ACCESS NUMBER: 52847

STUDY TITLE: Five-Year Meteorological Datasets for CALMET/CALPUFF and OCD5 Modeling of the Gulf of Mexico (GOM) Region

REPORT TITLE: Five-Year Meteorological Datasets for CALMET/CALPUFF and OCD5 Modeling of the Gulf of Mexico (GOM) Region

CONTRACT NUMBER: 03-06-PO-52847 (M06PX00073)

SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREAS: Western, Central, and Eastern Gulf of Mexico

FISCAL YEARS OF PROJECT FUNDING: 2006, 2007

COMPLETION DATE OF REPORT: July 2008

COSTS: Cumulative Project Cost: $50,000

PROJECT MANAGER: J. Haney

AFFILIATION: ICF International

ADDRESS: 101 Lucas Valley Road, Suite 260, San Rafael, CA 94903

PRINCIPAL INVESTIGATORS*: J. Haney, S. Douglas, B. Hudischewskyj

KEY WORDS: Meteorological data, CALMET, CALPUFF, OCD5, Gulf of Mexico

BACKGROUND: The Minerals Management Service (MMS) is the designated federal agency with the authority to regulate oil and gas exploration and development activities in the central and western planning areas of the Gulf of Mexico Outer Continental Shelf (OCS) region. In addition to managing oil and gas resources in the region, the MMS is also charged with environmental management responsibilities, including those related to air quality. The National Environmental Policy Act (NEPA) mandates the type of environmental reviews or assessments that need to be conducted in the area to assess potential on-shore air quality impacts of exploration, development, production, and pipeline right of way activities. Some assessments require the application of air quality dispersion models to evaluate potential impacts. Such analyses in the past were conducted using the updated Offshore and Coastal Dispersion (OCD5) model and often relied on a pre-processed, two-year meteorological dataset (1991-1993) as input. This dataset is now somewhat outdated. MMS expects that future air quality modeling efforts will rely on more recent and comprehensive datasets that include onshore surface and upper-air data, offshore buoy data, and output from prognostic meteorological models. MMS also plans to adopt the use of the EPA approved CALMET/CALPUFF Version 5.8 modeling system (dated June 23, 2007).

OBJECTIVES: In this study, ICF has prepared an up-to-date five-year meteorological dataset for the Gulf of Mexico OCS region that can be used to run air quality models for

a variety of environmental assessments. Geographically, the dataset covers the Gulf of Mexico (GOM) region, including both onshore and offshore areas. Given the disruption (to environmental monitors and activities) in the GOM caused by Hurricanes Katrina and Rita in late August 2005, the data were prepared for the period 2000-2004.

DESCRIPTION: The five-year dataset consists of two subsets of files. One set of files is formatted for use with the CALMET/CALPUFF modeling system (Earth Tech, 2006). The CALMET/CALPUFF input data files were constructed using a combination of onshore surface and upper-air data from the National Weather Service (NWS), offshore buoy data from the National Data Buoy Center (NDBC), and model output from the Rapid Update Cycle (RUC) model. Ozone data were also compiled as part of this dataset and these data were obtained from the EPA Air Quality System (AQS).

The second set of files is formatted for use with the updated Offshore Coastal Dispersion (OCD5) model (Chang and Hahn, 1997). The OCD5 files were prepared using onshore surface and upper-air data from the NWS, mixing height estimates obtained from the National Climatic Data Center (NCDC), and offshore buoy data from the NDBC.

SIGNIFICANT CONCLUSIONS: The datasets are intended for use by MMS and the OCS oil-gas, sand-gravel or alternative energy industry to assess potential impacts of future offshore oil and gas development in the GOM region, using either the CALMET/CALPUFF or OCD5 modeling systems. The data, data processing methods, quality assurance procedures, and output file formats and contents are described in the report.

STUDY RESULTS: As noted above, the study involved the preparation of an up-to-date five-year meteorological dataset for the Gulf of Mexico OCS region that can be used to run air quality models for a variety of environmental assessments. Datasets were created for the period 2000-2004 for both the CALMET/CALPUFF and Offshore Coastal Dispersion (OCD5) air quality modeling systems.

STUDY PRODUCTS: Douglas, S.G., and A.B. Hudischewskyj. Five-Year meteorological datasets for CALMET/CALPUFF and OCD5 modeling of the Gulf of Mexico Region. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2008-029. 53 pp.

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