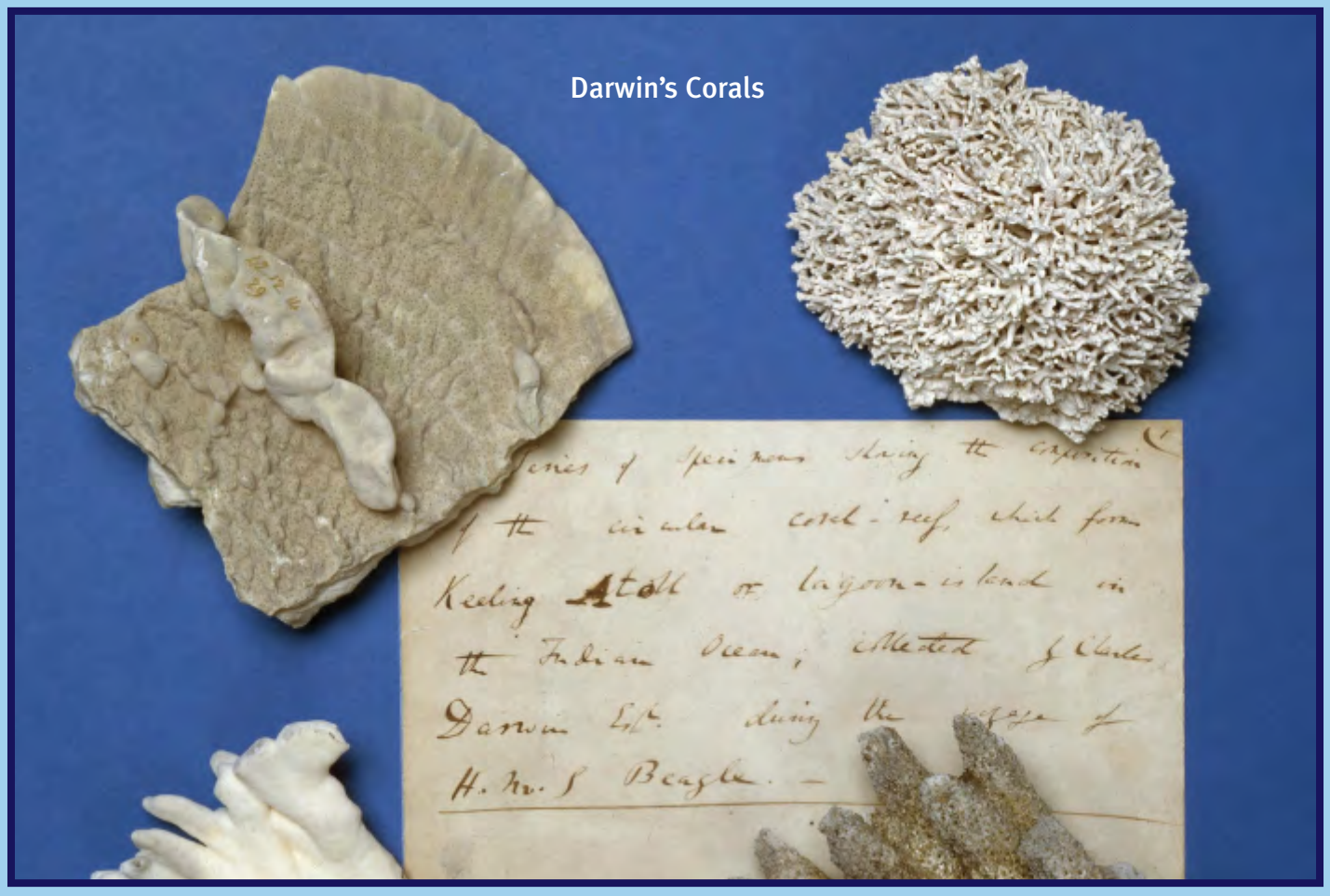
REEF ENCOUNTER

January 2010
No. 38

Newsletter of the International Society for Reef Studies



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Reef Encounter No. 38, January 2010

Newsletter of the International Society for Reef Studies

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Contents

Front cover
The Natural History Museum (NHM), London, holds a set of 20 reef specimens mostly collected by Charles Darwin during his short stay at Cocos (Keeling) Islands, 1–12 April,1836, during the voyage of the HMS Beagle. Uniquely, these specimens are accompanied by Darwin's own handwritten captions explaining that they are series showing the formation of reef-rock by reef-building organisms. Darwin had evidently made a little exhibit of the specimens, perhaps to accompany his presentation of his subsidence theory of coral reef formation in a paper read to the Geological Society of London on May 31, 1837. The NHM acquired the specimens not long afterwards in December 1842, and subsequently placed them on display in the former Coral Gallery, from which they were removed to collection storage in the 1970s. The specimens have never been further studied and identified, and are currently the subject of a research project by Brian Rosen and Jill Darrell (NHM).

Design and Layout by Rodney Cash and David Ashby

The International Society for Reef Studies was founded at a meeting in Churchill College, Cambridge, UK in December 1980. Its aim under the constitution is to promote, for the benefit of the public, the production and dissemination of scientific knowledge and understanding concerning coral reefs, both living and fossil.

i. In order to achieve its aim, the Society has the following objectives:
ii. To hold meetings, symposia, conferences and other gatherings to disseminate this scientific knowledge and understanding of coral reefs, both living and fossil.
iii. To print, publish and sell, lend and distribute any papers, treatise or communications relating to coral reefs, living and fossil, and any Reports of the Proceedings or the Accounts of the Society.

To raise funds and invite and receive contributions from any persons what so ever by the way of subscription, donation or otherwise providing that the Society shall not undertake any permanent at trading activities in raising funds for its primary objects.
The Society collaborates with Springer-Verlag in producing the quarterly journal Coral Reefs. This large-format journal is issued free of charge to all members of the Society, and concentrates on quantitative and theoretical reef studies, including experimental and laboratory work and modeling.

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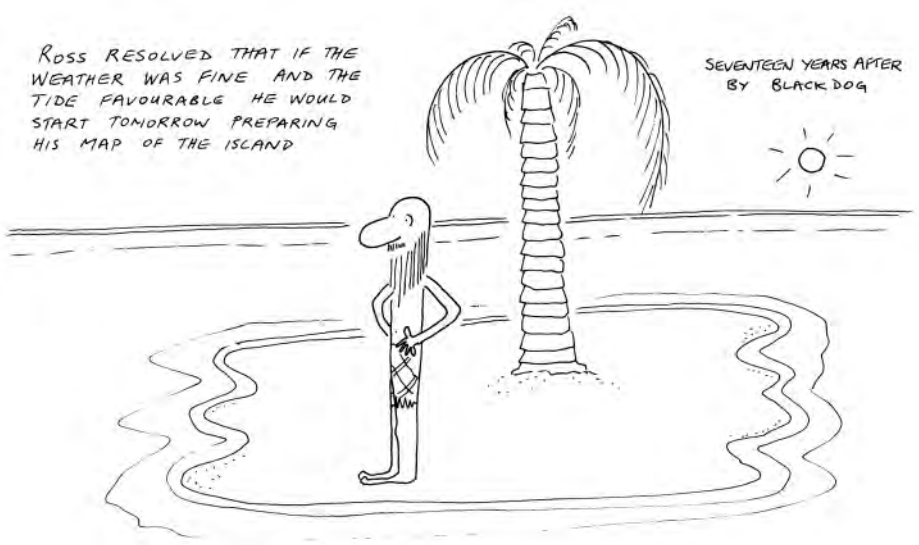
EDITORIAL

I do apologise for the very late arrival of this issue of *Reef Encounter*. This delay, I fully appreciate, will have been frustrating for the contributors and authors, and no doubt irritating to the ISRS members who have paid their subscriptions. I will work with the ISRS Council to try and find a more efficient way of producing the newsletter given my own time constraints at the moment. My co-editors (Steve Coles and Adel Heenan) have been very valiant, but as the production and printing are done in Cambridge, there is little that they can assist with during the final stages. I hope that nevertheless you will enjoy this issue, and we will do our utmost to get future issues running to a more regular schedule.

Sue Wells



ISRS COMMENT

From the President

This issue of *Reef Encounter* celebrates the life of Gray Multer, who worked tirelessly to help students get a start in coral reef research. He was one of the founding members of ISRS and the current issue reminds us that the Society has a fascinating history we should learn and appreciate.

I am pleased to announce that the editorial board of *Coral Reefs* voted J. E. N. (Charlie) Veron's paper, 'Mass Extinctions and Ocean Acidification: Biological Constraints on Geological Dilemma'" (Vol. 27, pp. 459–472) the Best Paper of 2008. Charlie's arguments, that ocean acidification, to which we are already committed to dangerous levels, could well be the worst impact of climate change for coral reefs, bring this issue into sharp focus. The Best Paper Award includes a certificate, a glass trophy, and a cash prize of $1000. Congratulations to Charlie, and may we all continue the difficult work of saving coral reefs with grace and optimism.

Charlie's success should remind you to submit your best—and most controversial—work to *Coral Reefs*, where you are guaranteed a large audience of exactly the people you are trying to reach. The journal's 2008 impact factor from the Science Citation Index was 2.975, our best score ever. In 2008, *Coral Reefs* ranked sixth among the 87 journals that comprise the marine and freshwater category. Many thanks to our authors and editorial teams, past and present, for making *Coral Reefs* a top-tier journal.

We have identified the venue for the Twelfth International Coral Reef Symposium (12ICRS) in 2012 in Cairns. Bob Richmond and his international committee began exploring options before the Eleventh ICRS in Fort Lauderdale last July, and their efforts have borne fruit. Terry Hughes, Director of the ARC Centre, will chair the Local Organizing Committee; Terry has actively supported the goals and activities of ISRS for many years and was awarded the Darwin Medal at 11ICRS.

ISRS has for many years partnered with the Ocean Conservancy to provide seed money to budding coral reef scientists through a programme of Graduate Research Fellowships. Reports from two of our recent awardees, Heidi Schuttenberg and Jez Roff, appear in the pages that follow. The full-blown program, funded through the generosity of an anonymous donor, is currently on hold, but the fellowships are important enough that the Society is making one award this year

from our own funds. The outcome of this year's competition is announced in this issue.

ISRS has long aspired to be a clear and prominent voice for coral reef conservation. On behalf of the Society I delivered the keynote address at the February 2009 meeting of the U.S. Coral Reef Task Force (USCRTF) in Washington, D.C. My talk, "Setting Priorities to Save Coral Reefs," renewed the call for scientists and managers to work in tandem to conserve and preserve reefs. Trite as this message may sound, there remains a disquieting level of mutual disrespect between two groups of dedicated professionals with a common goal. Why should managers and scientists talk more to each other? An interesting example comes from the scientific side. Data from John Bruno and colleagues in the June issue of *Ecology* (Vol. 90, pp 1478–1484) are recasting macroalgae in a secondary role in reef degradation, with potentially enormous implications for management and policy. If macroalgae are less of an issue than we previously supposed, does that imply management strategies to conserve herbivores are working? Should we worry less about herbivory, or more? My presentation at USCRTF led to discussions with NOAA personnel about getting scientists and managers in the USA together for a workshop on improving communication and co-operation.

Lastly, in this issue you will see our financial report for 2008. The Society is down US$17,500 from 2007, which is partially a reflection of the dismal economic climate. Regrettably, we will have to increase slightly the cost of membership in ISRS, beginning with our dues for 2010. We are working to shore up our finances, but it would be unrealistic to expect an immediate turnaround.

ISRS remains strong and vibrant, despite global economic turmoil. Get involved and help shape the future of coral reef science, policy, and management! Sign up a new ISRS member today!

Rich Aronson, President

ISRS Financial Report 2008

Because it owns no real property and has no paid employees, ISRS operates on a cash basis. Total cash assets on 31 December 2008 were US$136,187.68, and all are held in interest-bearing checking accounts. This total represents a net increase during 2008 of US$20,578.01 over the total cash assets at the end of 2007 of US$115,609.67. The cash assets include liabilities of US$10,052.07 designated for support of the next International Conference on Coelenterate Biology, and $38,079.19 in outstanding checks (not cleared by 31 December 2008). Hence equity available to the society at the end of 2008 was US$88,038.42.

Income received in 2008 consisted mainly of memberships (70%), editorial subsidies from Springer-Verlag (25%), donations (2%) and other sales (2%). Major expenses during 2008 were those related to publication of *Coral Reefs* and *Reef Encounter* (30%), postage and shipping fees (25%), editorial subsidies (21% – now paid directly to the Editor in Chief of *Coral Reefs*), and services provided by Allen Press/Marketing and Management (15%). Remaining expenses (9%) included bank and credit card charges, tax preparation, a 2007 student fellowship award paid in 2008, warehouse fees to Allen Press, and Florida State sales tax on 11th ICRS revenue.

Income and Expenses for 2008 were (US$):

Income:	
Memberships	69,695.00
Interest	539.48
Editorial Subsidies (from Springer-Verlag)	24,215.40
Other ICRS Sales	1,800.00
Donations	2,075.00
Total Income	**98,324.88**
Expenses:	
Editorial Subsidies Paid	24,215.40
Travel/Meeting Subsidies	452.50
Postage/Shipping	27,924.69
Bank Charges	49.00
Credit Card Charges	1,220.67
Management Fees – Allen Marketing & Management	13,404.62
Marketing Fees – Allen Marketing & Management	3,804.55
Coral Reefs – Springer-Verlag	30,307.32
Reef Encounter – Allen Press	3,755.87
2007 Tax Preparation	770.00
Student Fellowship*	6,000.00
Miscellaneous†	3,622.71
Total Expenses	**115,527.33**
NET INCOME (LOSS)	**(US$17,519.18)**

*2007 fellowship paid in 2008.
†Miscellaneous expenses include warehouse fees, ICRS expenses, website costs, publication of membership directory and Florida State sales tax on revenue from 11th ICRS.

As shown in the table, during 2008, expenditures plus liabilities exceeded income by $17,519.18. With rapidly rising costs and the continuing economic declines in many parts of the world, the society must find ways to balance its budget in future years. Because memberships account for 70% of income, the ISRS Council decided reluctantly to increase dues for Individual and Family Members by about 15%. Beginning in 2010, the new membership rates (2009 rates in parentheses) will be:

Individual	$95.00 (80)
Family	$105.00 (90)
Student	$25.00 No change
Sustaining	$200.00 No change

By themselves, these increases will only cover about 55% of the 2008 deficit. To cover the rest, the Council urges you to encourage other colleagues and students to become members of ISRS.

Donald Potts, Treasurer

New ISRS individual and family membership rates starting 2010

Individual membership	US$ 95.00
Family membership	US$105.00
Student membership	US$ 25.00
Sustaining membership	US$ 200.00

ISRS NEWS

More than just 'Best Paper'– *Coral Reefs Vol* 27

Our journal *Coral Reefs* is attracting some really excellent papers, so choosing 'Best Paper' presents some interesting conundrums. With the breadth of disciplines now covered, are we comparing apples with oranges? With so many papers published, how can anyone asked to choose 'the best' read enough of them in sufficient depth to make a considered judgement? We tend to read a selection of interest to us, and if asked to select the best, would chose from among that subset, raising the possibility that some very good papers would not receive any or many votes. Issues like these created such a bind with some members of the Editorial Board, which chooses Best Paper by popular ballot, that they abstained from participating. This abstention only amplified the likelihood that some very good papers would not get the chance to receive the gong.

We implemented a two-stage process this year to circumvent, or at least minimise these problems. In stage 1, members of the Editorial Board for Volume 27 and our current Editor and Topic Editors were invited to nominate one to three papers for inclusion on a short list of just four papers. Each member's nomination(s) were worth 3 points: nomination of just one paper would earn it all 3 votes; 2 papers 1.5 points each; 3 papers 1 point each. Eighteen members responded and nominated 20 papers in this first round, and due to tied scores, a short list of five (instead of four) was forwarded to the board members, who were given about six weeks to read them before a final vote (one vote for 'best') was called for. This final vote attracted 20 responses, and the winner of 'Best Paper' *Coral Reefs* Vol. 27 emerged.

I think this protracted two-stage process is an improvement, albeit not perfect. For example, maybe there could have been another stage when the Board members had a chance to read papers in the list of 20 before selecting a short list. We also had to deal with the nice embarrassment that Board Members were junior authors on four of the 5 short-listed papers. We therefore instituted a rule that excluded a Board Member from voting for a paper on which he or she was an author.

Across the Society, we should congratulate not only the winner and those on the short list, but all authors who made it to the 20 paper long list – out of the 67 published in Volume 27 – that are your entry into the rich diversity of ISRS's science.

Coral Reefs – Best Paper Award, Volume 27 (2008)

Order of entries in short and long lists is by page number

Winner

J. E. N. Veron. Mass extinctions and ocean acidification: biological constraints on geological dilemmas. Pp. 459–472

Short list

M. Wakeford; T. J. Done; C. R. Johnson. Decadal trends in a coral community and evidence of changed disturbance regime. Pp. 1–13

S. J. Purkis; N. A. J. Graham; B. M. Riegl. Predictability of reef fish diversity and abundance using remote sensing data in Diego Garcia (Chagos Archipelago). Pp. 167–178.

E. M. Graham; A. H. Baird; S. R. Connolly. Survival dynamics of scleractinian coral larvae and implications for dispersal. Pp. 529–539.

S. Goffredo; H. R. Lasker; An adaptive management approach to an octocoral fishery based on the Beverton-Holt model. Pp. 751–761.

Long List

A. S. Hoey; D. R. Bellwood. Cross-shelf variation in the role of parrotfishes on the Great Barrier Reef. Pp. 37–47

M.I. McCormick; R. Manassa; Predation risk assessment by olfactory and visual cues in a coral reef fish. Pp. 105–113.

C. Wild; C. Jantzen; U. Struck; O. Hoegh-Guldberg; M. Huettel; Biogeochemical responses following coral mass spawning on the Great Barrier Reef: pelagic–benthic coupling. Pp. 123–132.

M. del C. Gómez-Cabrera; J. C. Ortiz; W. K. W. Loh; S. Ward; O. Hoegh-Guldberg; Acquisition of symbiotic

Reefs, Science and Society –2010 European ISRS meeting

Wageningen, The Netherlands, December 13–17, 2010

The meeting will be organised by Wageningen University and the University of Amsterdam. A second announcement, including a call for abstracts, a conference website and details for registration will be distributed in February 2010. The organisers are:

- Dr Ronald Osinga, a research scientist at Wageningen University, involved for over 10 years in aquaculture of corals and sponges; and
- Dr Jaap Kaandorp, a leading scientist in the field of "in silico" biology of marine benthic organisms at the University of Amsterdam, and author of *The algorithmic beauty of corals, seaweeds and sponges*.

There are two venues: Cinemec (Ede-Wageningen), a new, modern venue that includes both conference facilities and cinemas (www.cinemec.nl); and Burgers' Zoo (Arnhem), one of the oldest and largest zoos in the Netherlands with a new, comfortable conference facility, located next to the aquarium section, which holds one of the largest indoor live coral displays in the world (www.burgerszoo.nl)

For further information, contact: Dr Ronald Osinga, Wageningen University, Aquaculture & Fisheries. E-mail: ronald.osinga@wur.nl

dinoflagellates (Symbiodinium) by juveniles of the coral *Acropora longicyathus*. Pp. 219–226.

M. Hirose; H. Yamamoto; M. Nonaka; Metamorphosis and acquisition of symbiotic algae in planula larvae and primary polyps of *Acropora* spp. Pp. 247–254.

C. A. Page; B. L. Willis; Epidemiology of skeletal eroding band on the Great Barrier Reef and the role of injury in the initiation of this widespread coral disease. Pp. 257–272.

F. Nunes; H. Fukami; S. V. Vollmer; R. D. Norris; N. Knowlton; Re-evaluation of the systematics of the endemic corals of Brazil by molecular data. Pp. 423–432.

P. L. Jokiel; K. S. Rodgers; I. B. Kuffner; A. J. Andersson; E. F. Cox; F. T. Mackenzie; Ocean acidification and calcifying reef organisms: a mesocosm investigation. Pp. 473–483.

F. Marubini; Christine Ferrier-Pagès; P. Furla; D. Allemand; Coral calcification responds to seawater acidification: a working hypothesis towards a physiological mechanism. Pp.491–499.

L. M. Chérubin; C. P. Kuchinke; C. B. Paris; Ocean circulation and terrestrial runoff dynamics in the Mesoamerican region from spectral optimization of SeaWiFS data and a high resolution simulation. Pp. 503–519.

D. E. Williams; M. W. Miller; K. L. Kramer; Recruitment failure in Florida Keys *Acropora palmata*, a threatened Caribbean coral. Pp. 697–705.

J. Stimson; E. Conklin; Potential reversal of a phase shift: the rapid decrease in the cover of the invasive green macroalga *Dictyosphaeria cavernosa* Forsskål on coral reefs in Kane'ohe Bay, Oahu, Hawai'i. Pp.717-726.

C. Humphrey; M. Weber; C. Lott; T. Cooper; K. Fabricius; Effects of suspended sediments, dissolved inorganic nutrients and salinity on fertilisation and embryo development in the coral *Acropora millepora* (Ehrenberg, 1834). Pp. 837–850

S. Jupiter; G. Roff; G. Marion; M. Henderson; V. Schrameyer; M. McCulloch; O. Hoegh-Guldberg; Linkages between coral assemblages and coral proxies of terrestrial exposure along a cross-shelf gradient on the southern Great Barrier Reef. Pp. 887–903.

S. J. Purkis; K. E. Kohler; The role of topography in promoting fractal patchiness in a carbonate shelf landscape. Pp. 977–989.

Terry Done, Member – Editorial Board of Coral Reefs*; Returning Officer – Best Paper Award, Vol. 27*

100 Questions of Importance to the Conservation of Global Biological Diversity

In the last issue of *Reef Encounter* (No 37, January 2009), we reported on how ISRS had been invited to help identify the 100 research questions of greatest importance for conservation policy makers and practitioners. These have now been published[1].

Several questions initially proposed with coral reefs in mind were ultimately rephrased into questions of broader ecological scope, e.g:

- Question 11. How is the resilience of ecosystems to climate change affected by human activities and interventions?
- Question 46. How will ocean acidification affect marine biodiversity and ecosystem function, and what measures could mitigate these effects?
- Question 52. How will multiple stressors, especially fishing, pollution, sea temperature fluctuations, acidification, and diseases, interact to affect marine ecosystems?

Two questions in the final list deal specifically with coral reefs:

- Question 17. What are the potential effects of feedbacks between climate change and ecosystem dynamics (e.g., drought, forest dieback, and coral bleaching) on the effectiveness of policy measures to sequester carbon and protect biodiversity?
- Question 48. Which management actions are most effective for ensuring the long-term survival of coral reefs in response to the combined impacts of climate change and other existing stressors?

Overall, there were very few ecosystem-specific questions, so the fact that Question 48 made it into the top

12th International Coral Reef Symposium (ICRS), 9-13 July 2012
Cairns, Australia.

Held every four years, the ICRS is the world's largest and most important coral reef meeting bringing together coral reef scientists, graduate students, resource managers, and policy makers. Over 2,000 talks and posters will be presented on major themes including Climate Change, Reef Ecology, Conservation Planning, Fish and Fisheries, Genomics, Management Tools, The Coral Triangle Initiative, and the Human Dimension of Coral Reefs. Proposals for mini-symposia will be solicited in early 2010 and abstract submission will be from mid-2010. Other activities will include a trade exhibition and a range of cultural social events.

Hosted by James Cook University and the Australian Research Council (ARC) Centre of Excellence for Coral Reef Studies, ICRS 2012 is expected to attract more than 2,000 delegates from 80 countries. The award winning Cairns Convention Centre, renowned for its unique environmental design, is only ten minutes from the Cairns International Airport and within easy walking distance of an extensive choice of suitable accommodation, cafes, bars and restaurants.

The Symposium's tradition of conducting scientific field trips before and after the event will continue in 2012 with trips to the World Heritage listed Great Barrier Reef including Heron Island Research Station, Lizard Island Research Station, and Orpheus Island Research Station.

For further information visit www.icrs2012.com

100 reflects both the seriousness of the threats facing reefs and the concern of scientists (most of whom were not coral reef researchers) and policy makers for coral reefs.

Note

1. Sutherland, W.J. *et al*. 2009. One hundred questions of importance to the conservation of global biological diversity. *Conservation Biology* 23: 557–567.

Isabelle Côté, Corresponding Secretary

An elderly coral was teaching
The younger corals 'bout bleaching:
Rid yourselves of Clade C
And acquire Clade D
Or else you'll soon be deceasing.

John Ware

ISRS FELLOWSHIP PROGRAMME

The ISRS Graduate Fellowship Programme provides a wonderful opportunity for young reef scientists. It is aimed at supporting significant and innovative research by a graduate student that will ultimately contribute to improved understanding and management of coral reefs throughout the world. Coral reef ecosystems continue to be threatened by direct anthropogenic stresses and climate change. Scientists and reef managers are increasingly working together to develop sound management strategies that are based on rigorous science. There remain however, many unanswered questions about reef disturbances and reef resilience, climate change and adaptation, reef connectivity, marine protected areas, fishery impacts, and effective management practices.

Applications are judged based on the quality of proposed research, the feasibility of the project (partly based on the students' track-record of publishing scientific findings) and the relevance of the project to improving management and reverse the ongoing degradation of coral reef ecosystems. A condition of each Fellowship is that recipients will report back to the ISRS, through *Reef Encounter*, on their research progress, outline their findings, and also publicize the research outcomes with appropriate acknowledgment for the support provided. Reports are to be submitted to the recording secretary (Dr Morgan Pratchett: morgan.pratchett@jcu.edu.au) within 12 months of receipt of the award. If you are a current awardee, you will be contacted when we need your report. Acknowledgement of ISRS funding in any publications that result from the research is also required

2009 Fellowship Award

In 2009, following the withdrawal of external sponsorship for the ISRS Graduate Research Fellowship Programme (previously the ISRS/TOC graduate fellowship), the ISRS made a decision to offer one fellowship of US$6,000, using Society funds. A total of 52 applications were received from graduate students in 32 differ ent institutions in 11 different countries (although the majority of applicants were from Australia and the USA). The quality of applications was very high, even though most were from students who had been enrolled for less than one year. The judging committee, composed of three of members of the ISRS Council, awarded the fellowship to Mr Rowan Trebilco of Simon Fraser University, Australia, for his proposal 'A size-spectrum approach to assessing coral reef fisheries impacts, habitat effects and ecosystem baselines'.

Rowan is currently working towards his PhD on trophic dynamics of fished versus unfished coral reef ecosystems, supervised by Dr Nick Dulvy. His research is being conducted at Kiritimati Atoll, in the central Pacific, taking advantage of marked differences in the history of fishing at different sites. This project will provide much needed information on the diverse impacts of extractive fishing on the functioning of critical ecosystems processes on coral reefs. Previously, Rowan completed an MSc in Biodiversity Conservation and Management at Oxford University. He has already published several papers relating to the conservation of sea birds.

Reports of the 2007 Fellowships

Understanding and strengthening effective coral reef governance: a map and compass to guide strategic change in Southeast Asia

Heidi Schuttenberg, Earth and Environmental Sciences, James Cook University, Australia; Sustainable cosystems, CSIRO, Australia. eidi.Schuttenberg@jcu.edu.au

My doctoral research involved developing a framework to assist in diagnosing and strengthening diverse approaches to coral reef management in Southeast Asia. I have synthesized expert opinion and the experiences of over 60 coral reef management projects into a visual framework – or "map" – that

The Philippines was unique in its widespread use of formally deputized community members who enforce the rules of local fish sanctuaries.

Malaysian Rangers.

Research Team

describes the strengths and weaknesses of common reef management approaches. The framework provides a means for making more strategic choices when designing or adapting reef management projects and programmes.

I developed the conceptual 'map' by adapting a methodology from organizational theory. First, I carried out an extensive meta-analysis of the requirements for effective coral reef and coastal management as identified by practitioners and academics over the last two decades. I then set up an on-line survey that asked coral reef management experts to describe the relationships between these requirements previously identified. Of the 160 experts contacted around the world, 80 responded (a 50% response rate). Their opinions were evaluated through a statistical technique called Multi-dimensional Scaling to develop a visual image showing how experts in reef management understand effectiveness.

In the second phase of my research, I took the conceptual map to the field in four countries in Southeast Asia (Indonesia, Philippines, Malaysia, and Thailand) to identify which approaches to reef management are used most commonly, and their comparative strengths and weaknesses. Over four months, I worked with field assistants to collect data from 60 coral reef management projects and programmes, ranging from small community sanctuaries to larger integrated coastal management projects. We used a structured survey (>200 interviews) to collect information on five basic governance tasks: (1) establishing institutions (laws, policies, organizations, etc); (2) building constituencies; (3) creating knowledge; (4) reducing threats; and (5) funding and enforcing management arrangements. Prior to data collection, I trained field assistants from the four countries in Bali where we spent several days carefully translating the survey into four languages and calibrating our survey delivery technique.

I am currently writing the results up as a PhD thesis and a series of papers, and presented some of the results in May 2009 at the International Marine Conservation Congress in Washington, DC. I am also in conversations to develop the research findings into a handbook for practitioners, tentatively titled: A Map and Compass to Strengthen Coral Reef Management. The research was conducted as part of my doctoral studies at James Cook University, Australia with additional technical support provided by the Australian Government's Commonwealth, Science, and Industrial Research Organization (CSIRO). The project is funded by an ISRS/TOC Fellowship, the GEF Coral Reef Targeted Research and Capacity Building for Management Program, and the Australian Government's Marine and Tropical Sciences Research Facility.

Historical ecology of coral communities from the inshore Great Barrier Reef

Jez Roff, Centre for Marine Studies, University of Queensland, St Lucia, Brisbane 4072, Australia.
g.roff@uq.edu.au

"As it is not in human record, but in natural history, that we are to look for the means of ascertaining what has already been … in order to be informed of operations which have been transacted in times past … or to events which are in time to happen"

James Hutton (1785)

Coral reefs are showing evidence of global decline across local and regional scales. Historical overfishing, nutrient loading, terrestrial discharge, combined with more recent threats of coral bleaching and coral epizootics have resulted in long term losses of abundance, diversity and habitat structure. Through palaeoecological reconstruction of coral reefs from the Caribbean region, recent studies have highlighted the collapse of

Figure 1. Inshore coral reefs from the Palm Islands region are characterized by extensive sections of collapsed branching Acropora *spp. on the upper reef slopes (~5m depth, Fantome Island)*

coral communities at a regional level, which is unprecedented within the Holocene and Pleistocene records. Whilst numerous studies have focused upon the historical ecology of reefs Caribbean region, there is a general paucity of data from the Indo-Pacific region, particularly from the Great Barrier Reef (GBR).

My PhD research at the ARC Centre of Excellence, University of Queensland, focuses on palaeoecological reconstructions of coral communities from the inshore GBR. In 2007 I was fortunate to receive a ISRS/TOC fellowship for a project that aims to identify changes to coral communities across decadal, centennial and millennial scales, in order to identify the effect of European settlement on inshore reefs of the GBR.

Prior to the advent of SCUBA in the 1970s, there were few surveys of coral communities on the GBR, the earliest being those conducted as part of the "Great Barrier Reef Expedition" to the Low Isles in 1928. De Vantier et al (2006) have shown that coral species richness is 41–67% lower in the Wet Tropics region (16–18°S) than in adjacent inshore regions, and that previously dominant Acroporid communities have been lost (Fig 1). It is difficult to determine the proximal causes of such regional declines, and the lack of historical data means that there is little direct evidence of the causes of changes in coral community structure following European settlement.

With the funding from ISRS, we conducted two field trips to the Palm Islands region (central inshore GBR) in 2007 and 2008. On the first trip, we successfully extracted over 40 sediment cores (up to 5m in length) from the back reef environments of two inshore reefs (Pandora and Havannah Reef). In 2008, we conducted extensive surveys of seven inshore and outer-shelf reefs to determine both modern coral community structure ('life assemblages') and *in-situ* coral rubble ('death assemblages').

We have now sectioned and analysed the sediment cores for coral composition (taxonomy and taphonomy), coral growth (CT-scanning), sedimentary analysis and isotopic composition. To determine both core chronology and temporally bracket changes in coral community structure, coral fragments were aged using the high-precision Thermal Ionisation Mass Spectrometry (TIMS) Uranium Series (U-Series) method (Fig 2), and over 140 dates have been obtained so far. The initial results show strong evidence of temporal shifts and transitions in coral community structure over broad ecological time scales, indicating the existence of multiple stable states in the inshore reefs of the central GBR.

Figure 2. In collaboration with the Radio Isotope Facility at the University of Queensland, exact ages of coral mortality have been determined using the TIMS U-Series method, allowing an accuracy of ±1-4yrs.

By assessing the spatial and temporal variability of these changes within the Palm Islands region, this project will provide a baseline or 'starting point' which can be used in the restoration of coral communities to major change at local and regional scales, instead of managing for an ecological 'status quo'.

I would like to sincerely thank Dr Rob van Woesik, ISRS and The Ocean Conservancy for their generous support and funding of this project, without whom this project would have been considerably harder to achieve.

CURRENTS

Letter to the Editor

Dear Editors

As the first editor of Reef Encounter, and the person who suggested its name, I read with interest your item on its origin (*Reef Encounter* 35, September 2007, p.8, www.fit.edu/isrs/index.html) and can shed more light on this.

You say that it was a pun on the name of the film, *Brief Encounter*, and this is essentially correct, except that it isn't a true pun. It is more a play on the words of the film title, part-pun and in part a deliberate misquotation – a standard humorous device much loved by writers of tabloid newspaper headlines. So yes, readers were also meant to spot the deliberate mistake and find it funny.

But maybe, as you imply, they didn't. Your explanation of the film and its story was, I guess, meant to help, but in a sense, it was beside the point, because that only left you, and no doubt others, wondering, "Quite how, why and whether it [i.e. the film itself] relates to coral reefs is another matter!" The short answer is that it doesn't, and was never meant to. As you said, there is nothing about the film itself that relates to reefs. For me, it was just the neat phrase of its title, which I thought to be well-enough known to lend itself to humorous treatment and adaptation, regardless of the film's content.

At the time of course, I had to assume that readers would get the joke of the title *Reef Encounter*. So, looking back, how far was I justified in that? Some would say, not very. The film was old (1945/6), even at the time of our first issue (1984), and it is quintessentially English (and I don't mean British) in its acting and preoccupations, so perhaps not an ideal start for an international newsletter about reefs. On the other hand, I have just found on a rather random sample, that at least one film website ranks *Brief Encounter* within the second hundred of the best 200 films ever, and the short review (http://www.filmsite.org/brie.html) explains why. So maybe it was OK to assume that many Anglophone readers at least would get the joke. (I have no idea how the film title was translated into other languages.)

Nevertheless, as you point out, many readers think the title of our newsletter is *Reef EncounterS* (i.e. in the plural). For a reader who has never heard of the film *Brief Encounter*, this would seem to be a literal improvement on *Reef Encounter*, while obviously missing the joke. Or maybe it was simply a way of referring to the collective set of issues. But perhaps too, with the success of another film, Spielberg's *Close Encounters of the Third Kind* (http://www.filmsite.org/clos.html), released only seven years before *Reef Encounter* was launched, and familiar, some readers may also have thought my title was an allusion to that film instead. It wasn't.

However, there is a further strand to the story. There had also been a literary magazine called *Encounter*, whose credibility had been scandalously compromised by the discovery in 1967 that it had been receiving covert funding from the CIA, and the then editor (Stephen Spender) resigned. No – I'm not implying that *Reef Encounter* is, was, or ever has been, funded by the CIA (at least, not to my knowledge). It's just that *Encounter* was a title that had become infamous, because it gave the public at large a calibration of the lengths the CIA was prepared to go to in its defence of the free world. I felt that the surreal quality of this story would give an ironic twist to our own choice of title, *Reef Encounter*. *Encounter* itself eventually closed in 1991 partly, we might suppose, under the self-defeating cloud of its CIA connections (http://en.wikipedia.org/wiki/Encounter_(magazine).

In any case, the word 'encounter', is just one of a whole group of words like 'dispatch', 'guardian', 'times', 'observer', 'gazette', which have been popular in the naming of newspapers, magazines and now also websites, whether used on their own, or compounded with other words like place-names. So even if the original film-based joke of *Reef Encounter* was going to be lost on many readers, and even if its ironic allusions to the CIA were never realized, the title at least belonged to established tradition, whilst also having a simple literal resonance. After all, that's what our readers do – they encounter reefs.

Which brings me to the regular item featured in most issues since I initiated it – The *Compleat Reef Encounter (CRE)*. (And thanks to those editors who followed me in maintaining this custom.) The idea was to include a reef experience which highlighted or encapsulated, preferably in some poignant, extreme or humorous fashion, interactions with the reef environment. The experience could be human or of any other kind. Incidentally, whilst on the subject of titles and their origins, I may as well say something about this title, too, and in particular our choice of the archaic spelling of 'compleat'. This alludes to a well-known English angling memoir written by Izaak Walton in 1653, The *Compleat Angler*, in which the author aims to pass on his experiences to a novice angler. Ever since then, the book's title has provided a humorous formula when someone is attempting to give a comprehensive (or ironically, a non-comprehensive) guide to any subject.

In fact our very first *CRE* was not a humorous one at all. This was a newspaper cutting from the *Guardian* [London] of June 16th 1983, a Reuters report from Brisbane, Queensland, about a London man, Peter Bird, who had covered all but 53 Km of his epic objective to row single-handed across the 14,500 Km of the Pacific from San Francisco, only to have to abandon his overturned boat in high seas off the Great Barrier Reef. He was looking for a gap in the reefs but did not have detailed-enough charts. He had to radio for help and was picked up by an Australian Navy patrol boat, outside the reef off Cape Weymouth, and his boat then sank whilst in tow.

So, in contrast to the mix of fact and humour in the content of our first issue, our first *CRE* definitely had pathos, though not without an element of noir humour, since solo ocean-rowers are regarded by most other people as crazy. In fact, what I have just discovered, and what we could not know at the time, was that over the next ten years, Peter Bird's story was to become even more poignant, with him eventually losing his life to his solo-rowing passion. An excellent tribute-cum-obituary can be found at: http://www.oceanrowing.com/peter_bird.htm, which includes further information about this Great Barrier Reef encounter. It seems that from Peter Bird's Compleat Reef Encounter, he went on, sadly, to an all-too-Compleat Ocean Encounter.

Yours sincerely,

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The need for a new peer review system in coral reef science: time for a change?

I believe that we, as a scientific body, are facing not just challenging but also disconcerting times – in terms of both ecosystem health, and the health of our science. Both, I feel, have declined over the past few decades. Specifically, in relation to the second issue, a review of our current system of peer review for manuscripts and research proposals has led me to believe that it needs to be revamped. This would help to promote accountability

and protect the authors of submitted papers and proponents of research proposals.

I wonder how many readers have experienced any of the following -

- Comments from a reviewer of a paper or proposal that were incorrect, due to ignorance on the part of the reviewer, lack of familiarity with the subject-matter, or what would appear to be "blocking": comments accompanied by a recommendation to 'reject', and acceptance of that recommendation by the editor/granting agency;
- The inclusion of *ad hominum* remarks in a review regarding one's work or the author or proponent personally;
- Rejection of a manuscript or proposal, followed some time later by a request to review what appears to be a remarkably similar document by someone suspected of having reviewed your work and rejected it;
- Rejection of a manuscript or proposal, and later reading or hearing about a very similar study being published, or a project with a very similar design to yours, being funded, involving someone who may have reviewed your documents;
- A request to review a manuscript or proposal that used language which was almost identical to yours in a document previously rejected as a result of reviewers' comments;
- An excellent peer review of a proposal, but rejection because of comments made by the expert review panel; etc.

I have spoken to many people who identify with one or more of the above. Perhaps it is time for a change to our standard blind review system. Perhaps our field has grown to the point where a different approach is needed: one that is fair to all – authors, research proponents, reviewers, editors, and granting agencies; one that is more transparent; one where the author/proponent has a stronger voice; and one where reviewers and others associated with the review process may be held accountable for comments, particularly if a problem arises in a specific review. I fear that if we continue on our current path, we run the risk of further damaging not only our ecosystem but also our science.

In a recent paper[1], I demonstrate why the peer review system has become problematic. I examined data from a US funding agency, a global fund-ing agency, and abstracting indices. The data indicate that research funding, and numbers of funded projects, have not kept pace with the increase in environmental problems, numbers of researchers, and funding demand, resulting in a chronic support gap. This has created a difficult atmosphere in which to work, contributing to the undermining of trust, mutual support, and free-flow of information. The end result: a poorly functioning review system.

I have therefore proposed a new peer review system, where the author or proponent is given a stronger voice. I examined the advantages and disadvantages of the current masking system and the alternate double-blinded review system, and have recommended a more transparent review system – the reverse-blind review system (RBRS). Among other things, I recommend that:

- The author's identity is kept from the reviewers, but that the identity of the reviewers is revealed to the author; the editor/agency would be aware of both.
- Expert 'panel' members be used in grant pro-posal reviews, similar to the editorial system of scientific journals, with each making direct recommendations to the funding agency;
- Duplicate/multiple expert panel members be used for each proposal, with an averaging of recommendations being made to the funding agency;
- There should be no panel meetings, in order to reduce input from non--experts and reduce confounding group interactions; rarely can all members of a larger panel be experts in a given field. Instead, greater responsibility would be placed on the funding bodies for decision-making; and
- Researchers be allowed to appeal decisions based on inaccurate, misleading, or other problematic information.

Such a system would, I believe, be fairer to the researchers, foster research, and increase information exchange. I invite you to read the paper[1] and hope you find it helpful.

I once attended a meeting at a marine lab where I saw in the education unit, a large, colour wall poster aimed at children. It showed a wooden boat on the sea, with many diverse animals in it: elephants, giraffes, lions, tigers, wildebeest, cows, horses, etc. I expected it to have a Noah's Ark conservation message on it, but the caption read "We're all in this lifeboat together." A wise message that gave me reason to pause.

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Reference

1. Sammarco, P.W. 2008. Crises on coral reefs and in coral reef science in the 21st century: The need for a new peer-review system. *Ethics in Science and Environmental Politics* 8: 108-119. (http://www.int-res.com/articles/esep2008/8/e008p109.pdf)

Pancake-seagrass formations in Florida Bay

Mysterious pancake-like patterns, resembling flattened circular nests of drifting seagrass blades (Figs. 1, 2), commonly occur in Florida Bay, USA. The 2,072-km^2

Fig. 1

Fig. 2

Bay, with its vast mangrove, seagrass and coral-reef habitats, and interact importantly with the Florida Coral Reef Tract via inter-island hydrodynamic exchanges[1]. The drifting fragments, consisting mostly of the shoal grass *Halodule wrightii*, are exceptional because they can maintain viability for up to four weeks[2]. Interestingly, such extraordinary mosaic patterns of pancake-seagrass rafts are previously unreported, but commonly originate in the western region of Florida Bay under light wind and wave conditions.

To date, we have no evidence identifying the mechanisms responsible for the circular patterns, but they do appear to be analogous to cold-water pancake-ice formations (see http://en.wikipedia.org/wiki/Pancake_ice), in respect to how they take shape. As in pancake-ice, the patterns are posited to be sculpted by the bumping action of adjacent clumps, in conjunction with the nature of the curved crescent-shaped individual blades. The initial stages of formation (Fig. 3, arrows) seem to develop from a tendency for the buoyant blades to be gently shuffled inward to coalesce as overlapping/interlocking concentric rings, with the mean pancake diameter being 18 cm –4 SD. The possibility that the pancakes are rolled into shape by tidal-current shear has also been suggested. Because pancake-seagrass formations are so striking, we would welcome any further observations/insights from the readership – the suggestion of "alien crop circles in the sea" has already been proposed.

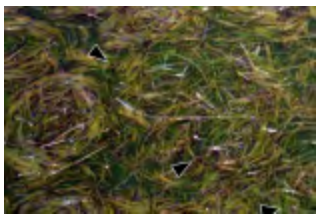

Fig. 3

Acknowledgements: Support came from the Smithsonian Marine Station at Fort Pierce (SMSFP Contribution No. XXX).

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References

1. *Porter, J.W., Porter, K.G., eds. 2001. The Everglades, Florida Bay, and Coral Reefs of the Florida Keys: An Ecosystem Sourcebook.* CRC Press, Boca Raton, Florida.
2. Hall, L.M., Hanisak, M.D. and Virnstein, R.W. 2006. Fragments of the seagrasses *Halodule wrightii* and Halophila johnsonii as potential recruits in Indian River Lagoon, Florida. *Mar. Ecol. Prog. Ser.* 310: 109–117.

NEWS

Safeguarding temperature loggers on remote coral reefs – lessons learned from relocating loggers in the Chagos archipelago

Research into sea surface temperature and impacts of thermal stresses on coral reefs has led to the increasing use of compact sea temperature loggers on reefs. While deployment itself is easy, ensuring they survive *in situ* for 2–3 years until recovery is less so. We had received numerous accounts of disappearance of anything from 50–100% of groups of deployed loggers, sometimes as soon as a few weeks later, even with those placed in sheltered lagoons.

Underwater temperature loggers have improved enormously in recent years, with diverse products commercially available. Durable, pressure resistant, compact devices, capable of recording over 30,000 temperature samples with accuracies of up to 0.1°C and with a battery life commonly exceeding five years, are widely available for prices below US$150 each. When these are deployed at sites to which return visits are infrequent and widely spaced, we need to ensure a good recovery rate. We developed a technique to reliably secure 20 *StowAway TB132 Tidbit* data loggers. We wanted to place these on reefs at a range of depths to 25 m deep on several atolls in the Chagos Archipelago, at sites that would not be revisited for 2–3 years.

Each logger was wrapped in a layer of film to protect against fouling, then fastened within a 15cm section of 35mm PVC pipe by zip ties, through holes drilled along the pipe. It was intended that the pipe sections would protect the device and its attachment ties from potential bites by fish. The pipe section was then secured with similar ties to a 1m steel stake that had been hammered into the reef at the required monitoring depth through a zip-lock bag containing a few hundred grams of concrete powder mixed with sand. The concrete was used dry, and the holes torn by punching the stake through the bag caused water to enter and solidify the concrete. This hardened in a manner that conformed to the substrate, thus helping to lock the stake in place. The bags could be readily prepared on the surface and transported underwater to the required location sealed and watertight. Even where the stake had toppled due to storms and decay of the underlying reef, the concrete disk prevented movement away from the site.

We tried this technique with 19 loggers (one of our 20 was dud) at seven sites across four remote Chagos atolls in March 2006. Loggers were usually sited in threes; at 5, 15 and 25m depth, in lines taken straight down the reef, with a GPS fix recorded for the site of the shallowest one. Opportunity was taken to recover six loggers at two sites in early 2008, when all were retrieved in working order (results were remarkable and are published in *Coral Reefs*). The remaining 13 could not be revisited for another year when, in March 2009, 12 of them were

found and collected. None of the sites were visited during the intervening two or three years to enable checking of the stakes.

When recovering, boats were stationed above each GPS reading that had been recorded during placement. Mostly the shallowest stakes were seen within 10m of the boat. Once a stake had been located, the others in each group of three were usually found in the same dive, but in several cases the shallowest stake was either on its side, missing, or the most concealed of the three by rapidly growing corals, particularly *Acropora*. Photos of the locality taken at the time of deployment proved useless as an aid for relocation given the rapidity of new coral growth in this archipelago.

The straight, perpendicular stakes usually caught the finders' eyes because they provide a striking contrast amongst shapes that, on reefs, are usually anything but straight. But in several cases even a 75cm high projection was barely sufficient. One at 25m was spotted by its 5cm projection above a *Pachyseris* plate which had reached a diameter of 1m in 3 years. Another was spotted underneath a table colony of *Acropora cytherea* that had completely overgrown the stake. But 1m stakes are usually sufficient, and only once was a second dive needed to find each group of three; when the first is seen, the others had to be nearby on these steep slopes. To several of the emplaced stakes we then attached a new logger.

Of the 19 loggers recovered, all but one were still recording after 2 or 3 years, though one failed after 14 months (though its data were retrieved). We recommend the use of this method of device protection and marking, and consider small roped buoys or reliance on particularly recognisable coral structures to be very unreliable (and the cause of many lost loggers). In this case, the resulting data set has given unprecedented insight into temperature profiles at a series of depths across this central Indian Ocean atoll system.

Alasdair Harris, Robert Gibbs, Jon Schleyer, Kirsty Taylor, Charles Sheppard

Reefs at Risk Revisited Workshop

The World Resources Institute (WRI), in collaboration with the International Coral Reef Action Network (ICRAN), hosted a workshop on the Reefs at Risk Revisited project immediately before the International Marine Conservation Congress in Fairfax, Virginia, USA, on 19 May 2009. As described in *Reef Encounter* 37, January 2009, ISRS is acting as scientific advisor to this project.

The workshop brought together 29 representatives from government agencies, non-governmental organizations, regional organizations, universities, and consultancies. Preliminary results from modelling local threats to reefs (land pollution, marine pollution, overfishing, and coastal development), and climate-related threats (past thermal stress, future thermal stress, and ocean acidification) were presented and ways to improve the indicators of these threats were discussed.

For local threats, participants recommended additions to the maps using data such as:

- Tourism centres (e.g. indicated by hotel capacity) and cruise ship visitation;
- Areas of recent/rapid development visible from satellite imagery;
- Use of fertilizer on agricultural lands;
- Dams that act as sediment traps and, conversely, mangroves that reduce sediment and nutrient delivery;
- MPAs rated as having effective management that could indicate places where threats from overfishing and destructive fishing are reduced; and
- Integrated coastal zone management (ICZM) efforts that could show where threats from coastal development have been lessened.

Individual threat indicators need to be validated using observational data (such as observed chlorophyll and sediment plumes for SeaWIFS for watershed-based threat, and data on fishing pressure from Reef Check, AGRRA, REEF, and PROCFish for overfishing). The overall Reefs at Risk (R@R) threat index will be validated against the coral reef condition index.

For climate-related threats, the indicators of past thermal stress, developed by NOAA, will be revised to include only the past 10 years of Pathfinder data and the threshold for coral bleaching will incorporate historical temperature variability. The newest publications and data sets on ocean acidification will be reviewed for comparison with the data from Cao and Caldeira (2008).

UNEP-WCMC will acquire and integrate additional sources of reef data to produce a more accurate, higher resolution global map of reefs that will be validated by partners. Workshop participants supported the concept of including an index of coral condition that integrates information on live hard coral cover, fleshy macroalgae, and level of overfishing, and a small working group will refine this index. Participants highlighted the importance of translating the final report into many languages. 'Reef stories' about threatened reefs and 'signs of promise' will be included and will range from peer-reviewed literature to 'voices of the community', all of which will be validated through third-party review.

For further information, contact Lauretta Burke, lauretta@wri.org

First Eco-health Report Card for the Mesoamerican Reef

In late 2008, the 'Healthy Reefs for Healthy People Initiative' launched the first MAR Eco-health Report Card for the Mesoamerican Reef, which provides an easy-to-understand overview of reef ecosystem condition and stewardship. It uses a five-point grading system, from 'very good' to 'critical', for seven reef indicators, which are then combined to form an Integrated

Reef Health Index – a "Dow Jones" style index for coral reefs.

The Report Card for 2008 is the first comprehensive health assessment of 326 reefs in the Mesoamerican Reef Ecosystem (MAR). Data were collected in 2006 through the Nature Conservancy / World Wildlife Fund Rapid Reef Assessment, with the participation of many local and international organizations. Most reefs are in poor to fair condition. The Report Card gives an overall picture of a reef in danger, in need of immediate protection, where collective efforts at management have not produced very encouraging results. At the same time, there are some elements in good condition and others that could readily be improved through better management choices. The Report Card clearly signals the urgency of stronger actions to protect our reef.

Report Cards will be produced every other year through the Healthy Reefs for Healthy people Initiative. See www.healthyreef.org to download the report card and watch the "Wanted: Healthy Reefs" video.

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Dynamite fishing in Tanzania

There are some countries where coral reefs face even more immediate threats than global warming. Tanzania is sadly one. It is one of the few countries left where dynamite fishing still occurs on a large scale. This devastating form of fishing first surfaced in the 1960s and by the mid-1990s had become a serious problem. A high profile national campaign involving local initiatives, hotel operators and the media, brought international attention to the issue and the Navy was enlisted to assist with enforcement. For a few years between 1997 and 2003 blasting was rare and, when it did start up, it was relatively quickly halted.

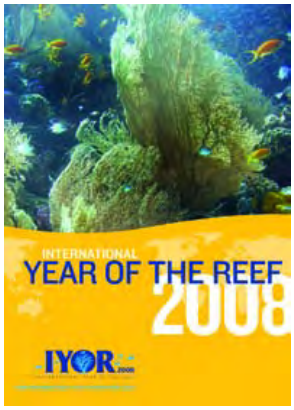
But since 2003, dynamite fishing has returned with increasing vengeance, despite the strenuous efforts of a range of organisations and individuals. The dynamiters are individuals who are generally known to the communities and to local government, and blacklists have been handed over to the authorities in Tanga, Dar es Salaam and Mtwara. Adequate legislation and prosecution procedures exist on paper. Responsibility for enforcement lies with the Fisheries Division and the District officers. A mechanism for involvement of villagers in fisheries management has been established for several years. Patrol boats and basic enforcement equipment are available, and the improvements that are needed to the patrols and to the judicial processes are known. Many, if not most, of the villagers would like to see an end to dynamite fishing. Funding should not be a problem as the US$63 million World Bank and GEF funded Marine and Coastal Environment Management Project (MACEMP), supports the Fisheries Department and local authorities.

Dynamite fishing

In December 2007, at a meeting hosted by the Ministry of Natural Resources and Tourism, and attended by senior national and local government officers, a resolution to adopt a zero tolerance policy against dynamite fishing was passed with extensive media coverage nationally. But this was never implemented. The Tanzanian Dynamite Fishing Monitoring Network, a voluntary network of marine conservationists and the private tourism and fisheries sector, has been collecting records of blasting since 2004 and has a depressing set of evidence. Reports by tourists when they return back home of unpleasant experiences when they have heard blasting while diving, is damaging Tanzania's image as a popular diving destination, although fortunately at some locations the reefs are still pristine.

If dynamite fishing was halted in the 1990s, with far fewer resources, it should certainly be possible now. Political will within country is perhaps the fundamental issue – but there is also need for much greater pressure from the donors, the international NGOs that support conservation work in Tanzania, and the international community as a whole.

International Year of the Reef 2008 (IYOR 2008)



The first IYOR took place in 1997 and was a global effort to raise awareness and understanding of coral reefs and the threats they face and to support related conservation, research, and management efforts. Despite its success, ten years later, there was still an urgent need to increase awareness further and to take action to conserve and manage coral reefs and associated ecosystems. The International Coral Reef Initiative (ICRI) and its members therefore designated 2008 as the International Year of the Reef (2008). The aim was to communicate to disparate audiences the value and importance of the world's coral reefs and the threats to their sustainability and to motivate these audiences to take action to protect coral reefs.

Two thirds (67) of the countries and territories in the world with reefs took part. Over 630 events took place, including 287 festivals, fairs, dive shows and exhibits, 243 workshops and seminars, 61 clean ups and reef-surveys, and 45 competitions. 15 videos were produced and the logo was translated into 12 languages. A few examples are given here:

In the USA, NOAA, the National Fish and Wildlife Foundation, the UrbanArts Institute at Mass College of Art, and other marine and ocean conservation NGOs supported the production and distribution of a series of 30-second television public service announcements on ocean and coral reef issues.

Telmex, the largest telecommunication company in Latin America, released three telephone cards with pictures of reefs on them. The cards were distributed widely all over Mexico.

Following an invitation from Governor Togiola Tulafono of American Samoa, the world-renowned ocean and wildlife artist and muralist Wyland painted a marine life mural at the Executive Office Building in Utulei.

Several schools in Australia offered students a graduation pack (comprising a class/group photo with a personalized graduation certificate for each student) featuring IYOR and list of things they can do to save coral reefs.

The Brazilian Coral Reef Exhibition consisted of 14 posters describing a range of Brazilian projects, and giving information on ecosystems associated with reefs such as mangroves, coral reef research, and a map showing important coral reef sites. The exhibition went to 16 locations on the Brazilian coast and was visited by many students and tourists.

AWARE Kids ran a global competition for children aged 3–12 years. 1400 children entered their artwork and conservation messages on the theme "Celebrate the Reef – Every Act Counts". *Poster by Vance, aged 12, from the Philippines, winner of the IYOR 2008 Art Contest.*

Information extracted from *The International Year of the Reef: the year in Review* compiled by Francis Staub, IYOR Co-ordinator, www.iyor.org

OBITUARIES

Kiyoshi Yamazato Ph.D. 1930–2009

Kiyoshi Yamazato made major contributions to coral reef science and education at both national and international scales. As one of the founders of the Japanese Coral Reef Society (JCRS), he served as chairman from its beginning in 1997 until 2005, and in 2004 was the chairman of the Local Organizing Committee of the 10th ICRS held in Okinawa. He contributed to the establishment of Sesoko Station, Tropical Biosphere Research Center at the University of the Ryukyus (UR) and, largely due to his strenuous efforts combined with his global network of reef scientists, this has become one of the world's top reef research centres, visited by researchers from around the world such as Drs Glynn, Loya, Kinzie, Titlyanov, Benayahu, Chou, and Richmond.

Kiyoshi Yamazato was born on Kume-jima Island, Okinawa, on 2nd June 1930. He obtained his Master's degree from the Zoology Department of Michigan University in 1957. He attended a summer course held at Hopkins Marine Station, with Dr Glynn as a lecturer, and there learned about the biology of corals for the first time, even though he had grown up on coral reef islands. Kiyoshi received his Ph.D. from the University of Hawaii in 1966, with a dissertation entitled 'Calcification in a solitary coral, *Fungia scutaria* Lamarck in relation to environmental factors'. On returning to Okinawa he worked on *Acanthaster* infestation and subsequently was one of the first researchers to report on the coral bleaching phenomenon. His main interests were life history and eco-physiology of corals, and in particular the reproductive biology of corals.

Kiyoshi taught coral reef biology and invertebrate zoology at UR for over 30 years, establishing the Special Graduate Programme in Marine Science for students from Asian and Pacific countries, and supervising many of them including Professor Thamasak Yeemin, who called Kiyoshi "Oto-san" (Father).

In the 1980s, he organized an international collaborative research project between UR and Chulalongkorn University to look at the coral communities of the Gulf

of Thailand. The main focus was to determine why the coral assemblages of the Sichang Islands had developed on non-reef substrates, when coral reefs should have been expected to develop in such a tropical zone. In 1991, Kiyoshi published his book *Biology of Corals* which is still the only textbook on coral biology written in Japanese. His last paper, co-authored with students from Indonesia and Bangladesh, was on the reproductive cycle of brooding corals at high latitude, and was written as a JCRS award paper, when he received the first JCRS Prize in 2007 for his great contribution to coral reef studies and education.

To demonstrate the important role that Kiyoshi played in the coral scientist community, JCRS is planning to publish a special issue of *Galaxea*, the journal of JCRS, that will be dedicated to Kiyoshi Yamazato. It will include 27 papers, with 18 from non-Japanese researchers who had close relationships with Kiyoshi. Coral researchers and scientists from all over the world will sadly miss Kiyoshi.

Michio Hidaka,
University of the Ryukus, Japan

Gray Multer, Ph.D. 1926–2008

Gray Multer was among the most focused and active members of ISRS in its early days and was indefatigable once elected to the Council. It was Gray who shepherded in the ISRS scholarship program that has subsequently funded research for graduate students and provided travel assistance to scientific meetings for many others (see *Reef Encounter* 37). He was made an Honorary Member in his later years.

But his work for ISRS was only one part of his multifaceted life. Gray's academic career started at Syracuse University where he earned A.B. and M.S. degrees in geology. He then worked with Texaco for two years, before returning to graduate school and receiving his PhD from Ohio State University. This led to a 30-year career as a teacher, mentor and valued colleague, starting at Wooster College, where he developed his passion for supporting undergraduates in their research.

Gray began his studies of coral reefs and carbonate rocks in the Florida Keys, spending summers working with Edward Hoffmeister of the University of Miami. In addition to pioneering work on the origin of the limestone of the fossil reef of Key Largo, Gray undertook early studies of coral growth rates with Gene Shinn, and eventually systematically cored the whole Florida Keys reef tract. With Hoffmeister, he studied the origin of caliche, the laminated reddish brown crust that blankets the Florida Keys, research that was critical in working out the stratigraphy and history of sea level fluctuations in Florida and the Bahamas.

However, perhaps his greatest contribution was the

construction of the West Indies Laboratory (WIL) on St. Croix in the U.S. Virgin Islands, for which he was recruited in the late 1960s by Fairleigh Dickinson University where he had been working since 1969. He directed every detail of the construction of this innovative facility and established a teaching and research programme which integrated undergraduate education and practical field research, developing a close-knit community of undergraduate, graduate and professional researchers from across the globe that foreshadowed programs like NSF's Research Experience for Undergraduates (REU) and off-campus, experience-based programmes that are now mainstays of many undergraduate institutions. He poured his energy into inspiring and mentoring his young faculty and their students, recruiting newly minted Ph.D.s, including John Ogden, William and Betsy Gladfelter, and Dennis Hubbard. Gradually the WIL grew into one of the finest research stations in the Caribbean, until it was tragically destroyed by Hurricane Hugo in 1989 and never re-built.

The sea was fundamental to Gray's being. He survived as a teenage sailor on the bridge of a destroyer in the horrific last Pacific island battle of Okinawa, and was medically discharged from the U.S. Navy. He worked his way up to captain of his Westsail 32 Planktos, a boat he built from the keel up and sailed throughout the Atlantic and Caribbean. Gene Shinn recalls Gray arriving "by sailboat" in the late 1950s in Miami. In later life, his love of the sea and "all-things-carbonate" triggered his move with Planktos to Antigua. Here, he and his wife, Susan, attracted friends, students and colleagues to participate in an array of research projects including reef coring, local anthropology and study of the ancient carbonate origins of the island. He would have liked to do much more sailing, wistfully musing while gazing at the Pacific at the 1996 ISRS that he probably wouldn't be able to sail out there after all.

Throughout his career, Gray was committed to informing the general public about the geological evolution of the earth, and particularly about coral reefs. He developed what are now famous guidebooks and map/brochures about the Florida Keys, the Virgin Islands, and Antigua. Most recently, he and Susan became community activists, championing until his death, causes that ran the gamut of environmental reform to voting security. All those who were the beneficiaries of his myriad kindnesses and gestures, ideas and teachings, through students, colleagues and organizations will remember him by the careers and achievements that he lovingly, inspired and aspired for us. Sailor, mentor, valued colleague – he will be greatly missed. "Hail Key Largo", old friend.

Denny Hubbard, John Ogden and Gene Shinn

MEETINGS

Systematics and evolution of scleractinian corals

Scleractinian coral systematics is in the middle of a revolution, a result of advances in molecular systematics and in the microscopic technology used for extracting morphologic information. New research[1] has shown that the majority of taxa at the suborder and family level are polyphyletic. From June 15–19, 2009, the Scleractinia Working Group (SWG) convened a 5-day workshop entitled *Systematics and evolution of scleractinian corals* at the National Museum of Natural History Museum of the Smithsonian Institution in Washington DC. The main goal of the workshop was to develop a strategy for revising the traditional phylogeny and classification system for Scleractinia and creating a new taxonomic synthesis, which integrates morphologic and molecular data. The synthesis will replace out-dated systems currently used in marine ecology, conservation biology, and paleontology.

The workshop was sponsored by the Encyclopedia of Life (EOL), with additional support from the Treatise on Invertebrate Paleontology (TIP), and led by Ann Budd, Stephen Cairns, and Nancy Knowlton. The twenty-six participants (18 professionals, three postdocs, five graduate students) consisted of marine biologists and paleontologists based in ten countries (Australia, France, Italy, Jamaica, Japan, Netherlands, Poland, Taiwan, U.K., U.S.A.), and included both taxonomic experts and those skilled in modern systematics techniques. SWG is currently engaged in three community database projects:

1. **Corallosphere** (www.corallosphere.org), led by Ken Johnson. Corallosphere is a publically-accessible taxonomic database containing >1600 fossil and modern genera. It provides a dynamic central system for collecting, editing, and disseminating data and images. All data and images are first entered into Corallosphere before they are shared with other databases.
2. **Scleractinian volumes of the Treatise on Invertebrate Paleontology** (paleo.ku.edu/treatise), led by Jarek Stolarski. These volumes will be part of a printed series of volumes published by the Paleontological Institute, University of Kansas; recent volumes are available online as downloadable chapters and a searchable database. The series synthesizes taxonomic information about all known invertebrate fossil genera.
3. **Encyclopedia of Life** (www.eol.org). EOL is a web-based species-level database covering all living organisms (~1.8 million known species) on Earth. The classification system adopted in Corallosphere is being shared with EOL.

After giving individual talks, participants divided into more focused taxonomic break-out groups, which each addressed different clades in the molecular phylogeny. A number of different morphologic characters that are potentially diagnostic of these clades were evaluated, but several seemed to provide more noise than phylogenetic signal. Problems identified with morphologic characters include: (a) the plethora of existing terms, (b) the lack of homology in character definition, (c) the relative newness of micromorphologic and microstructural characters and lack of usage and rigorous definition, and (d) the need for character weighting. In addition, several unresolved issues in the molecular analyses were discussed.

SWG agreed that existing classification systems for scleractinians are inadequate, and a revised system that better reflects new molecular results needs to be adopted as soon as possible. A detailed report is available for downloading from the Corallosphere website.

Nancy Budd, Department of Geoscience,
The University of Iowa, Iowa City, IA 52242. USA

Reference

1. Fukami, H, C. A. Chen, A. F. Budd, A. Collins, C. Wallace, Y.-Y. Chuang, C. Chen, C.-F. Dai, K. Iwao, C. Sheppard, N. Knowlton . 2008. Mitochondrial and nuclear genes suggest that stony corals are monophyletic but most families of stony corals are not (Order Scleractinia, Class Anthozoa, Phylum Cnidaria). *PLoS One* 3(9): e3222(1-9).

EOL Workshop

Sea Cucumbers in the Western Indian Ocean

In the Western Indian Ocean, sea cucumbers are primarily harvested from shallow reefs, in an artisanal fishery that has been active for many decades. However, the information on stocks, biology and ecology of the species involved that is crucial for management is lacking. Given the importance of this fishery and indications of overexploitation in some countries, the Western Indian Ocean Marine Science Association (WIOMSA) through its Marine Science for Management (MASMA) programme provided funding for a Regional Sea Cucumber project. Scientists from the Wildlife Conservation Society, the Universities of Reunion, Dar-es-Salaam, Stockholm and IH-SM in Madagascar, the Kenya Marine & Fisheries Research Institute and the Seychelles Fishing Authority established a multi-disciplinary team to carry out the work.

The project included studies on stocks and species distribution patterns, the impacts of marine protected areas on commercial populations, the reproductive biology of key commercial species, the socio-economics and management of the fishery and training in taxonomy and management of the fishery. A regional review1 was undertaken and a regional workshop was then organized in October 2008 in Mombasa, Kenya to disseminate the findings of the various studies. Each participating country has carried out a comprehensive species inventory, and information is now available on the reproductive biology of four commercial species (*Holothuria scabra, H. fuscogilva, H. notabilis, Actinopyga echinites and Stichopus horrens*) as well as on densities and distribution and size at sexual maturity. These data will be important for setting fisheries guidelines, and socio-economic profiles of the fishing communities will help to target alternative livelihood interventions.

Sea cucumbers

Prof. Chantal Conand, University of Reunion, and Dr. Nyawira Muthiga of the Wildlife Conservation Society Marine Program, the Principal Investigators for the project, acknowledge MASMA and all collaborators for their support.

Nyawira Muthiga, Wildlife Conservation Society, Mombasa, Kenya

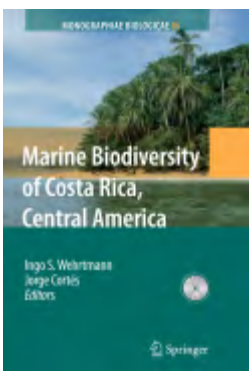
Selected references

1. Conand C, Muthiga N (eds). 2007. Commercial sea cucumbers: a review for the Western Indian Ocean. *WIOMSA Book Series No. 5*; pp. v + 63.
2. Conand, C. 2008. Population status, fisheries and trade of sea cucumbers in Africa and Indian Ocean. In: Toral-Granda, V., Lovatelli, A., Vasconcellos, M. (eds) Sea cucumbers: a global review on fishery and trade. *FAO Fisheries Technical Paper* 516: 153–205.
3. De la Torre-Castro M., Ochiewo J., Kithakeni Mbaga T. and Pinault M. 2007. A framework for addressing socio-economics and management aspects of the sea cucumber resources in the Western Indian Ocean considering multiple scales. *SPC Bêche de mer Information Bulletin* 25: 12–17.

BOOK REVIEWS

Marine Biodiversity of Costa Rica, Central America

Ingo S. Wehrtmann and Jorge Cortés (Editors), 2009
Springer. ISBN 978-1-4020-8277-1 (hardback)



Good news for science and conservation oriented fans of the tropical marine environment! The ultimate bioscience book on Costa Rica's marine life has now been published. Well-known marine scientists Wehrtmann and Cortés have done a tremendous job in assembling a comprehensive volume on the past and present of the biological diversity of coastal and marine species, communities and habitats in this environmentally blessed country. The book comes with a nice Foreword by Oscar Arias Sánchez, former Nobel Peace Prize winner and currently President of the Republic of Costa Rica, for a second time. As Arias correctly states in his preface, many of Costa Rica's diverse habitats lie mostly underwater and harbour a vast world of submarine flora and fauna most of us can hardly imagine. Luckily, Wehrtmann and Cortés have now compileda first-ever overview of the existing knowledge on species and ecosystems thriving in this country's coastal and marine waters. It is a must for all involved or just interested in tropical marine science, resource use and management, and conservation.

Costa Rica, bordering Nicaragua in the northwest and Panama in the southeast, forms part of today's Central American land bridge separating the Caribbean Sea clearly point out, the emergence of this isthmus millions from the Pacific Ocean. As Wehrtmann and

Cortés of years ago split marine populations, resulting in speciation and extinction while facilitating the evolution of trans-isthmian sister species. At present, Costa Rica's marine area, which includes its Territorial Seas and Exclusive Economic Zones (EEZ), is more than ten times larger than its landmass, mainly as a result of its 200 mile zone on the Pacific coast and the 200 miles around the oceanic Cocos Island in the Pacific Ocean. A surprising detail in this context is that the country has shared marine borders with both Colombia and Ecuador.

The book provides a fantastic overview of all marine taxonomic groups that can be found along the beaches, on the mudflats, in the mangroves, among the sea grasses, at the coral reefs, and in the deep sea environments of the Pacific Ocean and Caribbean Sea. Detailed accounts by a variety of Costa Rican and international authors are provided for such diverse groups as phytoplankton, benthic algae, foraminifera, sponges, zoanthids, octocorals, sipunculans, stomatopods, decapod crustaceans, cumaceans, barnacles, copepods, gastropods, opisthobranchs, marine fish –and their parasites! –, reptiles, amphibians, mammals, and many other species groups. A true feast for both the fanatic systematist and the sea exploring amateur!

The last chapter – and perhaps one of the most important sections of the book– deals with future perspectives for marine biodiversity research in Costa Rica. It concludes that this country's biodiversity includes almost 6,800 marine species, corresponding to about 3.5% of all marine species reported worldwide until today, thus making it one of the richest countries globally. Twice as many species are reported for the Pacific (4,745 species) when compared to the seas and shores of the Caribbean (2,321 species). Only some 288 species are shared between both coasts and oceans, while only 85 species result to be endemic for Costa Rica, with 40% of these endemics occurring around Cocos Island in the Pacific Ocean.

The book ends with a good systematic index of topics dealt with, but, unfortunately, it does not include an index of taxonomic names down to species level. Having an hierarchical overview of the taxonomic groups and the scientific names of their orders, families, genera and species, would have helped the reader better understand the scope and breadth of the biological diversity still to be found in the tropical salty waters of Costa Rica.

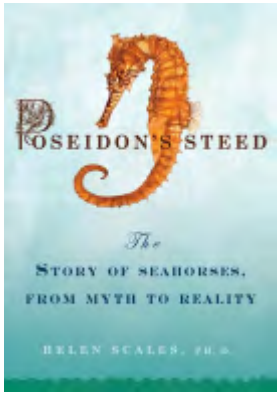
Furthermore, the editors and authors do not pay a lot of attention to the many threats affecting the diversity of species groups and habitats, such as industrial and artisanal overfishing, sea temperature rise, sea level rise, coastal development (for recreational purposes), and pollution, among others. It will be key to understand these threats – that is, both the stresses and the sources of stress – that negatively impact the marine biodiversity of this and neighboring countries, in order to be able to develop strategies, involving local, national, and regional stakeholders, that abate and mitigate those stresses and help increase species population viability and ecological integrity of key systems like reefs and mangrove forests. Hopefully, the scholars involved in this mega-project will be able to focus on these matters in another volume, as it would then complement this key work on the biodiversity of Costa Rica's marine habitats and species.

Finally, while reiterating Arias' words in his preface, we have to recognize that Wehrtmann's and Cortés' volume provides us with a wealth of knowledge that helps underscore the urgency to save the country's marine wonders, as it will be crucial for the future well-being of the peoples in this diverse country, and beyond. As the editors state in the last chapter, it is their hope that this book may promote awareness and interest for the marine biodiversity of Costa Rica and the Central American region. I am sure their hope is not in vain and will ultimately advance marine research and trigger coastal-marine conservation in this biologically critical part of the world.

Maarten Kappelle, University of Tennessee at Knoxville, USA,
and The Nature Conservancy (TNC), Costa Rica

Poseidon's Steed: The Story of Seahorses, from Myth to Reality

Helen Scales 2009
Gotham Books, Penguin Group (USA).
ISBN 978-1-59240-474-2.



This comprehensive book on seahorse natural history covers a diverse range of topics, including mythology, biology, the global seahorse trade, fisheries, aquaria, and conservation.

Two introductory chapters set the scene, initially outlining man's preoccupation with seahorses from Australian aboriginal cave paintings, to Greek mythology, Pictish art in the Scottish Orkney Islands and a scandal involving a golden winged seahorse unearthed from a Turkish tomb. In the second chapter, we are introduced to the Synagathidae family, including pipefish and seadragons (these flouncy fish are like seahorses that were invited to a fancy dress party and made an extra special effort with their costumes). While retaining a charismatic ability to entertain, this scientific turn covers anatomy, mating rituals and evolutionary development to teach us what seahorses are, why they look the way they do and where they have come from.

A conservation theme links chapters three to five. The plight of seahorses is uncovered, including the global trade in live and dead specimens driven by their use as ingredients in Traditional Chinese Medicine. This has expanded into contemporary markets in pre-packaged herbal remedies to treat a bizarre array of ailments, including impotence and limb debility. Topics more

familiar to the reef scientist are covered in Chapter four, which examines the integrated conservation model pioneered by Project Seahorse in the Philippines at Danajon Bank. We learn the story of the Handumon fishermen, who established a marine sanctuary in response to destructive fishing practices, such as trawling and dynamite fishing, while also following seahorse trade routes and considering alternative sources of livelihood. It is an original example of how the needs of a single species give rise to a holistic, inclusive approach that benefits broader conservation, as Scales neatly puts it: "to save seahorses, you need to save the seas, or if you like, the other way round".

In answering the final question- does it really matter if seahorses are there or not? - the importance of these creatures is succinctly captured. Scientifically, they offer unique insights into life in the sea, fishermen, traders, aquarium keepers and medicine makers are reliant on them, they inspire us to care about the natural world and, perhaps the key incentive for this book, the intrinsic appeal they make to our imaginations through their strange design and habits is considerable.

This is a valuable information source on seahorses. Of practical interest is the guidance on how to spot a seahorse, something Scales, a keen scuba diver, is well practiced at. Beyond that, her thoroughness, grasp of detail and surefootedness in covering a diverse range of material is impressive. There are close to 200 references in the bibliography. While retaining a strong seahorse focus throughout, it generates insight on general themes, such as ecology and conservation, with a thought-provoking text organised around key research questions (what makes seahorse males male? How many species are there? And more importantly, why does it matter?). Very few texts take an organism-led perspective on issues pertinent to reef systems. While you might never stop looking for them in the wild, this readable and original book provides the opportunity to uncover a wealth of interesting truths about seahorses.

Sarah Hamylton, Cambridge Coastal Research Unit, Dept of Geography, University of Cambridge, Cambridge, UK

Bookshelf

Quarternary coral reef systems. history, development processes and controlling factors. *Developments in Marine Geology* Vol 5

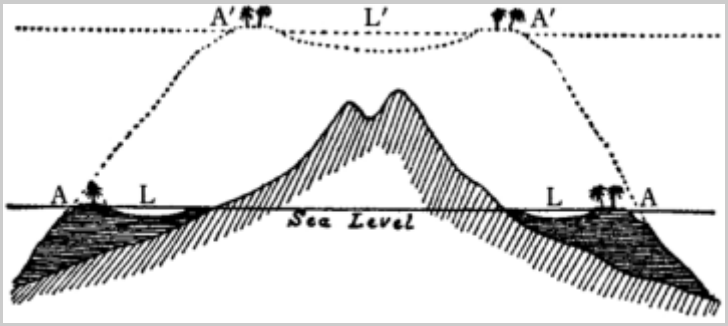
Lucien Montaggioni, University of Provence, Marseille, France; Colin Braithwaite, University of Glasgow, Scotland, U.K. 2009.

Elsevier, ISBN-13: 978-0-444-53247-3; 550 pp.

This volume presents state-of-the art knowledge about Recent coral reefs (1.8 million to a few centuries old) gained since the eighties, and introduces geologists, oceanographers and environmentalists to sedimentological and paleoecological studies of this ecosystem. Scleractinian reefs first appeared about 300 million years ago. Today coral reef systems provide some of the most sensitive gauges of environmental change, expressing the complex interplay of chemical, physical, geological and biological factors.

The topics covered include the evolutionary history of reef systems and some of the main reef builders since the Cenozoic, the effects of biological and environmental forces on the zonation of reef systems, the distribution of reef organisms and reef community dynamics through time, changes in the geometry, anatomy and stratigraphy of reef bodies and systems in relation to changes in sea level and tectonics, the distribution patterns of sedimentary (framework or detrital) facies in relation to those of biological communities, the modes and rates of reef accretion (progradation, aggradation versus backstepping; coral growth versus reef growth), the hydrodynamic forces controlling water circulation through reef structures and their relationship to early diagenetic processes, the major diagenetic processes affecting reef bodies through time (replacement and diddolution, dolomitization, phosphatogenesis), and the record of-climate change provided by both individual coral colonies and reef systems over the Quaternary.

Darwin was right



Darwin's diagram

For years, the formation of coral reefs, especially the extraordinary loop-shaped form of atolls, had puzzled European naturalists and seamen alike. Charles Darwin was not the first person to account for all their different forms in one unifying theory, but his subsidence theory (shown here in his original published version, from the first edition of his book, *The structure and distribution of coral reefs*, 1842) was so elegant and plausible that for a time at least, he simply swept away all other competing ideas. Darwin's various reef encounters were brief, and came during his time on HMS Beagle, at Bahia in Brazil, in the atolls of Tahiti and elsewhere in the South Pacific, at Mauritius, but most importantly, late on in the voyage at Cocos-Keeling, in the eastern Indian Ocean. Here he spent just 10 days surveying the reef and collecting specimens (now held at the Natural History Museum in London). Most remarkably however, he had already formulated his theory before he reached either Tahiti or Cocos Keeling, and it was only a very late decision by Captain FitzRoy, to call at Cocos-Keeling.

In 1976 a group of us (a subset of the Enewetak coral taxonomy workshop) rediscovered the USGS E1 borehole site (1952) on Medren [Parry] Island, Enewetak Atoll, in the northern Marshalls, Pacific Ocean. This is the borehole which first proved Charles Darwin's prediction (1835, 1837, 1842) that oceanic coral atolls are founded on subsiding volcanic foundations. I hastily made this temporary plaque ("Darwin was right!") to mark the occasion.

L-R, back row: Paul Jokiel, Michel Pichon, Austin Lamberts.

L-R front row: Dick Randall, John Wells, self (Brian Rosen), Bill Morgan.

Brian Rosen, Department of Zoology, The Natural History Museum, Cromwell Road, London SW7 5BD, Great Britain. Tel: +44 (0)20 7942 5584; Fax: +44 (0)20 7942 5054; E-mail: B.Rosen@nhm.ac.uk

Bronze sculpture in Christ's College garden, created by Anthony Smith to celebrate the bicentenary of Darwin's birth, 12 February 2009. Darwin is depicted as a twenty-two year old (in May 1831) during his final year at the college. The books shown with him include Alexander von Humboldt's Personal Narrative *which triggered Darwin's desire to travel and observe the geology and natural history of remote places.*

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