



Caribbean Marine Science



Official Newsletter of the AMLC Published Spring and Fall

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Association News

From the Editors' desk

Greeting to all our members. We hope most of you, your colleagues and friends are getting ready for our Scientific Meeting in Costa Rica this coming May. Everything is ready to receive your abstract and registration documents and fees. Please go to our webpage for all the details. Our previous meeting in Costa Rica was a lot of fun. You can expect excellent food and outstanding treatment by the “ticos”, they are extremely polite and willing to help in any way they can. We took one of the field trips for white water rafting and it was an unforgettable experience. Check the field trips offered by the conference. Deadline for abstract submission has been extended to April 15th.

In this issue we have compiled a set of interesting short articles about marine protection, global Climate

change, the “super” La Niña event of 2010-11 and its consequences, and the impacts of bleaching on reefs world-wide. There are several course offerings for the Summer and Fall. Enjoy!

Future Meetings of the AMLC

Our next Scientific Meeting will be hosted by the University of Costa Rica 23rd - 28th of May of 2011. Find the announcement below and/or check the AMLC webpage. We encourage you to register and make your travel and hotel reservations as soon as possible to avoid surcharges and late fees. It will be another excellent meeting in the tradition of the Association. Make your plans to attend this meeting and enjoy the Costa Rican hospitality and countryside. Dr. Jorge Cortés is the AMLC President and Conference Organizer. Your collaboration in organizing this event, even if you do not live in Costa Rica, will be appreciated.

AMLC List Server

The purpose of the AMLC list server is to facilitate communication and foster collaboration between and among our members. We hope all AMLC members will take advantage of this service – 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. Only AMLC members in good standing can post to the list. Messages not from a subscribed member will not be accepted. Current AMLC members are automatically subscribed with the list controlled by Dr. Aldo Croquer (croquereef@gmail.com), AMLC's Membership Director, and new members are added as they join. The list server address is: members@lists.amlc-carib.org

Please send contributions for the Newsletters. 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.

Profile

Center for Research in Marine Sciences and Limnology (CIMAR). Costa Rica

CIMAR is a multi-disciplinary research unit associated with the Vice-Chancellor Office of the University of Costa Rica. The center is organized through research programs and projects in conjunction with support modules for the execution of specific projects. Personnel include Faculty of the different academic units of the university and links with researchers from other institutions nationwide. Since 1979, the Institute has published 679 contributions in peer-reviewed journals focusing mostly on the aquatic biodiversity and the processes associated with their sustainable management, including assessment of environmental contamination, impacts and use of natural resources.

Objectives

To undertake scientific research for the generation of knowledge on the biological, chemical and physical processes regulating the stability of the national and regional aquatic ecosystems, including freshwater, coastal and oceanic environments.

To evaluate the marine and freshwater ecosystems in order to identify their potential use either as sources of natural resources or for conservation.

To develop multidisciplinary research programs with the participation of specialists in oceanography and limnology in order to establish the necessary scientific base for the proper management of the national aquatic ecosystems, either coastal, marine and freshwater, and the rational use of their resources.

To promote and to participate in the creation of a national research system in subjects related to the sea and freshwater.

To promote the training of scientists in disciplines related to the sea and freshwaters, providing the facilities for their training. Especially in support of the Systems of Graduate Studies, through the organization of conferences, workshops and training courses with national and regional coverage.

To encourage, by means of formal agreements, the collaboration with other government institutions, the private sector, and international organizations in charge of promoting oceanographic and limnological research.

To link research with outreach activities, especially in relation to the spreading of the scientific knowledge at the academic and popular level.

What we research?

Study areas:

- Caribbean coast
 - Cahuita National Park
 - Gandoca-Manzanillo Wildlife Refuge
- Pacific coast
 - Gulf of Papagayo
 - Gulf of Nicoya
 - Golfo Dulce
 - Cocos Island
 - Caño Island
 - Murciélago Islands
- Lakes and lagoons
- Rivers

Hundreds of papers have been published in international scientific journals based on the result of research in the following areas:

- Studies of lakes, lagoons and rivers of Costa Rica.
- Aquatic biodiversity and biosystematics.
- Physical, chemical, and aquatic contamination studies.
- Ecological evaluation of the Gulf of Nicoya.
- Coastal and insular ecosystems of Costa Rica.
- Ecology of coral reefs.
- Evaluation of multispecific fishing resources.
- Aquaculture.

Technical services

- Analysis of salinity dissolved oxygen, nutrients, chlorophyll and suspended sediments in marine and freshwater environments.
- Statistical analysis and "software" development for marine and freshwater populations.
- Determination of pesticides organ chlorides, dissolved hydrocarbons and trace metals.

Training

- Training in marine issues directed to administrators, conservationists, politicians and professionals.
- Training courses and workshops about marine sciences and limnology.

Other

- Environmental impact assessments in coastal, marine and freshwater environments.
- Management plans of marine and freshwater resources and ecosystems.
- Studies on coastal dynamics (erosion, surge, hurricanes).
- Mapping of coastal and marine zones

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General Interest

Governments Agreed to Protect 10% of Ocean by 2020.

Nations have agreed to set aside 10 percent of marine and coastal waters as protected areas by 2020, a substantial increase over the approximately 1 percent that is currently so designated, but significantly less than some nations and many environmental organizations had been demanding.

Meeting at the 10th Conference of the Parties to the Convention on Biological Diversity in Nagoya, Japan, delegates debated a wide range of competing figures. The European Union initially insisted on 20 percent, but China countered with 6 percent, while several other nations suggested 15 percent.

Specifically, the agreement states that, "By 2020, at least 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes."

The agreement "gives instruction such as where marine protected areas are established, how those areas are designated, how those areas should be protected and by whom," said Wako Hanaoka of Greenpeace Japan. However, he continued, "At the very least, the target should be 20 percent."

For Further Information: The official CBD website is available at <http://www.cbd.int/>.

Figures on Global Climate Show 2010 Tied 2005 as the Hottest Year on Record.

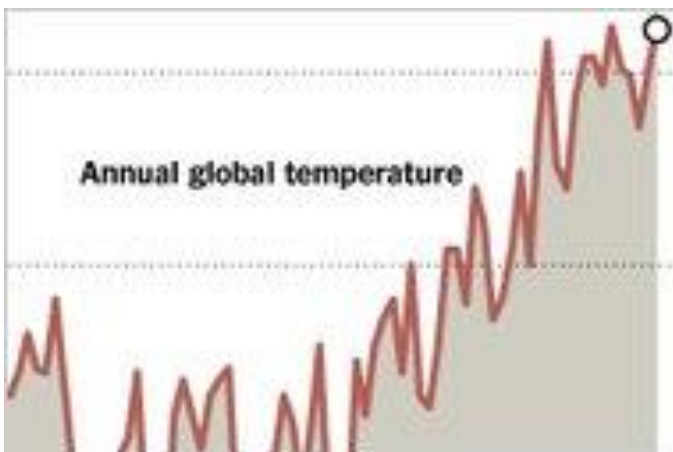
New government figures for the global climate show that 2010 was the wettest year in the historical record, and it tied 2005 as the hottest year since record-keeping began in 1880. The new figures confirm that 2010 will go down as one of the more remarkable years in the annals of climatology. It featured prodigious snowstorms that broke seasonal records in the United States and Europe; a record-shattering summer heat wave that scorched Russia; strong floods that drove people from their homes in places like Pakistan, Australia, California and Tennessee; a severe die-off of coral reefs; and a continuation in the global trend of a warming climate.

Two agencies, NASA and the National Oceanic and Atmospheric Administration, reported that the global average surface temperature for 2010 had tied the record set in 2005. The analyses differ slightly; in the [NOAA version](#), the 2010 temperature was 1.12

degrees Fahrenheit above the average for the 20th century, which is 57 degrees.

It was the 34th year running that global temperatures have been above the 20th-century average; the last below-average year was 1976. The new figures show that 9 of the 10 warmest years on record have occurred since the beginning of 2001. The earth has been warming in fits and starts for decades, and a large majority of climatologists say that is because humans are releasing heat-trapping gases like carbon dioxide into the atmosphere. The carbon dioxide level has increased about 40 percent since the Industrial Revolution. "The climate is continuing to show the influence of greenhouse gases," said David R. Easterling, a scientist at NOAA's National Climatic Data Center in Asheville, N.C.

Aside from NASA and NOAA, another agency, a research center in Britain, compiles a global temperature record. That unit has yet to report its figures for 2010. (The data sets are compiled by slightly different methods, and in the British figures, the previous warmest year on record was 1998.). The United States was wetter and hotter last year than the average values for the 20th century, but over all the year was not as exceptional in this country as for the world as a whole. In the contiguous United States, for instance, the NOAA figures showed that it was the fourth hottest summer on record and the 23rd hottest year. Still, some remarkable events occurred at a regional scale, including snowstorms in February 2010 that shattered seasonal records in cities like Washington, Baltimore and Philadelphia. In the summer, a heat wave broke records in the South and along much of the East Coast.



Source: Justin Gillis

Published: January 12, 2011

Super la Niña Event in 2010-11.

Historically, strong La Niña events drop the Earth's average temperature around one degree Fahrenheit, and the drop comes quickly. As a result, some of the same places that had record heat this summer may suffer through record cold this winter.

La Niña is the lesser-known colder sister of El Niño. La Niña chills the waters of the tropical Pacific Ocean, and in turn cools the entire planet for one to two years or more. This chilling has the potential to bring bone-numbing cold to many parts of the world for this and the following winter. As a result, world energy demand may spike in the next one to two years as much colder weather hits many of the major industrial nations. The developing La Niña event appears to be **special**, at least so far. It is well on its way to being the strongest of these events since the super La Niña of 1955-1956. During that powerful La Niña that lasted two years, the global average temperature fell nearly one degree Fahrenheit from 1953 to 1956.

The Southern Oscillation Index (SOI) measures the air pressure difference between Darwin, Australia, and Tahiti. The lower the value of the index, the stronger the El Niño typically is. The higher the SOI index, the stronger the La Niña. The September SOI value of +25.0 was the highest of any September going back to 1917, when it was +29.7. During that super La Niña, the global temperature fell 1.2 degrees Fahrenheit from 1915 to 1917. The +25.0 September SOI reading is also the highest for any month dating back to the +31.6 value in November of 1973.

The most recent La Niña developed in the spring of 2007, and persisted until the early summer of 2008. The global average temperature fell one degree Fahrenheit in that period of time, equal to all of the warming of the last 100 years! If the trend of this rapidly developing, potentially super La Niña continues, an equal or larger temperature drop can be anticipated during the next one to two years. This La Niña is coming on very fast and very strong. Already it is colder than the six coldest La Niñas of the last 60 years when they were at a similar stage of development.

What about the recent heat we've all heard about?

For the last year, the world has been dealing with the warming effects of a strong El Niño. The El Niño warms the ocean waters of the tropical Pacific Ocean and in turn heats the atmosphere. Western Russia melted under a record heat wave this past summer, after freezing from record cold last winter. Many parts of the southern United States had record heat this past summer, but also shivered under record cold last winter. The persistence of the jetstream to blow in patterns that changed very little for long periods of time contributed to these extremes of temperature. This locked in jetstream wind pattern enhances temperature anomalies by restricting the exchange of air flow from one place to another. What would be hot becomes very hot, and what would be cold becomes very cold.

It is common for the jetstream to behave this way when the sun is in the solar minimum, such as it has been for the last three years. We are emerging from the minimum, but the sunspot numbers are continuing to be very low. Some solar experts say this next sunspot maximum may be one of the weakest in 200 years. As a result, the tendency for the jetstream to blow over parts of the Earth with little month-to-month variability may continue this year. That would result in continued extremes of temperature. The difference would be this time cold areas would be even colder due to the oncoming super La Niña and the falling global temperature. The El Niño of the last year pushed the global temperature right back to where it had been in the beginning of 2007. The result has been no net warming or cooling since then. In fact, there has been no net warming or cooling since around 1999. Interestingly, the amount of carbon dioxide in the atmosphere has risen from 369 parts per million to 387 ppm (parts per million) during this time. This amount is above the level of 302 ppm in 1910, when 20th century global temperature started to rise. Despite this significant rise in carbon dioxide since 1999, there has been **no "global warming"** during this period.

Right now the Pacific Ocean is in the beginning of a thirty year cooler spell called the **Pacific Decadal Oscillation**. There is a strong, potentially super La Niña developing. The sun is still quiet with very few sunspots. When these conditions exist, the first two months of the cold season (December and January)

tend to be cold from Montana to Iowa to Florida up to the Great Lakes and most of New England. In addition, temperatures tend to be very cold from central and western Canada to Alaska. China could suffer a bitterly cold December and January if historic temperature patterns are consistent with current conditions. Much of central and western Europe are cold in these situations as well.

The second half of the cold season (February and March) typically experiences some changes in the global temperature patterns in these types of winters. For Europe the changes are not good. Bitter cold and snow dominates from western Russia across all of Europe. In other words, what starts as a cold winter in central and western Europe deepens into a severe winter in February and March across all of Europe. The extreme cold eases in southern China but it deepens in the north and northeastern part of the country. In the United States the cold of December and January in the middle and eastern part of the country reverses to mild weather from Texas to Florida up to the Great Lakes and New England. All of the western U.S. is cold and snowy up to the northern Great Plains. What starts as a mild winter out west turns much colder with large amounts of snow while the east gets a break from the cold.

The current La Niña is coming on stronger than any in decades. The world is demanding more and more energy to fuel growth even in hard economic times. This winter may test the world energy supplier's ability to provide it. The resulting increase in demand could produce a spike in energy costs. This could bring more hardship to people who are suffering through this long and deep recession. It remains to be seen if this La Niña equals or exceeds the super La Niña of 1955/56. Right now El Niño's colder sister is on the fast track to generate more temperature extremes and a very cold winter in some parts of the world.

Source: Art Horn.

Can be contacted at skychaserman@cox.net.

Narwhals Help Researchers Track Greenland Warming.

Researchers have confirmed that warming is continuing in waters off Greenland by attaching

satellite sensors to narwhals, which yielded otherwise inaccessible data as the whales swam and dived beneath the ice. In a paper in the *Journal of Geophysical Research-Oceans*, Kristin Laidre of the University of Washington and colleagues point out that, even as sea ice diminishes in the Arctic as a result of climate change, gaining access to Arctic regions to take oceanographic measurements in winter still requires the expense and logistical challenge of using icebreaking vessels. As a result, some data sets in the region remain incomplete.

Laird and colleagues therefore decided to try a different approach: tagging 14 narwhals with satellite sensors that recorded ocean depths and temperatures in Baffin Bay during feeding dives from the surface pack ice to the seafloor, as deep as 1,773 meters, or more than a mile. The data were automatically sent to a satellite when the narwhals surfaced for air between cracks in the sea ice. Each sensor tag provided up to seven months of data before falling off. Previously, winter temperature estimates in Baffin Bay were based on climatology data gathered from small settlements on both coasts. That data provided an estimated average winter temperature in southern Baffin Bay of about 37.9 Fahrenheit (3.3 degrees Celsius). Data from the narwhals, however, showed that the temperatures in the bay were in fact warmer—between 39.2 degrees Fahrenheit and 40.3 degrees Fahrenheit (4 degrees Celsius and 4.6 degrees Celsius). The researchers conclude that warming in



By attaching satellite sensors to narwhals, researchers have been able to gather data that they say shows the waters of southern Baffin Bay are warming. Glenn Williams, National Institute of Standards and Technology

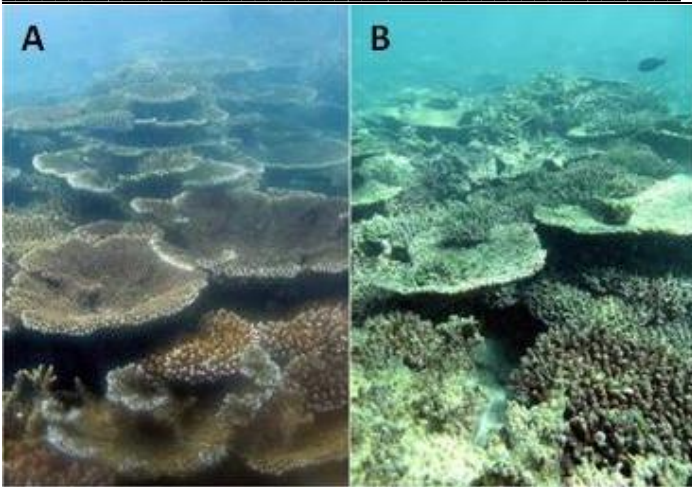
Baffin Bay, which had previously been identified during summer-only expeditions, has continued and is associated with a warmer West Greenland current. They add that their research shows that, in future, narwhals may provide a practical and easier alternative to icebreakers for at least some wintertime oceanographic studies in the Arctic

Source: Laidre, K., et al. 2010. Narwhals document continued warming of southern Baffin Bay. *Journal of Geophysical Research -Oceans* 115, C10049, doi:10.1029/2009JC005820. Contact: Fred Gorell, NOAA. E-mail: Fred.Gorell@noaa.gov

Coral Reefs Dying from Bleaching Events Worldwide.

Coral reefs are dying worldwide from what researchers are dubbing the worst episode of bleaching in at least 12 years. The ARC Centre of Excellence for Coral Reef Studies in Australia reported that bleaching had occurred across a wide swath of ocean waters in Southeast Asia and the Indian Ocean, including the so-called Coral Triangle, the area of richest marine biodiversity on the planet, which is bounded by Indonesia, Malaysia and the Philippines. “So far around 80 percent of *Acropora* colonies and 50 percent of colonies from other species have died since the outbreak began in May this year,” said Andrew Baird of the ARC. “It is certainly the worst coral die-off we have seen since 1998. It may prove to be the worst such event known to science.”

This follows reports of extensive bleaching in the western Caribbean, which *Science* magazine reports has “devastated” reefs in the Dutch Antilles and affected reefs off Panama and the island of Curacao near Venezuela. “I’ve never seen bleaching like it in Panama,” *Science* reported Nancy Knowlton of the Smithsonian Institution as observing. As reported in *Ocean Update* on October 19, experts with the National Oceanic and Atmospheric Administration (NOAA) Coral Reef Watch System predicted a summer of extensive bleaching as a result of warming temperatures.



Coral reef before (A) and after (B) the 2010 bleaching event s that sweep through reefs in the Indian Ocean and Southeast Asia. Researchers say the event is the worst since at least 1998 and perhaps in the scientific record. *ARC Centre of Excellence in Coral Reef Studies*

A ghost reef in Puerto Rico. This wide view shows thousands of bleached coral colonies at 22m deep in the south west shelf edge of Puerto Rico during the bleaching event of 2005. Photo E.Weil.

NOAA's Mark Eakin pointed out that, "High temperatures cause corals to force out the symbiotic algae that provide them with food. This makes the corals appear white or 'bleached' and can increase outbreaks of infectious disease."

"My colleagues and I have high confidence these successive ocean warming episodes, which exceed the normal tolerance range of warm-water corals, are driven by human-induced global warming," added Baird. "They underline that the planet is already taking heavy hits from climate change—and will continue to do so unless we can reduce carbon emissions very quickly."

Recent surveys by E. Weil in several localities in the Caribbean showed that, contrary to the 2005 event, the worst ever bleaching for this region at the time, the most affected reefs in 2010 were those in the south, extending from the southeastern Caribbean (Grenada, Barbados, Tobago) to the southwestern region, including all the spectacular reefs off the northern coast of Venezuela (i.e. Los Roques and the Netherland Antilles), Colombia, and the Caribbean coast of Panamá.

Bleaching prevalence in some localities reached 90% for important reef-building genera, and white plague disease outbreaks after the bleaching were still causing high mortalities in many of the important reef-building species in several reef communities in early March, similar to the bleaching and white

plague outbreaks of 2005 in the US Virgin Islands and Puerto Rico. The 2005 event affected mostly the northeastern Caribbean reefs. The difference with the recent event seem to be that during the summer-fall of 2010, several storms, heavy rains, high cloudiness and sediment loads hampering light penetration, and normal trade winds, helped in cooling the water faster and lowering the compounded effects of high radiation over the reefs.

For Further Information: Background and images of the Pacific bleaching are available at the ARC Centre of Excellence for Coral Reef Studies website: www.coralcoe.org.au. For more information on the Indo-Pacific contact A. Baird, ARC Centre of Excellence for Coral reef Studies (andrew.baird@jcu.edu.au), and for the Caribbean event, contact E. Weil, University of Puerto Rico (eweil@caribe.net),

Whaling Ban Remains in Place.

The International Whaling Commission (IWC) has elected not to adopt a controversial plan that would have sanctioned commercial whaling for the first time since 1986. Meeting in Agadir, Morocco, last week, the 88 member nations of the IWC could not reach agreement on a package of measures that, according to its proponents, would have reduced the number of whales being killed worldwide for commercial purposes. In 1982, the IWC voted to adopt what is commonly referred to as a commercial whaling moratorium, which took effect with the 1985/86 Antarctic whaling season. However, in the subsequent

quarter-century, Iceland, Japan and Norway have combined to kill more than 30,000 whales primarily through the use of two provisions in the IWC's rulebook, or Schedule. One, used by Norway, states that if a country lodges an official objection to an IWC decision within 90 days, it is not bound by that decision; the other permits countries to hunt as many whales as they choose for scientific research. Japan has taken advantage of this second provision to hunt whales in the Southern Ocean since 1987, and in the North Pacific since 1994.

The proposed deal would have ostensibly retained the moratorium while granting Iceland, Japan and Norway 10-year commercial whaling quotas. The deal's advocates, including the IWC delegation from the United States, argued that this would bring whaling under tighter control and reduce the number of whales being killed; its opponents countered that it would reward the whaling nations for defying the moratorium, that any proposed catch limits would be arbitrary and that by permitting continued Japanese whaling in the Antarctic, it would violate the Southern Ocean Sanctuary that the IWC adopted in 1994. In reaction to the proposed deal, long-standing IWC observer Dr. Sidney Holt, who as a member of the IWC's Scientific Committee in the 1960s was one of the first to warn of the need to ban the hunting of blue whales, commented: "How can a rational person

claim that one can declare a whale sanctuary, the primary purpose of which is to protect whales from being hunted in that area, and then say that the sanctuary remains but whales can be killed there? How can a rational being claim to be upholding a moratorium ... but negating its provisions?"

Such differences proved too significant to resolve, and on the third day of last week's five-day meeting, the Commission announced that "while it was very close to agreement on a number of issues ... there remain major issues upon which more work is required, including such matters as the question of the moratorium, numbers of whales that might be taken, [scientific] whaling, indigenous whaling, sanctuaries and trade."

At time of writing, it is unclear whether or not the draft agreement will form the basis for continued discussions in the months ahead.

From SeaWeb's ocean news. Further information is available at the IWC's official website, www.iwcoffice.org. The viewpoints of Dr. Sidney Holt and others may be read at the blog of the International Fund for Animal Welfare: www.mywhaleweb.com.

Global Coral Disease Database.

A new improved Global Coral Disease Database (GCDD) was launched recently. It is now available (www.coraldisease.org) to support coral reef science, management and decision-making communities in the collation, storage and liberation of coral disease data. Originally established in 2002 by NOAA and UNEP-WCMC, the GCDD was re-assessed in 2009 in light of the information needs and priorities of researchers, practitioners and managers working with coral disease. In consultation with an external expert advisory group, the look, feel and functionality of the GCDD has been improved and updated to match the identified needs. New features include:

- Interactive and real-time summary statistics of the global data holdings, allowing users to easily visualize updates;
- Increased number of search functions to allow customized data overviews;



Compromise talks in the International Whaling Commission broke down last week in large part due to disagreement over the future of Japan's whaling in the Southern Ocean Sanctuary. *Kieran Mulvaney.*

- Supporting metadata on survey methods, physical conditions at the survey site, and observer expertise to allow users to assess data quality;
- Ability to upload, store and manage personal data sets, and to view these in the context of global data;
- Facility to withhold your unpublished data from public view until a date you specify;
- Automatic batch uploads with in-built quality-assurance mechanisms;
- An automatic data exchange facility to link users with relevant raw data, while allowing contributors to maintain ownership of their data and control its distribution;
- Additional resources on coral disease such as best practices, decision trees, registry of experts etc..
- Visit and explore the site at:

www.coraldisease.org<<http://www.coraldisease.org>>

Nicola Barnard - Acting Director
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Meetings & Workshops

35th Scientific Conference of the Association of Marine Laboratories of the Caribbean.

The AMLC is proud to announce the 35th Scientific Meeting to be held from May 23-27, 2011 at the Centro de Investigación en Ciencias del Mar y Limnología (CIMAR), Universidad de Costa Rica, San José, Costa Rica.

Our conferences are held biennially and are attended by scientists, managers, government representatives, and students from the Caribbean region mainly, but from other areas of the world too, whose interests are focused on marine science, marine resources, resource management, and related issues in the greater Caribbean region.

In this meeting, we seek to initiate and facilitate the expansion of regional and interdisciplinary collaborations throughout the Caribbean. We welcome submissions relating to marine science in the Greater Caribbean region, including coral reef ecology, pelagic fisheries, sea turtles, oceanography, climate change, reef restoration, etc. Contributions in any area of marine science are welcomed. Contributions to the following topics, however, are encouraged:

-Ecology/Biology - including behavior, reproduction, invasive organisms, food web dynamics, biodiversity and species inventories, reef resilience, mesophotic and deep coral reefs, range extensions, habitat deterioration and mapping.

-Sea Turtle Ecology and Conservation – including genetics, tagging and tracking strategies, and resource management issues.

-Coral Diseases - including disease dynamics, effects on reef ecosystems, effects on reef populations and communities, pathogens, toxins, vectors, relationship with nutrients and anthropogenic effects, and coral resistance and immunity to disease.

-Connectivity - including habitat linkages between coral reefs, sea grasses, mangroves and other ecosystems, larval dispersal, settlement, recruitment, spawning aggregations, and land-sea interactions.

-Global and Regional Issues - including global warming, regional patterns of coral bleaching and disease/syndrome manifestations, physical oceanography, ocean acidification, remote sensing, natural disturbances, pollution, and sedimentation.

-Resource Management - including MPAs, ecosystem approaches to coastal management, fisheries, aquaculture, conservation, monitoring and assessment, social economics, and public awareness.

-Oceanography - including physical, biological, chemical, and geological oceanography; chemistry, geology, fluid dynamics, and air-sea interactions.

-Other topics will also be considered (subject to time limitations). Please take note of the deadlines for abstract submissions, early and late registration, and hotel reservations.

Plenary Speakers: We are honored to be featuring several distinguished plenary speakers at the conference. These will include, but not be limited to, the following:

Dr. Peter Mumby, University of Queensland, Australia, Principal Investigator of the FORCE (Caribbean) project

Dr. Patricia Miloslavich, Census of Marine Life (Caribbean), Universidad Simón Bolívar, Caracas, Venezuela

Dr. Robin Mahon, Director, Centre for Resource Management and Environmental Studies (CERMES), University of the West Indies at Barbados, Cavehill Campus, speaking on the Caribbean Sea Commission and related matters.

Workshops. Several workshops will be held during the meeting. These will include:

Marine Science, the AMLC, and the Caribbean Sea Commission (CSC): Opportunities for Information Transfer and Networking”
Leader: Prof. Robin Mahon.

Census of Marine Life: Tools for Environmental Managers in the Caribbean Region.
Leaders: Drs. Patricia Miloslavich & Eduardo Klein.
The goal of the workshop is to present and discuss the tools (projects, methods, data) that the Census of Marine Life program (www.coml.org), especially the Ocean Biogeographic Information System (OBIS) and the nearshore project NaGISA, can provide to environmental managers in the Caribbean region to adequately plan the conservation of marine biodiversity.

Dates and Fees

Through 15 April 2011 (Early Bird Registration)

Student	US \$ 130
Regular	\$ 330
†Official Institutional Representative	\$ 280

From 16 April 2011 to 23 May 2011

Student	US \$ 160
Regular	\$ 370
†Official Institutional Representative	\$ 220

(†This rate only applies to individuals officially designated by their institution as the voting representative to the AMLC Executive Board.)

To register and obtain information about abstract submission, travel, hotels, the meeting, and associated workshops, please visit –

<http://www.amlc-carib.org/meetings/2011.html>

We look forward to seeing you at this great meeting!

Be an early bird – register now!

Abstract Deadline - 15 April 2011

3rd Symposium on Acoustic Communication by Animals. August 1-5, 2011.

This four day conference will be held at Cornell University, Ithaca, NY and will bring together experts, students and others working in the field of acoustic communication by all species of animals. The topics will cover a wide range of subjects in this new and emerging field.

Participants may submit abstracts for poster or oral presentations. An extended abstract (up to two pages) is required and must be in English.

The presentation type for each contributor (poster or oral) will be chosen by the organizers to fit the schedule.

For more information, or to submit abstracts, please visit the Symposium Website :

<<http://www.certain.com/system/profile/web/index.cfm?PKwebID=0x2160313c2a&varPage=home>>

Abstract submission deadline: April 8, 2011

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

First Announcement : James Cook University and the Australian Research Council (ARC) Centre of Excellence for Coral Reef Studies warmly welcome you to Cairns, Australia for the 12th International Coral Reef Symposium (ICRS) from 9 - 13 July 2012. 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. ICRS 2012 is

expected to attract more than 2,000 delegates from 80 countries.

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. Activities at ICRS 2012 will include a comprehensive program to showcase the latest coral reef science, a trade exhibition, and field trips to the World Heritage listed Great Barrier Reef. Exciting and culturally significant Australian social events are planned.

Venue is the City of Cairns: Cairns is a cosmopolitan city and a premier destination for visiting the spectacular Great Barrier Reef and Australia's tropical rainforests. 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.

Field Trips: The Symposium's tradition of conducting scientific field trips before and after the event will continue in 2012 with trips to the Great Barrier Reef:

- a.. Heron Island Research Station,
- b.. Lizard Island Research Station, and
- c.. Orpheus Island Research Station.

For further information about attending or sponsorship opportunities, visit us at www.icrs2012.com or e-mail at: sponsorship@icrs2012.com.

2nd International Marine Conservation Congress, Making Marine Science Matter.

The call for proposals for symposia, workshops, and focus groups is now open for the 2nd International Marine Conservation Congress, Making Marine Science Matter/, which will be held from 14-18 May 2011 at the Victoria Convention Centre, Victoria, British Columbia, Canada. The deadline for proposals is 31 August 2010. You can find the proposal guidelines at <http://www.conbio.org/imcc>.

For additional information contact the program committee at IMCCprogram@gmail.com.

Workshop: QPCR for coral biologists.

QPCR for coral biologists workshop will be offered in the Florida Keys this summer. The workshop will take place on July 22-29, 2011, and the fee will be \$1,480. Please see the workshop's web page for more details on the program and application process: www.bio.utexas.edu/research/matz_lab/matzlab/QPCR.html

Please don't hesitate to contact us with questions.
Misha Matz (matz@mail.utexas.edu)
Carly Kenkel (carly.kenkel@gmail.com)
Integrative Biology Section
University of Texas at Austin

Courses

Ecology and Animal Behavior – Belize, 2011.

Join our research team for two intense weeks of total immersion into the world of animal behavior, ecology & conservation, Antillean manatees, bottlenose dolphins, coral reefs, mangrove forests, and seagrass beds in Belize!

Course Overview: This is a total immersion field course where you will live, work, and study from a marine science field station on a pristine, private island within the Belize Barrier Reef Lagoon System. Data collected during the course will contribute to our long- term research project established in 1998. You will learn through a variety of learning activities, literature review and discussion, independent and team projects, and actual field research. Be prepared to rise with the sun and spend 8-10 hours outdoors, including 3-4 hours on the water each day learning about the tropical Caribbean environment as we explore a maze of mangrove islands, seagrass beds, coral patches, and the Belize Barrier Reef. The course is divided into 4 major components: lectures/learning activities (~1 hour per day), independent reading and

assignments (~2 hour per day), data collection in the field (~3 hours per day), individual project development & implementation (~2 hours per day), presentation of pre-field component (~1 hour per day), and debate/group discussion of reading materials (~1 hour per day). Two days of extra-curricular activities are included: (1) diving or snorkeling at Turneffe Atoll, and (2) exploring an ancient Maya City. Additional, optional SCUBA dives are available as time and weather permits, but additional costs are involved.

Location: Spanish Bay Conservation & Research Center at Hugh Parkey's Belize Adventure Lodge, <http://belizeadventurelodge.com/> (Passport required)

Costs: US\$ 2995 includes housing, meals, most tips, field trips, ground & water transfer fees, research & materials fees; DOES NOT include airfare, books, extra tips, or credit hours. Many students have been successful in getting additional financial aid for study abroad through their home university. Two \$500 Scholarships are available to students from low-income countries.

Credit hours: The course is comparable to a 3 credit hour university course and meets the federal requirements for semester credit hours set forth last fall. You must make arrangements IN ADVANCE with BOTH your advising faculty and Dr. Self-Sullivan for credit to be given through your home university. Credit hour fees must be paid directly to your school and you must fulfill all study abroad requirements of your school.

Deadlines: Early registration & deposit due March 15, 2011; regular registration & deposit due April 1st, 2011; balance due April 15th, 2011. Late registration (after April 1st--if space available) incurs a \$100 late fee. If you are registering through your home university, earlier deadlines may exist; please check with your academic advisor.

Minimum / maximum class size: 8-24 students

Visit our facebook event page for more information and links to important documents:

<http://www.facebook.com/event.php?eid=370432825564>

Caryn Self-Sullivan, Ph.D. caryns@sirenian.org

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<http://www.nova.edu/ocean/>

President & Co-founder, Sirenian International, Inc.
<http://sirenian.org/caryn.html>

Perry Institute for Marine Science 2011 Internships.

Location: Lee Stocking Island, Exuma, Bahamas

Duration: 2 month minimum

Starting date: Year round

Application deadlines: Spring: February 1 Summer: April 15 Winter: October 1

Open to: All students pursuing or have recently completed a degree in marine science or biology.

Description: Interns will split their time between direct involvement in support of scientific research and operational support of science. Responsibilities will depend largely on the current projects being conducted during each period. Interns will gain firsthand experience with standard field procedures, experimental design, sampling protocol, environmental monitoring techniques, diving and boating, and perhaps most valuable, personal interaction with some of the world's leading marine scientists.

Requirements: Open water SCUBA certified, first aid, CPR and oxygen administration certified, experience operating small vessels (preferred)

To apply: Please visit www.perryinstitute.org for application form and detailed internship descriptions and agreement. Send additional questions to elamarre@perryinstitute.org.

Number of internships awarded each season will vary and are dependent on research demands and funding availability. Internships are non-salaried, however, room and board (shared accommodation) and transportation between LSI and Exuma International Airport (Georgetown, Bahamas) will be provided.

Summer Courses at Mote Marine Laboratory.

Mote Marine Laboratory's Tropical Research Laboratory is pleased to announce the schedule for advanced courses this summer to be held at the Summerland Key, Florida, facility. These URLs link to the individual courses:

Coral Tissue Slide Reading Workshop

http://www.mote.org/Keys/slide_workshop_2011.phtml

Diseases of Corals and Other Reef Organisms

http://www.mote.org/Keys/disease_workshop_2011.phtml

Course descriptions, fees, contacts, and application forms will be found at these Web sites.

Note on 2012 Coral Tissue Slide Reading Workshop: If there is sufficient interest, Dr. Peters will present this workshop at James Cook University for 3-4 days BEFORE the 12th International Coral Reef Symposium. Please contact Dr. Peters (epeters2@gmu.edu) if you are interested in taking the workshop there.

An Advanced Coral Tissue Slide Reading Workshop is being planned for AFTER the 12th ICRS at James Cook University.

Duke University Marine Laboratory – Marine Conservation.

The Duke Center for Marine Conservation at the Duke University Marine Lab. offers educational, research and collaborative opportunities for persons or organizations in the field of marine conservation.

Each year, the Duke University Marine Laboratory/Duke Center for Marine Conservation offers an exciting opportunity for international students. Duke's Integrated Marine Conservation Program teaches the principles necessary to the conservation and preservation of the coastal and oceanic environment. The focus is on interdisciplinary problem solving---using natural and social science theory to resolve real world

environmental problems. This program is a tremendous opportunity for students at any level to think about conservation biology and policy in an environment full of students and faculty grappling with the same issues.

The core class - BIO 109/ENV209 Conservation Biology and Policy - involves field trips, discussion groups, role play, lecture and a final project that focuses on the integration of science and policy. Students will leave the class with an appreciation of the policy process, as well as knowledge in the fundamentals of marine conservation.

Contact Information is as follows:

Debbie Pease, Executive Assistant
Duke Center for Marine Conservation
Duke University Marine Lab
135 Duke Marine Lab Road
Beaufort, NC 28516
Phone: 252-504-7636
Fax: 252-504-7638
Email: drpease1@duke.edu

Global Fellowships in Marine Conservation Duke University– 2011

Summer Term II - Deadline: 31 March 2011

For additional information regarding the Global Fellowships in Marine Conservation applicants are encouraged to contact :

ml_admissions@nicholas.duke.edu
<mailto:ml_admissions@nicholas.duke.edu>.

Fellowships for international students will fully cover travel expenses, room and board, and tuition for two courses, your required course BIOLOGY 109/ENVIRON 109/ENVIRON 209 Conservation Biology and Policy and an elective course of your choice to subject to availability. The courses begin on July 11 and ends on August 12, 2011.

Eligibility: The Global Fellowships are available to any international applicant with a good working knowledge of English who has an interest and qualifications in marine conservation biology. The course requires some background in marine science and political science. Usually Global Fellows have a BA or BS degree in hand.

Application: There is no separate fellowship application form. Intent to apply for a fellowship should be made known on the summer course enrollment form

<http://www.nicholas.duke.edu/marinelab/programs/enrollment_forms/index.html>.

Required Credentials: In addition to the enrollment form, each Global Fellowship applicant is required to submit the following credentials:

1. A brief essay - please limit this to one page - describing the applicant's education, research, and work experience background. Please note a Curriculum Vitae does not take the place of this essay.

2. A brief statement of purpose - please limit this to one page i.e., describing the applicant's reason for taking the course, how the applicant will be able to apply the training in his/her home country, the applicant's future goals.

3. A letter of recommendation from academic faculty or employer addressed to Dr. Larry Crowder. We do not offer guidelines about the information to be included in your reference letter. These letters typically include how the referee knows you, his/her opinions of your work together in the past, and thoughts about whether he/she feels you'd be well suited to this program.

4. A Complete Curriculum Vitae.

5. A copy of your transcript is preferred. It may be an unofficial version. The transcript can be emailed to drpease1@duke.edu or faxed to (252) 504-7638 or scanned and emailed to the attention of Debbie Pease. A non-certified translation of the transcript is fine. If sending a transcript is impossible, then please send a copy of your degree. If a traditional transcript is available, documentation certifying your courses, grades and official notes taken in each course during university studies in addition to a copy of your diploma will be required.

All credentials are to be posted to: The Duke University Marine Lab, Attention: Debbie Pease, 135 Duke Marine Lab Rd, Beaufort NC 28516, USA; or *faxed* to 252-504-7638 to the attention of Debbie Pease; or scanned and sent in MS Word or pdf format as an email attachment to drpease1@duke.edu

<<mailto:drpease1@duke.edu>>. No other format will be accepted.

Due Date: Global Fellowship applications and credentials must be received no later than 1st April 2011 by Ms. Debbie Pease (drpease1@duke.edu <<mailto:drpease1@duke.edu>>). All applicants will be notified of their award status shortly after the deadline date.

Field Ecology on Board – British Virgin Islands.

This program allows students to study the biology, ecology, and conservation of the Caribbean coral reef ecosystem. The emphasis is placed on field methods and labs, including small field experiments to test hypotheses. Program is limited to 10 students, and most (but not all) slots have been filled.

The program is conducted aboard a large catamaran sailboat that serves as the accommodations, transportation, classroom, and research platform. Each day, the participants will sail to a new island in the archipelago of the British Virgin Islands (including Tortola, Jost Van Dyke, Norman, Peter, Salt, Cooper, Virgin Gorda, Anegada, and Muskmelon) to investigate new habitats. Students will learn the nautical skills (seamanship, navigation, sailing) needed to become a proficient crew member on a research vessel and will earn their PADI Open Water or Advanced Scuba Diver certification during a total of 14 training and research dives. Prior to departure, students are required to complete the classroom portion of PADI's Open Water Diver or Advanced Diver Course online (www.padi.com). The program will be conducted in conjunction with a non-profit organization called the Marine Science and Nautical Training Academy (MANTA, www.manta-online.org). Participants will be required to engage in activities such as snorkeling, SCUBA diving, swimming, hiking, sailing, lifting scuba tanks, preparing meals, and vessel upkeep as part of this program.

The college program is offered through the College of Charleston, where four credits of lower- or upper-undergraduate study can be earned. Please email MANTA executive director Rusty Day

(Rusty.Day@manta-online.org) or Erik Sotka (SotkaE@cofc.edu) with questions. Also see <http://spinner.cofc.edu/international/downloads/11_Summer_programs/BVIs.11.pdf>

Erik Sotka
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Grice Marine Laboratory, 205 Fort Johnson Road,
Charleston, SC 29412
Office: 843-953-9191
eMail: SotkaE@cofc.edu
<http://sotkae.people.cofc.edu>

New Books

Coral Reefs: An Ecosystem in Transition

Zvy Dubinsky and Noga Stambler Editors.
Springer Verlag – 2011.

In the wake of the alarming decline in the vitality of coral reefs worldwide, and its resulting catastrophic effects on the biodiversity of associated biota, it is timely and a topic to revisit, review and update our views of the main processes related to corals, coral reefs, and their myriad of associated denizens. Leading authorities both established and young, have contributed their up-to-date summaries and evaluations of developments in their respective fields of expertise. The resulting book covers and integrates in one volume materials scattered in hundreds of research articles. The book has 29 chapters distributed among six parts or major topics: History and Perspective, Geology and Evolution, Coral Biology, The Coral Reef Ecosystem, Disturbances and Conservation and Management

Book can be purchased directly from Springer.com or Amazon.com. Price \$ 230.00. If you are a registered author at Springer, you'll get a 33.3% discount.

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 it to the address below, or send the information by e-mail to David Wilson at the e-mail address below.

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croquereef@gmail.com

Name & Title _____

Institution/Association _____

Address _____

Telephone _____

FAX _____

E-mail _____

Dues

Individual membership dues for 2009-2010 are \$25.00 due in June 2009. You can make your payment with Dr. Laurie Richardson (treasurer) or Dr. Aldo Croquer (Membership Director), whom can be contacted by e-mail at:

amlc.membershipdirector@gmail.com or at their personal e-mails in page 16. If you attended the Dominica meeting, your membership fee for the two years (2009-2010) was included in the registration fee. If you did not attend the meeting, please remit 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 card payments online at www.amlc-carib.org 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 (address on next page).

Name & Title _____

Institution/Association _____

Billing 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 1957 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.

Biannual AMLC scientific meetings are hosted by member laboratories actively conducting marine research in the Caribbean. The host laboratory arranges facilities for research presentations, and logistical arrangements. The AMLC has no designated official language so researchers are free to make their presentations in their native language.

Caribbean Marine Science, published twice per year in English and Spanish, is the 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:

- Assisting and initiating cooperative research and education programs
- Providing for a for exchange of scientific and technical information
- Fostering personal and official relations among members
- 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 March for inclusion in the Spring-Summer issue, and by the end of October for the Fall-Winter issue.

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