



Technical measures and innovative strategies for the mitigation of fishing impacts

Zaragoza (Spain) • 16 -20 September 2024



CIHEAM
ZARAGOZA



©Beatriz Guijarro (COB-IEO)

Objectives

Fisheries provide an excellent source of high-quality nutrients and make an important contribution to job creation in coastal areas; however, they have significant direct and indirect impacts on marine ecosystems and even on the climate. Minimising the impact of fishing has become an objective of international agreements, regional directives, and national regulations.

There is a wide range of fishing impacts: from the transformation of the seafloor landscape and its benthic habitats due to direct contact of fishing gear with the bottom to the resuspension of sediments and subsequent physical and chemical disturbance, as well as the loss of structuring benthic species. Fisheries cause changes in marine biodiversity and food webs through the decline of large predators and incidental catches of vulnerable species. The low species and size selectivity of some fisheries generates discards of target and non-target catches, a biomass that is wasted and that in addition can alter marine food webs, with the consequent impact on ecosystems. This low size-selectivity also affects the state of stocks and fishing yields. The carbon footprint of fisheries must also be considered.

The course aims to analyse the technical measures and innovative strategies that can be used to mitigate the impacts of fisheries and fishing gear. It will pay particular attention to measures and strategies used to improve population exploitation patterns, reduce discards and incidental catches of vulnerable species and reduce environmental impact.

By the end of the course, participants will:

- have an overview of fishing fleets and gear selectivity;
- understand the issues and principles related to selectivity of fisheries, discards, and incidental catches;
- be able to recognise other direct and indirect impacts of fisheries on the seafloor, vulnerable species, benthic communities and habitats, food webs, and climate change;

- have a comprehensive understanding of technical measures and innovative strategies to mitigate fishing impacts: from discards and habitat loss to greenhouse gas emissions;
- be aware of the regulatory framework that aims to improve the ecological efficiency of fisheries, with special emphasis on the Mediterranean;
- learn about experimental practices and tools to design, analyse, simulate and evaluate the effect of gear modifications on selectivity and gear performance;
- acquire knowledge about the ecological and socio-economic costs and benefits of improving selectivity and reducing other impacts;
- gain insight into international projects addressing the mitigation of discards, decarbonisation, fishing gear circularity, digitalisation, and artificial intelligence.

Organisation

The course is organised by the International Centre for Advanced Agronomic Mediterranean Studies (CIHEAM) through the Mediterranean Agronomic Institute of Zaragoza (CIHEAM Zaragoza), with the collaboration of the Spanish Oceanographic Institute (IEO-CSIC) and the technical support of the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO).

The course will be held from 16 to 20 September 2024 in morning and afternoon sessions at the Mediterranean Agronomic Institute of Zaragoza. It will also be held online through live sessions transmitted from CIHEAM Zaragoza. The programme will be delivered by well qualified lecturers from international organizations, and research centres in different countries. Enric Massutí, of the Balearic Islands Oceanographic Centre (IEO-CSIC) is the scientific coordinator.

The course requires individual work and active participation. Lectures will be combined with practical work on selectivity experiments. English will be the working language of the course.

Programme

1. Opening and programme presentation (1 hour)
2. Introduction (2 hours)
 - 2.1. Fishing fleets and fishing gears
 - 2.2. Impact of fisheries and fishing gears
3. Selectivity for static and mobile gears (2 hours)
 - 3.1. Species and size selectivity
 - 3.2. Gear parameters influencing selectivity
 - 3.3. Fish behaviour in relation to fishing gears
4. Other fishing impacts (3 hours)
 - 4.1. Impact on the seafloor and benthic communities
 - 4.2. Impact on food webs
 - 4.3. Impact on protected, endangered and threatened species
 - 4.4. Abandoned, lost or otherwise discarded fishing gear (ALDFG)
 - 4.5. Greenhouse gas emissions and carbon footprint
5. Improving selectivity, mitigating bycatch, and reducing impact (10 hours)
 - 5.1. Modifications to fishing gears
 - 5.1.1. Mesh size, mesh type and mesh material
 - 5.1.2. Bycatch Reduction Devices (BRDs)
 - 5.1.3. Alternative rigging and operation
 - 5.1.4. Use of mechanical/visual stimuli
 - 5.2. Mitigation of bycatch of protected, endangered and threatened species
 - 5.3. Reducing impact on the seafloor and benthic communities
 - 5.4. Fishing tactics
 - 5.4.1. Fisher behaviour
 - 5.4.2. Handling of catches on board
 - 5.4.3. Implementing Essential Fish Habitats (EFH)
 - 5.5. Decarbonisation
 - 5.6. Regulatory framework
 - 5.7. FAO-GFCM programme and activities for improving selectivity, mitigating bycatch, and reducing impact
 - 5.8. Design of innovative and selective trawl fishing gear
6. Assessing technological and innovative selectivity measures (7 hours)
 - 6.1. Planning selectivity experiments
 - 6.1.1. Design
 - 6.1.2. Data analysis
 - 6.1.3. Tools to simulate selectivity
 - 6.1.4. Reporting results and advice for fisheries management
 - 6.2. Practical work
 - 6.2.1. Estimation of selection curves and selectivity parameters
 - 6.2.2. Indicators of fishing exploitation patterns
 - 6.2.3. Prediction of fisheries yields after selectivity improvements (transition analysis)
7. Ecological and socio-economic costs/benefits of improving selectivity and reducing other impacts (4 hours)
 - 7.1. Evaluation of selectivity improvements in trawls. A methodological approach for the Western Mediterranean
 - 7.2. Evaluation of incidental catch reduction measures. A case study for dolphins in the Bay of Biscay
 - 7.3. Small-scale fisheries case study
 - 7.4. Recreational fisheries case study
8. Recent research and innovation projects (2 hours)
 - 8.1. Strategies for the elimination of discards. DISCARDLESS
 - 8.2. Decarbonisation. DecarbonyT
 - 8.3. ALDFG. EU Mission Searcular
 - 8.4. Fleet digitalisation. EVERYFISH
 - 8.5. Artificial Intelligence. SMARTFISH
9. Conclusions and final discussion (1 hour)

Guest lecturers

Alós, Josep - IMEDEA, Palma (Spain)
Comí, Pau - Xarxes Comí, La Ràpita (Spain)
Cuende, Elsa - AZTI, Sukarrieta (Spain)
Carpentieri, Paolo - GFCM, Rome (Italy)
Guijarro, Beatriz - IEO-CSIC, Palma (Spain)
Massutí, Enric - IEO-CSIC, Palma (Spain)
Ordinas, Francesc - IEO-CSIC, Palma (Spain)
Quetlas, Antoni - IEO-CSIC, Palma (Spain)
Sala, Antonello - CNR-IRBIM, Ancona (Italy)

In collaboration with:



With the technical support of:



©Grupo ECOBRED (COB-IEO)

Admission

The course is designed for professionals with a university degree, and is addressed to fisheries technical advisors, managers and researchers, fishing gear technologists, and other professionals involved in fisheries sustainability.

- 25 places will be available for face-to-face participation (32 hours of lectures and practical work).

- 25 places will be available for online participation (28 hours of lectures).

Knowledge of English will be valued in the selection of candidates.

Registration

- Candidates may apply online at the following address: <http://www.admission.iamz.ciheam.org/en/>
- Applications must include a *curriculum vitae* and copy of the supporting documents most related to the subject of the course.
- The deadline for the submission of applications is 5 May 2024. The deadline for candidates not requiring visa or financing is extended until 31 May 2024.
- Registration fees for the course amount to 500 euro for face-to-face participation and 350 euro for online participation. This sum covers tuition fees only.

Scholarships

Candidates from CIHEAM member countries (Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Türkiye) may apply for scholarships covering registration fees, and for scholarships covering the cost of travel and full board accommodation. Preference will be given to applicants from low and middle-income countries. If you wish to request a scholarship, please complete the relevant section when you make your online application to participate in the course.

Candidates from other countries who require financial support should apply directly to other national or international institutions.

Insurance

It is compulsory for participants to have medical insurance valid for Spain. Proof of insurance cover must be given at the beginning of the course. Those who so wish may participate in a collective insurance policy taken out by the Organisation, upon payment of the stipulated sum.

Contact:

Basurco, Bernardo

Academic coordinator

iamz@iamz.ciheam.org

<https://edu.iamz.ciheam.org/FishingImpacts2024/en/>

