Science, Service, Stewardship

Overview of SAFMC actions to protect and conserve deepwater corals

Joint meeting of the SAFMC Shrimp, Coral, and Ecosystem APs
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Fishery Management Plan for Coral (Coral FMP)

- The SAFMC established the Coral FMP together with the Gulf of Mexico FMC in 1982
- Prohibited harvest of stony corals, seafans, coral reefs, and live rock
- Designates special areas for protection including Coral Habitat Areas of Particular Concern

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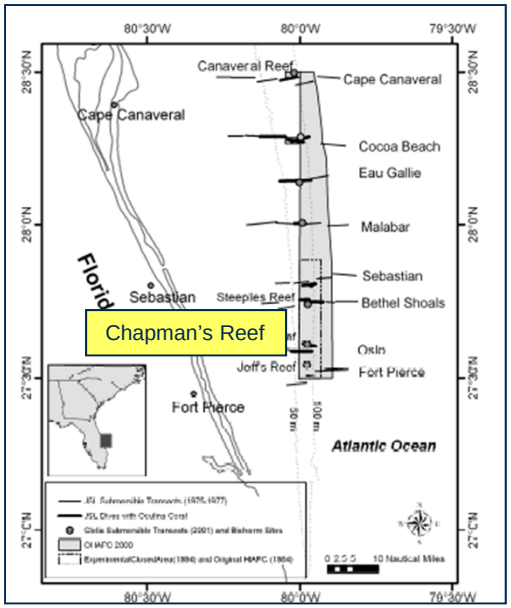
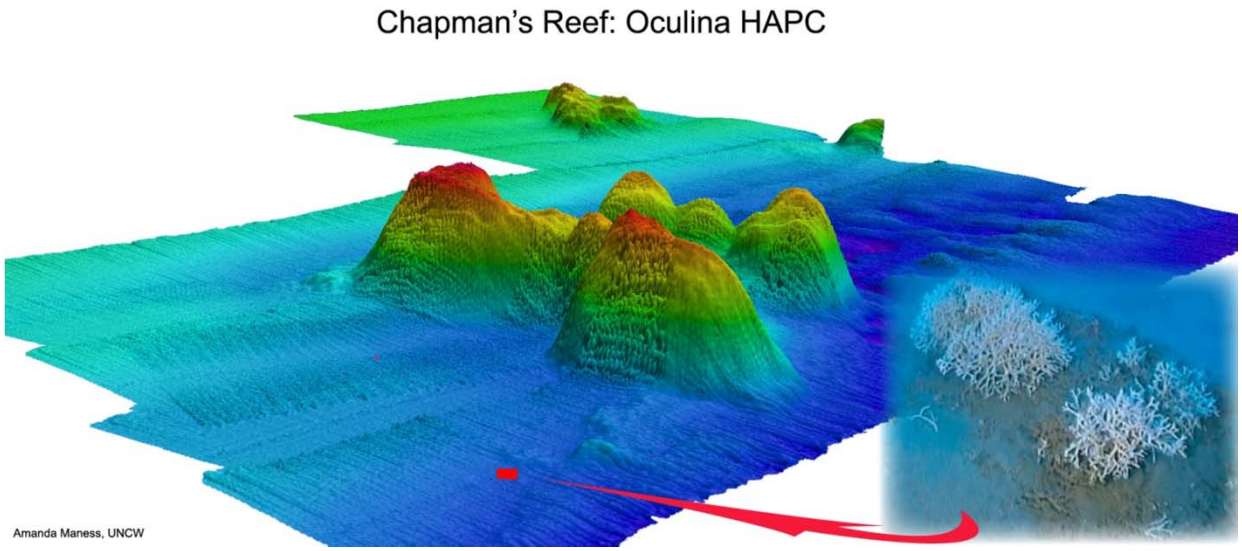
Coral HAPCs

The Coral FMP established criteria to designate Coral Habitat Areas of Particular Concern: 1) ecological value; 2) research value; 3) threat of exploitation; or 4) recreation value



From Reed et al 2007



Credit: Amanda Maness 2006

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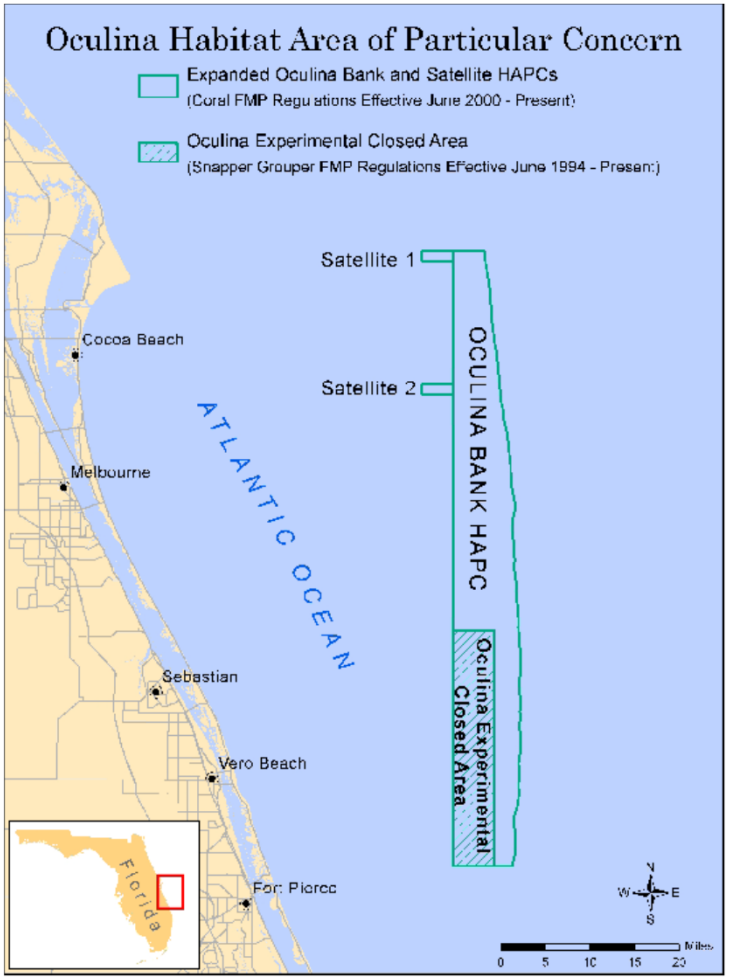
Oculina Banks CHAPC



- **1977 – 1981** Harbor Branch scientists describe Oculina reefs (Avant et al, 1977; Reed 1981)
- **1984** Established by SAFMC 92 mi² of reef ranging from 200-350 ft water depth
- **1994** CHAPC was declared an Experimental Closed Area
- **2000** CHAPC was expanded to include an additional 300 mi²
- **2006** Oculina Evaluation Team
- **2008** Harter et al., higher biodiversity and grouper densities and more intact coral inside the CHAPC (vs outside)

Assessment of fish populations and habitat on Oculina Bank, a deep-sea coral marine protected area off eastern Florida

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Abstract—A portion of the Oculina Bank located off eastern Florida is a marine protected area (MPA) preserved for its dense populations of the ivory tree coral (*Oculina varicosa*), which provides important habitat for fish. Surveys of fish assemblages and benthic habitat were conducted inside and outside the MPA in 2003 and 2005 by using remotely operated vehicle video transects and digital still imagery. Fish species composition, biodiversity, and grouper densities were used to determine whether *O. varicosa* forms an essential habitat compared to other structure-forming habitats and to examine the effectiveness of the MPA. Multivariate analyses indicated no differences in fish assemblages or biodiversity among hardbottom habitat types and grouper densities were highest among the most complex habitats; however the higher densities were not exclusive to coral habitat. Therefore, we conclude that *O. varicosa* was functionally equivalent to other hardbottom habitats. Even though fish assemblages were not different among management areas, biodiversity and grouper densities were higher inside the MPA compared to outside. The percentage of intact coral was also higher inside the MPA. These results provide initial evidence demonstrating effectiveness of the MPA for restoring reef fish and their habitat. This is the first study to compare reef fish populations on *O. varicosa* with other structure-forming reef habitats and also the first to examine the effectiveness of the MPA for restoring fish populations and live reef cover.

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The views and opinions expressed or implied in this article are those of the author and do not necessarily reflect the position of the National Marine Fisheries Service, NOAA.

Like shallow tropical coral reefs, deep-sea coral habitats support important ecosystem functions, for example, as hotspots for biodiversity and biomass production (Husebo et al., 2002; Jonsson et al., 2004; George et al., 2007) and as important fish habitat (Gilmore and Jones, 1992; Fosså et al., 2002; Ross and Quattrini [illegible] Like their shallow-w[illegible] parts, deep-sea [illegible] affected h[illegible] ve[illegible] moved [illegible]g and Norse, [illegible] al., 2000; Roberts, [illegible]s raising interest in deep-[illegible] coral ecosystem protection. With the passage of the Magnuson-Stevens Fishery Management and Conservation Act of 1996, an ecosystem approach to fishery management in the United States has been encouraged by linking the preservation of essential fish habitat with protection of fishery resources. Reauthorization of the Act in 2006 mandated the conservation and studies of deep-sea coral ecosystems. These mandates are expected to lead to the increasing use of marine protected areas (MPAs) as a fishery management tool (Allison et al., 1998; Bohnsack, 1998; Guenette et al., 1998).

One of the world's first deep-sea coral ecosystems to be designated a marine protected [illegible]s located approximatel[illegible]lorida's east coa[illegible]0 m. This [illegible]ina Bank, [illegible]gh-relief bio-[illegible] live coral, capping [illegible]ediment and coral rubble, [illegible] upon an underlying lithified base structure) constructed by the scleractinian ivory tree coral (*Oculina varicosa*). This species lives in water depths of 49 to 152 m without zooxanthellae and may form extensive thickets 1 m tall, which over thousands of years have built up mounds and ridges extending as much as 200 m laterally and 35 m above the surrounding seafloor (Reed, 1980). These *O. varicosa* bioherms are known to exist only off the east coast of Florida from Ft. Pierce to St. Augustine, a stretch of almost 150 km along the edge of the Florida-Hatteras slope and beneath the western edge of the Gulf Stream. Surface water currents may exceed 150 cm/sec and bottom currents may exceed 50 cm/sec (Reed, 2002a). Intact, live *O. varicosa* sup-

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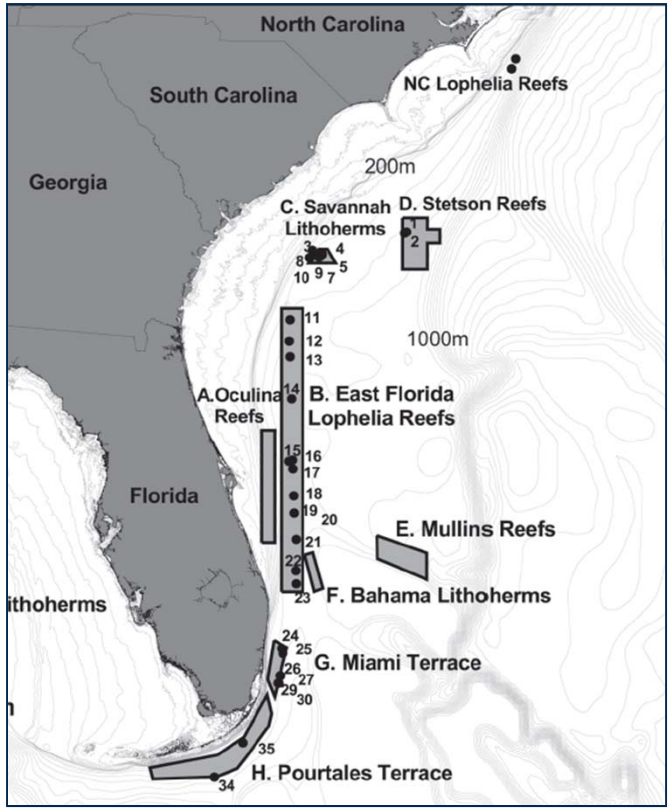
Coral Habitat Areas of Particular Concern



From Reed et al. (2005)

- **Oct 2004-2006** SAFMC Coral and Habitat Advisory Panels receive reports from deepwater scientists summarizing the state of knowledge on deepwater reefs in the region

  -- Reed, J. 2004. Deep-water Coral Reefs of Florida, Georgia and South Carolina: A Summary of the Distribution, Habitat, and Associated Fauna

  -- Ross, S. 2006. Review of distribution, habitats, and associated fauna of deep water coral reefs on the southeastern United States Continental Slope (North Carolina to Cape Canaveral, FL)

  -- Reed, J. 2006. Habitat and fauna of deep-water coral reefs off the southeastern USA

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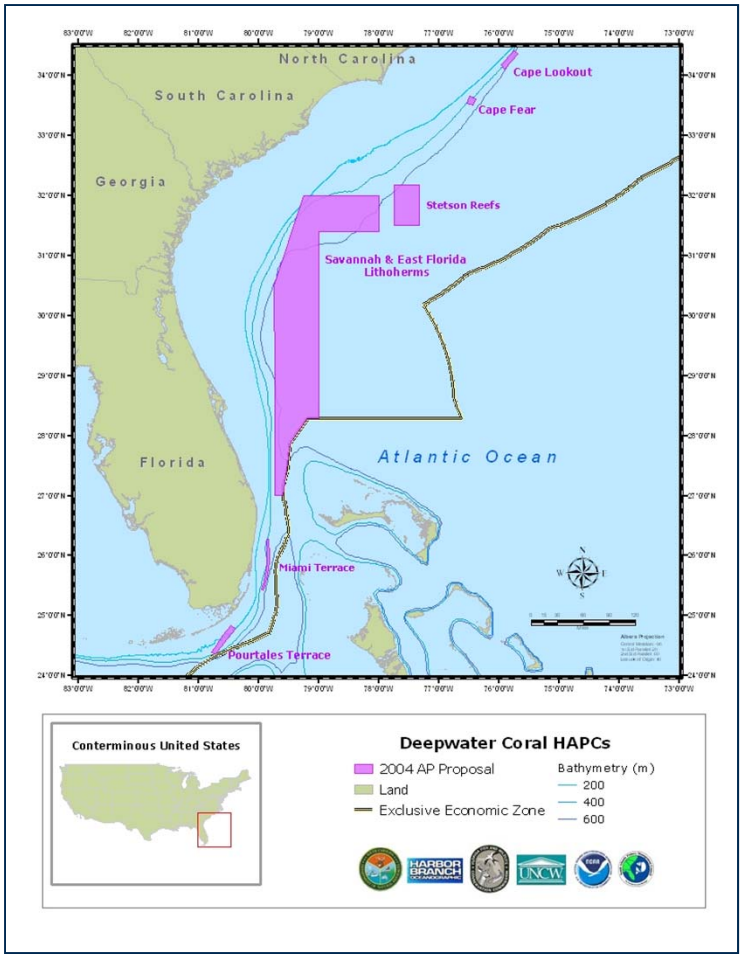
Coral Habitat Areas of Particular Concern



- **Oct 2004** APs recommend CHAPC designations for 6 areas
- **June 2006** Based on new information CHAPC boundaries are redrawn
- **June 2006** SAFMC adopts AP recommendation and start the process to implement through amending the Coral FMP

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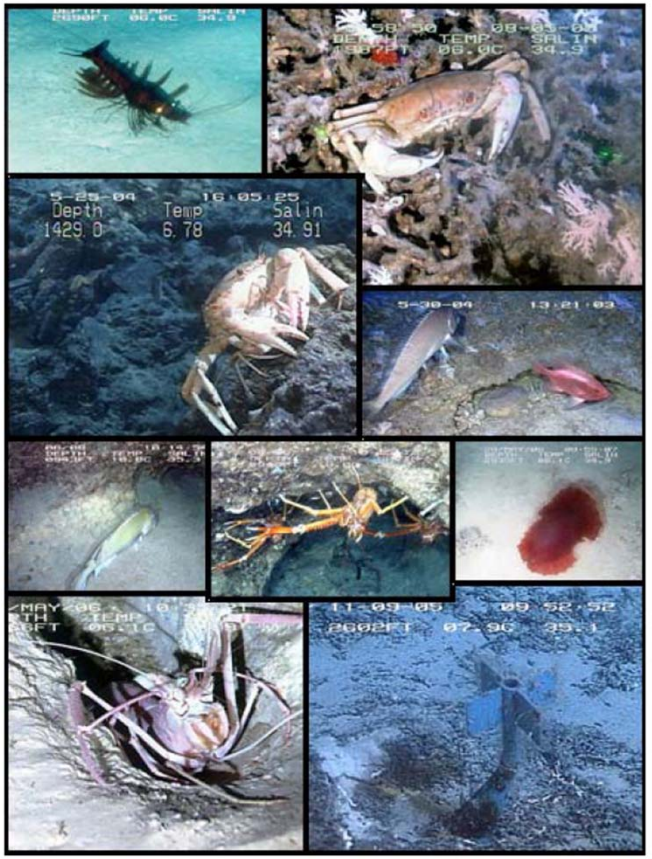
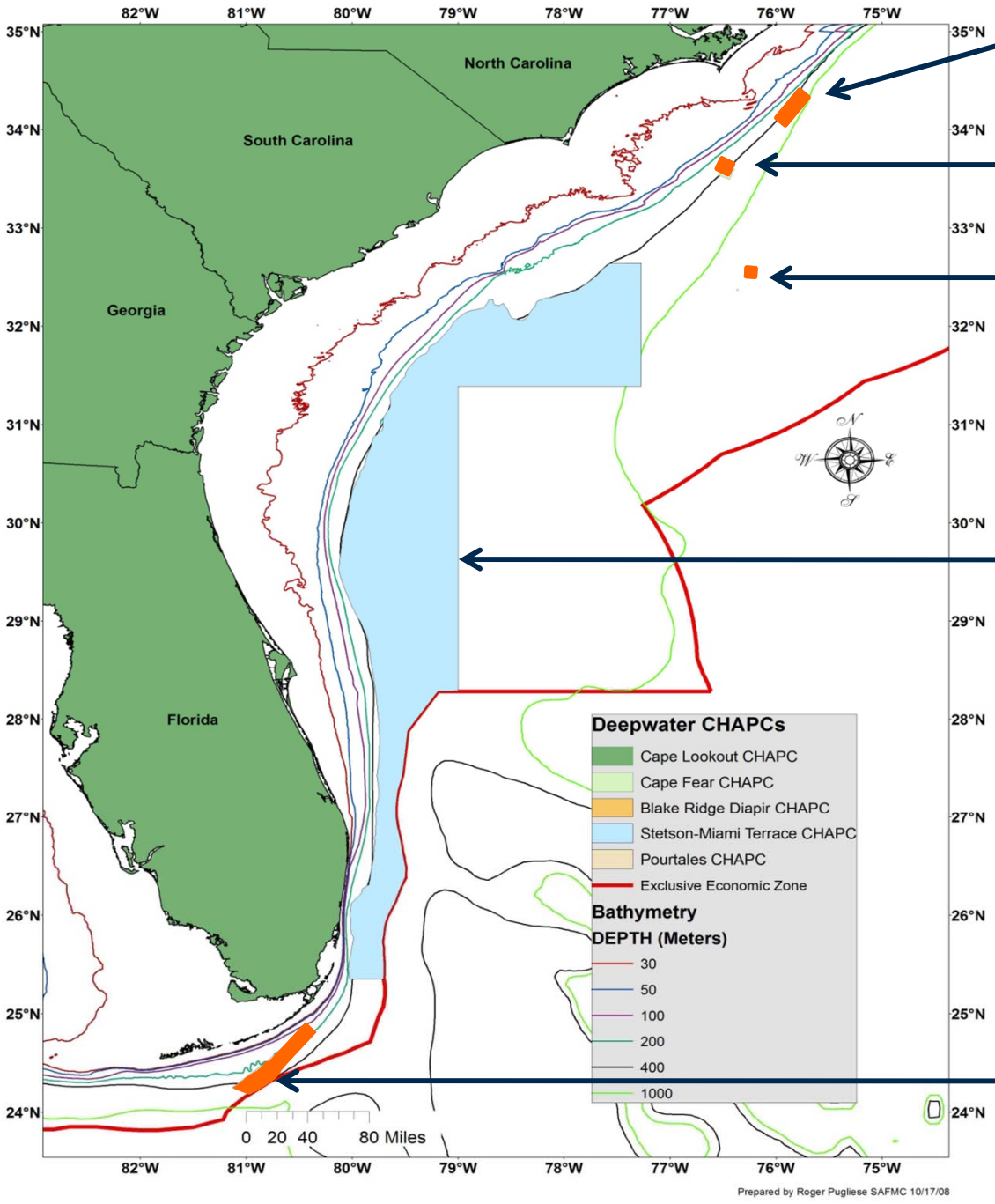
Coral Habitat Areas of Particular Concern Comprehensive Ecosystem Based Amendment-1

- **CE-BA1** drafted to amend several fishery management plans, including the Coral Fishery Management Plan
- **March 4 2010** Notice of Availability of the CE-BA1 rule to designate the CHAPC published in the Federal Register
- **March 26, 2010** Proposed CE-BA1 published in the Federal Register
- **June 22, 2010** Final CE-BA1 published in the Federal Register
- **July 22, 2010** Coral HAPC went into effect



Images from *Johnson-Sea-Link* submersible and ROV dives off eastern and southern Florida. From Reed and Farrington 2010.



Cape Lookout *Lophelia* Banks

Cape Fear *Lophelia* Banks

Blake Ridge Diapir

Stetson Reefs, Savannah and East Florida Lithoherms and Miami Terrace

Pourtales Terrace

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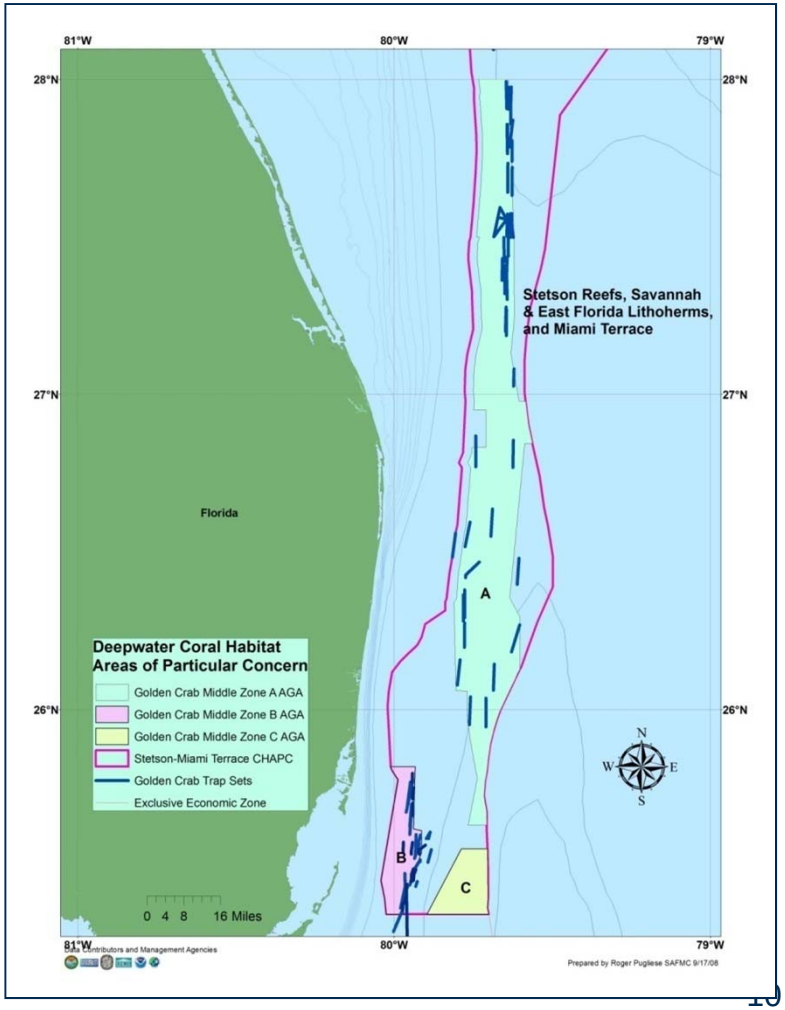
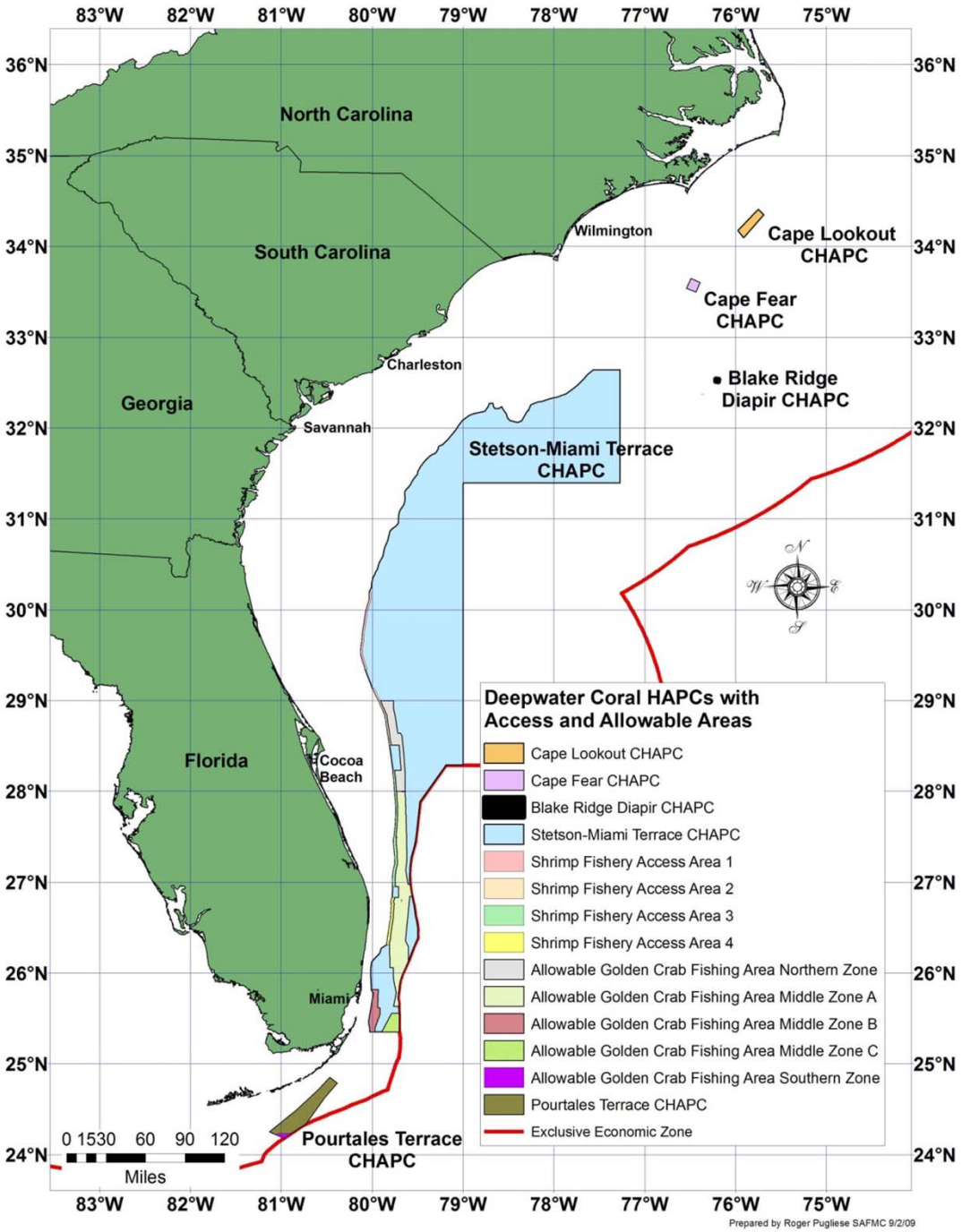
Allowable Fishing Areas for Golden Crab and Deepwater Shrimp

- SAFMC established *Allowable Golden Crab Fishing Areas* so the fishery may continue to operate in traditional fishing grounds.
- The majority of the fishery's traditional grounds was captured in the design of the proposed areas thanks to fishermen's input.
- Five *Allowable Golden Crab Fishing Areas* were designated.
- Four *Allowable Shrimp Fishing Areas* were also designated




83°W
82°W
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32°N
31°N
30°N
29°N
28°N
27°N
26°N
25°N
24°N
North Carolina
South Carolina
Georgia
Florida
Wilmington
Charleston
Savannah
Cocoa Beach
Miami
Cape Lookout CHAPC
Cape Fear CHAPC
Blake Ridge Diapir CHAPC
Stetson-Miami Terrace CHAPC
Pourtales Terrace CHAPC
0 1530 60 90 120
Miles
Deepwater Coral HAPCs with Access and Allowable Areas
Cape Lookout CHAPC
Cape Fear CHAPC
Blake Ridge Diapir CHAPC
Stetson-Miami Terrace CHAPC
Shrimp Fishery Access Area 1
Shrimp Fishery Access Area 2
Shrimp Fishery Access Area 3
Shrimp Fishery Access Area 4
Allowable Golden Crab Fishing Area Northern Zone
Allowable Golden Crab Fishing Area Middle Zone A
Allowable Golden Crab Fishing Area Middle Zone B
Allowable Golden Crab Fishing Area Middle Zone C
Allowable Golden Crab Fishing Area Southern Zone
Pourtales Terrace CHAPC
Exclusive Economic Zone
Prepared by Roger Pugliese SAFMC 9/2/09

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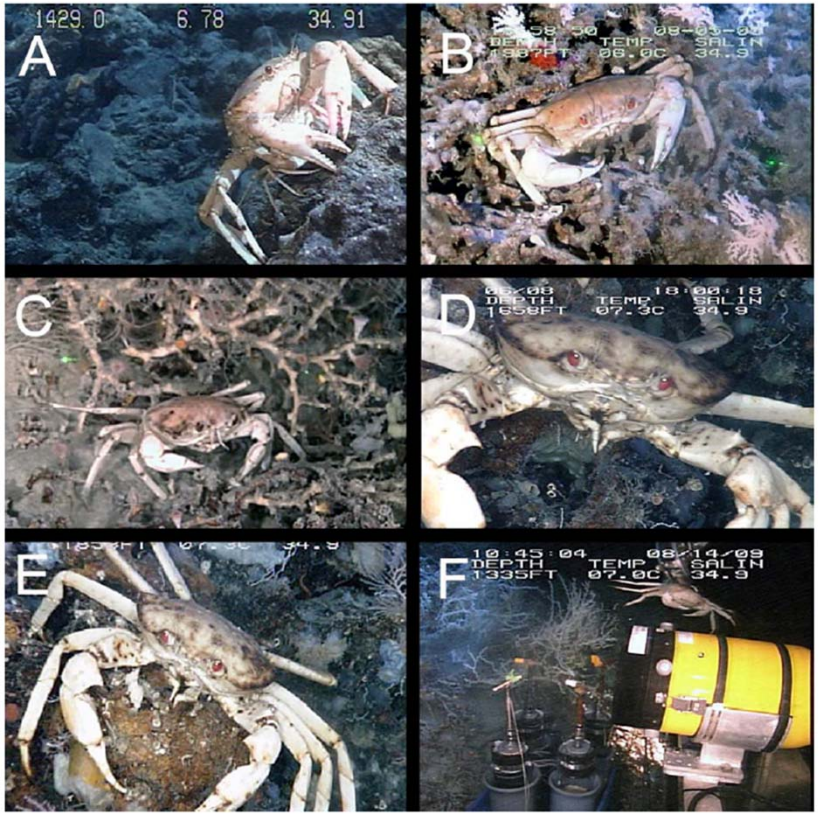
Coral Habitat Areas of Particular Concern Comprehensive Ecosystem Based Amendment-2

- **CE-BA2** designates CHAPCs as EFH-HAPCs These designations do not result in new regulations for these fisheries but require that future non-fishing activities in the areas be subject to review and consultation.
- **December 30, 2011** Final rule for CEBA2 was published in the federal register
- **January 30, 2012** CEBA2 went into effect



Images from *Johnson-Sea-Link* submersible. From Reed and Farrington 2010.

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Additional actions under evaluation…

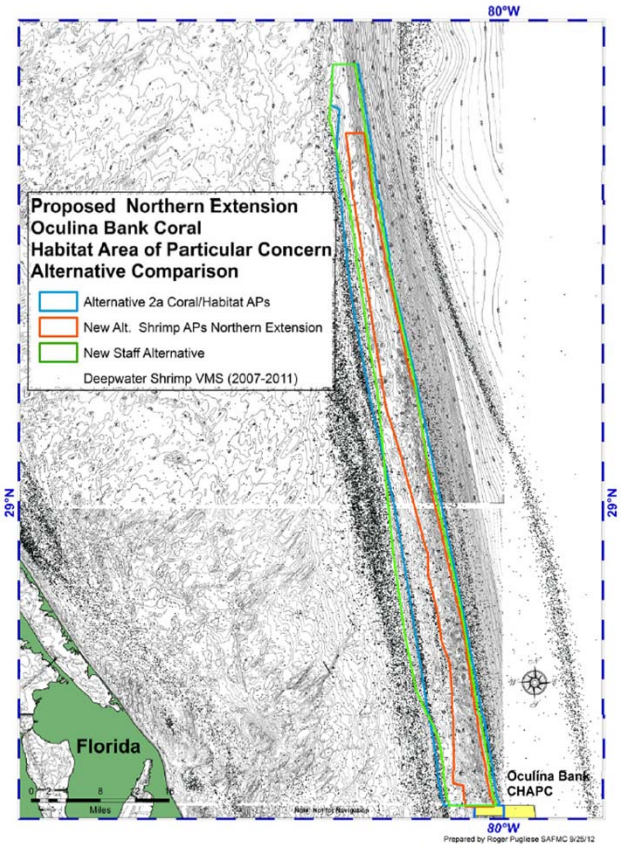


Figure 8. Scenarios for expanding the northern Oculina Bank HAPC boundary. The chart overlays the recommendations for a northern expansion from the Deepwater Shrimp AP, Coral AP and the Council staff.

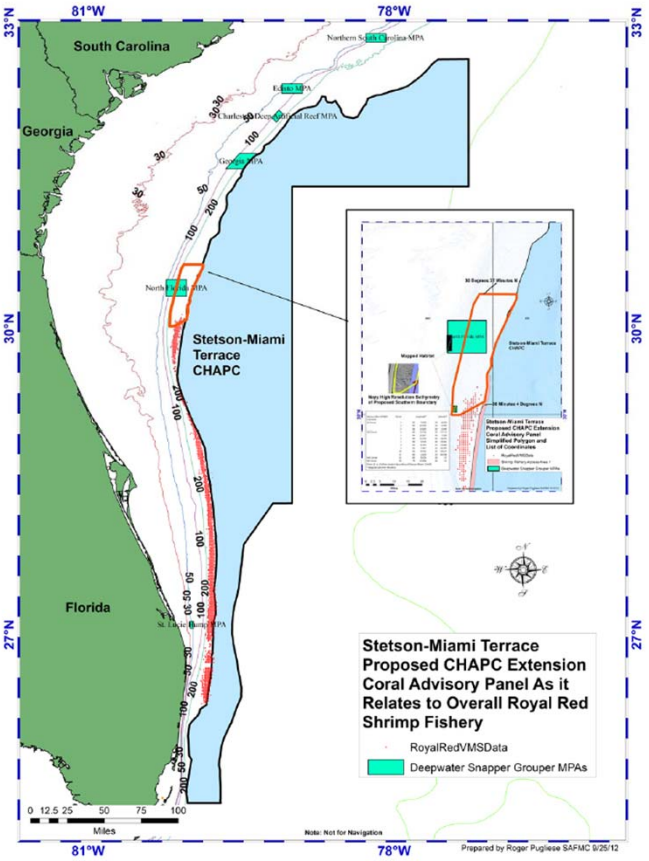
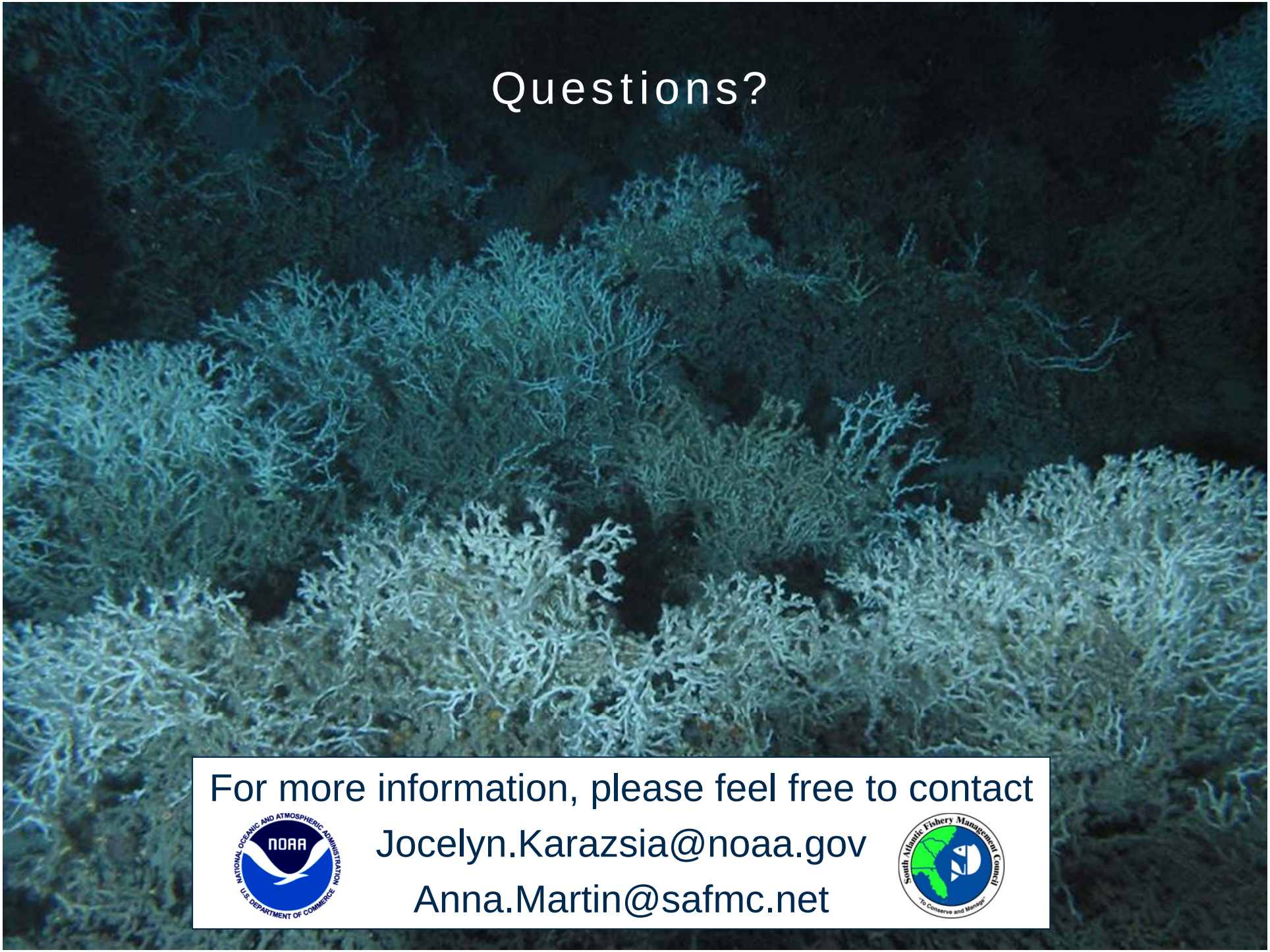


Figure 12. Coral and Habitat AP preferred recommendation for modification of Stetson-Miami Terrace Coral HAPC as it relates to overall royal red shrimp fishery activity based on VMS data.



Questions?

For more information, please feel free to contact

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