# Contents

# Training course information

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|---|---|
| **Training course name** | Training group on Management Strategy Evaluation (TCMSE21) |
| **Date** | 23-27 August 2021 |
| **Venue** | Virtual |
| **Instructors** | Dr. Carryn de Moor, University of Cape Town, South Africa |
| | Dr. José De Oliveira, Cefas, United Kingdom |
| | Mr. Simon Fischer, Cefas, United Kingdom |

# 1   Summary

Management Strategy Evaluation is an essential tool for evaluating management plans against management objectives, including whether such plans are consistent with the ICES precautionary approach and take appropriate account of uncertainty. This course provided a general introduction to Management Strategy Evaluation (MSE) by covering a range of topics with associated case studies and practical sessions, thereby equipping participants with the knowledge, skills and quantitative tools to undertake MSE on their own fisheries resources.

The course paired "theoretical" lectures with actual case studies from around the world (including several examples from Europe), which served to illustrate or highlight concepts introduced during the lecture sessions. The topics covered included a general introduction, operating models (conditioning, construction and weighting alternative hypotheses), management strategies (different types used, including model-based and model-free), uncertainty (the different kinds and where they fit into the MSE process), risk (various definitions and management) and communication of results (linking performance statistics to objectives, considering different stakeholders). The operating models were not limited to single species only, and there were examples with technical interactions (anchovy-sardine mixed fishery in South Africa) and the use of an environmental index in a Harvest Control Rule (Californian sardine). Small group discussions helped solidify concepts learnt each day and worked examples (HCRs in Excel and a full MSE in FLR using an ICES example) were used to turn concepts into practice. The course ended with a summary and Best Practice guidelines.

# 2 Context

## 2.1 Objectives

Management Strategy Evaluation is an essential tool for evaluating management plans against management objectives, including whether such plans are consistent with the ICES precautionary approach and take appropriate account of uncertainty. The main objective of this course was to provide a comprehensive introduction to Management Strategy Evaluation (MSE) by covering a range of topics with associated case studies and practical sessions, thereby equipping participants with the knowledge, skills and quantitative tools to undertake MSE on their own fisheries resources.

## 2.2 Level

The level was introductory, yet the course comprehensively covered all aspects of Management Strategy Evaluation. Prior experience with stock assessment models used to provide management advice, and with Excel and R was helpful. An introduction to FLR as an MSE tool was provided during the course.

# 3 Course programme, product, deliverance and instructors

## 3.1 Programme

The agenda is given in Annex 2 and was covered during the following time slots (Central European Summer Time CEST) each day:

10:00-11:30

Tea/coffee break

12:00-13:30

Lunch break

14:30-16:00

Tea/coffee break

16:30-18:00

## 3.2 Course products

The instructors provided lectures, case studies and practicals during the daily online meetings. Pdf's of the presentations were made available to participants. The code for the FLR practicals, together with in-code comments and answers to exercises were also made available to participants.

## 3.3 Deliverables

The instructors provided lectures, case studies and practicals during the daily online meetings. Pdf's of the presentations were made available to participants. The code for the FLR practicals, together with in-code comments and answers to exercises were also made available to participants.

## 3.4 Course instructors

Dr. Carryn de Moor, Marine Resource Assessment and Management (MARAM) Group, University of Cape Town, Rondebosch, 7701, South Africa.

Dr. José De Oliveira, Centre for Environment Fisheries and Aquaculture Science (Cefas), Pakefield Road, Lowestoft, NR33 0HT, United Kingdom

Mr. Simon Fischer, Centre for Environment Fisheries and Aquaculture Science (Cefas), Pakefield Road, Lowestoft, NR33 0HT, United Kingdom

## 3.5 Recommendations

The course was very well attended and over-subscribed. Eleven people who registered to attend the course were left on the waiting list. It is thus recommended that this course be repeated again in the near future, given the increased requests for and rapid uptake of Management Strategy Evaluation worldwide; there is a clear need for more persons to be trained to understand and actively participate in MSE, as well as for analysts to be able to effectively and correctly undertake the technical aspects of MSE.

The participants in an MSE range from the technical analysts undertaking the MSE modelling work, to scientific experts, industry and eNGO stakeholders, as well as managers and decision makers. There may also be use for a shorter course (2 or 2.5 day, eliminating the practical elements of the longer course) aimed at persons who will not undertake any technical modelling work themselves, but will still be involved in MSE and required to constructively input to the MSE process, review the ongoing work, and understand and interpret the outputs of MSE.

## 3.6 Review of online format

As instructors, we think the course ran very smoothly online. We had deliberately investigated and trial-tested tools available to us in MS Teams prior to the course to try to ensure effective participation online and replicate some of the advantages of meeting in-person. Although there were participants from many time zones, almost all of them joined all the sessions live to benefit from break-out session discussions, as well as our 'relaxed' lecturing which encourages questions throughout the presentations, as well as a Q&A session at the end of each presentation. We did record the lectures (excluding break-out discussions and Q&As at the end of lectures to protect participants privacy and encourage open discussion that may not have happened if subject to recording; given their nature, the practical tutorial times were also excluded apart from when the introductory presentation was made). These recordings were made available in a view-only format for those participants who had trouble connecting during a particular session, and were deleted two weeks after the end of the course.

# Annex 1:        List of participants

| Name | Institute | Country (of institute) | Email |
| --- | --- | --- | --- |
| Ane Laborda | AZTI | Spain | alaborda@azti.es |
| Anika Sonjudóttir | Marine and Freshwater Research Institute | Iceland | Anika.sonjudottir@hafogvatn.is |
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| Isabella Bitetto | COISPA TECNOLOGIA & RICERCA | Italy | bitetto@coispa.it |
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|---|---|---|---|
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| Nataliia Kulatska | Stockholm University Baltic Sea Centre | Sweden | nataliia.kulatska@su.se |
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| Niruban Chakkaravarthy Dhanasekaran | National Centre for.Sustainable Coastal Management | India | chakkarainiruagri95@gmail.com |
| Ole Ulloriaq Lønberg-Jensen | The Government of Greenland | Greenland | oleull@gmail.com |
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| Pia Schuchert | Marine Fisheries AFBI Aquatics | United Kingdom | pia.schuchert@afbini.gov.uk |
| Rajeev Kumar | Department of Fisheries and Oceans, Canada | Canada | rajeev.kumar@dfo-mpo.gc.ca |
| Rehab Farouk Soliman | Queen's University Belfast | United Kingdom | rabdelfattahsoliman01@qub.ac.uk |
| Sara Maggini | Bangor University | United Kingdom | srm18crx@bangor.ac.uk |
| Virginia Noble | Science/Stock Assessment and Research Division/ Marine Invertebrate Section | Canada | Virginia.Noble@dfo-mpo.gc.ca |

# Annex 2: Agenda

<u>Mon</u>:
Welcome and introduction of participants
Introduction to ICES (Jörn Schmidt)
**General Introduction – what is MSE?**
Terminology
Case Study 1: MSEs in Europe: WKNSMSE as an example
Practical: An introduction to FLR as an MSE tool

<u>Tues</u>:
**Operating Models (conditioning, construction and weighting)**
Case study 1: North Sea cod (alternative operating models in advice)
Case study 2: South African anchovy (robustness "tick" tests)
Case study 3: South African hake (reference set)
Practical: Conditioning the operating model for North Sea cod

<u>Wed</u>:
**Management Strategies (model-based and model-free)**
Case study 1: South African hake HCRs (model-based v model-free)
Case study 2: Californian sardine (use of environmental index in HCR)
Case study 3: North Sea cod (request from managers)
Practical 1: HCRs for South African sardine and anchovy (exercise in Excel)
Practical 2: Management strategy for North Sea cod

<u>Thur</u>:
**Uncertainty (different kinds and where they fit in)**
Case study 1: North Sea saithe (implementation uncertainty)
Case study 2: South African sardine (stock structure & implementation uncertainty)
Case study 3: North Sea cod & western horse mackerel (estimation, process and observation un-
certainty)
Practical: Running, parallelisation, and tuning of the MSE

<u>Fri</u>:
**Risk (various definitions and management, with examples)**
**Communication (Stakeholders, objectives and performance statistics)**
Case study 1: South African sardine and anchovy (linking objectives to performance statistics)
Case study 2: Bluefin tuna shiny app
**Summary session and Best Practice guidelines**
Practical: Summary statistics and outstanding issues

# Annex 3:   Results of the survey

**How did you hear about this course?**
18 out of 18 answered

ICES website                                                    12 resp.  66.7%

Word of mouth                                                    5 resp.  27.8%

E-mail                                                           0 resp.  0%

Other                                                            1 resp.  5.6%
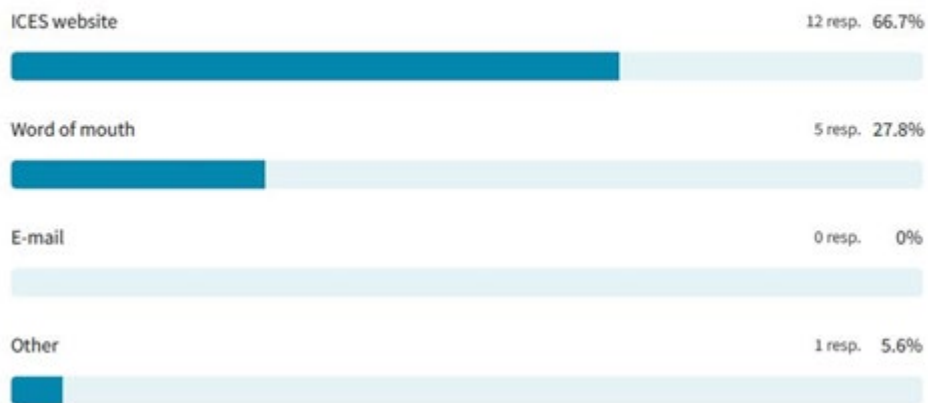
**Did the training course meet your expectations?**
17 out of 18 answered

Yes                                                             17 resp.  100%

No                                                               0 resp.  0%

Other                                                            0 resp.  0%
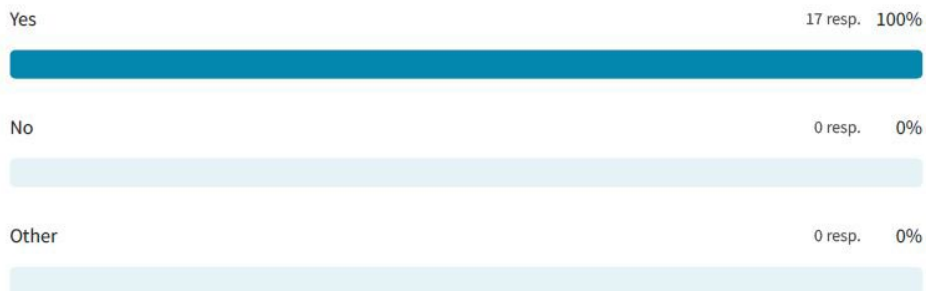
**Was the level of instruction appropriate?**
17 out of 18 answered

Yes                                                             17 resp.  100%

No                                                               0 resp.  0%

Other                                                            0 resp.  0%
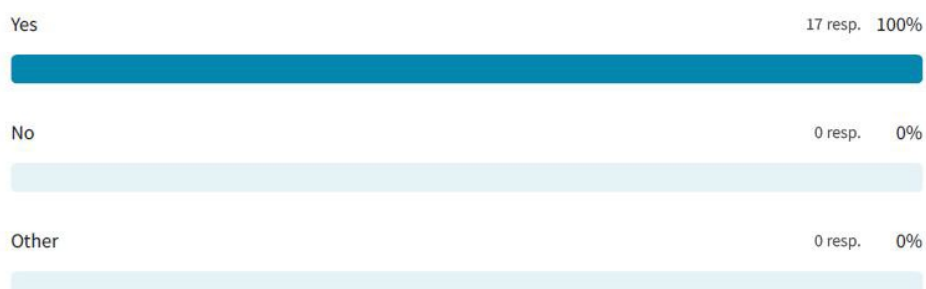
Was the level of difficulty appropriate?

14 out of 18 answered

Yes                                                    11 resp.  78.6%

No                                                      3 resp.  21.4%

Other                                                   0 resp.    0%

Inscription to the training course and communication with organizers were efficient

18 out of 18 answered

Yes                                                    17 resp.  94.4%

No                                                      0 resp.    0%

Other                                                   1 resp.   5.6%

The instructors were helpful, informative, and approachable.

18 out of 18 answered

Yes                                                    18 resp.  100%

No                                                      0 resp.    0%

Other                                                   0 resp.    0%

The length of the training course was

18 out of 18 answered

## 4.7 Average rating

| 0% | 0% | 0% | 22.2% | 16.7% | 44.4% | 5.6% | 5.6% | 5.6% | 0% | 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 resp. | 0 resp. | 0 resp. | 4 resp. | 3 resp. | 8 resp. | 1 resp. | 1 resp. | 1 resp. | 0 resp. | 0 resp. |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Too short                                    Appropriate                                    Too long
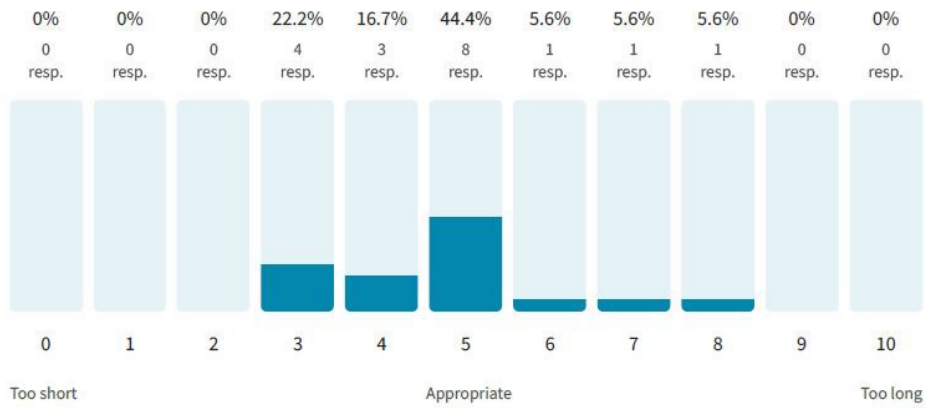
The length of the lectures were

18 out of 18 answered

## 4.8 Average rating

| 0% | 0% | 5.6% | 5.6% | 0% | 77.8% | 11.1% | 0% | 0% | 0% | 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 resp. | 0 resp. | 1 resp. | 1 resp. | 0 resp. | 14 resp. | 2 resp. | 0 resp. | 0 resp. | 0 resp. | 0 resp. |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Too short                                    Appropriate                                    Too long
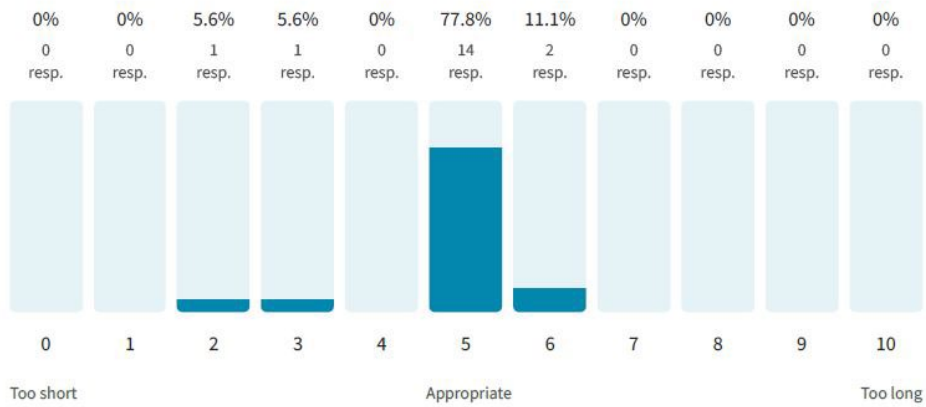
The length of the Q&A sessions were

18 out of 18 answered

## 5.1 Average rating

| 0% | 0% | 5.6% | 0% | 0% | 77.8% | 11.1% | 0% | 5.6% | 0% | 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 resp. | 0 resp. | 1 resp. | 0 resp. | 0 resp. | 14 resp. | 2 resp. | 0 resp. | 1 resp. | 0 resp. | 0 resp. |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Too short      Appropriate      Too long
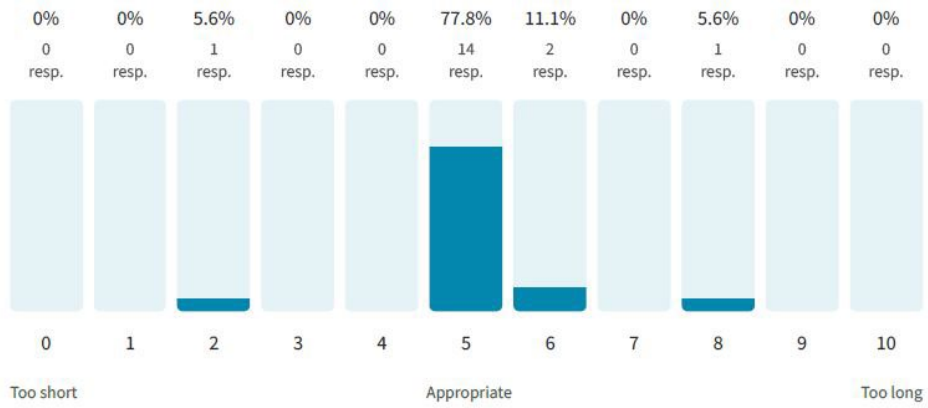
The amount of breaks during the course were

18 out of 18 answered

## 5.1 Average rating

| 0% | 0% | 0% | 0% | 0% | 94.4% | 5.6% | 0% | 0% | 0% | 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 resp. | 0 resp. | 0 resp. | 0 resp. | 0 resp. | 17 resp. | 1 resp. | 0 resp. | 0 resp. | 0 resp. | 0 resp. |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Too few      Appropriate      Too many
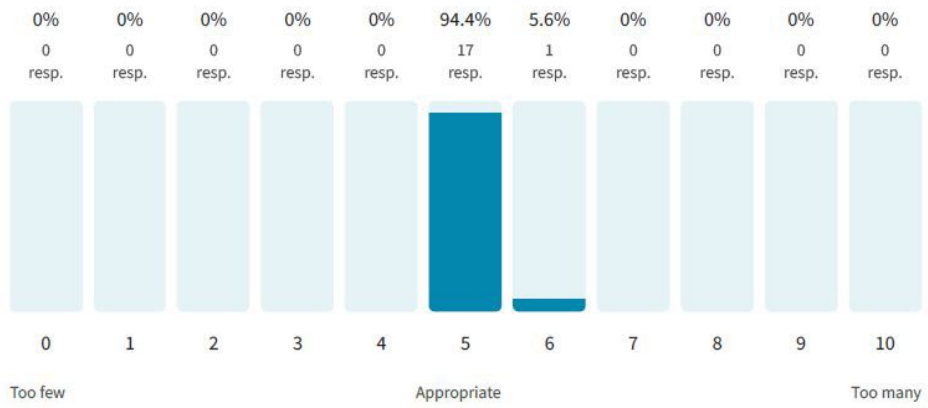
Did you receive sufficient support regarding platform testing and set-up?

17 out of 18 answered

| Yes | 17 resp. | 100% |

| No | 0 resp. | 0% |

| Other | 0 resp. | 0% |

Have you previously used Microsoft Teams for meetings or online courses?

18 out of 18 answered

| Yes | 17 resp. | 94.4% |

| No | 1 resp. | 5.6% |

| Other | 0 resp. | 0% |
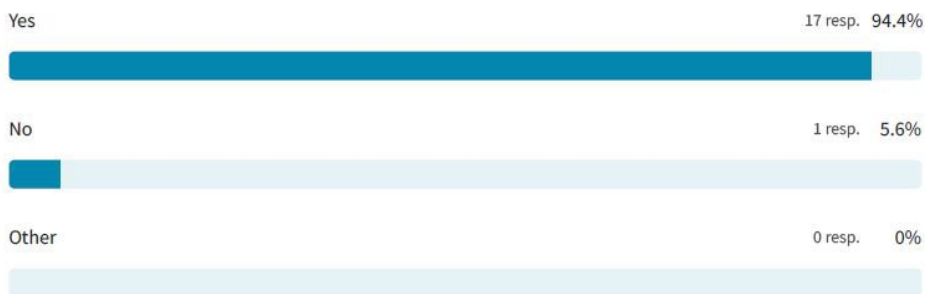
Would you have been able to join this course if it had not been online (without COVID travel restrictions affecting)?

17 out of 18 answered

| Yes | 11 resp. | 64.7% |

| No | 6 resp. | 35.3% |

| Other | 0 resp. | 0% |
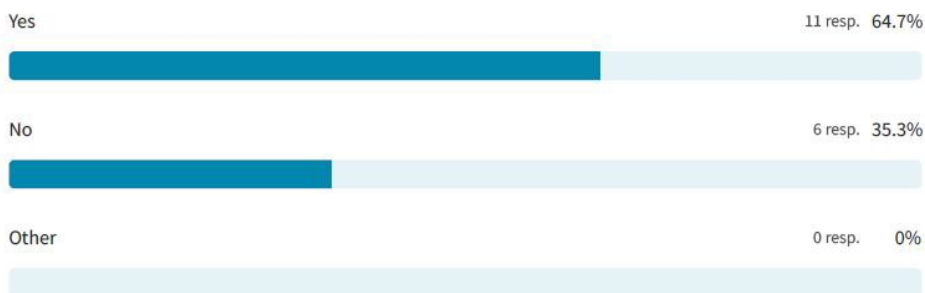
Have you attended any other ICES training courses?

18 out of 18 answered

Yes                                                                                                11 resp.  61.1%

No                                                                                                 4 resp.  22.2%

Not with ICES, but I have attended other training courses related to my expertise                  3 resp.  16.7%

Other                                                                                              0 resp.    0%


Would you be interested in another training course within ICES?

18 out of 18 answered

Yes, both physical and online training courses                                                     11 resp. 61.1%

Maybe                                                                                              3 resp.  16.7%

Yes, another online course                                                                         3 resp.  16.7%

Yes, a physical course                                                                             1 resp.   5.6%

No                                                                                                 0 resp.    0%

Other                                                                                              0 resp.    0%