



Mathematical Statistics
Stockholm University
Examensarbete 2012:5,
<http://www.math.su.se/matstat>

A Bayesian Simulation Study Using MCMC to Find Possible Ice Shelves Characteristics in the Arctic Ocean about 140 000 Years Ago

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October 2012

Abstract

The aim of this thesis is to investigate possible features of ice shelves in the Arctic about 140000 years ago. The ice shelves have a critical role in the global climate system and since the human carbon emissions will increase the temperature in the future it is important to understand more about how the ice sheet interacts with the global climate. Today most ice shelves are found in the Antarctic. The Antarctic data are being used as plausible relations between several parameters under the presumption that the ice shelves in the Antarctic today have similar features as ice shelves in the Arctic 140000 years ago. Seafloor findings suggest that the Arctic has been covered with huge ice shelf complexes. Markov Chain Monte Carlo, MCMC, is a general simulation method that draws values from approximate distributions. The Markov chain used here is the Gibbs sampler and the software OpenBUGS has been performing the simulations. The results suggest that huge ice shelf complexes were extreme events but support the idea of ice shelves in the Arctic in the past.

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