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Monsoonal influence on wake circulation around the Maldives

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The Maldives are a group of coral islands in the central part of the equatorial Indian Ocean along 73ºE that form a barrier to the seasonally reversing monsoonal currents. This puts it in direct contact with the eastward flowing Southwest monsoon current (SMC) during the Southwest monsoon (SWM) period from June to October and the westward flow from the Northeast monsoon current (NMC) during the Northeast monsoon (NEM) from December to April. The flow topography interaction of these islands with the monsoonal currents enhance primary productivity in the lee of the islands as a result of the island mass effect. Under these conditions, nutrients are input to the photic zone, leading to elevated chlorophyll blooms. SeaWIFs ocean colour imagery reveal a prominent chlorophyll bloom along the Maldivan western coastline during the NEM, a phenomenon termed as the Island Mass Effect.To date, these observations have been supported by satellite imagery and altimeter data but only during the NEM. The counterpart recirculation feature along the eastern coastline extends as a plume from the Maldives to southern India and then on to Sri Lanka during the SWM. However, due to extensive cloud cover during the SWM, there have been few observations that could be validated by satellite imagery. There is increasing recognition that the island mass effect and associated eddies modulate ocean productivity and this study will be the first of its kind to focus on the wake circulation of the Maldives region. This presentation will examine the dynamics of the wake circulation and coastal upwelling in the study area through an integrated approach using satellite imagery, field observations and a numerical model derived from the Regional Ocean Model System.