



# ICES Training programme

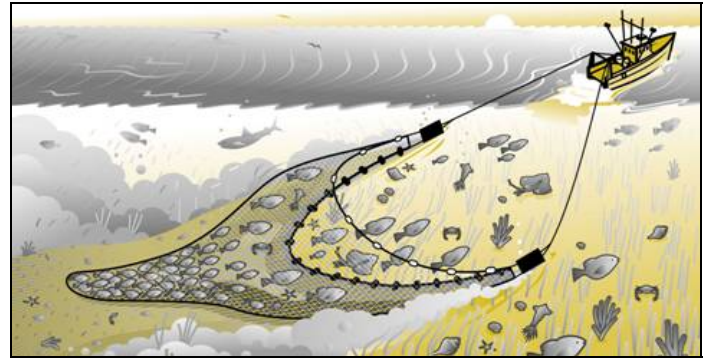
The International Council for the Exploration of the Sea (ICES) offers courses led by high-profile scientists and instructors. Visit the Training web page: [www.ices.dk/training](http://www.ices.dk/training).

## Trawl Survey Design and Evaluation

### Context and level

Trawl surveys play a central role in marine scientific research and fisheries management. Numbers-at-age indices calculated from trawl survey data, for example, are used extensively in stock assessments, providing fisheries independent information on catch rates, long-term trends and spatial patterns. Trawl survey data are also used in marine ecosystem and biodiversity studies, and particularly for the Ecosystem Approach to Fisheries Management (EAFM). ICES holds an extensive database of trawl survey results, and these will be used during the course. Although these surveys are often considered as routine, it can be very easy to compromise the data through problems in survey design, operation and analysis, e.g. in placement of stations, identification and quantification of catch or working up CPUE indices. The aim of the course is to help reduce or eliminate these issues.

This is an introductory course to scientific trawl surveys; their design, conduct and evaluation. It will be targeted at individuals who are starting out in trawl surveys. Nevertheless it would also benefit those who are already involved but wish to learn more and improve their understanding.

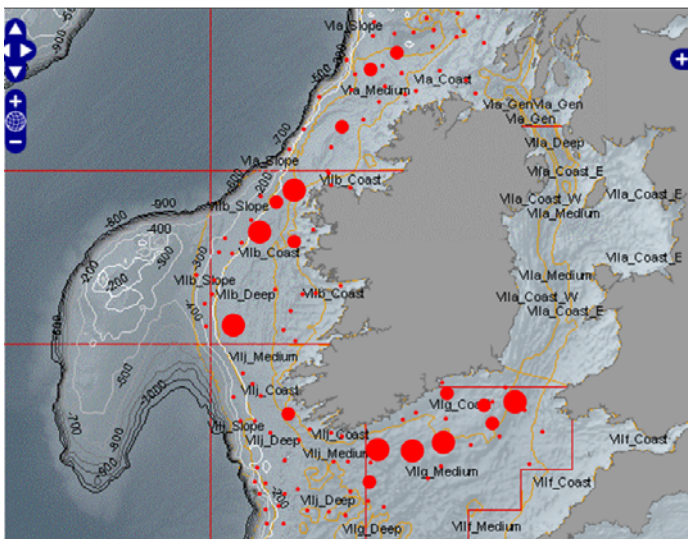


### Objective

The objective of the course is to provide a thorough grounding in the design and implementation of trawl surveys which will be useful for both beginners and experts. Students will be guided through the entire process of going to sea, collecting and storing the data, preparing them for stock assessments, and submission to ICES. Emphasis will be placed on how the data can be visualized and how problems of misinterpretation due to confounding can be avoided.

### Course lectures will cover:

- 1) Initial considerations such as defining objectives, whether a trawl survey is appropriate relative to other approaches (acoustic, ichthyoplankton, TV), and the possible influence of variables such as time of year, tide, and time of day.
- 2) Basics of survey design. Defining survey area, placing stations, and definition of strata.
- 3) Gear types and specification, the “ideal” trawl survey.
- 4) Practical aspects of preparing to go to sea, calibration of gear, and maintenance.
- 5) Trawl performance monitoring.
- 6) How and what of the catch to sample. Length/weight frequency data, age/length data, sexual maturity data. How many fish to sample, raising factors?
- 7) Analyzing the results.
- 8) Trawl surveys and their value for the Ecosystem Approach to Fisheries Management.



**Course 'practicals' will cover:**

- 1) Application of age length keys.
- 2) Calculation of trawl survey abundance at age indices.
- 3) Production of maps using ICES DATRAS data and R. Plotting trawl tracks, scaled circles, overlaying bathymetry. Simple interpolation methods.
- 4) Statistical methods for assessing differences in trawl data from comparative surveys.
- 5) Calculation of EAFM type "indicators" (large fish, biodiversity, species richness, size at sexual maturity).
- 6) Simulations to show impact of confounding or non-random sampling.

**Course dates**

4-8 November 2013

**Training course materials**

- Data downloads from ICES databases esp. DATRAS (available to participants on the ICES website 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)
- Analysis routines in R (will be made available to participants during the course)

**Venue**

International Council for the Exploration of the Sea  
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DK-1553 Copenhagen V  
Denmark  
Tel: +45 3338 6700  
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[info@ices.dk](mailto:info@ices.dk)

You can find more information about:

ICES HQ [here](#)

Hotels close to ICES [here](#)

The hostel next to ICES [here](#)

**Fee**

The fee for the course is 750 €<sup>1</sup>. This covers only tuition fees.

**Organization**

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

Doug Beare and Dave Reid, who both have extensive experience of trawl surveys, their analysis and use, 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 R (freely downloadable from <http://www.r-project.org/>) installed prior to arrival.

**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/](http://www.ices.dk/iceswork/training/registration/)

**The deadline for the submission of applications is 12 September 2013.**

**Programme**

The course will extend for five days. The morning sessions will consist of lectures on background and theory. The afternoons will be arranged as computer 'practicals' where trawl survey data analysis will be demonstrated using software such as Excel and R. During these afternoon sessions interaction among the course participants will be encouraged.

**Instructors**

Professor Dave Reid, Principle Investigator  
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**Contact ICES Secretariat for more information**

Coordinator for Training  
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<sup>1</sup>The course fee for participants from non-ICES member countries is 1250 €

