Spatio-temporal models for ecologists

An overview

Jim Thorson and Noble Hendrix Spring, 2016

TMB overview

CppAD (external C++ package)

- derivative calculations



Native TMB

R controlling session
(*.R file)

data pre-processing, call nlminb(), plot result Data, parameter values

Objective function & derivatives

C++ objective function (*.cpp file)

evaluate objective
 function and its derivatives



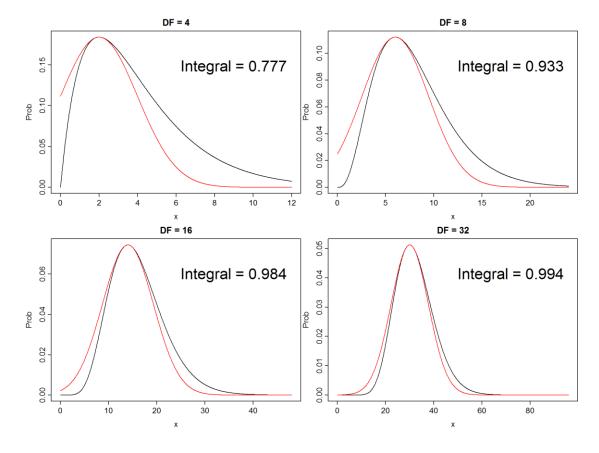
R packages, C++ code



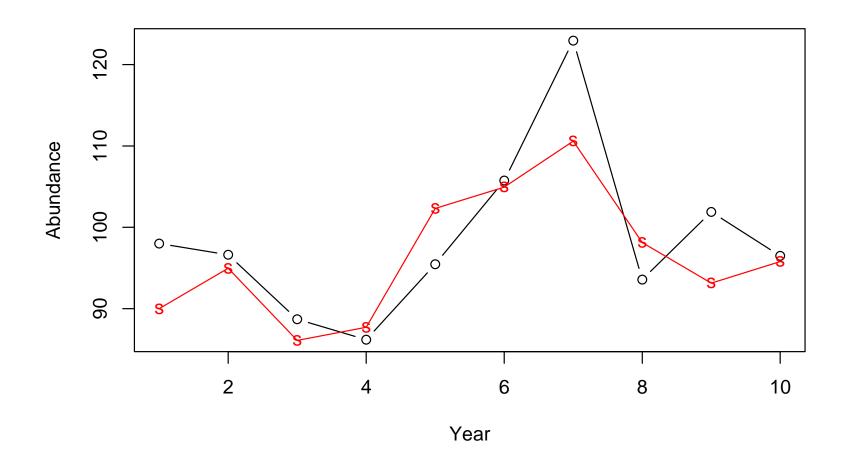
Eigen (external C++ package)

- matrix library

- Generalized Linear Mixed Models
- Laplace approximation

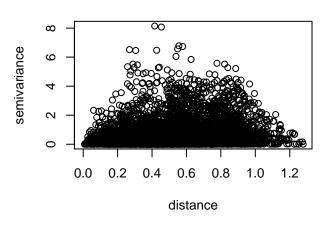


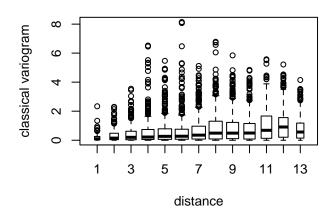
Temporal and state-space models



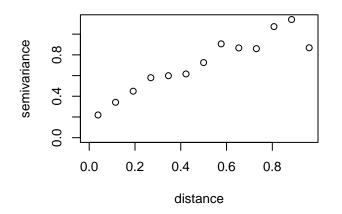
Geostatistical Models

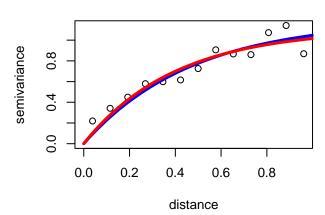
variogram cloud



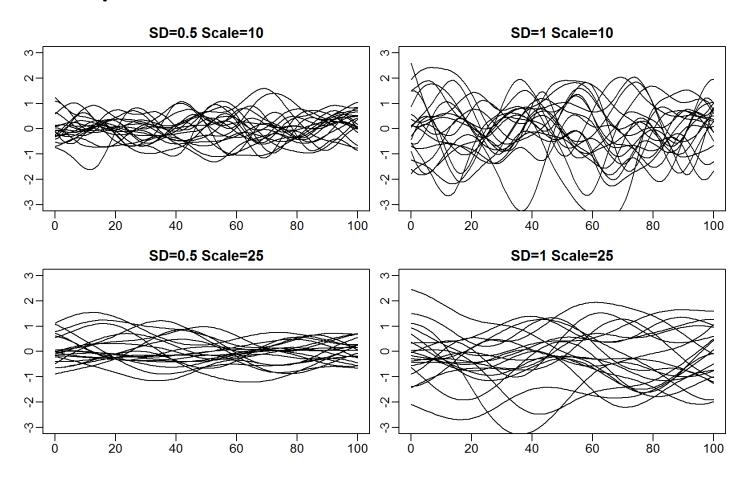


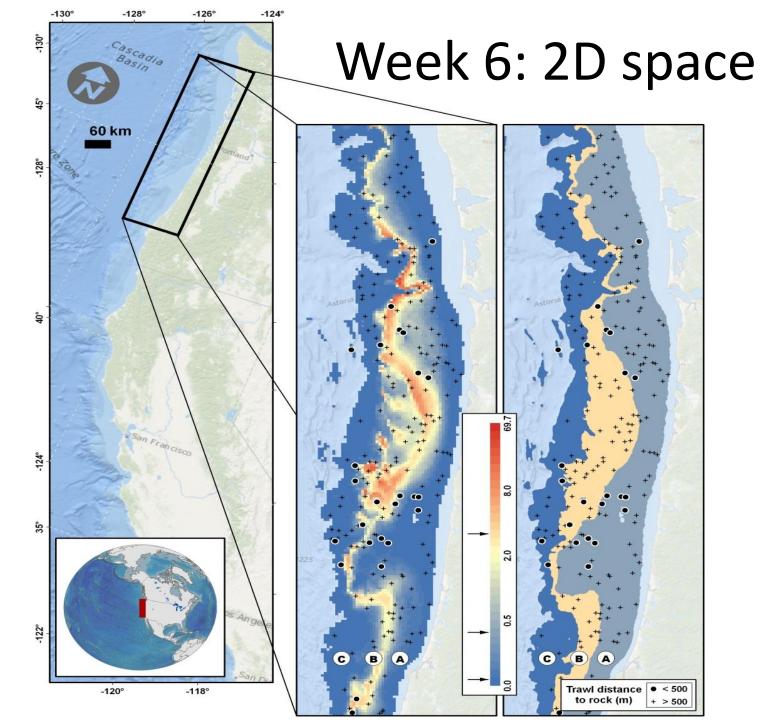
binned variogram

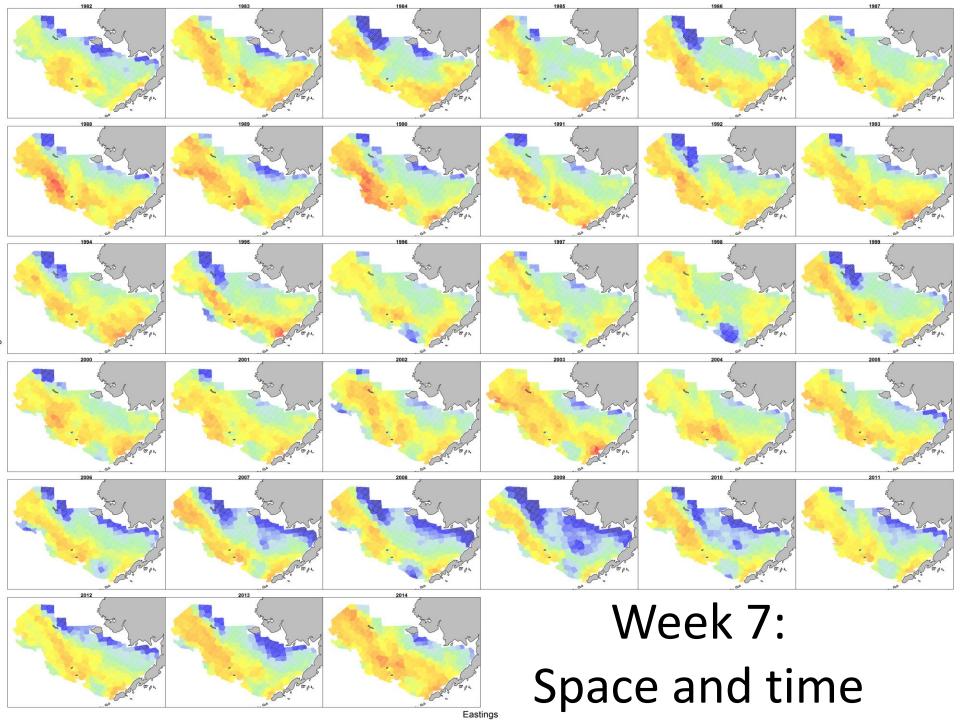




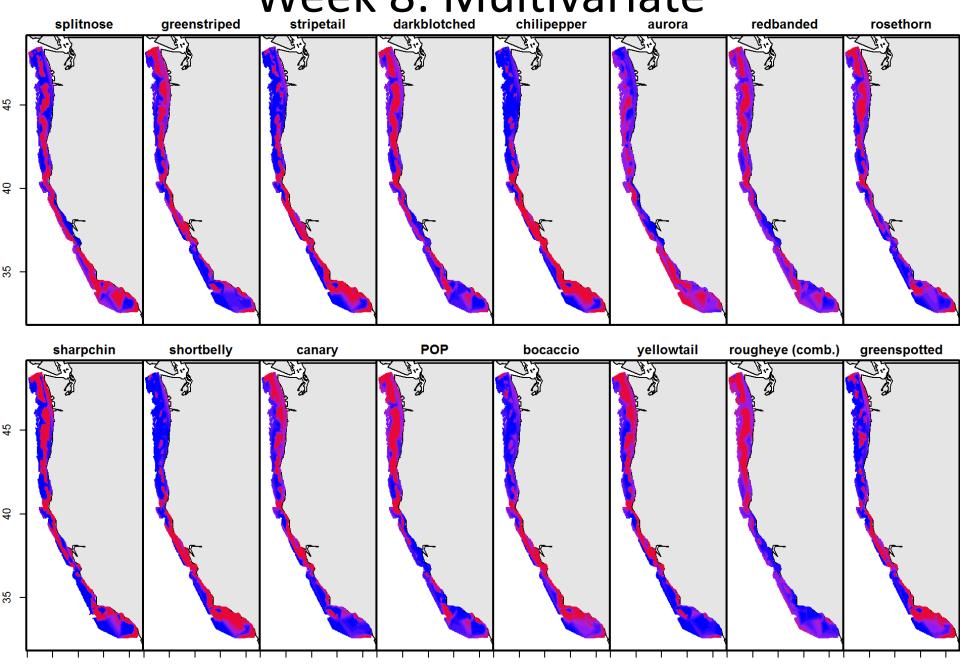
1-D spatial models and Gaussian Process







Week 8: Multivariate
stripetail darkblotched chilipepper aurora



Week 9: Movement

