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## Modeling ice-melt may lead to improved global climate forecasts

By [Matt Ford](#) | Published: September 12, 2007 - 01:12PM CT

A key variable in climate modeling is the Earth's albedo—a measure of how much of the Sun's radiation the Earth reflects relative to how much it receives. The importance of albedo is starkly illustrated by sea ice at high latitudes: as polar ice caps are white, they reflect solar energy but, when they melt into the ocean, the dark water readily absorbs the energy from the Sun. According to University of Utah mathematics professor Ken Golden, "In the late spring, melt ponds [atop the ice] critically affect the albedo of the polar ice packs. The drainage of these melt ponds is again largely controlled by the permeability of the ice." Given the vastly differing dynamics of ice versus water, a greater understanding of the ice permeability and the fluid flow through the ice is paramount to improving our ability to predict future climates.

In an [article](#) published in a recent edition of [Geophysical Research Letters](#), Prof. Golden and colleagues put forth a mathematical theory for brine moving through floating sea ice. A quote from the [American Geophysical Union](#), the group that publishes GRL, states that "sea ice is important because it is both an indicator and regulator of climate change; its thinning and retreat show the effects of climate warming, and its presence greatly reduces solar heating of the polar oceans." In addition to helping understand effects on climate, this work can help shed light on the microbial communities that live in sea ice and form one of the lower rungs on the marine food chain.




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Prof. Golden found that the governing equations exhibited what is known as universality—where the end result does not depend on the fine details of the structure, merely the dimensions. While this is not uncommon in the modeling world; it is uncommon to find that a complex real world material such as sea ice obeys such equations. In addition to developing the mathematical models for such a system, the researchers carried out physical measurements using X-Rays and CT-scans to help develop and verify their math.

In the Intergovernmental Panel on Climate Change's latest report they predicted that the summer arctic pack ice will disappear due to global warming sometime between 2050 and 2100. Professor Golden says that he hopes his work can help provide a more realistic depiction of sea ice in climate models and lead to better predictions of world climate and the current effects of warming.

*Geophysical Research Letters*, 2007. DOI: 10.1029/2007GL030447

Filed under: [sea ice](#), [albedo](#), [climate](#), [science](#)

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**EpaAmigo**

So basically, cover the earth in white and global warming goes away?

Cristo and Jeanne-Claude FTW! Or something.

September 12, 2007 @ 03:24PM

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