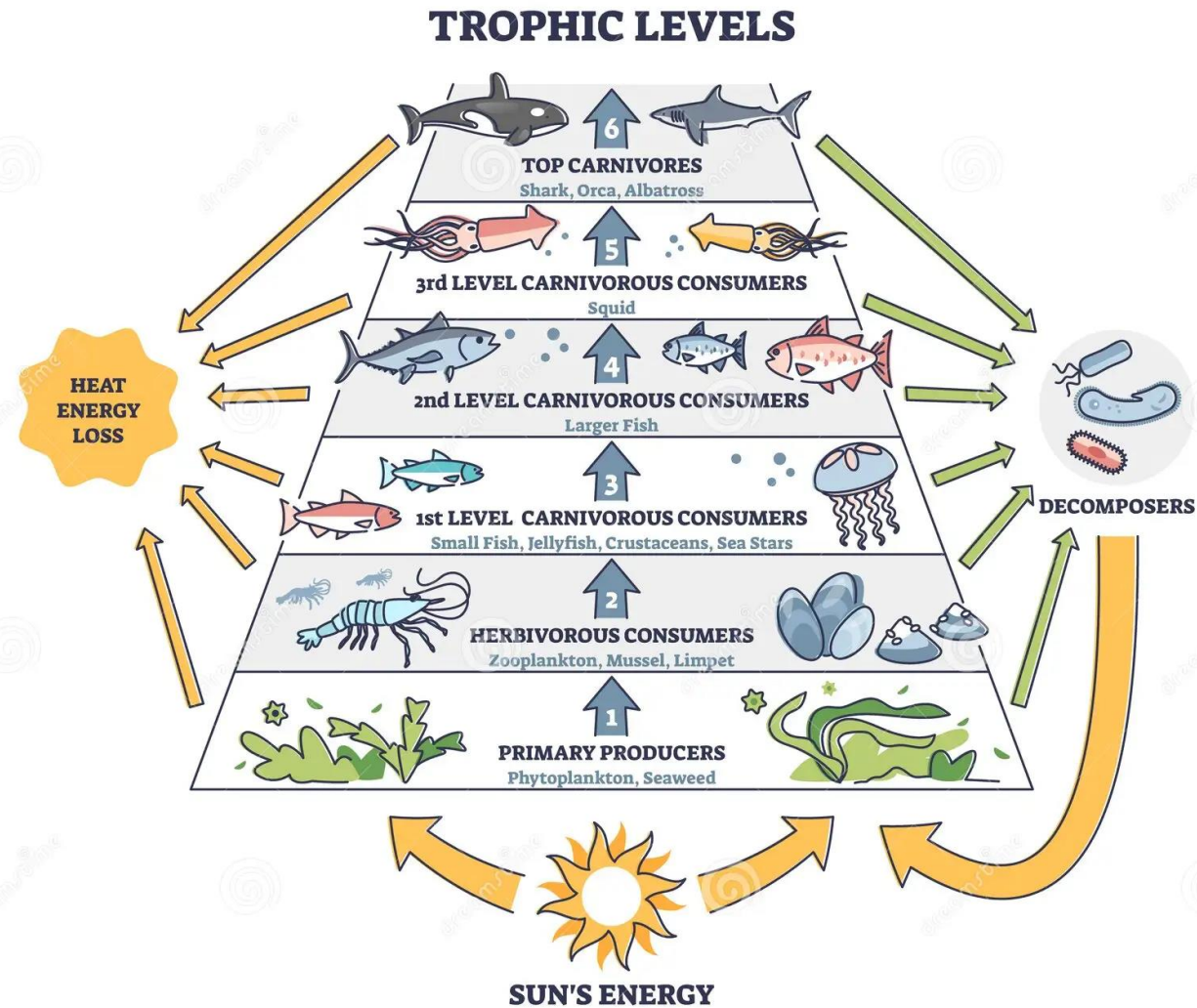


Microjellyfish and climate change

Fiskaaling: Amanda Vang, Eiríkur Danielsen

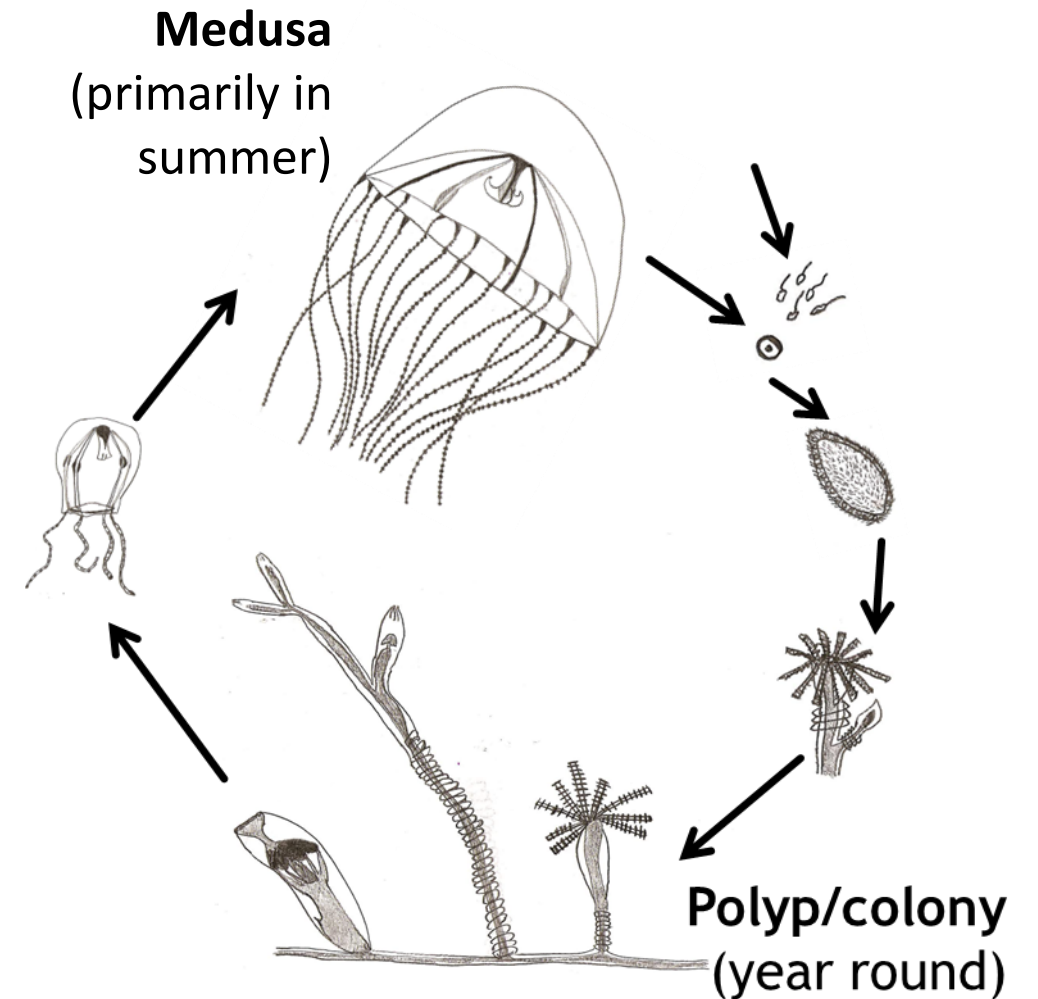
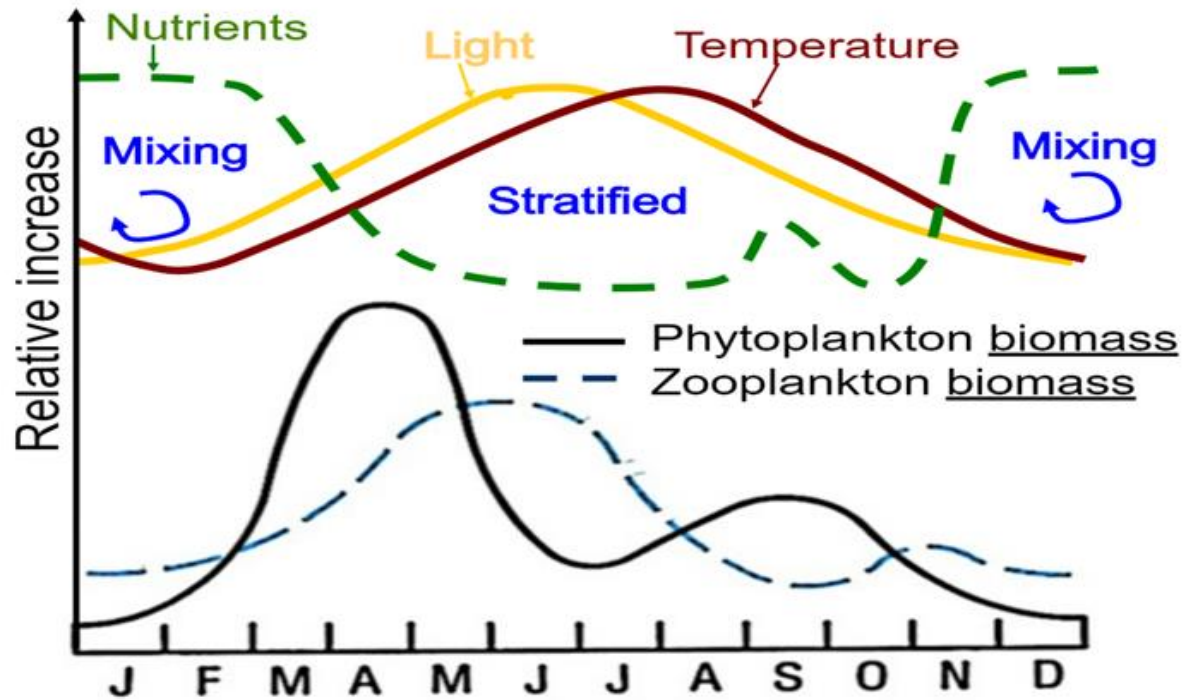
Jellyfish are important regulators of marine foodwebs

Changes in their abundances may have significant consequences for marine food webs and ecosystems

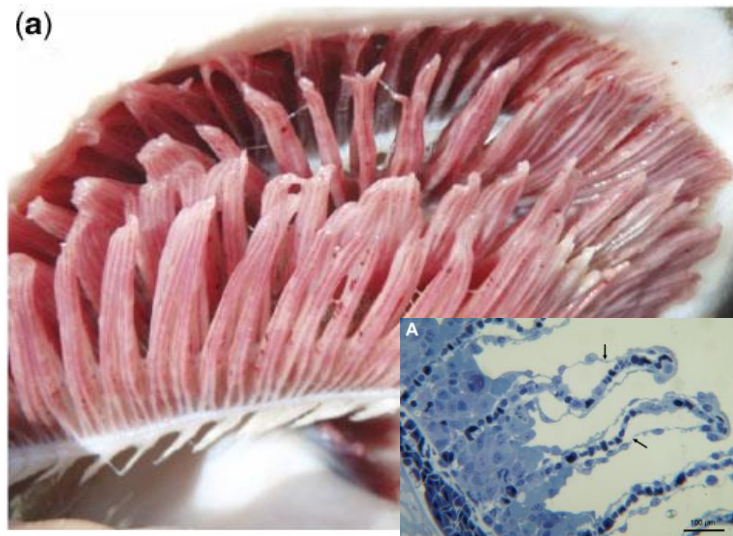


Jellyfish populations dynamics are influenced by seasonal cycles

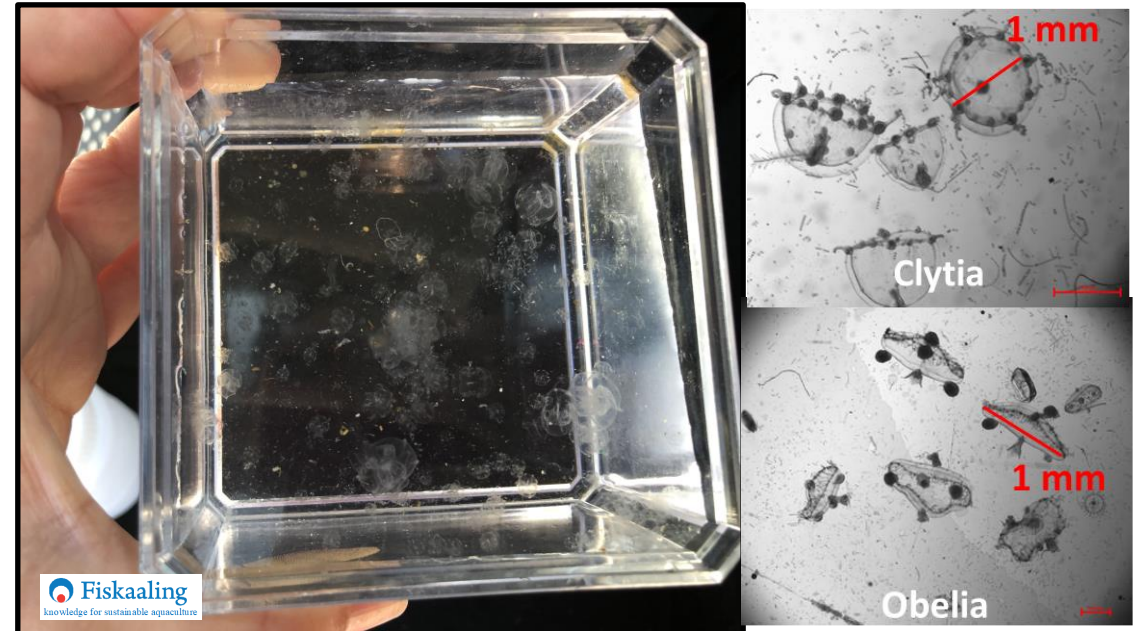
Annual cycle in N. Atlantic



Microjellyfish pose a significant risk to farmed salmon

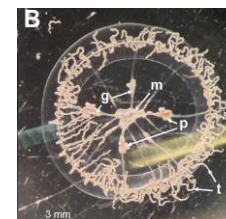


Identification of Microjellyfish by microscope



- stinging cells inject venom and damage gills
 - Increase risk for secondary infections
- Gelatinous form clogs gills
- Blooms deplete dissolved oxygen around cages

PLOS ONE



RESEARCH ARTICLE

Concurrent jellyfish blooms and tenacibaculosis outbreaks in Northern Norwegian Atlantic salmon (*Salmo salar*) farms

Sverre Bang Småge^{1,2*}, Øyvind Jakobsen Brevik^{1,2}, Kathleen Frisch^{1,2}, Kuninori Watanabe², Henrik Duesund¹, Are Nylund²

¹ Cermaq Group AS, Dronning Eufemiasgate 16, Oslo, Norway, ² Fish Disease Research Group, Department of Biology, University of Bergen, Thormøhlensgate 55, Bergen, Norway

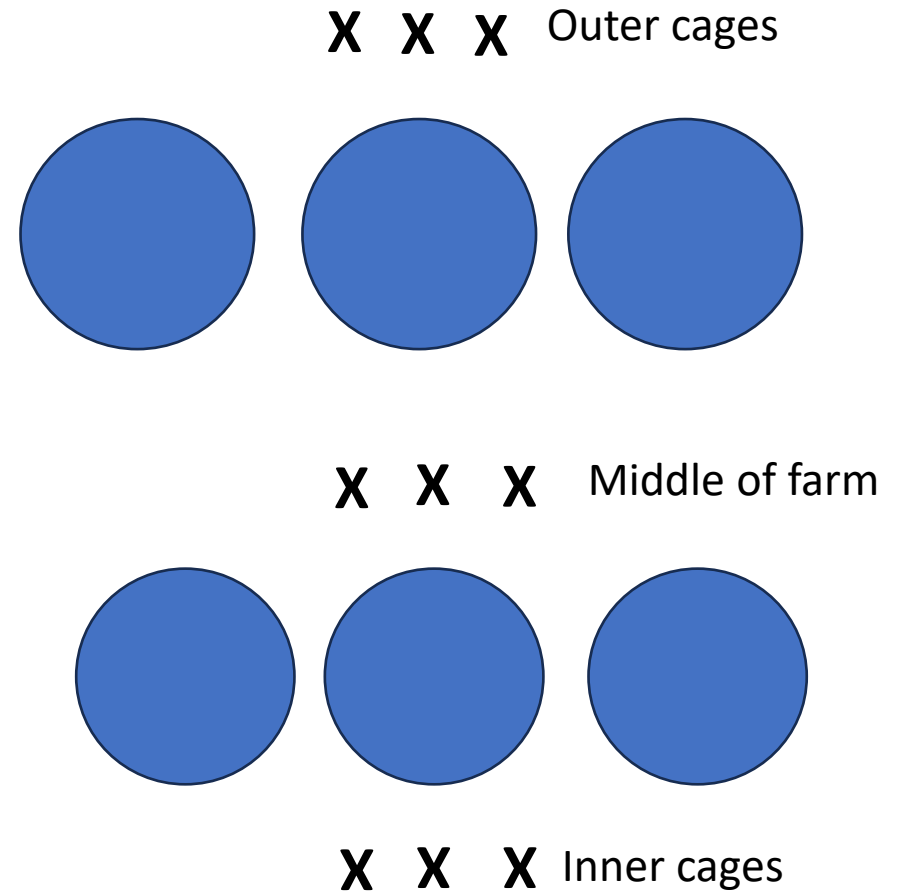
August-October 2023

First monitoring of microjellyfish at Faroese salmon farmsites

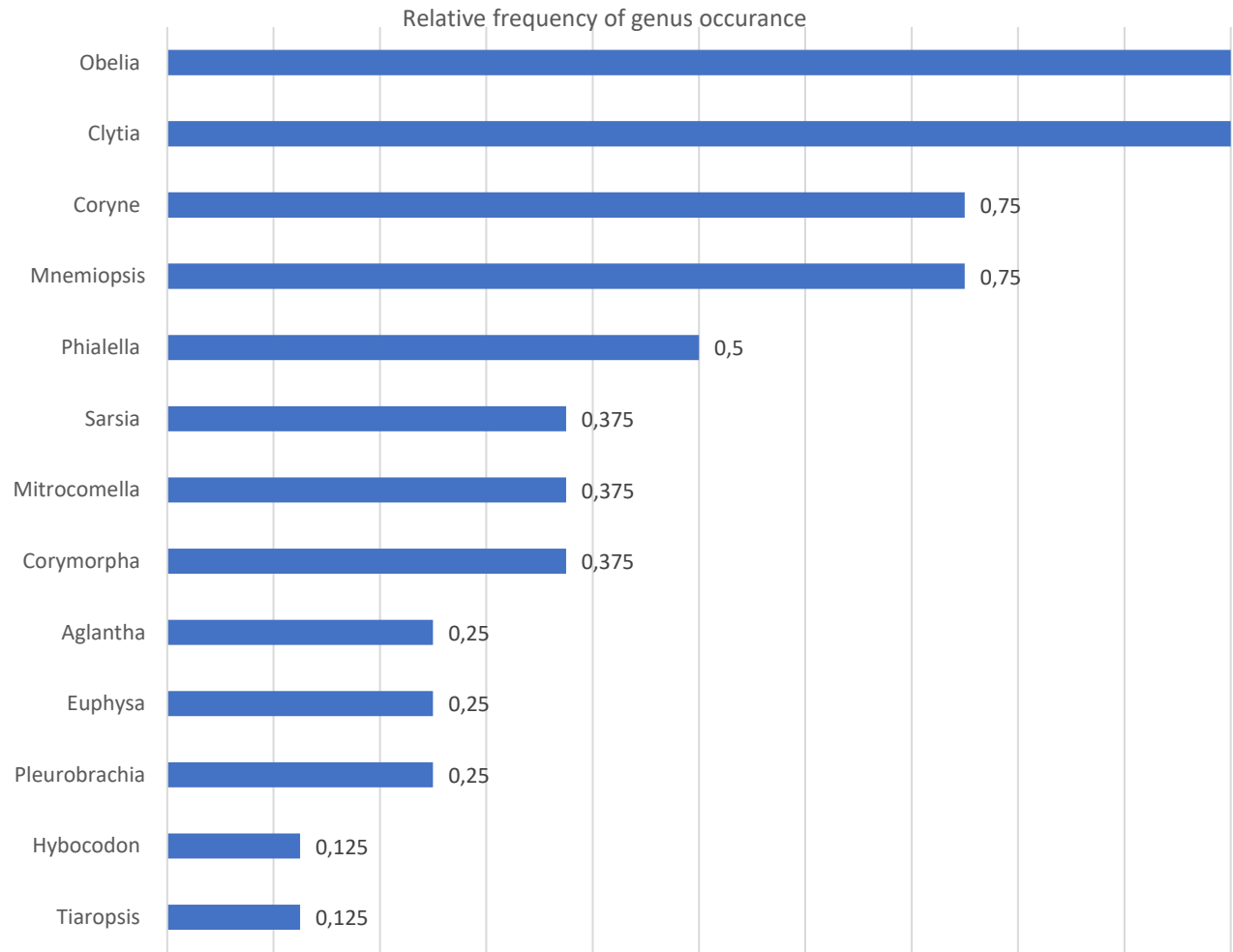


Triplicate vertical hauls at 3 stations with a 250 μ M, 0,3m plankton net

Microscope counts (diversity and abundance)
biobank individual specimens for genetic analysis



What genera of microjellyfish are common at Faroese farmsites?



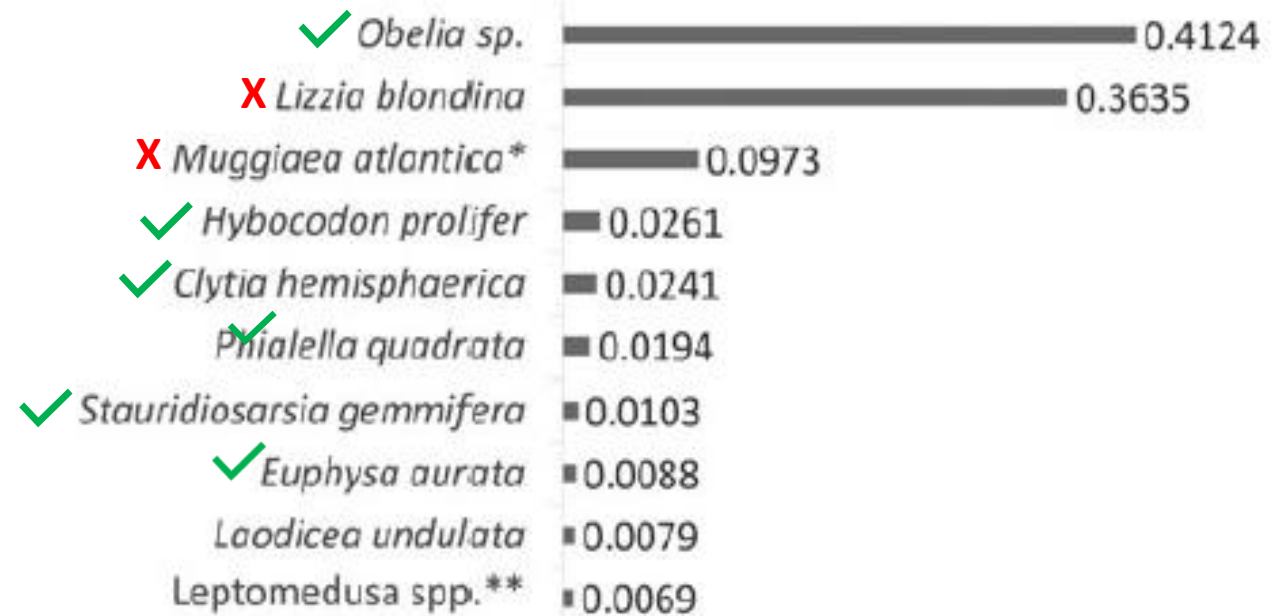
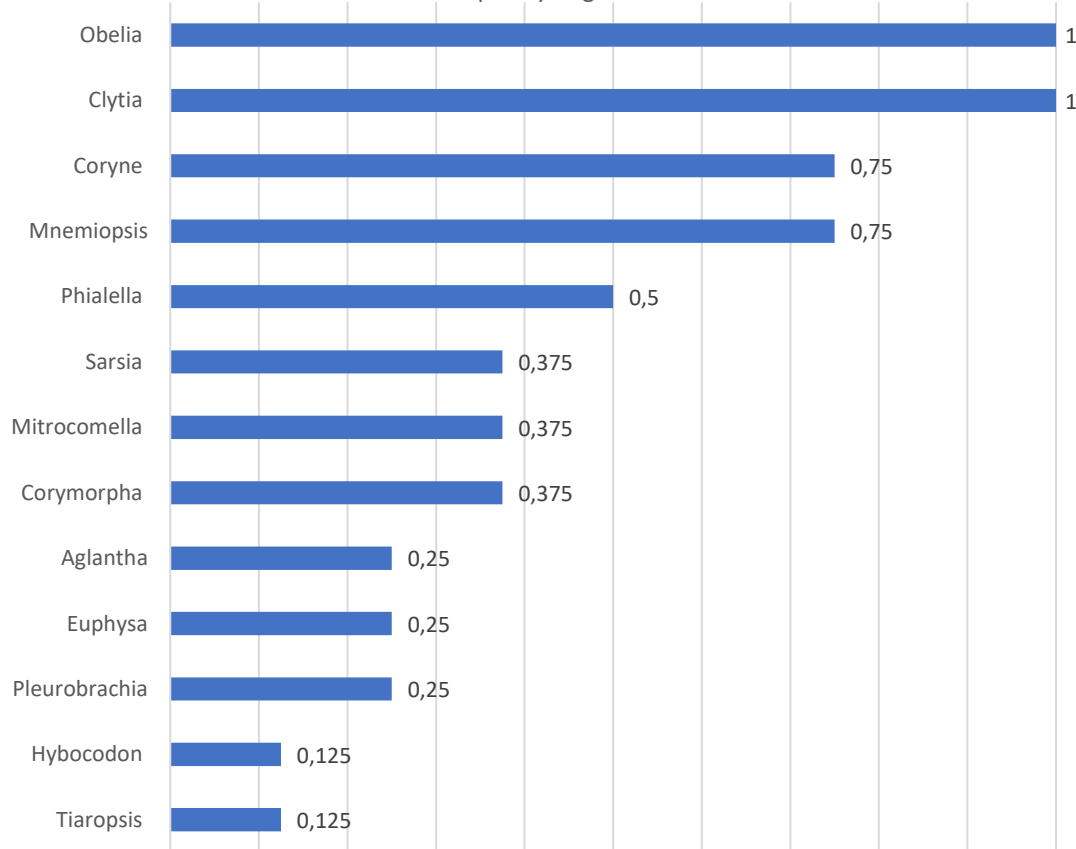
N= 8 sampling days



Do Faroese farmsites have the same genera as Scotland?



Relative frequency of genus occurrence

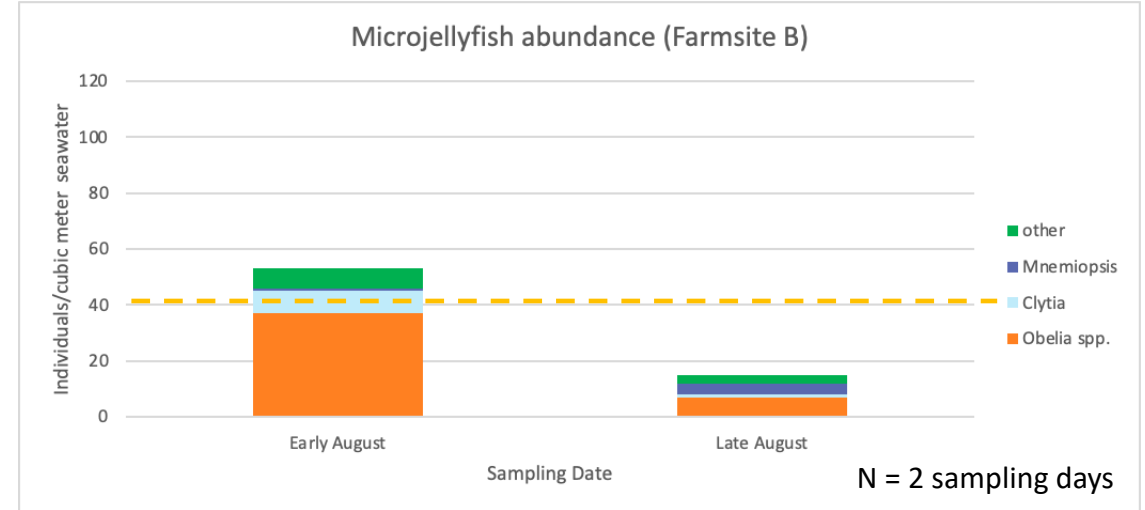
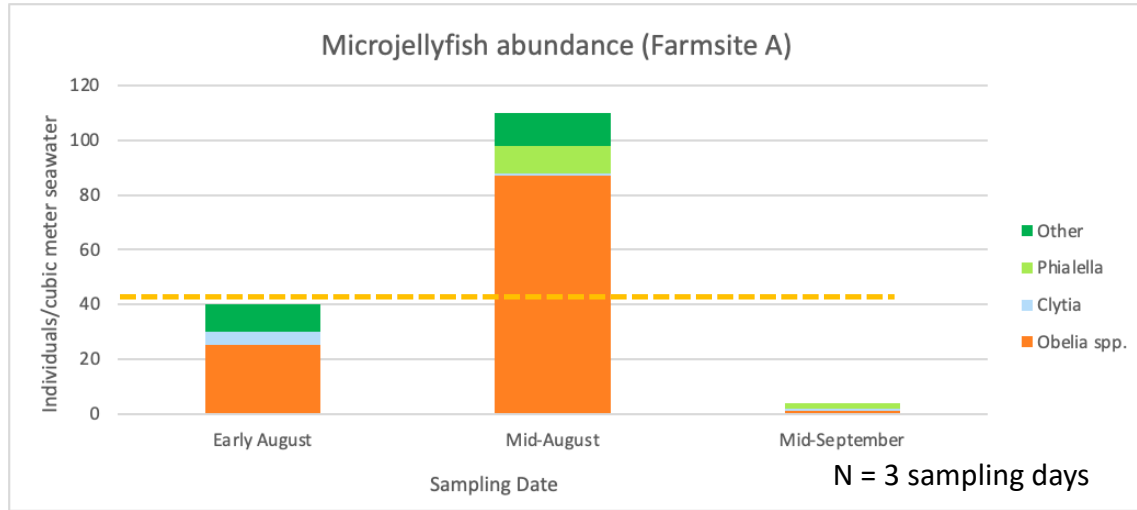


Journal of the Marine Biological Association of the United Kingdom, page 1 of 12. © Marine Biological Association of the United Kingdom, 2018
doi:10.1017/S000531541800032X

Cryptic hydrozoan blooms pose risks to gill health in farmed North Atlantic salmon (*Salmo salar*)

ANNA KINTNER AND ANDREW S. BRIERLEY
Pelagic Ecology Research Group, Scottish Oceans Institute, University of St Andrews, East Sands, St Andrews KY16 8LB, UK

Do Faroese farmsites have a similar microjellyfish density as Scotland?



Bloom defined as density > 280 jellyfish/cubic meter seawater



Cryptic hydrozoan blooms pose risks to gill health in farmed North Atlantic salmon (*Salmo salar*)

ARINA, SUTHERLAND, AND ANDERSON, G. (2013) *Hydrozoan Blooms and Gill Pathology in Farmed Atlantic Salmon*. *Journal of the Marine Biological Association of the United Kingdom*, 93, 1-11.

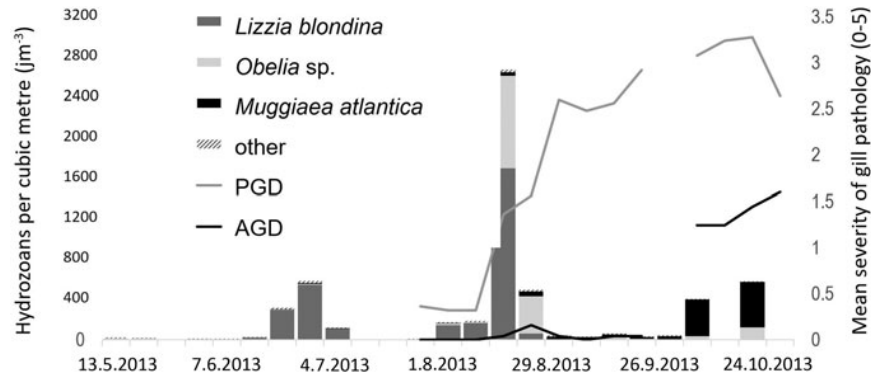


Fig. 12. Increase in PGD and AGD following bloom exposure. A major increase in PGD followed a high-magnitude spike in populations of *Obelia* sp. and *Lizzia blondina*; AGD also increased with lag.

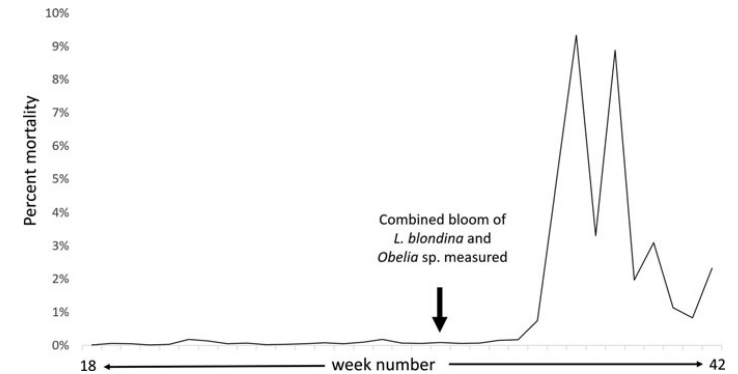
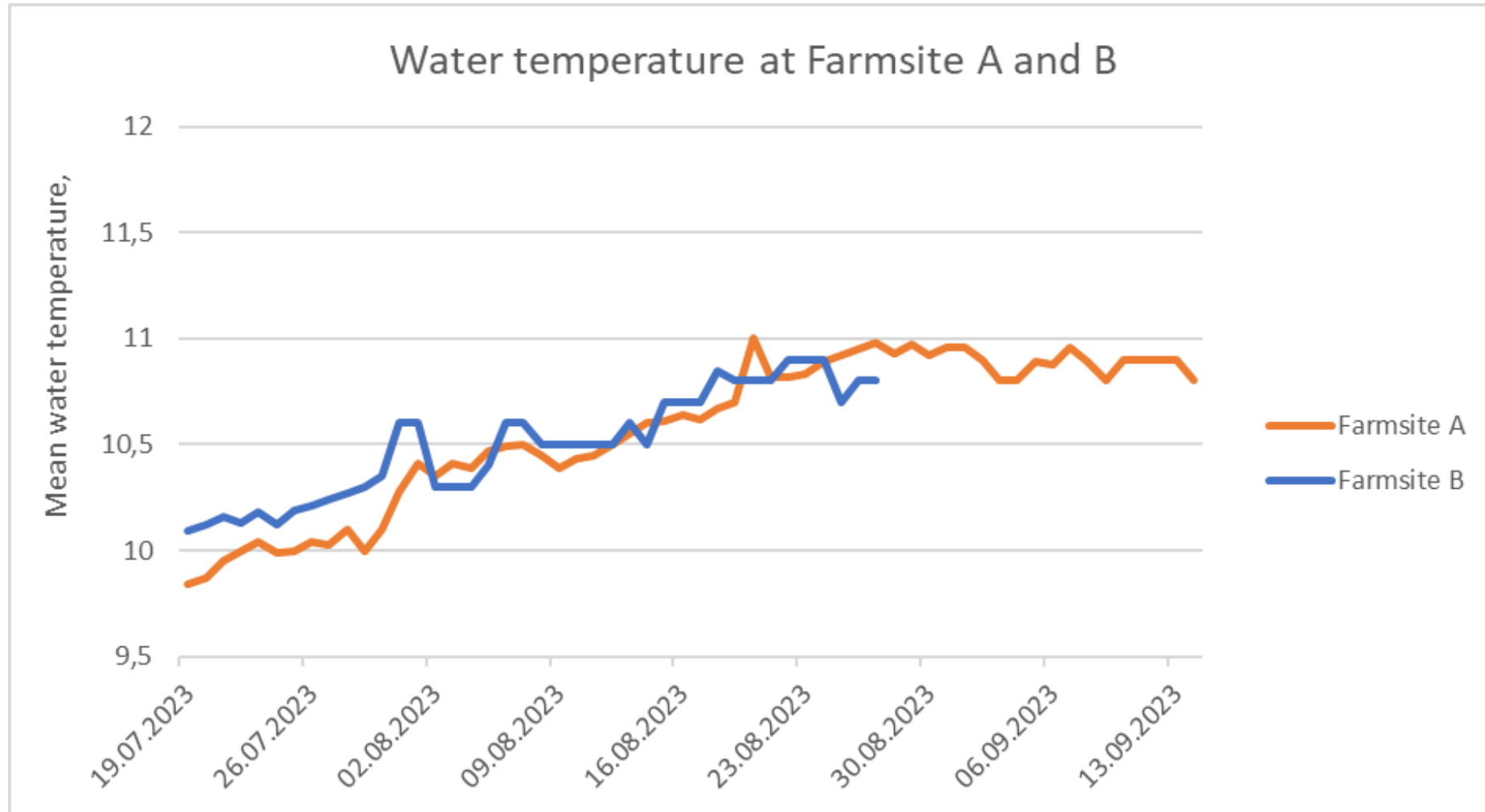


Fig. 13. Mortality increased dramatically at Portnalong in 2013 following exposure to multiple hydromedusan species and a rise in gill pathology.

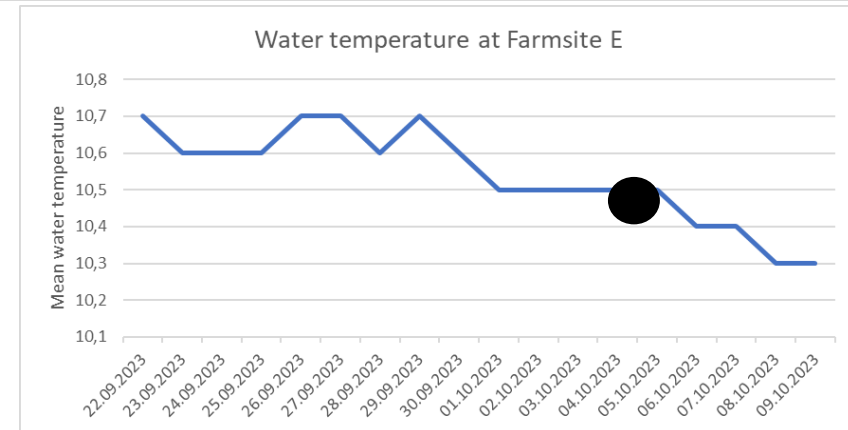
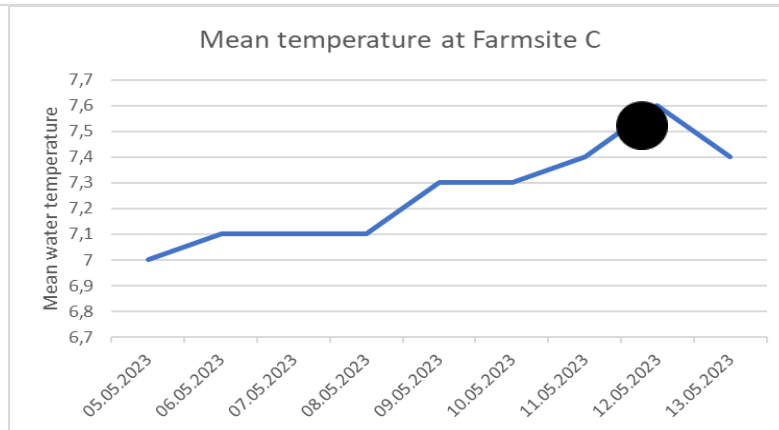
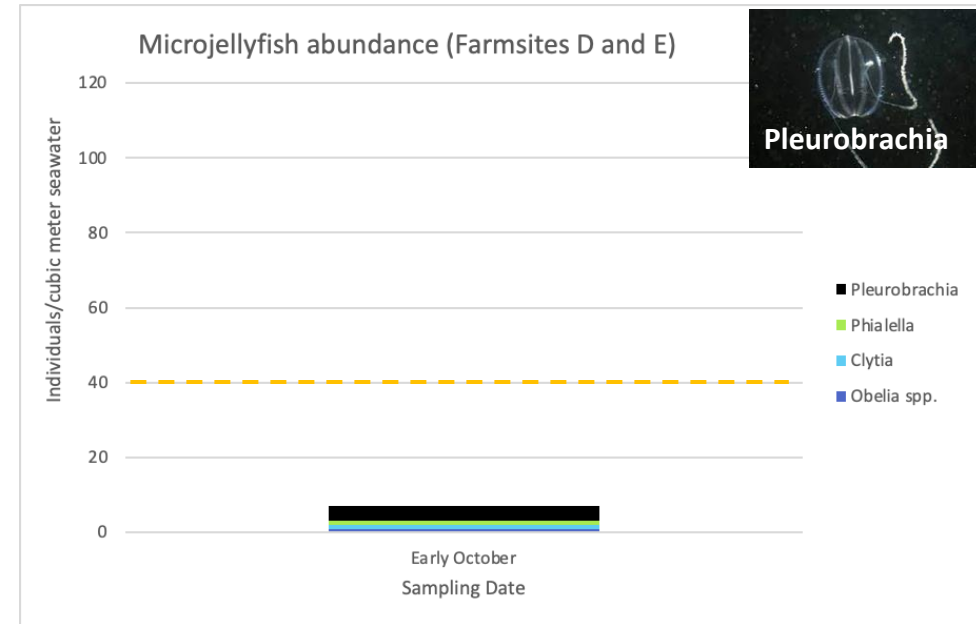
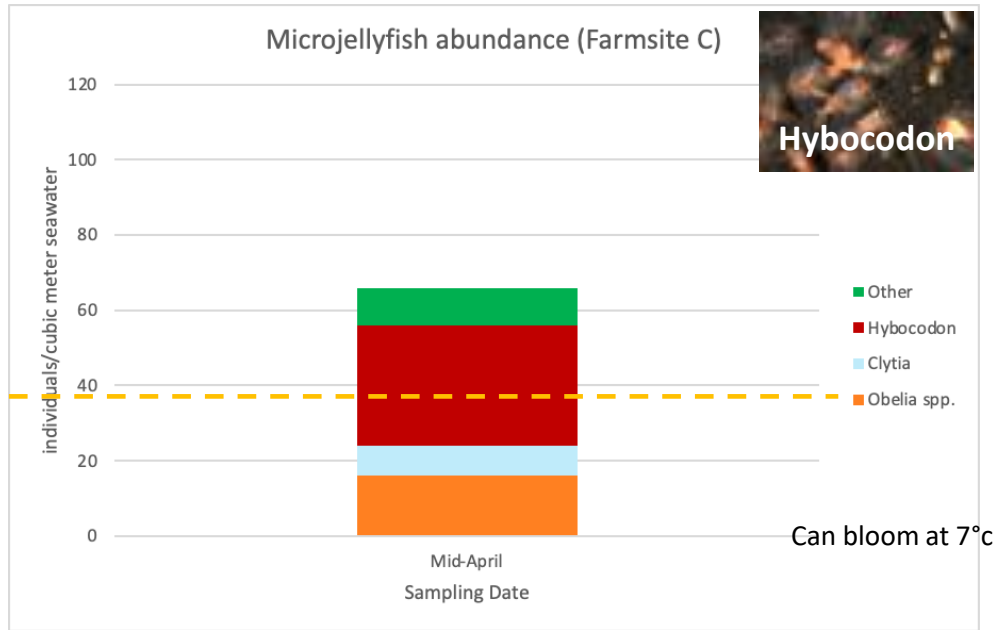
Spatial distribution and abundance is mediated (in part) by water temperature

In the Scottish study, blooms of *Obelia* and *Lizza Blondina* only occurred after at least a two week period of mean water temperature of 12.8°C



Blooms can be highly variable

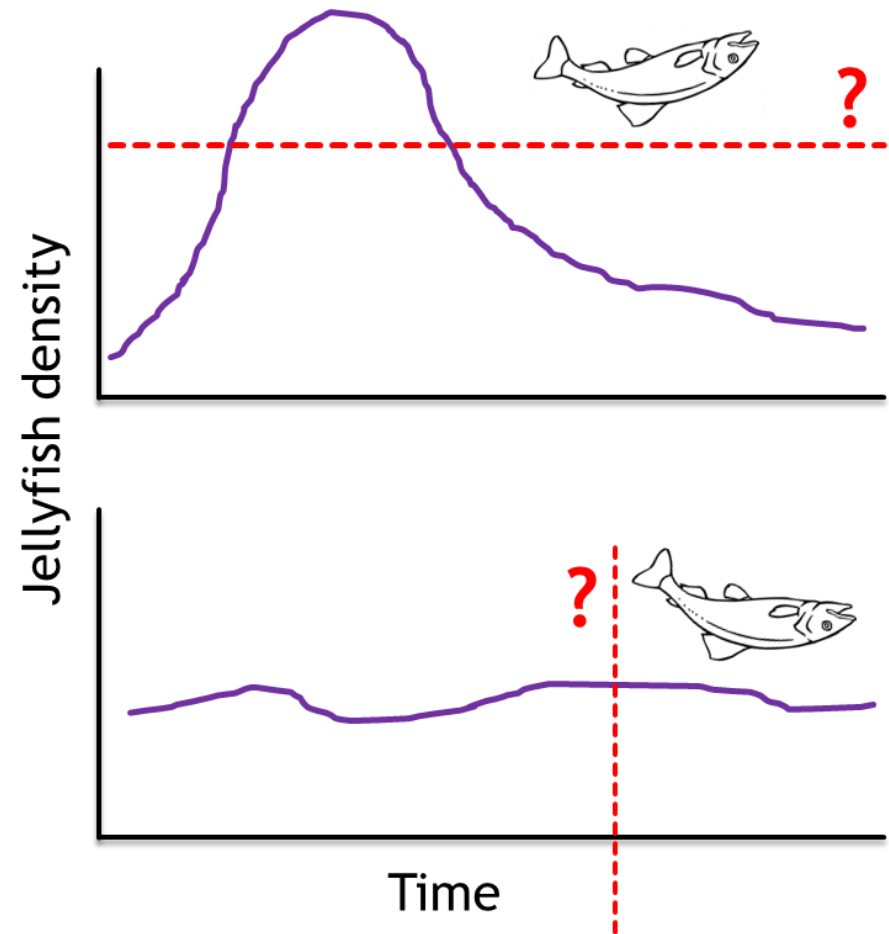
Here one day and gone the next.....



The Hybocodon and Pleurobrachia blooms did not cause a mortality event

Conclusions

- Faroese fjords have cold water hydrozoa commonly found in the North Atlantic region (*Obelia* and *Clytia*)
- Haven't identified warm water species (*Lizsa Blondina* and *Muggiaea atlantica*)
- 12°C might be a threshold for blooms that is important for monitoring at aquaculture sites
- Microjellyfish are a risk factor for complex gill disease at Faroese aquaculture sites, just like surrounding countries





ICES Journal of Marine Science, 2022

“increased and continued support of current gelatinous zooplankton monitoring efforts is needed in order to meet UN sustainability goals 13 and 14”.

Faroese stakeholders

Aquaculture Industry: Weekly monitoring
Use jellyfish data for planning handling

Research Institutions: Biodiversity time-series data
Develop functional indicators

Government: Investment and legislation
Biodiversity research and monitoring

Share monitoring data according to FAIR principles

Acknowledgements

Fiskaaling:

Eirikur Danielsen (microscopy)

Kim Bergkvist (Initial testing)

Bakkafrost:

Jógvan Johansen (Study design and sampling)

Hydrozoa Scotland:

Anna Kintner (expert advice and data sharing)

