ACCESS NUMBER: 10621

STUDY TITLE: Hydrographic Survey of NW Gulf of Mexico on R/V GYRE Cruise 89G-06

REPORT TITLE: Hydrographic data from the Texas and Louisiana Continental Shelf of the Northwest Gulf of Mexico: Texas Institutions Gulf Ecosystem Research Cruise 89G-06

CONTRACT NUMBER: MMS Purchase Order No. 10621

SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREAS: Central Gulf of Mexico; Western Gulf of Mexico

FISCAL YEAR OF PROJECT FUNDING: 1989

COMPLETION DATE OF REPORT: June 1989

COST: FY 1989: $11,000

CUMULATIVE PROJECT COST: $11,000

PROJECT MANAGER: D.C. Biggs

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KEY WORDS: Gulf of Mexico; Loop Current rings; hydrographic data; nutrients; chlorophyll; plankton standing stocks

BACKGROUND: From 16-25 May 1989, a 10 day R/V GYRE cruise was fielded for Training and Research in support of the Texas Institutions Gulf Ecosystem Research program. Texas A&M University (TAMU) funded the shiptime and provided salary for the 14C Productivity Tech on board, while the US Minerals Management Service (MMS) met the direct costs for four additional TAMU technicians to participate (2 MTs + 2 ETs).

OBJECTIVES: To collect hydrographic data to be shared with MMS from the East Breaks region of the northwest Gulf of Mexico during a Texas A&M Training & research cruise of R/V GYRE. The TAMU Technical Support Services Group proposed to operate CTD/rosett multisampler, 6-channel autoanalyzer, salinometer and a dissolved oxygen rig to acquire CTD and bottle hydrographic data from 18 24 stations over the Texas-Louisiana continental shelf. Within 30 days after the end of the cruise, hydrographic data were shared with MMS in technical report format, and within 90 days

after the end of the cruise the data will be provided to the MMS COTR in magnetic tape format.

DESCRIPTION: The principal scientific programs were: (1) continue "standard" sections of the Texas continental shelf in water depths of 20m, 50m, 100m and 200m off Galveston and off Corpus Christi. At each station: (a) do a vertical profile of the water column with CTD/rosette multisampler, taking bottle samples every 5m (20m station), 10m (50m and 100m stations) or 20m (200m station) for analysis of nutrients + oxygen + chlorophyll; (b) sample with Small Box Core to describe total benthic fauna and flora, trace metal content! organic carbon, grain size, and petroleum hydrocarbon composition; (c) sample with 30-foot benthic otter trawl to describe epifauna and fish; (d) do net hauls for phytoplankton (0.2m net) zooplankton (1m net) characterization; (2) extend these "standard" sections seaward onto the upper slope in water depths of 500m and 1000m, to sample upper slope distributions of CO2 and alkalinity in relation to Redfield oxic remineralization vs. anaerobic sulfide metabolism; (3) occupy a hydrographic station over, the site of the 1974 "blow-out" of a Pennzoil platform (270 57'7" N, 940 24'1" W) to see if hypersaline brine might be present within the crater; (4) occupy hydrographic stations in the Atchafalaya River and Bay, to follow up geochemical and radionuclide investigations begun there in March 1989 on GYRE cruise 89G-02; (5) make daily measurements of 14C production to continue/extend a long-term comparative study of primary productivity at various locations and seasons on the Texas shelf; (6) deploy drifting sediment traps to measure the flux of particulate matter out of surface waters concurrent with primary production measurements; (7) test benthic lander respirometer package and toward multi-frequency towed fish; (8) compile surface data on temperature, salinity, and chlorophyll continuously throughout the cruise to continue/extend the local reference data set begun on GYRE; cruise 87G-10, 87G-11, 87G-12, 88G-05, and 89G-02.

STUDY RESULTS: At each of the CTD stations, up to twenty-four 10 liter Niskin bottles were tripped on the upcast for analysis of nutrients, dissolved oxygen,a nd chlorophyll + acid degradation products. Nutrient analyses for nitrate, nitrite, ammonium, urea, silicate and phosphate were carried out on board, with a Technicon AA-11 six channel autoanalyzer. Dissolved oxygen was determined by a modified Winkler titration method, and pigments were estimated by the "Turner" fluorometric method (see Parsons et al, 1985). A Seatech 25cm pathlength transmissometer attached to the CTD provided information about suspended particle concentrations.

In addition to the hydrographic work, primary productivity was measured on May 18, 20, 21, 22, 23, and 24 in 6-hour on-deck 14C uptake experiments from 9 a.m. to 3 p.m. local time. Water samples and net tows were taken to characterize phytoplankton species composition,a nd zooplankton standing stocks were sampled with a 1m net of 333-um meh that was towed for 30 minutes at each of the CTD stations. The volume of water filtered by these zooplankton tows was estimated by a General Oceanics impeller type flowmeter that was strong across the mouth of the net.

STUDY PRODUCTS: Technical Report 89-03-T of the Department of Oceanography of Texas A&M University, College Station, Texas 77843.

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This 152-page data report is available for the cost of xeroxing plus postage and handling from the TAMU Department of Oceanography. Cost is $15 per copy if mailed Book Rate; $25 per copy if mailed First Class. It will also be submitted to the National Technical Information Service by MMS. Data are also available on 9-track magnetic tape, upon request by OMNET telemail to TAMU. TECHS.

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