

Gulf of Mexico Air Quality Near Oil and Gas Operations: Past Results and Preparations for New Geostationary Satellite Measurements

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Abstract

The Bureau of Ocean Energy Management (BOEM) is mandated by the Outer Continental Shelf Lands Act to ensure that emissions from oil and gas (ONG) operations in the Gulf of Mexico (GOM) do not significantly affect the air quality (AQ) of any US State. However, routine surface measurements of AQ such as nitrogen dioxide (NO₂) over the GOM for BOEM to evaluate its emissions inventories and assess ONG impacts are nonexistent. Therefore, BOEM entered into an Interagency Agreement (IAA) with NASA in 2017 to determine if satellite measurements can be used to monitor AQ (principally NO₂) over BOEM's jurisdiction in the GOM. The NASA/BOEM IAA culminated in a research AQ cruise in the GOM in May 2019 called the Satellite Coastal and Oceanic Atmospheric Pollution Experiment (SCOAPE), which collected surface AQ data to answer this question. The SCOAPE cruise determined that satellite NO₂ data are generally of sufficient accuracy to monitor GOM AQ over ONG operations. A second NASA/BOEM IAA will soon be finalized, which seeks to advance our understanding of GOM AQ and satellite measurements with a SCOAPE-II cruise that will potentially be coordinated with aircraft measurements. Additionally, the geostationary TEMPO (Tropospheric Emissions: Monitoring of Pollution) instrument will be launched in 2023, vastly increasing the amount of satellite data to evaluate GOM AQ and BOEM's emissions inventories by providing hourly, as opposed to the current once-daily, measurements.