ICES Advice

LDAC
19 April 2016
Eskild Kirkegaard
ACOM Chair

ICES
CIEM
Science for sustainable seas

CES

International Organization for scientific Cooperation in the North Atlantic and the Arctic since 1902;
20 Member States;
1964 Convention,
2002 Copenhagen Declaration
CES Strategic Plan, 2014-2018

Science for sustainable seas

ICES Vision and Mission

Vision: leading scientific organisation for marine ecosystems and knowledge for sustainable use of the seas

Mission: advance scientific understanding of marine ecosystems and provide information, knowledge and advice on sustainable mangement of human activites affecting/affected by marine ecosystems

Science regarding the ocean, requires international cooperation

ICES five main responsibilities

1. *Scientific research of marine systems*
2. *Politically independent integrated, ecosystem, and fisheries advice*
3. *Monitoring, data, and information products*
4. *Training programme*
5. *Dissemination, communication and outreach*

Examples of ICES Activities

1. Making ecosystem approach operational
2. Standards for data collection, quality assurance and accessibili of data, operational data products
3. Process, criteria, and methods for developing non-political scientific advice
4. Strategic areas; aquaculture and Arctic
5. Training
6. Publication and communication

Quality – process to deliver scientific advice

Best available knowledge (data and science)

Quality assured - peer reviewed advice

Transparent process: documented and open to observers

Unbiased and non-political: considered legitimate by governments and stakeholders

Relevant – meets the needs of the client

Timely

ICES Advisory Activities 2015

Meetings	Experts Attendances		Expert Work Days
106	2,490		17,404

Advice deliverables

shing opportunities: advice on single stock fishing opportunities (225 stock
2015)

sheries overviews: overview by ecoregion of fishing activities and impact o
shing in the ecosystem (to be issued in 2016)

cosystem Overviews: overview of Ecoregions with information on maj
gional pressures, human activities and state of the ecosystem (4 released
016, 3 to be released late 2016)

pecial requests: 25 special requests in 2015 on impact of fisheries, evaluati
fisheries management strategies, MSFD, eutrophication guidelines and
astic particles in fish stomachs

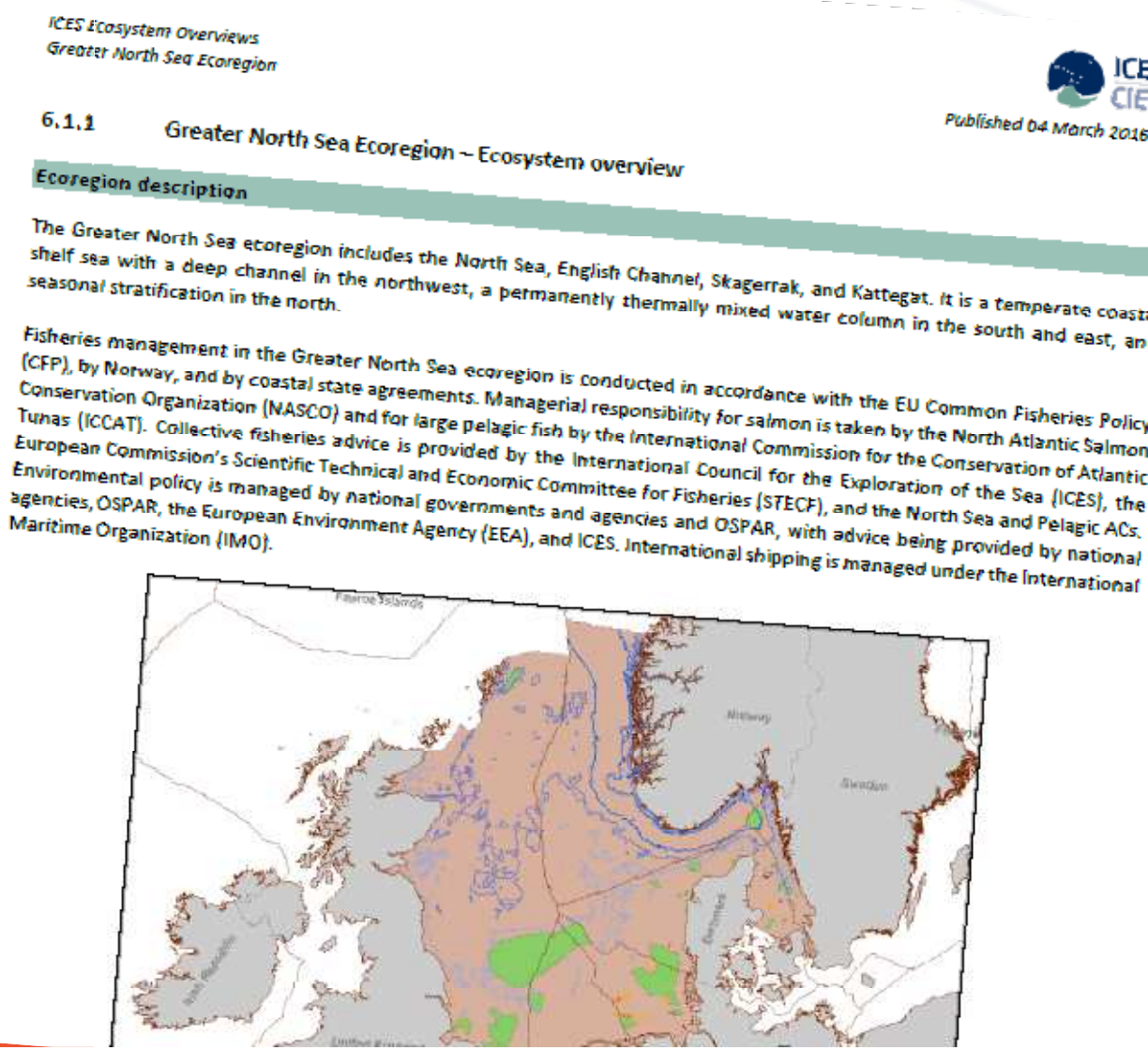
Integrated Ecosystem Understanding and IEAs of ICES regional seas – a regional process

Constructed to reflect local issues & factors that respond to local management

ICES regional assessment groups

Structure

- Setting the context
- Key trends
- Priority pressure
- Ecosystem state



ICES Ecosystem Overviews
Greater North Sea Ecoregion

Published 04 March 2016

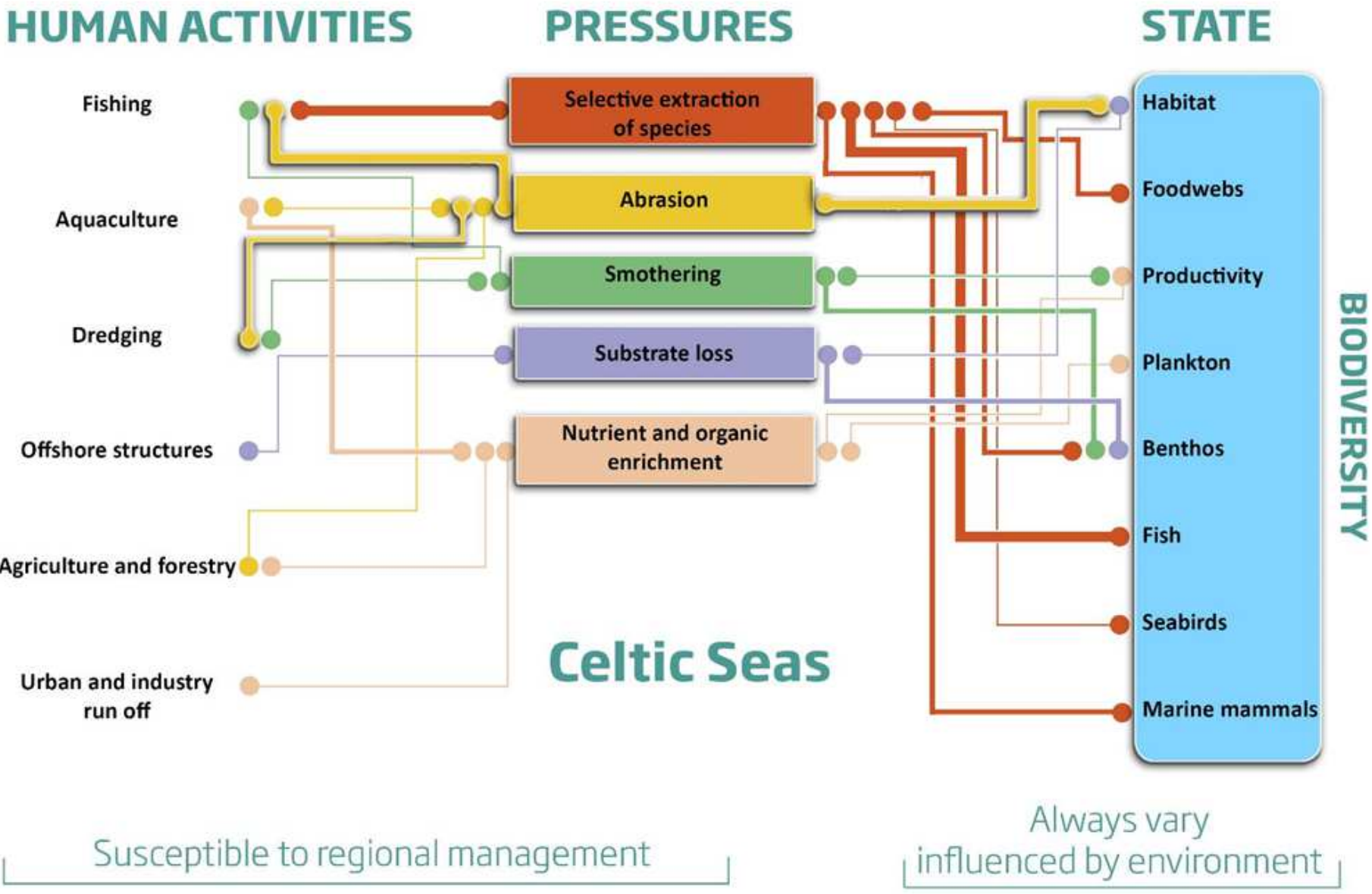
6.1.1 Greater North Sea Ecoregion – Ecosystem overview

Ecoregion description

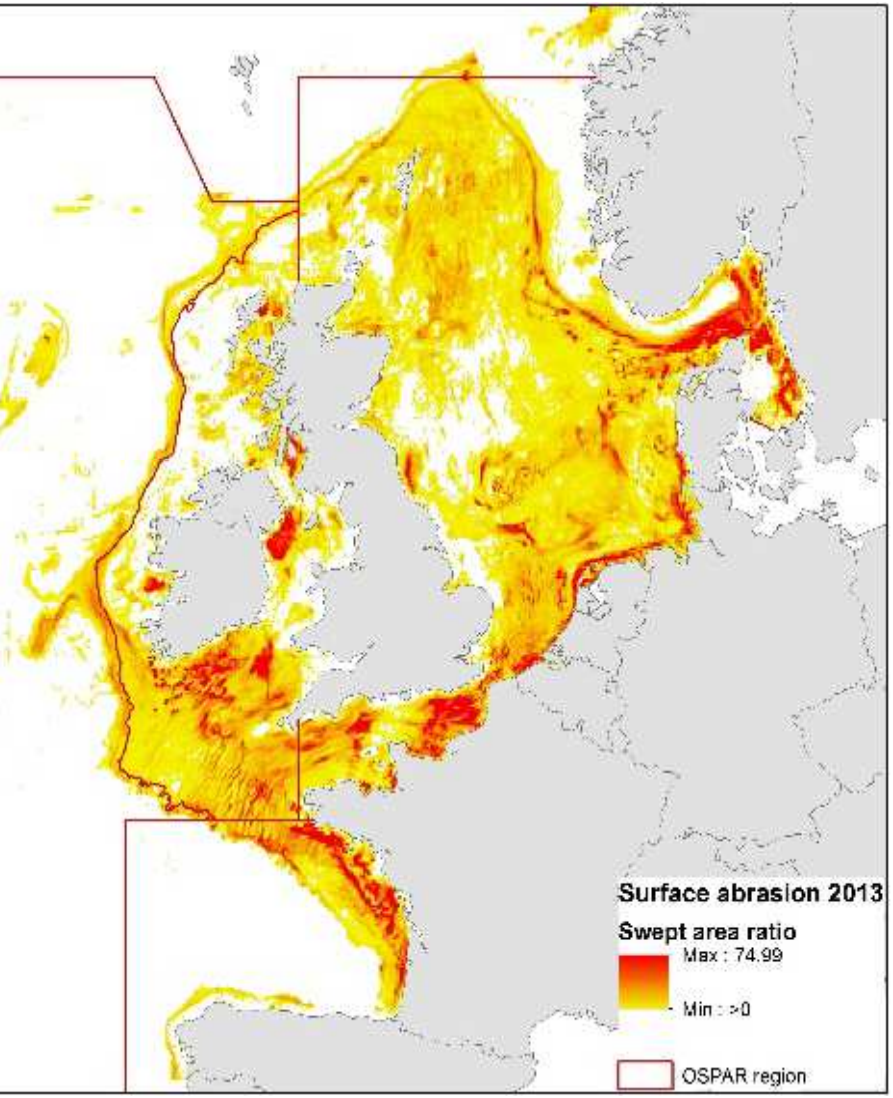
The Greater North Sea ecoregion includes the North Sea, English Channel, Skagerrak, and Kattegat. It is a temperate coastal shelf sea with a deep channel in the northwest, a permanently thermally mixed water column in the south and east, and seasonal stratification in the north.

Fisheries management in the Greater North Sea ecoregion is conducted in accordance with the EU Common Fisheries Policy (CFP), by Norway, and by coastal state agreements. Managerial responsibility for salmon is taken by the North Atlantic Salmon Conservation Organization (NASCO) and for large pelagic fish by the International Commission for the Conservation of Atlantic Tunas (ICCAT). Collective fisheries advice is provided by the International Council for the Exploration of the Sea (ICES), the European Commission's Scientific Technical and Economic Committee for Fisheries (STECF), and the North Sea and Pelagic ACs. Environmental policy is managed by national governments and agencies and OSPAR, with advice being provided by national agencies, OSPAR, the European Environment Agency (EEA), and ICES. International shipping is managed under the International Maritime Organization (IMO).

Prioritizing pressures in the system



Ecosystem Overview – Examples of Standard Products



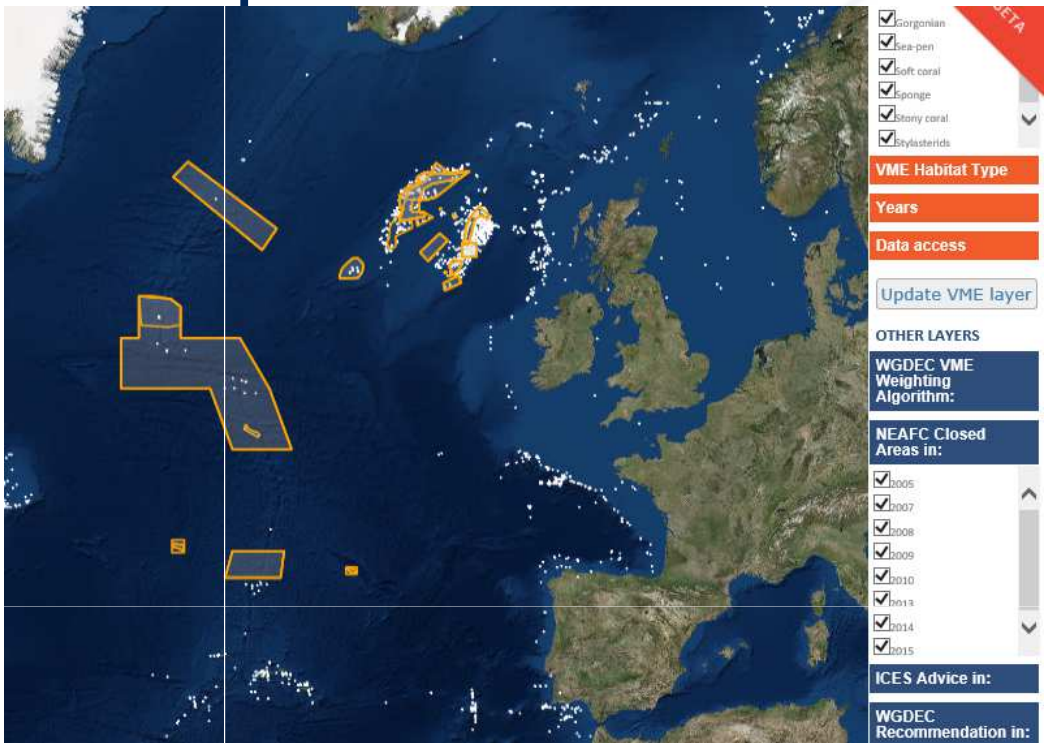


Figure 1.6.6.3.2 Surface abrasion pressure expressed as the swept area ratio from VMS data between 2009 and 2013 in the part of the OSPAR region with most data.*

http://www.ices.dk/marine-data/data-portals/Pages/vulnerable-marine-ecosystems.aspx

Vulnerable Ma
Ecosystems

New resource

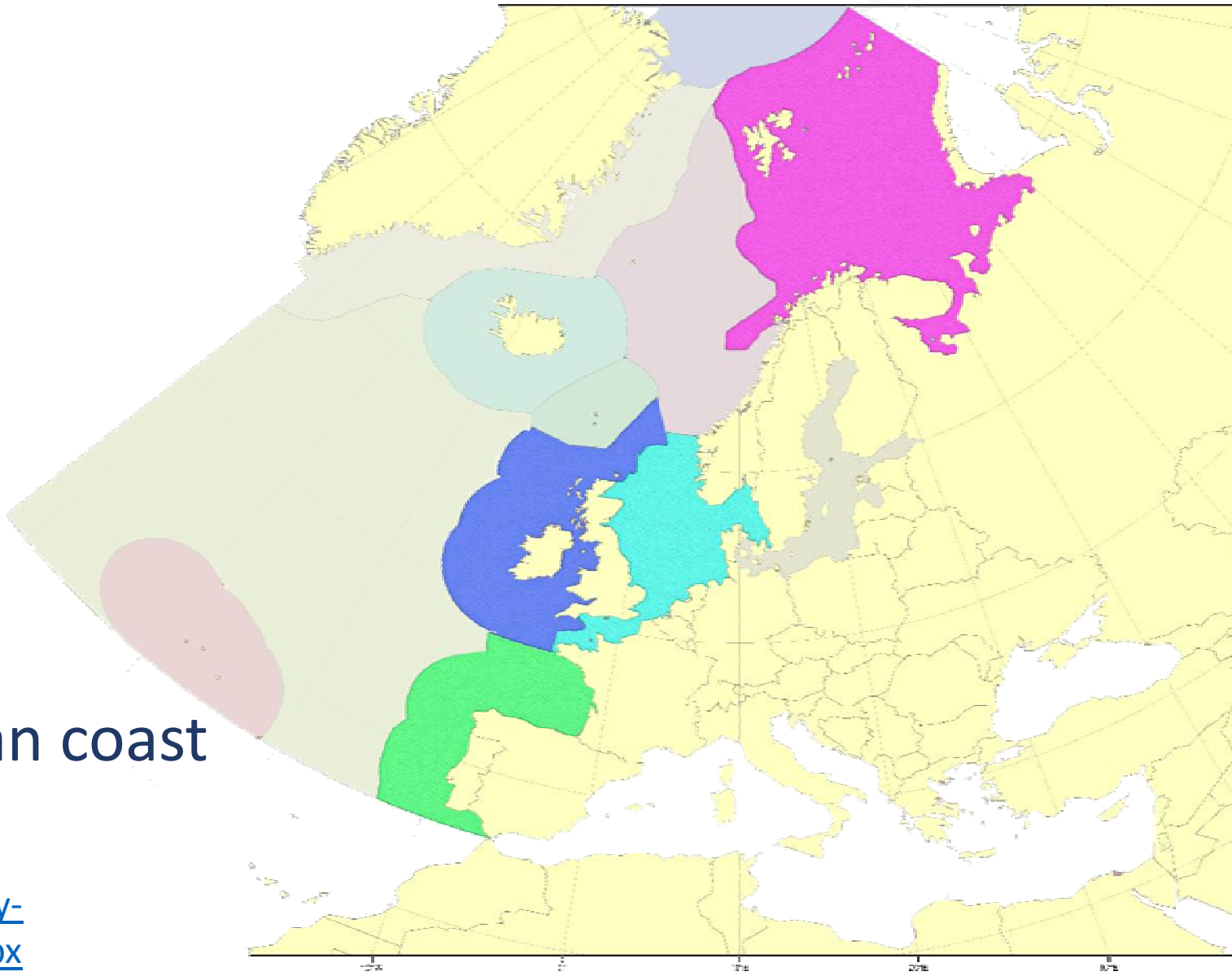
4 published

Barents Sea

Great North Sea

Celtic Seas

Bay of Biscay & Iberian coast



tp://www.ices.dk/community/advisory-
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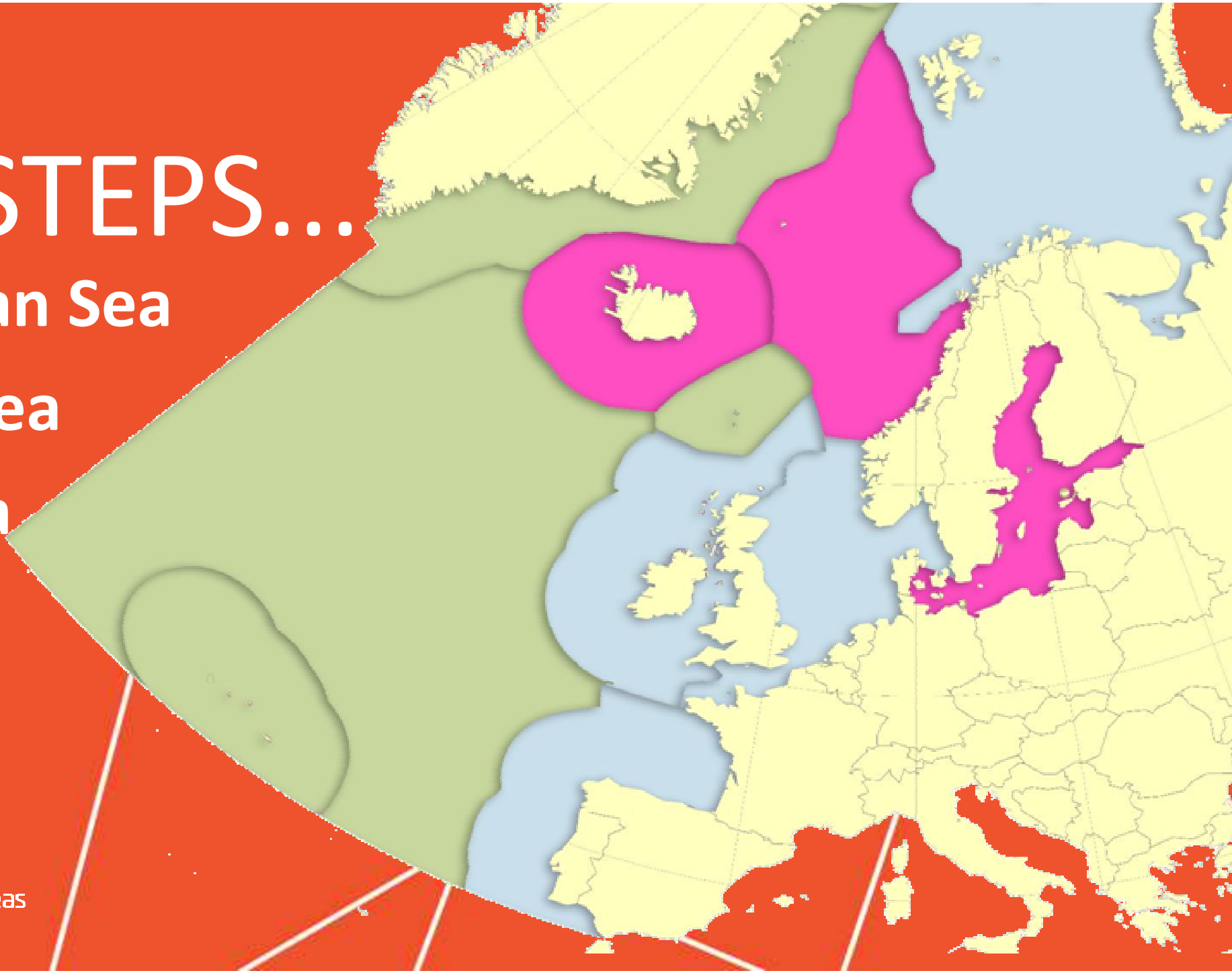
NEXT STEPS...

Norwegian Sea

Iceland Sea

Baltic Sea



ICES
CIEM

Science for sustainable seas

Fisheries overviews - rationale

A standard product

Regularly updated/automated

Overview of the fisheries in each of the ICES ecoregions

- who, where, when, how and what

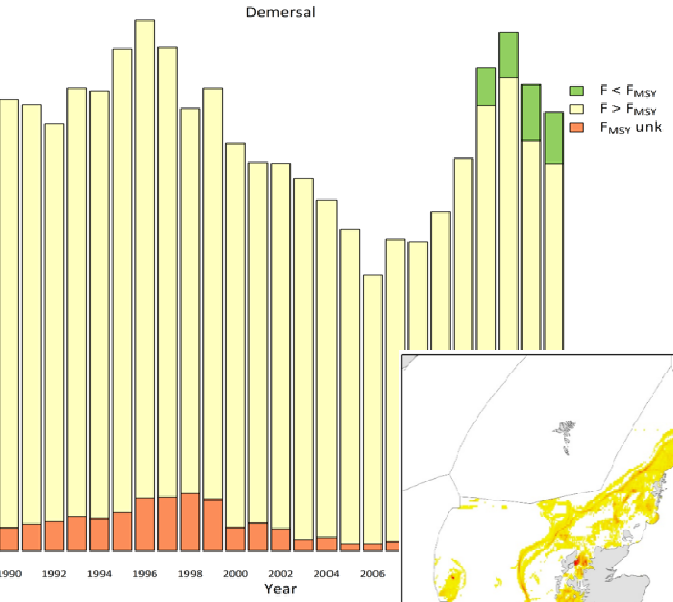
- status of the resource (over time)

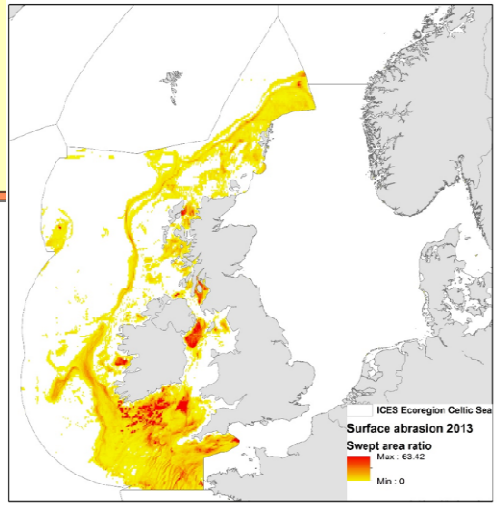
- impacts of fisheries

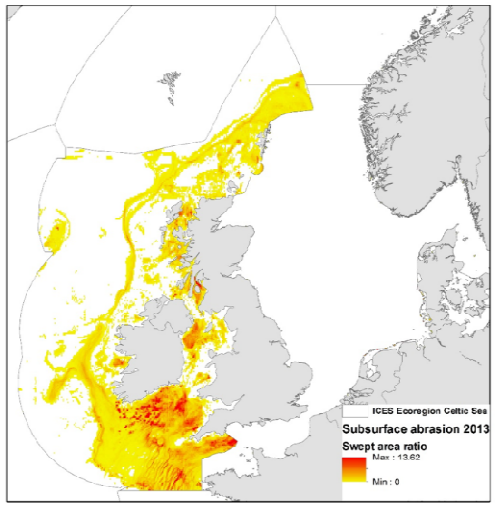
- management measures

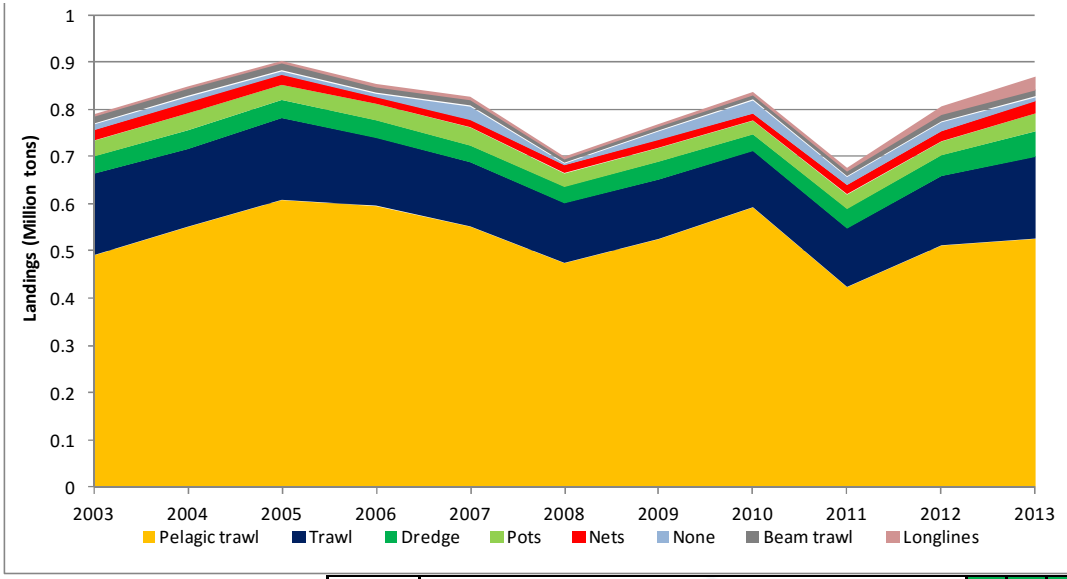
Ocean literacy - synthesis

Fisheries overviews – standard products







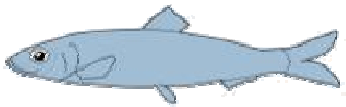


crustacean	Norway lobster (*Nephrops norvegicus*) in Division VIIb,VIIc,VIIj,VIIk, FU 16 (West and Southwest of Ireland, Porcupine Bank)			
	Norway lobster (*Nephrops norvegicus*) in Division VIIb, FU 17 (West of Ireland, Aran Grounds)			
	Norway lobster (*Nephrops norvegicus*) in Division VIIg,VIIh, FU 20 and FU 21 (Celtic Sea)			
demersal benthivore	Sole (*Solea solea*) in Division VIIe (Western English Channel)			
	Sole (*Solea solea*) in Divisions VIIf,g (Bristol Channel, Celtic Sea)			
	Sole (*Solea solea*) in Division VIIa (Irish Sea)			
demersal piscivore	Megrim (*Lepidorhombus spp.*) in Divisions IVa and VIa (Northern North Sea, West of Scotland)			
	Whiting (*Merlangius merlangus*) in Divisions VIIb,c,e–k (Southern Celtic seas and Eastern English Channel)			
	Haddock (*Melanogrammus aeglefinus*) in Division VIb (Rockall)			
	Seabass (*Dicentrarchus labrax*) in Divisions IVb and c, VIIa, and VIId–h (Central and South North Sea, Irish Sea, English Channel, Bristol Channel, Celtic Sea)			
	Cod (*Gadus morhua*) in Divisions VIIe–k (Eastern English Channel and Southern Celtic Seas)			
pelagic planktivore	Herring (*Clupea harengus)* in Division VIIa South of 52° 30' N and VIIg,h,j,k (Irish Sea, Celtic Sea and Southwest of Ireland)			
	Herring (*Clupea harengus*) in Divisions VIa and VIIb,c (West of Scotland, West of Ireland)			

The enabler Benchmarks: Relevant biological interactions in fish stock advice – reflecting ecosystem dynamics

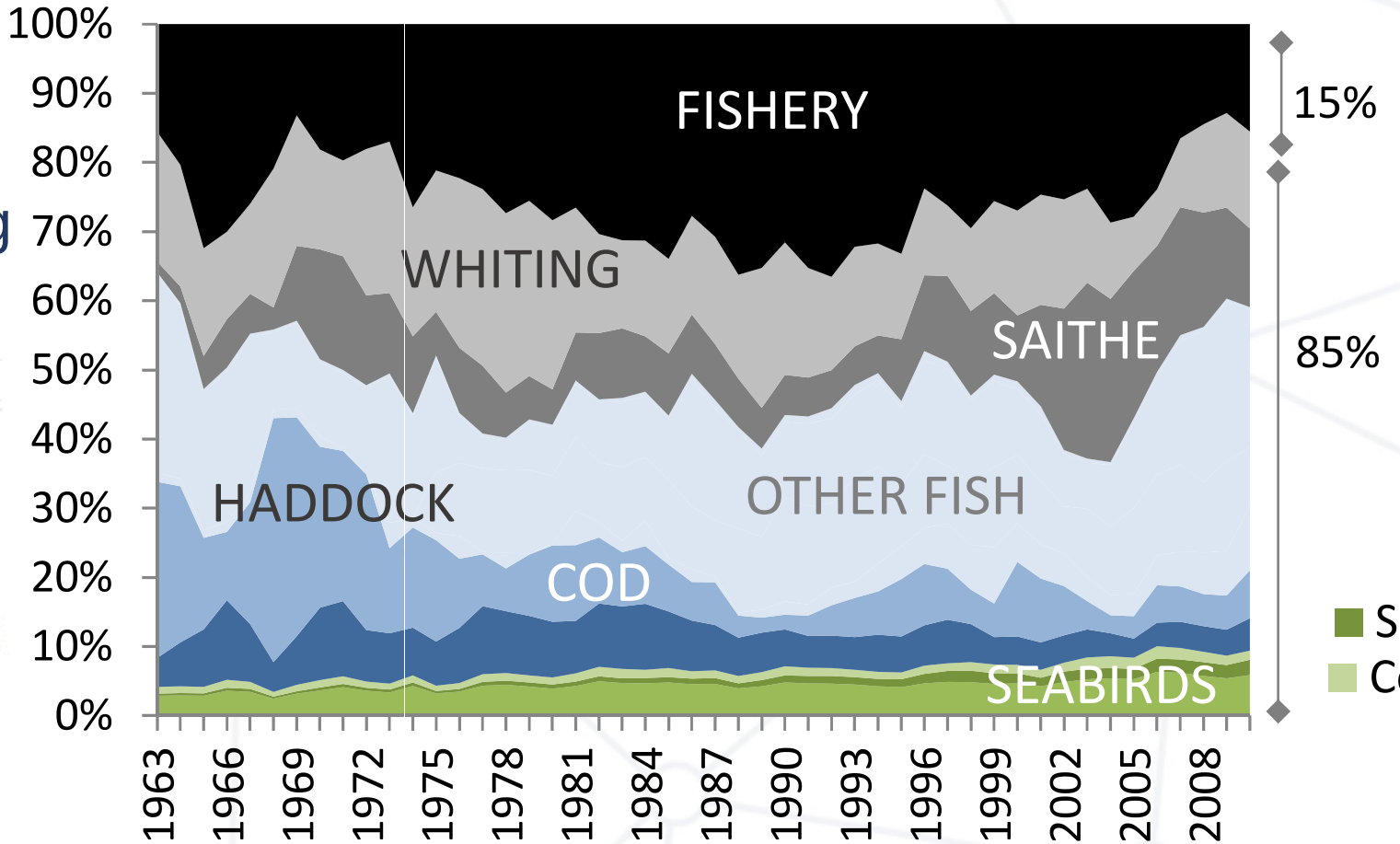
Forage Fish

ackerel herring



prat sandeel

Removals North Sea



ngle stock advice on
shing opportunities

ow much can you take
ut of the stock next
ear?

8.3.10 Herring (*Clupea harengus*) in Subdivision 30 (Bothnian Sea)

ICES stock advice

ICES advises that when the MSY approach is applied, catches in 2016 should be no more than 96 613 tonnes.

Stock development over time

The spawning-stock biomass (SSB) increased until the beginning of the 1990s; then the stock decreased, but showed an increase from the end of the 1990s and has been above MSY $B_{trigger}$ since 1986. Fishing mortality has been below F_{MSY} from the very beginning of the time-series, and just above since 2012. Recruitment is variable and increasing over time.

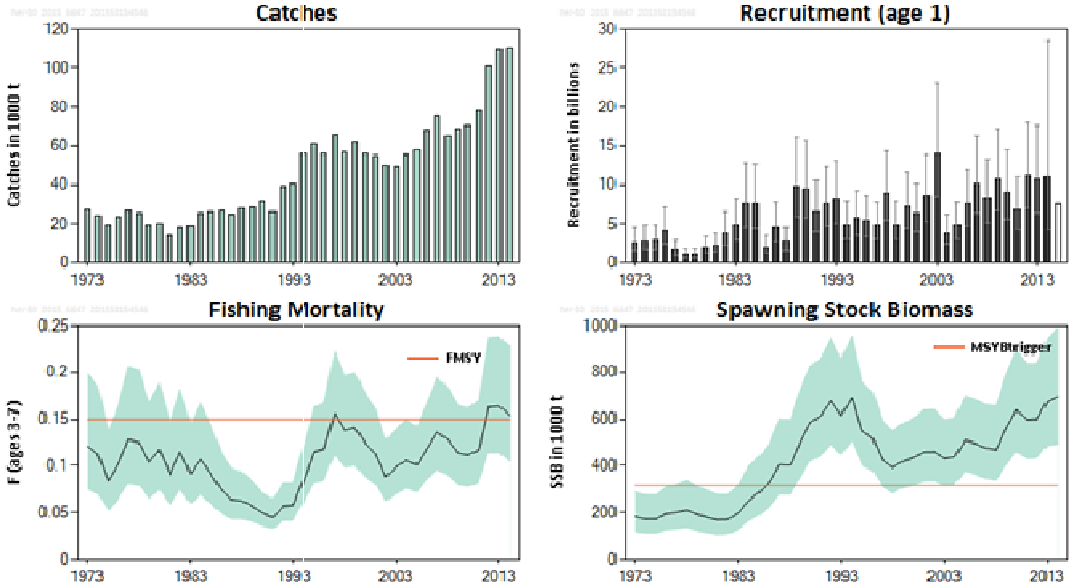


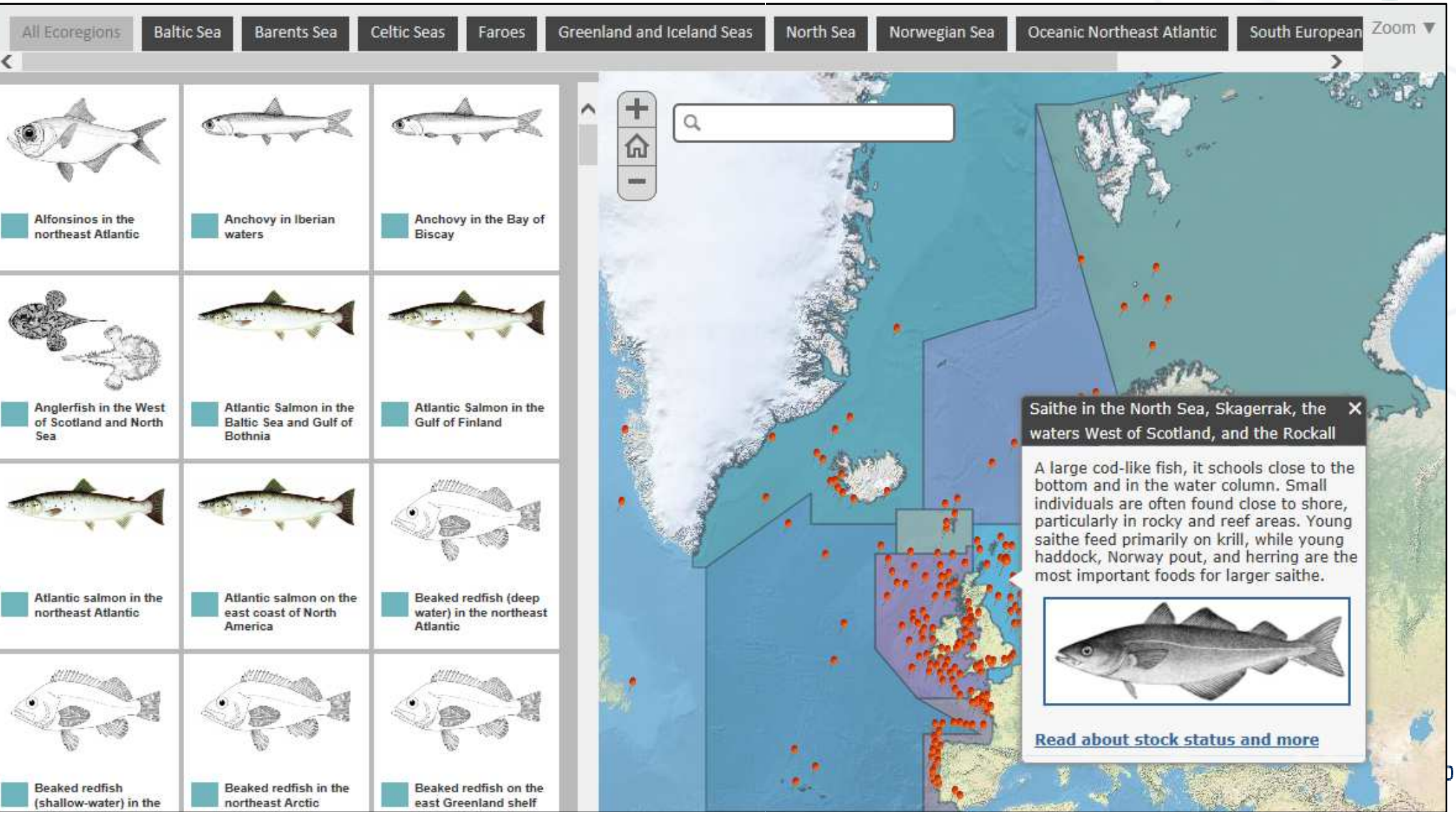
Figure 8.3.10.1 Herring in Subdivision 30. Summary of stock assessment (weights in thousand tonnes). Recruitment and SSB in 2015 are predicted. Recruitment, F, and SSB have confidence intervals (95%) in the plot.

Stock and exploitation status

Table 8.3.10.1 Herring in Subdivision 30. State of the stock and fishery, relative to reference points.

		Fishing pressure				Stock size			
		2012	2013	2014			2013	2014	2015
Maximum Sustainable Yield	F_{MSY}	✗	✗	✗	Above	MSY $B_{trigger}$	✓	✓	✓ Above trigger
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	✓	✓	✓ Above potential candidate reference points
Management Plan	F_{MGT}	-	-	-	Not applicable	SSB_{MGT}	-	-	- Not applicable

Advisory products: Fishing opportunities advice

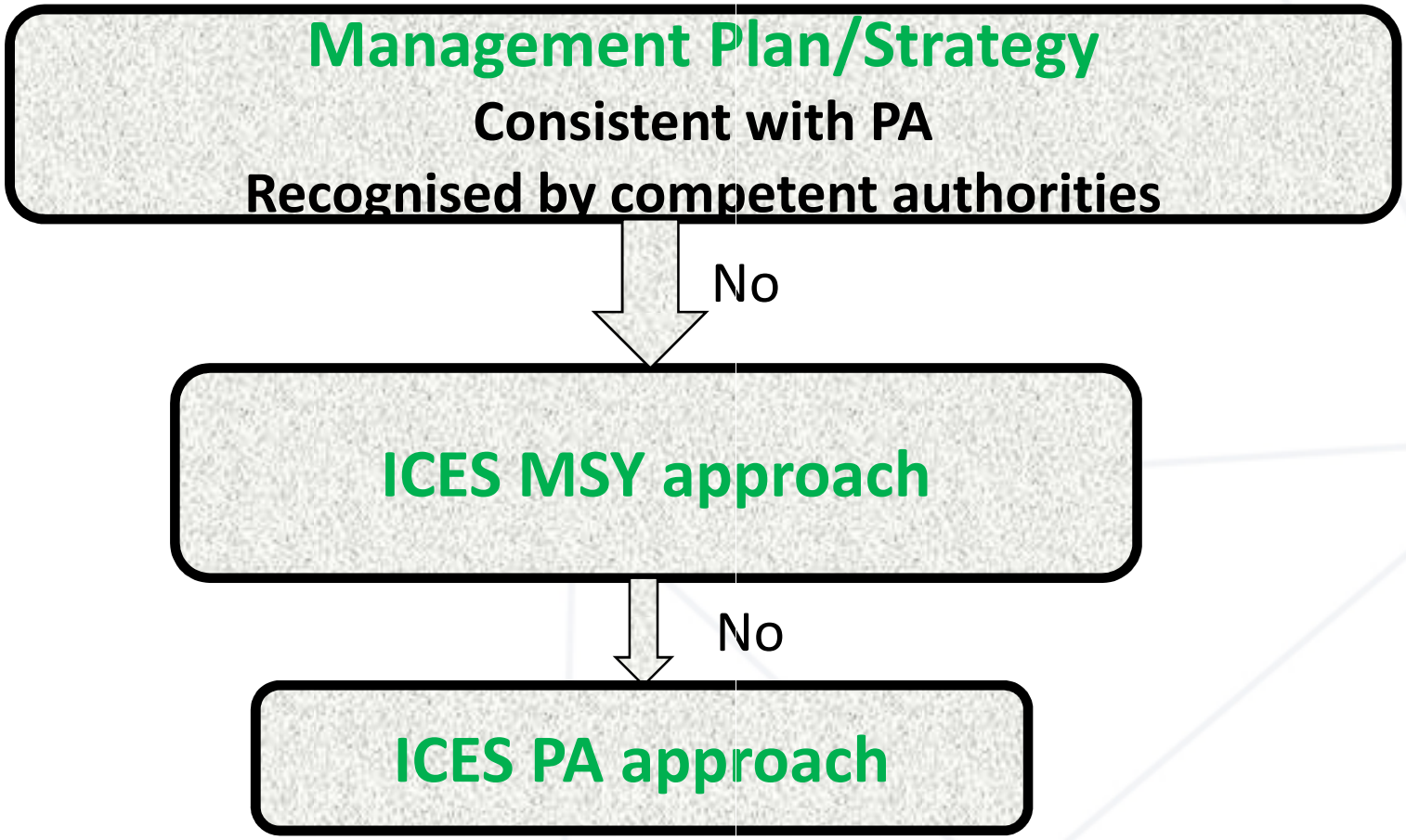


ble seas

Advisory products in 2015: Fishing opportunities

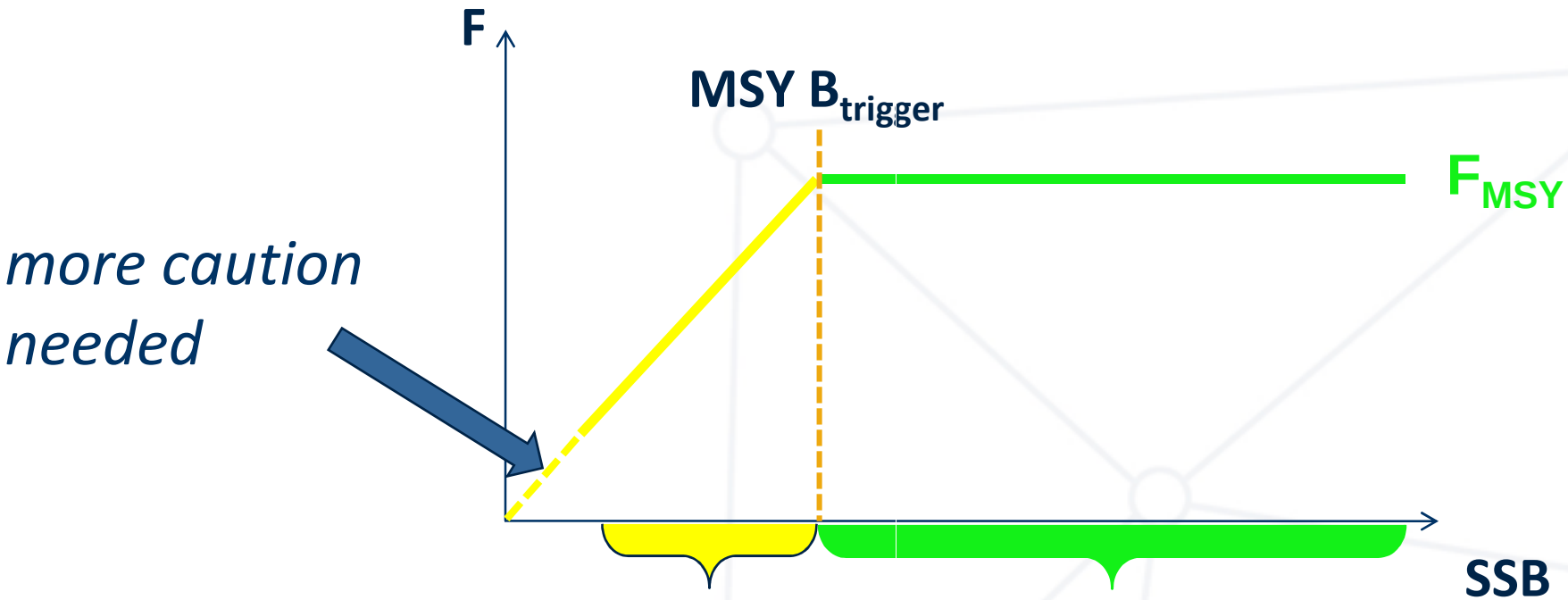
rea	Number of stocks for which advice was provided in 2015
eland and East Greenland	14
arents Sea	7
roe Plateau	4
ltic Sea and West of Scotland	69
orth Sea, Eastern Channel, Skagerrak and Kattegat	50
ay of Biscay and Atlantic Iberian Waters	22
altic Sea	19
idely distributed and migratory stocks	40

Basis for ICES advice

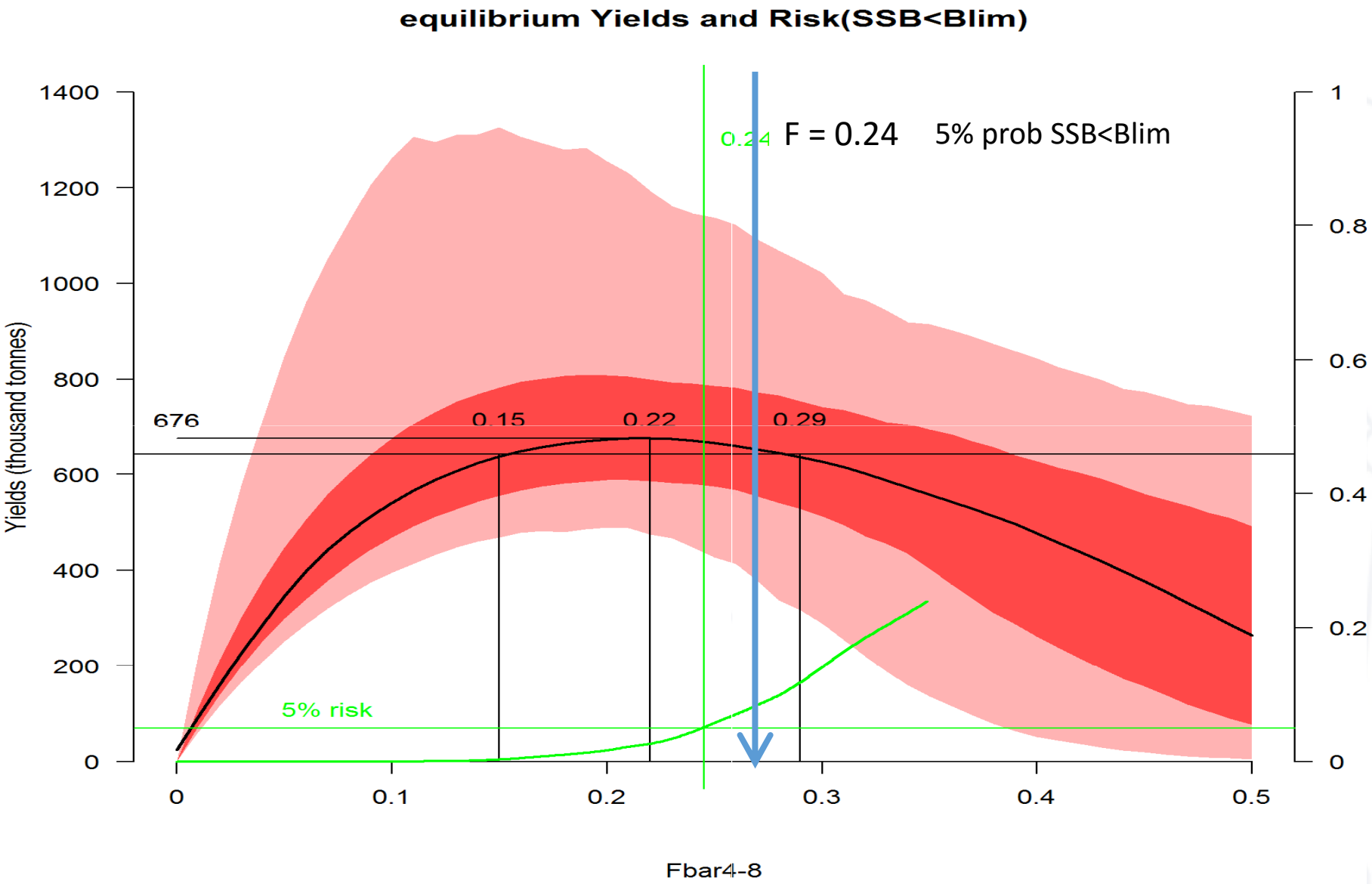


ICES MSY approach

- ✓ Maximize long term average yield
- ✓ Safeguard against low SSB
- ✓ Stay within precautionary boundaries



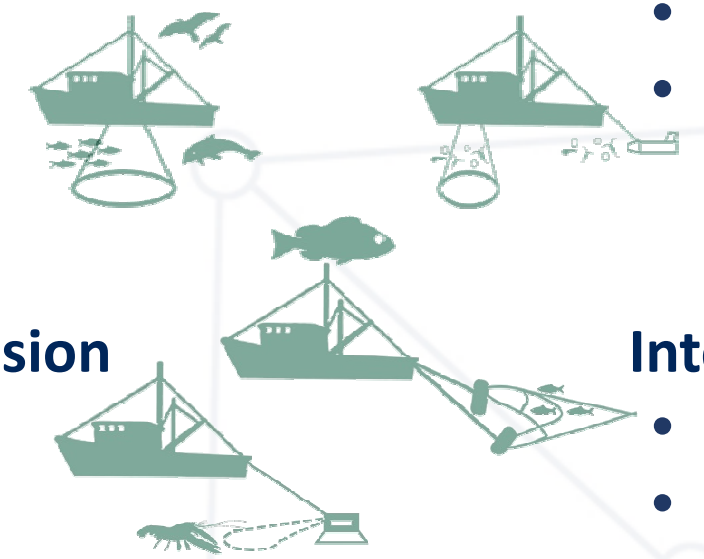
Mackerel: F ranges that gives >95% of MSY



Integrated Ecosystem Observation and Monitoring (> 25 expert working groups)

Survey planning & operation

- Acoustic + bird + mammal
- Otter & beam trawl + litter
- Ichthyoplankton
- TV for Nephrops
- Redfish



Survey development

- Survey design
- Integrated sampling
- Survey efficiency/rationalisatio

Monitoring data provision

- Marine litter
- Bycatch
- Noise
- Trawl & acoustic survey information

Integrated monitoring

- Meteorological products
- Satellite products
- Oceanographic monitoring

Science for sustainable seas

Linked to fishing/survey technology

WGFAST- Working group on fisheries acoustics, science and technology

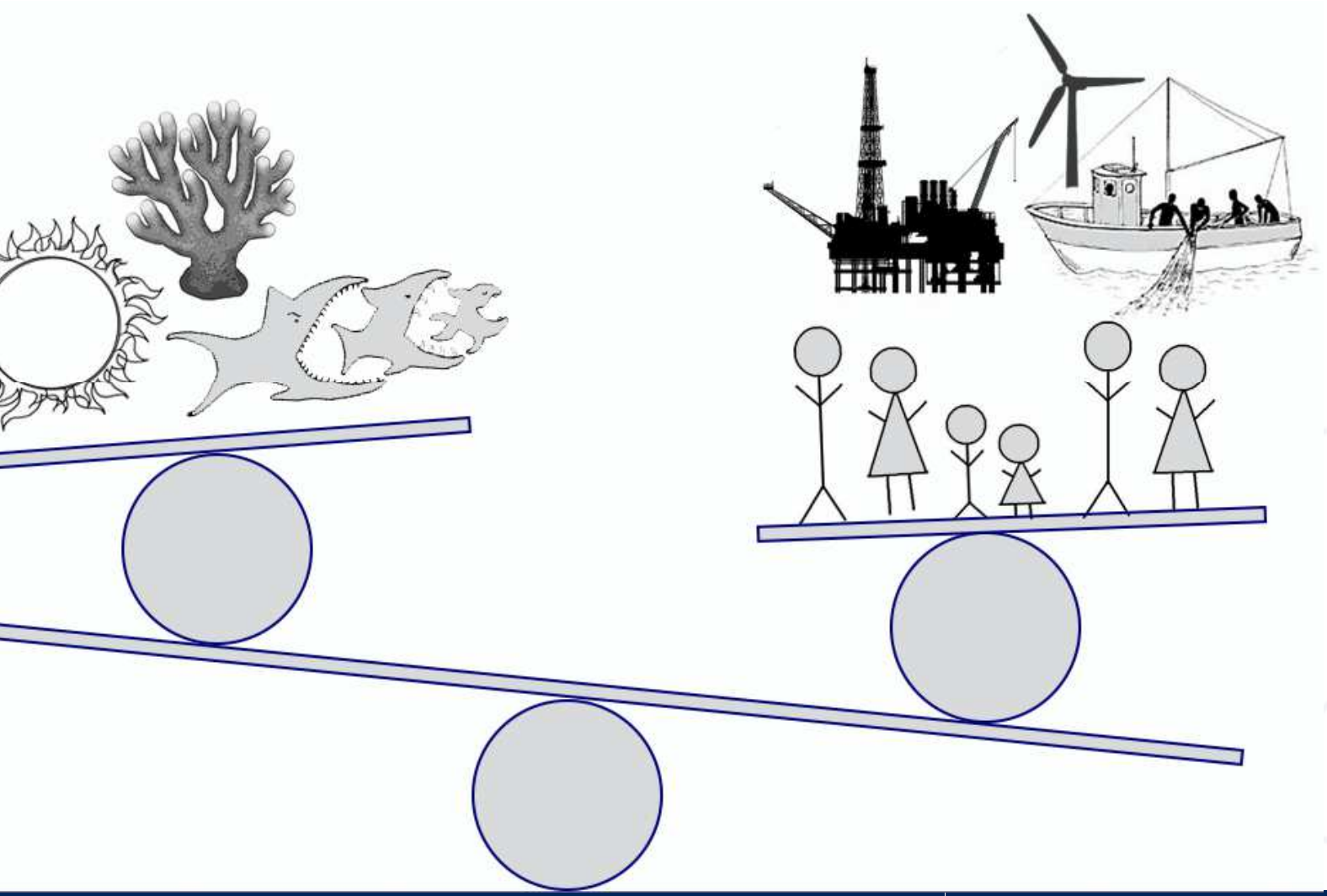
WGFTFB - ICES -FAO Working Group on Fishing Technology and Fish Behav

Recent workshops:

- Electric fishing/pulse trawls
- Survivability post catch
- Cod end/trawl design
- Mackerel surveys with industry

www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/Special_Requests/France_Effects_of_pulse_trawl.pdf

ragmatic Ecosystem Based Management



Balancing
human activities &
environmental
stewardship in a
multiple use contex