Media release

Underwater noise: The hidden danger of deep-sea mining

OceanCare releases first in-depth analysis of noise emissions from deep sea mining activities

Wädenswil, 22. November 2021: **Today, OceanCare releases its report titled "Deep-Sea Mining: A noisy affair". It is the first in-depth analysis addressing concerns about noise emissions from exploration and expected exploitation activities in the deep-sea and their potential impacts on marine life.**

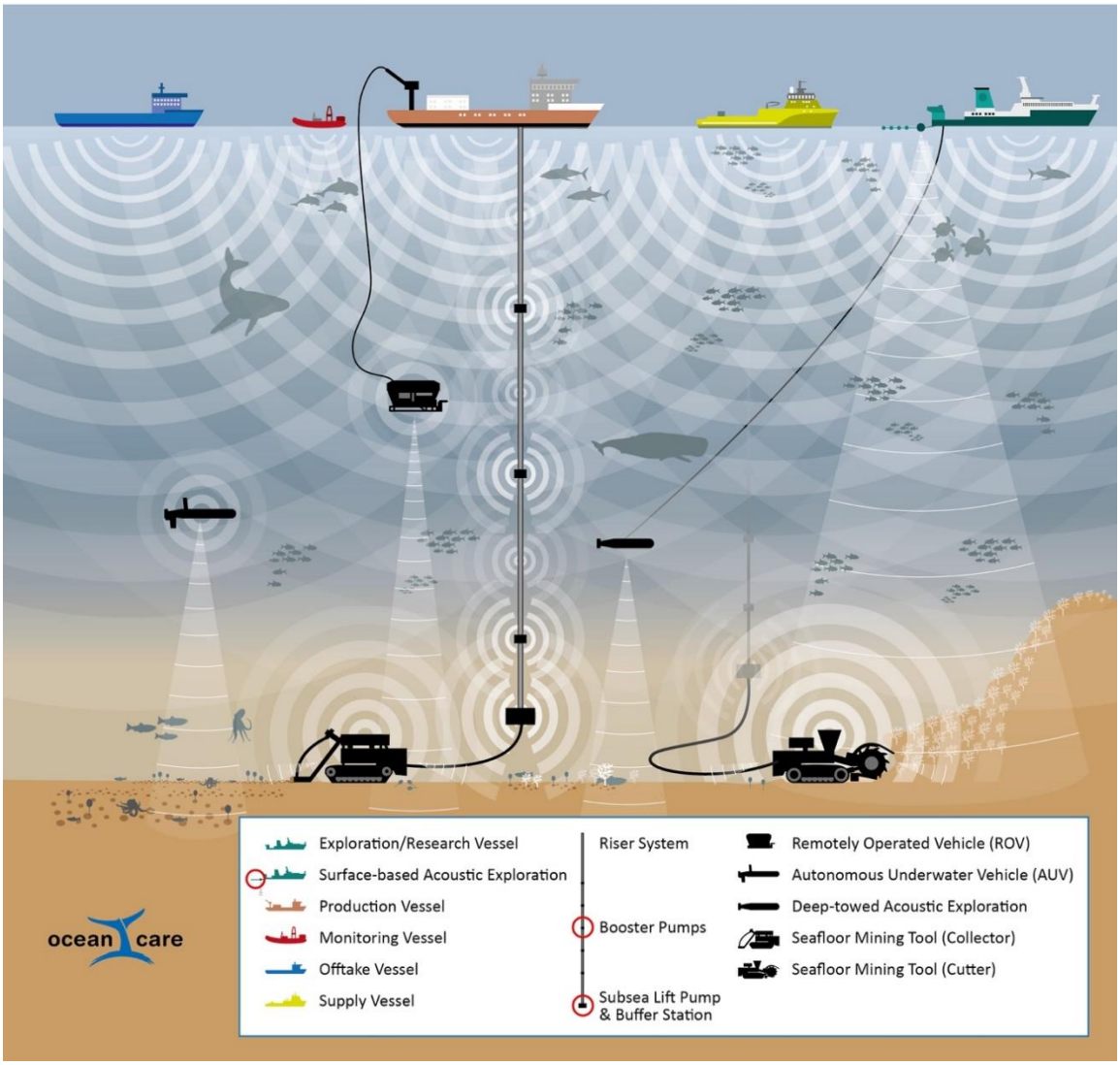
The report includes concrete recommendations to improve future decision-making regarding deep-sea mining (DSM). Main author is Cyrill Martin, lawyer and Ocean Policy Expert at OceanCare. His co-authors are marine biologist and ocean noise expert Dr. Lindy Weilgart, Dr. Diva Amon, a deep-sea expert and Dr. Johannes Müller, Ocean Policy Expert at OceanCare.

Deep-sea mining and underwater noise

While the debate around DSM has focused primarily on the physical destruction of the seafloor and sediment plumes, another important and harmful effect of deep-sea mining has only recently come into clearer focus: underwater noise.

"Underwater noise threatens marine life", says Cyrill Martin, Ocean Policy Expert at the marine wildlife protection NGO OceanCare. "High levels of noise would be emitted constantly over decades if deep-sea mining is permitted without further research and regulation", he adds. Underwater noise pollution is one of the key policy areas of OceanCare. The NGO has built expertise in and campaigned against underwater noise pollution for almost two decades.

Underwater noise is emitted at all stages of deep-sea mining. The depiction below shows the most relevant sources, some of which are temporary whereas others are near constant for years to decades.



Characteristics of underwater noise

Noise travels fast and very efficiently underwater, at almost five times the speed of sound in air. Low frequencies can, under certain conditions, be heard over distances of thousands of kilometers in the ocean. At about 800 – 1000 meters depth in temperate areas, the Sound Fixing and Ranging (SOFAR) Channel allows sound to travel almost unimpaired – similar to light conducted through a fiber optic cable.

Through commercial shipping, oil and gas exploration activities, naval activities, and construction, noise levels have increased in the ocean. "Levels of human-generated noise have doubled every decade since the 1960's in some regions", says Cyrill Martin. "Deep-sea mining would take noise pollution to a whole new level, due to the presence of loud noise sources throughout the entire, very deep water column and the very long duration of noise emissions.".

But just how noisy is deep-sea mining? While it is difficult to compare noise levels and their potential impact on land and underwater due to the different densities of air and water, some rough comparisons illustrate how loud the acoustic emissions from deep-sea mining would be. Converted to decibels in air, many sources from deep-sea mining, such as sonars, vessels, dredging, and drilling emit noise levels that are several hundred times louder than those of a space-rocket launch. Even if the comparison is not 100% exact, it is clear that noise from deep-sea mining is a serious threat.

Why sound is vital to marine animals

Marine animals use sound in almost all aspects of their lives – for communication, food-finding, predator or hazard detection, navigation, finding mates, and sensing their environment. Small larvae use sound to find suitable reefs on which to settle. Marine mammals such as whales and dolphins are known for their unique songs and sophisticated acoustic repertoires.

Human-made (or: anthropogenic) noise can impair all of these vital functions in marine animals. Studies have shown that noise can disrupt communication and drown out important signals. Displacement and reduced commercial catch rates of fish due to anthropogenic noise exposure have also been recorded. Loud sounds can disturb reproductive and resting behavior as well as navigation and foraging. It can result in hearing loss and cause injury. Stress responses and reduced health and fitness have also been observed, ranging from nerve damage and internal injuries to impaired egg development and malformations.

This is not entirely surprising: "Noise is commonly used to study stress in terrestrial animals, and sonic weapons have been used by militaries and police to disrupt, confuse, disorientate, demoralize, and even injure opponents", states the OceanCare report. "Around 150 marine species have shown to be impacted by noise, so there is no longer any doubt that underwater noise is a harmful and a serious pollutant", says Lindy Weilgart, marine biologist at Dalhousie University, Canada, and OceanCare consultant.

Marine animals use the whole acoustic spectrum to sense their environment. "It is clear that sound plays an immensely important role for marine animals", says Lindy Weilgart. "Humans are already emitting noise almost constantly through shipping, oil and gas exploration, military sonars and other activities. We are seeing the consequences in whales, dolphins and other marine animals. Adding another source of constant and loud noise without further research about the impacts and without significant efforts to reduce the noise would be utterly irresponsible."

What we don't know yet

The scientific research about life in the deep sea is still in its infancy, and there are many data gaps in our understanding of noise pollution in the ocean. While some important facts have been established, there is still a relatively new field for research in the deep sea. As deep-sea mining has not started on a commercial scale yet, not many details about the actual expected impacts are known. However, the lack of information makes this endeavor potentially more dangerous.

"Many of the species in the deep sea are not well understood, including how they might be impacted by DSM underwater noise or what knock-on ecological effects might occur as a result", says deep-sea biologist Diva Amon. "To proceed with an experiment that could have long-term impacts on the deep sea or even the entire ocean (such as its capacity to store enormous quantities of carbon) is reckless. Out of sight doesn't mean without impact. Humans tend to rush into activities without fully understanding their consequences" adds Cyrill Martin.

This is especially relevant as the benefits of deep-sea mining are not clear. While some proponents argue that minerals from the seafloor are indispensable raw materials for batteries powering our electric future, recycling and innovation could offer solutions. Many battery makers are switching to more readily available materials such as iron and phosphate. Tesla has announced that it will use cheaper lithium-iron-phosphate (LFP) cells in some of its vehicles. In China, LFP batteries are already common.

What needs to be done

1) OceanCare recommends incorporating and following the precautionary principle in regulations and to restrict noise emission until there is a sound scientific foundation showing that noise emissions from deep-sea mining activities do not harm the marine environment and species significantly.

2) Create a solid scientific foundation covering all relevant aspects and potentially harmful effects of noise pollution through deep-sea mining.

3) Adopt policy measures including a pause in the drafting of the Mining Code as well as environmental protection regulations and guidance by the International Seabed Authority (ISA), the regulatory body governing the international seabed, until reliable data are available about the noise emissions of deep-sea mining. The regulations should stipulate, among other measures, that underwater noise in mined areas and their vicinity should be at levels that are proven not to adversely affect the marine environment.

Other, related initiatives

In September 2021, the International Union for Conservation of Nature World Conservation Congress (IUCN WCC) strongly supported a moratorium on deep-sea mining, showing resolute opposition by governments, agencies and NGOs from around the world. In 2018 and 2021 the European Parliament adopted resolutions incorporating a moratorium on DSM.

Additionally, over 600 ocean experts from 44 countries signed a letter calling for a moratorium on deep-sea mining. Industry representatives from BMW, Volvo, Samsung, Google and Philips also support a temporary halt of DSM and pledged to abstain from using deep-sea minerals or finance DSM activities. Now, the International Seabed Authority has been called upon to issue a similar moratorium to put the brakes on mining activities deep in the ocean. We know less about the deep ocean than the surface of the moon. To degrade this fragile ecosystem before we understand its full worth could haunt us for decades.

Further Informationen

- Report deepsea miniing "A Noisy Affair": https://bit.ly/3HuSbwe
- Infographic deepsea mining: https://bit.ly/3oyUohy
- Video deepsea mining: https://www.youtube.com/watch?v=Pp1_N4rGWho

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Please contact us with any questions and interview requests.

About OceanCare

OceanCare is a Swiss non-profit organization. It was founded in 1989 and has a strong commitment to realistic and cooperative initiatives. The organization works at national and international level in the areas of marine pollution, environmental changes, fisheries, whaling, sealing, captivity of marine mammals and public education.

OceanCare holds Special Consultative Status with the Economic and Social Council of the United Nations (ECOSOC) and is a partner of the General Fisheries Commission for the Mediterranean (GFCM), the Convention on Migratory Species (CMS), and the UNEP/CMS Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), as well as UNEP/MAP. OceanCare is accredited observer at the Convention on Biological Diversity (CBD). OceanCare has also been accredited as a Major Group to the United Nations Environment Assembly (UNEA), which is the governing body of UNEP and is a part of the UNEP Global Partnership on Marine Litter.
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