



Sydney Coastal Councils Group
&
Surveying and Spatial Sciences Institute

GIS Forum:

***Sydney's Integrated
Spatial Future***

Final Report
March 2010



Principal Sponsor



Supported By





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Section 1 Aims, Methodology and Discoveries

1. Introduction

The spatial event presented by the Sydney Coastal Council's Group in collaboration with the Surveyors and Spatial Sciences institute (SSSI) provided a great opportunity to gain a snapshot of the Geographical Information System (GIS) use in the private sector and within local, state and national government areas.



(Fig 1) Event Organisers

The SCCG and SSSI were proud to offer the spatial event to add interest to this rapidly developing information industry. Participation and quality communication amongst spatial developers, interpreters and the decision makers was an integral part of addressing the issues and concerns coming from the use of spatial information by local government. The SSSI and the SCCG proposed that a forum bringing together key experts would be an efficient and effective means to convey knowledge regarding various spatial issues as well as identifying current and future opportunities for action.

The event consisted of presentations addressing five specially selected themes:

- Setting the Scene
- Risk and Hazard Assessment
- Asset Management
- Information Management
- Decision Support and Communication

2. Forum Overview

- **Origins**

Geographic Information Systems and the Spatial industry are rapidly expanding at an incredible rate through increased research and training opportunities, new applications, the capabilities of platforms and the increased availability of new data sets. The GIS Forum presented by the SCCG and SSSI, entitled, *Sydney's Integrated Spatial Future, 'Bringing managers and spatial professionals together'*, provided a great opportunity to take a snapshot of what is happening in the GIS realm and to find out what developments and learnings were directly applicable for local government to acknowledge and address. The objective as stated in the title was to bring the practitioners from the private sector and from government into the same room as the decision makers and managers. The aim being to provide an opportunity for stronger links and understanding to form between all stakeholders in attendance and to break down the 'wall of mystery' that can exist between information required, formats, data sets and databases when communicating graphical and spatial data across departments and organisations.

- **Support**

The SCCG and SSSI are very grateful for the involvement by its major and minor sponsors. Their support allowed the event to go ahead and their presence at the event itself was a great addition to the day's proceedings.

Major Sponsors:



Minor Sponsors:



(Fig 2) Sponsors of the Event

3. Forum Presentations

The forum gave council staff and spatial professionals the opportunity to hear from a range of speakers that covered many interesting and thought provoking topics and issues.

All presentation from the forum can be downloaded from the SCCG Website using the following link:

<http://www.sydneycoastalcouncils.com.au/Events.htm>



(Fig 3) Event Welcome



Key Note Address: 1

Dr. Pamela Abuodha, Associate Lecturer, School of Earth and Environmental Sciences, University of Wollongong:

- [“GIS where have we been? Where are we going?”](#)

Dr. Abuodha's presentation was co-authored by the University of Wollongong's Professor Colin Woodroffe from the School of Earth and Environmental Sciences. The presentation detailed the increased awareness that geospatial tools can bring to the issue of climate change and coastal management. Dr. Abuodha highlighted that mostly GIS has concentrated on physical variables, some processes and that very few applications extended far in terms of socio-economic factors. Her presentation presented methods for determining coastal vulnerability, community vulnerability and mapping of sites for potential flood inundation. The case study information was sourced from programs including the recently launched Geoscience Australia Smartline tool and the SCCG's project, 'A Systems Approach to Regional Climate Change Adaptation Strategies in Metropolises'.

Additional Presentations

Mr. Phil Flentje, Engineering Geologist and Senior Research Fellow, Faculty of Engineering, University of Wollongong

- [Landslide Inventory, Susceptibility and Hazard zoning capability](#)

Mr. Flentje used the Illawarra region of Australia, in particular the Wollongong area as a location for a spatial case study analysis of what is occurring in terms of land falls, flows and slides. Mr. Flentje's analysis also presented information regarding the percentage of land susceptible to landslide, lives lost and houses damaged or destroyed.

Additionally, Mr. Flentje presented the research and application of a landslide susceptibility modelling project. The model integrated knowledge-based data mining and a range of datasets including: Landslide inventory, geology, vegetation and derivatives such as slope, aspect, curvatures, terrain classification, flow accumulation and the wetness index. The collation of this information allowed for the creation of a pictorial representation of the data, a landslide hazard zoning map. An opportunity to extend this program to Sydney and other areas was also reviewed.

Ms. Liz Fulton, Senior GIS Analyst, Cardno Forbes Rigby

- [GIS – What's Available and how do I get it?](#)

Ms. Fulton's presentation described the availability and variety of spatial data and its potential to enhance business decisions and better service clients. Ms. Fulton discussed the various difficulties in acquiring and merging spatial data to a 'single point of contact' arrangement. Detailed by the presentation was the cost effective approach Cardno NSW had taken to deploy an enterprise method of spatial data collection, management & distribution for over 500 staff.



Mr. John Hudson, Director Sustainable Systems, NSW Department of Planning

- [Implementation & Review of E-Planning and Update of the Hunter LiDAR Project](#)

Mr. Hudson detailed the ePlanning program for the State of NSW and an over-arching strategy and implementation plan for the on-going use of planning services on-line for the next 5 years. The impetus behind pursuing e-Planning included developing and increasing the use of technology-based tools and systems and creating synergies with business processes to ultimately deliver improved planning information and services to the community.

The initiatives presented by Mr. Hudson included:

- e-Planning Roadmap
- electronic Housing Code (eHC) Project
- electronic Development Application Interoperability Specifications (eDAIS) Project
- “Planning Channel” on SiX

Mr. Ross Johnson, Land Information Officer, City of Ryde &

Mr. Lindsay Mason, Land Information Coordinator, City of Ryde

- [Internal GIS uses: What, How and the Advantages!](#)

Mr. Johnson and Mr. Mason from the City of Ryde presented a Local Government perspective on the spatial issues being faced by just one Council in the Sydney Metropolitan region, the City of Ryde. The presentation detailed how GIS spatial data was directly related to the Council’s overall business strategy. A big issue being faced by the council was a decade’s worth of data on the network that was not standardised and in addition to this, there was a lack of metadata across much of the information stored. Solutions to the spatial data challenges included identifying the inventory, adopting a spatial metadata solution, creating web availability for the data and developing an in-house training course for all users across Council.

Mr. David Leggett - Hornsby Shire Council

- [Managing Natural Assets with the assistance of GIS](#)

Mr. Leggett detailed the various natural assets that were being monitored and evaluated utilising GIS across the Hornsby Shire Council. From Mr. Leggett’s field expertise he described how the technologies of ArcPad and a hand held global positioning system (GPS) could be used to capture data. Specifically for monitoring Hornsby’s estuarine water quality, four probes have been strategically placed across the local government area to capture chlorophyll level data that can be used to warn of potentially harmful algal blooms. Mr. Leggett was not the only presenter from the event to highlight the fire management challenges associated with populations living close to bush. Part of the presentation was how Hornsby Shire Council was managing its legal responsibility to prevent bushfire spread from any land under its care, control and management. Mapping of potential hot spots was an initiative developed by applying the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Bushfire Risk analysis using Vegetation, Slope and Aspect parameters.

Mr. Greg Livingstone, Asset Strategy and Systems Manager, City of Sydney &
Mr. Matt Dobson, Spatial Information co-ordinator, City of Sydney

- [Local Government Asset Management Integration – Corporate Asset Management System \(CAMS\)](#)

The team from the City of Sydney (CoS) presented a comprehensive demonstration of the Council's CAM System. Mr. Livingstone highlighted why the CoS needed to use such a system and how it was integrated with other GIS information. The CAM system provided an integrated environment to undertake key asset management functions for all assets. The particular system utilised by the CoS provided an integrated environment to undertake key asset management functions for all assets, from buildings to public art collections. The system was chosen as it aligned with the CoS's vision of becoming 'Green, Global and Connected'.

Spatial Information Co-ordinator, Mr. Matt Dobson presented pictorial representations of the City of Sydney that highlighted issues with shadowing, angle of aerial photography and light detection and ranging (LiDAR) anomalies. Mr. Dobson showcased how three dimensional computer modelling could assist strategic planning, streetscape upgrades and the assessment of catchment and district requirements.

Prof. John McAneney, Director of Risk Frontiers and a Professorial Fellow in the Division of Environmental & Life Sciences, Macquarie University

- [Using GIS to map hazards and vulnerability- focusing on natural disasters and climate change](#)

Risk Frontiers has a vision to build safer communities through a better understanding of natural perils and their consequences. Professor McAneney as the organisations Director presented an assortment of the tools, research and application Risk Frontiers was involved with. By utilising various international and national case studies of earthquake, flood, coastal vulnerability, bush fire work the presentation showed how GIS information can assist with helping insurers and reinsurers better understand and price natural hazard risks in the Asia-Pacific region, develop probabilistic catastrophe models, undertake research in natural hazards, undertake post-event reconnaissance and increase public awareness.

Dr. Emma McIntyre, Eco Logical Australia

- [Use of Public Participation Geographic Information Systems \(PPGIS\): Comparing the “top-down” and “bottom-up” approaches to providing participants in environmental decision making with access to GIS](#)

Dr. McIntyre conveyed the benefits that are associated with having the public participate in the use of GIS. PPGIS was detailed as providing people with access to GIS hardware, software, data and training. The presentation detailed two approaches and two case studies. The analysis highlighted that there are still many issues to be addressed regarding PPGIS, these include:

- data ownership and access
- data accuracy and limitations
- cost of development and maintenance
- level of knowledge required for public use



Mr. Wayne Patterson, LPMA

- [CS2i: NSW Government Common Spatial Information Initiative](#)

Mr. Patterson conveyed that the Common Spatial Information Initiative (CS2i) is a cross agency service that will provide common eBusiness functions required for customers to access spatial and related information in an online environment. Operationally CS2i will comprise of a governance framework and an enabling framework. The Governance framework will assist interactions between agencies, help breakdown information silos, discoverability and access, communication of interests and the resolution of issues. The enabling framework has the objective to provide access and to make spatial information more cost effective.

Ms. Sue Ribbons, Project Leader, Floodplain Management. Pittwater Council Pittwater Council

- [Flooding, Flood Modelling and Flood Mapping: Communication Challenges](#)

Ms. Ribbons presented an informative and thought provoking presentation regarding the flood risk management process and the essential role that GIS has to play especially in assisting the collection, manipulation and presentation of vast amounts of spatial data. Ms. Ribbons highlighted the importance of being able to transfer this information to the community and other users. The presentation highlighted the importance of interactivity created by having GIS information available online through the internet to other stakeholders and the community.

Mr. Tony Roper, – Department of Environment, Climate Change & Water

- [Estuary Health – Technical and Policy Integration \(A State Government Perspective\)](#)

Mr. Roper presented how scientific data, GIS and policy can interact together to monitor estuary health affected by the multiple pressures of human activity and other stressors from the environment. Mr. Roper detailed the diversity of estuaries in terms of biophysical characteristics, pressures/stressors, ecological responses, societal values/needs, jurisdictions and tenures. A key issue was the challenge of being able to integrate estuary diversity with data diversity incorporating various forms of coverage, standards, databases, spreadsheets, GIS and custodians. Mr. Roper highlighted a key aim of needing to turn complex data into useful information for decision-makers.

Prof. Bruce Thom, Wentworth Group of Concerned Scientists, SCCG Honorary Member

- **Using GIS to assist policy making: A coastal perspective**

Professor Thom presented a passionate and informative address detailing the dynamics of the ocean and of the coastline in a climate changed world. Professor Thom explained how higher sea and air temperatures will induce more intense cyclones, and along with higher sea levels there will be increased shoreline erosion. In addition to the rate of sea level rise accelerating, more and more critical infrastructure and low-lying properties will also be flooded on increasingly higher spring tides. Professor Thom acknowledged that there are levels of uncertainty attached to various climate change projections; however, the trends looked clear enough to warrant strong adaptation action by governments in land use planning, provision of public infrastructure and environmental management. It was evidenced that GIS was integral in assisting governments in the decision making process and for communicating scenarios to the general public.



4. Attendance

The table below (Table 3) shows just a snapshot of the Council delegate's Local Government areas that were represented at the forum.

	<ul style="list-style-type: none"> • Manly • Willoughby • Leichardt • Hornsby • Warringah • North Sydney • Randwick 	<ul style="list-style-type: none"> • Pittwater • Woollahra • Port Stephens • Waverley • Liverpool • Mosman • Kogarah
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(Table 3)

Provided below (Table 4) is a presentation of the diverse range of roles and responsibilities of delegates whom were in attendance at the event:

<ul style="list-style-type: none"> • Water Cycle Management • GIS co-coordinator • Asset Management Controller • Land Information Officer • Senior GIS Officer • GIS/LIS Officer • Coordinator Land and Spatial Information • Infrastructure Systems & Business Support Manager • Geographic Information Systems Officer • Senior Lecturer 	<ul style="list-style-type: none"> • Climate Change Mitigation and Adaptation Project Officer • Manager Urban Planning • Principal Officer - Coast and Estuary • Biodiversity Officer • Land Information Officer • Senior GIS officer • Senior Assets Systems Officer • Team Leader Catchments Remediation • Team Manager - Geospatial NSW 	<ul style="list-style-type: none"> • Strata Division Leader • Consultant • Manager Domestic Property & Geospatial Services • Spatial Information Manager • Spatial Technology Consultant • Business Development • Surveyor • Coordinator Cartography • Director • Consultant
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(Table 4)



5. Future Opportunities

Analysis of the qualitative feedback provided by the event delegates showed that the event did meet expectations and was valuable to their respective organisations. Highlighted strongly by the delegates was the need for more events such as the one presented by the SCCG and SSSI. Delegates in their feedback communicated that they would like to see more depth of analysis applied to the topics presented in future events. The extensive list provided by delegates of additional topics and their potential ancillary capacity building events could be organised into four overarching themes:

1. Communication
2. Case Studies
3. Climate Change
4. Technology

- **Communication:** Responses given by delegates indicated that there was much to learn about bridging the gap between spatial professionals and the community when transferring spatial information.
- **Case Studies:** Respondents highlighted how they found it very valuable to hear from various spatial users about the processes involved with getting various projects up and running, the ways they used spatial data and how they disseminated spatial data across a range of stakeholders.
 - Future Projects
 - International research
 - i. (i.e.) inundation mapping
- **Climate Change:** The topic of climate change and the associated implication of sea level rise was certainly a prominent item of interest from delegate's responses. Items of mention included various mapping issues and integrating sea level rise with other GIS models.
 - Urban Design and climate change as it relates to spatial information
 - Provisions of local/state/federal government to manage climate change issues
 - Coastal Hazard line determination
 - Sources for vulnerability mapping and methodologies
- **Technology:** Respondents presented their concernment over the rapid development of software and hardware that is used by the spatial profession. Delegates wanted to stay abreast of the technologies used especially those regarding three dimensional modeling.
 - Innovations using 3D
 - Developments of GIS software
 - Data collection software
 - Sea level rise mapping
 - Storing Information

In addition to topics of interest to be covered by future events, respondents also gave an indication that workshops and training should also be on the calendar for future events presented by the newly formed partnership between the SCCG and SSSI.

Suggestion for activities from delegates included:

- Using various tools and their applications (i.e.)LiDAR, State Metadata portal
- Integration of GIS with asset management systems



6. Conclusion

Gordon Moore, a co-founder of the microprocessor company Intel has a law named after him relating to the processing power of a computer. Moore's law states that a computer's processing power doubles every 18 months. This law must be considered when designing and presenting capacity building opportunities for spatial practitioners. With much spatial work involving computers and heavily relying on their technological capabilities, ongoing professional development, awareness raising and capacity building must be ingrained into the management of the spatial profession in the public and private sectors to keep up with constant innovations.

Featured throughout many presentations from the event was how spatial practitioners utilised the process of communication. Spatial information in many instances is never just used by one person or one organisation. Many presenters called for more awareness about the most effective and efficient ways and means of transferring spatial information to ensure its correct use, value and further development to internal and external audiences.

Climate Change was a topic that was frequently featured throughout the event. Highlighted by many comments was that evidence based decision making was an integral component for Sydney Coastal Councils Group Member Councils to be able to progress initiatives to cater for the growing issues and needs pertinent to the region. Spatial data greatly assisted with creating awareness of the climate change issue and was a necessary tool that needed increasing investment and resources applied to it.

The event certainly raised many important issues that are affecting the spatial profession. The event also made emergent many critically important issues affecting the SCCG Member Councils regarding the development, use and communication of spatial information. It is hoped that the SCCG and SSSI collaboration can provide in the not-too-distant future, capacity building events specifically designed to enhance this important source of information.



Section 2: Appendices

Appendix 1

Event Presentations

All presentation from the forum can be downloaded from the SCCG Website using the following link:
<http://www.sydneycoastalcouncils.com.au/Events.htm>

Appendix 2

Event Assessment

Evaluation

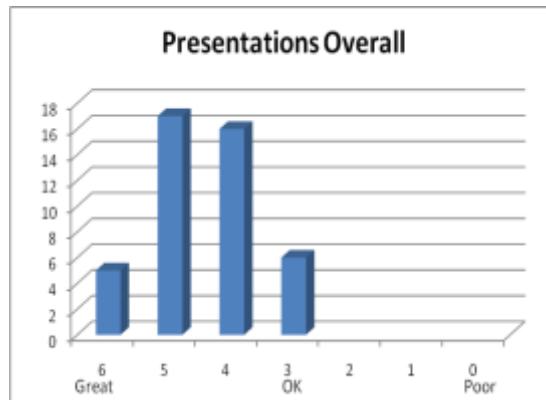
The following are the results from the individual Feedback forms delegates were asked to submit at the conclusion of the day's proceedings.

Summary

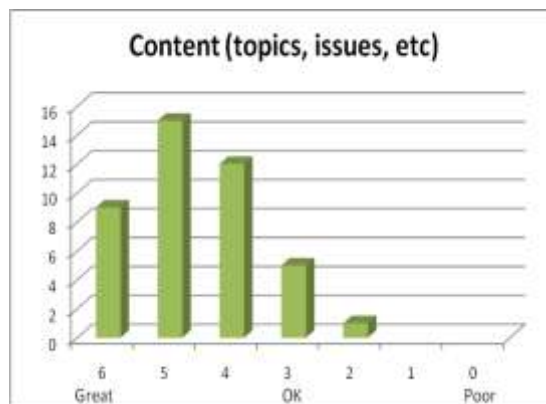
Delegates were asked to Rank on a Scale from (6) indicating Great through to (0) indicating Poor on a range of aspects of the forum's proceedings including:

- Presentations Overall
- Content (topics, issues, etc)
- Additional Resources (Handouts)
- Registration Process
- Venue
- Catering
- Time of day
- Overall

(a) Presentations Overall



(b) Content



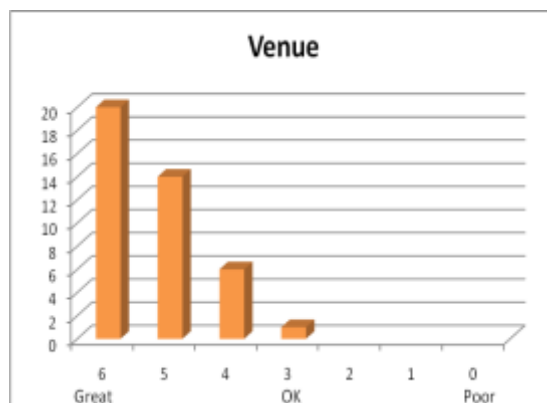
(c) Additional Resources



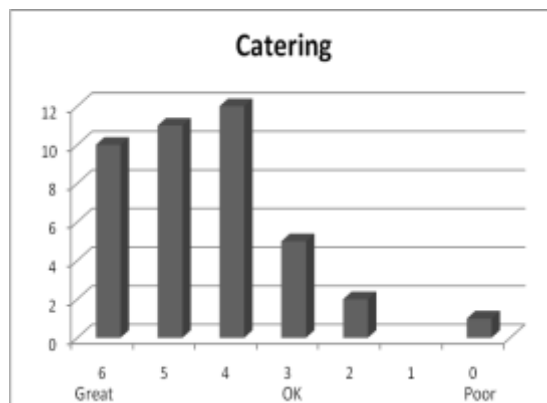
(d) Registration Process



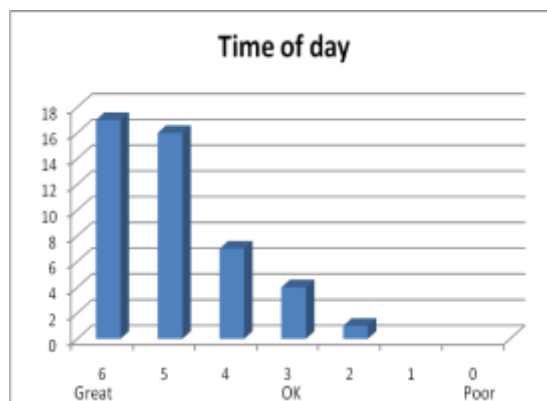
(e) Venue



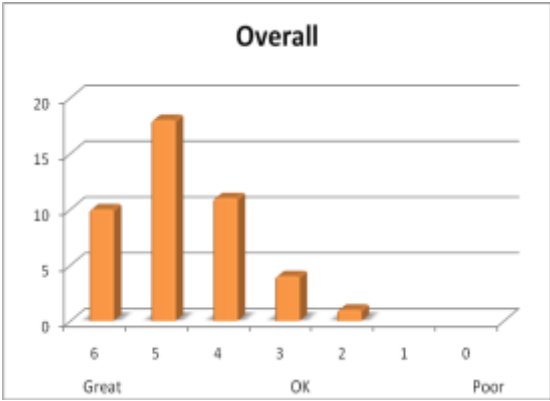
(f) Catering



(g) Time of Day



(h) Overall



Appendix 3 Evaluation Form



Feedback Form

SCCG & SSSI GIS Forum: *Sydney's Integrated Spatial Future*

Summary

Ranking	Great			Ok			Poor
Item	6	5	4	3	2	1	0
Convenor							
Presentations Overall							
Workshop							
Content (topics, issues, etc)							
Additional Resources (Handouts)							
Registration Process							
Venue							
Catering							
Time of day							
Overall							
Other							



Did the Forum meet your expectations? (Y/N) Why?

Was the content valuable to you/your organisation? (Y/N) Why?

Were there any additional topics you would like to have been covered at this Event?

What future spatial/GIS events would you like to see the SCCG & SSSI host for 2010? And can you provide any assistance?

Any Other comments?

Appendix 3 Evaluation Form (continued)



Presentation Review								
Ranking (Please (✓)Tick Selection)	Great			Ok			Poor	Additional Comment
Item	6	5	4	3	2	1	0	
Opening/ Welcoming								
"GIS where have we been? Where are we going?" Dr. Pamela Abuodha, University of Wollongong								
Using GIS to map hazards and vulnerability Prof. John McAneney - Risk Frontiers								
Flooding, Flood Modelling and Flood Mapping: Ms. Sue Ribbons - Pittwater Council								
Landslide Inventory, Susceptibility and Hazard zoning capability Dr. Phil Flentje, University of Wollongong								
Local Government Asset Management Integration –CAMS Mr. Matt Dobson & Mr. Greg Livingstone - City of Sydney								
Managing Natural Assets with the assistance of GIS Mr. David Leggett - Hornsby Shire Council								
Estuary Health – Technical and Policy Integration Mr. Tony Roper – DECCW								
GIS – What's Available and how do I get it? Ms. Liz Fulton - Cardno								
Implementation & Review of E-Planning and Update of the Hunter LIDAR Project Mr. John Hudson - Department of Planning								
Using GIS to assist policy making: A coastal perspective Prof. Bruce Thom, University of Sydney, Honorary Member SCCG								
Internal GIS uses: What, How and the Advantages! Mr. Lindsay Mason & Mr. Ross Johnson, City of Ryde								
Use of Public Participation Geographic Information Systems (PPGIS): Dr. Emma McIntyre, Eco Logical Australia								
CS2I NSW Government Common Spatial Information Initiative Mr. Wayne Patterson, LPMA								





The SCCG Capacity Building Program aims to discover, integrate and develop best practice thinking, learning and action for its Member Councils and relevant stakeholders to be more effective and efficient with coastal and estuary natural resource management, climate change responses and emerging sustainable development issues and needs by;

**Raising Awareness
Transferring Information and knowledge
Increasing Skills and Training
Facilitating Coordination and Supporting Member Councils**

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