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/training.

Ecosystem Modelling for Fishery Management

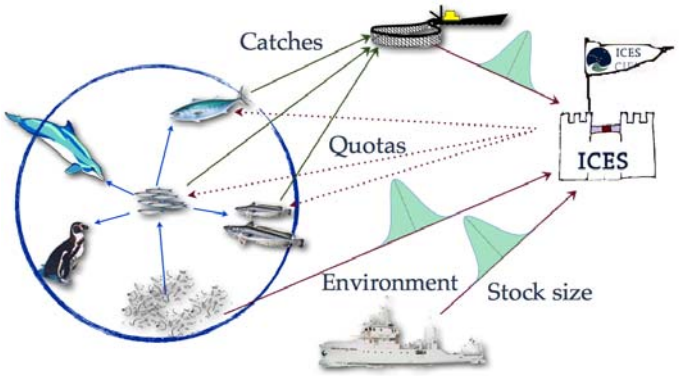
Context and level

As we move toward ecosystem approaches to fisheries it becomes increasingly important to address strategic questions that cannot be answered using the more tactical single-species assessment. Examples include trade-offs between fisheries due to food web interactions, evaluating potential impacts of MPAs, and predicting how climate change will impact ecosystem fish production and future fisheries from ecological, social, and economic perspectives.

The course will provide an introduction to using ecosystem modelling for strategic evaluations as part of fishery management. It includes,

- a review of ecosystem model types;
- an overview of food web modelling and integration with fisheries economics;
- time-dynamic modelling with emphasis on time series fitting and environmental impacts
- ecosystem carrying capacity, and trade-offs between fisheries;
- ecosystem-level management strategy evaluation;
- spatial modeling including habitat capacity modeling, fleet-effort dynamics, MPA evaluation, and spatial optimization (zoning); and
- an introduction to using ecosystem modeling in regional management councils;

The course will be split about evenly between lectures and tutorials, with a focus on hands-on development of simple models from scratch. The intention is to give participants confidence in constructing and interpreting basic ecosystem models, as well as a basic knowledge of more advanced methodologies for modelling.



Management Strategy Evaluation

The course is intended for scientists with some prior experience with ecosystem modelling. The open source Ecopath with Ecosim (EwE) software will be used extensively for the course, and participants are expected to have at least a basic familiarity with the approach. Some preparation is therefore expected prior to arrival, notably reading through the course material and exploration of the software.

Course dates

26-30 August 2013

Training course materials

- EwE6 User's Guide (download from www.ecopath.org)
- Reprints (will be made available to participants prior to the course)
- Lecture notes (will be made available to participants prior to the course)
- Presentations (will be made available to participants prior to and during the course)

Venue

International Council for the Exploration of the Sea
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DK-1553 Copenhagen V
Denmark
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Email: info@ices.dk
You can find more information about:
ICES HQ here
Hotels close to ICES here
The hostel next to ICES here

Organization

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

Villy Christensen and Steve Mackinson, who both have extensive experience with ecosystem modeling, will lead the course and provide course materials.

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

Participants are required to **bring their own laptops** (Mac with virtualization is OK) to connect to the ICES network, and also to have EwE (freely downloadable from www.ecopath.org) installed prior to arrival.

Admission and registration

The course is designed for a maximum of 25 participants. The working language is English.

The deadline for the submission of applications is 7 June 2013. Please use the online registration: http://www.ices.dk/iceswork/training/registration/

Fee

The fee for the course is 750 €[1]. This covers only the tuition fee.

Programme

The five-day course is arranged with a series of lectures introducing concepts and implementation, followed by hands-on sessions in which the participants explore the various modules and approaches in EwE, based on simple ecosystem models constructed during the course. For details, see the preliminary program below.

Instructors

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Contact ICES Secretariat for more information

Coordinator for Training
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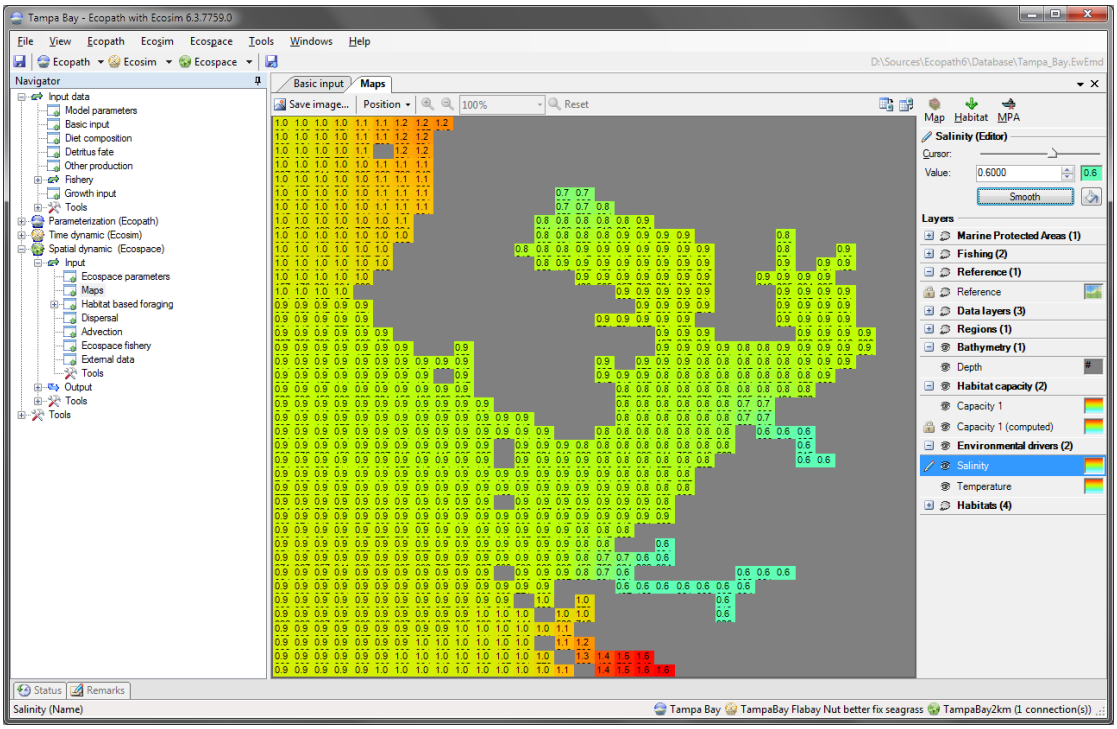
[1]The course fee for participants from non-ICES member countries is 1250 €



Day 1	Topic (program may be modified during course)
Morning (9.00)	Welcome to ICES Training Programme (ICES Coordinator for Training) About ICES, services, advice and practical issues (ICES representative) About this course (Villy Christensen and Steven Mackinson) Introduction of participants and lecturers, expectations Lecture: Ecosystem models: types and characteristics Lecture: Introduction to EwE, the approach and software
Afternoon	*Tutorial 1: Build and parameterize a simple food web model* Lecture: Mass-balance modelling; introduction; parameters *Tutorial 2: Mass-balancing of simple ecosystem models* Lecture (time permitting): Network analysis, indicators, model comparisons
Day 2	
Morning	All days will start with a summary of the previous day Lecture: Modelling predator–prey interactions; time-dynamic modelling; the foraging arena: density-dependence and carrying capacity. Modeling environmental impact. Primary production anomalies. Using climate drivers. *Tutorial 3: Introduction to time dynamic modeling*
Afternoon	Lecture: Time series fitting. Mediation: modeling non-trophic impacts. *Tutorial 4: Fitting ecosystem models to time-series data*
Day 3	
Morning	*Tutorial 5: Model fitting and performance testing: the North Sea* Lecture: Fishing policy exploration. Defining objectives for management *Tutorial 6: Fishing policy exploration: the North Sea*
Afternoon	Lecture: Modeling economic and social aspects of the fisheries sector Lecture: Management Strategy Evaluation, modelling multispecies fishery regulations (weakest stock, strongest stock with discarding, selective fishing quota); fleet quotas; target fishing mortality policy. Fleet size dynamics *Tutorial: Management Strategy Evaluation and fishery regulations*

Day 4	
Morning	Summary of model fitting, policy exploration, and MSE Lecture: Building modules for analysis and data extraction *Tutorial 7*: *The CEFAS Data-extractor* Spatial modelling in EwE; introduction; habitat capacity, spatial data; objectivity function; optimizations; linkages to Marxan; comparative studies *Tutorial 8*: *Defining, setting up and running a spatial model*
Afternoon	Lecture: Application of spatial modeling in fisheries and conservation. Using ecosystems models for fishery management: North Sea models; use in regional management councils; policy questions and objectives *Tutorial 9*: *Exploring the North Sea models*
Day 5	
Morning	Lecture: Linkages to other models, alternative modelling approaches within modelling frameworks. End-to-end modeling: On coupling models *Tutorial 10*: *Your own models: issues and solutions* Evaluation (written)
Afternoon	Lecture: The future of ecosystem modeling. Using EwE as a decision-support system Closing (16.00)