Report of the Training Course:
Opening the box - Stock assessment and fisheries advice for stakeholders, NGOs and policy-makers (TCSAFAS2012)

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Contents

Participants of the course "**Opening the box: Stock assessment and fisheries advice for stakeholders, NGOs and policy-makers (TCSAFAS)**" conducted 9-11 October 2012 at ICES Headquarters in Copenhagen. The course was given by Martin Pastoors, Centre for Marine Policy, Netherlands, Christopher Zimmermann, Thünen-Institute of Baltic Sea Fisheries, Germany, and Ciaran Kelly, Marine Institute, Ireland (instructors, #1, 2 and 3 front row from right).

Report of the ICES training course:

"Training Course: Opening the box: Stock assessment and fisheries advice for stakeholders, NGOs and policy-makers"

by

Martin Pastoors, Christopher Zimmermann, Ciaran Kelly

Summary

ICES is well known for providing advice on many different topics regarding marine ecosystems. One of advice topics deals with advice on fisheries management in the North East Atlantic. While the advisory process has been opened op to external observers since 2006, there is still a need to provide a better insight to the background and methods that are used to underpin the advice. This course was intended to fill that need. The course was directed at policy makers, NGO representatives and fisheries organizations.

The course was held for 3 days at ICES headquarters, 9-11 October 2012 and attracted 33 participants from 11 countries. One of the achievements of the course was that the audience was really representing the target audience: policy makers, NGOs, fisheries organizations and scientists contributed about a quarter of the total participants each. This generated a very engaging and committed atmosphere where individual perspectives could be shared on the topics that were raised.

The course program consisted of 16 topics or lectures, some with exercises. The brief context of the lectures is described below.

0. Introduction

By way of introduction, the participants engaged in a short and simple game called "Harvest" that demonstrates the potential strategies for harvesting fish when you cannot exactly estimate the size of the population you are harvesting from (Booth Sweeney and Meadows, 2010).

1. Context of fisheries advice (Martin Pastoors)

How does fisheries science sit within the overall context of fisheries management? How do international agreements influence the direction and scope of fisheries science and advice? How is fisheries science in Europe organized? And how does that compare with other areas (US, Australia, etc.). How is the governance of information of European fishery management?

2. ICES advisory process: overview and historical developments (Chris Zimmermann)

A brief description on how the ICES advice is derived, and how it has developed to the present standard. Explains how data from different sources form the basis of stock assessments, and how through screening, processing and use in stock assessments stock status reports and draft advice are developed. The work of different expert groups supporting the development of the advice is explained and the role stakeholders can have in the process. ICES advice usually follows the request of clients, and the different types of clients and requests are discussed.

3. Overview of ICES advice documents (Ciaran Kelly)

This session was an introduction to the ICES advice documents. In this session participants learned where to find ICES advice and what the documents contain. This section began with a short lecture and was followed up with a short exercise on the interpretation of three different fish stock summary sheets, and discussion. The aim was to become familiar with the layout and general content, before going deeper into the technical aspects.

4. Basics of stock assessment (Ciaran Kelly)

This session provided an introduction to population dynamics and stock assessment. The approach was to build things up from basics without resorting to mathematical expressions or statistical jargon. By the end of the session participants gained an understanding of what data goes into an assessment, what an assessment tries to do and what the outputs are.

5. Fishery management simulation exercise (Martin Pastoors)

This session was devoted to a role-play on fisheries management with the aim to experience the roles and interests of different actors in fishery management. The role-play has been developed in the JAKFISH project (Borodzicz and Drakeford, 2011)

6. Data collection and interpretation (Chris Zimmermann)

This section explains the different types of data required for our work: What does "fishery dependent" and "fishery independent" mean? What is needed before data can be used in assessments? Why do scientists collect data in the way they do and what is it used for? Survey types, strategies and their use are explained – and accessory data which are as important to the development of ecosystem advice as fisheries data. In the hands-on part of this session, participants are asked to interpret simple example data sets themselves, which is specifically ambitious if information from commercial catches and from surveys is conflicting.

7. Basics of stock assessment – Ciaran Kelly

This session explored the properties of stock assessment models and how a assessment model "sees the world". An example assessment model was broken down to show how population dynamics are modelled in an assessment. The fundamentals of the population and catch equations were explained without resorting to mathematical expressions. Armed with the knowledge of what an assessment model does different stock assessment models frequently used in ICES (XSA, ICA, SAM, etc) were explored looking at what these models require in term of input data and how they use that data to estimate different parameters of a population over time

8. Reference points, Precautionary Approach, MSY, stock-recruitment (Martin Pastoors)

Background to the precautionary approach in fishery management and the interpretation in ICES and other scientific advisory bodies. Compares precautionary approach in different areas. What do the concepts mean: limit and precautionary approach reference points? How have they been established? What is reduced reproductive potential? What are the calculations behind the concepts? An important element in the estimation of reference points is the stock-recruitment relationship. How does the precautionary approach relate to Maximum Sustainable Yield (MSY)? How has the ICES advice developed on the basis of the precautionary approach and MSY?

9. Single species forecasts (Ciaran Kelly)

In the lecture included a recap on basics of population dynamics and showed (graphically) how the estimated population propagates in a forecast. Explanations were provided on how the new recruits are estimated and how the population and catch options are derived in the TAC year. From these elements the basic layout of a standard ICES catch option table was deconstructed. At the end of this session participants should have gained some understanding of the consequences of assumptions in a short term forecast and how the output can become very sensitive to these.

10. Ecosystem approach and multispecies advice (Chris Zimmermann)

Up to the previous session we have dealt with a single species focus, but where does the Ecosystem approach to Fisheries management come into ICES advice? In this segment we will explore the broader context of fisheries management, in relation to policy frameworks such as the Marine Strategy Framework Directive. What do we know, and what do we not know about ecosystem aspects of fisheries? And how does the environment affect fisheries? The development of a Baltic multispecies management plan is used as an example on how the consideration of multispecies interactions will possibly change the single species advice in the future.

11. Question and answers on the ICES Advisory Process (with Poul Degnbol)

Poul Degnbol has a broad experience in fisheries science and advice from many different institutional perspectives (IFM, ACFM, EC, ICES secretariat). He is currently the Head of the ICES Advisory Programme. Th Questions and Answer session focussed on the underpinning of the ICES advisory procedures and on the quality of the data that is needed for stock assessment.

12. Mixed fisheries models and advice (Ciaran Kelly)

This session introduced the mixed fisheries advice that has recently been applied for mixed fisheries in the North Sea. The advice considers different scenarios. The methodology was introduced and an explanation provided for the rationale behind the different scenario's in the mixed fisheries advice. Afterwards there was a Q&A session where participants explored the utility and limitations of this approach.

13. Dealing with uncertainty and communicating risks (Chris Zimmermann)

By this time, you will know that uncertainty is an integral part of fishery science. This uncertainty has to be communicated. This section demonstrates different ways to do this. The reasons and points in the advice development process where most of the uncertainty occurs are explained – and strategies to reduce these. Examples are used to demonstrate where disputed advice was just wrong or unavoidably uncertain. Participants will get a chance to demonstrate that they could do better!

14. Mechanics of Harvest Control Rule (HCR) Evaluations (Ciaran Kelly)

This session was a run through the mechanics of the simulations behind the HCR evaluations. A General description of the modelling approaches was provided and it was demonstrated how different processes and uncertainties are incorporated in assessing the potential effects of HCRs.

15. ICES role in long term management plans (Martin Pastoors)

Short overview on the history of long term management plan, recovery plans and harvest control rules in Europe. Division of responsibility between science, policy and stakeholders in the development.

16. What else needs to be explained to better understand ICES advice? (Ciaran Kelly)

Synthesis of previous elements in the course. Describe the differences between short term tactical limits based advice (i.e. what not to do) and long term strategic target based advice. Pick up main points from the context of advice, precautionary approach, MSY, communicating uncertainty, stock assessments and forecasts, stock and recruitment, ecosystem approach, multispecies advice and mixed fishery advice. How do you deal with the balance between complexity and transparency? ON request from the audience, this session also included an presentation on the ICES approach to data limited stocks which was implemented this year for the first time.

Evaluation

Feedback from trainees was solicited during a wrap-up discussion and by using a course evaluation questionnaire. Most participants stated that they learned a lot and that the course content was close to their expectations. The sometimes very critical view on ICES procedures was found to be helpful to learn how to interpret the ICES advice, and to determine the limitations of it. Some of the participants specifically mentioned that, in their eyes, the credibility of the ICES advice has actually increased now that they know where the limitations are and how much work is spent to develop the advice.

The results of the online evaluation questionnaire indicated that half of the participants heard about the course by word of mouth. The amount of material covered by the course was found appropriate (average) with a tendency towards "too much" (mean 3.6 out of 5). The degree of difficulty was found slightly above average (3.4). For all other questions, the attendees scored between good and very good (mean between 4 and 5 on a 5-point scale): Quality of course outline 4.2, helpfulness of teaching staff 4.7, usefulness of course material 4.2, clarity of presentation 4.2, overall course content 4.3, overall organisation of the course 4.2, overall quality of teaching 4.6 and overall rate 4.2.

Individual responses from trainees to the evaluation questionnaire 6 "Good features of this course/suggestions for improvement":

- In general, I appreciated the course and I learned a lot. This is very valuable and enriching to interact during the course and ask questions, but this causes delay in the program. The organization of courses should maybe be adjusted to allow more time for this interaction. I enjoyed and found very informative the exercises and games, unless the game "fishery management simulation exercise" because I found the rules not very explicit and a little "stereotypical".)
- The first sessions on the first day were a bit boring because they didn't really relate to stock assessment, but rather explained how ICES is organized and how/to who it gives advice etc. This could be shortened significantly and maybe be supported by a summary document which course participants could read in advance (as this is really not complicated and does not need a comprehensive discussion). Other course components. e.g. on ecosystem ap-

proach and multi-species advice which are very interesting and "cutting-edge" should have deserved more attention. The exercises were useful because they helped to understand the underlying theories and principles. However, personally I did not like the role-play exercise at the end of the first day as I don't think that I learned anything new through it, but this will of course be very different for other course participants. Overall I think this was a useful and interesting course, not least thanks to the enthusiasm of the instructors.

- Good: the logic sequence of the presentations. Suggestion: lunch a survey before the course to have a overall profile of the participant background.
- Could perhaps consider too condense introductory sections (first day) as decision-making mechanisms etc. are not ICES' main focus. Also, they do get discussed naturally within the context of other presentations.
- It was somewhat difficult for me to follow the logic of the course, although it was clearly specified by the instructors. An easier structure (like three main points to cover, each of them possibly sub-divided) may be desirable or just affix the structure of the course somewhere in the room. I think three days in a row is rather a long of a course and it may be sensible to either have more (shorter) breaks or more exercises to 'cut the pace' especially in days 2 and 3 when tiredness builds up.
- Probably assumes too much prior knowledge about ICES and its work. Might be useful to involve someone not intimately involved in ICES stock assessments. - Notes / handouts to supplement presentations would be helpful. PP presentations not really sufficient on their own. - Maybe too much exercises. - Would like to have had more discussion of real examples. - Slight feeling that course was being made up as we went along I would like ICES to think on establishing a three levels course similar to those organized for scientists: beginners, intermediate and advanced; the course was so good that I would like to go further in detail and gain a further insight in the stock assessment and forecast process.
- Good range of topics, very interesting. Some of the exercises could have been explained a bit better.
- Good Features: Easy access to course material. Presentations easy to follow. Plenty of time for group discussion after presentations. Improvement: All presented material should be available before presentation. More anecdotal studies and exercises. Lunch provided (willing to cover costs!).
- Good course - mixed of individuals-exercises really good and helpful. Good to hear of caveat, challenges and the importance of uncertainty great to hear and being understood by course members. Need for ICES Basic modelling lingo and types explain. Assumption that people know modelling. Time (agenda) stricter Food provided for lunch would help keeping to schedule.
- Would like to have had access to course materials earlier.
- Good features: covered basics I was expecting. Enjoyed that there was some flexibility in course content (addition of data-deficient advice) Also was glad that even though running slightly behind, all of the topics listed were covered. Improvement: More knowledge checks I enjoyed the exercises, and liked that they proved difficulties and uncertainty, but it would have been good to have some 'correct' answers to ensure you understood the theory. I haven't yet seen the background materials, but it would be great to have 'notes' that were not included in the slides. I liked Ciaran's idea of having

more pictures in the presentations, but then supporting notes could be available to go through after the course was finished/in the evenings.

- Good opening game which got us all actively involved; relevant exercises which consolidated out understanding; high quality technical material clearly presented by very knowledgeable presenters who were very friendly and willing to answer questions. Suggest breaking up the longer lectures with more questions and small group work as some sessions lasted 1 1/2 - 2 hours without a 'brain break' so hard to concentrate. e.g. ask in pairs what do you understand ICES does? What is a reference point? How is a fishery managed? then feedback to main group. Have a quiz or a game to try to break up some of the denser technical material. Role play observers need something more to do, felt a bit left out and perhaps different groups should be more clearly identified with large picture badges or colours so easier to see who's who. Overall great course just a few suggestions to make it even better.
- Excellent course, thank you. I particularly liked the mix of presentations and exercises. More examples of HCRs would be interesting. i liked the fact that all instructors were in the room all the time and also asked questions of each other.
- Much too technical. Much too focussed on the North Sea and the Baltic Sea. Too many un-interesting exercises.
- Well organized lectures - mindful of placing the individual lectures in the advice process for easier overview for the participants. Less technical than anticipated, but with the amount of material covered I guess the only way to add further technical information would be to extend the course. The exercises in interpreting stock information was very illustrative and support the lectures well. Being taught by top qualified instructors is absolutely joyful!
- It was interesting and gave a good introduction to stock assessment. I was puzzled a bit by the amount of detail we were getting each time. Some very fundamental stuff were described in much detail, whilst other were considered as known. This did know jeopardize the learning process that much but gave the feeling of reading a book starting from chapter 3, switching to chapter 1 and continuing to 5. The examples on good and bad advice were very interesting. A small detail could be that presentations were not always on the sharepoint during the lecture but uploaded only after; it's quite handy having them during the lecture so you can scroll back to a previous slide without interrupting the instructor. I was hoping on some more technical stuff and to be able to read and interpret a whole advice after this course. Instructors could elaborate a bit more on the role-playing exercises. Stock-advice related exercises are much appreciated. Last day felt as it was useless. Overall the training was interesting and highly recommended to future participants, given the fact they are looking only for the very essentials of stock assessment. Many thanks.
- Gave interpretation and understanding of the ICES Advice. Background to Advice. Mentioned Popular version of advice - this could have been expended more! Various stakeholders and use of the ICES Advice e.g. production of fish lists based on interpretation of the Advice.
- Some content was too detailed for my needs, yet useful. Some content was detailed enough for my needs. Understand this is necessary to deliver to a range of stakeholders.

Recommendations

Compared to the first version of the course in 2010 the lectures were more simplified and all hands-on computer calculations omitted. This saved time for an expansion of the material on the Ecosystem approach, multispecies and mixed fisheries considerations and data-limited stocks, issues which have gained much more importance in ICES work over the last two years. From the evaluation it is clear that there are different perceptions on the strengths and weaknesses of the course which need to be taken into account for a next version of the course.

Course description

ICES is well known for providing advice on many different topics regarding marine ecosystems. One of advice topics deals with advice on fisheries management in the North East Atlantic. While the advisory process has been opened op to external observers since 2006, there is still a need to provide a better insight to the background and methods that are used to underpin the advice. This course was intended to fill that need. The course was directed at policy makers, NGO representatives and fisheries organizations.

Instructors

Martin Pastoors[1], Christopher Zimmermann[2], Ciaran Kelly[3]

Literature

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Annex 1: List of participants

List of Participants – Training course on Opening the box: Stock assessment and fisheries advice for stakeholders, NGOs and policy-makers (TCSAFAS 2012)

Atlantic Room, ICES Headquarters, Copenhagen, 9–11 October 2012

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