Draft Options Coral Amendment 10 Establish a Shrimp Fishery Access Area Along the Northern Extension of the Oculina Bank Coral HAPC

Amendment 10 to the Coral, Coral Reefs, and Live/Hardbottom Habitats of the South Atlantic Region

December 2020



Background

Coral Amendment 10 proposes expanding access to historic fishing areas along the eastern boundary of the northern extension of the Oculina Bank Coral Habitat Area of Particular Concern (OHAPC), implemented in Amendment 8 (SAFMC 2014) to the Fishery Management Plan for Coral, Coral Reefs and Live Hard Bottom Habitat in the South Atlantic Region (Coral FMP). Rock shrimp fishermen have requested the eastern edge of the northern extension of the Oculina Bank created in Coral Amendment 8 be reviewed to determine if historic trawling areas could be reopened to rock shrimp fishing.

The OHAPC was established through the original Coral FMP (SAFMC 1982). Anchoring in the OHAPC by fishing vessels was prohibited in 1996 through Coral Amendment 3 (SAFMC 1995). The OHAPC was expanded in Coral Amendment 4 to include newly discovered *Oculina* coral habitat and added two satellite areas (SAFMC 1998). With the discovery of an extensive northern distribution of *Oculina* and more extensive *Lophelia* deepwater coral ecosystems, regulations expanding OHAPC and deepwater Coral HAPCs (CHAPCs) were implemented through Coral Amendment 8. The latter expanded portions of the northern and western boundaries of the OHAPC (**Figures 1 and 2**), allowed transit through the OHAPC by fishing vessels with rock shrimp on board, and modified vessel monitoring system (VMS) requirements for rock shrimp fishermen transiting through the OHAPC with rock shrimp on board.

During development of Coral Amendment 8, the Council worked with the Habitat and Ecosystem, Coral, and Deepwater Shrimp Advisory Panels to find ways to best protect deepwater coral ecosystems while allowing for the fishery to operate in historic fishing areas. In response to comments received during the scoping and public hearing process, the Council modified the eastern boundary of the northern extension of the Oculina Bank two separate times at the request of industry and in the final version approved by the Council. However, after approval of Coral Amendment 8, some rock shrimp fishermen expressed concern because at times the fishery has operated slightly inshore of the northern extension boundary. The eastern edge of the Oculina Bank north of 28.5 N. was subsequently mapped in 2017 (Figures 5, 6, 7, 8, A-1, A-3 and A-4) to better characterize where coral habitat and soft bottom sediment occurred. However, other than use of conductivity, temperature, and depth (CTD) electronic instrument casts in two locations (Figure A-2), no validation of habitat type, species use or visual observation documenting distribution of coral rubble, low relief hard bottom or low relief deepwater coral habitat with use of remotely operated vehicles (ROV) was conducted. The 2011 NOAA Pisces cruise did have two multibeam mapping sites off Daytona and Titusville regions (Figures 5, 6, 7, 8 and A-5) where ROV dives were conducted. Southeastern United States Deep-Sea Corals (SEADESC) dive report characterizing habitat and identifying species encountered are summarized and presented in Appendix 1 (Figures A-6, A-7, and A-8).

The Deepwater Shrimp AP in 2018 recommended the Council move the eastern boundary of the northern expansion westward, based on recommendations by rock shrimp fishermen. The Coral AP discussed fishing closer to the high relief coral habitat and expressed concern over sedimentation due to the plume from the fishing gear. In subsequent Council discussion, members indicated concern over potential interaction of the gear and juvenile deepwater snapper grouper species, which are known to inhabit the base of the coral habitats and mounds which are also found along the eastern boundary.

DRAFT PURPOSE FOR ACTION

The purpose of Coral Amendment 10 is to increase rock shrimp fishery access to an area along the eastern boundary of the northern extension of the Oculina Bank Coral Habitat Area of Particular Concern while maintaining protection of the Oculina deep water coral ecosystems.

DRAFT NEED FOR ACTION

The need for Coral Amendment 10 is to provide access to historic rock shrimp fishing grounds along the eastern edge of the northern extension of the Oculina Bank Coral Habitat Area of Particular Concern.



Figure 1. Map of *Oculina* Bank CHAPC Highlighting Coral Amendment 8 Expansions North and West. Source: Roger Pugliese SAFMC Staff.

Coral Amendment 10	3	Options Paper
Establish a Shrimp Fishery Access	Area	December 2020
Along the Northern Extension of the	he Oculina Bank Coral HAPC	



Figure 2. Map of *Oculina* Bank CHAPC with Implementation of Coral Amendment 8 Source: Roger Pugliese SAFMC Staff.

Coral Amendment 104Options PaperEstablish a Shrimp Fishery Access AreaDecember 2020Along the Northern Extension of the Oculina Bank Coral HAPCDecember 2020

Rock Shrimp Fishery

The catches of rock shrimp have been variable over the past decade. Storms, abundance of other shrimp, regulations, and other factors have likely impacted rock shrimp landings. Historically (1980s and 1990s), rock shrimp catches were occasionally higher than they are today, but the fishery had its best year since 2009 in 2017. **Table 1** presents commercial landings of rock shrimp in the South Atlantic region from 2008 to 2018.

Table 1. Landings of rock shrimp off the Atlantic Coast from North Carolina through Florida,2008 -2018. Source: Atlantic Coast Cooperative Statistics Program Non-Confidential DataWarehouse.

Year	Region	Species	Pounds (lb)	Value (\$)
2008	South Atlantic	SHRIMP, ROCK	1,875,108	\$3,898,638.55
2009	South Atlantic	SHRIMP, ROCK	3,853,240	\$2,770,939.76
2010	South Atlantic	SHRIMP, ROCK	1,382,142	\$1,960,764.22
2011	South Atlantic	SHRIMP, ROCK	1,260,308	\$1,658,246.61
2012	South Atlantic	SHRIMP, ROCK	238,649	\$499,699.76
2013	South Atlantic	SHRIMP, ROCK	728,127	\$1,961,488.45
2014	South Atlantic	SHRIMP, ROCK	380,012	\$1,136,985.95
2015	South Atlantic	SHRIMP, ROCK	1,054,522	\$1,597,408.09
2016	South Atlantic	SHRIMP, ROCK	285,646	\$780,718.40
2017	South Atlantic	SHRIMP, ROCK	2,768,126	\$4,919,158.51
2018	South Atlantic	SHRIMP, ROCK	928,140	\$1,457,534.65

POTENTIAL OPTIONS

Issue. Rock shrimp fishermen requested the eastern edge of the northern extension of the Oculina Bank created in Coral Amendment 8 be reviewed to determine if historic trawling areas could be reopened to rock shrimp fishing.

The Council extended protection through the known northern extension of *Oculina*, to protect newly discovered extensive distribution of *Oculina* high relief coral mounds, low relief coral habitat and establishing conservation of the full extent of the deepwater *Oculina* coral ecosystem in the South Atlantic region. Fishermen requested the eastern edge of the northern extension of the *Oculina* Bank be reviewed to determine if historic trawling areas could be

reopened to rock shrimp fishing. The Council during the September 2020 meeting recommended proceeding to develop Coral Amendment 10 to include one action considering establishing a shrimp fishery access area (SFAA) along the eastern boundary of the northern extension of the Oculina Bank CHAPC. The Habitat and Ecosystem Advisory Panel, Coral Advisory Panel, and Deepwater Shrimp Advisory Panel discussed the possible establishment of a SFAA and comments will be provided to the Council in December 2020. The following are options and SFAA alternatives for consideration based on coordinates provided by industry in 2014 (**Table 2**) represented in **Alternative 2a**, and on coordinates provided by industry in 2013 (**Table 3**) represented as **Alternative 2b**. **Alternative 2a** (**Figures 3**, **5 and 6**) encompasses approximately 22 square miles in depth ranges for the proposed inside boundary of 92-95 and for the existing outside boundary of 98m. **Alternative 2b** (**Figures 3**, **7 and 8**) encompasses approximately 32 square miles in depth ranges for the proposed inside boundary of 88-90 and for the existing outside boundary of 98m. From VMS data, the maximum depths trawled for rock shrimp appears to be approximately150m.

Option 1 – Status quo. Do not develop an action to address the issue.

Option 2. Create a Shrimp Fishery Access Area (SFAA) along eastern edge of northern extension of Oculina CHAPC.

Table 2. Coordinates presented by fishermen as part of March 2014 public comment which are along the eastern edge of the OHAPC Northern extension.

Coordinates Provided by Industry (2014)	Latitude	Longitude
1	29.29213	-80.1728
2	29.183	-80.1442
3	29.05973	-80.1246
4	28.90697	-80.0898
5	28.81013	-80.0728
6	28.5	-80.017

Option 2. Alternative 2a.

SFAA boundaries based on coordinates presented by fishermen as part of March 2014 public comment.

Alternative 2a SFAA (2014)			
Point	Latitude	Longitude	
1	29.725	-80.2634	
2	29.58102	-80.2502	
3	29.56872	-80.2644	
4	29.49025	-80.2544	
5	29.29213	-80.1728	
6	29.183	-80.1442	
7	29.05973	-80.1246	
8	28.90697	-80.0898	
9	28.81013	-80.0728	
10	28.5	-80.017	

Table 3. Coordinates presented by fishermen as part of March 2013 public comment which are along the eastern edge of the OHAPC Northern extension.

Coordinates Provided by Industry (2013)	Latitude	Longitude
1	29.29213	-80.1728
2	29.183	-80.1442
3	29.05973	-80.1246
4	28.90697	-80.0898
5	28.81013	-80.0728
6	28.5	-80.017

Option 2. Alternative 2b

SFAA boundaries based on coordinates presented by fishermen as part of March 2013 public comment.

Alternative 2b SFAA (2013)			
Point	Latitude	Longitude	
1	29.725	-80.2634	
2	29.58102	-80.2502	
3	29.56872	-80.2644	
4	29.49025	-80.2544	
5	29.29213	-80.1728	
6	29.18887	-80.1482	
7	28.88742	-80.0907	
8	28.81005	-80.0759	
9	28.7659	-80.0681	
10	28.5	-80.017	



Figure 3. Northern Extension of the Oculina Bank Coral HAPC and SFAA **Alternative 2a** (based on 2014 Fishermen input) and SFAA **Alternative 2b** (based on 2013 fishermen input).

Coral Amendment 10	9	Options Paper
Establish a Shrimp Fishery Access Area		December 2020
Along the Northern Extension of the Ocul	ina Bank Coral HAPC	

Updated rock shrimp VMS analyses were provided during a Habitat Protection and Ecosystem-Based Management Committee Meeting, held in Key West, Florida on the April 7-8, 2015. As follow-up to direction to staff from the December 2014 Council meeting, additional analyses of rock shrimp VMS data through 2014 were conducted and catch information was further reviewed for the fishery. The chart (Figure 4) of the Northern Extension of the Oculina Bank includes a table highlighting fishing activity as related to those shown in Coral Amendment 8. This chart was developed to address statements by industry that the predominant fishing effort occurred along the edge of the existing eastern boundary of the Northern Extension. While greater fishing east of the existing boundary occurred, fishing points inside the edge of the boundary accounted for 1.76% of all fishing points during 2003-2014. With the implementation of the new VMS requirements in Coral Amendment 8, rock shrimp vessels have been able to transit across the northern expansion of OHAPC to the offshore fishing grounds to fish east of the present boundary. The Council, in development of the implemented Northern Extension of the CHAPC area, shifted the boundaries and reduced the overall size of the CHAPC three separate times to address industry concerns. The analyses show that significantly less overall impact is associated with the edge of the existing eastern boundary than is shown as an overall impact in Coral Amendment 8.

Figures 5-8 present the northern extension of the Oculina Bank CHAPC and SFAA Alternatives 2a and 2b as they relate to habitat mapped in 2017 during the Southeast Deep Coral Initiative (SEDCI) expedition and during the 2011 Pisces expedition.



Figure 4. Relative position of possible SFAA along eastern edge of the northern extension of the Oculina Bank CHAPC including past fishing activity based on historic VMS data.

Coral Amendment 10	11	Options Paper
Establish a Shrimp Fishery Access Ar	rea	December 2020
Along the Northern Extension of the	Oculina Bank Coral HAPC	



Figure 5. Northern extension of the Oculina Bank CHAPC (North) **Alternative 2a** SFAA and Habitat mapped in 2017 during the Southeast Deep Coral Initiative (SEDCI) expedition and during the 2011 Pisces expedition.



Figure 6. Northern extension of the Oculina Bank CHAPC (South) **Alternative 2a** SFAA and habitat mapped in 2017 during the Southeast Deep Coral Initiative (SEDCI) expedition and during the 2011 Pisces expedition

during the 2011 Pisces expedition.		
Coral Amendment 10	13	Options Paper
Establish a Shrimp Fishery Access A	Area	December 2020
Along the Northern Extension of the	e Oculina Bank Coral HAPC	



Figure 7. Northern extension of the Oculina Bank CHAPC (North) **Alternative 2b** SFAA and Habitat mapped in 2017 during the Southeast Deep Coral Initiative (SEDCI) expedition and during the 2011 Pisces expedition

during the 2011 Pisces expedition.		
Coral Amendment 10	14	Options Paper
Establish a Shrimp Fishery Access Area		December 2020
Along the Northern Extension of the Oculina	Bank Coral HAPC	



Figure 8. Northern extension of the Oculina Bank CHAPC (South) **Alternative 2b** SFAA and Habitat mapped in 2017 during the Southeast Deep Coral Initiative (SEDCI) expedition and during the 2011 Pisces expedition.

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Coral Amendment 10	15	Options Paper
Establish a Shrimp Fishery Access	Area	December 2020
Along the Northern Extension of th	ne Oculina Bank Coral HAPC	

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	Process Step	Date
~	Council directs staff directs staff to request input on industry requested SFAA in Northern Extension of OHAPC and options for scoping.	September 2020
\checkmark	Habitat and Ecosystem AP Webinar input on SFAA.	October 2020
\checkmark	Deepwater Shrimp AP and Coral AP Webinar input on SFAA.	November 2020
	Council reviews AP input and approves amendment for scoping.	December 2020
	Scoping Hearing	March 2021
	Council reviews public input and approves actions/alternatives.	March 2021
	Council reviews draft amendment, selects preferred alternative, and approves for public hearings.	June 2021
	Public Hearings	Summer 2021
	Council reviews the draft amendment, modifies the document as necessary, and approves for formal review.	September 2021

Committee Action:

DISCUSS COMMENTS AND RECOMMENDATIONS FROM THE HABITAT AND ECOSYSTEM AP, DEEPWATER SHRIMP AP AND CORAL AP APPROVE AMENDMENT FOR SCOPING OTHERS?

DRAFT MOTION: APPROVE CORAL AMENDMENT 10 FOR SCOPING AT THE MARCH 2021 COUNCIL MEETING.

Appendix A.

2017 Multi-beam Mapping Survey

The total area of seafloor mapped during the 2017 expedition was 480 km² off the south side of Florida and the *Oculina* Bank mapped during leg 2 (Figure 1.4). The area mapped during leg 1 was mostly at depths ranging between 200-300 m, and included a continuous ridge feature at approximately 250 m depth that should be explored in the future. The area mapped on leg 2 was mostly at depths shallower than 150 m, and showed some relief in close proximity of the existing *Oculina* Bank Coral HAPC.



Figure A-1. Map showing the operational area of leg 2 of expedition NF-17-08 aboard NOAA Ship *Nancy Foster* that surveyed deep-sea coral ecosystems in the South Atlantic Bight. Source: Expedition Report: 2017 Southeast Deep Coral Initiative (SEDCI) expedition aboard NOAA Ship *Nancy Foster* (NF-17-08: August 12-31, 2017).

Coral Amendment 1017Options PaperEstablish a Shrimp Fishery Access AreaDecember 2020Along the Northern Extension of the Oculina Bank Coral HAPCDecember 2020



Figure A-2. Map showing the locations of CTD casts conducted during (top) leg 1, and (bottom) leg 2 of NF-17-08. Note that the map does not include the five CTD casts conducted during leg 2 using the underway CTD system. Source: NOAA 2018.



Figure A-3. Benthic habitat mapped in 2017 along eastern edge of the Oculina Bank Coral HAPC (North) during Southeast Deep Coral Initiative (SEDCI) expedition aboard NOAA Ship Nancy Foster (NF-17-08: August 12-31, 2017) Source: Roger Pugliese, SAFMC staff, Data Source- NOAA 2018.

Coral Amendment 10	19	Options Paper
Establish a Shrimp Fishery Access	Area	December 2020
Along the Northern Extension of t	he Oculina Bank Coral HAPC	



Figure A-4. Benthic habitat mapped in 2017 along eastern edge of the Oculina Bank Coral HAPC (South) during Southeast Deep Coral Initiative (SEDCI) expedition aboard NOAA Ship Nancy Foster (NF-17-08: August 12-31, 2017). Source: Roger Pugliese, SAFMC staff, Data Source- NOAA 2018.



Figure A-5. The Northern Extension of the *Oculina* HAPC mapping from the Southeast Deep Coral Initiative expedition aboard NOAA Ship Nancy Foster and two multibeam mapping sites off Daytona and Titusville regions where ROV dives were conducted during the 2011 NOAA *Pisces* cruise. Source: Roger Pugliese, SAFMC staff, Data Source- NOAA 2011.

Habitat Description of Pinnacle Habitat Mapped and Characterized West of the Eastern Boundary of the OHAPC Northern Extension- 2011 NOAA Pisces Research Cruise

Source: Excerpt from Coral Amendment 8 Appendices – A Proposal for Extension of the Boundaries of the Oculina Coral HAPC.

The following is a description of habitat In June, 2011, using the NOAA Ship Pisces NOAA's Deep Sea Coral Program and HBOI's Cooperative Institute for Ocean Exploration, Research, and Technology conducted a survey in deep-water and shelf-edge reef sites along eastern Florida. The two multibeam areas were randomly selected off Daytona and Titusville areas; the multibeam survey was conducted overnight and followed up the next day with ROV dives using a ROV from NOAA's Southwest Fisheries Science Center which was outfitted with video and digital still cameras. Quantitative video and photographic transects were conducted during 4-hour dives to document the habitat and fauna. The sonar maps and ROV dives confirmed that the high-relief features of the NOAA regional charts were in fact high-relief Oculina coral mounds.

These ROV dives are described in SEADESC reports below (Figures A-6, A-7 and A-8) and show individual mounds to be conical shaped or elongated with E-W oriented ridges. The individual mounds are 15-20 m in height; maximum depth is 92 m and minimum depth is 64 m at the peaks. The slopes are gentle 10-45 degrees and covered with coral rubble, standing dead coral and sparse live *Oculina varicosa* coral colonies. The dead coral rubble and standing coral (both live and dead) provide habitat to a dense variety of benthic invertebrates and fish, most likely similar to that reported from the Oculina HAPC. At the base of some mounds is exposed limestone rock and 1-2 m relief ledges which also provide essential fish habitat to numerous commercially and recreationally important fish species including scamp, gag, snowy, and red groupers.

Between the mounds and west of the main reef track is mostly soft sediment but also coral rubble and patchy rock pavement habitat. East of the main reef track the base of the mounds flatten out between 90 and 100 m into the muddy Florida-Hatteras slope. Coral rubble may extend 10s of meter east of the mounds. Dominant fish observed during the ROV video transects included scamp (common), gag grouper, snowy grouper, red porgy (common), amberjack (abundant), black seabass (abundant), tilefish, red hogfish, tattler, cubbyu, blue angelfish, bank butterfly, morays, roughtongue bass, bigeye, scorpionfish, batfish, wrasses. Dominant invertebrates include *Oculina varicosa* coral (10-40 cm colonies), gorgonian corals, black coral (abundant), sponges, starfish, sea urchins, and mollusks. Unfortunately, the mounds appear to have been impacted by years of bottom shrimp trawling as documented within the Oculina HAPC.

Dive Number: NOAA SW Fisheries Phantom ROV 11-156A		es Location: Da -156A	Location: Daytona Oculina Pinnacles, site 1	
Dive Data:				
Minimum Bottom Depth (m):	70	Total Transect Length (m):	2524	
Maximum Bottom Depth (m):	90	Surface Current (kn):	.25	
On Bottom (Time- GMT): Off Bottom (Time- GMT):	13:34 17:53	On Bottom (Lat/Long): Off Bottom (Lat/Long):	29°14.1116'N, 80°09.8650'W 29°14.5875'N, 80°09.9818'W	
Physical (bottom); Temp (°C):	14.1	Salinity: 35.8 Visibilit	y (m): 18 Current (kn): 0	





Figure 1: Oculina rubble habitat (Image: DSCN7160)

Figure 2: Oculina varicosa (Image: DSCN7584)

Notes (Objectives, Site Description, Habitat, Fauna):

<u>Objective</u>: Survey Oculina coral mounds and ground truth sonar survey in area outside Oculina HAPC and never surveyed previously. Target site- Oculina mound (from Pisces multibeam): 29° 14.17'N, 80° 9.802'W; 70-90 m.

<u>Dive Events</u>: Surveyed seven *Oculina* mounds at the northern end of the *Pisces* Daytona sonar survey area. Prior to dive had to switch to different ROV and umbilical with standard definition camera. The *Phantom* ROV's top parallel lasers are calibrated at 20 cm, bottom lasers 61cm.

Site Description/Habitat/Fauna: Pisces shipboard multibeam surveyed for first time an area of deep-sea Oculina coral mounds along the shelf edge break, ~40 nmi north of the Oculina HAPC. The sonar survey off Daytona covered 5.7 x 0.8 nmi, discovering >100 mounds, 15-20 m relief, forming a very dense linear pattern oriented NNW-SSE. Individual mounds are conical to E-W oriented ridges, 150-450 m wide at the base, and with base depths of 85-90 m, and peaks 70-75 m. Mounds are Oculina bioherms; 70-100% coral rubble and mud on slopes (10-45°) and peaks, with scattered live and dead standing colonies of Oculina varicosa (white, azooxanthellate); most colonies ~10-30 cm diameter. The peaks are generally E-W ridges covered with coral rubble and patches of abundant standing dead coral. Near the base of some mounds is exposed rock pavement and 1-2 m ledges. Valleys between the mounds is mostly soft sediment, sandy mud, and shell hash. Dominant fauna: Fish- scamp (common), few gag and snowy grouper, red porgy, amberjack, tilefish burrow, black seabass, bank butterfly, blue angel, moray, roughtongue bass, bigeye, scorpionfish, batfish, wrasses, Ogcocephalidae; Sponges-Demospongiae, barrel sponge; Cnidaria- Oculina varicosa (Ivory tree coral), Telesto, Plexauridae, Titanideum, Condylactis gigantea, Cerianthidae, Antipatharia; Polychaeta- Sabellidae; Echinoderms- Eucidaris tribuloides, Centrostephanus, Narcissia trigonaria, Astroporpa annulata.

Figure A-6. 2011 NOAA Ship *Pisces* Daytona area SEADESC dive report characterizing habitat and identifying species encountered.

Dive Number: NOAA SW Fi Phantom RC	isheries Location: [DV 11-156B s	Daytona Oculina Pinnacles, site 2, southern end
Dive Data:		
Minimum Bottom Depth (m): 7	0 Total Transect Length (n	n): 1338
Maximum Bottom Depth (m): 9	2 Surface Current (kn):	.75
On Bottom (Time- GMT): 1	9:45 On Bottom (Lat/Long):	29°10.8294'N, 80°09.1835'W
Off Bottom (Time- GMT): 2	1:47 Off Bottom (Lat/Long):	29°11.2590'N, 80°08.9894'W
Physical (bottom); Temp (°C): 1	4.1 Salinity: 35.81 Visib	ility (m): 12 Current (kn): 0





Figure 1: Oculina rubble habitat with demosponge and Cidaroida urchins (Image: DSCN7708) Figure 2: Snowy grouper (Epinephelus niveatus) (Image: DSCN7826)

Notes (Objectives, Site Description, Habitat, Fauna):

<u>Objective</u>: Survey *Oculina* coral mounds and ground truth sonar survey in area outside *Oculina* HAPC and never surveyed previously. Target site- *Oculina* mound (from *Pisces* multibeam): 29° 10.948'N, 80° 9.0585'W; 70-90 m.

<u>Dive Events</u>: ROV transect surveyed four *Oculina* mounds at the southern end of the *Pisces* Daytona sonar survey area. One colony (15 cm) of *Oculina varicosa* was collected with a by-catch of two crabs.

Site Description/Habitat/Fauna: ROV ground truthed that the mounds are Oculina bioherms; ~70-100% coral rubble and mud on slopes (10-45o) and peaks, with scattered live and dead standing colonies of Oculina varicosa (white, azooxanthellate); most colonies ~10-30 cm diameter. Individual mounds are E-W oriented ridges with base depths of 85-90 m, and peaks 70-75 m. The peaks are covered with coral rubble and patches of abundant standing dead coral. Near the base of some mounds is exposed rock pavement and 1-2 m ledges. Valleys between the mounds is mostly soft sediment, sandy mud, and shell hash. Dominant fauna: Fish- snowy grouper, dozens of greater amberjack, black seabass, bank butterfly, bigeye, roughtongue bass; Cnidaria-Oculina varicosa (Ivory tree coral), dense burrowing anemones Cerianthidae, Virgularia, Stichopathes, hydroids; Echinoderms- Ophioderma devaneyi, dense congregations of black long-spined urchins Centrostephanus, Arbacia punctulata, Eucidaris tribuloides.

Figure A-7. 2011 NOAA Ship *Pisces* Daytona area SEADESC dive report characterizing habitat and identifying species encountered.

Dive Number: NOAA SW	Fisheries	Location: No	rth Canaveral Oculina
Phantom	ROV 11-15	57A Mo	ounds - Site 1; Reed Site DR 14
Dive Data:			
Minimum Bottom Depth (m):	64 To	otal Transect Length (m):	3747
Maximum Bottom Depth (m):	88 Su	urface Current (kn):	0.8-1.5
On Bottom (Time- GMT):	16:11 O	n Bottom (Lat/Long):	28°45.2923'N, 80°03.9855'W
Off Bottom (Time- GMT):	21:41 01	ff Bottom (Lat/Long):	28°46.4133'N, 80°04.4582'W
Physical (bottom); Temp (°C):	13.3 Sa	linity: 35.7 Visibilit	y (m): 15 Current (kn): .36



Figure 1: Oculina rubble habitat (Image: DSCN8040)



Figure 2: Snowy grouper (Epinephelus niveatus) and Tanacetipathes (Image: DSCN8268)

Notes (Objectives, Site Description, Habitat, Fauna):

<u>Objective</u>: Survey Oculina coral mounds and ground truth sonar survey in area outside Oculina HAPC. Target site- Oculina mound (from Pisces multibeam): 28° 45.497'N, 80° 04.283'W, 64-88 m. Only one submersible dive has been made in this area in 1982 on Reed Peak DR-14 (JSL I-1209).

Dive Events: ROV transect crossed ten Oculina coral mounds on a northerly heading. One colony of black coral (15 cm) was collected: Tanacetipathes sp. with six associated animals.

Site Description/Habitat/Fauna: Pisces shipboard multibeam surveyed for first time an area of deep-sea Oculina coral mounds along the shelf edge break, ~15 nmi north of the Oculina HAPC. The sonar survey off Titusville covered ~3.2 x 1.0 nmi, discovering ~35 10-20 m-tall mounds oriented in a linear pattern parallel to the shoreline NNW-SSE. Individual mounds are oval with an E-W oriented ridge at the peak; the peaks range from 64-75 m depth and the bases 80-88 m. Individual mound slopes and peaks are nearly 100% coral rubble with sparse small (10-40 cm) live Oculina varicosa coral colonies; the peaks appear hummocky with 20-cm tall patches of standing dead coral. The northern bases of the mounds have exposed rock boulders and 1 m ledges. Some of the dead coral appears to be coated with black fuzz, possibly cyanobacteria(?). Dominant fauna: Fish-snowy grouper, scamp, gag grouper, red porgy (common), black seabass (abundant), bigeye, bank butterfly, scorpaenids, roughtongue bass, cubbyu, red hogfish, tattler, leopard toadfish, toadfish, greater amberjack; Cnidaria- Oculina varicosa (lvory tree coral), Stichopathes, Plexauridae, Nidalia, hydroids, Cerianthidae, Antipatharia; Echinoderms- Centrostephanus, Eucidaris tribuloides, Ophioderma devanyi, Astroporpa annulata. Video of trawl door.

Figure A-8. 2011 NOAA Ship *Pisces* off Titusville area SEADESC dive report characterizing habitat and identifying species encountered.