

# Fungis

Newsletter of the  
Far North GIS Users' Group Inc



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## Bog Standard GIS.

Most of you would have seen the two wrinkled old Yanks hawking Cranberry drinks on TV, what has that got to do with GIS, I hear you ask? Well they actually use it to manage their Bogs, read on and be enlightened.

The cranberry vine, native to America thrives on the vital combination of soils and hydrology found in wetlands. The growers cooperative called Ocean Spray have a Cartographic section which distributes critical information to the grower owners.

The Cartographers have a twofold mission. First tracking cranberry acreage as part of their marketing strategy, each grower has an up-to-date map of his productive bogs, this itemises areas for delivery and hence on the volume of delivery is structured the individual grower stock equity. Secondly the information assists in creating crop forecasts and indicates Ocean Spray's position within the overall marketing in the US.

The individual map tracks total acreage, the size of the individual bogs, the variety being grown and the stage of production the bogs are in.

Way back in the dim dark ages of 1983 there used to be 12 cartographers employed. Now annual aerial photography and a modern GIS system perform the task more efficiently and quickly. They are now expanding their services and assisting their environmental department with management decisions. The pest and weed problems are also being addressed.

So when you next see the two wrinkled old men remember Cranberry Bogs are managed by modern GIS techniques. It still doesn't make Cranberry juice taste good.

Plagiarised with permission from ESRI ArcNews, Vol 16 No. 4.

## ESRI develops pollutant inventory interface for EPA.

ESRI Australia has developed a Public Interface application for the National Pollutant Inventory trials currently being conducted by the Victorian EPA. Eventually, the Pollutant Inventory will be available in public facilities such as libraries, for any member of the public to investigate pollution levels in the local area, using a Geographic Information System (GIS).

The pollution inventory trials are a direct outcome of the Environment Statement delivered by the Prime Minister in 1992, and consequent initiative of the Federal Environment Protection Agency. In the long term the proposed inventory will encourage improved waste minimisation and cleaner production by government and industry bodies through public access to information about emission of wastes.

The public interface now in prototype is the first indication of what community users can expect to see when examining the pollution inventory. Users will be able to select specific pollutants, see maps of concentrations or sources of emissions in their local area, and produce printed copies.

Based on ESRI Inc's Arc View product, the development has involved customising the functionality the software, and providing tools and buttons specific to the pollution inventory. Avenue, the programming language included with Arc View, allows users to easily create tools to satisfy individual needs.

The first trials of the public interface application will take place in Dandenong, Victoria and improvements to the interface will be on-going based on the response from users.

For more information contact:  
Jacqui Brown  
ESRI Australia, Ph 09 242 1005.



## **OmniSTAR**

### **The National Differential GPS Solution.**

OmniSTAR is the latest, and one of the most accurate positioning services available in the world today, providing positioning to within one metre instantly 24 hours daily.

OmniSTAR is a differential GPS service over Australia which is supported by a network of reference stations located throughout the continent to provide DGPS corrections back to the Network Control Centre in Perth.

Users may select single reference station positioning to give an accuracy of 2 - 5 metres or multiple reference station network positioning ( Wide Area DGPS) to give an accuracy of plus or minus one metre.

An extensive geodetic network has been surveyed in order to ensure system integrity, with connections to the Australian fiducial network made to establish datum shift parameters between the satellite and local datums.

Brazier and Motti are OmniSTAR agents with offices in Townsville, Cairns and Cloncurry. They have developed a functional compact lightweight unit in the form of a backpack. A state of the art plate antenna sits just above the head and eliminates the need for a bulky whip antenna.

Because of the high levelation of the Optus satellite the plate antenna is ideally suited to North Queensland. This ensures a strong uninterrupted signal.

Pricing is flexible with the base hire rate of \$220.00 per day , negotiable up to one month. Monthly hire has a daily rate of \$110 per day or yearly rate comes in at \$18,000.

Brazier and Motti will be happy to arrange a demonstration, initial inquiries can be made to Gary at the Townsville office.

phone 077 721 144 fax 077 722 557.

## **A Bit of Philosophy.**

Some time when you're feeling important,

Some time when your ego's in bloom,  
Some time when you take it for granted,

You're the best qualified in the room,  
Some time when you feel that your going would leave an unfillable hole,  
Just follow this simple instruction  
And see how it humbles the soul.

Take a bucket and fill it with water...  
Put your hand in it up to the wrist.  
Pull it out--- and the hole that's remaining is a measure of how you'll be missed.

You may splash all you please when you enter,  
You can stirr up the water galore:  
But stop, and you'll find in a minute  
That it looks quite the same as before.

The moral in this quaint example  
Is to do just the best that you can--  
Be proud of yourself, but remember--  
There's no indispensable man.

anon.

## **Science Software Source.**

Hearne Scientific Software has set up a home page on the Web. The site has an on line product catalogue, price list and order form. You can also download demos of most of the software, so you can try before you buy. The site contains links to Web pages maintained by software manufacturers. There is also news which affects current and prospective users of the software. This ranges from product availability, new product developments, upgrades etc.

## COASTWATCH ADVANCES COASTAL SURVEILLANCE.

Surveillance of Australia's vast coastline is being made easier and more efficient thanks to the introduction of a new computer system in Coastwatch, which is part of the Australian Customs Service (ACS).

The ACS is Australia's front line against the importation of illicit drugs, prohibited goods and the unlawful movement of people and cargo across national borders. Last year Coastwatch recorded 73,000 sightings, in approximately 29 million square miles. New civil surveillance arrangements recently announced will provide for coverage of nearly double the area, by mid 1996.

Coastwatch's Director of Contracts Graham Giles recently announced that a \$150,000 contract has been awarded to ESRI Australia to supply a GIS.

"This system will be used as a tool to improve our surveillance capabilities and our reporting to clients," said Mr. Giles.

ESRI will provide software, geographic and other data, hardware, and specialist services. The main feature of the easy to use GIS is the ability to view on-screen selected maps of physical features such as reefs, coastlines, islands, marine markers and beacons.

Coastwatch staff will find it easier to manage a range of data including information about surveillance sightings, the positions of Customs fleet vessels, routes of surveillance flights movements of aircraft and shipping, and the positions of fixed and movable oil platforms, wrecks, marine aids, and observation platforms.

Using the GIS database, they will also be able to study past flight routes and the history of surveys in a particular area and use this information to plan "best fit" future surveillance patterns.

Administrative boundaries, such as marine parks, the Australian Fishing Zone, restricted air space areas, and flight path information can also be displayed if necessary.

For Coastwatch, the new GIS is a huge technological advance on the old manual system of paper charts and maps. It also enables Coastwatch to easily customise surveillance patrols and the resulting information for particular clients, such as the Australian Fisheries Management Authority or Australian Quarantine Inspection Service.

The different units of measurement used by aviators and sailors are also catered for, with GIS users able to nominate and convert between the different units. Initially the stand-alone unit will be based in Canberra, though there are provisions for expanding access to regional coastwatch locations at Cairns, Broome, Darwin and Thursday Island.

A built in security system will protect against inappropriate use of the Coastwatch data, with certain information only available for specific functions.

Item courtesy Mark Billing ESRI Brisbane. ph. 07 3831 3210.

## New GPS Engine.

Rockwell Inc. has just released a new GPS engine in the US called Zodiac that breaks all price/performance barriers. The company expects that it will ignite the long discussed - but equally long forestalled - shakeout among GPS engine manufacturers, according to GPS World Newsletter.

GPS engines typically consist of several integrated circuits on a circuit board and take care of all the reception and decoding of signals from the Navstar Satellites. To make a functioning GPS unit, it is only necessary to add a user interface and put it in a box. Most re-



ceiver manufacturers make their own, although builders of special application products like vehicle tracking devices have long just bought the engines on an OEM basis.

But the new engine is so slick it may well force receiver manufacturers to reconsider how they do business. The new multi channel two-chip unit is differentially capable, but will only receive C/A code. It is priced under US\$50 in volume. It will be available in the new year. Rockwell publicity says the pricing level will result in consumer GPS receivers priced as low as US\$199.

Vijay Parikh, business director for Rockwell's wireless group is reported to say "Over 15 companies are doing GPS engines, and the market obviously is not large enough for all 15."

He believes that some of the companies currently offering their own proprietary GPS technology would prefer to buy engines like Zodiac, particularly price conscious companies with significant high-volume, consumer product lines such as Magellan and Garmin International.

extracted from GIS User Journal No. 14.

### **Spotting the Fire.**

The August edition of the Australian/New-Zealand LAN Magazine featured a MapInfo related application developed by CeaNet, a value added reseller of MapInfo Australia.

CeaNet's V-Track product enables the transferral of positional data, generated by a GPS navigation system, to a MapInfo geographic information system.

The article highlighted the effectiveness of such GPS technology to emergency services, particularly the NSW Fire Brigade, who are currently testing the technology out in four Sydney suburban stations.

The impressiveness of the MapInfo and CeaNet system is highlighted in the concluding paragraph of the article:

"This state of the art tracking system is one of the first systems of its kind in the world," said Ian MacDougall AC, NSW Fire Brigades Commissioner. "This initiative demonstrates that the NSW Fire Brigades are at the leading edge of technology in our mission to further reduce the response time of our vehicles and thus reduce the loss by fire to the community of NSW."

### **MapInfo in Cyberspace.**

MapInfo's worldwide web site was launched on September 29, 1995. The address is <http://www.mapinfo.com>.

Why don't you give it a look. Currently there is little more than address information for the Australian region.

Shortly this is to be supplemented by the development of an Australian Webb page. Interested persons can ring James Findlay on +61 2 437 6255 with suggestions. MapInfo is also on Microsoft Network

these items courtesy of MapInfo Australia P/L.

phone 02 437 6255

fax 02 439 1773.

### **A couple of Definitions of Remote Sensing.**

The art of dividing up the world into little multi-coloured squares and then playing computer games with them to release unbelievable potential that's always just out of reach.

Jon Huntington.

CSIRO Exploration Geoscience.

A time and cost saving mapping technique that utilises expensive software, hardware and data for the purpose of

producing once of, unrepeatable and unrequired information of spurious quality.

Nick Rollings  
RMIT Centre for Remote Sensing.

## **NGIS.**

The National Geoscience Information System will be launched in February, well ahead of schedule. NGIS is a 3 year, \$1.5 million project to place all of AGSO's geoscience data on line. Access to the information will be via a home page on the WWW.

It seems that the database will contain data held by AGSO, as well as other government departments and the scientific community. It will also hold a directory of datasets held by private organisations, and available on a restricted basis, usually after payment of a fee. The idea is that anyone researching Australia's geology will be able to use the service to either source data or at least determine what data is available.

For more info. contact David Berman at AGSO on <[dberman@agso.gov.au](mailto:dberman@agso.gov.au)> or <http://www.agso.gov.au>.

## **Defence Toys with Satellite.**

The idea of a geostationary surveillance satellite for the Department of Defence has popped up again. An article in a Defence Science and Technology Organisation in-house magazine, Defence Science News, says such a satellite could be in orbit by 2005.

The article by Dr. Tony Bedford, points out that a geostationary satellite with 10 metre resolution could be had for around \$50 million. This would be sufficient to track military aircraft and ships across the northern approaches to Australia.

Given the extraordinary amount of money being invested in the Jindalle Over the Horizon Radar, and in Airborne Early Warning Aircraft (each over the billion dollar mark), one wonders why the advantages of a surveillance satellite are not perfectly obvious to everyone.

Based on past experience, however, one would have to say that the probability of the defence chiefs, or anyone else in government, backing such a satellite is extremely remote.

the above items were derived from **GIS User and Spatial Business** with thanks to Wendy Chapman.

## **ArcView White Papers Available.**

The ArcView white paper series explains the underlying concepts of ArcView Version 2 software. As information documents, they are designed to educate as well as to provide the technical details needed to make informed decisions about ArcView. Two white papers are currently available: "ArcView: Functional Overview" and "ArcView Shapefile Technical Description". Additional papers due early in 1996 include papers on "Portable GIS, Database Connectivity and Network Connectivity". A late advice is that 'ArcView Version 2 : Working with Visual Basic' is now available.

ESRI Australia, Northern Region Manager, Mark Billing will be able to satisfy any queries regarding these White Papers or on the extensive product range offered by ESRI.

ESRI Australia.  
P.O. Box 659  
Spring Hill, Qld 4004  
phone 07 3831 3210  
fax 07 3831 3214.



## **ABS to abandon CCDs Following Kiwi Model.**

The Australian Bureau of Statistics is considering changes to the way it presents its geographic statistics to the outside world. Beginning with the 1996 Census, ABS intends to adopt unit blocks as its basic geographic unit.

Currently, data is aggregated to census collection districts (CCDs). It is anticipated that unit blocks will be smaller than CCDs, so allowing much greater resolution in demographic map making. As things stand, census information in Australia is collected by individual census-takers who visit each house. CCDs form the bottom of a hierarchy developed by the ABS, called the Australian standard geographic classification.

Under this arrangement, CCDs can be combined into statistical local areas or local government areas when appropriate. Typically, CCDs are geographic areas defined by local topography and the ability of the census-taker to cover the territory on census day.

With the growth of GIS-based geodemographic analysis, there has been considerable demand for datasets that describe various demographic parameters, and these have usually used CCDs. But many users have found that CCDs give an unnecessarily coarse result, and hence there has been pressure on the ABS to make its minimum geographic unit smaller.

Unit blocks will fulfil this need. According to a note from Dr. Greg Laughlin, the director of geography at the ABS, the proposed units will be similar to those used in New Zealand. "A unit block, provided it is sensibly defined, could be different shapes in different areas depending on the actual conditions on the ground. In this context the UK postcode system is an in-

teresting model. For example, in urban areas, unit block boundaries could be formed by individual streets, pathways, lanes, easements and reserves."

ABS is looking for comment on its proposals. Interested parties should contact Dr. Laughlin on.

+61-6-252-7759

sourced from GIS User Journal No. 14. Dec 93..

## **TRIMBLE ENHANCE THEIR PRODUCT BASE.**

Herga Instruments of Brisbane recently announced the release of Direct GPS. This provides GPS data capture and navigation within ArcView. The Addition of a Trimble Mobile GPS Gold Card (PC Card) to a suitable Notebook PC with ArcView 2 installed. The Trimble software integrates both GPS and data collection functions into the ArcView interface. Feature and attribute information and positions are simultaneously collected and stored in an ArcView shape file format. Shape files are a simple, non-topological data structure supported by ArcView software that can be easily converted into an ArcInfo coverage. Because data files are created in ArcView's native format, data conversion is eliminated and data management is simplified, reducing the amount of time spent processing data in the office.

The Direct GPS for ArcView software is incorporated into the ArcView interface, complete with all the benefits of ArcView's GIS functionality. Field operators can display existing ArcView themes, such as streets, as background maps. A GPS cursor shows operators their position against this map, allowing them to easily navigate to specific features for collection.

Direct GPS for ArcView tools allow users to create customized feature lists for each data collection session. For example, the GIS manager can con-



struct a list of features with associated attributes for the field crew to collect. This capability expedites the data collection process by allowing operators to simply select a feature from a list, rather than type entries into an ArcView table. Feature lists also increase data integrity by controlling the features and attributes users can collect, thereby ensuring that the data collected matches the format of existing ArcView themes.

GPS positions provided by the Mobile GPS Gold Card are accurate from two to five metres with a radio link for real time differential correction. Real time differential correction data are available from several commercial sources.

(Refer Fungis July/ Sept 95 and this issue).

The Direct GPS system provides the GPS components to collect data directly in shape file format: the GPS receiver, antenna, and GPS to GIS software. It runs with user supplied ArcView software and a suitable field computer, ie type 2 or 3 pcmcia slot and minimum 12 mb ram.

Information and field trials courtesy of  
Garry Essex, Herga Instruments, Brisbane.  
phone  
fax

## **From Photogrammetry to Geomatics a commemoration of the accomplishment that is VirtuoZo.**

In 1957 the concept of the analytical stereoplotter proposed by U. V. Helava marked the beginning of the analytical stage of photogrammetry. The collinearity condition equation here was satisfied by means of computation within an enclosed electronic computer. The outcome of an analytical plotter is digital if

a computer controlled drawing table is connected therefore the digital output is converted directly into a topographic map. A better way of achieving this result was to store the digital output directly to magnetic tape, then afterwards, as was required, this tape was used to control an automatic plotter to produce the hardcopy.

The greatest benefits drawn from the use of the analytical plotter were embodied in the densification of photogrammetric pass points, ie. the formation of digital aerotriangulation, and the birth of the Digital Elevation Model (DEM).

In the 1990's photogrammetry truly jumped into the digital era. Real-digital photogrammetry is now with us with the so called 'pixel photogrammetry', 'softcopy photogrammetry', 'raster-grammetry', 'digital photogrammetry' or "virtual photogrammetry". This requires that before any photogrammetric operations can be performed, the photographs must be digitized, ie. scanned to produce digital images. Alternatively, one could use a specially designed digital camera or other sensor system to get the digital image directly. These digital images are then processed using specialised computer software to yield the required products, namely, digital maps.

Such software when bundled with the required computer, is collectively termed the "Digital Photogrammetric Workstation" or DPW. The main functions of these workstations are to create DEM, to calculate and draw contour lines, to rectify photographs and to make maps. As the technique of automatic object recognition within an image is not yet matured, the fully automated production of topographic maps is still limited to the production of orthophoto maps with contours.

The evolution of photogrammetry to its current fully digital state heralds a new



epoch within the industry. The enormous advantages of digital photogrammetry are as follows.

1. It is a natural progression and appears the best way to realise automation within photogrammetry.
2. The computer based photogrammetric workstation can replace all kinds of optical-mechanical photogrammetric processing equipment. Many advantages thereby exist: there is no mechanical deterioration: there is no need for ongoing instrumental calibration: processing can be near real-time: all further improvements in computer technology will directly influence the efficiency of photogrammetric processing (and the speed of computers can be expected to increase exponentially).
3. Digital images are not prone to deformation and are therefore very stable.
4. Original observation data changes from image point coordinates to gray scale values of image points, thus improving processing accuracy.
5. Digital images are easily integrated with remote sensing and GIS. As a discipline, we have seen Photogrammetry change to "Photogrammetry and Remote Sensing". Recently this term has come under scrutiny with some photogrammetric related organisations and individuals opting for terms such as "Geomatics", "Geographical Informatics", and even "Iconic Information Engineering".

During the evolution of photogrammetry to its current truly digital state, we have been pleased to witness the success of the Wuhan Digital Automated Mapping System ( WuDAMS ), which has been accomplished by the research team directed by Professor Zang Zuxun at the Wuhan Technical University of Surveying and Mapping in the Peoples Republic of China. At present this system has entered the market with the cooperation of Geonautics Pty. Ltd., Jetway Graphic System Inc. Ltd., and

more recently, VirtuoZo Systems Pty. Ltd. The trading name for WuDAMS is VirtuoZo.

During this time, Professor Zang Zuxun has developed countless theories and computational methods in digital photogrammetry such as the theory and practise in one dimensional pixel arrangement along conjugate epipolar lines, the use of the bridging mode image matching method, global image correlation by way of dynamic programming and probability relaxation, etc. It is quite evident from the speed of VirtuoZo that one of Professor Zhang's most significant achievements within digital photogrammetry has been his success in the problem of image matching.

This item was provided by Graeme Brooke, a Director of Geonautics and VirtuoZo, a former North Queenslander and longtime member of our User Group.

Graeme continues to describe some of the features of this innovative software. VirtuoZo is a Unix based suite which accepts scanned stereo photography or stereo SPOT satellite imagery as input and very simply and quickly produces ortho-rectified imagery (Orthoimages), digital terrain models (DTM) and contour maps as primary output. Secondary output consists of dynamic three dimensional visualisation techniques in stereo of the modelled object.

Currently, the dominant use of VirtuoZo is to create DTM's and Contour Orthoimages for mapping purposes, or as a data source for proprietary GIS. Other uses of VirtuoZo have been, the solid modelling of individual objects in a workshop or laboratory environment, explosive blast crater measurement, dinosaur footprint archival and measurement, architectural facade recon-



struction and transport corridor measurement.

#### **Primary Image Input and Processing Formats.**

VirtuoZo processes standard 24 bit BIP format digital images with no data re-formatting necessary. Alternatively 24 bit TIFF can be accepted and reformatted within the software.

Scan resolution determines the accuracy of the eventual output DTM and hence accuracy of resultant contours and orthoimages. Scan resolutions between 7 and 100 microns have been tested. The most typical scan resolution used for production photogrammetry is 25 microns ( approximately 1000 dots per inch ). A 25 micron 24 bit monochrome scan of a standard 23 cm by 23 cm metric aerial diapositive is approximately 85 megabytes. The same photo scanned in 24 bit colour at 100 microns is about 15 megabytes.

#### **Secondary Input.**

It is necessary to relate the model created by VirtuoZo to a real world coordinate system, then it is necessary to have a number of known coordinated points that are identifiable in the stereo model. Each of these points requires known X, Y, and Z coordinates, in most instances four points suffice if using a metric camera.

#### **Processing and Functionality.**

This is somewhat lengthy to describe and can best be done by obtaining full details of VirtuoZo.

#### **The Created Products.**

The DTM created is a regular grid. The user nominates the DTM interval, and opts as to whether the eventual DTM grid will be orthogonal to the adopted mapping grid or to the flight line. This is executed by a single mouse click from within the menu.

The Orthoimage has had all distortions due to height differences removed from it. In effect the orthorectification process produces an image which is at once suitable to be used as a map, either as

hardcopy, or as a backdrop to a proprietary GIS and further used for heads up digitizing or even married to the Trimble Direct GPS with ArcView.

The user nominates the contour interval, the colour of the contour lines, how frequently emboldened contours should be displayed and whether contour annotation is required. Again a single Mouse click is all needed to generate contours. They can be either raster or vector format.

#### **Visualisation.**

Users can view the results of every stage of the photogrammetric process from raw images, through epipolar images in full stereo, orthoimage, contours and orthoimage with contours. Further visualisation techniques including the ability to view the model dynamically (in mono or stereo) as a live, computer generated, perspective model.

For further information contact VirtuoZo Systems.

phone +61 7 3871 0645

fax +61 7 3371 3602

## **Tropical Urban & Regional Planning.**

The Centre for Tropical & Regional Planning was created, at James Cook University, Cairns Campus, out of recognition of the growing need in Northern Australia and tropical regions around the world for suitably trained planners with a 'tropical' bias to their qualifications and experience.

The JCU programs in Tropical Urban & Regional Planning aim to produce planners who are able to contribute to the needs of urban, regional and remote planning and development in the tropics and to allow allied professionals to



widen their knowledge of the field of planning.

The programs taught by the Centre are a Master of Science in Tropical Urban and Regional Planning and a Post-graduate Diploma.

For further enquiries please contact:  
The Director  
Centre for Tropical Urban & Regional Planning, James Cook University,  
Cairns Campus, Smithfield 4878  
phone +61 70 421 218  
fax +61 70 421 216

## SEMINAR SEMINAR.

We are calling for expressions of interest from those who are interested in presenting a paper at our forthcoming annual Seminar in June 1996.

There is no specified Theme however in keeping with our Northern Identity we are most positive about subjects which are northern oriented.

Interested persons can register with:

Alan Stafford  
P.O. Box 523  
Mossman 4873  
ph 981 128  
fax 981 128  
email taimalan@msn.com

## From the Editor's Desk.

We conducted a Workshop at DPI Mareeba on 11 th. October. The theme GIS and Land Use Planning was addressed firstly by John Dickinson, he spoke on the GIS used in the Johnstone River Project and the production of an impressive Atlas which has seen service in furthering their aims. The second speaker was Les Searle who gave us a

powerpoint slide show on the latest Lands products centered around "Basic Land Information Network" (BLIN). The 25 attendees then participated in the usual social interchange over coffee and nibbles.

We have a few entries for our EMAIL listing.

Utz Welbrock Mareeba Shire Council  
utz@internetnorth.com.au

Mark Billing ESRI Brisbane Manager  
mbilling@esri.oz.au

Rose Eggleton ESRI Brisbane GIS Consultant.

reggleton@esri.oz.au

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cccpj@internetnorth.com.au

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allisos@mbw\_gis1.nth.dpi.qld.gov.au

The DPI telephone number is no longer 921 555 it is now 928 555.

I have just taken delivery of a pentium 133 beast with heaps of goodies so I will be spending Christmas honing my skills at Microsoft Golf.

Best wishes to all fellow Fungisites and families for a good Christmas break.



# WORKSHOPWORKSHOPWORKSHOPWORKSHOPWORKSHOPWORKSHOP

Our next workshop will be on **20 th. March 1996**

**Venu. Lands Conference Room      time    9.00 am to 12.30 pm.**

theme **To be Advised closer to the date.**

For further details and advance bookings contact our Secretariat,  
Judith Searle Phone/Fax 070 392 935

**Don't Be Left in the Dark  
Become a FNGIS Member.  
FAR NORTH GIS USERS GROUP Inc  
Membership Subscription Renewal.**

INDIVIDUAL    \$30	<input type="checkbox"/>	Membership is valid for 4 calendar quarters, starting the quarter in which membership is received.
CORPORATE    \$50	<input type="checkbox"/>	Corporate membership entitles an organisation to send up to 5 representatives to any FNGIS function at members' prices, and to receive up to 5 copies of the newsletter to a single mailing address.
FULL TIME		
STUDENT or    \$10	<input type="checkbox"/>	
UNEMPLOYED		

Name .....

Organisation .....

Mailing Address .....

.....Post Code .....

Phone ..... Fax .....

Email .....

Mail completed forms to: FNGIS Secretariat,

Judith Searle, 1 Norilla Cl., Lake Placid 4878.

Phone/Fax 070 392 935.

The Far North Geographical Information Systems Users Group Inc. (FNGIS) is a non profit organisation established as a local forum for knowledge exchange on GIS, and to promote the use and awareness of GIS in the Far North.

This newsletter is published quarterly, and distributed free to members. Articles and Paid advertising are welcome. Material should be submitted to the newsletter editor. Alan Stafford, ph 981 400 bus. 981 207 home phone/fax or P.O. Box 523 Moesman 4873.