order that they leverage technology to achieve the aforementioned ends.

The FNTC are working with a variety of Canadian government jurisdictions to explore technical solutions to ongoing issues. For example several orders of government have partnered on an initiative to bring industrial quality broadband to all BC First Nation communities. The FNTC and GeoBC have partnered to develop a First Nation Land and Resources Information Gateway (the FN Gateway).

This project leverages the broader GeoBC Lands and Resource Gateway infrastructure and services to provide First Nation restricted access to a broader range of data, information and custom tools to interact with this information. Additionally, the web interfaces will be designed for the target audience.

The project is supported and partially funded by the federal GeoConnections program and is subject to the Canadian Geospatial Data Infrastructure (CGDI) standards. A key requirement for such projects is the use of User Centred Design and a comprehensive User Needs Assessment (UNA) to ensure products and services are developed from the user down.

The project is currently underway. The UNA has been completed with extensive First Nation participation and work has commenced on site specifications and design.

Key features of the site will likely be a customised user interface, interactive wikis, best practice materials, a custom web mapping service with specific First Nation business themes, data distribution and discovery services for provincial data stored in the Lands and Resource Data Warehouse with a special security level for the First Nation user community.

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11. Rural Property Addressing - A Sign of Things to Come

Jeff Laubsch, Department for Transport, Energy and Infrastructure

Until November 2007 South Australia did not have a standard rural property addressing system in place.

Standard rural property addressing and location information is fundamental to improve rural safety (emergency services), identity management, electronic government business and general service delivery.

In 2003 Standards Australia launched the National Street Addressing Standard AS/NZS 4813:2003, which for the first time provided a nationally endorsed standard for rural property addressing. This standard is currently being implemented in all other states of Australia and New Zealand.

The Premier at the 2003 Bushfire Summit and the State Emergency Management Council, September 2005 endorsed the need for implementation of standard rural property addressing. Rural Property Addressing is a strategic action listed in the State Infrastructure Plan which stands to benefit many government departments/agencies responsible for dealing with the South Australian rural community.

Cabinet, 5 November 2007, endorsed implementation arrangements for statewide adoption of national standard rural property addressing with DTEI leading this whole of government project with support from the Office of State/Local Government relations for managing the relationship with local government and the Department of Justice, SAFECOM responsible for setting priorities from an emergency services perspective. State and Local Government have agreed responsibilities to work together to adopt the new system of Rural Property Addressing.

The initiative objectives are:

- for state and local government to work together to promote and establish a maintainable statewide rural property addressing system in line with AS/NZ 4819:2003
- to ensure effective implementation including:
- a rural address allocated and 'official' for broad use for the estimated 50,000 occupied rural properties in SA
- an ongoing up to date property address register is maintained and information shared with key stakeholders, in particular the emergency services.

The implementation of rural property addressing impacts the whole rural community. A significant communication package has been developed to communicate this initiative to the rural community. It is important for the rural community to understand the reason for this change and understand the address is distance based, located, simple and vital for safety and service delivery. The standard roadside signage will be outlined.

In its simplest form a “national standard” rural property address has a number (distance along the road from its start point – e.g. 5.24 kilometres along road is 524 if on right side of road), road name, suburb and postcode.

Additionally the principal access point from the road to the property/buildings has a GPS or map coordinate for precise electronic or map navigation and location.

The State Project Team has developed processes for allocating the initial address in the ‘office’ using GIS techniques and matching available registers of road, suburb, postcode and property data. This data includes Property Cadastre data enhanced to highlight properties that have a building or work shed on it with backdrop highest quality rectified imagery.

Issues have been encountered with unnamed roads, multiple names for roads, naming and direction of state roads, acceptance of localities and linking with the topographic road register. Processes and solutions to resolve these issues will be outlined.

The important flow, form and timing of information to Emergency Services, Australia Post and the Geocoded National Address File will be discussed.

This paper will provide an overview of the processes used and issues encountered in allocating a national standard rural address using GIS and spatially related information and ensuring that the address information is quickly available to major address users for their business (e.g. mail and service delivery).

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12. The Unexpected Demise of High-resolution Satellite Imagery

Mark Deuter, AEROmetrex Pty Ltd

Despite the hype surrounding the high-resolution end of the satellite image market, the technology has always failed to rival aerial photography in the provision of truly high-resolution spatial information. During the 1990s, inroads into aerial photography’s high-altitude commercial market (1:40 000 to 1:80 000 film scales) were made by Quickbird’s 60cm and Ikonos 90cm satellites. Urban myth has long held that the military has always

had much higher resolution satellite imagery at their disposal but the quality of intelligence arising from the Gulf War and the Iraq War strongly suggests otherwise.

The arrival of the 21st century has seen a major world-wide investment in research, development and commercial application of digital aerial cameras.

High-altitude 4-band digital aerial imagery is now rapidly regaining market share in this sector and is overtaking so-called 'high-resolution' satellite imagery as a source of regional-scale image data. Digital aerial imagery offers greater cost efficiency, flexibility, metric accuracy and image quality than satellite imagery and is the perfect image source for large-area project development, resource exploration, environmental monitoring, bushfire assessment, defence capability and agricultural applications. Licensing arrangements for image products are also usually tilted in favour of digital aerial photography.

The advent of high-performance pressurised aircraft, airborne GPS and IMU technology, and the continued rapid development of digital image processing technologies, has enabled digital aerial imagery acquisition and processing to become much more efficient. Unprecedented rates of production are now being achieved. Seamless orthomosaics of very high quality are now routinely produced, but FLGR (fast-look geo-referenced) imagery provides an even more cost-effective alternative for customers who have lower spatial accuracy requirements.

Examples of high-altitude 50cm and 90cm digital aerial imagery acquired during last summer's flying season in SA will be shown, along with a stacked series of images flown at various altitudes over Atherton, Nth Queensland.

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13. Aboriginal Remote Community Assets - Capture and Communicate

Greg Wilkins, Department for Families and Communities

How do we take a business unit from pen and paper field collection to the twenty first century without scaring the existing workforce?

The first challenge is to get ownership of the problem. Recognise that by adopting new technology in the field and in the office their job will be easier to communicate funding requirements, policy and development outcomes for these communities.

The Department for Families & Communities GIS Team has embarked on a project to assist the Aboriginal Asset Services (AAS) group to collect and deploy business and spatial information of indigenous remote communities that are spread across South Australia. By using existing enterprise technology and a small investment in mobile data capture devices and software the GIS Team were able to deploy the project within nine months.

The true success of this project was the delivery of the complete business information system; this included capturing, storing, maintaining, visualising, querying and outputting geospatial and business information. The project had three delivery components:

- The development and ongoing use of mobile GPS data capture devices for the purposes of capturing both the location of housing assets and also, their associated audit condition data as required for future funding bids from the Federal Government.
- The development of a data storage, extraction and maintenance system to effectively manage the captured data.
- A GIS web based application (Dekho) for displaying, querying and analysing the data by AAS staff, Office for Aboriginal Housing and other Government departments as required.

Today the AAS group have improved their critical workflows in the field, continually improving the integrity of their data, deliver spatial and business information through a single portal and understand that interoperability is critical if they wish to provide the best service to their clients.

14. Toward a Survey Accurate Cadastre: Land Services Group - Spatial Enablement Project

Peter Kentish & Dr Colin East, Department for Transport, Energy and Infrastructure

In October 2007, responsibility for the maintenance of the Digital Cadastral Data Base (DCDB) was transferred from the Department for Environment and Heritage to Land Services Group (LSG) of the Department for Transport, Energy and Infrastructure (DTEI). Staff and equipment were relocated to accommodation at LSG, 101 Grenfell Street, Adelaide under the management of the Surveyor-General.

The transfer of staff and responsibility was driven by a strategic decision of LSG to more spatially enable the State's land administration system.

One of the strategic objectives is to improve the spatial integrity of the cadastral layer of the DCDB utilising bearings and distances derived from survey plans that have been connected to coordinated survey marks. This information has previously been captured in the Lands Titles Office (LTO) as part of the survey examination process.

LSG has selected the newly released ESRI Cadastral Editor as the base software to enable this improvement in spatial accuracy. A project team has been established to confirm the conceptual design, technical assumptions, process integrity and maintenance processes of the proposed system and to undertake the development of new procedures for adoption within the business. It is the long term vision of LSG to progressively develop a Survey Accurate Cadastre, while continually improving the integrity of the current digitised version.

This presentation will discuss the journey undertaken by the Spatial Enablement Project (SEP) team so far. As one of the pioneer sites for implementation of Cadastral Editor, it has been a steep learning curve with plenty of challenges faced.

15. Hyperspectral Analysis for Environmental Applications

Dr Megan Lewis, University of Adelaide

The paper presents an overview of some of the potential for use of hyperspectral remote sensing for environmental applications. It draws on recent research conducted by the Spatial Information Group at the University of Adelaide and associates to illustrate the nature and potential of hyperspectral data, sources of imagery, methodologies for field and lab spectral characterisation of materials and approaches to image analysis. Examples are drawn from a range of applications including vegetation, viticulture, soils, salinity and aquatic environments, drawing on experience and findings from numerous studies, predominantly in South Australian environments. Emerging trends in the integration of hyperspectral and other forms of remote sensing including lidar are discussed, together with proposals for integrated infrastructure to enhance capability for remote sensing studies.

A/Prof Megan Lewis is Head of the Soil and Land Systems Discipline and Spatial Information research group at the University of Adelaide. She has taught vegetation ecology, remote sensing and environmental management in the tertiary sector for over 25 years, and supervised numerous higher degree research students in environmental remote sensing. Her research focuses on the use of remote sensing and spatial information for environmental applications, specialising hyperspectral analysis.

16. The COSI (Checking of Site Information) Project: Participative Management of Aboriginal Heritage Information

Nukunu Peoples' Council & Peter Birt and Rita Kucera, Department of the Premier and Cabinet

At SID 2007 we reported that we had digitised Aboriginal heritage information and introduced our plans to increasingly use spatial information in consultations with Aboriginal people about their heritage information. We undertook to report to SID 2008 to show what we are learning from this way of the appropriate and increasing use of spatial information.

This presentation will report about a Checking of Site Information (COSI) pilot project which is vital for developing processes for the review of site records across SA in a collaborative partnership with Aboriginal people.

There are 7,400 Aboriginal heritage sites that have been recorded over some 35 years across SA. The "standards of the day" varied when recordings were made, with the result that there are gaps in our knowledge. This information needs to be accurate and is central to negotiations about development and site protection.

The site information and some 1300 cultural heritage reports have been digitised so we can conduct spatially-enabled consultations.

The pilot objectives are to develop processes for roll-out across SA and to check site records.

The COSI project is to address gaps and errors in records about Aboriginal sites, particularly their confidential nature. It stemmed from advice from elders from the Adnyamathanha people whose traditional country encompasses the Flinders Ranges, and the Yankuntjara people whose country lies within the land between Coober Pedy and the APY Lands; and legal advice from the Crown Solicitor's Office. The elders' advice was facilitated by the use of spatial information in our consultations.

But this is a very complex task and the sheer number of sites across SA requires that processes be established to ensure accuracy, consistency and effectiveness which are facilitated by the use of spatial information. So a collaborative pilot project has been initiated with Nukunu people to ensure that culturally appropriate methods are used and the results are more reliable. A part of the pilot includes a process where the Aboriginal group is involved in a rigorous and transparent certification process which can ensure quality and standards in the recording of site information.

The spatial nature of the presentation and consideration of the information is central also to enabling effective partnerships in the review and management of this information.

There are many other expected benefits apart from verifying records, including increasing the number of sites for registration by the Minister of Aboriginal Affairs and Reconciliation, and all this done in a much more streamlined and cost-effective and culturally appropriate way than before.

This is a collaborative pilot, using participative action research, which will establish processes and standards for its roll-out across SA. Its evaluation will be of these processes, of the contribution from Aboriginal groups about the recording of site information and of the impact of the use of spatial information in all these processes. The cross-cultural aspects of the pilot provide an added dimension to both the processes used and the relevance of spatial information to Aboriginal ways of thinking and decision-making.

This is a current pilot project due to report by end June. The results will be presented at the Day.

17. Updating SA Native Vegetation Mapping using Landsat Imagery Classification

Felicity Smith, Department for Environment and Heritage

South Australian Department for Environment and Heritage manages SA native vegetation mapping data. This data is instrumental in informing natural resource management for the State. To better utilise the data in the future NRM arena there was a need to ensure that the data could be used for monitoring the change in

extent of native vegetation. To undertake monitoring a project was instigated to create a 2004 baseline of SA Vegetation Mapping data based on 2004 imagery. In the future this baseline can be used to undertake change detection. The focus of the project was to map the areas of native vegetation that were present in 2004 in the agricultural region where clearance is most notable. SA native vegetation mapping had been captured based on imagery from mid 1980's to 2000's and therefore was not consistent to any one year.

To efficiently map the native vegetation for 2004 across an area of 150,000km2 the project used Landsat imagery that was available for the defined period. Native vegetation mapping includes vegetation that is woody and non-woody. However Landsat imagery is unable to detect non-woody vegetation so the project focussed on woody vegetation only. An unsupervised classification of Landsat imagery was used to identify areas of woody vegetation. The project then undertook to use the classification data to map the woody vegetation that was present in 2004.

The project assessed the classification data to determine how to do the mapping. This presentation will highlight how the classification data was used to detect vegetation that was cleared between the original capture date and the year of assessment. The two datasets have definitions of structural and height ranges that define their woodiness and the similarities and differences between the datasets were investigated. A set of rules were developed to undertake the mapping based on the comparison.

The work identified between 80,000 to 90,000 hectares of vegetation that had been cleared and was incorrectly represented in the original mapping. The future options for using classified data to undertake change detection of native vegetation will be discussed.

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18. Proposed Project Overview of the Implementation of a Public GIS Portal for Members of the Community

Adrian Ballestrin, City of Tea Tree Gully

The use of geographic information systems (GIS) within Local Government is certainly not a new practice, with many Councils using GIS software for quite sometime, predominately for internal use by staff.

Initial local government GIS systems tended to focus more on making basic property information available to staff, such as parcel information, development/planning zones, suburb and ward boundaries, street names and reserve areas to name a few.

In recent times the demand for data to be accessible spatially has increased dramatically, with Councils placing an increased emphasis on asset management. The type of data being sourced is diverse and continuing to grow and includes information such as road and footpath networks, effluent systems, storm water infrastructure, garbage truck pickup zones, street signage, boat ramps and jetties, playgrounds, weed infestations, street sweeper activity and much more.

As the push for client services to be available 24/7continues to gather pace in both private and government sectors coupled with the improvements in the availability of ICT infrastructure, it is becoming increasingly apparent that there is a growing need for Councils to provide an online spatial information service solution for the public (in a restricted capacity).

Initial discussions regarding the potential to provide spatial information to the public were raised at the inaugural South Australian Local Government Mapinfo User Group meeting on the 4th of May, 2007. These discussions led to the proposal to begin preliminary investigations into the feasibility of implementing a central Public GIS Portal for members of the community. This concept is being pursued by a sub group (GIS Public Working Party) of members from the newly formed South Australian Local Government Mapinfo User Group, comprising of representation from both metropolitan and regional members.

The Working Party will be working to achieve a centrally hosted solution as the preferred option, making it easier to maintain, cost effective and above all easy for the public to gain access to. This being said, all participating Councils will have the opportunity to provide input and make suggestions as this project moves forward. Some of the suggestions and discussion points include: hosting of the site, the types of layers, the attribute data to be displayed and how it will be maintained and kept up-to-date to ensure currency. The emphasis will be on providing the public with access to Local Government specific datasets however, due to the nature of GIS other interrelated layers may be incorporated to enhance the users experience and provide additional benefits.

This presentation provides an overview of the Working Party's progress to date as well as providing a brief demonstration of the recently developed pilot site/portal using Pitney Bowes MapInfo Exponare Public.

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19. Geographic Based Information from the Australian Bureau of Statistics Website

Pam Balfour, Australian Bureau of Statistics

There is considerable demand for small area data for policy development, strategic planning and resource allocation purposes. Statistics for geographic areas smaller than state or territory are available for many data sets from the Australian Bureau of Statistics (ABS).

The Census of Population and Housing uses the greatest variety of geographic areas, ranging from the whole of Australia down to suburb and the smallest unit, the Census Collection District. Local Government Area and/or Statistical Local Area level data are available for collections as diverse as Births and Deaths, Building Approvals, Agricultural Commodities and Regional Population Growth. Data at smaller areas e.g. post code are available for selected collections such as motor vehicle registrations. Even areas such as River Basins and Drainage Divisions are used for disseminating output for collections such as the Agricultural Census and environmental surveys.

This presentation will look at what is freely available from the ABS website with particular focus on that rich source of small area socio-economic and demographic data, the Census of Population and Housing.

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20. Geospatial Data Initiatives from the Bureau of Meteorology

John Nairn, Bureau of Meteorology

The Australian Government Bureau of Meteorology holds a very large warehouse of environmental data, including rain gauge, wind, temperature, radar, satellite, numerical weather prediction model, hydrological, oceanographic, climate data and much more. The Bureau has recently been tasked with developing a National Water Account and will soon serve water data through the Australian Water Resources Information System (AWRIS).

This presentation will explore the geospatial data initiatives the Bureau of Meteorology has under development.

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21. Water Sensitive Urban Design

Professor Simon Beecham, University of South Australia

This presentation will focus on research on Water Sensitive Urban Design being conducted at the University of South Australia. This includes investigations into the reuse potential of water harvested using porous and permeable pavements. Sponsored by SA Water, UniSA's Centre for Water Management and Reuse has constructed a full-scale carpark-sized permeable pavement with underlying rainwater tank. This investigation builds upon existing research within the centre which has studied the infiltration rate, structural properties, lifespan and fit for purpose reuse potential provided by permeable block paving. The presentation will also cover other WSUD technologies such as siphonic roof drainage and bioretention systems.

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22. MapIQ - Integrating Spatial and Business Knowledge for Improved Customer Service

Nick Weinmann, Department for Families and Communities

With the introduction of "Ask Just Once" by the Office of Chief Information Office, it has made departments re-examine how they will leverage information and technology to give clients the best service delivery outcomes when dealing with the State government. The Department for Families & Communities (DFC) is committed to innovative solutions that meet these objectives. MapIQ is one solution that is reducing the barriers between government agencies.

In 2007 the departments GIS Team embarked on developing a lightweight scalable intranet mapping application that could provide varying levels of community and health information. The aim was to integrate existing GIS technologies with the departments SharePoint portal and therefore give staff quick access to a wealth of government and private information spatially. Today over five thousand DFC staff have access to over 50,000 health and community locations, two million referenced locations within South Australia through MapIQ.

Since MapIQ's release in January 2008 it has had a strong uptake within the department. This is due to the simple interface, efficient data mining processes, successful query matching rates and the delivery of information by activity groups. Additionally, MapIQ provides proximity searching features, street searching, emailing capabilities and digital printing outputs. The applications real strength is the way it integrates other government business data into this system. Staff have direct access to the Department for Health's - Human Services Finder, Australian Bureau of Statistic's - QuickStats, and DFC's intranet & internet contact pages from the map or results list.

By leveraging existing web applications and technologies DFC GIS team has been able to rapidly develop and deploy an application that can deliver fast and accurate information to all staff and their clients.

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23. Spatial Information Technologies and Multi-Disciplinary Research in Urban Studies

Dr Sadasivam Karuppannan, University of South Australia

Multi-disciplinary research on urban and regional planning issues has been applied recently to works on ageing, inter-regional migration, and housing. However, much research on these issues remains fragmented and, in particular, the intellectual barrier between spatial sciences and other social sciences relevant to urban and regional studies continues to be a powerful barrier in application and use of spatial information technologies. This is partly due to diminishing exposure to spatial information technologies in urban and regional planning curriculum in Australian universities. Even though urban and regional planners appreciate the benefits of spatial data and application of technologies like Geographical Information Systems in urban and regional studies, planning academia is slow and at times reluctant to introduce courses in spatial information technologies in planning curriculum.

In this paper, I review the prospects for cross-disciplinary research; and, examine the ways in which linkages between disciplines and professions can facilitate application of spatial information technologies in teaching and research. I introduce examples of ongoing research involving use of spatial technologies and explain their relationship to the quest for cross-disciplinary research on urban and regional issues.

A research on 'ageing and housing options for South Australia' involving the use of census data from 1996, 2001 and 2006 in geographical information systems is used to illustrate multidisciplinary nature of the research and illustrate how spatial information technologies can bring together apparently disparate academic disciplines. As new generation of South Australians move into older age, people are beginning to give serious thought to the type of living arrangements and housing choices available in their retired life. For some years, government policy in Australia favoured 'ageing in place' option, providing support in people's own homes. Arguing the case for 'ageing in place', policymakers make much of people's wish to stay in their own homes and to retain their freedom and self-sufficiency at home for as long as possible based on the assumption that freedom could not be preserved in any other forms of living arrangements. However, many aged persons are already making positive choices in favour of alternative arrangements. The research found that the current and future housing requirements of older South Australians varied within and between some groups/cohorts and this differentiation is clearly related to place of living, age, socio-economic status and the quantum of assets they hold. The difference in income and wealth influenced the timing of retirement, the way in which individuals picture their retirement, and the way they intend to fund their retirement.

My conclusion is that cross-discipline working should be promoted and that both interdisciplinary and multidisciplinary approaches can benefit research on ageing, housing and migration, provided that their specific merits and demerits of using spatial information and spatial information technologies are evaluated in relation to the research task in hand.

24. Place Names - A State, National and International Perspective

Bill Watt, Department for Transport, Energy and Infrastructure

Given the importance of place names in a spatial environment, this paper will summarise the processes, directions and issues associated with place names on three levels:

- State or Jurisdictional level from the perspective of South Australia.
- The national perspective – explaining the formation and role of the National body.
- The International perspective – discussing the role of the United Nations and the relationship between jurisdictional, national and international bodies.

The aim of the paper is to raise the awareness of the functions of the above mentioned bodies, and particularly the issues each are faces with.

25. South Australia Well Placed for a New CORS Infrastructure

Dr Craig Roberts, University of New South Wales

The lack of Commonwealth Government funding to higher education over the last decade has caused Universities to respond by rationalizing courses, teaching larger classes and reducing face-to-face teaching hours. The challenge for academics is to provide the same standard of education in less time, to more students and cater to the perceived needs of a predominantly Gen Y student cohort. But all is not lost! Gen Y are IT savvy, flexible, want engagement, freedom, respect and good education. Can we meet this challenge?

This presentation gives a brief overview of the structure of the Bachelor of Engineering (Surveying and Spatial Information Systems) program at the University of New South Wales, Sydney in order to provide context for a new first year course offered to all Engineering students. A new flexible first year option requires the course to cater for up to 200 students. The movie “Pulp Fiction” is used as an analogy and informs the order in which material is presented. The aim of the course is for students to appreciate spatial data quality – where does it come from, can I rely on it, how could I acquire data to the required accuracy and precision for a given task?

Some examples of student feedback from previous years are presented as well as some comments on how the course appeals to a Gen Y audience. This theme is extended to ask how to structure a Degree program to appeal to Gen Y and indeed how the Surveying / Spatial profession should be promoted to Gen Y. How will recent developments in national education such as the new 3 + 2 model at Melbourne University and the University of South Australia as well as the distance option at University of Southern Queensland appeal to Gen Y?

Educators have a responsibility to provide a high standard of education to support their respective professions whilst catering to the desires of a modern student cohort. Good education appeals to all generations.

26. Mashups: What are they and how can I benefit?

Phil Punter, ESRI Australia

With the recent explosion in location intelligence via GPS in-car navigation, Google Earth and other consumer technologies we often hear references to mashups on the web and discussions on connecting consumer GIS with Enterprise GIS.

GIS mapping was first introduced on the Web in the mid-1990s as an online map service. This has been described as the Web 1.0 environment, where one server "broadcasts" map services to many clients. Today there are thousands of map servers on the Internet serving hundreds of millions of maps each day. The Web 2.0 environment (the world of Web services) enables many new opportunities to use GIS, including collaborative computing, integration of user-contributed content, mashups, and shared distributed data management.

27. The Analyst's Detection Support System - An Overview

Peter Perry, Sydac Pty Ltd

The Analyst's Detection Support System (ADSS) was originally developed as an aid for spotting targets in a large volume of surveillance imagery, such as synthetic aperture radar scans. Since those early beginnings, it has evolved into a flexible, general-purpose image processing system capable of processing both small and large images in over 60 formats, including video imagery. It also represents a successful collaboration between Australia's Defence Science and Technology Organisation (DSTO) and sister organisations in the UK and Canada.

The concept of the ADSS is that most image processing operations are relatively simple; an image might be smoothed with a filter, or differentiated to detect edges and corners; we might scan the image for bright or dark patches, and then check the shape of those patches to decide whether they are of interest, or check whether there are differences between two images of the same scene.

However, a practical image processing application might need several of these steps combined. For example, we might want to compare two images of approximately the same area. Then first we must try to transform one image so it represents exactly the region of the other, and there are several ways to do this; we might attempt to find matching tie-points in each image and then use them to find a transformation between the two images, or we might attempt to transform one image, using a difference measure to determine the best transform; or we might have geocoding information that allows us to determine the latitude and longitude of selected points within the images, and select a transform on that basis. Then we must produce a transformed version of one image and subtract it from the other. Then we must look for areas of large difference.

Each of these processes is simple enough in itself, and is available as a separate module (actually a small stand-alone program) in the ADSS, which already has approximately 300 such modules. Part of the uniqueness of the ADSS is that it allows these modules to be connected together using a simple scripting language, Command and Data Language (CDL). There are other systems that can also do this, but most require that one stage be completed before the next can begin; the ADSS allows a later stage to commence as soon as earlier stages have provided it with sufficient information to do so; it also allows processing to be distributed over a network of computers and for larger images regions of the image can be processed in parallel.

The presentation will give an overview of the ADSS and how the modules are combined in a CDL script, with examples from simple image filtering through to real-time motion detection in video where the camera is mounted on a moving platform.

The ADSS is an ongoing project which aims to be both a research tool, allowing a the researcher to focus on a particular algorithm, knowing that he or she does not have to worry about the mechanics of image formats or ancillary operations such as filtering or edge detection. It is also intended to be scalable to very large images and has already found some operational use in processing wide-area surveillance. Sydac are involved with this project both through providing contract support (a team of 6 software people working in conjunction with DSTO scientists) and also in attempting to bring the project into the commercial field.

28. SSI and ASIBA Industry Directions

SSI & ASIBA

This presentation will provide an overview of the strategic directions of the Spatial Sciences Institute and the Australian Spatial Information Business Association for 2008/09.

29. Lane Cove Tunnel – Surveying the Collapse Recovery

Michelle Grose, Senior Surveyor

In the early hours of the morning of 2nd November 2005, a tunnel collapse on the Lane Cove Tunnel caused chaos in the Northern suburbs of Sydney. Fortunately, no-one was seriously injured, but the process of recovering the area was a long and intense process. For surveyors on the Marden Street site, it was also a valuable learning experience and an opportunity for the surveyors to work with a specialist team and excel in surveying, engineering, design, safe work practices and team work and communications.

In the first few days, the Marden Street team had a lot to do in a very short time to secure the area and make it safe for both workers and the community. Initial surveys of the area and of the extent of damage were performed. Twenty four hour monitoring was undertaken with the assistance of surface surveyors. At all times, safety was the highest priority in the highly sensitive area.

Once a final design was agreed on with the Road Transport Authority, the slow, but exact process of diverting the collapsed sections of tunnels began. Over the next 10 months, the task was completed. Excavation, as-built surveys, monitoring and the set-out of all structures was undertaken by a small team of surveyors, while still maintaining other day-to-day tasks. Sometime 24 hour coverage was also supplied to the client (Thiess John Holland Joint Venture).

There were no hard and fast rules for the methods of providing survey for the area, so most of the time, surveyors had to “ad-lib” and share many ideas for just how to get the job done. As confidence was lost by a few of the senior staff involved, the surveyors had to take on roles above those normally undertaken by contract surveyors. Daily meetings were held to establish safe work procedures and communicate all desired results to day and night shift operators.

The collapsed section of the tunnel was completed in September 2006 in preparation for the tunnel opening in February 2007.

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