The Impacts of Offshore Development

Oil and gas development on the Outer Continental Shelf (OCS) involves a whole series of marine-based procedures that begin with seismic exploration and end with landing the extracted hydrocarbons at a refinery onshore. Each one of these stages generates noise in the surrounding marine environment impacting all of the humans and animals that depend on that environment for their own survival and quality of life.

What are all these noises?

The public is already concerned about the impact of seismic airgun surveys on the environment.

There are a lot of scientific data on biological disruptions caused by seismic surveys and the impacts that around-the-clock seismic impulses have on marine mammals, fisheries, and even marine invertebrates. But there are many other processes that occur as a part of "Extraction and Processing" (E&P) that are less known but also exact a toll on the marine environment.

The offshore developers are taking their chances that they can avoid another catastrophic oil spill. But there is no "maybe" on these noises. If offshore development starts, the outer continental shelf (OCS) will become a factory floor.

Who are we?

Ocean Conservation Research is a growing group of scientists, engineers, and ocean advocates dedicated to improving the acoustic environmental health of the sea.

Our sustainable future depends upon a clear understanding of the environmental impact of human enterprise on the ocean. Our focus is on the environmental and biological effects of ocean noise pollution. We use our interdisciplinary understanding to craft technical, scientific, and policy solutions to some of the most pressing environmental challenges of our time.

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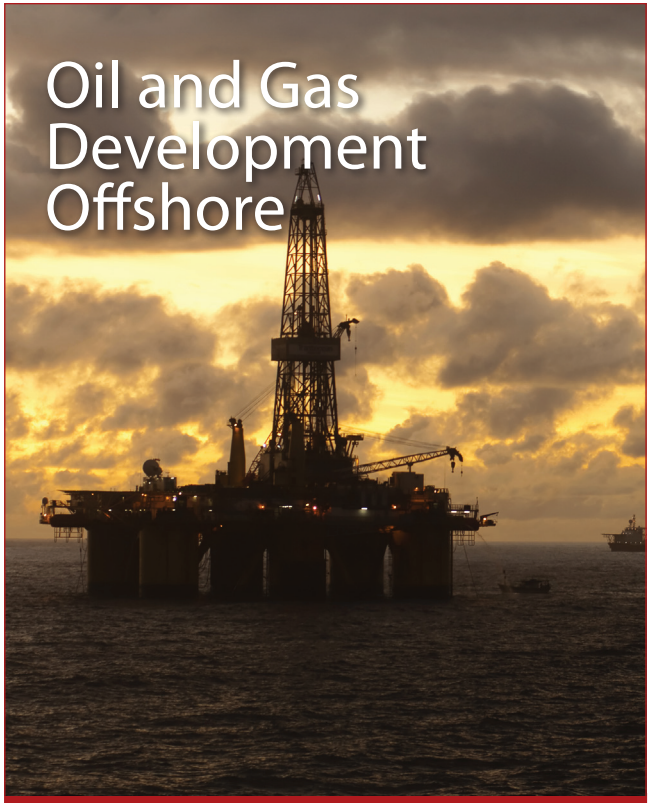
Oil and Gas Development Offshore



What happens after the airguns hit the water?

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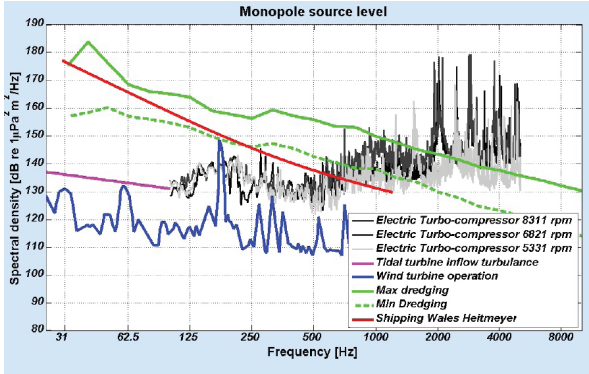
Science and technology serving the sea

If it goes as planned, the exploitation of offshore oil and gas would transform the outer continental shelf into a factory floor complete with the continuous roar of industrial equipment and processes.

Dynamically Positioned Operating Platforms and Floating Production, Storage, and Offloading (FPSO) Vessels (250Hz – 4Khz)

Deepwater drilling platforms are not built on an iron towers; rather, due to the depths of their operations, they are floating platforms held in place ("dynamically positioned") by 6-8 continuously operating "thrusters." These thrusters are 3-meter diameter propellers each typically driven by ~5000hp motors. The force (and noise) they exert is defening - the equivalent of 6-8 mid-weight cargo ships concentrated in the area of a single operating platform.

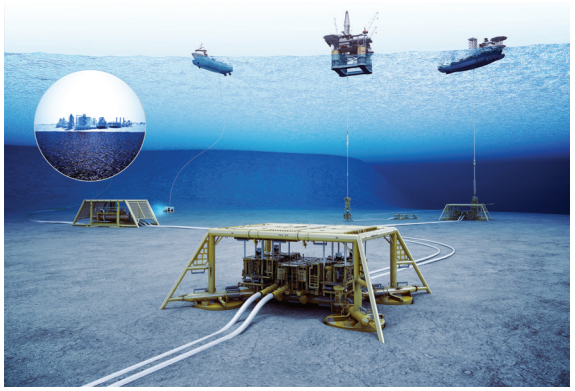


Offshore Industrial Noise Chart: Bas Binnerts

TNO innovation for life

Deepwater "Subsea" Processing Equipment (500Hz – 2.5kHz)

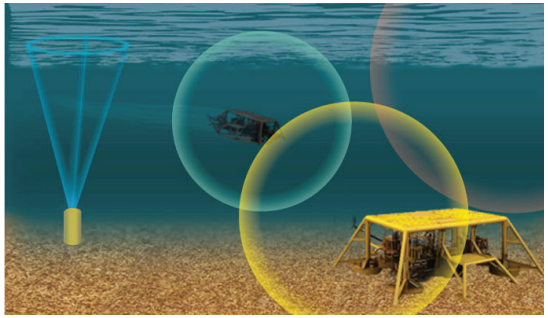
Deepwater hydrocarbon extraction employs large production and processing equipment mounted on the seafloor. It is used to "pre-refine" oil/gas (separate it from unwanted brine, gases, mud, and solids), re- inject the unwanted materials and substances back into the seafloor, and pump or pressure-drive the refined oil/gas up to the surface. This work is done under extreme pressures at the seafloor and generates noise that one industry professional describes as "really screaming."



FMC Technologies

Seafloor and equipment-mounted Navigation Beacons (10kHz – 100kHz)

Deepwater (subsea) operations employ various acoustical navigation and orienting beacons to track and locate equipment, monitor currents and depth, and locate operation areas. These signal sources are similar to airport radar beacons, except they are acoustical and often operate continuously in the 10kHz – 100kHz range. This range overlaps the communication and bio-sonar ranges of dolphins and toothed-whales, and the predator detection frequencies of "forage" or bait fish like shad, herring, and menhaden.



Acoustical control of Underwater Autonomous Vessels (20kHz – 75kHz)

Increasingly offshore enterprises are managed by Autonomous Underwater Vessels (AUV). They are controlled using acoustical single-channel or multi-nodal communication networks. These often operate in the 25kHz – 100kHz range, again overlapping the communication and bio-sonar ranges of dolphins and toothed-whales and the detection frequencies of "forage" or bait fish like shad, herring, and menhaden.

Service Vessels, Offloading Transport Tankers, and Personnel Carriers (250Hz – 4kHz)

Each drilling platform becomes a hub of industrial shipping activity: delivering equipment and supplies, offloading oil and gas, and transporting personnel to and from the platform.

Unless we act, these noises will become pervasive in our coastal waters and they will have negative impacts on coastal wildlife, environment, fisheries, and economies.