



ACRES UPDATE

FEATURES



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Cover: Landsat 7 ETM+ image showing several bushfires acquired over Perth on 15 February 2001, using bands 745 RGB. This was the first image processed through the ACRES STAR Service for the Western Australian Department of Land Administration.

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MANAGER'S MESSAGE

This is the first edition of *ACRES Update* published since my appointment as Manager of ACRES, so firstly a warm hello to all those I know through previous association. To those readers who I don't know personally, I hope our paths meet soon through our common interest in ACRES.



There is often a link between a change in the strategic direction of an organisation and a change in the management of that organisation.

Let me immediately emphasise to you that my transfer to ACRES has not been caused by, or will by itself cause, any change in the strategic direction of ACRES.

ACRES goal is still to maintain and regularly update a comprehensive archive of satellite remotely sensed data over Australia to help ensure that fundamental geographic information is available for the benefit of the Australian community.

There are of course many issues involved in achieving this goal, and they happen with varying degrees of visibility to you. On the one hand, the task of transferring all our image data onto a medium that provides long term security and access to the data is a major one that happens completely behind the scenes. On the other hand, the installation of high-speed communication links between Canberra and our receiving stations at Alice Springs and Hobart has brought a dramatic change to the visibility of our data. Our catalogue data is available on the web within hours of acquisition, and fully processed data sets are available to customers within 12 hours of acquisition.

Developments will continue in order to provide the data products that meet your needs and expectations. Improvements in the process we use for cloud cover assessment will make the information in our catalogue metadata more reliable. The installation of a new antenna at Alice Springs in December will be highly visible, but only to residents of Alice Springs! What you will see is that your acquisition requests will be granted more often, due to the reduction of conflict between satellite overpasses. The accuracy of our orthorectified Landsat and SPOT products will be improved to near sub-pixel level with the introduction of more accurate control, giving you the opportunity for direct pixel-to-pixel comparison of data. The introduction of subscription services for AVHRR and MODIS data by September demonstrates our commitment to the support of Environmental Satellites.

In establishing the priorities for these and other activities, we continually seek the input of our partners and users, and we welcome your input to this process at any time.

I hope you find our latest edition of *ACRES Update* informative and stimulating.

Ian Shepherd

ACRES NEW STAR SERVICE



ACRES new STAR (Speedy Transmission After Reception) Service has been introduced to provide customers with the quickest possible access to digital satellite imagery after a satellite overpass.

Within 12 hours of acquisition, the customer is notified that the processed product is available from the ACRES FTP site. Both full resolution and compressed images are available from the FTP site. Compressed images can be ordered in JPEG, GeoTIFF, MrSID or ECW formats. In addition, the full resolution product is written to media within the 12-hour time frame and sent by the next available courier.

Using the STAR Service, turnaround time may be significantly less than 12 hours, depending upon data type and other traffic on the communication link with the ACRES ground stations.

Requests for the STAR Service are required as early as possible to enable satellite programming and to maximise the chance of satellite availability.

The new STAR Service incorporates three new processes recently introduced by ACRES.

1. Priority future acquisitions by ACRES ground stations.
2. Immediate transmission of raw data to the Canberra processing facility after acquisition via ACRES new high-speed communication links.
3. High Priority Processing to customer specifications. This occurs immediately after data has been transferred to ACRES processing facility in Canberra.

Most ACRES products are available using the STAR Service including all Path Image and Map Oriented Image products from

continued next page

Landsat image of Perth bushfires delivered within five hours of acquisition



On Thursday 15 February at 9:55am Western Australian time, the Landsat 7 satellite passed over a series of bush fires in Northern Perth. The data captured was downlinked at ACRES receiving station in Alice Springs. All eight bands were immediately transferred by high-speed link to ACRES Data Processing Facility in Canberra.

The transfer to Canberra of nearly 1000 megabytes of full resolution data was completed by 2pm. Following a further 25 minutes of processing time, while the data was geometrically and radiometrically corrected, it was compressed to an ECW file and placed on an ACRES FTP site. Less than 25 minutes later, the Western Australian Department of Land Administration (DOLA) had the data ingested into their Image Analysis system and was busily assessing the fire damage in conjunction with local fire fighting personnel. Local media carried stories about the imagery being delivered so quickly. DOLA featured the story on their website which received thousands of hits as a result — www.rss.dola.wa.gov.au/fires

DOLA merged the STAR Landsat imagery with a digital air photograph taken 12 months earlier to generate an innovative product with effective resolution of 0.4 metres (pictured above). This merged product clearly

displayed individual houses, infrastructure and burnt areas.

Ken Dawbin of DOLA said he was absolutely delighted with the speedy service and the quality of the delivered product.

"For the first time, fire services personnel received imagery within a day of a fire and could readily assess the effectiveness of their fire fighting strategies," said Mr Dawbin.

Greg Pobar, Fire and Emergency Services Authority District Manager, Perth North, said they were able to make direct analysis of the fire behaviour, strategies and tactics using the images provided by DOLA.

"We were able to identify which spot fires contributed to threats to the community, the fire intensity and its behaviour over time and distance, as well as the areas where tactics adopted by ground crews worked, almost worked or didn't work at all," he said.

"Of real interest, we discovered a second ignition source on the morning the fire threatened Carramar and were able to study the influence this source had on the fire.

"The scar image overlain on aerial photography also allowed us to assess the level of fuels which were present and their influence on the fire — all directly from the image," said Mr Pobar.

Landsat 7, SPOT, RADARSAT and ERS satellites. Landsat super scenes and all ortho-corrected products are currently not available using the STAR Service due to the large data volume and the time involved in 'ground control point marking' respectively.

The total cost for all aspects of the STAR Service is only \$400 plus the regular cost of the product.

Comparison with standard turnaround times

Using ACRES general services, it normally takes one or two days after acquisition to freight raw satellite data to ACRES Canberra office for processing. Product generation takes an additional five days for standard processing, or 36 hours using the new Priority Processing Service. The STAR Service reduces this whole process to just 12 hours after satellite acquisition.

Applications

The STAR Service is designed for those who need satellite imagery products in a hurry. It will be highly beneficial to emergency services management when coordinating responses to floods, fires and oil spills.

The service is also ideal for agricultural applications, allowing landholders and consultants to receive timely information about the condition of crops and pastures. Land managers will be able to respond quickly to fertiliser requirements or pest infestation of crops.

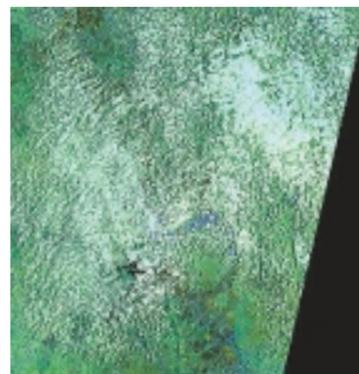
The STAR Service is particularly suited to other agricultural applications such as crop yield prediction and harvest monitoring. In these cases, the lead times allow for careful forward planning of satellite acquisitions.

Placing an order

Contact your preferred ACRES distributor who will need to place an order during normal ACRES business hours. ACRES Satellite Operations Services will advise of the earliest available acquisition date. The table above shows the *minimum* time needed to program a satellite before acquisition. These times are for genuine

Landsat 7 data delivered in five hours

In a preliminary case study of the STAR Service, a Landsat 7 ETM+ image of Emerald in Queensland was acquired at Alice Springs on 25 January 2001 and transferred to Canberra for processing in three hours. It was processed within two hours and delivered electronically to Agrecon Pty Ltd via FTP. Agrecon took just 22 minutes to download the 70 MB Enhanced Compressed Wavelet (ECW) image of six bands.



"This trial was more than successful. We really were impressed with receiving the imagery five hours after acquisition," reported Uys Lourens of

Agrecon. "ACRES STAR Service has great potential for regular use within Agrecon for crop monitoring studies."

SATELLITE	APPROXIMATE MINIMUM TIME REQUIRED BEFORE ACQUISITION TO PLACE REQUEST	EXTRA CHARGE
RADARSAT	34 to 65 hours* — emergencies only	US\$600
SPOT	36 to 72 hours* — emergencies only	No charge
Landsat 7	24 hours — subject to satellite availability	No charge
ERS	More than seven days	No charge

* Time varies depending on location of required scene.
NB: Time frames longer than those above incur no charge. Please place requests as early as possible.

emergencies only and additional charges may apply for RADARSAT data. If possible, two week's notice for future acquisition is best and will maximise the chance of satellite availability.

Terms and Conditions

- ▶ A confirmed STAR request constitutes a firm order and the customer is obliged to purchase the product following a "successful acquisition".
- ▶ For Landsat and SPOT, a maximum of five acquisition attempts per order will be made until a successful acquisition occurs.
- ▶ A successful acquisition occurs when ACRES downloads the required data from the satellite. For Landsat 7 and

SPOT, a successful acquisition also means that the product area ordered by the client is obscured by a total of less than 10% cloud cover, or any greater percentage defined by the customer at the time of ordering.

- ▶ All acquisitions are subject to satellite availability and made on a best effort basis. ACRES reserves the right to reject a STAR request.
- ▶ There is no charge if an acquisition is unsuccessful.
- ▶ If ACRES exceeds the 12 hour time frame, no STAR fee is payable. In such cases, the customer has the option of accepting the product at normal ACRES price, or rejecting the product with no money payable.

Radarsat data for surveillance of fishing vessels delivered in 9.5 hours

The Radarsat standard beam (S6) image covered an area south-west of Stewart Island, New Zealand. ACRES was able to get the acquisition granted within 48 hours before the satellite pass. The image was acquired at 4:30 EST on 6 February at the Tasmanian Earth Resources Satellite Station and transferred to Canberra within six hours of acquisition. It was then processed and ready for download from ACRES FTP server by 14:00

the same day — about nine hours 30 minutes after acquisition.

Landcare Research downloaded the full resolution product within one hour and 30 minutes. They analysed the data and sent the results to their client in the evening — all on the same day of acquisition.

Dr Stephen McNeil of Landcare Research said their client was impressed with the new service.



The existing satellite dish at Alice Springs. Photo by Shaun Evans.

SECOND SATELLITE ANTENNA ON TRACK AT ALICE SPRINGS

US company, EMP Systems, has been selected to supply an additional X-Band satellite tracking antenna system at ACRES ground station in Alice Springs. The contract, worth approximately \$A1.5 million, was signed in February.

"I would like to congratulate EMP Systems on winning the contract. ACRES is looking forward to working with them and building a long and mutually beneficial relationship throughout the course of the contract," said ACRES Manager, Ian Shepherd.

The 5-metre antenna will be able to track and receive image data signals from most of the current range of satellites supported by ACRES. Delivery is scheduled for December 2001.

Major milestones for this project:

Factory acceptance testing	October 2001
Packing and shipping to Alice Springs	October 2001
On-site installation	November 2001
On-site acceptance testing	December 2001
Project completion	December 2001



Preparing the site. Photo by Shaun Evans.

SPOT 4 data delivered for flood mapping in less than three hours

This SPOT 4 Xi image of Queensland floods was acquired at 11:20 EST on 12 February 2001 at Alice Springs. It took only 30 minutes to transfer this data from Alice Springs to Canberra where the dataset was quickly processed. A JPEG compressed image was ready for download from ACRES FTP server by 13:50 — about two hours 30 minutes after acquisition.



Analysts at Geo Mapping Technologies downloaded this image in 15 minutes using a 56K modem dial up Internet connection. Despite a high compression ratio of the JPEG image (1:22), David Moore of Geo Mapping Technologies said it was good quality and highly suitable for flood mapping by image interpretation.

"This image was almost cloud free and showed extensive flood plains of the Barwon River, which were partially flooded at the time of acquisition.

"The trial was successful and exceeded the specification of the

proposed STAR Service in that the image was delivered in less than three hours of acquisition.

"The new service is effective for providing satellite images for near real time monitoring," said David Moore.

This case study demonstrates that a highly compressed JPEG image is useful for identification and mapping of flooded areas. It also demonstrates that an image can be readily transferred via standard modems without the need for an expensive ISDN link.

ACRES ROLE IN INTERNATIONAL TESTING OF THE EO-1 MISSION AND DATA

According to EO-1 project scientist, Dr Jay Pearlman, ACRES was the only international ground station to successfully record a downlink of data from the experimental spacecraft at the initial attempt.

ACRES is part of a NASA Earth Observing-1 (EO-1) Principal Investigation Team led by Dr David Jupp, Science Leader of the CSIRO Earth Observation Centre.

As part of its contribution to the EO-1 investigation project, ACRES has been recording image data transmitted by EO-1 at the ground station in Hobart, Tasmania since December 2000. This station is operated by ACRES on behalf of the Tasmanian Earth Resources Satellite Station Consortium. The raw EO-1 image data is sent from Hobart to NASA for processing into image products. It is expected that this service will continue through EO-1's planned 11-month mission life. This contribution by ACRES allows for increased image data acquisition opportunities by EO-1 on a global basis.

Visiting Canberra during February, Dr Pearlman said Australia had made a significant contribution to the testing of EO-1.

"The results from CSIRO calibration and validation ground sites in Australia, in particular Coleambally, Lake Frome and Mt Fitton, are making a significant

contribution to the study of the quality of image data acquired by the EO-1 instruments. We are very pleased with the response and successes achieved by the teams of scientists working at these sites," said Dr Pearlman.

EO-1 was launched on 21 November 2000 with the primary purpose of developing and testing a set of advanced technology land imaging instruments. ACRES has a specific interest in data acquired by the Advanced Land Imager (ALI) instrument on board EO-1. ALI is new technology designed to acquire image data with similar characteristics to Landsat Thematic Mapper (TM) and Enhanced Thematic Mapper Plus (ETM+) data. The ALI instrument not only represents significant cost and weight savings compared to the Landsat 7 ETM+ instrument but also the potential to acquire image data with a larger dynamic range than ETM+ data.

After the planned completion date of the EO-1 mission in October 2001, NASA will assess the quality of data collected over its 11-month life and then decide on the suitability of EO-1 instruments as a

future means of collecting primary earth science data.

As a member of the research team, ACRES will provide Landsat 7 data for comparison with EO-1 data. ACRES staff will also participate in the comparative assessment of data from Landsat 7 ETM+ and EO-1 ALI data acquired over some of the CSIRO calibration and validation sites in Australia.

"EO-1 continues to operate nominally and collect images, averaging around five to six per day. On 23 April, EO-1 took its 1,000th data collection event (image)," NASA announced in May.

EO-1 is orbiting in formation with the Landsat 7 and TERRA satellites. The concept of constellation "formation flying" involves a series of satellites closely following each other along the same orbit, imaging in a pattern of "nested swaths". That is, the instruments acquire swaths of image data with one common edge. This provides image data from several spacecraft of a common area at roughly the same time.

Formation flying provides a unique opportunity to compare datasets and learn more about the Earth's surface. Comparison of these "paired scene" images will be one means of evaluating EO-1's land imaging instruments.

The EO-1 instruments are:

- The Advanced Land Imager (ALI);
- LEISA Atmospheric Corrector (LAC); and
- Hyperion.

The characteristics of the instruments are summarised at left in Table 1. For full details of the spacecraft and sensors check out the EO-1 Home Page at <http://eo1.gsfc.nasa.gov/miscPages/home.html>

Table 1: EO-1 Instrument Characteristics Summary

Parameters	Multispectral		Hyperspectral	
	Landsat 7 ETM+	EO-1 ALI	EO-1	
			Hyperion	LAC
Spectral Range	0.4–2.4* μm	0.4–2.4 μm	0.4–2.5 μm	0.9–1.6 μm
Spatial Resolution	30 m	30 m	30 m	250 m
Swath Width	185 km	37 km	7.5 km	185 km
Spectral Resolution	Variable	Variable	10 nm	2–6 nm
Spectral Coverage	Discrete	Discrete	Continuous	Continuous
Pan Band Resolution	15 m	10 m	N/A	N/A
Number of Bands	7	10	220	256

* Excluding thermal band.

VALIDATION TEAM USES LANDSAT 7 IMAGE TO MAKE EXCITING DISCOVERY

A Landsat 7 satellite image acquired in October 2000 and supplied by ACRES to CSIRO's Lake Frome EO-1 validation team led to an interesting biological discovery at Lake Frome, a giant salt lake in South Australia, in December last year.

In the imagery of Lake Frome, CSIRO scientists noticed distinct shorelines around islands in the area some months prior to their expedition. Once they arrived at Lake Frome, they discovered swaths of dead plague locusts forming bands 10 to 20 metres wide and up to 20 centimetres deep, stretching for several kilometres.

Dr Dean Graetz from CSIRO's Earth Observation Centre explained that Lake Frome was nearly full of water during Autumn 2000 when there were many swarms of plague locusts in the area.



The CSIRO team working on the huge white expanse of Lake Frome. (Photo courtesy CSIRO)



The band of dead locusts, stretching for several kilometres across the flat, white surface of Lake Frome. (Photo courtesy CSIRO)

"The locusts probably died trying to fly across the lake. Prevailing winds would have carried the dead locusts across the water to the shoreline where they were pickled by the salt," he said

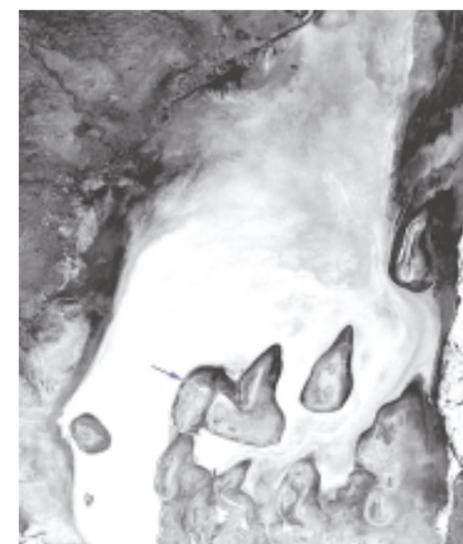
"The dark shore surrounding the islands is clearly shown in the Landsat image below right," said Susan Campbell, a member of CSIRO's Lake Frome EO-1 validation team. "But you'll notice on the higher resolution Hyperion image above right (acquired on 5 January 2001) that the locust line is actually on the outer edge of this dark area. Notice also that the islands are quite small.

"The really dark areas on the images are a mixture of salt and sand that is spectrally very dark, but not visibly so.

"The locusts, on the other hand, did appear as a very distinct, very dark band from our viewpoint on one of the islands. It wasn't until we were literally on top of it that we discovered it was made of millions of dead locusts," said Ms Campbell.

Right: EO-1 Hyperion image courtesy of US-based manufacturing company, TRW, who built the Hyperion instrument.

Below: The Landsat image acquired in October which sparked the interest in the dark bands.



POSTER NO 4

Poster No 4 features a Landsat 7 ETM+ image showing in the centre one of the best-preserved impact craters in the world, Gosses Bluff in the Northern Territory. It lies about 160 kilometres west of Alice Springs at the foot of the Macdonnell Ranges which are part of the Tnorala Conservation Reserve. The geographical coordinates are 23°50'S and 132°18'E.

Gosses Bluff was formed in the late Jurassic period, about 130 million years ago and is one of some 20 impact craters scattered throughout Australia.



SATELLITE IMAGERY AS ART

A unique application using satellite imagery is attracting attention for Mildura (VIC) artist, Tracey Andrews, and Canberra (ACT) artist, Lyn Moore. The artists have brought art and satellite imagery together in a distinctive series of displays. Their works use satellite imagery as a palette to illustrate Tracey's Aboriginal heritage in the Mildura-Lake Mungo-Willandra Lakes region.

Using Landsat 7 imagery provided by the Environmental Research & Information Consortium (ERIC) from ACRES Archive Print service, Tracey painted Ancestor tracks celebrating her Barkindji heritage.

"I painted tracks representing meeting/camping places and paths travelled by my people in the past, present and future and also tracks representing the local flora and fauna, the environment and the changes it has endured," said Tracey.

The images were part of an artwork, *Mapping Possibilities*, which was exhibited at the Mildura Palimpsest #3, 2000. It was Lyn and Tracey's third collaborative work.

This year, Lyn and Tracey further developed the theme of Tracey's heritage, and the significance of the Lake Mungo site, with an art installation titled *Mungo in the Backblocks*, for Palimpsest #4.

"Lake Mungo is the site of the earliest known human presence on the Australian continent, recently dated back in time to approximately 68,000 years," said Lyn. "As part of our exploration, we linked the latest satellite tracking with the earliest known human presence on this continent."

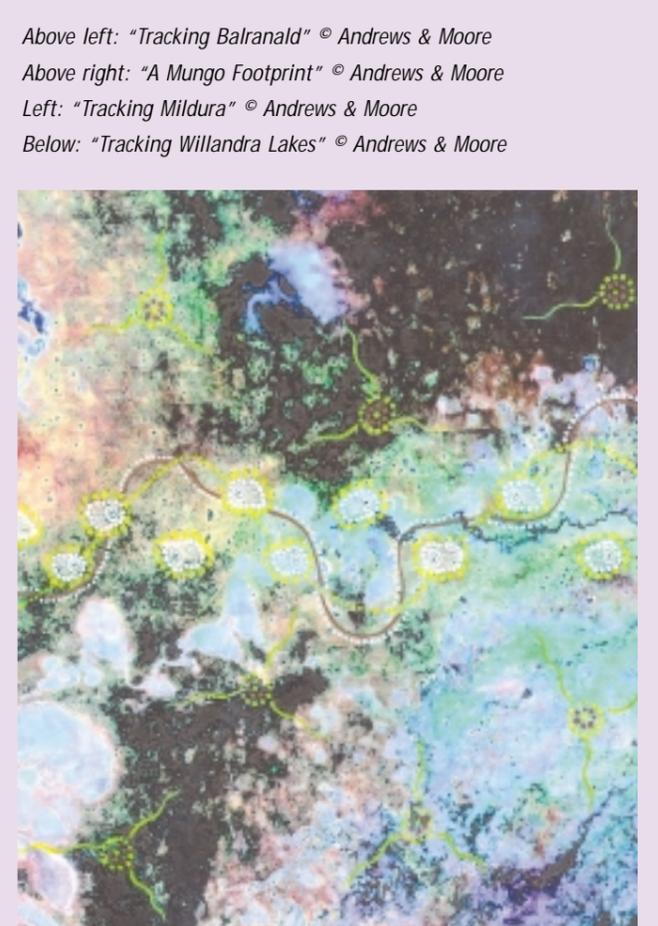
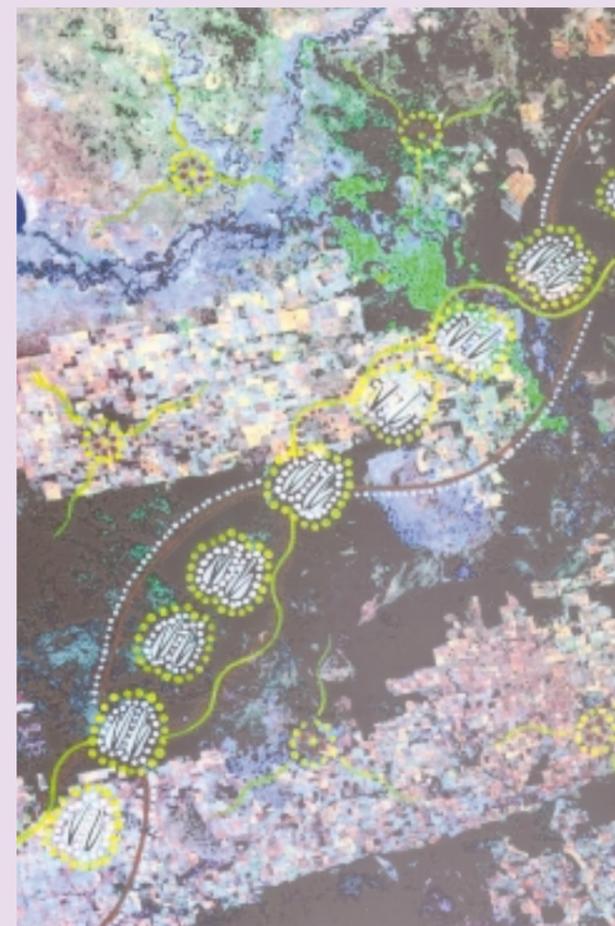
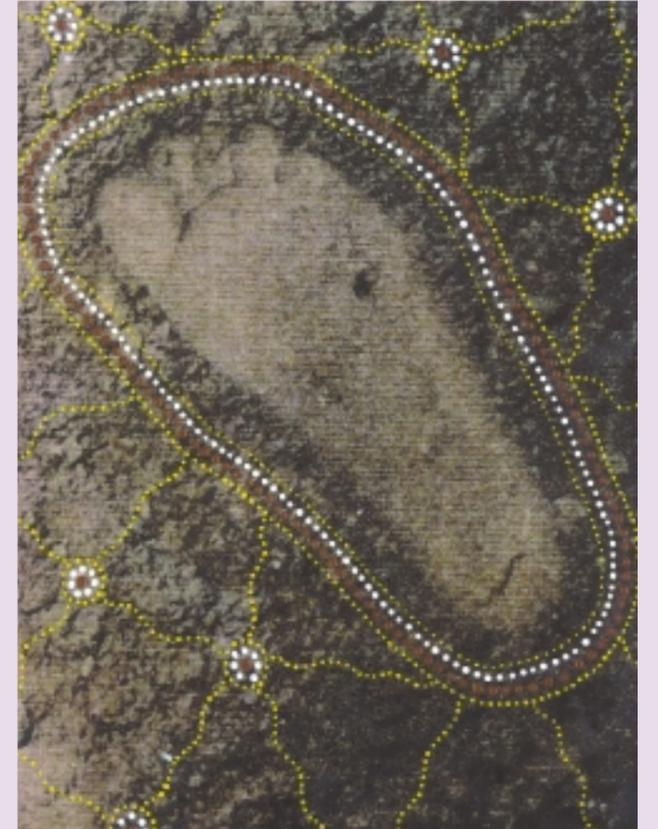
They used the geological imprint of Lake Mungo to metaphorically refer to this presence.

"I painted dots around Lake Mungo signifying the many years of an abundant and rich lifestyle surrounding the lake when it was full, and to emphasise the "foot" shape of it, which is a reminder of our tracks for ever more," said Tracey.

Contact Lyn and Tracey at silkroad@cybermac.com.au or by calling 02 6257 1991 within Australia.

Top: "Tracking North Mildura" © Andrews & Moore

Right: "The Footprint Mungo" © Andrews & Moore



Above left: "Tracking Balranald" © Andrews & Moore

Above right: "A Mungo Footprint" © Andrews & Moore

Left: "Tracking Mildura" © Andrews & Moore

Below: "Tracking Willandra Lakes" © Andrews & Moore

ACTION AGENDA DEVELOPS VISION FOR INDUSTRY

The spatial information industry in Australia is in need of reform according to a draft report issued by the Spatial Information Industry Action Agenda. The report is the culmination of seven-months work and sets out a series of goals, strategies and actions required to develop five fundamental areas identified by the Steering Group.

1. Develop a joint policy framework to ensure a mutually beneficial relationship between business and government.
2. Improve data access and pricing to maximise the use, distribution and creation of publicly funded products and services.
3. Increase effective research and development to create an innovative, strong, high value added industry.
4. Evaluate and reform education and skills formation to create and maintain a highly skilled, relevant and innovative workforce.
5. Develop domestic and global markets to expand the domestic market and provide a base to create a highly competitive export industry.

"During its term, the Steering Group looked at a range of processes and initiatives which could also have a significant impact on the industry," said Walter Mayr, Chair of the Spatial Information Industry Action Agenda.

"The Federal Government's Innovation Statement will have a very positive impact on the industry, particularly the expansion of funding for the START and COMET programs, from which a number of companies in the industry have already benefited. The expansion of funding for Cooperative Research Centres and the recently announced Innovation Access Program are two other initiatives with potential to enhance the development of innovation in the spatial information industry," he said.

"The report of the Inter-Departmental Committee (IDC) on Commonwealth Spatial Data Access and Pricing will have important implications for the availability of a number of important Commonwealth Government datasets. The Action Agenda team worked closely with the IDC to develop a common position which would benefit the industry as a whole," said Mr Mayr.

The Action Agenda Steering Group will report to Federal Cabinet in July and expects to release a detailed public report on the Action Agenda in August.

To obtain a copy of the final report, contact the Spatial Information Industry Action Agenda Taskforce at the Commonwealth Department of Industry, Science and Resources on 02 6213 6584 or email siiaa@isr.gov.au. For more information about the Action Agenda, please go to: www.isr.gov.au/agendas/Sectors/siiaa/index.html



SENATOR'S VISIT TO ACRES

ACRES Computer Operations staff demonstrated the art of image writing and how to use the ACRES Digital Catalogue when Senator Reid visited the Canberra facility in April.

From left, Peter Badowski, Senator for the Australian Capital Territory, Margaret Reid, Lien Ly and Quynh Pham.

FEES SCRAPPED FOR FUTURE ACQUISITIONS

With the introduction of the STAR Service, the fee that previously applied to SPOT future acquisition requests has been removed. Instead, ACRES has introduced a generic policy for future acquisitions covering the Landsat 7, SPOT, RADARSAT and ERS satellites.

- Acquisitions will be attempted on the basis of how they affect other priorities and ACRES assessment of the likelihood of future sales.
- There is no charge to the customer and no obligation to purchase.
- Routine requests for RADARSAT data are no longer available.

Policy for priority acquisition requests

- Priority acquisition requests are given a higher priority than routine acquisition requests.
- Priority acquisition requests must be accompanied by firm orders for products covering that area. The customer is obliged to purchase the data once it has been successfully acquired.
- For Landsat 7 and SPOT, a maximum of five attempts will be made per request. The first successful attempt will be processed and invoiced. For RADARSAT and ERS, one acquisition attempt will be made per order due to cloud not being a problem.
- For Landsat 7 and SPOT, a "successful acquisition" is when the product area ordered by the client is obscured by a total of less than ten percent cloud cover, or any greater percentage defined by the customer at the time of ordering.
- No charge is made for a priority future acquisition (except when imposed by the satellite operator).
- ACRES reserves the right not to accept acquisition requests that include impractical time limits, unreasonable areas or unreasonable repetition.
- Future acquisitions for ACRES STAR Service will be treated as a Priority Acquisition Request.
- All Priority acquisitions are made on a best effort basis, and usually on a first-in, first-served basis (excluding emergencies).

Future acquisition requests will be either "routine" (except for RADARSAT) or "priority". With routine future acquisition requests, there is no guarantee that the imagery will be acquired and there is no obligation on the customer to purchase any imagery if it is acquired.

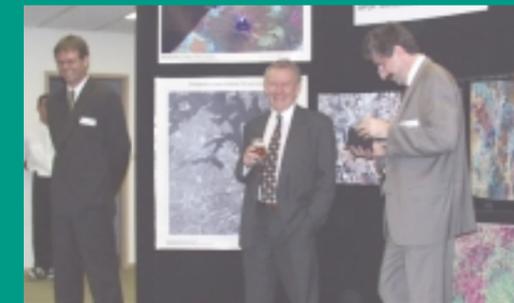
For priority future acquisition requests, ACRES will place high priority on acquiring the data (at the expense of background acquisitions) and customers are therefore obliged to purchase their product if the acquisition is successful. The definition of "successful acquisition" is given below.

All satellite programming requests should be submitted as early as possible before the onset of the imaging period to ensure that they are thoroughly analysed and able to be scheduled. Ideally, imaging requests should be placed at least two weeks prior to the acquisition date.

The new STAR Service incorporates priority processing and offers a highly attractive option if you require a future acquisition to be acquired, processed and delivered in the shortest possible time.

Policy for routine acquisition requests

- ACRES will accept requests for future acquisitions as "suggestions" and there will be no guarantee that the acquisitions will be attempted.



From left: Rob Lees, Carl McMaster and then CEO of Spot Image, Jacques Mouysset, at the opening.

SPOT IMAGING SERVICES OPENS ITS DOORS IN CANBERRA

The relocation of Spot Imaging Services' office from Sydney to Canberra in May coincided with the retirement of Managing Director of Spot Imaging Services in Australia, Carl McMaster. Rob Lees is the new Managing Director.

"I look forward to the challenge of consolidating Spot Imaging Services' role as a leading provider of satellite imagery as the new commercial satellite operators stimulate the growth of applications. The launch of SPOT 5 with its enhanced sensors from early 2002 and our role in the distribution of high resolution imagery from the Orbview 3 and 4 satellites from mid 2001 will see Spot Imaging Services well placed in the market," said Mr Lees.

The company's move to Canberra will enhance its relationship with ACRES, which receives SPOT data at its Alice Springs and Hobart ground stations. ACRES parent organisation, AUSLIG, is a major user of SPOT products for its national topographic mapping programs.

Spot Image has set up a global distribution network which today comprises four subsidiaries (Spot Image Corporation in the United States, Spot Imaging Services in Australia, Spot Asia in Singapore and Beijing Spot Image in China), an office recently opened in Germany, and over 80 distributors.

"As a leading company in the geographic information market, the Spot Image network will continue to provide products and services designed to match customer needs, based on a wide set of complementary optical and radar data, from one-metre to one-kilometre resolution," said Mr Lees.

PRIORITY PROCESSING SERVICE

Turn-around times and costs associated with ACRES Priority Processing Service were reduced in February. The improved service is designed to be used for the processing of data existing in the ACRES archive. It is available for ACRES full range of products from the Landsat, SPOT, RADARSAT and ERS satellites as well as the ACRES Image Writing Service.

Priority processing offers a 36-hour turn-around time from when ACRES sends an order confirmation until the product is ready for dispatch. Order confirmations are sent by ACRES within four hours.

The price of priority processing is only \$200 plus the normal ACRES product price.

The following terms and conditions apply for the Priority Processing Service.

- ACRES reserves the right to accept or reject a request for priority processing based on available resources at the time.
- The service is only available for data previously downlinked by ACRES and residing in the ACRES archive.
- Products are delivered by airfreight in the same manner as a standard ACRES product.

If you require a future satellite acquisition to be processed and delivered in the shortest possible time, the ACRES STAR Service will be more appropriate.

LANDSAT 7 UPDATE

Australian international ground station metadata added to the EROS Data Centre (EDC) archive.

Landsat 7 scene metadata from two more ground stations has been successfully added to the EDC global inventory. The ground stations at Alice Springs and Hobart have passed metadata ingest tests. Both stations' backlog of scenes have been ingested into the archive with daily ingest now fully operational. The Australian metadata archive joins the two Canadian stations (Prince Albert and Gatineau) in the production database, and brings the total international ground station scene inventory to approximately 60,000 scenes.

Landsat 5/7 cross calibration

A section on Landsat 5 and 7 cross calibration has been added to the *Landsat 7 Science Data Users Handbook*. The handbook can be accessed at: www.gsfc.nasa.gov/IAS/handbook_html/chapter8/chapter8.3.html

Second Landsat Data Continuity Mission workshop

The Landsat Data Continuity Mission (LCDM) specification, which defines the

key data characteristics for the next Landsat system, has been revised based on comments and feedback from LCDM workshops. Approximately 100 participants reviewed and discussed the latest draft of the LCDM data specification at the Second LCDM workshop in April in St Louis, USA. Workshop presentations are available at: ldcm.usgs.gov/

The final data specification will drive requirements for an LCDM spacecraft to be developed, launched and operating by a commercial data provider no later than mid 2006. At this time, some additions to the Enhanced Thematic Mapper Plus (ETM+) spectral bands are anticipated. It is also uncertain whether one or more thermal bands will be included.

Status of the Landsat 7 mission

- ▶ All spacecraft elements are operating nominally.
- ▶ The ETM+ continues to perform extremely well.
- ▶ Scan Mirror Anomalies are occurring less frequently.
- ▶ Duty cycle investigation is ongoing, in an effort to determine if additional

instrument on-time can be exercised without risk to the mission.

- ▶ 130,000+ images ingested into the US archive.
- ▶ 16,000+ images sold from the US archive.
- ▶ 166,000+ images downlinked to International Ground Stations.

Image assessment and anomalies

- ▶ Scan Mirror Anomalies
 - Anomalies continuing, 103 known to date.
 - Continuing to cluster around region of high-energy electrons.
 - No lasting effects anticipated on Landsat 7 ETM+.
- ▶ Late Start Anomalies
 - None seen since 20 January 2000.
 - Cause not understood.
 - Not considered active problem.
- ▶ Noise Spikes
 - Band1, Det.9 & Pan Band Det.14 — continuing.
 - Single Event Upsets — Proton Noise — Continuing.
 - Both considered very minor, no detriment to ETM+.

LAUNCH SCHEDULE FOR NEW REMOTE SENSING SATELLITES

Satellite	Operators	Brief Description	Launch Date	More Information
OrbView-4	Orbital Imaging	1m PAN, 4m MS, 8m HS	2nd Quarter 2001	www.orbimage.com
ENVISAT	ESA	Multi-sensor mission	October 2001	envisat.esa.int
OrbView-3	Orbital Imaging	1m PAN, 4m MS	3rd Quarter 2001	www.orbimage.com
EROS A2	ImageSat International	1.8m PAN	3rd Quarter 2001	www.imagesatintl.com
Aqua (EOS PM-1)	NASA	Multi-sensor mission	September 2001	eos-pm.gsfc.nasa.gov
QuickBird	EarthWatch	61 cm PAN, 2.5m MS	October 2001	www.digitalglobe.com
SPOT 5	CNES, Spot Image	2.5-5m PAN, 10 MS	2nd Quarter 2002	www.spotimage.fr
RADARSAT 2	CSA, Orbital Imaging	3-100m SAR	2003	www.orbimage.com
ALOS	NASDA	2.5m PAN, 10 m MS, & 10-100m SAR	Mid 2003	www.nasda.go.jp

MODIS UPDATE

MODIS data should be coming your way shortly.

How this data is delivered to the end-user will be determined by the results of a market survey conducted by ACRES during April and May.

The market survey consisted of a questionnaire posted by ACRES asking potential end-users to answer some questions relating to their MODIS needs. Participants' names were placed in a draw to win free MODIS data acquired by ACRES for one month.

The winner of this competition was Jennifer Robinson from Murdoch University. Thank you to all who participated.

Daily acquisitions

ACRES is acquiring daily MODIS passes from the Terra satellite.

"We are still experiencing occasional intermittent data losses of no more than 20 seconds when passing over Canberra. This is due to interference from NASA's Deep Space Network Station, which is located at Tidbinbilla, just outside Canberra, ACT. We anticipate that this data loss will not affect the final product too much because there is ample overlap between passes to fill in the missing data," said ACRES Operations Manager, Mike Pasfield.

Browse imagery

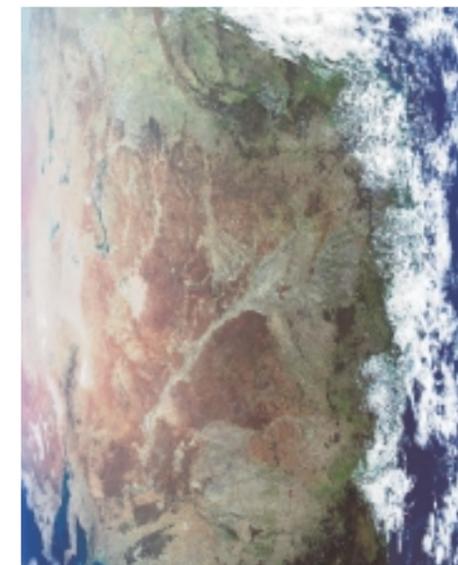
A MODIS processor was installed at the Tasmanian Earth Resource Satellite Station in late March. Further testing of the system in early April has indicated that, as per specifications, it is automatically processing MODIS data immediately after acquisition. The resultant Level One product will be used to produce a browse image for the ACRES Digital Catalogue. An identical processor was installed at the Alice Springs ground station during June.

ACRES is currently working on producing browse imagery for the Digital Catalogue. The browse images will be made up of one band from the 250 metre resolution data and two from the 500 metre data. The image you see below is a sample browse image, comprising bands 1,4,3 displayed in blue, green and red respectively.

This image was acquired on 4 April by the MODIS (Moderate Resolution Imaging Spectroradiometer) instrument onboard the NASA TERRA satellite. It covers an area some 2300 kilometres wide, from Eyre and Yorke Peninsulas in South Australia (lower left-hand corner) to the cloud-covered Queensland coast (top right).

The cloud cover extends down the east coast to the Victorian border. The central feature is the Darling River system and central New South Wales, with the Thomson, Warrego and Diamantina Rivers to the north.

This browse image has some panoramic distortion which would normally be corrected during higher level processing.



NOAA ACQUISITIONS TO RESUME BY SEPTEMBER

ACRES is in the process of upgrading its National Oceanographic and Atmospheric Administration (NOAA) Advanced Very High Resolution Radiometer (AVHRR) service to provide a more reliable reception and delivery service for customers. This decision was made following consultation with users and key stakeholders in the industry.

Completion of the upgrade in September 2001 will provide a dedicated NOAA AVHRR acquisition system capable of taking all passes of NOAA. The NOAA satellites were originally designed to provide information on cloud cover in an operational environment for meteorological applications.

"The current NOAA AVHRR reception system has been problematic for ACRES over a number of years. There have been ongoing conflicts with other acquisitions, and the existing NOAA reception system at the Data Acquisition Reception system is antiquated, unreliable and unsupported. So much so that the system has recently ceased operation, thus halting our ability to acquire data and support the mission," said ACRES Manager, Ian Shepherd.

"We are proposing to offer this data as an online subscription service to customers and are seeking information from interested parties on data format, delivery and other details," he said.

To register your interest in this data and assist ACRES with its product development, please contact one of ACRES Account Managers.

Gypsy Bhalla
Tel: (02) 6201 4232
Alla Metlenko
Tel: (02) 6201 4131
Medhavy Thankappan
Tel: (02) 6201 4130

RASTER 250K KEEPS ON GETTING BETTER

A total of 112 updated maps are included in AUSLIG's digital data product, RASTER 250K Version 2, which was released in October 2000. RASTER 250K consists of 531 scanned 1:250 000 scale topographic maps covering the whole of Australia.

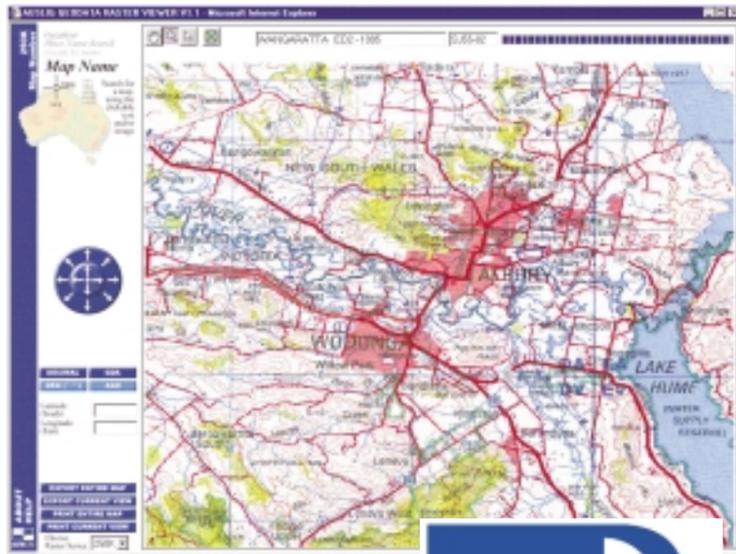
The product is ideal to use anywhere a large number of maps are required, or where storage is limited. By placing 531 maps on just two CDs, the maps are conveniently accessible, compact to store and the images will not wear out.

Version 2 was developed from its successful predecessor RASTER-250K and incorporates a range of improvements which were identified in customer feedback and market research. This included a new user interface incorporating improved map selection and manipulation options within a web viewer environment. The raster maps were migrated to the geocoded ECW file format, which allowed all of Australia to be delivered on two CDs. Latitude and longitude coordinates are also displayed on the maps.

The new version of RASTER 250K was well received in the market place with strong demand from professional and private people requiring a library of 250K maps. The two main uses of the map images are in field navigation and as backdrops within Geographical Information Systems and written reports. Professionals from outside the traditional spatial industries and the general public are also using RASTER 250K in conjunction with GPS to aid in field navigation and planning of fieldwork and trips.

RASTER 250K received the *Best Computer Based Product — 2000* award from the Asia Pacific branch of the International Map Trade Association.

RASTER 250K Version 2 can be purchased for \$99 from all AUSLIG Map Retailers listed at: www.auslig.gov.au/products/digitalmaps/raster250k/



The next edition of RASTER 250K, due for release within the next 12 months, will have improved quality and functionality of images as a base for private and professional users to use in field navigation and image backdrops.

IMPROVED DIGITAL ELEVATION MODEL SUITABLE FOR ENGINEERS, SCIENTISTS & PLANNERS

A greatly enhanced three-dimensional model of Australia is now available for the nation's engineers, scientists and planners.

"Australia is one of the oldest terrains in the world. Never before has it been portrayed at a national level with such detail and accuracy as in GEODATA 9 Second Digital Elevation Model (DEM) Version 2," said AUSLIG General Manager, Peter Holland.

Version 2 of AUSLIG's 9 Second DEM digital data product was released in May 2001 after a two-year collaborative effort between AUSLIG and the Centre for Resource and Environmental Studies (CRES) at the Australian National University.

A DEM is a three dimensional representation of the Earth's surface, usually constructed in the form of a regular grid with elevation points spaced at a regular interval. Version 2 is a gridded DEM computed from topographic information including point elevation data, elevation contours, stream lines and cliff lines. The grid spacing is 9 seconds in latitude and longitude (approximately 250 metres).

"GEODATA 9 Second DEM is specifically designed for Geographic Information Systems use," said Mr Holland. "Version 2 was developed to maximise the

MEETINGS AND EVENTS

DISTRIBUTOR AWARDS

Three companies were presented with ACRES Distributor awards for 1999–2000 during ACRES annual Distributors' meeting in December 2000.

The awards are determined on the basis of total distributor sales for the year.



Paul Trezise congratulated Terry Boyd and John Lee on the Bronze award for Resource Industry Associates.



Ken Dawbin accepted the Silver award for Satellite Remote Sensing Services, Department of Land Administration, WA, from Paul Trezise.

Bernie Fitzpatrick accepted the Gold award on behalf of Geoimage Pty Ltd from then ACRES Manager, Paul Trezise.



For excellence in sales growth by a distributor, an additional Special Achievement award was presented to Terry Boyd representing Resource Industry Associates.

usefulness of the product for a wide range of applications."

The elevation of source data high points (hills and mountains) is well represented and lends itself to a wide range of applications where accurate representation of absolute elevation values is needed — large scale projects for example such as planning the siting of signal transmitters and receivers by communication companies.

"CRES has worked very hard to make the DEM particularly useful for applications requiring accurate representations of surface shape and drainage structure. Applications such as spatially distributed hydrological modelling, spatial interpolation of surface climate and the assessment of biodiversity and agricultural productivity," said Mr Holland.



GEODATA 9 Second DEM can also be used to ortho-rectify remote sensing data. A geometrically accurate base layer can be created by removing distortions in datasets caused by elevation and viewing geometry.

New tiles from the 9 Second DEM Version 2 can be purchased for \$108 each and there are significant discounts for people who want to upgrade from

Version 1.1. The product can be purchased from all AUSLIG digital data distributors listed at www.auslig.gov.au/products/digidat/distlist.htm

For more information about this product, visit www.auslig.gov.au/products/digidat/dem.htm

SECOND ALOS INTER-AGENCY MEETING IN CANBERRA

The proposed launch of NASDA's Advanced Land Observing Satellite (ALOS) in mid 2003 was the focus at the second ALOS Data Node Inter-Agency meeting hosted by AUSLIG in Canberra from 19-21 December 2000.

Delegates attended from the Japanese National Space Development Agency (NASDA), the National Oceanic & Atmospheric Administration (NOAA), the Centre National d'Etudes Spatiales (CNES), the European Space Agency (ESA) and the Alaska SAR Facility.

AUSLIG is one of only four global nodes responsible for acquisition and distribution of ALOS data and will share responsibility for the Oceania Data Node with the CSIRO Office of Space Science and Applications.

The other three nodes are:

- European Data Node (CNES/ESA)
- US Data Node (NOAA/USGS)
- Asian Data Node (NASDA).

In conjunction with the ALOS Data Nodes meeting, a seminar was held to inform members of the Australian scientific and remote sensing applications community about the opportunities offered by the ALOS mission in both research and operational applications. More than 40 people attended, with participants from the Department of Defence, Emergency Management Australia, the Australian Geological Survey Organisation, Cooperative Research Centre for Satellite Systems and Resource Industry Associates.

The seminar included:

- an overview of the ALOS mission — schedule, sensors and their characteristics, acquisition plan;
- an overview of likely ALOS applications (land use monitoring, mineral resource assessment, agricultural management, hydrology, oceanography and disaster monitoring);



NASDA Director, Mr Nobuo Saki, in Canberra.

- a description of the Data Node concept for data acquisition and distribution, why it has been established and how it will work, with special reference to the Oceania Data Node;
- an update on data policy and pricing; and
- a description of potential areas of collaboration for Australian researchers and government agencies.

ACRES also attended the third ALOS meeting held in Tokyo in June which

focused on the technical aspects of the ALOS processing system.

To find out more about the ALOS sensors and data applications, go to:

www.eoc.nasda.go.jp/guide/satellite/satdata/alos_e.html

www.eorc.nasda.go.jp/ALOS/set_dar.html

For more information on the ALOS project and schedule, go to:

alos.nasda.go.jp/index-e.html

www.eorc.nasda.go.jp/ALOS/set_ra.html

VISITS TO ACRES DISTRIBUTORS

ACRES Remote Sensing Account Manager, Medhavy Thankappan, visited all ACRES distributors in Australia during March to discuss business strategies.

Distributors were presented with sales performance charts and year-to-date sales reports. Discussions about distributor sales performance vis-à-vis projected marketing plans from the previous year provided some insights into the changing market situation with respect to remote sensing data use and potential areas for market development.

"Although brief, the visits were well-received and helped to review and reinforce AUSLIG's business relationships with distributors. They also demonstrated our commitment to communicate with them," said Mr Thankappan on his return.

Medhavy also briefed distributors on current issues such as online ordering, the planned new MODIS/AVHRR subscription service, the ACRES Digital Catalogue and proposed changes to SPOT-LITE.



Delegates in Maspalomas, Spain.

LANDSAT TECHNICAL WORKING GROUP MEETING #9

Maspalomas in Spain provided the backdrop for the 9th meeting of the Landsat Technical Working Group (LTWG) in February. Hosted by the EROS Data Centre (EDC), operators of the Landsat 7 satellite, the conference drew together 39 representatives from 11 international ground stations. Wenjun Wu, ACRES Senior Software Engineer, represented Australia.

The meeting provided delegates with insights into other ground station architectures and development plans, as well as their individual responses to handling non-Landsat remote sensing missions.

Two key issues for ACRES at the meeting were NASA's new priority scheme for data acquisition and the progress of exchange data between International Ground Stations and USGS EROS Data Centre (EDC).

Points of interest

- **ETM+ payload duty cycle** is forcing all ground stations to limit data downloads. The amount of imagery download requests not granted is set to increase as new ground stations come online. Consequently, new schedule planning rules are being imposed and ground stations are being encouraged to cooperate with adjacent ground stations to maximise data take. ACRES has initiated discussions with its Asian counterparts.
- **Data policy:** USGS is negotiating with Space Imaging on data rights for existing Landsat 4 and 5 archives. Until any announcement is made by USGS, ACRES obligation to pay

royalties on Landsat 5 data remains unchanged.

- **New members:** South Korea, Puerto Rico and Egypt have announced their intention to negotiate agreements with USGS for Landsat 7 data.
- Most ground stations are basing their new systems on computer industry hardware and open standards.

The 10th LTWG met in Sioux Falls, South Dakota, in June. The 30th meeting of LGSWG will take place in the USA in September 2001.



Ariel Pearce (left) was ecstatic with the hamper presented by John Knight from AUSLIG's Mapping program.

GDIN FORGING STRONGER RELATIONSHIPS

ACRES exhibition at the 4th Global Disaster Information Network (GDIN) 2001 Conference held in Canberra, Australia, in March 2001 featured examples of geographic data and satellite imagery used for disaster management. There was also a competition to promote ACRES new STAR service.

AUSLIG's General Manager, Peter Holland, presented a paper at the Conference describing the activities of the Global Spatial Data Infrastructure, the Global Map project, the Asia Pacific Spatial Data Infrastructure and the Australian national geo-spatial data infrastructure. The paper also discussed the benefits to GDIN of Spatial Data Infrastructure activity generally.

The GDIN Conference aims to build closer relationships among users and providers of disaster management information; and to explore how communication and information management technologies can be used to promote sharing of disaster information.

Visitors to the booth were invited to guess how many star-shaped lollies were in a large jar to win a luxury hamper.

Congratulations went to Ariel Pearce, Manager of the International Disaster Management Centre at Swinburne University of Technology in Melbourne, who won the competition with her guess of 613 lollies in the jar. Runner-up with an estimate of 650 was GDIN Executive Director, Larry W Roeder from California, USA. The exact number of lollies in the jar was 620!

CONFERENCE CALENDAR

3–5 July 2001 Darwin, Australia

5th North Australian Remote Sensing and Geographic Information Systems Conference (NARGIS)

Tel: +61 8 8946 6805
Fax: +61 8 8946 7088
Email: nargis01@ntu.edu.au
Web: nargis01.ntu.edu.au

9–13 July 2001 Sydney, Australia

International Geoscience and Remote Sensing Symposium (IGARSS)

Tel: +61 2 6257 3299
Fax: +61 2 6257 3256
Email: igarss@ausconvservices.com.au
Web: www.IGARSS2001.org

17–19 July 2001 Sydney, Australia

Geospatial Information and Agriculture

Tel: +61 2 9262 2277
Fax: +61 2 9262 2323
Email: gia2001@tourhosts.com.au
Web: www.giaconference.com

24–26 September 2001 Brisbane, Australia

6th International Conference on GeoComputation

Tel: +61 7 3201 2808
Fax: +61 7 3201 2809
Email: sally.brown@uq.net.au
Web: www.geosp.uq.edu.au/gc2001/

25–28 September 2001 Brisbane, Australia

Australian Surveyors Congress: 2001 A Spatial Odyssey

Tel: +61 2 6282 2282
Fax: +61 2 6282 2576
Email: isa@isaust.org.au
Web: www.isaust.org.au/2001/index.htm

1–5 October 2001 Toulouse, France

52nd International Astronautical Congress

Tel: +33 1 4567 4260
Fax: +33 1 4273 2120
Email: iaf@wandoo.fr
Web: www.iafastro.com

19–20 November 2001 Melbourne, Australia

International Symposium on Spatial Data Infrastructure (SDI)

Fax: +61 3 9347 4128
Email: sdi@sunrise.sli.unimelb.edu.au
Web: www.sli.unimelb.edu.au/SDI

19–23 November 2001 Melbourne, Australia

AURISA 2001

Tel: +61 2 6257 3299
Fax: +61 2 6257 3256
Email: aurisa@ausconvservices.com.au
Web: www.aurisa.asn.au

2–6 September 2002 Brisbane, Australia

11th Remote Sensing and Photogrammetry Conference

Tel: +61 2 6257 3299
Email: 11arspc@ausconvservices.com.au

STAFF CHANGES



From left: Steve Alder, Cheryl Page, Sandra Browne and Chris De La Rue.

SOS RESPONDING TO CUSTOMERS' NEEDS

ACRES customer service officers, Sandra Browne and Cheryl Page, teamed up with Steve Alder and Chris De La Rue of Satellite Operations in March to form ACRES new Satellite Operations Services (SOS).

The merger of these two sections provides improved services for distributors and other customers. The team offers more backup personnel for maintaining services, and their broad range of skills, knowledge and experience is providing a more efficient response to customer needs.

SOS is staffed from 8:30am to 5:00pm (Australian Eastern Standard Time) each working day.

Steve Alder Tel: +61 2 6201 4109
Email: SteveAlder@auslig.gov.au

Sandra Browne Tel: +61 2 6201 4107
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Chris De La Rue Tel: +61 2 6201 4104
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ACRES Fax: +61 2 6201 4199

STOP PRESS As *ACRES Update* went to press, staff bid a fond farewell to Cheryl who left ACRES on 29 June



Ian Shepherd

NEW ACRES MANAGER

Ian Shepherd took over the reins as ACRES manager in January 2001 following a restructure of AUSLIG. Ian was one of several managers to be rotated in the restructure which aims to strengthen the organisation's ability to meet its strategic and operational business objectives.

Ian's industry background has meant a smooth transition to his role of managing Australia's remote sensing program. Armed with a surveying degree from the University of NSW and photogrammetry qualifications from the International Institute for Aerospace Survey and Earth Sciences in the Netherlands, Ian spent 16 years with Leica in Sydney, including a term as their General Manager. He joined AUSLIG's Sydney office as Manager in 1995 and acted as ACRES Manager from August 1996 to December 1997.

As Manager of AUSLIG's Information Access program from January 1998 to January 2001, Ian further developed his knowledge of ACRES products, services, customers and distributors.

ACCOUNT MANAGER

Gypsy Bhalla has been temporarily filling the role of Account Manager since September 2000, alongside regular Account Managers, Medhavy Thankappan and Alla Metlenko. Gypsy has had many years' experience in the remote sensing/GIS industry in technical and client service roles. She joined AUSLIG after taking time out of the workforce to have her first baby, Lara.

As a team, the Account Managers support Commonwealth clients and remote sensing distributors to help increase the use of remote sensing data in the community. This involves them in a variety of activities — the provision of relevant information, responding to enquiries, establishing and maintaining business relationships, promotional activities and market development activities. In many ways they are AUSLIG's "window" to the remote sensing market and, along with Satellite Operations Services staff, they are an important interface between the ACRES production team and ACRES customers.

PRODUCT MANAGER

Jim Mollison was recently appointed to the position of Remote Sensing Product Manager. Jim performed this role between 1995 and 1997 in between his regular Account Manager duties. Immediately prior to this new appointment, Jim was AUSLIG's Mapping Product Manager.

AUSLIG's Product Managers are broadly responsible for ensuring that AUSLIG's products are relevant, accessible and promoted to the market. This involves them in a broad range of tasks — the development of product plans, market research, product development, product definition and promotion, publications, product documentation and support of sales staff.



From left: Gypsy Bhalla, Jim Mollison, Alla Metlenko and Medhavy Thankappan.

ACRES DISTRIBUTORS

AUSTRALIAN CAPITAL TERRITORY

AGRECON

170 Haydon Drive
Bruce ACT 2617
Tel: +61 2 6201 2552 (BH)
Fax: +61 2 6201 5243 (BH)
Tel: +61 2 6255 0644 (AH)
Fax: +61 2 6255 0645 (AH)
Mobile: 0413 048 863
Email:
buttonb@agrecon.canberra.edu.au
Web: www.agrecon.canberra.edu.au

Environmental Research & Information Consortium (ERIC)

2 Napier Close
Deakin ACT 2600
PO Box 179
Deakin West ACT 2600
Tel: +61 2 6260 5161
Fax: +61 2 6260 5162
Email: eric@eric.com.au
Web: www.eric.com.au

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Email: johnlee@ria.com.au
Email direct:
johnlee@interact.net.au
Web: www.ria.com.au

Spot Imaging Services

Deakin Chambers,
4/14 Hannah Place
Deakin ACT 2600
PO Box 9141
Deakin ACT 2600
Tel: +61 2 6232 5171
Fax: +61 2 6232 5992
Email:
spotimage@spotimage.com.au
Web: www.spotimage.com.au

NEW SOUTH WALES

ENCOM Technology

Level 2
118 Alfred Street
Milsons Point NSW 2061
Tel: +61 2 9957 4117
Fax: +61 2 9922 6141
Email: info@encom.com.au
Web: www.encom.com.au

Land and Property Information New South Wales

Department of Information Technology and Management
Panorama Avenue
Bathurst NSW 2795
PO Box 143
Bathurst NSW 2795
Tel: +61 2 6332 8200
Fax: +61 2 6331 8095
Email: info@lic.gov.au
Web: www.lpi.nsw.gov.au

NORTHERN TERRITORY

GEOIMAGE PTY LTD

Suite G7 Paspalis Centrepoint Building
48-50 The Smith Street Mall
Darwin NT 0800
GPO Box 3499
Darwin NT 0801
Tel: +61 8 8941 3677
Fax: +61 8 8941 3670
Email: darwin@geoimage.com.au
Web: www.geoimage.com.au

QUEENSLAND

Department of Natural Resources and Mines

Geographic Data Services
Cnr Main and Vulture Streets
Woolloongabba QLD 4102
Locked Bag 40
Coorparoo Delivery Centre QLD 4151
Tel: +61 7 3896 3187
Fax: +61 7 3406 2762
Email: jo.plunkett@dnr.qld.gov.au
Web:
www.dnr.qld.gov.au/resourcenet/vg/slots/index.html

GEOIMAGE

13/180 Moggill Road
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Indooroopilly QLD 4068
Tel: +61 7 3871 0088
Fax: +61 7 3871 0042
Email:
geoimage@geoimage.com.au
Web: www.geoimage.com.au

Geo Mapping Technologies

Suite 2A, 17 Peel Street
South Brisbane QLD 4101
PO Box 3857
South Brisbane QLD 4101
Tel: +61 7 3846 2992
Fax: +61 7 3846 2588
Email: info@geomap.com.au
Web: www.geomap.com.au

GEODATA SPOT-LITE ONLY

ERSIS Australia
18 Merivale Street
South Brisbane QLD 4101
PO Box 3055
South Brisbane QLD 4101
Tel: +61 7 3844 7744
Fax: +61 7 3844 2400
Email: timb@ersis.com.au
Web: www.datamall.com.au

SOUTH AUSTRALIA

Department for Environment and Heritage

Environmental and Geographic Information
300 Richmond Road
Netley SA 5037
PO Box 550
Marleston SA 5033
Tel: +61 8 8226 4904
Fax: +61 8 8226 4906
Email:
cameron.james@saugov.sa.gov.au
Web: www.mapland.sa.gov.au

TASMANIA

Space Images

Central Science Laboratory
University of Tasmania
Sandy Bay TAS 7005
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Hobart TAS 7001
Tel: +61 3 6226 2156
Fax: +61 3 6226 2494
Answering Machine:
+61 3 6223 3975
Email:
enquiries@spaceimages.utas.edu.au
Web: www.spaceimages.utas.edu.au

VICTORIA

Resource Industry Associates

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Fax: +61 3 9686 2633
Email: info@ria.com.au
Web: www.ria.com.au

GEODATA SPOT-LITE ONLY

Land Information Group
Level 2, 121 William Street
Melbourne VIC 3000
PO Box 500
East Melbourne VIC 3002
Tel: +61 3 9269 4575
Fax: +61 3 9269 4500
Email: j.white@nrsc.com.au
Web: www.giconnections.vic.gov.au

WESTERN AUSTRALIA

GEOIMAGE

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65 Brockway Road
Floreata WA 6014
PO Box 287
Floreata Forum WA 6014
Tel: +61 8 9383 9555
Fax: +61 8 9383 9666
Email: perth@geoimage.com.au
Web: www.geoimage.com.au

Satellite Remote Sensing Services

Department of Land Administration
65 Brockway Road
Floreata WA 6014
PO Box 471
Wembley WA 6913
Tel: +61 8 9340 9330
Fax: +61 8 9383 7142
Email:
dawbin@uranus.dola.wa.gov.au
Web: www.rss.dola.wa.gov.au

GEODATA SPOT-LITE ONLY NGIS Australia

Level 1, 161 Great Eastern Highway
Belmont WA 6104
PO Box 347
Belmont WA 6104
Tel: +61 8 9277 9600
Fax: +61 8 9277 9611
Email: ngis@ngis.com.au
Web: www.ngis.com.au

INTERNATIONAL

Landcare Research

Canterbury Agriculture & Science Centre
Gerald Street
Lincoln New Zealand 8152
PO Box 69
Lincoln 8152
New Zealand
Tel: +64 3 325 6700
Fax: +64 3 325 2418
Email: BellissS@landcare.cri.nz
Web: www.landcare.cri.nz

PT Indica Dharma Consulting Services

Golden Plaza Blok G. 43-44
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INDONESIA
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Fax: +62 21 750 8985
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