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Shaping Ecosystem-Based Fisheries Management

Jochen Depestele, Feedback from the scoping workshop on 3 February 2022

SEAwise has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000318

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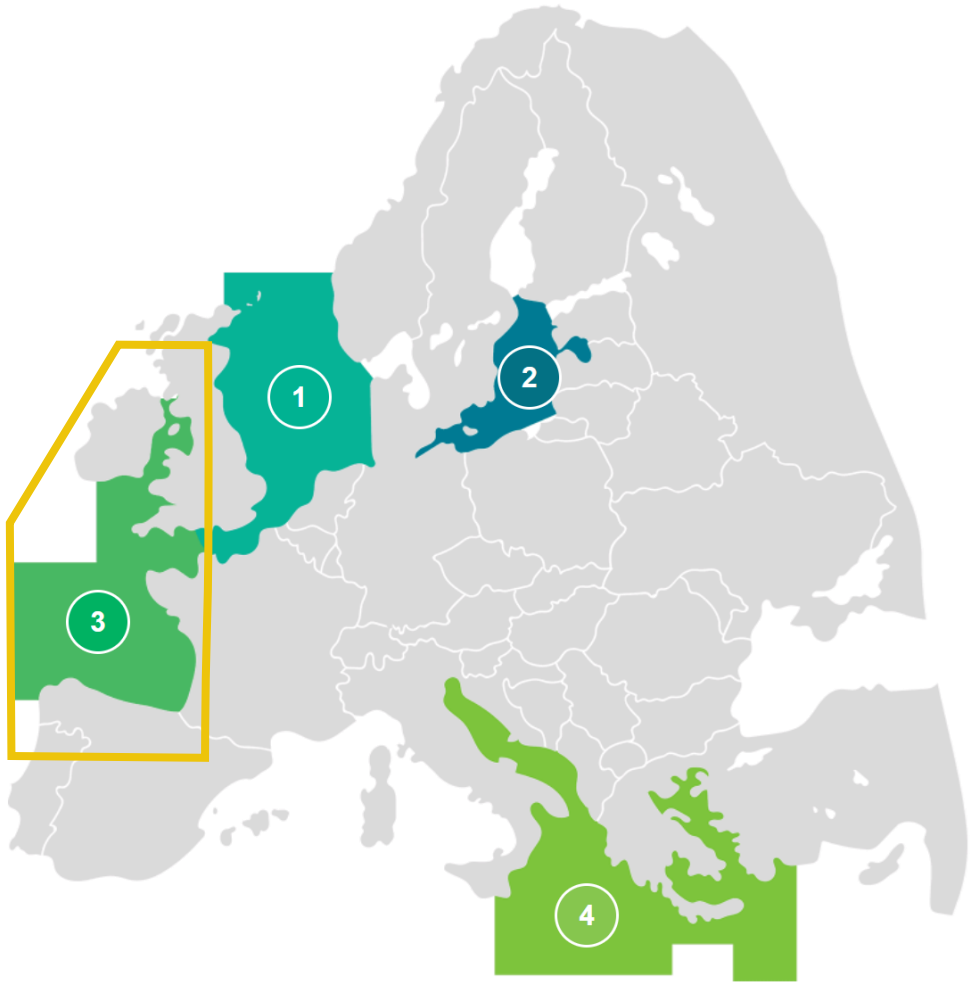
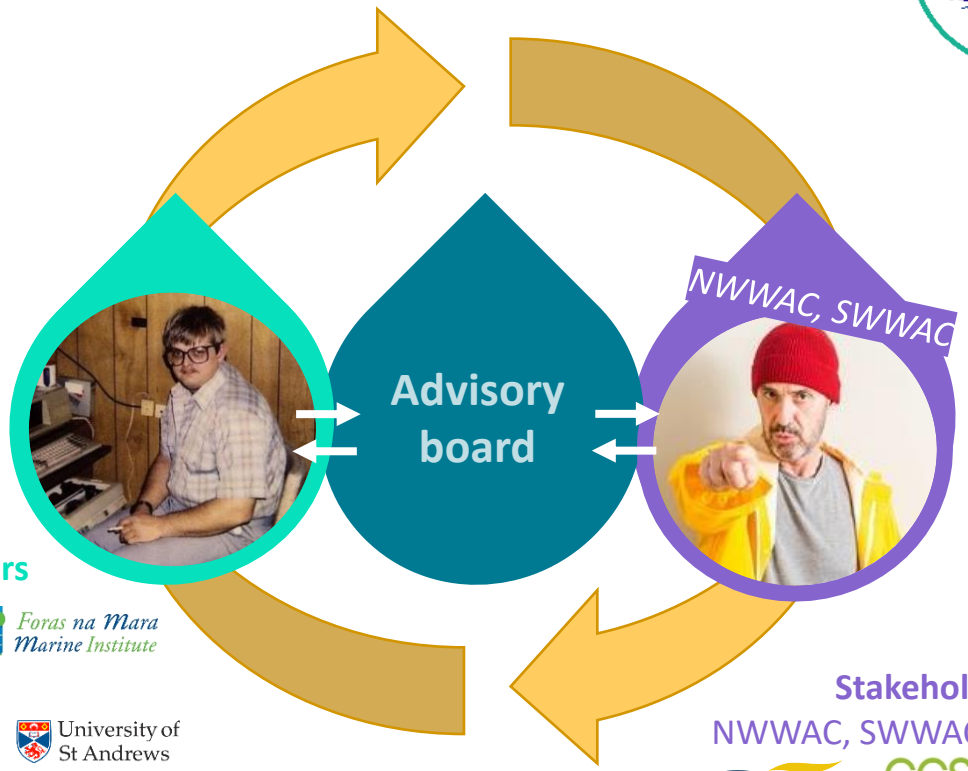
H2020 project. 4 regions.
24 partners. 1 advisory board. 6 ACs.
4 years. 1 approach.





WW Partners

AZTI · Foras na Mara Marine Institute · Cefas · ILVO · University of St Andrews · UBO · cepesca · University of Strathclyde Glasgow · AGRO CAMPUS OUEST · Ifremer

Stakeholders

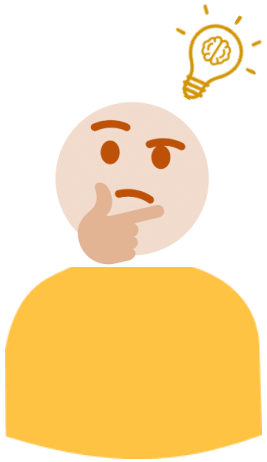
NWWAC, SWWAC, CCS, PELAC, NSAC, MEDAC, BSAC

Advisory Board

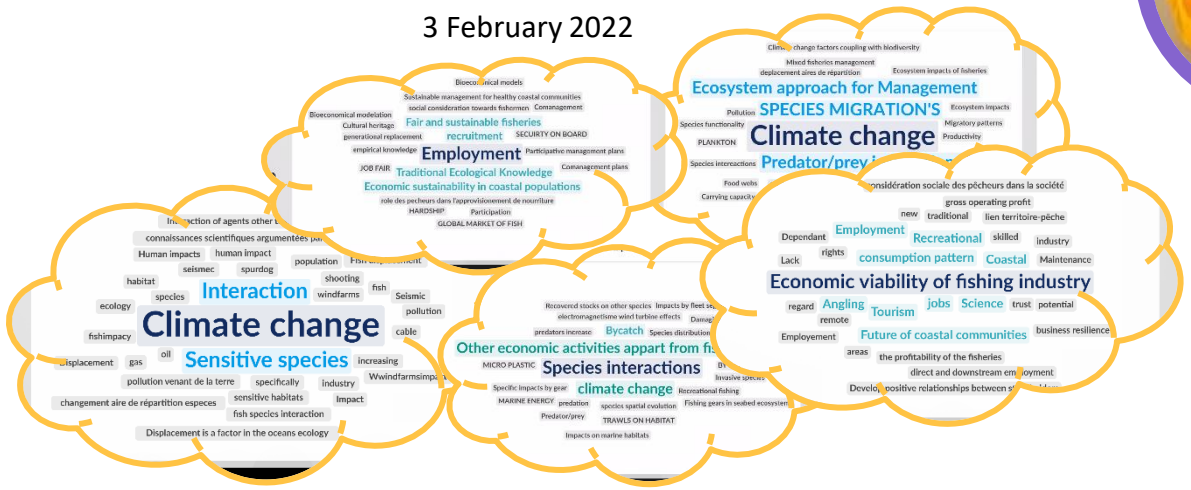
Ernesto Penas-Lado, Mark Dickey Collas, Elisabetta (Bee) Morello, Javier Garat, Martin Pastoors, Antonia Leroy, Magaret (Peg) Brady, Athanassios Tsikliras, Eva Plaganyi

What are items for EBFM?

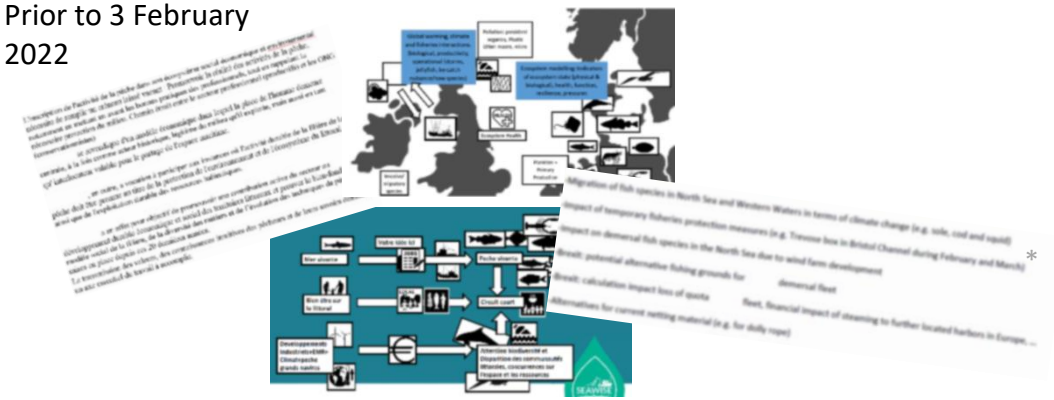
Item identification by ACs

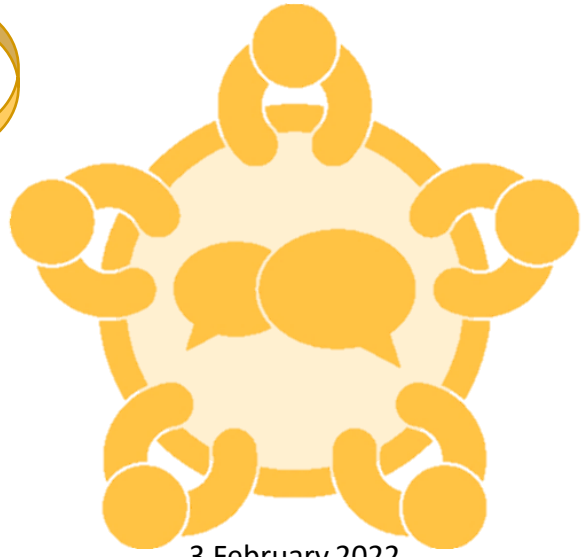


3 February 2022



Prior to 3 February 2022

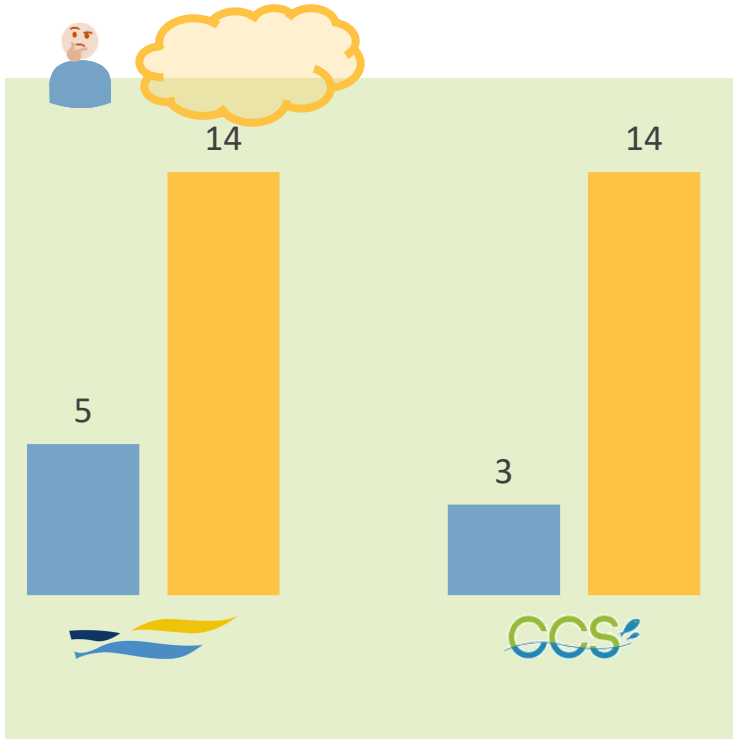


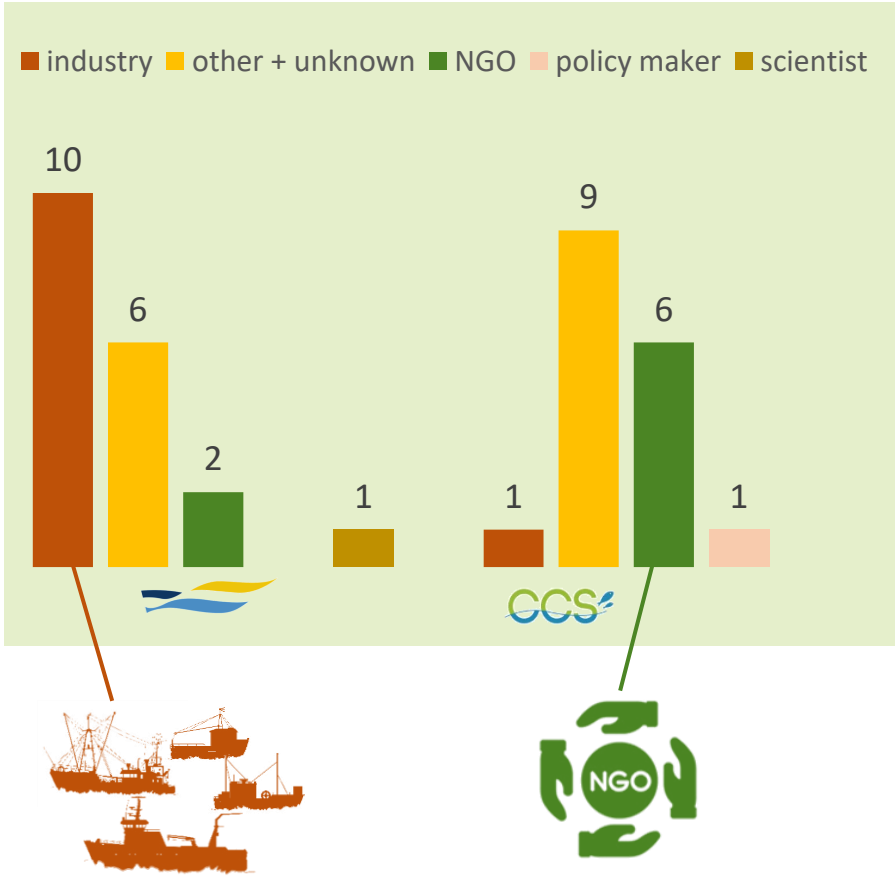


3 February 2022

*Individual scopings are intentionally blurred in this slide

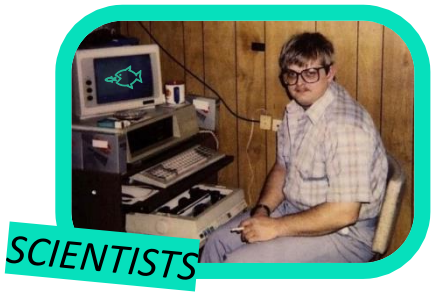
36 respondents in the WW





SCOPING EBFM

Scoping EBFM topics



Top 5 across regions & stakeholders

- Climate change
- Windfarms
- Employment
- Small-scale fisheries
- MPAs

WW specific items

Social & Fisheries topics

(Coastal) economics

Spatial management
Fisheries revenues

Coastal communities
Employment
Pollution
TAC

Ecological topics

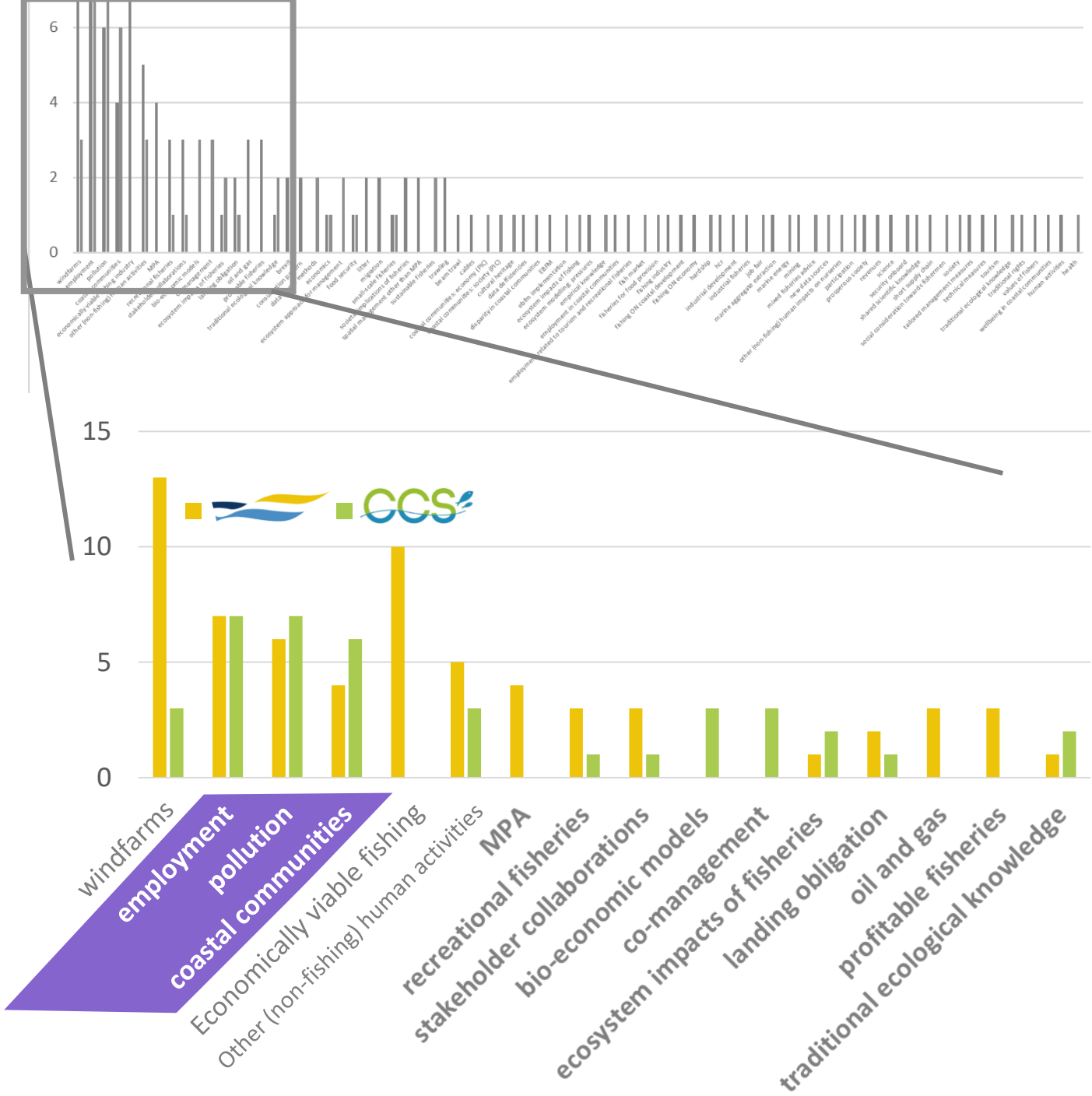
Marine mammals
Bycatch
Species interactions

Biodiversity
Ecosystem resilience
Benthic habitats

Cod
Seabass
Seabirds

SCOPING EBFM:

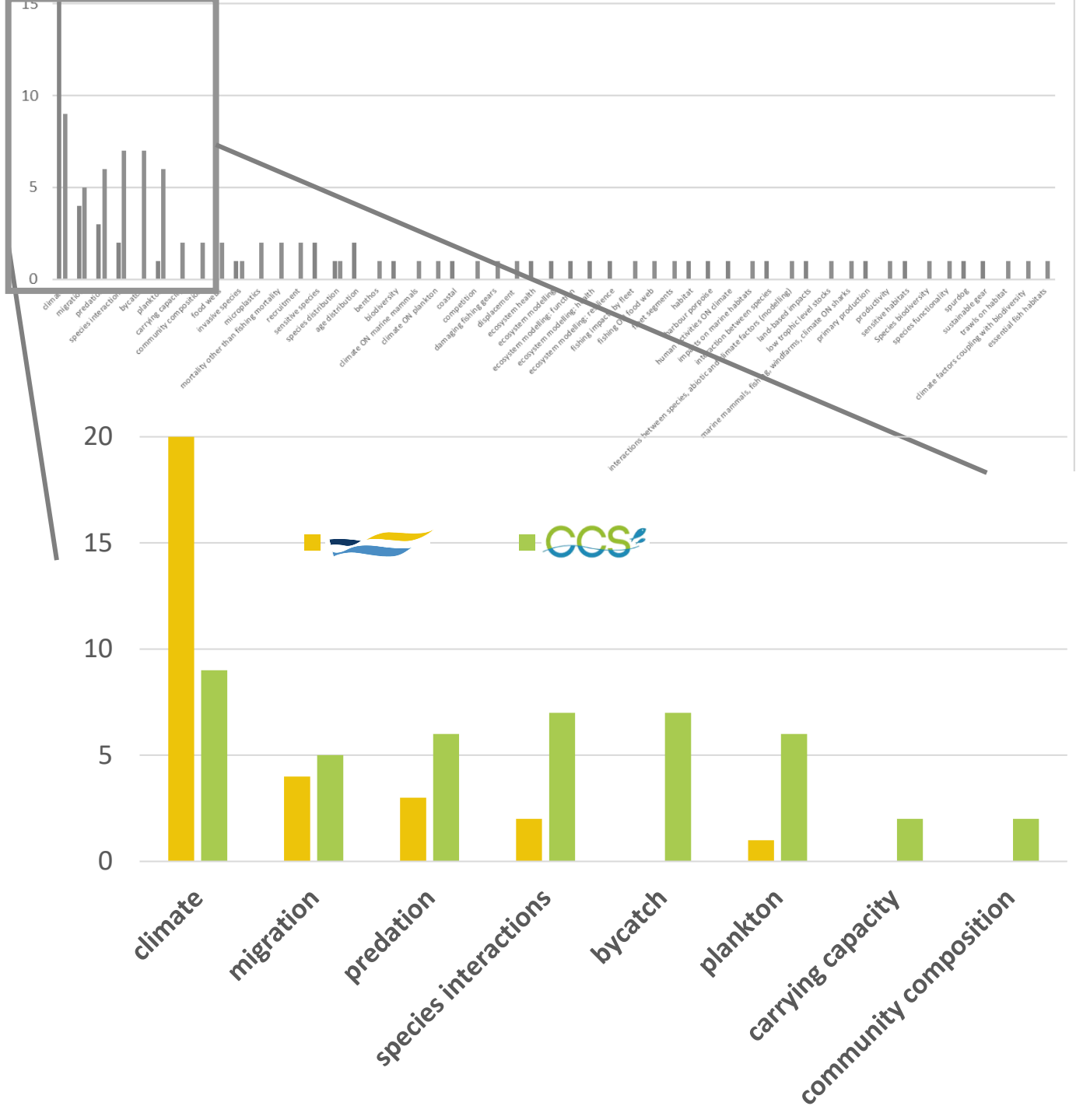
77 social items



SCOPING EBFM:

51 ecological items

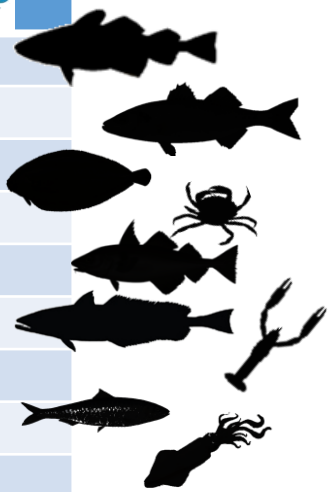
(excl comm spp)



List of commercial and non-commercial species

Bold species: mentioned ≥ 4 times

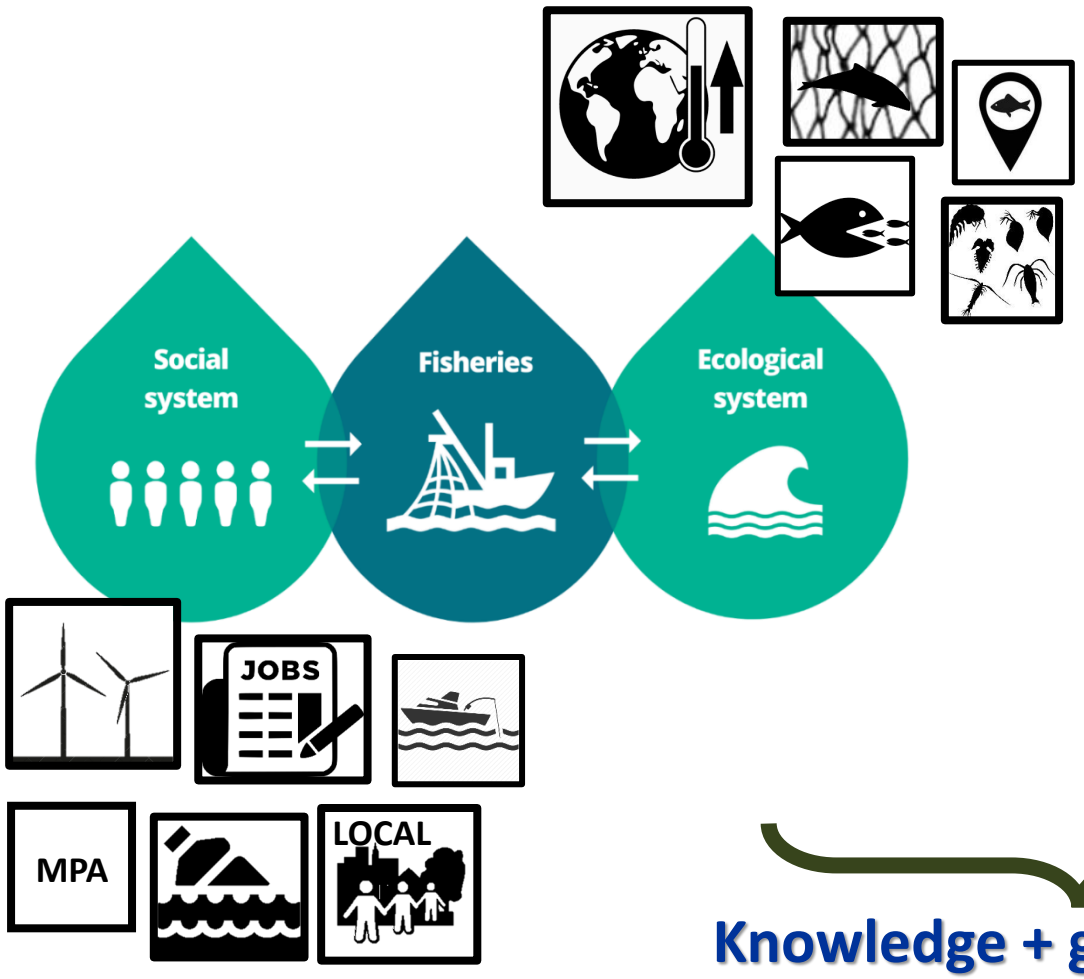
TOP 20 SPECIES		CCS
cod	9	1
seabass	5	1
sole	4	2
crabs	2	2
haddock	4	
hake	1	3
Nephrops	3	1
sardine		4
squid	4	
elasmobranchs	2	1
octopus	1	2
shrimp	2	1
anchovy		2
flatfish	2	
gadoids	2	
monkfish	2	
pollack	2	
red mullet	2	
tuna		2



ALL SPECIES		CCS
marine mammals	2	6
PET species	2	4
seabirds	3	3
benthos	1	3
sensitive species		4
cetacean	3	
plankton	3	
PET spp	1	1
sprat	2	
basking shark		1
elasmobranchs		1
fodder fish	1	
porbeagle shark		1
sandeel	1	
seamounts, canyons		1
turtles	1	

SCOPING & REVIEWING EBFM

Scoping EBFM topics



Systematic reviews

1 method.

WP 2	WP 3	WP 4	WP 5	WP 6
SOCIAL ECONOMIC EFFECTS	ECOLOGY ON FISHERIES	FISHERIES ON ECOLOGY	SPATIAL ASPECTS	HOW TO MANAGE? (models)

5 databases.

Knowledge + gaps for EBFM

Addressing gaps in SEAwise?

WP 2

To identify studied

- Social & Economic indicators
- Fisheries management measures

Screening 1399 studies → 187 retained

WW = 45

WP 2

SOCIAL ECONOMIC EFFECTS

MPAs
Small-scale fisheries
TACs

Knowledge + gaps for EBFM

Employment
Coastal communities
Food security

WP2 incl.
T2.2 economic indicators
T2.3 Social indicators
T2.5 health aspects of fish

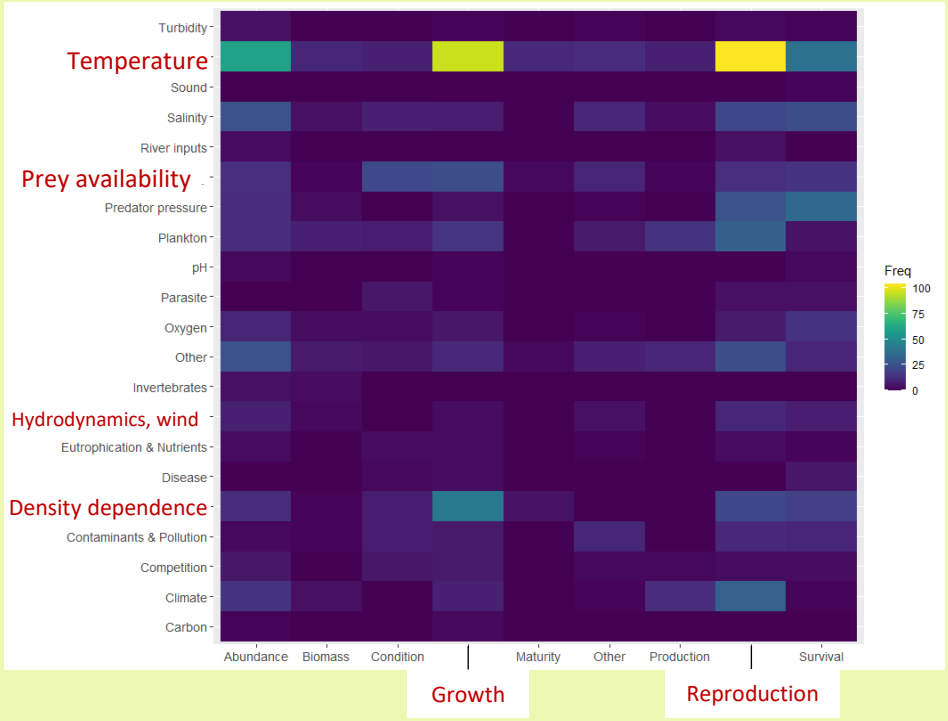
WP 3

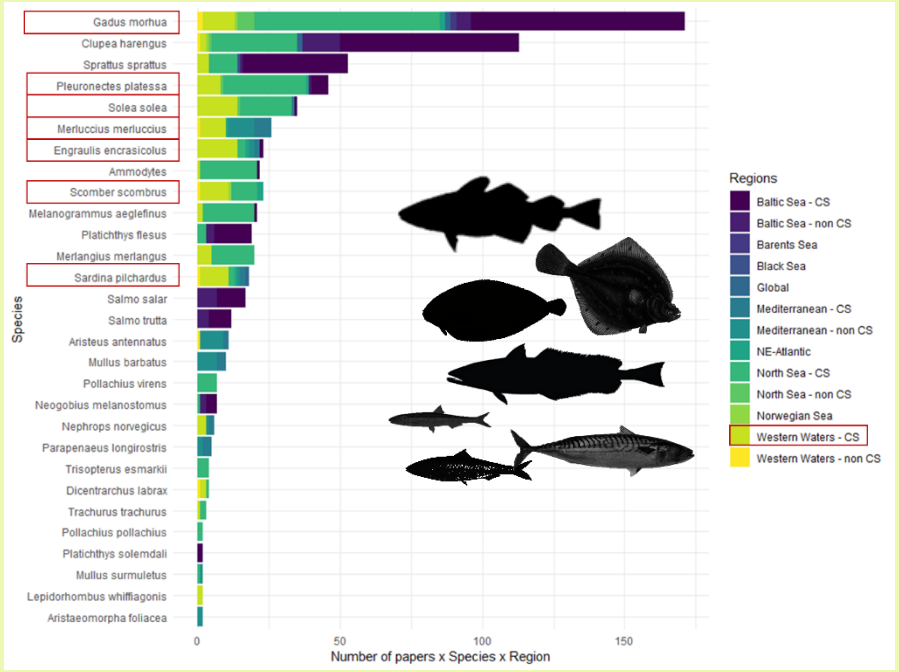
Impact of the environment on productivity of commercial species across Europe

- What are key drivers?
- Which processes do they impact?

Screening 2050 studies → 516 retained

WW = 80





WP 3

ECOLOGY ON FISHERIES

Climate change

temperature, salinity

Plankton

Species interactions

Knowledge + gaps for EBFM

Nutrients, pollution

Habitat change (WP5)

SEAWISE

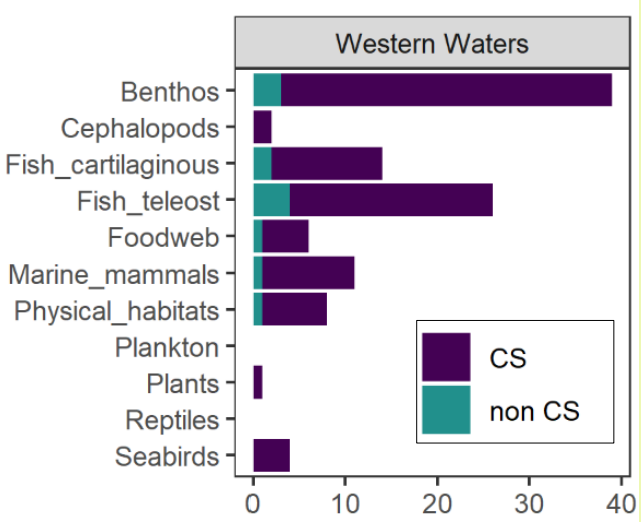
T3.2: recruitment
T3.3: fish growth (e.g. seabass)
T4.4 food web, nutrient flow
T5.4 Habitat productivity

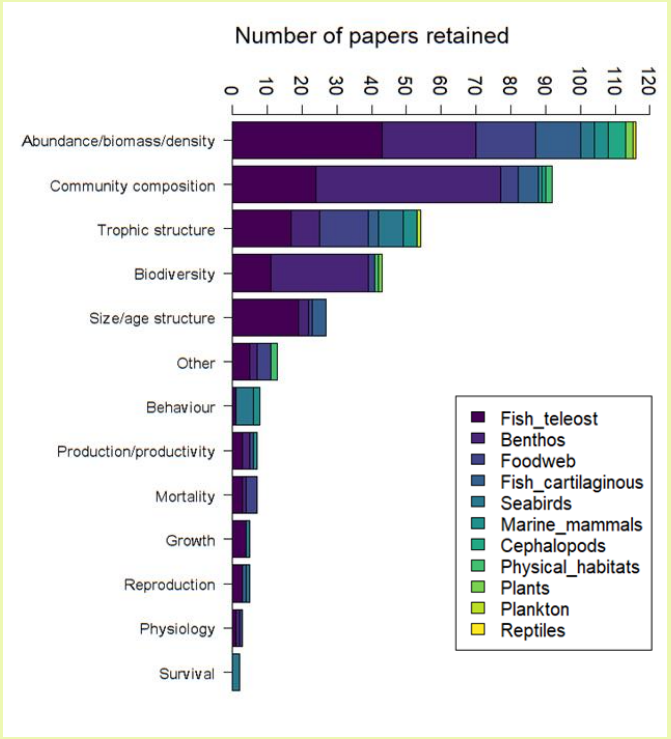
WP 4

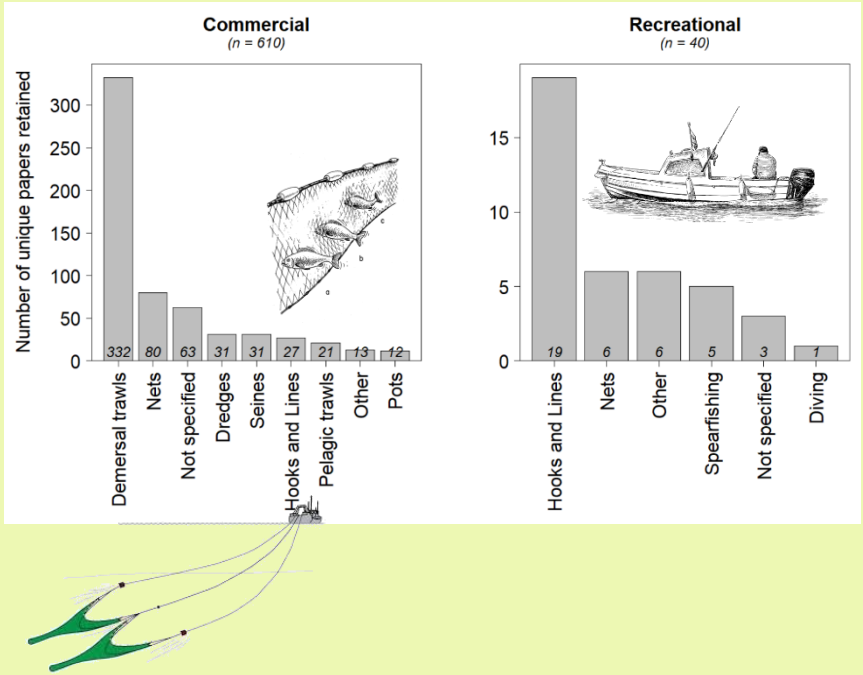
To map available knowledge and evidence of impacts of commercial and recreational fisheries on key species and habitats across European sea basins

Screening 2569 studies → 549 retained

WW = 73







WP 4

FISHERIES ON ECOLOGY

Benthos, teleost fish
Marine mammals,
Seabirds

Knowledge + gaps for EBFM

Litter

SEAWISE

T4.5: litter

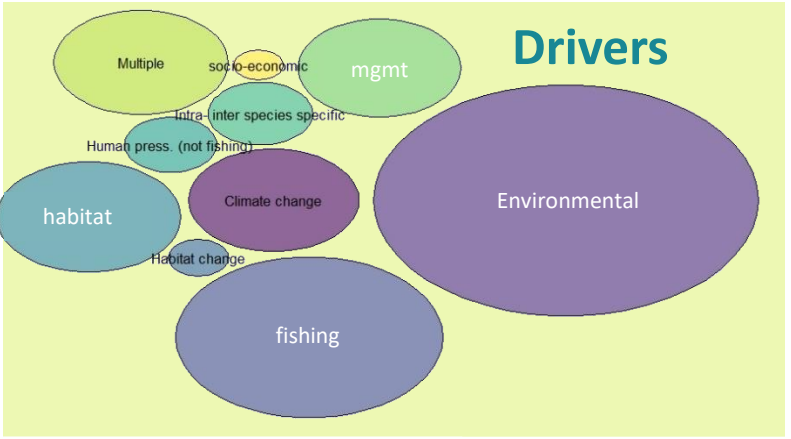
WP 5

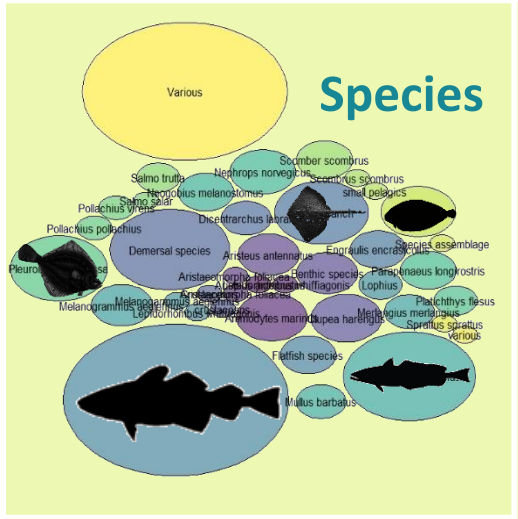
To investigate

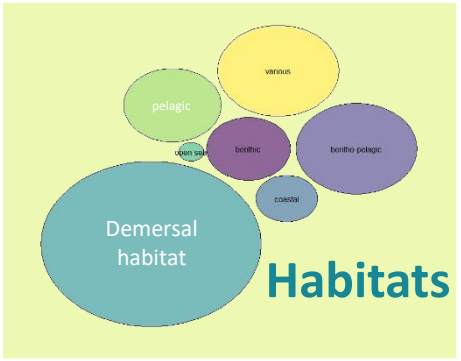
- Spatial aspects of fisheries and ecology of commercially fished stocks
- Drivers of spatial distribution

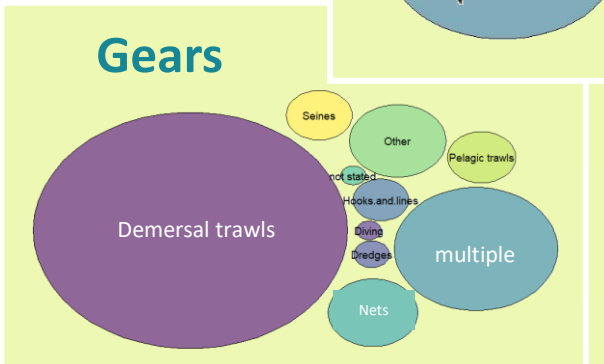
Screening 1049 studies → 934 retained

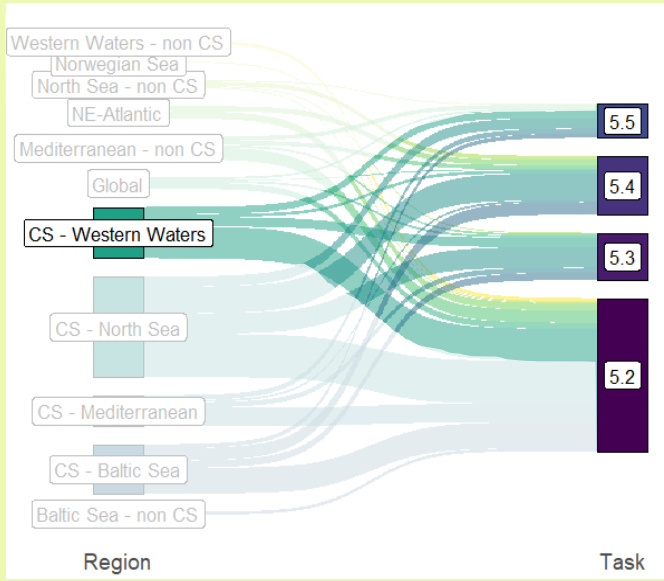
WW = 62











WP 5

SPATIAL ASPECTS

- Environmental conditions and distribution of fish
- Distribution of fisheries and other human activities

Knowledge + gaps for EBFM

Effect of

- Spatial management measures on fisheries
- Habitats on species

WP5: spatial aspects of fish & fisheries, incl other human act's
WP6: management models

End-user driven advice

Where are we now?

Scoping EBFM topics

Systematic reviews

Knowledge + gaps for EBFM

Where are we now?

End-user driven advice

Scoping EBFM topics

Systematic reviews

Knowledge + gaps for EBFM

WP1, Knowledge exchange and integration

WP2: Social and economic effects of and on fishing

WP3: Ecological effects on fisheries yield

WP4: Ecological effects of fisheries

WP5 Spatial management impacts

WP6 Evaluation of management strategies

Spring 2023 workshop !

End-user driven advice

scoping & reviewing EBFM

spring 2023

EBFM APPROACH

Advice, incl spatial 2024

EBFM tool 2025

WP1, Knowledge exchange and integration

WP2: Social and economic effects of and on fishing

WP3: Ecological effects on fisheries yield

WP4: Ecological effects of fisheries

WP5 Spatial management impacts

WP6 Evaluation of management strategies

IT'S TIME TO GET SEAWISE.

Thank you!

https://www.seawiseproject.org/

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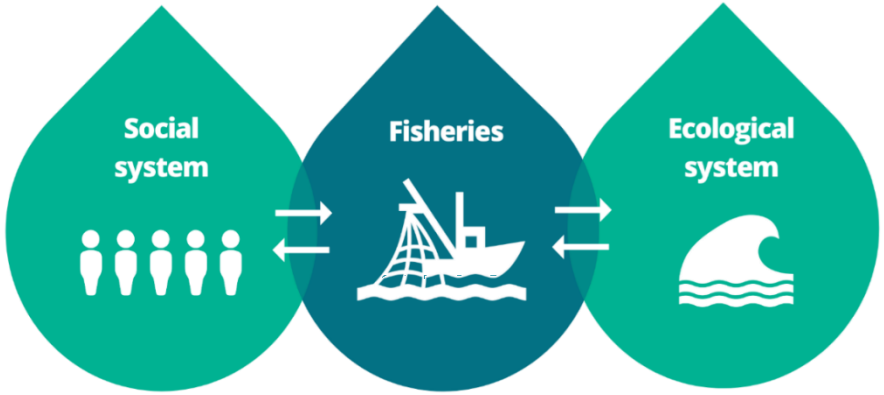
Jochen Depestele (WW lead, ILVO BE) jochen.depestele@ilvo.vlaanderen.be

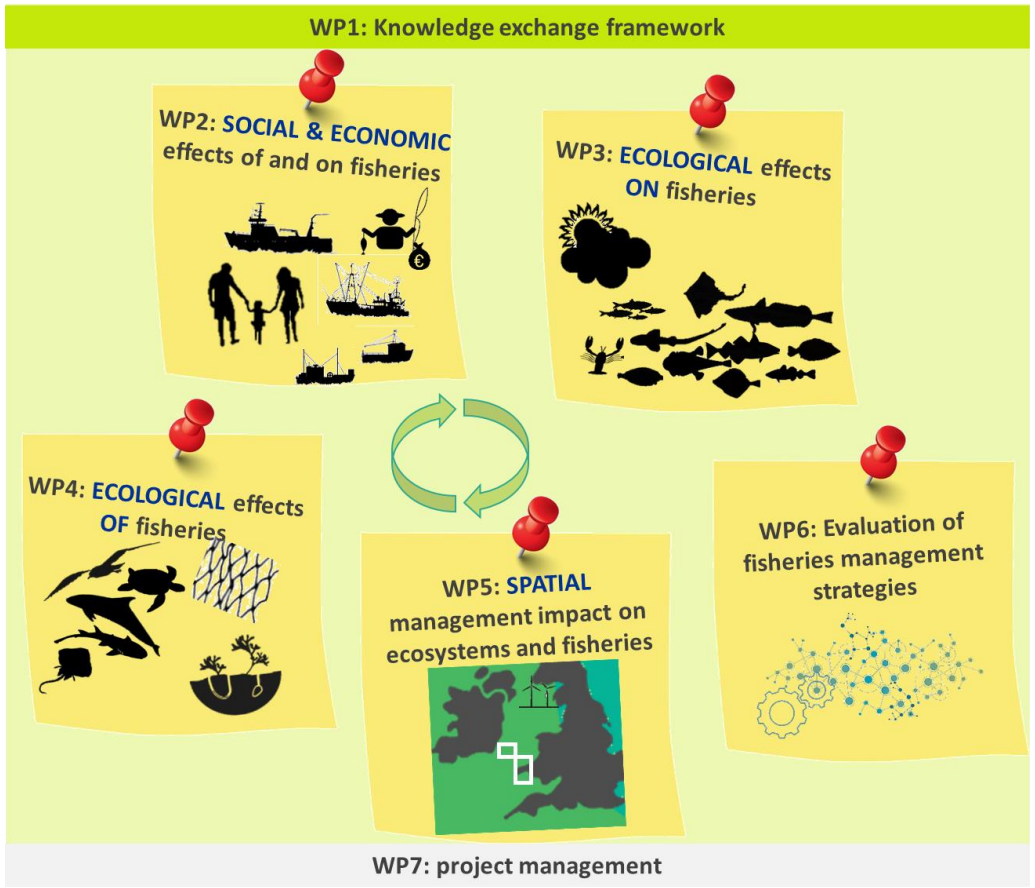
SEAwise has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000318

ANNEX 1
Shaping EBFM

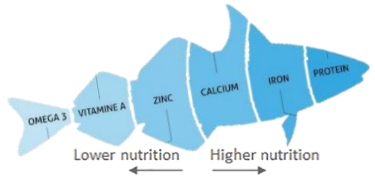


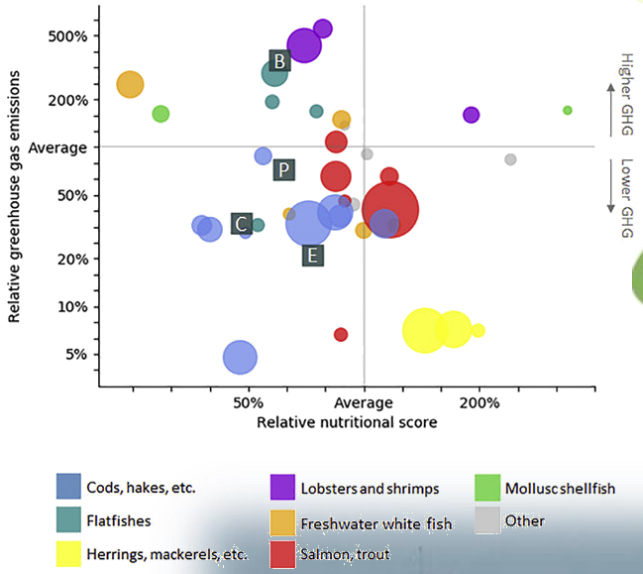
Management				Legislative framework
EBM Ecosystem Based Management	Eco Tourism, Aquaculture, Oil & Gas, MPA, JOBS, LOCAL	Fishing fleets	Impacts of all sectors on ecosystem components	CFP, MSFD, HD, BD, WFD, MSPD etc.
EBFM Ecosystem Based Fisheries Management	JOBS, LOCAL	Fishing fleets	Effects of fishing, climate and Mortality on fished stocks and other ecosystem components	CFP, MSFD
EAFM Ecosystem Approach to Fisheries Management			Target species plus climate, mortality from predators	CFP
SS Single species Approach to Fisheries Management			Target species only	CFP

ANNEX 2
WP details

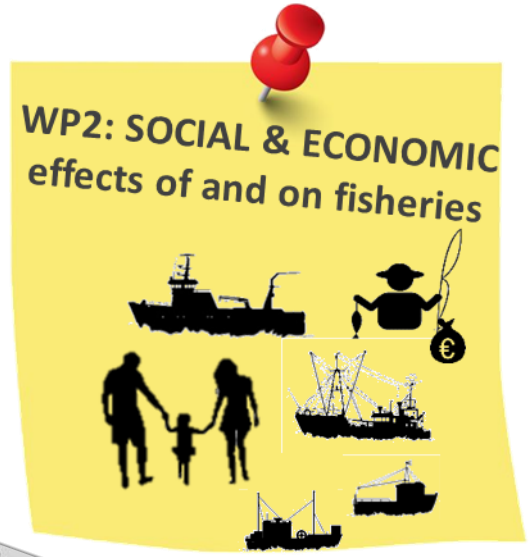


WP2 = social and economic effects

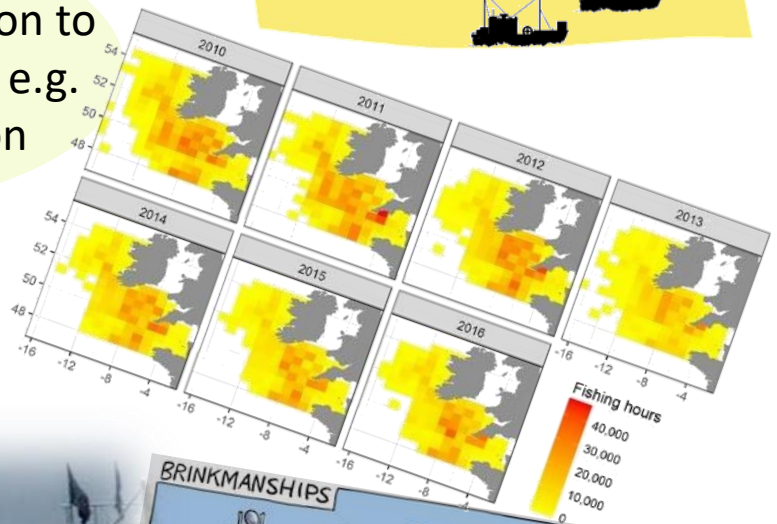




Health benefits & **carbon footprint**



Fishers behavior in relation to management measures, e.g. spatial effort allocation

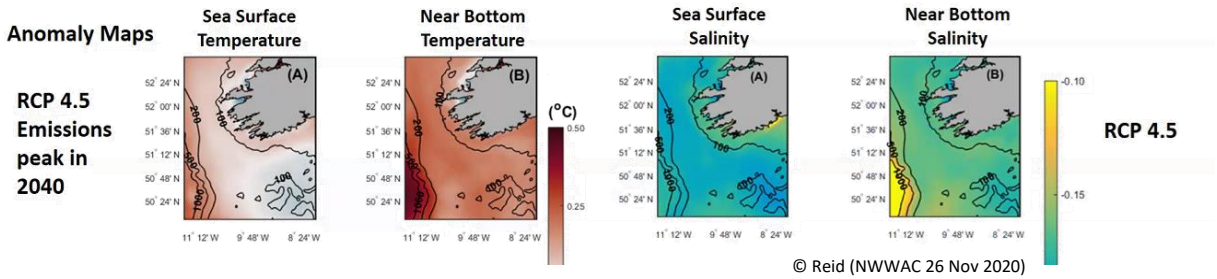


Social consequences of management measures, incl. Brexit, development of new social indicators

© Hallström et al (2019)

WP3 = fish productivity

Warmer and fresher under climate change



© Reid (NWWAC 26 Nov 2020)

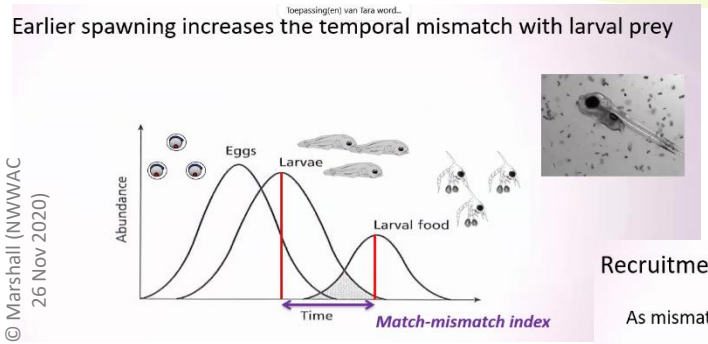
Natural mortality rates

Individual growth rates

Recruitment rates

biomass

Maturity rates



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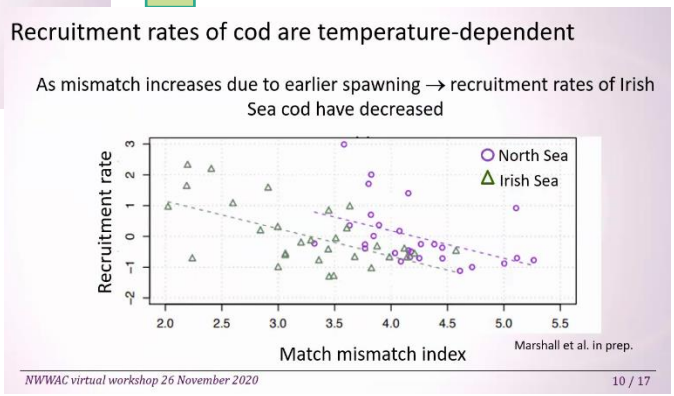
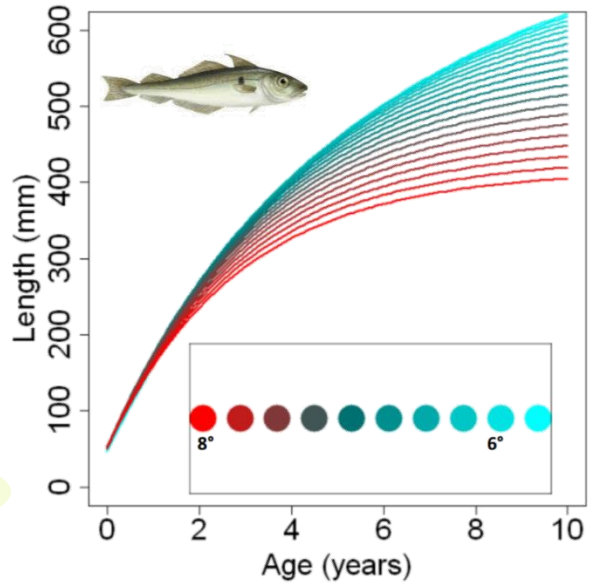
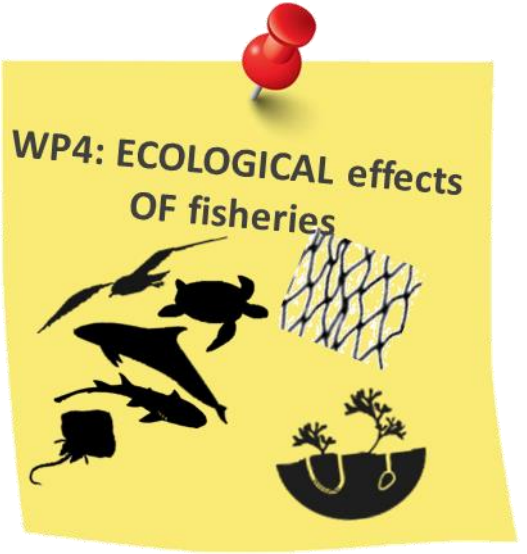


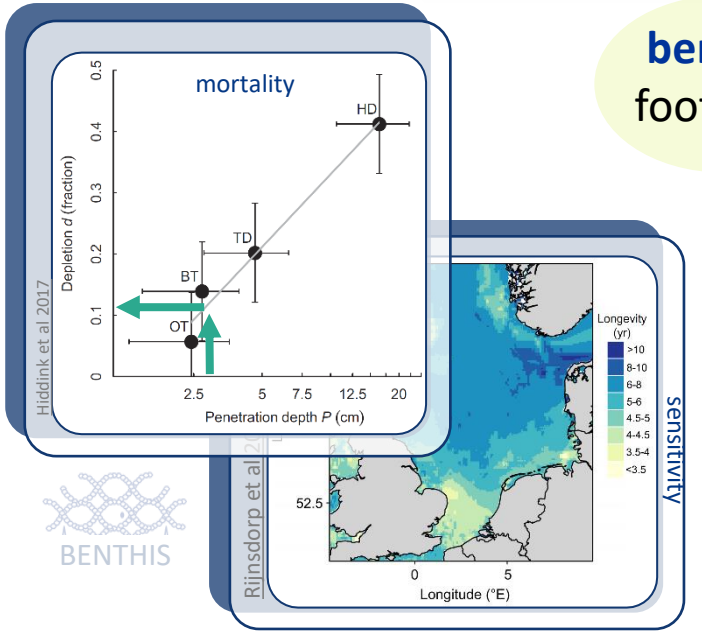


© Baudron et al 2011
Marshall (2020)

WP4 = ecological impacts

Bycatch of
Protected
Endangered
Threatened
species

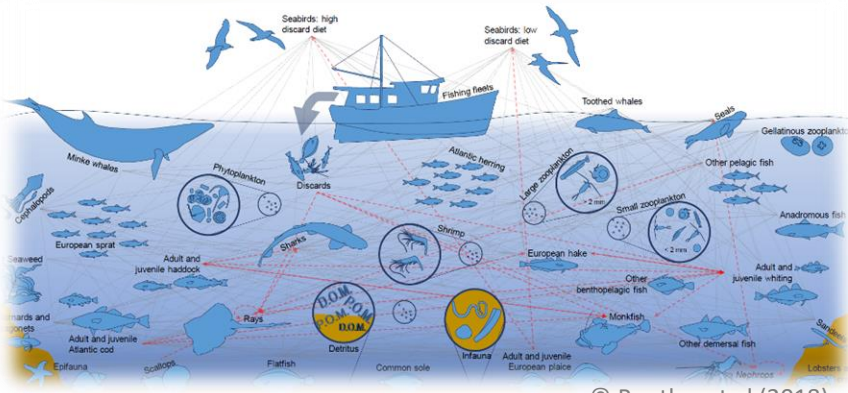




benthic
footprint

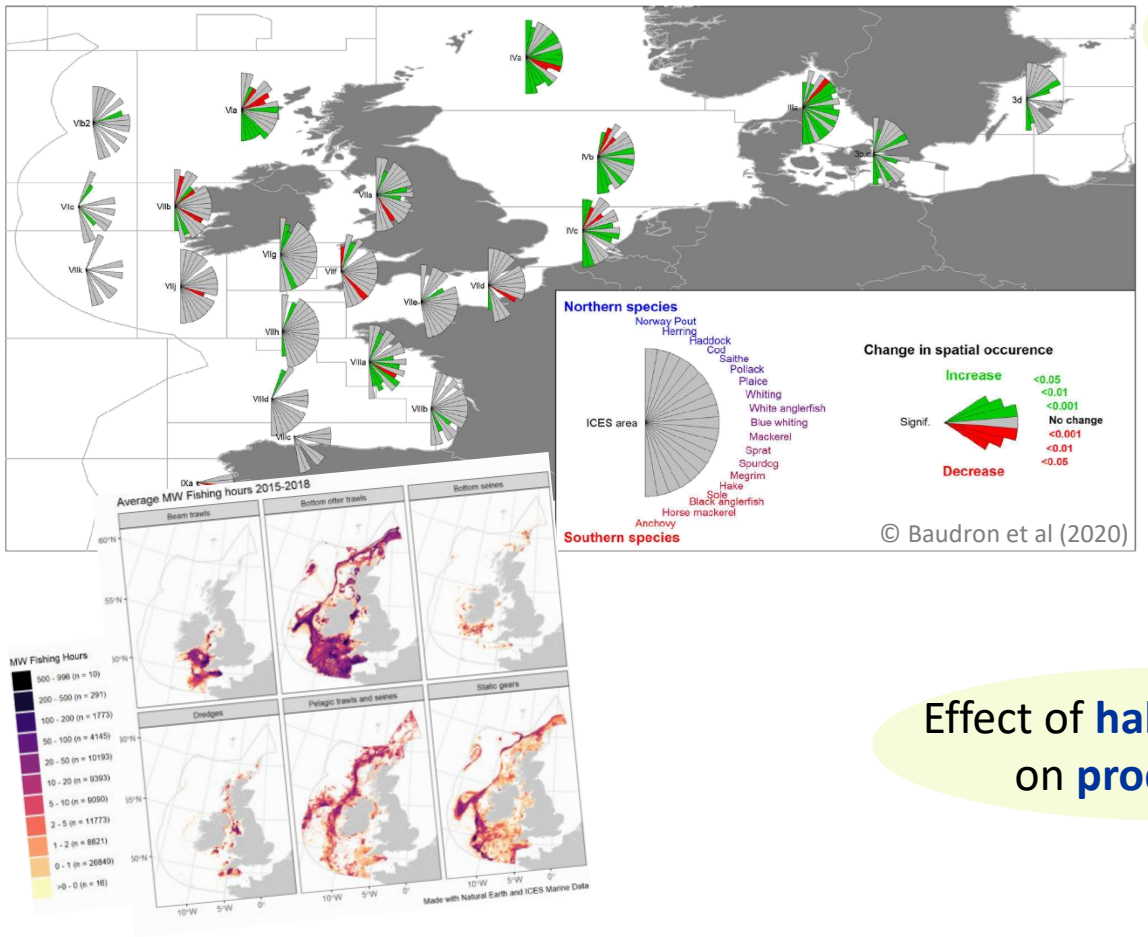
litter footprint

Fishing impacts
on **food webs**



© Bentley et al (2018)

WP5 = SPATIAL management



Spatial distribution of **fish** & **fisheries**

WP2: fisheries as social-ecological system

Predicting the effect of changes in **fishable area**

Effect of **habitat changes** on **productivity**

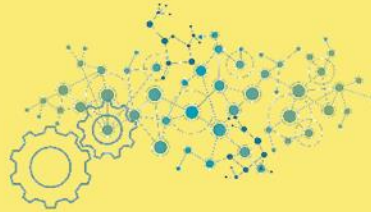
WP3: ecosystem change ON fish & health

WP5 SPATIAL management impact on ecosystems and fisheries

- Effect of spatial and temporal closures, gear restrictions, selectivity changes
- Changes in productivity and its consequences to fish abundance and spatial distribution of fleets
- impact on stock management of *Nephrops*, sole, hake, haddock, cod, whiting, anglerfish, seabass, megrim…

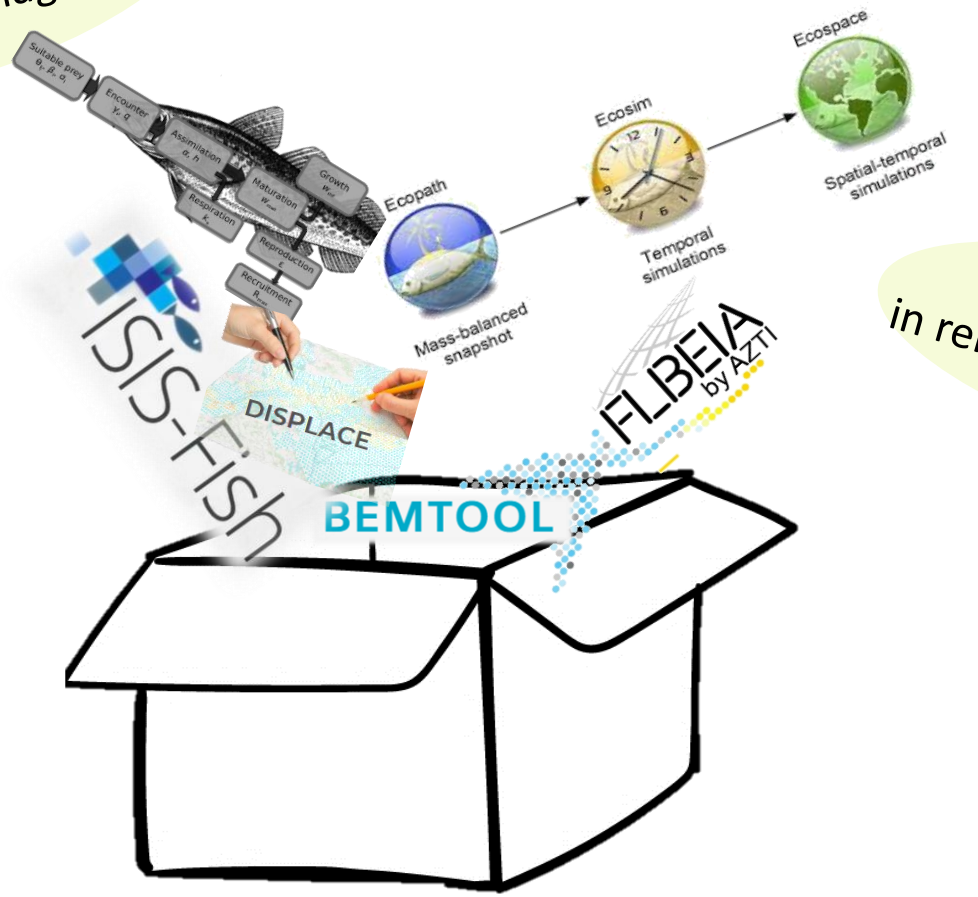
WP6 = management & advice

WP6 Evaluation of fisheries management strategies



Integration of **social and economic** effects in predicting effectiveness of management

Integration of ecosystem change in **stock productivity**

Design and evaluation of **management strategies**

Targets and limits in relation to ecosystem change