

# Real Science Review: Ecology



**7<sup>th</sup> Grade Student in Texas:** Miss Marple, you say we are going to analyze an Environmental Impact Statement concerning plans to lease plots off the Texas coast for oil drilling. But why do we, I guess I mean the government, want to lease at all? My folks told me we had a humongous oil spill about 10 years ago. Why are we allowing drilling at all?

**Miss Marple:** Whether or not we agree with the government policy of allowing offshore drilling, the fact is there is a policy to make the U.S. energy independent. Otherwise, we must import oil from other countries, who could choose to jack up the price or even withhold oil exports to us to make us do their bidding. In addition, some countries with which we are friendly are located in unstable regions and that can affect their exports of oil. We can't achieve energy independence without offshore drilling because this is where a great deal of oil and natural gas is found. Someone is going to produce the oil and gas we use. It might as well be us. The EIS is the government's way of understanding the environmental hazards and making sure that companies with a lease have the best technology and practices to minimize the impact of any accidents.

## Vocabulary Used in the Original Research Report

**Benthic:** Ocean floor in deep water (greater than 300 feet), soft bottom habitats containing microorganisms, coral and associated fauna.

**Federal Register:** This is the official journal of the federal government of the United States that contains government agency rules, proposed rules, and public notices.[1] It is published every weekday, except on federal holidays.

**Flower Gardens:** a region off the Texas coast with an unusually rich abundance of coral and reef life.

**Mitigation** (mi-tə-'gā-shən): making something less severe, dangerous, painful, harsh, or damaging

**Pelagic** (pə-'la-jik): relating to, or living or occurring in the open sea

**Stipulation** (sti-pyə-'lā-shən): a condition, requirement, or item specified in a legal instrument

Original Report: Gulf of Mexico Multisale Environmental Impact Statement for Proposed Gulf of Mexico OCS Oil and Gas Lease Sales. Published by Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, U.S. Department of the Interior, New Orleans. March, 2017.

The report consisted of:

Volume 1 (Executive Summary, Purpose and Need for Actions, Alternatives for Proposed Actions, Impact-producing Factors and Scenarios) 285 pages.

Volume 2 (Description of Affected Environment, Impact Analysis, Consultation and Coordination, 514 pages.

Volume 3 (12 Appendices)

This adaptation is of the Executive Summary, in Volume 1, 285 pages. Adapting authors: W. R. Klemm and Todd O'Hara

# Introduction

In pursuit of developing the nation's energy resources, and according to the Outer Continental Shelf Lands Act of 1953 as amended in 1988, the federal Bureau of Ocean Energy Management (BOEM) launched a 5-year program to evaluate the predicted environmental impact of leasing rights for 10 ocean drilling lease sales off the Gulf of Mexico coasts (Figure 1). The purpose of this program was to contribute to meeting domestic demand for oil and gas and enhance national economic security in an environmentally and economically responsible way. Oil is a fundamental resource, serving as feedstock for liquid hydrocarbon products, including gasoline, aviation and diesel fuel, and various other petrochemicals. The data obtained through this 5-year program study will enable BOEM to determine whether and how to proceed with lease sales for within the region.

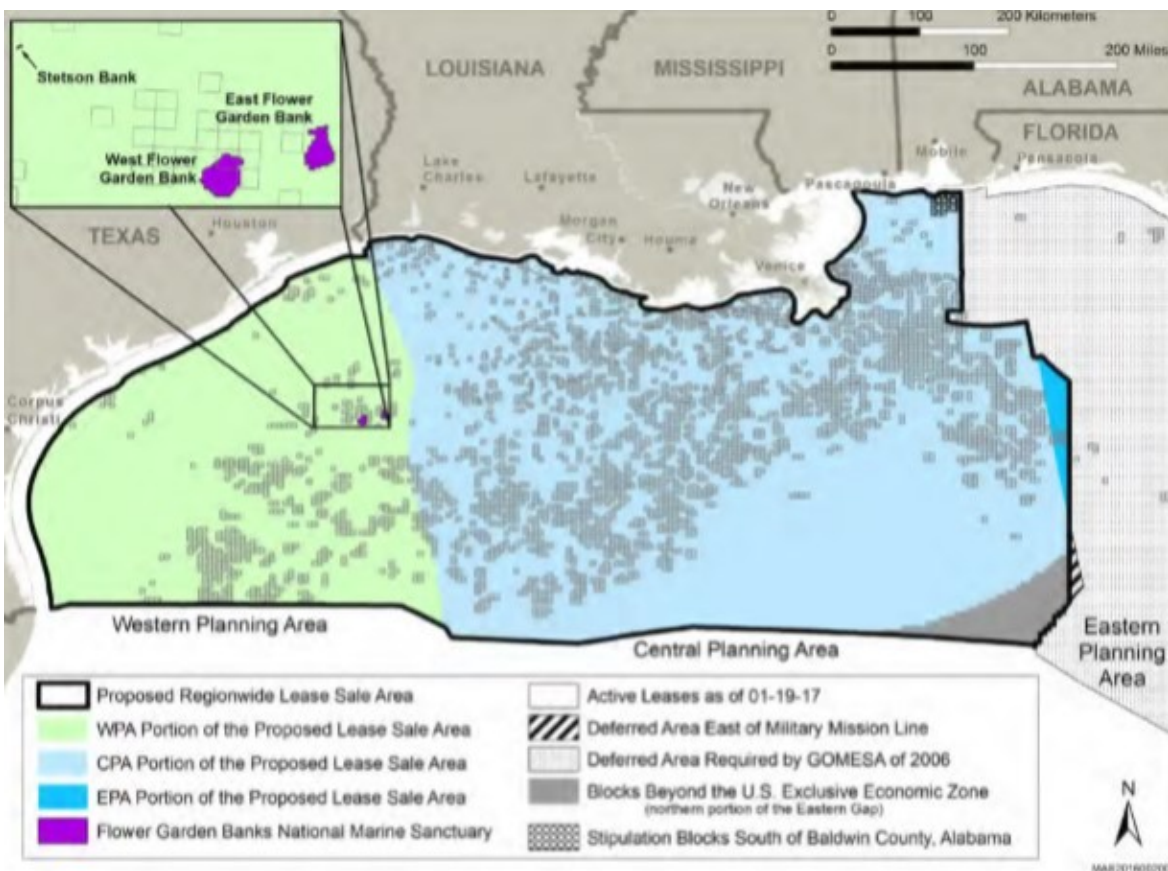


Figure 1. Proposed region-wide lease sale area for unleasable blocks within all three planning areas, totaling approximately 91.93 million acres.

## Introduction: Questions to Answer

1. To what extent has BOEM succeeded in defending the allowance of ocean drilling? How would you improve the defense?
2. To what extent has BOEM made the case that an EIS is needed?

Specifically, BOEM has prepared this Environmental Impact Statement (EIS) to identify potential environmental damage from ocean oil and gas drilling (Figure 2) and to use that information to inform requirements and stipulations to be included in lease contracts.

## Methods

The study aimed at specific proposed lease regions off the coasts of Texas, Louisiana, Mississippi, and Alabama. The plan was to study a specified region of coastal waters in each year of the 5-year plan. Prior to the study, public hearings prior to the study were held from April 29 to June 1, 2015 in five cities: New Orleans, Houston, Panama City, Mobile, and Gulfport. At the same time public comments

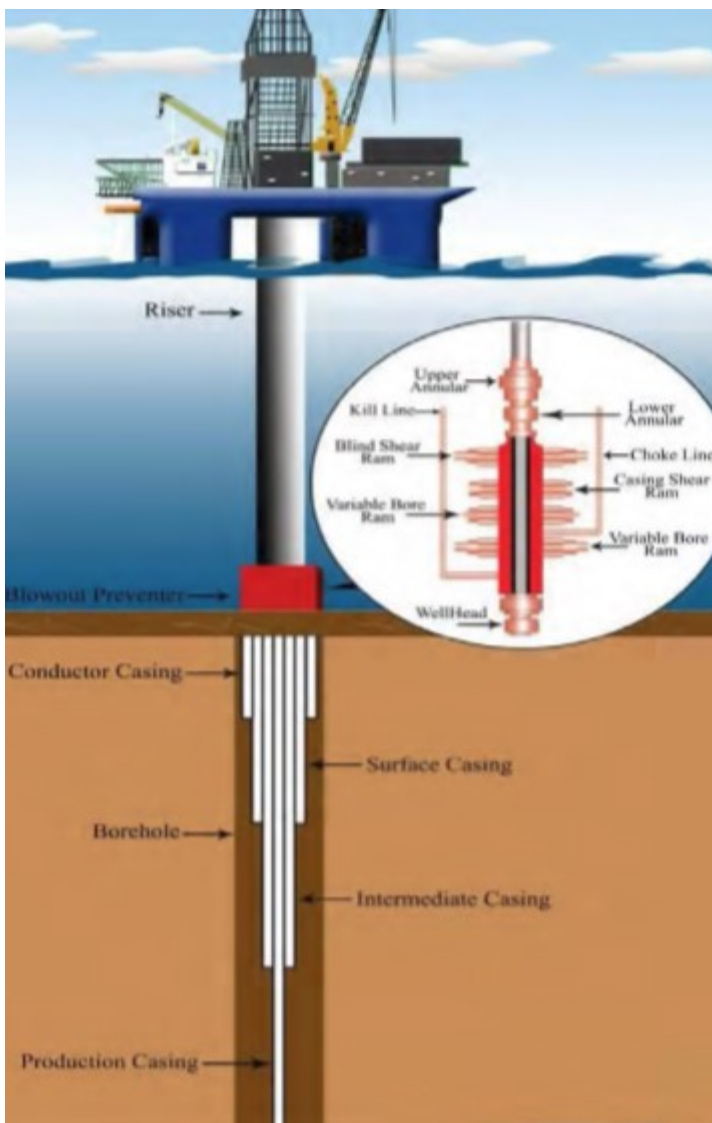
were also received via the government regulations website (<http://www.regulations.gov>).

On September 4, 2015, BOEM published a Call for Information in the Federal Register for each lease site included in the study. The call invited potential lease bidders to identify specific lease plots of interest within the program region. The Call also provided an opportunity for the public to provide information on environmental, socioeconomic, and other relevant concerns. The Call was closed on October 5, 2015.

A Notice of Availability of the Draft Multiscale EIS was published in the Federal Register on April 22, 2016. This initiated a call for public comments on the Draft Multiscale EIS. This 45-day comment period ended on June 7, 2016. BOEM then held public hearings that were attended by 93 individuals in Beaumont, New Orleans, Panama City, Mobile, and Gulfport.

### Questions to Answer: Methods

1. Was enough opportunity allowed for the public to input concerns? Why or why not?
2. Is 5 years enough time to evaluate plans from proposed bidders? Why or why not?



**Figure 2. General schematic of an oil drilling platform**

The concerns from public commentary and the results of the EIS will be used by BOEM to inform lease bidders of the terms and stipulations on drilling and oil production activity and mitigation plans. Qualified bidders on leases must show that they can comply with existing criteria and the concerns outlined in this EIS.

## Results and Discussion

Participants in the pre-program public hearings voiced common concerns over the welfare of marine wildlife in general and of protected species, such as some marine mammals and sea turtles. Other concerns shared focused on the quality of habitats, fish and fisheries, sensitive benthic communities, and pelagic resources. Socioeconomic concerns raised involved impacts on fisheries, recreation, tourism, and local jobs. There were also suggestions related to BOEM procedures for alternatives (see below) or mitigation and specific analysis methods used to evaluate environmental impact. Others suggested incorporation of recent industry technological and safety advances.

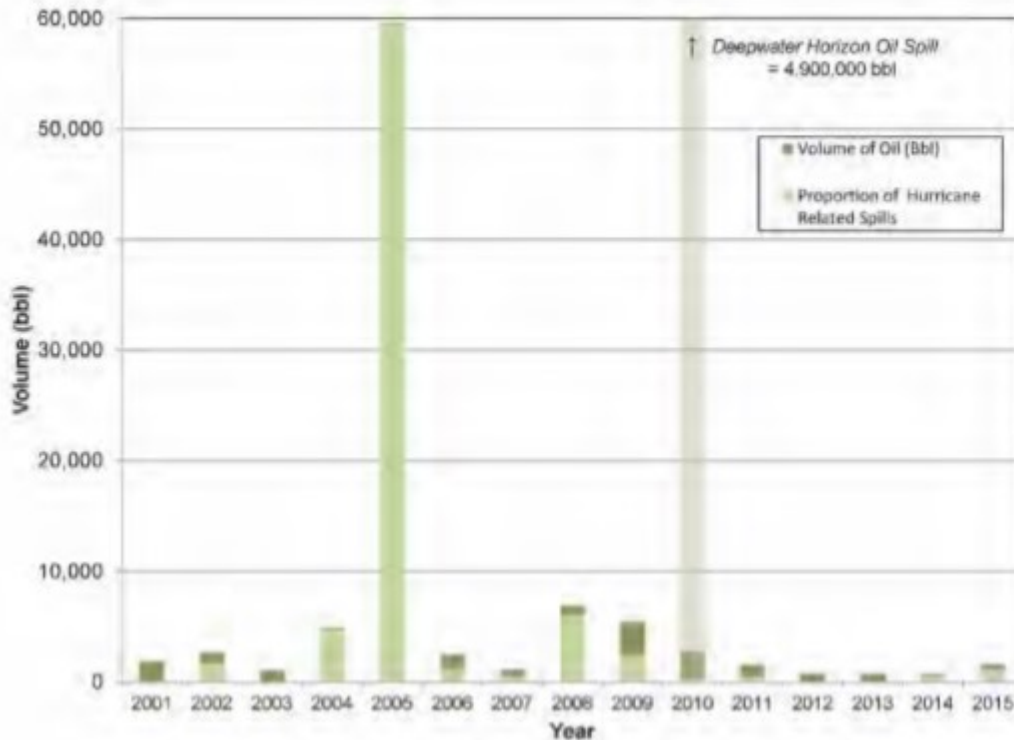


Figure 3. Total volume of oil spilled in the Gulf of Mexico due to hurricane damage and oil drilling activity accidents.

BOEM received one letter from the Louisiana Department of Natural Resources requesting that BOEM consider secondary and cumulative impacts on lease sales and how those relate to potential harm leases might pose to Louisiana wetlands. The Louisiana Department of Natural Resources also urged BOEM to implement plans to validate predictions of social and environmental effects on coastal resources.

Public response to the Notice of Availability included 1,300 comments via letter, email, written and verbal comments gathered at public meetings, and feedback collected through the regulations.gov website. Many comments came from the “No New Leases” organization. In response to requests from the Mississippi Coalition for Vietnamese-American Fisher Folks and Families organization, BOEM had portions of the Multisale EIS (summary, fish, and invertebrates, and commercial fishing sections) translated into the Vietnamese language.

The initial step in the EIS was to establish the scope of the program, in terms of deciding how much of the coastal region between Texas and Florida should be considered.

## Alternatives

BOEM considered four action alternatives and one no-action alternative.

**Alternative A (The Preferred Alternative).** This alternative would include all the areas within the U.S. portion of the Gulf of Mexico. Several exceptions would block sales in certain regions including areas within the current boundary of the Flower Garden Banks National Marine Sanctuary.

**Alternative B.** This alternative would allow for proposed lease sales involving central and eastern planning areas, but not the western (Texas coast) areas of the Gulf.

**Alternative C.** This alternative would allow for leasing within the western (Texas coast) planning area but not in the central and eastern planning areas. Blocked from leasing would be the Flower Gardens area located off the Texas coast.

**Alternative D.** This alternative could combine action alternatives A, B, or C, allowing flexibility to offer leases under any alternative, with additional exclusions. Certain planning areas could be excluded from leasing based on their ecological importance and sensitivity to oil- and gas-related activities.

**Alternative E.** No action. This alternative would cancel all future lease sales, although previously issued leases would remain in force. If a prior lease sale were to be canceled, a future lease sale in that area would be delayed.

## Mitigating Measures

Lease term contracts will stipulate any mitigating measures deemed necessary. Ten possible lease stipulations await approval by the Assistant Secretary of the Interior for Land and Minerals Management. Also applicable are proposed measures to reduce or eliminate environmental and/or potential multiuse conflicts with the Department of Defense.

## Environmental Impacts

This EIS described and analyzed potential impacts of a lease sales. Analysis included routine activities, accidental events, cumulative impacts, and unavailable information. Issues related to oil and gas exploration, development, production, and transportation activities include the potential for:

- Oil spills,
- Wetlands loss,
- Air emissions,
- Wastewater discharges and water quality,
- Marine trash and debris,
- Structure and pipeline activities,
- Platform removal,
- Vessel and helicopter traffic,
- Multi-use conflicts,
- Support services,
- Population fluctuations,
- Land-use planning,
- Impacts on beaches and recreation,
- Aesthetic influences,
- Environmental justice,

- Conflicts with State coastal zone management programs.

## Impact Conclusions

In general, for all alternatives A-D, the projected impacts are projected to range from Negligible to Moderate. For Alternative E, which prohibits leasing, there obviously would be no impact. A detailed examination is summarized below.

### Air Quality

A modeling analysis for impacts on air content of O<sub>3</sub> (ozone), NO<sub>2</sub>, SO<sub>2</sub>, and particulate matter yielded the conclusion that the overall expected impact of a single lease site would be **minor**, while the impact from one lease site area would be **moderate**.

### Water Quality

Water contamination from discharge of ocean water from drilling operations are projected to be **negligible**. Any oil spills would have a moderate effect, because residual oil dissipates quickly through dispersion, weathering and the implementation of cleanup operations.

### Coastal Estuaries, Coastal Barrier Beaches and Dunes

Impacts from oil spills are expected to be **minor** because of the distance of most lease sites from the coast, the expected weathering of spilled oil, the projected low probability of large spills, the resiliency of wetland vegetation, and the available cleanup techniques.

### Benthic Communities

#### Results: Questions to Answer

1. How do you interpret the fact that only one of the affected states filed items of concern?
2. What do you think was the rationale for alternatives B and C?
3. Did they consider all of the important potential impacts? What might they have omitted?
4. What are the problems with their rating scales of “negligible, minor, moderate, major, and beneficial”?
5. How would this scale, or any other, affect the terms and conditions they might put into a lease contract?
6. In what ways is the poverty of coastal communities relevant to this EIS?

Expected impacts at depths beyond 300 feet range from **negligible** to **minor**, because accidental events are rare, usually temporary, and highly localized to the drilling site. A similar conclusion applies to shallow water communities overall, though local damage at a given site could cause **severe** damage.

#### Sargassum and Associated Communities

This ocean grassy environment has an expansive reproductive cycle throughout the region that promotes rapid recovery from any oil spills or mechanical damage from vessel activity. Impacts in any one region are thus expected to be **negligible**.

#### Fish and Invertebrate Resources

Impact-producing factors include human-produced sound, bottom-disturbing activities, and accidental oil spills. Overall impact however is expected to be **minor** due to short-term localized effects. Commercial and recreational fishing cause far greater effects.

#### Birds

Projected impacts should be no worse than **minor**, because

any impacts would be short-term and reversible. Some species lay several eggs at a time, so the replacement rate could help sustain a population. A large oil spill would produce **moderate** damage to bird population.

### **Marine Mammals**

Impacts overall are projected to range from **negligible** to **moderate**.

### **Sea Turtles**

Projected impact on the five endangered sea turtle species should range from **negligible to moderate**, depending on a low impact due to noise or a larger impact of a spill injuring an individual. Historically, far greater damage has been produced by harvesting of eggs, loss of suitable nesting beaches, and commercial fishing.

### **Beach Mice**

These small coastal mice live on beach dunes in parts of Alabama and Florida. Pipeline construction would degrade their habitat, but oil spill impacts would be **negligible** because beach mice live above the intertidal zone.

### **Corals**

Endangered corals are elkhorn, staghorn, star, and mountainous species. Assuming adherence to all lease stipulations, the impact on other coral species should be **negligible**. Accidental drilling events could cause severe damage in localized areas, but the number of such events is small. Note that the Flower Gardens coral region is blocked from leasing.

### **Commercial Fishing**

Temporary disruption of fishing harvests can be caused by seismic surveys, drilling activities, and service-vessel traffic. Placement of drilling structures prevents trawling in the region, which could reduce shrimp harvests in the well site. However, drilling platforms create safe new environments for reef fish like snapper and groupers. Oil spills could cause closures of fishing zones and reduce the supply of seafood. Accidental events would be likely small and localized. Overall, the projected effects range from **negligible** to **beneficial**.

### **Recreational Fishing**

Vessel traffic would cause localized disruption of fishing. Oil drilling structures create new habitats for fish and could be beneficial for fishing. Overall, the projected effects range from **minor to beneficial**.

### **Archeological Resources**

**Major** effects could occur if drilling activities occurred in an underwater archeological site. However, archeological surveys can identify such areas and contracts can prohibit drilling not at such sites.

### **Land Use and Coastal Infrastructure**

Ocean drilling is supported by onshore facilities and the impact of those facilities can range from **moderate to beneficial**.

### **Economic Factors**

Lease sales are economically beneficial to the corporations involved and produce lease and royalty revenue for the federal government (Fig. 4).

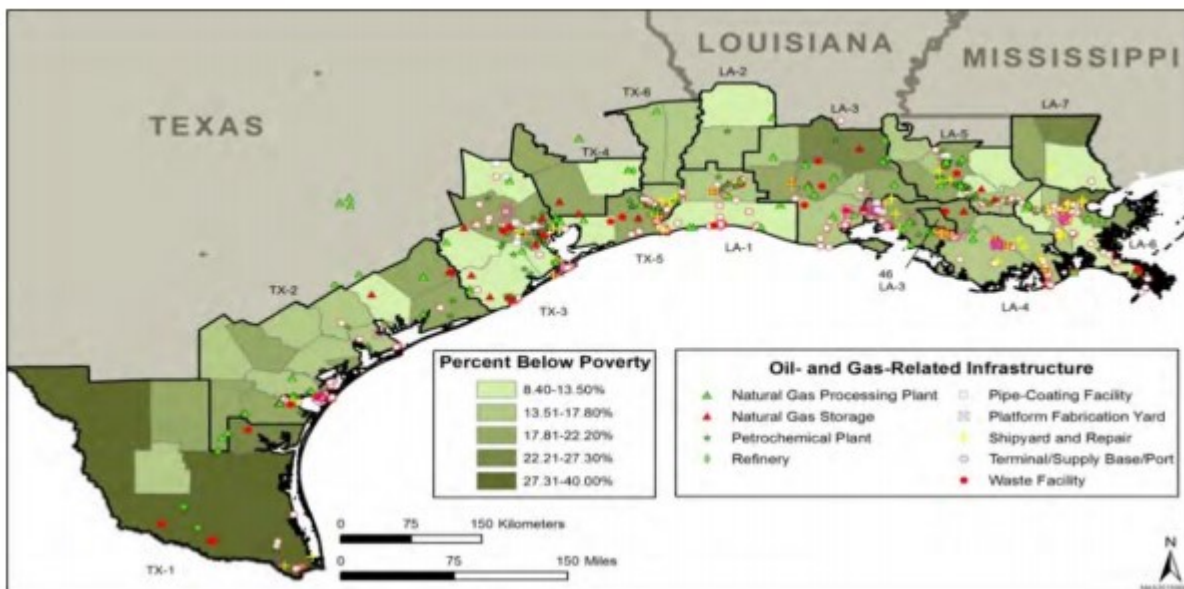


Fig. 4. Percentage of poverty in coastal counties that could benefit from oil-related economic activity.

## Social Factors

Any potential accident is not likely to be of sufficient scale or duration to have more than a **negligible** to **moderate** impact. Overall, some oil production activities can have socially **beneficial** effects.

Twelve attached Appendices specify possible lease contract stipulations on:

- Geological surveys,
- Permits and applications,
- Inspection enforcement,
- Pollution prevention measures,
- Oil-spill response plans,
- Faring and venting,
- Use of best available and safest technologies,
- Mitigation plans and capabilities,
- Multiple lease stipulations,
- Models for air quality monitoring,
- State coastal management programs,
- BOEM responses to comments from concerned citizens and corporations.

**References:** Abundant details are found in the various chapters of the three-volume report, totaling nearly 1,000 pages. Supporting data for this EIS included over 231 graphs and charts, and 125 data tables.

**DISCLAIMER:** This paper is an adaptation of the original EIS and reflects the adapting author's interpretation of the original. The adaptation is not complete nor necessarily accurate in all detail. This adaptation should be used only for educational purposes in accordance with "fair use" provisions of U.S. copyright law.