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# Deep sea mining



IMARES

WAGENINGEN UR

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## Sustainable extraction of resources from the deep sea

The seabed is a treasure trove of oil, gas and valuable resources. Existing sources such as the oil and gas reserves under the North Sea and on land will soon no longer be sufficient. Although deep sea mining is technologically complex and therefore expensive, it is rapidly becoming economically viable. But production takes place in fragile ecosystems, and IMARES, part of Wageningen UR (University & Research centre) helps the companies involved in such developments to carry out mining at great depths in an ecologically responsible way.

### Projects

Little is known about the ecosystems at the bottom of the deep sea. However, we have developed models that take into account this lack of information while still helping to guide companies looking to carry out ecologically sustainable work in deep sea ecosystems. At the same time, our researchers use smart methods and innovative techniques such as *DNA fingerprinting* to collect as much information as possible on these areas. A specially equipped laboratory has been set up for this purpose at our site in Den Helder, where we work closely with colleagues from Wageningen University to gradually unravel the composition of deep seabed ecosystems. These techniques are currently used for analysing the fouling of ship hulls, for instance, while the first full scale deep sea application is expected next spring.

Our modelling tools enable us to calculate the *Environmental Impact Factor* in order to provide the maritime industry with practical tools to limit the impact of economic activities on the deep seabed. This allows companies to precisely gauge which measures will provide the greatest contribution to reducing the pressure on the environment. We are working together with major companies in the sector on a further refinement of this methodology, which has already been successfully deployed to make shipping more sustainable.

### Leadership

Several deep sea mining initiatives are currently being developed. For example, the industry (IHC Merwede, Boskalis) has initiated a project called 'Towards minimal impact in deep-sea mining'. Another enterprise taking place among sector leaders is the 'Winning at sea' partnership, focused on long-term knowledge development. Finally, a thematic network called ProSeaFlore was recently established, bringing together companies and research institutes to map the challenges of the future.

As an independent research institute, IMARES is playing a leading role in all these initiatives. From this position, we define sustainability and look for a responsible balance between economy and ecology in the deep sea. The state-of-the-art facilities in our laboratory in Den Helder provide an increasing amount of information on the composition of the deep seabed. Together with maritime companies, governments and other research institutes, we define the type of knowledge needed and the joint projects required to find it.

### Partners and networks

IMARES participates in all the major Dutch networks in the field of sustainable maritime operations. For instance, we are a member of the Maritime Knowledge Centre together with leading companies and research institutes in the Netherlands, and work closely with the Platform Ships' Emissions in the organisation of the Clean Seas Maritime Technology Network. We are also one of the pioneers in ProSeaFLOre, a thematic network related to deep sea mining. Finally, IMARES founded the Maritime Campus Netherlands, a partnership of businesses, educational institutions, research institutes and governments that work on the theme of sustainable maritime development.

*'We are gradually unravelling the composition of deep seabed ecosystems.'*

### Contact

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