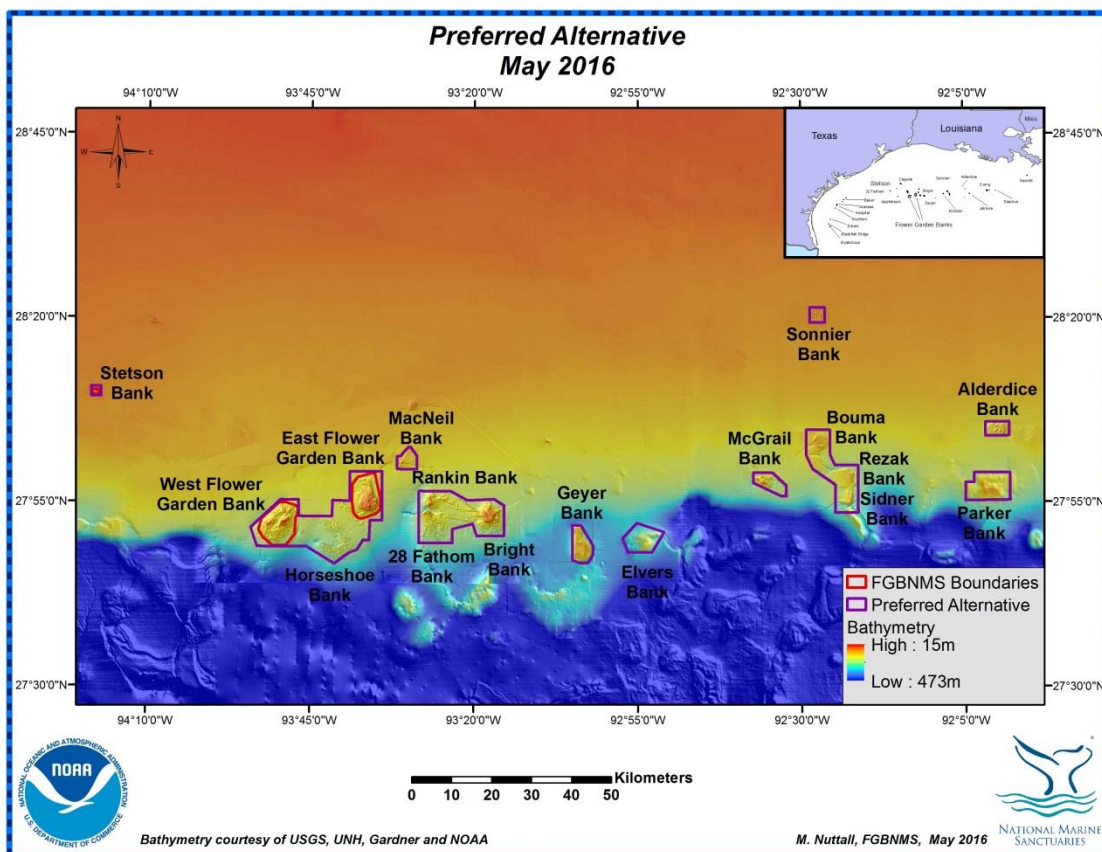


FLOWER GARDEN BANKS NATIONAL MARINE SANCTUARY EXPANSION PROPOSED ACTION SITE DESCRIPTIONS



The purpose of this document is to give a brief overview of the reefs and banks included in the preferred alternative in the Draft Environmental Impact Statement released by the Flower Garden Banks National Marine Sanctuary (FGBNMS) in June, 2016.

The bathymetry presented in the maps was collected by Dr. Jim Gardner, then of USGS-Menlo Park, now of University of New Hampshire, NOAA, and Minerals Management Service (MMS). The maps have been adapted by the FGBNMS to illustrate boundary options, infrastructure, shipping fairways, and management zones.

The underwater images were collected by FGBNMS during research cruises conducted with University of North Carolina-Wilmington – Undersea Vehicle Program (UNCW-UVP) using ROV, unless otherwise indicated. The images were taken at the locations represented on the specific pages.

Contents:

- Page 3 – Stetson Ring**
- Page 4 – WFG/Horseshoe/EFG Bank Complex**
- Page 5 – MacNeil Bank**
- Page 6 – Rankin/28 Fathom/Bright Bank Complex**
- Page 7 – Geyer Bank**
- Page 8 – Elvers Bank**
- Page 9 – McGrail Bank**
- Page 10 – Rezak/Sidner/Bryant/Bouma Complex**
- Page 11 – Sonnier Bank**
- Page 12 – Alderdice Bank**
- Page 13 – Parker Bank**

For more information contact:

Kelly Drinnen
Sanctuary Outreach Specialist
Flower Garden Bank National Marine Sanctuary
4700 Ave. U, Bldg 216
Galveston, TX 77551
409-621-5151, ext. 105
<http://flowergarden.noaa.gov>
email: fgbexpansion@noaa.gov

Stetson Bank – Amend current boundaries (55-200 feet deep)

Stetson Bank was named after Henry C. Stetson, a Woods Hole Oceanographic Institute geological oceanographer. The ring around Stetson Bank was not identified as an important associated feature until 1997, after the original sanctuary boundary designation. Data was presented in the *FGBNMS Special Edition, Gulf of Mexico Science*, 1998. Additional mapping was conducted by FGBNMS to complete the coverage of the Stetson Ring bathymetric dataset. Uplifted siltstone and claystone boulders comprise the features of the ring, which provide substrate and habitat for black corals, gorgonians, sponges, invertebrates and deep reef fish. (Images 1-2)

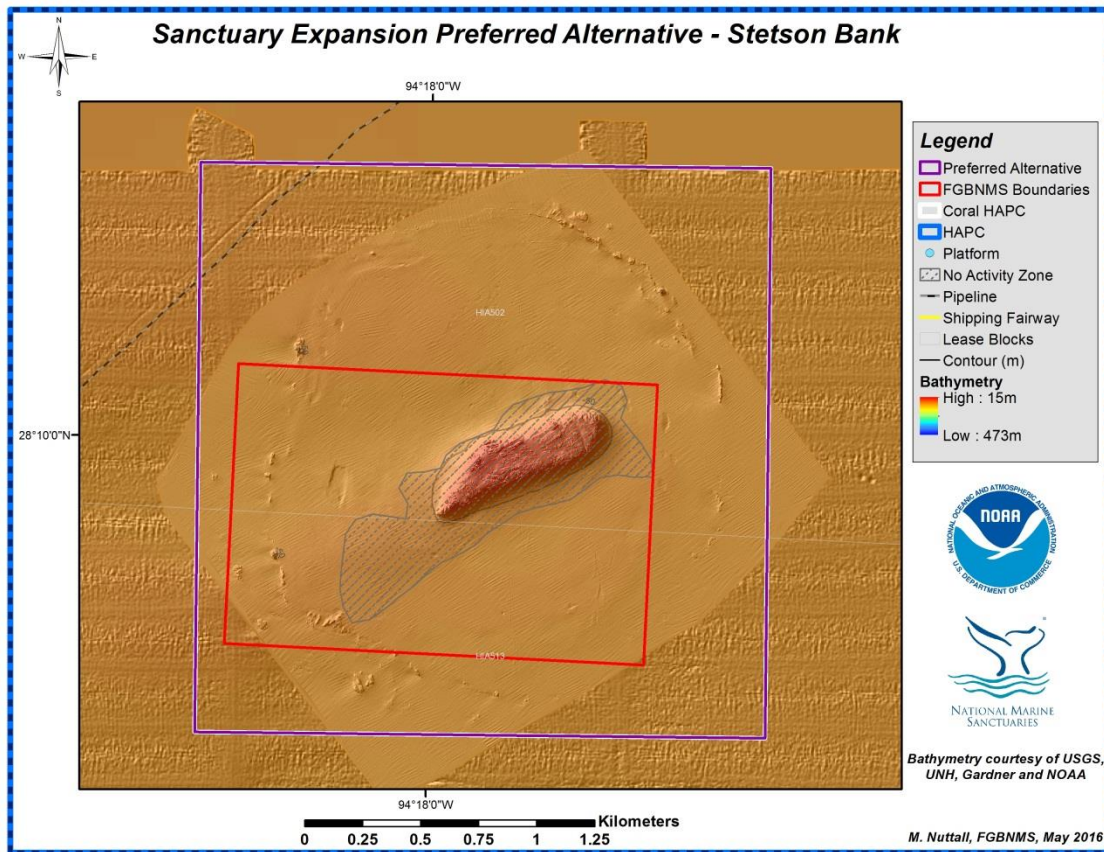


Image 1 – Sponge community around Stetson Ring



Image 2 – Sponges and black coral around Stetson Ring

WFG/Horseshoe/EFGB Bank Complex (55-575 feet deep)

Horseshoe Bank was revealed through mapping by NOAA in 2004 and named by FGBNMS research staff due to the shape of the feature. This effort revealed a feature made up of thousands of patch reefs providing habitat for mesophotic corals, sponges, algae, invertebrates and fish. (Images 3-5) It also includes interesting mud volcano features. Multibeam mapping also revealed hard bottom features not previously protected within the original FGBNMS boundaries at East and West Flower Garden Banks.

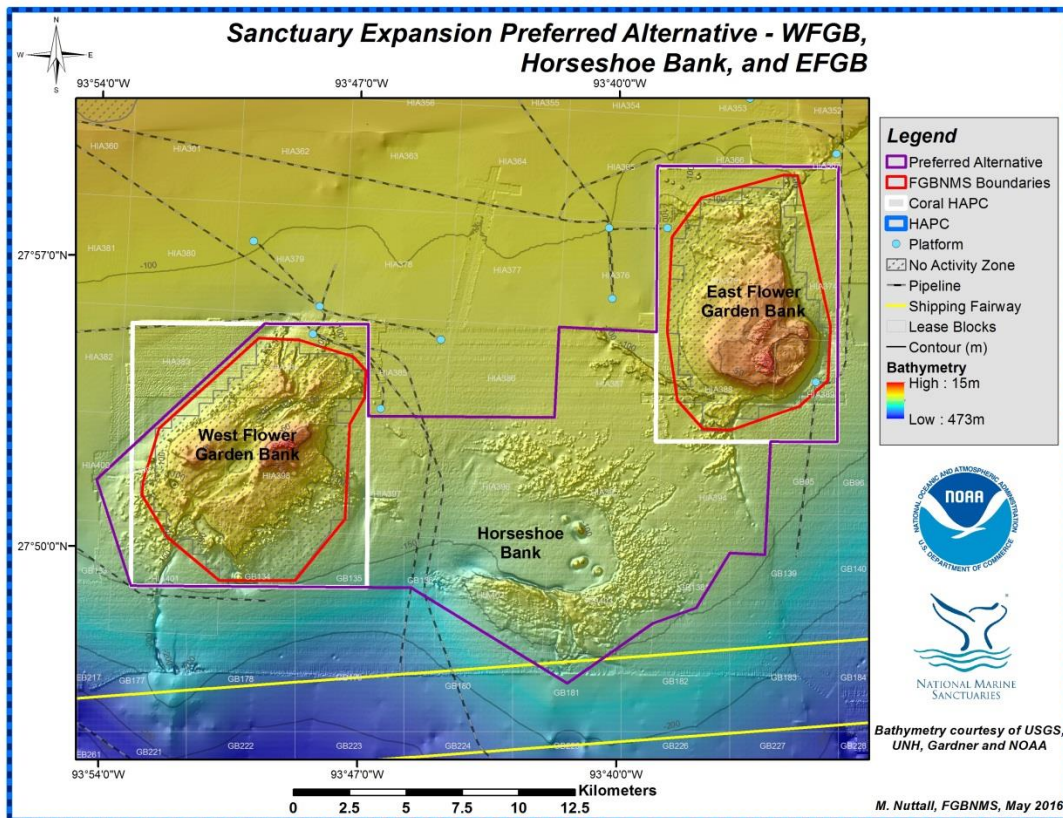


Image 3 – Soft coral, black coral and gorgonians.

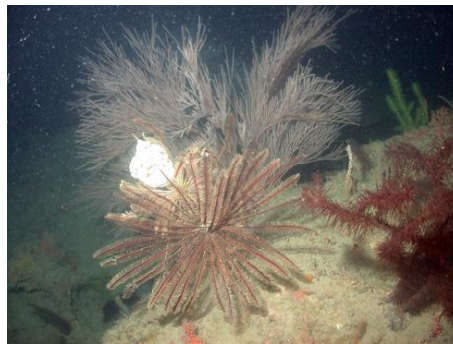


Image 4 – Crinoid and basket star and numerous types of black coral.



Image 5 – Black corals and a branching stony coral.

MacNeil Bank (210-315 feet deep)

MacNeil Bank was named after F. Stearns MacNeil, a U.S. Geological Survey geologist. The bank is located northeast of East Flower Garden Bank and is structurally connected by a ridge that runs between the two features. MacNeil Bank harbors mesophotic habitat including black corals, gorgonians, sponges and fish. (Images 6-8)

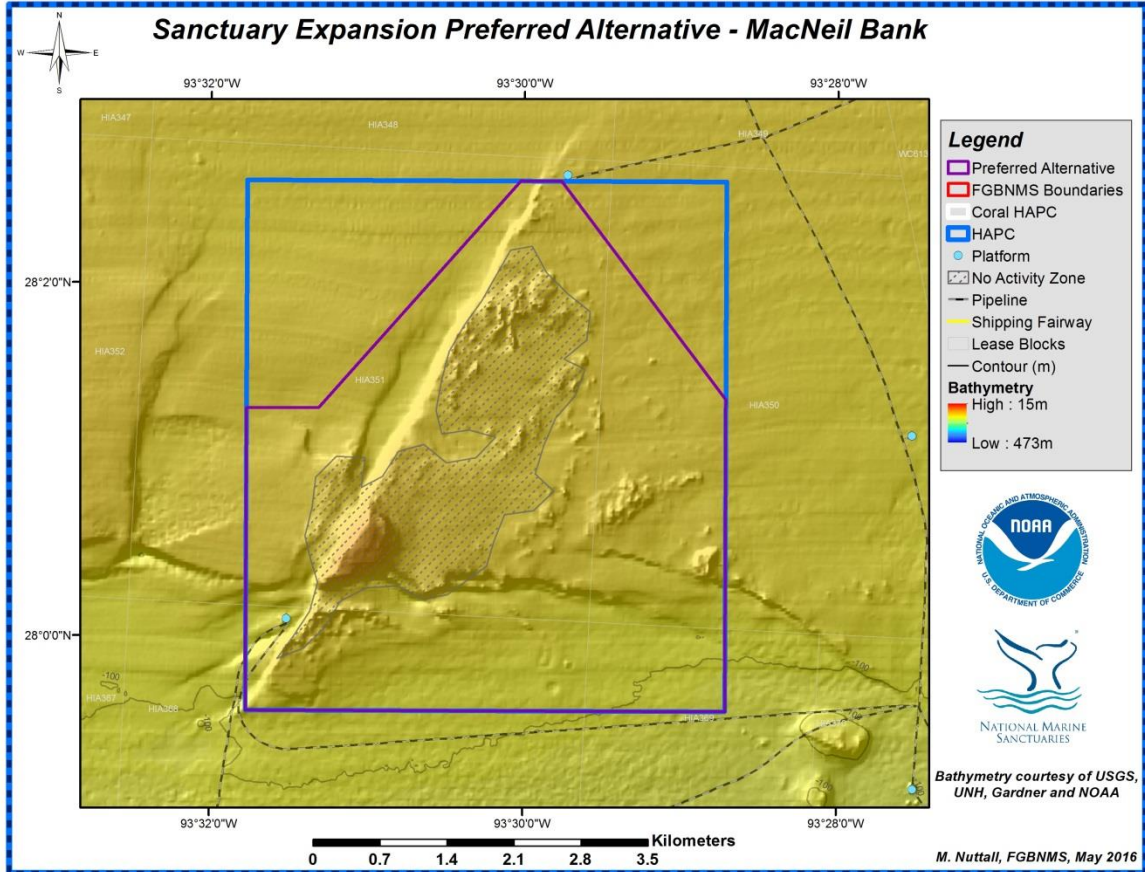


Image 6 – A Webbed Burrfish swims among sea whips, sponges and gorgonians

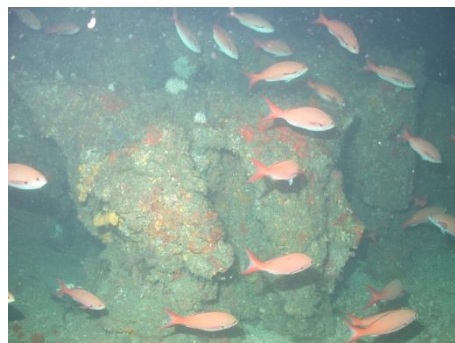


Image 7 – A school of Creolefish swims around a meter tall feature on MacNeil Bank



Image 8 – Sponges and black corals.

Rankin/28 Fathom/Bright Bank Complex (95-570 feet deep)

Rankin Bank was named after John L. Rankin of the Minerals Management Service. The bank is located 15 km due east of East Flower Garden Bank (EFGB). It is physically connected to MacNeil Bank to the north via a ridge feature that continues on to EFGB. Rankin Bank is just north of 28 Fathom Bank. The two features are split by a 1000 m (3280 ft) wide trough, reaching down about 154 m (570 ft). A series of ridges and patch reefs connect Rankin/28 Fathom and Bright Banks. The banks harbor mesophotic habitat consisting of black corals, gorgonians, algae, sponges, stony corals and a variety of invertebrates. (Images 9-11) Extensive fields of an algae (*Codium sp.*) have been documented during ROV surveys. Mud volcanos exist in several locations.

Bright Bank was named after Thomas Bright, a marine biologist from Texas A&M University. The bank peaks at approximately 29 m (95 ft) and once harbored a coral reef. In the 1980s, treasure hunters targeted this feature and used dynamite to excavate the top of the reef, damaging many of the coral features. This is an example of insufficient protection through the current management in place.

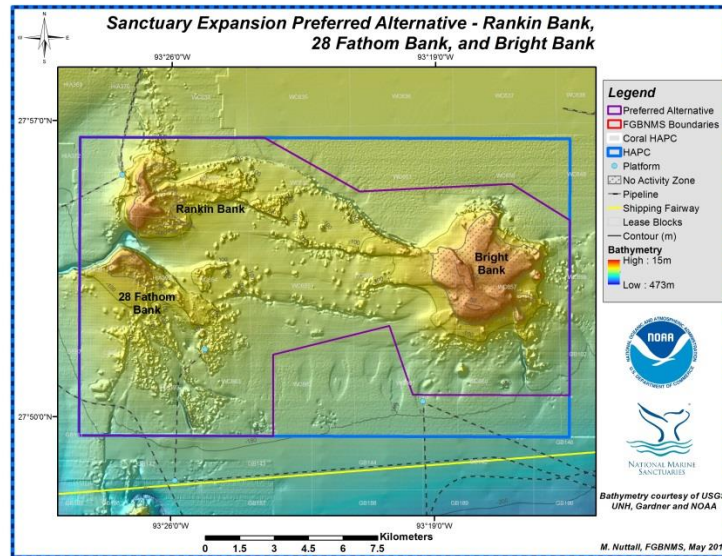


Image 9 – Remnants of coral reef habitat on the crest of Bright Bank – results from treasure hunting using explosives to excavate.



Image 10 – Stony corals, soft corals and black corals at Bright Bank

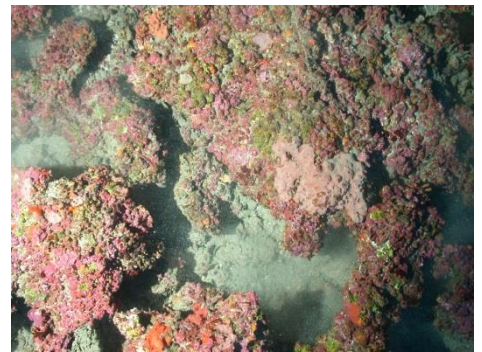


Image 11 – Colorful coralline algae at 28 Fathom Bank.

Geyer Bank (105-670 feet deep)

Geyer Bank was named after Richard A. Geyer, a Texas A&M University geophysicist. The bank lies on an active salt diaper on the upper continental slope and reaches approximately 32 m (105 ft) depth. It supports a coral community, as well as mesophotic coral habitats including black corals, gorgonians, fish, sponges, algae and invertebrates. (Images 12-14) Recent observations have documented a *Sargassum* bloom on the reef crest and divers have documented enormous numbers of reef butterflyfish at specific times of year. A shipping lane cuts across the top of the bank. Unfortunately, this makes it a convenient place to drop anchor, impacting the resources. A large tanker was recently anchored on top of the feature, just outside of the shipping lane.

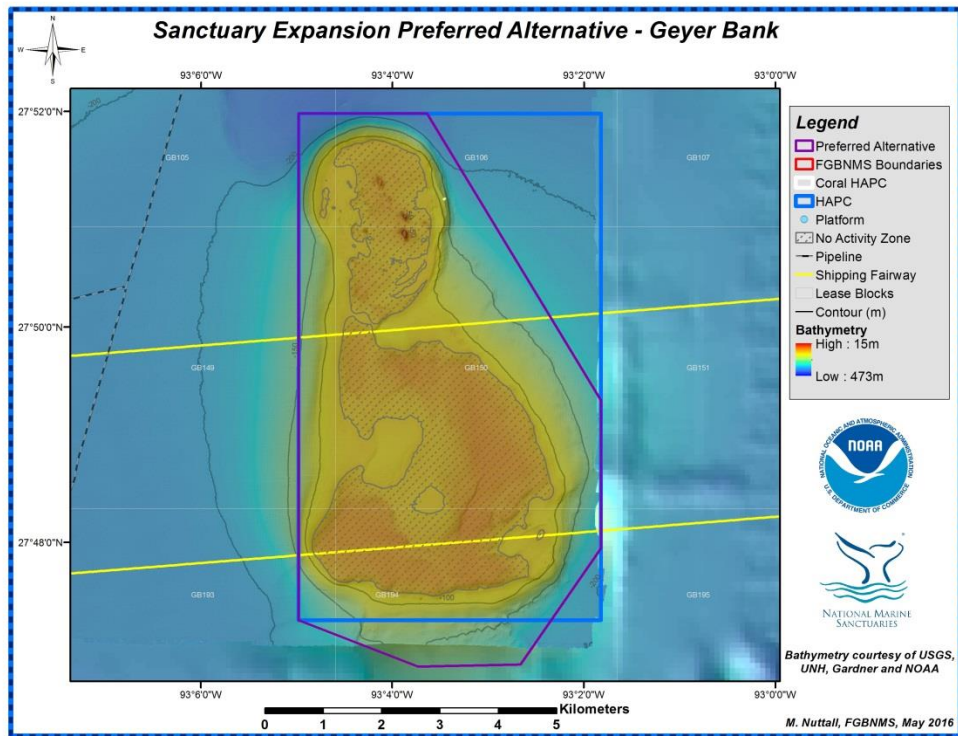


Image 12 – Sponges, algae and Reef Butterflyfish on the crest of Geyer Bank. Image: FGBNMS/G.P. Schmahl

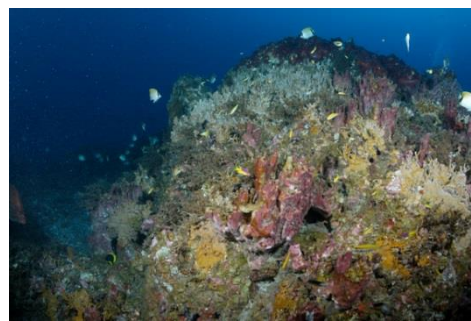


Image 13 – Sponges, algae, and coral on the crest of Geyer Bank. Image: FGBNMS/G.P. Schmahl

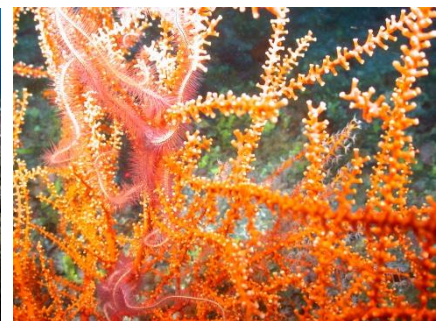


Image 14 – Brittlestars intertwined through the branches of a colorful gorgonian, *Swiftia exerta*, in mesophotic coral habitat.

Elvers Bank (230-675 feet deep)

Elvers Bank was named after Douglas J. Elvers, a Minerals Management Service geophysicist. The bank is at the very edge of the shelf and reaches a depth of about 675 ft (206 m). This site harbors a variety of habitats, including mesophotic habitats dominated by black corals, gorgonians, fish, sponges, algae and invertebrates. An algal nodule field visited during ROV operations was dominated by a small orange/red sponge (possibly *Ptilocaulis* sp.), that provided habitat for (at least one) dwarf frogfish – a species rarely seen in this part of the Gulf. Interesting fields of sea pens and yellow stalked crinoids have been documented here, as well as outcroppings covered in glass sponges. These long-lived animals are rare throughout the region.

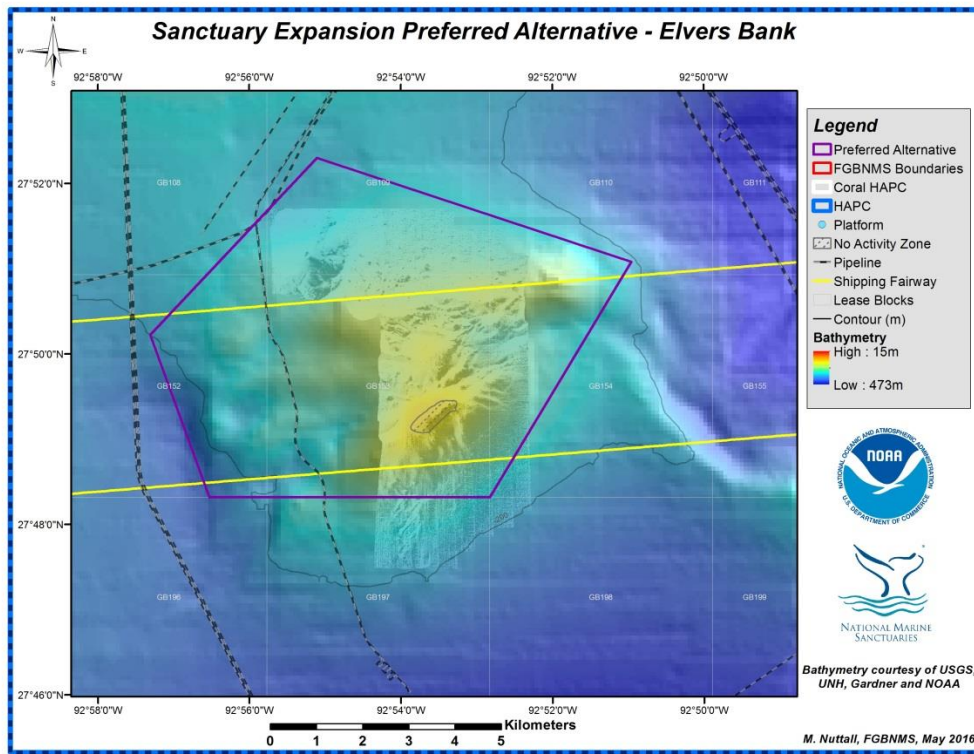


Image 15 – Large unidentified nudibranch photographed at Elvers Bank. This animal is about 15 cm long. 160m depth.

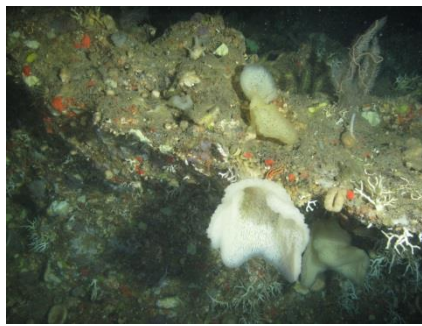


Image 16 – Glass sponge fields at 160m at Elvers Bank.

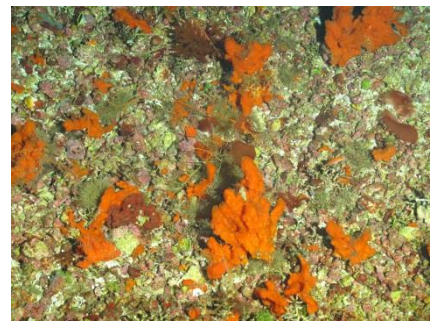


Image 17 – Algal nodules dominated by orange sponges and possibly a population of dwarf frogfish at Elvers Bank. 70m depth

McGrail Bank (formerly 18 Fathom Bank) (145-490 feet deep)

McGrail Bank was named after David W. McGrail, an oceanographer with Texas A&M University and the U.S. Coast Guard. The bank crests at about 45 m (145 ft), and features areas of coral reefs dominated by large colonies of the blushing star coral, *Stephanocoenia intersepta*. The coral cover is approximately 28% in discreet areas, and is unique in the sense that no other coral reef is known that is dominated by this species (Image 15). The deeper portions of the bank harbor mesophotic coral communities including black corals, gorgonians, fish, sponges, algae and invertebrates. (Images 16-17) Recent ROV surveys have documented a *Sargassum* bloom on the coral reef crest, potentially threatening the coral colonies.

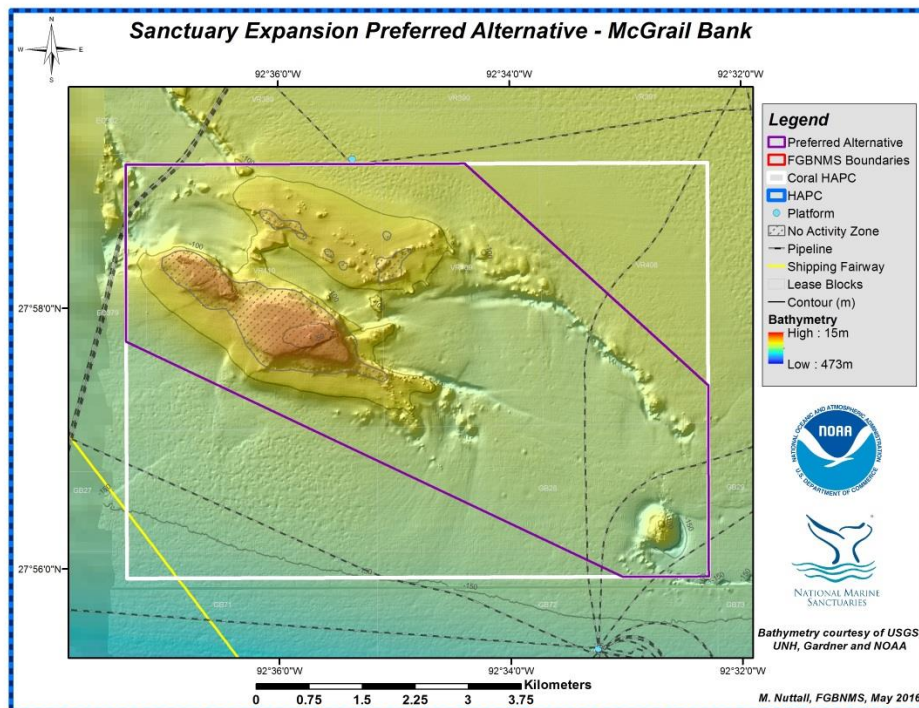


Image 18 – Large colonies of blushing star coral dominate the crest of McGrail Bank.
Image: FGBNMS/Sustainable Seas Expedition 2002



Image 19 – Lush stands of black corals, gorgonians and crinoids inhabit the mesophotic reefs of McGrail Bank. Conspicuous fish at this depth range include these Bank Butterflyfish and Roughtongue Bass.

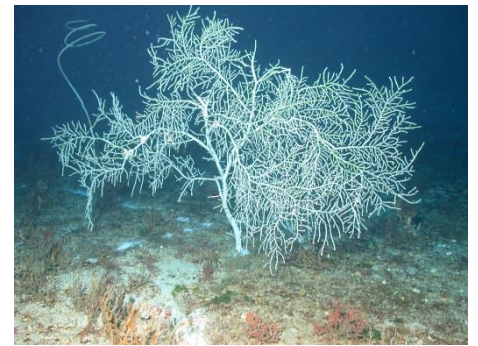


Image 20 – A large gorgonian colony stands in a forest of a dozen or more in the mesophotic habitat of McGrail Bank.

Bouma, Bryant, Rezak, Sidner Complex (195-610 feet deep)

Bouma Bank is named for Arnold H. Bouma, an LSU geologist. Rezak Bank is named after Richard Rezak, a Texas A&M University (TAMU) oceanographer. He co-authored *Reefs and Banks of the NW GOM*, the original authoritative work in the region. Bryant Bank is named after TAMU marine geologist William R. Bryant. Sidner Bank is named after TAMU geologist Bruce Sidner. The mesophotic habitat is prevalent throughout the complex, and is dominated by black corals, gorgonians, fish, sponges, algae, and invertebrates.

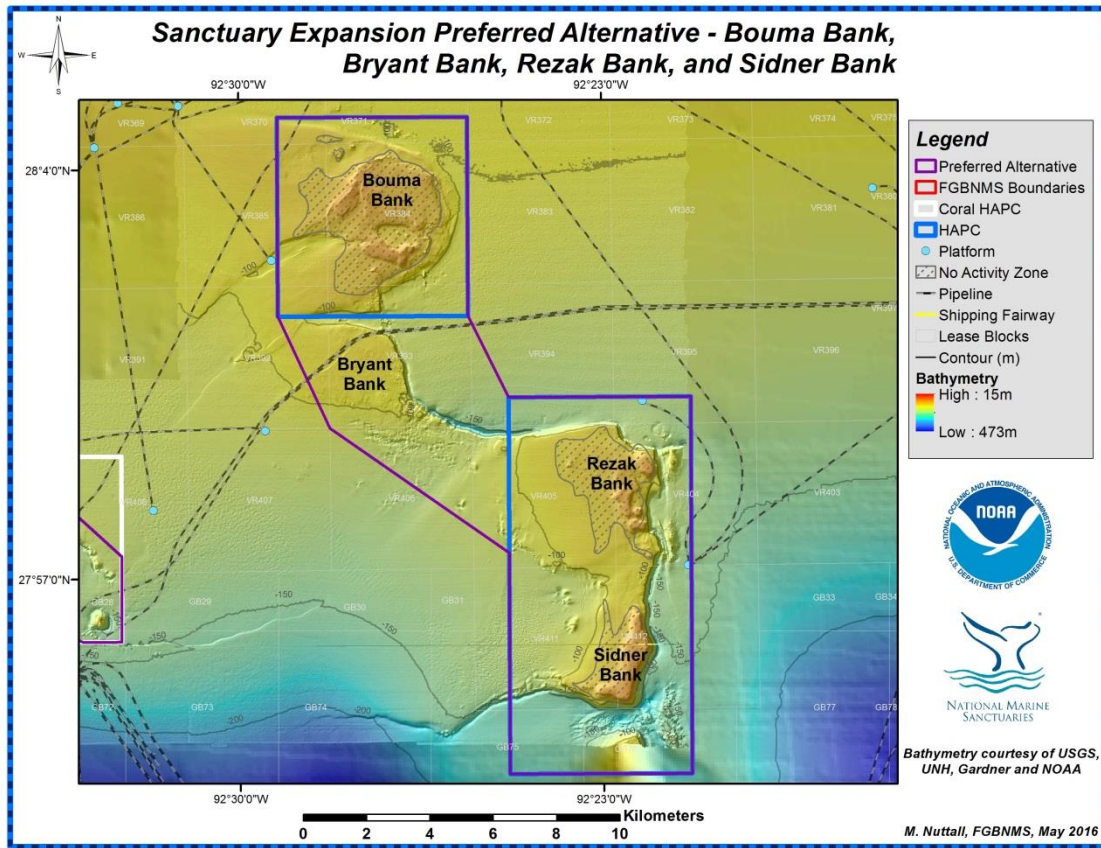


Image 21 – Lush sponge/algae field and a lizardfish at about 65 m at Bouma Bank.



Image 22 – Colorful gorgonian, *Thesia rubra*, at around 95 m at Bryant Bank.

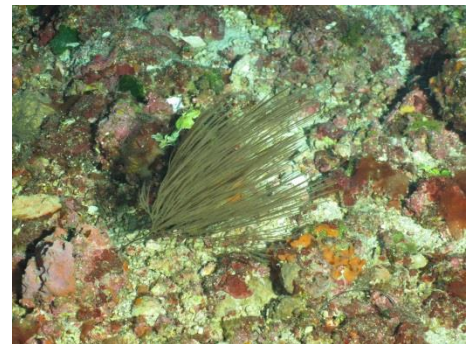


Image 23 – Algal nodule habitat with black coral, *Antipathes furcata*, at about 65 m at Rezak Bank.

Sonnier Banks (formerly Three Hickey Rock, Candy Mountain) (65-315 feet deep)

Sonnier Banks are named after Farley Sonnier, an offshore wildlife photographer. This feature has two peaks that are accessible and popular with recreational scuba divers. It is located closer to the mid-shelf area of the continental shelf. The substrate is very similar to Stetson Bank – made up of uplifted siltstone and claystone. This fragile substrate has been impacted by anchoring and hurricanes over the years. Like Stetson Bank, the crests of the peaks at Sonnier Banks are dominated by coral communities featuring fire coral, sponges and algae. (Images 18-20) The deeper portions harbor mesophotic communities.

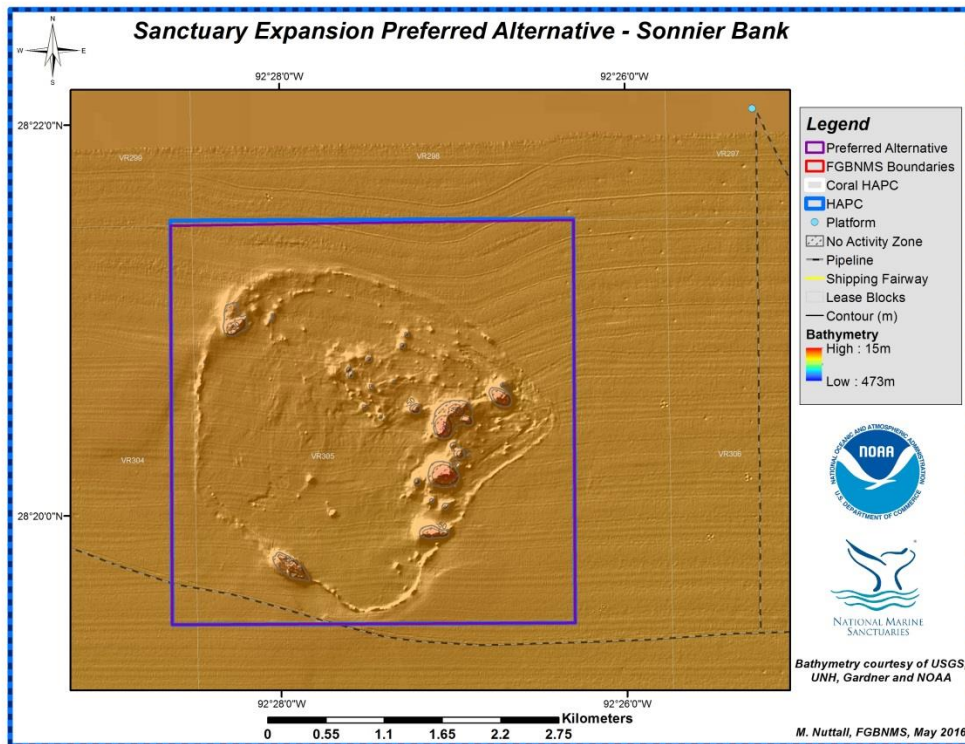


Image 24 – Sponges and fire coral dominated habitat on the crest of Sonnier Banks. Image: FGBNMS/ G.P. Schmahl



Image 25 – Sponge dominated ridge at Sonnier Banks. Image: FGBNMS/Sustainable Seas Expedition 2002



Image 26 – Fire coral and sponge dominated ledge at Sonnier Banks, with Sergeant Majors and Blackbar Soldierfish. Image: FGBNMS/ Sustainable Seas Expedition 2002

Alderdice Bank (165-240 feet deep)

Alderdice Bank was named after Robert Alderdice, founder of the Flower Garden Ocean Research Center. Spectacular basalt outcrops bearing a diverse assemblage of epibenthic organisms and fishes are a unique feature of the bank cresting at about 50m (165ft), with a base at about 73m (240ft) (Image 21). Analysis of the basalt indicated a Late Cretaceous origin – approximately 77 million years old. This is the oldest known rock exposed on the continental shelf off Louisiana and Texas. The most conspicuous biology on the peaks are sea whips, sponges, and branching bryozoan colonies, along with swarms of reef fish (Images 22 & 23). The habitat below the spires are dominated by black corals, gorgonians, fish, sponges, algae, and invertebrates.

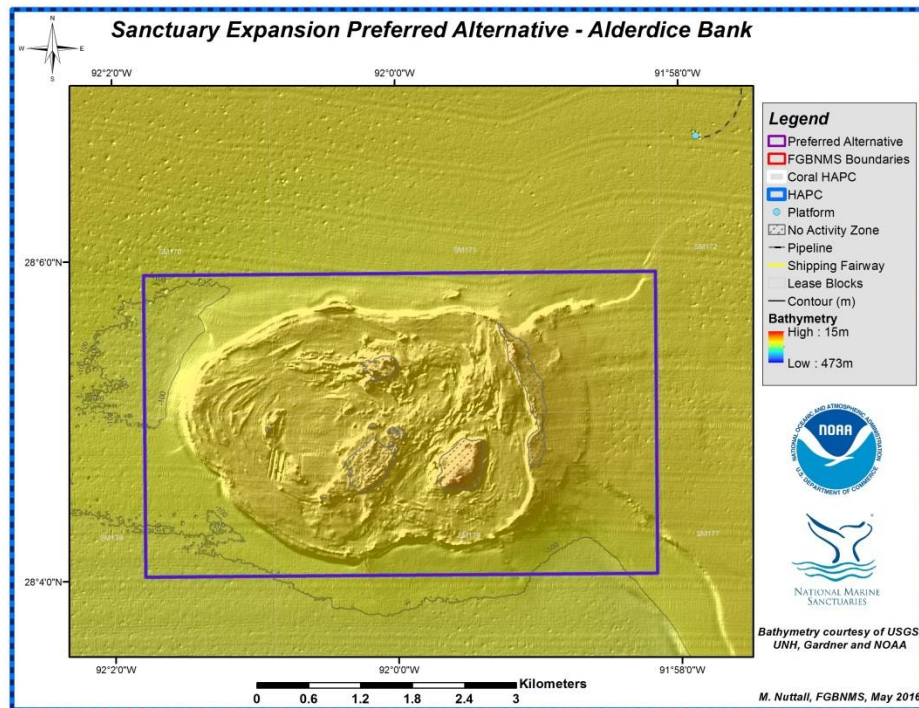


Image 27 – Basalt spire at Alderdice Bank.

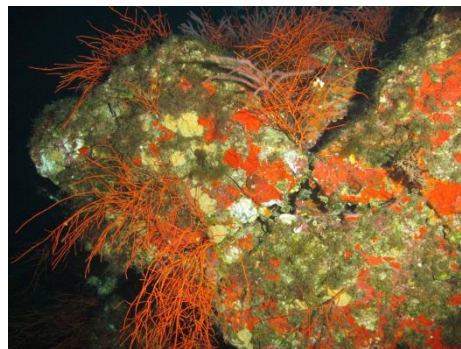


Image 28 – Basalt blocks at Alderdice Bank covered in gorgonians, encrusting sponges and coralline algae, with a Spotfin hogfish



Image 29 – Anchor chain draped through a lush algae/sponge field at Alderdice Bank.

Parker Bank (185-475 feet deep)

Parker Bank is named after Frances L. Parker, an oceanographer from Scripps. The bank harbors significant mesophotic habitat that is dominated by black corals, gorgonians, fish, sponges, algae, and invertebrates. A large field of abundant *Hypnogorgia* gorgonians was encountered during ROV surveys, as well as high relief ridges providing plenty of habitat for fish and invertebrates.

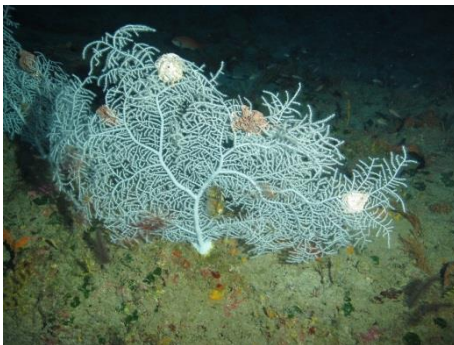
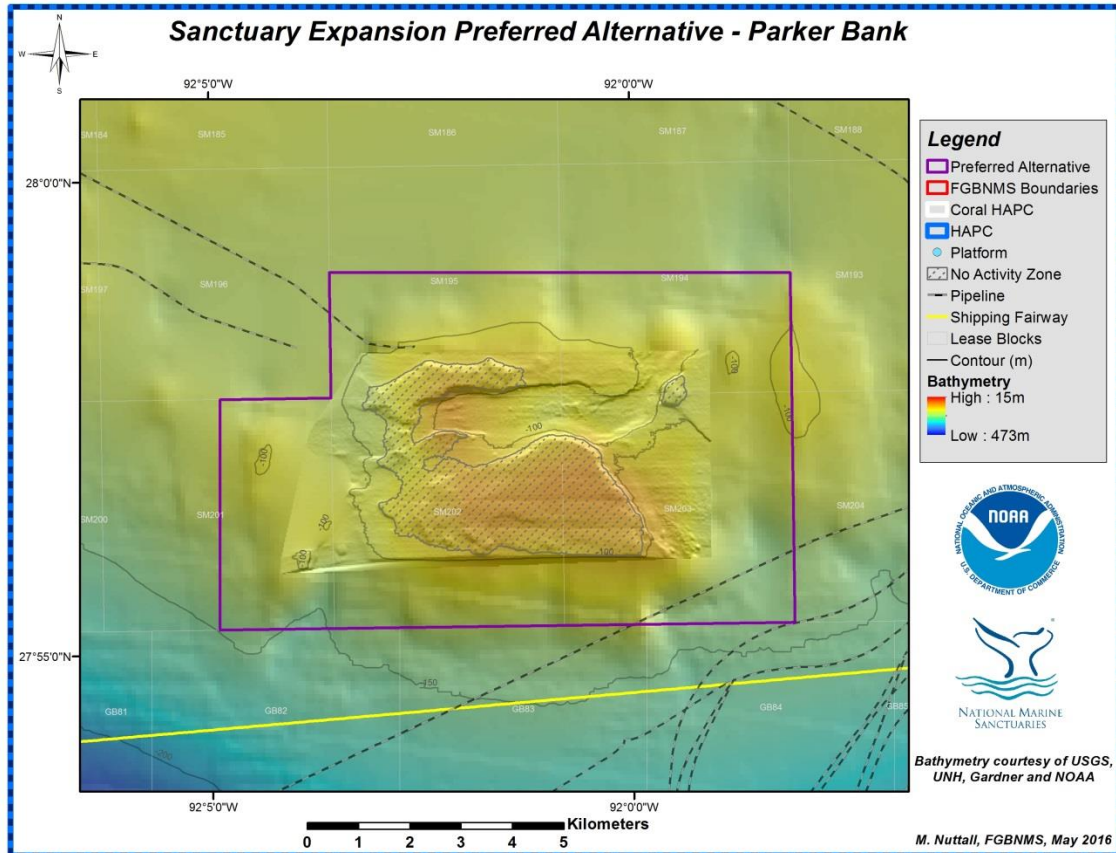


Image 30 – One of many *Hypnogorgia* gorgonians in a field at Parker Bank, providing habitat for large basket stars which unfurl to feed at night. Around 96 m depth.

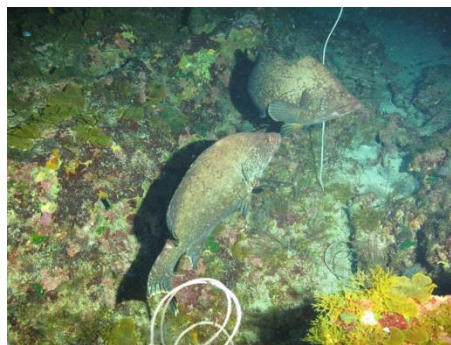
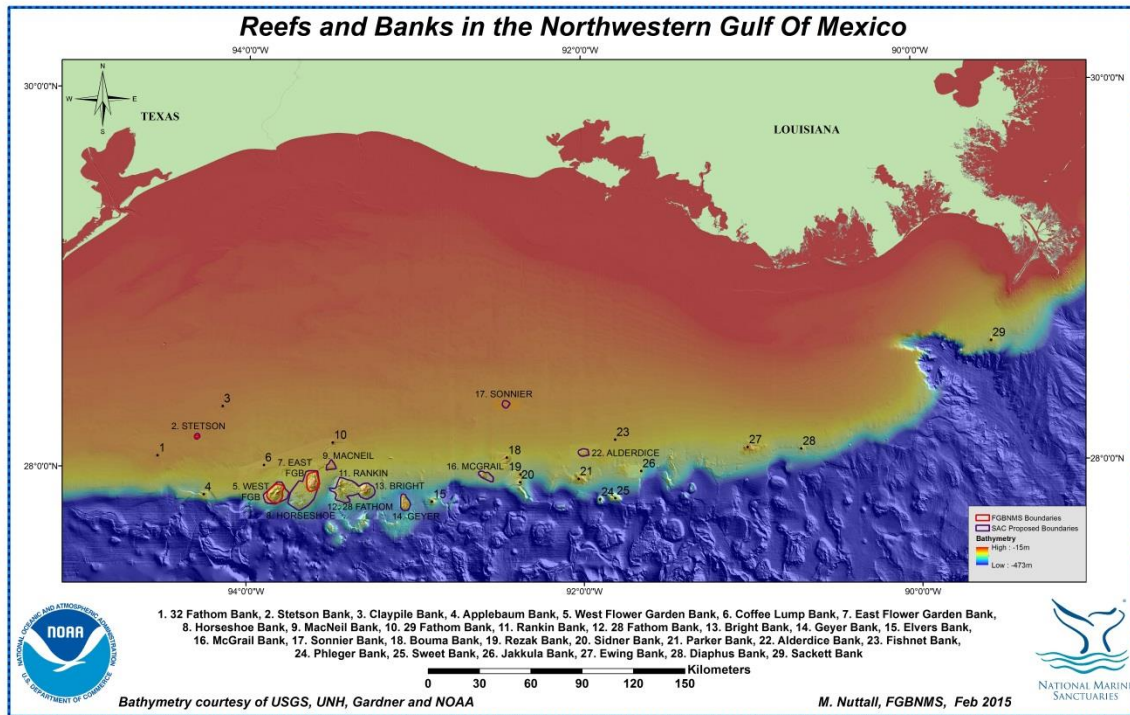


Image 31 – A pair of marbled grouper, *Dermatolepis inermis*, at about 67 m deep at Parker Bank.



Image 32 – A large black coral, *Plumapathes pennacea*, at about 57 m deep at Parker Bank.



The reefs and banks within the sanctuary boundaries and included in the preferred alternative, are just a few of several dozen features in the northwestern Gulf of Mexico. Since the Boundary Expansion Working Group conducted their analysis for this process in 2007/2008, the FGBNMS research team and partners have continued exploration in the region. Below is a list of additional locations visited since 2008 (from west to east):

- 29 Fathom
- Elvers
- Bouma
- Rezak
- Sidner

Multibeam mapping has taken place at:

- Claypile
- Coffee Lump
- Elvers (partial)
- Ewing