

Climate Change Impacts on Coastal Ecosystems

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ABSTRACT

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*Coastal ecosystems,
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macrophytes,
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Coastal ecosystems such as seagrass beds and coral reefs are unique habitats at the interface between terrestrial and oceanic environments. Such ecosystems are among the most productive and dynamic ecosystems, which are highly sensitive to climate change including ocean warming and acidification. Calcifiers such as corals and sea urchins are suggested to be negatively affected by ocean warming and acidification. Meanwhile, macrophytes such as seagrasses and seaweeds are suggested to be positively affected by ocean warming and acidification, as the increase in temperature and CO₂ concentration in seawater can potentially increase their photosynthetic rates and productivity. Here, some recent studies are introduced to explore how ocean warming and acidification affect calcifiers and macrophytes by conducting interaction studies. Ocean warming and acidification were negatively affected coral growth rate and sea urchin physiology, while photosynthesis and growth of seagrasses and seaweeds were particularly increased under ocean warming and acidification, thus potentially alleviating the negative effects of ocean warming and acidification. However, they do not always provide habitat refugia for calcifiers. Ocean warming and acidification are also suggested to modify the trophic interactions in coastal ecosystems. The present studies showed that ocean warming and acidification have the potential to shift the balance in coastal ecosystems and assessing the organism interactions is important to give a better understanding of the response of coastal ecosystems to climate change.

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