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## Climate change effects in the Bay of Bengal Large Marine Ecosystem <sup>☆</sup>



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### ABSTRACT

Evidences are accumulating on the long-term changes in seawater temperature, acidity, deoxygenation, cyclones and sea level in the Bay of Bengal Large Marine Ecosystem. These changes have impacts on ocean productivity, habitats and biological processes. Distributional and phenological changes in fish species, and increase in frequency and intensity of coral bleaching are becoming evident. Fisheries, particularly traditional fisheries, will be the most vulnerable to climate change. Climate warming will also affect the inland and coastal aquaculture sectors of the Bay of Bengal LME countries. Impacts will include changes in hydrology and therefore availability of water, physical threats to aquaculture facilities, and prevalence or spread of known and new diseases of aquatic organisms. The most important and critical adaptation measures will be to develop human resources capacity to increase understanding of the marine resources, and implement measures to sustainably manage fisheries. Bay of Bengal Large Marine Ecosystem project's two main directions taken for climate change response are contribution to the understanding of large-scale processes and climate change effects on one hand, and contributions to adaptation by addressing habitat degradation, pollution and fisheries management, as well as developing capacity and resilience of coastal populations on the other. Recognizing that current problems in weak fisheries management make the sector vulnerable to climate change, BOBLME supports adaptation and increases resilience by strengthening fisheries management and providing assistance to improve fisheries assessments. By strengthening governance, BOBLME also contributes to the integration of climate change adaptation into decision-making and response initiatives, e.g. disaster risk management plans.

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## 1. Introduction

The effects of climate change are a reality in the Bay of Bengal and in the majority of the large marine ecosystems (LMEs) of the world. The Bay of Bengal LME (BOBLME), the northeastern basin of the Indian Ocean, is one of the largest LMEs, comprising the territorial waters and entire Exclusive Economic Zones (EEZs) of four coastal countries (Bangladesh,

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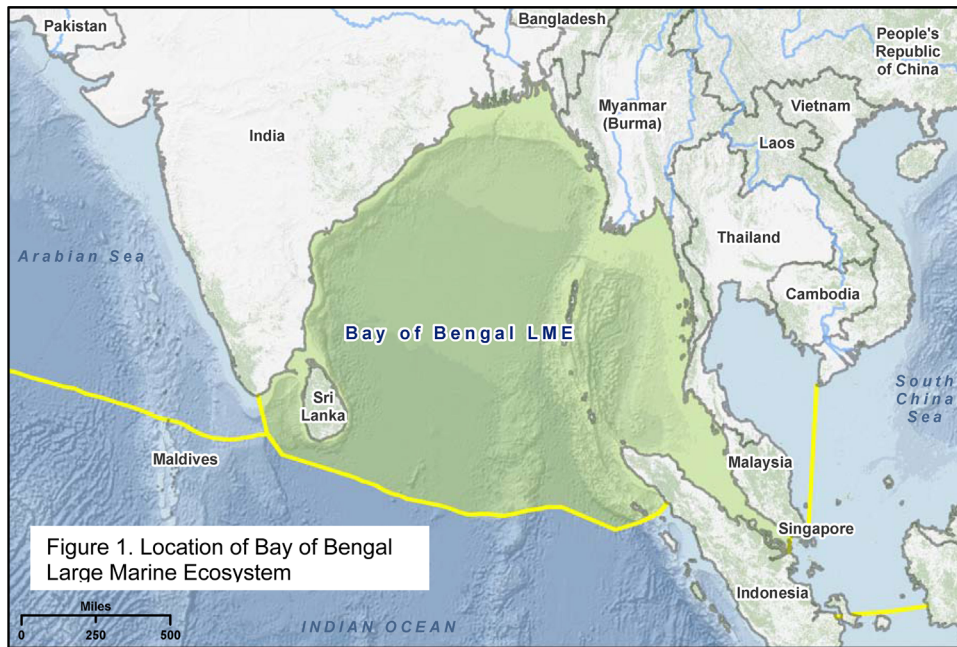


Fig. 1. Location of Bay of Bengal Large Marine Ecosystem.

Maldives, Myanmar and Sri Lanka) and substantial portions of four other countries (India, Indonesia, Malaysia and Thailand), as well as a large area beyond national jurisdiction (ABNJ) – for a total of 6.2 million km<sup>2</sup> (Fig. 1). Not only is the BOBLME one of the largest of the world's 64 LMEs, it is also the most populous with an estimated coastal population of more than 450 million people. Climate change effects are therefore also expected to have profound impacts not only on biological systems, but also on society as a whole (Doney et al., 2012; Barange et al., 2014).

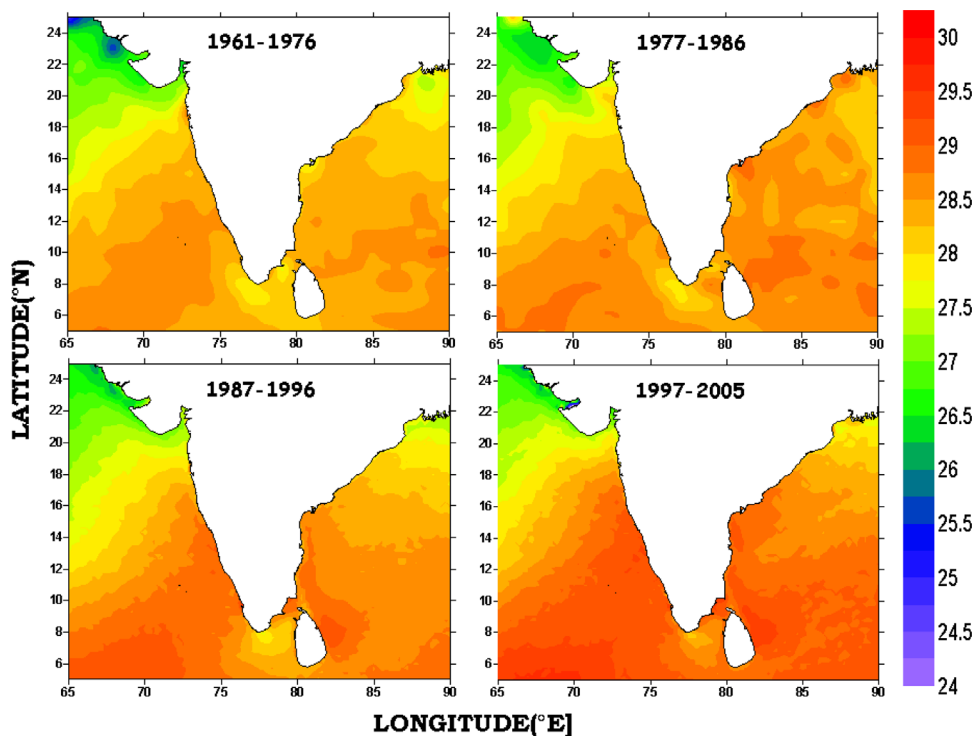


Fig. 2. Rise in Sea Surface Temperature (the color code reference is given in °C at the right side of the maps (from Vivekanandan (2010)). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

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