

## **Lunchtime seminar at University of Iceland: ADMB**

Monday 16 September 12:25–13:25

University of Iceland

VRII, Room 147

Title: A flexible software interface to latent random variable models

Speaker: Hans Skaug is Professor of Statistics at the Department of Mathematics, University of Bergen, Norway. His research interests are computational statistics and statistical ecology. He has developed line transect methods and genetics based methods for estimating animal abundance. Before joining the Department of Mathematics in 2004, he worked as a statistician at the Institute of Marine Research in Bergen.

Abstract:

The computational challenge offered by hierarchical models is the need to integrate over the latent random variables in order to do maximum likelihood estimates of parameters. In spatial statistics and state space models the integral is high dimensional, and classical numerical integration techniques fail.

I will explain how the Laplace approximation in combination with Automatic Differentiation (AD) provides a flexible and “automatic” framework for fitting such models. The approach is implemented in the open source system ADMB (<http://admb-project.org/>), which from a user perspective is automatic at the level of the MCMC based software WinBUGS. I will talk about 10 years of experience with developing ADMB models in different areas, and focus on recent sparse matrix developments needed for large spatial GLMMs.