NOAA Technical Memorandum NMFS-SEFC-147

Bibliographies of the National Marine Fisheries Service's Assessments of Impacts of the Buccaneer Gas and Oil Field and of Brine Disposal from Salt Domes of the Strategic Petroleum Reserve.

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NOTICE

This Technical Memorandum should be cited as follows:

Caillouet, C. W., Jr. 1984. Bibliographies of the National Marine Fisheries Service's assessments of impacts of the Buccaneer gas and oil field and of brine disposal from salt domes of the Strategic Petroleum Reserve. NOAA Technical Memorandum NMFS-SEFC-147, ii + 35 p.

It can be obtained by writing to the National Technical Information Service, 5258 Port Royal Road, Springfield, Virginia 22161.

Bibliography of the National Marine Fisheries Service's Assessment of Impacts of Buccaneer Gas and Oil Field

The environmental assessment of the Buccaneer gas and oil field in the northwestern Gulf of Mexico was conducted during 1975-1980. The project, funded by the Environmental Protection Agency through Interagency Agreement with NOAA/NMFS and managed by the NMFS Galveston Laboratory, was an inter-disciplinary investigation of environmental impacts of the Buccaneer gas and oil field located about 50 km south southeast of Galveston, Texas. The investigation covered sediments, suspended particulates, hydrocarbons, biocides, elemental sulfur, avian populations, benthic communities, microbial communities, fishes (pelagic, demersal and reef), macro-crustaceans, bio-fouling communities, currents and hydrography, trace metals, ichthyoplankton, and mathematical modeling. The journal articles, reports, dissertations and theses from this study are listed below (many of the reports are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161:

Anderson, J. B., R. R. Schwarzer, and H. C. Clark. 1977. Sedimentology, geochemistry and trace metal analysis, p. 89-174. In: Jackson, W. B. (ed.), Environmental assessment of an active oil field in the northwestern Gulf of Mexico, 1976-1977. NOAA Annual Report to EPA, NTIS Accession No. PB 283890.

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Bibliography of the National Marine Fisheries Service's Assessment of Impacts of Brine Disposal from Salt Domes of the Strategic Petroleum Reserve

The Energy Policy and Conservation Act of 1975 (PL 94-163) required the development of a SPR (Strategic Petroleum Reserve) to avert future energy crises such as that experienced by the United States in the early 1970's. As a consequence, the DOE (U.S. Department of Energy) developed a SPR program that involved solution-mining of land-based salt domes in Texas and Louisiana to create caverns for the storage of petroleum. The program called for discharge of concentrated brine, produced as a by-product of solution-mining of salt domes, into the waters of the northwestern Gulf of Mexico. The EPA (Environmental Protection Agency), NMFS (National Marine Fisheries Service), the commercial shrimp industry, and environmental groups expressed concern regarding potential effects of brine disposal on shrimp (Penaeus spp.) and other biota of the northwestern Gulf of Mexico. As required by EIS's (Environmental Impact Statements), brine disposal monitoring plans were developed by DOE, EPA and NOAA (National Oceanic and Atmospheric Administration). These plans encompassed environmental impact research managed by NMFS and others.

Among the salt dome brine disposal sites originally proposed by DOE, only two are currently operational: the Bryan Mound brine disposal site off Freeport, Texas, and the West Hackberry brine disposal

site off Southwest Louisiana (Fig. 1). At the Bryan Mound brine disposal site, brine discharge was initiated on March 10, 1980. At the West Hackberry brine disposal site, brine discharge began May 10, 1981. It has been proposed by DOE that an additional brine disposal site called Big Hill be located off the upper coast of Texas, and it is projected to become operational in 1985.

The NMFS brine disposal impact assessment consisted of four major projects (Table 1) carried out during the years 1978-1982 by NMFS and its contractors (Table 2). The research, managed by the NMFS SEFC (Southeast Fisheries Center) Galveston Laboratory in Galveston, Texas, was funded by DOE through interagency agreements with NOAA. Program management, which covered the NMFS projects and other projects carried out by the NOS (National Ocean Survey) and DOE contractors, was provided by NOAA's NESDIS (National Environmental Satellite, Data and Information Service) in Washington, D.C. Data management for the NMFS projects was provided by the NMFS SEFC NFEL (National Fisheries Engineering Laboratory) in Bay St. Louis, Mississippi, the NMFS SEFC FIMD (Fisheries Information Management Division) in Miami, Florida, and the NESDIS. Project data files are archived by FIMD and NESDIS.

For the most part, the projects employed state-of-the-art fisheries assessment techniques. The rationale for such an approach was (1) that the results would be expressed in terms familiar to the shrimp industry, and (2) any failure to detect impacts would suggest that the impacts were not of major consequence to the shrimp fisheries.

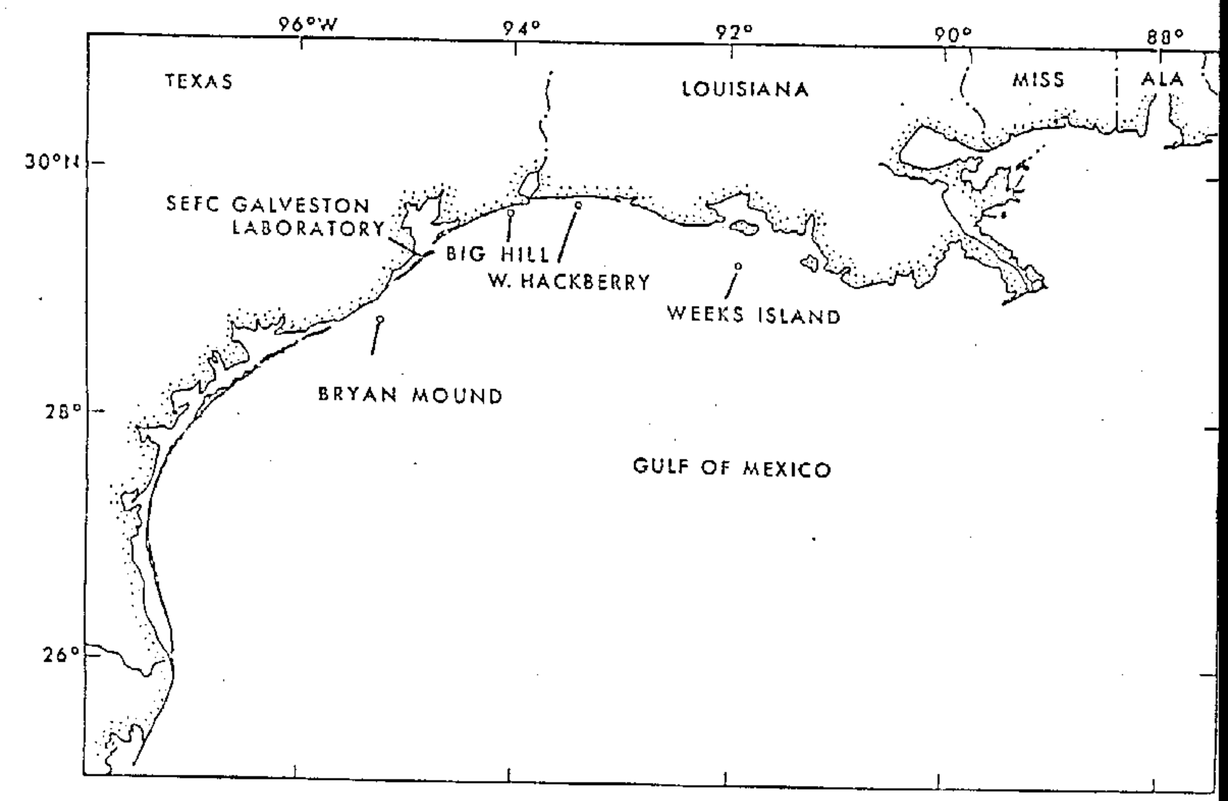

Figure 1. Locations of study sites in the assessment of impacts of brine disposal in the northwestern Gulf of Mexico.

Table 1. Sequences of four projects and their work units along with responsible organization or agency (in parentheses) contributing to the assessment of impacts of brine disposal in the northwestern Gulf of Mexico (See Table 2 for explanation of acronyms; see Fig. 1 for locations of study sites).

Projects and Work Units (responsible organization or agency)	1978 1979 1980 1981 1982
Biological/Chemical Survey of Texoma (West Hackberry) and Capline (Weeks Island) Sector Salt Dome Brine Disposal Sites off Louisiana	
Macro- and Meiobenthos (CEM)	X-X
Zooplankton (LGL)	X-X
Bacteria (TAMU)	X-X
Demersal Fishes & Macro-crustaceans (TAMU)	X-X
Sediments & Suspended Particulates (ERCO)	X-X
Hydrocarbons (ERCO)	X-X
Trace Metals (SRI)	X-X
Inorganic Nutrients (TAMU)	X-X
Shrimp Catch and Effort Data Analysis (LGL)	X-X
Shrimp and Redfish Studies; Bryan Mound Brine Disposal Site off Freeport, Texas	
Shrimp Catch and Effort Data Analysis (SAI)	X---X
Analysis of Shrimping Success, Recruitment & Environmental Variables (SAI)	X---X
Shrimp Mark-Release Investigations (LGL)	X---X
Shrimp Spawning Site Survey (LGL)	X---X
Shrimp Catch-Effort Sampling Survey (LGL)	X---X
Brine Toxicity Bioassays on Shrimp (UH)	X---X
Brine Avoidance/Attraction Bioassays on Shrimp (UH)	X---X
Brine Toxicity Bioassays on Redfish (TAMU/LGL)	X---X
Brine Avoidance/Attraction Bioassays on Redfish (TAMU/LGL)	X---X
Shrimp Population Studies; West Hackberry and Big Hill Brine Disposal Sites off Southwest Louisiana and upper Texas Coast	
Shrimp Catch and Effort Data Analysis (TAMU)	X---X
Analysis of Shrimping Success, Recruitment & Environmental Variables (URI)	X---X
Shrimp Mark-Release and Port Interview Sampling Survey (LGL)	X---X
Shrimp Spawning Site Survey (LGL)	X---X
Shrimp Population Studies; Bryan Mound Brine Disposal Site off Freeport, Texas	
Shrimp Mark-Release and Port Interview Sampling Survey (LGL)	X---X
Brine Disposal Impact Analysis & Assessment (TAMU)	X---X

Table 2. List of participating principal investigators contributing to the assessment of impacts of brine disposal in the northwestern Gulf of Mexico.

Boehm, P. D., ERCO (Energy Resources Company, Inc.), Cambridge, MA

Brooks, J. M., Department of Oceanography, TAMU (Texas A & M University), College Station, TX

Comiskey, C. E., SAI (Science Applications, Inc.), Oak Ridge, TN

Foreman, J., NESDIS (National Environmental Satellite, Data and Information Service), NOAA (National Oceanic and Atmospheric Administration), Washington, D.C.

Gallaway, B. J., LGL (LGL Ecological Research Associates, Inc.), Bryan, TX

Gazey, W. J., LGL, Bryan, TX

Grant, W. E., Department of Wildlife & Fisheries Sciences, TAMU, College Station, TX

Hausknecht, K. A., ERCO, Cambridge, MA

Holley, H., NFEL (National Fisheries Engineering Laboratory), SEFC (Southeast Fisheries Center), NMFS (National Marine Fisheries Service), NOAA, Bay St. Louis, MS

Howe, N. R., Marine Science Program, UH (University of Houston), Galveston, TX

Table 2.(continued)

Johnson, M. F., LGL, Bryan, TX

Landry, A. M., Department of Marine Biology, Mitchell Campus, TAMU, Galveston, TX

Margraf, F. J., LGL, Bryan, TX

Matis, J. H., School of Applied Statistics, TAMU, College Station, TX

Neff, J. M., Department of Biology, TAMU, College Station, TX

Owens, D. W., Department of Biology, TAMU, College Station, TX

Parker, R. H., CEM (Coastal Ecosystems Management, Inc.), Fort Worth, TX

Reitsema, L. A., LGL, Bryan, TX

Saila, S. B., Graduate School of Oceanography, URI (University of Rhode Island), Kingston, RI

Savastano, K., NFEL, SEFC, NMFS, NOAA, Bay St. Louis, MS

Schwartz, J. R., Department of Marine Biology, Mitchell Campus, TAMU, Galveston, TX

Tidwell, D., FIMD (Fisheries Information Management Division), SEFC, NMFS, NOAA, Miami, FL

Tillery, J. B., SRI (Southwest Research Institute), San Antonio, TX

Major products of NMFS's assessment were (1) final reports to DOE (see bibliography), copies of which are available from the DOC (Department of Commerce), NTIS (National Technical Information Service), 5285 Port Royal Road, Springfield, Virginia 22161, (2) data files archived by the NESDIS and the FIMD, and (3) research papers by participating investigators (see bibliography).

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