Areas of interest for mapping in the AIORC region

The AIORC Team

Overview

Identifying areas of high priority for mapping is a difficult task since priorities can be established based on a number of criteria. A GIS approach for prioritization that was developed by the AORA Atlantic Seabed International Working Group (ASMIWG), for example, considers several factors that were used to identify three target areas (Wolfl et al., 2017), which have subsequently been prioritized during mapping campaigns of partner nations. Other groups within the AIORC region, such as the Florida Coastal Mapping Program have also used GIS approaches to try to identify mapping priorities. In all cases, identifying areas and establishing priorities is very much dictated by the community that is engaged in the exercise. The SCRUM Web Application for soliciting input from the community seeks to collect high-level input from community members to identify areas that may be of interest to multiple parties. Ultimately, the choice will depend on strategic priorities balanced with risks and benefits as well as cost-benefit.

We believe that it is important to identify areas that will deliver large amounts of coverage with few days of effort (e.g. deep water). In addition, identifying areas that are not frequently traveled and are therefore not likely to be targeted opportunistically or via CSB are of high priority. Areas that can deliver high value scientifically, and/or and with respect to management, human safety and sustainable development are of high priority. Finally, extending our collective reach to corners of the ocean where mapping technology and mapping resources are lacking, increases the priority and need for acquiring new mapping data. Toward this end we have identified several areas that are of high priority for mapping (Figure 1).

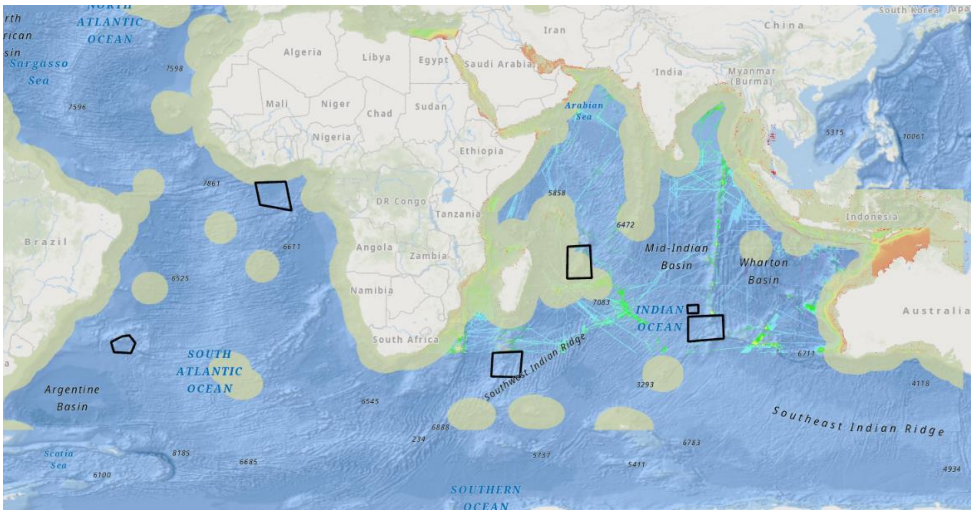


Figure 1: The Atlantic/Indian Ocean Region with high-priority areas for mapping identified with black boxes, and the extent of EEZs overlain.

Many ongoing projects within the region have been identified as target areas for active research programs (e.g. iAtlantic, Figure 2). The prioritization of these areas are based on the research

goals of the program. It can be assumed that there will be resources dedicated to mapping these areas, which we believe makes them lower priority for our purposes.

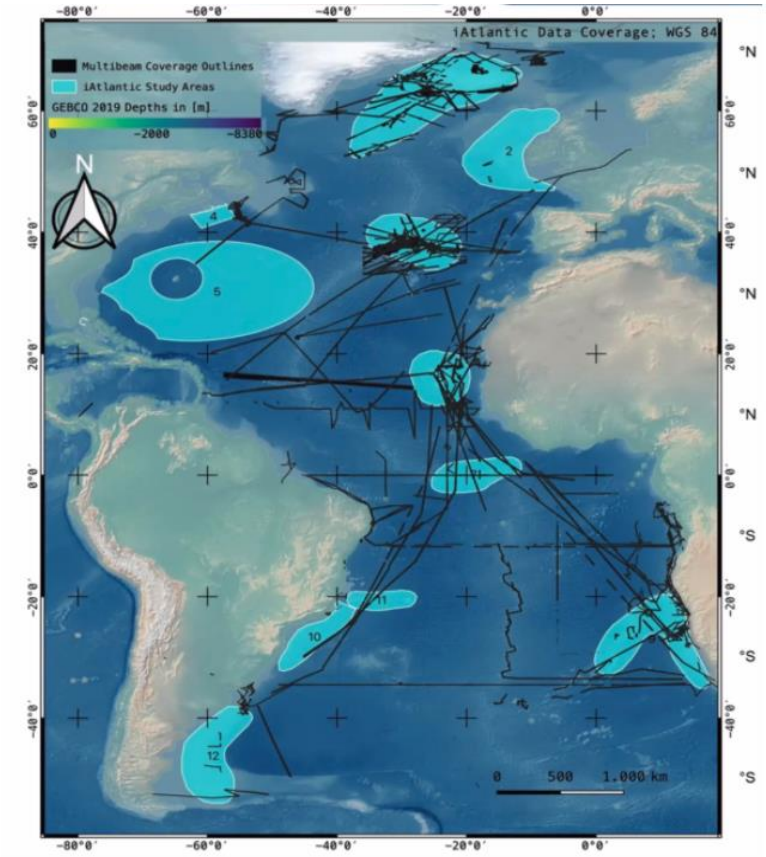


Figure 2: The Atlantic Ocean with the study areas of the iAtlantic program identified in blue. These are areas of active research that are likely to be (at least partially) mapped and characterized as part of the international iAtlantic program.

Several groups and organizations around the AIORC region have expressed the need for capacity building. Some seek instrumentation for their vessels (e.g. Egypt), some seek training and/or software licenses (e.g. Kenya), others have equipped vessels but limited resources to mobilize them (e.g. Mexico, Nigeria, South Africa). One group, Monaco Explorations, has established a plan for an expedition in 2022 (Figure 3), and is actively working to develop mapping capabilities. We believe that it is important to include these factors related to opportunities across the complex landscape of ocean mappers when identifying priorities and thinking about how limited resources can deliver the most data and value for financial investments made.

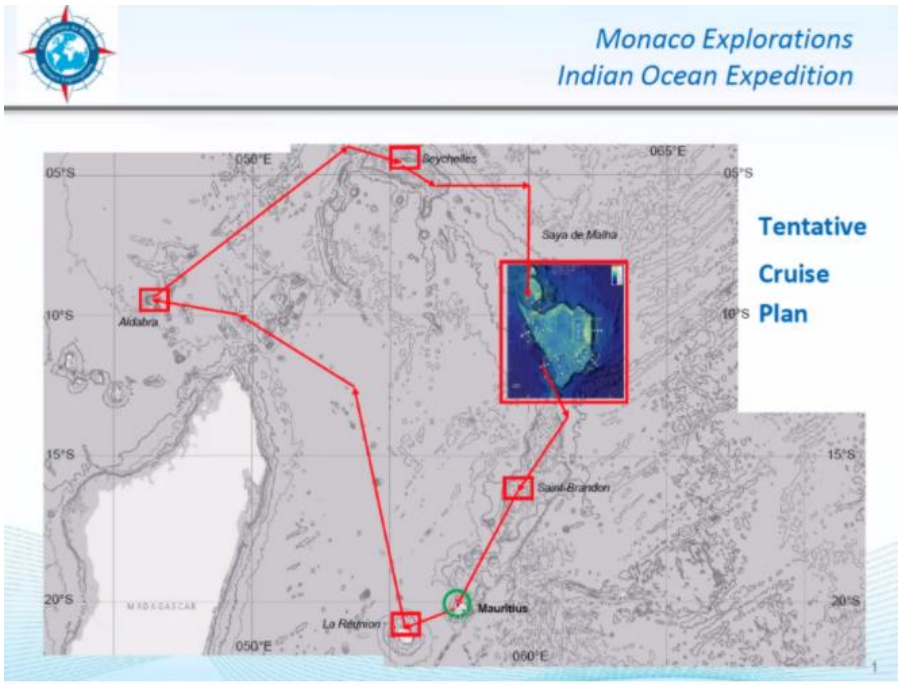
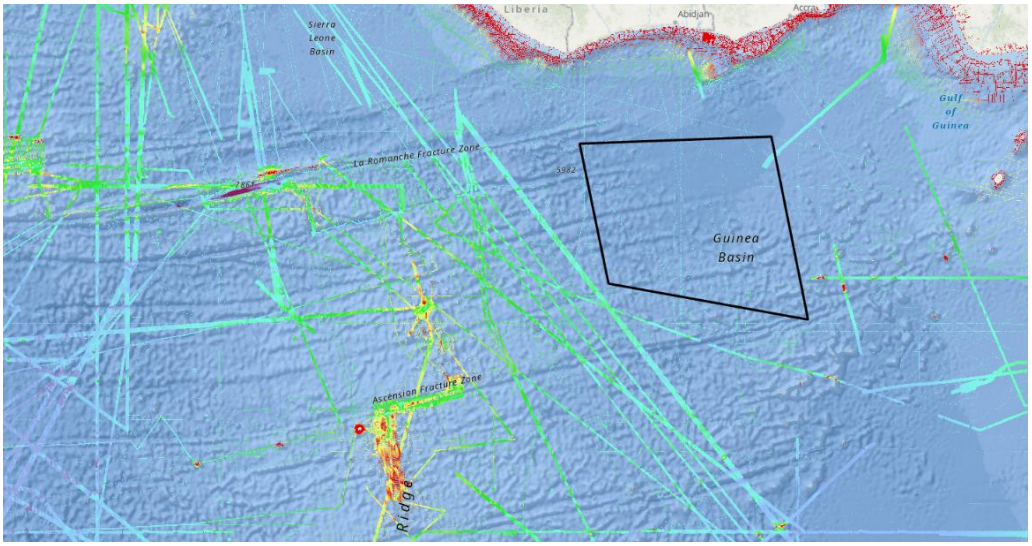


Figure 3: Proposed survey area in the Indian Ocean from Monaco Explorations. This group is trying to establish mapping capabilities and is working with the AIORC to identify data gaps and opportunities to fill data gaps.

With all this in mind, we have identified several potential areas for prioritized mapping efforts. We present three areas that we believe are the highest priority for mapping, and two additional areas that may be of interest, depending on the criteria used to make the final judgement and assessments.From our perspective, acquiring mapping data anywhere within these boxes, especially in a coordinated/campaign fashion would be greatly beneficial to the community of stakeholders within the region.

Area 1: Atlantic Ocean: Guinea Basin



Approximate Lat/Long: 1S, 0W

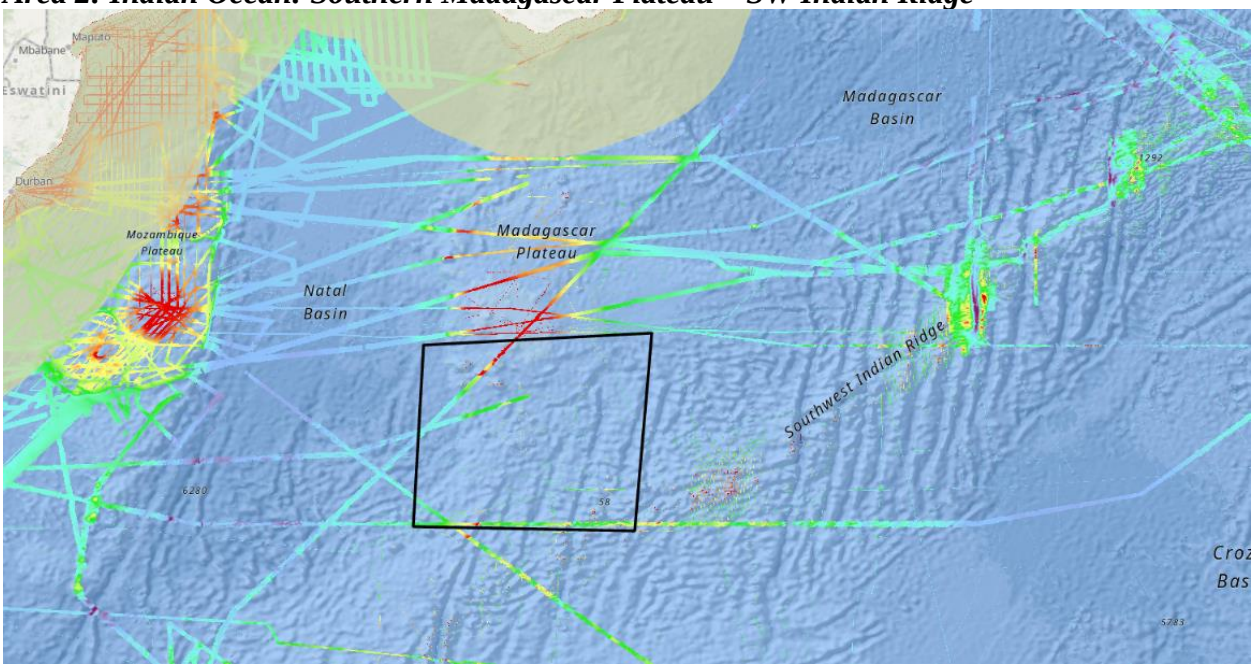
Rationale:

- Sparse data coverage
- Distant sediment fans from African rivers
- Onset of transform folds
- Habitats for African fisheries
- Nations in surrounding region not particularly well-equipped with mapping technology

Other considerations:

- Possible piracy concerns
- Nigeria now equipped with a mapping vessel and interested in conducting surveys in the Gulf of Guinea
- Near to, but distinct from, and iAtlantic priority area in the Eastern Atlantic

Area 2: Indian Ocean: Southern Madagascar Plateau – SW Indian Ridge



Approximate Lat/Long: 37S, 44E

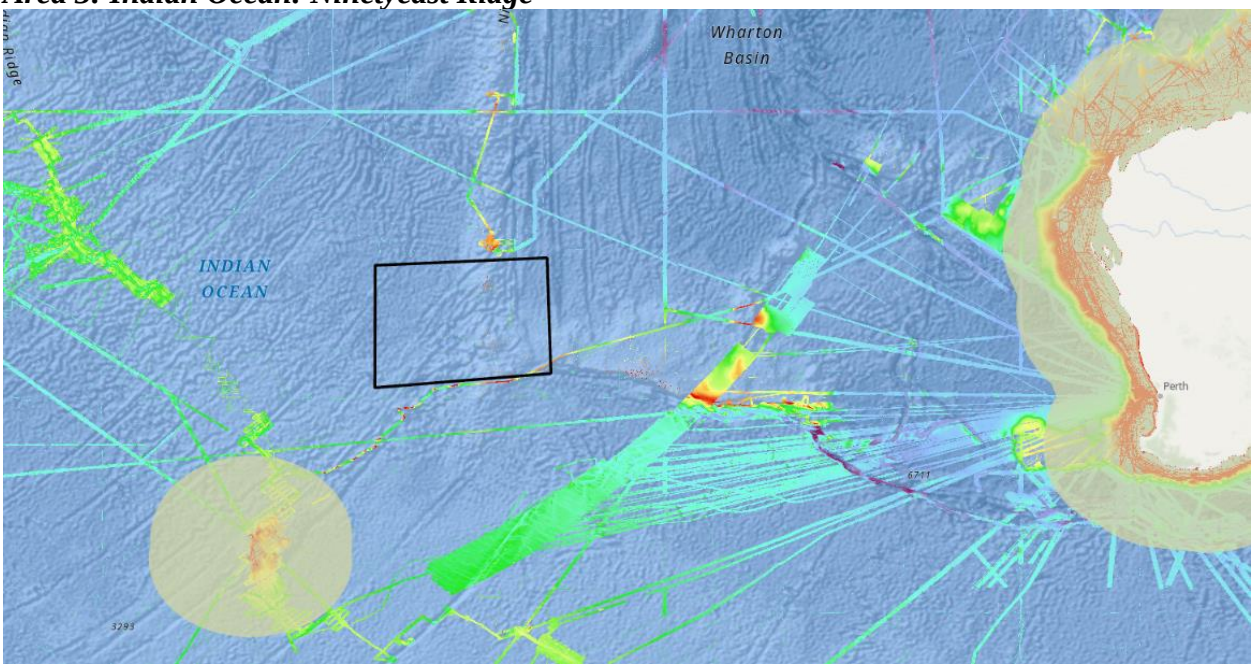
Rationale:

- sparse data coverage
- region lacking survey and mapping capacities
- important for understanding ocean circulation
- Support conservation effort (marine mammals, habitat characterization)

Other considerations:

- part of ECS claim area from Madagascar
- Area of ongoing effort for habitat mapping and ecosystem vulnerability (https://www.wiomsa.org/ongoing-project/wio-wio-benth-identification-characterization-and-vulnerability-assessment-of-benthic-ecosystems-in-the-wio/)

Area 3: Indian Ocean: Ninetyeast Ridge



Approximate Lat/Long: 30 S, 87 E

Rationale:

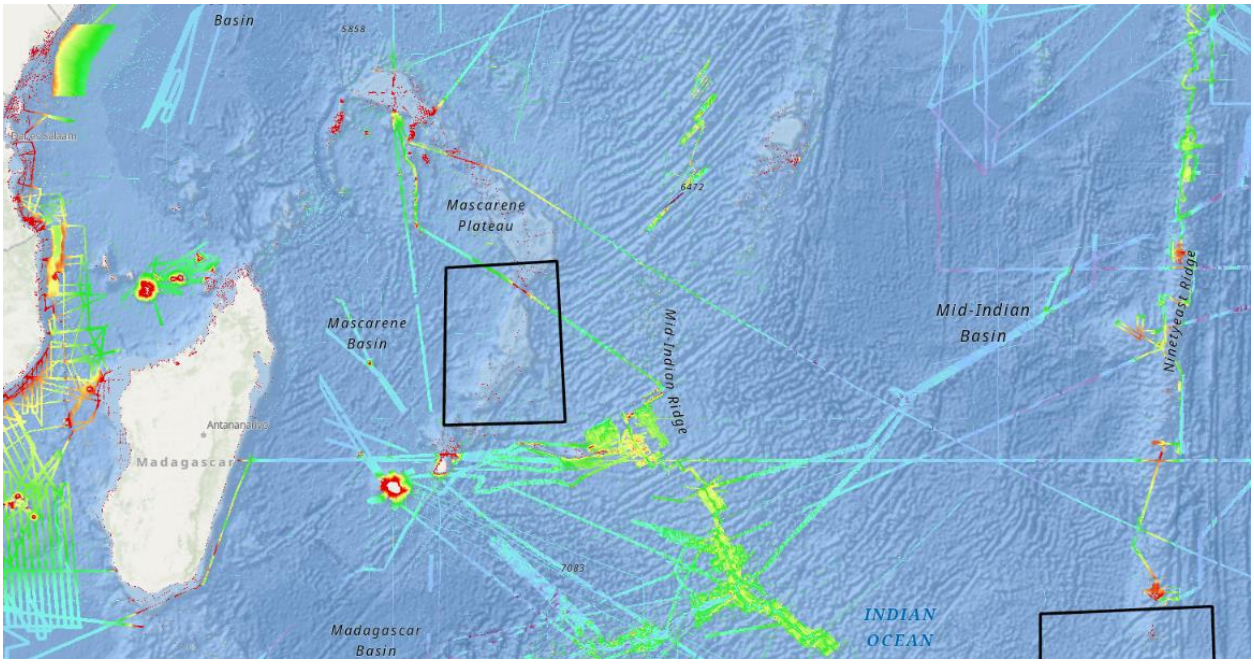
- Remote area with sparse to no data coverage
- Not heavily traveled
- Triple junction - should have significant scientific impact in the field of geology
- Habitat characterization and insight about global connectivity (biogeography) of organisms

Other considerations:

- relatively close to MH370 search area

Other possible areas of interest:

Area 4: Indian Ocean: Mascarene Plateau



Approximate Lat/Long: 60E, 15S

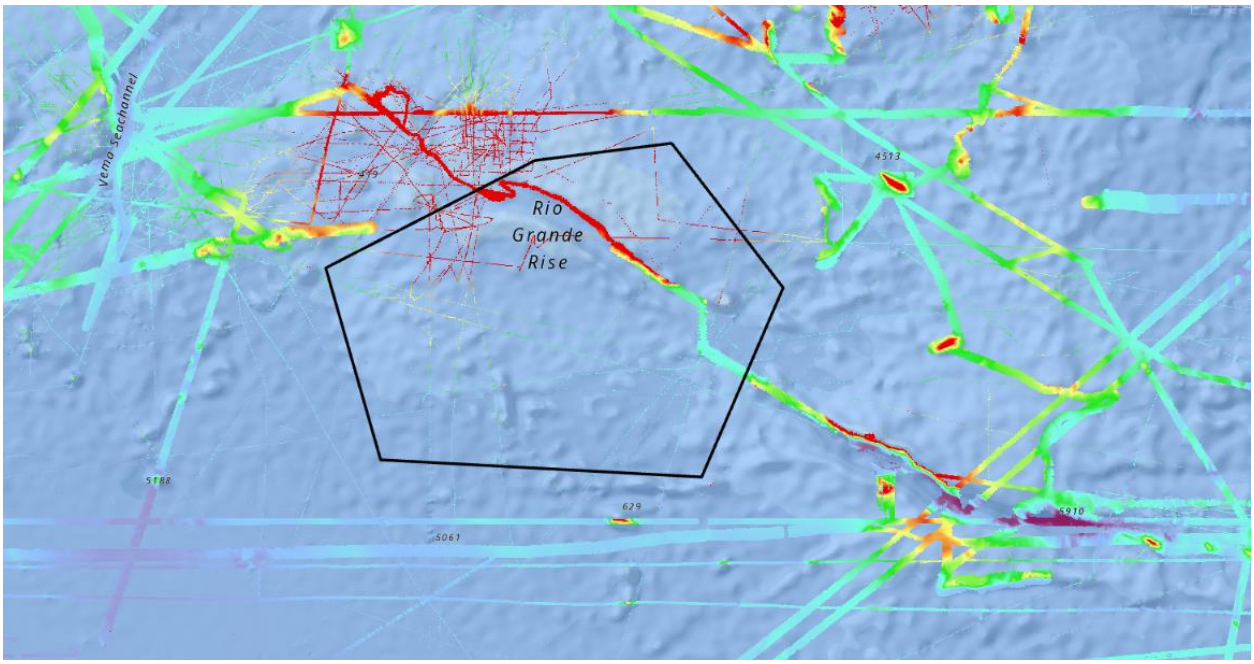
Rationale:

- sparse data
- interesting/unknown geology
- likely interesting and important habitats

Other considerations:

- part of an EEZ
- within planned work area of Monaco Explorations (see Figure 3)

Area 5: Atlantic Ocean: Southern Rio Grande Rise



Approximate Lat/Long: 35W, 32 S

Rationale:

- area of high research interest
- scarce data

Other considerations:

- Coordinated mapping via Belem Statement may include this region
- Adjacent to an iAtlantic priority area which will likely be targeted through iAtlantic project resources and coordination