Spatial Data Analysis Network (SPAN) Newsletter
Sept. 1998

Mission Statement: "To achieve excellence in the application of innovative spatial analysis in support of research, education and community outreach."

Spatial Data Analysis Network (SPAN)
Introduction
SPAN (Spatial Analysis Network) was established as a University-wide research support group within the Division of Information Technology. The role of SPAN is to support research, education, and consultancy in the areas of remote sensing, image processing, and geographic information systems (GIS). SPAN has the capability to process and interpret large digital data sets, such as satellite imagery, airborne video imagery, maps, and other data.

SPAN aims to facilitate research into human and physical problems associated with the Murray-Darling Basin, to provide a University-wide set of computer-based tools and training to help researchers address these problems, and to develop and promote a University-wide user base in GIS applications.

The Team:
SPAN has expanded and extended its research supports to Bathurst and Albury campuses through the appointment of new staff. Please contact these people if you have questions or queries concerning GIS or remote sensing related projects.

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After finishing school I studied for a Bachelor of Applied Science (Environmental Science) (Hons) and a Graduate Diploma in Education (Secondary) (Science) at Charles Sturt University between 1992 and 1997. My working background includes working as a waiter in a restaurant, teaching swimming and life saving, and as a casual employee with Charles Sturt University and the NSW Department of Land and Water Conservation, working on GIS and Remote Sensing related projects. My time outside work during the summer sees me coaching the Junee Swimming Club. I also play water polo and compete and officiate at local swimming carnivals.

In regards to my background, I have virtually been at home for the last 2 years as I have a 2 year old son (a little活 wire!). My work history is varied, although my full-time employment has always been in the field of GIS and mapping. I was working for Queensland Transport for 2 1/2 years (prior to being hired by the GIS and mapping department). Before this, I worked for the Navy for 4 years at the Hydrographic Office producing navigational charts and plans. I also spent some time at NRMA and a private mapping organisation. My education is in the field of Cartography, Survey Drafting and Information Systems. Yes, I am still studying to get through my Bachelor of Tech degree...half way there!

I have spent most of my life living in Adelaide, South Australia. After finishing school, I studied Geography and Biology at the Flinders University of South Australia between 1988 and 1991. Then, I spent five years working in the hospitality industry, during which time I studied for a Certificate in Tourism. Jobs I had during that time included working as a waiter at a five star hotel, a kitchen hand at the Adelaide Convention Centre and as a Tour Guide on Kangaroo Island. In 1997 I returned to study the Graduate Diploma in Applied GIS and Remote Sensing at the University of Adelaide. In 1998 I moved from Adelaide to the Wodonga region to work for the Victorian Department of Natural Resources and Environment. In Wodonga, before starting at CSU in August 1998, I am a town bushwalker, and enjoy most water sports (particularly water skiing), I also have a strong interest in Australian wildlife and my favourite place would have to be the Flinders Ranges in the mid north of South Australia.
Highlights of SPAN activities during 1998 are as follows:

- Progress towards establishment of GIS digital data directory for CSU.
- Progress towards the establishment of Environmental Geographic Information Systems (GIS) database on major river catchments, where CSU campuses are located.
- Introduction of GIS training workshops for staff and postgraduate students.

SPAN supports a growing number of research projects that enable the development of new expertise in GIS skills.

1. Geospatial Data Library

Spatial Analysis Unit is compiling the catalogue of geospatial data to improve the coordination, quality, usage and understanding of digital data sets held by Charles Sturt University. The catalogue provides a brief description, including the spatial extent, of data sets held in the Spatial Analysis Unit. All of these data sets are supported by a further detailed description. The catalogue also provides information on the arrangements for accessing and using the data held in SPAN. Production of this catalogue is part of SPAN's work of maximising the value of data and information assets of the university. The catalogue is being constantly updated and new editions of the catalogue will include databases at Bathurst and Albury. In the future, most of the information in the catalogue will be placed on the SPAN Web site.

In future, the GIS Units at different CSU campuses will have their data sets listed in a GIS database directory that is maintained. Records show custodians, contact person, and whether the information is distributable. Further inquiries regarding this catalogue should be directed to:

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Albury, Mr. Chris Medlin email: cmmedlin@csu.edu.au phone: 069 41 9922

2. Development of an advanced digital airborne video system

Dr. John Louis, Dr. Gordon Chapman, Dr. David Lamb and Gary McKenzie

The first Airborne Video System is providing photographic-like data at 1:4000 resolution with 4 spectral bands to monitor changes in vegetation and other environmental applications. Users can specify data of flying altitude (1 m at 5000 feet and 2 m at 10000 feet) provided there is good weather. Currently, the second digital camera is being developed. The research group has employed Mr. Conrad Dare-Edwards as part-time Technical Officer for 2 months to assist in assembling the equipment and in developing the data acquisition software. The second camera is expected to be ready for aerial testing before the end of the year.

3. Managing CSU students market share using GIS

Dr. Markus Heggland (ANU), Dr. John Louis (School of Information Studies), Dr. Jivan Athan (School of Information Studies), Kylie Little (Marketing and Communication), Dr. Mark Farrell (School of Management)

This research has an application focus but it considers issues important to GIS (desktop and interface development and maintenance of spatial data). The aim of the 1 year study period is to improve the user interface of embedding data within the current GIS environment to enable market analysis to create interactive manipulation of the student data. GIS is an excellent tool for analysing data and information with the key aspect at the transition being effective communication between the GIS, the user and other information containers.

Australian Bureau of Statistics (ABS) Census Data 1996 provides the most up-to-date information available about Australia's population. It provides instant access to Australia's population, age, education, housing, income and transport information. These census characteristics have been used to study the social and economic circumstances of particular population groups. While some of this information is available from other sources, only a census can provide the information for the country as a whole and for small geographic areas and small population groups. CDATA96 contains tabulated census data, digital boundaries and base map data. These base maps, however, are simple outlines comprising of major roads, major rivers and railway lines.

ABS Detailed Base Map Data contains detailed base map including streets, town centres, coastlines, lakes, national parks and features such as post offices, police stations, airports, schools, caravan parks, churches, hospitals for Australia. This digital data would have a useful value to the Population GIS database. SPAN is in the process of purchasing this data.

The first GIS digital data on population came out in 1986, CSU Library has purchased both the 1986 and the 1991 census data. However, due to budget cut they have decided against buying the 1996 data. The CSU Library continues to receive the CEJ and it contains a generalised statistics on the Australian population. SPAN has also purchased the 1991 census data.

The Research Management Committee has funded the purchase of ABS Census Data 1996 which allow SPAN to distribute the latest census data to CSU users at cost of transfer for their research and planning needs.

4. Murrambidgee Pollution Model

Research collaboration with DLWC (Des Bennet, Alistair Buchan and Adam McLean) at Leeton; and Dr. Xinlin Yang.

The Murrambidgee River is an important source of water for agriculture, town water supply and recreation. Possible pollution incidents which threaten the quality and usefulness of this water and the safety of water users include chemical or pesticide spills (e.g. from road accidents) and the release of water contaminated by high concentrations of blue-green algae from water storage (e.g. weirs, dams or turbation water storage).

The project aims to develop a Graphical User Interface on a GIS which allow DLWC Officers to input the location of a pollution incident into the system. The computer will then calculate the volume of pollution and specific current environmental data to predict the downstream movement of a pollutant. This information could then be combined with current water user information to alert the officers to those locations and persons that should be notified of impending possible contamination.
Support Services

Technical support and training in the use of GIS software is supplied by SPAN. Good training reduces the time necessary for successful GIS implementation. Training classes are provided on regular basis and can be matched to various levels of expertise. SPAN also works in collaboration with Remote Sensing and Statistics academics to coordinate Remote Sensing and SPLUS workshops.

GIS Introductory Workshops
September 10 1998 Where: Jack Cross Centre, Time: 9:00 – 5:00 p.m.

It was designed to offer customized solutions to social and environmental applications. SPAN will offer short courses using television material and in a professional environment. Training will include conceptual components and hands on utilizing a variety of GIS software. SPAN will encourage an existing course or develop totally new course, as required. The plan is to conduct regular courses for all levels of GIS users at all three campuses.

Similar workshops will be conducted at Bachar and Albury before the end of the year. If there is any interest for a group workshop, please notify SPAN's manager and we'll make some arrangement to design one that is specific to your application area.

SPAN will develop introductory training packages in the following GIS software packages: Genimap, Mapinfo, and ArcInfo. Currently, SPAN is refining the training materials developed for Genimap and Mapinfo.

These training workshops are not intended to substitute for GIS courses, but focus on hands-on training that would be appropriate for the standard GIS applications. The major aim is to get participants to perform simple GIS tasks such as mapping and data querying themselves.

SPLUS Introductory Workshop
September 11 1998 Where: Jack Cross Centre, Time: 9:00 – 5:00 p.m.

This workshop examines the application of modern statistical techniques using S-PLUS. This software can be linked to GIS software.

Dr. Bernard Elkins and Dr. John Lins (School of Information Studies) are conducting the above.
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S-PLUS

Control, clarity, and confidence - that's what S-PLUS delivers. S-PLUS incorporates the S language developed at AT & T Bell Labs, the only modern, object-oriented language created specifically for data exploration and analysis. Its flexible, extensible design makes S-PLUS an ideal environment for exploring and understanding scientific or technical data. A comprehensive solution for data analysis problems, S-PLUS offers you outstanding graphics, mathematical and matrix computations, advanced modelling methods not available in other data analysis software, a truly object-oriented programming language, and dynamic access to external C/Fortran routines. It's the only data analysis program to put you in complete control of your analysis.

Workshop to be announced: Application of GIS Network Analysis to Water Resource Management

Convenors: Dr. Xihua Yang, Mr. Bill Gates (School of Information Technology), Ms. Siti Anuar (SPAN)

Network modelling techniques have been well developed in today's geographical information systems (GIS). However, this is an emerging field and many major applications have been in the areas of traffic routing and allocation analyses. Very little work has been done on their application in water resources. Many water resources management practices are often dealing with network problems, such as drainage capacity assessment in agricultural drainage network, water flow (travel time) and downstream pollution prediction in a drainage network, evaluation of pipeline and water supply systems. The GIS network analysis have great potential in these areas.

In this workshop we will explore, by lectures, demonstrations and practical work, the principles, procedures and functions of GIS network analysis. Case studies will be presented in the area of common water management practice, such as agricultural drainage network, capacity assessment, sandcrest discharge computation, river flow rate and water pollution simulation. Hands-on exercises are being designed for these case studies using ERDAS's AutoView GIS. Participants will complete the whole process of network analysis (from data preparation, analysis and results presentation).