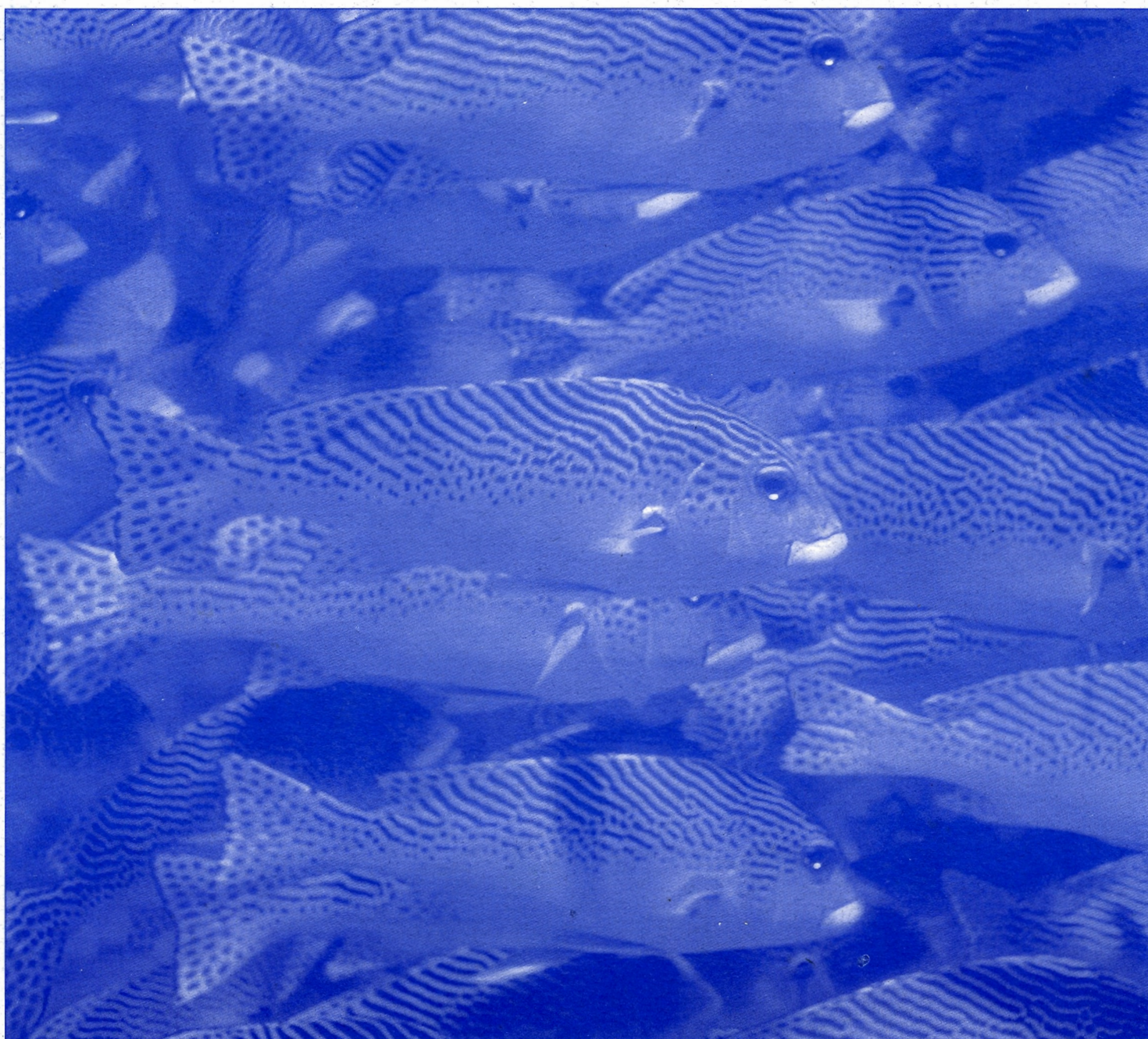


L I Z A R D I S L A N D

Research Station

NEWSLETTER 90/91



The Trustees of the Lizard Island Reef Research Foundation, and everyone connected with the Station have pleasure in thanking all those organisations and individuals who have provided financial assistance.

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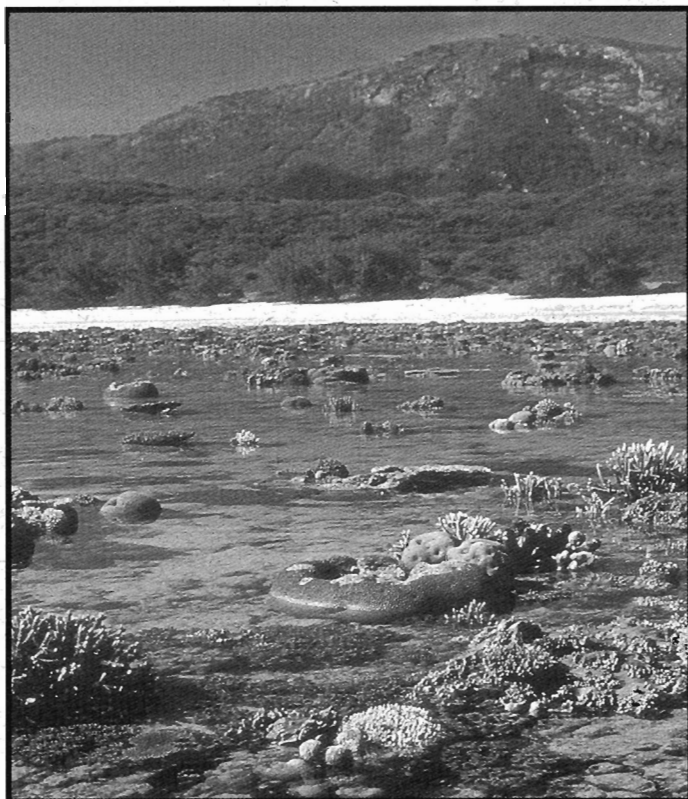
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LIZARD ISLAND RESEARCH STATION NEWSLETTER 1990/91



Lizard Island lagoon at low tide

The station has had yet another exciting and successful year of research activity and development.

This newsletter covers the period from 1 July 1990 to 30 June 1991.

Please address any queries about the station's facilities to:

Co-Directors

Lizard Island Research Station
PMB 37

Cairns Qld 4871

Australia

Phone and fax: (070) 60-3977

International: 61 70 60-3977

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About the Station

The Lizard Island Research Station is a facility of the Australian Museum dedicated to supporting research into all aspects of the biology, geology, hydrology, history, management and conservation of the Great Barrier Reef.

Situated on the northern Great Barrier Reef (14°40'S 145°28'E), the waters surrounding Lizard Island are largely unaffected by human impact. The station has four self-contained houses for visitors, which together accommodate up to 24 people. Boats, scuba tanks, a running seawater aquarium system and air-conditioned laboratories are available to support scientists and students with research and educational interests in the tropical marine environment.

Staff

The research station has four staff members: two co-Directors who are active researchers, and two maintenance officers.

In August 1990, Lyle Vail and Anne Hoggett took over as co-Directors. Lyle's research interests are reproductive and population biology of crinoids and holothurians, and Anne's are taxonomy and systematics of echinoderms.

Lance and Marianne Pearce are now in their third year as maintenance officers at the station.

Margaret Hoggett, Jean Cameron and Kate Padgham each spent many months on the island as care-giver and teacher for Anne and Lyle's son, Alex Vail.

Vision of the station's future

We see the Lizard Island Research Station improving its already excellent reputation as a facility for marine research on the Great Barrier Reef: we want it to become the preferred venue for coral reef research by scientists from all over the world. This can be achieved by ensuring that the environment is maintained in near-pristine condition and by providing superior research and housing facilities.

To help maintain quality of the environment, we will continue to provide input into plans for management of the Great Barrier Reef, and to lobby for change if management practices are inadequate. To provide superior research and housing facilities, we will maintain and update those that already exist and develop others. The station is well-known for being one at which equipment can be relied upon to work: maintenance will continue to have the highest priority so that research can proceed safely and efficiently.

We see the reefs themselves as the main "laboratories". Accordingly, the emphasis is on making them easily and safely accessible: equipment priorities are boats, motors, boating safety gear and diving equipment. For the indoor laboratories, priorities are the acquisition and upgrading of basic equipment such as balances, microscopes, centrifuges and computers.

It is important to obtain the best possible scientific and educational value from the station by encouraging high usage rates. In addition to scientists and postgraduate students, educational groups are welcome. All potential users must feel



that they can rely upon help from station staff in the planning stages of their visit, as well as during their stay. Non-scientists who visit the island should leave with the impression that science is both relevant and important to the community, and that the station itself is a dynamic research centre.

In short, we want the Lizard Island Research Station to make major contributions to coral reef research and to play a part in enthusing the Australian public about science.

- Anne Hoggett and Lyle Vail



Developments

Insect screens have been fitted to windows of all bedrooms on the station. This will be appreciated by visiting researchers during the island's short mosquito season. The other major housing improvement this year is replacement of the **kitchen cabinets** in two visitor houses (Kirby and Suntory) and in the maintenance officers' house.

A new **promotional video** has been produced for the station by QTV Cairns. It explains the history, philosophy and facilities of the station as well as showing research in progress with extensive underwater footage. The video is shown at the station to groups of tourists and is available to school and university groups intending to visit the station. Donation of footage for the video, by Coral Sea Imagery (Townsville), TCN 9 (Sydney) and the Great Barrier Reef Marine Park Authority (Townsville), is gratefully acknowledged.

Plans for the **Raymond E. Purves Laboratory** have been submitted to council and to the Queensland National Parks and Wildlife Service. This new wet lab will provide a much-needed area for work such as dissecting and preserving fish, and sorting samples. It comprises a well-ventilated room with an adjoining outdoor undercover area, both with running fresh and salt water. This laboratory area will also be useful as a meeting room for educational groups. Building will commence in 1991/92.

Alcan Australia Ltd. continued its valued support of the station this year by donating two **new Quintrex 4.6 m aluminium dinghies** as replacements for ones that had been in constant use for over ten years.



A new **waste disposal plan** has been implemented. Aluminium, glass and steel continue to be recycled and burnables are still incinerated. An improved compost bin has been constructed and other waste is removed to Cairns. Researchers are responsible for the proper disposal of any chemicals they bring to the island.

Storage cabinets have been purchased for the variety of flammable chemicals used at the station.

Canopies were installed on most dinghies this year to provide shade for boat attendants.

Air quality testing equipment has been purchased so that output from the scuba compressors can be monitored in accordance with new diving regulations.

Events and issues

Cyclone Joy reached category 4 (on a scale of 5) in December 1990 in the Coral Sea, and for several days was heading straight for Lizard Island. Considerable activity ensued at the station, securing boats, equipment and buildings. Eventually, the cyclone passed south of Lizard Island to cross the reef near the latitude of Cairns and the coast near Ayr. Coastal north Queensland suffered considerable damage from wind and floods caused by Cyclone Joy, but no damage occurred at Lizard Island as wind speed did not exceed 35 knots and rain was moderate. However, heavy seas from the normally calm northwest made field work difficult in the latter part of December.

Rezoning the Cairns Section of the Great Barrier Reef was completed by the Great Barrier Reef Marine Park Authority this year. The station and the Australian Museum, among others, expressed concern that the new plan allowed spearfishing in the Marine National Park A Zone, where it had been prohibited previously. Most of the Lizard Island coastline is in this zone. Recreational spearfishing is incompatible with certain types of research activity. As a result of lobbying by the station as well as the museum and other groups, the Authority exempted several reefs (including Lizard Island) from spearfishing activity in this zone. The Authority plans to commission research to determine the relative effects of spear and line fishing in 1991/92.

Bench fees

The station is not directly funded by any government, and must meet its running costs from bench fees paid by users. The fee includes accommodation, use of a small boat, laboratory space and equipment, aquarium system, weights and belts, and scuba tanks with air fills (for qualified divers).

From 1 January 1991, fees are \$75 per night for a researcher and \$55 per night for an assistant during the summer season (October to February). During winter (March to September), fees reduce to \$65 for a researcher and \$50 for an assistant.

A subsidised bench fee is available to postgraduate students working on their own projects (\$29 per night, \$22 for an assistant).

Attractive rates are available for visits by groups of school and university students undertaking course work at the station, and one group leader comes free with each group of eight students.

Commercial operators are welcome to use the station's facilities when space permits at a commercial rate.

For visits longer than 28 consecutive days, a 10% discount applies to the whole period.

Visitor Statistics

	1989/90	1990/91
Projects	48	36
Australian scientists & assistants	29	20
Australian postgraduates & assistants	39	27
Foreign scientists and assistants	27	21
Foreign postgraduates and assistants	18	10
TOTAL research personnel	113	78
Educational group-members	0	38
Volunteers	15	24
Commercial users	9	23
Other visitors	11	46
TOTAL number of visitors	147	209
Average number of:		
Researchers per night	7.5	5.2
All visitors per night	8.9	8.1
Average research visit duration (days)	-	24.5

Volunteer program

An active volunteer program continues to operate, in which people can receive accommodation at the station in return for work. The work is usually a combination of cleaning, de-rusting, painting, digging, chopping and track clearing. Opportunities for volunteer work occur mainly from March to September.

This year, 24 volunteers completed a great deal of valuable work. The station acknowledges this contribution, and thanks the following people: Vicki Sorenson, Per Sorenson, Regular Mahlemann, Virginia Craney, Stephan Bauhaus, Brent Matsuda, Andrew Maehl, Jens Luetz, Len Cusack, Suzanne Hauswaldt, Janice Warren, Sue Greene, Steve Blake, Nigel Williams, Averil Simpson, Bettina Engelbrecht, Bill Heegard, Kristin Rudeen, Thomas Collins, Suzy Collins, Nathan Shelton, Anne Kimpton, Steve Fowler, and Tara Pogue.

In addition, special thanks are due to Zolly Florian (Optical Microscopes Unit, James Cook University) for donating his time and expertise to visit the station to service and give advice on our microscopes, and to Rob Joyner (Exhibitions, Australian Museum) for his input into design of an educational display on the lab verandahs.

Tours

Guests of the Lizard Island Lodge visit the station every Monday and Friday for a tour of the station. In addition, tours are also given on an irregular basis to people from visiting research vessels, tour boats, yachts, fishing boats and the campground.

Scientists and crew from the Japanese Marine Biotechnology Inc. research ship "Soghen Maru" and the USSR research vessel "Akademic Oparin" visited in December 1990.

Members of CEDAM, a marine-oriented group based in New York, also called in to the station during their Great Barrier Reef collecting trip for the New York aquarium. Visiting tour boats included "Queen of the Isles", "Noel Buxton", "Kangaroo", "Elizabeth E II", "World Discoverer" and "Frontier Spirit". In all, over 1,200 people toured the station this year.

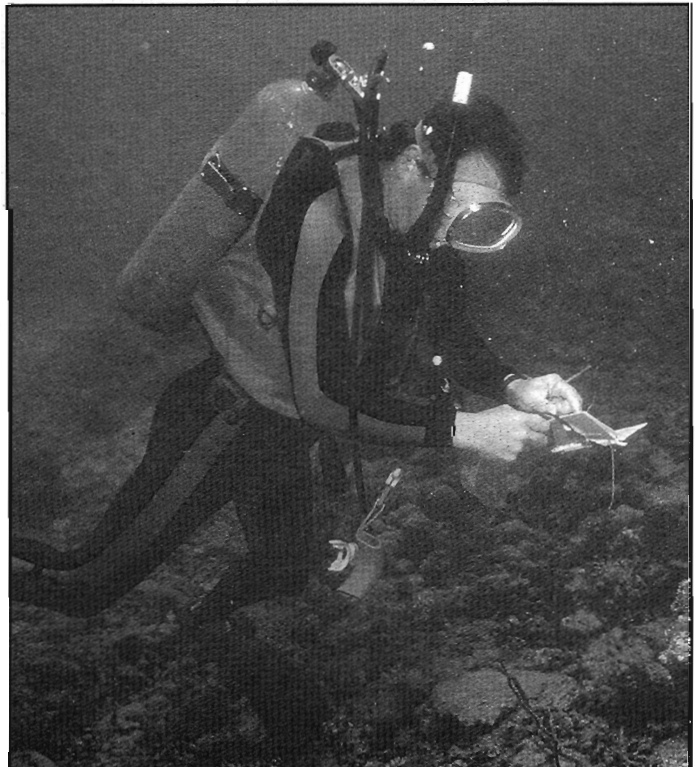
Support for Research

**Qantas/Lizard Island
Travel
Fellowships**



Qantas Airways, in association with the Australian Museum, offers two travel fellowships each year. These comprise an economy class return air ticket to Cairns from any city served by Qantas. The fellowships are open to people who will conduct significant research at the Lizard Island Research Station. The successful applicants should spend a minimum of four weeks at the station. Bench fees and other costs are not included in the fellowship. A condition of the award is submission of a report on the project, including photographs, within two months after visiting the station. This will be used for publicity by both Qantas and the research station.

A 3-page proposal including: 1) aims, 2) methodology, 3) a personal curriculum vitae and 4) significance of the research to the Great Barrier Reef should be sent to Dr Pat Hutchings, Australian Museum, P.O. Box A285, Sydney South, NSW 2000, Australia (Fax: (02) 339-8304). Closing date for applications for the 1992 fellowships is 1 October 1991.



Qantas Fellowship holder Ken Sebens at the site of his coral transplant experiment

LIZARD ISLAND RESEARCH STATION

Doctoral Fellowship for 1992

The Australian Museum, in conjunction with the Lizard Island Reef Research Foundation, is offering a three-year fellowship to a PhD student to support field work on the Great Barrier Reef, based at Lizard Island Research Station. The inaugural fellowships were awarded in March 1984.

The Fellowship is available to any student enrolled, or about to enrol, in a PhD program. It is expected that the recipient will carry out significant long-term field studies in a scientific discipline relevant to the Barrier Reef.

The Fellowship includes two return air fares from the participant's university to Lizard Island, bench fees and accommodation at the Lizard Island Research Station for approximately four months per annum for a maximum of three years. A limited amount of money is also available for equipment. The total value of the Fellowship is Aust. \$14,500 (\$4,833 per annum for three years), and is not available for living expenses or salary.

The Australian Museum established the Research Station at Lizard Island on the northern part of the Great Barrier Reef in 1972. The Station supports research into all aspects of the biology, geology and hydrology of coral reef ecosystems. Air-conditioned laboratory space, boats, diving equipment, running sea-water aquaria and self-contained accommodation units are available. A 14m motor/sailing catamaran, RV. Sunbird, carrying up to six scientists and giving access to all of the northern Great Barrier Reef, is operated in association with the station.

Lizard Island is 27km off the coast of Queensland and 240km north of Cairns. Transport from the mainland is by daily commercial aircraft.

CONDITIONS OF AWARD

The applicant must either be in receipt of a scholarship or provide documentation showing that living expenses will be covered during the proposed tenure of the scholarship. An overseas student may wish to apply for a Fellowship for only one year in order to obtain comparative data with other geographical regions; this would be acceptable provided that the data from Lizard Island contributes significantly to our understanding of the Great Barrier Reef.

INFORMATION

For further details regarding research facilities at Lizard Island, etc., please contact The Co-Directors, Lizard Island Research Station, PMB 37, Cairns, Qld. 4871 phone no. (070) 603-977. For information about the grant please contact The Deputy Director, Australian Museum, P.O. Box A285, Sydney 2000 phone no. (02) 339-8111, fax no. (02) 339-8304.

Fellows will be required to make a progress report at the end of each year of the grant.

APPLICATIONS

A research proposal clearly setting out: (1) aims, (2) methodology, (3) budget, (4) name of supervisor, (5) summary of the applicant's academic record and achievements, (6) significance of research to the Great Barrier Reef, (7) personal Curriculum Vitae and (8) a letter approving the project from the head of the university's department where the applicant would be enrolled, must be sent to the Museum. Overseas students should include a letter from their supervisor indicating the acceptability of overseas field work to the program at that particular university and how closely involved the supervisor will be with the project.

CLOSING DATE: 15 OCTOBER, 1991

Six copies of the application should be sent to:

The Deputy Director
LIRS Fellowships
The Australian Museum
P.O. Box A285
Sydney South, NSW, 2000
Australia

**australian
museum**

Research Activities

Projects assisted by Qantas Travel Fellowships

Two travel fellowships were awarded this year by the Australian Museum and Qantas Airways.

Dr Kenneth Sebens (Marine Science Centre, Northeastern University, Nahant, Mass., USA) conducted research on the effects of water movement on reef corals at Lizard Island for five weeks during January to April 1991. He spent six months in Australia as a visiting scientist at the Australian Institute of Marine Science (Townsville, Qld.), on sabbatical from his teaching and administrative duties at Northeastern. The research at Lizard Island was supported by grants from the National Science Foundation (U.S./Australia Co-operative Science Program) and the Whiting Foundation (Boston, Mass. USA) as well as by the Lizard Island/Qantas Travel Fellowship.

The research comprised three projects dealing with the effects of water movement. The first was a descriptive study of near-bottom flow habitats across reefs with a variety of flow regimes. Water movement was measured using electromagnetic current meters mounted 0.5 m off the surface of the reef. Small scale flow around coral polyps was measured using microthermistor flow meters and macro-video imaging. Measurements were made under all surface wave and tidal current conditions over the five week period to provide the first quantitative description of flow experienced by corals across a gradient of wave exposure.

The second project was a flow-tank analysis of prey capture by three coral species at varying flow speeds. The flow-tank allowed accurate control of both prey particle density and flow speed. In addition to capture rates by hundreds of individual polyps on the coral colony, the exact location of capture on branches and colonies was examined to see how capture success was influenced by current speed. Species were found to have optimal

capture rates at different flow speeds. Location of capture on the coral branches also changed with flow speed.

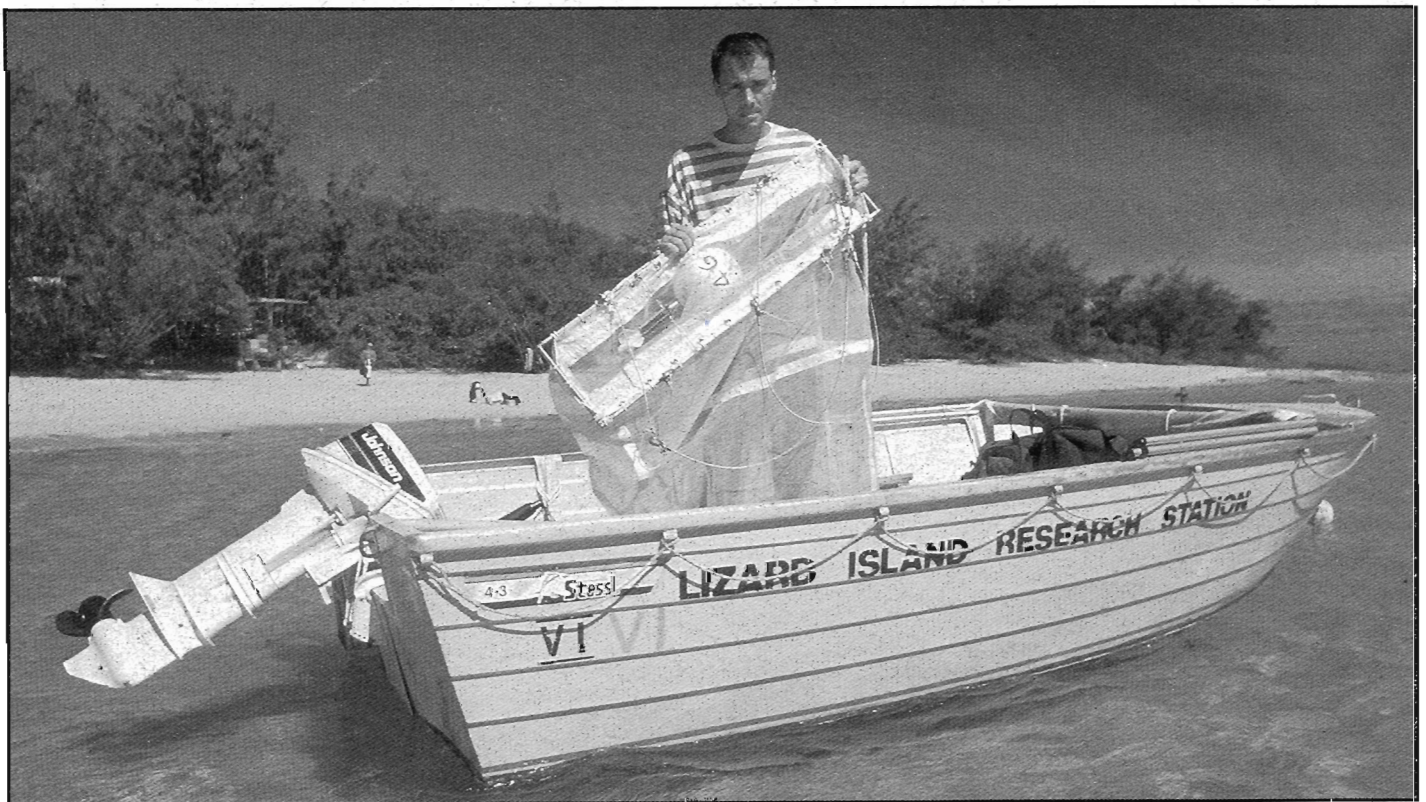
The third project was a transplant experiment to determine the effects of flow on growth in the field. Coral colonies were divided into separate branches, mounted onto PVC frames and transplanted to areas of high, moderate and low wave-induced flow, all within 10 m of each other. The branches were weighed in water at the beginning and end of the seven week experiment, showing mean skeletal growth of up to 17% over the seven weeks. The experiment showed that water flow is likely to be important to coral growth under realistic field conditions.

This information will help us to understand coral distributions and to predict the impact on coral reefs of developments that change current patterns and siltation rates.

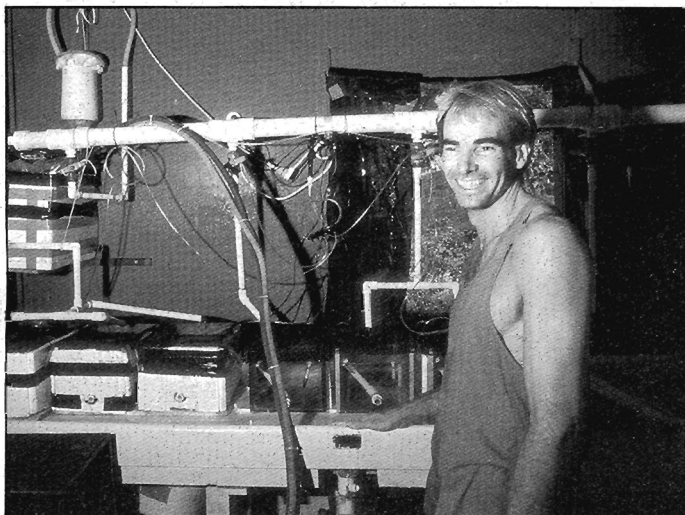
Vincent Dufour (University of Perpignan, Perpignan, France) studied short-term variations in recruitment of reef fish larvae during a five week period at Lizard Island in February-March 1991. This represents part of his Ph.D. research and was conducted with the assistance of the French/Australian Co-operative Research Program as well as the Lizard Island/Qantas Travel Fellowship.

The majority of reef fish have planktonic larvae. From previous studies in French Polynesia by Dufour and others, it appears that most fish larvae settle out of the plankton onto the reef at night. By towing a net along the reef crest at different times of the day and night, this pattern was also demonstrated at Lizard Island. By sampling throughout the lunar cycle, it was found that the greatest number of larvae settled on nights during the new moon at Lizard Island, again confirming a trend found in French Polynesia.

Because it is thought that recruitment rate is a major determinant of adult reef fish population levels, this research will increase our understanding of fluctuations in reef fish numbers.



Vincent Dufour preparing to tow for larval fish



Mark McCormick with his goatfish feeding experiment

Lizard Island Doctoral Fellowship research

Three Lizard Island Doctoral Fellowship holders carried out substantial fieldwork at Lizard Island during the year.

Allison Green (Marine Biology, James Cook University) was awarded the 1991 fellowship to conduct research for her thesis on labrid fishes (wrasses). This work is planned as a multi-scale analysis of the family's ecology, taxonomy and biogeography.

Ecological study of the wrasses will provide a valuable comparison to damselfishes, the family upon which most ideas of reef fish ecology have been based, because the life history strategies of the two families are very different. Wrasses differ from damselfishes in that they undergo marked shifts in habitat usage, colour and body form. Indeed, different species names have been given incorrectly to different stages of the same species; this study will improve the taxonomy. The biogeography of wrasses will be studied by quantitative surveys of distribution and abundance in temperate and tropical waters, both in Australia and America. The American component will be carried out with the assistance of a Fulbright Scholarship awarded to Allison this year.

Allison began field work at Lizard Island in July 1990, and has spent 116 days at the station in 6 trips during 1990/91.

Campbell Davies (Marine Biology, James Cook University) is now in the second year of his doctoral fellowship and Ph.D. project. He is conducting a trapping and tagging program to determine mobility and demography of large reef fishes, such as coral trout and emperors. Fishing with 18 traps, Campbell has tagged over 2,000 fish in the lagoon and reports a high recapture rate yielding data on rates of growth, mortality and recruitment and on movements of fish on the reef. This provides vital information for management of these commercially valuable fish stocks.

He spent 86 days over four trips to the station during the year.

Mark McCormick (Marine Biology, James Cook University) is in the third and final year of his doctoral fellowship. He is studying the factors that influence settlement of planktonic fish larvae onto the reef. This summer, he conducted feeding experiments with goatfish larvae and found that the level and frequency of food availability affects rate of settlement.

The patterns of distribution and abundance of adult reef fish appear to be heavily dependent on the patterns of larval settlement, but the factors influencing settlement are largely unknown. Thus, by examining this important phase of the life cycle, Mark's study has important implications for management of reef fish stocks.

Mark spent 104 days at the station in a single trip this year.

Research projects and participants

(* indicates researcher is a postgraduate student)

Biologically active substances from marine invertebrates

Dr Peter Murphy (Australian Institute of Marine Science, Townsville, Qld., Australia).

Survey of marine invertebrate larvae

Dr Thurston Lacalli (University of Saskatchewan, Saskatoon, Canada) assisted by Mary K. Lacalli.

Metabolism of algae and corals

Dr John Chisolm (Australian Institute of Marine Science, Townsville, Qld. Australia).

Allelopathy in soft corals

*Mauro Maida (Chemistry and Biochemistry, James Cook University, Townsville, Qld., Australia) assisted by Mikel Becerro and Anthony Carroll.

Population biology of corals

Dr Terry Hughes (Marine Biology, James Cook University, Townsville, Qld., Australia).

Demography of reef crest corals

*Victoria Nelson (Marine Biology, James Cook University, Townsville, Qld. Australia) assisted by Sue Mitchell and Lexa Grutter.

Internal bioerosion of dead corals

*Barbara Musso (Marine Biology, James Cook University and Australian Institute of Marine Sciences, Townsville, Qld., Australia) assisted by Sue Mitchell and Lexa Grutter.

Feeding ecology of corals

Dr Kenneth Sebens (Northeastern University, Nahant, Mass. USA) assisted by Robin Aiello Allmon and Jan Witting (both from Northeastern University) and Katharina Fabricius (University of Munich and Australian Institute of Marine Science) and accompanied by Dr Barbara Thorne, Alison and Chip Sebens.

Anthozoan distributions in relation to habitat

James Thompson and Brenda Thompson (Watsonville, CA, USA)

Reef bioerosion

Prof Howard Choat and Dr David Bellwood (Marine Biology, James Cook University, Townsville, Qld., Australia), assisted by Lou Dong Chun, Dani Tikel and Linda Axe.

Giant clam survey

Dr David Phillips (Mott McDonald, Croydon, England), assisted by Hilary Phillips.

Larval development of gastropods

Dr Klaus Bandel (Geologisch Palaontologisches Institut und Museum, University of Hamburg, Germany).

Comparative biology of gastropods

*Frank Reidel (Geologisch Palaontologisches Institut und Museum, University of Hamburg, Germany).

Ecology of cowries

*Monika Zorn (Geologisch Palaontologisches Institut und Museum, University of Hamburg, Germany).

Parasites of crabs and lobsters

Dr Jeffrey Shields (Department of Parasitology, University of Queensland, Brisbane, Qld., Australia), assisted by Sandra Whittingham, Fiona Wood, Jim Roberts, Danielle Roberts and accompanied by Julie Shields and Jason Shields.

Ecology of benthic ostracods

*Patricia Behrens (Zoologisches Institut und Museum, University of Hamburg, Germany) assisted by Thomas Krupp and Dr Sabine Dittmann.

Visual evolution and design in stomatopod crustaceans

Prof. Thomas Cronin (Department of Biological Sciences, University of Maryland, USA), Dr N. Justin Marshall (Department of Biological Sciences, University of Maryland, USA) and Prof. Roy Caldwell (Department of Integrative Biology, University of California, Berkeley, CA, USA), accompanied by Michael Caldwell.

Biology of herbivorous fishes

*Lou Dong Chun (Marine Biology, James Cook University, Townsville, Qld., Australia) assisted by Kendall Clements and Linda Axe.

Demography and population patterns of large reef fish

*Campbell Davies (Marine Biology, James Cook University, Townsville, Qld., Australia) assisted by Ken White, Stephen Skull, Steve Lindsay, Jamie White and Rod Forbes.

Biology of large reef fishes

*Beatrice Ferreira (Marine Biology, James Cook University, Townsville, Qld., Australia) assisted by Phillip Laycock.

Nutrition of small reef fishes

*Brigid Kerrigan (Marine Biology, James Cook University, Townsville, Qld., Australia) assisted by Linda Axe and Astrid Hülsmann.

Development of visual systems in fish

*Julia Shand (Marine Biology, James Cook University, Townsville, Qld., Australia).

Early life history of goatfish

*Mark McCormick (Marine Biology, James Cook University, Townsville, Qld., Australia) assisted by Jenny McIlwain and Astrid Hülsmann.

Wrasse taxonomy, biology, ecology and biogeography

*Alison Green (Marine Biology, James Cook University, Townsville, Qld., Australia) assisted by Karen Miller, Sue Greene and Steve Blake.

Feeding by herbivorous fishes

Dr Frank Talbot (National Museum of Natural History, Smithsonian Institution, Washington D.C., USA) and Suzette Talbot, assisted by Kimbra Cutlip.

Settlement of reef fish larvae

*Vincent Dufour (Laboratoire d'Ichtyologie, Université de Perpignan, France).

Geologic impact of Cyclone Ivor

Michael Gagan (Centre for Coastal Management, Université of New England Northern Rivers, Lismore, NSW, Australia) assisted by Patrick Gagan and Heather Lynch.

Aboriginal occupation of Lizard Island

Robynne Mills (Anthropology, University of Sydney, NSW, Australia) and an assistant.

Vegetation of Lizard Island

Dianne Tarte, Eddie Hegerl and George Batianoff (Australian Littoral Society, Moorooka, Qld., Australia).

Vegetation of coral cays

Prof J.R. de Sloover and A.L. Jacquemart Université catholique de Louvain, Belgium).

Ant ecology and biogeography

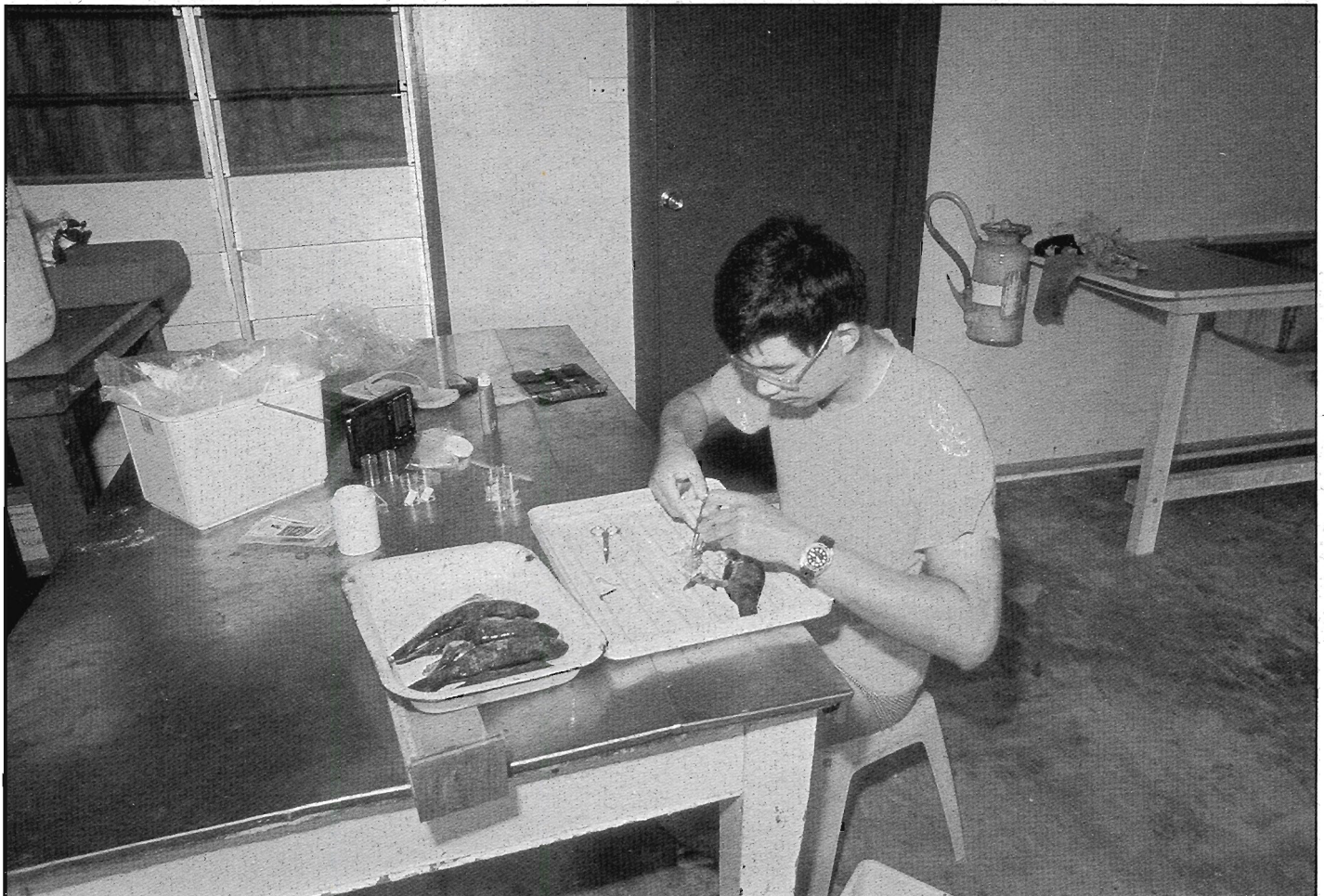
Aniruddh Patel (Museum of Comparative Zoology, Harvard University, Cambridge, Mass. USA) assisted by John Gaertner.

Study of marine reserves and endangered species

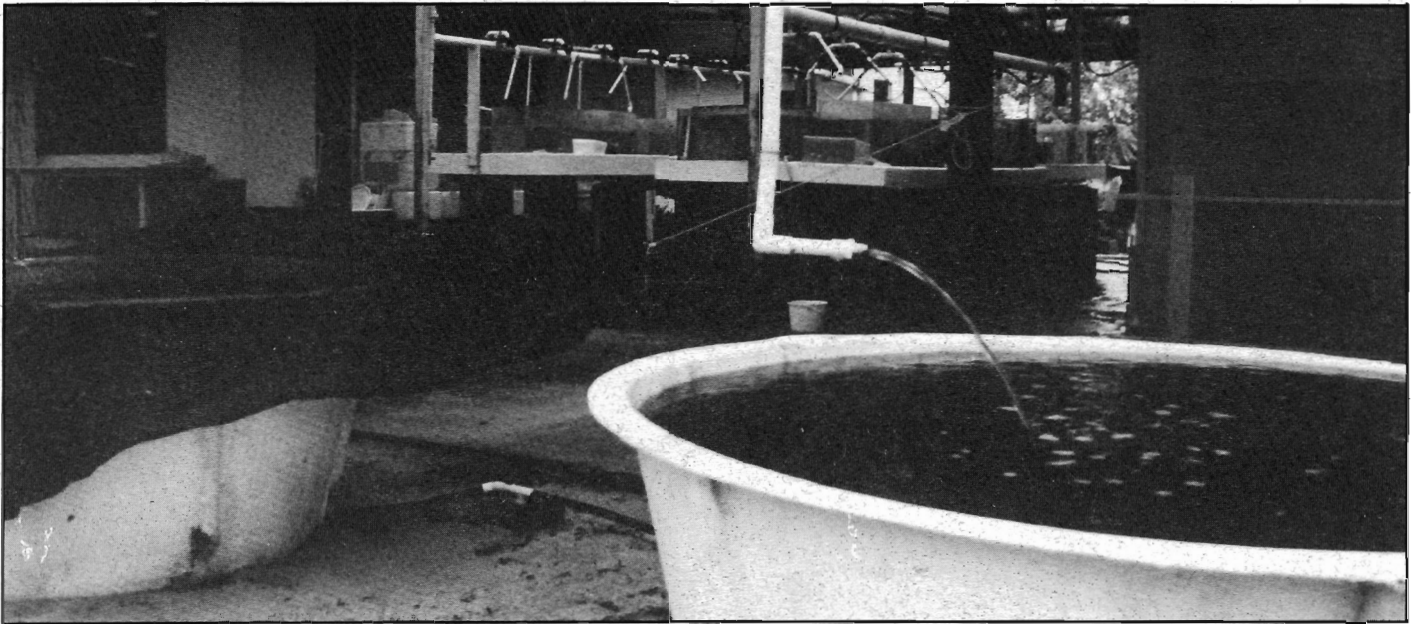
Gurli Grönqvist (Environment Protection Agency, Solna, Sweden).

Philosophical perspectives on reef management

Dr Denise Russell (Department of General Philosophy, University of Sydney, NSW, Australia).



Lou Dong Chun (James Cook University) dissecting parrotfish



Sea-water aquarium

Reconnaissance for future visits

- Dr Pamela Reid (Rosentiel School of Marine and Atmospheric Science, University of Miami, Florida, Miami, FL, USA) examined the station's facilities before joining the ship-based Ocean Drilling Project as a carbonate sedimentologist.
- Dr Myron Anderson (Biology, Gustavus Adolphus College, St. Peter, MN, USA), accompanied by Jean Anderson, investigated the station as a possible site for an undergraduate college course on reef biology.
- Dr Betsey Rasmussen (Oregon Graduate Institute for Science and Technology and the Washington Park Zoo, OR, USA) is interested in pursuing studies on behaviour of white-tip reef sharks at the station.
- Representatives of two Japanese organisations (Marine Biotechnology Inc. and the Research Institute of Innovative Technology for the Earth) examined the station's facilities for possible future work on the Great Barrier Reef. Subsequently, the station provided logistic support for scientists from the Marine Biotechnology research ship "Soghen Maru", who were collecting algae and invertebrates in search of new biologically active substances.

Publications

There are now 296 papers, books and theses in the station's collection of scientific literature based on work carried out at Lizard Island. Sixteen of these were received this year, and are listed below. All visiting scientists are invited to send two copies of papers resulting from work at the station to be added to this collection. A complete list of contributions is available on request.

Brown, A.L., 1990. Measuring the effect of aircraft noise on seabirds. *Environment International* 16:587-592.

Dojiri, M. and M.J. Grygier, 1990. *Pionomolgus gallicolus* gen. et sp. nov. (Poecilostomatoida: Lichomolgidae), a gall-inducing copepod of a scleractinian coral from Australia. *Australian Journal of Zoology* 37:695-703.

Duffey, J.E. and M.E. Hay, 1990. Seaweed adaptations to herbivory. *Bioscience* 40:368-375.

Grygier, M.J., 1989. Three new species of *Myzostoma* (Myzostomida). *Proceedings of the Biological Society of Washington* 102:793-804.

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Educational and Other Activities

Copland College

This Canberra (Australia) high school made its second visit to the station with ten Year 12 students led by Jannine Cowan and Dr Jeffrey Sewell and accompanied by Kahn Cowan. Again, the students made good use of their time here by carrying out individual research projects.

College of Idaho

This college (in Caldwell, Idaho, USA) also made its second trip to the station, this time with 19 undergraduates led by Prof. Eric Yensen, Prof. Sherilyn Robison and Prof. Don Mansfield, and accompanied by Carlotta and Erica Yensen and Bill Robison. The students carried out an active field program of both group and individual projects.

Coral spawning

This year, the major coral spawning activity occurred in December, with low numbers of corals also spawning in November, January and February. Coral researchers **Dr Charlie Veron** (Australian Institute of Marine Science, Townsville, Qld., Australia) and **Dr Kenneth Sebens** (Northeastern University, Boston, Mass., USA) visited the station to observe the event.

Several commercial film crews also used the station's facilities as a base for filming the coral spawning. These include:

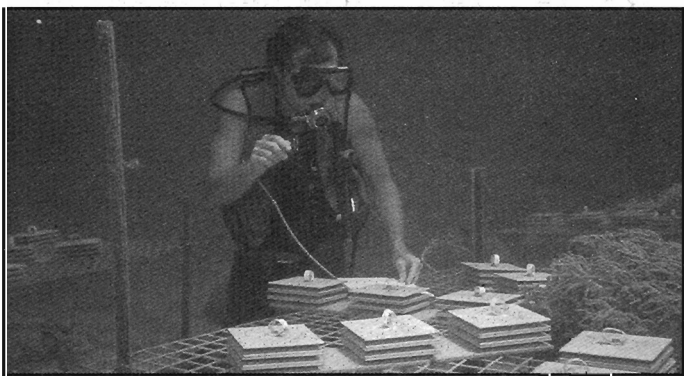
Mainichi Broadcasting System Inc. (Osaka, Japan) Ko Fujiwara, Sato Hiromitsu, Shiuru Taktuchi, Takeshi Yoshimura, Ikuro Nakamura, Naoyuki Toyoda, Michiko Umino and five others, with assistance from Phillip Dor.

BBC Natural History Unit

Martha Holmes, Michael de Gruy, Ross Isaacson and others, with Dr Mary Stafford-Smith as consultant.

TCN 9 Today Show

Robyn Wade and two others.



Maurio Maida (James Cook University) with his array of settlement panels

Other visitors

Crustacean Conference field trip

The International Crustacean Conference was held at the Australian Museum in 1990. A post-conference field trip to Lizard Island was led by Dr Jim Lowry and Gwen Baker (Australian Museum, Sydney, NSW), which was attended by the following delegates: Prof. Rodney Feldman (Kent State University, Kent, Ohio, USA); Dr G. Jensen (University of Washington, Seattle, Washington, USA); Dr A. Armstrong (University of Washington, Seattle, Washington, USA) and family; Dr Andrew Cockcroft and Dr Tristram Wooldridge (both of the University of



Copland College Students preparing to snorkel the lagoon

Port Elizabeth, South Africa); and Prof. W. Emmerson (University of Transkei, South Africa).

Collecting for Manly Oceanarium

Ian Gordon, Sharon Kent and Lawrence Smith attempted to capture *Nautilus* from deep water off the outer barrier reefs. Their collecting was hampered by strong wind conditions. One *Nautilus* was collected but it was eaten in the trap by a large, deep water crab.

Underwater video and photography

David Hannan (Coral Sea Imagery, Townsville) obtained extensive footage from the Lizard Island area and adjacent reefs for commercial purposes. He donated much of this excellent footage for use in the station's new promotional video. He was assisted by Peter Hannan, Toni Davis, Ian Gynther. Fred Bavendam (commercial underwater-photographer, Connecticut, USA) joined the Coral Sea Imagery team as a consultant and to take still photographs.

Government enquiry into National Parks

Five members of the NSW Public Accounts Committee visited the station as part of a study tour of Queensland National Parks. The group comprised Victoria Walker (Director), Phillip Smiles MP (Chairman), George Souris MP, John Murray MP, and Alan Walsh MP.

World Wide Fund for Nature

Coral reefs have been included on the agenda of the World Wide Fund for Nature as ecosystems in need of special care. Following the WWF conference in Sydney, the Deputy Director-General, Dr Henner Ehringhaus, and a WWF management consultant, Reg Bird, visited the station to gain first-hand experience of coral reefs. They were accompanied by Anne Bird and Marian Ehringhaus.

Greenpeace

Molly Olsen, Kelly Quirke and Lara Crew (Greenpeace, Sydney and San Francisco) visited the station to discuss conservation of coral reefs and oil drilling.

Others

Des Griffin (Director, Australian Museum) and Lynda Kelley (Human Resources, Australian Museum) visited to examine station management practices.

Bob Johncox, a Canadian biology teacher presently at Cairns State High School, visited the station to learn more about the Great Barrier Reef as part of his teacher exchange program. He was accompanied by his family.

Dr Don Hill and party from Sydney are donors, and spent some time at the station to observe its operations.

R.V. Sunbird

Notwithstanding the relatively quiet year experienced with 103 operational days compared to 162 in 1989/90, R.V. SUNBIRD still managed to pay its way with a just under break-even figure for the year's operation. This self-supporting potential should enable R.V. SUNBIRD to remain available as a low-cost marine research platform. Our thanks go to those researchers who used R.V. SUNBIRD to make this possible.

Time ashore saw R.V. SUNBIRD on the hard with the crew wishing they were back at sea. (Charter us - we're worth it!) Engine rooms were stripped for major maintenance on the drive train and engine accessories. Lois also made time to formalise her sea experience and now holds a Class V Masters ticket to skipper a vessel up to 20 metres in length and up to 100 miles offshore. Terry remains Captain with a Class IV Masters ticket, a highly qualified and experienced team.

Features and charter fees

R.V. SUNBIRD is a motor-sailing catamaran of 14.1m length, 7.2m beam, and shoal-draft configured hulls allowing operations in water depths as little as 2 metres. She cruises at 8 knots under power and is in survey to carry up to six research personnel for operations throughout the entire Great Barrier Reef/Torres Strait area as well as the western Coral Sea and Gulf of Carpentaria regions. Operations further afield may be undertaken with adequate notice to arrange appropriate permits. Sufficient food, water and domestic facilities are available for uninterrupted operations of around 120-130 research mandays (viz 6 for 3 weeks, or less personnel for longer periods).

R.V. SUNBIRD has a laboratory space below decks together with a large/galley area and an exceptionally large unobstructed and stable aft deck. 12v DC and 415/240v 50 Hz AC generators are standard, refrigerator and freezer are available and 6 cfm 3200 psi SCUBA compressor with 6 x 90 cf tanks are carried for use by certified divers.

CHARTER FEES current till at least 30 June, 1992 are \$725 per day for bona-fide research activities; this figure is after a \$110 subsidy by the Australian Museum for research operations, and covers use of all R.V. SUNBIRD facilities (SCUBA equipment, ZODIAC dive tender - MKII 13'9" - and outboard fuel etc). The only additional charge is \$15 per research manday for catering which includes 3 full meals as well as snacks and (non-alcoholic) beverages.

The forgoing rates apply for operations to/from Cairns; R.V. SUNBIRD can be positioned to commence operations elsewhere if required for a rate of 1 day per 250m (400km) travel required to/from Cairns.

For full details as to usage, facilities, costing, availability and any special requirements, enquiries are welcomed and should be directed to either Lois Wilson or Terry Ford.

R.V. SUNBIRD Marine Research Charters
P.O. Box 5955
CAIRNS QLD 4870
Phone 070 332 889*
International 6170 332 889*
Fax 070 517683

*Please note this is a new telephone number.

Research activities

MARK McCORMICK, J.C.U., Townsville, chartered R.V. SUNBIRD for 5 days as a mother ship. He was assisted by Leanne Fernandes, Jenny McIlwain, Brett Molony, Rob VanWoesik and Andrew Steven, in his study of the effects on Brewer Reef by Australia's first floating hotel. It was the last of a number of surveys conducted by the team over a few years; before, during and after the operation of the hotel which has been sold and is now relocated in Vietnam.

R.V. SUNBIRD proved to be excellent logistic support for a Japanese Film group both in transporting a large quantity of associated equipment between Cairns and Lizard Island, and putting them on site at various reef within a 10 mile radius of Lizard Island. Cables streamed from her decks, carrying current to underwater cameras, lights and communication systems. An onboard video monitor checked coral spawning progress while divers patiently waited in dry comfort.

DR BRUCE MAPSTONE, J.C.U., Townsville, contracted R.V. SUNBIRD for a total of 59 days to travel to 50 reefs within the Cairns Section of the Great Barrier Reef Marine Park. This task was achieved over three cruises with a field party of five (Howard Choat, Tony Ayling, Rachel Webb, Jim Higgs, Ian Roderick, Jamie Larkcombe, Brian Cohen, Stuart Ireland) at any one time. The work involved sampling a variety of reef organisms, including giant clams, fishes, starfish and crown of thorns. Estimates were also made of the cover of sponges, soft corals, live and recently dead hard corals. The work was part of the Great Barrier Reef Marine Park Authority's ongoing monitoring programme, but more specifically, to test the effects of zoning seven years after the Cairns Section had been declared with a view to possible re-zoning.

The Tropical Rock Lobster Project, CSIRO, Cleveland, headed by Dr. Roland Pitcher and assisted by Darren Dennis and Tim Skewes, embarked on a repeat performance of 1990's Torres Strait Rock Lobster population survey. Fifty randomly chosen sites were sampled. This year's sampling was aided by the use of GPS navigation (for precise site location) which will be invaluable to future surveys. This year's results will be compared to 1990's data, a measure of interannual changes in relative abundance, especially of the 1+ year class. Accurate estimates of mortality will be made available for the first time from this comparison.

Due to excellent weather conditions (by Torres Strait's standards) the population survey was finished within 16 days. The remaining 5 days were utilised in the Project's monthly post-larval lobster collection programme. Collectors were sampled at five sites between Hawkesbury Island and Mabulag Island. The collectors are being trialled due to success of the Western Australian Rock Lobster Collector Programme. The catch of western rock lobsters is predicted 4 years in advance of post-larvae in collectors, Potential larval lobster ground were also investigated at the end of the cruise through dive surveys.

BRIAN LONG, CSIRO Fisheries, Cleveland, took advantage of R.V. SUNBIRD's positioning in Torres Strait for the tropical rock lobster survey, to embark Michael Cosgrave to continue his research into sea grasses of the Torres Strait. Using a video camera in an underwater housing mounted on a supporting frame and an onboard monitor, observations on seagrass density were recorded for over 50 sites. Continuous and accurate data on position and depth was also collected by inputting GPS and sonar information directly into a computer database. In the future this information will be incorporated in a Torres Strait Geographic Information System.

Publications

The following publications for 1990/91 have resulted from field work using the R.V. SUNBIRD:
LEIS, J.M. 1991 Distribution of fish larvae in the Great Barrier Reef Lagoon, Australia.
Marine Biology 109: 157-166
LEIS, J.M. and S.E. Reader. 1991 Distributional ecology of milkfish, *Chanos chanos*, larvae in the Great Barrier Reef and Coral Sea near Lizard Island, Australia.
Environmental Biology of Fishes 30: 395-405

Support for the Station

Lizard Island Reef Research Foundation

This year a milestone has been reached. \$1 million has been raised since the Foundation was formed in 1978.

Thanks must go to all those individuals and organisations who recognise the importance of having a facility dedicated to increasing our knowledge of the amazing Great Barrier Reef. Good management of this World Heritage Area comes from good information, and this information can only come from scientists with access to the right equipment that works. The Foundation will help ensure that the Lizard Island Research Station and the R.V. Sunbird continue to provide excellent service.

Thanks should also go to the Trustees. In particular, the commitment of Sir John Proud must be acknowledged. As the inaugural Chairman Sir John ensured the success and effectiveness of the Foundation, and continues as one of its most enthusiastic members.

Given the somewhat difficult times the Foundation is grateful for corporate contributions, especially the continuing support of Qantas and Alcan Australia. A generous donation from the Raymond E Purves Foundation will enable the building of a new wet lab, and funds from the James N Kirby Foundation have been used to purchase essential hardware.

The Trustees of the Foundation appreciate all donations, but unfortunately all the donors cannot be listed here. Special mention, however, must be made of the contribution of the First Mackay Company of Girl Guides and the 3rd Mackay Brownies - thank you.

Fund-raising priorities

1. **Dive compressors:** New regulations and outdated equipment make two new Bauer dive compressors essential in 1991/92.
2. **4WD Vehicle:** Repair of the station's Land Rover is no longer cost-effective. A replacement vehicle is required in 1991/92.
3. **Boats:** Although two dinghies were replaced this year by a donation from Alcan, two other new dinghies are still required.
4. **Outboard motors:** The station has 11 motors which require replacing about every 18 months in order to maintain a high level of reliability and safety. Financial assistance with this replacement schedule is needed.
5. **Microscopes:** There is increasing demand for microscopes at the station. One new dissecting microscope and light source is needed annually over the next four years.
6. **Microscope video system:** With increasing usage of the station by educational groups, a video camera and monitor that can be attached to a dissecting microscope is sought, as this would be a valuable teaching aid.
7. **Housing refurbishment and extension:** Loomis house has only a single bedroom. The house would be made more useful by the addition of several bedrooms and the upgrading of its kitchen.

In-Kind donations

The following organisations have made non-monetary donations or offered discounts for their services to the station during the year. Their assistance is sincerely appreciated.

Lizard Island Lodge; Australian Regional Airlines; Australian Airlines; Qantas; Coral Sea Imagery, Townsville; TCN 9, Sydney, Alcan.



Aerial view of Lizard Island

Help!

Your support will help to ensure the future of this vital research facility.

Please respond today by completing this coupon.

I wish to make a donation of \$_____ to the Foundation. Payment is by attached cheque/money order.

Please charge \$_____ to my Bankcard/Mastercard/Visa No.

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I wish to make a bequest to the Lizard Island Reef Research Foundation. Please send me further information.

Name _____

Address _____

_____ Postcode _____

Send to: Lizard Island Reef Research Foundation
Australian Museum
P.O. Box A285
Sydney, NSW 2000 Australia
Telephone (02) 339 8111

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ARE TAX DEDUCTIBLE

Do you want to receive future newsletters?

It's time to update the newsletter mailing list.

Institutions will continue to receive newsletters, but would individuals please indicate their continuing interest by returning a copy of the form below to:

Lizard Island Research Station
c/- Australian Museum
P.O. Box A285
Sydney, NSW. 2000
Australia

You can also use this form to advise of a change of address.

Yes, I would like to continue receiving the Lizard Island Research Station newsletter.

Name _____

Address _____
