

BUREAU OF OCEAN ENERGY MANAGEMENT | ENVIRONMENTAL STUDIES PROGRAM

Quarterly Reports

FY 2022 Third & Fourth Quarter

BOEM

Bureau of Ocean Energy
Management



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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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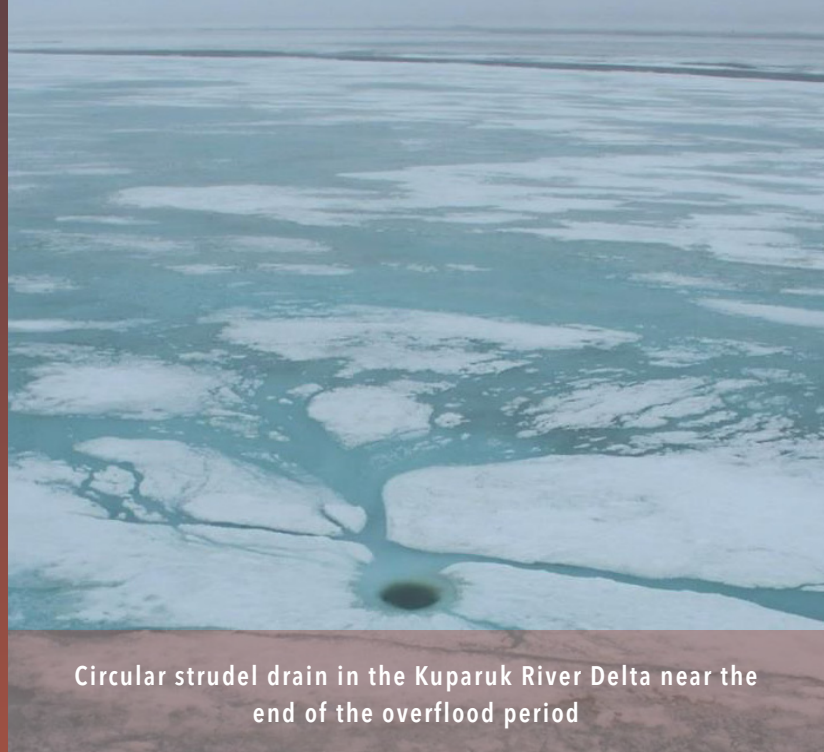
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Update of River Overflow on Sea Ice and Strudel Scour Database

Conducted by: Coastal Frontiers Corporation and DF Dickins Associates, LLC

National Studies List: AK-20-03

Study Products: Final report, technical summary



Circular strudel drain in the Kuparuk River Delta near the end of the overflow period

Purpose/Information Use:

River overflow on sea ice occurs annually in the nearshore region of the United States (U.S.) Beaufort Sea during a brief period in the spring when river breakup precedes the breakup of the landfast sea ice. When it reaches the coast, river water flows on top of the grounded and floating sea ice, spreading up to 6 miles offshore. This brief but energetic phenomenon is a potential hazard to offshore oil and gas development in that it can impede access to facilities, disperse spilled oil, and expose buried subsea pipelines through strudel scouring (when water flowing through cracks in the ice disturbs and digs into the seafloor). This study mapped the extent of peak river overflow onto the landfast ice in the nearshore region of the U.S. Beaufort Sea between 2008–2020. The results of the study will allow BOEM and other agencies to assess potential environmental hazards to present and potential future oil and gas facilities within the study area.

Findings/Results:

- The study mapped a total of 274 river overflow boundaries between 2008–2020.
- The immediate region fronting all but one of the 13 major rivers in the study area (Topagoruk River) flooded annually. In the central portion of the study area, between Cape Halkett and the Staines River, the entire coast flooded 25% of the time. Elsewhere, the flooded areas were discontinuous.
- The overflow phenomenon appears to be governed by interactions between a number of environmental forces, some of which (e.g., soil moisture at high elevations at the onset of snowpack thawing, ice jams in distributary channels, roughness and snow cover on the sea ice, wind events during flooding, and density of drainage features on the sea ice) are complex, are poorly understood, or lack sufficient data to evaluate their contributions to the overall overflow process.

Final Report: [\(Click to access\)](#)

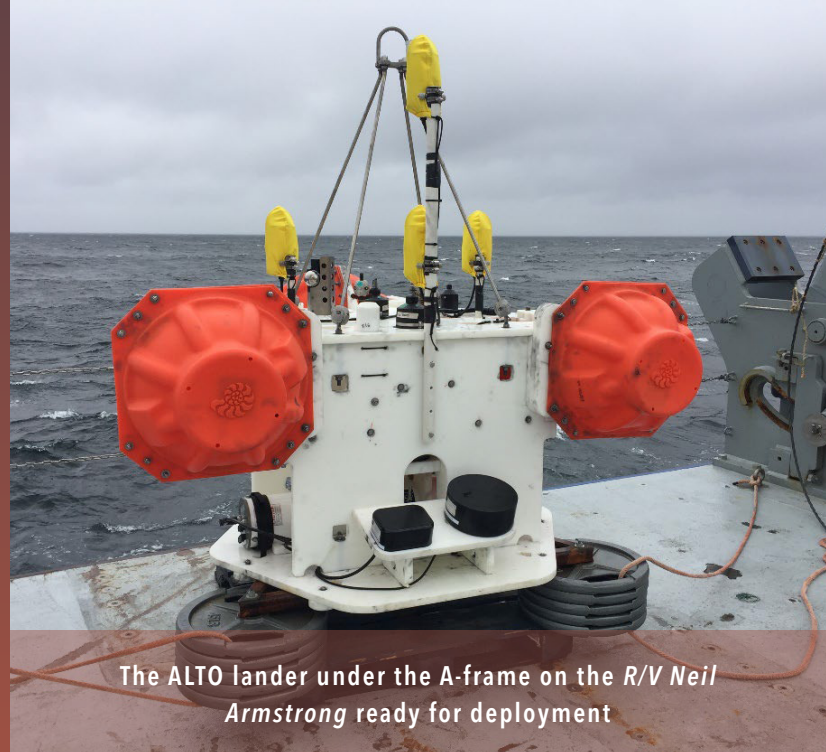
Hearon G, Plana Casado A, Scott C, Dickins D. 2022. Update of the river overflow on sea ice and strudel scour in the U.S. Beaufort Sea. Anchorage (AK): U.S. Department of the Interior, Bureau of Ocean Energy Management. 98 p plus appendices. Report No.: OCS Study BOEM 2022-044.

Atlantic Deepwater Ecosystem Observatory Network (ADEON) – An Integrated System for Long-Term Monitoring of Ecological and Human Factors on the OCS

Conducted by: **University of New Hampshire**

National Studies List: **AT-16-08**

Study Products: **Final reports, technical summary**



The ALTO lander under the A-frame on the R/V Neil Armstrong ready for deployment

Purpose/Information Use:

ADEON is an effort to establish a long-term ocean ecosystem observing network and provide baseline measurements and environmental monitoring across multiple disciplines. The National Oceanographic Partnership Program supports this partnership effort by BOEM, the Office of Naval Research (ONR), and the National Oceanic and Atmospheric Administration (NOAA). The overarching goal of this study was to establish an integrated, deep-water observing system for the U.S. Mid- and South Atlantic Outer Continental Shelf (OCS) to generate multi-year, year-round measurements of the natural and human factors associated with OCS ecology and soundscape. Innovative online visualization tools for exploring the ADEON data allow researchers to continue to use the data long after the project is complete. The ADEON data will inform ecosystem-based management activities and improve BOEM's understanding of impacts of energy development activities on marine resources.

Findings/Results:

- Marine mammal use of the OCS is more complex than previously documented in the literature and seasonal surveys.
- The presence of individual ships significantly impacts the measured and modelled soundscape across the OCS.
- In the ADEON region, acoustic energy is greater at the seafloor than the ocean surface.
- Oceanographic conditions at the seafloor exhibit greater variability than at the surface. Benthic (at or near the seafloor) variability is a major driver of biomass in the water column.

Final Report: [\(Click to access\)](#)

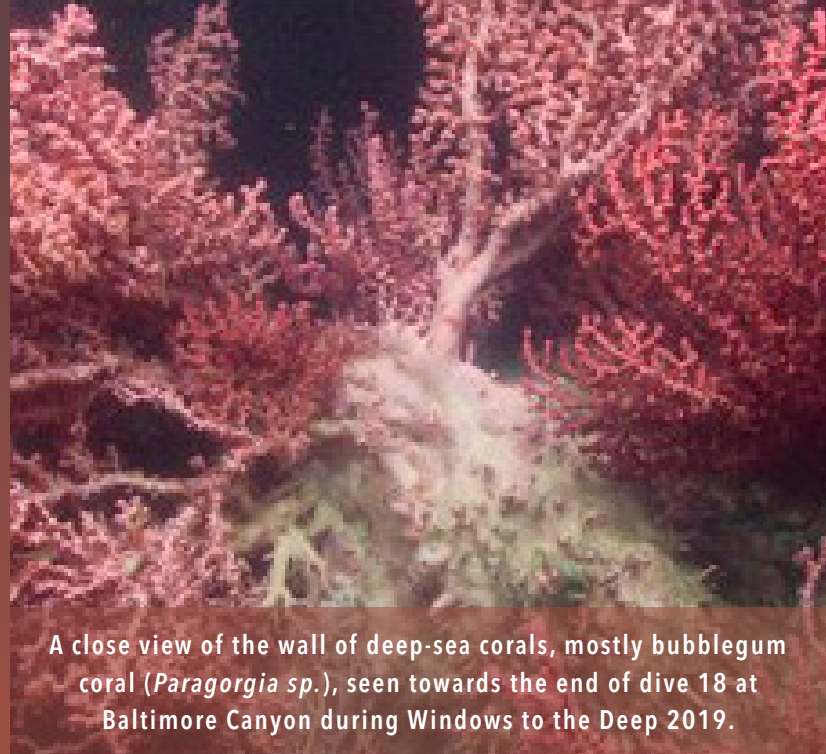
Miksis-Olds, JL, Ainslie M, Butkiewicz T, Clay, T, Hazen E, Heaney K, Lyons AP, Martin B, Moore T, Ridgeway T, Warren JD. 2021. Atlantic Deepwater Ecosystem Observatory Network (ADEON): an integrated system for long-term monitoring of ecological and human factors on the Outer Continental Shelf synthesis report. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 320 p. Report No.: OCS Study BOEM 2022-047.

Data Synthesis and Advanced Predictive Modeling of Deep Coral and Hardbottom Habitats in the Southeast Atlantic: Guiding Efficient Discovery and Protection of Sensitive Benthic Areas

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

National Studies List: **AT-16-10**

Study Products: **Final report, technical summary**



A close view of the wall of deep-sea corals, mostly bubblegum coral (*Paragorgia sp.*), seen towards the end of dive 18 at Baltimore Canyon during Windows to the Deep 2019.

Purpose/Information Use:

Offshore energy projects include activities that may physically disturb the seafloor and negatively affect benthic biota (animals and plants living on or near the seafloor). BOEM requires information on the locations of sensitive benthic habitats, including deep-sea corals and hardbottom areas capable of supporting diverse benthic communities. Many deep-sea corals form complex 3D structures that can increase local biodiversity by providing microhabitats for use by other species (e.g., fishes, crustaceans, echinoderms). Areas with exposed hardbottom provide surfaces for attachment by sessile (nonmoving) invertebrates (like deep-sea corals) and may be associated with greater diversity and abundance of large fish. BOEM will use the results of this study to inform and support environmental assessments and decision-making for proposed offshore energy development in the southeast Atlantic portion of the Outer Continental Shelf.

Findings/Results:

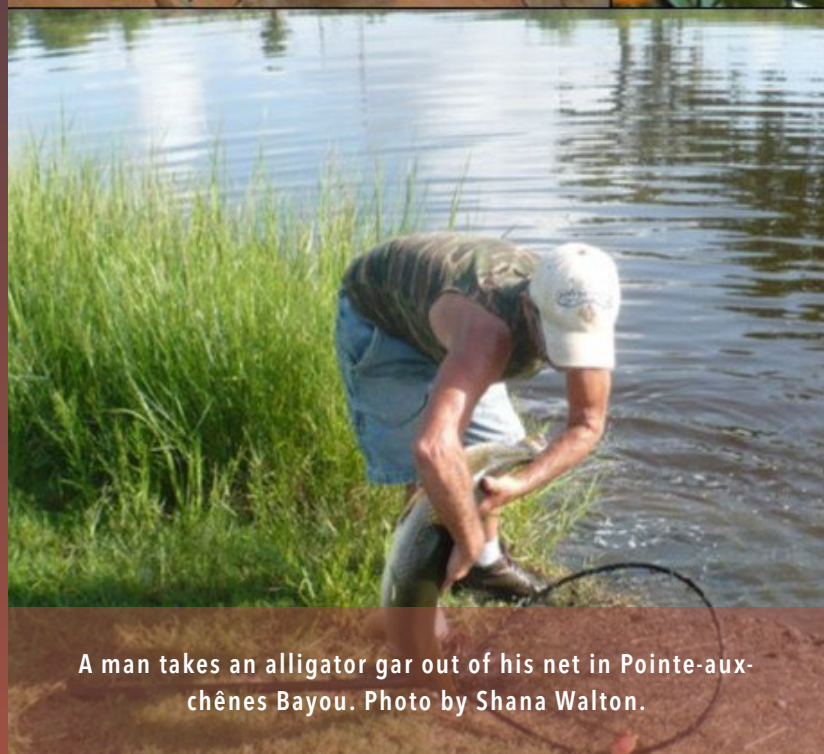
- Multi-taxon occupancy models offer a novel framework for estimating the spatial distributions and biodiversity of deep-sea corals and hardbottom habitats using presence-absence data.
- The study produced maps of the observed and predicted occurrence across the study area for 24 taxa of deep-sea corals and for hardbottom habitats, as well as a map of the predicted genus richness (the number of related species expected at each grid cell).
- Corresponding maps provide a measure of the variability, or uncertainty, associated with the model predictions at each grid cell.

Final Report: [\(Click to access\)](#)

Poti M, Goyert HF, Salgado EJ, Bassett R, Coyne M, Winship AJ, Etnoyer PJ, Hourigan TF, Coleman HM, Christensen J. 2022. Data synthesis and predictive modeling of deep-sea coral and hardbottom habitats offshore of the southeastern US: guiding efficient discovery and protection of sensitive benthic areas. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 224 p. Report No.: OCS Study BOEM 2022-038.

Subsistence in Coastal Louisiana: An Exploratory Study

Conducted by: Louisiana State University
National Studies List: GM-09-01-09
Study Products: Final reports, technical summary



A man takes an alligator gar out of his net in Pointe-aux-chênes Bayou. Photo by Shana Walton.

Purpose/Information Use:

In the aftermath of the *Deepwater Horizon* oil spill in 2010, individuals suffered subsistence losses due to damages to wild resources they could no longer access—resources they would have acquired through their own labor or through gifting and sharing. However, subsistence has never been studied systematically in the Gulf of Mexico Region. To help remedy this situation, this study was designed to 1) explore the range of subsistence activities (including production, exchange sharing, barter, and small-scale informal sales); 2) identify key dynamics in the overlapping activities of commercial and household consumption; 3) field test research methods to study subsistence; and 4) produce preliminary data about subsistence harvesting, exchange, and consumption. The findings of this study will provide much-needed information on subsistence activities and their importance in Louisiana and will be used to support future environmental assessments and potential future studies.

Findings/Results:

- Although media accounts portray subsistence as a sporadic activity, in coastal Louisiana, subsistence is both ordinary and pervasive. Hunting and harvesting are part of everyday life in coastal communities.
- Coastal communities may not view what they do (gardening, hunting, crabbing, or shrimping and sharing their harvest with family or neighbors) as part of one single system (“subsistence”).
- Harvesting and sharing are connected to family and community in complex ways, and subsistence activities are central to personal, cultural, and regional identity.
- Coastal communities worry that rapid environmental change threatens hunting and harvesting. Loss of access to hunting and harvesting can have environmental justice implications, with poorer communities and individuals impacted most heavily.

Final Reports: (Click to access)

Regis H, Walton S. 2019. Subsistence in coastal Louisiana, volume 1: an exploratory study. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 172 p. Report No.: OCS Study BOEM 2022-063.

See also [Volume 2](#), [Volume 3](#), [Volume 4](#) and [Appendix A](#)

California Deepwater Investigations and Groundtruthing (Cal DIG) I

Conducted by: United States Geological Survey
National Studies List: PC-17-02
Study Products: Final reports



Stylaster californicus with a Blacksmith (*Chromis punctipinnis*).

Purpose/Information Use:

This study focused on potential seafloor hazards and impacts of renewable energy infrastructure in the Outer Continental Shelf offshore Morro Bay, California. The study area has high wind resource potential, is in water depths of 1,300 to 5,000 ft, and is adjacent to a decommissioned nuclear power plant with a developed electric grid connection. The study produced a three-volume report that addresses biological analysis of seafloor video data (volume 1), geologic framework and hazards (volume 2), and seafloor habitat (volume 3). The findings will help BOEM address important issues associated with marine spatial planning and potential offshore infrastructure development, such as offshore floating wind turbines.

Findings/Results:

- Nearly 120,000 observations of organisms and their habitat were made from 25 video transects selected from 185 hours of remotely operated vehicle video.
- The vast majority of geological faults and other structures in the study area exist within sediment and rock formations that are more than 2.5 million years old and are unlikely to present a substantial hazard to seabed infrastructure.
- Soft sediment (mud and fine sand) cover 92.7% (3,013 mi²) of the study area. Mixed and hard substrate areas comprise 4.8% (156 mi²) and 2.5% (84 mi²) of the study area, respectively.

Final Reports: (Click to access)

[Kuhnz LA, Gilbane L, Cochrane GR, Paull CK. 2021. California Deepwater Investigations and Groundtruthing \(Cal DIG\) I, volume 1: biological site characterization offshore Morro Bay. Camarillo \(CA\): U.S. Department of the Interior, Bureau of Ocean Energy Management. 72 p. Report No.: OCS Study BOEM 2021-037.](#)

[Walton MAL, Paull CK, Cochrane G, Addison J, Caress D, Gwiazda R, Kennedy D, Lundsten E, Papesh A. 2021. California Deepwater Investigations and Groundtruthing \(Cal DIG\) I, volume 2: fault and shallow geohazard analysis offshore Morro Bay. Camarillo \(CA\): U.S. Department of the Interior, Bureau of Ocean Energy Management. 56 p. Report No.: OCS Study BOEM 2021-044.](#)

[Cochrane GR, Kuhnz LA, Gilbane L, Dartnell P, Walton MAL, Paull CK. 2022. California Deepwater Investigations and Groundtruthing \(Cal DIG\) I, volume 3: benthic habitat characterization offshore Morro Bay, California. Camarillo \(CA\): U.S. Department of the Interior, U.S. Geological Survey and Bureau of Ocean Energy Management. 18 p. Report No.: Open-File Report 2022-1035 and OCS Study BOEM 2021-045.](#)

Characteristics and Contributions of Noise Generated by Abrasive Cutting During Conductor-Removal Operations

Conducted by: **Tetra Tech, Inc.**

National Studies List: **PC-20-x05**

Study Products: **Final reports, technical summary**



NoiseSpotter Bottom Platform Deployment

Purpose/Information Use:

There are 23 oil platforms planned for decommissioning within federal waters offshore southern California. Part of the decommissioning process involves cutting the platform conductors (pipes that serve as the outside casing for oil wells) in order to remove them. This study sought to determine the sound pressure levels generated from cutting these platform conductors (i.e., how loud the cutting process is) and how much they contribute to the ambient soundscape (the background level of noise in the ocean). Data were also collected on the presence of marine mammals in the study area and their contribution to the soundscape. The findings of the study will improve BOEM's ability to assess impacts of conductor-removal operations to protected marine mammal, fish, and invertebrate species of interest during decommissioning and to develop appropriate mitigation strategies.

Findings/Results:

- Data were collected for a total of 25 conductors incorporating a total of 40 identified mechanical cutting events. The cut depth ranged from 20 to 25 ft below the mudline and the duration of the cuts was dependent on the number of casing strings that needed to be cut.
- Cutting oil and gas platform conductors produces underwater sound pressure levels that contribute to the existing underwater ambient acoustic environment; however, sound pressure levels are generally below the thresholds of injury to marine mammals.
- Marine mammals were detected in the study area and their calls also contributed to the underwater ambient acoustic environment.

Final Reports: (Click to access)

[Fowler K, Pellerin P, Zoidis A. 2022. Characteristics and contributions of noise generated by mechanical cutting during conductor removal operations; volume 1: final report. Camarillo \(CA\): U.S. Department of the Interior, Bureau of Ocean Energy Management. 105 p. Report No.: OCS Study BOEM 2022-029.](#)

[Fowler K, Pellerin P, Zoidis A. 2022. Characteristics and contributions of noise generated by mechanical cutting during conductor removal operations; volume 2: appendix A. Camarillo \(CA\): U.S. Department of the Interior, Bureau of Ocean Energy Management. 44 p. Report No.: OCS Study BOEM 2022-029.](#)

[Fowler K, Pellerin P, Zoidis A. 2022. Characteristics and contributions of noise generated by mechanical cutting during conductor removal operations; volume 3: appendices B–F. Camarillo \(CA\): U.S. Department of the Interior, Bureau of Ocean Energy Management. 252 p. Report No.: OCS Study BOEM 2022-029.](#)

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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