10 Key Findings From a Rapidly Acidifying Arctic Ocean

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Polar bear on a remnant ice floe: Credit: Gerard Van der Leun at Flickr.

As predicted by chemistry, change in the Arctic Ocean is acceleratingas temperatures warm faster than the global average, as the seaice melts, as northern rivers run st into the atmosphere. The *Arctic Ocean Acidification Assessment*, a new report from the Arctic Monitoring and Assessment Program(AMAP), presents these 10 key f

1. Arctic marine waters are experiencing widespread and rapid ocean acidification. In the Nordic Seas, acidification is taking place over a wide range of ocean Seas. Other ocean acidification signals have also been encountered in surface waters of the Bering Strait and the Canada Basin of the central Arctic Ocean.

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2. The primary driver of ocean acidification is uptake of carbon dioxide emitted to the atmosphere by human activities. The ocean has swallowed our atmos delaying even more warming has been the increasing acidification of seawater. The average acidity of surface ocean waters worldwide is now ~30% higher than at the

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3. The Arctic Ocean is especially vulnerable to ocean acidification. Arcticrivers plus melting ice input huge (and increasing) amounts of freshwater into theArcti
air. Add the fact that dramatic decreases in Arctic summer sea-ice cover—real and projected—allowfor greater transfer of CO2from

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4. Acidification is not uniform across the Arctic Ocean. Other processes influence the pace and extent of ocean acidification. Rivers, sea-floor sediments, and coas
Sea-ice cover, freshwater inputs, and plant growth and decay also influence local ocean acidification. The contributions of these processes vary fromplace to place,sea

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5. Arctic marine ecosystems are highly likely to undergo significant change due to ocean acidification. Arctic marine ecosystems are generally characterized
integrity of such a simple structure depends greatly on keystone species.Pteropods(sea butterflies) and echinoderms (sea stars, urchins) are key food-web organisms
most biological studies have been undertaken in other ocean regions. Arctic-specific long-term studies are urgently needed.

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6. Ocean acidification will have direct and indirect effects on arctic marine life. Some marine organisms will respond positivelyto new conditions associated w
centuries. While some seagrassesappear to thrive under such conditions. Birds and mammals are not likely to be directly affected by acidification but may be indirectly
which nutrients and essential trace elements in seawater are available to marine organisms. Shell-building Arctic mollusks are likely to be negatively affected by acidif

and early larval stages may be more sensitive. In general, early life stages are more susceptible to direct effects of ocean acidification than later life stages.

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7. Ocean acidification impacts must be assessed in the context of other changes happening in Arctic waters. Arctic marine organisms are experiencing not on predators and prey, or among competitors—also play an important role in shaping ocean communities. As different marinelife responds to environmental change in d yet.

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8. Ocean acidification is one of several factors that may contribute to alteration of fish species' composition in the Arctic Ocean. Ocean acidification is like Arctic change include rising temperatures, diminishing sea ice, and freshening surface waters.

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9. Ocean acidification may affect Arctic fisheries. Few studies have estimated the socio-economic impacts of ocean acidification on fisheries, and most have focu affected by ocean acidification, but the magnitude and direction of change are uncertain. Fish stocks may be more robust to ocean acidification if other stresses—for e

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10. Ecosystem changes associated with ocean acidification may affect the livelihoods of Arctic peoples. Marine species harvested by northern coastal commun unaffected species, but these changes would likelyexert a cultural toll. Recreational fish catches maychange to different species. While marine mammals—important to