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

This course is held in collaboration with the International Commission for the Conservation of Atlantic Tunas **(**ICCAT, www.iccat.int**)** and the Secretariat of the Pacific Community (SPC, http://www.spc.int**)**

Management Strategy Evaluation
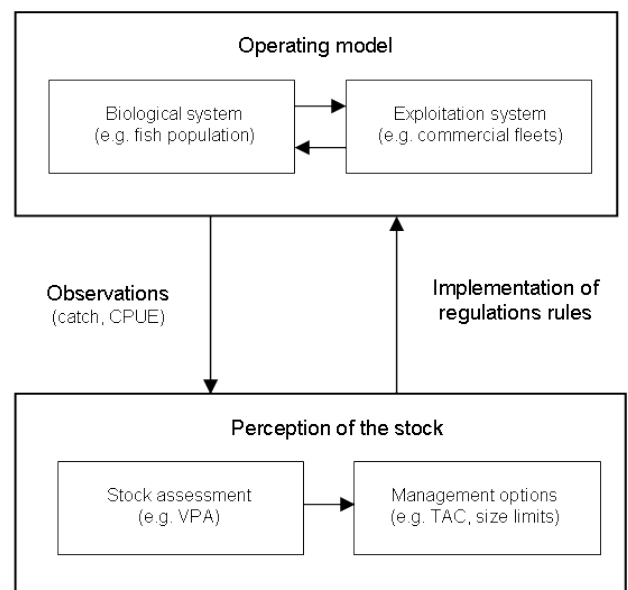### - including Fisheries Library in R (FLR)

Objective and level

The adoption of the precautionary approach for fisheries management requires a formal consideration of uncertainty. However, traditional stock assessment mainly considers uncertainty in observations and processes (e.g. recruitment), whereas uncertainty about the actual dynamics (i.e. model uncertainty) has a larger impact on achieving management objectives.

Therefore Management Strategy Evaluation (MSE) is an important tool for developing scientific advice frameworks through simulation testing. This involves creating simulation models (i.e. operating models) that represent hypotheses about the stock dynamics and using these to evaluate candidate management strategies, where management strategies include data collection regimes, stock assessment methods, choice of reference points and management measures (e.g. Harvest Control Rules).

The training course will demonstrate how to conduct Management Strategy Evaluation (MSE) using FLR (http://flr-project.org/) in order to develop long term management plans that are robust to uncertainty.

It is assumed that participants will already have knowledge of stock assessment. The course will be conducted using R (www.r-project.org/) and experience in using R is also assumed.

Case studies will be based upon actual examples of using MSE to develop advice. Course participants are welcome to bring their own data.

By the end of the course, the participants will be able to:

- Perform a stock assessment in R/FLR, then simulation test it.
- Develop Harvest Control Rules then set management measures based upon stock assessment outputs and biological reference points.

Course dates

9-13 December. The five-day course will run from 9.00 am to 18.00 pm in morning and afternoon sessions.

Venue

International Council for the Exploration of the Sea
H. C. Andersens Boulevard 44-46
DK-1553 Copenhagen V
Denmark
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 and the ICCAT Secretariat as part of training.

The course and course materials are provided by Laurence Kell (ICCAT), Iago Mosqueira (JRC) and Graham Pilling (SPC).

The course includes applied examples, case studies and practical computer based exercises.

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 using Windows or Linux.

Instructors

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Fee

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

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[1] The course fee for participants from non-ICES member countries is 1250 €.
  For special invited ICCAT members there is no fee.

Admission and registration

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

Please register online: here

The deadline for the submission of applications is **4 October 2013.**

Programme

The five-day course is organised as a series of morning and afternoon sessions. Computer based exercises will be linked to each topic and scheduled throughout the course.

Day	Lecture	Topic
Monday		**Introduction**
	1	Use of R and FLR
	2	Case studies and data
Tuesday		**Management Procedures I**
	3	VPA based stock assessment
	4	Biological reference points
	5	Non-linear modelling of stock recruitment data
Wednesday		**Management Procedures II**
	6	Stock projection
	7	Harvest control rules
Thursday		**Operating models:**
	8	Data rich examples
	9	Data poor examples
Friday		**Evaluation**
	10	Translating models into advice
	11	Bio-economics

Contact ICES Secretariat for more information

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