NEWSLETTER OF THE RESEARCH AND MONITORING SECTION

REEF RESEARCH

Great Barrier Reef Marine Park Authority

VOLUME 2 - No.3 SEPTEMBR 1992

EDITORIAL

Well, its Happy Birthday time here at Reef Research. We are now one year old and apparently hale and hearty. Interest is increasing and, as an indicator of this, this issue actually had, for the first time, more articles than could be fitted into the available pages. If the need is there, and I hope it is, the size of the newsletter will be increased. The newsletter has changed its format slightly over the year, as is appropriate for a newly hatched entity, and has moved to having a number of regular columns regarding specific topics. 'Slick Talk' was the first of these and is joined in this issue by 'COTS COMMS', the Crown-of-thorns Starfish newsletter prepared by Brian Lassig (which will, in future, be part of Reef Research) and 'What's Out There', the regular feature on monitoring.

The rationale behind these changes has been to more effectively structure the newsletter for readers with specific interests and, of course, to save money on mailing costs, however there are other benefits. Most of the research and monitoring programs overlap to a greater or lesser extent and it seems sensible that one publication should cover all our fields of endeavour. Probably nowhere is this more evident than in the Crown-of-thorns Starfish program where research has been commissioned in virtually every discipline that the Section has funded as part of its general program. Many of the findings that have transpired from COTS research have had a direct bearing on future directions for research in other areas. I hope that Reef Research helps to identify the relationships between apparently different areas of work.

Anyway, I'm off to blow out this one candle, have a piece of cake and hope for 'many more to come'.

Ed.

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Readers are invited to submit material for publication, inclusion is the decision of the Editor, all contributions or inquiries should be addressed to:

The EDITOR REEF RESEARCH
Great Barrier Reef Marine Park Authority
PO Box 1379
TOWNSVILLE QLD 4810

FAX : (077) 72 6093

Editor.....Steve Hillman
Assistant Editor.....Trish Sanders
Design & Art.....GBRMPA Production Unit
Printed by.....Image Print

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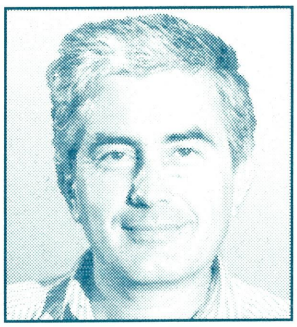
WHAT'S IN THIS ISSUE

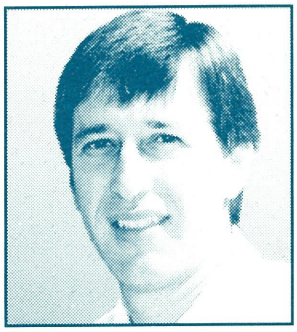
RESEARCH AND MONITORING STAFF

Simon Woodley	*Director*
Jon Brodie	*Coordinator, Water Quality*
Andy Steven	*Project Officer, Water Quality*
Rob McGill	*Assistant Project Officer*
	Water Quality
Brian Lassig	*Coordinator*
	Crown-of-thorns Starfish
Udo Engelhardt	*Project Officer*
	Crown-of-thorns Starfish
David Lawrence	*Coordinator*
	Torres Strait Baseline Study
William Gladstone	*Project Officer*
	Torres Strait Baseline Study
Vic Mc Grath	*Assistant Coordinator*
	Torres Strait Baseline Study
Bruce Mapstone	*Coordinator, Effects of Fishing*
John Robertson	*Project Officer, Effects of Fishing*
Leon Zann	*Coordinator*
	State of the Marine Environment Report
Elaine Eager	*Project Officer*
	State of the Marine Environment Report
Steve Hillman	*Information Services*
	& Editor Reef Research
Jamie Oliver	*Project Officer, Monitoring*
Ray Berkelmans	*Project Officer, Monitoring*
Rick Schneider	*Assistant Project Officer, Monitoring*
Lea Scherl	*Project Officer*
	Human Use / Social Impact
Dominique Denzaken	*Assistant Project Officer*
	Human Use / Social Impact
Steve Raaymakers	*Project Officer*
	Oil Spills & Sea Dumping
Christine Dalliston	*Assistant Project Officer*
Beryl Dennis	*Administration Assistant*
Trish Sanders	*Administration Assistant*
	& Assistant Editor Reef Research



LEON ZANN

Leon joined GBRMPA in early 1985. After completing his PhD (on biorhythms in marine animals) in 1972, he became research fellow at James Cook University, investigating tropical marine fouling for the Department of Defence. In 1979 he joined the University of the South Pacific in Fiji as Senior Lecturer in Marine Biology, and worked in most of the small island countries of the region. He came to GBRMPA as Senior Project Manager and in 1986 became the coordinator of the Crown-of-Thorns Starfish Research Program. The Pacific again called, and in 1990-91 Leon was the United Nation's Fisheries Adviser to Western Samoa. He rejoined GBRMPA in 1992, and is now Coordinator of the 'State of the Marine Environment Report for Australia'. His special interest in the ecology and fisheries of small islands has given him an invaluable 'holistic' perspective in this present assignment.



RAY BERKELMANS

Ray Berkelmans is a Project Manager in the R&M Monitoring Unit. The majority of monitoring projects are conducted by external consultants and include impact assessment monitoring programs funded by developers (mainly tourism) and general monitoring programs funded internally. Tasks include impact assessment of development proposals as part of a team, setting monitoring objectives, liaison and negotiation of monitoring requirements with developers, assessing proposals and reports, disseminating results and managing the administrative aspects of projects. Ray joined the Authority in 1986 and worked for the Great Barrier Reef Aquarium for 4 years prior to being transferred to Research and Monitoring in 1990. Prior to joining the Authority, he worked for the Commonwealth Industrial Gases Ltd for 6 years as a gas applications specialist. Ray has a BSc in Marine Biology and Zoology (1979) and is currently studying towards his MSc. His research interest is in temperature stress responses and acclimatisation of corals. His work is being undertaken in the context of local anthropogenic impacts and global warming. He also tutors a Masters degree course at James Cook University part-time.

Crown-of-thorns Starfish

Brian Lassig

There may be no such thing as a free lunch, but there is a free COTS COMMS. A what? COTS COMMS - the Crown-of-thorns Starfish Communicator. Issue #10 of COTS COMMS is included with this issue of Reef Research and in future the two newsletters will be amalgamated into a single publication to save on printing and mailing costs.

COTS COMMS was started in February 1989 with a view to:

- helping Crown-of-thorns Starfish (COTS) researchers and other interested parties to keep informed of research in progress, as well as the progress of research;
- reporting on the current status of COTS outbreaks on the Great Barrier Reef;
- providing a venue for, and encouraging, information exchange between COTS researchers;
- advertising forthcoming attractions (meetings, seminars, workshops *etc*)
- reporting on relevant meetings *etc*;
- advertising relevant 'grey' literature; and
- advertising of publications in press.

Achievement of these objectives requires input from readers. I'd appreciate any feedback or contributions from new readers of COTS COMMS. If you'd like copies of back issues let me know.

A significant aspect of COTS research has been the spin-offs to our understanding of much broader issues relating to coral reef ecology. The amalgamation of COTS COMMS with Reef Research reflects that 'big picture' philosophy.

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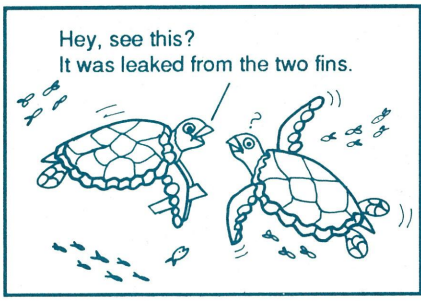
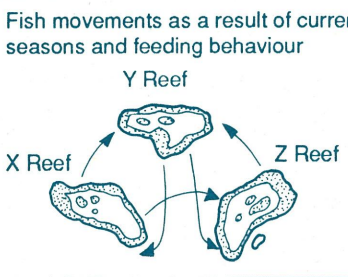
Coralations



Junk Food



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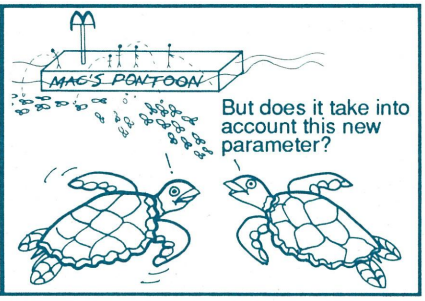


HERON ISLAND DREDGE SPOIL DUMP MONITORING

Michael Gourlay , University of Queensland

During the enlargement of Heron Island boat harbour in late 1987, dredging operations caused the release of considerable quantities of silt which were carried by tidal and other currents along the island's shoreline and onto the reef flat. Silt deposits affected marine flora and fauna on the reef and concern was expressed concerning the long term effects of these deposits and the potential for the release of further quantities of silt from the spoil dump reclamation located on the island's southwestern shoreline near the boat harbour.

Following a request from the Great Barrier Reef Marine Park Authority, a monitoring programme was established to investigate both the response of the spoil dump to the continuing action of marine and meteorological conditions and the dispersal of silt from it onto the reef flat surrounding the island. During this monitoring programme the spoil dump was surveyed several times to determine changes in its size and shape. It was extensively probed and excavated to determine the nature of the sediments stored in it, particularly the amount of silt within it. Observations were made of waves and other conditions responsible for reshaping the spoil dump and releasing silt from it. Sediment sampling along several transects on the reef flat at six monthly intervals gave information about the amounts of silt retained on the reef flat.

Monitoring extended over a three-year period from May 1988 to April 1991, but not all aspects were monitored for the complete period, particularly during the first twelve months before the monitoring programme was fully established.

NATURE AND QUANTITY OF MATERIAL IN SPOIL DUMP

The spoil dump was surveyed in May 1988, April 1989, January 1990 and June 1991. In addition, low level quasi vertical aerial photographs made in December 1987 gave sufficient information about the spoil dump shoreline to define conditions immediately after completion of the spoil dump. A survey by Department of Harbours and Marine in August 1984 gave an approximate indication of the pre-existing shoreline configuration. The spoil dump material was investigated by a combination of trenches and shallow holes dug with a backhoe, and auger holes during April 1989.

The material contained in the spoil dump was found to be very heterogeneous, ranging in size from large pieces of rubble, through cobbles, shingle, sand to silt but negligible clay-sized material. Particle shapes are also very variable. Silt is very unevenly distributed within the spoil dump, often being concentrated in lenses, and generally it is more prevalent in the northern part of the spoil dump near the jetty. The silt in the highly concentrated zones develops cohesion on drying. When exposed this cohesion is sufficient to maintain a vertical erosion scarp up to 0.5m high.

The initial volume of the spoil dump in December 1987 has been estimated as 14860m^3 relative to August 1984 beach contours. This volume has been reduced by 1780m^3 (12%) during the three and a half year period to June 1991. It is estimated that about 10% of the material in the spoil dump is silt.

CONDITIONS PRODUCING SILT PLUMES

The stability of the spoil dump, the release of fine materials from it, and the realignment of the shoreline are affected by winds, waves, tides, currents, rain, etc. These conditions were observed daily about an hour before high tide together with the occurrence and extent of any silt plume. The primary disturbing agent, wave action, is greatest at high tide since the water depth over the reef flat is greatest then. At lower water levels wave action reduces and negligible wave action reaches the island's beaches when tide levels are less than mean sea level .

It has been established that silt plumes are more likely to occur when winds are strong and tides are high. This is consistent with the increased size of waves under such conditions. Silt plumes were not observed on most occasions when wind speeds were less than 15kn, average breaking wave heights less than 0.3m or high tide levels less than 2.5m. Incidence of plumes under given conditions decreased and they became less extensive during the twenty-month period from May 1989 to January 1991. The reasons for this decrease are probably associated with a reduction in silt available on the upper beach face under continuing relatively mild wave conditions as well as the cleansing action of heavy rainfall during March and April 1990. However, the influence of rainfall upon the occurrence of silt plumes is not simple nor apparently as significant as winds, waves and tide level.

Erosion of the northern end of the spoil dump near the jetty is primarily caused by waves coming from the northern side of the reef, whereas erosion of the southern end of the spoil dump is caused by waves coming from the southern side of the reef. More silt plumes are generated near the jetty than at the southern end of the spoil dump. This is because breaking waves during the period of observation were generally larger near the jetty and there is more silt in the vicinity of the jetty than further south.

The two occasions when significant erosion of the spoil dump occurred in April 1989 and January 1990 were both associated with swell originating from distant cyclones and coming over the northern reef edge at very high tides.

CHANGES IN BEACH AND SHORELINE

During the process of erosion and reshaping of the seaward face of the spoil dump, the silt is carried away by currents and either deposited on the reef flat or removed from the reef platform. Sand and shingle are redistributed to form the new beach profile and new beach alignment. Rubble generally remains on the beach at the base of the erosion scarp until removed by human action, generally to protect the jetty or the helipad.

The shoreline of the spoil dump is being realigned by the present dominant waves into a new 'stable' equilibrium form. Waves from the north breaking at an angle to the shoreline are attempting to form a crenulate bay shape south from the southern end of the timber wall protecting the helipad. This process is causing considerable erosion in the vicinity of the jetty and is being modified by human activity involving the placement of rubble to reduce erosion. The southern portion of the spoil dump and its adjoining beach have been realigned to be parallel to the crests of waves coming over the reef edge to the south of the boat harbour. In both cases, the realignments appear to be a response to negligible net alongshore sediment transport towards the spoil dump.

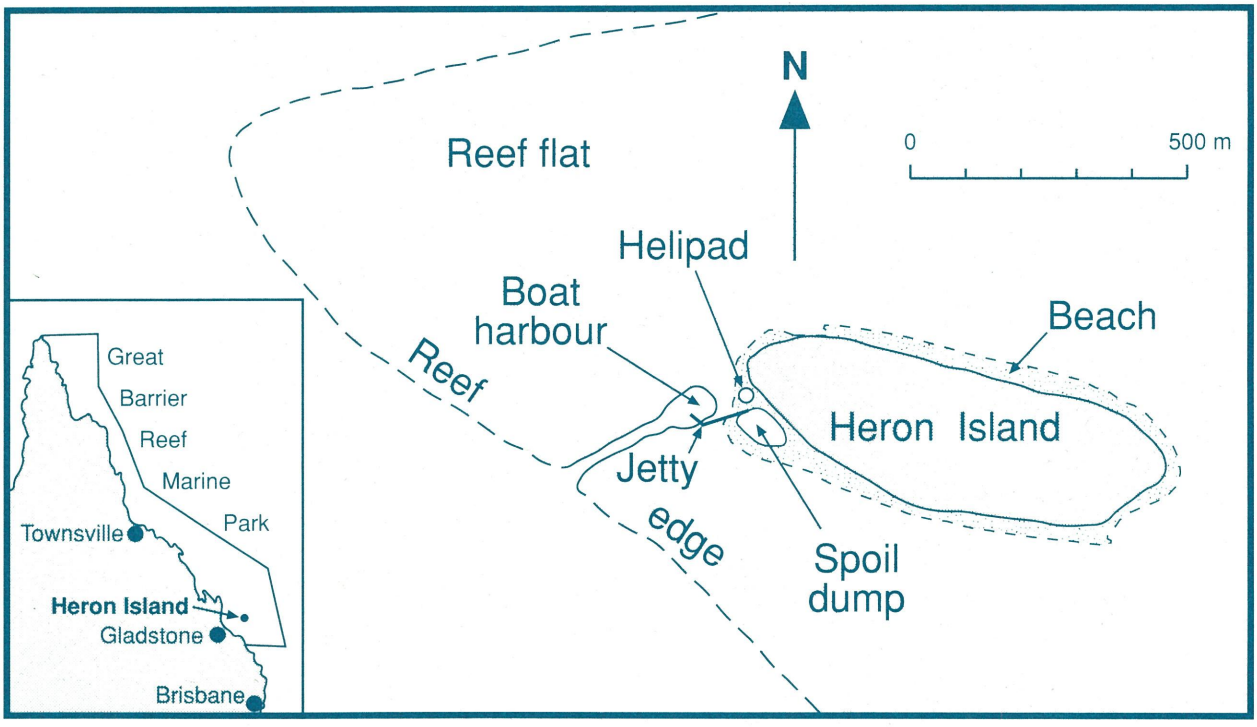
SILT PLUMES AND REEF FLAT SEDIMENTATION

Material in the silt plume is predominantly silt and is essentially the same size distribution as the silt found in the spoil dump. The extreme size range is 0.0015 to 0.095mm but most of the material (>90%) lies between 0.004 and 0.06mm with the median size being about 0.01mm. Silt deposited on the reef flat closer to the spoil dump is somewhat coarser (0.03mm median size) than that released in the plume. Negligible amounts of material finer than 0.008mm were found on the reef flat and this is consistent with the very low settling time for such particles which are likely to be removed from the reef by tidal currents either before they settle onto the reef surface or after they are subsequently stirred up again by wave action.

Silt plumes now originating from the spoil dump are generally much more localised and less extensive than those which occurred during construction operations. They are also less likely to extend over large areas of the reef, since the larger waves causing them occur at high water and subsequent ebb tide currents are likely to remove suspended material from the reef flat. Currents induced by the dominant east-southeasterly to southeasterly winds can be expected to assist this process of removal.

During severe wind events when waves are breaking over the reef flat, extensive turbidity has been observed. This turbidity is not necessarily associated with the spoil dump but such conditions in association with ebb tide currents provide a mechanism for cleansing the reef flat and removing fine sediments from it.

Overall it is concluded that the continuing effects of the 1987 dredging operations and the spoil dump upon the adjoining reef flat are small in comparison with the initial effect and under normal conditions are decreasing in magnitude. Significant erosion and realignment of the spoil dump shoreline in the short term are only likely with large waves (eg during storms and cyclones) at high tides. Such conditions occur infrequently and are likely to cause more damage to the reef flat by direct influence such as mechanical damage and sediment resuspension then the pulse release of silt from the spoil dump that accompanies these events.



Human Use/Social

Dr Lea M. Scherl

If by 'reef' research you may have been led to believe that only the biota and the physical processes would be featuring in this newsletter, then think again. If this were the case, then there is clearly a need to reframe 'reef' to include the relationships between humans and reefs from the perspective of the people who interact with the system. Since this is the first time that information on the human use/social impacts program features in 'Reef Research', it is probably worthwhile to give an overview of the program of the last two years and the directions that are set for the near future.

An underlying objective of the human use/social impacts program of research and monitoring has been to further the introduction of a social science perspective to the management of the Great Barrier Reef (GBR) Marine Park. This has been approached from a number of angles:

a) *the provision of opportunities for discussing issues related to Social Sciences in Resource Management;*
b) *participation in management planning;*
c) *research in the area of visitor experiences;*
d) *close liaison with the Queensland Department of Environment and Heritage (QDEH) to coordinate efforts in this area;*
e) *steps towards developing an integrated visitor use database for the GBRMarine Park; and*
f) *steps towards developing Social Impact Assessment guidelines.*

Two workshops were conducted in the general area of visitor management and social carrying capacity. They both had presentations from international and national professionals in the field of recreation planning and management, and resource valuation. In the first workshop (October 1990) a number of case studies, from the perspective of 'amenity' issues and decisions faced by managers on those issues, were discussed in detail by staff members of both the GBRMPA and QDEH. The second (July 1992) was characterized by a broader level of discussion on the importance and application of social knowledge to resource management.

In order to effectively contribute a social science perspective to GBR Marine Park management, there is a need to understand and participate in the decision making process. This is particularly the case because social science knowledge is not as often used as biophysical knowledge in the management of natural resources. To this end, I have been involved in management planning, contributing to the identification of social values of GBR areas, the development of a visitor opportunity spectrum and 'amenity' related management objectives.

The major achievement of the last two years has been the design and implementation of the Great Barrier Reef Recreation/Tourism Experience Study at Lady Musgrave Island and Reef. This study is contributing to the broader scheme of involving the community in management planning of the GBR Marine Park, as well as providing some baseline data on the nature of recreation and tourism experiences at one location.

The study aimed to develop an understanding of the nature of recreation/tourism experiences at Lady Musgrave Island and Reef (how visitors perceive their experiences and what is most salient to them) and visitors' perceptions of specific management issues and options for the area. The particular issues and options that were canvassed

Impact Program

need to be addressed in the revised management plan which is being developed for the Island. Three visitor groups were interviewed during four periods of on-site data collection, 'day-trippers', 'yachtees' and campers. Interviews were tape recorded and, in total, 208 interviews were content analysed (114 'day-trippers', 54 campers and 40 'yachties').

QDEH provided the support for the field trips and a number of staff from both management agencies participated in the data collection. This facilitated the interaction of staff with user groups, and staff participation in the process of social science research. The project received a lot of support from the tour operators that go to Lady Musgrave Island and Reef, without which it would have been very difficult to conduct the study. There were also very good responses to the study from the visitors who were interviewed. To ensure that the study would be relevant to management needs, a project team approach was adopted involving managers and researchers throughout the research process (and this will continue during the application phase). Preliminary analyses have been completed, as well as a draft report for internal review. Further analyses are now being carried out together with the preparation of a final report.

Another study, which included interviews similar to the ones conducted at Lady Musgrave, has been carried out at Whitehaven Beach (Whitsunday Island) by staff of QDEH with support from the GBRMPA. Data from this study are presently being analysed. In addition, a limited literature review on Social Impact Assessment, which is to form the basis of a report to the GBRMPA, has been undertaken. Staff of the GBRMPA have also started to compile information on the nature and location of available data on visitor use of the GBR Marine Park and are liaising with QDEH to integrate data collection, storage and retrieval throughout the GBR region.

Thus, this coming financial year will see the completion of reports on the Great Barrier Reef Recreation/Tourism Experience Study, on guidelines for Social Impact Assessment, on a detailed and integrated picture of the nature and location of all available visitor use data ,and inclusion of these data in the GBR Marine Park database. You may find the 'socialites' doing less socializing and interacting with the reef while these reports are being completed!

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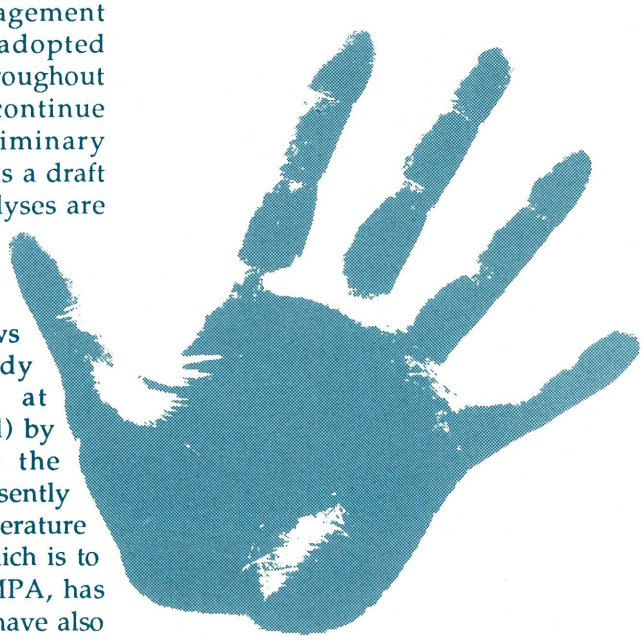

What's out there

Dr Jamie Oliver

Monitoring Issues Highlighted at the International Coral Reef Symposium in Guam

Two months ago, scientists and environmental managers from around the world converged on the small island of Guam in the western Pacific, to attend the 7th International Coral Reef Symposium. The last symposium of this type was held in Townsville in 1988, and it was immediately evident that there had been a substantial shift in the attitudes and interests of many reef workers in the intervening 4 years. Although there were plenty of the usual research papers on the biology, ecology and geology of coral reefs, there was a dramatic increase in the number of papers and sessions dealing with global reef status and the need for monitoring at a variety of scales.

The two plenary addresses dealt with the fate of coral reefs during an anticipated period of increasing anthropogenic pressure and global climate change. They both set the scene for subsequent monitoring sessions by highlighting firstly how precarious the existence of reefs in many parts of the world may be, and secondly on how little hard data we have on what changes have actually occurred on reefs over the last few decades and what changes may be likely to occur during the next few decades of anticipated global climate change.

During the 5-day symposium there were two full day sessions on monitoring in which over 40 papers were presented. The first session was a special UNESCO sponsored workshop entitled 'Monitoring: What to do and how to do it.' while the second dealt with the 'Methods and results of long-term monitoring on coral reefs.' Both sessions were well attended and provided an excellent overview of the status of monitoring programs and of reef-health in a variety of locations.

It was particularly sobering to listen to the results of monitoring programs on Jamaican reefs, which show that coral cover has declined precipitously. The initial cause for reductions in coral cover were natural (hurricane damage) but the failure to recover was considered to be partly a result of heavy fishing pressure. In the Indo-Pacific region, preliminary data also suggests that many reefs are being degraded as a result of human activities (over-exploitation of reef resources, destructive fishing techniques and poor land management on adjacent coasts). However more intensive, quantitative monitoring is needed on most reefs in the region in order to clearly establish the magnitude and cause of any degradation. This is also true of the Great Barrier Reef even though its condition is clearly much better than most reefs in the region. Many of the papers presented during the monitoring sessions were specifically directed at improving the methods used for monitoring long-term changes on coral reefs. Use of video and photographic techniques was advocated by some scientists as a potentially cost-effective and quantitative technique for benthic monitoring, while the traditional line transect method came in for some criticism. AIMS and the Great Barrier Reef Marine Park Authority are considering standardising on video transects as a standard survey technique for both long-term broad-scale monitoring and site-specific impact monitoring.

The need to carefully evaluate the characteristics and limitations of survey techniques, and the importance of carefully designed and statistically rigorous programs was stressed by several speakers. It was also evident that there is a need for a standard for monitoring tools and techniques which can be adopted by all reef workers as a common minimum requirement. This would allow all workers to exchange data and build up a synoptic view of any changes which might be occurring on a global scale.

With this in mind a series of meetings was held during the symposium aimed at bringing scientists and institutions together from around the world to cooperate in the collection and dissemination of monitoring data. Initial steps were taken to form a Pacific monitoring network called PACICOMP, although this initiative was overshadowed by a proposal put forward by a consortium of international organisations to establish a global monitoring network aimed at detecting the effects of global climate change on coral reefs. There was some debate as to how feasible it would be to detect relatively small global climate effects on reefs which exhibit substantial short-term natural and human-induced changes. Nonetheless initial expressions of interest were given by individuals from most institutions to make a start by providing some of the data already being collected for distribution in a standardised format. Australia could play an important part in this effort because of the pristine nature of many of its remote reefs, and because of the considerable effort currently being put in to long-term monitoring.

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A Water Quality Monitoring Program for the Great Barrier Reef

Jon Brodie

Why

The Great Barrier Reef lagoon, the body of water between the outer reefs and the mainland and including the inter-reefal areas, can be described as a semi-enclosed coastal sea. Complete circulation and interconnection with the Coral Sea to the east is hindered by the reefs and the area is uniformly shallow with maximum depths of the order of 80 metres. Many coastal seas in other parts of the world have been adversely impacted by terrestrial runoff from catchments used for agricultural, urban and industrial development. Prominent examples are the Black Sea, the Baltic Sea, the eastern North Sea, the northern Adriatic Sea, Chesapeake Bay and the Inland Sea of Japan. Greatly enhanced nutrient inputs from rivers leading to eutrophication has been the main problem and examples include the Danube and Dneiper Rivers into the Black, the Rhine, Ems and Elbe into the North and the Po into the Adriatic.

Some controversy exists among scientists as to the gravity and extent of any eutrophication problems in the GBR lagoon. Evidence of increased land runoff of nutrients is convincing enough, however, for it to be clear that a long-term water quality monitoring program, focusing on nutrient pollution, is required. Recent estimates suggest approximately four times as much sediment, nitrogen and phosphorus now enter the GBR lagoon from terrestrial runoff as entered in the period before European settlement of Queensland coastal catchments. The major component of this increased flux is attributed to agricultural activity with only a minor contribution from sewage discharges.

How

The complex nature of the GBR system makes the choice of a set of monitoring stations difficult. The lagoon is a long, thin strip. River inputs enter the western side from a large number of catchments, nutrient-rich upwelled water enters on the east from the Coral Sea, a number of coastal cities lie on the western edge and shipping uses the whole length of the lagoon. 3000 reefs and 1000 islands are scattered through the lagoon and these also have a profound effect on ambient water quality. The principal objectives of the water quality monitoring program, to detect long-term trends in water quality and to gauge large scale spatial variation, play a major role in the selection of sampling stations.

Comparison of a number of overseas long-term monitoring programs has revealed that the best indicators of eutrophication in the water column have been the concentration and composition of phytoplankton and dissolved oxygen status. Use of chlorophyll concentration as an indicator of phytoplankton biomass has been generally successful. Parameters such as salinity, temperature and pH may also be useful in identifying the sources of enhanced productivity. If actual nutrient concentrations are to monitored it is now clear that the full range of species present, particulate, dissolved organic and dissolved inorganic, must be measured.

Where

The proposed monitoring program consists of a set of interlocking programs at different spatial and temporal scales. There are four principal components.

At the largest spatial scale, but lowest frequency, over 100 stations throughout the GBR will be monitored once or twice a year in association with Australian Institute of Marine Science studies into nutrient dynamics, fluxes and budgets. This program has been proceeding for over ten years already and has already given us our best wide-scale nutrient data set for the region. Complete nutrient analysis as well as chlorophyll will be

measured at each station. This program is integrated with the reef-wide monitoring program of AIMS which includes a water quality component. Sampling and analysis will be done by AIMS.

38 stations lying along 10 cross-reef transects samples will be monitored on a monthly basis for oceanographic parameters such as salinity, temperature, dissolved oxygen as well as chlorophyll. The transects lie in the following regions: Lizard Island (1); Cairns (2); Townsville (2); Whitsundays (2); Keppel Bay/Capricorn-Bunkers (3). The stations range from the coast to the outer edge of the shelf and sampling will be carried out by personnel from Queensland Department of Environment and Heritage, Coastal Management Division and from Heron and Lizard Island Research Stations.

Five stations in a transect from Port Douglas to Agincourt Reef will be monitored on a weekly basis for oceanographic parameters and phytoplankton. Sampling will be carried out by staff of Reef Biosearch, the scientific and interpretive arm of the Quicksilver reef tour operation, and take place from Quicksilver vessels.

The final component of the program is continuation and extension of river flux monitoring for nutrients and sediment. This will build on work already in progress by AIMS and hopefully involve cooperation with Queensland Water Resources Commission's (DPI) work in this area.

The program as a whole will run in parallel with long-term benthic monitoring programs at present being designed by the Authority. Other concurrent work, the results of which can be integrated with the water quality monitoring program, include a number of research projects in the water quality program and long-term temperature monitoring at present being started by AIMS and GBRMPA. Future extensions of the program will include sediment monitoring and re-examination of remotely-sensed imagery for chlorophyll detection using the results of the monitoring program for ground truthing.

Many of the elements of the program should be started by late 1992. Some of the early work will be used to refine design and logistical aspects of the program and to test the data analysis systems chosen for use. However it will take some years for enough data to be available from many areas to begin to measure long-term trends.

Australia's First National State of the Marine Environment Report

Elaine Eager

The last issue of Reef Research introduced readers to Ocean Rescue 2000 — a national program that aims to conserve and ensure the sustainable use of Australia's marine environment to the year 2000 and beyond.
(see External Services Program, *RR* 2(2):5)

An important component of Ocean Rescue 2000 is the preparation of Australia's first comprehensive review and assessment of the state of the marine environment of Australia and its territories. The preparation of this State of the Marine Environment Report (SOMER) is being undertaken by the Great Barrier Reef Marine Park Authority on behalf of the Department of the Arts, Sport, the Environment and Territories, in cooperation with Commonwealth and State Government environment and resource agencies.

SOMER will describe the features and resources of the marine environment; the uses, past and present; impacts; data and information collection programs; and existing management. It will highlight and address environmental issues and information gaps, provide an assessment of the state of the marine environment and make recommendations on future marine environment reporting.

The general approach adopted for preparation of the Report involves:

- commissioned review papers by technical expertsfrom government and private sectors on topics identified by a preliminary workshop of interested agencies and experts and subsequent follow-up by the project Coordinator. The papers will serve as the source material for the final report and be published as a separate technical annex;
- the synthesis of the information in the review papers and public input to produce the main or overview report by June 1993;
- an Advisory Committee to provide advice to GBRMPA on the proposed outline of the report and possible expert contributors; to provide advice on the quality of the information collected and collated; and to review the conclusions drawn to ensure the highest possible technical credibility for the report;
- public participation through an advertised call for submissions from organisations and individuals who can provide technical information which could contribute to the report;
  a review workshop in March 1993 involving the Advisory Committee and experts from government and private sectors to discuss the findings and recommendations before the report is finalised for consideration by the Australian and New Zealand Environment and Conservation Council and the Australian people.

In April 1992, Dr Leon Zann was appointed as the SOMER Coordinator. Elaine Eager, on transfer from GBRMPA's Education/Information Section, is Dr Zann's assistant on the project.

The Advisory Committee will be chaired by Dr Don Kinsey, recently retired Executive Officer of GBRMPA, eminent coral reef researcher and widely experienced research and public agency administrator. Another nine members of the Committee will bring expertise in marine ecology, chemistry, coastal geomorphology, physical oceanography, fisheries science and management, wildlife management, environmental law, resource economics and coastal wetlands. Several members will also bring experience of the contribution non-government organisations can make to conservation efforts.

Welcome to the second appearance of 'Slick Talk' in Reef Research. In this issue we report on some relevant outcomes of Spillcon 92, the fourth convening of Australia's premier oil spill conference, and provide an update on electronic charts by Commodore Leech of the Royal Australian Navy. Apart from Commodore Leech's submission , input from external sources has been a little disapointing, and although this is probably related to the infancy of 'Slick Talk', I would like to reiterate the invitation to all readers to submit news items and/or articles on the scientific and environmental aspects of oil spills for inclusion in future appearances of 'Slick Talk'. Let's get the exchange of information flowing!

Spillcon 92

The Australian Maritime Safety Authority and the Australian Institute of Petroleum jointly hold an international conference on oil spills in the marine environment every two years. Spillcon 92, the fourth such conference, was held on the Gold Coast from 6 to 9 June and attracted over two hundred and sixty Australian and international participants. For the first time the International Energy Agency participated as a co-sponsor.

A total of twenty two papers were presented by leading oil spill experts covering a wide range of subjects including the effects of oil on the environment, oil spill response planning, marine operations, shipping design and construction and case studies of recent spills including the Gulf war and the 'Kirki'.

With a theme of 'Environmental Care - Responsible Action' Spilcon 92 had a slightly greater focus on the environmental and scientific aspects of oil spills than previous Spillcons, and resulted in a number of outcomes of direct interest to scientists and environmental managers involved in this area.

The priorities of oil spill response were reiterated and confirmed in a paper by Dr June Lindstedt-Siva of ARCO USA, and these are, in order of priority:

- *Protect human life, health and safety.*
- *Minimise ecological impacts.*
- *Minimise social and economic impacts.*

The prioritisation of ecological impacts over socio-economic impacts is an important point, as despite the fact that ecological impacts are both much longer lasting and harder to repair than socio-economic impacts, spill responders are often forced by commercial and political pressures to protect socio-economic resources at the expense of ecological resources. Many socio-economic resources are vitally linked to ecosystems, for example fisheries, and protection of the environment will therefore also ensure protection of these socio-economic resources.

A paper by Dr Jennifer Baker of Environmental Impact Assessments, UK, gave a very informative summary of the impacts of oil on the environment. Impacts can range from total devastation of mangrove forests to actual enhancement of growth rates in some marsh plants. The exact nature of impacts is so dependant on a number of variables that it is not possible to accurately predict impacts in the event of a spill. Dr Baker gave an interesting discussion of recovery of ecosystems from oil spills, stating that ecological damage from oil spills is never permanent and that 'recovery' will start sooner or later, although recovery times can vary from a few days to decades. The definition of what constitutes recovery is something that the scientific community needs to address. Is it return to an ecosystem with the same species composition and community structure and function as that present before the spill, or simply attainment of a state where the toxicity or other damaging properties of the oil have declined to a level that is tolerable to the most robust colonising organisms? Clarification of such definitions by ecologists is necessary in order to assist decision making by those responsible for oil spill clean-up.

For a full list or copies of papers presented at Spillcon 92 give me a call on 077 818 818.

ECDIS - Electronic Charts

One of the inescapable realities of oil spills is the fact that due to the nature of oil on water, the nature of the marine environment and the physical limitations of oil spill equipment, even the best oil spill response will have limited effect in preventing environmental impacts once a spill has occured.

It is therefore paramount that maximum effort be channeled into preventing oil spills from occuring in the first place. Improving navigation capabilities is obviously one way of doing this. A new international initiative to improve safety of navigation is the Electronic Chart Display and Information System or ECDIS.

ECDIS uses three technologies to reduce the incidence of errors in navigation by largely removing the human element. These technologies are Global Positioning System, Electronic Chart Data Base and Computer Graphics. These technologies combined in ECDIS provide the mariner with continuous, real time, high accuaracy position superimposed on an electronic chart display with audible warnings of impending danger.

North American statistics indicate that 90% of ship groundings are caused by navigation error, and that 70% of these may be avoided with the use of ECDIS. In recognition of the value of ECDIS the Australian Hydrographic Service has dedicated two staff positions and $300 000 in the current financial year to developing ECDIS in Australia.

(information courtesy of Commodore J.W. Leech, Australian Hydrographic Service, RAN)

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