ICES Training programme

The International Council for the Exploration of the Sea (ICES) offers courses led by high-profile scientists and instructors. Visit the Training web page: www.ices.dk/iceswork/training/training.asp

AD Model Builder and Stock Assessment

Context and level

This will be an advanced course in fisheries stock assessment modelling, but rather than running the audience through a number of predefined models and have them memorize check lists for how to use them, this course will enable participants to:

- Build assessment models in AD Model Builder (ADMB)
- Modify existing ADMB models

AD Model Builder is a package designed to meet the requirements posed by typical stock assessment models (nonlinear, highly parameterized, possibly time-varying parameters). Published benchmarks have shown that it provides faster and more reliable parameter estimation than other generic function minimisers. This is achieved with automatic differentiation (AD) and the programming interface is a thin layer on top of C++, with convenient features to read and write data files, perform vector and matrix calculations, with optional features like random effects and MCMC analysis. Model input and output is in plain text files, that can be analyzed and plotted in R or other statistical packages. AD Model Builder is free software (http://admb-project.org), originally written by Dave Fournier, the 2009 recipient of the American Fisheries Society's William E. Ricker Award.

After going through biomass-dynamic models, statistical age-structured models and MCMC analysis, the focus will be on random effects and finally a State-space Assessment Model (SAM), which is used for several assessments in ICES. This is a full stochastic model that allows selectivity to vary gradually with time, and can handle years with missing data. It has fewer model parameters than full parametric statistical assessment models, as quantities such as fishing mortalities and stock sizes are modelled as random effects.

admb
FAST, ACCURATE, STABLE OPTIMIZATION

Course dates

21–25 February 2011

Fee

The fee for the course is €500. This covers only tuition fee.

Admission and registration

The course is designed for a maximum of 25 participants. The working language is English. Participants are expected to be familiar with likelihood functions, nonlinear optimisation, and programming statistical models in general.

Please register online:
www.ices.dk/iceswork/training/registration/

The deadline for the submission of applications is 20 December 2010.

Venue

International Council for the Exploration of the Sea
H. C. Andersens Boulevard 44–46
DK-1553 Copenhagen V
Denmark
Tel: (+45) 33 38 67 00
Fax: (+45) 33 93 42 15
Email: info@ices.dk
You can find more information about:
ICES HQ here
Hotels close to ICES here
The hostel next to ICES here

Programme

Day		Topic
Monday	AM	Introduction to AD Model Builder Building a simple model
	PM	Estimating the mean Linear regression
Tuesday	AM	Biomass-dynamic models
	PM	Statistical catch-at-age models
Wednesday	AM	Bayesian models and priors
	PM	MCMC analysis and diagnostics
Thursday	AM	Random effects Linear mixed effects
	PM	Univariate state-space model State-space assessment model
Friday	AM	State-space assessment model
	PM	Student problems Summary

Organization

The course is organized by the ICES Secretariat as part of the ICES Training programme.

The course and course materials are provided by Anders Nielsen (DTU-Aqua) and Arni Magnusson (MRI).

The course includes applied examples, case studies, and hand-on exercises on the computer.

Participants are required to bring their own laptops to connect to a local area network. They should be able to install software and additional packages.

Instructors

Anders Nielsen, DTU Aqua, National Institute of Aquatic Resources, Technical University of Denmark, Charlottenlund Castle, Jægersborg Allé 1, 2920 Charlottenlund, Denmark
Tel: (+45) 35 88 34 54
Email: an@aqua.dtu.dk

Arni Magnusson, Marine Research Institute, Skulagata 4, PO Box 1390, 121 Reykjavik, Iceland
Tel.: (+354) 575 2000
Email: arnima@hafro.is

Contact ICES Secretariat for more information

Søren Anker Pedersen
Coordinator for Training
Tel: (+45) 33 38 67 52
Email: training@ices.dk