IndOOS-2: A Roadmap to Better Observations of the Rapidly Warming Indian Ocean

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Over the last decade the Indian Ocean has absorbed 30% of the global oceanic heat uptake and the fate of this heat and its impact on future change is unknown. Projections foresee accelerating sea level rise, more frequent extremes in monsoon rainfall, and decreasing oceanic productivity. Almost two-thirds of humanity live around the Indian Ocean, many in countries dependent on fisheries and rain-fed agriculture. Coastal population growth is conflating with climate change to further increase exposure and vulnerability of these populations. The Indian Ocean observing system (IndOOS), established in 2006, is a multi-national network of sustained oceanic measurements that underpin understanding and forecasting of weather and climate for the Indian Ocean region and beyond. However, gaps in the IndOOS have so far limited forecasting efforts, left large discrepancies in the basin energy budget, and kept us in the dark about ecosystem stressors. A three-year, international review of the IndOOS by more than 60 scientific experts provides a roadmap to an improved observing network —IndOOS-2 —that can better meet future scientific and societal challenges. Core findings include the need for 1) chemical, biological, and ecosystem measurements alongside physical parameters; 2) better resolved upper-ocean processes to yield improved sub-seasonal to seasonal forecasts; 3) expansion into the western Arabian Sea; and 4) expansion into key coastal regions and the deep ocean to better constrain heat and freshwater changes. IndOOS-2 will require new resources and partnerships, creating opportunities for Indian Ocean rim countries to enhance their monitoring and forecasting capacity as part of a growing Global Ocean Observing System community.

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