

Climate Change and the Oceans

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As the bulk of the carbon in the atmosphere-hydrosphere-biosphere system is dissolved in seawater, the oceans play the most important role in regulating the climate of Planet Earth. The Earth has experienced cyclic oscillations in the climate in the past, but since the Industrial Revolution human activities have been altering the climate to an extent that far exceeds natural variability. This has several important impacts on the oceans, including ocean acidification and ocean deoxygenation. Since the ocean is absorbing a significant fraction of carbon dioxide that is anthropogenically released to the atmosphere, the seawater pH has fallen by 0.1 unit and is projected to fall further by 0.3 units by the end of 21st century. Also, ocean warming coupled with eutrophication is causing loss of dissolved oxygen from seawater. Both of these phenomena are going to severely affect marine biodiversity, modify biogeochemical cycles and alter ecosystem services offered by the oceans. Another major phenomenon that will have huge socio-economic impact will be flooding of low lying coastal areas due to sea level rise. The human beings must not only be prepared to adapt to these changes, but also make all efforts to cut down greenhouse gas emissions, the single most important factor contributing to global change.