

Reports of IODP Exp. 359: Sea Level, Currents, and Monsoon Evolution in the Indian Ocean

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IODP Expedition 359 was conducted from October to November in 2015 in the Maldives Archipelago in the Indian Ocean to study changes of sea level, currents and monsoon evolution in the Indian Ocean during the Neogene. The monsoon is one of the most dramatic recurring weather phenomena on Earth and affects over a billion people every year. However, little is known about when the monsoon started and how it changed over time. The monsoon brings rainfall to the continents, which is critical for agriculture, and increased river discharge to the oceans. It is known for its winds that change direction with the winter and summer monsoon. Many studies have tried to reconstruct the monsoon history from the rain-induced weathering and discharge into the ocean. In Expedition 359 a novel approach was taken to extract the history of the monsoon from wind-related features. The winds of the monsoon drive the ocean currents across the Maldives. These currents, like rivers in the ocean, carry sediment. In the Inner Sea of the Maldives the currents slow down and release the sediment to build large drift deposits. The sediments in these drifts hold the record of climate change and monsoon activity for the last 12 million years. The sediments, however, also buried ancient reef buildups that flourished in the Inner Sea before the monsoon started. These reefs hold the history of sea level changes before the onset of the monsoon. In this way, IODP Expedition 359 was able to reconstruct environmental changes in the Indian Ocean since the late Oligocene to the present.

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