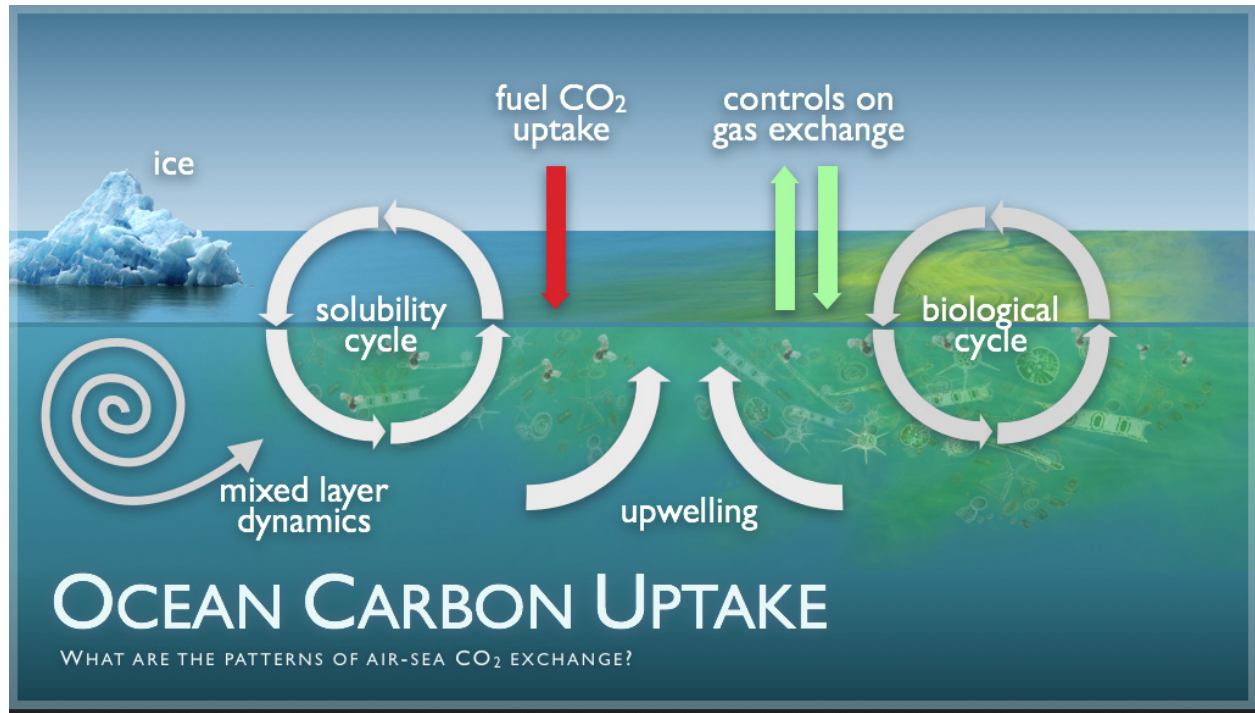


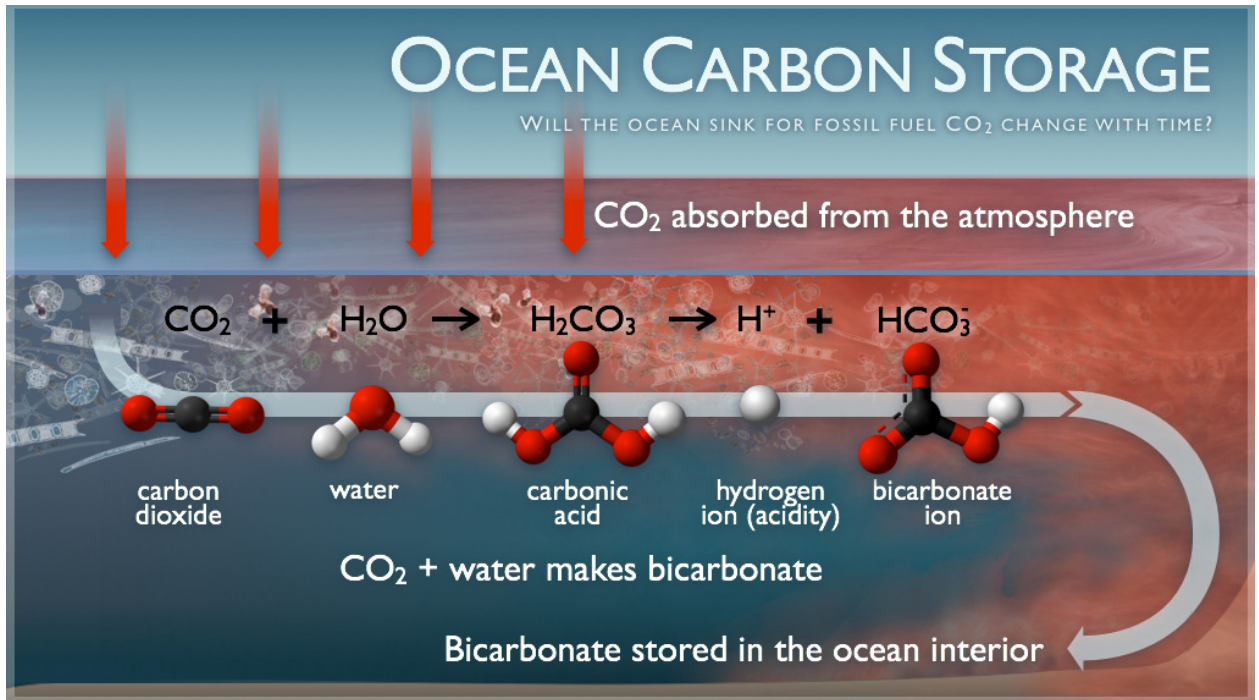
## OCEAN ACIDIFICATION, [OCEAN](#) Newsletter Research Staff

Gordon Peabody, Editor, Spring, 2014, [gordonpeabody@gmail.com](mailto:gordonpeabody@gmail.com)

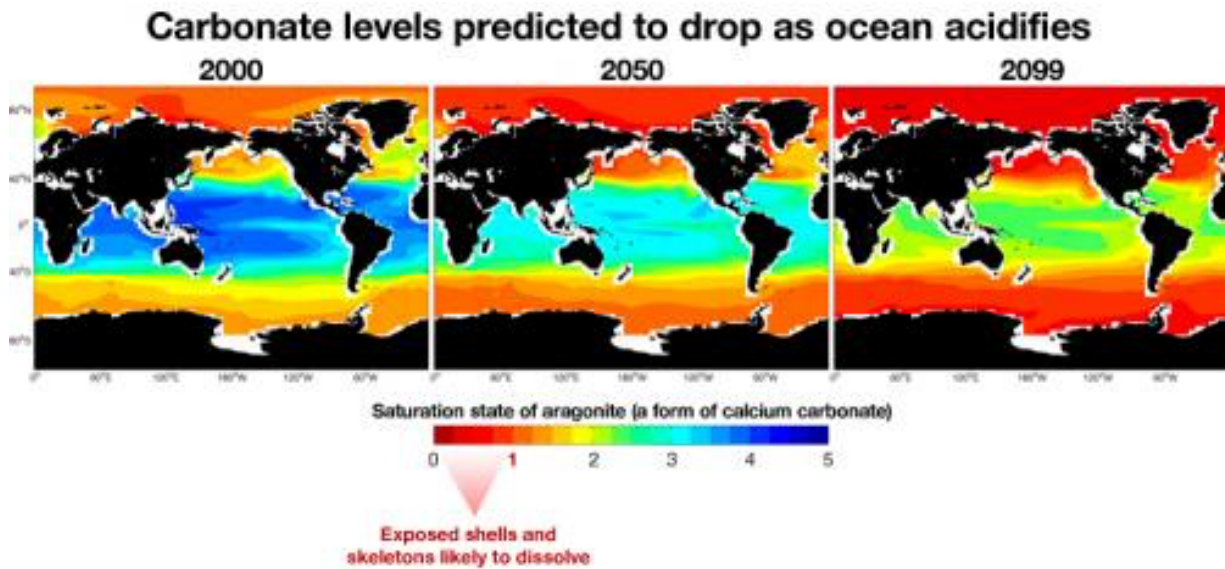
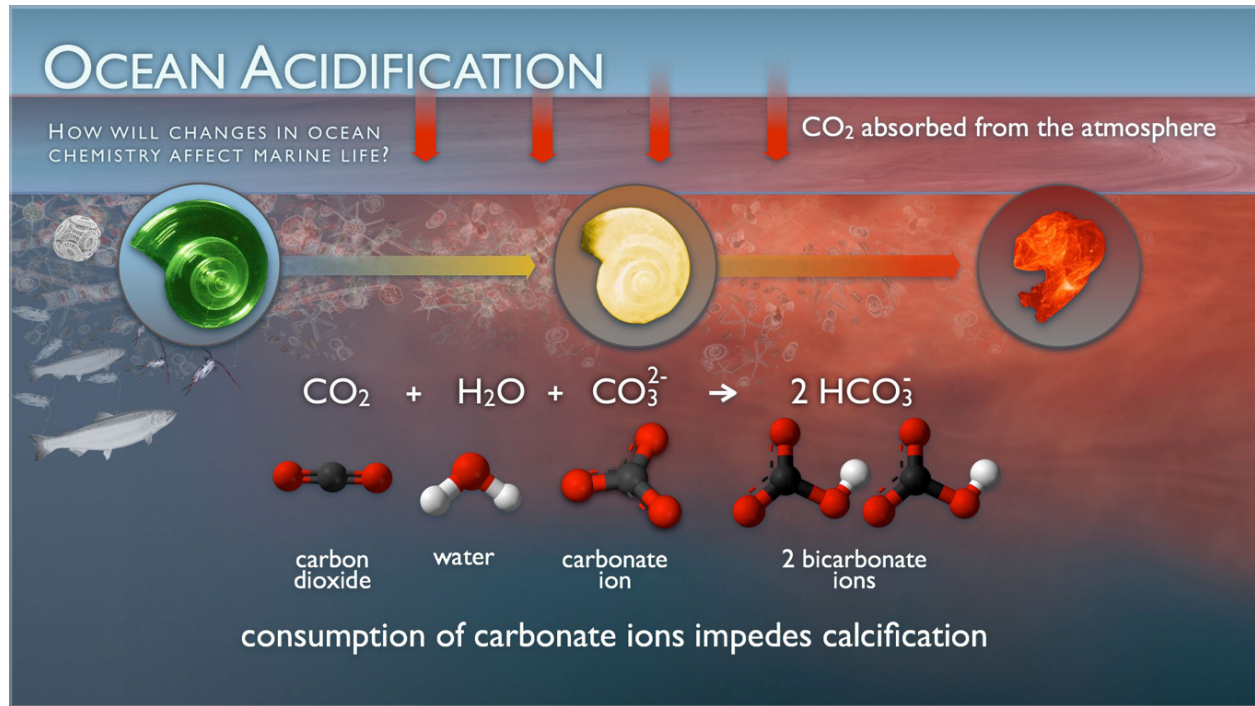
### Ocean Acidification



The surface ocean currently absorbs about one-fourth of the CO<sub>2</sub> emitted to the atmosphere from human activities, namely from fossil-fuel combustion, deforestation and cement production. When the ocean absorbs CO<sub>2</sub> it is beneficial because it keeps it out of the atmosphere, therefore slowing climate change. However, as the CO<sub>2</sub> dissolves in seawater, it forms carbonic acid, increasing ocean acidity. Since industrialization began in the 18th century, surface-ocean acidity has increased by 30%. The arctic is more susceptible to acidification due to the fact that cold water absorbs CO<sub>2</sub> more readily than warm water. As the oceans continue to absorb CO<sub>2</sub> the amount they can absorb in the future may diminish.



The effects of ocean acidity are a more recent study topic, but have been found to be widespread. The Alfred Wegner Institute compiled data regarding 5 animal taxa: crustaceans, vertebrates, echinoderms, corals and mollusks; all 5 were affected negatively. It has been shown to inhibit shell growth in a variety of species and decrease calcification in coral. Young and adult fish seem less susceptible to acidification but fish eggs and larvae may be more sensitive and some fish may develop reproductive disorders. Fish stocks may be better able to handle the acidification if they weren't already susceptible to other environmental stressors such as habitat degradation and overfishing.



Sources: Images from NOAA

-- Astrid C. Wittmann, Hans-O. Pörtner. Sensitivities of Extant Animal Taxa to Ocean Acidification.

Nature Climate Change, 2013; DOI: 10.1038/nclimate1982. Aug 25, 2013

--Doyle, Allister. Reuters. Study: Acidification of Arctic Waters Threatening Fish Reproduction. MSN.com

--The Monaco Declaration, 2nd International Symposium on the Ocean in a High CO<sub>2</sub> World.

--National Geographic. <http://ocean.nationalgeographic.com/ocean/critical-issues-ocean-acidification/>

Carbon Dioxide is putting shelled animals at risk.

[http://sio.ucsd.edu/Ocean Acidification/](http://sio.ucsd.edu/Ocean%20Acidification/)

<http://scrippsnews.ucsd.edu/Releases/?releaseID=1310>

<http://calcofi.org/field-program/rosette-sampling/454-under-co2.html>

<http://sccoos.ucsd.edu/projects/20120A/>

"Ocean acidification and calcifying reef organisms: a mesocosm investigation" P. L. Jokiel Æ K. S. Rodgers Æ I. B. Kuffner Æ A. J. Andersson Æ E. F. Cox Æ F. T. Mackenzie

"High-Frequency Dynamics of Ocean pH: A Multi-Ecosystem Comparison" Hofmann GE, Smith JE, Johnson KS, Send U, Levin LA, et al. (2011). PLoS ONE 6(12): e28983. doi:10.1371/journal.pone.0028983

