



**SPAN's mission is to achieve excellence in the application of innovative spatial analysis in support of research, education and community outreach**



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## Manager's Message

2007 is drawing to a close after another successful year of research support by SPAN. Following a resignation in January, our unit was one staff member short, making it even busier than usual. Fortunately, in September we were able to secure the assistance of Deanna Duffy who is introduced on page 3.

In this newsletter you will find information about our new 'Nomad' rugged portable PDA style computers with inbuilt GPS for data collection out in the field and the latest on the census 'Data packs' that SPAN has purchased for research use. These contain more detailed data than is freely available from the ABS website. Also included in this edition is news about some of the research projects with which SPAN is involved and a brief report on the Mapped Out conference that was held at the CSU convention centre in conjunction with World GIS Day in November.

I would like to thank all the members of the SPAN team for the outstanding support they have provided to researchers throughout the very busy year.

I hope everyone has a safe and happy holiday over the festive season. We look forward to supporting your research needs in 2008.

*Gail Fuller*

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SPAN is a research support unit within the Centre for Research and Graduate Training at Charles Sturt University. It has offices at Wagga Wagga and Thurgoona campuses to provide postgraduate and staff research support in three main areas: remote sensing, Geographic Information Systems (GIS) and spatial statistics.

## Can SPAN help you?

SPAN might be able to assist your research in ways you do not anticipate. From simple data retrieval and map making to complex spatial and statistical data analysis, SPAN is available to enhance the quality of your research. If you are a researcher, academic or postgraduate student at Charles Sturt University and believe that some aspect of your research might be assisted by using our skills, do not hesitate to contact the Manager, Gail Fuller, on 32004 or [gfuller@csu.edu.au](mailto:gfuller@csu.edu.au) to discuss your project requirements.

**Want to know more? Visit [www.csu.edu.au/research/span/](http://www.csu.edu.au/research/span/)**

# Projects

SPAN has been assisting Susan Buik, Honours student in the School of Environmental Sciences, with sourcing data, producing maps and developing digital data entry forms in ArcPad for her to use on the new TDS Nomad handheld GPS computer devices when collecting data out in the field.



*Paratya australiensis*  
From Gooderham and Tsyrlin

Freshwater shrimps make up a large proportion of the macroinvertebrate biomass in the riverine systems of the Murray-Darling Basin. They are an important component within these ecosystems due to their roles as a detritivore and as a food source for many native animals. Susan's project aims to identify the factors that influence habitat occupancy and spatial distributions of freshwater shrimps in an Australian lowland river system at the mesoscale.

## Regional Governance Futures: A case study of regional governance in the Australian federal system.

Local and regional governance are important issues in any system of government. In Australia, there has long been debate over whether the different roles undertaken by government are being fulfilled at the right levels (e.g. local, state, regional or federal), and whether each of these levels of government has the right capabilities and resources to achieve the tasks it should be performing. There has also been debate over how different levels of government might be better encouraged to work together, and how the Australian federal system might evolve in the medium-to-long term to help deliver improved governance outcomes on a range of issues.

CSU's Associate Professor Ian Gray and researchers from other universities are undertaking case studies as part of this national research project examining the challenges and opportunities faced by local and regional governance as the federal system evolves in response to pressure to deliver improved governance outcomes.

For this project SPAN is sourcing and developing many digital datasets that represent the areal boundaries of numerous community, welfare, sporting and other local, regional, state and federal organisations as well as the various government department boundaries at local, state and federal levels. SPAN is producing both hard copy paper maps and electronic media for use in the focus group meetings. SPAN also plans to develop a web-based tool to assist in the study by allowing survey respondents to submit maps on which they are able to indicate the area that they consider to be their own region.

# Equipment

SPAN has recently taken delivery of five 'TDS Nomad' outdoor rugged handheld computers with inbuilt GPS for use by researchers doing field data collection.



The Nomads feature a high resolution 480 x 640 sunlight visible touchscreen display, 806 MHz Marvell PXA320 XScale processor, 128Mb RAM, numeric keypad, CF and SD expansion slots and Bluetooth 2.0 capability. Housed in a military standard, fully sealed and shock resistant casing, these units are designed to withstand the rigours of the outdoor environment. Standard software includes Windows Mobile 6 and Microsoft Office Mobile. In addition SPAN has installed ArcPad and can design forms including various drop-down menus, buttons and fields for quick and easy data collection.

These units can be used in conjunction with the Ricoh Caplio 500SE GPS cameras featured in SPAN's July 2007 newsletter and the Toughbook field portable laptop to give a complete data capture, recording and processing solution for all field work.

To make a booking to borrow any of this equipment contact SPAN or use the form on our website at [http://www.csu.edu.au/research/spa/resources/equipment\\_req\\_form.htm](http://www.csu.edu.au/research/spa/resources/equipment_req_form.htm)

# Projects



Water for Rivers Org has funded Stacey Kopf to complete a PhD study examining the geomorphology, hydrology and in-stream habitat of Old Man Creek, an anabranch of the Murrumbidgee River. The aims of this research are to determine the effect of flow regime on fish species composition, abundance and distribution. Data will be used to model the available habitat quality and quantity for adult and larval fish under different flow scenarios. This information will be used to predict how altering flow regimes may change fish habitat and fish populations in this anabranch system. The project will involve field surveys, lab experiments, field experiments and mathematical and conceptual modelling with the overall aim of being evaluated as a case study or reference study for similar fluvial systems. SPAN is assisting Stacey with her research by providing spatial data, creating ArcPad forms for field data collection on the Nomad (see previous page) and mapping her data.



Professor Spennemann with one of the WWII guns on Kiska Island

# Staff

SPAN gives a big welcome to Deanna Duffy who is filling the position of Research Support Officer on a contract basis for six months at the Thurgoona SPAN office. Deanna introduces herself below:

I have recently moved back to Australia after spending 17 years away, first in London then in San Francisco. After graduating from San Francisco State University in May 2006 with a BA in Geography, my first job in the field was with UC Berkeley's Fire Research Centre where I conducted field research and started training as a GIS officer. From there I worked as a GIS Officer at an engineering consulting firm specializing in groundwater hydrology.

Simon McDonald, SPAN's Spatial Analyst at Thurgoona, has made me feel very comfortable. We have been rearranging the office furniture for the last month but I think we have finally come to a perfect setup!

My first task with SPAN was to complete hours of digitizing for one of Professor Dirk Spennemann's projects. This research is investigating the decay of World War II anti-aircraft and coastal defence guns on Kiska Island, in the Aleutian Islands (see image to left). My task was to digitize contours from scans of a few old paper-based army maps so that we could create a Digital Elevation Model (DEM). It took so long that I was dreaming of contours in the end!

Once all other relevant points were digitized and the DEM, aspect and slope were derived, we went on to create a Topographic Relative Moisture Index (TRMI) for the island. Like the digitizing, the many steps required to create the TRMI took weeks as some steps required more than a day to process. The resulting TRMI, DEM, slope and aspect layers will enable Professor Spennemann to spatially model the decay of the guns and therefore formulate management schemes for the preservation of these artefacts.



# Conference



The Riverina Spatial Information

Group (RIVSIG) hosted the annual Mapped Out 2007 conference to commemorate World GIS Day, Wednesday 14<sup>th</sup> November. The conference, themed 'Showcasing the use of Spatial Data to enhance the operation and delivery of Government Services', was held at CSU's Convention Centre in Wagga. Presentations included:

- \* The National Agricultural Monitoring Systems (NAMS) and Airborne Electromagnetic (AEM) surveys by Ian Mullins from The Bureau of Rural Sciences;
- \* James Davis from Junee Shire Council with the council's new 'Landsurfing' web based mapping tool designed to stimulate business and economic development in the shire;
- \* An update from Doug Lugton on the data available through the Department of Lands' Spatial Information Exchange;
- \* Anne Freer from the Australian Bureau of Statistics on the range of 2006 Census of Population and Housing products available and the release dates for this data.
- \* Lagen Spatial's Alex Cox presented Feature Manipulation Engine (FME), a product that performs spatial data translations and transformations;
- \* The importance of metadata, the ANZLIC metadata profile and the role and future of the Australian Spatial Data Directory by John Hockaday from Geoscience Australia;
- \* The cadastral redraw project currently being undertaken by Wagga Wagga City Council, including guidelines for improving GIS accuracy and standards was discussed by Rob Harman and Amy Peterson of Dynamic Satellite Survey;
- \* GIS support of emergency management and the new developments in GIS capabilities within the State Emergency Services by Elliott Simmons.

SPAN is involved in the '**Northern connections – movement of birds between Australia and its near northern neighbours 2007-2009**' project. CSU researcher David Roshier and others are investigating the movements of birds between SE Asia and Australia, including seasonal movements of whole or sub-populations, frequent but irregular movements of individuals and infrequent movements of populations in response to particular events such as drought. The conservation of Australia's avian diversity and the assessment of risks of avian borne diseases entering Australia from the north are dependent on understanding the connections between the two regions and these population dynamics. Satellite telemetry, the genetic structure of waterbird populations and the dynamics of migratory species at sites in northern Australia are being used in this study.

SPAN's role so far has involved processing bird tracking data and producing files that are compatible with Google Earth. To view the tracks so far see: (<http://csusap.csu.edu.au/~droshier/wanderers.png.html>)

# Data

SPAN has now received **Census Datapacks**, including two updates, from the Australian Bureau of Statistics. These Census Datapacks contain the data from the 2006 Census of Housing and Population Community Profile for all of Australia with details to Collection District (CD) level. The datapacks also give the census geographic boundaries as digital basemap data, suitable for use in a GIS.

The Profiles include:

- **Basic Community Profile** - basic demographic information for an area, including age, ancestry, income, education, family type and more.
- **Indigenous Profile** - key Census characteristics of Aboriginal and Torres Strait Islander persons, families and dwellings, including comparisons with non-Indigenous people.
- **Place of Enumeration Profile** - key Census characteristics of persons, families and dwellings. This data is based on place of enumeration. This differs from the other Community Profiles in that it provides data on where people were counted on Census Night rather than where they 'usually' live or their 'usual address'.
- **Time Series Profile** - How have we changed over the past decade? What trends have occurred in housing, families, education? The Time Series Profile provides information to conduct analysis and compare statistics across a number of years.
- **Expanded Community Profile** - more detailed information about an area's characteristics. It builds on the Basic Community Profile, providing more categories within a classification.
- **Working Population Profile** - provides a range of data, including how many people work full-time or part-time, their incomes, which industries they work in, which industries have people working long hours, which occupations utilise the Internet, and how people travel to work.