Data Documentation

Dataset Information

Dataset Title:

NCCOS Assessment: U.S. West Coast Cross-Shelf Habitat Suitability Modeling of Deep-Sea Corals and Sponges, 2016-10-01 to 2020-09-30

Description:

This data collection contains geospatial data from models predicting the spatial distributions of deep-sea corals and sponges offshore of the continental U.S. West Coast to 1200 m depth. It includes raster datasets at 200 x 200 m spatial resolution depicting the mean of the predicted relative habitat suitability, the coefficient of variation of the predicted relative habitat suitability, the classified mean relative habitat suitability, and the 'robust high' habitat suitability prediction for each of 31 taxa of deep-sea corals and 15 taxa of sponges and raster datasets at 200 x 200 m spatial resolution depicting the number of taxa of deep-sea corals associated with hard substrate that have 'high' habitat suitability or 'robust high' habitat suitability at each grid cell. The data collection also includes raster datasets at 200 x 200 m spatial resolution depicting each of the 66 spatial environmental predictor variables considered for fitting the models.

Purpose:

The Pacific Outer Continental Shelf (OCS) Region includes an extensive area offshore of California, Oregon, and Washington for which the U.S. Department of the Interior Bureau of Ocean Energy Management (BOEM) oversees the responsible development of energy and mineral resources. Information about the distribution of sensitive biota in the region, including deep-sea corals and sponges, is critical for making environmentally sound decisions about managing those activities and developing mitigation measures to avoid or minimize impacts on marine environments and organisms. To meet this critical information need, BOEM partnered with the US Department of Commerce National Oceanic and Atmospheric Administration (NOAA) National Ocean Service (NOS) National Centers for Coastal Ocean Science (NCCOS) and the NOAA National Marine Fisheries Service (NMFS) to develop habitat suitability models predicting spatial distributions of suitable habitat for deep-sea corals and sponges. The objectives of this study were to collect and compile observations of deep-sea coral and sponge occurrence from survey data, to identify and derive datasets depicting environmental characteristics that might be correlated with the occurrence of these organisms, and to predict and map the spatial distributions of suitable habitat across the study area for selected taxa. In addition, preliminary ground-truthing of the deep-sea coral and sponge models was conducted using survey data collected in partnership with NOAA NMFS, BOEM, the US Geological Survey (USGS), and others. Products include geospatial datasets and maps to meet BOEM's environmental assessment, management, and decision-making needs, as well as to support coastal and ocean management efforts by other local, state, and federal agencies.

Methods:

Records of deep-sea coral and sponge occurrence (presences) were obtained from the NOAA National Database for Deep-Sea Corals and Sponges (McGuinn et al. 2020). Maximum entropy (Maxent) models were generated to estimate relationships between occurrence and spatial

environmental predictor variables depicting seafloor topography, substrate, oceanography, and geography. Models were used to predict and map habitat suitability for each deep-sea coral and sponge taxon across the entire study area. Variability in model predictions was also mapped for each taxon to provide a measure of the level of confidence in model predictions. For more details, see Poti et al. (2020).

Cited Publications:

- McGuinn, R.P., T.F. Hourigan, S.L. Cross, L.M. Dornback, P.J. Etnoyer, D.E. Sallis, and H.M. Coleman. 2020. NOAA's National Database for Deep-Sea Corals and Sponges. 2020 Status Update. NOAA Tech. Memo. NMFS-OHC-007. 56 p. https://spo.nmfs.noaa.gov/sites/default/files/TMOHC7.pdf
- Poti, M., S.K. Henkel, J.J. Bizzarro, T.F. Hourigan, M.E. Clarke, C.E. Whitmire, A. Powell, M.M. Yoklavich, L. Bauer, A.J. Winship, M. Coyne, D.J. Gillett, L. Gilbane, J. Christensen, and C.F.G. Jeffrey. 2020. Cross-Shelf Habitat Suitability Modeling: Characterizing Potential Distributions of Deep-Sea Corals, Sponges, and Macrofauna Offshore of the US West Coast. Camarillo (CA): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2020-021. 267 p. https://espis.boem.gov/final%20reports/BOEM_2020-021.PDF

Data Sources:

- NOAA National Database for Deep-Sea Corals and Sponges (version 20190208). NOAA Deep Sea Coral Research & Technology Program (DSCRTP). https://deepseacoraldata.gov/
- NOAA NCEI Bathymetric Data Viewer. https://www.ncei.noaa.gov/maps/bathymetry/
- California State University, Monterey Bay Seafloor Mapping Lab. http://seafloor.otterlabs.org/SFMLwebDATA_SURVEYMAP.htm
- Monterey Bay Aquarium Research Institute (MBARI) Seafloor Mapping. https://www.mbari.org/products/data-repository/seafloor-mapping/
- USGS Pacific Coastal and Marine Science Center, Seafloor Mapping. https://cmgds.marine.usgs.gov/data/pacmaps/data.html
- NOAA NCEI Coastal Relief Model (CRM). https://www.ngdc.noaa.gov/mgg/coastal/crm.html
- General Bathymetric Chart of the Oceans (GEBCO). https://www.gebco.net/data_and_products/historical_data_sets/#gebco_2014
- USGS usSEABED: Pacific Coast Offshore Surficial Sediment Data Release, version 1.0. https://pubs.usgs.gov/ds/2006/182/data_cata.html
- NASA Ocean Color SeaWiFS, Aqua MODIS, Terra MODIS, VIIRS. https://oceancolor.gsfc.nasa.gov/
- California Current System 31-Year Historical Reanalysis. University of California Santa Cruz Ocean Modeling and Data Assimilation. https://oceanmodeling.ucsc.edu/reanalccs31/
- NOAA National Weather Service WAVEWATCH III 30-Year Hindcast Phase 2. https://polar.ncep.noaa.gov/waves/hindcasts/nopp-phase2.php
- Global Self-consistent, Hierarchical, High-resolution Geography Database (GSHHG): full resolution coastline data version 2.3.6, https://www.ngdc.noaa.gov/mgg/shorelines/

Associated Datasets:

- Poti, M., S.K. Henkel, J.J. Bizzarro, T.F. Hourigan, M.E. Clarke, C.E. Whitmire, A. Powell, M.M. Yoklavich, L. Bauer, A.J. Winship, M. Coyne, D.J. Gillett, L. Gilbane, J. Christensen, and C.F.G. Jeffrey. 2023. NCCOS Assessment: U.S. West Coast Cross-Shelf Habitat Suitability Modeling of Benthic Macrofauna, 2016-10-01 to 2020-09-30. NOAA National Centers for Environmental Information. Dataset.

- Poti, Matthew; Goyert, Holly F.; Salgado, Enrique J.; Bassett, Rachel; Coyne, Michael; Winship, Arliss J.; Etnoyer, Peter J.; Hourigan, Thomas F.; Coleman, Heather M.; Christensen, John. 2023. NCCOS Assessment: Southeastern U.S. Predictive Modeling of Deep-Sea Corals and Hardbottom Habitats. Dataset. (in prep)
- Goyert, Holly F.; Bassett, Rachel; Christensen, John; Coleman, Heather; Coyne, Michael; Etnoyer Peter J.; Frometa, Janessa; Hourigan Thomas F.; Poti, Matthew; Salgado, Enrique J.; Williams, Bethany; Winship, Arliss J. 2023. NCCOS Assessment: U.S. Gulf of Mexico Predictive Modeling of Deep-Sea Corals and Chemosynthetic Communities. Dataset. (in prep)

People & Projects

Dataset Authors:

- Poti, Matthew; Henkel, Sarah K.; Bizzarro, Joseph J.; Hourigan, Thomas F.; Clarke, M. Elizabeth; Whitmire, Curt E.; Powell, Abigail; Yoklavich, Mary M.; Bauer, Laurie; Winship, Arliss J.; Coyne, Michael; Gillett, David J.; Gilbane, Lisa; Christensen, John; Jeffrey, Christopher F.G.

Principal Investigator:

- Matthew Poti; matthew.poti@noaa.gov; US DOC, NOAA, NOS, National Centers for Coastal Ocean Science (NCCOS)

Additional Principal Investigators:

- Lisa Gilbane; lisa.gilbane@boem.gov; US DOI, Bureau of Ocean Energy Management (BOEM), Pacific Outer Continental Shelf (OCS) Region

Primary Point of Contact:

- Matthew Poti; matthew.poti@noaa.gov; NCCOS
- NCCOS Data Manager, nccos.data@noaa.gov, NCCOS

Collaborators:

- Sarah Henkel, Oregon State University (OSU), Hatfield Marine Science Center
- Joseph J. Bizzarro, Institute of Marine Sciences, University of California, Santa Cruz and US DOC; NOAA; National Marine Fisheries Service (NMFS); Southwest Fisheries Science Center (SWFSC); Fisheries Ecology Division
- Thomas F. Hourigan, US DOC; NOAA; NMFS: Deep Sea Coral Research and Technology Program (DSCRTP)
- M. Elizabeth Clarke, US DOC; NOAA; NMFS; Northwest Fisheries Science Center (NWFSC)
- Curt E. Whitmire, NWFSC, Fishery Resource Analysis and Monitoring Division
- Abigail Powell, Lynker Technologies and NWFSC
- Mary M. Yoklavich, Institute of Marine Sciences, University of California, Santa Cruz and SWFSC, Fisheries Ecology Division
- Laurie Bauer, CSS, Inc. and NCCOS
- Arliss J. Winship, CSS, Inc. and NCCOS
- Michael Coyne, CSS, Inc. and NCCOS
- David J. Gillett, Southern California Coastal Water Research Project
- John Christensen, NCCOS
- Christopher F.G. Jeffrey, CSS, Inc. and NCCOS

Partners:

- Changming Dong, University of California, Los Angeles
- Andrew Moore, University of California, Santa Cruz

Funding:
- US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)
- US DOI, Bureau of Ocean Energy Management (BOEM)

Associated Online Resources:
- NCCOS Project, Characterizing Potential Distributions of Deep-Sea Corals, Sponges, and Macrofauna Offshore of the U.S. West Coast, https://coastalscience.noaa.gov/project/project/predictive-benthic-habitat-suitability-modeling-of-deep-sea-biota-on-the-us-pacific-outer-continental-shelf/
- NOAA Deep-Sea Coral Data Portal, https://deepseacoraldata.noaa.gov/
- US West Coast Deep Sea Corals and Sponges, https://experience.arcgis.com/experience/cb28b1ae13f44d5796f7088660578b3c

Extents

Start Date: 2016-10-01
End Date: 2020-09-30

Northern Boundary: 47.75512
Southern Boundary: 31.99803
Western Boundary: -125.75885
Eastern Boundary: -117.12375

Keywords

Sea Areas, Water Bodies, Marine Protected Areas:
- Coastal Ocean
- Continental Shelf
- Eastern Pacific
- Southern California Bight
- Olympic Coast National Marine Sanctuary
- Greater Farallones National Marine Sanctuary
- Cordell Bank National Marine Sanctuary
- Monterey Bay National Marine Sanctuary
- Channel Islands National Marine Sanctuary

NCCOS Keywords:
- NCCOS Research Priority > Marine Spatial Ecology
- NCCOS Research Topic > Ecological and Biogeographic Assessments
- NCCOS Research Topic > Habitat Mapping
- NCCOS Research Location > Region > Pacific Ocean
- NCCOS Research Location > U.S. States and Territories > Washington
- NCCOS Research Location > U.S. States and Territories > Oregon
- NCCOS Research Location > U.S. States and Territories > California
- NCCOS Research Data Type > Geospatial
- NCCOS Research Data Type > Derived Data Product

- NCCOS Research Data Type > Model

File Information

Total File Size:	20.8 GB total, 648 files in 17 folders (unzipped), 1.71 GB (zipped)
Data File Format(s):	GeoTiff .TIF (and ancillary files .TIF.AUX.XML, .VAT.CPG, .VAT.DBF)
Data File Compression:	.zip
Data File Resolution:	200 x 200 meters
GIS Projection:	oblique Mercator coordinate system (origin = 39°N 125°W, azimuth = 75°, scale = 0.9996, datum = WGS84)

Data Files:

- Environmental_Predictors/
  (Bottom_Salinity_and_Temp/ Ocean_Color/ Ocean_Currents/ Wave_Height/ Wave_Height/)
    - [Season]_Max_Wave_Height_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Max_Wave_Power_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_Bottom_Salinity_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_Bottom_Temperature_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_EastWest_Bottom_Current_Velocity_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_NorthSouth_Bottom_Current_Velocity_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_Surface_Chlorophyll_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_Surface_Reflectance_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_Vertical_Bottom_Current_Velocity_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_Wave_Height_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - [Season]_Mean_Wave_Power_200x200m.TIF (and ancillary file .TIF.AUX.XML)

  Seafloor_Topography/
    - CrossSectional_Curvature_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Depth_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - EastWest_Aspect_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - General_Curvature_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Longitudinal_Curvature_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - NorthSouth_Aspect_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Plan_Curvature_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Profile_Curvature_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Rugosity_ArcChordRatio_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Rugosity_SurfaceRatio_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Slope_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Slope_Of_Slope_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Total_Curvature_200x200m.TIF (and ancillary file .TIF.AUX.XML)

  Substrate_and_Geography/
    - Distance_to_Shore_200x200m.TIF (and ancillary file .TIF.AUX.XML)
    - Hard_Mixed_Soft_200x200m.TIF (and ancillary files .TIF.AUX.XML, .TIF.VAT.CPG, and .TIF.VAT.DBF)
    - Hard_Soft_200x200m.TIF (and ancillary files .TIF.AUX.XML, .TIF.VAT.CPG, and .TIF.VAT.DBF)

  - Latitude_200x200m.TIF (and ancillary file .TIF.AUX.XML)
  - Longitude_200x200m.TIF (and ancillary file .TIF.AUX.XML)
  - Mean_Grain_Size_200x200m.TIF (and ancillary file .TIF.AUX.XML)
  - Percent_Gravel_200x200m.TIF (and ancillary file .TIF.AUX.XML)
  - Percent_Mud_200x200m.TIF (and ancillary file .TIF.AUX.XML)
  - Percent_Sand_200x200m.TIF (and ancillary file .TIF.AUX.XML)

- Model_Predictions/
  [Taxon Category]/
  - [Taxon]_Classified_Mean_Habitat_Suitability.TIF (and ancillary files .TIF.VAT.CPG, .TIF.VAT.DBF, and .TIF.VAT.DBF.XML)
  - [Taxon]_CV_Habitat_Suitability.TIF (and ancillary file .TIF.AUX.XML)
  - [Taxon]_Mean_Habitat_Suitability.TIF (and ancillary file .TIF.AUX.XML)
  - [Taxon]_Robust_High_Habitat_Suitability.TIF (and ancillary files .TIF.VAT.CPG and .TIF.VAT.DBF)

  Coral_Richness/
  - Num_Taxa_Corals_HardSubstrate_with_High_Habitat_Suitability.TIF (and ancillary file .TIF.AUX.XML)
  - Num_Taxa_Corals_HardSubstrate_with_Robust_High_Habitat_Suitability.TIF (and ancillary file .TIF.AUX.XML)

Documentation Files:

- USWestCoast_DeepSeaCoralsSponges_Modeling_BrowseGraphic.JPG
- DataDocumentation.PDF

Table 1: Environmental Predictors Data Dictionary

Variable: Definition	**Units**	**Source**
Max_Wave_Height: Seasonal/annual maximum of the significant height of combined wind waves and swell	m	NOAA Wavewatch III 30 year hindcast Phase 2, U.S. West Coast (1979–2009); Poti et al. (2020)
Max_Wave_Power: Seasonal/annual maximum of the energy flux per unit of wave-crest length	W/m	NOAA Wavewatch III 30 year hindcast Phase 2, U.S. West Coast (1979–2009); Poti et al. (2020)
Mean_Bottom_Salinity: Seasonal/annual mean of the water salinity at the deepest level of an ocean circulation model	psu	UC Santa Cruz 31 year hindcast ocean circulation model (1980–2010); Poti et al. (2020)
Mean_Bottom_Temperature: Seasonal/annual mean of the water temperature at the deepest level of an ocean circulation model	°C	UC Santa Cruz 31 year hindcast ocean circulation model (1980–2010); Poti et al. (2020)
Mean_EastWest_Bottom_Current_Velocity: Seasonal/annual mean of the east-west (u) component of current speed at the deepest level of an ocean circulation model	m/s	UC Santa Cruz 31 year hindcast ocean circulation model (1980–2010); Poti et al. (2020)
Mean_NorthSouth_Bottom_Current_Velocity: Seasonal/annual mean of the east-west (u) component of current speed at the deepest level of an ocean circulation model	m/s	UC Santa Cruz 31 year hindcast ocean circulation model (1980–2010); Poti et al. (2020)

Variable: Definition	**Units**	**Source**
Mean_Surface_Chlorophyll: Seasonal/annual mean of the satellite-derived concentration of chlorophyll-a at the ocean surface	mg/m^3	SeaWiFS (1997–2001); Terra MODIS and Aqua MODIS (2000–2017); VIIRS (2012–2017); Poti et al. (2020)
Mean_Surface_Reflectance: Seasonal/annual mean of the satellite-derived mean normalized water-leaving radiance at 547 nm	sr^{-1}	Terra MODIS and Aqua MODIS (2000–2017); Poti et al. (2020)
Mean_Vertical_Bottom_Current_Velocity: Seasonal/annual mean of the vertical component (w) of current speed at the deepest level of an ocean circulation model	m/s	UC Santa Cruz 31 year hindcast ocean circulation model (1980–2010); Poti et al. (2020)
Mean_Wave_Height: Seasonal/annual mean of the significant height of combined wind waves and swell	m	NOAA Wavewatch III 30 year hindcast Phase 2, U.S. West Coast (1979–2009); Poti et al. (2020)
Mean_Wave_Power: Seasonal/annual maximum of the energy flux per unit of wave-crest length	W/m	NOAA Wavewatch III 30 year hindcast Phase 2, U.S. West Coast (1979–2009); Poti et al. (2020)
CrossSectional_Curvature: Curvature of the seafloor along the line of intersection between the surface and the plane formed by the slope normal and aspect (slope direction), indicating whether the seafloor is convex (>0), concave (<0), or flat (0)	radians/100m	Poti et al. (2020)
Depth: Seafloor depth derived from a synthesis of bathymetry datasets	m	Various multibeam bathymetry; NOAA Coastal Relief Models; General Bathymetric Chart of the Oceans (GEBCO); Poti et al. (2020)
Distance_to_Shore: Euclidean straight-line distance to the shoreline	m	Global Self-consistent, Hierarchical, High-resolution Geography Database (GSHHG); Poti et al. (2020)
EastWest_Aspect: Sine of the direction of seafloor slope	unitless	Poti et al. (2020)
General_Curvature: Extent to which the seafloor is convex (>0, e.g., ridges), concave (<0, e.g., valleys), or flat (0)	radians/100m	Poti et al. (2020)
Hard_Mixed_Soft: Categorical map indicating whether the seafloor is comprised of hard substrate, mixed substrate, or soft substrate	N/A (2 = Hard, 1 = Mixed, 0 = Soft)	Poti et al. (2020)
Hard_Soft: Categorical map indicating whether the seafloor is comprised of hard substrate or soft substrate	N/A (1 = Hard, 0 = Soft)	Poti et al. (2020)
Latitude: Latitude in projected coordinate system	m	Poti et al. (2020)
Longitude: Longitude in projected coordinate system	m	Poti et al. (2020)

Variable: Definition	**Units**	**Source**
Longitudinal_Curvature: Curvature of the seafloor along the line of intersection between the surface and the plane formed by the slope and aspect (slope direction), indicating whether the seafloor is convex (<0), concave (>0), or flat (0)	radians/100m	Poti et al. (2020)
Mean_Grain_Size: Average particle size of the surficial sediments, interpolated from point samples	phi units	USGS usSEABED; OSU; SCCWRP; BOEM; Poti et al. (2020)
NorthSouth_Aspect: Cosine of the direction of seafloor slope	unitless	Poti et al. (2020)
Percent_Gravel: Percentage composition of the gravel fraction in the surficial sediments, interpolated from point samples	unitless	USGS usSEABED; OSU; SCCWRP; BOEM; Poti et al. (2020)
Percent_Mud: Percentage composition of the mud fraction in the surficial sediments, interpolated from point samples	unitless	USGS usSEABED; OSU; SCCWRP; BOEM; Poti et al. (2020)
Percent_Sand: Percentage composition of the sand fraction in the surficial sediments, interpolated from point samples	unitless	USGS usSEABED; OSU; SCCWRP; BOEM; Poti et al. (2020)
Plan_Curvature: Curvature of the seafloor along the line of intersection between the surface and the horizontal plane, indicating whether the seafloor is convex (>0), concave (<0), or flat (0)	radians/100m	Poti et al. (2020)
Profile_Curvature: Curvature of the seafloor along the line of intersection between the surface and the plane formed by the aspect (slope direction) and the z-axis, indicating whether the seafloor is convex (<0), concave (>0), or flat (0)	radians/100m	Poti et al. (2020)
Rugosity_ArcChordRatio: roughness of the seafloor, calculated as the ratio of the area of the contoured seafloor surface to the area of a plane of best fit to the seafloor that accounts for slope	unitless	Poti et al. (2020)
Rugosity_SurfaceRatio: roughness of the seafloor, calculated as the ratio of the area of the contoured seafloor surface to the horizontal planar area	unitless	Poti et al. (2020)
Slope: steepness of the seafloor, calculated as the magnitude of the maximum gradient in seafloor depth	degrees	Poti et al. (2020)
Slope_Of_Slope: curvature of the seafloor, calculated as the magnitude of the maximum gradient in seafloor slope	degrees	Poti et al. (2020)

Variable: Definition	**Units**	**Source**
Total_Curvature: roughness of the seafloor, where greater values indicate an area is more rugged	radians/100m^2	Poti et al. (2020)

Table 2. Deep-Sea Coral and Sponge Taxa Data Dictionary

Taxon Name	**Category**
Acanthogorgia	Gorgonian Corals
Acanthoptilum gracile	Sea Pens
Adelogorgia phyllosclera	Gorgonian Corals
Anthoptilum grandiflorum	Sea Pens
Antipathes dendrochristos	Black Corals
Bathypathes	Black Corals
Chromoplexaura marki	Gorgonian Corals
Chrysopathes speciosa	Black Corals
Clavularia	Soft Corals
Coenocyathus bowersi	Stony Corals
Desmophyllum dianthus	Stony Corals
Eugorgia rubens	Gorgonian Corals
Funiculina	Sea Pens
Halipteris californica	Sea Pens
Heteropolypus ritteri	Soft Corals
Isidella tentaculum	Gorgonian Corals
Leptogorgia chilensis	Gorgonian Corals
Lophelia pertusa	Stony Corals
Paracyathus	Stony Corals
Paragorgia	Gorgonian Corals
Parastenella ramosa	Gorgonian Corals
Pennatula phosphorea	Sea Pens
Plumarella longispina	Gorgonian Corals
Ptilosarcus gurneyi	Sea Pens
Stylaster californicus	Stylasterid Corals
Stylatula	Sea Pens
Swiftia kofoidi	Gorgonian Corals
Swiftia pacifica	Gorgonian Corals
Swiftia simplex	Gorgonian Corals
Umbellula lindahli	Sea Pens
Virgularia	Sea Pens
Aphrocallistes vastus	Glass Sponges
Asbestopluma	Demosponges
Craniella arb	Demosponges
Demospongiae	Demosponges
Farrea occa	Glass Sponges
Haliclona	Demosponges
Heterochone calyx	Glass Sponges
Hexactinellida	Glass Sponges

Taxon Name	Category
Hyalonema	Glass Sponges
Mycale	Demosponges
Polymastia	Demosponges
Rhabdocalyptus dawsoni	Glass Sponges
Rhizaxinella gadus	Demosponges
Staurocalyptus	Glass Sponges
Thenea	Demosponges

Parameter Information

List of major parameters included in this accession:

- Habitat Suitability

Parameter Description:

Parameters: Habitat Suitability
Property Type: calculated
Units: none
Observation Category: model output
Sampling Instrument: Models/Analyses > Data Analysis > Environmental Modeling
Sampling and Analyzing Method:

Records of deep-sea coral and sponge occurrence (presences) were obtained from the NOAA National Database for Deep-Sea Corals and Sponges (McGuinn et al. 2020). Maximum entropy (Maxent) models were generated to estimate relationships between occurrence and spatial environmental predictor variables depicting seafloor topography, substrate, oceanography, and geography. Models were used to predict and map habitat suitability for 31 taxa of deep-sea corals and 15 taxa of sponge taxon across the entire study area. For 22 taxa of deep-sea corals considered to be associated with hard substrate, maps of habitat suitability were combined to create maps depicting the number of taxa of deep-sea corals associated with hard substrate that have 'high' habitat suitability or 'robust high' habitat suitability at each grid cell. For more details, see Poti et al. (2020).

Data Quality Method:

Non-parametric bootstrapping was used to estimate variability (uncertainty) in predicted habitat suitability. The mean habitat suitability from 100 bootstrapped model predictions was selected as the best estimate of habitat suitability. The coefficient of variation (CV) of the 100 bootstrapped predictions was calculated as a measure of variability in model predictions at each grid cell. To allow comparisons of predicted habitat suitability across taxa, the mean habitat suitability was classified into a map with four habitat suitability classes ('very low', 'low', 'medium', 'high') using a series of breakpoints identified through receiver operating curve analysis. A map of 'robust high' habitat suitability identified grid cells for which all 100 bootstrapped predictions were classified in the high habitat suitability class. Maps of habitat suitability were reviewed by study authors and collaborators with expertise in the ecology of deep-sea corals and sponges. In addition, data collected by study authors and collaborators was used to demonstrate how models could be validated. See Poti et al. (2020) for details.

Document Information

Date: 2023-02-25

Resource Provider:	NCCOS Data Manager, nccos.data@noaa.gov, US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)
Comment:	This data documentation describes data files archived as a NOAA NCEI data accession, and is intended to provide dataset-level metadata for the purposes of discovery, use, and understanding.
Use Limitation:	NOAA makes no warranty, expressed or implied, regarding these data, nor does the fact of distribution constitute such a warranty. NOAA cannot assume liability for any damages caused by any errors or omissions in these data.