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STUDY TITLE: Development of Alabama GIS Data in Support of the MMS Gulf-wide Information System (G-WIS)

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CONTRACT NUMBER: 31025

SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREAS: Eastern and Central Gulf of Mexico

FISCAL YEAR OF PROJECT FUNDING: 2000

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COST: FY 2000: $100,000

PROJECT MANAGERS: B. Tew

AFFILIATION: Geological Survey of Alabama

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KEY WORDS: Eastern Gulf of Mexico; Alabama; Geographic Information System; GIS; biology; oil spill contingency planning; land use/land cover; human-use data; administrative boundaries; oil and gas

BACKGROUND: The Alabama Coastal area is a region of dynamic and complex coastal and nearshore ecosystems and natural environments in which anthropogenic factors and pressures have become increasingly significant. Parts of coastal Alabama have been extensively impacted by rapid growth and development associated with urban and residential expansion, a flourishing tourism/resort industry along the Gulf of Mexico beaches, and both onshore and offshore oil and gas exploration and development activities, among other factors. Owing to the complexity and diversity of issues and problems related to the coastal area, its environmental sensitivity, and its importance to Alabama's economic and social development, GSA has conducted numerous scientific investigations in the area, many of which have led to published reports of findings.

In 1995, the GSA participated in mapping of shoreline types for use in oil spill contingency planning during the initial phases in the development of the MMS G-WIS. Limited financial resources at that time restricted data development and GIS compilation to identification and attribution of shoreline types. Therefore, additional GIS development is necessary to provide comprehensive data to support oil spill

contingency planning and other environmental applications and analyses in the Alabama region.

This data development program targeted the Alabama coastal counties (Mobile and Baldwin) and the offshore Alabama state waters area. The successful completion of this project will result in a more comprehensive GIS database for the Alabama coastal area that will enhance the ability of MMS, state resource agencies, and others to make informed decisions regarding the development of Alabama's coastal and offshore resources in a safe, environmentally prudent manner.

OBJECTIVES: (1) Identify the best available data/information resources for development or update of the data layers to be compiled; (2) Modify, compile, and integrate identified existing data into G-WIS specified digital format; (3) Develop new data sets, particularly up-to-date land use/land cover, as appropriate; and (4) Make all data developed as part of this project available to MMS, industry, and the public in various electronic formats and via various delivery mechanisms.

DESCRIPTION: This data development program targeted the Alabama coastal counties (Mobile and Baldwin) and the offshore Alabama state waters area. Recent vintage (1995-1996) LandSat Thematic Mapper imagery (35m resolution) was classified to determine land use/land cover. This classification was based on a modified Anderson classification scheme developed at the USGS. Fieldwork included mapping land use seed sites onto enlarged paper copies of the imagery to serve as a check for the classification. The imagery was then classified using ERDAS Imagine® software. The raster image was then vectorized into an ArcInfo coverage. A coverage of all roads in the coastal counties (ROADS) based on the United States Geological Survey (USGS) Digital Line Graphs (DLGs) was created. A coverage (PLAC_NAM) of point features representing all place names on USGS Topographic maps was created from the USGS Geographic Names Information System (GNIS). A state oil and gas lease block boundary coverage (LEAS_ST) was created from a Chart of Submerged State Lands produced by the Alabama Department of Conservation and Natural Resources (DCNR). USGS 7.5 minute topographic map index coverage (INDEX) was created to include all 7.5 minute Topographic maps (Scale 1:24,000) in Mobile and Baldwin Counties A managed lands coverage (MGT) of public lands managed by state and federal agencies was created from available shapefiles from the DCNR State Lands Division, the USGS, and the United States Forest Service. The shapefiles were obtained in a variety of projections and generated at a variety of scales. The GSA converted all shapefiles to ArcInfo coverages and projected them all to a common projection. Each newly generated coverage was reviewed and the coverages were appended into a managed lands coverage. Because many of the managed lands boundaries are unavailable, it is unlikely that this coverage includes all managed lands in the coastal counties, but it does include a significant portion of the available data. Stream (STREAMS) and lakes (LAKES) coverages containing all linear and polygonal water-related features were created from USGS DLGs. All water bodies in the coverage that were labeled on the USGS 1:100,000 topographic maps were attributed with the name listed on the map. The point human-use features coverage (SOCECON) and associated attribute (SOC_DATA) and source (SOURCES) information was updated to include additional

features (e.g., gas wells, gas platforms, factories, artificial reefs, etc.). The biologic data table (BIORES) and species table (SPECIES) were updated to remove *Cepphus grille* (Black guillemot) because this bird is not found in Alabama based on information provided by the DCNR Marine Resources Division. While reviewing the biologic data with ADCNR Marine Resources Division, two mammal species present off the coast of Alabama, the Bottlenose dolphin and the West Indian manatee, were identified as absent from the database. Although, no systematic study of these marine mammals has been completed, some systematic and anecdotal information is available. A marine mammal (M_MAMMAL) polygon coverage to indicate marine mammal presence in the Alabama waters was created and associated SEASONAL, BIORES, BREED, SPECIES, and SOURCES tables were updated to include the marine mammal data. Data for these marine mammals were entered into the database in a generic fashion to include a presence in all Alabama coastal waters. All other biologic data coverages were reviewed by biologists with the DCNR Marine Resources Division and found to be acceptable. All data sets were compiled in accordance with the Gulf-Wide Information System Database Specification Manual and the Gulf-Wide Information System Data Dictionary. All data sets were documented with metadata developed according to the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM).

SIGNIFICANT CONCLUSIONS: Sixteen GIS datasets and tables were created or updated during this project. Although these data sets include all available data, some of the data sets may not be complete compared to ground conditions because systematic study and compilation of data for the coastal area has not been completed.

STUDY RESULTS: Sixteen GIS datasets and tables were created or updated during this project. These data sets result in a more comprehensive GIS database for the Alabama coastal area.

STUDY PRODUCTS: The following ArcInfo coverages, look-up tables and FGDC compliant metadata records for all coverages were provided to MMS on CD-ROM:

BIORES
BREED
INDEX
LAKES
LAND_USE
LEAS_ST
MGT
M_MAMMAL
PLAC_NAM
ROADS
SEASONAL
SOCECON
SOC_DATA
SOURCES
SPECIES
STREAMS

*P.I.'s affiliation may be different than that listed for Project Manager.