

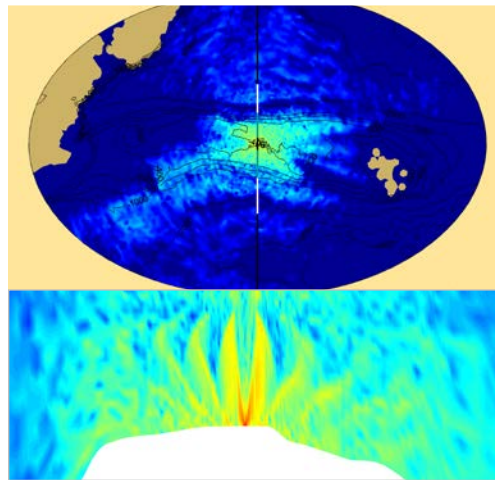
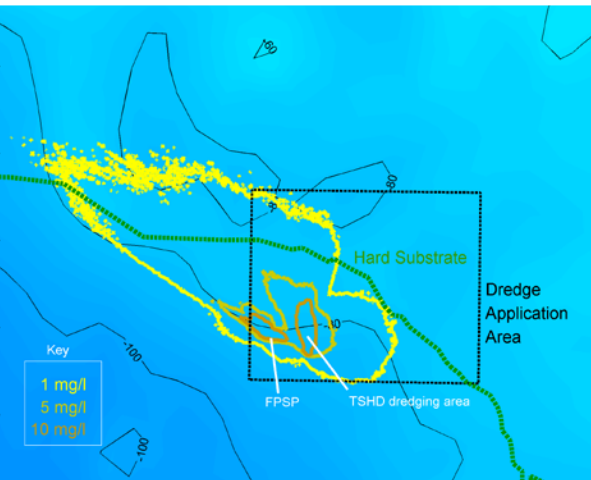
Deep sea minerals exploration and recovery



HR Wallingford can help address the engineering and environmental challenges faced by clients in the deep sea minerals sector, building on our long track record in world class maritime engineering, navigation and hydraulic/ecological studies. We are committed to working with owners, developers, designers and contractors to develop reliable and effective technical solutions based on sound engineering practice. With our active programme of research we can advise on the management of environmental risks stemming from the physical disturbance of the seabed by mineral recovery operations.

Interest is returning to the valuable and rare minerals located on or near the seabed in our oceans. There are however important risks associated with mineral recovery operations in the demanding conditions of deep waters greater than 200m. Existing mineral recovery technologies such as dredging need to be adapted and tested, or new technologies developed,

for this challenging environment. Ship movements must be conducted safely, far from shore. Onshore facilities need to be built to process and handle recovered minerals. Owners and designers must address the many stakeholders' expectations of environmental protection during the recovery, processing and transshipment of minerals from the seabed.



Meteorological forecasting and risk

Mineral recovery will occur far from shore and encounter extreme conditions. We supply forecasting and prediction services to prepare the marine engineering sector during their high-risk activities.

- > Meteorological and oceanographic investigations
- > Operational and extreme environmental conditions
- > Extreme weather impacts

Field investigations and data collection

We plan, implement and supervise marine surveys in challenging conditions during the assessment and operational stages of internationally important projects.

- > Topographic, bathymetric and hydrological surveys
- > Meteorological and oceanographic surveys
- > Sediment transportation and morphological analysis
- > Sediment release during marine dredging and processing operations

Environmental management

We have state of the art capabilities in the prediction of the physical effects of activities at the seabed; which are fundamental to understanding and managing the ecological risks of mineral recovery operations.

- > Sediment plume prediction and management
- > Underwater noise and ecological modelling
- > Input to Environmental Impact Assessments
- > Environmental monitoring

Marine terminal design

We provide the complete package of services to plan and design onshore facilities to handle efficiently and safely the recovered marine minerals.

- > Assessment and design of marine terminals
- > Computational and physical modelling
- > Full-bridge navigation simulation
- > Dredging assessment and design