



Trophic ecology and its influence on metal transfer in the mesopelagic food-web from Norwegian Fjords and the North Sea: A multi-tracer approach using stable isotope and fatty acid analyses

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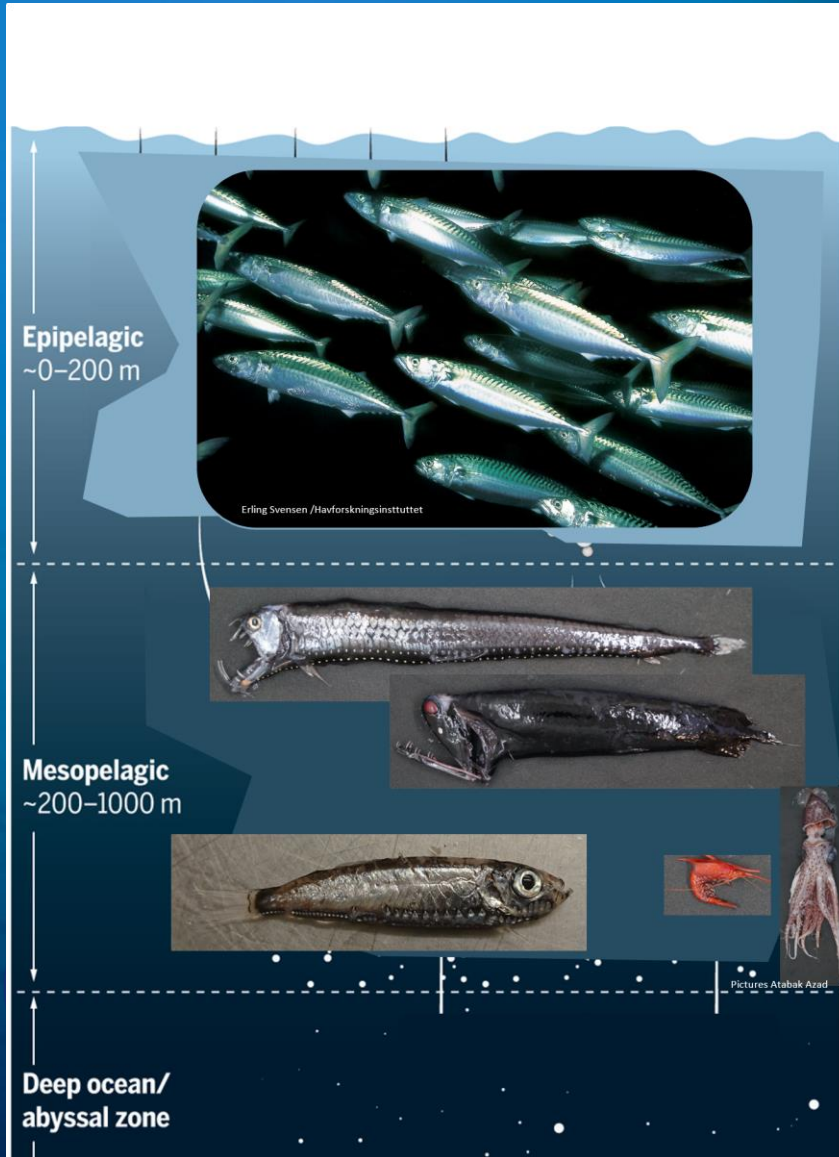
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Session 1:Trophodynamic Processes**

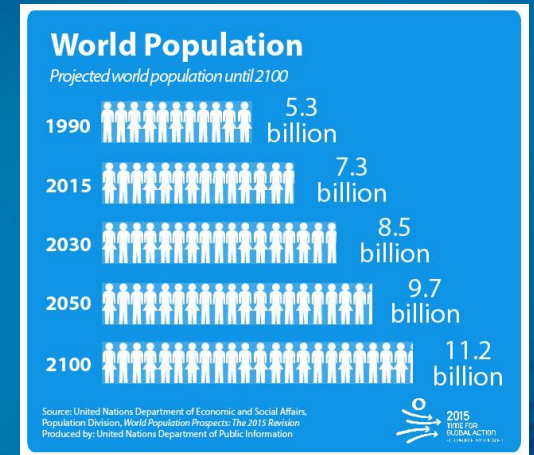


Mesopelagic zone

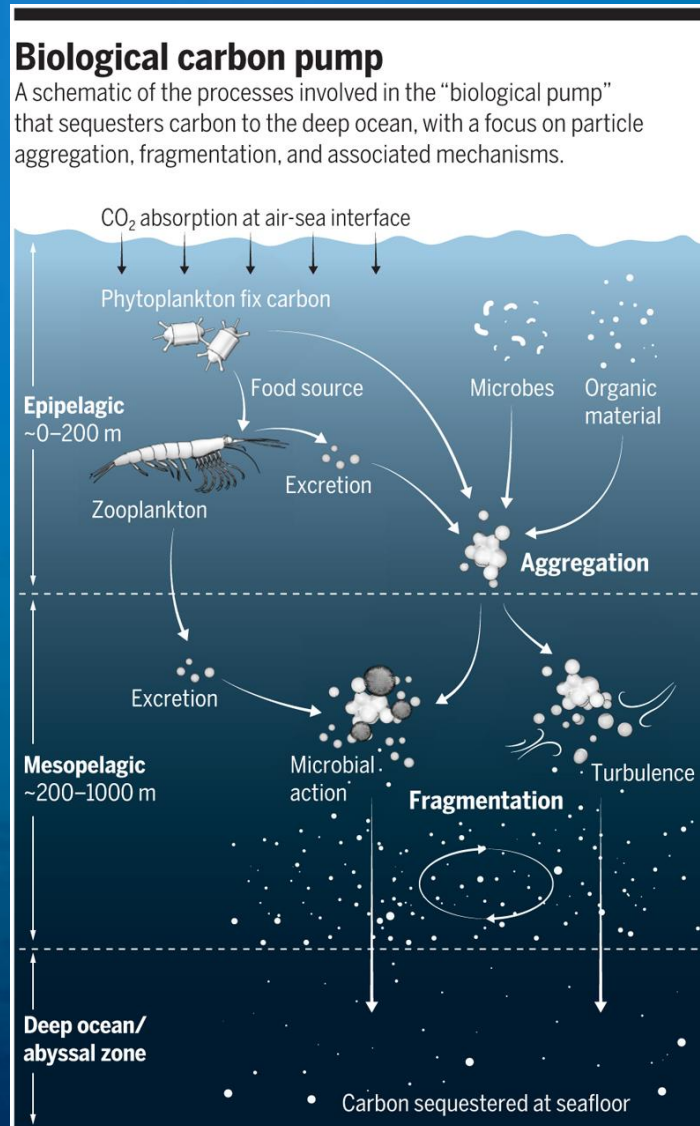


100 x Annual catch

Biomass estimation: 1-10 000 000 000 t



Exploitation



Risk



Benefit



Nutritional value

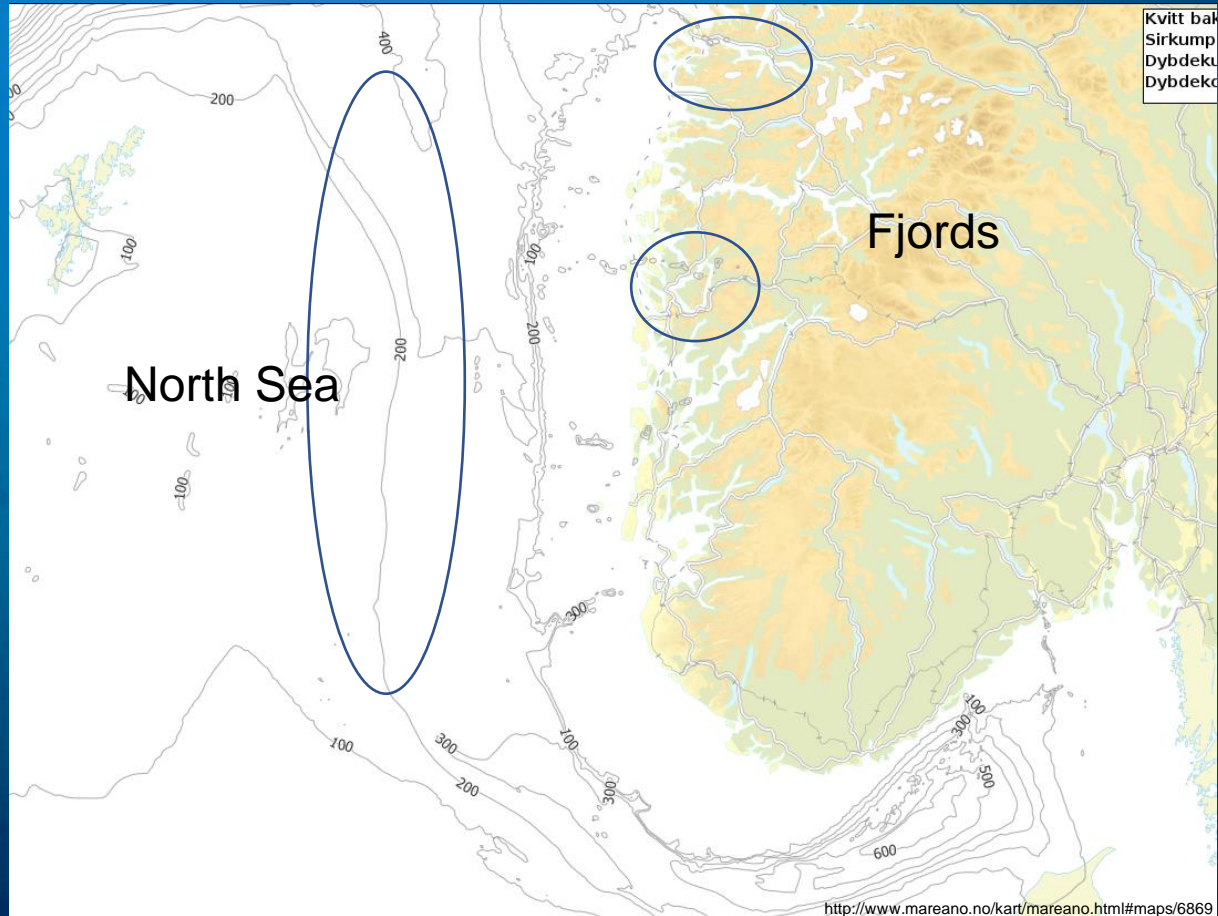
Research question

- Are mesopelagic species special → metal composition, trophic position and fatty acid profile?
- How low trophic are the mesopelagic species?



Material & Methods

Mesopelagic cruise March 2021



Measurements:

- Trace elements
- Fatty acids and fatty alcohol
- Stable isotopes (C+N)





Glacier lantern fish



Silvery lightfish

Velvet belly

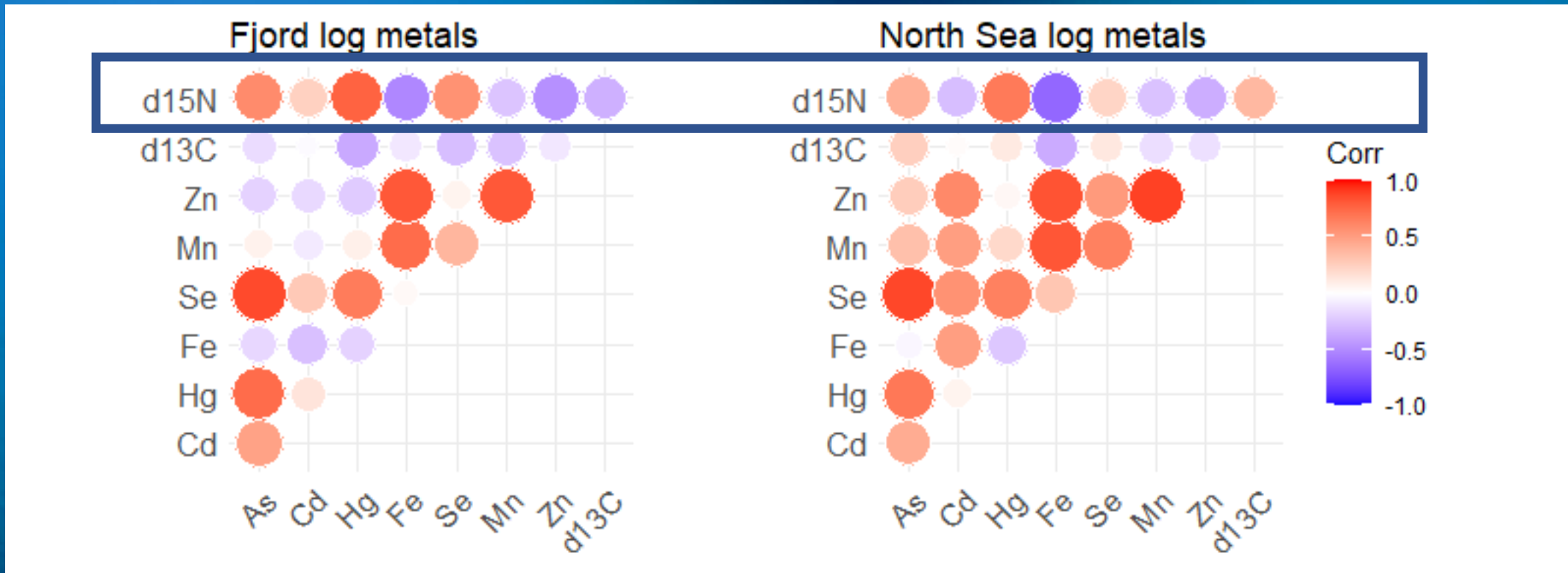


Blue whiting



Greater Argentine

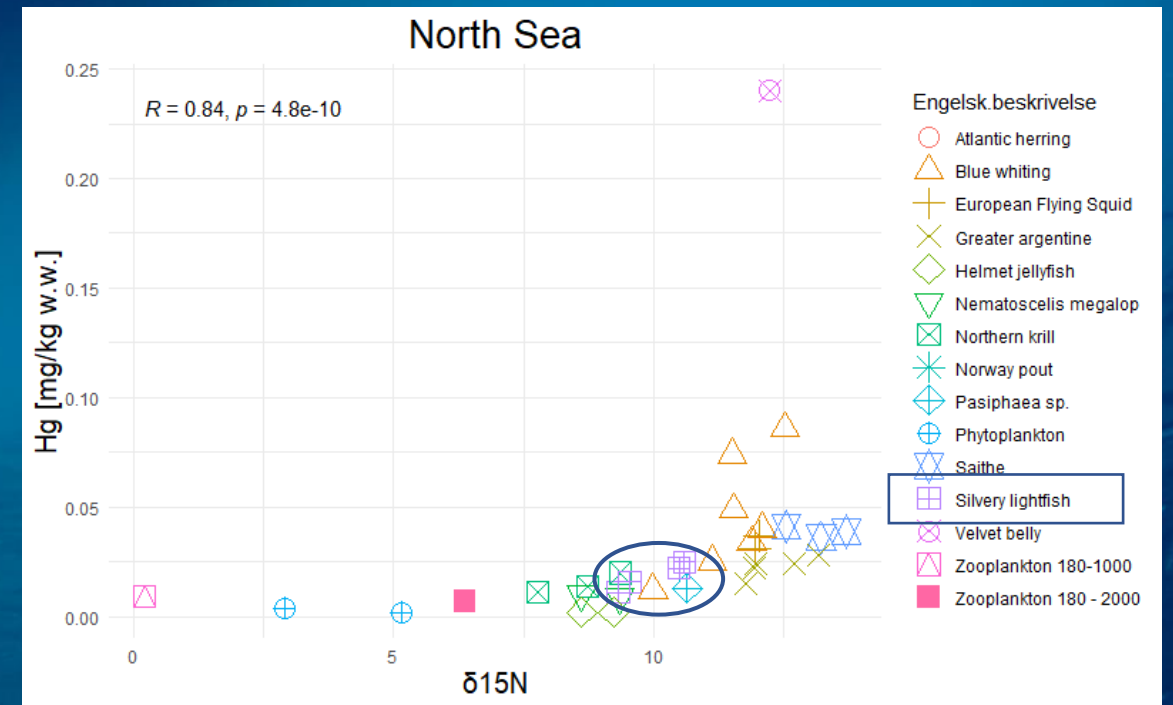
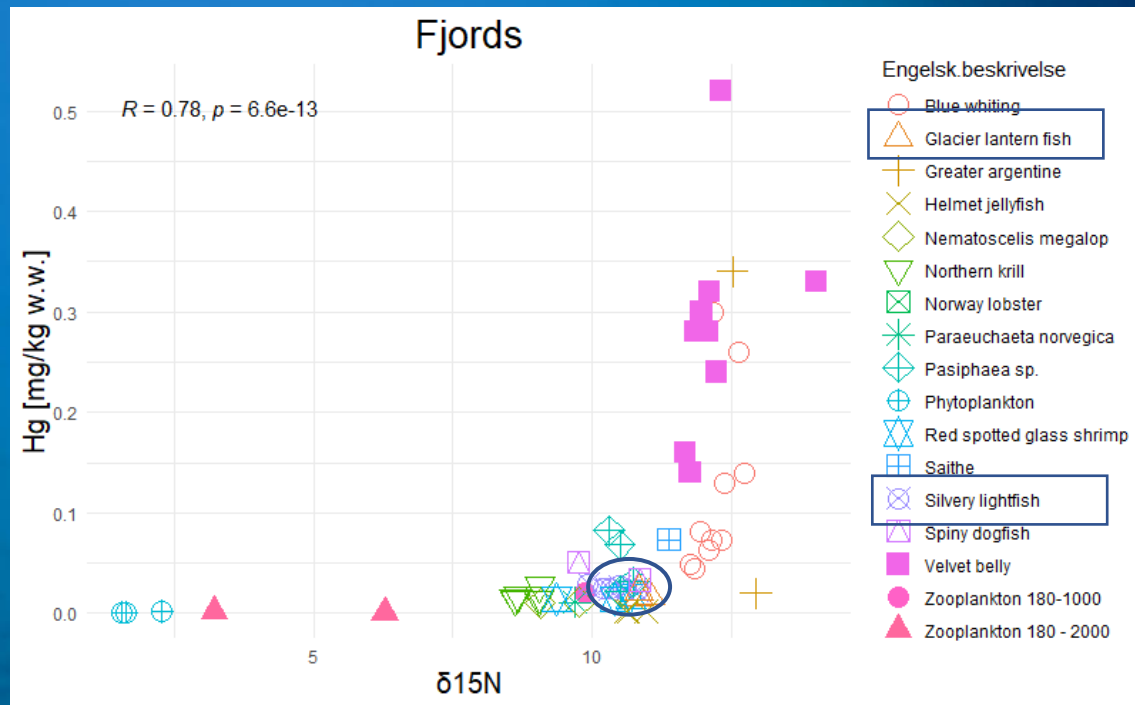
Element accumulation in the two food-webs



→ Same pattern with Hg and As biomagnifying



Mercury biomagnification



Food web magnification factors

2.95

1.73

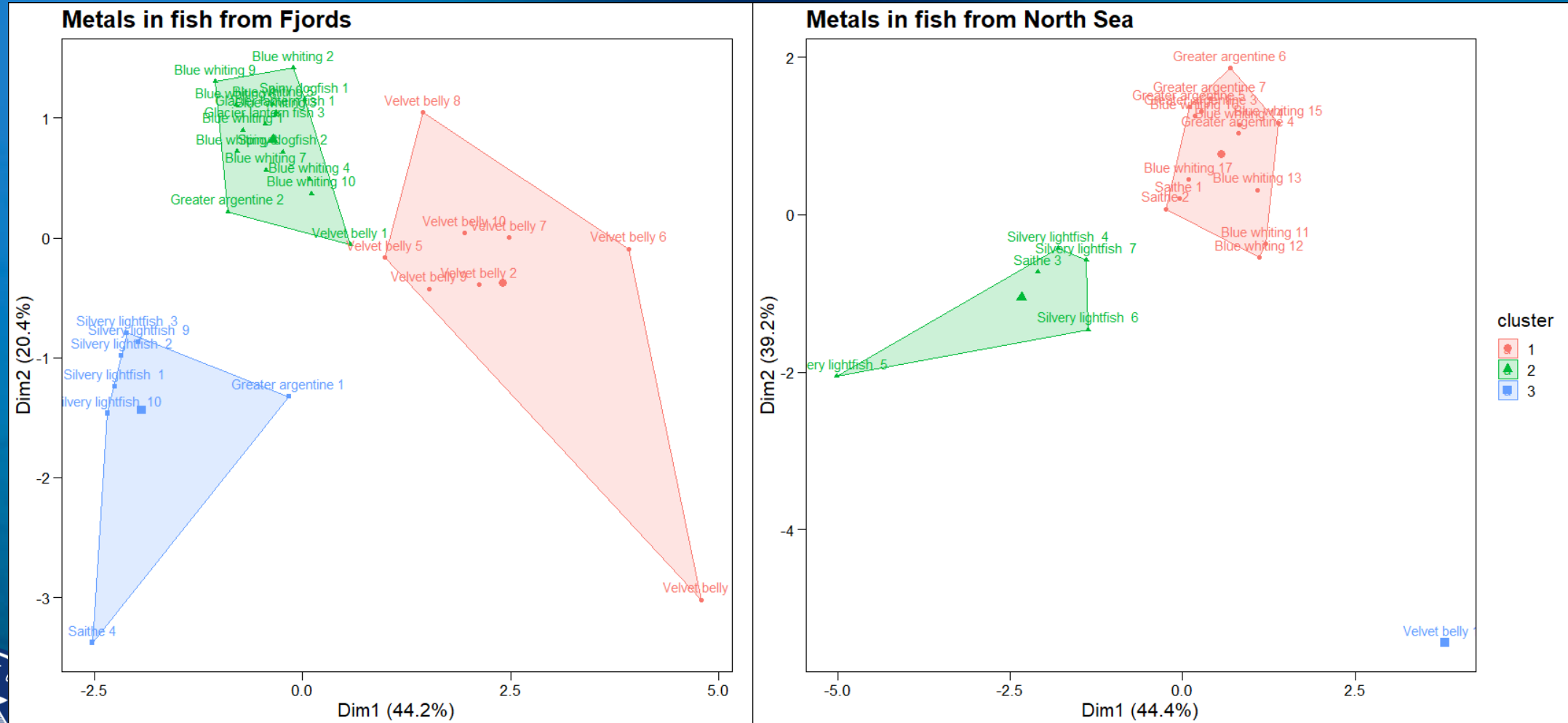
Comparable to **Gulf of St. Lawrence (Canada): 1.48**

Lavoie et al 2012



→ Meso fish species do not stand out

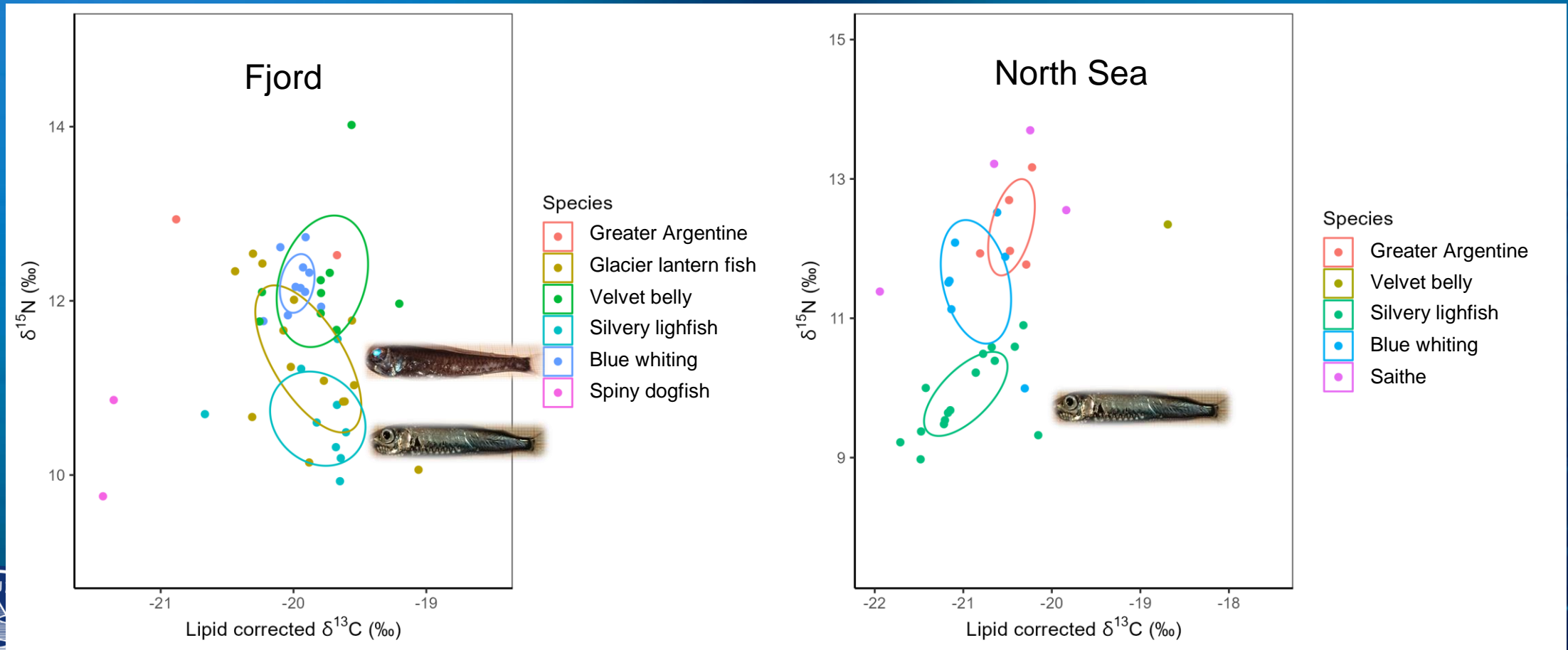
Are mesopelagic species different? – Total metal composition



→ Considering whole element composition → Silvery lightfish is different.

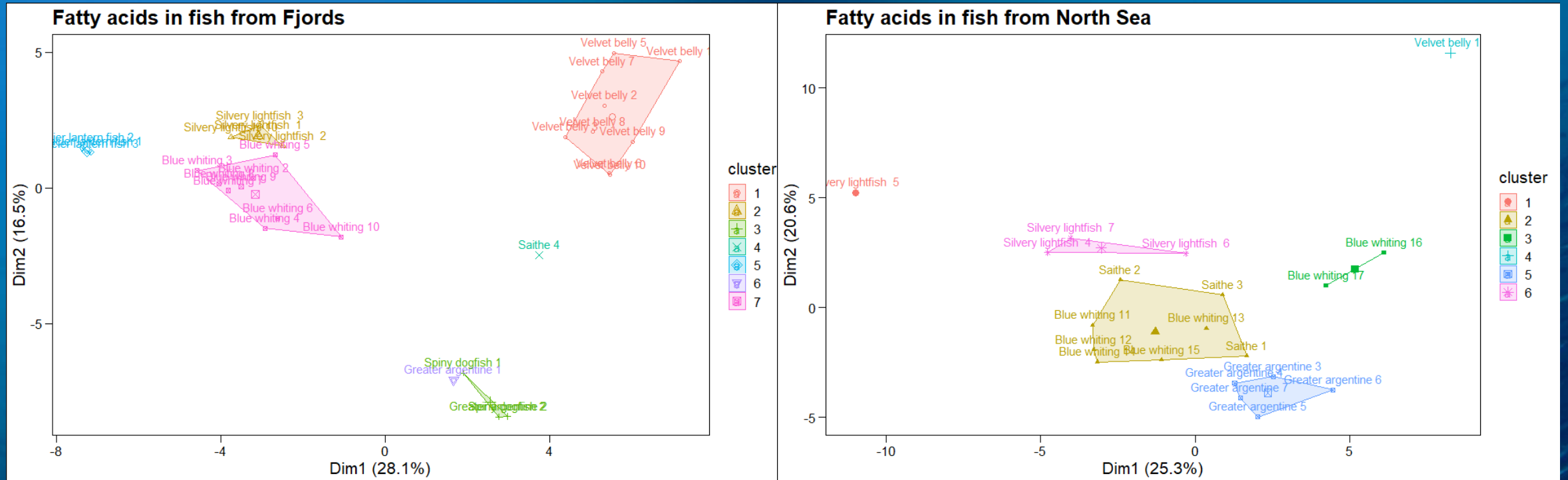


Are mesopelagic species different? Isotopic niche



→ Isotopic niche of especially Silvery lighfish is different → LOW TROPHIC

Are mesopelagic species different? Fatty acid composition



All species have there own cluster → All are different

Conclusion

- Mesopelagic species.....

.....have a distinct element composition

.....do fill a specific niche

.....FA composition is specific

Indicates that they ARE SPECIAL 😊

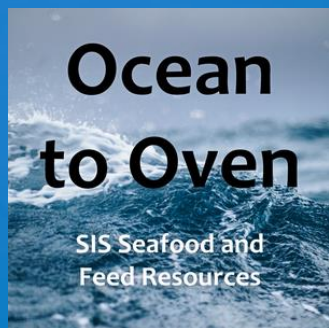


Future perspectives



- Finding out what makes them SPECIAL!
- Bayesian modelling to compare the isotopic niches more closely
- Isotopic mixing modelling to find out more about trophic interactions
- Using single FA as tracers and correlate to findings from metals and trophic interactions.





Seafood and Feed Resources – Ocean to Oven

<https://www.hi.no/en/hi/forskning/projects/seafood-and-feed-resources>



Meeso :Ecologically and Economically Sustainable Mesopelagic Fisheries

<https://www.meeso.org/>



Thank you for your attention!!

And...even small fish might make big waves

