

# Quarterly Reports

FY 2021 Second Quarter



*Latest Reports and Study  
Profiles Posted to the  
Environmental Studies Program  
Information System (ESPIS)*

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The Environmental Studies Program (ESP) Quarterly Reports include summaries of the Bureau of Ocean Energy Management (BOEM) environmental studies completed each quarter. These studies inform BOEM's policy decisions on the development of energy and mineral resources on the Outer Continental Shelf (OCS).

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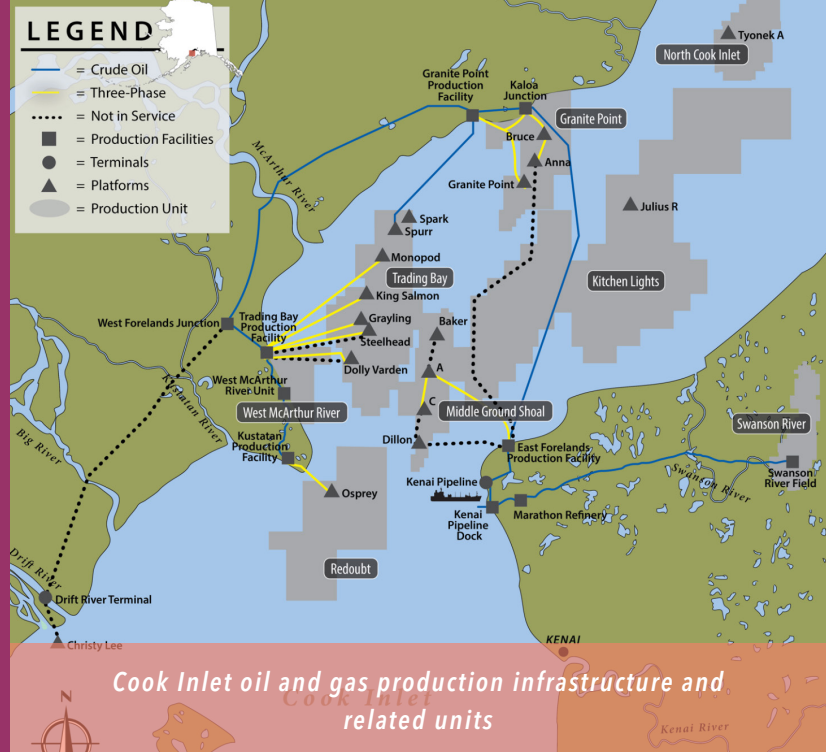
# Oil Spill Occurrence Estimators for Onshore and Offshore Crude and Refined Oil Spills on the Alaska North Slope and Cook Inlet, Alaska

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100240>

**Conducted by:** Nuka Research and Planning Group, LLC

**National Studies List:** AK-18-x12

**Study Products (available in ESPIS):** Final report, technical summary



## Purpose/Information Use:

BOEM requires information regarding oil spills to assess the potential environmental impacts of oil and gas development and production on the Outer Continental Shelf (OCS). With this need in mind, researchers developed statistical models to estimate the number of historical oil spills (oil spill occurrence) in both the Cook Inlet and on the Alaska North Slope. While all spills larger than one barrel from 1966–2019 were characterized, only spills from 1996–2019 were used to evaluate trends and develop the occurrence estimators. The latter years were selected because they included the most consistent dataset in terms of reporting regulations and record keeping. BOEM will use this information in future assessments of potential spills from oil and gas exploration, development, and production on the OCS.

## Findings/Results:

- In the Cook Inlet, the model indicated that the number of annual spills of all types of oil is expected to increase by 0.36 for every increase of one million barrels of oil production. For crude oil spills only, the expected increase is 0.32 spills.
- On the North Slope, for every increase of one million barrels of oil production, the model estimates increases of 0.12 spills for all types of oil and 0.066 spills for crude oil only.
- It was not possible to develop a regression model to estimate the annual volume of oil spills.

## Final Reports:

Robertson T, Campbell LK. 2020. Oil spill occurrence rates for Cook Inlet, Alaska oil and gas exploration, development, and production. Anchorage (AK): U.S. Department of the Interior, Bureau of Ocean Energy Management. 78 p. Report No.: OCS Study BOEM 2020-051.



# Using Nanotags to Measure Shorebird and Bat Responses to Offshore Wind Turbines

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100220>

**Conducted by:** University of Rhode Island

**National Studies List:** AT-17-01

**Study Products (available in ESPIS):** Final report, technical summary



*Block Island Wind Farm, the first operational offshore wind energy facility in North America, located ~5 km (3 miles) off the southeast corner of Block Island*

## Purpose/Information Use:

As of February 2022, there are 18 leases for commercial-scale offshore wind energy facilities on the Atlantic Outer Continental Shelf (OCS). There is concern with the potential impact of offshore wind energy development on migratory birds, which may be affected directly by collisions with offshore wind turbines or indirectly due to altered flight paths or displacement from customary foraging or resting areas. Assessing collision risk is particularly challenging at offshore wind energy facilities when compared with land-based wind energy facilities where carcasses can be found on the ground. The primary goal of this project was to evaluate automated radio telemetry technology (using radio tags to track birds) and modeling methods in assessing bird movements at the Block Island Wind Farm. BOEM will use the results of this study to assess whether telemetry is a viable technology for tracking bird movements at this time.

## Findings/Results:

- From 2017–2019, the tracking stations on Block Island detected a total of 157 unique tags from 15 species. Of the three focal species tagged at breeding areas in coastal Rhode Island, Connecticut, and New York, researchers detected 79% of the common terns, 24% of the roseate terns, and 33% of the piping plovers moving past Block Island.
- There was considerable annual variation in the total number of tagged individuals, species, and total detections at both the Black Rock and Southeast Lighthouse Stations from 2017 to 2019. One factor that affected the total number of detections was the type of receiver.
- There is a need for more research on the triangulation method used to estimate locations from stations with fixed directional antennas and for more calibration surveys at offshore sites.

## Final Reports:

Paton PWC, Cooper-Mullin C, Kouhi S, Loring PH, Moore J, Miller J, Potty G. 2021. Assessing movements of birds using digital VHF transmitters: a validation study. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 222 p. Report No.: OCS Study BOEM 2021-009.



# Southern New England Ventless Trap Survey and Lobster Seasonal Movement

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100210>

**Conducted by:** University of Rhode Island

**National Studies List:** AT-17-03

**Study Products (available in ESPIS):** Final report, technical summary



*Lobster tagged in 2018 with a green sphyron t-bar tag behind carapace and acoustic tag on top of carapace*

## Purpose/Information Use:

To fully assess the potential impacts of offshore wind power, BOEM requires baseline information on the area under development. This information would also allow for comparisons after a facility is constructed. For fisheries resources, the information needed includes monitoring of fisheries resources and habitats prior to the construction of offshore wind energy facilities. The goal of this study was to assess the abundance, distribution, habitat use, and movement of the American lobster and Jonah crab in areas of offshore wind energy development. Twenty-four lease blocks within the Rhode Island/Massachusetts Wind Energy Area were selected for this study and sampled using a trawl of 10 traps with a standard design used by state fisheries managers. BOEM will use the data generated by this study to better understand and assess the potential impact of offshore wind power on these species. This information can also be used with other information gathered after construction to develop measures to mitigate any identified negative impacts.

## Findings/Results:

- Overall lobster abundance was similar in 2014 and 2018, but significantly lower in 2015. Jonah crabs were least abundant in 2015 and most abundant in 2018.
- Seasonally, lobster abundance was highest in summer, and Jonah crab abundance was highest in summer and fall.
- Spatially, lobster abundance was highest in the eastern lease blocks characterized by boulders and the transition from boulders to sand. Jonah crab abundance was highest in the northern and central lease blocks, which are characterized by soft sediments and sand.

## Final Reports:

Collie JS, Malek Mercer A, Glass C, Long M, Langan J. 2019. Spatial and temporal distributions of lobsters and crabs in the Rhode Island Massachusetts Wind Energy Area, 2018 update. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 75 p. Report No.: OCS Study BOEM 2021-010.

# Offshore Oil and Gas Activity Impacts on Ecosystem Services in the Gulf of Mexico

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100226>

**Conducted by:** Louisiana State University

**National Studies List:** GM-14-03-11

**Study Products (available in ESPIS):** Final report, technical summary



*Red snapper caught in the Gulf of Mexico*

## Purpose/Information Use:

Ecosystem services are the material and energy outputs drawn from the natural environment and used by humans. They include food supply, pollination, recreation, water treatment, soil formation, storm mitigation, and any other materials or processes supplied by natural or managed ecosystems. Though ecosystem services are, by definition, valuable to humans, they are not always valued by modern economies, which can lead to market failures. Past research has sought to place a monetary value on ecosystem services, and this study critically reviews the previous research with respect to three Gulf of Mexico (GOM) ecosystem services: recreation, fishing, and storm mitigation. The study also performs an analysis to predict how one ecosystem service (commercial fishing) might be impacted by changes in oil and gas platform numbers. The results of the study will provide BOEM a better understanding of the usefulness and limitations of using Ecosystem Services Valuations (ESVs) for ecological-economic cost-benefit analysis.

## Findings/Results:

- The GOM fishery provides an estimated \$1-2 billion in food-provisioning ecosystem services to the U.S.; this figure does not include any recreational ecosystem services associated with fishing.
- The ecosystem model developed for this study suggests that platform removal would have little impact on the population of red snapper, and hence its economic value.
- Using ESVs for ecological-economic cost benefit analysis should be done with caution due to the wide range of valuations from past ESV studies, and because the source of the variations is currently unknown.

## Final Reports:

Snyder B, Dismukes D, Gomez V, Narra S. 2020. Use and limits of ecosystem services valuations in the Gulf of Mexico. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 90 p. Report No.: OCS Study BOEM 2021-006.

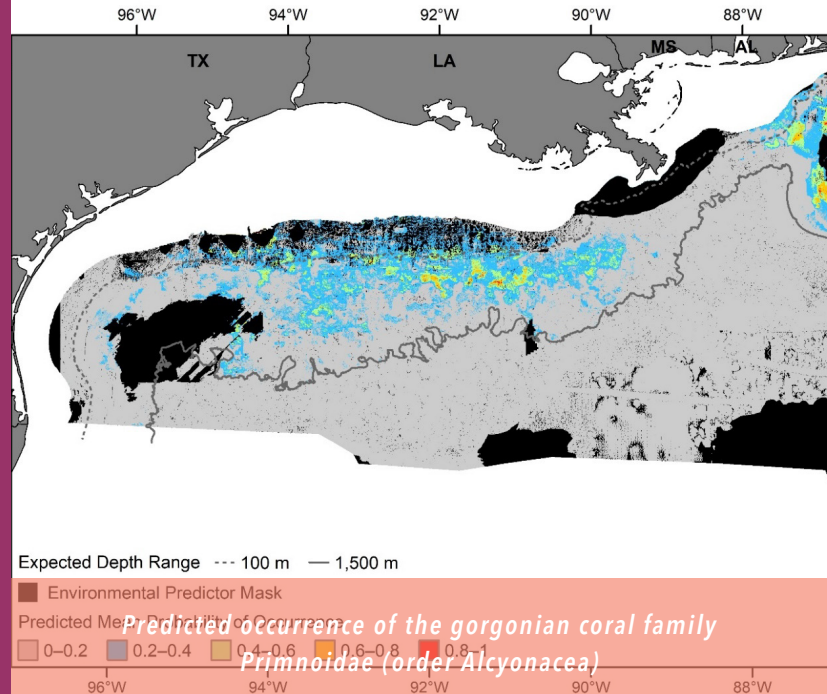
# Deepwater Coral and Chemosynthetic Atlas and Modeling Program: Gulf of Mexico

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100154>

**Conducted by:** National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science

**National Studies List:** GM-15-06

**Study Products (available in ESPIS):** Final report, technical summary



## Purpose/Information Use:

Deep-sea corals (DSCs) can create local hotspots of biodiversity by creating three-dimensional structures that provide homes for other organisms. BOEM has identified DSCs and chemosynthetic communities (made up of organisms that use inorganic molecules such as methane as a source of energy, rather than sunlight) as sensitive deep-water species. For this reason, BOEM requires oil and gas operators to avoid such habitats. This study first compiled a database of presence or absence observations of DSCs and chemosynthetic communities with associated measures of sampling effort (i.e., the survey area associated with each sample), then used this information to develop high quality predictive maps of the distribution of these organisms across the entire Gulf of Mexico (GOM). BOEM will use these maps and data products to better assess the potential impacts of offshore energy development on the marine environment in the GOM.

## Findings/Results:

- The project delivered maps and digital files of the predicted distributions of 44 deep-sea coral taxa and 3 chemosynthetic communities, along with maps of predicted taxonomic richness for a number of multi-genus and multi-family models.
- The report presents a map of the predicted genus richness for 28 genera of structure-forming stony corals, gorgonian corals, and black corals, and summaries by planning area and depth zone.
- Due to challenges with limited data, the predictions for chemosynthetic communities should be considered preliminary and less precise than what was achieved for the corals.

## Final Reports:

Goyert HF, Bassett R, Christensen J, Coleman, H, Coyne M, Etnoyer PJ, Frometa J, Hourigan, TF, Poti M, Salgado EJ, Williams B, Winship AJ. 2020. Characterizing spatial distributions of deep-sea corals and chemosynthetic communities in the U.S. Gulf of Mexico through data synthesis and predictive modeling. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 317 p. Report No.: OCS Study BOEM 2021-027.



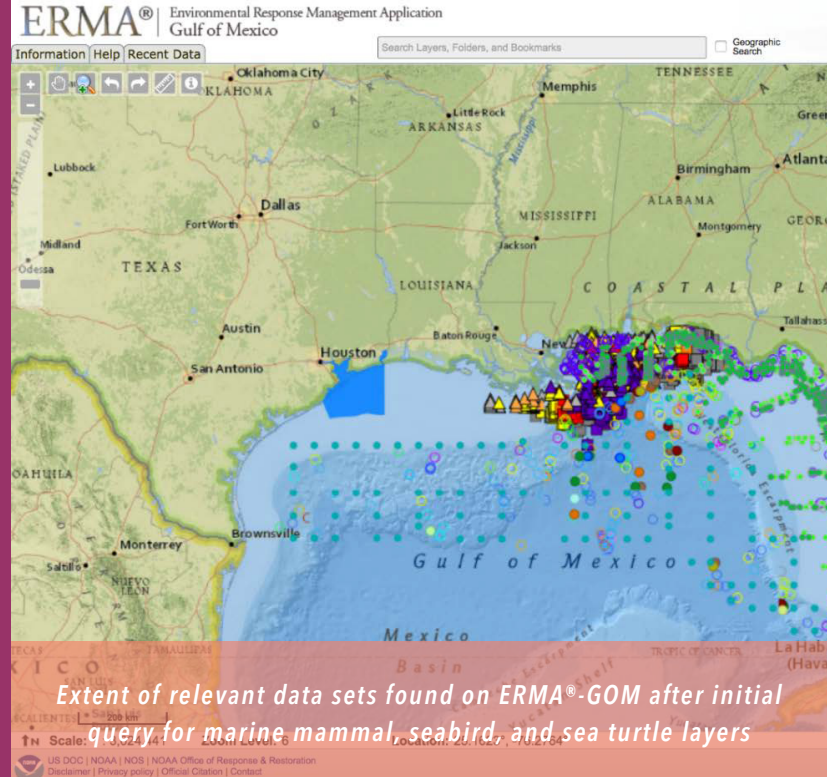
# Gulf of Mexico Marine Assessment Program for Protected Species (GOMMAPPs): Marine Cadastre Planning Tool and Outreach Support

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100176>

**Conducted by:** National Oceanic and Atmospheric Administration (NOAA) Southeast Fisheries Science Center; Quantum Spatial, Inc.

**National Studies List:** GM-16-09a

**Study Products (available in ESPIS):** Final report, technical summary



## Purpose/Information Use:

GoMMAPPs is a partnership program between BOEM, NOAA, the U.S. Fish and Wildlife Service, and the U.S. Geological Survey. Historically, living marine resource data collected from the Gulf of Mexico (GOM) have been inconsistently collated, creating the need for better data. GoMMAPPs meets this need by identifying and filling in data gaps for select taxa (marine mammals, birds, and sea turtles). BOEM will use the results of GoMMAPPs to inform regulatory decisions, and data generated will also help other agencies and stakeholders involved in effective management and conservation of protected species in the GOM.

## Findings/Results:

- As one component of GoMMAPPs, this study completed a review of scientific literature, created a database containing information on relevant studies, identified and summarized data gaps, and created three Esri ArcGIS® maps for use in outreach and education efforts.
- The literature review identified 51 relevant studies. Sampling methodologies fell into one of four categories: radio telemetry (34 studies), point counts (5), genetic analysis (11), and line transects (16). Some studies incorporated more than one sampling methodology.
- The Eastern GOM Planning Area overlapped with the greatest number of identified studies (41), followed by the Central GOM (37) and Western GOM (33) Planning Areas.

## Final Reports:

Rogers E, Marcella T, Ramirez A, Kot C. 2021. Identifying past studies and prioritizing research gaps in support of the Gulf of Mexico Assessment Program for Protected Species (GoMMAPPs). New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 85 p. Report No.: OCS Study BOEM 2021-011.

# Natural Habitat Associations and the Effects of Dredging on Fish at the Canaveral Shoals, East-Central Florida

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100163>

**Conducted by:** U.S. Navy

**National Studies List:** NT-14-x12

**Study Products (available in ESPIS):** Final report



*Breaking waves and turbid water are common conditions on the Southeast Shoal except under very calm seas*

## Purpose/Information Use:

Sand shoals of the Outer Continental Shelf (OCS) are an important source of beach-quality sand for coastal nourishment and restoration projects. Demand for this resource is predicted to grow in response to continued shoreline development, storm erosion, and rising sea levels. Ensuring continued access to sand is essential for safeguarding vulnerable coastal infrastructure. Sand shoals are also an important habitat for a myriad of marine species, many of which are of high economic value or conservation priority. This study sought to better quantify the habitat preferences and seasonality of federally managed fish and sea turtles associated with a large sand shoal complex at Cape Canaveral, FL, and compare animal use of an active sand borrow area to a nearby undisturbed site with similar physical characteristics. The results of the study will help BOEM better understand the biological impacts of OCS dredging.

## Findings/Results:

- Overall, there was minimal evidence suggesting that sand shoals at Cape Canaveral served a more important role for large fish or sea turtles than other adjacent habitats within the study area.
- Although OCS dredging has potential to negatively impact the marine environment, the relative impact to managed species in sand shoal systems is likely to be muted by some of the common traits of the large-bodied fish and sea turtles targeted in this study (such as low site fidelity, high mobility, and seasonal migration).

## Final Reports:

Iafrate JD, Watwood SL, Reyier EA, Ahr BJ, Scheidt DM, Holloway-Adkins KG, Provancha JA, Stolen ED. 2019. Behavior, seasonality, and habitat preferences of mobile fishes and sea turtles within a large sand shoal complex: insights from traditional sampling and emerging technologies. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 183 p. Report No.: OCS Study BOEM 2019-043.

# Using Advanced Population Genomics to Better Understand the Relationship Between Offshore and Spawning Habitat Use for Atlantic Sturgeon

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100292>

**Conducted by:** U.S. Geological Survey

**National Studies List:** NT-14-x12

**Study Products (available in ESPIS):** Final report, technical summary



## Purpose/Information Use:

Atlantic sturgeon are a large, ancient fish native to the Atlantic Coast of North America and have experienced significant decrease in numbers due to overexploitation and other anthropogenic impacts. Five Distinct Population Segments (DPSs, which are based on distinct genetic and physical characteristics within a given species) of Atlantic sturgeon are listed, managed, and protected under the Endangered Species Act. However, Atlantic sturgeon frequently form mixed-stock aggregations in marine and estuarine waters, which creates a management challenge. Consequently, individual fish can only be assigned to their DPS using molecular genetic techniques. This study used recent advances in genomics (the branch of biology concerned with the structure, function, evolution, and mapping of genomes) to reduce the amount of uncertainty when assigning fish to a DPS. The results of the study will help BOEM better understand potential impacts to Atlantic sturgeon from offshore energy and mineral development activities.

## Findings/Results:

- The method developed in this study (genotyping-in-thousands by sequencing) advances our ability to study the population genomics of Atlantic sturgeon.
- Based on the observed differences in allele frequencies (the incidence of a gene variant in a population) among populations, the genomic baseline developed in this study supports previous assertions that Atlantic sturgeon show homing to natal rivers (where they were born), despite mixing extensively in marine waters during non-breeding periods.

## Final Reports:

Kazyak DC, Aunins A, Johnson R, Lubinski B, Eackles M, King TL. 2019. Using advanced population genomics to better understand the relationship between offshore and spawning habitat use for Atlantic sturgeon. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 70 p. Report No.: OCS Study BOEM 2020-062.



## Department of the Interior Mission

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

## Bureau of Ocean Energy Management

The mission of the Bureau of Ocean Energy Management is to manage development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way.

## BOEM Environmental Studies Program

The mission of the Environmental Studies Program (ESP) is to provide the information needed to predict, assess, and manage impacts from offshore energy and marine mineral exploration, development, and production activities on human, marine, and coastal environments. The proposal, selection, research, review, collaboration, production, and dissemination of each of BOEM's Environmental Studies follows the DOI Code of Scientific and Scholarly Conduct, in support of a culture of scientific and professional integrity, as set out in the DOI Departmental Manual (305 DM 3).

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