



# ACRES

## UPDATE



Graham Bashford (AUSLIG GM) discusses the APEC map with Bob McMullan and Vice President Tri Sutrisno.

## Indonesia Vice President inspects ACRES

Indonesian Vice President Tri Sutrisno included a visit to inspect Australia's Remote Sensing capabilities at ACRES in his recent visit to Canberra. On 23 September 1994 Vice President Tri was accompanied on a briefing and tour of ACRES facilities at Belconnen by the Australian Trade Minister, Senator Bob McMullan, the Secretary of the Department of Administrative Services, John Mellors and AUSLIG General Manager, Graham Bashford.

With the recent completion of the new Indonesian ground station and processing facilities, Australia and Indonesia now use similar systems to access earth resources satellites and have overlapping reception areas. There are cooperative opportunities to learn from each other's experiences and to provide back-up capabilities if break downs or satellite conflicts occur.

The Vice President was given a briefing on ACRES capabilities and demonstrations of project work using imagery of Indonesia acquired by ACRES. A demonstration of the use of satellite imagery for updating AUSLIG's topographic maps was also presented.

AUSLIG has recently signed a MOU with its Indonesian counterpart, Bakosurtanal, and in a joint project produced a map of the APEC countries for distribution at the recent APEC leaders forum in

### INDONESIA SPECIAL

Australian-Indonesian RS project

P.T. Indica Dharma leads the way

Trochus shell mapping with TM



## Manager's message

My first 6 months as ACRES Manager have been both interesting and challenging. I have been fortunate to have been able to meet many of the key players in the industry both within Australia and overseas. I feel that I now have a good understanding of the major challenges that lie ahead.

As you will quickly gather from this newsletter, our relationship with our Indonesian colleagues at LAPAN has been very active recently. We believe this will result in long term benefits for ACRES and indeed the whole Australian remote sensing industry.

In October I attended the SPOT GOSS 9 meeting in Ottawa, Canada. The list of initiatives unveiled by SPOT Image was very impressive. The new Managing Director, Jacques Mouysset, also impressed all present with his enthusiasm and expertise. Jacques subsequently visited Australia and we held useful discussions regarding strengthening even further the excellent working relationship between SPOT and ACRES. During the GOSS meeting the French Government announced approval of funding for 2 further SPOT satellites, termed 5A and 5B. This welcome announcement virtually guarantees continuity of the SPOT program until the year 2010.

While in Canada I had the opportunity to visit the Canada Centre for Remote Sensing and to observe the Canadian industry at close quarters. The grouping of large government and private sector monopolies provides an interesting contrast to the more devolved model that is in place in Australia.

In October I also attended the inaugural meeting of the Australian Space Council's Remote Sensing Board. The Board will certainly be busy. Its initial priorities have been agreed as the development of plans for an Australian Earth Observation Network, development of the value added services sector, development of an education and training program and the review of the organisation of remote sensing in Australia. Besides that there's always the minor matter of establishing the expected data requirements of the Australian remote sensing user community!

The year ended fittingly with the ACRES data distributors' meeting where we reviewed our performance and discussed plans for the year ahead. I can promise you that 1995 will be an exciting year in terms of new data sources, new marketing initiatives and even higher levels of customer service from ACRES.

*Paul Trezise*

## Editorial

ACRES Update is still alive! Due to a number of factors, including my absence overseas in the latter part of 1994, the September/October edition did not see the light of day. With this first edition for 1995, quarterly publications will resume in earnest.

This edition has a strong Indonesian flavour reflecting our growing closer ties with that country as a nation and more specifically in the remote sensing industry. Recent activity has included Ministerial visits to Australia by the Vice President of Indonesia, Tri Sutrisno; our own minister Frank Walker, in Indonesia; a number of exchange visits between our ground stations and successful business activity by P.T. Indica Dharma, ACRES Indonesian agent. A number of articles in this edition provide some detail of these activities. The seeds have been sown; we look forward to the development of a mature and mutually rewarding relationship.

*Dennis Puniard*

## Variable Window Products provides flexibility

The recent introduction of Variable Window Products for both Landsat and SPOT provides ACRES customers with more flexible options when ordering images other than full scenes. Variable window products are now available in both photographic and digital format and allow data sets to be ordered based on a customer's needs rather than the limitations of quarter scenes or map sheets.

The variable window products are only available for map oriented products with either systematic or precision correction, depending on accuracy requirements. The pixels are resampled and oriented to the North-South Australian Map Grid (AMG). For Landsat TM the smallest data set is 2025 sq km and the largest 60,000 sq km. For SPOT the smallest is 900 sq km and the largest 10,000 sq km. Prices are based on the area covered by the product ordered so that the customer only pays for the amount of data needed for their application. Product ordering has also been simplified with a central coordinate (latitude and longitude) nominated and N-S and E-W dimensions in kilometres of the area required.

For more details on product specifications and prices contact:

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Tel: (06) 201 4131 (SA, NT, WA)

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Jakarta. The Vice President viewed a draft version of this map during his visit.

A large media contingent accompanied the Vice President on his tour and high profile coverage on both television and written media was accorded the visit in Indonesia. With such high level interest in remote sensing in Indonesia there would appear to be many opportunities for cooperative ventures.



Top right: Paul Trezise, ACRES Manager shows the Vice President and Senator Bob McMullan the ACRES operations. Merv Trubee is the ACRES operator.

Below right: Vice President Sutrisno accompanied by Senator McMullan departs ACRES The Indonesian Ambassador to Australia, Mr Sabam Saigian, is on Senator McMullan's left.



Below: John Mellors (Secretary DAS) welcomes Vice President Tri Sutrisno and Senator Bob McMullan to ACRES.



Senator McMullan presents a framed image of Seram to the Vice President.

## P.T. Indica Dharma leads the way in Indonesia

ACRES distributor in Indonesia P.T. Indica Dharma has experienced its most successful year yet in its remote sensing business. In only their third year of operations they have become ACRES second biggest distributor taking out the silver award at the recent distributor's meeting held in Canberra. Mr G. Haryuatmanto (Anto) received the award from AUSLIG General Manager, Graham Bashford (*below*).



Since its establishment in 1991, the company has developed its capabilities, expanded staff numbers and added to its product range. Staff include Mr Mohammed Isnaini as Director, Mr G. Haryuatmanto and Ms Lissa Rakmi Utari as applications experts and sales representatives. In addition to being an ACRES distributor they also distribute data from the Thailand Ground Station and are distributors for MicroBrian and ER Mapper software. More recently the company has been appointed a distributor for the new LAPAN Station.

Much of the success of the business is due to support from the company's President Director Dr Syarifuddin Harahap and its focus on the mapping of forestry concession areas.

The company has recently moved to new office premises in a new business area in the South Jakarta area of Fatmawati. Future projects include continued development of new markets and a lead role in the Australian Indonesia Visible Inferred Scanner (AIVRIS) project in conjunction with Trippett-Sheddon and CSIRO.

*Left to right: Mohammed Isnaini, Dennis Puniard, Lissa Rakmi Utari, G. (Anto) Haryuatmanto outside P.T. Indica Dharma Consulting Services office in Jakarta.*



## Australia - Indonesia project paves the way

ACRES and its Indonesian counterpart, LAPAN, have recently been working together in a joint project aiming to make data exchange and communications between the two organisations functional. The project, known as the Remote Sensing Ground Station Cooperation Project was funded by the Australian Department of Industry Science and Technology (DIST) as part of its International Industry Collaboration Programme.

The projects objectives included:

- Understanding limitations and opportunities through agreements by the parties with satellite operators;
- The exchange of catalogue information;
- Development and testing of data exchange mechanisms;
- Understanding satellite scheduling and archiving policies;
- Technical assessment of each others systems;
- Training of Indonesian operators in photographic techniques and TQM procedures;
- A marketing and sales workshop in Indonesia; and
- Investigation of SAR processing capabilities.

The project commenced in earnest in July 1994 with a visit by the Project Manager, Dennis Puniard and the ACRES Business Manager, Tim Shirley to Jakarta.

Activities during the project have included:

- A visit to Canberra, Alice Springs and Darwin by LAPAN managers, Mr Dijardjana, Mr Mawardi Nur and Mr Bambang Tedjasukamana;
- A visit to Canberra for on site experience by LAPAN production managers Mr Mohammed Natsir, Mr Ignatius Arisdio and Mr Nurdinsyah Mokobombang;
- A visit to LAPAN's Jakarta Facilities by Dennis Puniard, Mike Pasfield, Anton Albina and Madeleine Clark;
- A visit to LAPAN's facilities at Pare Pare and Jakarta by Dennis Puniard and Robert Denize; and
- A visit to Jakarta by Peter Radonyi.

The project was completed in early December with the successful achievement of all objectives. Data from all satellites can now be successfully exchanged between the two stations.

*Left to right: Bambang Tedjasukmana, Tim Shirley, Dr Mahdi Kartasmita, Mawardi Nur.*





LAPAN headquarters at Pare Pare.



Operations Room at Pekayon.



LAPAN Processing Centre, Pekayon, Jakarta.

## Australian minister tours Indonesia

In November 1994 the Honorable Frank Walker, Australian Minister for Administrative Services, visited Indonesia. He was accompanied by the DAS secretary, John Mellors. The tour included Eastern Indonesia and Jakarta where a reception was held to mark the opening of a new DAS office in Jakarta. The minister met with Vice President Tri Sutrisno and other national and provincial government representatives.

The reception in Jakarta was attended by several prominent Indonesians involved in remote sensing activities from both government and private industry. The minister's speech made prominent mention of remote sensing and GIS technologies and business opportunities especially in relation to the development of Eastern Indonesia. He said in part:

"Australia thinks (the region) is important because it is closest to Australia.. It is also where development is most needed and where some of the country's poorest people live."

"Feasibility studies for a large hydropower plant were currently being carried out in the Mamberamo Valley in Irian Jaya and for low-cost housing in Kupang, East Nusa Tenggara."

"Other projects currently being studied include those related to satellite remote sensing and aero-mapping surveys."

Australia, he said, was also interested in the tourism industry and plans to assist in the expansion of the smaller airports in many parts of the region.

The visit has continued to build relationships at the highest level and provides a stepping stone for further cooperative projects.



Left: Antenna at Pare Pare, Sulawesi.



Right: Robert Denize, ACRES Chief Engineer and LAPAN Station Manager Nur Hidayat at Pare Pare.

# A classification strategy for mapping trochus shell habitat in Torres Strait, Australia

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## INTRODUCTION

The large marine gastropod, *Trochus niloticus*, has been used for thousands of years by the island peoples of the South Pacific as a source of food, craft material and trade. In the 1800s it formed the basis of the mother-of-pearl, shell trade that was controlled from Europe. While the extent of harvesting that characterized these times is not found today, the annual world harvest is still over 5 million kg and trochus remains an important cash crop and food source (Bouchet and Bour 1980). With increasing human populations and technological advances that facilitate the gathering of trochus, there is concern over current levels of harvesting and degradation of the reef habitats that support trochus (e.g. Glucksman and Ludholm 1982, Nash 1985, Yen 1985, Catterall and Poiner 1987, Honma 1988).

However, the tropical coral reefs where trochus shell is found are remote and in many cases, uncharted. As well, it is only certain sections of the reefs that are prime trochus habitat. As *T. niloticus* feeds mainly on algae, the best locations are the high energy sections of the reefs. These generally form narrow zones along the windward edges of the formations. Trochus are found in both intertidal and subtidal reef areas. Most inhabit water depths of between 5 and 6m although the larger commercial sizes often occupy deeper water (e.g. Heslinga et al. 1984, Hahn 1989). The task of estimating the abundance of trochus and the distribution of suitable habitat is a difficult one. This is the reason few surveys have been conducted for the commercial fishery areas (Long et al. 1993).

Remote sensing is a suitable base for mapping trochus habitat. However, mapping the habitat requirements of trochus demands high spatial resolution in a sensor system. For this reason satellite remote sensing has not made a contribution to mapping trochus habitat until comparatively recent times. Bour et al. (1986) and Loubersac and Populus (1986), working in New Caledonia, demonstrated that simulated SPOT imagery was capable of mapping the reef areas used by trochus with high accuracy. These results were confirmed after the launch of SPOT (Bour 1988). In the Australian region, Long et al. (1993) used Landsat TM imagery and a relatively simple classification technique as a means of rapidly estimating the trochus stocks of the eastern Torres Strait.

Work by the current team made use of the field data and air phot derived maps of Long et al. to establish the level of detail possible with Landsat TM imagery if more sophisticated processing approaches were tried. This commenced with the successful classification of the reef surrounding Yorke Island in Torres Strait (Hill and Ahmad 1992). In attempting to extend this process to surrounding reefs, it became clear that they displayed different patterns of trochus habitat. One practical problem, from the image analysis point of view, is that the islands and reefs which support trochus, are distributed patchily across broad areas. Because of differences in the size, location and geomorphology of the islands/reefs, they exhibit a diverse range of spectral classes for classification. As well, water depth alone, is not necessarily a good indicator of prime habitat. This state of affairs may lead to long and involved image processing sessions before a satisfactory classification of the full range of classes is successfully achieved.

The general aim of this paper is to assess the usefulness of Landsat TM data for mapping of trochus shell habitat for the reefs of the Bourke Isles in Torres Strait, which separates Australia and Papua New Guinea. In specific terms, however, emphasis is given to the description of a methodology that stream-lines the process of classifying prime habitat for commercial sized trochus across a group of reefs. It relies on transfer of a classification mask generated from an intensively surveyed reef to similar but unsurveyed areas.

## STUDY AREA

The location of the study area is Torres Strait, being roughly 100 km from north to south and 250 km east to west, occupies an area of approximately 8,000 km between Papua New Guinea and Australia. It is a shallow zone, up to approximately 50 m in depth, that features a host of reefs, islands and shoals (e.g. Harris 1989). The Bourke Isles are located in the eastern Torres Strait. These islands are coral cays surrounded by elongated, platform reefs. The major reef flats face the prevailing south east trade winds and it is along the windward edge of these that most large trochus are found.

Climate of the area is mild for a tropical region being dominated by the south east trade winds that blow from June to November and the north west monsoon that brings heavy rains between January and May. Maximum, annual average temperatures range from 24°C to 30°C with average, annual precipitation of 1,750 mm (Thursday Island). The dry season provides good conditions for the capture of satellite data with little cloud cover. During the monsoon season, however, there is little likelihood of usable imagery.