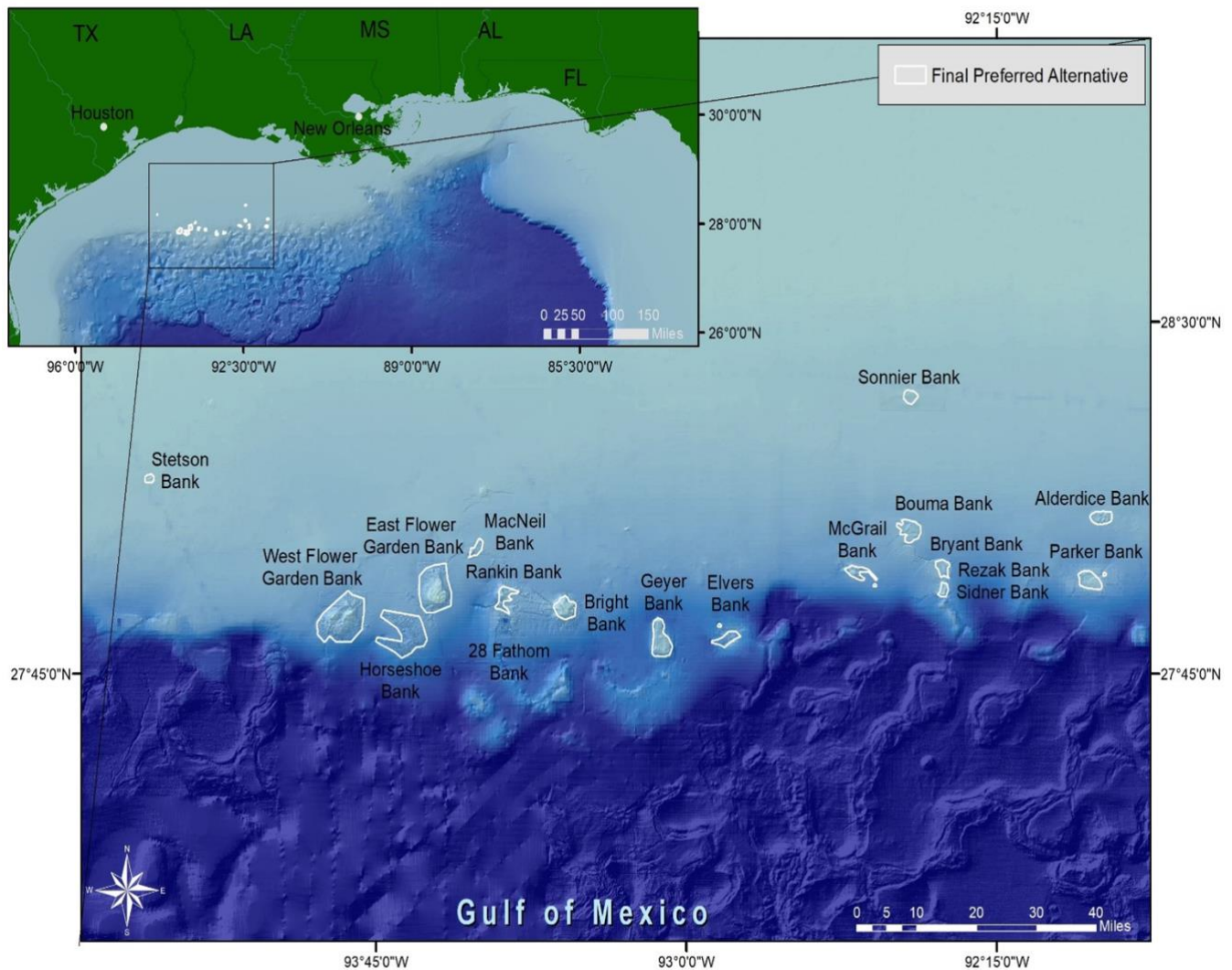


FLOWER GARDEN BANKS NATIONAL MARINE SANCTUARY EXPANSION FINAL RULE/FINAL PREFERRED ALTERNATIVE SITE DESCRIPTIONS



The purpose of this document is to give a brief overview of the reefs and banks included in the Final Preferred Alternative in the final rule released by Flower Garden Banks National Marine Sanctuary (FGBNMS) in January 2021, and the accompanying Final Environmental Impact Statement (FEIS).

The bathymetry presented in the maps was collected by Dr. Jim Gardner (University of New Hampshire), the National Oceanic and Atmospheric Administration (NOAA), and the Bureau of Ocean Energy Management (BOEM). The maps were adapted by FGBNMS to illustrate the boundaries of the Final Preferred Alternative, infrastructure, shipping fairways, and management zones.

The underwater images were collected by FGBNMS during research cruises conducted with the University of North Carolina Wilmington – Undersea Vehicle Program (UNCW-UVP) and Global Foundation for Ocean Exploration, using a remotely operated vehicle (ROV), unless otherwise indicated.

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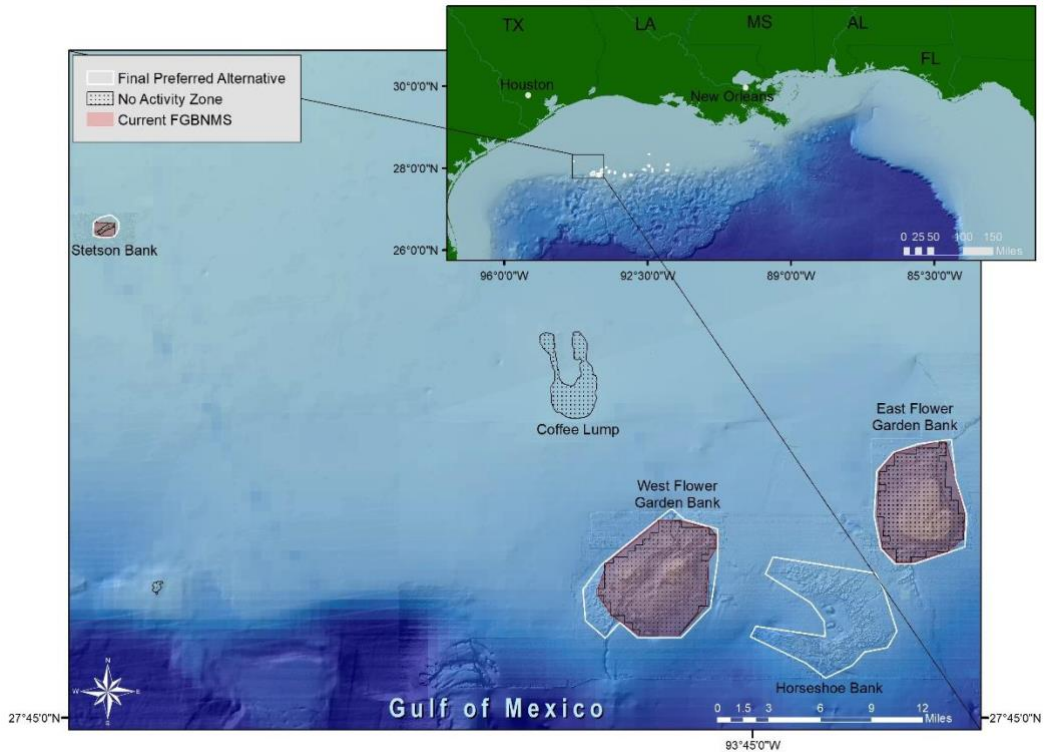
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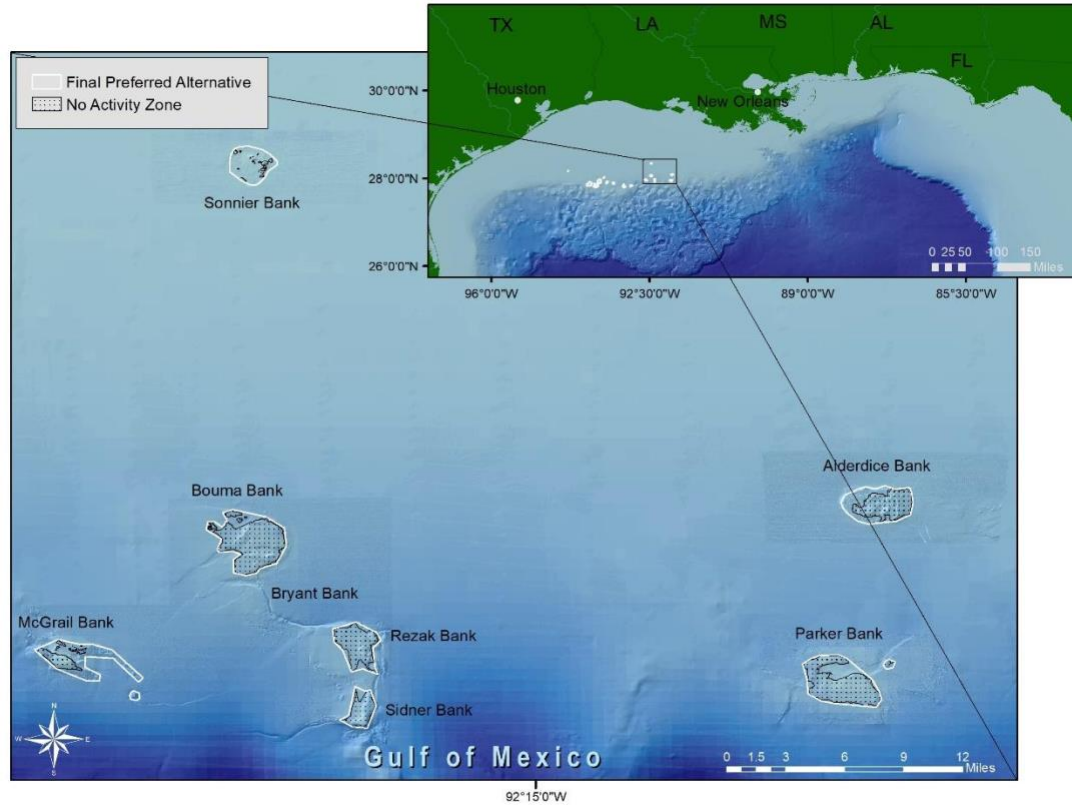
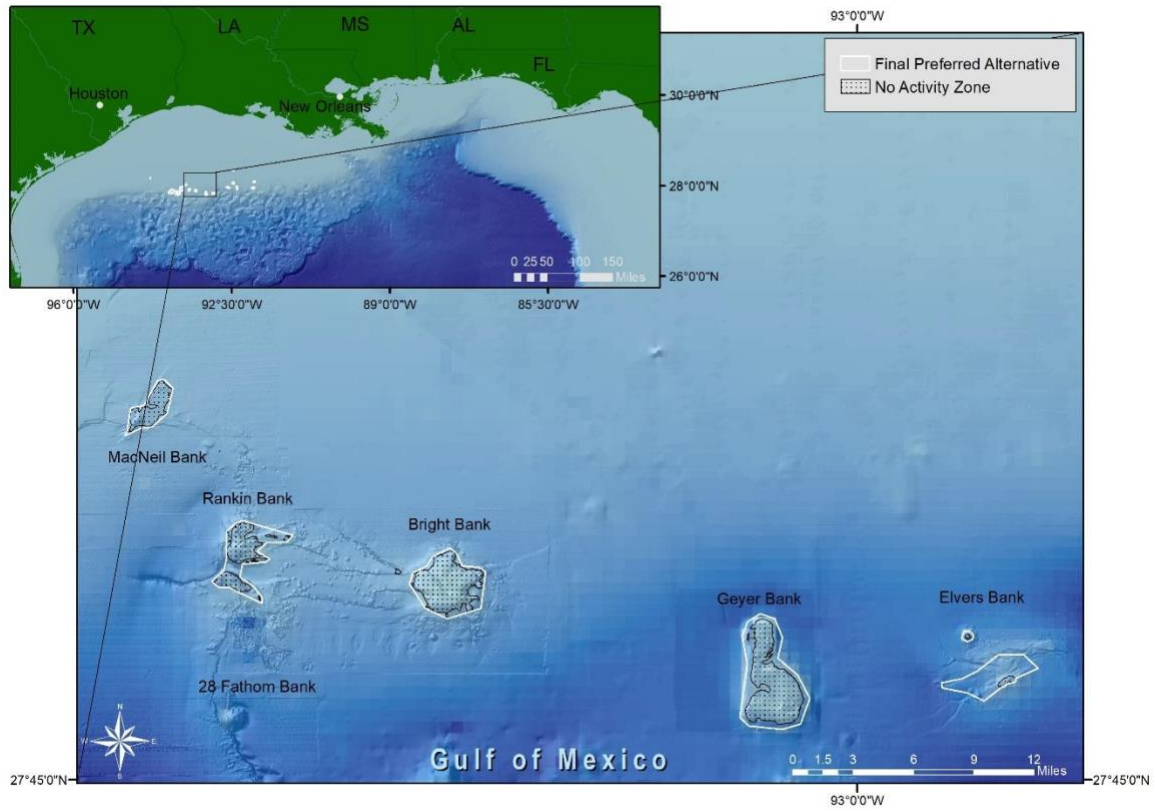
Background – Final Preferred Alternative

NOAA’s Final Preferred Alternative adds 14 banks to the existing boundary, for a total of 17 banks. This increases the current sanctuary area from approximately 56 square miles to 160 square miles. A detailed description of NOAA’s development of the Final Preferred Alternative can be found in the final rule and FEIS.¹

The following maps show the expansion locations from west to east, and identify the current sanctuary (Stetson, East Flower Garden, and West Flower Garden banks) and the Final Preferred Alternative. The maps also show the Bureau of Ocean Energy Management’s (BOEM’s) No Activity Zones (NAZs), which were influential in the development of the Final Preferred Alternative boundaries.



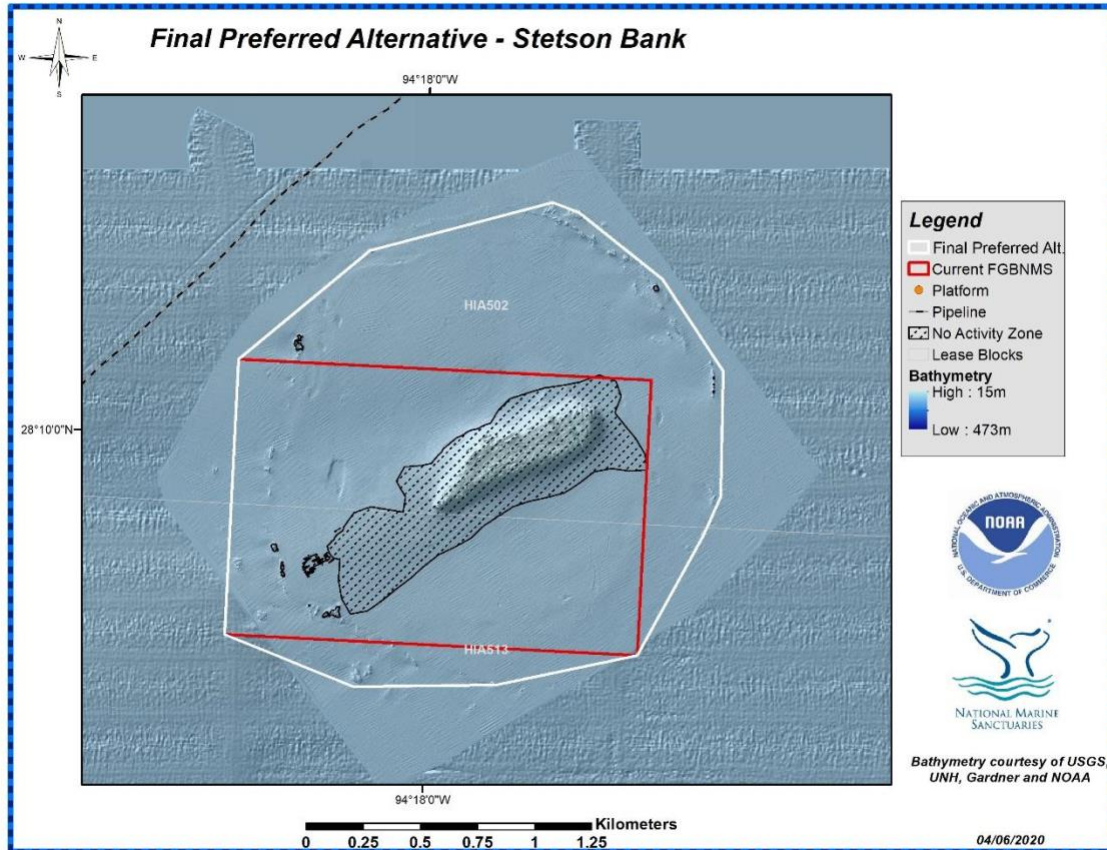
¹ See <https://flowergarden.noaa.gov/management/sanctuaryexpansion.html>



Stetson Bank – Amend current boundaries

Action will increase area from 0.84 sq. miles to 1.43 sq. miles
 Depth range: 56ft – 200ft (17m – 61m)

Stetson Bank was named after Henry C. Stetson, a Woods Hole Oceanographic Institute geological oceanographer. The ring around Stetson Bank was originally identified as an important associated feature when mapped in 1997, after the initial boundary designation. Additional mapping was conducted by FGBNMS to complete 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, octocorals, sponges, invertebrates, and deep reef fish.

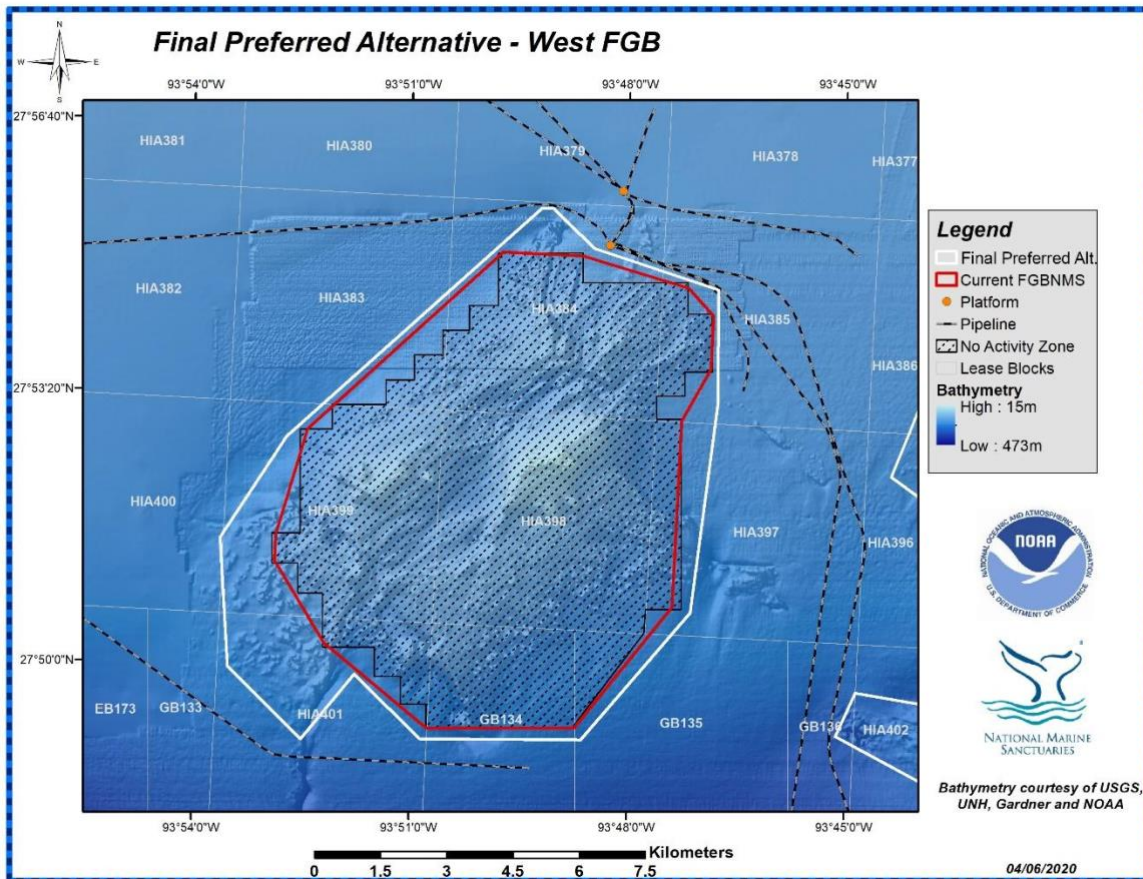


(Left) Sponge community around Stetson Ring. (Right) Sponges and black corals around Stetson Ring.

West Flower Garden Bank – Amend current boundaries

Action will increase area from 29.94 sq. miles to 37.15 sq. miles
 Depth range: 56ft – 545ft (17m – 166m)

Multibeam mapping revealed hard bottom features not previously protected within the original sanctuary boundaries at West Flower Garden Bank (FGB). These features include populations of branching stony corals, black corals, and octocorals.

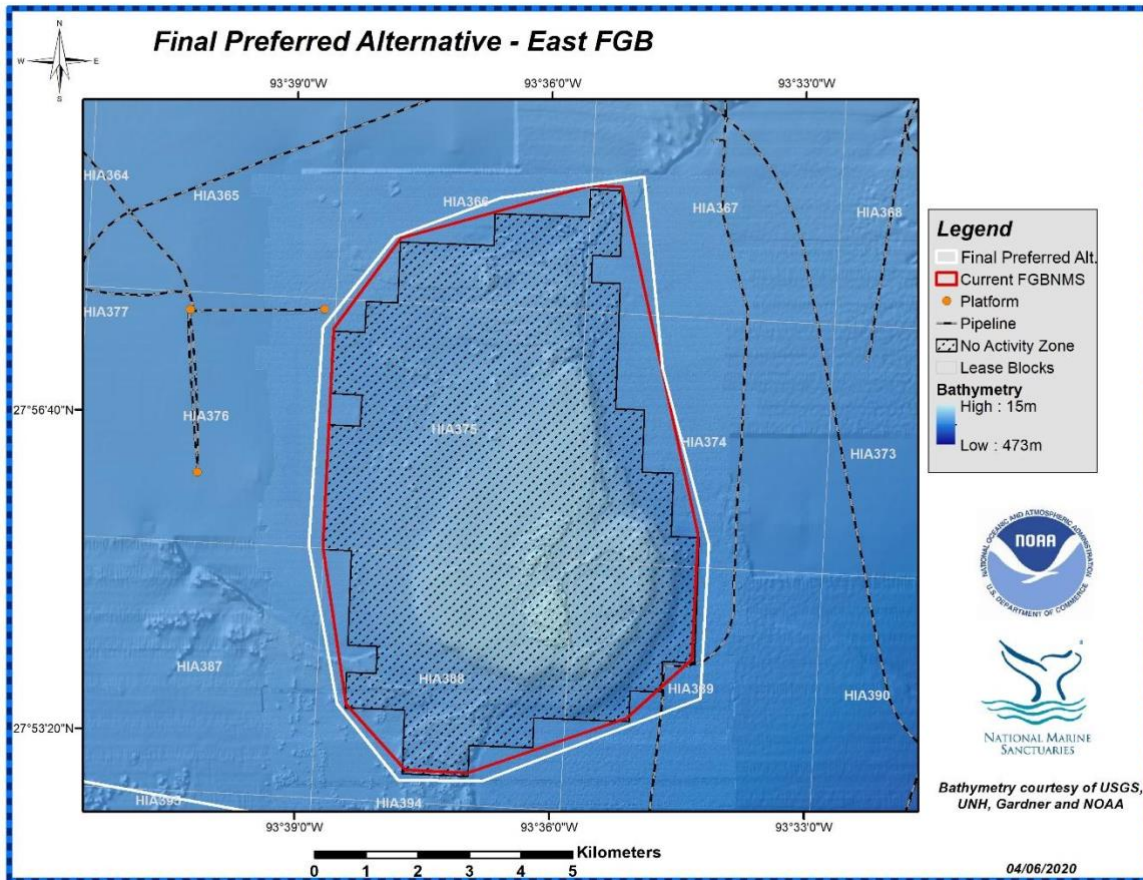


(Left) Branching stony coral and black coral at West Flower Garden Bank. (Center) A crinoid, black corals, and longline at West Flower Garden Bank. (Right) An octocoral and black corals at West Flower Garden Bank.

East Flower Garden Bank – Amend current boundaries

Action will increase area from 25.43 sq. miles to 27.82 sq. miles
 Depth range: 62ft – 446ft (19m – 136m)

Multibeam mapping revealed hard bottom features not previously protected within the original sanctuary boundaries at East Flower Garden Bank. These features include populations of branching stony corals, black corals, and octocorals.

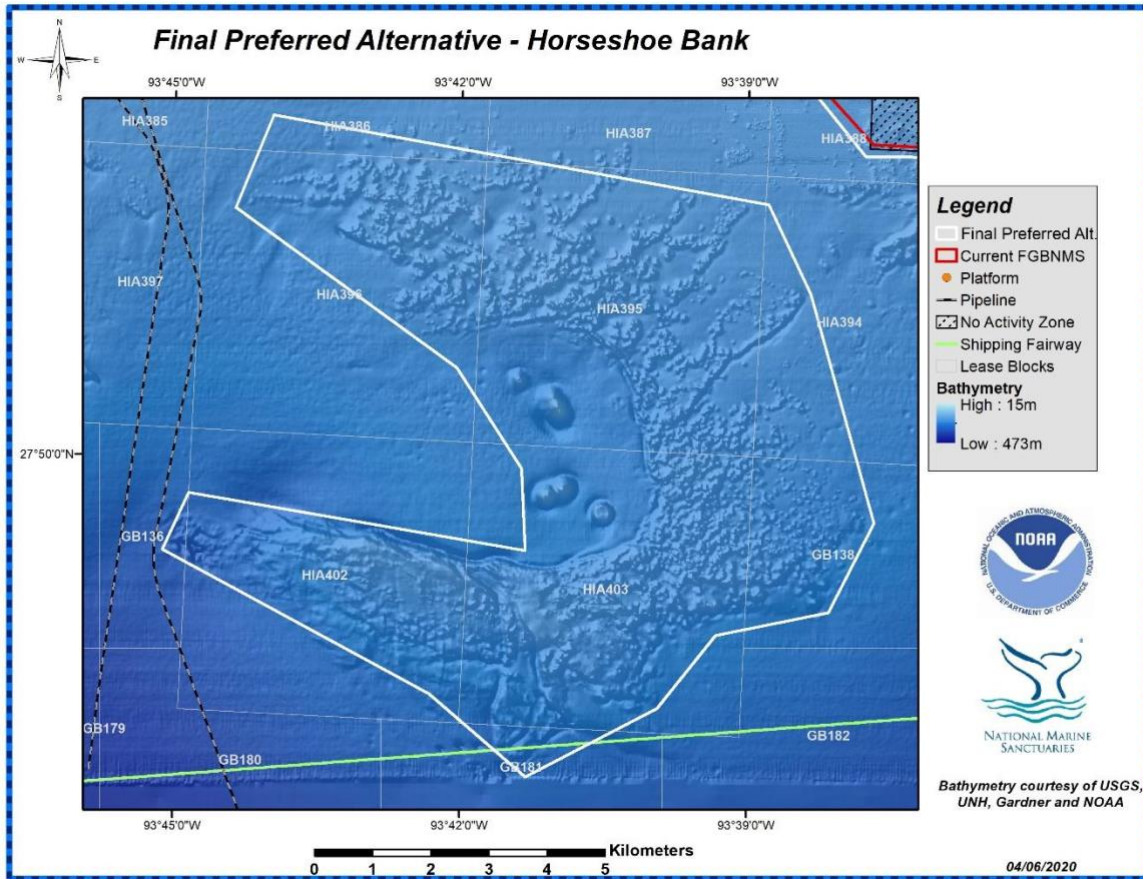


(Left) A crinoid perched on top of a black coral at East Flower Garden Bank. (Center) Black corals at East Flower Garden Bank. (Right) Stony cup corals, black corals, and an octocoral at East Flower Garden Bank.

Horseshoe Bank

28.68 sq. miles, depth range: 243ft – 646ft (74m – 187m)

Horseshoe Bank was revealed through mapping by NOAA in 2004. This effort showed a feature made up of thousands of patch reefs providing habitat for mesophotic corals, sponges, algae, invertebrates, and fish. It also includes interesting mud volcano features. FGBNMS research staff named this feature after its shape.

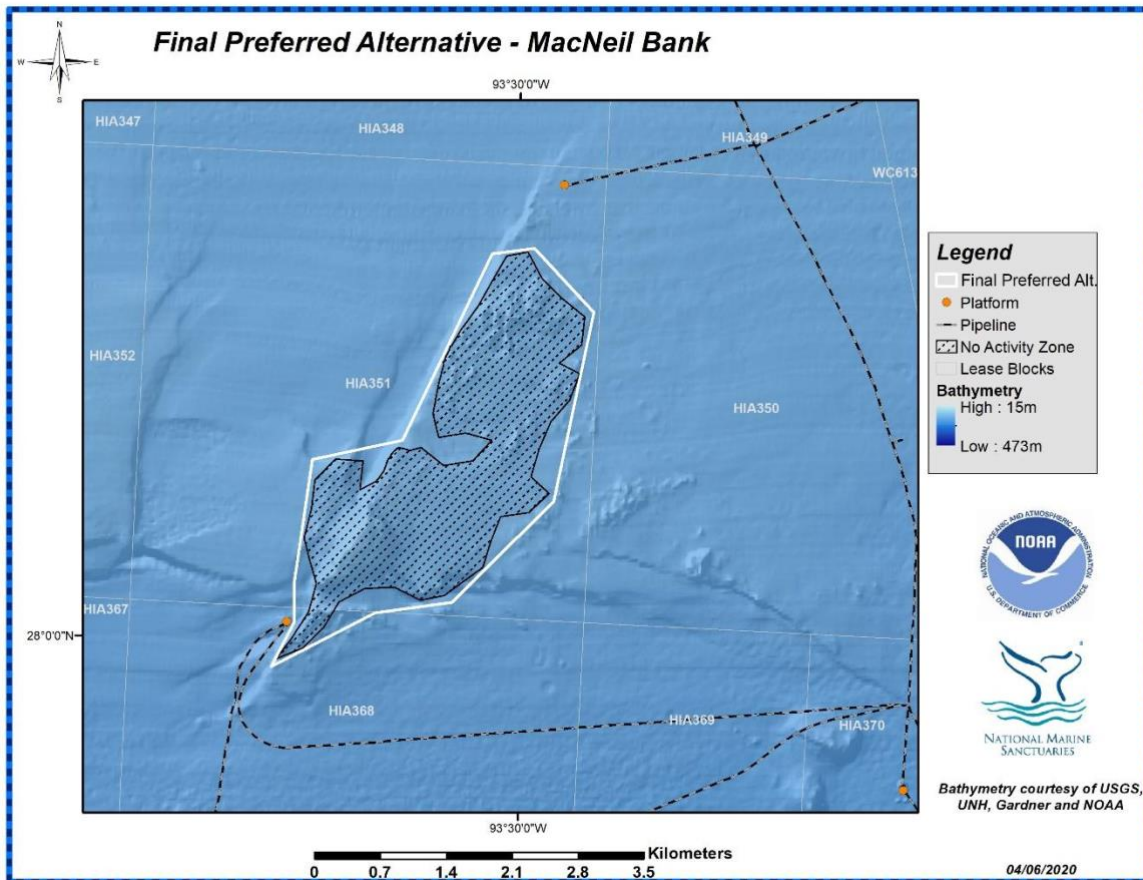


(Left) A garden of black corals and octocorals on an outcropping at Horseshoe Bank. (Center) A colorful anemone amid black corals and octocorals at Horseshoe Bank. (Right) A scamp grouper in a field of black corals and octocorals at Horseshoe Bank.

MacNeil Bank

2.72 sq. miles, depth range: 210ft – 315ft (64m – 96m)

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 to East Flower Garden Bank by a ridge that runs between the two features. MacNeil Bank includes mesophotic habitat featuring black corals, octocorals, sponges, and fish.

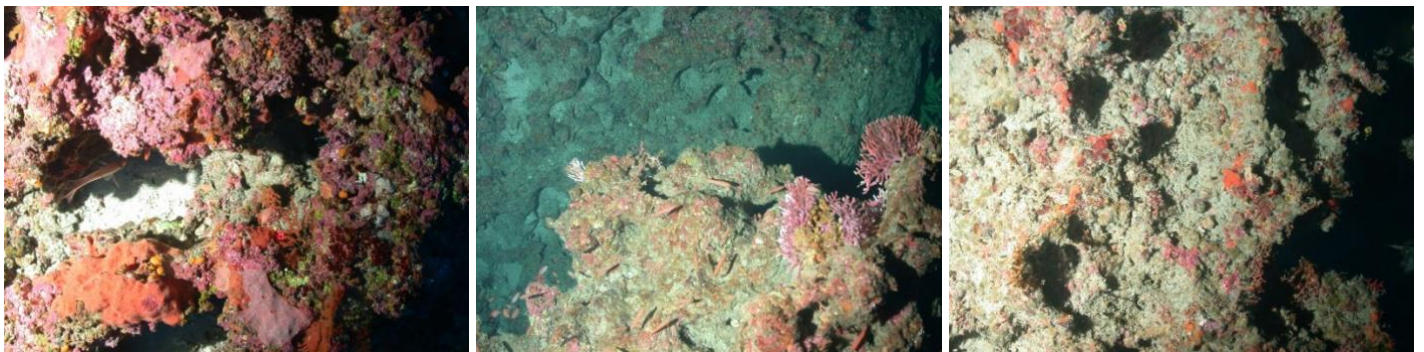
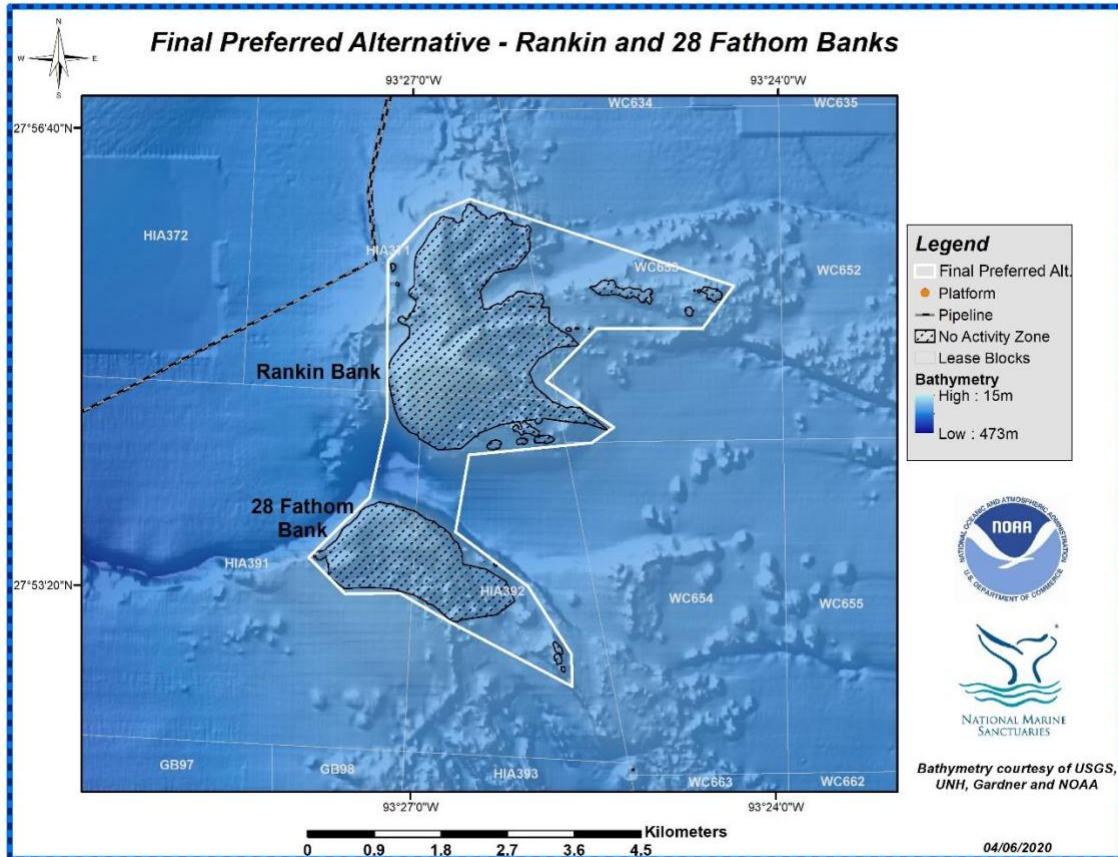


(Left) Colorful encrusting sponges, black corals, octocorals, and crinoids at MacNeil Bank. (Center) A school of creolefish swim around a 3 foot (0.3 meter) tall feature on MacNeil Bank. (Right) Sponges and black corals at MacNeil Bank.

Rankin and 28 Fathom Banks

5.57 sq. miles, depth range: 164ft – 571ft (50m – 174m)

Rankin Bank was named after John L. Rankin, of the Minerals Management Service (now BOEM). The bank is located 9.3 miles due east of East Flower Garden Bank. It is physically connected to MacNeil Bank to the north via the ridge feature that continues on to East Flower Garden Bank. Rankin Bank is just north of 28 Fathom Bank. The two features are split by a 3,280ft (1,000m) wide trough, reaching down about 571ft (174m). These banks include mesophotic habitat consisting of black corals, octocorals, algae, sponges, stony corals, and a variety of invertebrates.

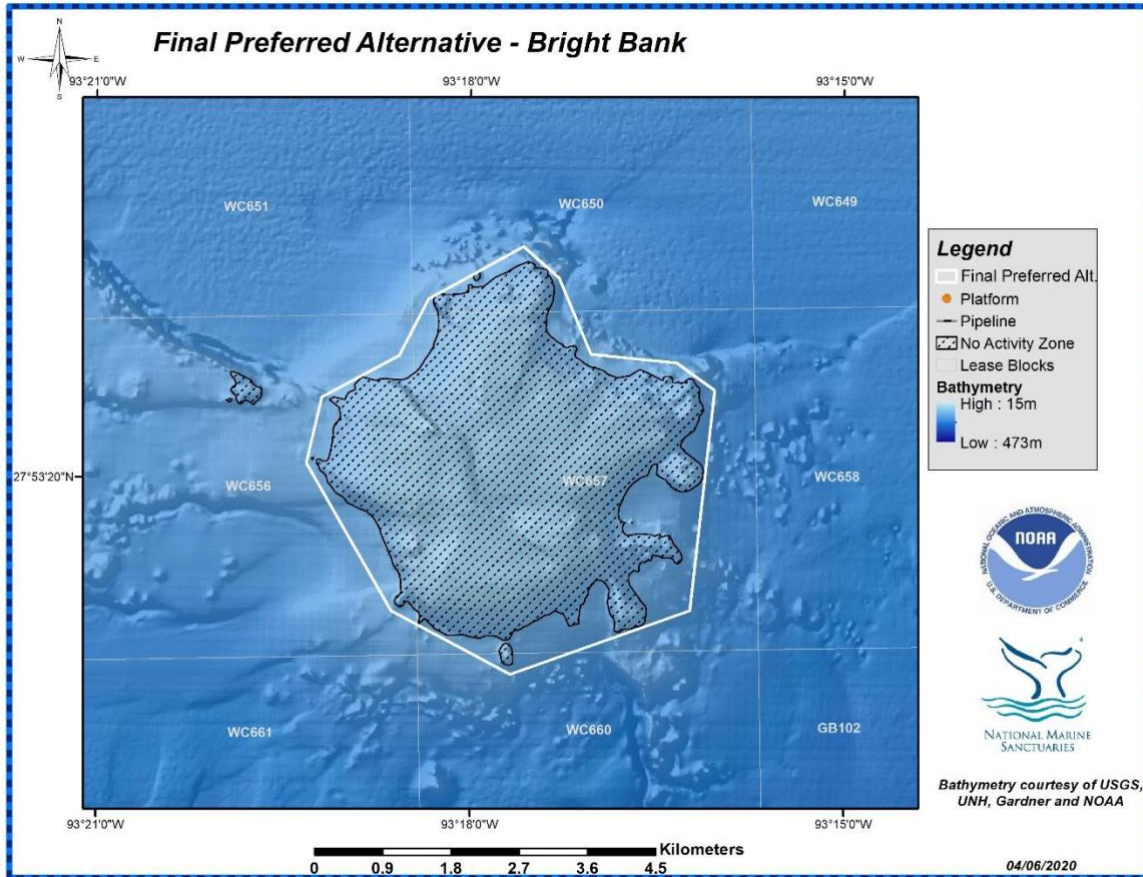


(Left) Colorful coralline algae, encrusting sponges, and octocorals at 28 Fathom Bank. (Center) Threadnose bass swim near stony corals and coralline algae at 28 Fathom Bank. (Right) Coralline algae and octocorals at Rankin Bank.

Bright Bank

7.65 sq. miles, depth range: 112ft – 384ft (34m – 117m)

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

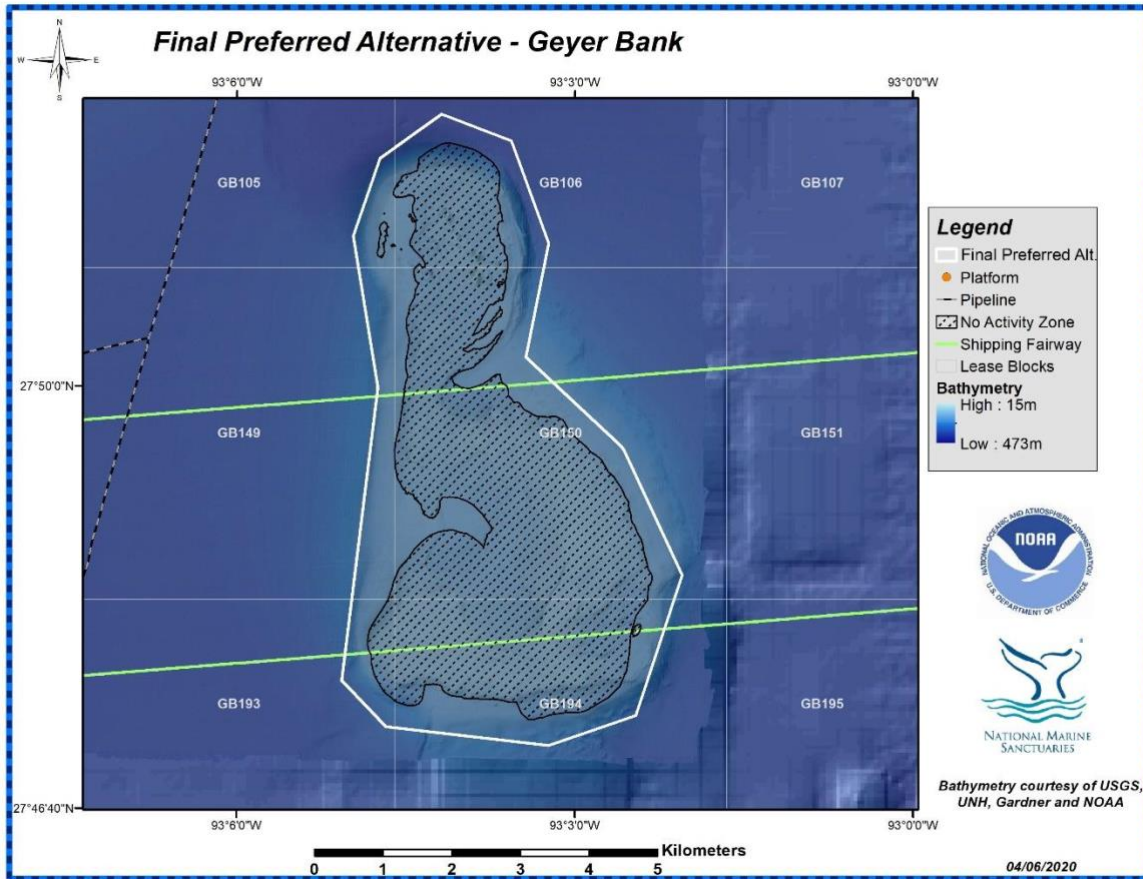


(Left) Just remnants of coral reef habitat remain on the crest of Bright Bank. (Center) Leafy algae, encrusting sponges, and tropical fish on the reef crest at Bright Bank. (Right) An excavation pit and debris left over from treasure salvage activities at Bright Bank.

Geyer Bank

11.52 sq. miles, depth range: 128ft – 722ft (39m – 220m)

Geyer Bank was named after Richard A. Geyer, a Texas A&M University geophysicist. The bank lies on an active salt diapir on the upper continental slope. It supports a coral community, as well as mesophotic coral habitats including black corals, octocorals, fish, sponges, algae, and invertebrates. Diver surveys have documented a *Sargassum* bloom on the reef crest, as well as enormous aggregations of reef butterflyfish. A shipping lane cuts directly across the top of the bank, and in 2011, a large tanker anchored on top of the feature, just outside of the shipping lane. Sanctuary regulations should prevent any further anchoring incidents.

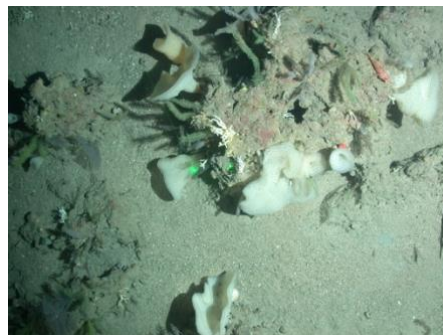
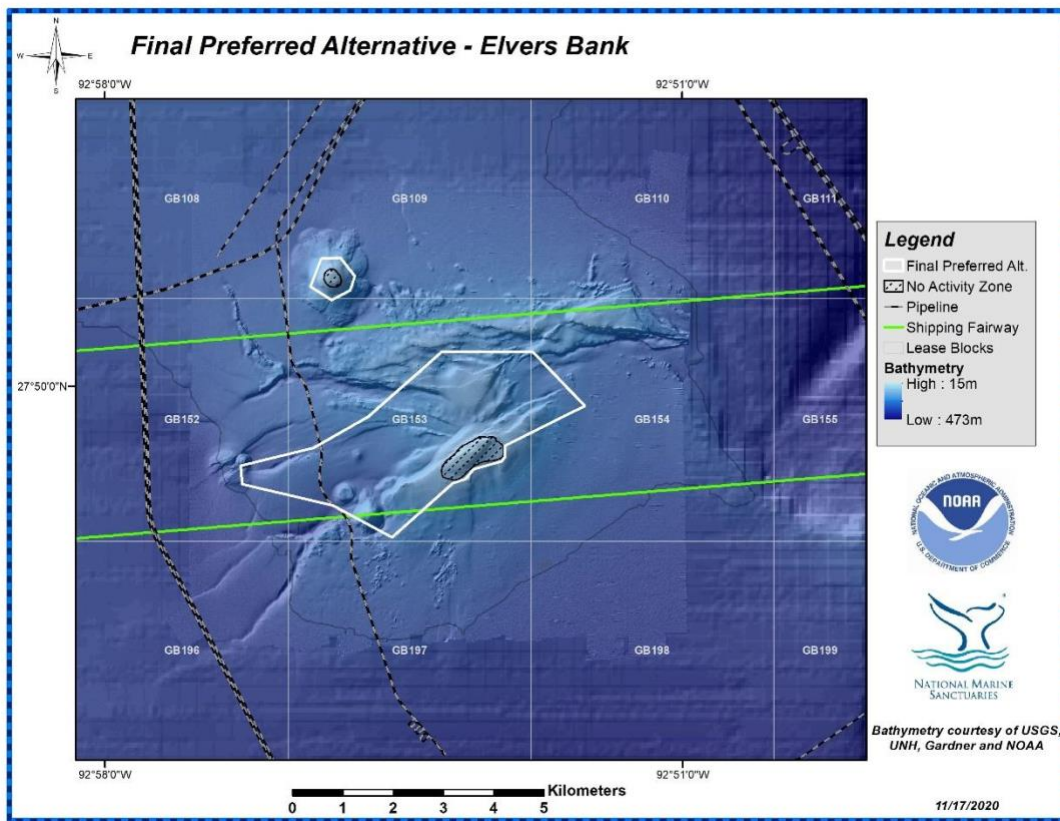


(Left) Sponges, algae, and reef butterflyfish on the crest of Geyer Bank (Photo: Schmahl/NOAA). (Center) A large black coral bush providing cover for trumpetfish at Geyer Bank. (Right) Giant anemone, sponges, and fire coral at Geyer Bank.

Elvers Bank

4.62 sq. miles, depth range: 217ft – 682ft (66m – 208m)

Elvers Bank was named after Douglas J. Elvers, a Minerals Management Service (now BOEM) geophysicist. The bank is at the very edge of the continental shelf and reaches a depth of about 675ft (206m). This site includes mesophotic habitat dominated by black corals, octocorals, fish, sponges, algae, and invertebrates. It also includes an algal nodule field dominated by a small orange/red sponge, which provides 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. A new species of black coral was recently identified at Elvers Bank, however, the proposed boundaries do not incorporate the area where the new species was documented.

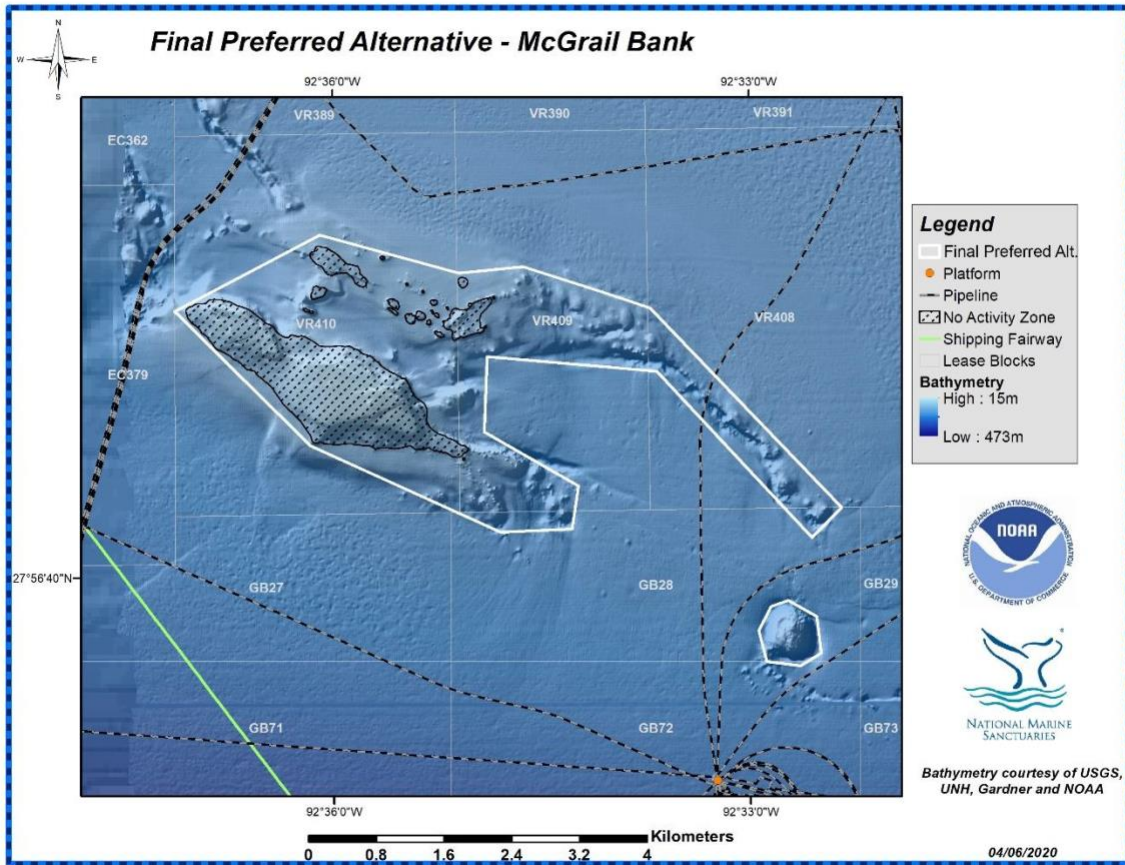


(Left) Dense cover of crinoids, octocorals, and sponges at Elvers Bank. (Center) Glass sponge fields at 525 feet (160m) at Elvers Bank. (Right) Colorful algal nodules and orange sponges at Elvers Bank.

McGrail Bank (formerly known as 18 Fathom Bank)

4.71 sq. miles, depth range: 144ft – 512ft (44m – 156m)

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 145ft (45m), and features areas of coral reefs dominated by large colonies of blushing star coral (*Stephanocoenia intersepta*). This is unique in that no other coral reef is known to be dominated by this species, and in some areas, the coral cover is as high as 28%. The deeper portions of the bank include mesophotic coral communities featuring black corals, octocorals, fish, sponges, algae, and invertebrates. Recent ROV surveys have documented a *Sargassum* bloom on the coral reef crest, potentially threatening the coral colonies.

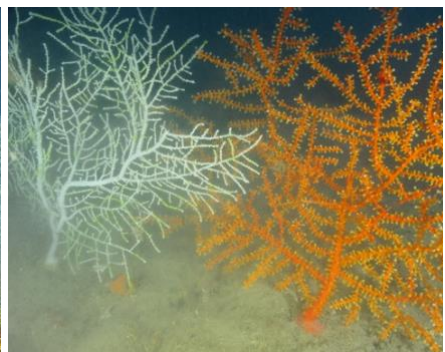
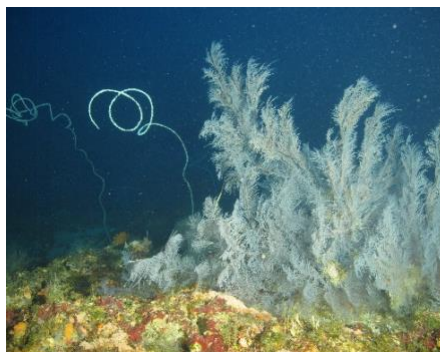
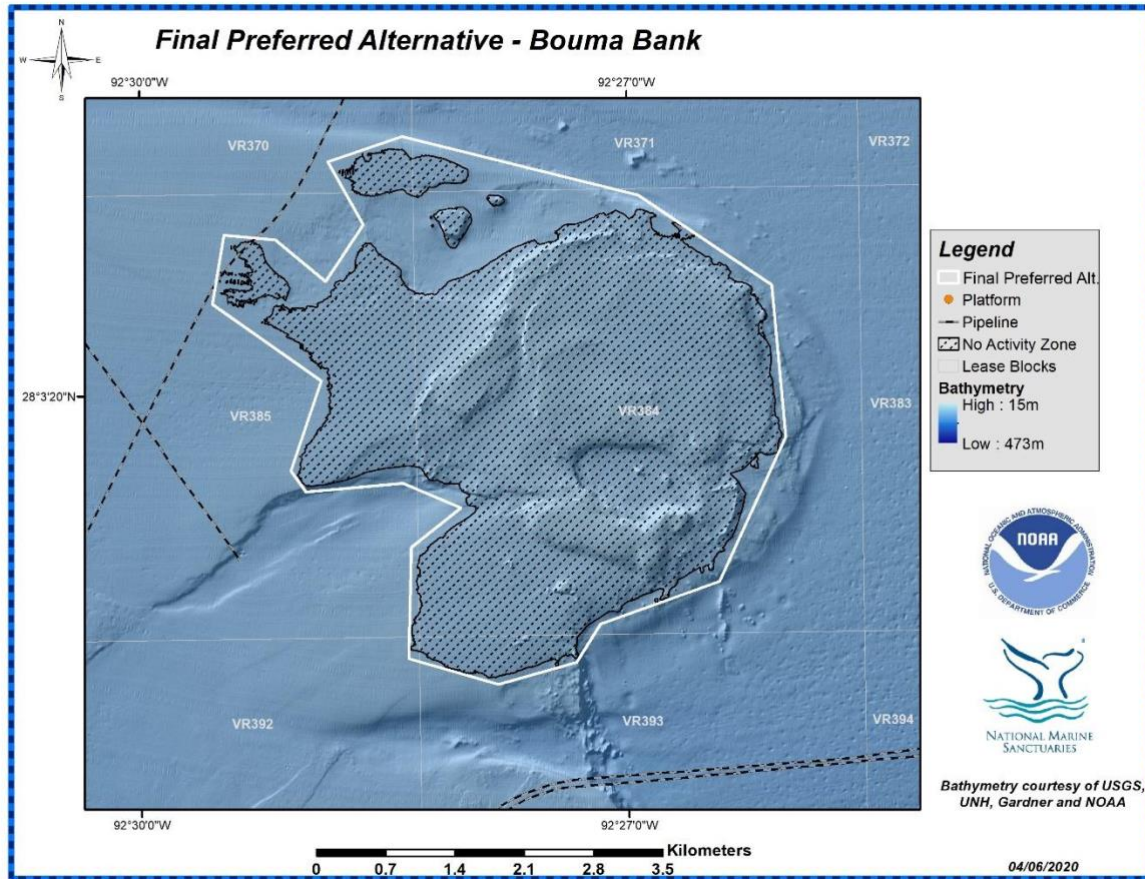


(Left) Large colonies of blushing star coral on the crest of McGrail Bank (Photo: NOAA/Sustainable Seas). (Center) A large octocoral colony in a forest of a dozen or more at McGrail Bank. (Right) Bank butterflyfish and roughtongue bass swim amid black corals and octocorals at McGrail Bank.

Bouma Bank

7.67 sq. miles, depth range: 187ft – 322ft (57m – 98m)

Bouma Bank is named for Arnold H. Bouma, a Louisiana State University geologist. Bouma Bank is on the northern side of a feature that includes several banks. Mesophotic habitat is prevalent throughout the complex, and is dominated by black corals, octocorals, fish, sponges, algae, and invertebrates.

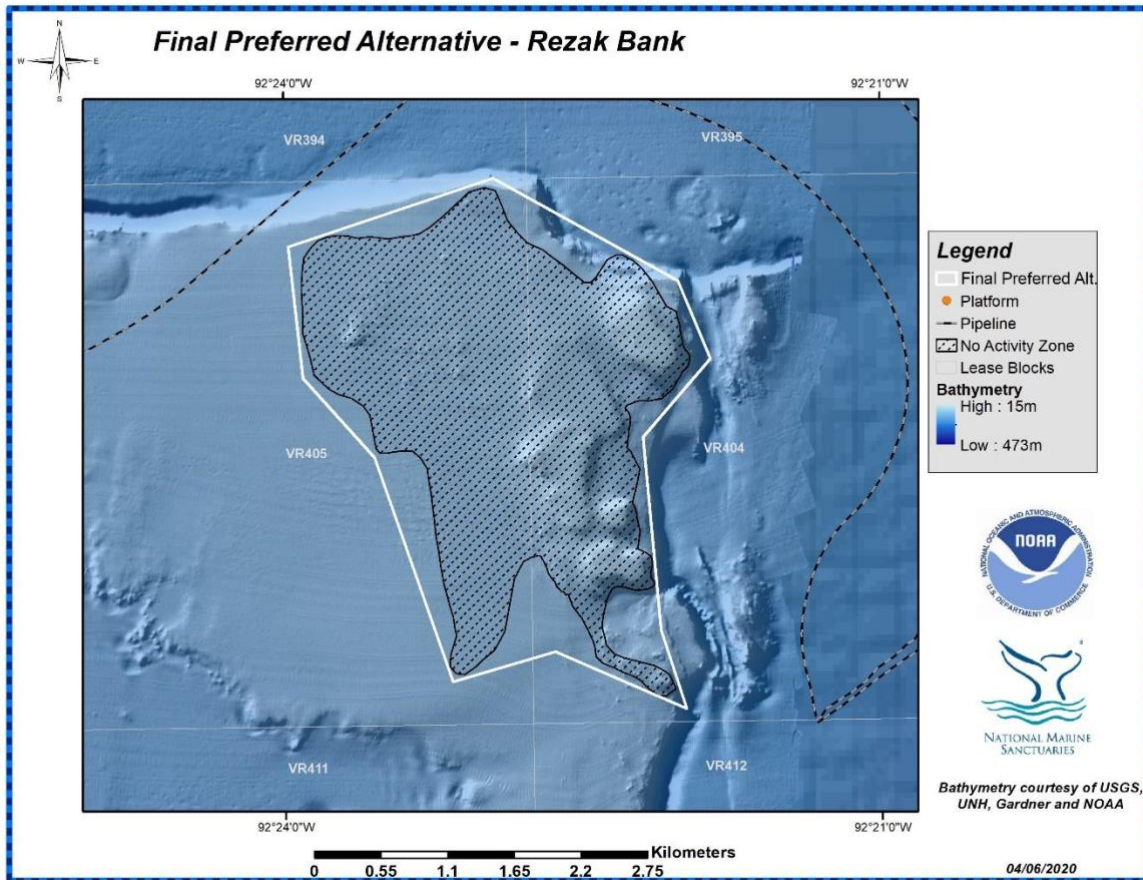


(Left) A lizardfish in a lush sponge/algae field at Bouma Bank. (Center) A large black coral bush and black coral sea whips at Bouma Bank. (Right) Large, brightly colored octocorals at Bouma Bank.

Rezak Bank

3.68 sq. miles, depth range: 197ft – 430ft (60m – 131m)

Rezak Bank is named after Richard Rezak, a Texas A&M University oceanographer who co-authored *Reefs and Banks of the Northwestern Gulf of Mexico* – the original authoritative work on this region. Rezak Bank is on the southern side of a feature that includes several banks. Mesophotic habitat is prevalent throughout the complex, and is dominated by black corals, octocorals, fish, sponges, algae, and invertebrates.

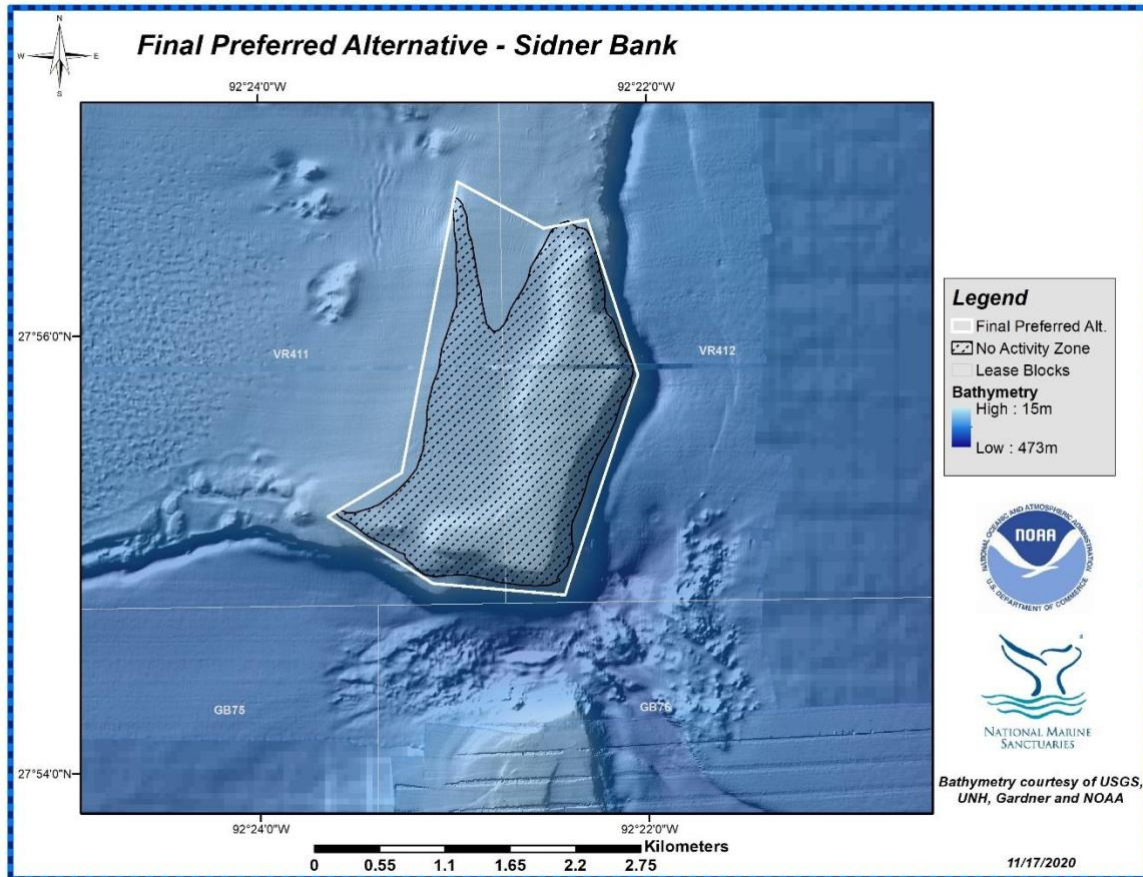


(Left) Aggregation of invasive lionfish in the algal nodule zone at Rezak Bank. (Center) Giant anemone in colorful algal nodule habitat at Rezak Bank. (Right) Red snapper in the algal nodule zone at Rezak Bank.

Sidner Bank

2.03 sq. miles, depth range: 190ft – 417ft (58m – 127m)

Sidner Bank is named after Bruce Sidner, a Texas A&M University geologist. Sidner Bank is on the southern side of a feature that includes several banks. Mesophotic habitat is prevalent throughout the complex, and is dominated by black corals, octocorals, fish, sponges, algae, and invertebrates.

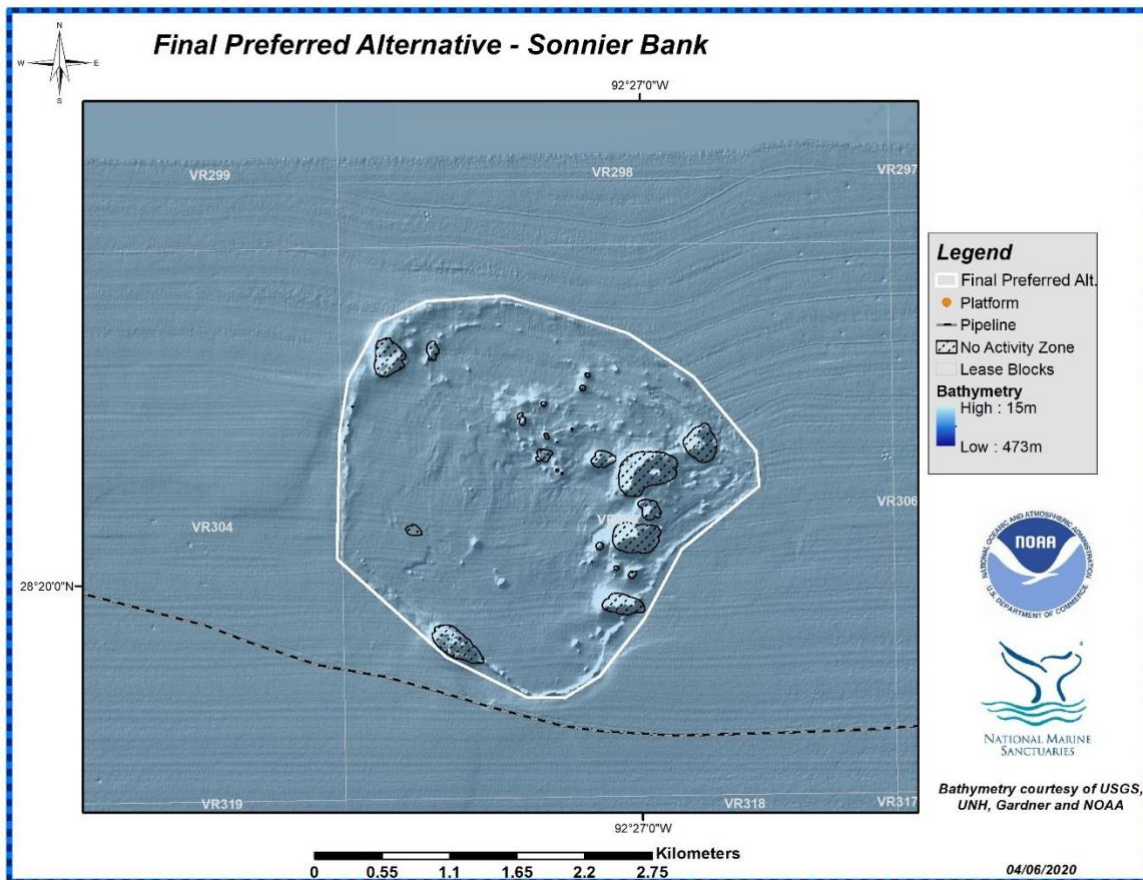


(Left) Colorful encrusting sponges and a sea urchin at Sidner Bank. (Center) A yellowmouth grouper, a squirrelfish, and schooling bonnetmouth at Sidner Bank. (Right) An Atlantic thorny oyster in coralline algae habitat at Sidner Bank.

Sonnier Bank (formerly known as Three Hickey Rock, Candy Mountain)

3.06 sq. miles, depth range: 390ft – 210ft (19m – 64m)

Sonnier Bank is named after Farley Sonnier, an offshore wildlife photographer. The area has two peaks that are accessible and popular with recreational scuba divers. Like Stetson Bank, it is located closer to the mid-shelf area of the continental shelf, has a substrate made of uplifted siltstone and claystone, and is dominated by coral communities featuring fire coral, sponges, and algae. The deeper portions include mesophotic communities. Over the years, this fragile substrate has been impacted by anchoring and hurricanes.

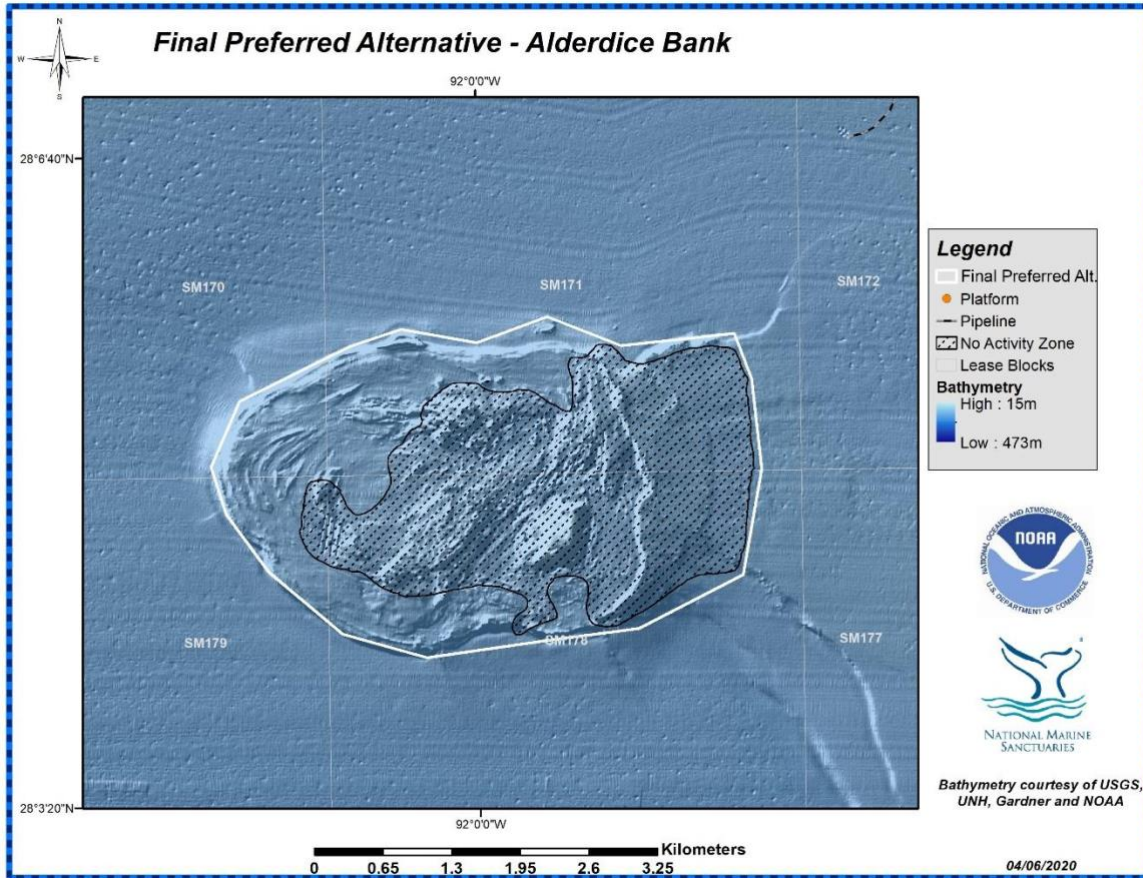


(Left) Sponge and fire coral dominated habitat on the crest of Sonnier Bank (Photo: Schmah/NOAA). (Center) A black coral bush and sponges at Sonnier Bank. (Right) Red snapper swimming through algae/sponge habitat at Sonnier Bank.

Alderdice Bank

5.03 sq. miles, depth range: 200ft – 321ft (61m – 98m)

Alderdice Bank was named after Robert Alderdice, founder of the Flower Garden Ocean Research Center. This bank features spectacular basalt outcrops, cresting at about 187ft (57m) with a base at about 240ft (73m). Analysis of the basalt indicates a Late Cretaceous origin – approximately 77 million years ago. This is the oldest known exposed rock on the continental shelf off Louisiana and Texas. The most notable marine life on the peaks are sea whips, sponges, and bryozoan colonies, along with swarms of reef fish. The habitat below the basalt spires is dominated by black corals, octocorals, fish, sponges, algae, and invertebrates.

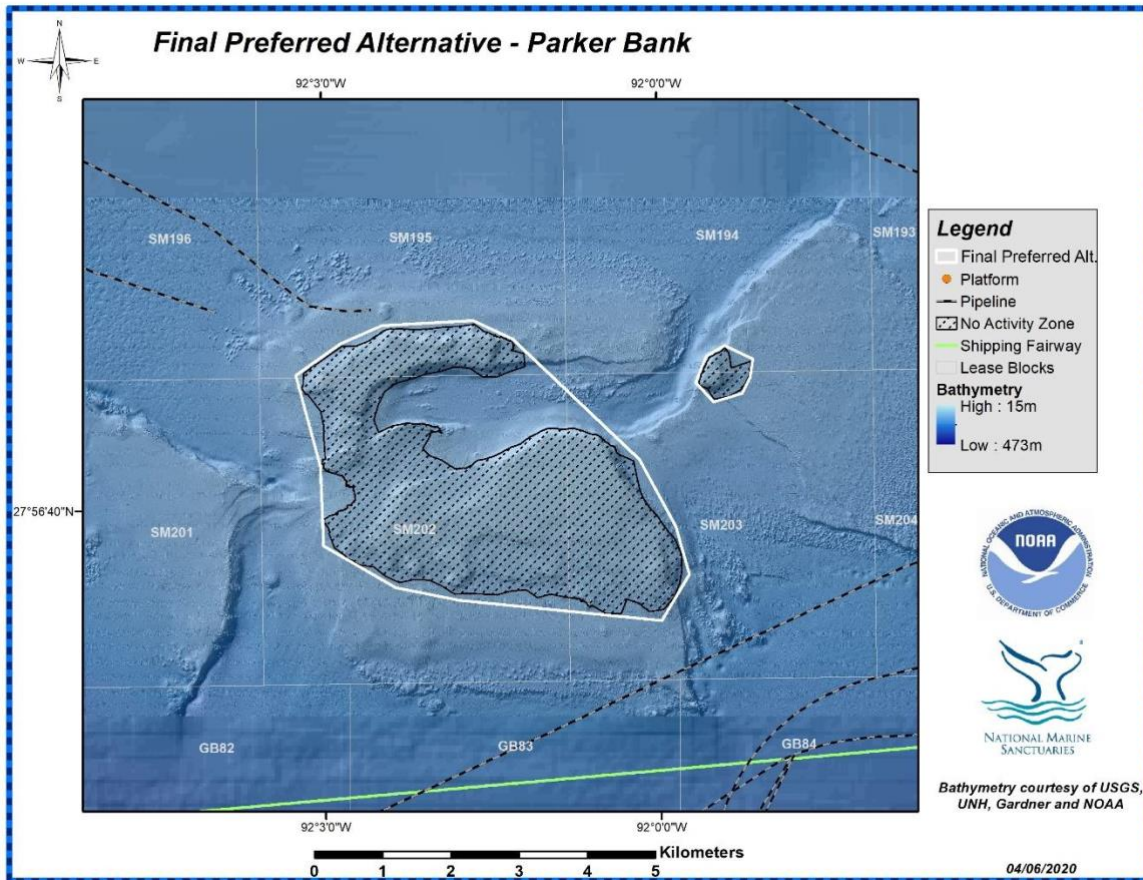


(Left) Basalt spire at Alderdice Bank, covered in colorful encrusting sponges. (Center) Anchor chain draped through a lush algae/sponge field at Alderdice Bank. (Right) Basalt blocks covered in octocorals and encrusting sponges at Alderdice Bank.

Parker Bank

7 sq. miles, depth range: 190ft – 387ft (58m – 118m)

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



(Left) A black coral sea fan, leafy red algae, and sponges in algal nodule habitat at Parker Bank. (Center) A pair of marbled grouper at Parker Bank. (Right) A ledge encrusted with colorful sponges, Atlantic thorny oysters, and sea urchins at Parker Bank.