



SCHOOL of GEOSCIENCES
The University of Edinburgh
Grant Institute
The King's Buildings
James Hutton Road
EH9 3FE

Secretariat
The International Seabed Authority
14-20 Port Royal Street
Kingston, Jamaica

2 July 2021

Dear Sir or Madam,

On behalf of the EU H2020-funded iAtlantic research project (www.iatlantic.eu), I am writing to offer our comments on the draft standards and guidelines for the exploitation of seabed minerals, released for consultation in May 2021. In particular, we offer feedback on the **Draft Guidelines for the establishment of baseline environmental data**.

We welcome this opportunity to input to the development of these standards and guidelines, and very much hope that constructive collaboration between the Authority and the scientific community will continue to strengthen in the future.

Yours sincerely,

Prof J Murray Roberts FRSB
Head Changing Oceans Research Group
Co-ordinator European H2020 ATLAS & iAtlantic projects

Office +44-(0)131-650-5091
Mobile +44-(0)7810-772021
Email murray.roberts@ed.ac.uk



**iAtlantic response to the review of the draft standards and guidelines
associated with the draft regulations on exploitation of mineral resources in the Area**

TEMPLATE FOR COMMENTS

<i>Document reviewed</i>	
Title of the draft being reviewed:	Draft Guidelines for the establishment of baseline environmental data Developed by the Legal and Technical Commission
<i>Contact information</i>	
Surname:	Roberts
Given Name:	Murray
Government (if applicable):	n/a
Organization (if applicable):	The iAtlantic Project (www.iatlantic.eu)
Country:	n/a
E-mail:	murray.roberts@ed.ac.uk
<i>General Comments</i>	
<p>We welcome the opportunity to comment on the draft standards and guidelines issued by the ISA for public consultation in May 2021. iAtlantic is a multidisciplinary scientific research project working to improve our understanding of the health and status of ecosystems in the deep and open Atlantic Ocean, involving marine scientists from countries bordering the north and south Atlantic Ocean.</p> <p>We hope you find the following comments helpful and constructive.</p>	
<p>It is essential that robust environmental baselines are established prior to any mining activity so that any impacts can be detected and monitored. Data collection to establish such baselines must be scientifically rigorous and of sufficient scope to take into account natural variability and cycles of environmental change over spatial and temporal scales. An environmental baseline is a critical component of the EIA and we believe measures required to establish a robust baseline should be a mandatory requirement for all contractors.</p> <p>The content of the 'establishment of environmental baselines' document is variously presented as guidelines, recommendations and operating procedures. There is no indication of minimum requirements expected of contractors, nor how the various types of data collection should be prioritised since none of it is mandatory. There should be a mandatory standard minimum level of data collection applied to all contractors, with the required environmental parameters, sampling protocol and sample curation described in equal levels of detail, in order to ensure that all operators can establish robust environmental baselines of equal quality and rigour. The ability of contractors to collect such data must be scrutinised, collected data subjected to stringent quality assurance, and all contractors monitored for compliance.</p>	
<p>It is unclear how these guidelines are intended to dovetail with existing ISA guidance on sampling and surveying methodologies to be utilised by contractors (e.g., ISBA/25/LTC/6/Rev.1 and Corr.1). This should be clarified to avoid confusion or overlapping/incompatible standards.</p>	
<p>We note that these guidelines are "primarily" applicable to polymetallic nodules only, and that "some elements may not apply to all mineral types". We would welcome clarity on how and when guidelines for establishing environmental baselines in mid-ocean ridge settings (i.e., for seafloor massive sulphide mining) and on/around seamounts (i.e., for cobalt crust mining) will be drafted, since these environments and ecosystems are considerably different to those relevant to polymetallic nodule exploitation and therefore require appropriately tailored approaches to sampling and surveying, rather than simply an</p>	

<p>iteration of the guidelines laid out for polymetallic nodules.</p>
<p>“Best Available Techniques” and “Good Industrial Practice” are referred to in several places in the document but are not explained or defined, which is confusing and unhelpful. The guidelines should also note that, if sampling/survey practice is changed in order to follow “Best Available Techniques” this can lead to false discontinuities. If a change occurs in sampling/survey practice, an overlap between the two strategies should be undertaken for cross-validation.</p>
<p>We are pleased to see reference to the scientific community in this document. However, we feel that the wording could and should be strengthened in order to actively encourage and promote greater involvement of the scientific community in the establishment of robust environmental baselines. Data and samples collected by contractors in the process of establishing environmental baselines should be augmented by data published in the scientific literature wherever possible, and the potentially productive collaboration between contractors and the scientific community could be highlighted more strongly in this respect. Baseline data should be viewed in a regional context in order to better identify anomalies, trends and deviations from the norm; closer collaboration between these two communities could be instrumental in achieving this.</p>
<p>The timeframes over which environmental data needs to be collected in order to be able to differentiate climate change-driven changes from natural cycles, or from impacts arising from mining and/or other human activities, is missing from these guidelines. Climate change will inevitably drive a shifting environmental baseline, and this must be accommodated in the guidelines, along with clear guidance on how to address the cumulative impacts of multiple stressors.</p>
<p>Emphasis is given on understanding natural dynamics from seasonal to decadal variability. This requires high-resolution, long-term data acquisition but this is not realistic: data collection to adequately cover all seasonal variation requires sending a ship to remote areas of the ocean 4 times a year, and would have to be repeated over 20 years to cover decadal oscillations. Seafloor observatories can support this type of monitoring but they are usually single, fixed point installations and won't account for spatial variability.</p>
<p>The guidelines do not adequately prescribe the spatial scales and location of reference sites relative to prospective mining sites.</p>
<p>The guidelines do not adequately provide for establishment of baseline conditions in the mesopelagic (mid-water) environment, nor do they address connectivity between the different components of the marine system. Consequently, the full range of potential impacts posed by deep-sea mining activity in the marine environment could not be adequately assessed against a baseline established using these guidelines in their current format.</p>
<p>The guidelines are missing the collection of baseline information on life history traits (growth, age, reproductive cycle) of the benthic megafauna component. This is important because the limited existing information on some benthic megafauna components (e.g. corals, sponges) indicate that they can be long-lived and slow growing with low reproductive output, but information on these traits for fauna colonizing nodules does not exist. The ISA's draft guidelines relating to EIAs refers to life history traits of species, therefore collection of this information is required at baseline stage in order to assess their sensitivity (particularly recoverability) to potential impacts.</p>
<p>Although there is a detailed description of potential ecotoxicological effects on key species, there is no reference on increased sedimentation effects on species. This is particularly relevant for suspension and filter feeding organisms as it can clog their feeding apparatus and eventually result in their death. We feel it is important to have sediment concentration thresholds for key taxa. This potential impact is referred to in the impact assessment preparation guidance, but not addressed in the environmental baseline guidance.</p>

Specific Comments		
Page	Line	Comment
4	87	As well as sampling, the importance of observation/mapping should be included here as a valuable means of surveying and monitoring.
5	128	Reference to global ocean biogeography should include Global Open Ocean and Deep Seabed (GOODS) - UNESCO 2009
5	136	“Time-series” is not adequately defined: biological data should be included in the time series as well as temperature and hydrographic parameters.
6	147	Add multibeam bathymetry
6	148	“bathymetric entities” should be defined. Please refer to the processes of seafloor segmentation (“morphometric analysis”) by Brown et al. (2011) DOI: 10.1016/j.ecss.2011.02.007
6	149	Define “physiographic zones and units”
10	300	Seafloor images and video should be included here
13	412	The terms “physiographic zone” and “physiographic units” need to be defined or referenced
20	704	This variable (and nutrients) are also necessary to classify deep water masses – some deep-water masses are difficult to classify using T-S data alone.
38	1471	Habitat classification should be included here and requires some specific guidelines. Firstly in larger spatial scales using acoustic techniques (e.g. Brown et al. 2011; doi:10.1016/j.ecss.2011.02.007) - this can be achieved by obtaining terrain variables from bathymetric data (e.g. slope, rugosity, aspect) and subsequent modelling procedures (e.g. using GIS Benthic Terrain Modeller tool - Walbridge et al. 2018; doi:10.3390/geosciences8030094). In smaller scales, seafloor images have been used to classify "seascapes" using a number of available classifications including EUNIS (https://eunis.eea.europa.eu), CMECS (https://iocm.noaa.gov/standards/cmecs-home.html) and others
38	1479	Bathymetric data repositories should also be included.
39	1509	Connectivity should clearly include gene flow (it is unclear if this is what is meant by “molecular connectivity”) and population demography
39	1526	To assess baseline biological diversity in areas where we do not have a good taxonomic knowledge, molecular taxonomy has to be mandatory for taxa identification. If identification is only based on morphology a huge portion of biodiversity and its spatial heterogeneity will be omitted.
39	1545	Net samples? Need to be specific.
41	1625	Fish and squid, not just fish
51	2011	This section is missing reproduction studies: larval biology but also gonad studies (type of reproduction, fecundity, etc.)
51	2011	This section should refer to work done by DOOS and GEOBON on Essential Biological Variables, which should be included in guidelines for parameters to be measured (Levin et al., 2019; https://doi.org/10.3389/fmars.2019.00241) (Muller-Karger et al., 2018 https://doi.org/10.3389/fmars.2018.00211)
<i>Additional rows can be added to this table by selecting “Table” followed by “insert” and “rows below”</i>		

Comments should be sent by e-mail to ola@isa.org.jm