Deposit-scale studies of deep-seafloor mineral deposits.

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We report here initial results from two multinational research programmes, aimed at understanding the formation, fate and preservation of seafloor mineral deposits at a deposit scale. Our motivation is to help source scarce elements that are critical to securing a low-carbon future. During 2016 we spent four months at sea surveying and sampling seafloor massive sulphides and cobalt-rich crusts in the Atlantic. These studies form part of two programmes: the EU-funded 'Blue Mining' project (agreement 604500), and the UK/Brazilian-funded 'MarineE-tech' project (NERC ref: NE/M011186/1).

Here, we describe how we deployed autonomous underwater vehicles to map the seafloor, deployed an ROV to drill and collect hundreds of samples of cobalt-rich crust, deployed innovative seismic and electromagnetic systems to image the sub-seafloor and deployed a robotic drilling rig to recover core from deep beneath seafloor massive sulphide deposits. We also generated and tracked sediment plumes using landers and an AUV. Our work was integrated with real-time hydrographic modelling that informed our surveying priorities and modified our experimental approach. Initial geochemical results are also presented as part of this session.