BOEM

Bureau of Ocean Energy Management

BOEM's Greenhouse Gas Inventory and Studies

EPA Oil & Gas Greenhouse Gas Data Webinar

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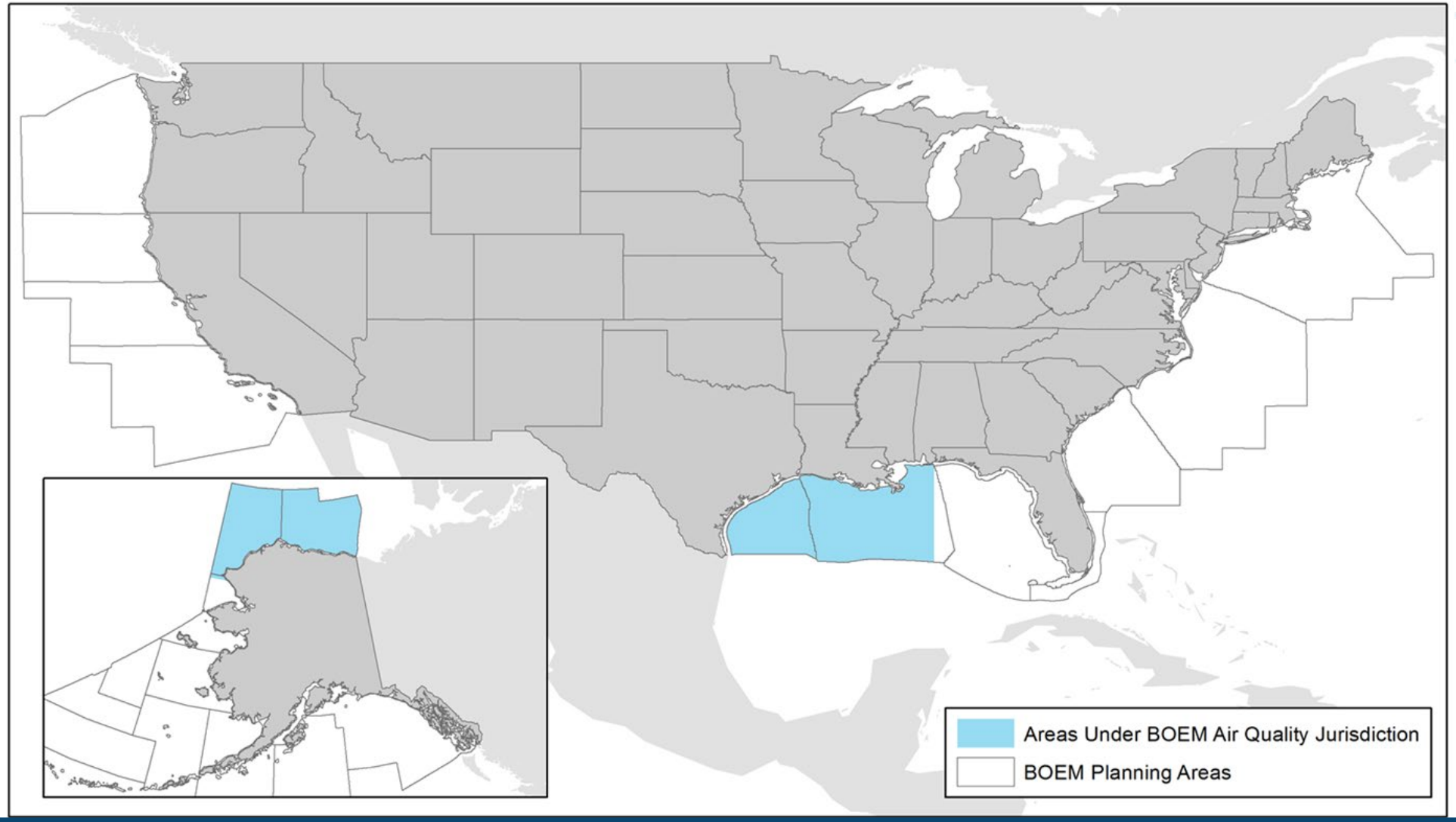
Air Quality: BOEM's Statutory Responsibility

OCSLA Section 5(a)(8) states:

The Secretary of the Interior is authorized to prescribe regulations "for compliance with the national ambient air quality standards pursuant to the Clean Air Act . . . to the extent that activities authorized under [the Outer Continental Shelf Lands Act] significantly affect the air quality of any State."

There are other provisions in OCSLA that authorize regulations for environmental protection such as OCSLA Section 5(a).

BOEM's Air Quality Jurisdiction



OCS Air Quality System (AQS)- Emissions Module

Purpose:

- To develop a web-based emissions reporting tool for OCS oil and gas, which would collect activity data, automatically calculate emissions, and perform quality assurance

Status:

- For CY2021 effort, BOEM issued NTL No. 2020-N03
- Operators submitted collected activity data and draft emissions for the CY2021 effort by April 22, 2022
- BOEM will have final CY2021 data by the beginning of 2023
- For information: **https://www.boem.gov/2021-OCS-Emissions-Inventory**

OCSAQS
The Outer Continental Shelf Air Quality System

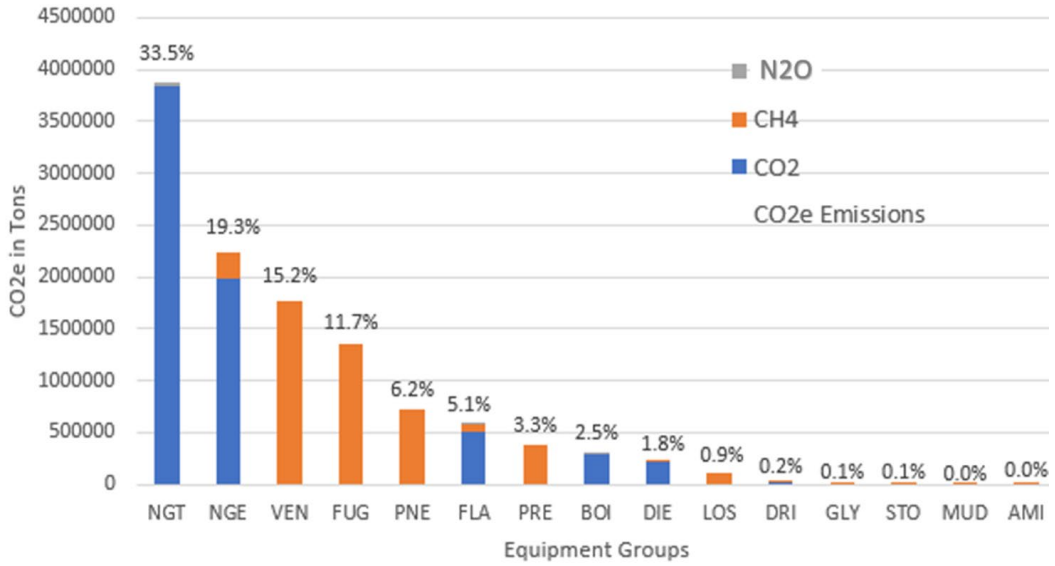
Table 1: Updated 2021 Emissions Inventory (Draft)

	2005	2008	2011	2014	2017	2021 Draft (Adjusted After Corrective Action)
CO_2	8,848,779	8,417,165	11,882,029	5,940,330	6,857,360	5,891,253
CH_4	214,499	422,707	271,355	225,667	187,894	95,636
N_2O	130	125	167	98	118	122
CO_{2e}	14,250,099	19,022,140	18,715,529	11,611,272	11,589,943	8,318,355

For access to the tool:
https://ocsaqs.doi.gov

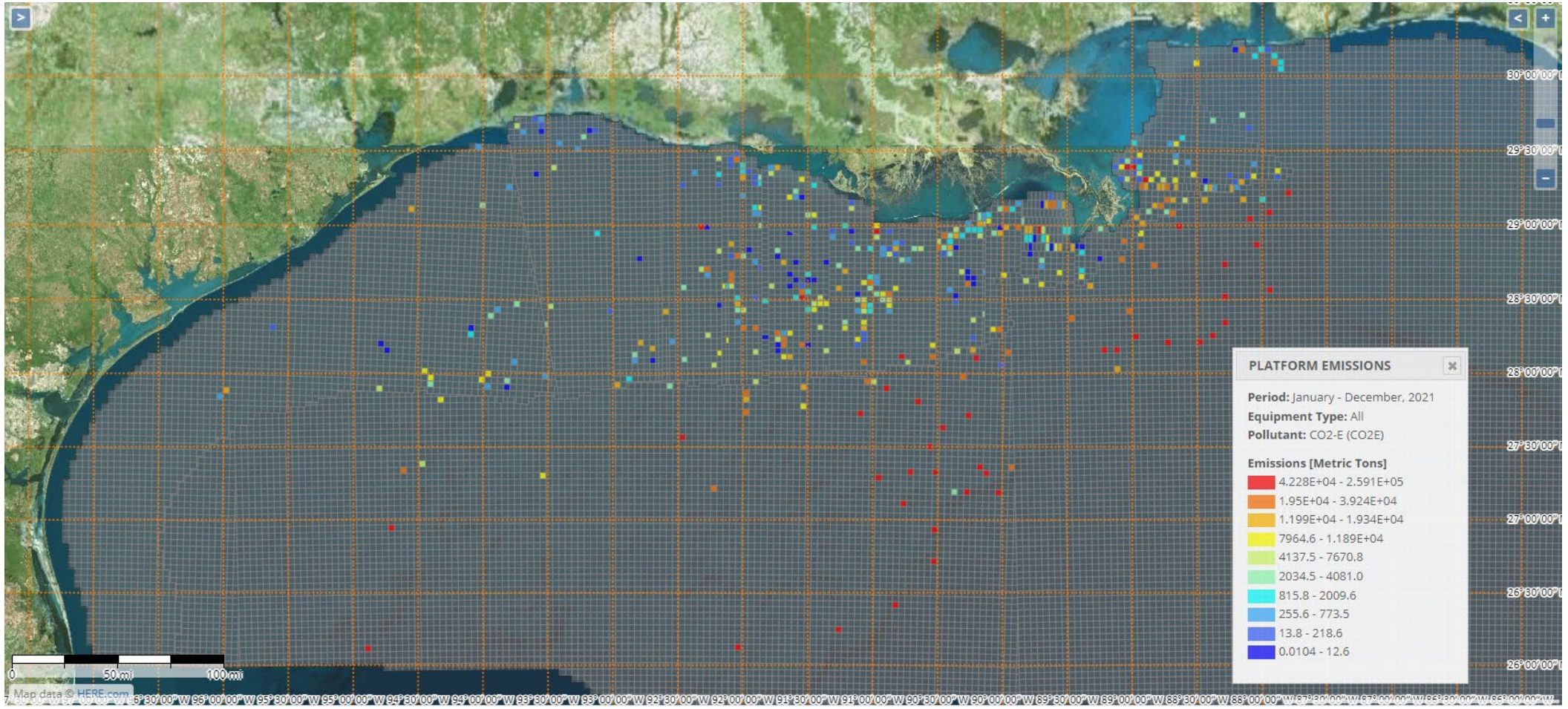
Emission Calculations

- **Criteria pollutants and precursors**
  - Carbon monoxide (CO)
  - Nitrogen oxides (NO_x)
  - Particulate matter ($PM_{2.5}$ and PM_{10})
  - Sulfur dioxide (SO_2)
  - Volatile organic compounds (VOC)
  - Lead (Pb)
  - Ammonia (NH_3)
- **Major greenhouse gases (GHGs)**
  - Carbon dioxide (CO_2)
  - Methane (CH_4)
  - Nitrous oxide (N_2O)
  - CO_2 equivalents (CO_2e)
- **Hazardous Air Pollutants (HAPs)**



OCS AQS Graphical Results for Draft 2021 Data

Draft 2021 Platform CO2e Emissions



OCS AQS- Modeling Module

Purpose:

- To develop a web-based dispersion modeling tool for OCS oil and gas, which would import emissions and stack parameter data from the emissions module, use existing 5-year meteorological dataset, run the AERMOD and CALPUFF dispersion models, exporting results
- Model proposed sources with nearby existing facilities, one facility or all facilities

Status:

- CALPUFF for the GOM has been implemented
- Implementation of CALPUFF for Alaska will begin soon
- Implementation of AERMOD for both regions will begin soon
- Completion date by December 2022

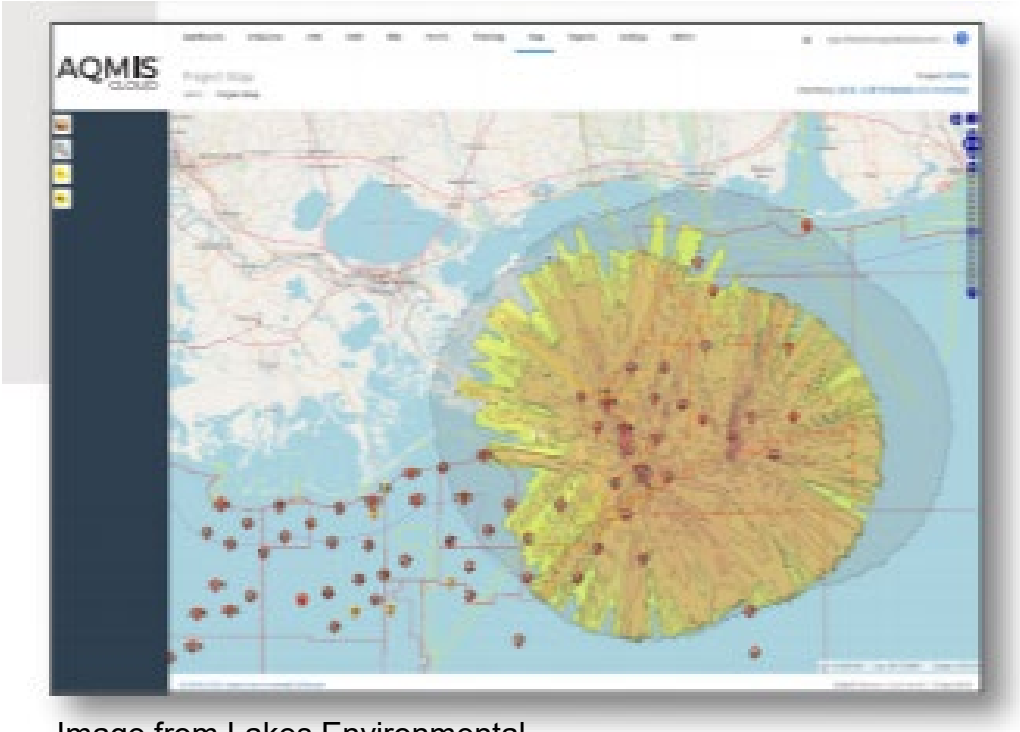


Image from Lakes Environmental

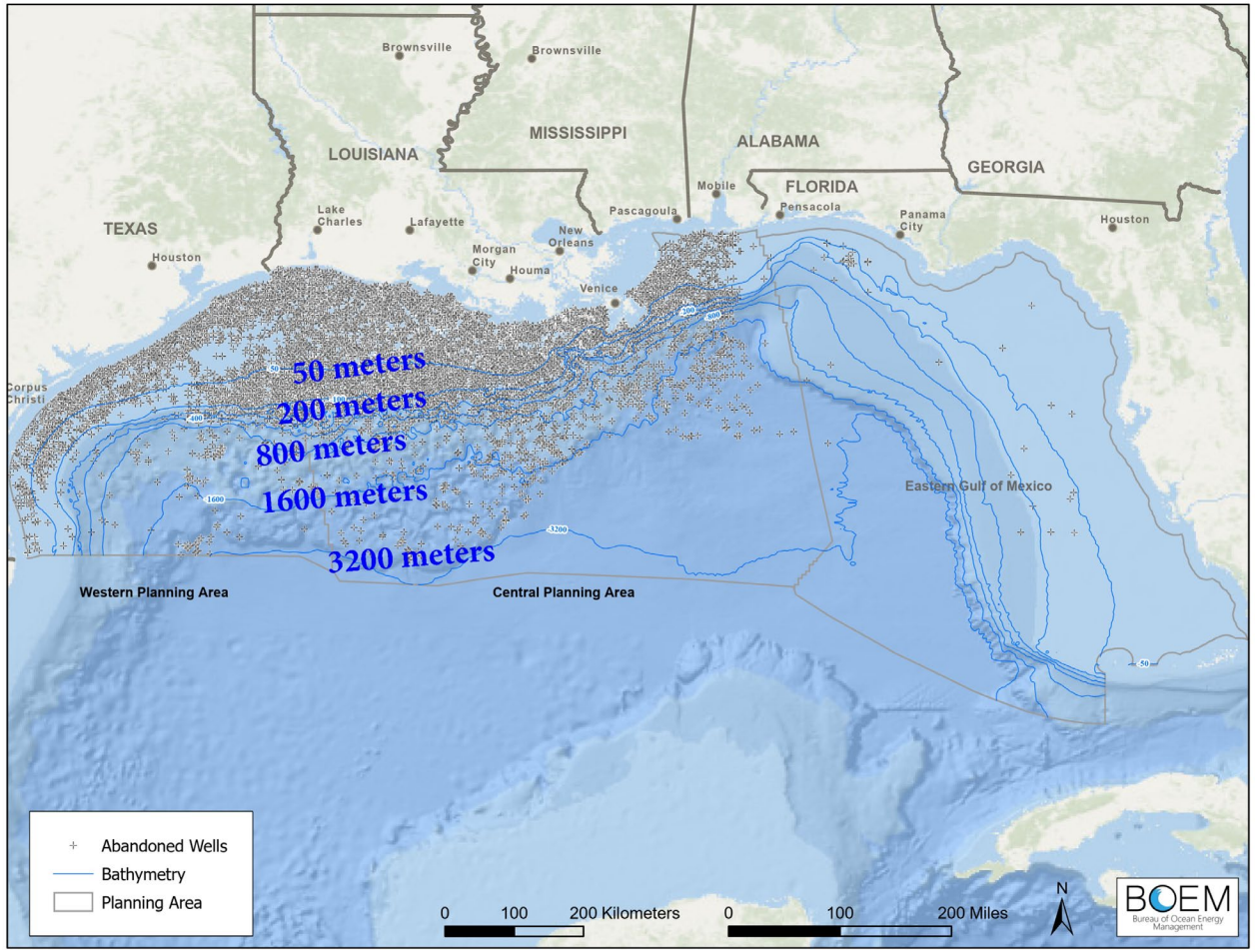
Impact of Abandoned Oil & Gas Wells on Air and Water Quality in the Gulf of Mexico

Purpose:

- Investigate the air and water quality at abandoned oil and gas wells in the Gulf Mexico through scientific measurement and characterization.
- Use the scientific data collected from the sampled abandoned oil and gas wells to determine if they are leaking in the Gulf of Mexico and, if so, to what extent.

Status:

- A request for proposals was posted
- A joint BOEM/BSEE study



Satellite Coastal & Oceanic Atmospheric Pollution Experiment

Purpose of this NASA Inter-agency Agreement:

- To assess the feasibility of using satellite data (TROPOMI NO_2) for offshore air quality applications

Conclusions:

- (1) can satellite data be used to inform BOEM about Air Quality over the Outer Continental Shelf?
  - Yes, TROPOMI satellite showed total column NO_2
- (2) how accurate are NO_2 satellite data over the Gulf of Mexico?
  - TROPOMI Total Column NO_2 satellite data agreed with both coastal and shipboard Pandora spectrometers that provided independent ground-truth. Under clean air conditions, satellite-Pandora agreement was 2-3%; for more polluted conditions, agreement was 15-20%.

https://marinecadastre.gov/espis/#/search/study/100183

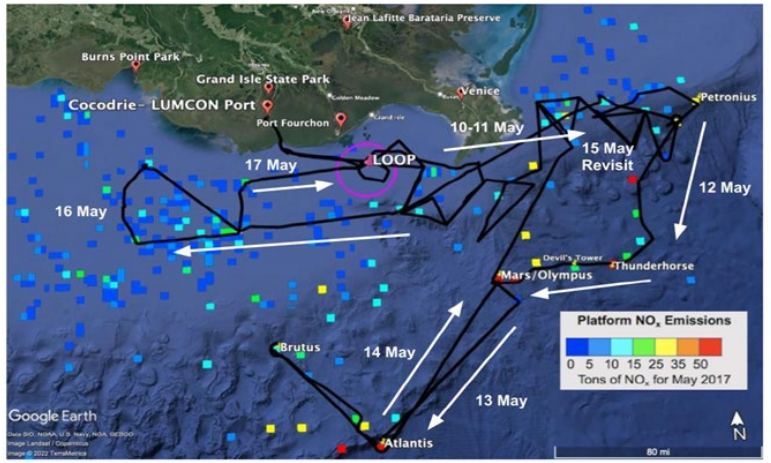


Figure 1 – SCOAPE cruise track (black), with arrows indicating movements of *R/V Point Sur,* in May 2019. Pandora calibrations were conducted at Cocodrie. Canister samples were coordinated with ship canister filling from locations in Louisiana shown as red pins.

Offshore Air Quality from NASA's Satellites and Related Experiments

Purpose of this NASA Inter-agency Agreement:

- To gather offshore air pollutant measurements via airflights, cruises, and other methodology for validation of satellite data and emissions inventories, which will improve impact assessments (SCOAPE II in June 2024)
- To develop Standard Operating Procedures (SOPs) using satellite data for BOEM's air quality management from its authorized sources

Status:

- NT-22-02
- IAA will be signed soon
- Proposed FY23 aircraft campaign with Carbon Mapper

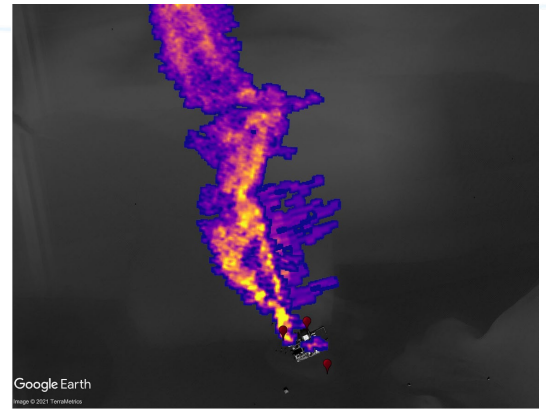


Image from Carbon Mapper

Table 2. Offshore instrumentation on R/V Point Sur during SCOAPE cruise.

Species	Instrument	Collaborator
NO_2 (and calibrator)	In situ	NASA GSFC
Column NO_2	Pandora (PSI)	NASA GSFC (Swap*)
O_3	In situ Ozonesondes	NASA GSFC
Temperature, RH, etc.	Met system	R/V Point Sur
Aerosol (AOD) & O_3 columns	Microtops Columns	NASA GSFC
VOCs (plus CO & CH_4)	In situ canisters	UCI (Blake)
HCHO	In situ (Aeris)	NASA GSFC (Hanisco)
PBL height	Ceilometer	UMBC (Delgado)
Black carbon	Aethalometer	NIST (Conny)
CH_4, CO_2, H_2O	In situ (Picarro)	GSFC (Kawa / Hanisco)

* Collaborators for loaned instruments in parentheses.

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