

**STUDY TITLE:** Research, Compilation, and Digitization of Problematical and Uncontrolled Source Maps for the Louisiana Statewide Oil and Gas Pipeline Digital Database

**REPORT TITLE:** Outer Continental Shelf pipelines Crossing the Louisiana Coastal Zone: A Geographic Information System Approach

CONTRACT NUMBER: 1435-01-98-CA-30895

SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREA(S): Louisiana Coastal Zone, coastal waters, and OCS Area

FISCAL YEAR (S) OF PROJECT FUNDING: 1998, 1999

COMPLETION DATA OF REPORT: August 2002

COST(S); FY 1998 \$64,518; CUMULATIVE PROJECT COST \$64,518

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KEY WORDS: Northern Gulf, Louisiana Coastal Zone, pipeline, GIS, maps, georeference, OCS

**BACKGROUND:** The Louisiana Geological Survey (LGS) had compiled over 1000 high quality, detailed pipeline maps into a Geographic Information System (GIS). Additional pipeline source maps had been collected, but contained inadequate geodetic control for digitization. These problematic and uncontrolled source maps required additional work to enable their use as accurate GIS sources. By assisting LGS in the compilation of this material, MMS gains the best digital pipeline data available in the Louisiana Coastal Zone (LCZ). MMS had a requirement to merge this data with their own OCS pipeline GIS data, identify OCS-originating pipelines that enter the Louisiana Coastal Zone, and identify their termini or LCZ exit point.

**OBJECTIVES:** (1) To use lab and field methods to georeference the uncontrolled source maps possessed by LGS and to digitize them into the LGS Pipeline GIS. (2) to merge the Louisiana pipelines with the MMS OCS pipelines in a GIS environment. (3) to identify and trace the OCS originating pipelines to their termini within, or their exit point from, the Louisiana Coastal Zone.

**DESCRIPTION:** The study area consists of the Louisiana Coastal Zone and the Louisiana OCS Area. The project has five major phases. (1) Evaluation of existing inadequate source maps and research to determine best methods of problem resolution. Some archival research and field investigation of suspicious pipelines was necessary. (2) Establishing spatial control (geo-referencing) for the existing uncontrolled source maps. Problems with detail level, map projections, edge-matching, and cartographic errors were corrected. (3) Digitization and GIS compilation of the pipeline map data. Both digitizing table and heads-up technology was used to enter spatial data. Attribute data was entered in a database (4) Merging the LGS data with MMS offshore data set. ArcInfo export file (.e00 format) obtained from MMS was combined and edgematched in a GIS (5) Identification of OCS originating pipeline termini. Each pipeline termini was characterized as to type tie-ins, receiving stations, compression stations, separation stations, gas plants, liquid processing stations, measurement and regulation stations, refineries and docking facilities. For those pipelines passing through the LCZ, their exit points are noted.

**SIGNIFICANT CONCLUSIONS:** This collaborative project between MMS and LGS has resulted in considerable value added to each organization's pipeline data, and thus significant enhancement of their routine, pipeline related activities. The OCS pipeline GIS data produced for this project is not a complete inventory of the OCS pipelines that pass through the Louisiana State waters, due to an incomplete collection of operator source maps. However, an efficient method for establishing a substantial OCS pipeline GIS for the Louisiana Coastal Zone has been completed. Additions to these data should prove to be even more efficient, now that this methodology has been established. For the Louisiana Geological Survey and Mineral Management Service of the U.S. Department of Interior to pool resources to produce compatible, public domain, pipeline data for both the State of Louisiana and the United States of America, has proven to be a mutually beneficial endeavor.

**STUDY RESULTS:** Geospatial control was established for one hundred and eighteen (118) LGS in-house, operator supplied, source maps. Two hundred and fifteen (214) LGS in-house source maps, from fifteen (15) companies were digitized and compiled into the LGS digital pipeline system. These LGS pipeline data were merged with the MMS/OCS pipeline data to meet the MMS database definition and format specifications. All LGS and MMS pipeline linear features that do not enter the Outer Continental Shelf were deleted. For the purpose of edgematching at the State/Federal boundary, a total of thirty-one (31) LGS pipeline linear features were spatially adjusted. All edgematching adjustments were made under MMS advisement.

The LGS pipeline attribute data, derived from one hundred and twenty-four (124) source maps, were populated into the database. All pipelines were traced from their origin in the OCS to terminus.

One pipeline (1) crosses the Louisiana Coastal Zone; and exits by way of the Texas/Louisiana state boundary. One pipeline (1) crosses the Louisiana Coastal Zone

and exits by the way of the Mississippi/Louisiana state boundary. Four pipelines (4) enter the Louisiana Coastal Zone and terminate at a refinery. Fifteen pipelines (15) enter the Louisiana Coastal Zone and terminate at a tanker terminal.

**STUDY PRODUCT(S):** Peele R.H., J. Snead, and W. Feng, 2002. Outer Continental Shelf Pipelines Crossing the Louisiana Coastal Zone: A Geographic Information System Approach. A final report for the U.S. Department of the Interior, Minerals Management Service Gulf of Mexico OCS Region, Metairie, LA. Cooperative Agreement No.1435-01-98-CA-30895.

Peele, R.H., W. Feng, and J. Snead, 2002. Outer Continental Shelf Pipelines Crossing the Louisiana Coastal Zone: A Geographic Information System CD-ROM. A CD-ROM containing the GIS data in both ArcView and ArcInfo formats for the U.S. Department of the Interior, Minerals Management Service Gulf of Mexico OCS Region, Metairie, LA Cooperative Agreement No. 1435-01-98-CA-30895.