

Developing statistical model-based bioregions for the Indian Ocean

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Biogeographic regions are commonly used to define meaningful geographic units in broad-scale ecological and evolutionary studies. Identifying biogeographic regions not only informs evolutionary and macroecological process, but it frames diversity as part of practical units to inform conservation and resource management. In response to these management needs, the Global Ocean Biodiversity Initiative (GOBI) and CSIRO are working to develop bioregionalisations for the Indian Ocean. There are two phases to this work. Firstly, we are gathering together experts on statistics, biogeography and management to identify the best statistical methodologies for the development of data driven biogeographies. We present the outcomes of the workshop here. Using the identified methods we will develop bioregional models of the physical environment and taxon-specific datasets, including broad scaled datasets of benthic marine invertebrate, fish and sea birds from CSIRO, University of Tasmania, Museum Victoria, Bird Life International and other regional partners. Together the physical and biological data will provide a broad scale understanding of the biogeographic provinces of the Indian Ocean basin and importantly incorporate new and extensive open access biological data into bioregional models. These analysis will be used in a series of expert elicitation workshops to be run in conjunction with Indian Ocean stake-holders and partners to integrate the open-access scientific information with the data, information and traditional knowledge held by Indian Ocean Rim countries. The project will draw on experience in CSIRO, GOBI partners, and collaborate with regional and national stakeholders to ensure that identifying biogeographic boundaries within the Indian Ocean benthic and pelagic environments is done using a consistent, robust and clearly communicated participatory approach. Ultimately, this project will provide an Indian Ocean bioregionalisation based on quantitative models and expert knowledge to help inform the management of physical and biological regions within the Indian Ocean.