Polymetallic Nodule Mining: Integrating scales, processes, impacts and knowledge

Elisa Baldrighi (host), CNR-IRBIM (Italy), elisa.baldrighi@irbim.cnr.it
Jeroen Ingels (host), Florida State University, Coastal and Marine Laboratory (USA), jingels@fsu.edu
Andrew K. Sweetman (co-host), The Lyell Centre for Earth and Marine Science, Heriot Watt University, Edinburgh, UK, A.Sweetman@hw.ac.uk
Adrian Glover (co-host), Natural History Museum London, UK, a.glover@nhm.ac.uk
Thomas Dahlgren (co-host), University of Gothenburg, Sweden, thomas.dahlgren@marine.gu.se
Erik Simon-Lledó (co-host), National Oceanogrraphy Centre, Southampton, UK, erimon@noc.ac.uk

As the Anthropocene progresses, polymetallic nodule mining in the deep sea draws nearer. The International Seabed Authority has so far issued 18 contracts for polymetallic nodule exploration. While research into spatial and temporal patterns of abyssal ecology and biodiversity advances, these remote environments remain largely unknown. Unanswered questions about the nature and extent of potential mining impacts on biota, and ecosystem functions and services persist. What is clear is that nodule mining will affect the seafloor and water column, but with uncertainty about magnitude, duration and scale of impact, as well as the resilience and restoration of natural habitats.
Spatial and temporal patterns of biodiversity, ecology, and biogeochemistry, and the variability and responses caused by natural or climate-related changes, form the necessary baselines against which to assess future impacts. Spatial and temporal patterns of organism density, distribution, biodiversity and ecosystem function in deep-sea nodule areas, their monitoring, and the links to biogeochemical and other environmental conditions as their drivers are therefore essential.
We welcome studies investigating the heterogeneity of abyssal and mesopelagic systems in the context of deep-sea polymetallic nodule mining and environmental management. We particularly encourage participation of integrative studies across organism-size classes, and those connecting surface-to-seafloor ecology, ecology-biogeochemical patterns, and mining impacts. Within the session, we envisage different scientific disciplines coming together and addressing meaningful questions about the mechanistics of nodule mining impacts, the repercussions for biodiversity and ecosystem function across various spatial and temporal scales, and the ability and timescales needed for these systems to recover.