BOEM
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OCS Scientific Committee Meeting
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Arctic Air Quality Impact Assessment Modeling

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AQ = Air Quality IM = Information Management PO = Physical Oceanography	FE = Fates & Effects SS = Social Systems HE = Habitat & Ecology	MM = Marine Mammals and Protected Species REN = Renewable Energy

* Denotes project that remains contingent on collaboration with external groups.

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Tentative Ranking: 1

Arctic Air Quality Impact Assessment Modeling

BOEM Information Need:

BOEM requires information on the spatial and temporal distribution of emissions caused by onshore oil & gas sources on the Alaskan North Slope and proposed offshore sources on the Beaufort Sea and Chukchi Sea OCS to:

- Improve the assessment of cumulative impacts required for NEPA review documents
- Support BOEM's new jurisdiction to control air pollutant emissions from facilities on the Arctic OCS
- Assess onshore sources not already accounted for through past State and Federal air permitting requirements
- Assess emissions from oil spill response vessels and equipment

Date Information is Required: Next drilling season (2013)

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Tentative Ranking: 1

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Background:

A) Relationship with Previous Work/Efforts

- Several past project proponents have developed separate meteorological files for both the Beaufort Sea and Chukchi Sea OCS providing no consistency in dispersion modeling;
- EPA and ADEC have collected various inventories of emissions of North Slope onshore emission sources that are not consistent;
- UAF/BOEM WRF Mesoscale Meteorology Model Study will produce a high-resolution 30-year hindcast (1979-2009) dataset that will be used in developing the new datasets for the years……
- In 1980 the DOI emission exemption formulas were developed using models that do not include current state-of-the-art air dispersion methods and used one set of meteorological data to represent both the GOM and Arctic weather conditions.

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Background:

B) Relationship with Concurrent/Future Efforts

- UAF/BOEM WRF Mesoscale Meteorology Model will produce a high-resolution 30-year hindcast (1979-2009) data that will be used in developing the new datasets;
- Meteorological datasets will be provided to future project proponents to ensure consistency in air quality dispersion modeling for DOI Pollution Prevention and Control Regulatory Program and for NEPA environmental reviews for the Arctic OCS;
- BOEM GOMR is proposing concurrent investigation of emission exemption formulas for the DOI Pollution Prevention and Control regulatory program;

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Study's Objectives:

- Develop meteorological datasets that represents the Beaufort Sea and Chukchi Sea OCS
- Prepare inventory of onshore emission sources and project representative offshore emission sources
- Determine whether cumulative impacts, exclusive BOEM approved activities would be statistically significant
- Determine whether secondary formation of $PM_{2.5}$ and ozone are significant for cumulative impacts
- Investigate, and if necessary revise, emission exemption formulas required under 30 CFR Part 550 Subpart C

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Methods:

- Build upon meteorological datasets developed by the MMM Study, and by project proponents, that reflect climatological conditions on the North Slope, the Beaufort Sea OCS, and the Chukchi Sea OCS;
- Format the compiled data sets for use in CMAQ and CAMx, and for dispersion models approved for the Arctic OCS;
- Build on previous database of onshore emission inventories for the onshore North Slope;
- Prepare a comprehensive onshore and offshore emission inventory;
- Conduct air quality dispersion modeling for criteria pollutants, including ozone, and also including secondary formation of $PM_{2.5}$;
- Analyze statistical significance of cumulative impacts relative to the NAAQS;
- Analyze results to determine if revisions to the current emission exemptions formulas are necessary and if so, suggest proposed changes.