

# EXISTING PROJECTS AND NEW APPLICATIONS/COLLABORATIONS

*CoolFish workshop Wednesday 14th October*

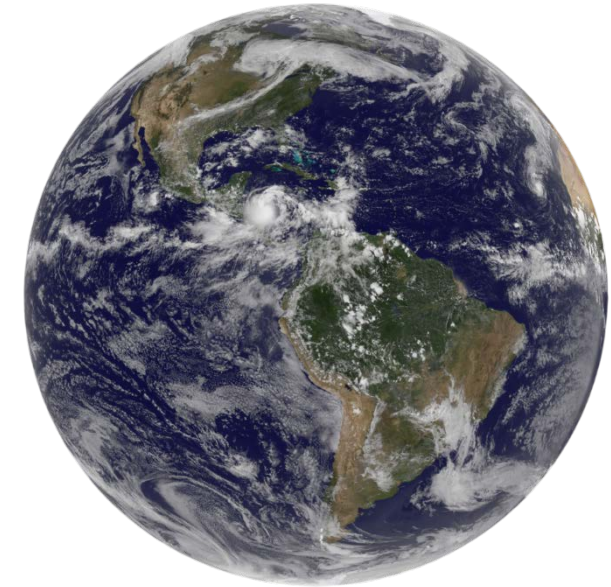
*Guro M. Tveit, Tom Ståle Nordtvedt (SINTEF Ocean)*

# MARINE REST RAW MATERIALS

# FOOD GAP



71 % of the earth is water.....



..... but only 2 % of the world food production comes from the ocean

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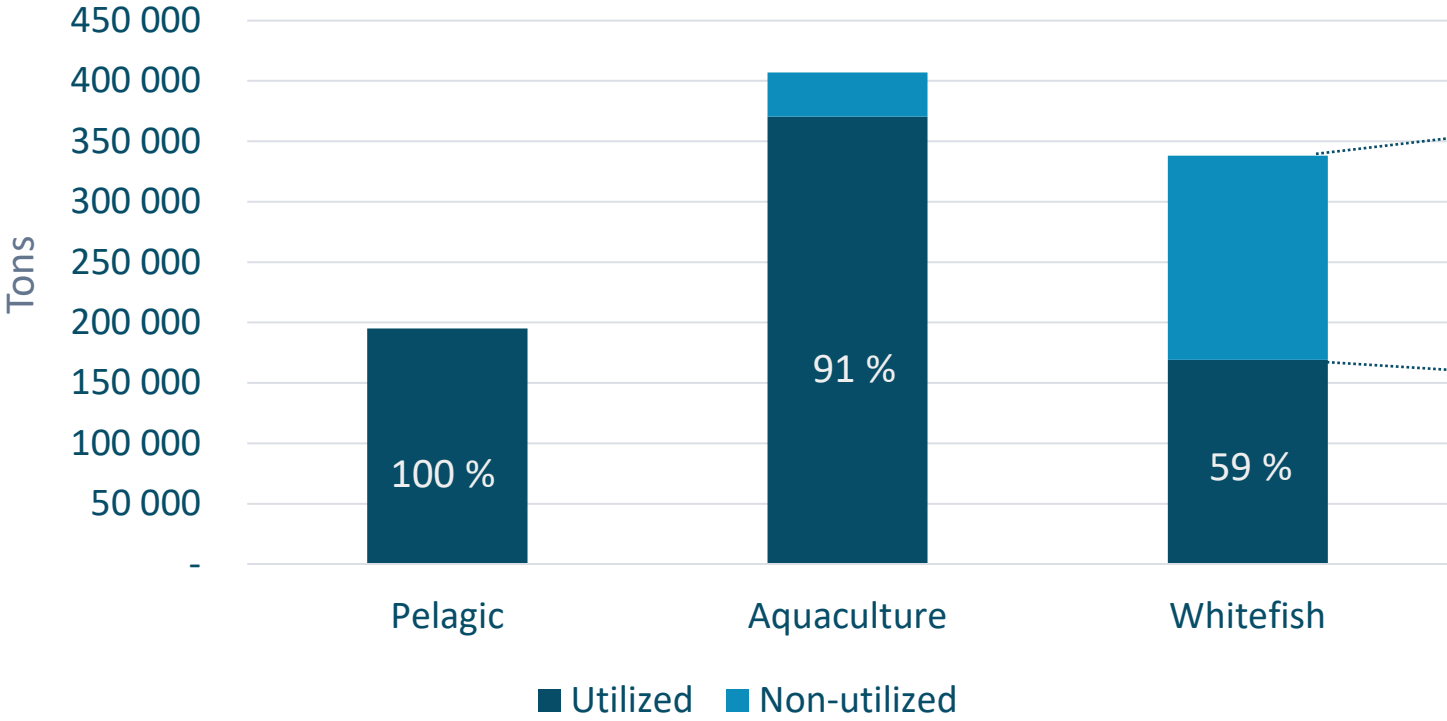
*...When discards prior to landing are included, 35 percent of global catches are lost or wasted and therefore not utilized...*



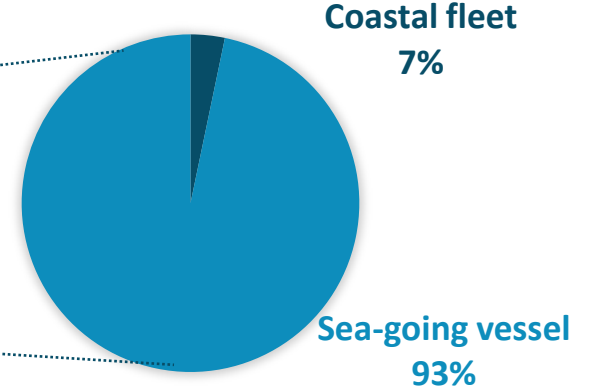
THE STATE OF  
**WORLD FISHERIES  
AND AQUACULTURE**

# MARINE REST RAW MATERIAL IN NORWAY

DEGREE OF UTILIZATION OF REST RAW MATERIALS



DISTRIBUTION OF THE NON-UTILIZED RAW MATERIAL



Source: Richardsen, R., Myhre, M., Nystøyl, R., Strandheim, G., & Marthinussen, A. (2019). Analyse marint restråstoff 2018 - Tilgang og anvendelse av marint restråstoff i Norge.

# THE POTENTIAL IN THE NON-UTILIZED RAW MATERIAL



Non-utilized whitefish rest  
raw materials  
**131 700 ton**  
**(2018)**



6 600 ton lipids



~ 14 million people could get  
their daily recommended intake  
(250 mg EPA + DHA) for a whole  
year



18 500 ton protein

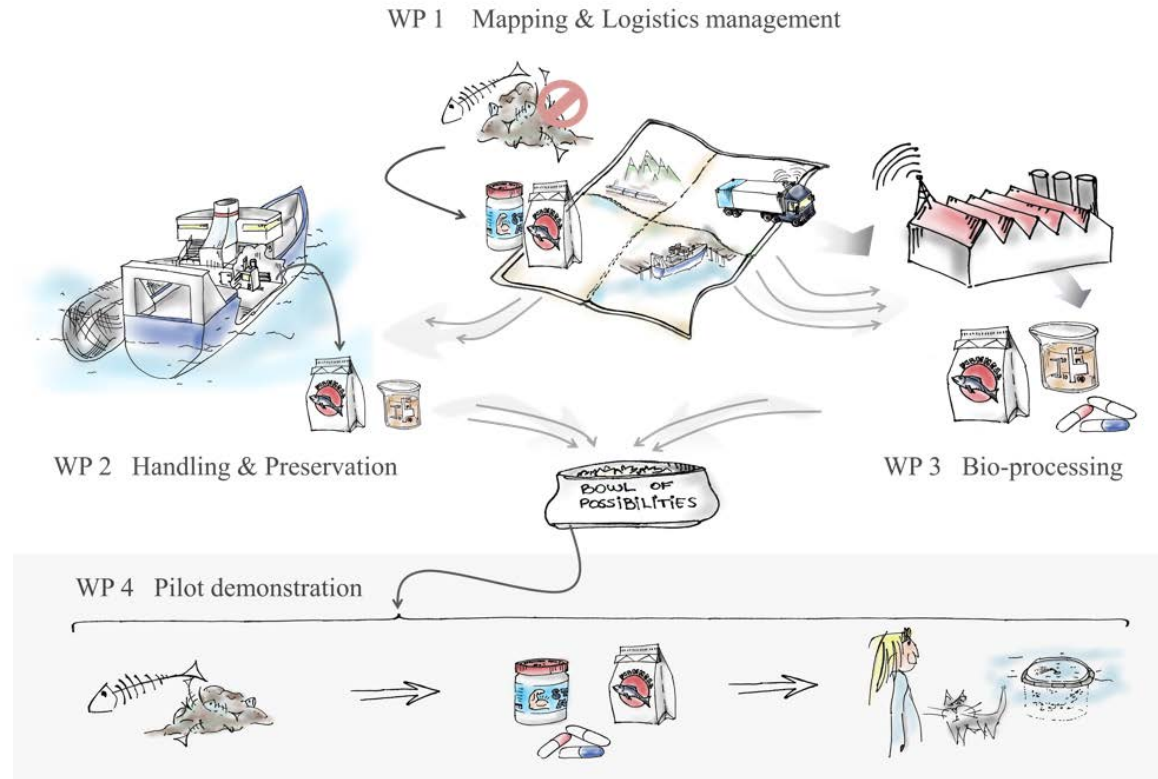


~ 0.8 million people could get  
their daily requirement of  
proteins for a whole year

# SUPREME

Sustainable production of ingredients from whitefish rest raw materials (2019 – 2022)

Project coordinator: PhD Ana Carvajal, Research manager, SINTEF Ocean, 9.9 MNOK



WEB: <https://www.sintef.no/projectweb/supreme/>

Facebook: <https://www.facebook.com/SUPREMEProsjekt>

Instagram: [https://www.instagram.com/supreme\\_prosjekt/](https://www.instagram.com/supreme_prosjekt/)



# LOW-TROPHIC AND MESOPELAGIC FISHERIES

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# MESOPELAGIC

The mesopelagic layer is one of the least understood ecosystems on Earth. Recent research suggests that the fish biomass in the mesopelagic ecosystem might be 10 times higher than previously thought, and therefore represent 90 % of the fish biomass of the planet.



# SFI HARVEST

The **main objective** of SFI Harvest is to develop knowledge and technologies for responsible harvesting and processing of lower trophic marine resources, allowing sustainable growth of Norway's biomarine industries.



## SUSTAINABLE MANAGEMENT OF MESOPELAGIC RESOURCES

*SUMMER's ambition is to obtain the information vital for a sustainable use of ocean resources through a comprehensive understanding of ocean functioning across its full depth.*

Up to now the ocean has been studied in layers, with a bias towards the surface one where photosynthesis takes place and viewing the flux of material as simply downward.

However, the unexpectedly large new estimates of mesopelagic biomass clearly indicate that we need to consider the whole ecosystem vertically integrated from surface to seafloor because these abundant organisms frequently traverse the full water column.

<https://summerh2020.eu/>



Horizon 2020  
European Union funding  
for Research & Innovation



# MEE SO

Can organisms living deep in the oceans be exploited in an ecologically and economically sustainable way, or are they too vulnerable?

This is the overarching question in the MEE SO research project. Global population growth increases the demands for food, including marine products. Mesopelagic organisms, living at depths between 200 and 1000 m, represent the largest unexploited resource left in the oceans.



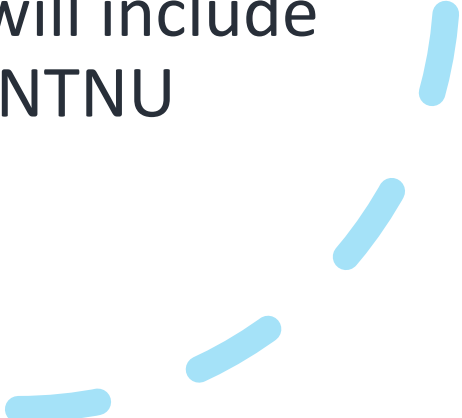


# NEW VESSELS

- To utilize a higher amount of the RRM generated by the sea-going vessels, the RRM needs to *be preserved by thermal and/or chemical methods* in order to increase their shelf life or *be processed into semi-manufactures or ingredients on board*
- On board processing solutions need to be flexible, compact and adapted to demanding on-board conditions
- Some technological solutions suitable for on board processing:
  - Silage
  - Enzymatic hydrolysis
  - Thermic
  - Feed and oil production
  - Other...
- Storage capacity
  - Storage of frozen RRM or selected fractions?
- More for food purposes?



## Other related projects

- Cruize (started this year) – Develop innovative and energy efficient solutions for hotel power demand of cruise ships – Lead by SINTEF Energi (Cecilia Gabriellii)
  - Electrification of fishing vessel (started this year) – develop system solutions for costal fishing vessel – Lead by Sintef Ocean (Sepideh Jafarzadeh)
  - INDEE+ (application) – part of it will include fishing vessels in India – Lead by NTNU (Armin Hafner)
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# IPN –Project (Idea)

- Multi purpose fishing vessel. Energy operation

# Support to spins- off project

- FHF
- Enova
- Norges forskningsråd
- Innovasjon Norge

