

## CHAPTER 2B

### GEOGRAPHICAL DATA ACQUISITION AND BASEMAP DEVELOPMENT OF HISTORICAL BARATARIA BASIN

(Task 3.2B)

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#### 2B.1 Summary

Coast wide spatial information was collected, coded and processed to provide baseline information for modeling efforts. The spatial information includes habitat, topography and bathymetry information. We continue our efforts to collect, organize, and process available temporal information for the Barataria Basin.

#### 2B.2 Introduction - Task Objective

The CLEAR skill assessment exercise proposed to measure current forecasting abilities for the Barataria Basin as a comprehensive approach to combine model results and observations to define the present status and predict future trends in this watershed. The previous watershed model for this area (BTLESS) included a large spatial and environmental database dated 1996 as their endpoint. In parallel to this modeling effort, other state agencies have also initiated landscape models for coastal Louisiana. All of these efforts necessitate a common database easily available through a clearinghouse site. This database is critical for accurate testing and evaluation of state-of-the-art computational abilities. This common database will guarantee access to the same information by the multiple researchers and will favor multi-institutional collaborations as data is exchanged, corroborated and utilized. The clearinghouse could also act as an historical archive of the different efforts and up-to-date environmental spatial and temporal information. As a seminal effort to populate this CLEAR database, the objective of this task was to prepare, code and process the available historical spatial and temporal data required for the Barataria Basin. The spatial and temporal data includes, but is not limited to, bathymetry, habitat classified maps and temporal inputs (e.g., tides and salinity) to the model domain. However, in support of other efforts, the data includes spatial information for the Louisiana coastal zone.

#### 2B.3 Methodology

Study area maps were collected from three different sources. The USGS National Wetlands Research Center has prepared vegetation/habitat maps of the coastal zone for three different years (1956, 1978 and 1988). Copies of the original jpg files were obtained from Mr. DeWitt Braud, Dept. of Geography, Louisiana State University. The most recent of habitat classified

image (the composite of 1988/90) raster is available for download at the LSU ATLAS website (atlas.lsu.edu). These maps were digitized and georeferenced with a GIS software (ArcView) that facilitates the manipulation of the data in an effective manner.

The topographic data was downloaded from the Atlas website (atlas.lsu.edu), a site maintained by the LSU CADGIS Research Laboratory. Currently downloadable is the contour form (as shapefiles), the DEM form, the raw point form, and the edited point form of the LIDAR data. Each file contains these four forms and associated metadata files stored in a zip archive. The total of downloaded files was 963 zip files, although this database is being constantly updated.

The bathymetry data was collected from NOAA- National Geophysical Data Center. A search was processed to locate all available data points. Figure 2B-1 indicates the results of this search. As observed in the figure most of the information is coastwise and no shallow water bodies are reported.

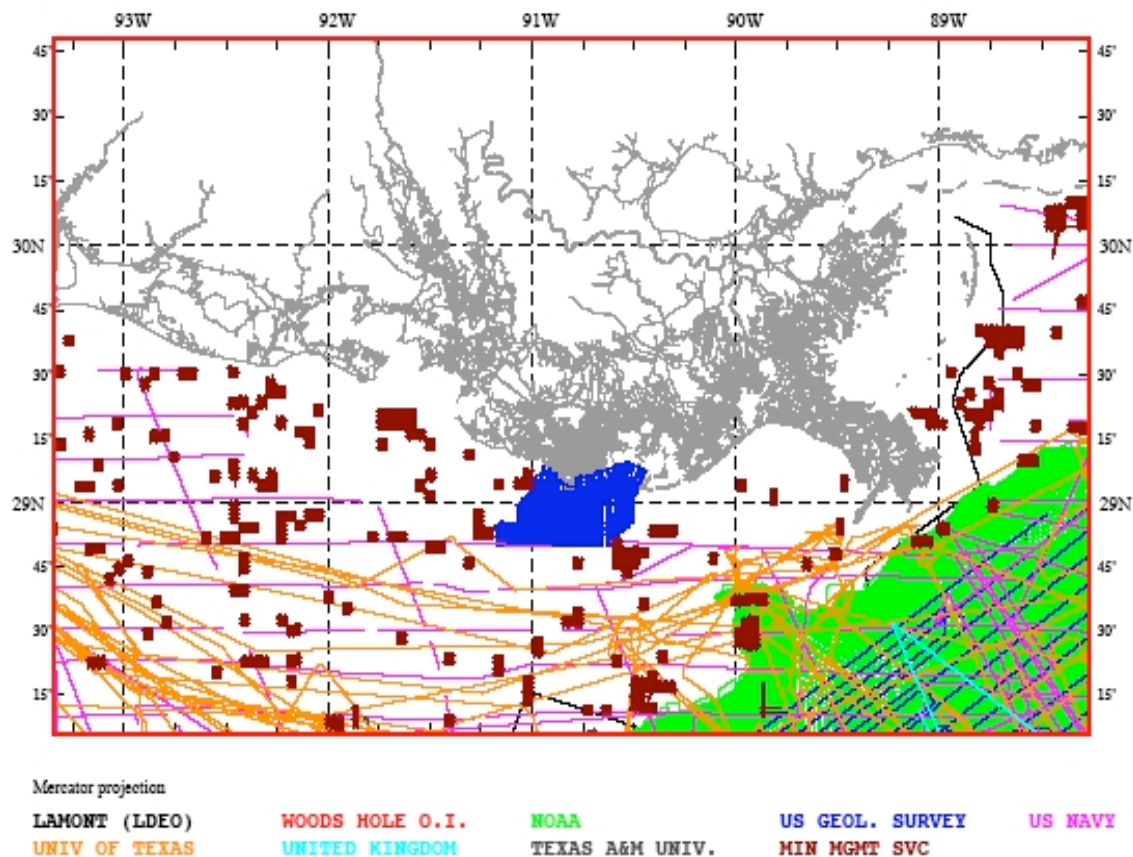


Figure 2B-1. Data points available for download for the Louisiana Coastal Area from NOAA.

### 2B.3.1 Habitat Classified Maps

The coastal Louisiana land cover and wetland trend data developed by the NWRC was generated from various data sets developed by the NWRC and the State of Louisiana, Department of Natural Resources (LA DNR) for various projects. The 1956 and 1978 raster

habitat datasets were produced by the Louisiana Geological Survey under contract to the LA DNR Coastal Management Division for a Minerals Management Service (MMS) funded study of marsh management practices in coastal Louisiana. The 1956 and 1978 data sets were based on US Fish and Wildlife Service (USFWS) habitat data. The 1988/90 data set is a composite produced by the NWRC and was based on 1988 habitat data and 1990 classified Landsat Thematic Mapper Satellite water data also produced by the NWRC (see ORG\_LA\_HAB directory). The classified images did not have a common coordinate or point of origin. The 1988/90 was the smaller of the files and thus the other two maps were trimmed to match the area (see ORG\_REF\_LA\_HAB directory). These maps were then reclassified to four wetland categories (1. swamp, 2. fresh, 3. brackish and 4. salt marshes), and two other habitats (open water and developed lands) to match the categories used by the previous landscape models (see REF\_LA7\_HAB directory) and finally, the maps were aggregated to 1 km<sup>2</sup> by majority rule to create a coast-wide map (see ONEKM\_LA7\_HAB directory).

### 2B.3.2 Topography Maps

The Light Detection And Ranging data is a georeferenced elevation data and dense coverage. There are several hundred files that cover most of the Louisiana coastal zone. Each file represents a DEM quadrangle. The files were downloaded and processed to create a 1-km<sup>2</sup> map that incorporates the average value of all the LiDAR data per cell. The resulting map matches the habitat map extension.

### 2B.3.3 Bathymetry Data

The bathymetry request to the National Geophysical Data Center clearly indicates that shallow water bodies are not considered by routine surveys and we have been unable to gather this information.

## 2B.4 Results

(see also 9 DVDs included with report)

- A. Percentage of work completed - 45% of task work has been completed.
  - 1. Tasks and/or milestones completed - Task 1 spatial database was completed.
  - 2. Data acquired and or processed
    - a. Habitat Maps Directory Structure
      - ORG\_LA\_HAB - original spatial maps
      - LA19XXHAB - a subdirectory per year which includes:
        - Filename.tif - original geotif image from
        - Filename.img - formatted file for ArcGIS
        - Filename.jpg - graphic file
        - Filename.xml - data spec file
        - Filename.dat - ascii raster file
        - Filename.obj - binary compressed file
      - ORG\_REF\_LA\_HAB - georeference spatial maps all areas same size.
      - LA19XXHAB - a subdirectory per year which includes:

- Filename.tif - formatted geotif image
- Filename.img - formatted file for ArcGIS
- Filename.jpg - graphic file
- Filename.xml - data spec file
- Filename.dat - ascii raster file
- Filename.obj - binary compressed file
- REF\_LA7\_HAB - reclassified spatial maps under the BTLESS model.
- LA19XXHAB - a subdirectory per year which includes:
  - Filename.tif - formatted geotif image
  - Filename.img - formatted file for ArcGIS
  - Filename.jpg - graphic file
  - Filename.xml - data spec file
  - Filename.dat - ascii raster file
  - Filename.obj - binary compressed file
- ONEKM\_LA7\_HAB - aggregated spatial maps to 1 sq. km.
- LA19XXHAB - a subdirectory per year which includes:
  - Filename.tif - formatted geotif image
  - Filename.img - formatted file for ArcGIS
  - Filename.jpg - graphic file
  - Filename.xml - data spec file
  - Filename.dat - ascii raster file
  - Filename.obj - binary compressed file

b. Topography Maps

- ONEKM\_LA\_TOPO.jpg - graphic file
- ONEKM\_LA\_TOPO.xml - data spec file
- ONEKM\_LA\_TOPO.dat - ascii raster file
- ONEKM\_LA\_TOPO.obj - binary compressed file

c. Bathymetry Maps – A total of 18 files are included as result of our request to the NGDC.

B. Tasks and/or milestones not accomplished

- Nature of problems encountered (eg. Model development; data needs; project needs) - TASK 2 Time Series Database - The BTLESS model incorporated nine climate forcing functions, including wind speed and direction, rainfall and evaporation, and tide in hourly time series, while salinity, temperature, river discharge, and inorganic sediment concentrations as daily time series. Wind velocity and direction records start in 1964 for the area, tide stages were acquired from the National Ocean Service (NOS) at Bayou Rigard, Grand Isle for 1955-1979 and from East Point, Grand Isle from 1980-1988. Salinity values from Grand Terre Laboratory (near Grand Isle) collected by Louisiana Department of Wildlife and Fisheries were used as the boundary condition for the Barataria basin (1959 – 1988) Daily maximum temperature records were collected from the National Weather Service tables for New Orleans Airport. Daily river discharge and sediment load data was obtained from the US Army Corps of Engineers, New Orleans District for the Tabert Landing Station. The updating of this information has taken longer than planned. Several new sources have been identified.
- Remedial action taken or planned - We are in talks with Mr. Eric Swenson to crosscheck and corroborate new sources of information.