

## Environmental Studies Program: Ongoing Study

Title	Oil-Spill Occurrence Estimators for the Outer Continental Shelf in the Arctic (AK-16-04)
Administered by	Alaska Regional Office
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Procurement Type(s)	Contract
Conducting Organizations(s)	ABS Group
Total BOEM Cost	\$363,850 (task orders to date)
Performance Period	FY 2017–2022
Final Report Due	Multiple reports expected
Date Revised	August 9, 2021
PICOC Summary	
<i><u>Problem</u></i>	The OCS spill occurrence rates used in non-Arctic BOEM NEPA analyses are based on historical platform, pipeline or tanker crude oil-spill rates, almost entirely from the Gulf of Mexico and Pacific OCS. For analyses in the Arctic BOEM has to consider differences in oil-spill occurrence factors between the Arctic and Gulf of Mexico OCS and Arctic-specific factors.
<i><u>Intervention</u></i>	Apply a Monte Carlo fault tree model to modify historical oil-spill occurrence rates from other OCS areas to develop oil-spill occurrence estimators for the Arctic OCS.
<i><u>Comparison</u></i>	Factors to be considered include: differences storm rates and vessel activity, as well as Arctic-specific factors such as ice gouging.
<i><u>Outcome</u></i>	Oil-spill occurrence estimates to support NEPA analyses for oil and gas lease sales or development projects in Arctic OCS areas.
<i><u>Context</u></i>	Beaufort Sea and Chukchi Sea Planning Areas

**BOEM Information Need(s):** The Oil-Spill-Risk Analysis (OSRA) is a cornerstone to BOEM EISes, EAs, and oil-spill contingency planning. Oil-spill issues constitute a substantial portion of public comments submitted on sale or development EISs in the Alaska Office. This study is necessary to develop oil-spill occurrence estimators for NEPA analyses for oil and gas lease sales or development projects in Arctic OCS areas.

**Background:** The OCS spill occurrence rates used in non-Arctic BOEM NEPA analyses are based on historical platform, pipeline or tanker crude oil-spill rates, almost entirely from the Gulf of Mexico and Pacific OCS. For analyses in the Arctic since 2002, the BOEM Alaska Office has incorporated a fault-tree approach, which considers 1) differences in oil-spill occurrence factors between the Arctic and Gulf of Mexico OCS and 2) Arctic-specific factors. Recent examples of such analyses include:

Bercha Group, Inc. 2014. Updates to Fault Tree Methodology and Technology for Risk Analysis Chukchi Sea Sale 193 Leased Area. OCS Study BOEM 2014 -774. Anchorage, AK: USDO, BOEM, Alaska OCS Region. 109 pp.

Bercha Group Inc. 2013. Updates to Fault Tree for Oil Spill Occurrence Estimators, Update of GOM and PAC OCS Statistics to 2012. OCS Study BOEM 2013-0116. Anchorage, AK: Prepared by Bercha International Inc. for USDO, BOEM, Alaska OCS Region. 35 pp. <http://www.boem.gov/2013-0116/>.

Bercha, F.G. 2011. Summary Final Report Alternative Oil Spill Occurrence Estimators for the Beaufort and Chukchi Seas - Fault Tree Method. OCS Study BOEMRE 2011-030. Anchorage, AK: Prepared by Bercha Group, Calgary, Alberta, for USDO, BOEMRE, Alaska OCS Region. 48 pp. <http://www.boem.gov/BOEM-Newsroom/Library/Publications/2011/2011-030.aspx>.

**Objectives:**

- Update Gulf of Mexico and Pacific OCS historical oil-spill statistics.
- Provide analyses on topics relevant to oil-spill occurrence rates, spill sizes, oil-spill frequency distribution, and other parameters.
- Obtain fault tree spill occurrence rates and confidence intervals for NEPA analyses for any Arctic OCS Lease Sales or for OCS offshore oil and gas developments.

**Methods:** Task orders from this study will: 1) review and assimilate oil-spill occurrence reports, data and geohazard data from alternative sources and locations as needed to update Gulf of Mexico and Pacific OCS historical data; 2) conduct literature searches and analyses on relevant topics, such as potential causal factors of oil spills in Arctic regions and differences in oil-spill occurrence factors between the Arctic and Gulf of Mexico and Pacific OCS, assessing the relative importance of various causal factors and conducting sensitivity analyses, evaluating whether oil-spill sizes and frequency distributions vary as a function of annual oil production rates; 3) use these data together with measures of spill size and frequency variance to run the Monte Carlo fault tree model with these measures of variance; 4) provide fault tree analyses as needed for Arctic oil and gas lease sales based on BOEM-supplied exploration and development scenarios, generating life-of-field oil-spill occurrence rates and indicators; 5) provide fault-tree analyses as needed for site-specific oil and gas developments in the Arctic, taking into account site-specific geohazards and generating life-of-field occurrence indicators; 6) provide a formal report documenting each analysis, and 7) provide professional support to BOEM in regard to statistical issues of occurrence rates and estimator(s) related to this study and its results.

**Specific Research Question(s):** How can historical oil-spill occurrence rates from the Gulf of Mexico and Pacific OCS be adapted to provide oil-spill occurrence estimators for the Beaufort Sea and Chukchi Sea Planning Areas?

**Current Status:** Analysis for task order 3 is underway.

**Publications Completed:**

ABSG Consulting Inc. 2018. US Outer Continental Shelf Oil Spill Statistics. Arlington (VA): Prepared for US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2018-006.

ABSG Consulting Inc. 2018. US Outer Continental Shelf Oil Spill Causal Factors Report. Arlington (VA): Prepared for US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2018-032. pp 36.

**Affiliated WWW Sites:**

<http://www.boem.gov/akstudies/>

<https://marinecadastre.gov/epis/#/search/study/100225>