

USGS –Seamless Pilot National Topography Model (NTM) for Southeast Texas

Jeffrey J. Danielson
USGS EROS
CoNED Applications Project Chief
Inland Bathymetry Research
March 19, 2024

Cynthia Miller-Corbett
USGS NGTOC
Hydrologist
Inland Bathymetry Research

Topobathymetric Elevation Models (TBDEMs)

- Topobathymetric elevation models are a merged rendering of both topography (land elevation) and bathymetry (water depth) to provide an integrated seamless elevation product

- Elevation Data sources

- Light Detection and Ranging (Lidar)

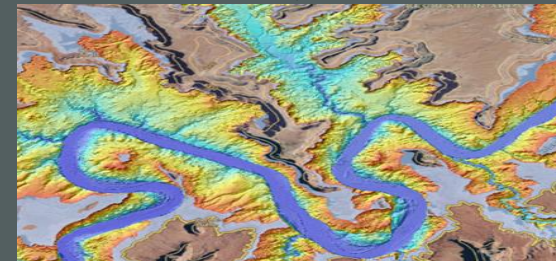
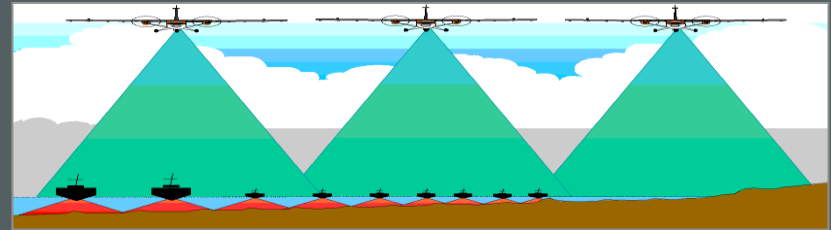
- Airborne (NIR-1064nm)
 - Terrestrial Ground-Based (NIR-1064nm)
 - Topobathymetric (CZML: Green-532nm)

- Structure-from-Motion (SfM)

- Bathymetric Sonar (Acoustic)

- Multi-Beam
 - Single-Beam
 - Swath
 - Hydrographic Surveys

- Satellite-Derived Bathymetry



Bathymetry → Integrated Inland Elevation ← Terrestrial

Southeast Texas Pilot National Topography Model (NTM) – Requirements / Specifications and AOI

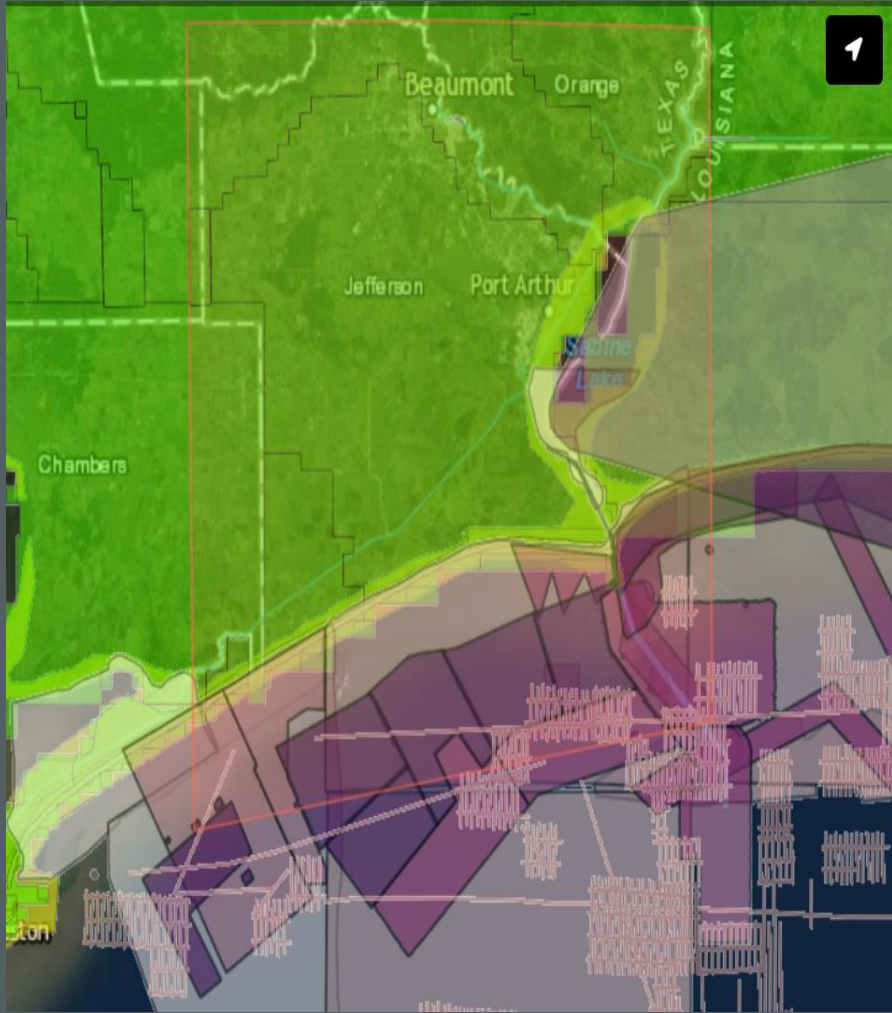
- **Spatial Resolution:** 1-Meter
- **Projection:** UTM Zone 15N
- **Horizontal Datum:** North American Datum of 1983 (NAD83 2011)
- **Vertical Datum:** North American Vertical Datum of 1988 (NAVD88)
 - Geoid – Geoid12B
- **Lidar Quality Level Specifications / Point Density:**
 - Topographic Lidar: Quality Level 2 (QL2) – 0.7 meter pulse spacing, 2 points per sq. meter, 10cm RMSEz
 - Bathymetric Lidar: Quality Level 2 (QL2B) – 0.7 meter pulse spacing, 2 points per sq. meter, 0.25, 0.0075 vertical accuracy coefficients (IHO S-44), 10cm RMSEz
- **Gap-Filling:** Smooth interpolate transition between land/water interfaces and moderate to high-resolution bathymetry data sources
- **Land / Water Masking for Integration**
- **Interpolation:** Terrain/TINs (Lidar) and Empirical Bayesian Kriging / Spline (Sonar)
- **Nesting:** Consistent Resampling, Cell Alignment (Pixel Edge), and Spatial Resolution
- **Spatially Referenced and Compliant FGDC Metadata**

SETxNTM AOI



US Interagency Elevation Inventory (USIEI)

<https://coast.noaa.gov/inventory/>



FILTERS

SORT: COLLECTION YEAR

996 Datasets

USACE Hydrographic Surveys

CALCASIEU TO SABINE

COLLECTION DATE:
3/8/2022

STATUS:
Complete

COLLECTION YEAR:
2022

USACE Hydrographic Surveys

CALCASIEU TO SABINE

COLLECTION DATE:
3/8/2022

STATUS:
Complete

COLLECTION YEAR:
2022

USACE Hydrographic Surveys

CALCASIEU TO SABINE



NOAA Bathymetric Data Viewer

<https://www.ncei.noaa.gov/maps/bathymetry/>



National Centers for
Environmental Information
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Bathymetric Data Viewer

NOAA / NESDIS / NCEI / Maps / Seafloor Mapping

Layers

Bathymetric Surveys

- Multibeam Survey Tracklines ?
- Multibeam Survey Footprints ?
- Multibeam Bathymetry Mosaic ?
- NOAA NOS Hydrographic Data: ?
 - All Surveys with Digital Data
 - Surveys with Bathymetric Attributed Grids (BAGs)
 - Surveys without Digital Data
- BAG Color Shaded Relief ?
- Single-Beam Surveys ?
- Single-Beam Sounding Density ?

Search Bathymetric Surveys ?

- Crowdsourced Bathymetry Files ?

Search CSB Files ?

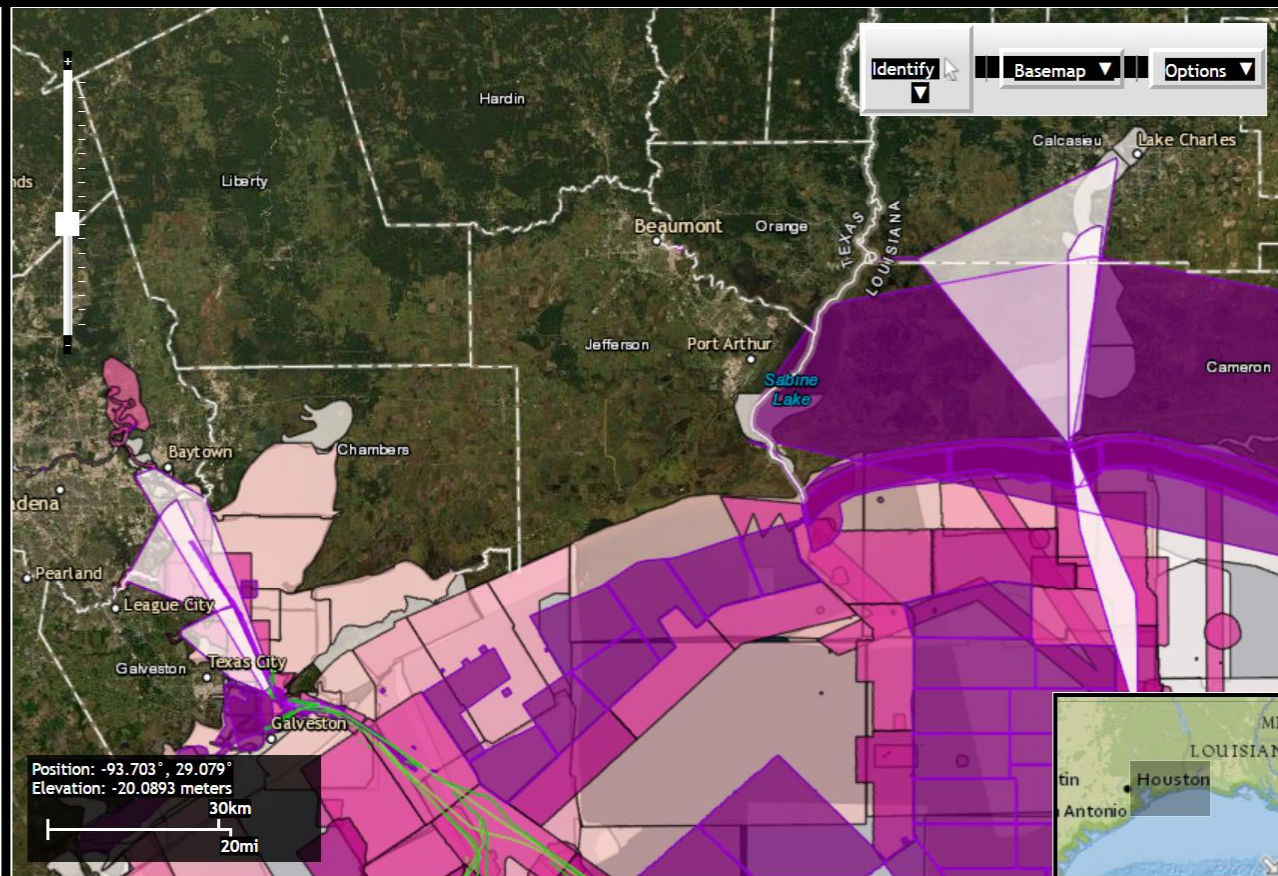
Digital Elevation Models

- DEM Footprints ?
- DEM Color Shaded Relief ?
- All DEMs
- Continuously Updated Digital Elevation Model (CUDEM) Bathymetric-Topographic Tiles

Grid Extract

More Information

Help



Mercator

Arctic

Antarctic



NOAA Data Access Viewer (DAV)

<https://coast.noaa.gov/dataviewer/#/lidar/search/>



DIGITAL COAST: DATA ACCESS VIEWER

IMAGERY

LAND COVER

ELEVATION

HELP

SHARE



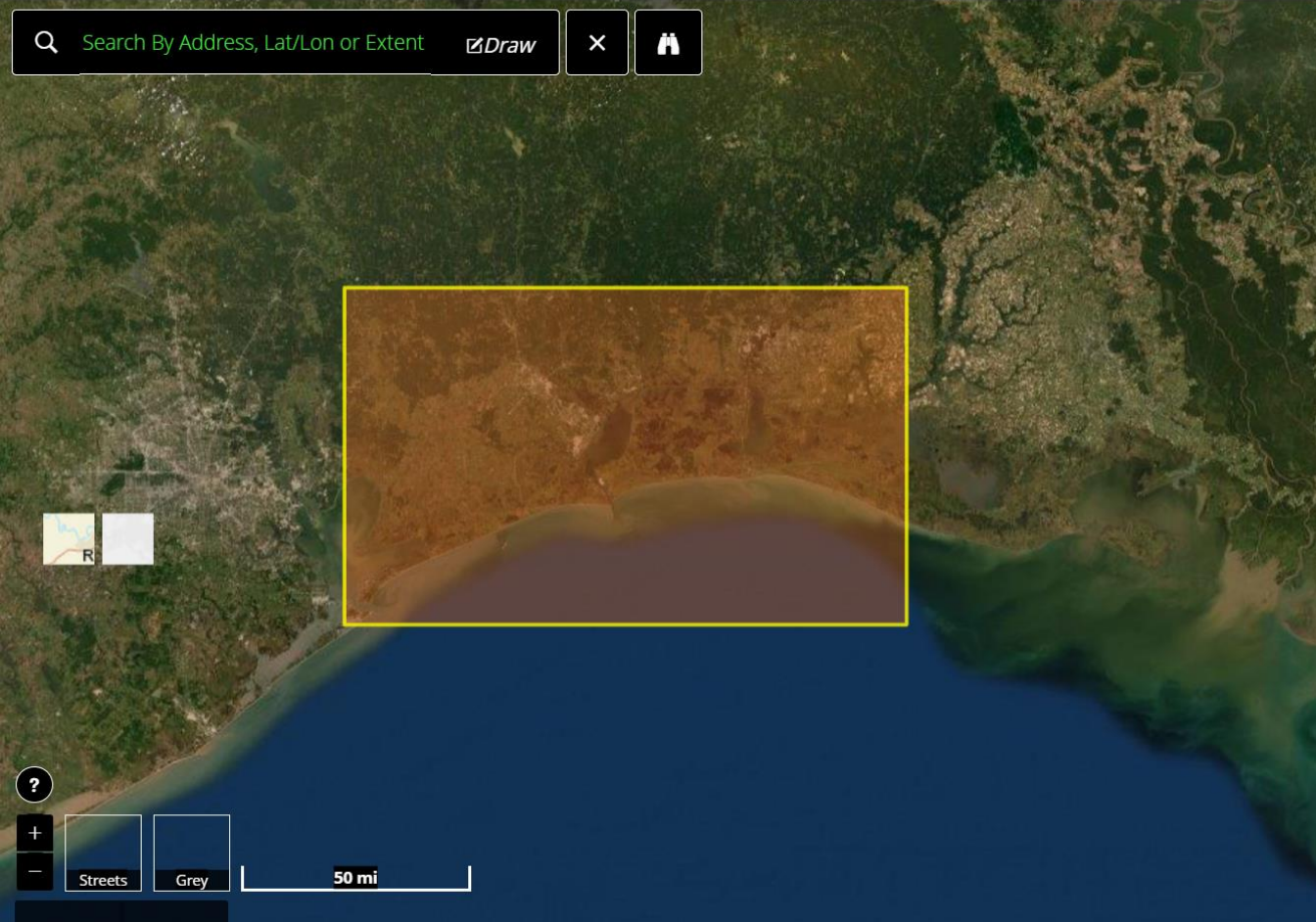
Search By Address, Lat/Lon or Extent

Draw



Filter by Provide

Sort Results



2018 TWDB Lidar: Coastal Texas

TNRIS, TX Water Development Board

15,539,510,396 Pts • BULK DOWNLOAD



2018 TWDB Lidar DEM: Coastal Texas

TNRIS, TX Water Development Board

14.47 GB • BULK DOWNLOAD



2018 USGS Lidar: Bayou Nezpique, LA

USGS

30,434,389,672 Pts • BULK DOWNLOAD



2018 - 2019 NOAA NGS Topobathy Lidar Post Hurricane Harvey: Galveston to Corpus Christi, TX

NOAA NGS

2,810,424,297 Pts • BULK DOWNLOAD



2018 USGS Lidar: Sabine River, LA

USGS

Showing 27 results



USACE Hydrographic Surveys (eHydro)

<https://www.arcgis.com/apps/dashboards/4b8f2ba307684cf59>

USACE Hydrographic Surveys powered by eHydro

USACE District:

All

USACE Channel:

All

Channel ID:

All

Survey Date Range:

Predefined Custom Date Range

All Surveys

Last 60 days

2022

2021

2020

Use the dropdown menus or simply pan and zoom on the map to filter the Hydrographic Survey data.

Use any combination to drill down to the data you are interested in. To remove the filter, set the filter to "All".

Select Survey:

List is limited to **50 records**. To see older surveys, configure a custom date range or zoom in on the map to limit results.

District: CEMVP
Name: POOL_08_UPPER_MISSISSIPPI
Survey ID: UM_SP_P08_20220425_CS_6850_6860

Survey Date: 4/25/2022, 7:00 AM

[Download Data](#)

District: CEMVP
Name: POOL_08_UPPER_MISSISSIPPI
Survey ID: UM_SP_P08_20220425_CS_6860_6870

Survey Date: 4/25/2022, 7:00 AM

Survey List

Number of Surveys

 **77,444**

1,148 last 60 days

Last update: 2 minutes ago



Earthstar Geographics | US Army Corps of Engineers | USACE

Powered by Esri

Texas – SETx Integration Pilot



662 – Hydro
Navigation
Surveys

SURVEYJOBIDPK	SDSFEATURENAME	SURVEYTYPE	CHANNELAREAIDFK	usaceDistrictCode	SOURCEPROJECTION
NR_03_MBB_20160427_OT_40_MLLW	SABINE	OT	CESWG_NR_03_MBB	CESWG	Texas South Central
NR_03_MBB_20160218_OT_40_MLLW	SABINE	OT	CESWG_NR_03_MBB	CESWG	Texas South Central
PA_01_PAC_20170904_OT_40_MLLW	SABINE	OT	CESWG_PA_01_PAC	CESAM	Texas South Central
SR_03_HWY_20170904_OT_31_MLLW	SABINE	OT	CESWG_SR_03_HWY	CESWG	Texas South Central
SR_02_OTB_20170904_OT_31_MLLW	SABINE	OT	CESWG_SR_02_OTB	CESWG	Texas South Central
NR_01_SMC_20170902_OT_40_MLLW	SABINE	OT	CESWG_NR_01_SMC	CESWG	Texas South Central
GI_02_HIB_20170902_OT_13_0901_MLLW	GULF INTRACOASTAL WATERWAY	OT	CESWG_GI_02_HIB	CESWG	Texas South Central
SR_01_SOT_20170904_OT_31_0903_MLLW	SABINE	OT	CESWG_SR_01_SOT	CESWG	Texas South Central
SN_02_SRC_20170904_OT_40_MLLW	SABINE	OT	CESWG_SN_02_SRC	CESWG	Texas South Central
GI_01_PAH_20170904_OT_13_0902_MLLW	GULF INTRACOASTAL WATERWAY	OT	CESWG_GI_01_PAH	CESWG	Texas South Central
PA_02_JPA_20170831_OT_40_MLLW	SABINE	OT	CESWG_PA_02_JPA	CESWG	Texas South Central

Texas Natural Resources Information System

https://data.tnris.org/

The screenshot shows the TNRIS data portal interface. At the top left is the TNRIS logo, and at the top right is a shopping cart icon labeled 'Cart'. Below the logo is a search bar with the placeholder text 'Search collections by keyword' and a magnifying glass icon. Below the search bar is another search bar with the placeholder text 'Search collections by geolocation'. Below that is a button with a pencil icon and the text 'Draw search area on map'. Below the search bars are several filter buttons: 'Availability', 'Category' (with a blue notification bubble containing the number '1'), 'File Type', 'Date Range', and 'Sort by: NEWEST'. To the right of these filters is a 'Clear all filters' link. Below the filters is a 'Show Map' toggle button. To the right of the toggle is a pagination control showing '1 - 24 of 79' and a page number '1' in a box, followed by '2 3 4' and a '24 / page' dropdown menu. Below the pagination are six data collection cards arranged in a 2x3 grid. Each card has a title, a year tag, and two category tags. The cards are: 'Panhandle Lidar' (2018, Lidar, Download), 'Upper Coast Lidar' (2018, Elevation, Lidar, Download), 'Crockett County Lidar' (2018, Elevation, Lidar, Download), 'Eastern Texas Lidar', 'Buffalo Bayou Lidar', and 'South Texas Lidar'. At the bottom of the page are four navigation links: 'Legal', 'Copyright', 'Programs', and 'Contact'.

TNRIS Cart

Search collections by keyword

Search collections by geolocation

Draw search area on map

Availability Category ¹ File Type Date Range Sort by: NEWEST Clear all filters ×

Show Map 1 - 24 of 79 < 1 2 3 4 > 24 / page

Panhandle Lidar
2018
Lidar
Download

Upper Coast Lidar
2018
Elevation Lidar
Download

Crockett County Lidar
2018
Elevation Lidar
Download

Eastern Texas Lidar

Buffalo Bayou Lidar

South Texas Lidar

Legal Copyright Programs Contact

USGS – Inland Bathymetric and Topobathymetric Inventory



ScienceBase-Catalog Communities Help

ScienceBase Catalog → USGS Data Release Products → U.S. Geological Survey Inlan...

U.S. Geological Survey Inland Bathymetric and Topobathymetric Survey Inventory, version 3

View

USGS Inland to Coastal Zone Water Feature Bathymetric and Topobathymetric Surveys

Dates

Publication Date : 2023-09-29
Start : 2010
Last Update : 2023

Citation

Miller-Corbett, C.D. and Curtis, M.H., 2023, U.S. Geological Survey Inland to Coastal Zone Bathymetric and Topobathymetric Survey Inventory, version 3: U.S. Geological Survey data release, <https://doi.org/10.5066/P9PDX9X3>.

Summary

The U.S. Geological Survey (USGS) Inland Bathymetric and Topobathymetric Survey Inventory, v. 3 includes a survey records inventory and dataset footprints (when available) for inland bathymetric and topobathymetric surveys published by the USGS for the conterminous US and Puerto Rico. Survey records include water feature, state, publication title, data vintage, mission, online linkage to reports and datasets, collection methods, survey and survey product resolution, datums, geoid, and accuracy information if known. This database, identified as the USGS Inland Bathymetric and Topobathymetric Survey Inventory, v.3, has been approved for release by the U.S. Geological Survey (USGS). Although this database has been subjected to rigorous review and is substantially complete, the USGS reserves the right to revise the data pursuant to further analysis and review. Furthermore, the database is released on condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from its authorized or unauthorized use.

Map »



Spatial Services

ArcGIS Mapping Service :

<https://gis.usgs.gov/sciencebase3/>

ScienceBase WMS :

<https://www.sciencebase.gov/catal>

<https://www.sciencebase.gov/catalog/item/5fce600bd34e30b912396ad0>



Coastal National Elevation Database (CoNED) Project Methods and Tools

Journal of Coastal Research

Topobathymetric Elevation Methodology: Coastal

Jeffrey J. Danielson^{†*}, Sandra J. Wright[†],
Gesch[†], Cindy A. Thatcher[§], and Barras[§]

[†]U.S. Geological Survey
Earth Resources Observation and Science Center
Sioux Falls, SD 57198, U.S.A.

[§]U.S. Geological Survey
Eastern Geographic Science Center
Reston, VA 20192, U.S.A.



www.JCRonline.org



- topobathy_tools
- a93_to_xyz
- add_metadata_fields
- BAGs_to_points
- BAGs_to_tiff
- blend_rasters
- blend_rasters_subset
- breaklines_to_land_mask
- calc_stats_recursively
- calculate_rmse
- clean_raster
- contour_land_mask
- count_vertices_per_tile
- create_land_points_batch
- create_land_points_for_kriging
- delete_geoprocessing_history
- dice_bnds
- download_all_survey_files
- elevation_masks
- erase_raster
- extract_by_mask2
- featureclass_to_xyz_batch
- fill_donuts
- fill_external_gaps
- fill_raster_voids
- fill_raster_voids2
- find_bad_edges
- generalize_bnds
- geoid2geoid
- krig_batch
- land_mask
- land_mask_with_seeds
- list_MXD_layers
- list_neighbors
- list_raster_properties_recursively
- make_final_raster
- make_final_raster2
- make_micro_mosaic_datasets
- make_mosaic_dataset
- make_shoreline_mask
- make_spatial_metadata
- merge_rasters
- noaa_htm_to_xls
- noaa_xml_to_xls
- NoData_to_value
- planarize_bathy_surveys
- planarize_bathy_surveys_batch
- point_boundary
- point_boundary2
- quick_hillshade
- relief_masks
- relief_masks_by_tile
- relief_masks_with_seeds
- remove_toolboxes
- replace_MXD_paths
- report_internal_nodata
- roughness_interface_line
- run_breaklines_to_land_mask
- select_bnds
- send_email
- simple_raster_bnd
- simple_raster_bnd_batch
- slope_mask
- slope_mask_by_tile
- slope_mask_cleanup
- values_to_NoData
- vdatum_raster
- vdatum_raster_batch
- verify_raster_paths

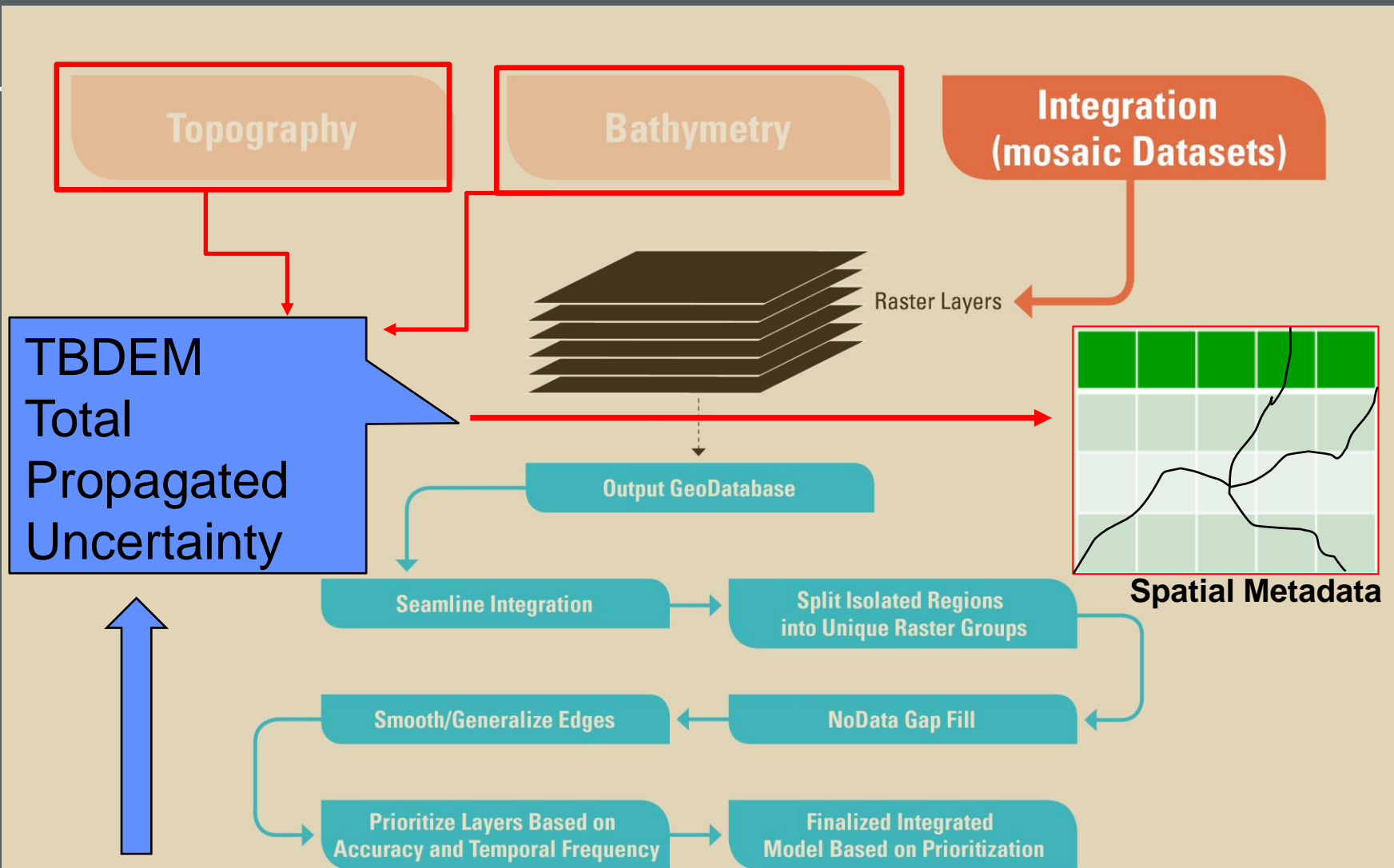
- verify_spat_meta_fields
- water_mask
- xyz_to_featureclass
- xyz_to_featureclass_batch



www.cerf-jcr.org

B.; Thatcher, C.A., and Barras, J.A.,
ology: Coastal National Elevation
Wright, C.W. (eds.), *Advances in
rch, Special Issue, No. 76, pp. 75–*

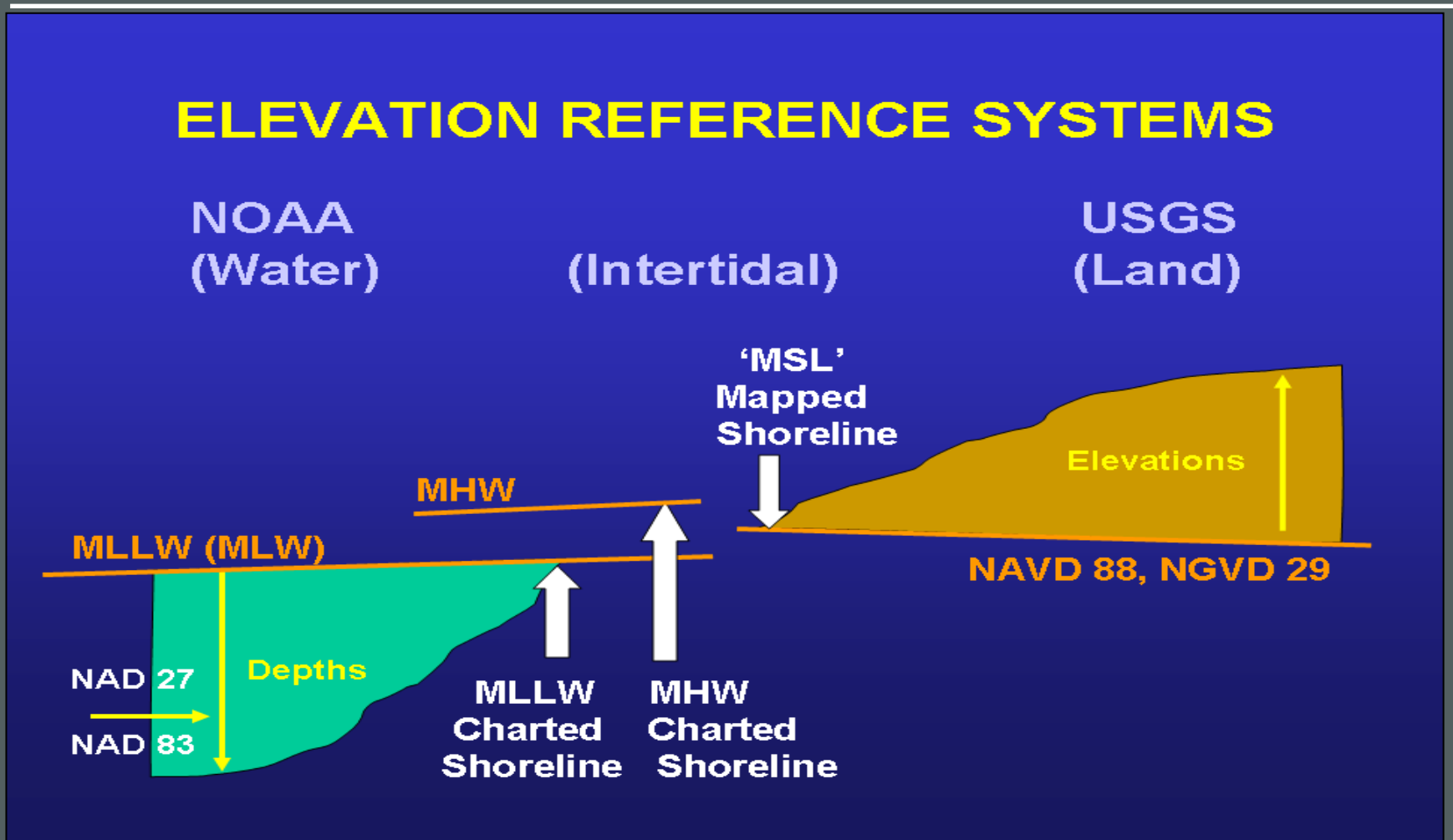
Topobathymetric – Integration Workflow



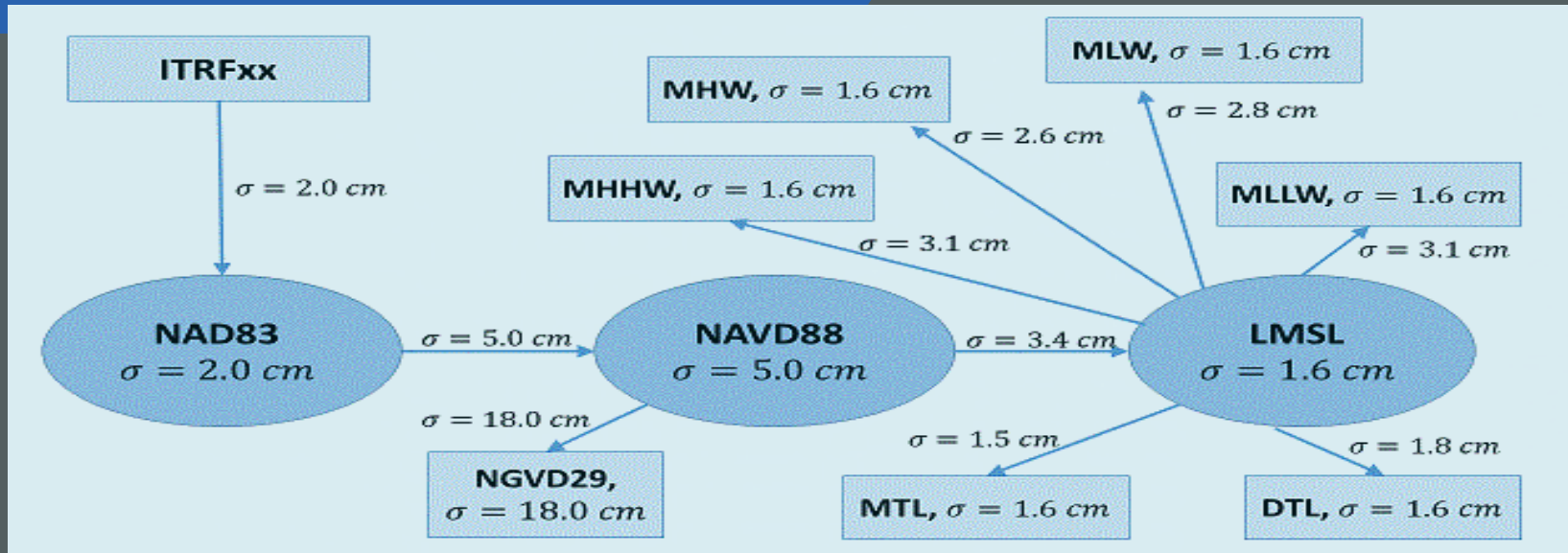
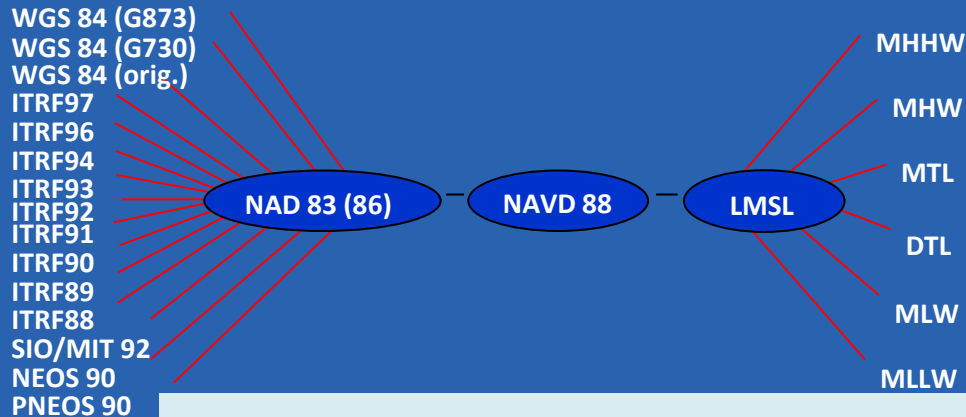
Source Error + Datum Error + Interpolation Error

$$\text{Total Vertical Uncertainty} = \pm \sqrt{(\text{source uncertainty})^2 + (\text{interpolation uncertainty})^2}$$

Elevation Reference Systems



Datum Transformation and Uncertainty



SETx Pre-Processing Steps for Topographic Lidar:

TBDEM Requirements:

Spatial Resolution: 1-Meter

Projection: UTM Zone 15N

Horizontal Datum: North American Datum of 1983 (NAD83 2011)

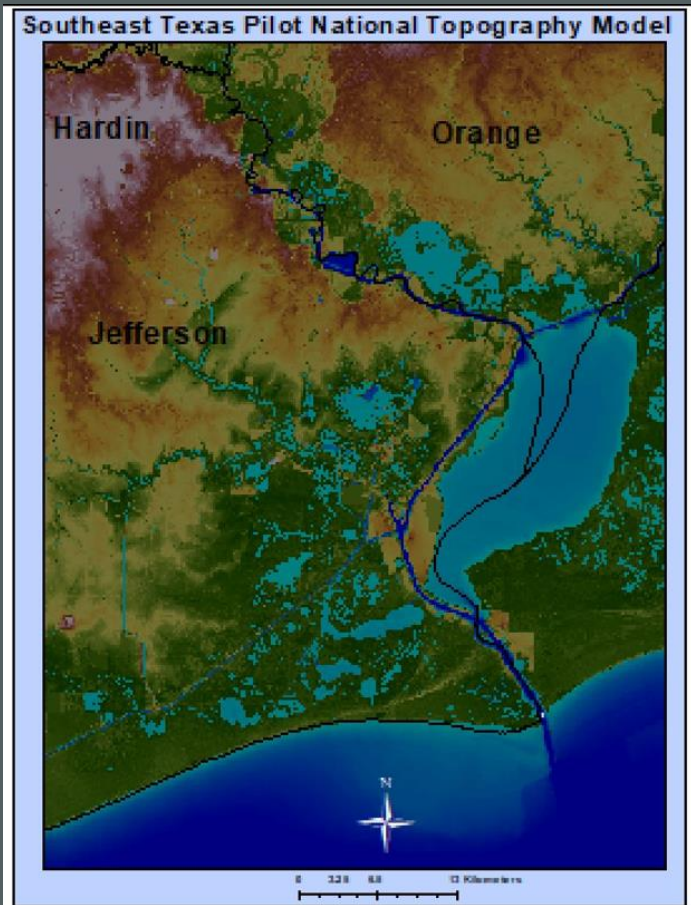
Vertical Datum: North American Vertical Datum of 1988 (NAVD88)

Geoid – Geoid12B (Geoid18-Addl Copy Transformed Following Project Completion)

Raster Data Format: GeoTIFF

- **Spatial Pre-Processing Steps (Topographic Lidar):**
 - **Mosaic Rasters or Grid Point Cloud Data**
 - **QA/QC Processed Raster**
 - **Compute Basis Statistics**
 - **Check Projection – Define / Reproject to Final Spatial Reference**
 - **Generate Simple Raster Boundary**
 - **Check for Small Raster Voids, Fill Raster Voids if they exist**
 - **Breakline Processing – If no vendor breaklines exist, generate from point cloud using Convex Hull Algorithm and manually adjust.**
 - **Check Vertical Datum, Convert to Final Spatial Reference if necessary**
 - **Clip Final Raster to SETx Project Area of Interest**

Southeast Texas – 3D NTM Pilot Model



Credit: Jeff Danielson and Cynthia Miller-Corbett, USGS

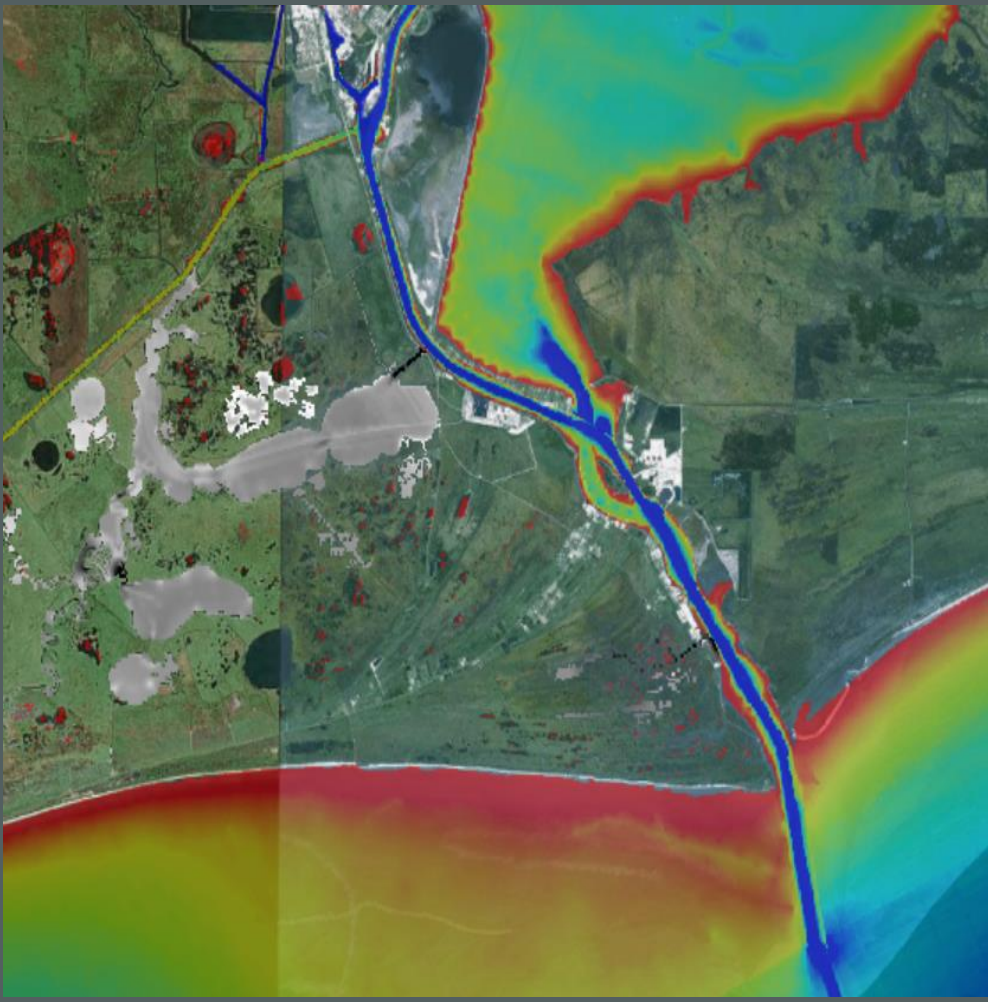


Danielson, J.J., Miller-Corbett, C.D., and Thatcher, C.A., 2023, Southeast Texas Pilot National Topography Model (NTM), 1933 to 2021: U.S. Geological Survey data release, <https://doi.org/10.5066/P9N4WLC8>.

TBDEM Highlights:

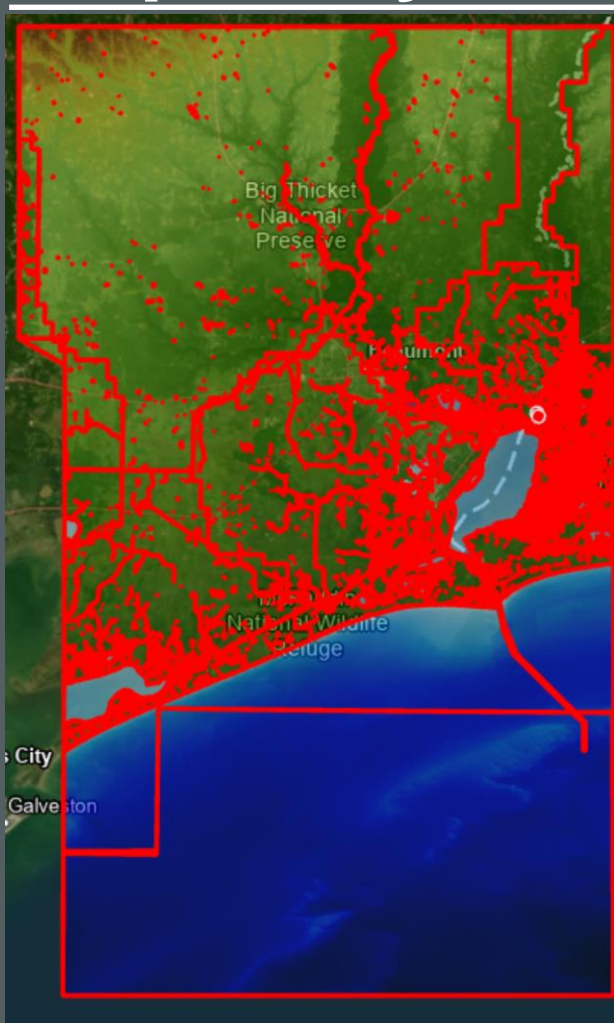
- Raster Format: Cloud Optimized GeoTIFF (COG)
- Raster Size: 67.33 GB
- Minimum Elevation = -34.43 Meters
- Maximum Elevation = 100.04 Meters
- Absolute Vertical Accuracy = 0.27m compared to 82 NOAA NGS GPS on Benchmarks

Southeast Texas – 3D NTM Pilot Model



**SETX NTM
Bathymetry
Coverage**

Southeast Texas – 3D NTM Pilot Model Spatially Referenced Metadata (Sources)



	Title	Source Organization	Date Acquired
1	USACE Hydrographic Bathymetry 2021	U.S. Army Corps of Engineers	2021
2	USACE Hydrographic Bathymetry 2007	U.S. Army Corps of Engineers	2007
3	Upper_Coast_TNRIS_Topo_Lidar_2018_Hydroflattened_Values_O...	Texas Natural Resources Information System	2018
4	Upper_Coast_TNRIS_Topo_Lidar_2018	Texas Natural Resources Information System	2018
5	SETX_NTM_Void_Filled_Areas_2023	U.S. Geological Survey	N/A
6	NOAA_NCEI_CUDEM_1/9th_Arc_Second_Topobathymetry	NOAA	1933 - 2017
7	NOAA_NCEI_CUDEM_1/3rd_Arc_Second_Bathymetry	NOAA	1897 - 2009
8	LA_Sabine_River_Topo_Lidar_2018	U.S. Geological Survey	2018
9	LA_Chenier_Plain_Topo_Lidar_2017_Hydroflattened_Values_Only	U.S. Geological Survey	2017
10	LA_Chenier_Plain_Topo_Lidar_2017	U.S. Geological Survey	2017
11	Keith_Lakes_Salt_Bayou_Topobathy_2023_Transition_Patch	U.S. Geological Survey	2007; 1933 - 201
12	Keith_Lakes_Salt_Bayou_Intercoastal_Waterway_Topobathy_202...	U.S. Geological Survey	N/A
13	Keith_Lakes_Salt_Bayou_Bathymetry_2007	Texas Water Development Board	2007
14	Jefferson_Liberty_Chambers_TNRIS_Topo_Lidar_2017	Texas Natural Resources Information System	2017
15	Jefferson, Liberty, Chambers TNRIS_Topo_Lidar_2017_Hydroflatt...	Texas Natural Resources Information System	2017
16	FEMA_Region_6_Neches_Basin_Topo_Lidar_2016_Hydroflattened_...	U.S. Geological Survey	2016; 2017
17	FEMA_Region_6_Neches_Basin_Topo_Lidar_2016	U.S. Geological Survey	2016; 2017
18	Eastern_Texas_3DEP_NRCS_Topo_Lidar_2018	U.S. Geological Survey and National Resource...	2018

SETxNTM By the Numbers:

- 18 Layers Make-up the Spatial Metadata
- 11 Unique Topography/Bathymetry Sources
- 6 Federal and State Source Organizations
- Topography: 2016 to 2018
- Bathymetry: 1933 to 2021

Southeast Texas – 3D NTM Pilot Model

Texas Water Development Board: Keith Lake-Salt Bayou

TWDB: Keith Lake-Salt Bayou (2007)



Hydrographic Survey of the Keith Lake-Salt Bayou System

April 2007 Survey



Prepared by:
The Texas Water Development Board

December 2007

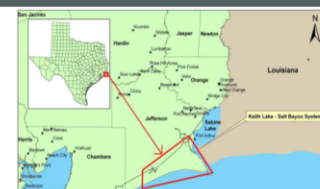


Figure 1 - Location of the Keith Lake-Salt Bayou System

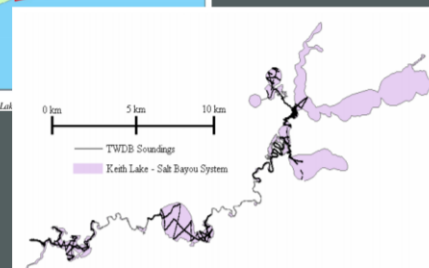


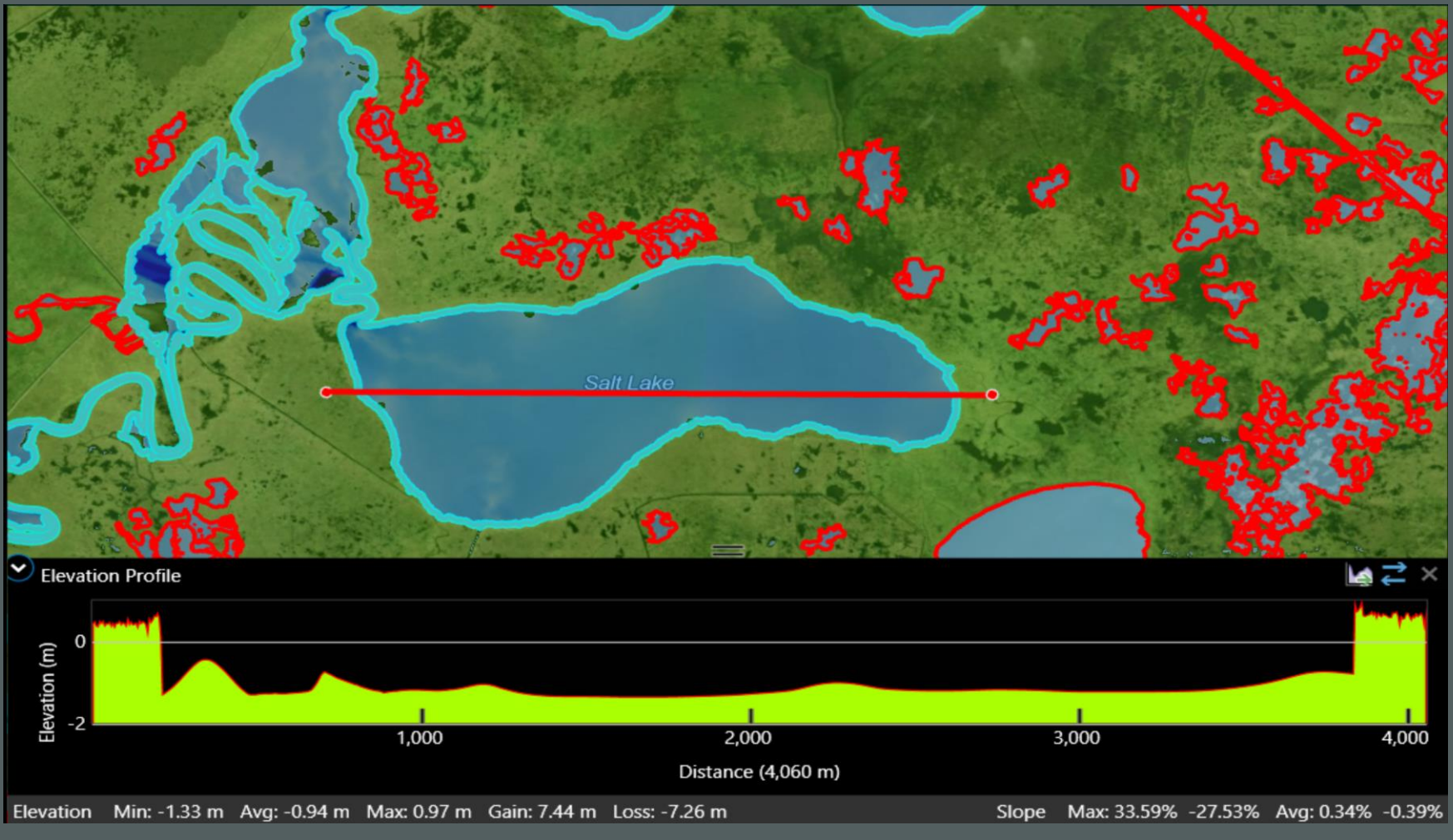
Figure 2 - TWDB data collection within the Keith Lake-Salt Bayou system

TWDB Bathymetry:

- Source Vertical Datum: NAVD88 (2007)
- Source Vertical Units: Feet (2007)
- Single-Bream Sonar: Tracklines

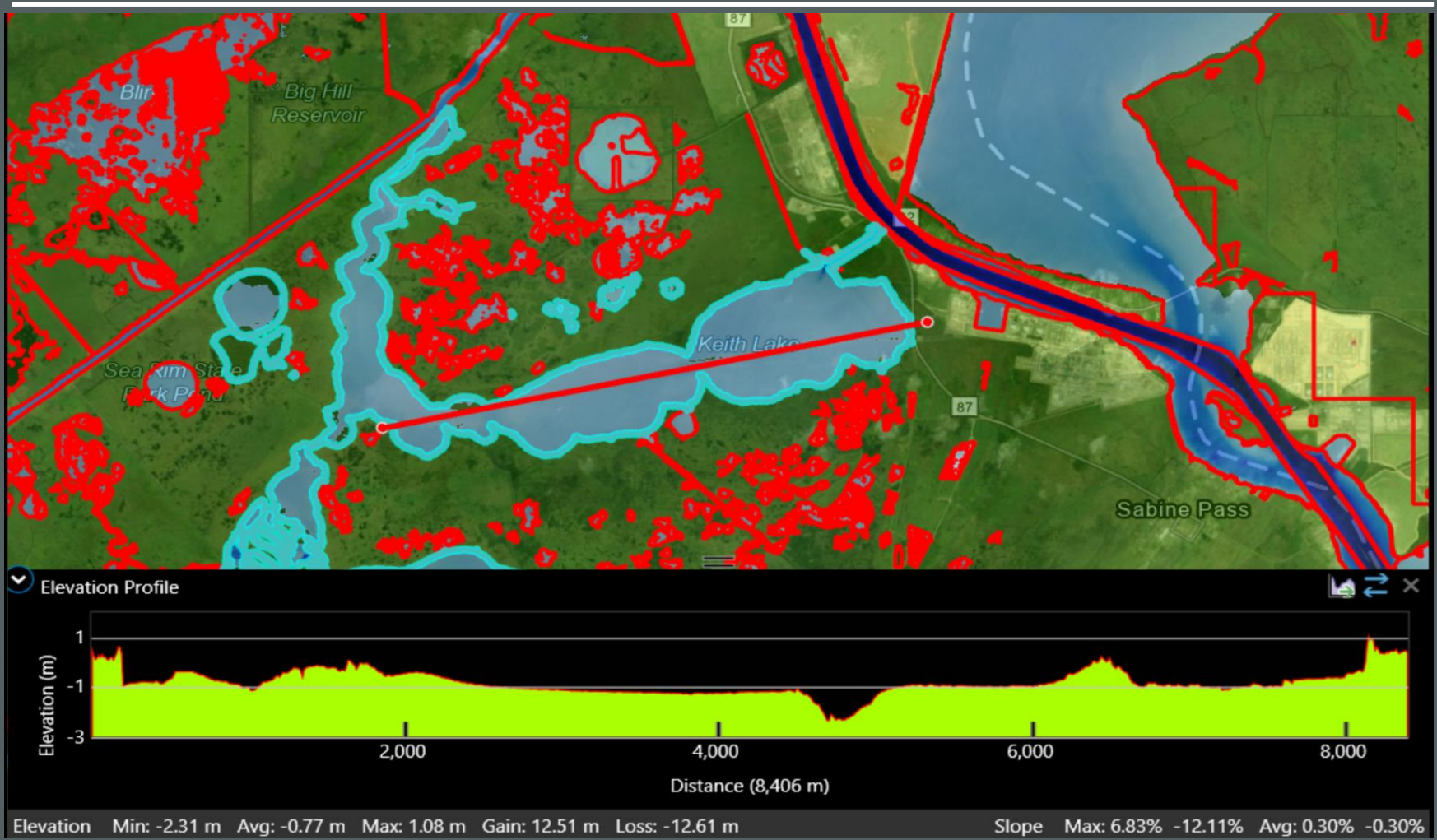
Southeast Texas – 3D NTM Pilot Model

TWDB: Keith Lake-Salt Bayou



Southeast Texas – 3D NTM Pilot Model

TWDB: Keith Lake-Salt Bayou



Southeast Texas – 3D NTM Pilot Model

USACE Galveston District: Neches/Sabine Waterway

USACE Neches and Sabine Bathymetry (2021/2007)



[About](#) - [Business With Us](#) - [Careers](#) - [Contact](#) - [FAQs](#) - [Library](#) - [Locations](#) - [Media](#) - [Missions](#) - [Projects](#)

US Army Corps of Engineers Galveston District Website

[Home](#) / [Missions](#) / [Navigation](#) / [Hydrographic Surveys](#) / Sabine Neches Waterway

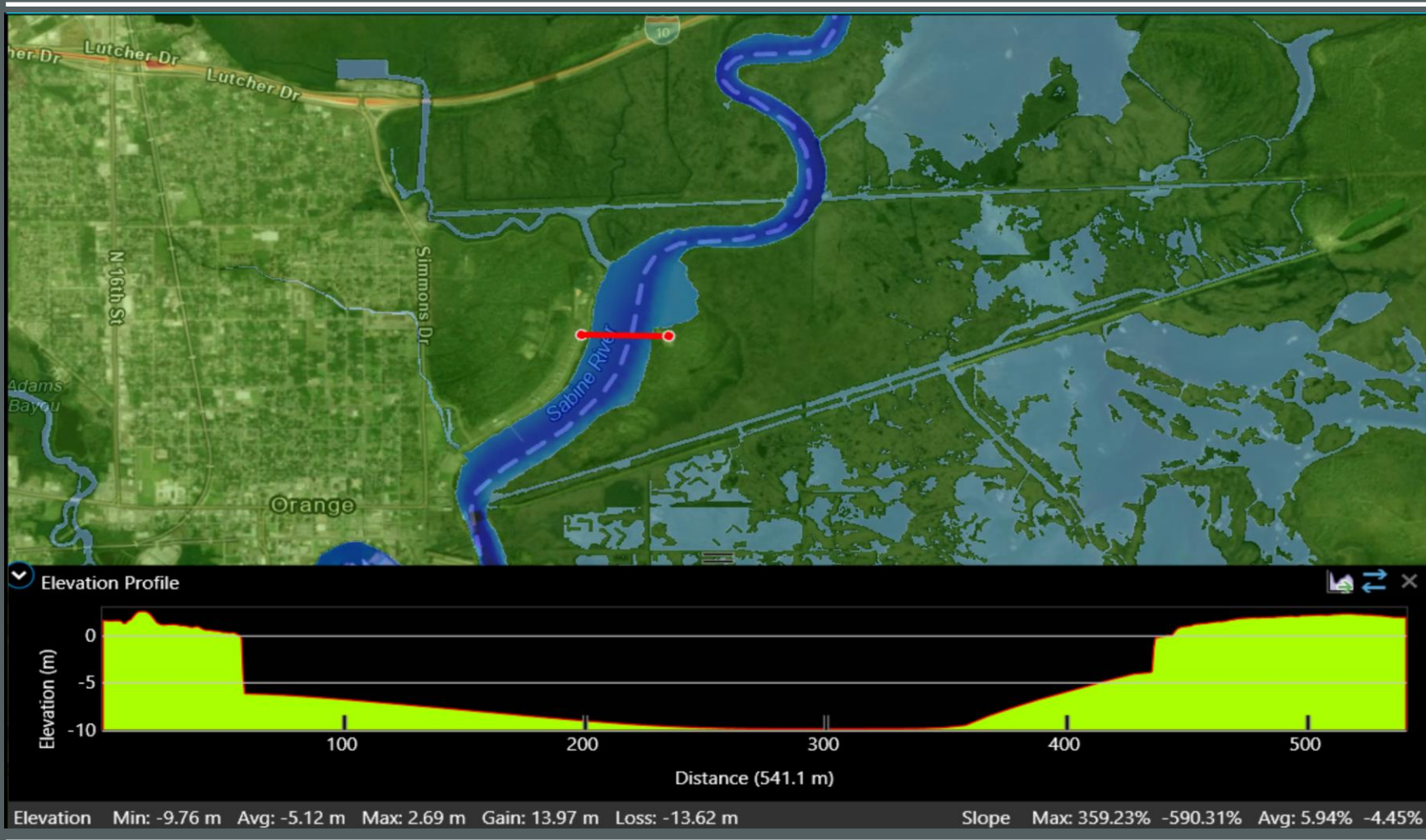
Sabine Pass to Port Arthur Canal Index & Channel Maps

PAGES	CHANNEL	Station to Station	Survey Date(s)	PDF Map	XYZ Data
tbd	Sabine Bank Channel Extension	tbd	05/18/23; 07/28/23; 09/01,28/23; 10/18/23; 11/08/23; 12/07,08,11/23	Survey Map	XYZ
1 - 9	Sabine Bank Channel	95+740.87 to 18+091.09	06/03/22; 05/16,17/23; 12/05,08,31/23	Survey Map	XYZ
10 - 11	Outer Bar Channel	18+091.09 to 214+13.87	05/17/23	Survey Map	XYZ
12 - 14	Jetty Channel	214+13.87 to 0+00	05/08/23	Survey Map	XYZ
15 - 18	Pass Channel	0+00 to 296+24.44	05/09,11/23	Survey Map	XYZ

USACE Bathymetry:

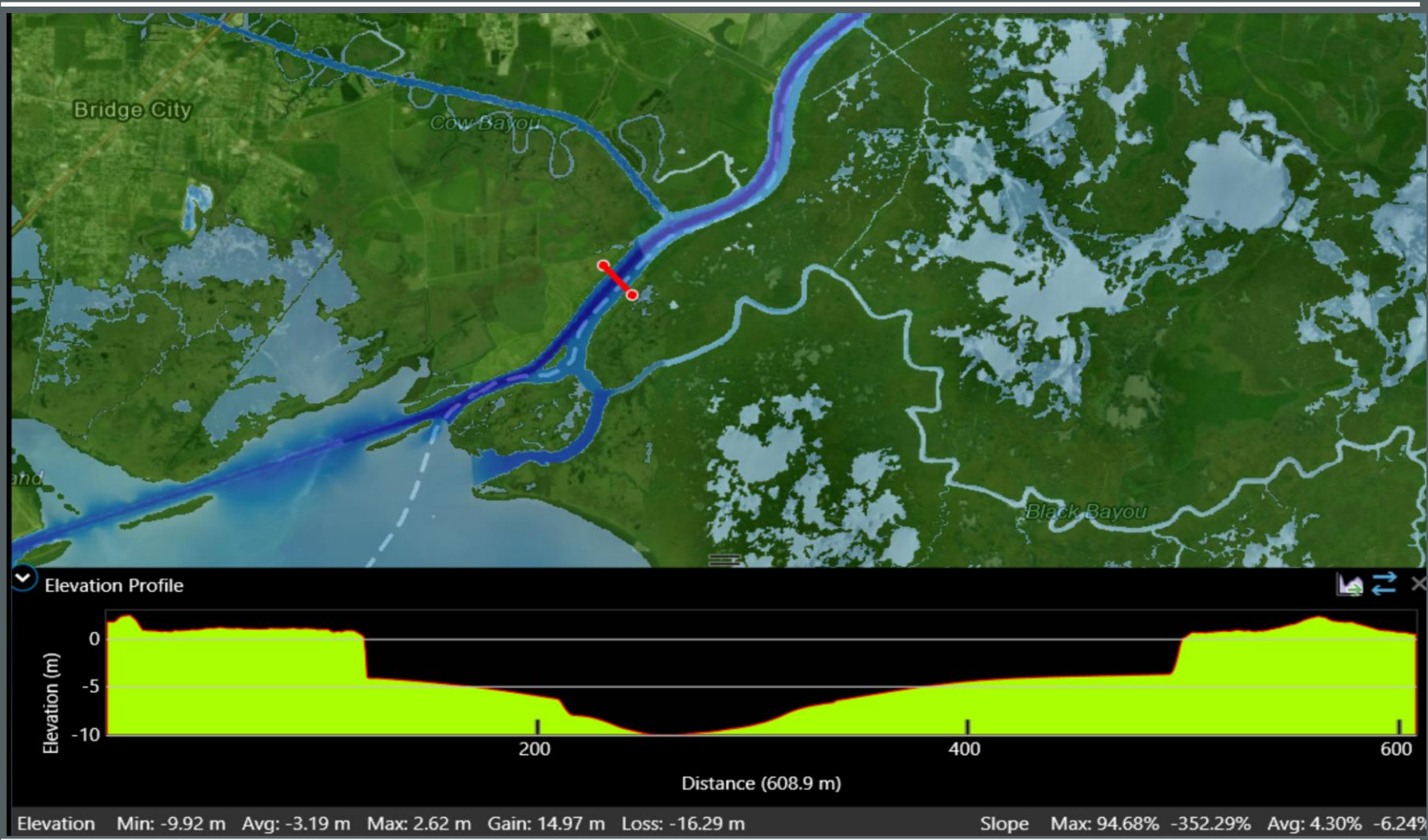
- Source Vertical Datum: MLLW (2021), MTL (2007)
- Source Vertical Units: Feet (2021), Meters (2007)
- Single-Bream Sonar: Cross-Sections (50 to 100 ft. approx. spacing)

Southeast Texas – 3D NTM Pilot Model Sabine River Elevation Profile



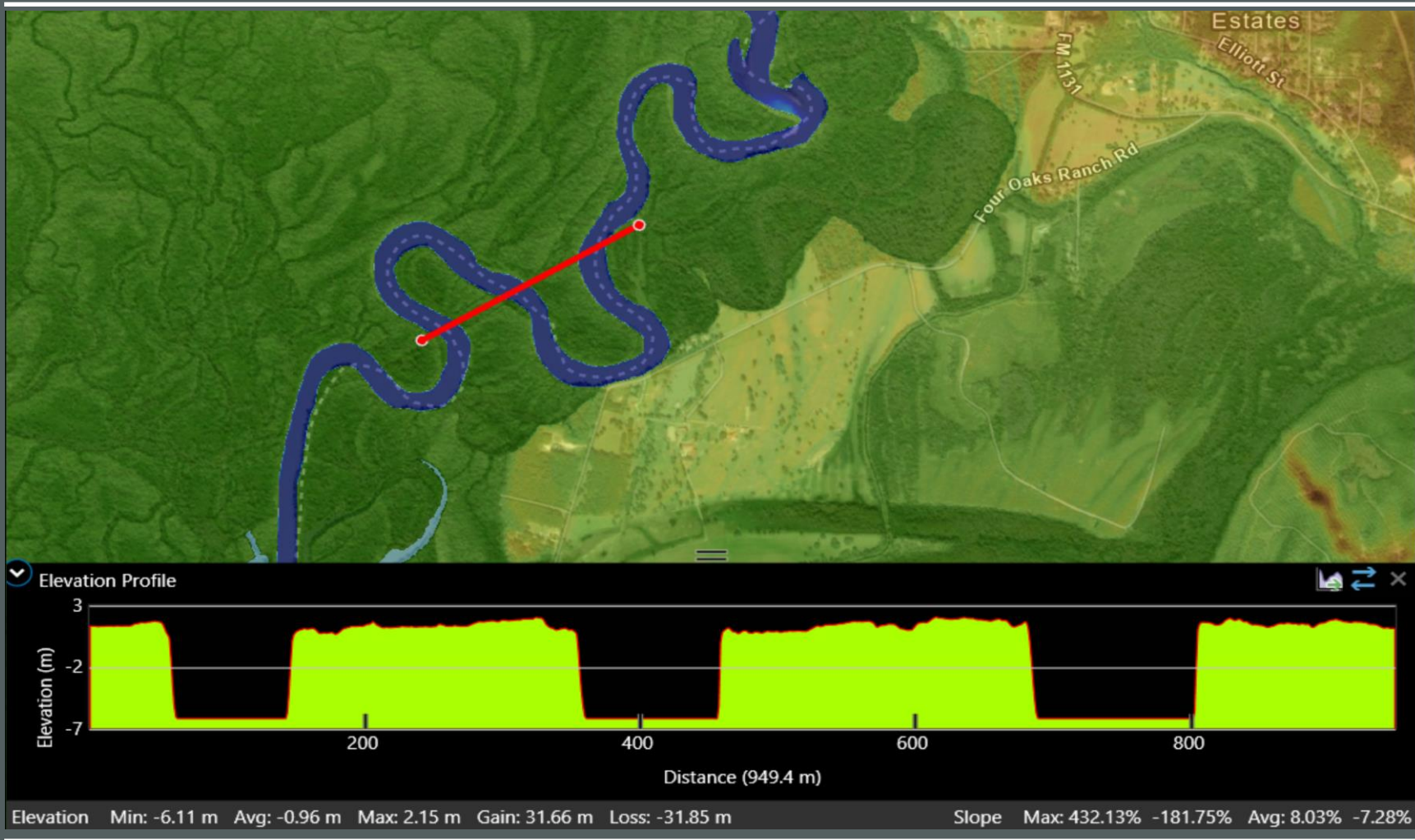
Southeast Texas – 3D NTM Pilot Model

Sabine River Elevation Profile

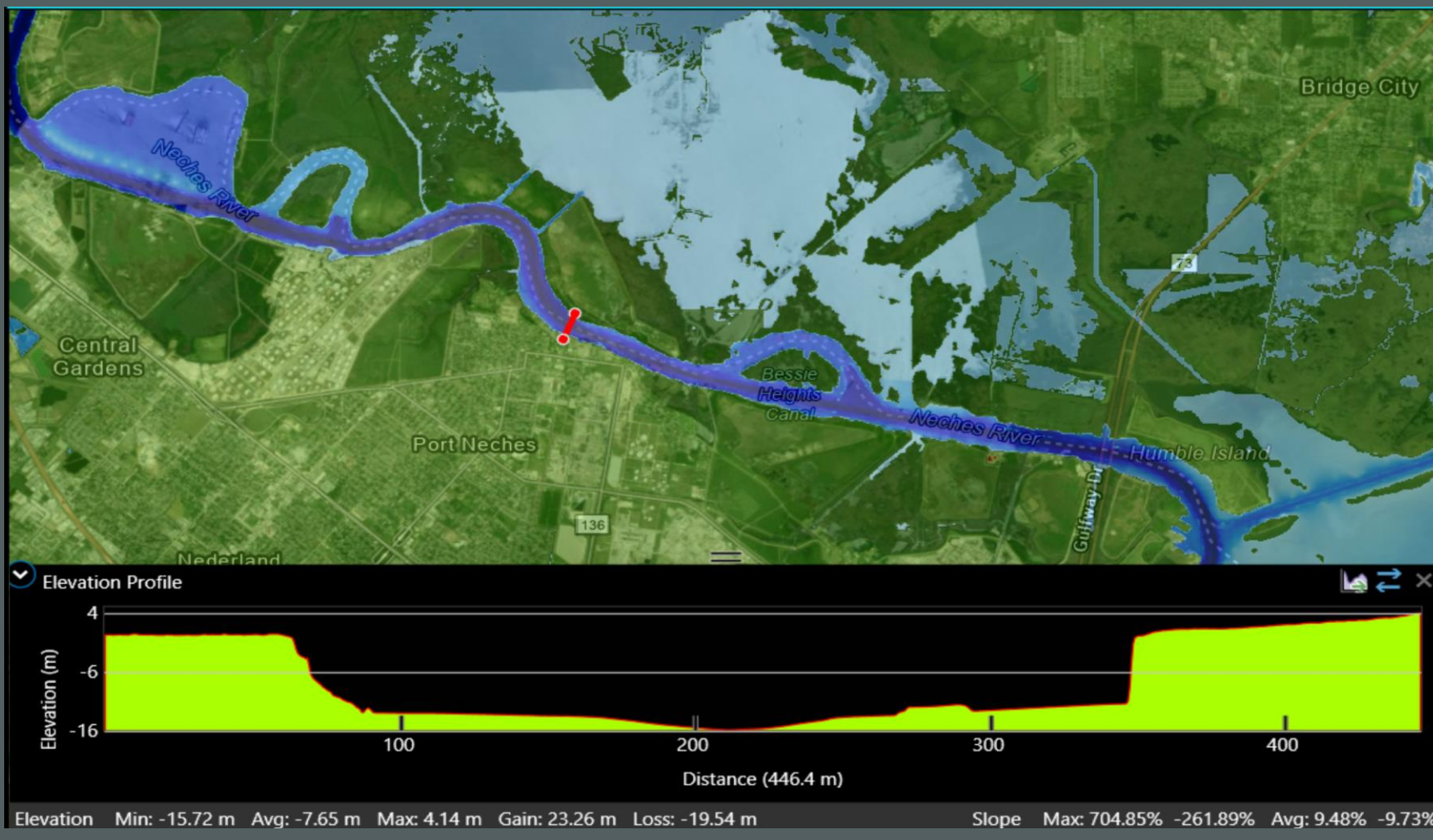


Southeast Texas – 3D NTM Pilot Model

Neches River Elevation Profile



Southeast Texas – 3D NTM Pilot Model Neches River Elevation Profile



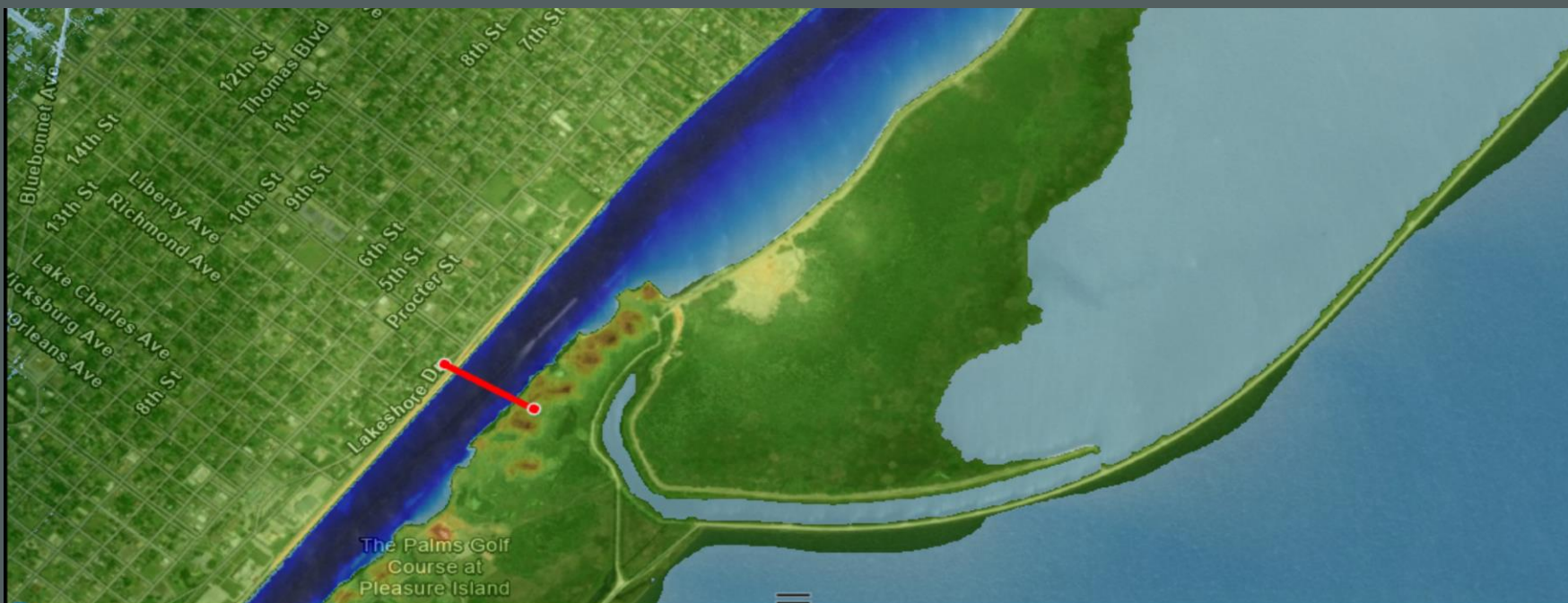
Southeast Texas – 3D NTM Pilot Model

Sabine Lake Elevation Profile



Southeast Texas – 3D NTM Pilot Model

Sabine Pass Elevation Profile



Southeast Texas – 3D NTM Pilot Model Sabine Pass Elevation Profile



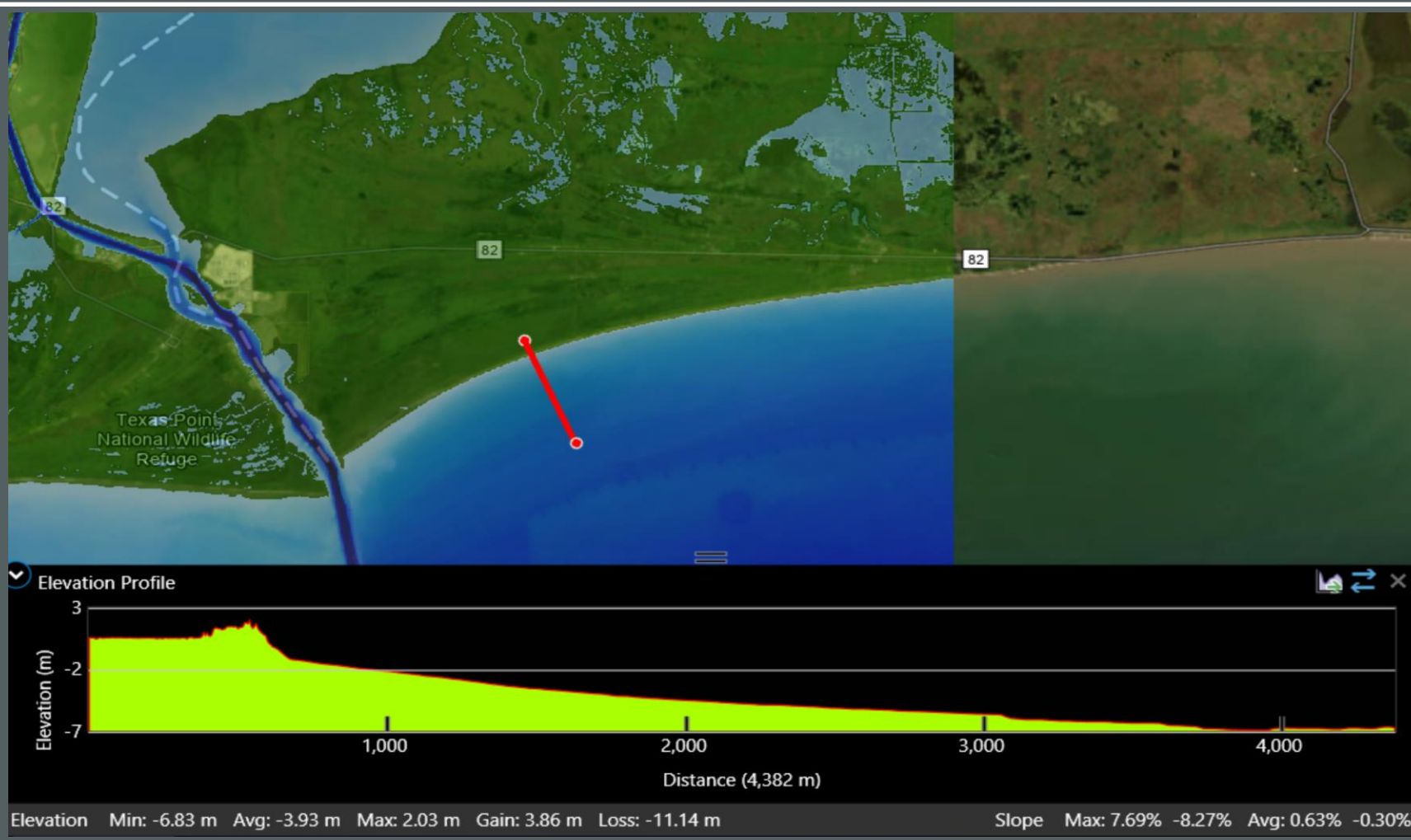
Southeast Texas – 3D NTM Pilot Model Intercoastal Waterway Elevation Profile



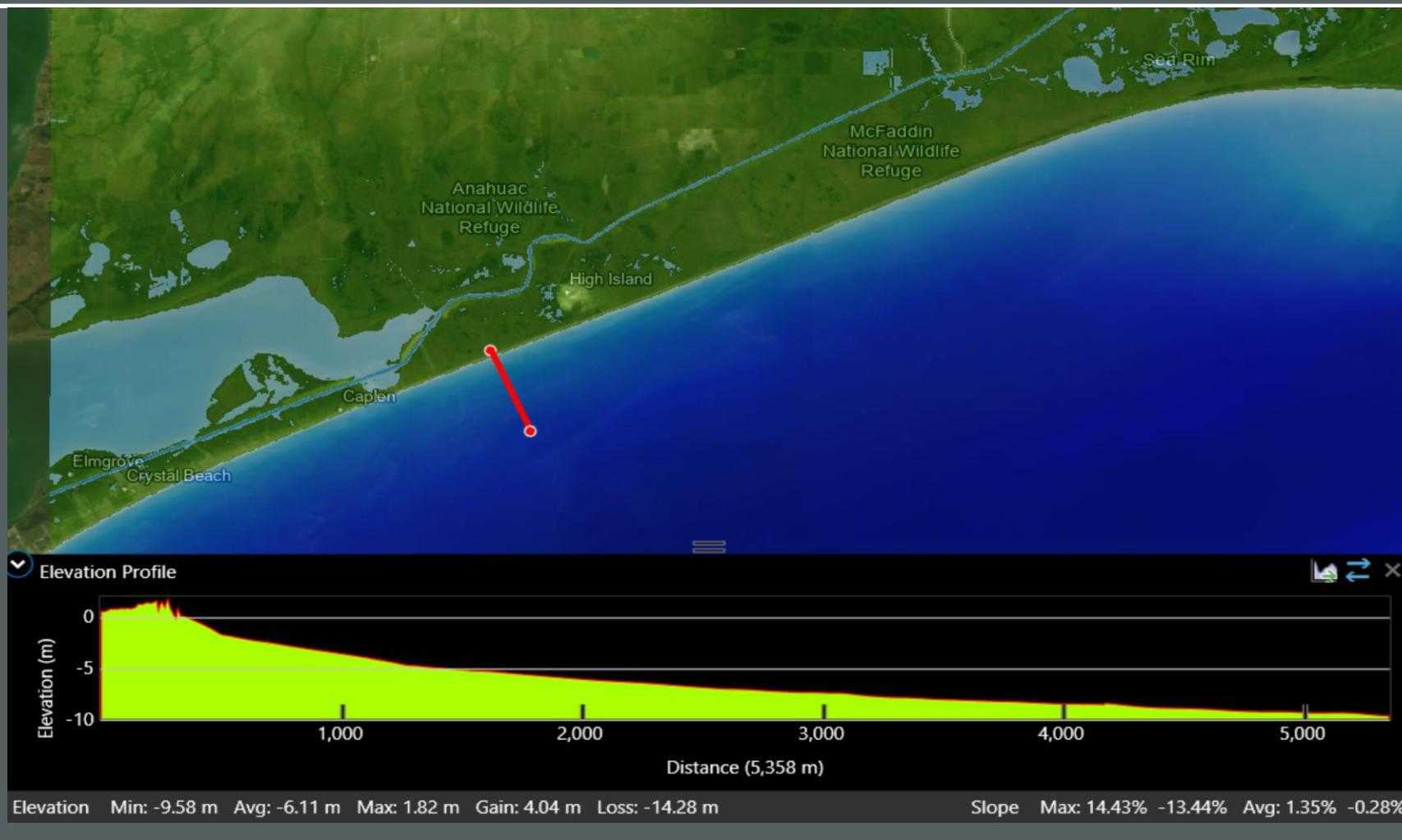
Southeast Texas – 3D NTM Pilot Model Intercoastal Waterway Elevation Profile



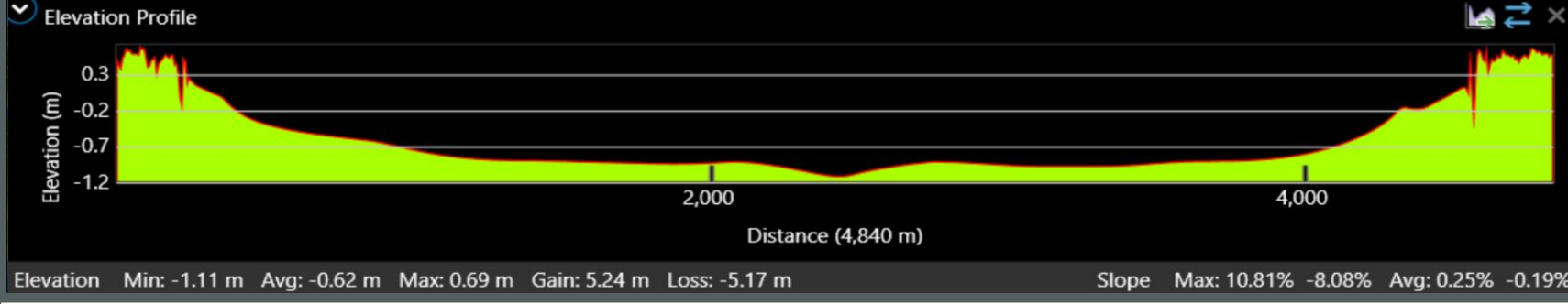
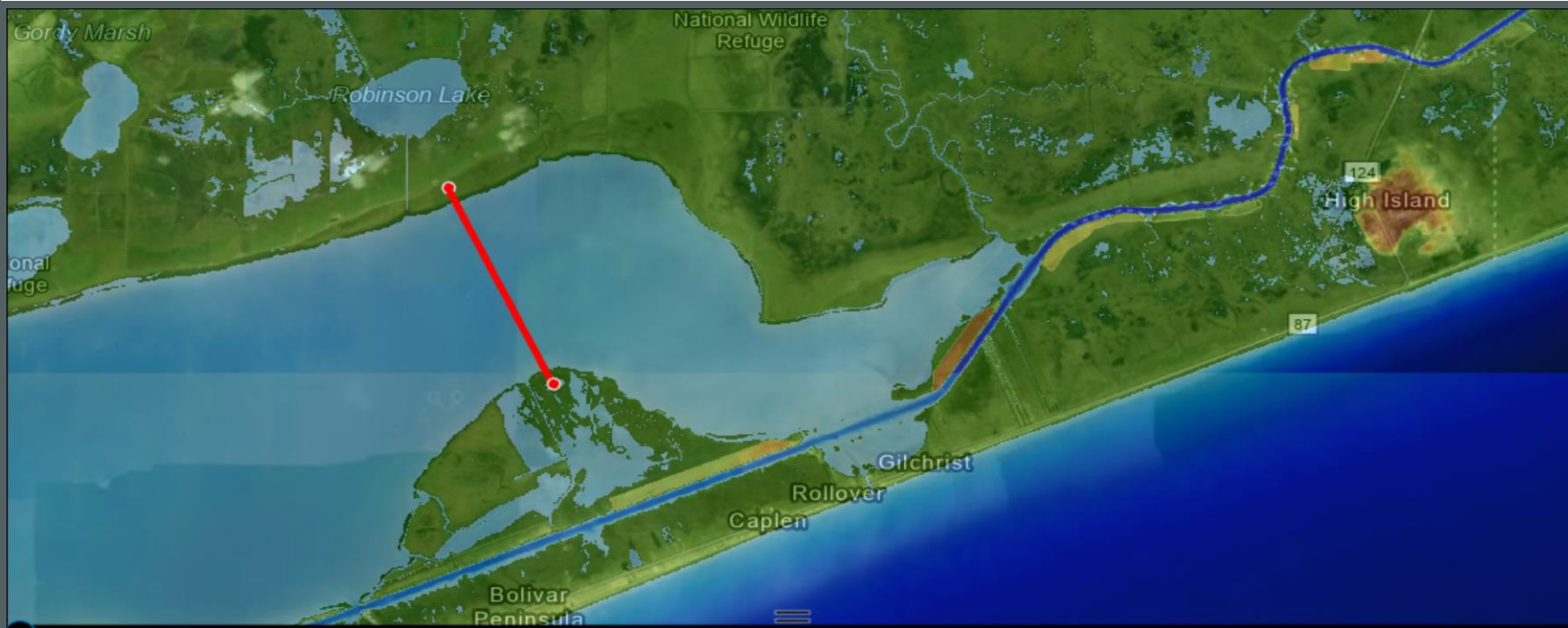
Southeast Texas – 3D NTM Pilot Model Offshore Elevation Profile



Southeast Texas – 3D NTM Pilot Model Offshore Elevation Profile



Southeast Texas – 3D NTM Pilot Model East Bay Elevation Profile



Southeast Texas – 3D NTM Pilot Model

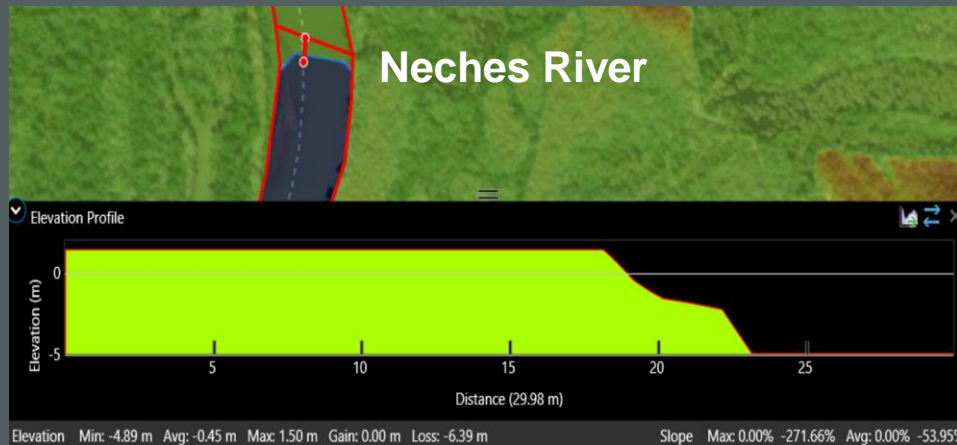
Hydro-Flattened TBDEM Areas (More Bathymetry)



SETx NTM Hydro-Flattened TBDEM Areas

■ Key Comments:

- Located spatially in areas with no current or known bathymetry coverage
- Over 1,358 single-part features in the spatial metadata with areas greater than 15,000 meters
- Example features include lakes, canals, waterways, and rivers
- Water clarity is a limiting factor so acoustic technologies will have to be emphasized along with targeted bathymetric lidar acquisitions
- **There is a significant need for more comprehensive inland bathymetry mapping in Southeast Texas**
- **More coordination and partnering!**



3DEP Data Collaboration Announcement (DCA)

The screenshot shows the USGS website header with the logo and navigation menu. The main content area features a large 3D hydrography map with a yellow river channel. A text box on the map reads "3D Hydrography Program" with a "Learn More About 3DHP" button. Below the map is a navigation menu with links: HOME, COMPONENTS OF NGP, SUPPORTING THEMES, GEOGRAPHIC NAMES, OPERATIONAL SUPPORT, SUPPORT, TOPOGRAPHIC MAPS, and MEETINGS. A central text block states: "The USGS National Geospatial Program (NGP) collaborates with a wide range of stakeholders to share costs of topographic data acquisition in support of collective mission and business requirements. The Fiscal Year (FY) 2024 3DNTM DCA has been released. The initial deadline for project submissions was October 20, 2023." Below this are three columns: "3D Elevation Program DCA" with a 3D elevation map, "3D Hydrography Program DCA" with a 3D hydrography map, and "DCA Frequently Asked Questions" with an "FAQS" button.

An official website of the United States government Here's how you know

USGS
science for a changing world

SCIENCE PRODUCTS NEWS CONNECT ABOUT

Latest Earthquakes | Search

[NATIONAL GEOSPATIAL PROGRAM](#) [COLLABORATION AND PARTNERSHIPS](#)

Data Collaboration Announcement Portal

By [National Geospatial Program](#)

3D Hydrography Program

[Learn More About 3DHP](#)

HOME

COMPONENTS OF NGP

SUPPORTING THEMES

GEOGRAPHIC NAMES

OPERATIONAL SUPPORT

SUPPORT

TOPOGRAPHIC MAPS

MEETINGS

The USGS National Geospatial Program (NGP) collaborates with a wide range of stakeholders to share costs of topographic data acquisition in support of collective mission and business requirements. The Fiscal Year (FY) 2024 3DNTM DCA has been released. The initial deadline for project submissions was October 20, 2023.

3D Elevation Program DCA

3D Hydrography Program DCA

DCA Frequently Asked Questions

FAQS

www.usgs.gov/3DNTM/DCA



Inland Bathymetry Research 3DEP Lidar Explorer – Topobathy Lidar Publications



3DEP LidarExplorer

[Search](#) [Process](#) [About](#)

LIDAR ▾

Type a lidar project name

BASE MAP

Which product are you interested in?

LIDAR

DEM

OTHER

Show where Lidar is available.

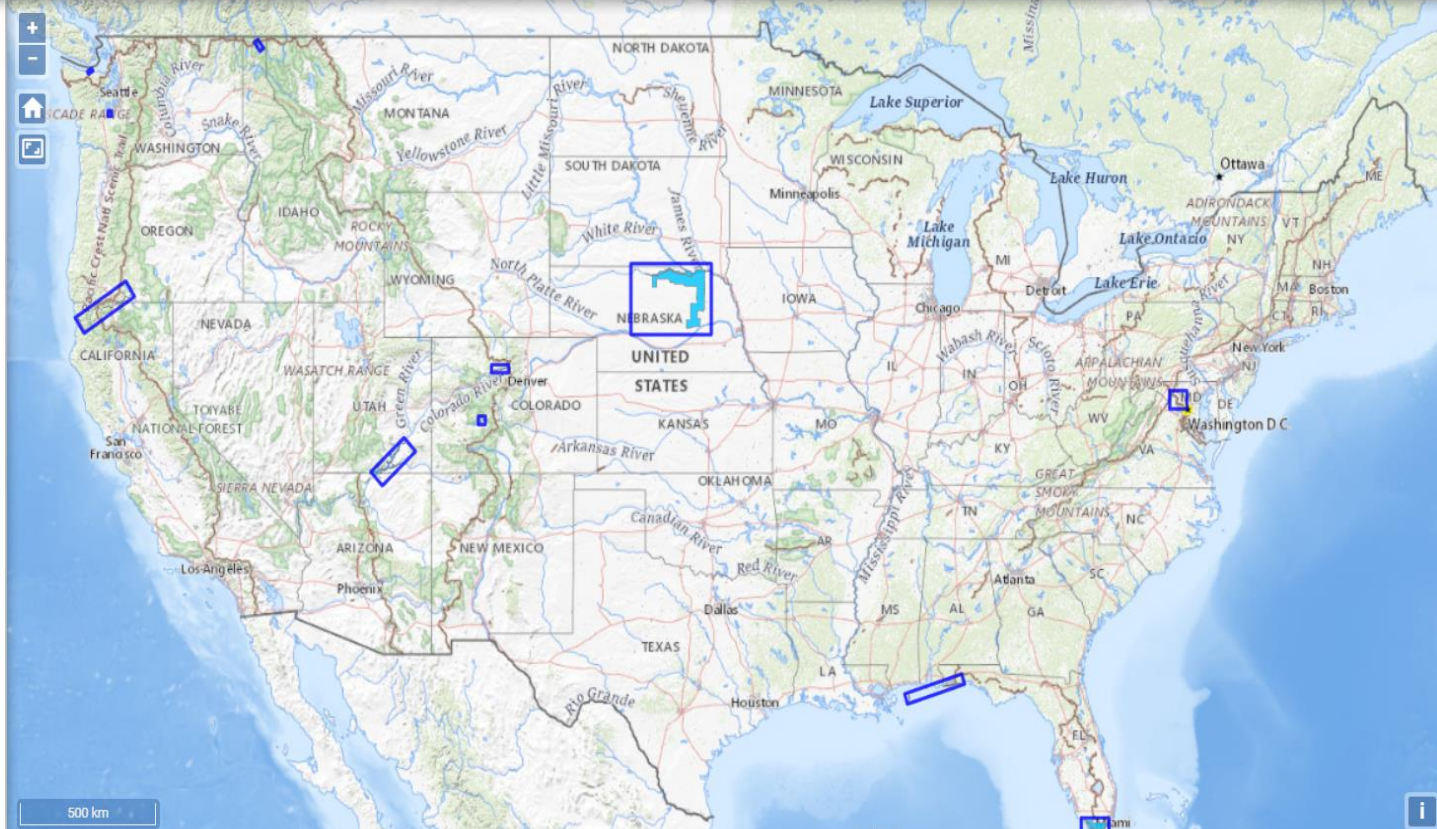
Show Topobathy Lidar.

Click on the map to retrieve information about a lidar project.

Show options for filtering the lidar map display? ▾

[Show Legend](#) [More Info](#)

Define Area of Interest



Southeast Texas – 3D NTM Pilot Model

USGS ScienceBase

ScienceBase Catalog → Earth Resources Observatio... → Southeast Texas Pilot Nation...

Southeast Texas Pilot National Topography Model (NTM), 1933 to 2021

View

Dates

Publication Date : 2023-11-03
Start Date : 1933
End Date : 2021

Citation

Danielson, J.J., Miller-Corbett, C.D., and Thatcher, C.A., 2023, Southeast Texas Pilot National Topography Model (NTM), 1933 to 2021: U.S. Geological Survey data release, <https://doi.org/10.5066/P9N4WLC8>.

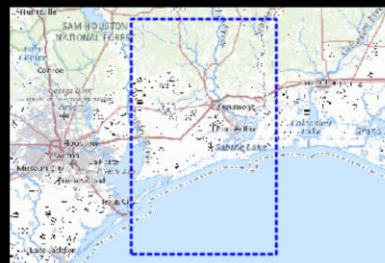
Summary

The U.S. Geological Survey (USGS) 3D Elevation Program (3DEP) has initiated the development of a second pilot 3D National Topography Model (3DNTM) to generate 3-dimensional surface elevation models that integrate topographic bare-earth elevation surfaces with river channel bed and coastal bathymetry and topobathymetry. Detailed knowledge of integrated river system topography, bathymetry, and topobathymetry is essential for fisheries habitat restoration, hydrologic modeling, and other key science applications such as flood mapping and identification of fluvial geomorphic features. An integrated 1-meter topobathymetric digital elevation model (TBDEM) for Hardin, Orange, and Jefferson counties in Southeast Texas has been developed for this second pilot study. This pilot 3DNTM product supports the Southeast Texas Flood Coordination Study where flood planning and modeling are essential for resource management to minimize impacts from rainstorm and hurricane events. Within the pilot project area of interest, the following hydrographic features are included: reaches of the Neches and Sabine Rivers, Sabine-Neches Water Way (Sabine Channel), Lake Sabine, the Keith Lake-Salt Bayou, and the Intercoastal Waterway. The Southeast Texas TBDEM comprises the spatial integration of 12 different geospatial elevation sources, including topographic lidar data from USGS 3DEP and Texas Strategic Mapping (StratMap), single-beam acoustic data from Texas Water Development Board for the Keith-Lakes-Salt Bayou System, multiple single-beam acoustic surveys from the U.S. Army Corps of Engineers, and nearshore to offshore bathymetry from the National Oceanic and Atmospheric Administration (NOAA).

... show more ...

Contacts

Map »



Communities

- Earth Resources Observation and Science Center (EROS) *
- USGS Data Release Products

Tags

Harvest Set : USGS Science Data Catalog (SDC)

Theme : elevation, geoscientificInformation, inlandWaters, oceans

Place : 3D Elevation Program (3DEP), 3D National Topography Model (3D NTM), Beaumont, East Pass, Gulf of Mexico, Hardin County, Jefferson County, Keith Lake-Salt Bayou System, National Geospatial Program (NGP), Neches River, Orange County, Port Arthur, Port Neches, Sabine Lake, Sabine River, Sabine-Neches Waterway,

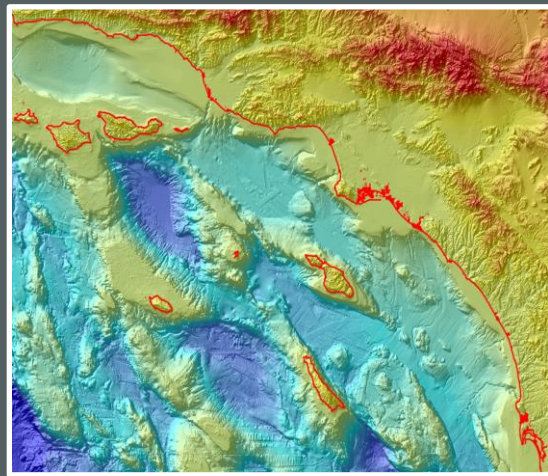


<https://doi.org/10.5066/P9N4WLC8>

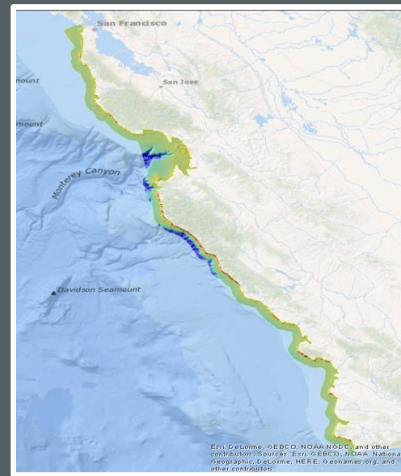
Questions (Jeffrey Danielson, daniel@usgs.gov, Cynthia Miller-Corbett, cmcorbet@usgs.gov)



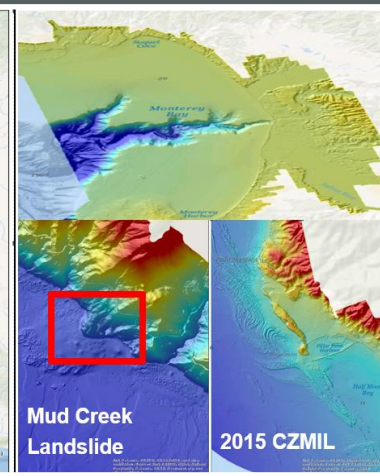
San Francisco Bay



Southern California

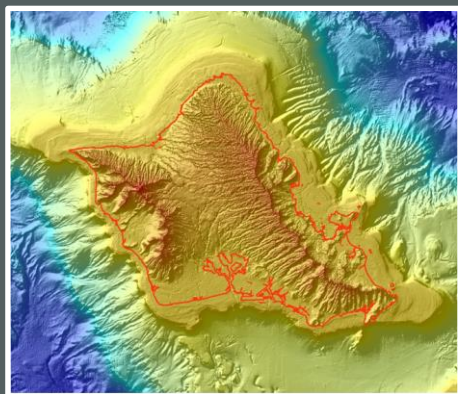


Central California

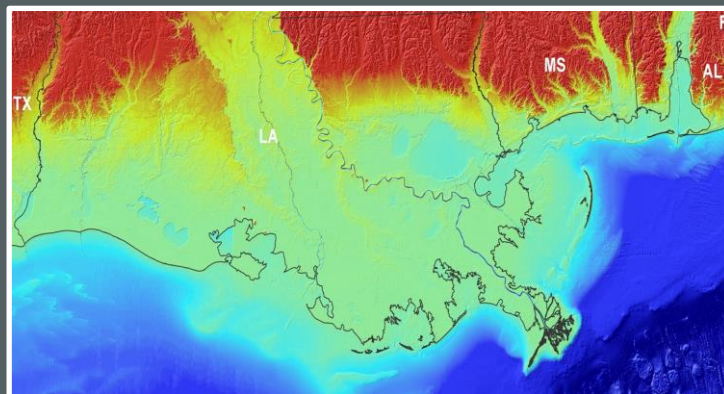


Mud Creek Landslide

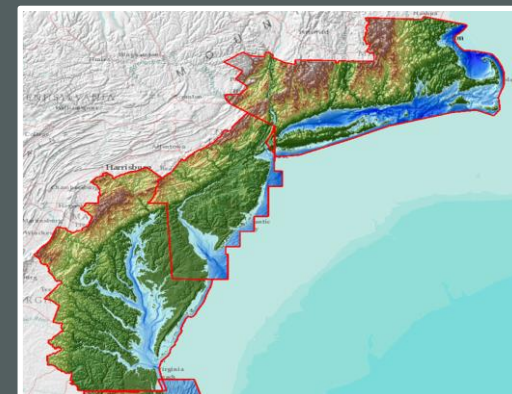
2015 CZMIL



Hawaii - Oahu



Northern Gulf of Mexico (NGOM)



Hurricane Sandy Region