Generic EFH Amendment Habitat Spatial Layer Metadata

All publicly available and contemporary benthic habitat spatial layers were used to construct EFH maps for all federally managed shrimp and finfish species (Alternative 2). In some cases, multiple data sources for individual habitat characterization were obtained (submerged aquatic vegetation [SAV] and mangroves). To combine the multiple habitat data layers in these instances, the 'Merge' feature class tool in ArcMap was used. Then, combined features were dissolved using the 'Dissolve' tool in ArcMap to create a uniform polygon layer to describe presence of that habitat throughout the Gulf of Mexico. The extent of the layers was also cropped to the EEZ boundary of the Gulf using 'Clip' tool in ArcMap when the extents of combined layers were larger. A similar process was followed for the soft sediment habitat layer to combine percent grain size observations. Below is a list of the individual data sources, along with the associated benthic habitat spatial layer metadata.

Submerged aquatic vegetation

1. *Florida Fish and Wildlife Conservation Commission-Fish and Wildlife Research Institute (FWC-FWRI)*

This GIS data set was developed to represent the most recent seagrass mapping available in Florida for current statewide display and analysis. Not all areas have been mapped. This data set includes areas that were not previously mapped in other statewide compilations. This data set is not appropriate for time series comparisons to previous statewide compilations.

This polygon GIS data set represents a compilation of statewide seagrass data from various source agencies and scales. The data were mapped from sources ranging in date from 1987 to 2021. This dataset is complete as of data available to FWRI in July 2022. Not all data in this compilation are mapped from photography; some are the results of field measurements. See the "Sources" section for more information. The original source data sets were not all classified in the same manner; some used the Florida Land Use Cover and Forms Classification System (FLUCCS) codes 9113 for discontinuous seagrass and 9116 for continuous seagrass; some defined only presence and absence of seagrass, and some defined varying degrees of seagrass percent cover. In order to merge all of these data sources into one compilation data set, FWRI reclassified the various source data attribute schemes into two categories: "Continuous Seagrass" and "Patchy (Discontinuous) Seagrass". In areas where studies overlap, the most recent study where a given area has been interpreted is represented in this data set. This data set is not comparable to previous statewide data sets for time series studies - not all areas have been updated since the previous statewide compilation and some areas previously not mapped are now included. Please contact GIS Librarian to request the source data if you need to do a time series comparison. This data set has been updated in several areas from the previous compilation, including Naples Bay (2007), Choctawhatchee Bay (2007) and the Florida Panhandle (2010), Florida Bay (2016), portions of the Caloosahatchee, Loxahatchee, and St. Lucie Rivers (2011), Lake Worth Lagoon (2018), Rookery Bay (2014), Estero Bay and the West Coast (2014), Indian River Lagoon (2021), the Springs Coast (2020) and Southwest Florida (2020). Version 2 of the Unified Florida Reef Tract Map, with seagrass data ranging in source date from 2004-2015, has

also been integrated into this compilation to represent the most recent data available from St. Lucie County to the Dry Tortugas in Florida Keys.

https://geodata.myfwc.com/datasets/myfwc::seagrass-habitat-in-florida/about

2. *Convention of Environmental Cooperation North American Blue Carbon Project* http://www.cec.org/north-american-environmental-atlas/north-american-blue-carbon-2021/

This dataset shows the global distribution of seagrasses, and is composed of two subsets of point and polygon occurrence data. The data were compiled by UNEP World Conservation Monitoring Centre in collaboration with many collaborators (e.g. Frederick Short of the University of New Hampshire), organizations (e.g. the OSPAR Convention for the Northeast Atlantic sea), and projects (e.g. the European project Mediterranean Sensitive Habitats "Mediseh"), across the globe.

This dataset was created from multiple sources (in 128 countries and territories) from 1934-2020, including maps (of varying scales), expert interpolation and point-based samples. Before inclusion in the dataset, occurrence records were reviewed using published reports, peer-reviewed literature and expert consultation.

Link to additional seagrass metadata

3. *NOAA Data Atlas – Gulfwide USGS dataset*

This dataset is a compilation of SAV GIS maps developed by the U.S. Geographic Survey using various surveying and image analysis techniques (mostly aerial photographonline). This data set includes information from 1940 to 2003. The USGS SAV coverages were merged into a single shapefile using the Merge tool in ArcView 10.0

https://www.ncei.noaa.gov/maps/gulf-data-atlas//Metadata/ISO/USGS_GulfwideSAV_1940_2003.html

Mangroves

1. *FWC-FWRI*

This GIS data set represents mangrove areas in Florida.

This GIS data set represents mangroves in Florida. The data are extracted from land use and land cover data from Florida's water management districts from1999-2017.

https://geodata.myfwc.com/datasets/myfwc::mangrove-habitat-in-florida-1/about

2. *Convention of Environmental Cooperation North American Blue Carbon Project* http://www.cec.org/north-american-environmental-atlas/north-american-blue-carbon-2021/

This dataset shows the global distribution of mangrove forests, derived from earth observation satellite imagery. The data was created using Global Land Survey data and the Landsat archive.

Approximately 1,000 Landsat scenes were interpreted using hybrid supervised and unsupervised digital image classification techniques.

Link to additional mangrove metadata documentation

Salt marsh

Convention of Environmental Cooperation North American Blue Carbon Project
http://www.cec.org/north-american-environmental-atlas/north-american-blue-carbon-2021/

Specific to North America, data were collected using remote sensing and field surveying from 1997-2012 with U.S. data contributors represented by FWC-FWRI and the U.S Fish and Wildlife Service. In total, this dataset is composed of data derived from peer-reviewed articles and grey literature, including reports and databases created by governmental and non-governmental organizations, universities, institutes and researchers globally.

Data in the original source materials were collected using remote sensing and field-based survey methods, with data quality ranging from high-resolution maps to low-resolution representations. Initial work in compiling this dataset was led and funded by The Nature Conservancy with support from United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC), with the second phase led and funded by UNEP-WCMC with contributions from Conservation International. As part of this process, detailed descriptions of the datasets were obtained and recorded within the associated metadata. Where available, these included the time frame of data collection, source(s), resolution and methods of processing.

Data contributors were asked to submit metadata with each dataset to provide the contextual information important for informing analyses. Saltmarshes were identified in accordance with definitions provided by data sources, where available, or were determined using expert opinion (available in the supplementary material).

The precautionary principle was applied to ensure consistency across designations e.g if we were uncertain about the classification of the habitat was not included. Please refer to the supplementary material and associated metadata for more information regarding each data source presented. Where overlaps occurred, newer or ground-truthed data were prioritized. If equivalent in quality, overlapping and adjacent datasets were incorporated into the layer and dissolved to calculate total area.

Although data outlining mangrove extent are not included in the dataset, these habitats overlap with saltmarshes in some subtropical and tropical regions, with mangrove trees growing amongst saltmarsh, or with clear zones across the intertidal belt dominated by marsh plants or by mangroves. We therefore expect there to be some overlap between maps of these two habitats, although we have not yet "cleaned" these or assessed the level of overlap. The dataset contains a broad range of saltmarsh habitats, for example, the grass-dominated systems which are prevalent in the Eastern United states

This map is not intended to reflect a comprehensive assessment of saltmarsh presence and absence, but rather an overview of the extent of our knowledge and data availability with regards

to the locations of these habitats globally. While some datasets within the compilation document the time frame of data collection, the dataset as a whole cannot be used for temporal analyses of change due to an incomplete systematic survey of saltmarsh extent globally over time. Other challenges encountered when collating spatial habitat data globally include differing spatial resolutions (1:10,000 to 1:4,000,000); data collection methodologies (e.g. field surveys, remote sensing); licenses and use restrictions; spatial formats and data quality. Not all data records were validated through *in situ* surveys (denoted within the dataset), and some records were only available as points rather than polygons. While lacking estimates of area, these points provide important information on the location of these saltmarshes and the halophytic species known to occur in the region (through the accompanying Access database). Saltmarshes were identified in accordance with definitions provided by data sources, where available, or were determined using expert opinion (available in the supplementary material).

Citation: https://bdj.pensoft.net/articles.php?id=11764&instance_id=3527879

Link to additional saltmarsh metadata

Softbottom

NOAA Data Atlas (sediment specific data largely derived from INSTAAR, University of Colorado) and published in 2011.

https://www.ncei.noaa.gov/maps/gulf-data-atlas/atlas.htm

http://instaar.colorado.edu/~jenkinsc/dbseabed/resources/gsmseabed/

The data set was partitioned for grain size and sediment characterization (e.g. mud, sand, etc.) as described below. After discussions with the EFH IPT, the work group decided to combine all other granular layers and dissolve (using the Dissolve tool in ArcMap) to create a homogenous soft bottom spatial layer for the Gulf of Mexico.

A strong division in the Gulf of Mexico for continental shelf areas exists between sandy environments in the east (Mississippi, Alabama, Florida) and muddy environments in the west (Louisiana, Texas). This division reflects the input and overall westward movement on the shelf of muds from the Mississippi River delta. However, even in the muddy regions, sand shoals (including barrier islands) form where wave/current interactions sort and build up mobile sands. Shell accumulations of gravel texture are often associated with the shoals. Close inshore in turbid and brackish waters, oyster beds and reef buildups are widespread.

On the eastern, very sandy Gulf shelf, sorted sands and gravels with important biogenic fractions dominate over wide areas and show irregular geographic patchiness. The variability is partly due to sand waves (seabed dunes). In the region of the Florida Keys, many existing and drowned coral-algal reef and bank structures are present. Some areas sheltered by the Keys accumulate muddy sediments, such as in Florida Bay.

The deeper parts of the Gulf seabed (>200 m) are comprised mostly of mud sediments, but sands are occasionally detected in the sparse samplings of these depths. These sands are thought to be

from gravity slumps and flows of materials from the shelf edges caused by sea-level changes of the past, including the Mississippi River Delta. Suspendates and bottom flows of mud from the active delta appear to spread widely before finally settling over the slopes and basin floor.

Some upper-slope regions have notably extensive areas of hard substrate. Many interconnected processes have formed these features: drowning of ancient coral reefs and deltas, growth of deep cold coral (*Lophelia*) banks, and formation of carbonate crusts from the alteration of gas hydrates.

Hard bottom and coral

FWC-FWRI

For the purposes of the 2016 EFH 5-year review records of hard bottom and coral were considered separately but are derived from the same spatial data layer created by FWC-FWRI. These data were collected from as far back as 1960s through 2013. Data were collected by a number of sources including the SEAMAP survey.

This GIS data set represents a compilation of coral and other hard bottom type data available to FWRI as of July, 2013. The extent, time frame and/or resolution of source data sets vary. Mapping methods and minimum mapping units also differ among source datasets. This is not intended to be a comprehensive survey - data gaps do exist. Sliver polygons might be visible due to differences in overlapping study areas, as well as some gaps present in the source data sets. Refer to attribute table and metadata for references to source data.

https://geodata.myfwc.com/datasets/myfwc::coral-and-hard-bottom-habitats-in-florida/about