



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

Greater Farallones National Marine Sanctuary

991 Marine Dr., The Presidio
San Francisco, CA 94129

March 19, 2017

Mr. Phil Anderson, Chair
Members of the Pacific Fishery Management Council
Submitted via email to: pfmc.comments@noaa.gov

RE: Groundfish Essential Fish Habitat and Rockfish Conservation Areas: New Research

Dear Chairman Anderson and members of the Pacific Fishery Management Council:

Greater Farallones National Marine Sanctuary (GFNMS) proposed options to the Pacific Fishery Management Council (Council) in 2013 to modify Pacific Coast Groundfish Essential Fish Habitat (EFH) management measures, which included gear specific options for EFH Conservation Areas. These options reflected a review of new information regarding three ecologically important habitat areas and have since been incorporated in whole or in part into the action alternatives. The purpose of this letter is to provide the Council with information you may find pertinent for areas that were not included in our 2013 proposal.

Since 2013, GFNMS has expanded north and west to include the waters off the coast of Sonoma and southern Mendocino counties. In 2014, GFNMS and partners characterized benthic habitat in this area, and have new information to share on substrate type and fish densities at and around "The Football." Additionally, GFNMS has administrative responsibilities for portions of Monterey Bay National Marine Sanctuary from the San Mateo county line north to Marin County. Benthic habitat characterization research was conducted in this area as well in 2016 and 2017, and we have new information to share at Pioneer Canyon.

Upon review of the data provided in the Alternatives Analysis for West Coast Groundfish EFH, we confirmed that the coral, sponge, sea pen and whip data we collected in 2014 were incorporated into the analysis for alternatives at The Football. However, the Alternative Analysis does not include the substrate and fish data from our 2014 survey. Our survey results show that area around The Football also has hard and mixed substrate, not only soft bottom habitat as portrayed by data from NOAA's FRAM data warehouse and the Alternatives Analysis. Similarly, 2016 survey results of seafloor type in Pioneer Canyon show hard substrate in that area, whereas the Alternative Analysis portray the substrate type as soft. Given the Council will soon make a decision on the final preferred alternative for modifications to EFH Conservation Areas, we are providing this information for your consideration (Attachment 1).

Thank you for the opportunity to submit this information for Council consideration. If you have any questions, please contact Karen Reyna, 415-970-5247.

Sincerely,

A handwritten signature in black ink that reads "Maria Brown". The signature is written in a cursive, flowing style.

MARIA BROWN, Superintendent

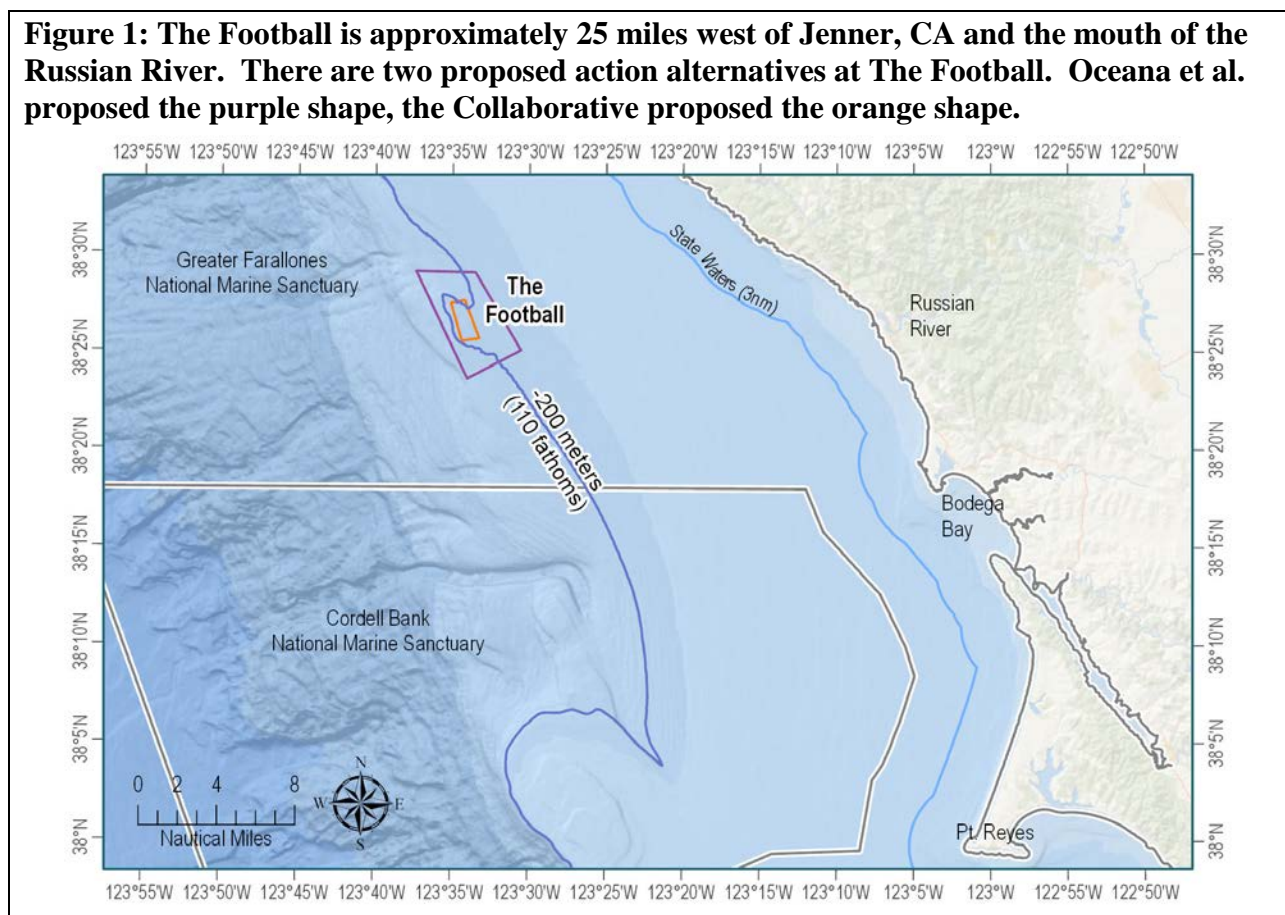
Attachment 1 – Supplemental Information for PFMC

Attachment 1
Supplemental Information for Pacific Fishery Management Council
From Greater Farallones National Marine Sanctuary – March 19, 2018

The Football:

Cordell Bank and Greater Farallones national marine sanctuaries, as well as NOAA's National Centers for Coastal Ocean Science (NCCOS), U.S. Geological Survey (USGS), and California Academy of Sciences (CAS) completed a remotely-operated vehicle cruise September 2014 to survey and characterize the "The Football" (*Figure 1*). Using results from this survey, a site characterization report of The Football was published in 2016.

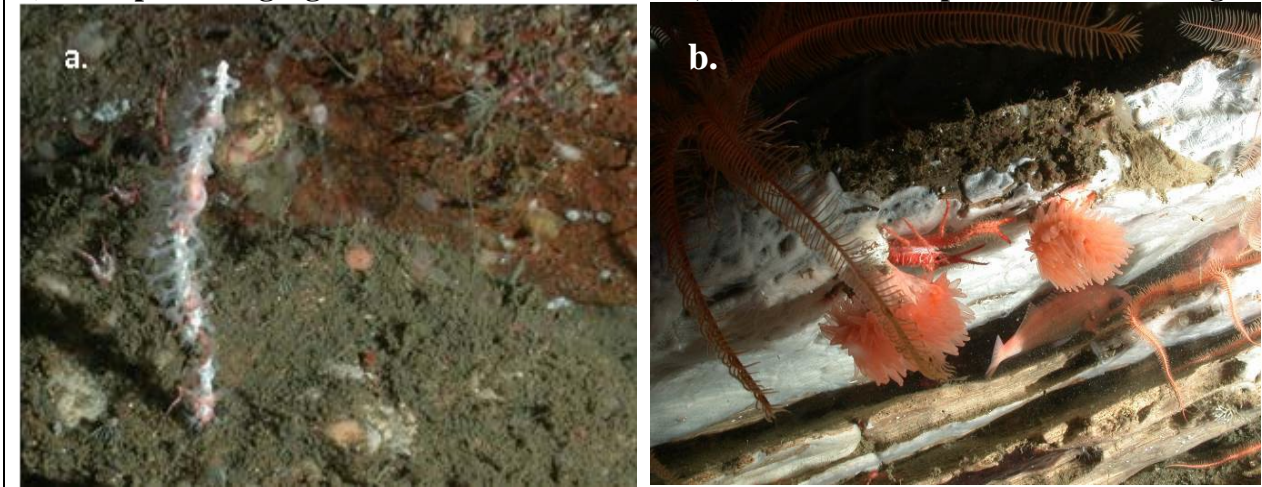
Figure 1: The Football is approximately 25 miles west of Jenner, CA and the mouth of the Russian River. There are two proposed action alternatives at The Football. Oceana et al. proposed the purple shape, the Collaborative proposed the orange shape.



The expedition achieved its goal of ground-truthing predicted habitat classifications based on a multibeam assessment and predictive habitat suitability models for coral and fish occurrence. Sea whips, shark eggs, cup corals, and other specimens were collected, which CAS and NCCOS analyzed and catalogued. A new coral species, *Swiftia farallonesica* was identified (*Figure 2*). A wealth of still images and high definition video for use in education and outreach was captured.

Figure 2: Images from The Football

a) New species of gorgonian: *Swiftia farallonesica*; b) Flabellidae cup corals on rock ledge.



Ledge Habitat

The Football contains important features such as large boulder-like strata and rocky outcrops that form ledges and overhangs. Furthermore, observations from transect HC-30 show a large sedimentary rock outcrop with many ledges and overhangs, which is an ideal habitat for invertebrates and hundreds of rockfish (*Figures 2b, 3 and 4*; Graiff et al., 2016)

Figure 3: Areas of The Football explored in 2014.

The rocky outcrop that forms ledges and overhangs is highlighted in white.

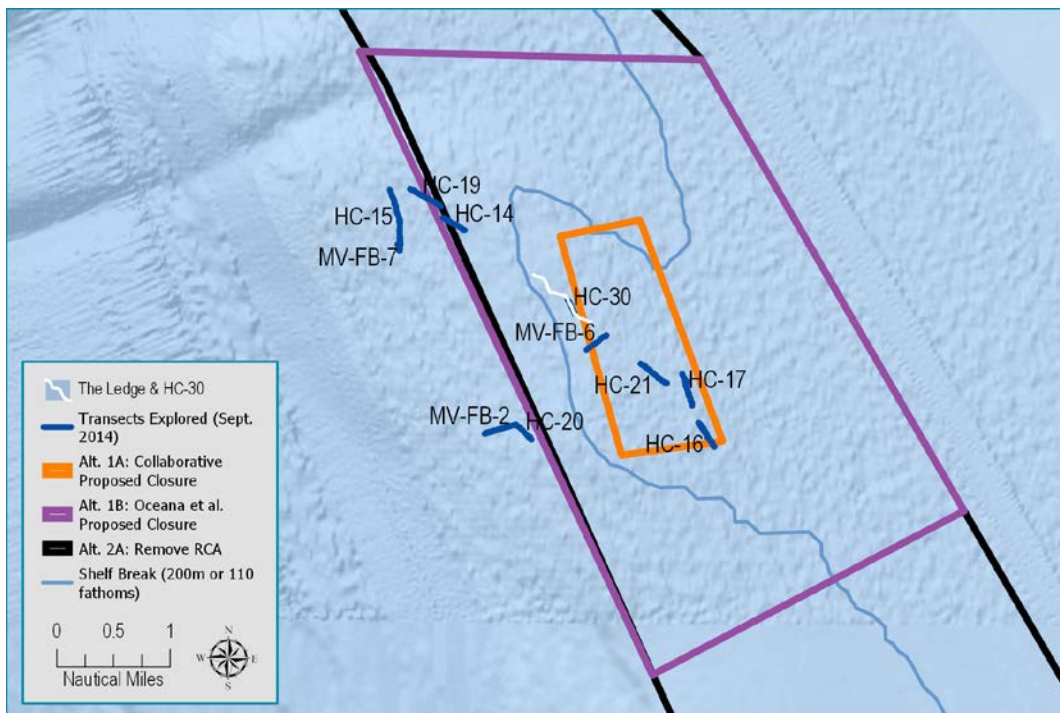


Figure 4: Images of the ledge habitat at Transect HC-30.



Substrate at The Football

The survey of The Football covered a total area of 5,632 m² of seafloor during eleven 15-minute quantitative transects (*Figure 3*). Habitat types are classified as (1) soft-flat (40% of the total area surveyed), comprised completely of sand or sand with a few boulders, primarily on transects to the west of The Football feature; (2) hard-flat (25% of the total area surveyed), comprised of sand mixed with cobbles, boulders or rocks, or a mix of cobbles, boulders and rocks; and (3) hard-rugose (35% of the total area surveyed), primarily composed of a mix of larger rocky substrata like boulders, rock, cobbles. A large sedimentary rock outcrop that was eroded, forming many rock ledges and overhangs, on

transect HC-30 was originally predicted to be hard-flat habitat, was based on survey results included in the hard-rugose category (Graiff et al. 2016).

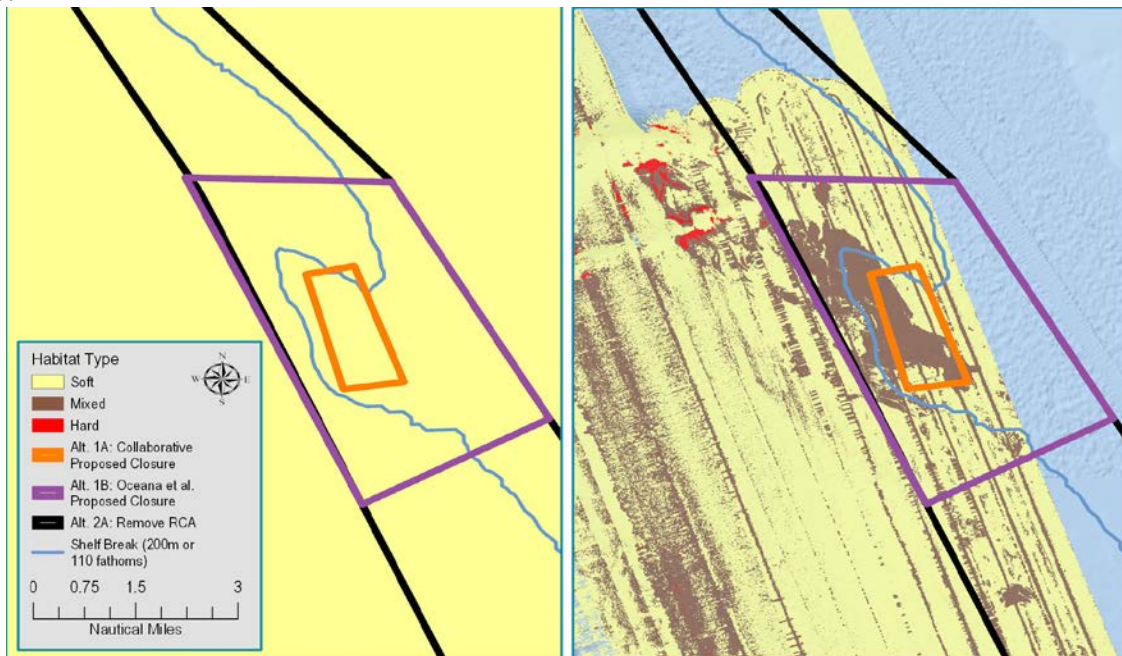
Upon review of the data provided in the Alternatives Analysis, we confirmed that coral, sponge, sea pen and whip data were incorporated into the analysis. However, the substrate and fish data were not included because the information was published in 2016, after the data collection cut-off for the Alternatives Analysis. NOAA’s FRAM data warehouse shows The Football as soft habitat and the Alternatives Analysis Metrics website does not show any hard or mixed habitat for the two action alternative designs at The Football (*Table 1*).

Table 1: Metrics on habitat classifications for the two proposed alternatives at The Football (Source: *Groundfish Essential Fish Habitat Alternatives Analysis Metrics website*)

Site Name	Alternative	Area (sq mi)	Hard (sq mi)	Mixed (sq mi)	Soft (sq mi)
Russian River	Oceana et al.	20	0	0	20
The Football	Collaborative	2	0	0	2

The Alternatives Analysis metrics shows The Football in both action alternatives as soft habitat. However, USGS in 2016 classified the substrate as soft, hard and mixed habitat (*Figure 5*).

Figure 5: Substrate type at The Football. The left image is the substrate data used in the EFH Alternatives Analysis. The right image is the substrate data interpreted by USGS in 2016.



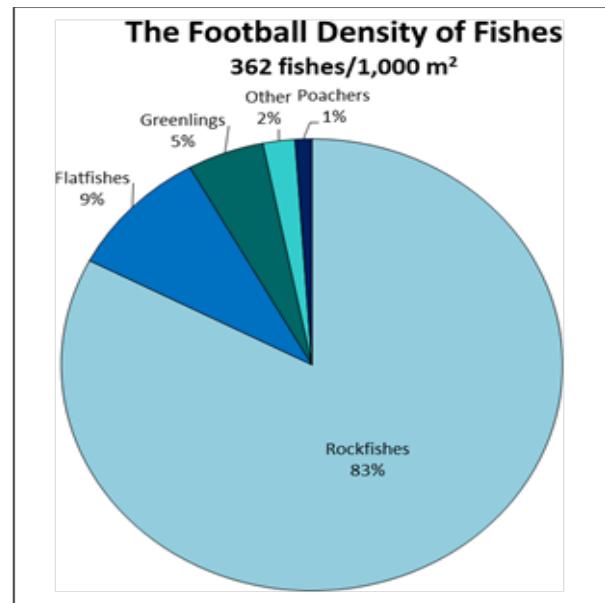
NOTE: The quality of the multibeam data that produced the image on the right was compromised due to rough sea conditions. In particular, the linear areas, which are classified as mixed substrate habitat, are likely soft substrate based on the classification of surrounding areas.

Rocky habitat at The Football is relatively uncommon. The rocky area is mostly surrounded by expanses of low relief, soft sediments (as predicted from multibeam sonar data). (Graiff et al., 2016).

Fish

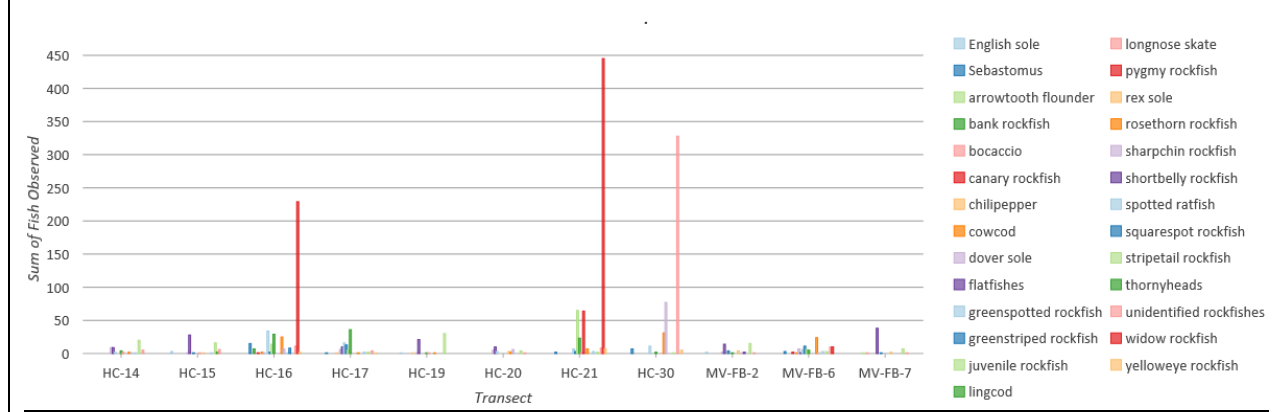
Fish densities were determined by analyzing video data. Rockfishes (at least 16 *Sebastes* species and at least 1 *Sebastobus* species) comprised 83% of total fish density. Flatfishes (from at least 6 species) accounted for 9% of total density and many individuals could not be identified to the species level, because they were mostly covered in soft sediment. The remainder of the fish assemblage included lingcod (5%), other taxa (2%) and poachers (1%; Graiff, et al., 2016). The number of fish that are managed by the Groundfish Fishery Management Plan have been identified by transect. The transect associated with the ledge and overhang habitat (HC-30) yielded a high number of groundfish (*Figures 6 and 7*).

Figure 6: Percent composition of densities of fish groups from The Football.



Graiff et al., 2016

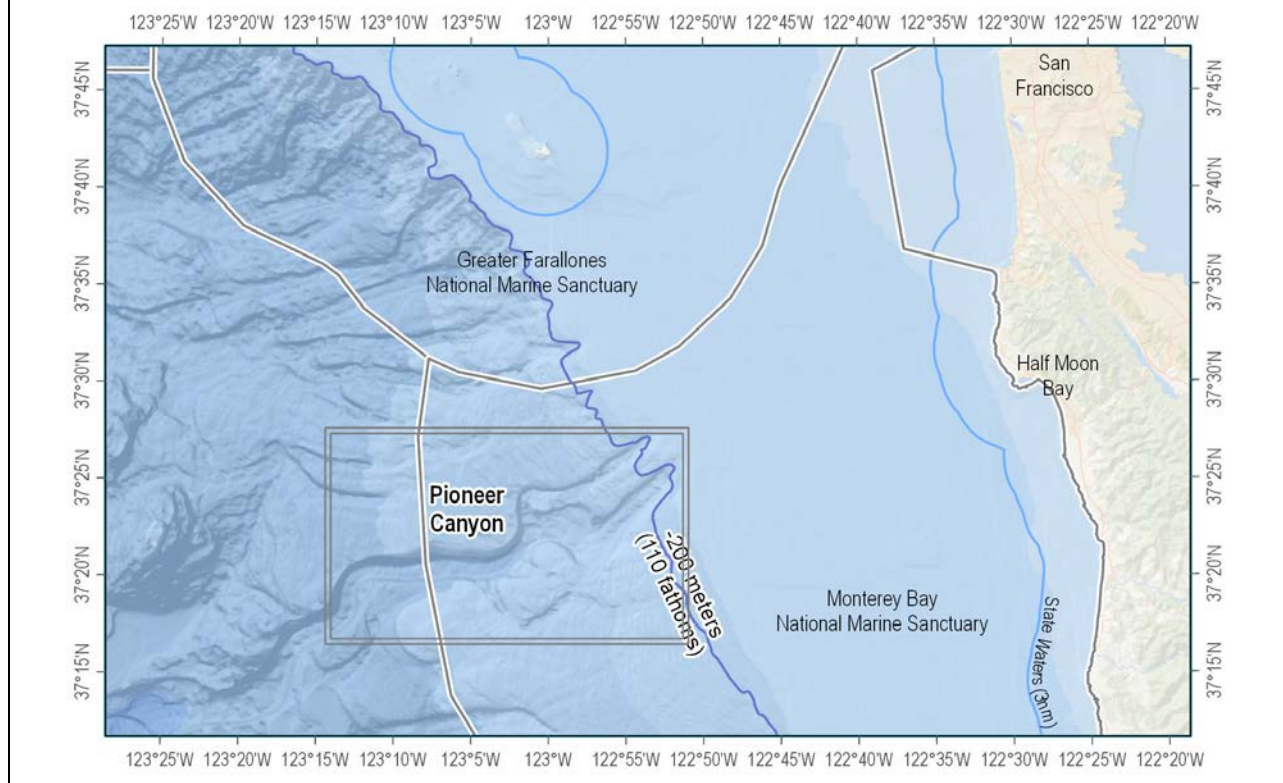
Figure 7: A breakdown of species listed in the Groundfish Fishery Management Plan by transect.



Pioneer Canyon

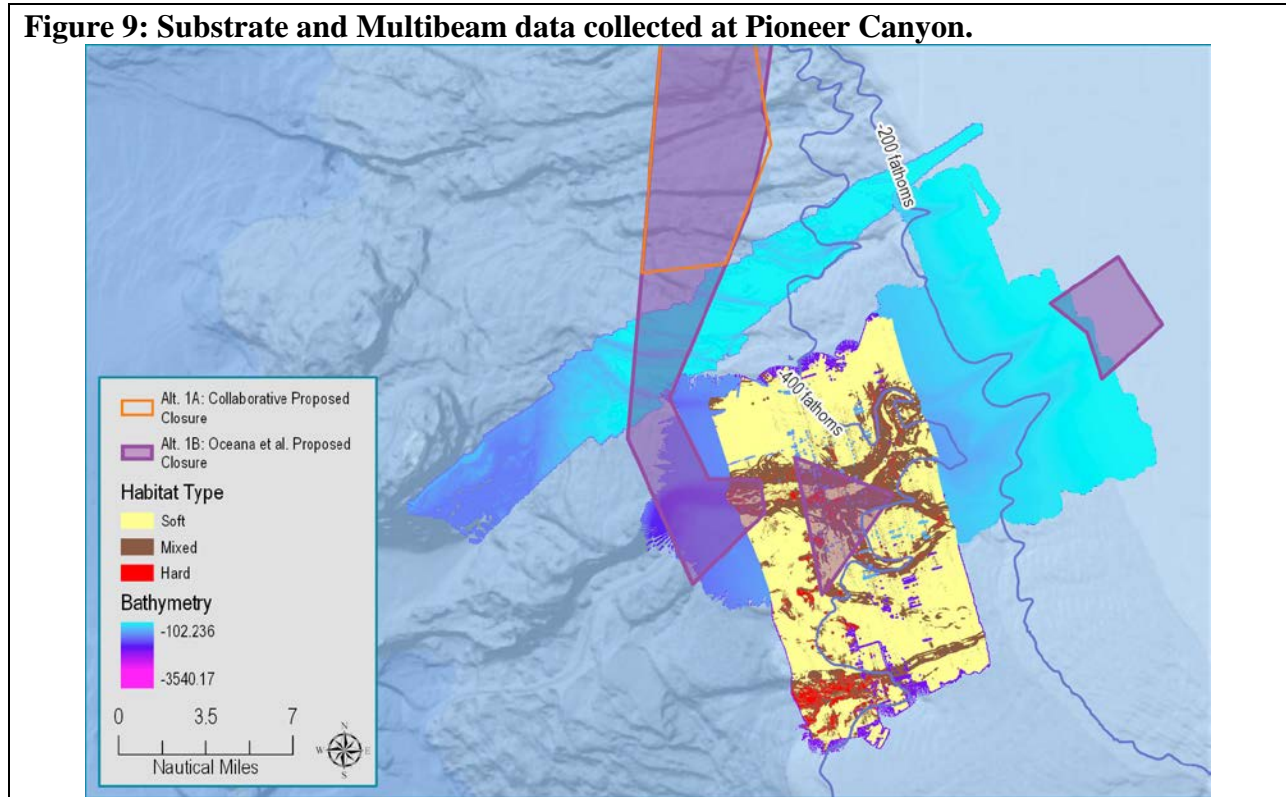
Pioneer Canyon has steep-sided gorges on the seafloor of the continental slope, west of Half Moon Bay, CA. Pioneer Canyon is approximately 30 miles long, at its widest point is 2.3 miles wide, and ranges in water depth from 200 meter depth to 2500 meters depth. The eastern half of the canyon, including the head of the canyon, is within Monterey Bay National Marine Sanctuary (24 km, from -200 m to -1350 m in water depth) (*Figure 8*).

Figure 8: The head of Pioneer Canyon is approximately 20 miles west of Half Moon Bay, off of the San Mateo County coast.



Multibeam and backscatter data were collected at the western portion of Pioneer Canyon in 2016, from E/V Nautilus, using Kongsberg EM 302 Multibeam Echosounder. USGS performed predicted substrate modeling, using multibeam and backscatter data collected in 2016, which included the western portion of Pioneer Canyon. Subsequent multibeam and backscatter data were collected in 2017, from E/V Nautilus, using Kongsberg EM 302 Multibeam Echosounder. The eastern portion of Pioneer Canyon was included in these surveys, thus completing mapping/data collection for Pioneer Canyon (*Figure 9*). The predicted substrate modeling has not been completed for the eastern portion of Pioneer Canyon.

Figure 9: Substrate and Multibeam data collected at Pioneer Canyon.



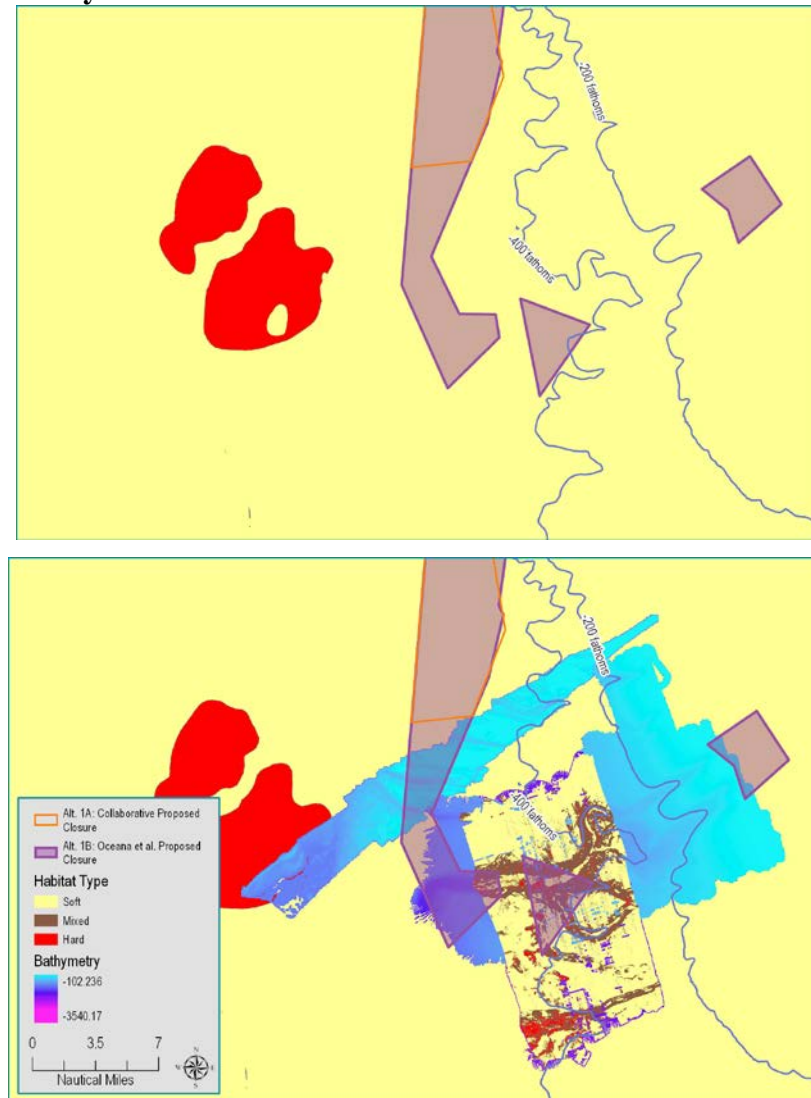
Bamboo and black corals have long been thought to occur in Pioneer Canyon, having been described in dive records from the submersible Sea Cliff in the late 1980s and early 1990s, and listed as bycatch in fishing trawl records. In 2016, Pioneer Canyon was explored using a deep sea, reproach-class ROV Hercules. The high definition camera on the Hercules revealed many bamboo coral forests and rocky features with complex and diverse corals, sponges, other invertebrates, and associated fish.

Figure 10: Close-up of the eight tentacles on each polyp of a bamboo coral (an octocoral) in Pioneer Canyon.



There is one action alternative shape at the location of Pioneer Canyon where USGS performed predicted substrate modeling. NOAA’s FRAM data warehouse shows this portion of the canyon as soft habitat and the Alternative Analysis Metrics website does not show any hard or mixed habitat for the action alternative at Pioneer Canyon. Recent data collected by USGS show hard, mixed and soft habitat (*Figure 11*).

Figure 11: Substrate at Pioneer Canyon. The top image is the substrate data used in the Alternatives Analysis. The bottom image is the substrate data and bathymetry captured through multibeam by USGS.



Work Cited:

Graiff, K., D. Lipski, P. Etnoyer, G. Cochrane, G. Williams, E. Salgado. 2016. Benthic Characterization of Deep-Water Habitat in the Newly Expanded Areas of Cordell Bank and Greater Farallones National Marine Sanctuaries. Marine Sanctuaries Conservation Series ONMS-16-01. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 38 pp.