

ICES – Science, Data and Arctic



Jörn Schmidt
Chair Science Committee
International Council for the Exploration of the Sea

Photo by [Daiwei Lu](#) on [Unsplash](#)

Short excursion: what is ICES?



ICES is an intergovernmental organization with 20 member countries:

Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Russian Federation, Spain, Sweden, United Kingdom, and United States of America.



Through strategic partnerships our work in the Atlantic Ocean, and specifically the North Atlantic, extends into the Arctic, the Mediterranean, the Black Sea, and the North Pacific.



Translation and application of knowledge

Science: knowledge creation

Advice: knowledge translation



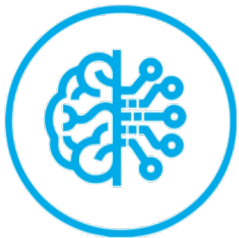
Ecosystem
science



Impacts of
human activities



Observation
& exploration



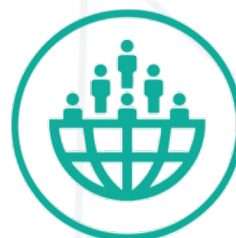
Emerging techniques
& technologies



Seafood
production



Conservation &
management science



Sea &
society



@ Mark Dickey-Collas

Expert Groups in 2021



- 118 Working Groups
 - Normally multi-year workplans
 - Topic driven
- 38 Workshops
 - Normally one-off events
 - Issue-driven



Vecteezy.com

Science for sustainable seas



ICES Training

Aim: to build capacity in ICES and to support the scientists involved in the advisory process

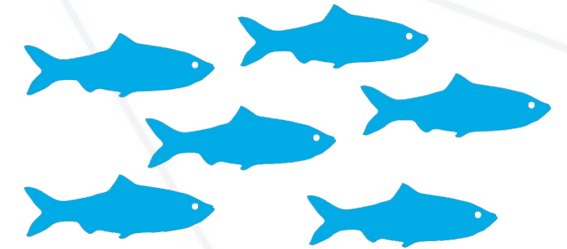
- Stock assessment (introductory and advanced),
- Management strategy evaluation,
- Communication of science and advice,
- How to lead an effective technical meeting
- Many more...



What are we already doing in relation to ocean observation?



- Development of **sampling methods** and **protocols**
 - Series of ICES Survey Protocols (SISP)
- Joint **planning** of surveys
 - survey planning groups
- Quality assurance and control through **data governance**
 - Data governance groups
- **Using data** in assessment and science groups
 - Stock assessment groups, integrated ecosystem assessment groups
- Developing **technology** for data collection and analysis
 - Gear technology, machine learning, omics, acoustic and image technologies...



Data Governance

Devolved

Dedicated

Title	Entity
Vessel Monitoring System (VMS) data	WGSFDGOV
Vessel Monitoring System (VMS) – NEAFC	WGSFDGOV
Acoustic	WGACOUSTICGOV
DATRAS	WGDG
ICES Report on Ocean Climate (IROC)	WGOH
RDB, Regional DataBase	SC-RDB
RDBES, Regional DataBase and Estimation System	SC-RDB
SmartDots	WGSMART
Transparent Assessment Framework (TAF)	WGTAFGOV

Semi-dedicated

Biodiversity birds	JWGBIRD
ByCatch	WGBYC
EggsAndLarvae	WGALES
InterCatch	SC-RDB; WGCATCH
Marine aggregates	WGEXT
Stock Assessment Graphs	ACOM
Vulnerable Marine Ecosystems	WGDEC

Title	Entity
Litter data	WGML;WGML
Catch statistics	FAO; Eurostat; Secretariat
Phytoplankton Biovolume Report	HELCOM PEG
DOME Biological Community	HELCOM ZEN; HELCOM PEG;
DOME contaminants, biological effects and fish disease	OSPAR MIME; HELCOM EN-HAZ; WGBEC; MCWG; WGMS; WHPIDMO; AMAP
HELCOM Eutrophication Assessment Tool (HEAT)	HELCOM EN-EUT
OSPAR Common Procedure Eutrophication Assessment Tool (COMPEAT)	OSPAR ICG EUT
Continuous underwater noise	HELCOM EN-NOISE; OSPAR ICG NOISE
Impulsive Underwater Noise	OSPAR ICG NOISE; HELCOM EN-NOISE
Platform requests	US-NODC; UK-BODC; SeaDataNet; ICES Secretariat
Station Requests	OSPAR MIME; HELCOM STATE
ICES Vocabulary	Multiple groups

Oceanography	DIG
Preliminary catches	ICES Secretariat
Stock Information Database	ICES Secretariat

Not assigned/Secretariat only

Data flow schematics

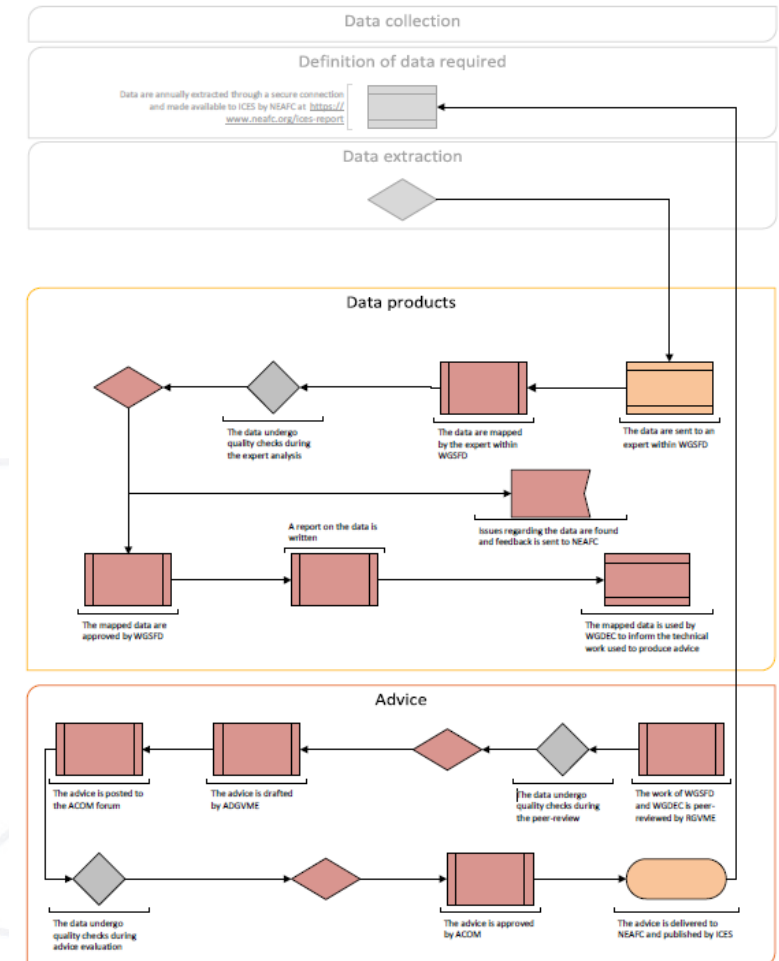
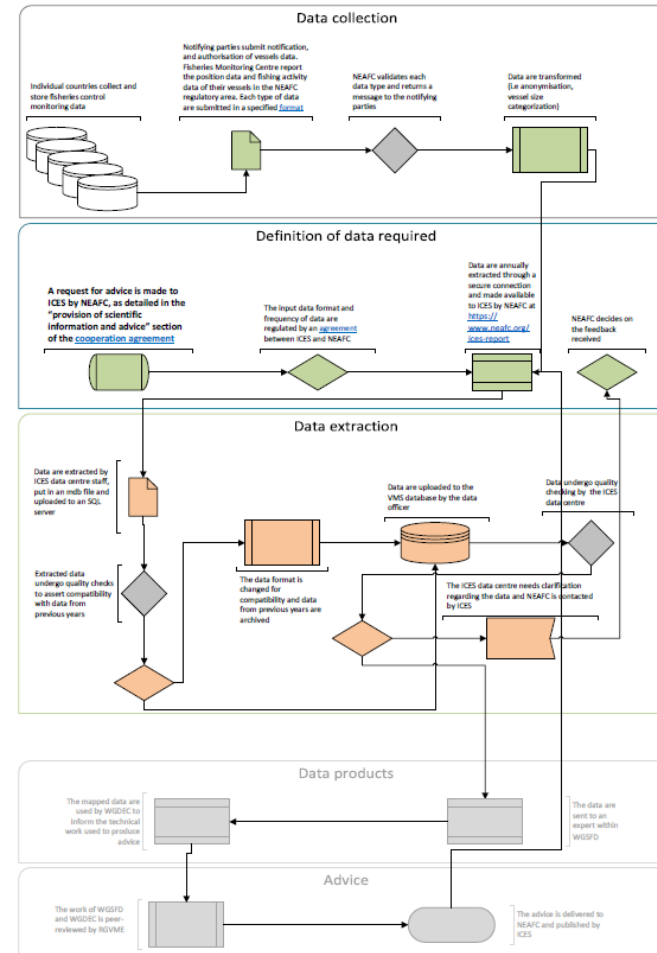
Vessel Monitoring System (VMS) and Catch Data in the North East Atlantic Fisheries Commission (NEAFC) regulatory area

Volume 1 : Edition 1 | May 2020

ICES DATA FLOW SCHEMATICS



ICES
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INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA
CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER



Use of Ocean Observation

- Fish stock advice
- Ecosystem Overviews
- Fisheries Overviews
- Special requests
 - Vulnerable marine ecosystems
 - Bycatch
 - Fishing impacts

ICES Advice on fishing opportunities, catch, and effort
Greater North Sea ecoregion
Published 29 May 2020

Herring (*Clupea harengus*) in Subarea 4 and divisions 3.a and 4.a, eastern English Channel

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2021 s

Note: This advice sheet is abbreviated due to the Covid 19 disruption. I

Stock development over time

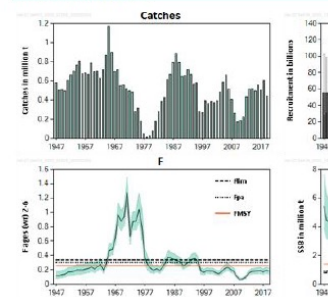


Figure 1 Herring in Subarea 4 and divisions 3.a and 4.a, autumn span intervals are shown for 558, f, and recruitment.

Stock and exploitation status

Table 1 Herring in Subarea 4 and divisions 3.a and 4.a, autumn span points.

		2017	2018	2019	
Maximum sustainable yield	F_{MSY}	✓	✓	Below	
Precautionary approach	F_{PA}	✓	✓	Harvested sustainably	
Management plan	F_{MGT}	—	—	Not applicable	

ICES Advice 2020 – her.27.30474 – <https://doi.org/10.17895/ices.advice.6026>
ICES advice, as adopted by its Advisory Committee (ACOM), is developed upon by ICES clients (European Union, NASCO, NEAFC, Iceland and Norway).

ICES Ecosystem Overviews
Oceanic Northeast Atlantic ecoregion
Published 12 December 2019

13.1 Oceanic Northeast Atlantic ecoregion – Ecosystem c

Table of contents

Ecoregion description
Key signals within the environment and the ecosystem
Pressures
State of the ecosystem
Sources and acknowledgments
Sources and references

Ecoregion description

The Oceanic Northeast Atlantic ecoregion consists of the portion (ABNJ), i.e. outside the 200 mile limit of the exclusive economic zone of Iceland, and Greenland. The ecoregion is mostly deeper than 1000 m, and comprises mostly extensive abyssal seamounts, and the Rockall-Hatton Plateau rising above the abyssal differs from all other ecoregions by being distant from land; as a terrestrial processes. A number of claims are made on the parts c from adjacent EEZs. Alongside the exploitation rights, such claims ca

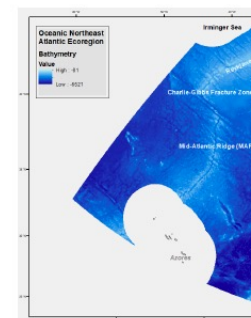


Figure 1 ICES Oceanic Northeast Atlantic ecoregion, corresponding to eastern North Atlantic.

ICES Fisheries Overviews
Celtic Seas ecoregion

Published 30 November 2020

Introduction

The Celtic Seas ecoregion covers the northwestern shelf seas of the Europe (Figure 1). It includes areas of the deeper eastern Atlantic Ocean and coastal seas that are heavily influenced by oceanic inputs. The ecoregion ranges from north of Shetland to Brittany in the south. Three key areas constitute this ecoregion:

- Northern parts; the Malin shelf, west of Scotland, eastern Rockall Bank, and north of Scotland (parts of Subdivision 2.a.2, divisions 4.a and 6.a, and Subdivision 6.b.2);
- the Celtic Sea and west of Ireland (Division 7.b and Subdivision 7.c.2; parts of divisions 7.e, 7.f, 7.g, 7.h, and subdivisions 7.i, 2 and 7.k.2);
- the Irish Sea (Division 7.a).

In the north there are strong linkages with the North Sea, in the southeast a strong linkage with the channel area, and in the south a strong link with the Bay of Biscay. The eastern part of the Rockall Bank is within the geographic scope of the ecoregion although it is separated from the western European shelf by the Rockall Trough.

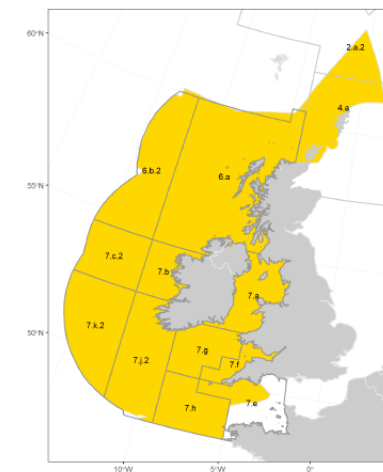


Figure 1 The Celtic Seas ecoregion (highlighted in yellow) and ICES statistical areas.

ICES Advice 2020

2

Support of Arctic Science Cooperation



Joint ICES/PICES Working Group
on Integrated Ecosystem
Assessment of the Northern
Bering Sea-Chukchi Sea
(WGIEANBS-CS)

ICES/PICES/PAME Working
Group on Integrated
Ecosystem Assessment (IEA)
for the Central Arctic Ocean

Arctic Fisheries
Working Group (AFWG)

Working Group on the
Integrated
Assessments of the
Norwegian Sea
(WGINOR)

Working Group on the
Integrated Assessments of
the Barents Sea (WGIBAR)

Our Ecosystem Overviews provide a description of the ecosystems, identify the main human pressures, and explain how these affect key ecosystem components.

<https://www.ices.dk/advice/ESD/Pages/Ecosystem-overviews.aspx>

Fisheries overviews summarize fishing activities at ICES ecoregion-level, including which countries are catching what species, the various fishing methods being used, and how stocks are managed.

<https://www.ices.dk/advice/Fisheries-overviews/Pages/fisheries-overviews.aspx>

Support of Arctic Science Cooperation



- ICES Data Centre manages a number of large dataset collections related to the marine environment. Since its inception in 1991, AMAP has used ICES monitoring guidelines, data management, and assessment frameworks.
- International Symposium on Plastics in the Arctic and Sub-Arctic Region (2021)
- Capelin - The canary in predicting effects of climate on the Arctic marine environment (2022)
- Many more: <https://www.ices.dk/events/symposia/Pages/default.aspx>



2021
2030

United Nations Decade
of Ocean Science
for Sustainable Development



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The United Nations
Decade of Ocean Science
for Sustainable Development
(2021-2030)



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development



- Support and leverage ICES and PICES member countries' activities related to UNDOS and emphasizing areas of mutual research interest, especially
 - climate change
 - fisheries and ecosystem-based management
 - social, ecological and environmental dynamics of marine systems
 - coastal communities and human dimensions
 - communication and capacity development
- Incorporates strategies to facilitate UNDOS cross-cutting inclusivity themes
 - gender equality, diversity, equity and inclusion
 - early career engagement
 - involvement of indigenous communities and developing nations in the planning and implementation of joint activities

Thank you very much!



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Science for sustainable seas