

DEEP CCZ BIODIVERSITY SYNTHESIS WORKSHOP

Terms of Reference

Workshop Background

In 2012, ISA established nine Areas of Particular Environmental Interests (APEIs) within the Clarion Clipperton Zone (CCZ) in the eastern Pacific Ocean to serve as a representative network of no-mining areas designed to protect biodiversity and ecosystem function across the region from seafloor mining impacts. The design of the APEI network was based on recommendations formulated in a workshop organized by ISA in 2007 that examined elements of protected area design, and synthesized the biodiversity and ecosystem data from the CCZ available at the time (Wedding et al., 2013). Since then, a substantial number of research and contractor surveys have been conducted. As a result seafloor biodiversity and ecosystem data has been collected in the CCZ, including from several APEIs, which provide a good basis for a new scientific review and synthesis in support of the review of the CCZ APEI network.

An Environmental Management Plan (EMP) for the CCZ was adopted by ISA in 2012. One of the provisions of this EMP identifies the need for the Legal and Technical Commission of ISA to undertake a regular review of its implementation. As part of the review process currently undertaken by the LTC is the consideration of potential additional APEIs that could be established in order to close some “gaps” in the existing network. Hence, the new data from existing APEIs, and evaluation of biodiversity patterns relative to contractor areas, are highly relevant to considering the effectiveness of the current APEIs and the siting of new ones if additional protection is needed.

Workshop Goals

This four-day workshop aims to review the large amount of biodiversity and environmental data collected since the initial design of the CCZ APEI network at 2007 workshop and the final adoption by ISA in 2012, and generate a broad synthesis of biodiversity information along and across the CCZ. In particular, the workshop will focus on: (i) reviewing and analyzing recent seafloor ecosystem data from the CCZ; (ii) synthesizing patterns of biodiversity, community structure, species ranges, genetic connectivity, ecosystem function, and habitat heterogeneity along and across the CCZ, and (iii) assessing the representativity of the APEIs relative to exploration contract areas.

Various questions will be addressed including those relating to key biotic components (microbes to megafauna):

- 1) **Biodiversity:** How do species/taxon richness and evenness vary along and across the CCZ? Do contractor areas have similar levels of species/taxon richness and evenness to the proximal APEI(s)?
- 2) **Community structure:** How does community structure vary along and across the CCZ, in terms of abundance, species/OTU structure, etc? What appear to be the strongest environmental correlates (e.g., POC flux, nodule abundance, depth, bathymetric

parameters) of abundance, diversity and community structure for different components of the biota, including size categories (e.g., megafauna versus macrofauna), mobility types (sessile versus mobile), dwelling location (infauna versus epifauna), and trophic groups (e.g., suspension feeders versus deposit feeders)?

- 3) **Biogeography:** Are species ranges (based on morphology and barcoding) generally large or small compared to the distances between APEIs and contractor areas? What is the degree of species (or lowest OTU) overlap/community similarity between different study locations across the CCZ?
- 4) **Genetic Connectivity:** What are latitudinal and longitudinal scales of genetic connectivity? Is there evidence of genetic connectivity (e.g., shared haplotypes) between APEIs and/or contractor areas?
- 5) **Ecosystem Functions and Drivers:** how do ecosystem functions (e.g., SCOC, C-cycling and C-flows, rates and depths of bioturbation, carbon burial, calcium carbonate dissolution, nutrient fluxes) and potential ecosystem drivers (including seafloor POC flux, ocean depth, sediment properties such as grain size, TOC, nodule abundance and properties) vary along and across the CCZ? Do APEIs have similar levels and ranges of ecosystem functions and ecosystem drivers to contractor areas?
- 6) **Habitat Modeling:** Do APEIs have a similar range of habitats (i.e., habitat diversity) to proximal contractor areas, based on habitat modeling studies?
- 7) **Data Gap Analysis:** What data gaps preclude answering any of the above questions and how can they best be filled?

Expected outputs

A workshop report will be prepared, by the designated co-chairs and the ISA Secretariat. This report will then be made available for information to the Legal and Technical Commission in 2020.