



# NEWSLETTER

No. 14

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## LIZARD ISLAND RESEARCH STATION GREAT BARRIER REEF



## HIGHLIGHTS

- \*\*\*\* POST GRADUATE AND GERMAN FELLOWSHIPS AWARDED
- \*\*\*\* IBM XT COMPUTER AND SYMPHONY DONATIONS RECEIVED
- \*\*\*\* REPLACEMENT DINGHIES PURCHASED
- \*\*\*\* RV SUNBIRD ASSISTS RESEARCH GBR TO PAPUA NEW GUINEA
- \*\*\*\* PAPUA NEW GUINEA MANAGEMENT TRAINING PROGRAM SUCCESSFUL
- \*\*\*\* STATION EXPERIENCES BUSIEST YEAR EVER

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

Accommodation for up to 16 people, boats, diving equipment, a running sea water system and air conditioned laboratories are available on the reef to support scientists and university students with research and educational interests in tropical environments. Enquires concerning these facilities are invited and should be addressed to: Drs Barbara L Kojis, Norman J. Quinn, Co-Directors, Lizard Island Research Station, Private Mail Bag 37, Cairns, Queensland 4871, Australia.

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This newsletter summarizes the activities of the station from 1 July 1987 to 30 June 1988.

## FELLOWSHIP AWARDED

The 6th Lizard Island Doctoral Fellowship has been awarded to Sydney University student Julian Caley. He proposes to study the role that "disturbance" plays in the structure of biological reef communities together with the effect predators and competitors have on the abundance and distribution of species. Congratulations Julian!

Last year's Lizard Island Honours Fellowship recipient, Anne Hemsley from Griffith University, was awarded a 1st class Honours for her study of the biochemistry and molecular genetics of toxin granule proteins isolated from cone shells.

Ph.D Fellowship - Three years support

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

The fellowship is valued at \$A13,000 (\$4,333 for 3 years) and covers bench fees, assists with travel costs to the island and some equipment. It is not a stipend.

A student enrolled at an Australian University will be in receipt of a Commonwealth or other recognized scholarship. A student enrolled at an overseas University should provide documentation of how living expenses will be covered. Grantees will be required to make a progress report at the end of each year of the grant.

One Year Fellowship

This scholarship is for up to \$2,000 and covers bench fees at the station for one year. This scholarship is intended to assist Honours or Masters students. An overseas PhD student may wish to apply for this Fellowship in order to obtain comparative data with other geographical regions. This would be acceptable providing that the data from Lizard Island contributes significantly to our understanding of the Great Barrier Reef.

The research proposal should clearly set 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. 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.

Applications for the awards for 1989 close on 15 December 1988.

Applications and requests for further information should be sent to: Director, 'LIRS' Fellowships, The Australian Museum, P.O. Box A285, Sydney South, N.S.W. 2000 Australia. For details about the facilities at the Lizard Island Research Station contact the Co-Directors, Drs. B. Kojis and N. Quinn.

#### COMPUTER DONATION

IBM Australia very generously donated an IBM XT computer and the IBM Personal Decision Series Computer Software. This means that researchers now have their own IBM computer to record and analyze data and write papers. Imagineering of Sydney also kindly donated a copy of the software package Lotus Symphony which we are using to produce station accounts and budgets as well as keeping track of everything from diesel usage to sea water temperatures.

#### NEW BOATS

Our trusty fleet of aluminium dinghies are beginning to show their age. We are in the process of replacing them with newer models as funds become available. The 4.3 m Stessl is the first of our replacements. The second, the 5.2 m Stessl is fitted with twin 15 hp motors which use little petrol, and fills an important niche in providing reliable and safe transport to neighbouring reefs in good weather conditions.

#### RV SUNBIRD ASSISTS RESEARCHERS THE ENTIRE LENGTH OF GBR AND INTO PAPUA NEW GUINEA

This was the year that RV Sunbird matured as a small, low charter fee vessel facilitating research the entire length of the Great Barrier Reef from One Tree Island to Papua New Guinea. In August, Dr T Flannery from the Australian Museum led an expedition for three weeks to the remote islands in Milne Bay Province, Papua New Guinea for mammal trapping. D Johnson and a team from the Australian Institute of Marine Science surveyed the reefs in October from Cairns to Princess Charlotte Bay for the elusive crown of thorns starfish. Professor H Choat and Dr J Leis (James Cook University and Australian Museum) in November studied larval fish in the waters around Lizard Island. Nautilus for the Waikiki Aquarium were caught in a deep water trap set and retrieved in January 1988. In March, Captain Matt and Mipi Jumelet guided the craft from Cairns to the Swains and on to Heron and One Tree Islands assisting Dr P Doherty's (Griffith University) fish studies. The month of April saw a return to the lower latitudes to assist with sea grass research for CSIRO's Dr I Poiner at Yorke Island.

### PAPUA NEW GUINEA TRAINING PROGRAM

In September, Mr Paul Lokani of Papua New Guinea's Department of Primary Industry, Fisheries Division and Mr Marko Sappu of the Chemical Technology Department, Papua New Guinea University of Technology participated in a management training course at the station. They were given instruction in operating RV Sunbird, maintaining station equipment, servicing laboratory equipment, use of computers, accounting procedures and management techniques. The program received assistance from Air Niguni, Air Queensland and the Australian - Papua New Guinea Society.

### ANOTHER BUSY YEAR

The number of scientists using the station and RV Sunbird was again high this year. Over 240 scientists, post graduate students, assistants, dignitaries, undergraduate students, natural historians and volunteers utilized the station. The daily use rate for all station facilities was 10.8 people per day which slightly exceeded last year's mean of 10. We are pleased that the number of post graduate students and other researchers using the station is increasing. This was the first year we had 35 students and assistants at the station. That is five times the number of students that used the station in '85 - '86.

Table 1: Station Visitor Statistics 1 July to 30 June 1988

	'86-'87	'87-'88
Total number of researchers and assistants	152	142
Number of Australian researchers	37	35
Number of foreign researchers	87	72
Number of students	28	35
Mean number of researchers per day	8.0	8.4
Mean number of all visitors per day	8.7	9.5

Table 2: RV SUNBIRD Usage

	'86-'87	'87-'88
Number of days used for:		
Science	105	100
Public Relations	4	0
Transit	19	12
Supply of Station	30	40
Maintenance	85	85
Total days	243	237
Mean number of researchers on board per night	1.1	1.2

## STAFF CHANGES

Shirley and Barrie Trett finished their contract and returned to their home at Magnetic Island. We welcome Paul and Margaret Watts as Maintenance Officer and Accommodation / Transport Officer to the station.

## RESEARCH

Dr. Mark Hay (University of North Carolina at Chapel Hill) is studying the evolution of feeding specialization in marine herbivores and the role that unusual seaweed toxins play in this. He has found that seaweed toxins which deter feeding by fish often stimulated feeding by small, less mobile herbivores that are usually susceptible to fish predation (crabs, amphipods, polychaetes, assoglassons, etc.). These small herbivores have apparently evolved to a tolerance to the seaweed toxins and thus secured a relatively safe living site. While living in toxic seaweeds, small herbivores are less prone to predation from fishes. Additionally, several of the smaller herbivores concentrate the seaweed toxins and use them directly in their own defense. The patterns on the Great Barrier Reef are being compared to those in the Caribbean Sea and temperate Atlantic.

Mary Stafford Smith (University of York) is a PhD student studying the effects of sediment on corals. Her main interests lie in the identification of particularly sensitive species which could act as early indicators of community stress in areas under man made sediment impact. Leptoria phrygia appears to be a highly sensitive species while Porites spp. is tolerant to sediment overlying their tissues for long periods. The latter case suggest that there may be some very interesting physiological mechanisms operating. Mary's work is supported by grants from the Great Barrier Reef Marine Park Authority, the Australian Institute of Marine Science and from her own university.

Patricia Behrens, a PhD student from the University of Hamburg (West Germany) started working on benthic podocopidan ostracods. The benthic ostracods of the north east coast of Australia, especially from the Great Barrier Reef islands are mostly unknown. This area is particularly interesting because the settlement of the polynesian island started from here. Besides the taxonomic work she will study the biology and ecology of different species in relationship to their modes of dispersal. The distribution of benthic ostracods is of special zoogeographical interest because of their lack of pelagic larvae. Patricia's field work and travel cost are supported by a fellowship from the Australian Museum.

Ten Australian Littoral Society members worked on the geomorphology of 6 of the island's beaches, wide ranging entomological and arachnid collections and a plant collection targeting recently introduced weed species. Over 100 plant

specimens were collected and have been identified by the Queensland Herbarium. They included 6 new records of weeds for the island. Likewise, the entomological collection yielded a number of interesting new records for Lizard Island.

Research visitors to the station are listed below.

#### AUSTRALIAN SCIENTISTS

J BARKER, James Cook University, Townsville. Comparative growth and survivorship experiment of giant clams.

B BICKNELL, (assisted by K MARSHALL, J O'ROURKE, B BLAINEY, A BICKNELL and G ALDIS) University of New South Wales. Decomposition of macromolecules in a coral reef lagoon.

L BROWN, (assisted by R MATHERS, T, K, T AND L BROWN) Griffith University, Brisbane. Study of the effects of aircraft noise on nesting seabirds.

J H CHOAT (assisted by B KERRIGAN and D BELLWOOD), James Cook University, Townsville. Dynamics of herbivorous fish populations.

A HOGGETT (assisted by L VAIL), Northern Territory Museum, Darwin. Collect echinoderm specimens for the Northern Territory Museum.

P HUTCHINGS (assisted by M REID), Australian Museum, Sydney. Continuation of bioerosion studies and polychaete spawning.

R OLSON (assisted by M OLSON, L SULLIVAN, K OSBORNE, R MCPHERSON, J SMALL, P DIXON and K HAIR), Australian Institute of Marine Science, Townsville. Acanthaster planci larval studies.

D SUTTON and L TROTT, James Cook University, Townsville. Factors affecting mortality of Acanthaster planci larva raised under field and laboratory conditions.

R WILSON and G POORE (assisted by D PATCH, J & T WILSON) Museum of Victoria, Melbourne. Collection of Polychaetes and Crustacea.

#### OVERSEAS SCIENTISTS

M AWAI, Waikiki Aquarium, Honolulu. Collection of live Nautilus for the Waikiki Aquarium.

S, A, D and B BEDDING, Papua New Guinea University of Technology, Lae, Papua New Guinea. Nesting turtles of the Coral Sea.

R CALDWELL (assisted by G, E and M CALDWELL), University of California Berkeley. Chemical communication in stomatopods.

T LE CAMPION, Centre d'Océanologie de Marseille, Marsellie. Microboring organisms, comparison between French Polynesian and Australian coral reefs.

S & L COLLARD, (University of California, Santa Barbara). Field survey of the GBR for a book.

J CONSTANS (assisted by L RONGGUAN, W PING and Z XUKI) Cousteau Society, Nice, France. Filming coral reproduction.

L DIDHAM, Kenya. Comparison between East African and Great Barrier Reef coral communities.

T & H EMMERICH, Feodor Lyneu Gymnasium, West Germany. Investigation of tropical reefs for advancement of teaching skills.

B GANING (assisted by B ASLUND), Department of Zoology, Stockholm. Coral reef ecology site investigation for Ambio.

M HAY (assisted by J PAWLIK). University of North Carolina. Selective feeding by herbivorous fish on marine algae.

E LIESKE, Hamburg, West Germany. Field guide of Indo-Pacific reef fish.

P LOKANI and M SAPPU, Department of Primary Industry, Fisheries, Papua New Guinea and Papua New Guinea University of Technology. Management Training Fellowship recipients.

M & L JEBB, Director, Christianson Research Institute, Madang, Papua New Guinea. Inspection tour of Great Barrier Reef Research Stations.

D MEBS (assisted by V LEHNEN). University of Frankfurt. Biologically active compounds from marine animals.

R, S, S & S MANZANELL. Biologische Abteilung, Switzerland. Comparison of filarioid nematodes in Australian lizards.

K MARKOLF & V SIDRYS, University of California Los Angeles. Preliminary survey of mating in reef fish.

C MERRETT (assisted by B FOXWORTH), National Museum of Wales, Cardiff. Arachnida collecting.

B & J PRATT-JOHNSON, Vancouver, Canada. Journalists from Diver magazine.

A SCHWARZ and S DIONNOE, Earthwatch, Vancouver, Canada (assisted by M GREENWOOD, C JAN, I THORALEY, J LOTHROP, A & M RITTERS, R McCONCHIE, J OSBOURNE, S NIEL, S VOGELGESANG, J PICARD, R BROOKS, D WHITE, S BUTLER, A ELLIS, D BIERWIRTH, A HORNER, C CURRIER, F NEILSON and M WRIGHT). Social organization, reproductive behaviour and physiological correlates of sex change in the damselfish Dascyllus reticulatus.

H SWEATMAN (assisted by L TAN), Smithsonian Institution of Tropical Research, Panama. Settlement cues used by juvenile humbug fish.

F, S, N TALBOT and assistant, California Academy of Science. Tracking of sonically tagged fish.

B, D & M TARR, King Fahd University of Petroleum & Minerals Research Institute, Saudi Arabia. Comparative studies of Epinephelus and Caesio with Arabian Gulf observations.

W L MONTGOMERY, Northern Arizona University, Flagstaff. Gut microbes and lipid storage and dynamics of herbivorous fishes.

#### R.V. SUNBIRD SCIENTISTS

J H CHOAT & J LEIS, (assisted by L WILSON, B KERRINGAN, K DEAN), James Cook University and Australian Museum. Larval fish ecology.

P DOHERTY (assisted by N PRESTON, M MEEKAN, L WHITELEY, A LEITCH, L WORLAND, P PARKER and A GREEN), Griffith University, Brisbane.

T FLANNERY (assisted by F IRAN, T ENNIS, D BEECHFY, R SAUNDERS and MIKE), Australian Museum, Sydney. Collections of mammal fauna in the Woodlark Islands, Papua New Guinea.

D JOHNSON (assisted by D BASS, B MILLEN, S BAINBRIDGE), Australian Institute of Marine Science, Townsville. Survey of Crown of Thorns starfish populations.



I POINER (assisted by B LONG & R ACKLORD) CSIRO, Cleveland. Sea grass surveys in the Torres Strait.

B SAUNDERS (assisted by P BOND) Bryn Mawr College, Bryn Mawr, U.S.A. Genetic variation in Nautilus populations.

THE AUSTRALIAN MUSEUM SOCIETY, led by P BERENTS, Australian Museum, Sydney.

QUEENSLAND WILDLIFE PRESERVATION SOCIETY, Cairns, Educational tour to Outer Barrier Reef.

#### POST-GRADUATE STUDENTS

T AUSTINS, James Cook University, herbivorous fish grazing on Porites coral.

P BEHRENS (assisted by S MEYER, J KIRSCH), University of Hamburg, Hamburg, West Germany. Ostracod taxonomy and ecology.

R BIRDSEY, James Cook University, Townsville. Feeding behavior of fish.

J CALEY, University of Sydney, Sydney. Fish settlement on disturbed reefs.

K CLEMENTS (assisted by S TRUEMAN), James Cook University, Townsville. Herbivory in newly settled reef fish.

L DONG CHUN, James Cook University, Townsville. Herbivory in juvenile reef fish.

T FROMM, Freie Universitat, Berlin, West Germany. Sexual conditions in hippolytid crustaceans in field populations and laboratory cultures.

J FROMONT (assisted by K LICASTRO), James Cook University, Townsville. Distribution and abundance study of sponges of Lizard Island.

A HEMSLEY (assisted by 4 assistants), Griffith University, Brisbane. Investigation of Conus spp. toxin precursor genes.

A HOGGETT (assisted by L VAIL), University College of the Northern Territory, Darwin. Collection of ophiotrichid ophiuroids for electrophoretic analysis.

L HOWITT, Sydney University, Sydney. Polychaete spawning.

M MEEKAN (assisted by P LAW and J MURDOCH), Griffith University, Brisbane. Fish recruitment on disturbed reefs.

M MILICICH (assisted by A ROGERS, K MILICICH, G MCKIVER), Griffith University, Brisbane. Larval fish recruitment using light traps.

M STAFFORD-SMITH (assisted by N CLARKE, M STAFFORD-SMITH and J GREY). University of York. Sedimentation effects on corals.

P SPEAR, James Cook University, Townsville. Parasitic indicators of black marlin migrations.

A STEVENS, James Cook University, Townsville. Feeding behaviour of herbivorous fish.

S THORROLB, James Cook University, Townsville. Comparative studies in larval fish recruitment using light traps.

M WESTNEAT, Duke University, North Carolina. Tropic biology of herbivorous fishes.

#### OTHER VISITORS

K BACK, member Lizard Island Reef Research Foundation.

P BERENTS, R & R PAULL, E & R WEATES, S & R SAVAGE, D

RUSSELL, S PERKINS, A NORFOR, L STOCKDALE, B CLAY, J IRANI, E & C SCHONELL, E HEPBURN, C WOOD, C BUDA, B FARRELL, L PLATE AND T CONLAN. The Australian Museum Society, Sydney. Educational tour.

J BAKER, Director, Australian Institute of Marine Science.

M CAMPBELL, A DOWNEY, R BLENKIRON, B DAWSON, C GRIFFITHS, J & G HORTON, M & I STEWART and Y ZYMATICIS, Queensland Wildlife Preservation Society of Queensland. Educational tour.

B CUMMINGS, Dynavac, Brisbane. Service freeze dryer.

B & M DUROSE, Computer consultant.

T FERGUSON, Executive Director of the Australian Broadcast Corporation.

J GAYLER, Member of Leichhardt.

R GIBBS, Linbrook International, Brisbane. Service liquid scintillation counter.

J GIBSON, conservationist.

A J GORDON, radio journalists from the Canadian Broadcast Corporation.

D GRIFFIN, Director, Australian Museum.

S HALL, The Friends of the Art Gallery of South Australia.

D HILL, Managing Director Australian Broadcast Corporation.

G KELLHER, Chairman Great Barrier Reef Marine Park Authority.

A LANDEFORT, Finnish Broadcasting Corporation, Helsinki. Broadcast journalist.

L KENNEDY, Cairns Post, journalist.

B KINGSFORD-SMITH, with 18 members of The National Trust of Australia. Day tour of the research station.

M LANG, Program Director Australian Broadcast Corporation.

H & J ROSSITER, Sydney Grammar School. Plant adaptation to island soils.

T WARD, D & K ELSDON, H & E STOCK, J GRIMSHAW, D TARTE, J & B CURGENVEN and P FRAMPTON, Australian Littoral Society. Assess beach forms and beach processes, collection of insects and spiders, distribution of introduced plants and diel activity of patterns in coral decapods.

H WHELAN and R MEYERS, Editor, Australian Geographic Magazine.

E YENSEN, S ROBINSON, P PACKARD, T BICAK, Y ARMENTA, S BOYDEN, ELLEN CLARK, B HIRARI, V MANTLE, B MCNEEL, L NEWCOMB, D OLSON, D OLSON, A ROEDER, A STRINE, P TURNBULL, M VANMELLE, D CONBARGEN and S WILLIAMS, College of Idaho. University field course on marine ecology.

#### STATION VOLUNTEERS

We would like to thank the following people who volunteered their time to help improve the facilities of the station. Their assistance has made the station a better place to work and live.

L & T BROWN, D CAIRNS, L & S COLLARD, G DUANE, D GIROWETZ, S GRIFFITH, M JULL, L HAYES, B LAW, A LEWIS, P LYONS, R MATHERS, T MORRIS, E REHM, M STAFFORD-SMITH, L STEWART, P VILLFORM, K YATES.

If you know of someone who is interested in doing some volunteer work at the station, please have them contact the Co-Directors at the station. Unfortunately, we can only provide free accommodation and passage on RV Sunbird from/to Cairns - Lizard Island.

#### RV CALYPSO VISITS THE STATION

Captain Albert Falco and the crew of J Cousteau's RV CALYPSO visited the station in November. The CALYPSO was filming coral spawning off Yonge Reef.

#### CANE TOADS ON LIZARD ISLAND

The first occurrence of the cane toad (Bufo marinus) was observed on Lizard Island by the resort's swimming tennis court area in October 1987. This coincided with several deaths of sand goannas. Queensland National Parks and Wildlife Service rangers visited the island in November and caught 10 adult toads near the resort.

Additional sampling was done at the research station, airstrip and swamps without catching any toads. It has been suggested that the toads have arrived in bagas carried on the resort's supply barge for its landscape program. In additional trips a tape recording of mating toads was played to lure the toad from their burrow. A further 4 toads were caught. Trapping efforts in mid December yielded no further toads and obvious goanna deaths have stopped.

#### TRAVEL INFORMATION

AIR FARES One way economy :	From	To Cairns
	Sydney	\$431
	Melbourne	\$505
	Brisbane	\$366
	Townsville	\$207
	Lizard Island	\$114

#### DISCOUNTS FOR RESEARCHERS

Discount fares are available to well organized researchers. Ansett and Australian airlines offer an AIR PASS which allows for up to 6000 km of travel and five stopovers in Australia for \$600. There are some restrictions with this fare.

Ansett and Australian Airlines have generously offered discount air fares to assist scientists whose funding has fallen short of requirements and who wish to travel to Cairns to undertake studies on the Great Barrier Reef at the Lizard Island Research Station. The Co-Directors, Barbara Kojis and Norm Quinn, approve requests on the basis of need and scientific merit.

Applicants for this program should send their research proposal to the Co-Directors. Please indicate the source of funding for your project and why travel assistance is required.

You may either apply for a 50% reduction on a confirmed ticket with Australian Airlines or a 75% reduction for a stand by ticket with Ansett. Please indicate in your letter to the Co-Directors which discount you are applying for. These discounts apply only on the published economy fare between your base location and Cairns. The ticket is not transferable. This does not include the cost of travel from Cairns to Lizard Island. The approval for the discounts is controlled by the management of the Cairns offices of the airlines where the ticket is issued.

We hope that the generous assistance offered by Ansett and Australian Airlines helps you in your efforts to understand the Great Barrier Reef.

Students under the age of 26 receive a 25% discount on Ansett and Australian Airlines.

**Discounts for International Researchers:** A 30% rate reduction (called See Australia) is given to international travelers on domestic sectors if over 1000 km in total is flown.

**Surface Travel to Lizard Island:** The MV Noel Buxton ((070) 51 7393) offers space available travel from Cairns to Lizard Island for \$60. The ship departs the Cairns wharf nearly every Monday from April to late November at 2000 h and arrives Lizard Island at 1100 h the next day. She then continues on to Thursday Island and returns to Cairns without stopping at Lizard Island. Reasonable amounts of cargo may be carried at no additional charge.

**Cargo to Lizard Island:** Non-perishable food and other cargo can also be transported via the M.V. Noel Buxton at the same rate as for RV Sunbird.

### TOURS

The station tours are increasingly popular attracting over 2000 people during the year. Most of the visitors are passengers from the MV Noel Buxton with the rest coming from the M.V. Teal, the Lizard Island Lodge, yachties and campers.

### RAINFALL RECORDS

Rainfall in mm	1986	1987	1988
January	519	205	33
February	53	399	297
March	149	117	435
April	187	147	141
May	57	49	13
June	74	52	32
July	31	32	

August	11	20
September	2	53
October	51	0
November	7	18
December	6	132
Totals	1207	1224

#### MEAN HYDROLOGICAL DATA

Mean surface water temperature °C taken daily from beach at 900 h

	1987	1988
January		29.5
February		29.0
March		28.2
April		27.9
May		25.7
June		24.1
July		
August		
September	23.1	
October	25.7	
November	28.7	
December	28.9	

#### PUBLICATIONS TO 30 JUNE 1988

Since the issue of Newsletter No. 13, we have received a further 21 reprints bringing the total to 234. These publications are listed below. A complete publications list is available. Please write if you would like to receive one. If you have published research based on your visit to the station please send us two reprints if you have not already done so.

- BRALEY R, 1988. Report on a giant clam recruitment mapping survey at Lizard Island in early April 1987. GBRMPA Report. 8pp.
- BRUCE N, 1986. Australian Pleopodias Richardson, 1910, and Anilocra Leach, 1818 (Isopoda: Cymothoidae), crustacean parasites of marine fishes. Records of the Australian Museum 39:85-130.
- BRUCE N, 1987. Australian Renocila Miers, 1980 (Isopoda: Cymothoidae), crustacean parasites of marine fishes. Records of the Australian Museum 39:169-182.
- CANNON L R G AND H SILVER, 1987. Sea Cucumbers of Northern Australia. Queensland Museum, Brisbane, 60pp.
- DOHERTY P J, 1987. Light traps: selective but useful devices for quantifying the distributions and abundances of larval fishes. Bulletin of Marine Science 41:423-431.
- DONALDSON T J, 1987. Social organization and reproductive behavior of the hawkfish Cirrhitichthys falco (Cirrhitidae). Bulletin of Marine Science 41(2):531-540.
- GLADSTONE W, 1987. A spine - bending story. Australian Natural

- History 22(7):303-305.
- GLADSTONE W, 1987. Role of female territoriality in social and mating systems of Canthigaster valentini (Pisces: Tetradontidae): evidence from field experiments. Marine Biology 96:185-191.
- GLADSTONE W, 1987. The courtship and spawning behaviors of Canthigaster valentini (Tetradontidae). Environmental Biology of Fishes 20(4):255-261.
- GLADSTONE W, 1987. The eggs and larvae of the sharpnose puffer fish Canthigaster valentini (Pisces: Tetradontidae) are unpalatable to other reef fishes. Copeia 1987(1):227-230.
- HALL S J, 1985. Four new species of Myodocopine ostracodes (Sarsiellidae) from Lizard Island, North Queensland. Journal of Crustacean Biology 5(3):500-522.
- HALL S J, 1987. New species of Sarsiella and Anscottiella (Ostacoda: Myodocopina) from Lizard Island, North Queensland. Journal of Crustacean Biology 7(4):738-763.
- HOLLAND N D, A B LEONARD, J R STRICKLER, 1987. Upstream and downstream capture during suspension feeding by Oligometra serripinna (Echinodermata: Crinoidea) under surge conditions. Biol. Bull. 173:552-556.
- IMAJIMA M and H A TEN HOVE, 1986. Serpulinae (Annelida, Polychaeta) from Nauru, the Gilbert Islands (Kiribati) and the Solomon Islands. Proc. Japn. Soc. syst. Zool. 32:1-16.
- LEIS J M and B GOLDMAN, 1987. Composition and distribution of larval fish assemblages in the Great Barrier Reef Lagoon, near Lizard Island, Australia. Aust. J. Mar. Freshw. Res. 38:211-223.
- LEIS J M, B GOLDMAN and S UEYANAGI 1987. Distribution and abundance of billfish larvae (Pisces: Istiophoridae) in the Great Barrier Reef Lagoon and Coral Sea near Lizard Island, Australia. Fishery Bulletin 85(4):757-765.
- LEONARD A B, J R STRICKLER and N D HOLLAND 1988. Effects of current speed on filtration during suspension feeding in Oligometra serripinna (Echinodermata: Crinoidea). Marine Biology 97:111-125.
- IMAJIMA M and H A TEN HOVE, 1986. Serpulinae (Annelida, Polychaeta) from Nauru, the Gilbert Islands (Kiribati) and the Solomon Islands. The Proceedings of the Japanese Society of Systematic Zoology 32:1-16.
- SAUNDERS W B and P D WARD, 1987. Sympatric occurrence of living Nautilus (N. pompilius and N. stenomphalus) on the Great Barrier Reef, Australia. The Nautilus 101(4):188-193.
- VAIL L, 1987. Reproduction in five species of crinoids at Lizard Island, Great Barrier Reef. Marine Biology 95:431-446.
- VAIL L, 1987. Diel patterns of emergence of crinoids (Echinodermata) from within a reef at Lizard Island, Great Barrier Reef, Australia. Marine Biology 93:551-560.

#### FUTURE DEVELOPMENTS

We have been promised by Telecom that a telephone will be installed on the island by the end of 1989!

**NEW USAGE FEES**

Inflationary pressures have necessitated an increase in bench fees for students, researchers and RV Sunbird users. Station running costs have increased by more than 10% in the last year. RV Sunbird costs have increased by 25% in the last 2 years because, only now, are maintenance costs being recognized. Salaries have also increased with the cost of living rises. All fees are in Australian dollars. As of 30 June 1988 \$A1.00 = \$US 0.82. Researchers intending to use the station, especially during our busy months of July to August and mid-October to January, should book early. Deposits of 10% of your estimated bench fees will allow us to confirm your bookings for both the station and RV Sunbird. Deposits are refundable if you cancel a minimum of two months before your anticipated arrival.

**Research Station - From 15 August 1988 (Fee increases will not apply to researchers on calendar year budgets until 1 January 1989)**

FULL RATE RESEARCHERS \$65 per person per night. A \$5 per night discount is given to scientific researchers if payment is received within 30 days of invoicing. A further \$5 per night discount is offered for scientific researchers who visit the station between 1 February and 30 June, 1 September and 15 October. The full rate bench fee reduces to \$45 per day after 30 days consecutive usage. There is no discount on this fee.

A NON-PARTICIPATING FAMILY MEMBERS rate of \$30 per night applies between 1 February and 30 June and 1 September and 15 October. This is subject to space availability and can only be confirmed one month prior to arrival. At other times the full bench fees apply. A \$5 per night discount is given if payment is received within 30 days. SCUBA tanks, boats and laboratory space are not provided for non-participating family members.

RESEARCHERS FROM CONTRIBUTING INSTITUTIONS not funded by a government grant are charged \$45 per night. Please write to the Co-Directors if your institution is interested in becoming a contributing institution.

Bench fees for GRADUATE STUDENTS working on their own independent research rises to \$20 per night. A discount of \$3.00 per night is given to accounts paid within 30 days of invoicing between the period 1 February and 30 June and 1 September and 15 October. At other times a discount of \$1.50 per night will be given accounts settled within 30 days of invoicing.

Preference is given to scientific researchers wishing to use the station. However, if space is available we will

consider UNIVERSITY STUDENT GROUP visits. If you are interested in organizing a university student trip to Lizard Island please enquire at least 3 months before the proposed trip. Student groups visiting the station as part of a course are charged \$45 per night per person. This fee must be paid when the booking is made.

**R.V. Sunbird charter fees as of:**

**1 January 1988**

Full day, overnight or odd hours usage starting/returning Lizard Island within 100 nautical mile radius

\$525

Full day, overnight usage from non Lizard Island base-on application

Full day 8 hours or less between 7 am and 6 pm \$425

Half day 4 hours or less between 7 am and 6 pm \$325

Day trip to the Cod Hole \$475

Transit to/from Lizard Island to Cairns \$675

Fee for customs entering or leaving Australia \$250

A \$25 per day discount applies for accounts paid within 30 days of invoicing.

**1 July 1989**

Full day, overnight or odd hours usage starting/returning Lizard Island within 100 nautical mile radius

\$575

Full day, overnight usage from non Lizard Island base-on application

Full day 8 hours or less between 7 am and 6 pm \$450

Half day 4 hours or less between 7 am and 6 pm \$350

Day trip to the Cod Hole \$500

Fee for customs entering or leaving Australia \$275

A \$25 per day discount applies for accounts paid within 30 days of invoicing.

The use of SCUBA tanks and dinghies (other than the Zodiac 3.2 m tender) will incur an additional charge. Catering is optional. Researchers wishing to have their charter catered for should write for current costs. Catering costs include the cost of the food and a labor component for organizing menus, purchasing food and cooking. Researchers are expected to assist with the clean up after meals.