

International Seabed Authority  
14-20 Port Royal Street  
Kingston  
Jamaica

Potsdam, 24 June 2021

To: [ola@isa.org.jm](mailto:ola@isa.org.jm)

**IASS Comments on the Draft Guidelines for the establishment of baseline environmental data**

Dear Madam/Sir,

The Institute for Advanced Sustainability Studies (IASS), which has had observer status at the Authority since 2017, is pleased to provide comments, as annexed to this cover letter, on the *Draft Guidelines for the establishment of baseline environmental data*, open for public consultation until 3 July 2021 (<https://isa.org.jm/mining-code/standards-and-guidelines>).

We provide express consent for this document to be uploaded to the Authority's website and for wider dissemination. The following persons have contributed to this document: Dr Sabine Christiansen, Pradeep Singh, Dr Aline Jaeckel, Sebastian Unger, and Dr Bernd Christiansen (Hamburg University).

If you have any questions, kindly contact us at [Sebastian.Unger@iass-potsdam.de](mailto:Sebastian.Unger@iass-potsdam.de). We thank you for your kind attention.

Yours sincerely,

Sebastian Unger

Lead, Ocean Governance Research Group

Institute for Advanced Sustainability Studies e.V. (IASS)

## TEMPLATE FOR COMMENTS

<i>Document reviewed</i>	
<b>Title of the draft being reviewed:</b>	Draft Guidelines for the establishment of baseline environmental data
<i>Contact information</i>	
<b>Surname:</b>	Unger
<b>Given Name:</b>	Sebastian
<b>Government</b>	n/a
<b>Organization</b>	Institute for Advanced Sustainability Studies (IASS) Potsdam
<b>Country:</b>	Germany
<b>E-mail:</b>	Sebastian.Unger@iass-potsdam.de
<i>General Comments</i>	
<p><b>Transparency &amp; process of developing the draft standards and guidelines:</b> Given the importance of the standards and guidelines, their development should be fully transparent. It appears that the draft standards and guidelines were developed by working groups of LTC members, independent experts, consultants, and contractor representatives.</p> <ol style="list-style-type: none"> <li>1. All contributors (formal and informal) and their affiliations should be named and an explanation provided as to how any conflict of interests were managed.</li> <li>2. It is inappropriate for contractors to contribute to drafting legal documents that seek to regulate their very activities. In contrast, member states of the ISA have not been involved in the drafting of these key documents, even though states are the ones holding decision-making power. This undermines the procedural integrity of the ISA's draft standards and guidelines.</li> <li>3. Given the private interests represented within the drafting group, it would be appropriate to include information on the key differences of opinion on provisions of the draft, to enable the Council to make an informed decision.</li> </ol>	
<p><b>Too general:</b> The draft guidelines are not specific enough in several key areas, such as the pelagic part of the ecosystem (i.e. the water column), sampling methods, toxicological impacts, as well as impact-related and ecological baseline studies.</p> <p>The document provides a general review, some of which appears to be of secondary importance. For example, collisions with seabirds may certainly be an issue with tall oil rigs or illuminated wind turbines located in migration routes, but here a study of habitat use or feeding ecology would be far more useful to detect a change in prey availability due to local mining impacts (p. 55-56, lines 2216-2270).</p> <p>The guidelines mostly resemble a review of the literature, mentioning numerous methods but prescribing none. As such, it contains hardly any concrete values or threshold limits that one might expect.</p>	
<p><b>Lack of minimum standards:</b> The draft Guideline provides no minimum standards against which a baseline can be evaluated as a fundamental part of an application for exploitation.</p>	

**Pelagic ecosystems:** The draft Guideline fails to address and adequately include environmental effects on midwater (pelagic) ecosystems. Understanding effects of seabed mining on commercial fish stocks and other mid-water species and ecosystem is critical.

The introduction to the draft guidelines states that baselines "*include spatial and temporal data on both the pelagic and benthic fauna and their ecosystem functions...*" However, the recommendations as outlined in the draft guidelines are not suitable for a meaningful baseline assessment of pelagic biota with respect to possible impacts from mining operations.

Some key compartments of the pelagic ecosystem are either not considered at all (e.g., microzooplankton, pelagic microbes, benthopelagic zooplankton), or the recommended methodologies are not suitable to assess them (e.g., mesozooplankton, gelatinous zooplankton). Consequently, it will be **impossible to comprehensively detect changes in the pelagic ecosystem** composition caused by exploitation activities. The draft guidelines foresee only a limited dataset, as compared to the benthic studies: there are no connectivity studies and, despite being mentioned in the introduction, no assessments of ecosystem functioning, for example trophic interactions between benthic and pelagic fauna, although these may be crucial for maintaining ecosystem stability. The recommendations do not feature procedures which are appropriate for systematically sampling all (size and functional) groups and depths. This will make comparisons between sites, and even between different depths within sites, impossible.

The focus of the guidelines is on the larger pelagic fauna of the deep scattering layer, *i.e.* on mesopelagic micronekton and nekton down to 1000 m. This community may certainly be affected by mining activities, particularly in some FeMn crust and SMS mining scenarios or if tailings are released in or close below the mesopelagic zone, but mining for nodules and most SMS deposits will occur at bathyal or abyssal depths and directly affect the bathy- and abyssopelagic fauna, respectively. These groups are only marginally and summarily covered in the recommendations as sampling stratum from "*1000 m to 10 m above the seafloor*". The benthopelagic zooplankton up to 10 m above the seafloor is not covered at all, although this layer will be affected most by mining operations. In addition, it is known that this layer hosts a specialised fauna which is distinct from the layers above, including meroplanktonic larvae, and may have various interactions with benthic biota (see references in Christiansen et al., 2020). Microbial communities in the near-bottom water layer may play a crucial role in biogeochemical cycles.

*(See Christiansen et al, 'Potential Effects of Deep Seabed Mining on Pelagic and Benthopelagic Biota' (2020) 114(September 2018) Marine Policy 103442 <https://doi.org/10.1016/j.marpol.2019.02.014>; Drazen et al, 'Midwater Ecosystems Must Be Considered When Evaluating Environmental Risks of Deep-Sea Mining' (2020) 117(30) Proceedings of the National Academy of Sciences of the United States of America 17455, <https://www.pnas.org/content/pnas/117/30/17455.full.pdf>)*

**Regulatory clarity:** The draft guidelines on baselines necessarily focus on sampling work that must be done during the exploration phase, as the baseline must be established by the time a contractor applies for an exploitation contract. As such, it is somewhat unclear how the Draft Guidelines relates to the existing "Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area (ISBA/25/LTC/6/Rev.1). The latter provide guidance to contractors on issues such as species-specificity and minimum standards for the sampling distribution over space and time. These and other key requirements are either not mentioned or not clearly spelled out in the draft guideline.

**Statistics:** A welcome highlight is the emphasis placed on the use of statistics and on the robustness of statistical results (mentioned numerous times) as well as on the measuring of underwater noise (p. 17, lines 578-593).

**Specific Comments**

Page	Line	Comment
4	89	“Good Industrial Practice” is relatively meaningless in a frontier industry. Given that these Guidelines focus on baselines, it might be appropriate to refer instead to “Best environmental practice” or “Good scientific practice” or similar.
4	93	<p><i>“Scope, coverage and standard of baseline data needed to characterize the physical, chemical, geological as well as sediment properties and biological communities in the Area.”</i></p> <p>Strongly suggest replacing “Area” with “Marine Environment” or “impact zone” which must include the water column.</p> <p>“Area” is legally defined as “the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.” (UNCLOS, article 1(1)(1))</p> <p>Much of the environmental impacts of DSM will be in the water column rather than the seabed and subsoil and the ISA is legally required to protect <i>all</i> areas of the marine environment from harmful effects of DSM. (UNCLOS, articles 145, 192). Limiting baselines to the seabed and subsoil would not be in accordance with UNCLOS.</p>
39	1538-1544	The deep scattering layer is formed mainly by larger, vertically migrating animals such as fish, squid, euphausiid and decapod crustaceans etc. However, smaller sized zooplankton are also an integral part of the mesopelagic realm, which is not acknowledged here, <i>i.e.</i> by recommending appropriate methods.
39	1545-1547	It is not clear why sampling should extend only to 10 m above the seafloor. It is known that the layer between 10 m above the seafloor and the bottom hosts a specific zooplankton community (benthopelagic zooplankton) and often features higher abundance and biomass than the layers above (See references in <i>Christiansen et al, ‘Potential Effects of Deep Seabed Mining on Pelagic and Benthopelagic Biota’ (2020) 114(September 2018) Marine Policy 103442 <a href="https://doi.org/10.1016/j.marpol.2019.02.014">https://doi.org/10.1016/j.marpol.2019.02.014</a> )</i>
40	1548-1552	This is very vague. The maximum range of the ship's sonar depends on the frequency used, <i>i.e.</i> for smaller organisms, which require higher frequencies, the maximum range is much shorter than 1000 m. One solution to this problem could be a profiling echosounder. Imaging systems are certainly a valuable tool to complement net sampling, but it has to be considered that their sample volume is usually rather small (as in the Underwater Video Profiler) so that their use is limited to the more abundant, small-sized zooplankton in the epi- and mesopelagic realms.

40	1581-1589	<p>This is the only detailed description of sampling procedures, but is limited to acoustic sampling of the epi- and mesopelagic zones, which are probably the layers least affected by DSM.</p> <p>The method is supposed to "<i>estimate biomass as a function of depth and total integrated biomass from the surface to 1000 m depth.</i>" However, at greater depths, the ship-borne multifrequency echosounder will introduce a strong bias towards larger organisms, because the higher frequencies required for smaller organisms have a much shorter range than low frequencies (see also lines 1548 and following).</p>
41	1596 - 1629	<p>This chapter, which is obviously supposed to deal with sampling methodologies for the different compartments of the pelagic communities, is confusing.</p> <p>"<i>Zooplankton</i>": The description of the zooplankton sampling is vague; quantitative assessments are not explicitly mentioned. It is stated that "<i>different sampling for each size class</i>" should be employed, but no details are given which samplers should be employed for which size class, and which size classes are to be covered. A "<i>mesh size less than 1 mm</i>" may mean anything. Bongo nets are certainly not suitable for the purpose, but opening/closing nets are mandatory for sampling zooplankton in deeper waters (for state-of-the-art sampling methods in the deep sea, see Christiansen B. (2016) Deep-Sea Zooplankton Sampling. In Clark M.R., Consalvey M. and Rowden A.A. (eds) <i>Biological Sampling in the Deep Sea</i>. Chichester: John Wiley &amp; Sons, Ltd, pp 103-125, <a href="https://www.wiley.com/en-au/Biological+Sampling+in+the+Deep+Sea-p-9780470656747">https://www.wiley.com/en-au/Biological+Sampling+in+the+Deep+Sea-p-9780470656747</a>)</p> <p>Plankton pumps may be useful for near-bottom sampling, but are limited due to their small sample volume. The limit to the layers above 100 m above the seafloor is in contrast to the statements in #224 and makes no sense at all, because the greatest impact by DSM on the pelagic fauna will most likely occur below 100 m above the seafloor. Methods for sampling benthopelagic zooplankton, including meroplankton, are not described, for example, epibenthic sledges equipped with hyperbenthic nets, upward-aiming echosounders, etc.</p> <p>"<i>Mesopelagic nekton</i>" is wrongly listed here under the heading "<i>Zooplankton</i>". Again, sampling is limited to the layers above 100 m above the seafloor. However, since most mining sites will be located well below the mesopelagic zone anyway, near-bottom sampling will usually be relevant only for bathy-and abyssopelagic fauna.</p> <p>"<i>Nekton</i>": no depth range is given here for sampling nekton; only for "<i>larger elements</i>" a reference is given to the deep scattering layer, <i>i.e.</i> again the mesopelagic zone. It is not clear whether any sampling is provided also for deeper layers, except for "<i>demersal nekton and scavengers</i>", which are separately covered in section 6.</p>

42	1638-1640	Here, the parameters " <i>diel migration of zooplankton, abundance and composition of other faunal groups</i> " are listed, but it is not clear what "other faunal groups" are, and diel vertical" migration cannot be assessed with the methods described above.
56	2233-2256	The study of contaminant loads of (migratory) birds or of population changes in breeding colonies at a distance of hundreds to thousands of kilometers from the mine site are not helpful.
56	2258-2261	To utilize apex predators (seabirds, cetaceans and the like) as indicator species, trained MMOs (marine mammal observers) and the appropriate methodology will have to be employed (as also suggested in lines 2204-2212 of the draft guideline). Recording chance sightings (as required in para. 51 of ISBA/25/LTC/6/Rev.1 + Corr.1) will not suffice when one wants to obtain useful data on the abundance and distribution of seabirds, cetaceans and the like.

Comments should be sent by e-mail to [ola@isa.org.jm](mailto:ola@isa.org.jm)