



ICES Training programme

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/iceswork/training/training.asp

This course is held in collaboration with the International Commission for the Conservation of Atlantic Tunas (ICCAT) capacity building programme. Visit the ICCAT web-page: www.iccat.int

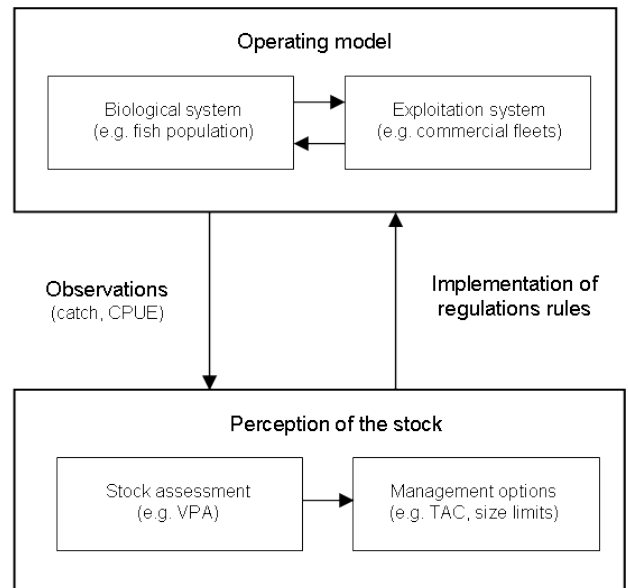
Management Strategy Evaluation (including FLR)

Objective and level

The adoption of the precautionary approach for fisheries management requires a formal consideration of uncertainty. Therefore, since 1998 ICES advice on fisheries management has consisted of a dual system of limit and “precautionary approach” reference points, the latter providing a buffer to safeguard against natural variability and uncertainty in the assessment, and ensuring that limit reference points are avoided with high probability. 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.

The World Summit on Sustainable Development (WSSD, Johannesburg 2002) commits signatories to maintain or restore stocks to levels that can produce the maximum sustainable yield (MSY) by 2015. A main management objective e.g. for ICCAT stocks, is to maintain stocks at levels which will permit the maximum sustainable catch. There is therefore a pressing need to develop new precautionary management advice based on targets rather than limits. This training course will demonstrate how to conduct Management Strategy Evaluation (MSE) using FLR (<http://flr-project.org/>) to develop long term management plans that are robust to uncertainty.

It is assumed that participants will have knowledge of stock assessment, including estimation of stock status and biological reference points. The course will be conducted using R (www.r-project.org/) and experience in using R or similar modelling languages will be assumed.



Case studies will be based upon ICES and ICCAT stocks. Course participants are welcome to bring their own data.

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

- Run a stock assessment in R/FLR.
- Develop Harvest Control Rules (HCRs) that generates the management outcomes based upon stock assessment outputs and biological reference points.
- Evaluate the performance of alternative sampling and assessment procedures and HCRs given uncertainty.
- Evaluate the trade-offs between risk to the stock and benefits to fishers of alternative scientific advice and management plans.

Course dates

5-9 April 2010. The five-day course will run from 9.00 am to 18.00 pm in morning and afternoon sessions.

Venue

Centro Tecnológico del Mar, CETMAR, Bouzas, Vigo, Spain. You can find more information about the venue here: www.cetmar.org

Fee

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

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) and Iago Mosqueira (Cefas).

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.

Admission and registration

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

Please register online:

www.ices.dk/iceswork/training/registration/

The deadline for the submission of applications is 19 February 2010.

Instructors

Laurence Kell
 ICCAT Secretariat (www.iccat.int)
 Corazón de María, 8.
 28002 Madrid,
 SPAIN
Laurie.Kell@iccat.int

Iago Mosqueira,
 Cefas Fisheries Laboratory.
 Lowestoft, Suffolk NR33 0HT
 UK
iago.mosqueira@cefas.co.uk

Programme

The five-day course is organised as a series of morning and afternoon sessions. Hands-on exercises will be linked to each topic and scheduled throughout the course. Assignments will be conducted in the open-source programming language R and the FLR sets of packages.

Day	Lecture	Topic
Monday	1	R & FLR Using R
	2	Using FLR with case study data sets
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

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

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