

## Environmental Studies Program: Studies Development Plan | FY 2021–2023

Title	National Outer Continental Shelf (OCS) Oil Spill Occurrence Rates (NT-21-03)
Administered by	Headquarters
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PICOC Summary	
<i>Problem</i>	OCS petroleum hydrocarbon spill data for analyses—including the number, volume, and rate of such petroleum hydrocarbon spills—is needed to support the assessment of potential impacts under the National Environmental Policy Act (NEPA).
<i>Intervention</i>	Updated OCS petroleum hydrocarbon spill data will be collected into a systematic collation of data for mathematical analyses.
<i>Comparison</i>	A suite of objective statistical methodologies will provide estimates of petroleum hydrocarbon spill rates to use in oil spill risk analysis (OSRA) and NEPA analyses.
<i>Outcome</i>	This study will deliver National estimates of the occurrence of OCS oil spills for a range of spill volume size classes.
<i>Context</i>	All OCS planning areas.

**BOEM Information Need(s):** OCS oil spill occurrence rates and their confidence intervals as well as spill volumes are used for analyzing potential oil spills and their impacts in NEPA documents and oil spill response plans. With the implementation of the Oil Pollution Act of 1990 ([U.S. Public Law 101-380](https://www.govinfo.gov/records/US-PUBLIC-LAW-101-380), August 18, 1990), estimates of oil spill occurrence became even more important to natural resource trustees and to responsible parties involved in oil and gas activities. The Bureau of Ocean Energy Management (BOEM) needs up-to-date quantifications of spill occurrence for the OCS to perform OSRA (<https://www.boem.gov/environment/environmental-assessment/oil-spill-occurrence-rate-oil-spill-risk-analysis-osra>).

**Background:** The OSRA model, developed in 1975 by the Department of the Interior (DOI), is a tool that evaluates large offshore oil spill risks. This model is used to develop probabilistic estimates of oil spill occurrence and contact. A realistic, objective methodology for estimating oil spill occurrence rates is required for the model’s application. This study will provide rates that can be applied or adjusted for each OCS region. OSRA results are used in preparation of NEPA documents such as Environmental Impact Statements (EISs) and Environmental Assessments (EAs) that inform the leasing process and subsequent environmental oversight. Spill rates and median spill volumes are also used in NEPA oil spill scenarios, including cumulative scenarios.

Currently, the Bureau of Safety & Environmental Enforcement (BSEE) maintains OCS spill data related to oil and gas activities on the OCS. BSEE receives these data from operators, who are required to submit offshore incident reports to the agency for various safety and environmental events, including spills of chemicals or crude oil ([30 Code of Federal Regulations \[CFR\] 250.187](#), [30 CFR 254.46](#), and [BSEE Notice to Lessees \[NTL\] 2019-N05](#)). Spills may include crude or refined petroleum, drilling fluids, other chemicals, or mixtures thereof. BOEM uses these spill data and derived spill rates to assess and disclose oil spill risks to help inform leasing and plan decisions<sup>1</sup>. The BSEE spill data and BOEM analyses have also been used to support BSEE responsibilities, principally oil spill response planning, drilling permitting, and rulemaking. Both bureaus have an interest in ensuring oil spill data and spill rate analyses are updated regularly. Since 1975, a series of spill rate analyses have been conducted by BOEM or its predecessors (e.g., Anderson *et al.*, 2012), where spill rates were determined in terms of the volume of oil produced or handled. The most recent by ABS Consulting, Inc. (2016) collated data through as late as 2015. Ongoing studies will collate data through as late as 2021 but are not designed to analyze National OCS spill rates (ABS Consulting, 2018; <https://marinecadastre.gov/espis/#/search/study/100250>). This study proposes to Nationally update OCS spill data and spill rate analyses through calendar year 2022 (1964–2022).

**Objectives:** The overarching goal of this study is to update oil spill rate data for OCS platforms and pipelines, as well as spill rates from 1) U.S. and worldwide tankers and 2) U.S. barges. Having updated oil spill and oil spill occurrence rate data and their uncertainty is critically important to analyze the potential risk and consequence of OCS oil spills, investigate causal factors contributing to the occurrence, size, or frequency of oil spills, enhance oil spill response planning, and target future regulatory reform to better manage risk.

Specific objectives are:

- Examination of historical spill occurrences and of volume of oil handled
- Analysis of other potential exposure variables and causal factors
- Estimate spill occurrence rates and normalize these rates 1) based on number of spills per volume handled and 2) other relevant exposure variables
- Complete OCS spill rate trend analyses
- Estimate median and mean spill volumes for a range of spill size classes
- Estimate uncertainty metrics such as confidence intervals
- Prepare reports that presents the data and methods used, data analyses, and significance of findings

**Methods:** The investigators will update National OCS oil spill occurrence estimates previously calculated for OCS (ABS Consulting Inc., 2016). They will collect, examine, and reconcile crude and refined oil spill records and cleanup reports for the OCS for spills  $\geq 1$  bbl from industry, U.S. Coast Guard (USCG), Environmental Protection Agency (EPA), U.S. Department of the Interior (DOI), BOEM, BSEE, U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (USDOT, PHMSA), state (e.g., Alaska Department of Environmental Conservation [ADEC]), and other datasets through 2022. The investigators will also calculate accident frequencies for small spills and perform appropriate statistical analyses, including trend analysis. Results will be collated into an electronic database in a standard format.

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<sup>1</sup> <https://www.boem.gov/environment/environmental-assessment/oil-spill-modeling-program-additional-references>

**Specific Research Question(s):** What are the OCS spill rates, median volumes, and mean volumes for small and large spills and their uncertainty?

**References:**

Anderson, C.M. Mayes, M., and LaBelle, R.P. 2012. Update of Occurrence Rates for Offshore Oil Spills. Bureau of Ocean Energy Management OCS Report 2012-069. Bureau of Ocean Energy Management, Herndon, VA  
([https://www.boem.gov/uploadedFiles/BOEM/Environmental\\_Stewardship/Environmental\\_Assessment/Oil\\_Spill\\_Modeling/AndersonMayesLabelle2012.pdf](https://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Assessment/Oil_Spill_Modeling/AndersonMayesLabelle2012.pdf))

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