

Ecologically and economically sustainable mesopelagic fisheries (MEESO)

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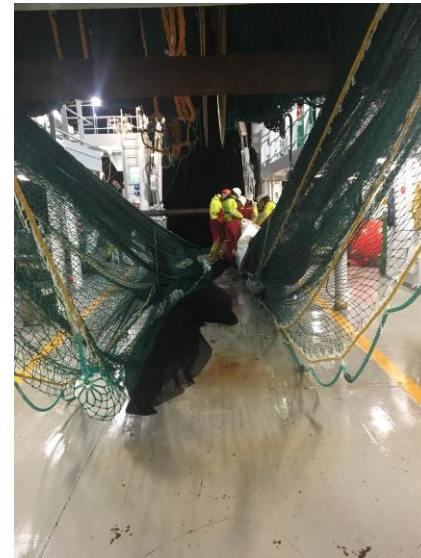
What is MEESO about?

- Global human population growth is causing increased demand for food, including marine proteins and lipids.
- Mesopelagic organisms represent one of the largest unexploited resource left in the world's oceans.
- *However, the biomass and ecological role of the mesopelagics are not known.*
- **MEESO** will explore the potential of using the mesopelagic resources for products included in the human food chain,
- and assess options to sustainably manage and govern their exploitation.

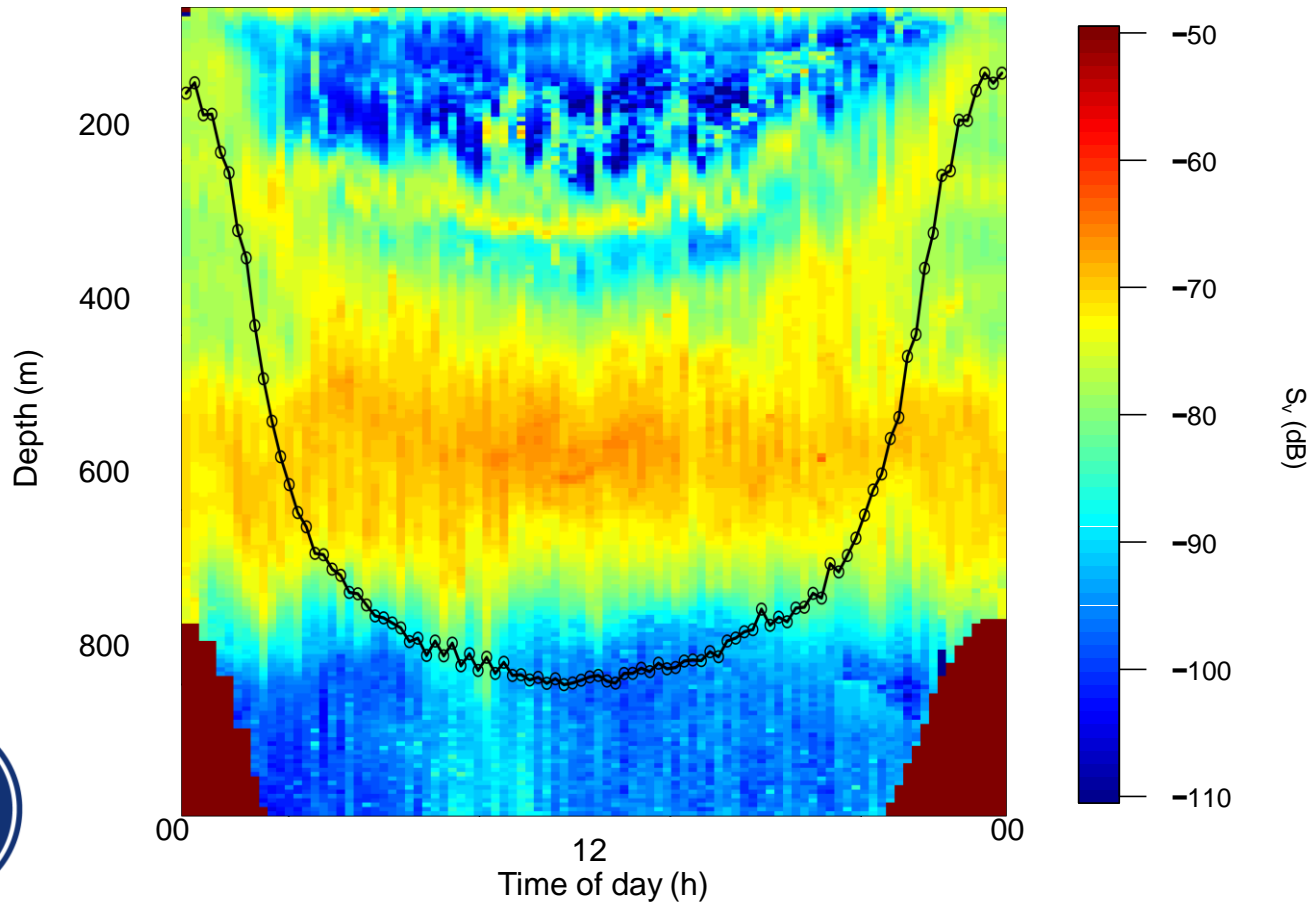


1st priority of **MEESO** will be to measure the biomass and abundance of mesopelagic populations

- New developments of fine meshed trawls with identical mesh size from opening to cod-end
- Mouth opening areas range from 36-800 m²
- Submersible multifrequency broadband acoustics on towed platforms, enabling counting, target strength estimation and acoustic signatures of single targets throughout the depth range of the mesopelagic zone



Mesopelagic fish and plankton in an ocean basin doing daily vertical migrations as observed with ship mounted acoustics



What is the mesopelagic zone?

- Normally, taken to be the depths between 200 and 1000 m.
- Formally, defined as depths where light is too low for net primary production, but still present at detectable levels.



Key features of the mesopelagic ecology

- Epi- and mesopelagic communities are parts of one ecosystem
- We need to quantify food web structure and interactions for the marine ecosystem as a whole
- Mesopelagic community may shape epipelagic community through competition and predation
- The mesopelagic community is not dominated by lower trophic levels

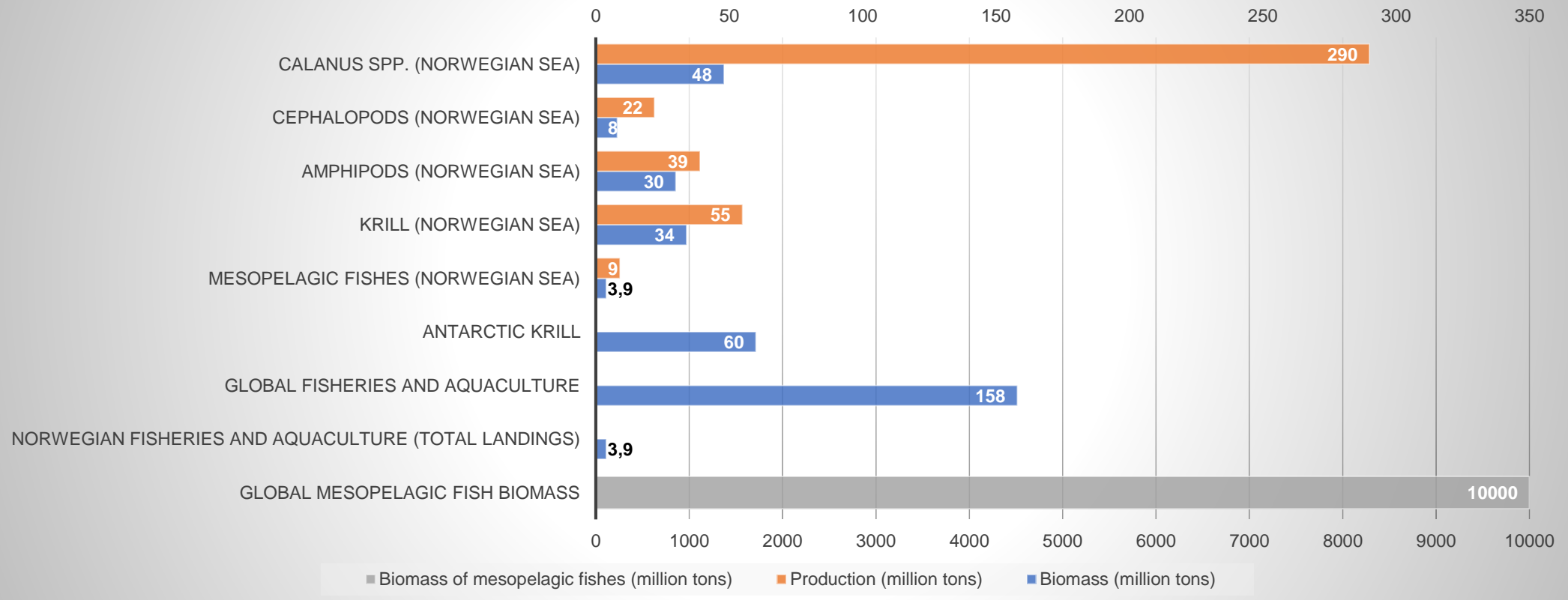


Ecosystem services provided by the mesopelagic ecosystem

- Direct mesopelagic fisheries (Blue whiting, redfish)
- Indirect; food for epi- and mesopelagic commercial stocks (tuna, salmon, marine mammals, blue whiting, +)
- Contribution of the mesopelagic community to carbon vertical flux through the biological pump may be 20 % of total carbon flux, on average



Biomass and production of selected resources

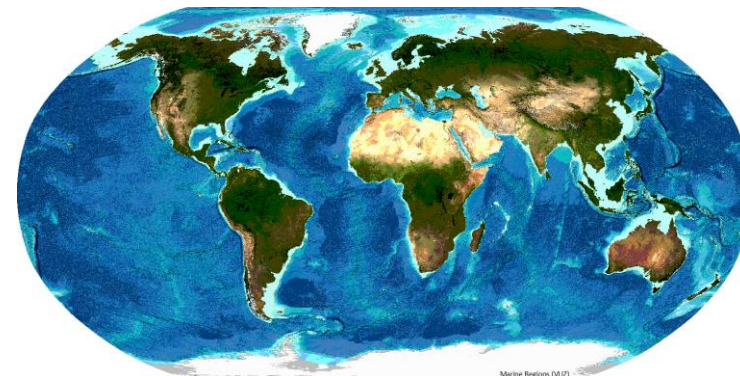
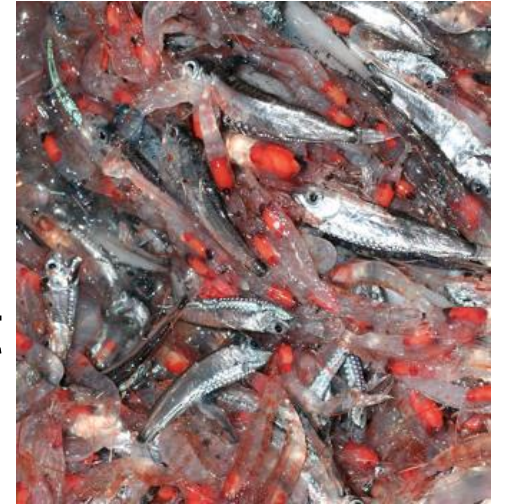


Shows the enormous potential and the vital ecological role of the mesopelagic community

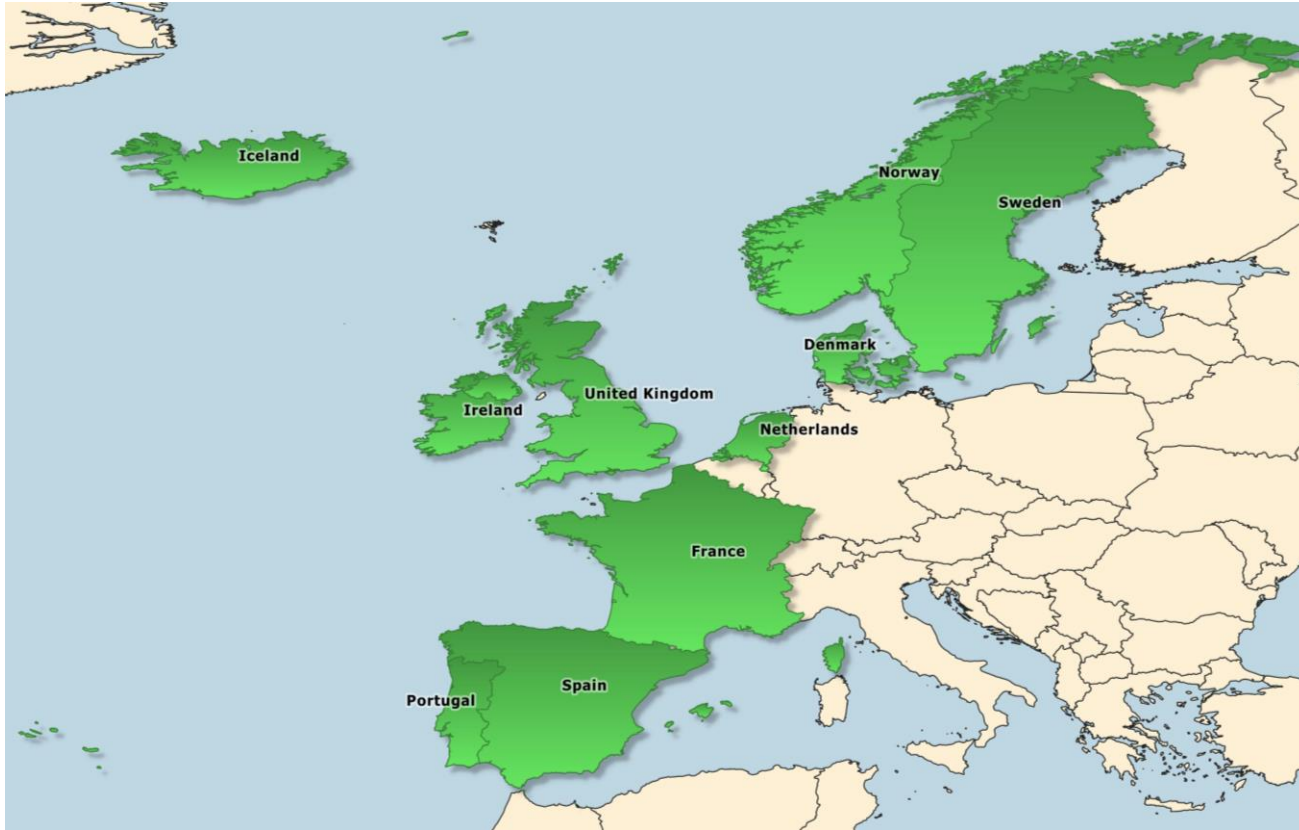


Considerations for assessment and management

- Data-poor stocks: assessment models must handle that
- Mixed fishery? Management of mixed fishery.
- Red-listed species? By-catch?
- Maintain ecosystem services (diversity, trophic structure and contribution to carbon flux)
- Potential future fisheries may be multinational fisheries in international waters: must be managed and governed in accordance with that.



The MEE SO team



20 Partners from 10 countries:
Norway, Ireland, Spain, Iceland,
Netherlands, Denmark, UK, Sweden,
France, Portugal



#	Participant Legal Name	Country
1	HAVFORSKNINGSINSTITUTTET	NO
2	MARINE INSTITUTE	IE
3	SINTEF OCEAN AS	NO
4	FUNDACION AZTI - AZTI FUNDAZIOA	ES
5	Marine and Freshwater Research Institute Iceland	IS
6	WAGENINGEN UNIVERSITY	NL
7	DANMARKS TEKNISKE UNIVERSITET	DK
8	UNIVERSITY OF STRATHCLYDE	UK
9	INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA	Denmark
10	LIEGRUPPEN FISKERI AS	NO
11	WORLD MARITIME UNIVERSITY	SE
12	COLLECTE LOCALISATION SATELLITES SA	FR
13	IMAR- INSTITUTO DO MAR	Portugal
14	NOFIMA AS	NO
15	NATURAL ENVIRONMENT RESEARCH COUNCIL	UK
16	TEAGASC - AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY	IE
17	PELAGIA AS	NO
18	BORD IASCAIGH MHARA	IE
19	EUfishmeal	DK

