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*Mathematics of sea ice to help predict climate change.*

Sea ice is both an indicator and agent of climate change. It also serves as a primary habitat for microbial communities sustaining life in the polar oceans. Fluid flow through porous sea ice mediates a broad range of processes, such as the growth and decay of seasonal ice, the evolution of summer ice albedo, and biomass build-up. A new understanding of the fluid permeability of sea ice, and the thermal evolution of its microstructure, promises to improve forecasts of how global warming will affect earth's icepacks, and how polar ecosystems may respond. Related work on electrical properties will help in monitoring ice thickness. Video from a 2007 Antarctic expedition where we measured fluid and electrical transport in sea ice will be shown. (Received July 29, 2008)