

COASTAL AMERICA 2011 AWARDS PROGRAM NOMINATION FORM

Please circle the award type (only one) you are recommending this team for:

Partnership Award - Spirit Award - Special Recognition Award

1. Full Name of Nominated Team: Florida Keys *Acropora* Restoration and Spawning Team

2. Nominator Contact Information:

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3. What is the lead Federal Agency (if any) for this project? (or lead organization for Special Recognition Awards): National Oceanic and Atmospheric Administration

4. Please provide a brief abstract overview of the project you are nominating (1 page max.)

Short Abstract

The *Acropora* restoration and spawning team is comprised of five partners, including one federal, one state, two non-profit organizations and one business. The Teen Research Underwater Explorers (TRUE Dive Team) monitored *Acropora* coral spawning in the Florida Keys during summers of 2009 and 2010. *Acropora* corals are listed as threatened under the Endangered Species Act (ESA). The spawning occurred in the evenings from 7-12 August 2009 in a location where a ship had run aground and where coral recruits from the Coral Restoration Foundation (CRF) had been transplanted. This was the first time that nursery-raised *Acropora* corals had been documented to spawn in nature. Funding and science guidance was provided by National Oceanic and Atmospheric Administration (NOAA) and Florida Fish and Wildlife Conservation Commission (FWC). The Florida Keys Dive Center (FKDC) provided logistical support with vessel and dive support. The spawning has since led to a broader collaboration between the groups that now include restoration projects in the Florida Keys. The restoration of *Acropora* is necessary to sustaining the reef ecosystem in the Florida Keys. Each of the groups listed provides a unique and vital piece to this effort.

Long Abstract

Caribbean *Acropora* corals have undergone a 97% decline in regional abundance since the 1970s. This has resulted in two *Acropora* species, *Acropora palmata* (Elkhorn coral) and *Acropora cervicornes* (Staghorn coral); being given threatened status under the Endangered Species Act. To promote future healthy populations, the Coral Restoration Foundation (CRF) operates an *Acropora* coral nursery off of Key Largo, FL. CRF is a non-profit organization

designed to promote coral growth and educate the general public to the decline of *Acropora* in the Florida Keys. To help in this endeavor, the National Oceanic and Atmospheric Administration (NOAA), through the the Florida Fish and Wildlife Conservation Commission, has funded the Teen Research Underwater Explorers (TRUE Dive Team) to document, monitor and collect gametes from the 2009 coral spawn, and subsequently again in 2010 and 2011.

The TRUE Dive Team program (a non-profit) was established introduce young men and women to marine science using SCUBA diving as the mechanism. The group consists of 12-18 year old men and women who are mentored by professional scientists and SCUBA divers. TRUE Dive Team mentors are volunteers from federal, state, private sector, and academic research scientists in an informal education environment. The program's mission is to expand and promote opportunities for young and emerging explorers by involving them in the marine sciences through underwater exploration and research activities, such as special environmental and undersea conservation projects that educate, promote active citizenship, and develop effective leadership skills.

TRUE Dive Team accompanied by FWC and NOAA scientists monitored the coral spawning in 2009, when *Acropora* corals that were transplanted from the CRF nursery spawned on Molasses Reef in the Florida Keys. This marked the first documented time that nursery-raised corals spawned in nature. This was a tremendous event that would have gone undocumented without the collaboration. Building on the success of 2009, NOAA funded the TRUE Dive Team in 2010, but no *Acropora* coral spawning was witnessed. This has since raised several questions as to whether or not spawning occurred that year. NOAA has again funded the TRUE Dive Team to document the coral spawning in 2011 but *Acropora* spawning was witnessed a month earlier and it has been decided to defer the monitoring until 2012.

The unique partnership between the various groups has allowed the monitoring of *Acropora* project as a whole to succeed, as well as provide the basis for ongoing work between the groups. The groups now collaborate on the full restoration and maintenance of sites. Each unit provides a valuable piece of the puzzle and each shares the information openly. CRF provides the nursery but often needs outside help to maintain the growing site, CRF is also responsible for maintain its outplanting sites on Molasses Reef. The TRUE Dive Team provides three dozen well trained teen-aged divers, very willing to volunteer. FWC and NOAA provide the funding mechanism and the proper coral training for the divers beyond just restoration. The Florida Keys Dive Center (FKDC) provides a platform and support logistics for it all to occur.

5. Project Need and Resource Benefits/Outputs (2 pages max.)

Background

Caribbean *Acropora* corals have undergone a 97% decline in regional abundance since the 1970s. This has resulted in two *Acropora* species, *Acropora palmata* (Elkhorn coral) and *Acropora cervicornes* (Staghorn coral); being given threatened status under the ESA. In order to track genotype abundance and distribution, it is necessary to first geo-locate known populations, perform genetic analyses and, hopefully, rear larvae for later recovery efforts. To that end, the TRUE Dive Team was funded by NOAA through FWC to monitor, document and

collect gametes from the *Acropora* coral spawning in 2009, and again in 2010 and 2011. Spawning occurred in 2009 and is described in more detail below.

The TRUE Dive Team program was established to increase the attraction to science and technology careers in today's youth through exposure to the marine sciences. TRUE Dive Team is a non-profit 501(c)(3) organization formed in 2010, and consists of a diverse group of young men and women (ages 12-18) mentored by federal, state, private sector, and academic research scientists in an informal education environment. Scientists from NOAA, US Geological Survey (USGS), FWC and the University of South Florida-College of Marine Science (USF-CMS) are active science mentors in the program. The program's mission is to expand and promote opportunities for young and emerging explorers by involving them in the marine sciences through underwater exploration and research activities, such as special environmental and undersea conservation projects that educate, promote active citizenship, and develop effective leadership skills. TRUE currently consists of a total of 30 students. TRUE is an American Academy of Underwater Sciences (AAUS) organizational member and therefore meets their stringent SCUBA qualifications. Because of this, TRUE students have been able to work on various NOAA and FWC projects in the past

Site and Methods

TRUE Dive Team Explorers and adult leaders, accompanied by FWC and NOAA research scientists, chartered a vessel from Florida Keys Dive Center to document the *A. palmata* and *A. cervicornes* spawning at Molasses Reef on the evenings of 7-10 August 2009. Along with documenting the coral spawning, gametes needed to be collected and provided to Dr. Margaret Miller (NOAA) to perform cross-fertilization experiments and to document genotype abundance and distribution. The *Acropora* species only spawn at night. As such all of the SCUBA diving was completed between 8 pm and 12 am. For safety, underwater lines with strobes were placed on the seafloor to guide the Explorers to the appropriate coral sites. Gametes were collected by placing lead-weighted nets over the corals with a collection jar inverted at the surface of the nets, thus allowing the gametes to be collected in the jars. When gametes were collected, a pick up vessel was called to expedite delivery of the gametes and deliver to shore.

Results and Significance of Work

Spawning did occur during the monitored dates in 2009. Underwater video and photographs were taken at each site throughout the spawning process and were placed online. In addition, the NOAA *Acropora* Spawn Blog was updated daily by the group. Gametes were collected each night of the spawning and taken to a NOAA facility. *A. palmata* spawning was also documented at White Bank Shoal on the evening of 11 August 2009. The spawning provided for a truly unique event, nursery-raised *A. cervicornes* spawned at Molasses Reef. The new coral recruits were placed at the site of the *M/V Wellwood* grounding on Molasses Reef by the CRF only two years earlier. This proved to be the first documented coral spawning of nursery-raised corals.

The collaboration has given rise to this team now working on a number of other projects. In 2011, the groups worked together taking coral recruits from the nursery and placing them directly on the restoration site. Also while on the restoration site, CRF and TRUE Dive Team

members perform maintenance, which entails collecting any broken *Acropora* pieces and reattaching them to the bottom. Finally, the groups have conferred to release several outreach materials. Prior to departing for the Florida Keys, TRUE Dive Team produced a coral spawning field guide with assistance from NOAA and FWC scientists. Several hundred underwater photographs and underwater video were taken to document the spawning event and since been taken to document the maintenance and restoration work. The images and videos were provided to media outlets and were seen on TV and in newspapers. The photos and videos were also openly shared on the TRUE Dive Team and CRF websites. The TRUE Explorers that are part of the ongoing project present their findings when they returned back to their schools (i.e., peer-to-peer teaching).

The partnership is expected to grow in the coming year. The National Association of Underwater Instructors is interested in promoting a coral restoration specialty course to help promote what is currently being done. There are also two other dive clubs willing to volunteer their time to maintain the nursery.

Photos



2009 during spawning



2010 departing to spawning monitoring site



2011 working on coral nursery



2011 working on coral nursery

6. Partnership Functioning - Funding & Other Support (1 page max.)

Florida Fish and Wildlife Conservation Commission

Functioning: FWC provides science guidance on every aspect of the project before, during and after the various expeditions by way of a research scientist. They provide personnel and science training.

Funding: FWC provides a mechanism for the funds to TRUE Dive Team from NOAA. (provides in-kind support)

National Oceanic and Atmospheric Administration

Functioning: NOAA provides science training on how to document the coral spawning, as well as personnel to help collect the coral gametes. They provide personnel and science training.

Funding: NOAA provides all of the funding to TRUE Dive Team to support the spawning effort. (provides direct and in-kind support)

Teen Research Underwater Explorers

Functioning: TRUE Dive Team provides the majority of the SCUBA divers and covers the planning and execution of the various expeditions. They also provide the basis for the education outreach internally and externally. They provide personnel, equipment, science and dive training, outreach materials and leadership.

Funding: TRUE Dive Team receives the funds from NOAA (via FWC) and then coordinates with the different entities to cover trip costs. (recipient and provides in-kind support)

Coral Restoration Foundation

Functioning: CRF operates the coral nursery and provides training in the nursery and during the maintenance and restoration operations. They provide personnel and equipment.

Funding: CRF receives logistical support (e.g., vessel, diving) from the TRUE Dive Team grant. (provides in-kind support)

Florida Keys Dive Center

Functioning: FKDC is a for-profit business and operates the vessels and provides SCUBA diving support through personnel and equipment.

Funding: Although FKDC is paid for their services, they provide these services at a deeply discounted rate, which allows for the projects to continue with limited funding. (receives payment and in-kind support)

7. Team Partners:

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