



Australian Centre for Remote Sensing

ACRES

UPDATE



Spot satellite captures Sydney bushfires at their height

INSIDE

Detecting salt lands in Victoria

Satellite imagery for environmental health

ACRES distributes Thai data

New South African satellite

On Saturday, 8 January, the bushfires to the south of Sydney were at their height. The SPOT satellite passed over Sydney at 10.53am local time on that day and its multispectral sensor captured something of the devastation occurring at that time.

The image above shows graphically the extent of the fires in the Royal National Park. The township of Bundeena on the southern side of Port Hacking had been saved, but the fires were still burning vigorously at the southern end of the park. The fires around Sutherland and Jannali were burning fiercely at the time this image was acquired.



AUSLIG

FEBRUARY 1994



LANDSAT Saga Continues

Since the failure of LANDSAT 6 in October last year, little real progress seems to have been made in 'fast tracking' LANDSAT 7 or building a new LANDSAT 6. In fact, the LANDSAT 7 program seems to have become a bit of a 'hot potato' between departments of the US Government.

At time of writing (early February) NASA and the US Department of Defence, the joint program managers, are not able to agree on funding of the HRMSI sensor or the processing facilities. Meantime, NOAA, the previous program managers, are keen to take the program back again. LANDSAT 7 is presently planned for March 1998 launch. Let's hope LANDSAT 5 can hold on for a while longer yet.

Carl McMaster moves on



The Manager of ACRES for the last four years, Carl McMaster, has left ACRES to take up a position as Managing Director of SPOT IMAGING SERVICES in Sydney. Carl first joined ACRES in 1986 as Assistant Director under Don Gray. When Don retired in 1989 Carl was appointed Manager. Prior to his appointment to ACRES Carl spent many years in the National Mapping organization (AUSLIG's predecessor) in the fields of aerial photography, surveying and mapping. When he resigned in late 1993 he had completed 31 years in the public service in mapping, surveying and remote sensing.

In his time as Manager at ACRES Carl was responsible for many notable achievements, including the introduction of Synthetic Aperture Radar reception and processing, the use of Optical Tape technology for data archiving and the successful negotiation of significant international agreements with ESA (Europe), NASDA (Japan) and EOSAT (USA). In Carl's time as Manager ACRES has moved from a single sensor (LANDSAT MSS) facility to a multi sensor, multi processor, world class organization.

We thank Carl for his major contribution to remote sensing in Australia and wish him luck in his future role with SPOT.

ACRES releases its first CD-ROM product

ACRES released its first CD-ROM based product at the AURISA 93 Conference in Adelaide.

THE BASE FROM SPACE - VOLUME 1: URBAN IMAGES

The Urban Images volume comprises a collection of remotely sensed digital images for planners, Geographic Information System (GIS) users and those with an interest in viewing Australia's capital cities from space. The imagery is easily input into a GIS or simply viewed and processed using either the FARMIMAGE software provided on the disc or the software on our own computer.

The Product

- Landsat Thematic Mapper 3 colour images of Canberra, Sydney, Melbourne, Brisbane, Adelaide, Perth, Darwin, Hobart with 25m resolution.
- SPOT panchromatic image of Adelaide at 10m resolution.
- NOAA AVHRR image of the whole of Australia at 1km resolution.
- FARMIMAGE Image Processing software.
- 'Help' files to tell you about the satellites and the software.

The Software

FARMIMAGE is windows based, user friendly, image processing software developed by the University of NSW, which allows you to manipulate the images to their best advantage and also allows the import and processing of other image files and the export of processed files in several formats.

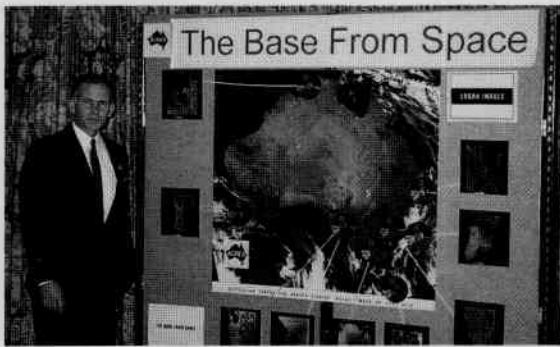
The Value

The total value of the images and software is in excess of \$12,000, now available at a special package price of \$995.

The Photographic Option

For users not yet able to use CD ROM, the images are available in map scale photographic images for \$300 each.

If you have any queries, please telephone John Lee on (06) 252 4431, or any ACRES Distributor.



John Lee with the 'Base' on Display.



Yves Beschq (SPOT), Dennis Puniard and John Lee deep in discussions.



Tom Tadrowski (SA) and Jeff Bailey (RIA) enjoy some hospitality.

Top end remote sensing users' group

After initial discussions between a number of Darwin based remote sensing users, it was decided that it would be a good idea for a Remote Sensing Users' Group to be established. As such, on 3 February 1994, a meeting facilitated by Bernie Fitzpatrick and with the cooperation of Bill Hazelton and Waqar Ahmad was held at the Northern Territory University, Myilly Point Campus, Darwin.

Twenty people, who represented major remote sensing users, turned up for the meeting, with another eight registering their interest, but unfortunately sending their apologies due to other commitments. An introduction of how the meeting came about, and a quick overview of some issues in relation to what has been going on with respect to some National issues which relate to the Northern Territory, were presented by Bernie Fitzpatrick. All those present then

introduced themselves with a short talk on their interest in remote sensing. An open discussion then followed about the likely format of such a users' group and its benefits. The overall feeling of those present was that it should be considered that a users' group was now formed.

It was agreed that a meeting every three months with a rotating venue within the group be the way to go. It was felt by all that it should be kept as informal as possible with a primary focus on applications. As well, it was agreed that the group could become the focal point for contact with respect to remote sensing activities in the Top End of the Northern Territory. The users' group was also seen as a possible forum to work together on joint projects where common interest across users was evident.

The fact that there is an active core of remote sensing people in Alice Springs was also recognised and that those present at the meeting represented primarily Darwin interests. As such, the name of the group agreed on was the Top End Remote Sensing Users' Group. The idea of an annual workshop was floated as a means of getting all those involved in remote sensing within the Northern Territory together to present current work and outcomes, and discuss other issues that may be of common interest.

It was decided that the group should be independent, and that the point of contact for the group should be the Northern Territory University. Also agreed to was the matter that a letter or notice be sent out to other remote sensing groups to advise that the group had been formed and should be seen as a first point of contact for remote sensing activities within the Top End.

The following are the contact details for the Top End Remote Sensing Users' Group:

Dr Waqar Ahmad
Top End Remote Sensing Users' Group
Northern Territory University
PO Box 40146
Casuarina NT 0811
Tel: (089) 46 6805
Fax: (089) 46 6712

Dr Bill Hazelton
Northern Territory University
Tel: (089) 46 6824
Fax: (089) 46 6712

Paul Frazier
Conservation Commission of the Northern Territory
Tel: (089) 89 4573
Fax: (089) 89 4403

Bernie Fitzpatrick
GEOIMAGE Pty Ltd
Phone: (089) 41 3677
Fax: (089) 41 3670

AGRECON

Agrecon was established in 1992 as a research and development company specialising in the delivery of remotely sensed image products, advisory and consultancy services for primary producers, other rural land holders, private companies and government agencies involved in the development, use and management of natural resources. Agrecon is jointly owned by the University of Canberra with the Vice Chancellor and Dean of the Faculty of Applied Science as co-directors.

PHILOSOPHY, FUNCTION AND MARKET

Agrecon advocates integration of remote sensing with traditional agronomic, engineering and planning techniques for improved decision making and more cost effective mapping, monitoring and management of environmental resources. Agrecon specialises in products and services for client groups including:

- individual farmers and graziers, corporate primary producers, Land Care and Catchment Management Groups
- consulting agronomists, engineers and natural resource managers
- Shires, Municipalities, public utility companies, resource management agencies and government departments
- specially funded research and development projects requiring the supply, customisation, processing or use of remotely sensed imagery

Agrecon ranks amongst the top remote sensing companies in Australia, based on product volume and quality, having supplied more than five hundred products to over 250 clients during the last two years, including family farmers, corporate land holders, land care groups, consultants, resource management agencies, Shire and Municipal Councils, government departments, banks, legal firms, insurance and public utility companies.

AGRECON'S PRODUCTS

Agrecon is a designated distributor of ACRES conventional photographic and digital products. At a small additional cost, many of these standard products are customised to meet particular client requirements – such as photographic enlargement of small subsets to nominated scales. Clients are strongly advised to lodge orders for these products through Agrecon, which provides specialised advice on product selection (including suitable dates, cloud free scenes, relevant spectral band combinations, accurate sub-scene positioning, appropriate levels of computer processing and photographic contrast), and to ensure quality control.

Farmimage is a registered trademark referring to a special range of low cost remotely sensed satellite image products and software developed specifically for primary producers and other rural land holders. A

Farmimage depicts the property of any rural land holder and that of adjacent neighbours. It is customised to the particular requirements of individual clients and comes as a geocoded product in false colour photographic form and/or as a digital data set able to be displayed and processed on personal computers. By way of example, a customised photographic *farmimage* product covering 15km x 15km at 1:25,000 scale (including two page commentary) costs just \$310.00. The three band digital data set acquired with the photographic product costs just \$250.00 (or \$375.00 without the photograph). Products are available using either Landsat or SPOT satellite data. Larger areas up to 900 square km can be supplied as *Farmimage* products.

Farmimage Software

Agrecon is a franchised distributor of a leading supplier of computers and peripherals, specialising in video controller boards for high resolution SVGA display and large capacity hard disks for data storage. The advent of low cost hardware has been accompanied by a sudden increase in the demand for low cost image processing software for distributed versus centralised image processing. *Farmimage* software is a low cost package for displaying, manipulating and processing multispectral remotely sensed digital imagery in raster format on IBM compatible PCs under Windows 3.1, under DOS 3 or higher. It was developed as part of the "Remote Sensing Training for Farm Management" project involving ACRES, Agrecon, the Centre for Remote Sensing and GIS (CRS&GIS) at the University of NSW, and the NSW Department of Conservation and Land Management (CALM). The project was sponsored during 1992–3 by the NSW Education and Training Foundation Pty Ltd (ETF). The software is supported by CRS&GIS. Single copies of *Farmimage* software are available for \$250.00. The cost of a site licence for a specified number of copies is subject to negotiation.

The initial version of the software, released in November 1993, runs in 256 colour display mode. Hardware requirements include a SVGA monitor, 256 colour video controller and a hard disk to store the results of image processing. *Farmimage* is able to load any size file that will fit in RAM. It was designed with image file band sizes in the 0.3 to 5.0 Mb range (requiring 0.9 Mb and 15 Mb of available memory respectively to load a 3 channel colour image). Larger files can be accessed through the enhanced memory handling features supported by Windows by creating virtual memory on the hard disk to emulate RAM.

Farmimage software outperforms other low cost image processing packages. Its user friendliness is enhanced through an extensive system of online Help, Information and Catalogue functions at all levels. This removes the need for an accompanying manual, basic textbook or glossary of remote sensing terms.

Farmimage software supports the following indicative operations:

- import a range of data formats and export in generic .BIL format (no header). Farmimage will display images in Farmimage (.FIM) format and in microBRIAN, ERDAS and ESIPP formats without file conversion. On Screen classifications may be performed using data in any of these formats but the results will be stored in a Farmimage format. There are utilities available to convert from the formats listed above and any other formats that are BIL or separate sequential band files into Farmimage format. BIP formats used by programs such as PC-A-Image are not supported.
- subset, decimate, select channels or mask an image
- select and display in single channel pseudocoloured or grey scale form as well as three channel full colour
- assign any channel combination in any order to red, green and blue colour guns
- interrogate headers to obtain information on user supplied as well as system generated file attributes
- roam, pan, zoom (up to 16 times), read pixel-line coordinate position and obtain 8 bit pixel values (within a 0-255 step range) for any nominated locality
- (automatic) histogram, interactive (linear, logarithmic or power) contrast stretch in preview and final mode
- spatial filtering (to smooth or sharpen)
- calculate a vegetation index or channel ratio
- on-screen digitisation of polygons
- classify an image into user defined thematic classes, user selectable colours
- review and adjust classification parameters
- calculate areas down to single pixel accuracy
- create, save and retrieve image, mask, polygon or classification files
- generate hard copies of resulting imagery using dot matrix, laser or ink-jet printers
- obtain help, information and definitions at all levels through a catalogue system accessible via an alphabetical index, structured page-within-book networked menu or browse mode
- export imagery to PC paintbrush for annotation

Over the next 12 months additional functions will be added along with GPS compatibility and matching vector based GIS software for storage, retrieval and analysis of attribute data for points, lines and area features.

ALTERNATIVE PRODUCTS

For small holdings, or where it is important to obtain more detail than satellite imagery, Agrecon as a designated distributor of the Australian Surveying and Land Information Group (AUSLIG):

- selectively enlarges air photos, either as individual prints or mosaics of multiple prints
- digitises and merges aerial photography with satellite imagery

Agrecon has also developed a range of customised digital and photographic products for Shire and Municipal Councils, other planning bodies and resource management agencies for mapping, monitoring and managing large areas. Clients have the choice of:

- single product coverage for the entire project area, or
- an assemblage of discrete tiles defined by nominated map sheet or AMG boundaries.

By purchasing low cost, uncontrolled digital data from ACRES and rectifying it to a nominated coordinate system, Agrecon is able to deliver precision products in a cost effective manner. The cost of generating photographic products from the same data is substantially lower than purchasing conventional satellite image products.

VALUE ADDED AND PROJECT RELATED IMAGE PROCESSING

Agrecon also undertakes special projects involving more advanced forms of image processing, value adding or data integration. This includes precision forms of geometric and radiometric rectification, mosaicing of imagery acquired on different dates from adjacent orbits, merging of imagery from different satellites, multi-temporal change detection image analysis, land cover classification, inventory and yield estimation. While according priority to rural landholders, Agrecon also specialises in hydrologic applications and riparian and remnant vegetation mapping.

Progress is being made towards a yield estimation bureau service for the Australian cotton industry based on satellite pre-harvest crop monitoring. Date specific correlations between post canopy closure spectral response and lint yields achieved during the last five years for individual fields of selected producers. This information is eagerly sought by growers seeking to compare potential yield with pre-planting contract estimates to minimise exposure and risk associated with the purchase of options on international cotton futures markets. It also has the potential to serve as a basis for refining industry estimates of ginning, transport, warehousing and international shipping requirements to handle likely season product volumes. Preparations are under way for a less ambitious census of rice areas in southern NSW.

All enquiries on Agrecon's products, price lists and services should be directed to:

Dr Brian Button
Managing Director
Agrecon Pty Ltd
University of Canberra
PO Box 1
Belconnen ACT 2616
Tel: (06) 201 2565
Fax: (06) 201 5353
Mobile: 015 26 4623