

# PROJECT OF THE MONTH

## NCRI plays Cupid and Corals Go Wild

Wendy Wood, National Coral Reef Institute

A few days after the full moon of August, corals off the coast of heavily populated Broward County, FL began their annual spawning period, releasing sperm and eggs, also known as gametes, into the water column. Center for Sponsored Coastal Ocean Research-supported scientists from the Nova Southeastern University's National Coral Reef Institute (NCRI), working with scientists and managers of Florida's Department of Environmental Protection were there to catch the action. During several night dives, divers collected gametes as they were being released from colonies of the great star coral *Montastraea cavernosa*. This species is one of the most important reef-building Caribbean and Atlantic coral species, particularly in Florida.

Departing at dusk on August 23 from Nova Southeastern University Oceanographic Center, the scientists anchored at pre-selected sites and entered the water around 6:00 pm.



*The NCRI facility at Nova Southeastern University in Ft. Lauderdale, Fla. (Photo credit : NCRI)*

A couple weeks before the predicted spawning date, tissue samples were taken from several large, tagged colonies to determine which colonies were male and which ones were female. These colonies were then targeted for gamete collection. Large mesh nets topped with plastic collection cups were tented over the female

colonies to catch the buoyant eggs as they floated to the surface after being released. Collection of sperm is a bit trickier since sperm quickly disperse in the water upon release instead of floating to the surface like the positively buoyant eggs. Thus, divers equipped with plastic bags were stationed near the male colonies, poised to scoop up as much as they could as clouds of sperm were released from the male colonies.



*A star coral releases its gametes into the water. (Photo credit: NCRI)*

“Imagine stumbling around in the dark with a small flashlight trying to collect fruit flies in a ziplock bag while the entire room is swaying back and forth. That’s the closest I could come to describing what collecting coral gametes by hand is like” commented NCRI research assistant and graduate student Adam St. Gelais. “When it all comes together though, it is a very special thing for a coral researcher to witness.”

The divers’ long hours of waiting were rewarded when the male colonies released their gametes around 9 pm, and the female colonies followed about 20 to 30 minutes later. The collected gametes were brought to the surface and placed in buckets on the dive boat to mix and fertilize. Back at the laboratory, the fertilized eggs were placed in a controlled aquarium environment where development of the eggs into free-swimming larvae occurred over the next several days. Several colonies of *M. cavernosa* that were being maintained in outdoor tanks at NCRI also spawned

for the first time, and gametes were collected and transferred to aquaria inside. Once the larvae matured, they were ready to settle onto natural limestone plates placed in the aquaria. After settlement, the larvae metamorphose into a primary polyp, the building block of the coral animal. Other polyps bud off from the primary polyp as the coral grows into a juvenile colony.

enough for field transplantation, they will be returned to the reef to aid restoration of damaged reefs.

“This outstanding research is consistent with NCRI’s mission of providing management related research output on assessment, monitoring, and especially restoration of coral reefs” stated Dr. Richard Dodge, Executive Director of NCRI and Dean of the Nova Southeastern University Oceanographic Center.

With coral reefs worldwide experiencing degradation and loss of corals due to pollution, overfishing, climate change and coastal development, tools are sought to help restore the health of the reefs. Practical solutions to restoring and reinvigorating coral reefs are urgently needed, and the transplantation of healthy corals is one option for doing this.

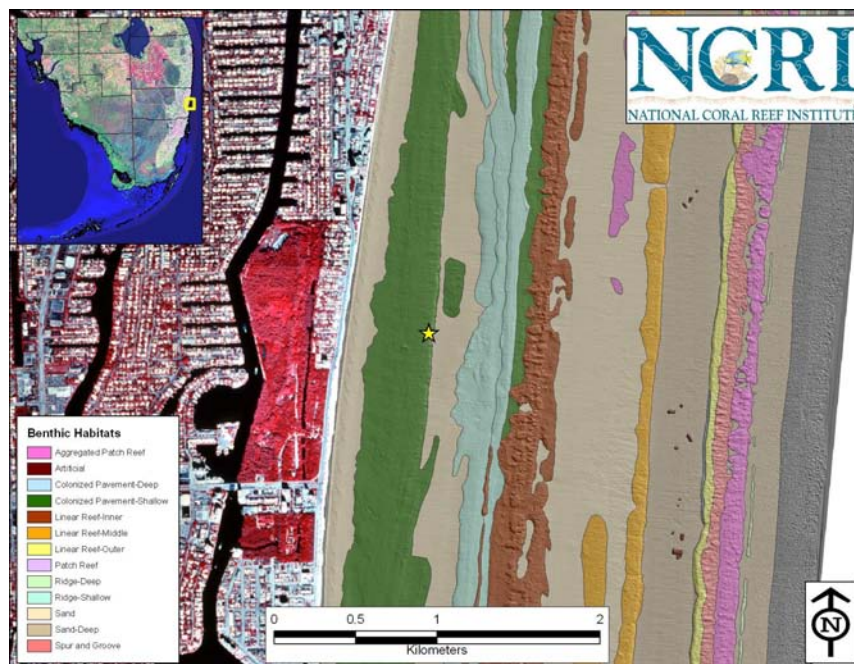
“The use of sexually reproduced, juvenile corals grown in the laboratory has great potential to provide a viable alternative in coral reef restoration” says NCRI research scientist Dr. Alison Moulding. “This research aims to develop and provide a useful tool in the manager’s toolbox to help address critical issues facing coral reefs in the US and worldwide.”

*NCRI is a core component of NOAA’s Coral Reef Conservation Program, and is administered by the National Centers for Coastal Ocean Science’s Center for Sponsored Coastal Ocean Research. For more information, contact David Hilmer at (301) 713-3338 or David.Hilmer@noaa.gov.*



*Gametes are collected and placed in buckets for transport back to NCRI. (Photo credit: NCRI)*

The resulting juvenile corals will be nurtured and grown in the protected laboratory environment until they are large enough to be moved to the outside coral husbandry system. After they have reached a size large



*This map shows the location of the spawning collection. (Photo credit: NCRI)*