Data Documentation

Dataset Information

Dataset Title:

NOAA RESTORE Science Program: Living shoreline site suitability model transfer for selected water bodies within the Gulf of Mexico: Best Management Practice for Galveston Bay, Texas

Description:

Best Management Practices for shoreline protection measures in Galveston Bay, Texas, based on the Shoreline Management Model (SMM) V5.1 model created by Virginia Institute of Marine Science, Center for Coastal Resources Management. Digital format as shapefile.

Purpose:

This dataset was created to help determine alternate shoreline best management practices for Galveston Bay, Texas.

Shoreline Management Model (SMM) Version 5.1 for preferred shoreline best management practices was modified for Galveston Bay, Texas, NOAA Restore Science Program and Troy University, VIMS CCRM, and Galveston Bay Foundation.

The data in this accession were funded by the NOAA RESTORE Science Program under award NA17NOS4510100 to Troy University.

Methods:

The Galveston Bay Foundation (GBF) and Virginia Institute of Marine Science (VIMS) Center for Coastal Resources Management (CCRM) worked together to modify the 2013 NOAA Environmental Sensitivity Index (ESI) for use as the base shoreline for Galveston Bay. GBF inventoried shoreline erosion control structures and delineated riparian land use/land cover, beaches, marsh, Cypress trees, marinas, and canals using aerial interpretation of 2015 Texas TOP Imagery, personal observation, and ground truthing. Stratmap 2018 LiDAR rasters and USGS National Elevation Dataset (NED) 1/9 arc-second datasets were used to delineate bank height. Nearshore water depth was determined using Continuously Updated Digital Elevation Model (CUDEM) - 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles. Roads and permanent structures were delineated using a combination of data from TxDOT roads and aerial interpretation of Texas TOP and Google Earth imagery. The SAV (Seagrass) layer was created by referencing 2015 TOP and Google Earth imagery and data from the Texas Parks & Wildlife Department. The oyster reef layer was created by referencing 2015 TOP and Google Earth imagery and data from Texas Parks & Wildlife Department, Texas General Land Office, and Harte Research Institute. Fetch (Exposure) was calculated using VIMS CCRM Fetch Model. All input datasets were transferred onto the base shoreline and used as input into the SMM version 5.1 modified for Galveston Bay.

Data Sources:

- DOC/NOAA/NESDIS/NCEI > National Centers for Environmental Information, NESDIS, NOAA, U.S. Department of Commerce. 2014. Continuously Updated Digital Elevation Model (CUDEM) - 1/3 Arc-Second Resolution Bathymetric-Topographic Tiles. NOAA Data Access Viewer, accessed February 5, 2019. https://coast.noaa.gov/htdata/raster2/elevation/NCEI_third_Topobathy_2014_8580/
- DOC/NOAA/NESDIS/NGDC > National Geophysical Data Center, NESDIS, NOAA, U.S. Department of Commerce. 2014. Continuously Updated Digital Elevation Model (CUDEM) - 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles. NOAA Data Access Viewer, accessed February 5, 2019. https://coast.noaa.gov/htdata/raster2/elevation/NCEI_ninth_Topobathy_2014_8483/
- Harte Research Institute (HRI). 2011. Oysters_TX_BHA_2011_TCMS_AEA. By request.
- NOAA Office of Response and Restoration. 2013. Sensitivity of Coastal Environments and Wildlife to Spilled Oil: Upper Coast of Texas: ESIL (ESI ShorelineTypes - Lines). Download ESI Maps and GIS Data | response.restoration.noaa.gov accessed November 28, 2018. https://response.restoration.noaa.gov/esi_download#Texas
- Texas General Land Office (GLO). 2011. OysterReefs_GLO-RMC. By request.
- Texas Natural Resources Information System (TNRIS). Strategic Mapping Program (StratMap). Upper Coast Lidar, 2018-03-22. Accessed August 27, 2019. https://data.tnris.org/collection/b5bd2b96-8ba5-4dc6-ba88-d88133eb6643
- Texas Natural Resources Information System (TNRIS). Texas Orthoimagery (TOP) Imagery 2015. Brazoria, Chambers, Galveston, and Harris Counties. Accessed for download August 22, 2019. https://data.tnris.org/collection/b7e5b638-99f0-4676-9411-c88d06d49943
- Texas Parks & Wildlife Department (TPWD). Boat Ramps. TPWD Geographic Information Systems website accessed 2019. https://tpwd.texas.gov/gis/
- Texas Parks & Wildlife Department (TPWD). 2006. sde.DL.OYSTERS_TAMU. By request.
- Texas Parks & Wildlife Department (TPWD). 2012. Seagrass. TPWD Geographic Information Systems website accessed 2019. https://tpwd.texas.gov/gis/
- Transportation Planning and Programming (TPP) Division of the Texas Department of Transportation (TxDOT). TxDOT Roadways, accessed October 22, 2019. https://gis-txdot.opendata.arcgis.com/datasets/txdot-roadways
- US Fish and Wildlife Service. 2019. FWS National Realty Tracts Simplified (FWSInterest_Simplified). Accessed 2019. https://www.fws.gov/gis/data/CadastralDB/links_cadastral.html
- U.S. Geological Survey (USGS). USGS National Elevation Dataset (NED) 1/9 arc-second. 2007-2008 Houston City, Chambers County, Brazoria County, Galveston County, and Jefferson County. The National Map Download, accessed August 23, 2019. https://viewer.nationalmap.gov/basic/#/

Associated Datasets:

- NOAA RESTORE Science Program: living shoreline site suitability model transfer for selected water bodies within the Gulf of Mexico: best management practice for Perdido Bay, Baldwin County, Alabama (NCEI Accession 0222947). https://doi.org/10.25921/1s1a-d817
- NOAA RESTORE Science Program: Living shoreline site suitability model transfer for selected water bodies within the Gulf of Mexico: Best Management Practice for Lake Pontchartrain (in prep.)

People & Projects

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Funding:

- US DOC; NOAA; NOS; NCCOS; RESTORE Science Program
- US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)

Associated Online Resources:

- National Centers for Coastal Ocean Science. 2020. RESTORE Sponsored Research Project: Living shoreline site suitability model transfer for selected water bodies within the Gulf of Mexico: A GIS and remote sensing-based approach. https://www.fisheries.noaa.gov/inport/item/63228
- RESTORE Project, Living shoreline site suitability model transfer for selected water bodies within the Gulf of Mexico: A GIS and remote sensing-based approach, https://restoreactscienceprogram.noaa.gov/projects/living-shoreline-tool
- Galveston Bay Shoreline Protection Map Viewer, https://cmap2.vims.edu/GBShoreProtectViewer/

Extents

Start Date:	2018-11-05
End Date:	2020-03-03

Northern Boundary:	29.8750
Southern Boundary:	29.0163
Western Boundary:	-95.2517
Eastern Boundary:	-94.3809

Keywords

Sea Areas, Water Bodies, Marine Protected Areas:

- Gulf of Mexico
- Galveston Bay
- East Bay
- Trinity Bay
- Tabbs Bay
- Upper San Jacinto Bay
- Burnet Bay
- Lake Anahuac
- Dutton Lake
- West Bay
- Christmas Bay
- Bastrop Bay
- Chocolate Bay
- Dickinson Bay
- Dickinson Bayou
- Jones Bay
- Highland Bayou
- Moses Lake
- Dollar Bay
- Offatts Bayou
- Rollover Bay
- Clear Lake

NCCOS Keywords:

- NCCOS Research Location > Region > Gulf of Mexico
- NCCOS Research Location > U.S. States and Territories > Texas
- NCCOS Research Data Type > Geospatial
- NCCOS Research Data Type > Model

File Information

Total File Size:	113 MB, 11 files in 1 folder (unzipped), 7.85 MB (zipped)
Data File Format(s):	ShapeFile .SHP (and ancillary files .CPG, .DBF, .PRJ, .SBN, .SBX, .SHX)
Data File Compression:	N/A
Data File Resolution:	100 (meter)
GIS Projection:	NAD 1983 UTM Zone 15N

Data Files:

- GalvestonBay_ShorelineProtectionModel_results.shp
- GalvestonBay_ShorelineProtectionModel_metadata.xml (metadata)

Documentation Files:

- BrowseGraphic.JPG
- DataDocumentation.PDF

Parameter Information

Parameter Description:

Parameters: SMMv5Class
Property Type: calculated
Units: Enumerated Domain
Observation Category: model output
Sampling Instrument: Models/Analyses > Data Analysis > Environmental Modeling
Sampling and Analyzing Method:

Results are determined based on input parameters.

Data Quality Method:

Results were compared to field observations. Topology has been checked.

Table 1: Data Dictionary for GalvestonBay_ShorelineProtectionModel_results

Column	Variable	Label	Definition	Attribute Type	Range	Attribute Values
1	Object Id	FID	Internal feature number.	Unrepresentable Domain	0 – 27,529	
2	Geometry	Shape	Feature geometry.	Unrepresentable Domain		Polyline
3	String	roads	roads are present within shoreline buffer.	Enumerated Domain		Roads, No
4	String	PermStruc	permanent structures (houses, swimming pools, etc.) are within the shoreline buffer.	Enumerated Domain		Permanent Structure, Not Observed
5	String	BnkHgtClas	Bank height within 25 feet of shoreline.	Enumerated Domain		0-5 feet, 5-10 feet, >10 feet
6	String	RiparianLU	Riparian land use/ land cover.	Enumerated Domain		Agriculture, Bare, Cemetery, Coastal Prairie, Commercial/industrial, Extensive marsh, Forested, Grass, Paved, Public land, Railroad, Residential, Scrub/shrub
7	String	SAV	Indicates if Submerged Aquatic Vegetation (SAV) is present within 100 feet of the shoreline.	Enumerated Domain		Yes, Maybe, No
8	String	Beach	Beaches are persistent sandy shores that are visible during high tides.	Enumerated Domain		Yes, Not Observed
9	String	Boat_Ramps	Presence of boat ramp.	Enumerated Domain		Yes, Not Observed
10	String	Type_	Describes Boat ramp type, if present.	Enumerated Domain		Private, Public, N/A
11	String	Canals	Presence of man-made, navigable canal.	Enumerated Domain		Canal, No
12	String	Cypress	Cypress trees or cypress swamp is present (Yes).	Enumerated Domain		Yes, Not Observed

Column	Variable	Label	Definition	Attribute Type	Range	Attribute Values
13	String	Marsh	Marsh is present along shoreline.	Enumerated Domain		Yes, Not Observed
14	String	MarshOutfl	Marsh Outflows are short segments of the shoreline that cut across channel openings in a marsh.	Enumerated Domain		Yes, Not Observed
15	String	Tree_Fring	When the dominant riparian land use is not forested, but a line of trees is maintained along the bank edge, the land use is noted to include a tree fringe. Tree fringe between 100 and 500 feet is considered a wide tree fringe. If > 500 feet, it would be labeled "forested" in the RiparianLU field.	Enumerated Domain		Yes, Yes-Wide, No
16	String	OysterReef	The presence of or potential for oyster reefs located within 100 feet of the shoreline.	Enumerated Domain		Yes, Maybe, No
17	String	bathymetry	Nearshore bathymetry within 10 meters of shoreline.	Enumerated Domain		Deep, Shallow
18	String	tribs	Shoreline is classified as being part of a tidal creek or a major tributary. A tidal creek has limited shoreline exposure to fetch less than 2 miles.	Enumerated Domain		Tidal creek, Major tributary, Major tributary - Dutton Lake, or Major tributary - Lake Anahuac
19	String	Marinas	Marinas present (Yes).	Enumerated Domain		Yes, No
20	String	GrpStruON	On-shore erosion control structures classified into four groups.	Enumerated Domain		Bulkhead, Groin, Revetment,

Column	Variable	Label	Definition	Attribute Type	Range	Attribute Values
						Unconventional, Not Observed
21	String	GrpStruOFF	Off-shore erosion control structures.	Enumerated Domain		Breakwater, Groin Field, Not Observed
22	String	WideBeach	If Beach is present and greater than 10 feet at high tide line.	Enumerated Domain		Yes, Not Observed
23	String	SandSpit	Sand Spit features are generally sandy and may be dominated by beach, dune, and/or marsh habitats.	Enumerated Domain		Yes, Not Observed
24	String	defended	Shoreline is defended by an erosion control structure listed in the GrpStruON or GrpStruOFF fields.	Enumerated Domain		Yes, No
25	String	rd_pstruc	Road or permanent structure is present within the shoreline buffer.	Enumerated Domain		Yes, No
26	String	lowBnkStrc	Shoreline has a low bank height and there is a road or permanent structure present that might impede bank grading.	Enumerated Domain		Yes, No
27	String	ShlType	shoreline defended or undefended based on time of survey.	Enumerated Domain		Defended, Undefended
28	String	Exposure	Maximum average fetch for a section of shoreline (low: 0-0.5 mile, moderate: 0.5-2 miles, high: > 2 miles).	Enumerated Domain		Low, Moderate, High
29	String	StrucList	List of structures found in the GrpStruON and GrpStruOFF fields.	Unrepresentable Domain		

Column	Variable	Label	Definition	Attribute Type	Range	Attribute Values
30	String	SMMv5Class	Galveston Bay Shoreline Protection Model preferred shoreline best management practices classification.	Enumerated Domain		Beach Nourishment – as needed, Marsh Planting with or without Shoreline Grading, Low-profile Breakwater with Marsh Planting, High-profile Breakwater with Marsh Planting, Revetment or Bulkhead, Ecological Conflicts, Existing Breakwater, Highly Modified Area, Land Use Management, No Action Needed, Special Geomorphic Feature
31	String	SMMv5Def	Definitions for the preferred shoreline BMPs listed in the SMMv5Class field.	Unrepresentable Domain		
31	String	SMMDefPt1	First part or sentence of definition for shoreline recommendation located in SMMv5Class field. (Definitions for the SMMv5Class field have been divided into six fields (SMMDefPt1 - SMMDefPt6). This is to avoid losing the entire definition which is generally longer than the 254-character limit imposed by shape file text fields.)	Unrepresentable Domain		
31	String	SMMDefPt2	Second part or sentence of definition for shoreline recommendation located in SMMv5Class field.	Unrepresentable Domain		

Column	Variable	Label	Definition	Attribute Type	Range	Attribute Values
31	String	SMMDefPt3	Third part or sentence of definition for the shoreline recommendation located in the SMMv5Class field.	Unrepresentable Domain		
31	String	SMMDefPt4	Fourth part or sentence of definition for the shoreline recommendation located in the SMMv5Class field.	Unrepresentable Domain		
31	String	SMMDefPt5	Fifth part or sentence of definition for the shoreline recommendation located in the SMMv5Class field.	Unrepresentable Domain		
31	String	SMMDefPt6	Sixth part or sentence of definition for the shoreline recommendation located in the SMMv5Class field.	Unrepresentable Domain		
32	String	DefDate	Date of definition or definition revision.	Unrepresentable Domain		
33	Double	ShapeLenFt	Length of segment measured in feet.	Range Domain	3.28-20067.24 ft.	
34	Double	Shape_Leng	Length of segment measured in meters.	Range Domain	1.00 – 6116.51 m	

Document Information

Date:	2020-12-29
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.
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