Caribbean Marine Science

Official Newsletter of the AMLC
Number 1, March 2006 Published Spring and Fall

Contents

Association News

From the Editors' desk

Our greetings to all the AMLC members. We begin by extending our thanks to Anthony Knap and the Bermuda Biological Research Station for their kind invitation and organization of our forthcoming Executive Board Meeting. A short laboratory profile is presented below for your information and if you want more detailed information, please go to their website.

This issue is mostly concentrated on providing information for several interesting courses in many different areas during this Summer and Fall, of this year. There are also some opportunities in Australia for next year.

Proceedings of the Curacao Meeting

The proceeding from our previous Scientific Meeting in Curacao will be printed before the end of the year. All manuscripts have been reviewed and sent back to authors and they are supposed to be back in the hands of Dr. Norman Quinn, chair of the guest editors by May 15th, 2006. We would also like to express our gratitude to Dr. Norman Quinn and all the guess editors who helped in reviewing and moving the reviews of all the c contributions submitted for the Proceedings of the Curacao Meeting. It is now in the hands of Dr. Jorge Cortés and the Revista to publish this issue hopefully, before our next scientific meeting in the Virgin Islands.

Future Meetings of the AMLC

2006 - Executive Board Meeting – Hosted by the Bermuda Biological Station in Bermuda, from June 15-17.

2007 - Scientific Meeting – Hosted by Rick Nemeth and the University of the Virgin Island in St. Thomas from July 9 - 13. Dr. Rita Colwell, former director of the U.S. National Science Foundation is scheduled to be our Keynote Speaker. Dr. Colwell served NSF for several years, having been appointed by President Bill Clinton, and she is certain to provide us with new and interesting insights into the future of science in our region.

2008 - The Executive Board Meeting will be concurrent with the 11th International Coral Reef Symposium, hosted by NOVA University in Ft. Lauderdale, USA.

2009 - Scientific Meeting – Hosted by Clare Morrall of the St. George's University Department of Marine Biology. The Executive Board enjoyed its 2005 meeting in Grenada so much that it prevailed upon Clare to host this Scientific Meeting so all our members may enjoy Grenadian hospitality.

AMLC List Server and Web Site

The purpose of these list servers is to facilitate communication and foster collaboration between and among our members. We recently found it advantageous to transfer our list server operation from the FIU server to the AMLC server. You should have received a notice by e-mail. We hope all AMLC members will take advantage of this new capability – if you have any news, requests, or questions to distribute to the membership, just send a message to the email address below. On-line discussions among members concerning Caribbean marine issues are encouraged. Don't be shy! The NEW list server addresses are:

members@lists.amlc-carib.org

Only AMLC members in good standing can post to the list. Messages not from a subscribed member will not be posted. Current AMLC members are automatically subscribed, and new members are added as they join AMLC. The newsletter will be circulated electronically through our list server, which insures delivery and that only paid members are in our mailing list.

The Executive Board is grateful and thanks our Treasurer, Laurie Richardson, for getting the AMLC list server service implemented. We also wish to express our appreciation to David Nagle, our new Information Officer, for transferring the service to the AMLC server. This is a valuable resource for all of us if we make use of it.

We have a new web site located at www.amlc-carib.org. If you forget the URL, just do a Google search on "AMLC" and it will magically appear! Again, we owe a large debt of gratitude to David Nagle, our new Information Officer. David has volunteered a great deal of time and energy to establish and maintain our new website. There is still more to do, but steady progress is being made. Thank you, David!

Once again, we request contributions for the Newsletter from our members and readers. We have a very diverse membership involved in many different areas of research. Your Newsletter is an efficient way of sharing information about your projects, or even better, finding help or cooperation from other members of the Association.

Ernesto Weil and Isabel Urreiztieta, Editors. Steve Legore Associate editor.

Profile

Bermuda Biological Station for Research

The Bermuda Biological Station for Research (BBSR) is a U.S. non-profit research and educational institution covering all facets of marine science, including coral reef ecology, blue-water oceanography, and the connections between ocean health and human health.

Mission

BBSR conducts world class science and education from its unique mid-Atlantic location. We seek to improve society's understanding of marine ecosystems, ocean/atmospheric interactions and ocean health, and their influence on man's habitat and health. BBSR, an independent U.S. non-profit research organization and Bermuda Registered Charity, provides well-equipped facilities for scientists and students from Bermuda and around the world.

Ideal Location

Bermuda's mid-Atlantic location makes it an ideal place to study the environment for scientists and students from around the globe. The unique marine habitat around Bermuda includes elements of both northern and southern Atlantic fauna and flora, with northerly incursions of reef-building corals and mangroves. Because of Bermuda's small size and mild climate, a great variety of habitats, including deep ocean water depths of over 12,000 feet, are readily accessible throughout the year with a minimum of effort.

Rich History

In 1896, the idea of establishing a station in Bermuda for research in biology and zoology was first considered. In 1903, by agreement between scientists from Harvard University, New York University and the Bermuda Natural History Society, BBSR was established. BBSR was incorporated in New York in 1926 as a U.S. not-for-profit organization. In 1932, the Bermuda Government and the Rockefeller Foundation joined forces to provide facilities and a modest endowment, and BBSR opened at its present location. During these early years, BBSR was primarily a summer operation, used by university professors and their students from the United States.

After the Second World War, BBSR became a year-round research center, starting in 1954 with the establishment of Hydrostation "S": regular, repeated deep-sea observations that continue today, creating the longest continuous oceanic database in the world. Over the next few decades, increasing numbers of visiting scientists brought an increased emphasis on biological and geological studies. The Bermuda Government established a monitoring program of Bermuda's inshore waters and marine communities which continues today.

Resident scientific programs strengthened in the 1980s as BBSR became a key link in an international effort to describe and understand the ocean/atmosphere system on a global scale. BBSR is now one of two U.S. centers for time-series studies on temporal variability in the ocean and the impact of the ocean on global climate change, under the auspices of the Joint Global Ocean Flux Study.

In 1998, BBSR established the International Center for Ocean and Human Health, considered the first of its kind on an international scale to explore the ocean health/human health connection. In 1999, BBSR established the Center for Integrated Ocean Observations, which uses new technologies to build on almost a century of marine research at BBSR.
I've attached the description of BBSR in Word format. The links below to our latest annual report and issue of Currents should provide you with most additional info you might need. Please let me know if you have any other questions.

For more information log into:
Annual Report: <http://www.bbsr.edu/ar04.pdf>
Currents: <http://www.bbsr.edu/cf05.pdf>

The Bermuda Biological Research Statation

General Interest

No more seafood??

Greetings from Labasa in the Fiji Islands (Pacific), writes Father Api; I thank you and feel very moved to hear the stories about the Haida Nation and the British Virgin Islands. Fiji is now putting a lot of its effort into tourism. We have been warned about this recently by the University of the South Pacific. I really believe the land owners who allow their seashore to be built up with hotels and resorts must be made aware of the danger of sewage pollution and advised how to act to protect their environments. I come from a village opposite a hotel. One problem we are faced with is the sea that runs between the village and the hotel has stopped providing us with fresh sea food. Something has happened and I believe it's something to do with the hotel. Fiji needs to be careful now, or else it will be too late.

For other islands, it may already be too late. Thomas Goreau writes from Jamaica (Caribbean): Since early childhood, I watched all the reefs of Jamaica killed by algae whose uncontrolled growth was caused by

untreated sewage. Waves of algae spread outwards from all the sewage sources over a period of 40 years, as each part of the coast was developed, until all of our reefs were smothered. Foreign experts came afterwards, did superficial studies, and blamed the fishermen instead of sewage! The result of their wrong diagnosis, based on faulty science and ignorance of local environmental history, are proposals that cannot possibly work. They advise to create marine protected areas and stop people from fishing and then the corals and fish will thrive.

Yet these protected areas are full of dead and dying corals and the algae have not vanished! In fact, the only way to get rid of algae is to starve them, by cutting off the fertilizers and other nutrients pouring into the sea. When this is done the algae quickly die; I saw a bay in Jamaica cleaned up in only a few months this way. The only way to restore the fisheries is to restore the health of the coral reef habitat that maintains them, not to pretend that sick areas that are protected can support more fish. At the United Nations Experts Meeting on waste management in Small Island Developing States, I wrote the review chapter on the effects of land-based sources of nutrients (from detergents, sewage, fertilizers, pesticides and other sources) on coral reefs and fisheries. The problem can be solved by using biological tertiary treatment to recycle all the nutrients on land. In this way the productivity of the land can be improved, and we don't poison the sea and kill our corals and fish. The entire group of experts called for complete elimination of all human caused sources of nutrients to the coastal zone and the sea. But this message was lost completely at the United Nations Summit for small islands in 2005, and has also been totally ignored in the Small Island State Position Paper for the forthcoming United Nations Commission on Sustainable Development meetings on energy and environment. All the key points have been dropped. It seems that we do not want to learn from our experience. If so, we only have ourselves to blame.

Author: Father Api and T. Goreau
Date: Tuesday, 2 May 2006

ICRAN Newsletter

We are proud to present the fifth ICRAN Newsletter, detailing ICRAN news from its network of sites, partner activites, project updates, and coral reef related events held over the last year. In the interests of those with low e-mail capacity I have not attached the actual newsletter, but an electronic version is available from our website on the link below:

http://www.icran.org/PDF/Newslettermarch2006.pdf

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Caribbean Journal of Science

Please take a few seconds to read about our journal and the advantages we offer scientists doing research on Caribbean natural history. Contact Dr. Ines Sartre, the Chief Editor if you need additional information or if you would like to receive an examination copy. You can also read about our journal's history (http://caribjsci.org/dec01/37_302-305.pdf) and visit our website (www.caribjsci.org).

The Caribbean Journal of Science publishes formal articles, research notes, book reviews, and essays relevant to Caribbean natural science. Emphasis is on the various branches of zoology, botany, ecology, and geology. We offer authors:

- International peer review
- Careful editorial review
- Coverage by leading bibliographic services, including: Biological Abstracts, Current Contents, Elsevier Geological Abstracts, Science Citation Index Expanded, UnCover, and Zoological Record

Ines Sartre
Editor, Caribbean
Journal of Science. www.caribjsci.org

Meetings & Conferences

International Tropical Marine Ecosystems Management Symposium: 3 Global Problems, Local Solutions Cozumel, Mexico, 16-20 October 2006

Important: Participants expecting to travel to Cozumel, Mexico via the USA are requested to enquire about the relevant visa requirements as soon as possible

The International Tropical Marine Ecosystems Management Symposium (ITMEMS) is a major activity of the International Coral Reef Initiative (ICRI). Convened previously in Australia (1998) and the Philippines (2003), ITMEMS facilitates productive discussion and information sharing by people involved in management of coral reefs and related ecosystems, and the implementation of the ICRI Framework for Action.

Despite cultural, social and economic differences within and between countries and regions, threats to tropical marine ecosystems and challenges are common across the globe. ITMEMS 3 provides an opportunity to exchange lessons learned, good practices, and effective local solutions amongst peers and to develop communication networks within the tropical ecosystem management community.

For more information, contact us at info@itmems.org.

New Books

First Comprehensive Handbook on Coral Reef Restoration to be Published

Retired Senator Bob Graham hails content as "the art and science" of restoring hidden treasure

As an undergraduate student in 1978, William F. (Bill) Precht first explored coral reefs at Discovery Bay Marine Lab in Jamaica. "I had an epiphany after my first scuba dive there. It was so beautiful I knew immediately I wanted to spend the rest of my life learning about and protecting coral reefs."

Precht, who is Ecological Sciences Program Manager for PBS&J, has served as both editor of and contributor to the Coral Reef Restoration Handbook: The Rehabilitation of an Ecosystem Under Siege. The book will be published by the scholarly CRC Press and available in bookstores this month.

In the foreword, retired Florida Senator Bob Graham writes, "…the information that can be gleaned within the pages of this book will set a path towards continued preservation of this valuable underwater treasure to be used, appreciated, and experienced for future generations."

Precht hopes to do just that. "This handbook is the first scientific composite of the various methodologies we use to date that deals with the restoration of coral reefs." The book includes work by 40 leading authorities on coral reefs, including five from PBS&J, and presents a historical perspective on lessons learned, "what's worked and what hasn't." notes Precht.

The range of maladies afflicting fragile coral reef ecosystems has been incurred by a range of natural and anthropogenic causes. Pollution, shipping, over-fishing, and tourism are some of the contributing factors, as well as natural disasters like hurricanes, pandemic disease outbreaks, and coral bleaching.

"To stop irreversible reef decline, policymakers, scientists, and managers must properly assess damages and develop restoration efforts on reefs under their stewardship" comments Precht who hopes the Coral Reef Restoration Handbook will pave the way for more efficient implementation of protective policies and rehabilitation techniques.

At PBS&J, Precht specializes in the assessment, restoration and rehabilitation of coastal habitats, especially coral reefs, seagrass, and mangrove systems. He is also a Visiting Research Scientist with the Smithsonian Institution's Caribbean Coral Reef Ecosystem Program and an adjunct faculty to Northeastern University. In October 2005, he led a workshop on coral reef restoration at the James L. Knight Center of the University of Miami.

About PBS&J: PBS&J (**www.pbsj.com**) is an employee-owned firm that provides infrastructure planning, engineering, construction management, architecture, and program management services to public and private clients. The firm is ranked by *Engineering News-Record* as 22nd among the nation's top consulting firms.

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www.crcpress.com

Toxicology of Marine Mammals

Edited by Joseph G. Vos, Gregory Bossart, Michel Fournier, and Thomas O'Shea

Toxicology of Marine Mammals focuses on the effects of natural and introduced toxicants on organs and systems in marine mammals. It provides overviews on health status and contamination, with subsequent chapters devoted to whales, pinnipeds, dolphins, polar bears, manatees, and sea otters. Internationally renowned researchers assess the mounting evidence for adverse effects on reproduction and the chemically-induced increased susceptibility to death from infectious diseases. The concluding chapter addresses perspectives and issues for the future. This compelling book features research from a vast geographic landscape ranging from the tropics to the Artic, with case studies on intriguing areas of contamination such as the St. Lawrence River and the Baltic Sea. It identifies the severe threats that environmental contaminants pose to the health and future of marine mammals. It also makes an urgent call for legislation to regulate the incessant pollution ravaging our seas and devastating the marine mammal population worldwide. Toxicologists working in marine biology and veterinary medicine, conservation scientists, fisheries scientists, environmental scientists, and wildlife managers will all benefit from this comprehensive resource.
Features:
-Provides an overview of the impact of environmental contaminants on marine mammals
-Examines the methods and difficulties in assessing the health risks to these mammals and in determining the casual relationships between environmental contaminants and specific target organ toxicity
-Investigates strandings and die-offs

For Order Information:
Catalog no. TF1197, 2003, 656 pp.
ISBN: 0-415-23914-1, $149.95

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Oceanography and Marine Biology: an Annual Review, volume 42

Edited by R. N. Gibson, John D. M. Gordon, and R. J. A. Atkinson

Ever-increasing interest in oceanography and marine biology and its relevance to global environmental issues creates a demand for authoritative reviews summarizing the results of recent research. Oceanography and Marine Biology: an annual review has answered this demand since its founding by the late Harold Barnes more than 40 years ago. Its objective is an annual consideration of basic areas of marine research, dealing with subjects of special or immediate importance, adding new subjects as they arise. The volumes maintain a unified perspective on the marine science. Physical, chemical, and biological aspects of marine science are dealt with by experts

actively engaged in these fields. This essential reference text for researchers and students in all fields of marine science finds a place in libraries of marine stations and institutes, as well as universities. It consistently ranks among the highest in impact factors for the marine biology category of the citation indices compiled by the Institute for Scientific Information. Volume 42 contains analysis on convective chimneys in the Greenland Sea, spawning aggregations of coral reef fishes, exopolymers (EPS) in aquatic systems, the marine insect *Halobates*, and much more.
Features:
-Relates recent marine research to global ecological issues
-Offers recent observations of marine microbial thiotrophic ectosymbioses
-Explores the role of exopolymers (EPS) in aquatic systems
-Investigates the biology, adaptations, distribution, and phylogeny of the marine insect *Halobates*
-Discusses the role of dimethylsulphoxide in the marine biogeochemical cycle of dimethylsulphide
-Contains comprehensive author, systematic, and subject indexes

For Order Information:
Catalog no. 2727, July 2004, 448 pp.
ISBN: 0-8493-2727-X, $169.95
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Courses

Field Research on Coral Reefs

We are offering a spring 2007 semester-long graduate level (but open to seniors) course on field research on coral reefs. The first 3-4 weeks of the semester will be spent at UNCW planning individual research projects, and satisfying AAUS diver requirements. The group will transfer to the island of Curacao where the 10 weeks of field research will be conducted. The course objective and format is to emphasize the selection of research questions, planning the work, executing it and the students preparing their data for both written and oral presentations.

Five instructors will take turns leading the students in group research projects coordinated to study the physiology and ecology of reef organisms along an environmental gradient. This course is aimed at upper level undergraduates who plan to go on to graduate school, or beginning graduate students. For more information including course costs, etc. please go to:
http://people.uncw.edu/szmanta/2007%20BIO%20585%20CoralReef%20Field%20Course.htm

or contact me at the addresses and telephone numbers below. The course is limited to 12 students, who must have a GPA of 3.0 or greater and be scuba certified with a min. of 12 logged dives. Deadline for application to qualify for partial scholarships is June 15th. This may sound early to you, but it takes a lot of pre-planning to offer such a course, in order to lock-in reasonable airfares and lodging.

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Coral Reef Research Group
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Web Page: http://people.uncw.edu/szmanta

Reef Check Australia Volunteer Internship Position

Reef Check Australia is looking for some motivated and independent people to assist with the coordination of the 2006 survey season from MAy/June to November 2006 for our Great Barrier Reef Project. If you want to gain experience in coral reef monitoring and team management this is an outstanding opportunity!

The Project Officer position will involve the planning, coordination and leadership of Reef Check research teams to survey up to 30 sites on the Great Barrier Reef and the Coral Sea. You will also be

responsible for data management, analysis and the creation of a scientific report.
Additional responsibilities subject to interest include helping to design a school education program, fundraising event coordination and grant writing.

Reef Check Australia has 30 trained volunteers and works with 15 dive operators on the Great Barrier Reef Project. Good communication, motivation, delegation and social skills are therefore essential.
Minimum Rescue Diver required, however an insured instructor is preferred.

The position is entirely volunteer. However, we can provide applicants with some support in applying to other foundations for funds to support themselves during their stay in Australia.

Required skills and qualifications:

Tertiary qualification in marine biology
Rescue diver with a minimum of 50 logged dives
Current first aid, CPR and oxygen provider qualifications
Proven experience with team leadership and coordination of projects
Good communication skills, both verbal and written
Ability to take initiative and work independently
Desired skills and qualifications:

Divemaster or Instructor with full insurance
Experience with coral reef monitoring

Why Work for Reef Check Australia?

Part of the United Nation's official International coral reef monitoring program
Strong scientific reputation
Work with likeminded people at the cutting edge of coral reef conservation
Benefits to you include the opportunity to:
Enhance your research skills
Enhance team management skills
Enhance project coordination skills
Contribute to Australia's long-term data set
Take part in the most comprehensive Reef Check Training program in the world
Work with like-minded professionals and volunteers at one of the world's leading centres of tropical marine science. Log up to 100 dives at some of Australia's most spectacular coral reefs
Potential for ongoing opportunities with Reef Check

Applicants should send their resume to Jos Hill at jos@reefcheck.org

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Analysis of Multivariate Data from Ecology and Environmental Science, using PRIMER v6. Training workshop.

Clam Bayou Marine Science Education Center (USF), Boca Ciega Bay, St Petersburg FL, October 16-20, 2006

This five day workshop will cover the statistical analysis of assemblage data (species by samples matrices of abundance, area cover etc) and/or multi-variable environmental data which arise in a wide range of applications in environmental science and ecology, from environmental impact assessments, through fundamental community ecology studies and monitoring of widescale biodiversity change, to biomarker studies and purely physical or chemical analyses

Based on the PRIMER package (Plymouth Routines In Multivariate Ecological Research), a worldwide standard software tool used in over 2000 recent SCI-listed papers, for analysis of assemblages of marine benthic flora/fauna, corals, plankton, fish, algae etc, and, increasingly, terrestrial, freshwater, palaeonto-logical, microbial & genetic data

The workshop covers definitions of similarity, clustering (CLUSTER), ordination by non-metric multi-dimensional scaling (MDS) and principal components analysis (PCA), hypothesis testing on

similarity matrices (ANOSIM) and other permutation tests (RELATE), linking biotic patterns to environmental variables (BEST/Bio-Env), identifying species responsible for observed community pattern (SIMPER, BEST/BvStep), comparison of ordinations (2nd stage MDS), dominance curves and (bio) diversity indices, including measures based on taxonomic relatedness of species (TAXDTEST), and practical issues such as taxonomic identification level, sample design, choice of analysis, etc

Lectures will also cover new tools in PRIMER v6, released in March 2006, e.g. a much wider range of similarity measures including new dispersion-weighted and taxonomically-based coefficients, new global permutation tests for a) groups formed in dendrograms (for a priori unstructured samples), b) dominance curves and c) optimal biota-environment relationships (the latter also examined by new non-parametric ˜linkage trees. Also new in v6 are SIMPER analyses for 2-way layouts and abiotic variables, missing data algorithms for environmental data, improved MDS plots and diagnostics, merging of non-matching species lists, a wide class of richness estimators, workspaces which are navigable and savable, major speed and data capacity enhancements etc

The workshop will be given by Dr K R Clarke (PRIMER-E and an honorary fellow of the Plymouth Marine Lab, UK). Bob Clarke is a researcher in ecological statistics and has worked for many years at the PML, where he was responsible for adapting and developing the methods underlying the PRIMER package.

Hands-on lab sessions will use real literature case studies, analyzed with PRIMER. Participants are also encouraged to bring some of their own data to the course. The emphasis throughout is on practical application and interpretation, the theoretical aspects (e.g. the multivariate statistical methods which are the core of the course) being carefully selected to be those that are simple to describe and understand.
No prior statistical knowledge is assumed

Venue

The workshop will be held at the University of South Florida, Clam Bayou Marine Science Education Center, set in a Nature Preserve on Boca Ciega Bay, about 15 minutes drive from the St Pete Campus of USF. Whilst the schedule is an intensive 5 days of lectures and labs, 8 am to 5 pm (but finishing mid-afternoon Friday for those who need to get away), there will be opportunity to relax-recreate during lunch breaks by wandering round the reserve or taking short canoe trips.
In addition to snacks and coffee at mid-morning and afternoon breaks, lunches will be provided as part of the course fee. Accommodation and other main meals; however, are not covered by the course fee (though it is hoped to arrange an evening event at the center, including dinner, on the Thursday).

Accommodation is not available at the Clam Bayou center itself. There are several chain hotels (Holiday Inn, Howard Johnson, Hampton Inn) about 10 minutes drive from the center; also the small town of Gulfport (about 15 minutes away) has character accommodation and restaurants. Non-local participants will need to arrange their own travel and accommodation, but the local organizer, Walt Jaap, can provide further information on the hotels and travel possibilities

Lectures and exercises will take place in a multi-function room, not a computer laboratory, so participants are expected to bring their own laptop computers to use during the lab sessions, analyzing literature data sets and some of their own data (with Bob Clarke's help). Not every participant needs a laptop and you may prefer to share with a colleague's one machine between two people is very workable (in fact, has some benefits in terms of livelier interactions!).

Workshop costs

Course fee: $700 ($500 for full-time students) for a full 5 days. This includes materials (but not software), and catering at breaks and lunches

Software license for PRIMER6. The PRIMER version 6 software will be used throughout and, to register, participants must either already have purchased a license for this new version or purchase/upgrade at the time of the course*. The below are discounted

license fees for course participants (postage will be added if software is required in advance of the workshop)

Private sector company: $800 new v6 - $400 upgrade+ to v6 from v5.

Public sector institution: $600 new v6 - $300 upgrade+ to v6 from v5.

University staff/student (research use only**): $400 new v6 $200 upgrade+ to v6 from v5

*An exception can only be made for a student who will, in future, only be using their supervisor's PC (and their supervisor already has a registered v6 license), or they will be using a machine covered by a v6 teaching license at their university.

**University use of v6 for contractual work requires an appropriate public or private sector license

+ If upgrading, please first check with Cathy (admin@primer-e.com) that you hold
a valid v5 license

Contact and Registration
Contact the local organizer, Walt Jaap, e-mail: wjaap@tampabay.rr.com, wjaap@marine.usf.edu
phone: 727-896-0521 or 727-553-3612. Walt can e-mail you a detailed schedule for the workshop and a registration form, and can send non-locals information on the hotels and directions.

Registration for the course is solely through PRIMER-E in Plymouth, UK. Registration must be accompanied by payment, for both course and software fees, preferably by providing credit card information (Visa or Mastercard only). Cards will be debited on receipt of registration form, or later if requested, but no later than the registration
deadline of 21 July 2006. Dollar checks drawn on a US bank can also be accepted but these must again arrive by the registration deadline.

The course will cater for about 25 participants, and is limited to an absolute maximum of 30: places will be allocated in strict order of receipt of registration,
with payment. Forms can be faxed (++44 1752 783366) or posted to Cathy Clarke at PRIMER-E. Invoices, confirming payment, will be issued. (Cathy can also e-mail proforma invoices, if requested. Contact her on admin@primer-e.com). Late registrations will be accepted, space permitting, also in order of payment.

Training of Trainers Certification

Reef Check Foundation will be offering this 3-day Course during Saturday 21 October to Sunday 23 October following the ITMEMS 3 Symposium in Cozumel, Mexico. The course will include the new 2006 training and testing EcoDiver materials and will provide participants with a formal Reef Check Trainer Certification. This course will include at least one dive at the marine park. A specialty certification may also be obtained from one of the major dive certification organizations. Details regarding travel subsidies, local housing, and scholarships will be advertised through the coral list, RC list server and on the RC website as they become available. This Training Course is primarily aimed at existing RC Coordinators and a maximum of 25 participants will be allowed. Note that this will overlap with the ICRI General Meeting (22 - 23). If you expect to attend ITMEMS 3, and would like to attend this course, please send an email to rcinf o@reefcheck.org to indicate this.

GIS Technology and the Marine Systems

I'd like to announce a great opportunity to learn GIS technology and how it can be used for marine ecosystem research. This course will take place in the Marine Protected Area of Capo Rizzuto. Participants will have the chance of becoming successful Geographic Information System users through the ESRI Authorized "Introduction to ArcGIS 9.x". Additional modules will introduce the participants to GIS-based tools and techniques of marine scientists with underwater and computer sessions. They will learn how to map marine habitats from satellite images and verify them on the field, perform marine fauna and flora surveys and find associations among all the biotic and abiotic components using GIS.

Francesca Riolo
When: August 16-26, 2006. **Where**: Marine Protected Area of Capo Rizzuto - Crotone, Italy

To know more about this course you can download the pdf at:
http://www.mappamondogis.it/images/diveandgis/divegis_courseprogram.pdf
or visit the website:
http://www.mappamondogis.it/divegis.htm

Field Course in Coral Reef Ecology

Instructors

Alfred Beulig, New College of Florida, email: beulig@ncf.edu Bruce Wright, Conservation Science Institute bruce.wright@conservationinstitute.org and Carlos Ormond, Simon Fraser University, email: cormond@sfu.ca

The field courses will take place at the Bocas del Toro Biological Station, Boca del Drago, Isla Colon, Bocas del Toro, Panama. The station is located on the Caribbean side of Panama and situated on a beach between tropical rain forests and coral reefs. Marine habitats include extensive turtle grass beds, hard and soft coral reefs, beaches, rocky intertidals, mangrove forests and estuaries.

Schedules

Summer field courses are four weeks in length; Winter course is three weeks in length.
Summer Session B (15 June through 12 July), Summer Session C (15 July through 11 August), Winter Session (20 December through 9 January).

Description

The course will briefly survey reef systems in various parts of the world and focus in depth on Caribbean reefs. Using the reefs at Boca del Drago as examples, we will carry out an inventory of representative reef biota to characterize a general reef community. We will examine several theories on the origins of coral reefs, discuss community structure, biodiversity, chemical make-up, nutrient cycles and water circulation in the reef ecosystem in exposed and protected environments. The course will emphasize field methods and compare several experimental designs and sampling procedures for usefulness in various types of studies. Both SCUBA and snorkeling will be employed during the course. If interested students do not have SCUBA certification this will not limit them in the course. Most work will take place during the day, but some night dives are planned as well.

Individual research

During the first 10 days of the course students will conduct field exercises to gain experience in the use of sampling equipment and methods used in coral reef research and monitoring. Students will prepare a written research proposal and conduct an original research project of their choosing. Students will carry out their project during latter half of the course and present their findings in and end-of-course symposium at the field station.

Course credit

Up to six units of credit will be granted for these courses. Credit must be arranged by the student through his/her academic advisor and university. Contact ITEC for details.

Tuition

Tuition costs $1800 USD. Tuition fee includes all room and board, local transportation and a three-day field trip to the Boquete cloud forests.

Institute for Tropical Ecology and Conservation (ITEC); 1023 SW 2nd Ave., Gainesville, FL 32601; phn: 352-367-9128, fax: 352-367-0610, email: itec@itec-edu.org., or the above instructors. Please visit us on the web at www.itec-edu.org. ITEC is a Non-profit (501c3) organization.

2006 LMSEP - Sea Of Abaco

There are still a couple of berths available for this summer's Lucaya Marine Science Expedition Program (LMSEP).

This course is a unique opportunity for advanced undergraduates and graduate students to explore the natural and cultural history of the Sea of Abaco. The

program is designed to provide students with an intensive hands-on study of the flora and fauna of the Sea of Abaco with an emphasis on coral reefs and the challenges they face in today's world. Combined with lectures and readings encompassing a wide range of marine science topics, students will learn various field techniques and lab analyses aboard a working research vessel. Students will actively participate in all research vessel operations, including training in sailing and navigation.
LMSEP has been granted permits from the Ministry of the Bahamas to collect samples for *Symbiodinium* diversity analyses and to install several permanent survey stations throughout the Abacos. Students will actively participate in sampling and processing a wide variety of symbiotic cnidarians for subsequent molecular diversity analyses.
Additionally, students will learn the practical skills of properly selecting and installing permanent stations for benthic marine surveys.

A few practical techniques of the LMSEP will include:
· oceanographic profiling and analyses
· introduction to PAM fluorometry
· extraction and isolation of Symbiodinium from host tissue Â· cell counts using a haemocytometer Â· light and dissecting scope microscopy Â· quadrat sampling, linear transect and radial belt transect survey methodologies Â· GPS and costal piloting, plotting and navigation

The two-week program sets sail from Marsh Harbour, Abaco on 8 July and returns to port on the 21st.

See http://www.coralreefscience.com <https://webmail.fiu.edu/cgi-bin/fetch.cgi?url=http%3A%2F%2Fwww.coralreefscience.com> for more information and application materials.

Change of Address

MOVING? To ensure that you continue to receive *Caribbean Marine Science*, notification of upcoming AMLC meetings and other AMLC information, please fill out the following change of address form and mail to:

Dr. Laurie Richardson
79 Marina Avenue
Key Largo, FL 33037
richardl@fiu.edu

Name & Title

_____

Institution/Association

_____

_____

Address _____

_____

_____

Telephone _____
FAX _____
E-mail_____
Scientific Interests _____

_____

Dues

Individual membership dues for 2004 are $25.00 due March 31st, 2005 unless you attend the Curacao Scientific Meeting, in which case your meeting registration fee will include membership dues. If you are not planning to attend the Curacao meeting, please do send your dues as discussed here. You may also help AMLC with a donation membership contribution if you wish; the schedule for these is presented below. Student dues are still $5 per year.

The AMLC can accept credit cards payments (Visa, MasterCard or American Express) for AMLC dues. A 5% service charge will be added to credit card payments. Checks must be in U.S. dollars, from U.S. banks (or a U.S. dollars bank draft), made out to "AMLC", and sent to Laurie Richardson.

Name & Title

_____

Institution/Association

_____

New Address _____

_____

Telephone_____

FAX _____

E-mail_____

Scientific interests _____

_____

Membership Options: Student (US$5.00)_____ Regular (US$25.00)____Sponsor(US$30.00)___ Sustaining Member (US$50.00)_____ and Patron (US$100.00)_____.

My check (bank draft) is enclosed for US$_____ OR Please charge US$_____ to my Visa ( ) Mastercard ( ) (Charge will include an additional 5% to cover handling expense)

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AMLC Background & Goals

The Association of Marine Laboratories of the Caribbean (AMLC) was founded in 1956 by marine researchers with interests in the marine science of the tropical Atlantic and Caribbean. Founded primarily as a scientific organization, the strength of the AMLC lies in the diversity of its member laboratories and the extensive expertise of its membership. Institutional, individual scientist and student memberships are available.

Annual AMLC meetings are hosted by member laboratories which are actively conducting marine research in the Caribbean. The host laboratory arranges for facilities for research presentations, copies of the presented abstracts (the proceedings) and accommodations for participants. The AMLC has no designated official language so researchers are free to make their presentations in their native language.

Caribbean Marine Science, published in English and Spanish, is the biannual newsletter of the AMLC and informs members of AMLC activities, pertinent events, and relevant research.

The purpose of the AMLC is to advance common interest in the marine sciences by:

a. Assisting and initiating cooperative research and education programs
b. Providing for a for exchange of scientific and technical information
c. Fostering personal and official relations among members
d. Publishing the proceedings of scientific meetings and a newsletter

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Contributions to the AMLC Newsletter:
All members of the AMLC (individual and laboratory) are encouraged to send relevant news items at any time, to the newsletter. Relevant news items include, but are not limited to: new facilities, faculty/staff changes, positions available, research programs and initiatives, publications of general interest, awards, visiting scientist opportunities, and education programs. Submitted items should be sent to the AMLC newsletter office by the end of February for inclusion in the Spring issue, and by the end of September for the Fall issue.

Please send your information and comments to:

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