

Crocker Reef Aid to Navigation (Buoy #16) Coral Reef Injury Restoration and Monitoring



Bill Goodwin
Florida Keys National Marine Sanctuary
Marine Resources Manager

National Marine Sanctuaries National Oceanic and Atmospheric Administration



- August 4, 1984 – a 122-meter (400-foot) freighter, the *Wellwood*, ran aground on Molasses Reef
- Impacted over 75,000 m² of coral reef habitat
- Destroyed 5,805 m² of living corals



Florida Keys National Marine Sanctuary





Design and construction of 25 coral
reef replacement modules during
Summer of 2001



Summer 2002:
22 modules installed at
Wellwood site as per restoration plan



The *Wellwood* restoration site today

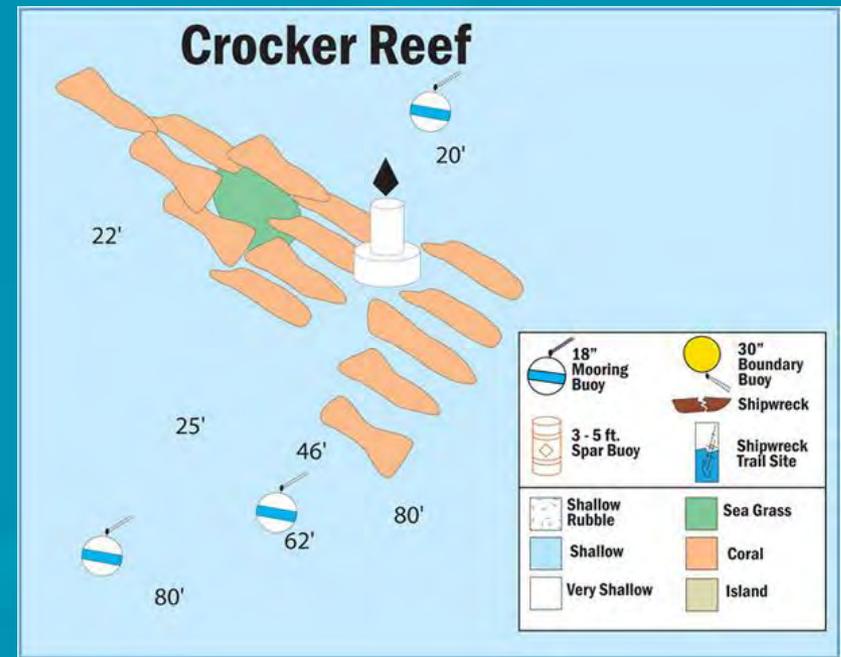


Small-scale emergency coral reattachment project at South Carysfort Reef

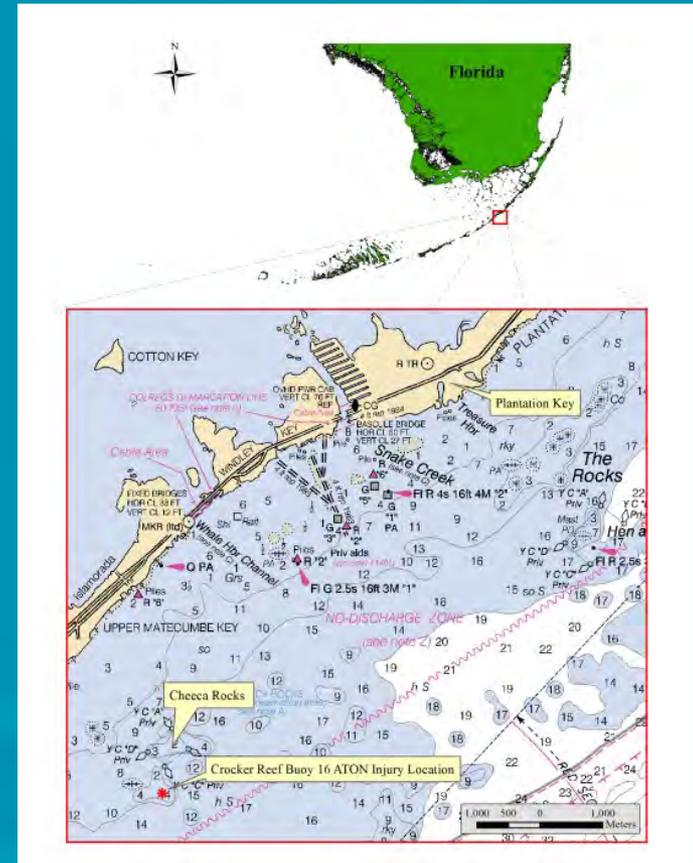
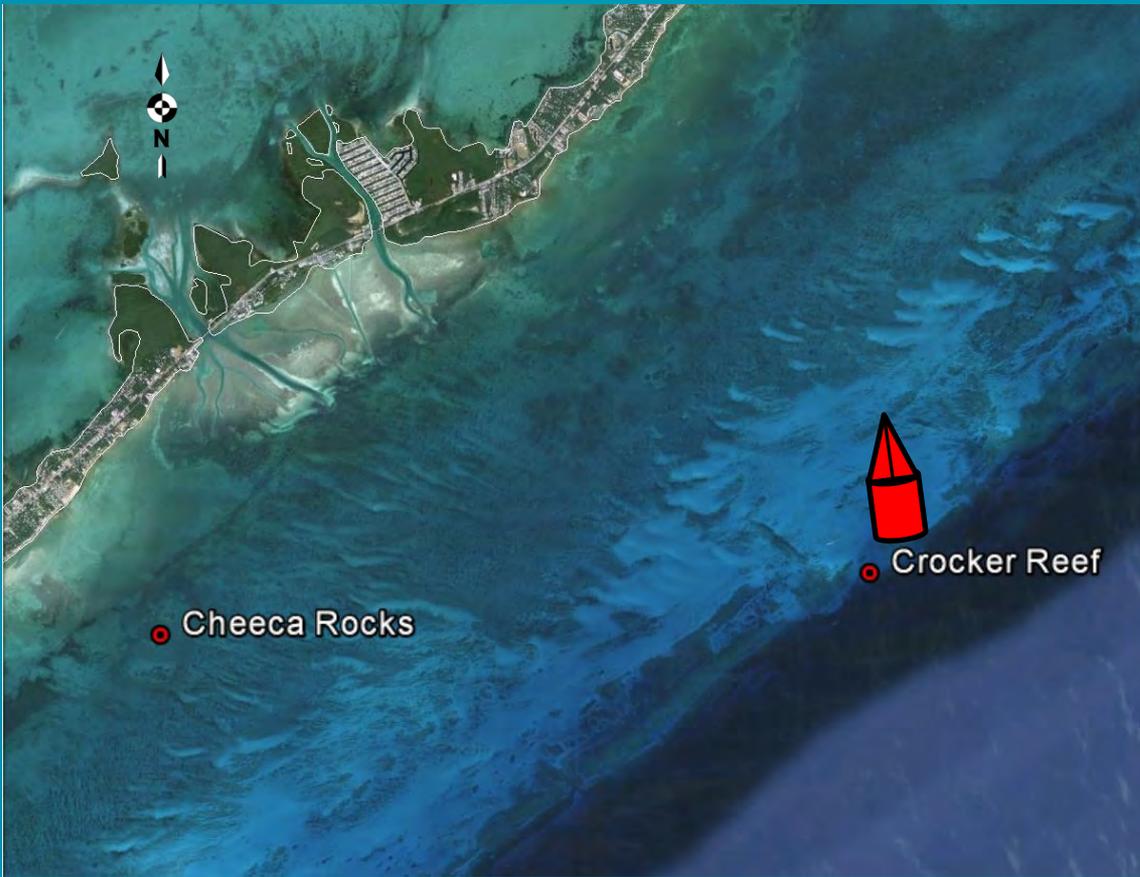


Crocker Reef Aid to Navigation (Buoy #16)

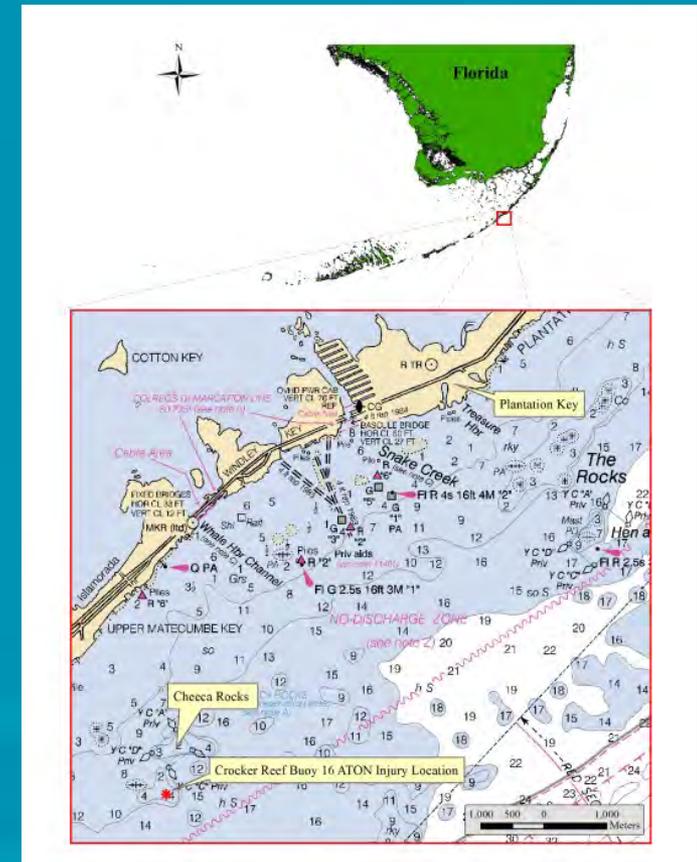
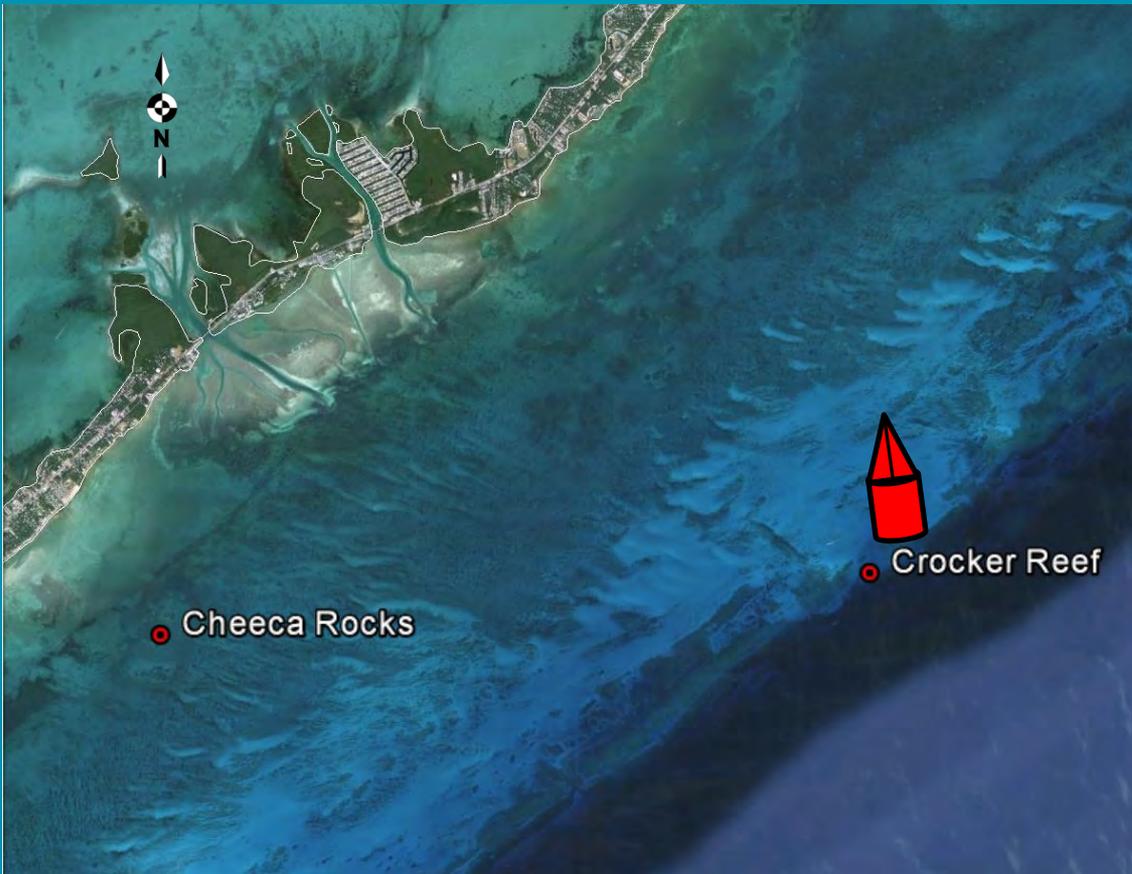
aka, ***“The CRATON”***



National Marine Sanctuaries National Oceanic and Atmospheric Administration



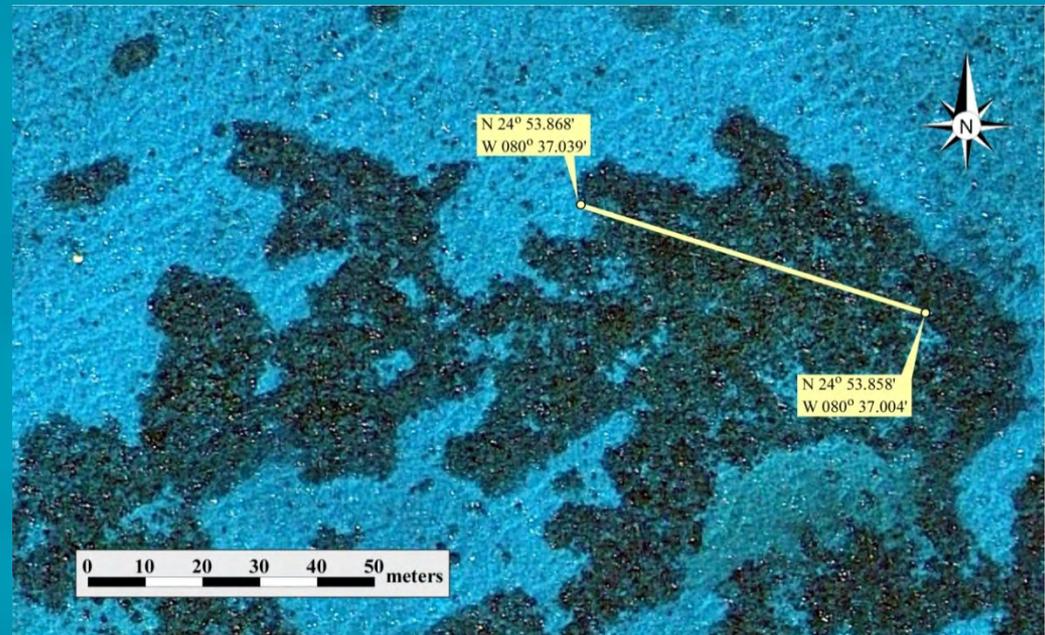
National Marine Sanctuaries National Oceanic and Atmospheric Administration





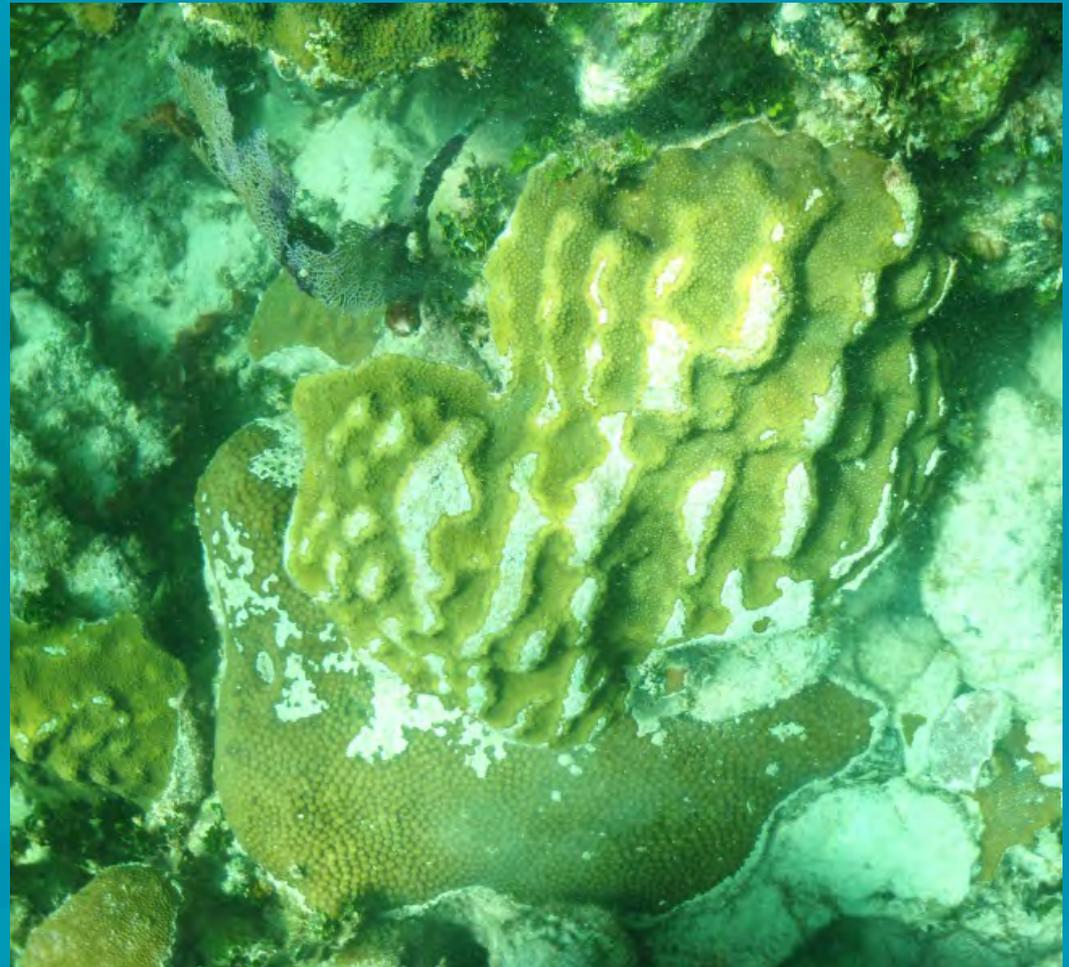
Researchers from NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML) notified FKNMS of coral reef injury caused by CR ATON on April 11, 2014

Injury assessment conducted by FKNMS staff documented an injury path that measured 64.5 meters (approximately 212 feet) in length



Injury types at CR ATON site :

Living tissue abrasion



Injury types at CR ATON site :

Fracturing of coral colonies



Injury types at CR ATON site :
Dislodging of coral colonies

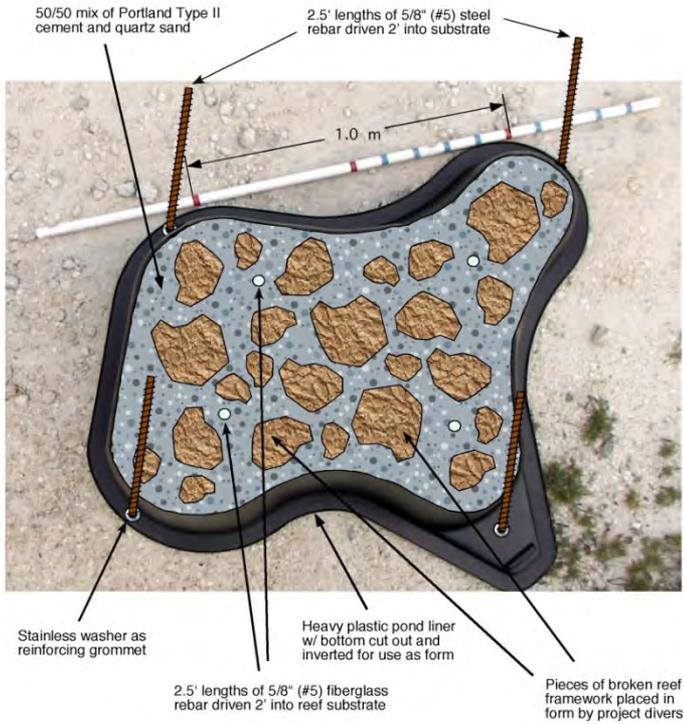


Injury types at CR ATON site :

Generation of loose framework rubble



“Reeform” Diagram

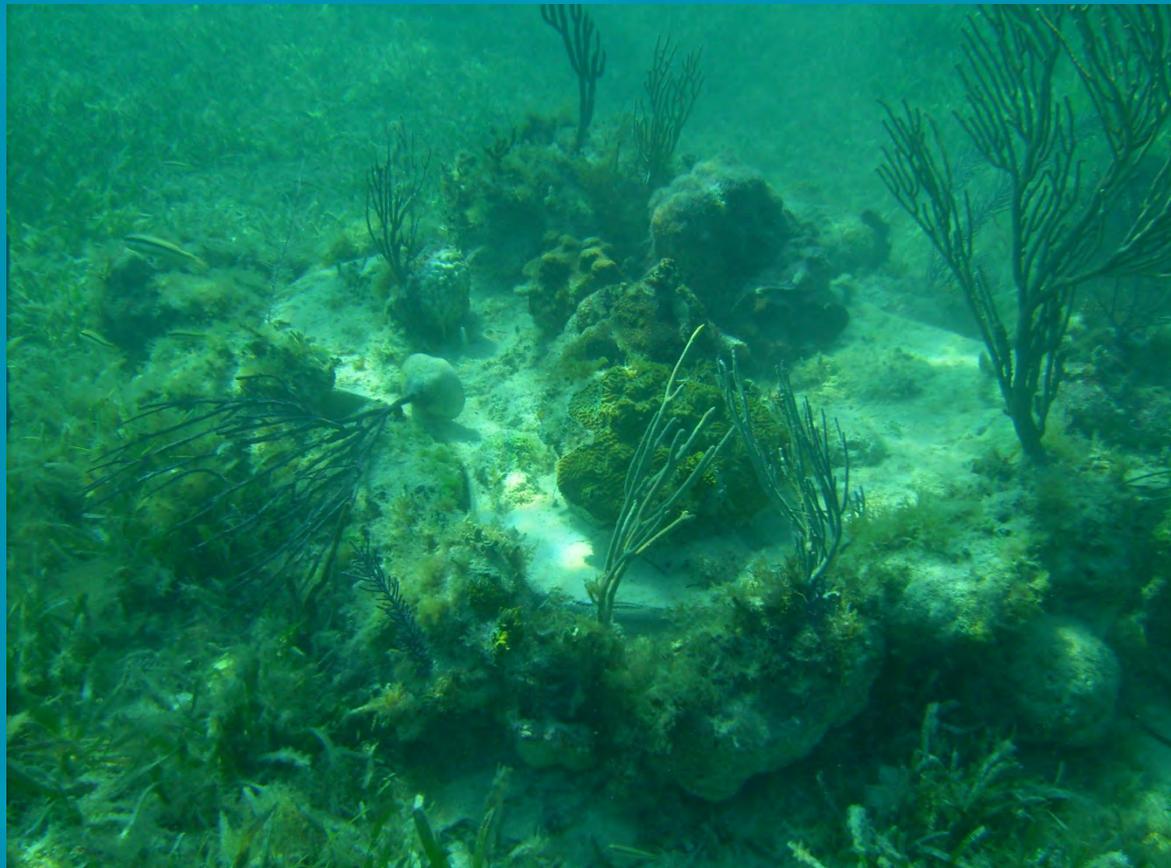


Area of “Reeform” = 1.25 m²



Construction of pilot module at *What Doin'?* grounding restoration site in February 2009

What Doin'? module with rubble dressing stones and corals attached





- Restoration plan and cost estimate documents developed
- Submitted to ONMS HQ for approval to spend from pooled general coral restoration fund

Crocker Reef ATON Buoy #16
CORAL COMMUNITY RESOURCE PROTECTION PLAN
FLORIDA KEYS NATIONAL MARINE SANCTUARY
MONROE COUNTY, FL

Prepared by:

National Oceanic and Atmospheric Administration
Florida Department of Environmental Protection

Approval to spend greenlighted:

- Tools and materials purchased
- Timeframe for restoration project established
- Staffing, vessel and dive planning/logistics sorted out

**7.1 Crocker Reef ATON # 16: Estimated Response, Restoration and Monitoring Costs
As of March 25, 2015**



Primary Restoration, Monitoring, and Oversight Costs

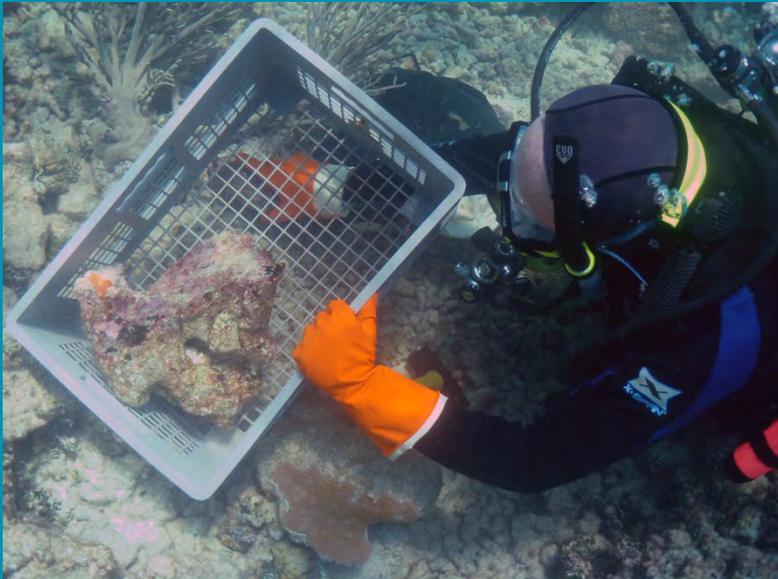
NOAA Primary Restoration Costs	\$55,612.57
NOAA Primary Restoration Monitoring Costs	\$19,750.52
NOAA Primary Restoration Oversight Costs	\$2,786.01
Subtotal NOAA Primary Restoration Costs	\$78,149.10

National Marine Sanctuaries National Oceanic and Atmospheric Administration



July 13, 2015 -
The boat's loaded, the
staff are on board, all
systems are go!

First order of business:
move corals and rubble
to hardbottom staging area



Use of rescue net litter to transport loose coral colonies and fragments



Rescue net worked very well for moving large, intact coral colonies as well



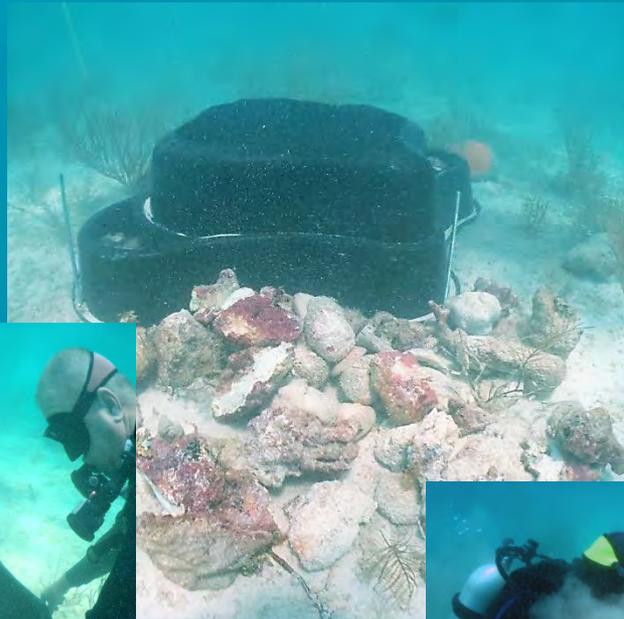
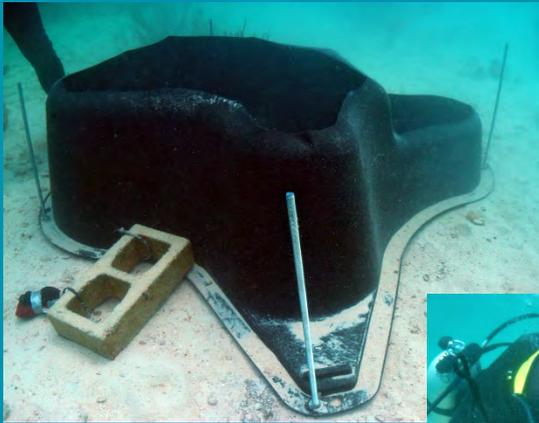
Prepping corals and
attachment sites for final
placement



Most coral colonies were attached
directly to hardbottom substrate



Construction of ReeForm modules



Topside support and “cement management”
were crucial to the success of the project



Newly constructed modules were allowed to “cure” for several days



Pond liner forms are removed
from completed modules



July 22, 2015 – Project completed. All living coral colonies from injury site have been securely attached to modules or surrounding hardbottom substrate



National Marine Sanctuaries National Oceanic and Atmospheric Administration



The day after completion of the project, a baseline monitoring event is conducted



National Marine Sanctuaries
National Oceanic and Atmospheric Administration

