

Mark your calendars...

- August 9: 10 am—4 pm; National Marina Day at Camachee Cove Marina
- August 9: 8:30am—noon. Science Exploration Day at 500 Old Beach Rd, St. Augustine. This is a hands-on parent/child workshop. To register, e-mail ginaamcd@bellsouth.net
- August 11: 9 am—noon. Educator collecting permit workshop at GTMNERR (Guana). RSVP with Angie at 904-823-4500.
- More on back page!

Lots going on!

Wow, time has really flown by this summer. I was fortunate to be able to take a 3-week trip to Estonia and England with my mother and son in June. My mother was born in Estonia, and wanted to take us there to show us some of her memories and to allow us to make some of our own. We visited with relatives in both Estonia and England. In July, I spent a week at the International Coral Reef Symposium in Fort Lauderdale (see related article on pages 2-3), and another week at the National Marine Educators' Association conference in Savannah, GA. I'm still in the midst of summer camps (so those of you who receive the print version of this newsletter will notice that it's a bit tardy—sorry!)

Maia P. McGuire

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New fishing regulations for Gulf of Mexico anglers

People who are planning to fish for reef fish in the Gulf of Mexico need to be aware of new federal and state regulations that went into effect on June 1, 2008. These regulations affect both commercial and recreational anglers fishing for any reef fish in the Gulf, including grouper, snapper and triggerfish. The regulations are designed to increase survival of fish that are caught and then released. Anglers fishing for reef fish using non-artificial bait must now use non-offset, non-stainless steel circle hooks instead of the traditional J-hooks. The new regulations also require that anglers in the Gulf of Mexico have two tools in their tackle kits. These are a dehooking device and a venting tool. To learn more about the new regulations, visit the Fisheries section of the Florida Sea Grant website at <http://www.flseagrant.org>.

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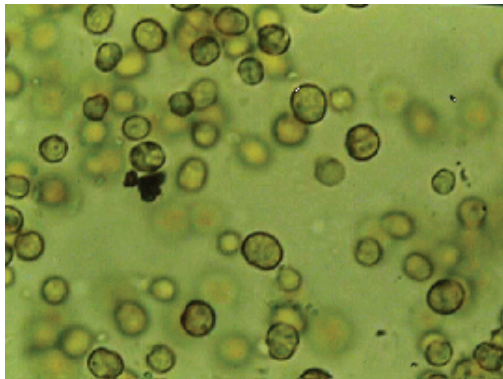
Reefs for the Future



“Reefs for the Future” was the theme for the 11th International Coral Reef Symposium (ICRS) held July 7-11 in Fort Lauderdale, FL. ICRS is held every four years, and coral reef researchers and managers

from around the world attend. This year’s ICRS had about 2500 participants. Many of the world’s coral reefs are in decline. This fact caused the invited keynote speakers to express concerns about whether there will be any coral reefs in the future. While some coral reefs are stable and healthy, the majority of coral reefs face threats from global climate change, disease, coastal development and overfishing.

Global climate change negatively impacts coral reefs in several ways. Sea surface temperatures have increased by 0.5°C in the past 40 years. Most reef-building corals can only live within a certain range of water temperatures. As temperatures increase, we expect to see corals expand their range north and south into waters that are currently too cold for them. Supporting this expectation, elkhorn corals have been found for the first time on reefs in the northern Gulf of Mexico. However, as water temperatures



Microscopic, single-celled algae called zooxanthellae live inside coral tissues and contribute to the golden-brown color of corals. When corals become stressed, they lose the zooxanthellae and become “bleached.”

rise, it is expected that corals in tropical areas will die. Corals are known to become stressed and “bleach” when water temperatures are above 30°C (86°F). Some bleached corals are able to recover when water temperatures return to normal, however many colonies die. As temperatures increase, they cause sea level to rise because of thermal expansion. It is predicted that thermal expansion alone will result in an increase in sea level of 0.3 to 0.6 meters (1-2 feet) by 2100. Melting of polar ice caps is expected to cause an additional increase in sea level of four to six meters (perhaps up to 20 feet), but the timeline for this is unknown. A third probable impact of global climate change is an increase in the acidity (decrease in pH) of the oceans. This is a concern for reef scientists as coral skeletons are made from limestone, which dissolves when pH is lowered. Studies are under way to investigate the effect of changes in pH on corals and coral reefs.

In 2006, two Caribbean coral species, staghorn and elkhorn coral, were added to the U.S. endangered species list as threatened species. Historically, these two branching coral species along with the mound-shaped star and brain corals have been the primary reef building corals in the Caribbean. In the early part of this century, an outbreak of a coral disease killed large numbers of staghorn and elkhorn corals. The disease outbreak has decreased in intensity in recent years, and those corals seem to be starting to recover. However, there are six other coral diseases that are common in the Caribbean, and some of those diseases are wiping out the star and brain corals. These large corals tend to be killed by disease. In the US Virgin Islands, disease resulted in the loss of over 50% of the corals in one year. The result of coral deaths is a shift from reefs dominated by large, reef-building corals to those dominated by smaller, “weedy” coral species, or sometimes to reefs covered in algae or seaweed. This is a concern, as the smaller corals will probably not be able to grow upwards rapidly enough to keep up with sea level rise, so some reefs may become “drowned.” Corals need to be in shallow water as they contain tiny plant cells in their tissues which provide them with needed sugars and help them produce limestone skeleton.

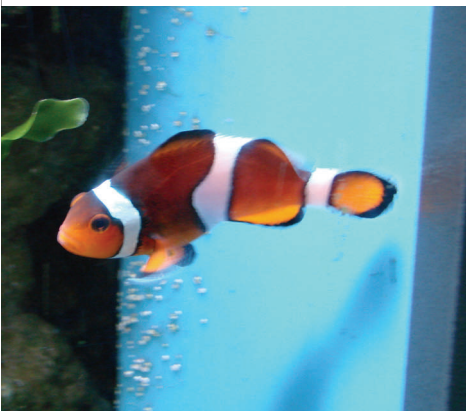
Coral Reefs for the Future (cont.)

Coastal development primarily affects coral reefs when sediment washes into the ocean from land that is being cleared or from channels that are being dredged. This sediment can settle on top of coral reefs, smothering corals. It also reduces the amount of light that can get to corals. There are often compounds like heavy metals associated with the sediment and these can be toxic to invertebrates. Elevated nutrient levels can also result from coastal runoff. Scientists are concerned about the impact of the sediments and associated toxins on coral larvae. Many coral species release gametes or larvae into the water column on a predictable schedule, and scientists in some Pacific regions have worked with local municipalities to have dredging operations halted just before and for about a week after the spawning times. It is hoped that this will maximize successful recruitment and survival of coral larvae in those areas.

Many island nations rely on marine fish as their primary source of protein. However, as populations have increased, the demand on reef fish has also increased and many of the traditionally-fished species (mostly predatory fish) are no longer available in sufficient quantities. Many fisheries around the world are now harvesting plant-eating fish, which were previously considered “trash” fish. In the early 1980’s, a disease wiped out 97% of the long-spined sea urchins in the western Atlantic. Overharvesting of plant-



The Caribbean Coral Reef Institute logo recognizes the importance of all ecosystem components in maintaining reef health while emphasizing their fragile nature by portraying formally abundant key species: the Nassau grouper (*Epinephelus striatus*), elkhorn coral (*Acropora palmata*), and black urchin (*Diadema antillarum*).



Many tropical species like this clownfish can be farm-raised. Purchasing cultured fish helps protect coral reefs.

eating fish and the loss of the grazing sea urchins both result in increases in the amount of algae (seaweeds) found on coral reefs. These algae can overgrow, overshadow or cause sediment to fall on corals. The marine aquarium trade is a \$200-330 million a year industry. It involves 11-12 million specimens representing 140 species, most of which are from the Indo-Pacific region. Indonesia supplies 91% of the specimens for the marine aquarium trade and the United States represents 68% of the purchases. Collection of marine fish and invertebrates in the Pacific often involves destructive techniques, including the use of dynamite, and there is a high rate of mortality among the animals collected. Aquarium hobbyists can help protect Pacific reef species by purchasing fish and invertebrates that have been grown in aquaculture facilities instead of wild-caught specimens.

Will there be reefs in the future? The consensus seems to be that there could be, but that it is critical that we reduce the rate of global climate change, particularly the rate of carbon dioxide release into the atmosphere. 2008 Darwin Award winner Dr. Terry Hughes put it this way, “Coral reefs are in decline, but are not doomed--IF we can slow global climate change.” Meanwhile, plans for the 12th ICRS in 2012 are under way.

The symposium held a photo contest, with prizes awarded in six categories. To view the photos, go to <http://www.nova.edu/ncr/11icrs/photocontest.html>.



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More “Mark your calendars”

- September 8-October 2: Upland Habitats Master Naturalist program (Clay Co). See www.masternaturalist.org to register.
- September 13—Intracoastal Waterway Cleanup (City of Palm Coast). Contact Judi Stetson at 386-986-3782 for more information or to register.
- October 3-November 7: Freshwater wetlands Master Naturalist program (Volusia Co). See www.masternaturalist.org to register.
- October 12-25: Freshwater wetlands Master Naturalist program (St Johns Co). See www.masternaturalist.org to register.
- October 4-5: Home and Garden Show, St Johns County Agricultural Center. Call 904-209-0430 for more information.
- October 23-25: Florida Association of Science Teachers annual conference, Orlando. See www.fastscience.org for information.
- November 15: 4-H Marine Ecology Event (Kissimmee). See http://florida4h.org/projects/marine/state_mee.shtml for materials and information.

Please check the calendars at <http://calendar.ifas.ufl.edu> for other environmental education programs around the state.

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