AUSTRALIAN CENTRE FOR REMOTE SENSING

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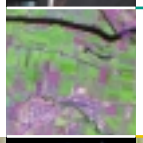
ACRES UPDATE

FEATURES



ACRES

Contents

Cover: Landsat 7 ETM+ image acquired on 15 August 2001 showing Canberra's newest and fastest growing district of Gungahlin. The Bands displayed are 2, 4, 7 and 8 as blue, green and red.

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GEOSCIENCE AUSTRALIA

MANAGER'S MESSAGE

FREE Online Data!!!

This has been the call of the market, ever since online distribution tools such as FTP and WWW have been available to users with a standard PC. The Federal Government has responded to this call in its recently announced policy on Spatial Data Pricing, with specified datasets to be available online without charge.

ACRES has now begun implementing the policy ahead of schedule by making two significant datasets available online free of charge: AVHRR data from the NOAA polar orbiting satellites; and MODIS data from NASA's TERRA satellite. Both datasets are from free-to-air broadcast satellites, where access to the satellite data is unrestricted and without cost. Separate articles report on these releases in this edition of *ACRES Update*.

AVHRR is a well-known dataset to many users in Australia, and is relatively small in size, so we expect many users to take advantage of its online availability. MODIS, on the other hand, is a new dataset and has no existing user base in Australia. It is also a large dataset (a minimum file size for downloading is 200MB). Access to MODIS data will therefore be very limited. We hope however to establish a dialogue with early adopters of the data to help plan our further MODIS developments.

The level of interest shown in this data, particularly the AVHRR, will be an early sign of success of the new pricing policy. Regardless of the level of interest however, the extension of the policy to other online datasets from ACRES is very limited. SPOT, Radarsat and ERS are not Commonwealth datasets and fall outside the policy. Landsat 7 data is distributed in Australia under Commonwealth copyright. However, Landsat products are customised products, that is, processed from raw data to a customer's specific requirements. They are sold under the policy at a price sufficient to recover long-term distribution costs.

The global trend in remote sensing is towards commercialisation, with perhaps higher data costs. In this case, the disparity in pricing between Government-owned datasets and remote sensing data is likely to widen. This may hinder the future growth of the industry.

It was satisfying for everyone in the industry to see the successful launch in October of two new high resolution satellites, Quickbird from DigitalGlobe, and TES (Technology Experiment Satellite) from ISRO, the Indian Space Research Organisation. ACRES has no direct involvement in either mission, but we support all endeavours to expand and promote the industry.

Ian Shepherd

GOVERNMENT WIDENS ACCESS TO SPATIAL DATA

A package of initiatives announced by the Federal Government in September will help position the Australian spatial information industry to capture a greater share of a large and rapidly growing global market — currently estimated at around $34 billion, with a growth rate of 20 per cent a year.

The Federal Government plans to open up access to fundamental spatial data held by the Commonwealth to stimulate the development of a viable private sector spatial information industry in Australia.

Announced by the Minister for Industry, Science and Resources, Senator Nick Minchin, the move aims to maximise the benefits to the community from the government's investment in spatial data.

Spatial (or geographic) data is information that can be mapped, including data about natural resources, the environment, social services, infrastructure, and digital versions of topographic maps and hydrographic charts.

The new policy will provide free online access to specified spatial data just as soon as the necessary technology becomes available within the custodian agencies. Products that cannot be immediately made available on the Internet will be supplied at the marginal cost of transfer. The policy also removes restrictions on commercial use or value-added activities related to those spatial data.

"The bottom line is that the private sector will have greater access to public-funded data from which they can develop innovative new products and services, while the community will reap maximum economic and social benefits from its investment in the data," said Senator Minchin.

To allow time for existing value-added resellers of government data to adjust to the new arrangements, the policy will be phased in over a six-month period.

Senator Minchin announcing the range of initiatives designed to stimulate the spatial information industry.

Some data will be available under the new policy immediately. By February 2002, there will be a much more extensive range of data available.

In line with the new policy, a wide range of data is now available free to the public. This includes information about surface water quality, land use, dryland salinity risk, geology, gravity, seismic activity, geohazards, climate, World Heritage areas, Antarctic place names, the Register of the National Estate, a number of geodetic data products, and digital topographic data covering the whole of Australia at a scale of 1:1 million.

The new *Global Map Data Australia — 1M* is now available online to download free at **www.auslig.gov.au/download/download.htm**

Sections of the report of the Commonwealth IDC on Spatial Data Access and Pricing are available at: **www.csdc.gov.au**

ASIBA ACTING ON AGENDA

Following the completion of work by the Spatial Information Industry Action Agenda Steering Group, the Minister for Industry, Science and Resources, Senator Minchin, launched the final report of the Action Agenda, *Positioning for Growth*, in September. The report is a definitive statement on the strategies and actions for industry and government to work towards and remove impediments to industry growth and participation in the global spatial information economy.

Tony Wheeler, Chair of the Australian Spatial Information Business Association.

"The Action Agenda is a joint effort by all key stakeholders — businesses, educational and research institutions and Commonwealth, State and Territory governments. I would especially like to commend the high degree of commitment shown by the industry to achieving a strong, sustainable and internationally competitive spatial information sector in Australia," Senator Minchin said.

Much of the responsibility for implementing the recommendations of the Action Agenda will be taken by the Australian Spatial Information Business Association (ASIBA).

ASIBA is a single organisation representing business interests in the spatial information industry and provides a concrete example of the improved communication and goodwill between stakeholders that the Action Agenda has already generated.

An important early outcome of the Action Agenda was the formation of ASIBA in July this year.

Chief Executive Officer of ASIBA, David Hocking, said he is taking an evenhanded approach with the five strategies outlined by the Action Agenda to better position the industry for growth.

"The challenge in these early days is to find a balance between building credibility with the States and having enough resources to maintain the momentum which has been created by the Action Agenda," said David.

ASIBA is visiting the States and Territories to discuss what roles they are prepared to take in following through with the recommendations of the Action Agenda which are now endorsed by Government.

"There has been a lot of support and enthusiasm from everyone I've spoken to so far, and with the right level of resources, we will be able to continue building on this process," he said.

- For more information about ASIBA, visit their website at: **www.asiba.com.au**
- For more information about the Spatial Information Industry Action Agenda, visit: **www.isr.gov.au/agendas/Sectors/siiaa/index.html**

From left are Walter Mayr, Chair of the Spatial Information Industry Action Agenda Steering Group; Nik Fominas, Chief Executive Officer, GeoInsight; and Senator Minchin.

STRONG NATIONAL SPATIAL AGENCY CREATED

AUSLIG has become a Division of *Geoscience Australia* in a merger of two Commonwealth spatial organisations. According to the Chief Executive Officer, Dr Neil Williams, the amalgamation will enhance customer service and delivery of spatial and geoscience services to the nation.

At the function to announce the merger on 25 September were, from left: AUSLIG General Manager, Peter Holland; Federal Member for Eden-Monaro, Gary Nairn; Geoscience Australia Chief Executive Officer, Dr Neil Williams; Senator Margaret Reid; and former ACT Deputy Chief Minister, Brendan Smyth.

"Our ability to deliver core functions, customer service, and advice and access to government will be significantly enhanced in the new organisation," he said in a joint statement with AUSLIG General Manager, Peter Holland.

"The core functions of AUSLIG and AGSO are complementary. Both organisations acquire, process, analyse and disseminate fundamental spatial information in one form or another. Functions such as geodesy, gravity and maritime boundaries are supported by compatible activities in both organisations."

However, it is "business as usual" as a taskforce addresses short term implementation issues.

The merged organisation has a budget approaching $100 million and more than 530 staff. AUSLIG's contribution is 115 APS employees, an annual appropriation of $25 million, product revenues of $5 million, a large base of capital assets and a significant level of out-sourced service delivery.

Why has the amalgamation occurred and what are the benefits?

- AUSLIG and AGSO have a long history of cooperation and collaboration. Each organisation has benefited in the past from access to the knowledge, experience, technology and products of the other.
- Both AUSLIG and AGSO have large spatial data holdings and are implementing technologies for online access to this information.
- An amalgamated organisation will be able to respond well to the recommendations of the Spatial Information Industry Action Agenda and the government's new policy on spatial data access and pricing. An amalgamated organisation will also be better able to adjust to any reductions in product revenue resulting from the policy.

What will be the name of the new organisation and its products?

- The new organisation will be known as Geoscience Australia. AUSLIG will be the National Mapping Division of Geoscience Australia. The names AUSLIG and AGSO will both be replaced with Geoscience Australia.
- Existing product names such as ACRES, NATMAP and GEODATA will be unaffected by the amalgamation.

$2M GOVERNMENT GRANT FOR SPATIAL INFORMATION PROJECT

A new Canberra-based project which will promote the use of spatial data in emergency management is the beneficiary of a $2 million Federal Government grant.

ACT Senator Margaret Reid presented a Certificate of Achievement to GeoInsight CEO, Nik Fominas, when she announced the $2 million grant for the project.

The 15-month GeoInsight project will develop and deliver spatial data workshops around Australia and also provide online education, demonstrations and tools to the community until October 2002.

Announcing the grant on 25 September, Senator Margaret Reid said the outcomes of the project will help Australia's emergency services better understand the benefits of having spatial information technology available to counter life-threatening emergencies such as floods and bushfires.

"GeoInsight aims to foster a strong relationship between Australia's emergency management industry, spatial data suppliers and value-added resellers. Any products developed during the life of the project will be taken over commercially," said GeoInsight Chief Executive Officer, Nik Fominas.

"In this day of rapid technology advances, spatial information is becoming a much sought after resource for risk assessment, management and planning across a range of industries and sectors. With the help of the grant, we hope to keep Australia at the forefront of developments.

"The project complements the Commonwealth Government's Spatial Information Industry Action Agenda as well as building on excellent initiatives within Geoscience Australia," said Mr Fominas. "GeoInsight is already bringing together emergency management spatial information practitioners in the States and Territories and is gaining enthusiastic support."

Geoscience Australia's National Mapping Division is contributing to the project with in-kind business assistance and a range of datasets from the Landsat 7, SPOT and RADARSAT satellites.

Geoscience Australia is also contributing to GeoInsight through its Cities Project, providing multihazard risk assessment and emergency management for urban communities.

Other key stakeholders include:

- Emergency Management Australia
- Bureau of Meteorology and
- Australasian Urban and Regional Information Systems Association.

GeoInsight is a project of ACT-based company Technik Pty Ltd which received the grant under the Technology Diffusion Program which is managed by the Department of Industry, Science and Resources. Technik has been operating in Canberra for more than 13 years and has been responsible for facilitating numerous special projects involving government, industry and tertiary institutions.

For more information about the GeoInsight project, visit their website at: **www.geoinsight.net.au**

ACRES Distributors will be amongst the first to see a major exhibition at the National Museum of Australia during the next ACRES Distributors meeting held in Canberra in December.

SENSING SOMETHING SPECIAL AT THE NATIONAL MUSEUM OF AUSTRALIA

ACRES is a major supporter of the exhibition, *To Mars and Beyond: Quest for the Origins of Life*, which will take visitors on a once-in-a-lifetime journey to the darkest depths of our solar system and beyond to 'search for the origins of life'.

The exhibition opens in Canberra on 13 December 2001 and moves to Melbourne in June 2002.

A feature of the exhibition will be a projection of live satellite imagery over Australia, appearing within seconds of its acquisition at the ACRES ground station near Alice Springs.

Developed by a team of engineers and remote sensing specialists at ACRES, the technology to present the live feed has been made possible thanks to a combination of fast computers at the ground station and a high-speed communication link between Alice Springs and Canberra.

The system supports Landsat 7's Enhanced Thematic Mapper Plus imagery; multispectral and black and white SPOT imagery; and MODIS imagery.

It will automatically switch between live and replay mode and visitors will also see an index map of Australia on the screen, showing the path of the satellite, the names of major geographic features and some information about the satellites.

The real time browse imagery will be projected onto a big screen in the exhibition, with two Landsat passes, two MODIS passes and at least one SPOT pass every day.

ACRES plans to use the new browse imagery as a showcase for remote sensing and its associated technologies at other trade exhibitions and conferences.

"It could be useful for browsing the images in near real-time for forest fires and floods for example," said ACRES Applications Specialist, Shanti Reddy.

SPEEDY DELIVERY OF SATELLITE IMAGERY BENEFITS AGRICULTURE INDUSTRY

Farmers are now able to use satellite imagery on the same day it is acquired to make decisions about crop management and improve their productivity and crop forecasting.

The introduction of near real time delivery of satellite imagery by ACRES in February has dramatically reduced delivery time of satellite data from days to just hours, providing the quickest possible access to digital satellite imagery after a satellite overpass.

The use of satellite data in the agricultural industry in Australia has been increasing steadily over the past five years, particularly for its ability to provide information on a range of situations and over relatively large areas. With the introduction of ACRES STAR Service, satellite imagery can now be delivered within a matter of hours, increasing its effectiveness as a decision making tool.

Same day satellite imagery — the new crop management tool

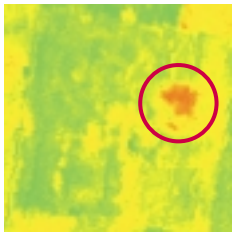
A pilot project in Victoria called CropView is using the STAR Service to provide near real time satellite imagery to six broad-acre farms covering 10 000 hectares in Victoria's south-east Wimmera district.

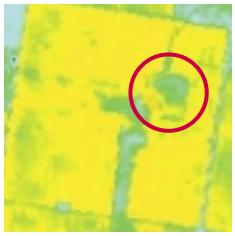
CropView Project Manager, Charlie Andrews is using SPOT imagery obtained through SPOT Imaging Services in Canberra to map the greenness index, commonly called the Normalised Difference Vegetation Index (NDVI).

"CropView is based on delivering timely tactical information to farmers during the growing season," he said.

Using the imagery, farmers are able to identify and control weed growth in its early stages, identify and control fungal diseases before they cause extensive damage to the crop and identify and control pest infestations. With a classified image of their crops delivered to them by the end of the day on which the satellite captured the image, farmers can make an immediate decision about the best way to manage their crops. When a farmer spends $100 000 a year

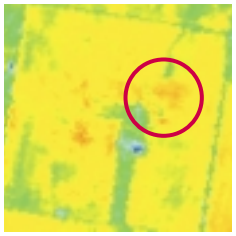
This NDVI classified SPOT 4 image, acquired 29 July 2001, shows the variation in a paddock about six weeks after the wheat crop was sown. It is a pseudo-colour image. Red indicates a higher NDVI and green indicates a lower NDVI. The circled red area (about 12 hectares in size) shows a patch of sour grass (weed) with a much higher 'greenness index' than the rest of the paddock which is still mainly dominated by the soil reflectance characteristics.





In this SPOT 4 NDVI image acquired on 9 October, spraying has killed off the sour grass which appears less 'green' than the rest of the paddock. The variation in the crop and potential yield can be seen in this image.

The sour grass in this SPOT 4 August 30 image is becoming less dominant but still indicates one of the 'greener areas'. Spraying still has not occurred. The wheat crop is starting to dominate the response in the other areas. The green strip in the centre of the lower half of the paddock is an area of trees which now is 'less green' than the surrounding crop.



This SPOT 4 PAN Xi merge image, acquired on 9 October, gives a good visual indication of the variation in the paddock. Spraying prevented the sour grass from seeding and spreading.

All images provided by Cropview and SPOT Imaging Services, Canberra. © CNES 2001

on chemicals to control weeds, pests and disease, any tool that can help reduce this cost is most welcome.

With the success of CropView, Charlie anticipates developing the project into a commercially viable organisation serving up to 2000 farmers in the future.

Spatial decisions help harvest management in sugar industry

One of Australia's biggest sugar producers, the Mackay Sugar Co-operative Association Limited, is breaking new ground in the industry with the use of near real time satellite imagery to oversee the harvest from its 100 000 hectares of sugarcane fields in Queensland.

The availability of near real time satellite imagery came at a time when about 40 percent of Mackay Sugar's field staff accepted an early retirement package offered by the Co-operative last year. This meant that some hard decisions had to be made about the future approach to harvest management and crop estimating.

While encountering a number of teething problems during the season's crush, Mackay Sugar is confident that the new system is the way of the future and offers considerable cost savings when measured against the former 'on-the-ground' process.

The Brisbane office of Geoimage Pty Ltd and Mackay Sugar staff have worked closely to develop sugar cane yield prediction and harvest monitoring techniques using remotely sensed data.

By analysing satellite spectral response and sugar cane yield data in conjunction with other spatial data, a spatial-spectral approach is being developed to provide estimates of total seasonal yield prior to the commencement of the harvest season.

In addition, to assist in planning and management of resources during the harvest season, a methodology, again using spectral and spatial data, is being developed to monitor the harvest as it progresses.

The town of Walkerston in the Pioneer Valley lies in the southern half of these two images.

The SPOT 4 image right was captured on 11 May 2001 and the image below right was captured on 28 July 2001.

Both image subsets are from data supplied using the ACRES STAR delivery service.

Examination of the images reveals fields where sugar cane has been cut (purplish colouring) between these two dates.

Images courtesy of SPOT Imaging Services, Canberra.

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POSTER NO 5

Poster No 5 included with this issue of *ACRES Update* features a SPOT 4 Xi multispectral image showing a vibrant sugar cane growing area in Queensland around Mackay and the Pioneer Valley.

The image was acquired by ACRES on 11 May 2001 and provided to Geoimage Pty Ltd on the same day via ACRES STAR Service for use by Mackay Sugar Cooperative Association Limited.

The image is a colour composite using SPOT 4 Xi data, and is reproduced courtesy of SPOT Imaging Services, Canberra.

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NEW ANTENNAE TO UPGRADE SERVICES FROM ALICE SPRINGS

ACRES ground station near Alice Springs will have its additional X-Band satellite tracking antenna operational early in the New Year. Extensive preparation has been carried out to house the 5-metre antenna.

US company, EMP Systems, who are supplying the antenna system, have contracted an Alice Springs company, Chambers Engineering, to carry out the civil works required for the installation of the antenna. This includes constructing the concrete pad and digging the cable trenches. Chambers Engineering are awaiting delivery of the anchor bolts and template as well as the reinforcing steel for the concrete pad. As soon as these materials arrive, site work will commence.

"The project has slipped by about two months due to a re-design of the antenna pedestal. Factory acceptance testing is now scheduled for late December," said ACRES Project Manager, Peter Badowski. "We are expecting the antenna to arrive at the ground station during January. The completion date is now expected to be about mid-February 2002."

Groundwork for the additional X-Band antenna. Photo by Shaun Evans.

The new state-of-the-art antenna will be able to track and receive image data signals from most of the current range of satellites supported by ACRES. It will allow ACRES to continue meeting the demands for national data coverage of a wide range of satellite imagery and will also provide a much-needed back-up system.

Improved NOAA reception

A Memorandum of Understanding to supply, install and operate a 2.4 metre National Oceanographic and Atmospheric Administration (NOAA) antenna system at the ground station was signed by AUSLIG and the Bureau of Meteorology in September 2001.

The new antenna will be used primarily for the direct reception of High Resolution Picture Transmission data from the NOAA polar orbiting satellites. The new system will meet a number of objectives. One of these objectives is to provide ACRES customers with access to Common AVHRR Processing Software (CAPS) data in near-real-time, providing the Bureau of Meteorology with near-real-time data in Australian Satellite Data Archive (ASDA) format and also providing CSIRO with data in ASDA format for archiving.

"Once this project is completed early in the new year, most likely by the end of January 2002, the NOAA antenna will stand in the north-western corner of ACRES Data Acquisition Facility in Alice Springs," said ACRES Manager, Ian Shepherd.

ACRES Data Acquisition Facility near Alice Springs.

BEST PRACTICE SOFTWARE DELIVERS IMPROVED NOAA PRODUCTS

NOAA AVHRR data is now available on the ACRES website free of charge thanks to a close working relationship between ACRES, the Bureau of Meteorology (BoM) and CSIRO's Earth Observation Centre (EOC).

Together these three organisations have upgraded National Oceanic and Atmospheric Administration (NOAA) Advanced Very High Resolution Radiometer (AVHRR) reception in Australia to provide benefits to users of NOAA AVHRR data. Further enhancements are just around the corner.

In the first phase of the upgrade project, BoM provided its current reception/ingest system to ACRES to install at the Data Acquisition Facility near Alice Springs, replacing the previous ACRES system which could no longer be maintained.

Data is collected on the main 9m antenna at Alice Springs and transferred to Canberra on ACRES high-speed communication link.

At the ACRES main processing centre in Canberra, EOC has installed the current version of Common AVHRR Processing Software (CAPS), which represents the "best practice" processing software for NOAA AVHRR in Australia. This processed product is now made available on the ACRES web site free of charge.

The data is available within 12 hours of reception, and a rolling archive of seven days of data is available on the website at all times. Due to operational conflicts for use of the 9m antenna, a limited number of NOAA-16 passes per day are acquired.

EOC has historically maintained the Australian archive of NOAA AVHRR data, and has provided data to the market from that archive. This arrangement will continue under a new agreement with EOC, ensuring that the Australian archive is consistent and central.

Under its agreement with ACRES, BoM will be replacing its reception system with a new version, which will be compatible with all other BoM operated NOAA sites. The new system will provide operational efficiencies and reliability, but there will be no visible change to the data from the user's perspective.

ACRES and BoM are also jointly funding the purchase of a new dedicated antenna for NOAA AVHRR reception at Alice Springs. ACRES will then be able to acquire every NOAA pass, and make it available to users.

This development will provide Australian users with a reliable source of the NOAA AVHRR data until 2008 when the system will be replaced.

PRICES AND COPYRIGHT NOW ON PAR FOR LANDSAT DATA

The prices and copyright conditions for Landsat 5 data are now in line with those for Landsat 7 data. These changes were announced by the United States Geological Survey in July this year following changes to the management and operation of its Landsat 5 satellite.

Approximately 20 percent was taken off the prices for ACRES Landsat 5 Thematic Mapper (TM) data, bringing them into line with the corresponding Landsat 7 Enhanced Thematic Mapper Plus (ETM+) data prices. Details of the prices are available from the ACRES web site at: **www.auslig.gov.au/acres/prod_ser/acr_ind.htm**

Licence conditions for Landsat 5 TM data also came into line with the conditions applying to Landsat 7 ETM+ data. As a result there are no restrictions on the use and redistribution of the data by the purchaser, except that the purchaser include the copyright notice on any copy of the data or derived product.

"There are obvious benefits to users in these changes. Firstly, the reduction in price makes the extensive archive of historical data more accessible to users, at a time when demand for change detection studies in many areas is increasing. Secondly, for users purchasing both TM and ETM+ data, the simplified paperwork will be welcomed. Perhaps most importantly, the opportunities for value adders to create business opportunities with Landsat data will be further enhanced," said ACRES Manager, Ian Shepherd.

For ACRES customers, the new conditions apply to both new data delivered after 16 July 2001 and all TM data previously supplied by ACRES. Landsat licences are also available from ACRES web address above.

ACRES has a comprehensive archive of Landsat 5 data up to December 1999.

Rob Gourlay, Managing Director of ERIC, (centre) receiving the award from John Gates of Gates Lawyers and sponsor of the Award (left), with former ACT Deputy Chief Minister, Brendan Smyth (right).

ACRES distributor wins award and attracts investment interests from overseas for its work in assessing suitability of cold climate districts for viticulture.

ERIC WINS RESEARCH AWARD

Environmental Research and Information Consortium Pty Ltd (ERIC) recently won the inaugural ACT Government's R&D Grants Scheme Award for the Best Emerging Product in the Environmental Industries.

The award acknowledges the evolution of ERIC's product developments to the development of comprehensive business solutions in environmental management to reduce investment risk, improve profitability and achieve sustainable development.

ERIC had received an ACT Government R&D grant to research and further develop techniques for the selection of viticulture sites and grape varieties within the Canberra Wine District (CWD).

The consortium plans to continue expanding on these technologies with future satellite-based projects. They are currently seeking funding for a study to identify crops in viticulture using multi-temporal analysis of satellite data. Results from this project will prove invaluable to the viticulture industry in issues such as disease prevention.

ERIC is also using its R&D results to map sites for neem, sandalwood and mahogany in the Northern Territory. ERIC, an ACRES Distributor, has made intensive use of Landsat 7 satellite imagery to achieve many of its research goals in their project to develop techniques for selecting viticulture sites. Together with more traditional climate data and innovative modelling techniques, the consortium has used this imagery to assess the suitability of the district for grape growing.

Thermal imagery was used to assess specific climatic conditions within the relatively cool climate of the CWD. Cool climates such as these are generally desirable for the viticultural industry, but the selection of cool areas increases the potential for damage by frost.

Night time thermal images from Landsat 7's Enhanced Thematic Mapper Plus sensor were used to map cold air drainage, and show areas at risk of frost. The images used for this analysis were acquired in June following a successful application for acquisition to NASA. ERIC used the results to identify spatial patterns of cold air and investigate relationships with topography.

Further applications of LANDSAT imagery used for the study include the classification and mapping of vegetation throughout the district.

Using recent LANDSAT images processed through the TNTmips GIS/Image processing software, 18 classes of vegetation were derived ranging from sparse grassland to dense woodland and forest cover. This cost-effective method of identifying woody vegetation addresses legislative requirements relating to clearing of native vegetation.

ERIC is now working with Chris Cameron, Chief Winemaker at Pepper Tree Wines and winner of the prestigious Jimmy Watson Memorial Trophy 2001 presented by the Royal Melbourne Wine Show for the Best Red Beverage Wine for a one year old wine. Chris and ERIC are developing a proposal for the development of a new winery and major new plantings in the district to support established overseas wine export markets in the USA and Britain.

The early results of this study have already attracted investment interest from overseas.

NEW MODIS PRODUCTS NOW AVAILABLE

The first products sourced by ACRES from the MODIS sensor on board the Terra satellite are now available. This new-age sensor covers the entire Earth's surface every one to two days, acquiring data in 36 spectral bands over a 2330 km swath.

Processed data will be available at no charge from ACRES FTP site for seven days after each acquisition. The free access from the Internet is in line with the Commonwealth's new Pricing and Access Policy for its spatial data.

MODIS data can be used to improve the understanding of global dynamics and processes occurring on the land, in the oceans and in the lower atmosphere. MODIS is playing a vital role in the development of validated, global, interactive Earth system models. These models can predict global change accurately enough to assist policy makers in making sound decisions concerning the protection of our environment. More information about the applications of MODIS data is available from NASA's website at: **modis.gsfc.nasa.gov**

MODIS scenes provided by ACRES cover the full 2330km across track and 10° of latitude along track. Scene boundaries occur at the centre line at 10°S, 20°S, 30°S and 40°S. The amount of data acquired above 10°S and below 40°S varies with each acquisition.

Data for each scene is be available in three files relating to their pixel size:

File number	Pixel Size (metres)	Bands	Approximate File Size (Mb)
1	250	1–2	515
2	500	1–9	225
3	1000	1–36	205

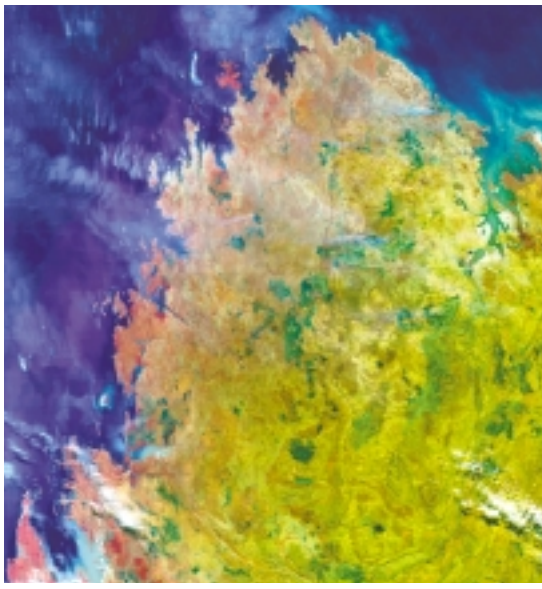
These file sizes are quite large and will require large bandwidth connections to the Internet. It is therefore expected that this data will be sourced by large research organisations with access to good communications infrastructure.

To download data, customers first need to register on ACRES MODIS web pages and agree to the MODIS licence conditions. Customers will then be provided with a login name and password to access the FTP site and download data.

More details about the MODIS product are available through the ACRES Products and Services web page at **www.auslig.gov.au/acres/prod_ser/acr_ind.htm**

In early 2002, ACRES will also begin providing MODIS products that are processed on demand from the ACRES raw archive. These products will incur a charge and be available for any data in the ACRES archive. The current online MODIS product is only available within seven days of an acquisition.

MODIS image acquired by ACRES on 26 October 2001 showing small forest fires in the top end of the Northern Territory, west of the capital city, Darwin.



MODIS image acquired by ACRES in May 2001 showing forest fires in the top end of the Northern Territory, west of the capital city, Darwin.

PLANNING CONTINUES DESPITE ALOS LAUNCH DELAY

NASDA, the National Space Development Agency of Japan, has announced that development of its Advanced Land Observing Satellite (ALOS) has been delayed, with a new launch date planned in 2004.

Despite the delay, detailed planning for the global distribution of ALOS data is proceeding.

Data nodes will be responsible for processing Level 0 data to Level 1 and distributing it to customers in their region. ACRES is the data node for the Oceania region, and possibly Antarctica. The processing systems for multispectral and radar data are in development, simulation studies for acquisition planning are in progress, and a data policy is in discussion.

Data nodes are meeting semi-annually to progress plans for this key satellite with its focus on a global monitoring program for mapping and environmental assessment.

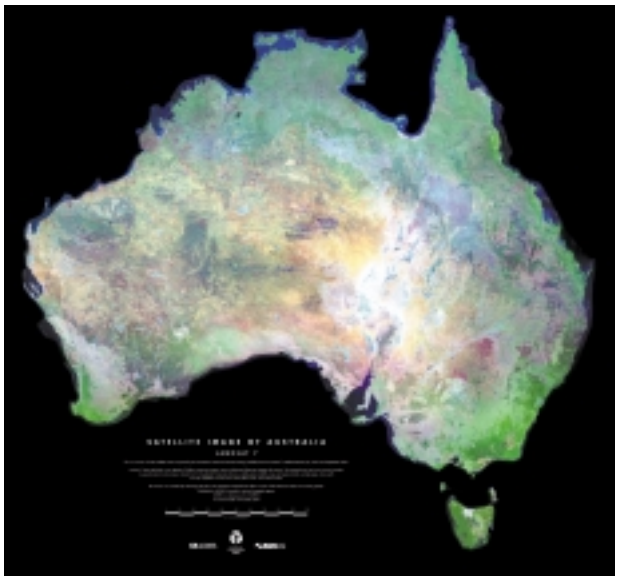
AUSTRALIAN LANDCOVER AS NEVER SEEN BEFORE

A unique view of Australia has been compiled from 369 Landsat 7 scenes showing land cover across the country in colourful detail.

The scenes were acquired by ACRES between July 1999 and September 2000 and used by the Australian Greenhouse Office as part of their National Carbon Accounting System. GEOIMAGE Pty Ltd joined the scenes together to create a mosaic and Geoscience Australia's National Mapping Division has now published it as a large glossy poster.

The poster is presented at 1:5 million scale and measures approximately 93cm x 84cm. It is available for purchase from Geoscience Australia, ACRES Distributors and Geoscience Australia Map Retailers for $16. A list of distributors and retailers can be found at: **www.auslig.gov.au/products/distrib.htm**

The National Carbon Accounting System provides a complete accounting capability for sources and sinks of greenhouse gas emissions from Australian land based systems. The system underpins reporting of Australia's greenhouse gas emissions for the National Greenhouse Gas Inventory and the Kyoto Protocol. It also supports emissions trading discussions and provides a basis for emissions projections to assess progress towards meeting international targets.

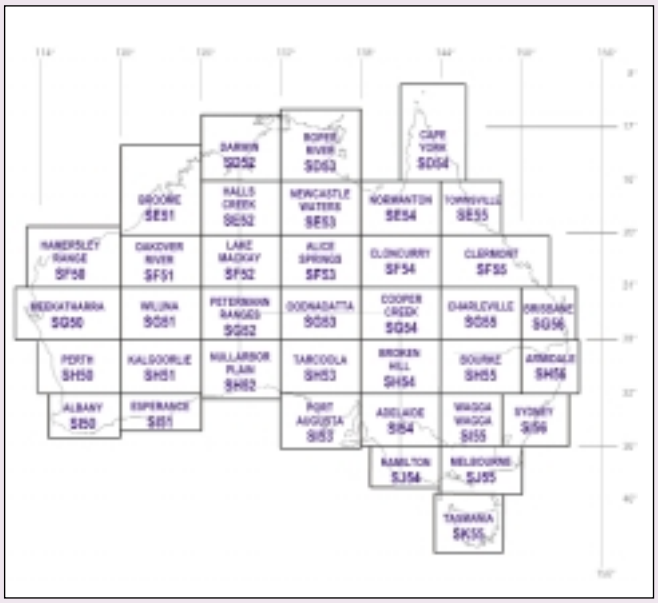


The poster shows land cover across Australia in pseudo-natural colour using bands 2,4,7 as blue, green, red. In general, forests appear as dark green, healthy crops and pasture lands as light green, bare earth and dry vegetation as red, brown and yellow tones, and water as blue.

OFF-THE-SHELF LANDSAT 7 IMAGES

ACRES is now selling off-the-shelf orthocorrected Landsat 7 imagery covering all of Australia. The images were acquired between July 1999 and September 2000, and were used to produce the Year 2000 Mosaic by the Australian Greenhouse Office (AGO) as part of their National Carbon Accounting System.

Under an agreement with the AGO, Geoscience Australia is distributing the ortho-corrected single scenes that were used in the mosaic as well as larger tiles that have been extracted from the complete Australian mosaic.



All images have been resampled to 25m pixels and comprise bands 1, 2, 3, 4, 5 and 7. ACRES initially supplied the AGO with path-oriented, system-corrected products. The methods of ortho-correcting, mosaicing and other processing done by the AGO are described in *Technical Report No 9* at: **www.greenhouse.gov.au/ncas/files/publications.htm**

Single scenes

The fixed date single scenes will be available early next year from ACRES at $1080. This is half the regular retail price for an orthocorrected single scene.

Tiles

The tiles cover fixed areas that are roughly equivalent to the size of Geoscience Australia's 1:1 Million map sheets. The map to the left shows the approximate extent of each of the 37 tiles.

Because of the large area covered with each tile, the file size for each tile is about 8Gb, split into four files. The large file size also means that turnaround times may be more than five days for orders of several tiles or more.

The price of tiles varies depending upon the number of tiles ordered. The table below shows the pricing structure.

Number of tiles	Discount per tile	Price per tile	Total price
First 2	0%	$6,000	$12,000
Next 10	50%	$3,000	$30,000
Next 25	75%	$1,500	$37,500
Total Country	Various, as above		$79,500

PROJECT TO IMPROVE ORTHOCORRECTED IMAGE PRODUCTS

ACRES is controlling Landsat 7 passes using recently acquired dGPS surveyed Ground Control Points in a major project that will ultimately improve the locational accuracy of ACRES orthocorrected products.

The first phase of this project involves the collection of differential Global Positioning System (dGPS) surveyed Ground Control Points (GCPs) at 130 sites evenly distributed across the eastern third of the Australian Continent. McMullen Nolan and Partners are currently undertaking this work under contract to Geoscience Australia. The GCPs will be used for the accurate geocoding of Landsat 7 satellite passes. They will be of particular value in many parts of Australia where there are not enough well-defined GCPs available to produce accurate orthocorrected products.

"ACRES will be using the GCPs to control and 'chip' Landsat 7 passes of eastern Australia. The first step is to control full length cloud free Landsat 7 passes of Australia using the dGPS surveyed GCPs," said ACRES Applications Specialist, Craig Smith.

"Following the control of each pass, a large number of Supplemental Control Points (SCPs), with associated image chips, will be created. These SCPs and the 9" DEM will be used to generate orthocorrected products," he said.

Creation of the SCPs are expected to result in a number of improvements in ACRES orthocorrected products.

- Improved locational accuracy of products in all parts of Australia, but particularly in the poorly mapped parts of Australia.
- Faster product generation time.
- Improved geometric registration of multi-temporal products for any given area.

The early results of the project for eastern Australia will become operational early next near with full results available from mid year 2002.

ACRES plans to acquire similar quality GCPs covering the remainder of the continent to complete the project for all of Australia in the next 12 to 18 months.

LAUNCH SCHEDULE FOR NEW REMOTE SENSING SATELLITES

Satellite	Operators	Brief Description	Launch Date	More Information
Aqua (EOS PM-1)	NASA	Multi-sensor mission	20 December 2001 launch readiness	eos-pm.gsfc.nasa.gov
ENVISAT	ESA	Multi-sensor mission	January 2002	envisat.esa.int
SPOT 5	CNES, Spot Image	2.5–5m PAN, 10 MS	2nd Quarter 2002	www.spotimage.fr
OrbView-3	Orbital Imaging	1m PAN, 4m MS	2nd Quarter 2002 (OrbView-4 launched on 21 September was unsuccessful)	www.orbimage.com
EROS B1	ImageSat International	0.82m PAN	4th quarter 2003	www.imagesatintl.com
RADARSAT 2	CSA, Orbital Imaging	3–100m SAR	2003	www.space.gc.ca
ALOS	NASDA	2.5m PAN, 10 m MS, & 10–100m SAR	Early 2004	www.nasda.go.jp

The CSIRO team at the huge dry salt expanse of Lake Frome. Photo courtesy CSIRO.

ANOTHER YEAR POSSIBLE FOR EO-1

NASA will extend the Earth Observing-1 (EO-1) mission by up to 12 months to allow further testing of its performance.

When NASA launched the mission last November, it was intended to be for a period of 11 months. Both the flight demonstration and validation efforts associated with EO-1 were very successful and extra funding was allocated to extend the mission's life until November 2001. This allowed science validations covering the full growing season in the Northern Hemisphere to be completed.

Considerable external interest prompted NASA to consider proposals to extend the life of EO-1.

An extension of three months has now been approved, with further extensions subject to demand.

CSIRO has submitted an expression of interest on behalf of Australian users to acquire data.

Australia has had two areas of involvement with EO-1. The Earth Observation Centre at CSIRO is a Principal Investigator for the EO-1 sensor, Hyperion, involved with the calibration of the data at discrete sites in Australia. ACRES has assisted NASA with data acquisition at the TERSS facility in Hobart. This raw data has been shipped to NASA for processing and distribution to Principal Investigators worldwide.

The Earth Observing satellite is a New Millennium Mission Program of NASA. The focus of the mission is to demonstrate new technologies for their use on any next generation earth observing systems developed by NASA. The mission carries three sensors, Advanced Land Imager (ALI), Hyperion and Leisa Atmospheric Corrector (LAC).

ALI is an advanced multispectral instrument which is testing technologies for use on the Landsat Data Continuity Mission. Hyperion is a high-quality, medium-resolution hyperspectral sensor, and LAC is a specialised hyperspectral sensor for measuring water vapour variations and detecting cirrus cloud.

The latest status of the EO-1 project can be monitored at: **eo1.gsfc.nasa.gov/miscPages/home.html**

ACRES STAFF CHANGES

ENGINEERING EXPERTISE

The creation of three new engineering positions at ACRES reflects a shift in focus over the past few years towards a more engineering focused organisation. The positions were created in June 2001 as part of a BAE SYSTEMS restructure. BAE SYSTEMS is employed under contract to provide operations and maintenance services to ACRES.

With the increased level of engineering expertise, ACRES is better placed to achieve its future strategic goals, which includes maintaining a remote sensing archive with a range of imagery that provides maximum value to the remote sensing customer community.

The new Systems Engineer, Ian Gesch, has the primary responsibility of maintaining and improving operational systems. David Wu, the new Software Engineer, investigates technical faults and leads software development projects. The main focus for Graduate Engineer, Matthew Greenfield, is software maintenance and operations support.

In other changes over the past few months, Karyn Linney has moved from Operations to an administrative role, with responsibility for purchasing, accounts payable and travel. Joe Kucharski is now wholly responsible for maintaining ACRES Intranet and Internet sites. Patience Hughes and Geoff Bailey have accepted permanent positions in Operations.

ACRES new engineers (from left): Matthew Greenfield, Ian Gesch and David Wu. Photo by Colin Ellis.

ACRES 2000–2001 SALES REPORT

Total ACRES gross sales for the 2000–2001 financial year were 4 percent less than the previous year. Table 1 shows the amount and proportion of sales for each data type.

Landsat sales constituted a much higher proportion of total sales than in previous years. This was due to a significant purchase of Landsat 7 data by the Australian Greenhouse Office (AGO) for their National Carbon Accounting System.

"Excluding the AGO sales, the volume of sales decreased dramatically compared to the previous year. Reasons for this include the greater sharing of data due to the new relaxed licensing conditions for Landsat and the reduced expenditure budgets in other government departments for satellite imagery," said Remote Sensing Product Manager, Jim Mollison.

"Environmental monitoring accounted for 82 percent of sales, which is a major increase compared to the traditional 30–40 percent from previous years. This change was obviously influenced by the large order from AGO. Surprisingly, exploration only accounted for three percent of sales, representing a major shift away from this application. Both crop analysis and map production fell substantially in percentage and absolute terms compared to the previous year," said Jim.

"Price changes over the last few years have meant that the measure of usage units is more accurate in measuring market demand for satellite imagery. One usage unit represents one full scene from the archive, even if that one scene was sold as four quarter scenes to four customers. The graphs below show the dramatic increase in Landsat usage units during the last year and a levelling out in SPOT usage units," said Jim.

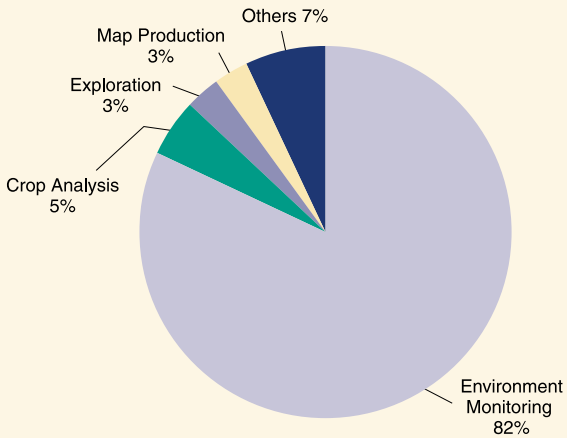
TABLE 1

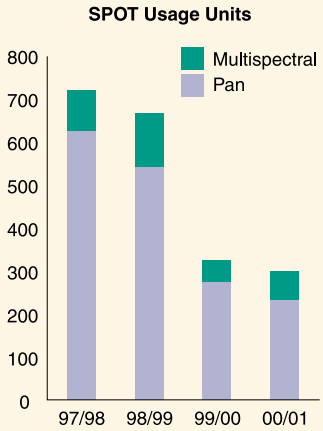
TOTAL GROSS SALES 2000/01

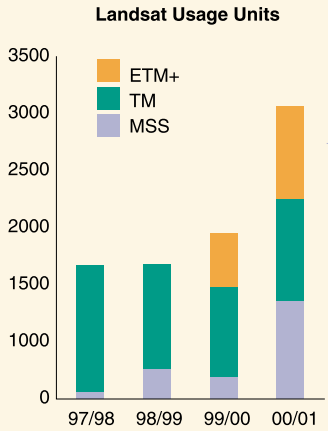
LANDSAT		
ACRES MSS	$589,047	10.4%
ACRES TM	$1,809,041	32.1%
ACRES ETM+	$1,632,283	29.0%
EROS MSS & ETM+	$194,715	3.5%
SUB-TOTAL	$4,225,085	75.0%
SPOT		
Panchromatic & Mono	$1,120,020*	19.9%
Multispectral (XS & Xi)	$71,963	1.3%
Overseas SPOT	$1,500	0.0%
SPOT-LITE	$33,516	0.6%
SUB-TOTAL	$1,226,999	21.8%
OTHER		
RADARSAT	$84,689	1.5%
ERS SAR	$20,400	0.4%
JERS	$1,620	0.0%
Image Writing	$57,252	1.0%
Royalties	$2,467	0.0%
Freight	$8,092	0.1%
Misc	$10,408	0.2%
SUB-TOTAL	$184,929	3.3%
GRAND TOTAL	**$ 5,637,013**	**100.0%**

* 79% of this figure is attributable to Geoscience Australia's mapping program to meet Australia's mapping requirements.

Sales by Application Type 2000–2001







NASA has announced that the Landsat Data Continuity Mission (LDCM) will succeed Landsat 7, with data becoming available from the new system in 2006.

TAKING OVER FROM LANDSAT 7

LDCM is an effort by NASA and the USGS to fulfil US policy obligations and ensure the continuity of multispectral data that the Landsat program has been providing for a quarter of a century.

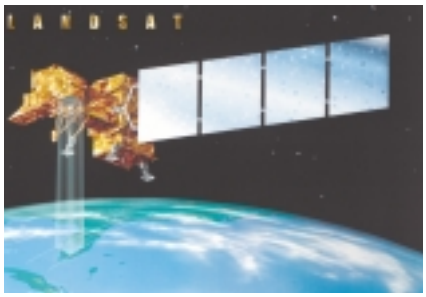
NASA intends to fulfil the objectives of the LDCM by procuring data from an industry-owned system. Following an extensive process of public consultation and industry briefings, NASA has now released its Request for Proposal for the LDCM.

The procurement process has two phases — formulation and implementation. The purpose of the formulation phase is to give NASA visibility of the proposed industry-owned systems. The Request for Proposal covers the formulation phase of the project. It is based on an LDCM Specification for data and data products and on an LDCM Data Policy.

The Data Specification will certainly provide the market with a quality product. Some features such as the inclusion of thermal bands, and other bands for coastal zone observations and cirrus cloud detection are not included in the Specification but are stated as performance goals for the Contractor to consider.

The Data Policy continues many objectives of the Landsat 7 Data Policy. Data products will be distributed at Cost of Fulfilling User Request (COFUR) and without restriction on reuse or value-adding. However, the data products will be processed and distributed by the Contractor, not USGS.

Data products that are not part of NASA's data purchase will be owned by the Contractor, and will be outside the terms of the Data Policy.



"It is our interpretation of the Data Policy that any data acquired by ACRES will be owned by the Contractor, and will be outside the Data Policy," said ACRES Manager, Ian Shepherd.

Further details on the LDCM are available at: **ldcm.usgs.gov/**

FRONT COVER

The Landsat 7 ETM+ image on the front cover of this issue shows Canberra's newest district, Gungahlin, which is one of the fastest growing areas in the city. Gungahlin is the last major greenfield development site in Canberra.

The image was acquired on 15 August 2001 showing Bands 2, 4, 7 sharpened using 15m Pan band and displayed as blue, green and red.

The larger image shows all Canberra.

EDITORIAL CONTRIBUTIONS

We welcome contributions outlining projects which are using satellite imagery in an innovative way. Please send a brief summary along with images which would highlight your project. All contributions will be considered for inclusion in the next issue of *ACRES Update*.

Please email your proposal to:
FelicityEdge@auslig.gov.au

IMAGES TO INFORMATION

A forum that promises to shape the future of Australasian remote sensing in the 21st century will be held in Brisbane next year.

The available and growing suite of remote sensing datasets with improved spatial, spectral, temporal, and radiometric resolutions, advanced processing techniques and methodologies, and the growing number of new graduates and post-graduates all bode well for the future of the remote sensing community.

Increased numbers of proven applications, and a heightened awareness of the technology by the user community provide an ideal time to bring together potential users, current users, technologists, researchers and vendors to assess the status and future directions of remote sensing. The forum where this will occur is the Remote Sensing and Photogrammetry Association of Australasia's 11th Conference, *Images to Information*, Brisbane, from 2–6 September 2002.

An innovative mix of keynote speakers, sessions and workshops will provide the opportunity for delegates to present their findings, experiences and views to key users, practitioners, managers and scientists looking to further the application of remote sensing in the 21st century.

"We're now at a critical stage in remote sensing in Australasia," said Conference Convener, Dr Stuart Phinn. "With the release of the Spatial Information Industry Action Agenda in Australia, and continuing developments of new airborne and satellite sensors in the region, we have a real choice of image data sets and information to apply to our problems in the natural and built environments. With its current and future focus of remote sensing applications, *Images to Information* will address a wide variety |of applied problems and set the scene for this new Century."

Conference details are in the Conference Calendar below.

At the ACRES exhibition booth during the International Geoscience and Remote Sensing Symposium 2001. From left: Alan Forghani, Geoscience Australia; Vernon Singhroy, Canadian Centre for Remote Sensing; John Markley, Mackay Sugar Cooperative Association Ltd; Alla Metlenko, Geoscience Australia; and Bernie Fitzpatrick, Geoimage Pty Ltd.

CONFERENCE CALENDAR

24–28 June 2002 — **Toronto, Canada**

International Geoscience and Remote Sensing Symposium (IGARSS) 2002 and 24th Canadian Symposium on Remote Sensing

Tel: +1 281 251 6067
Email: grss@ieee.org
Web: www.igarss02.ca

8–12 July 2002 — **Ottawa, Canada**

Joint International Symposium on Geospatial Theory, Processing and Applications

Tel: +1 613 224 9851
Email: exdircig@netrover.com
Web: www.geomatics2002.org

2–6 September 2002 — **Brisbane, Australia**

11th Remote Sensing and Photogrammetry Conference

Tel: +61 2 6257 3299
Fax: +61 2 6257 3256
Email: 11arspc@ausconvservices.com.au
Web: http://www.geosp.uq.edu.au/11arspc/default.htm

16–19 September 2002 — **Sydney, Australia**

9th International Oil Spill Conference (SPILLCON) 2002

Tel: +61 3 9417 0888
Email: spillcon@meetingplanners.com.au
Web: www.spillcon.com

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Fax: +61 7 3406 2762
Email: jo.lawrence@dnr.qld.gov.au
Web: www.dnr.qld.gov.au/resourcenet/veg/slats/index.html

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Web: www.datamall.com.au

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Fax: +61 8 9383 7142
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