atlas

UNDERSTANDING DEEP ATLANTIC ECOSYSTEMS

# Feeding ecology and competition of Atlantic Vulnerable Marine Ecosystems

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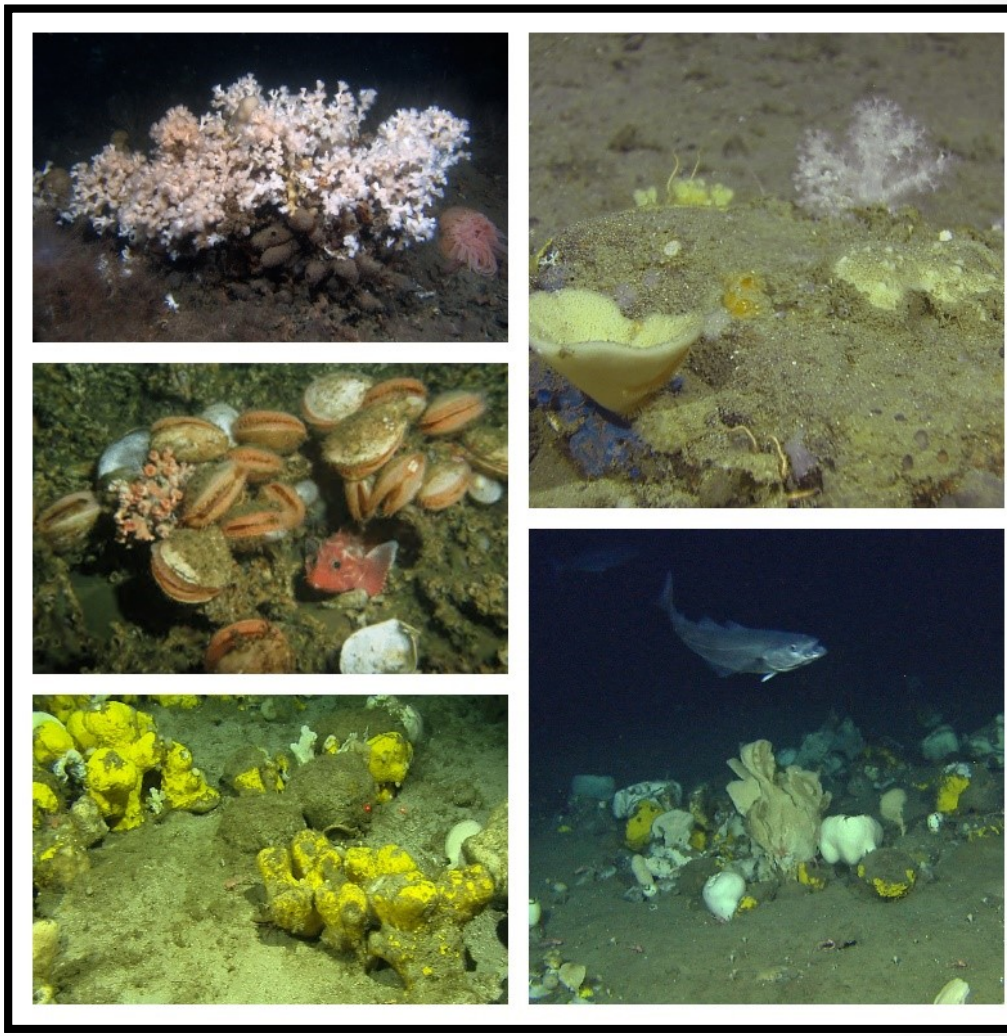
# Overview

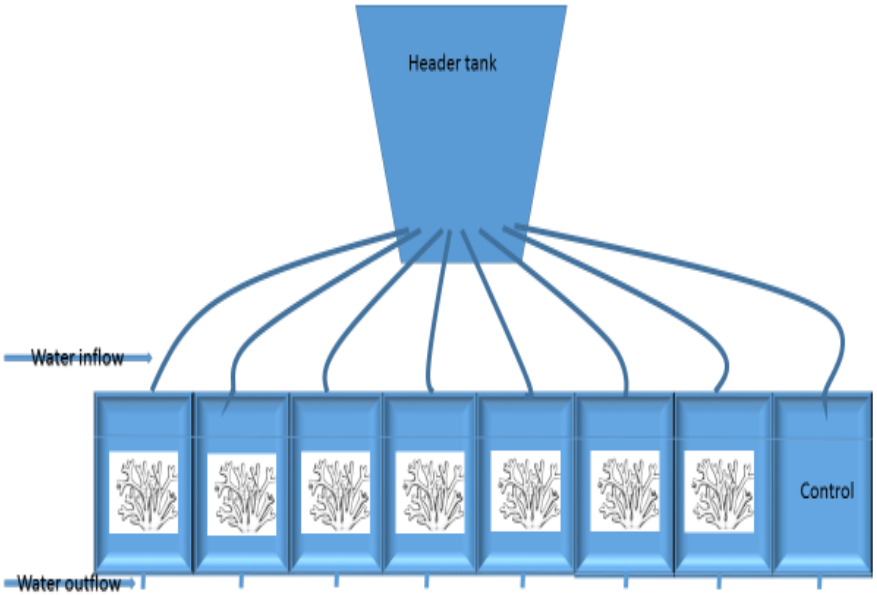
- Cold-water corals and sponge grounds have been documented to be very important habitat forming ecosystems and are classified as Vulnerable Marine Ecosystems (VMEs).
- Little is known about how co-occurring ecosystems and species interact under different conditions such as flow and food concentrations, which are highly likely to change in direct response to climatic change.
- Two case studies/areas Norway and the Azores

# Norway

- five co-occurring species were submitted to three flow regimes and two food concentrations. *Lophelia pertusa, Acesta excavata, Geodia barretti, Stryphnus* sp. and *Phakellia ventilabrum*



# Methodology

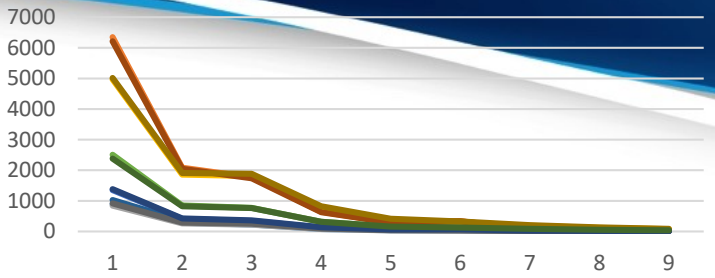



- Six treatments
  - 3 different flows, 2 food concentrations.
    - LSNF, MSNF, HSNF, LSHF, MSHF, HSHF

Water samples measured for Particle concentration (1 to 16 µm in diameter)

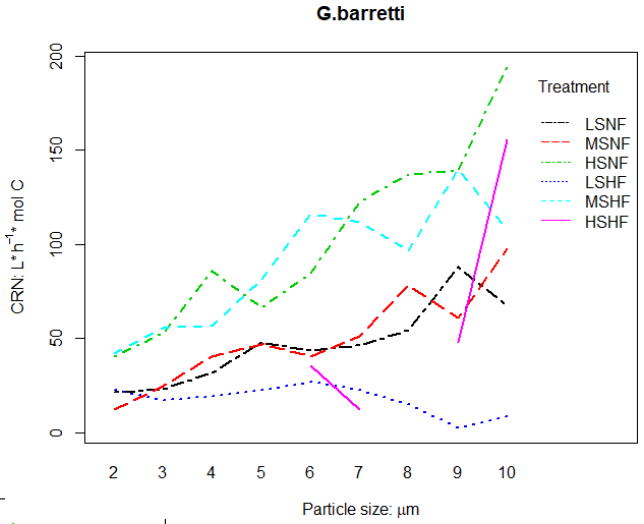
- Clearance Rate (CR) was calculated
  - Litres of water that are cleared of the particle of interest per unit of time
- Water samples were also analysed for microalgae and bacteria.
  - CR for this particles was also calculated

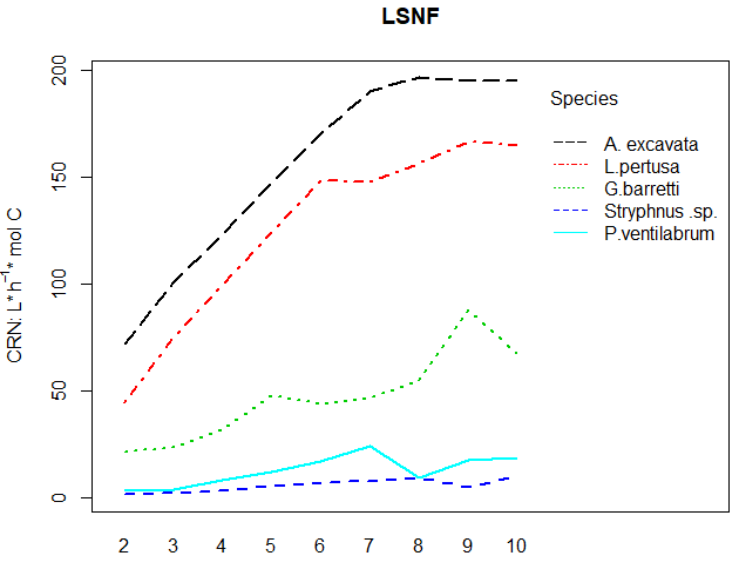
# atlas Results

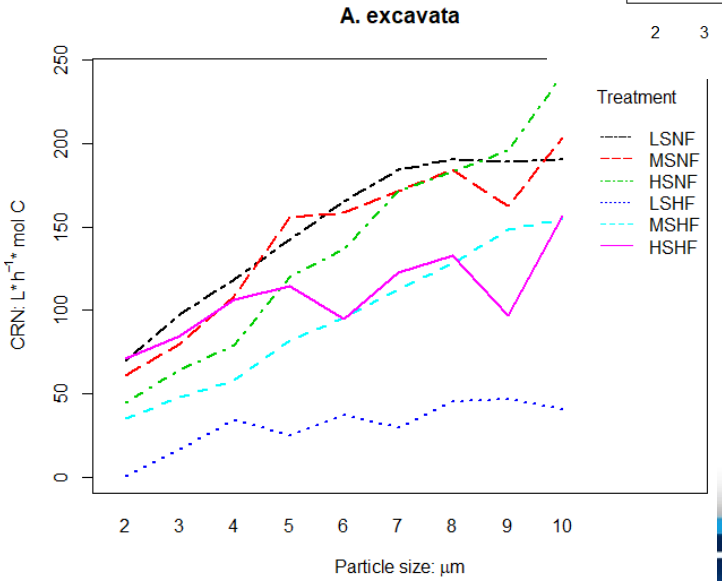



High variability on the data gave non significant results, but general trends can be seen.

- CR increases with particle size
  - Results might be influenced by the smaller amount of particles at higher particle size
- *A. excavata* gets stressed at high food treatments
- *A.excavata* and *L.pertusa have higher CR at LSNF and MSNF treatments*
- Sponges have a higher CR at MSHF and HSNF treatments



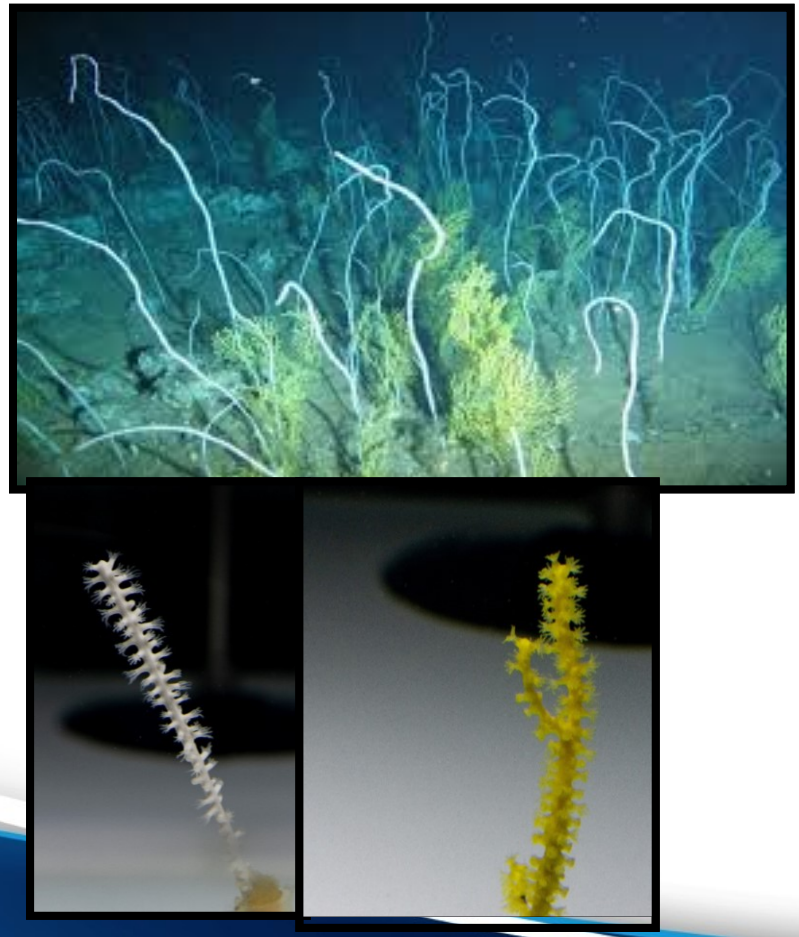



# Shortcomings

- High variability in data
- Specimens produced particles which gave a negative CR
- Low sample size

# Azores



Two co-occurring species were submitted two one food treatments and two different flow regimes.

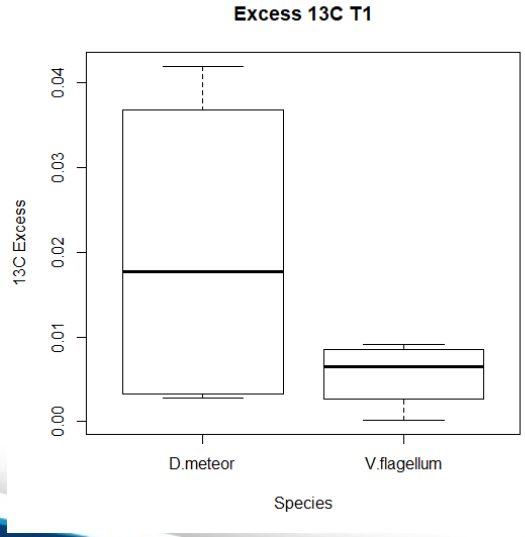
*Dentomuricea meteor* and *Viminella flagellum*

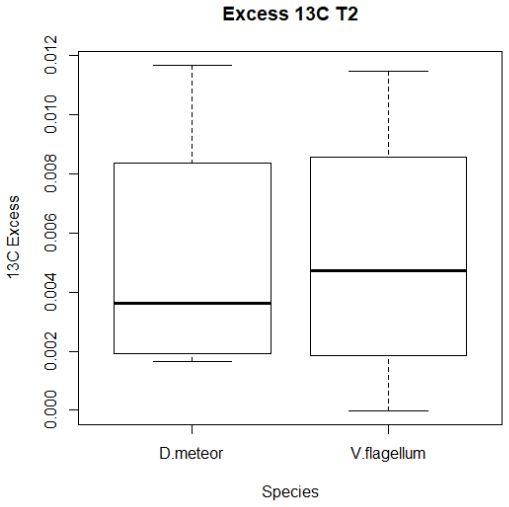
# Methodolgy

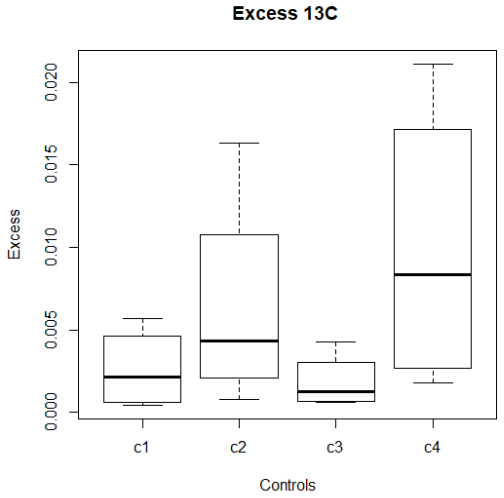
- Two treatments T1 and T2  4 cm $s^{-1}$ and 2 cm $s^{-1}$ respectively controls for each species in each flow speed were performed
- Specimens were fed with  isotopically enriched rotifers
- Tissue was treated and analysed with IRMS
- Bulk assimilation of $^{13}C$ and $^{15}N$ in the coral tissues was calculated as the excess above background and normalized to biomass and was used as a proxy for food intake

# Results

- High variability, no statistically significant results
- In both controls *D.meteor* had a lower assimilation than *V.flagellum* for both $^{13}C$ and $^{15}N$
- *D.meteor* had a higher assimilation of both $^{13}C$ $^{15}N$ in T1 when compared to *V.flagellum*, the relationship was opposite but not as strong for T2.



# Shortcomings

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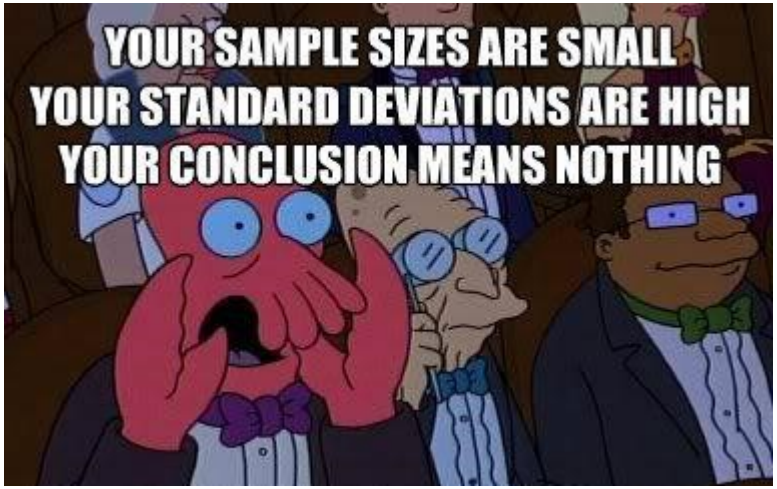

# Thank You

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