

# Climatic Change and Fate of Marine Life

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Global climate is changing dramatically as a result of increasing emission of the greenhouse gases and this may directly lead to the increase in global mean temperature. IPCC 2007 report (Inter Governmental Panel on Climate Change) has forecasted that global mean temperature increases from 1.1°C to 6.4°C by 2100. If it is so it will become a great threat for the existence of terrestrial and aquatic ecosystems. By covering 70% of the earth, ocean has become vast and vital ecosystem and it drives major climatic and weather processes and supply food and habitats for marine organisms. So influence of climate change on the marine environment will not limit only to the increase in

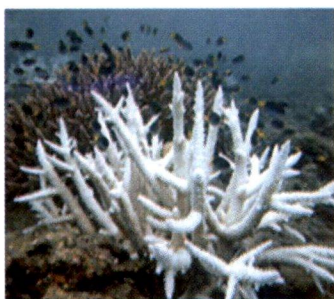


Figure: 1 Bleached and a healthy coral

Ocean absorbs the heat added to the earth's system and help to control the vast temperature variations of atmosphere. Due to the increasing emission of greenhouse gasses atmospheric temperature increase and to balance this thermal variation ocean tend to absorb more and more heat by resulting Warmer Ocean. Marine fauna that have adapted to specific temperature ranges were stressed from this and tend to alter their age of development, sexual maturity, and timing of spawning, growth and survival rate. Coral

Melting of polar ice is another severe impact of atmospheric warming which should attain our special concern. According to the IPCC 2013 report this global warming will cause to melt the 25% of the ice cover at the Northern hemisphere at the end of 21<sup>st</sup> century. This will lose the habitats for marine fauna that lives only in polar region such as seals, walruses, polar bears, penguin and Antarctic krill. Some of them such as Antarctic krill are food source for many sea birds and mammals in the Southern ocean. Primary production of marine algae which are the base of Arctic food webs in polar environment decreases with the melting of ice

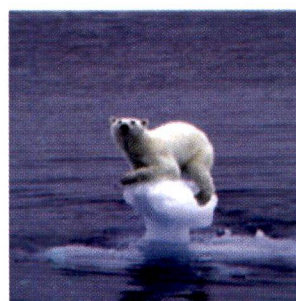


Figure 2: Effects of polar ice melting

cover. So species that depend on polar marine algae such as Arctic cods are affected. Therefore polar food webs can be collapsed. As the glaciers and polar ice melt, it increases the sea level. IPCC 2013 report has revealed that **over the period 1901 to 2010, global mean sea level rose by 0.19cm**. So species that are specific to shallow water such as coral reefs, sea grass and mangroves cannot survive. Since their survival depends on their ability to move towards the shallow water slow growing species will be threatened. It also loses nesting habitats for species such as sea turtles which migrate to the coast for laying eggs.

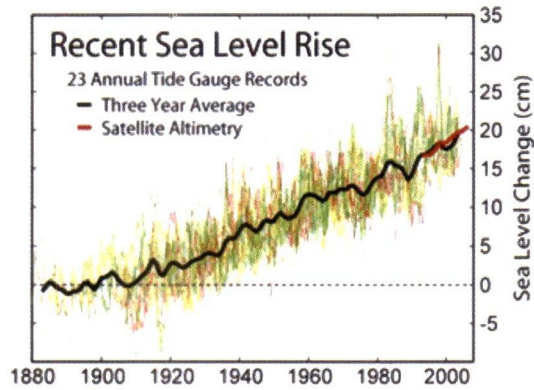


Figure 3: Sea level rise from 1880-2000  
(Source: Wikimedia)

On the other hand melting ice increases the global input of freshwater resulting changes in the salinity level of the ocean. Green et al.2008 has revealed a decrease in salinity or freshening of Scotia shelf and Gulf of Maine waters. Marine organisms which are unable to tolerate low salinity levels will be vanished due to this.

Changes in ocean temperatures and wind patterns can alter the oceanic current system too. This will affect to the migratory patterns and reproduction of many oceanic fauna. For instance many reef- building coral and reef fish species rely on dispersal of their larvae by currents.

Ocean act as carbon sink by absorbing Carbon dioxide emitted to the atmosphere. Water reacts with CO<sub>2</sub> to form bicarbonate ions. Normally carbonate and bicarbonate ions in the ocean are in equilibrium to buffer against large pH

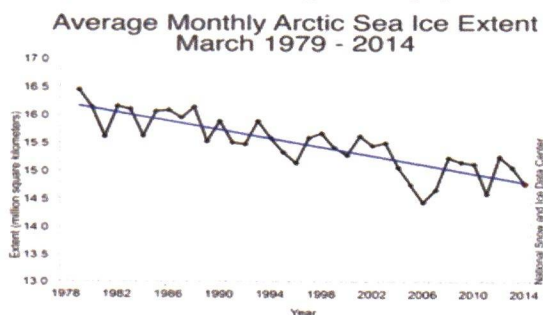


Figure 4: Average Monthly Arctic sea ice Extent  
(Source: US National Snow and Ice Data Center)

variations. So large addition of CO<sub>2</sub> can reduce the availability of carbonate and make the seawater corrosive to calcium carbonate structures. Therefore calcifying organisms are in a threat of dissolving their CaCO<sub>3</sub> structures.

As the oceans become warmer water hold less oxygen and it will cause oxygen stress in ocean environment. So organisms that are sensitive to oxygen concentration will be affected.

Accordingly almost all the marine organisms are in a threat due to the climatic change.

References:

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## අපේ පාරිසරික උරුමය සුරකිමු

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| 01. | <p>උපතේ පටන් මවු තුරුලට යන<br/>සැප විපතෙහිදී කරමින් හැම<br/>කැප වී දරන අපෙ හැම<br/>අපගේ යුතුකමකි පරිසර මව</p>                       | <p>තෙක්ම<br/>මෙහෙයක්ම<br/>වගකීමක්ම<br/>රැක්ම</p> |
| 02. | <p>ගහ කොළ මනුසතා සවුපා විභග<br/>මහ බලවත්ත හිරුගෙන් ලැබ ජීව<br/>සහනය සුව සදා නල දෙයි සුසුම්<br/>දහමෙක අසිරි දිස් වේ පරිසරය</p>       | <p>කැල<br/>බල<br/>වැල<br/>තුළ</p>                |
| 03. | <p>ප්‍රා දලු සැලේ මාරුතයට හාදු<br/>නා දළවක රුසිර වැනුමට වදන්<br/>බෝ දලු ලෙලෙන විට ලොවුතුරු සිවය<br/>ගෝපලු පාදක රිද්මය වස් දඬවේ</p>  | <p>දි දී<br/>මදී<br/>දිදී<br/>වදී</p>            |
| 04. | <p>බැස යන රිදී දිය දහරා<br/>දස අත සුවද දෙන මල් ගොමු<br/>ගොස “ගුමු ගුමු” නගන බිඟු කැල<br/>ඇස නළවමින් හිනැහෙනවා</p>                   | <p>මනහර ය<br/>පියකරුය<br/>කඩිසරය<br/>පරිසරය</p>  |
| 05. | <p>නිල්වන් අඹර මැද දිදුලන<br/>පිල් විදහා රජන සිකි නළගන<br/>විල් තුළ ඕලු සියපත් මානෙල්<br/>කුල්මත් කරයි හද දුක් ගිනි</p>             | <p>දේදුන්න<br/>වැන්න<br/>ගොන්න<br/>නිවමන්න</p>   |
| 06. | <p>දිනිතිය සොබා දම් කිසිවිට නොගෙන<br/>මිනිසට කරයි සේවය මැසිවිලි<br/>පෙනි පෙනි ඒ බව අවගති කරවමින්<br/>මිනිසුනි නොකරන්න පරිසර මවට</p> | <p>පගා<br/>නොනගා<br/>වගා<br/>නිගා</p>            |
| 07. | <p>කිරියා කොහෙද නම් හොඳ නම<br/>හිරිහැර නොම කළොත් පරිසරෙ<br/>පරිසරෙ සුරැකියොත් ඇය ඔබ<br/>සිරි විඳ දිගා කල් ජීවිත</p>                 | <p>මැකේවී<br/>රැකේවී<br/>රකීවී<br/>රැකේවී</p>    |