In hot water: Ice Age findings forecast problems

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(PhysOrg.com) -- The first comprehensive study of changes in the oxygenation of oceans at the end of the last Ice Age (between about 10 to 20,000 years ago) has implications for the future of our oceans under global warming.

The study, which was co-authored by Eric Galbraith, of McGill's Department of Earth & Planetary Sciences, looked at marine sediment and found that that the dissolved oxygen concentrations in large parts of the oceans changed dramatically during the relatively slow natural climate changes at the end of the last Ice Age. This was at a time when the temperature of surface water around the globe increased by approximately 2 C over a period of 10,000 years. A similar rise in temperature will result from human emissions of heat-trapping gases within the next 100 years, if emissions are not curbed, giving cause for concern.

Most of the animals living in the ocean, from herring to tuna, shrimp to zooplankton, rely on dissolved oxygen to breathe. The amount of oxygen that seawater can soak up from the atmosphere depends on the water temperature at the sea surface. As temperatures at the surface increase, the dissolved oxygen supply below the surface gets used up more quickly. Currently, in about 15 per cent of the oceans - in areas referred to as dead zones - dissolved oxygen concentrations are so low that fish have a hard time breathing at all. The findings from the study show that these dead zones increased significantly at the end of the last Ice Age.

"Given how complex the ocean is, it's been hard to predict how climate change will alter the amount of dissolved oxygen in water. As a result of this research, we can now say unequivocally that the oxygen content of the ocean is sensitive to climate change, confirming the general cause for concern."

The results of this study were published in *Nature Geoscience*.

More information: www.nature.com/ngeo/journal/va … t/full/ngeo1352.html

Provided by McGill University