May 4th, 9:00 AM - 11:00 AM

Impacts of Doliolids on the Marine Microbial Community off the Oregon Coast

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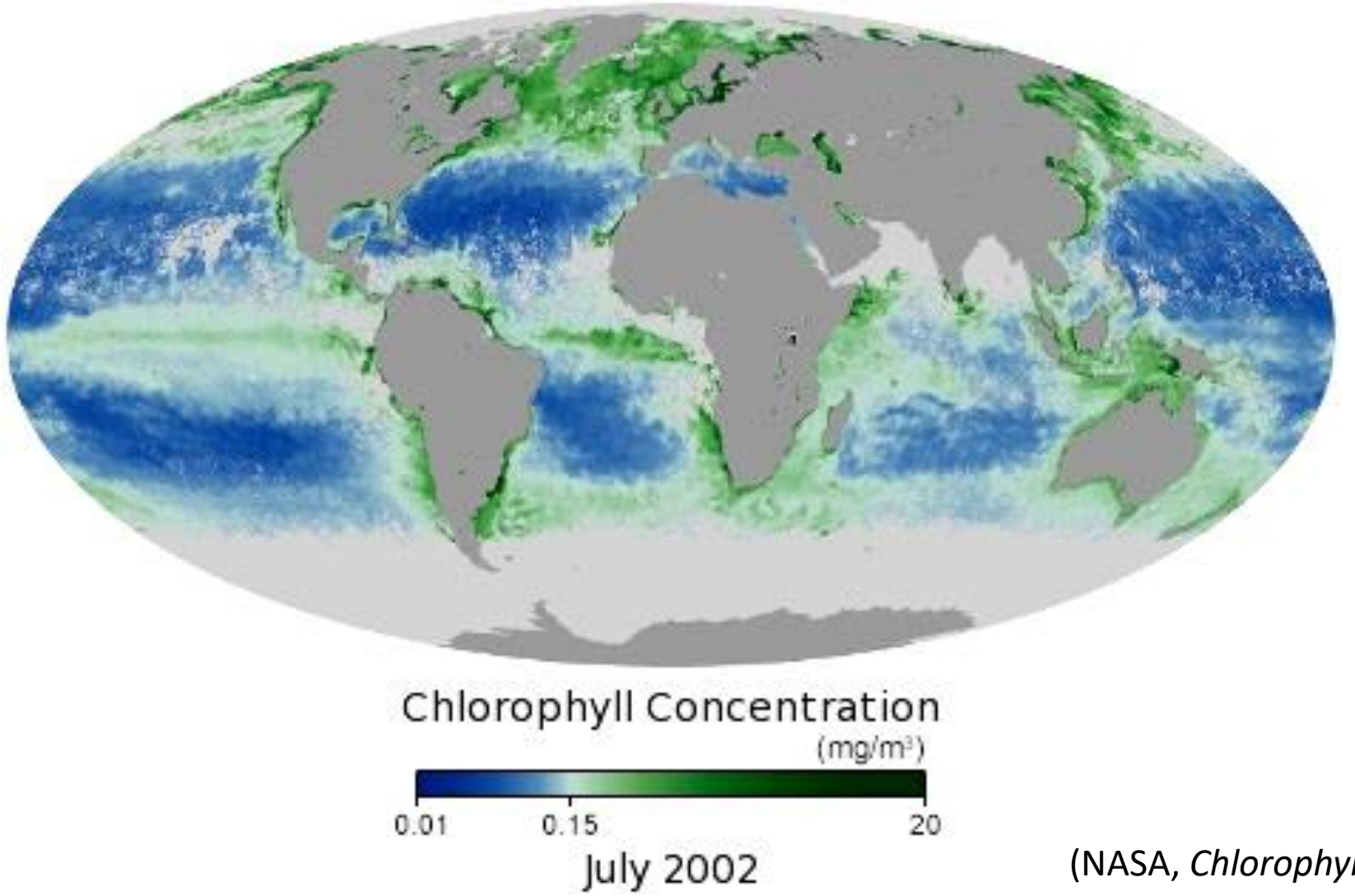
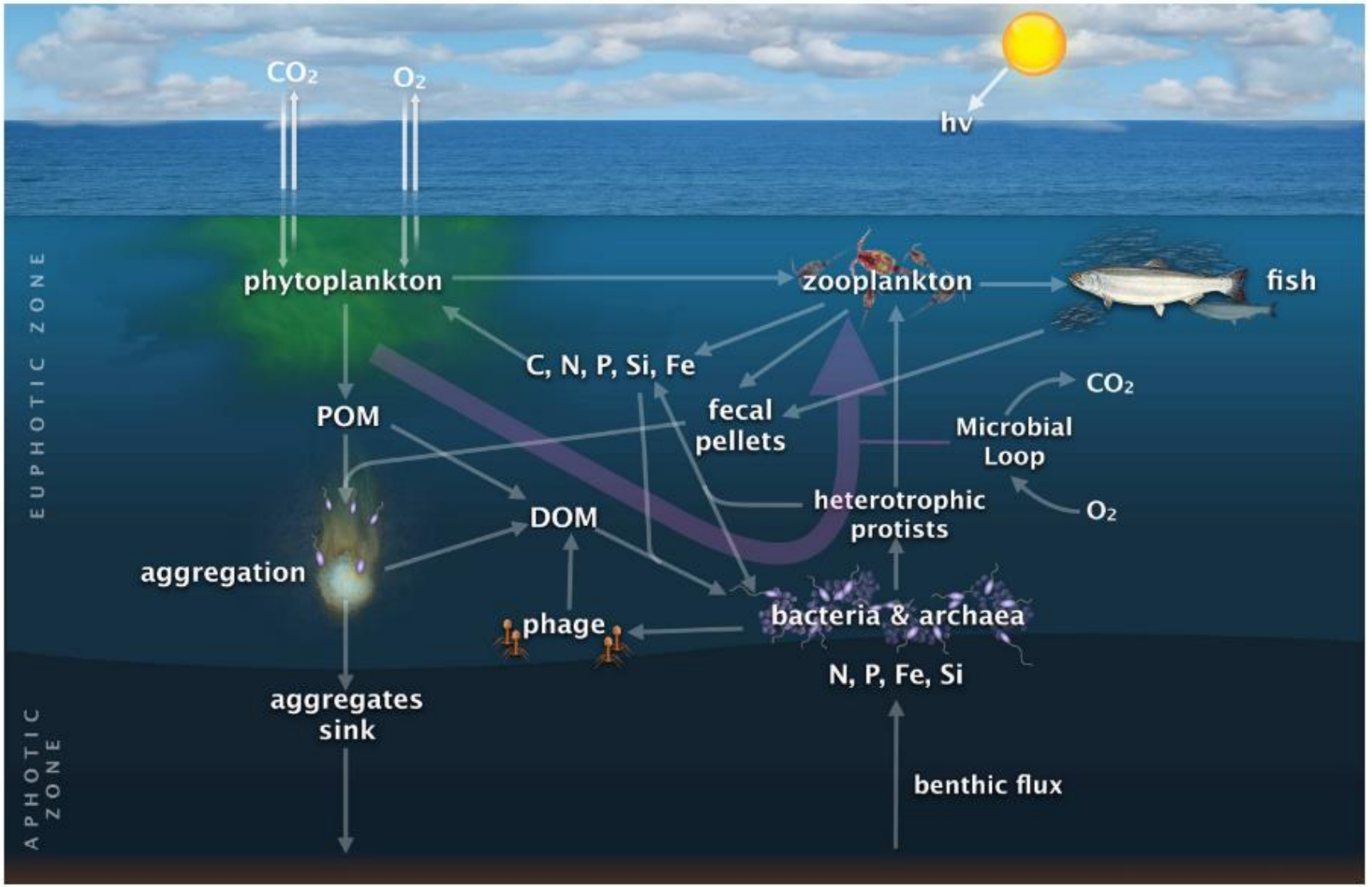
Marine Microbes are Important



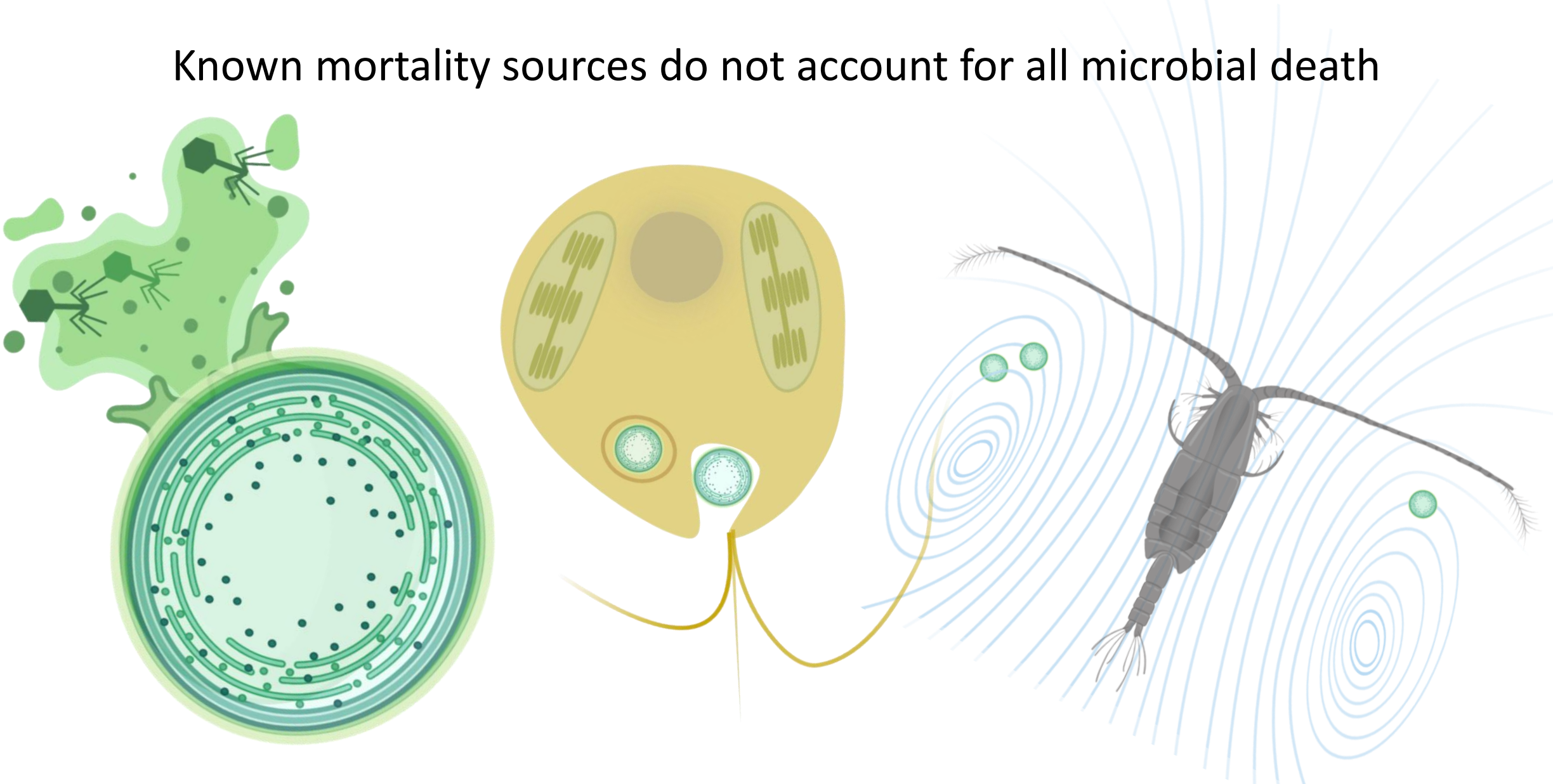
(NASA, *Chlorophyll* 2021)

Fine scale interactions within the plankton community are not well understood.



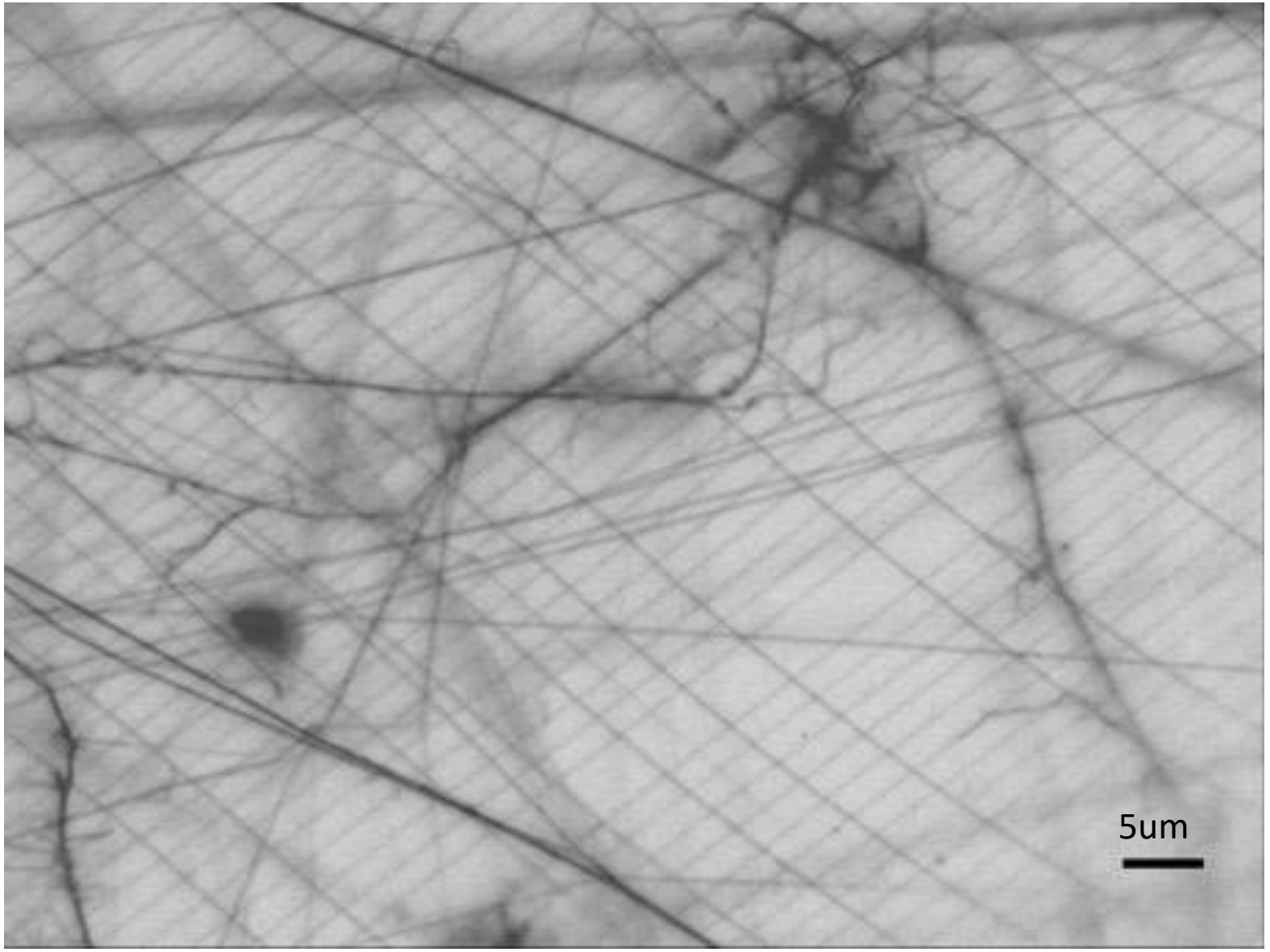
(Worden et al., 2015)

Known mortality sources do not account for all microbial death



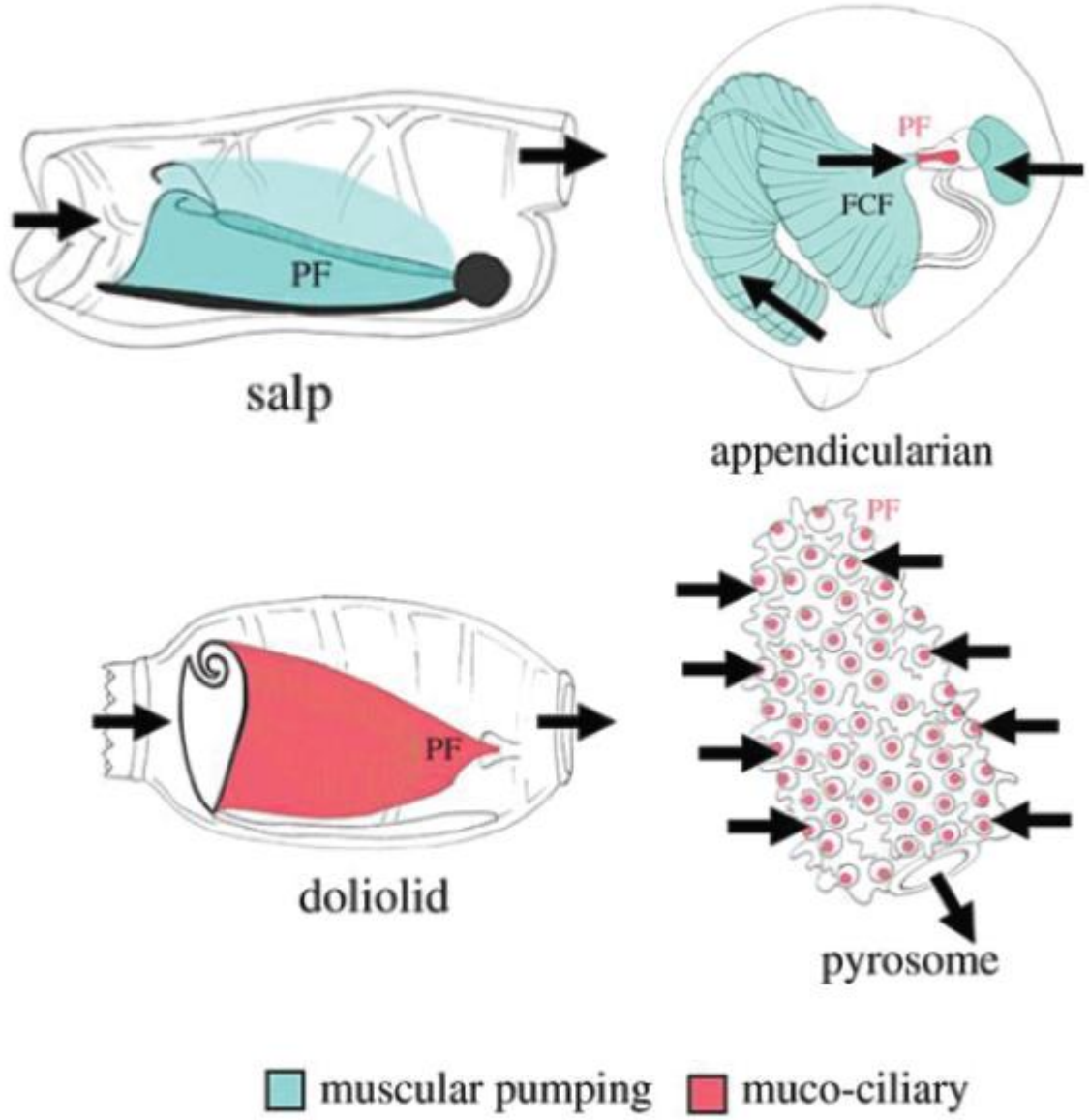
"…a significant component [missing] (between 5% to 55%)" – Beckett et al. 2021 *bioRxiv*
Talmy et al. 2019 *Environmental Microbiology*

Mesh size openings are functionally smaller than their measure.



(Sutherland, Madin, & Stocker, 2010)

Pelagic Tunicates have unique feeding strategies



Conley et al, 2018

Doliolids feeding is unusually linked to the microbial food web.

Mesa.edu.au

Doliolid Feeding

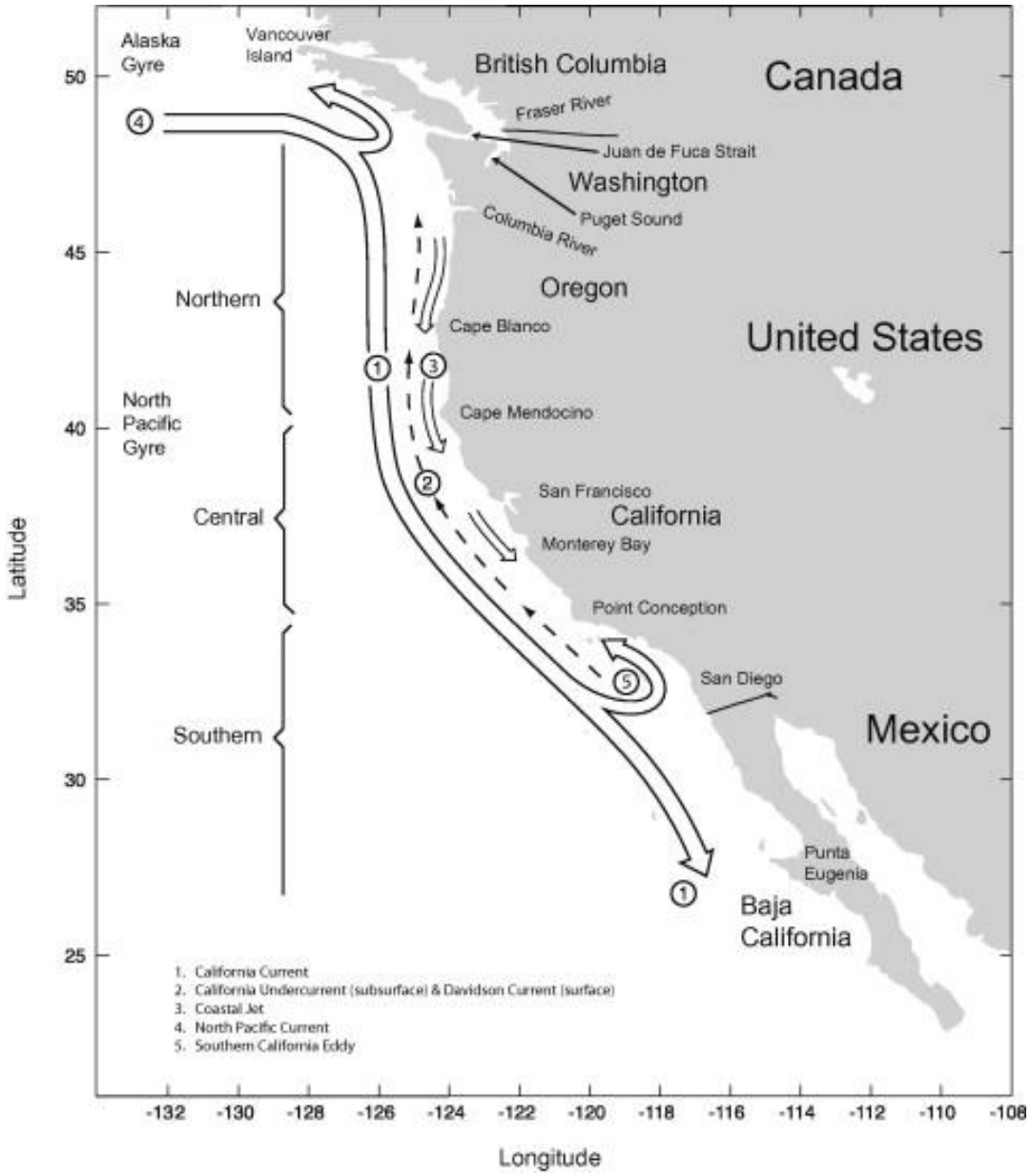
(Frischer et al., 2021)

Do doliolids feed selectively?

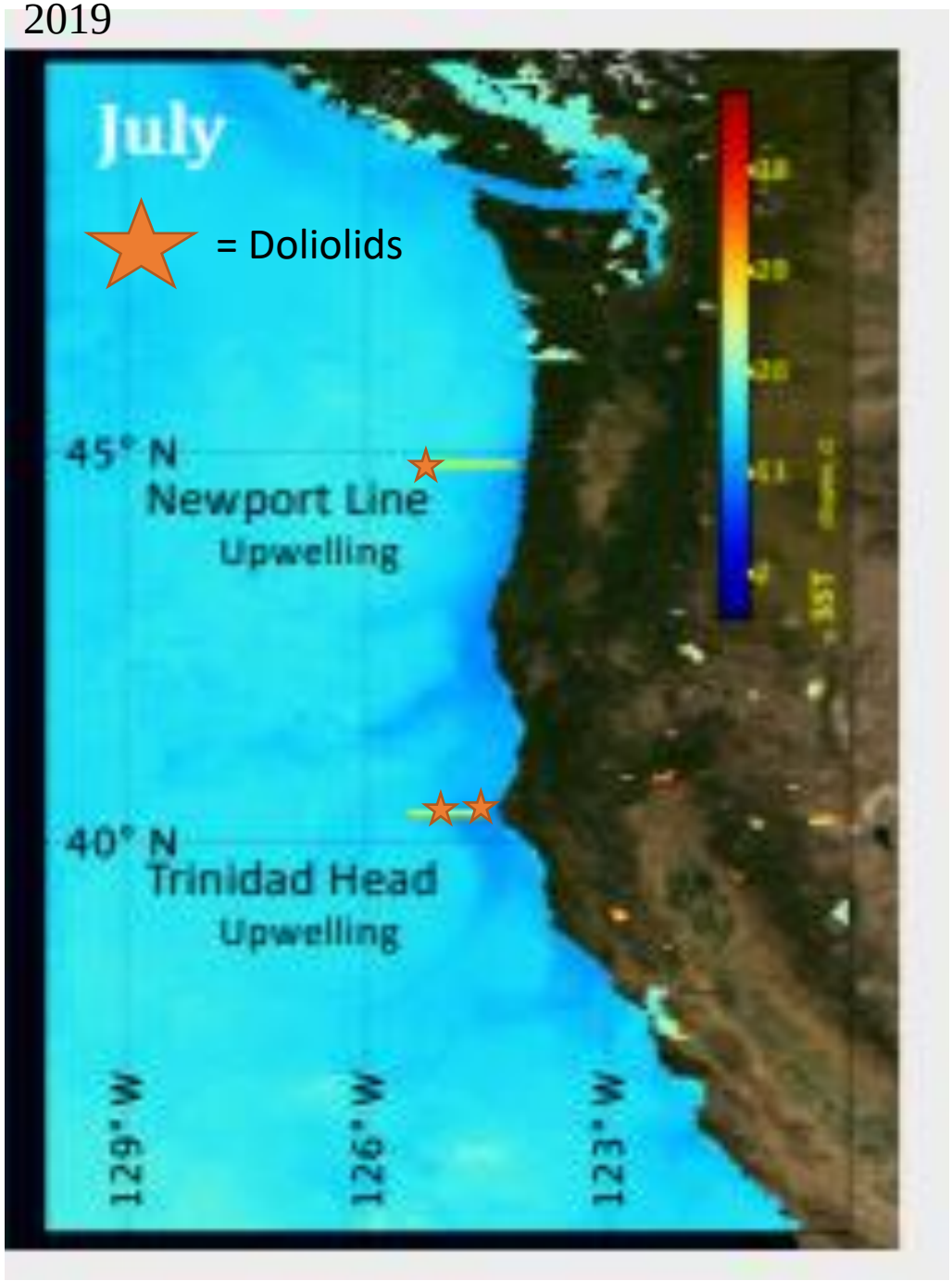
If so, what drives prey selectivity?

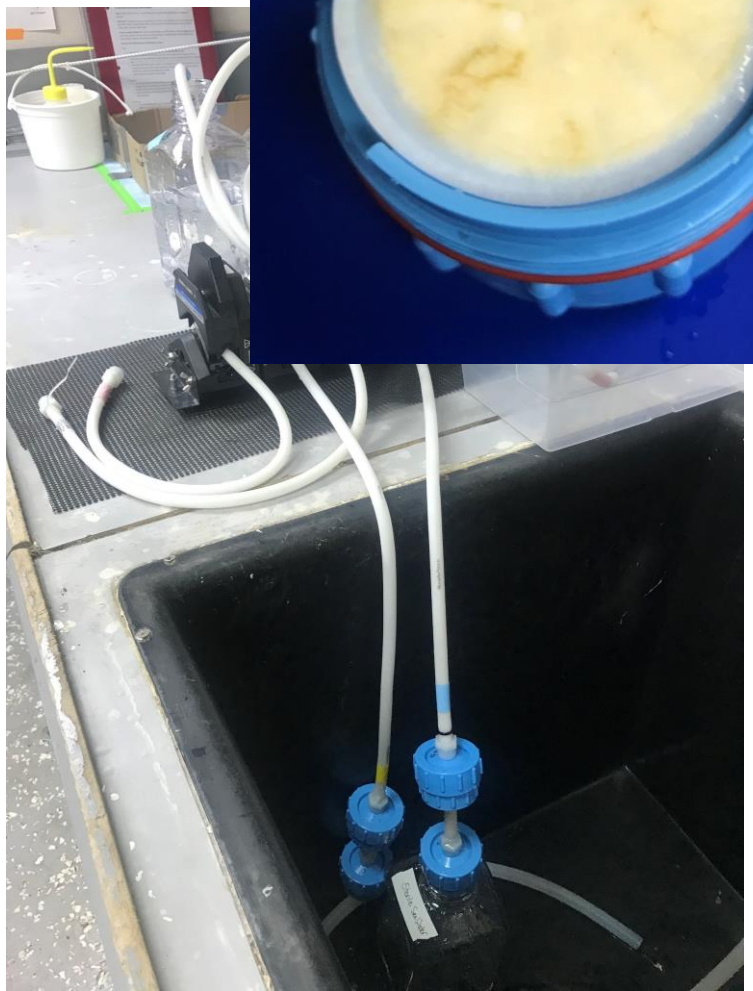
California Current System

- Upwelling increases nutrient availability.
- Phytoplankton support juveniles of important fisheries
- Economically very important.
- Understanding what impacts the microbial community is critical.



Massive bloom events are often associated with upwelling conditions.

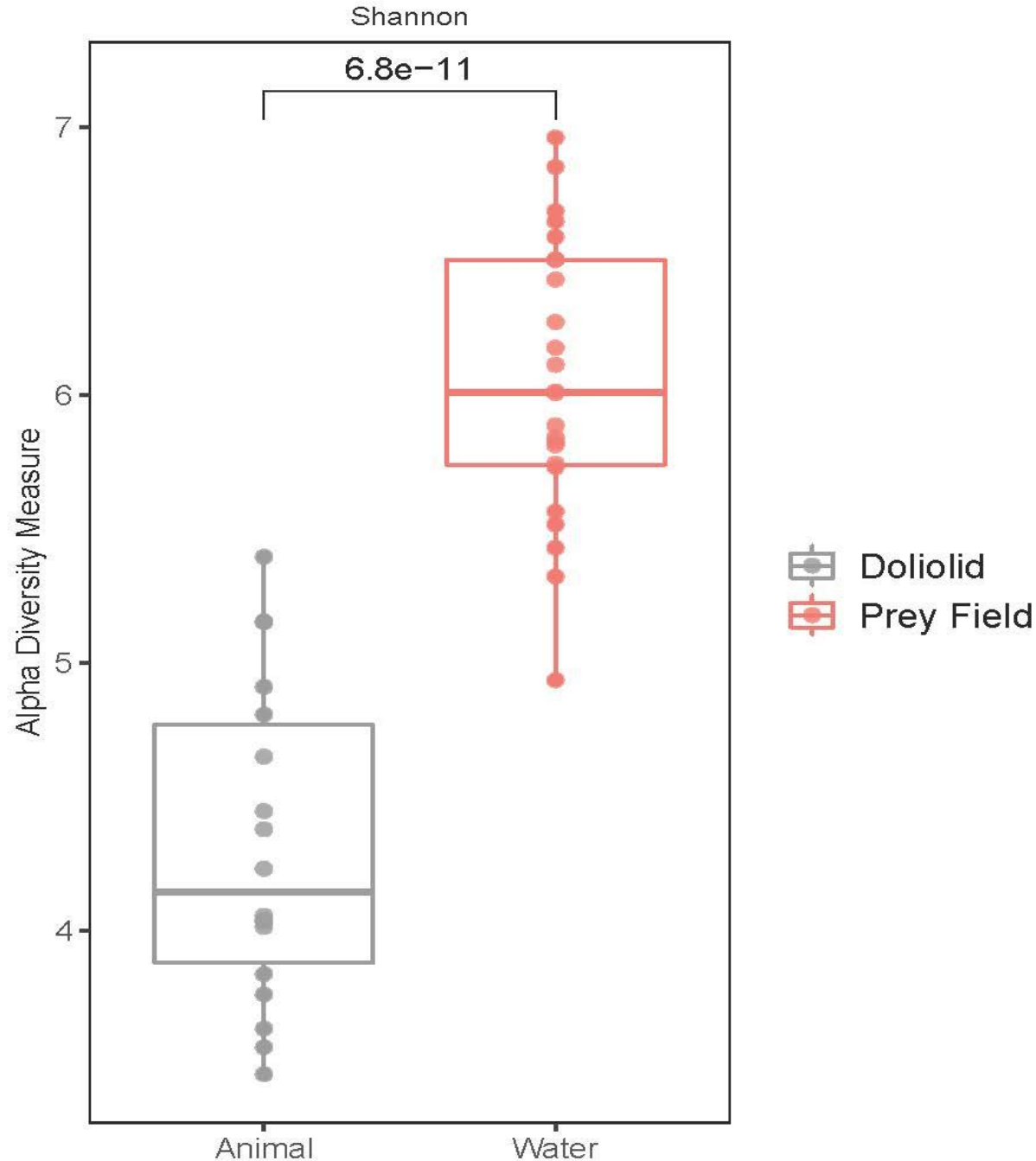




Approach

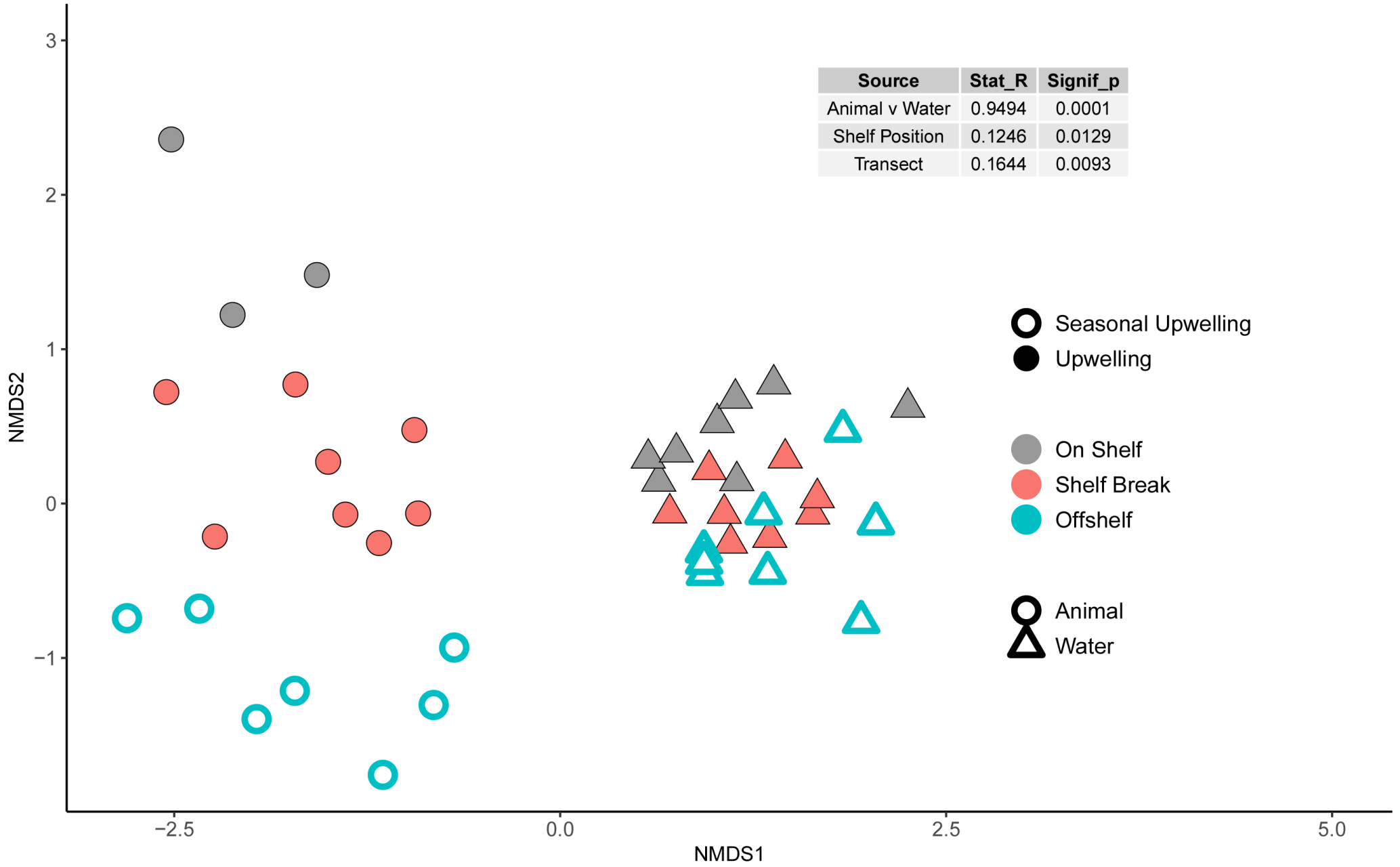
- DNA Extraction – animals + prey field
- V4 region of the 16S rRNA gene, using barcoded primers
- Illumina high throughput sequencing
- Comparative analysis in R

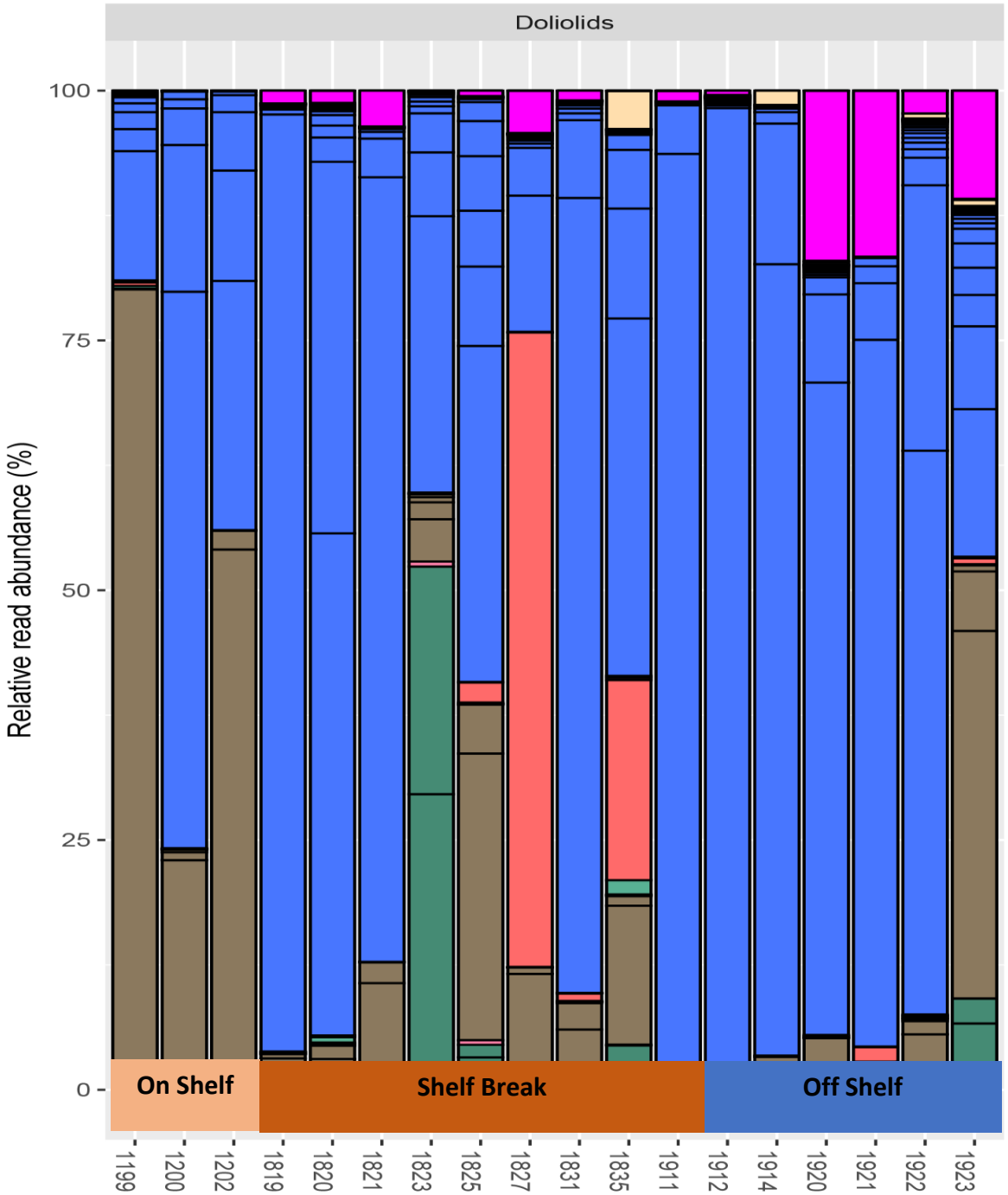
Seawater is more diverse than Doliolid microbiome.



Doliolid microbiome is different than the surrounding seawater.

Source	Stat_R	Signif_p
Animal v Water	0.9494	0.0001
Shelf Position	0.1246	0.0129
Transect	0.1644	0.0093



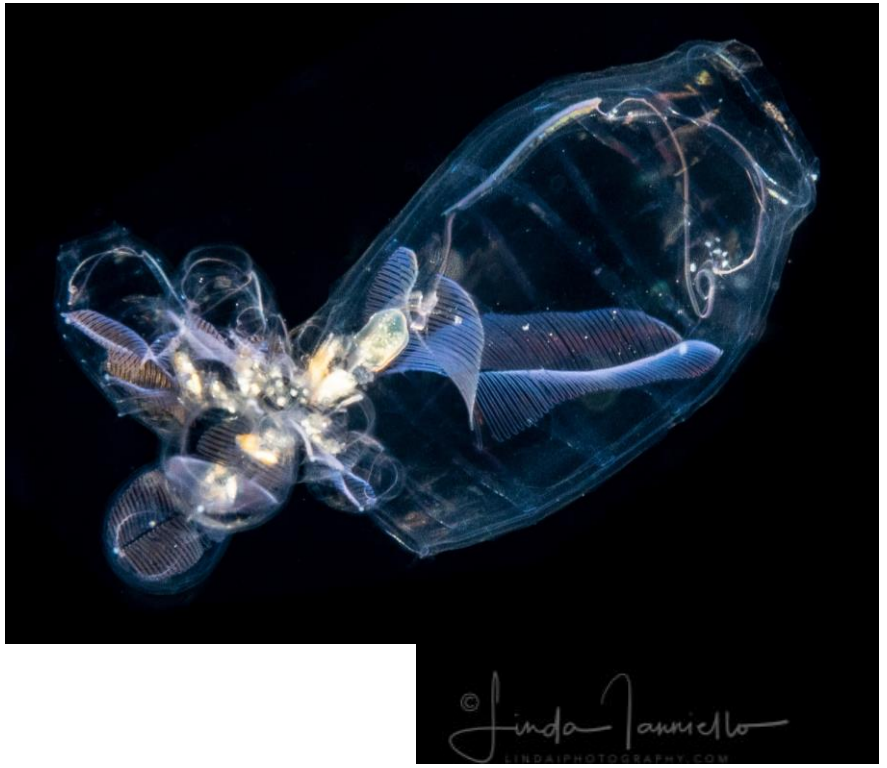


Potential prey in Doliolids.

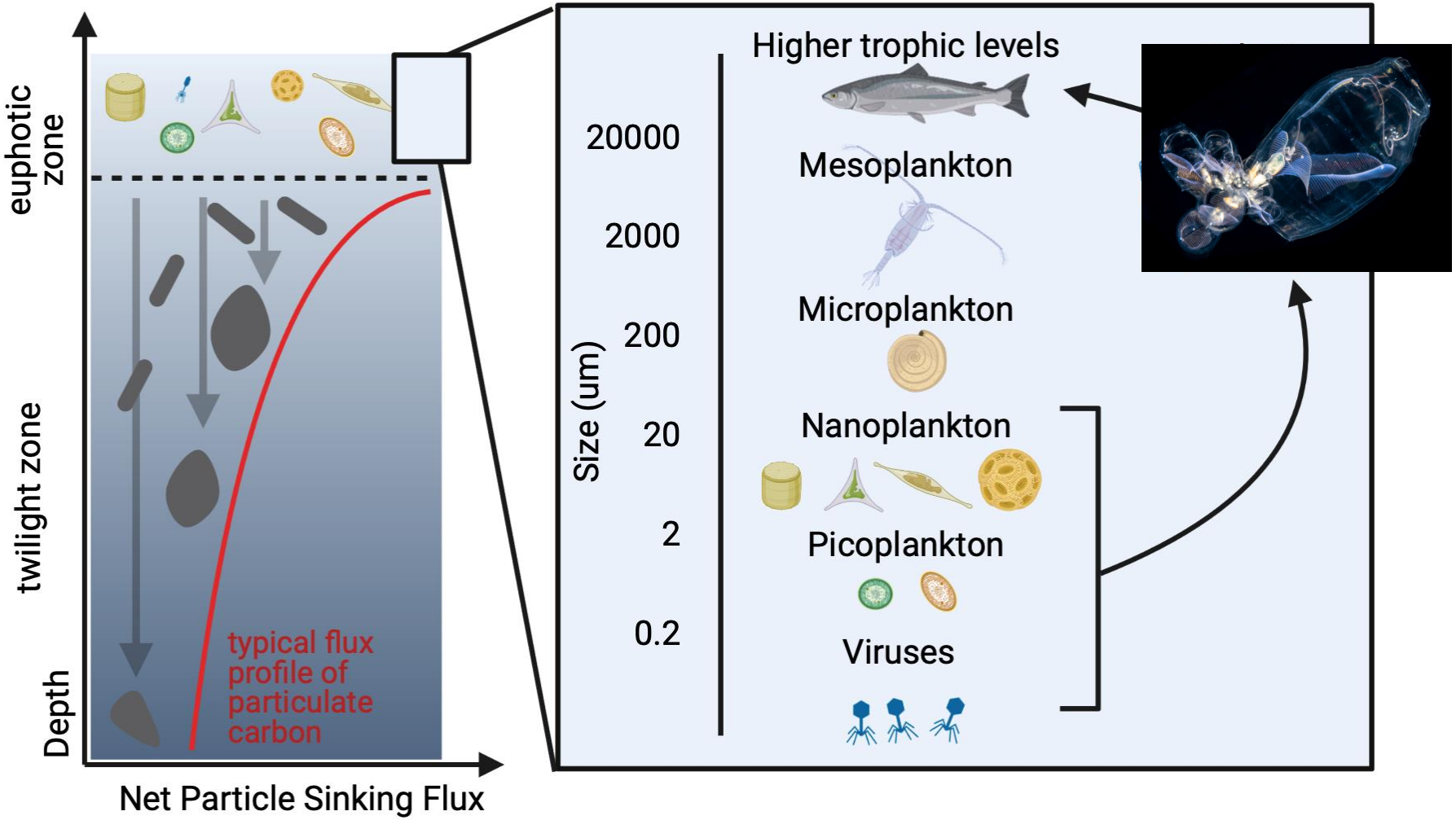
- Flavobacteriales (Flavobacteriia)
- Rhodobacterales (Alphaproteobacteria)
- Synechococcus (Cyanobacteria)
- Oceanospirillales (Gammaproteobacteria)
- Campylobacterales (Epsilonproteobacteria)
- Candidatus Pelagibacter (Alphaproteobacteria)
- Phaeocystis (Cyanobacteria)
- Sphingobacteriales (Sphingobacteriia)
- Imantonia (Cyanobacteria)

Results

- Doliolids are eating bacteria and picoplankton.
- Diversity indices suggest that doliolids feed selectively.
- Doliolids restructure the microbial community during bloom conditions.
- Doliolid mortality, due to mesh clogging, is a carbon sink. (Takahashi, 2015)

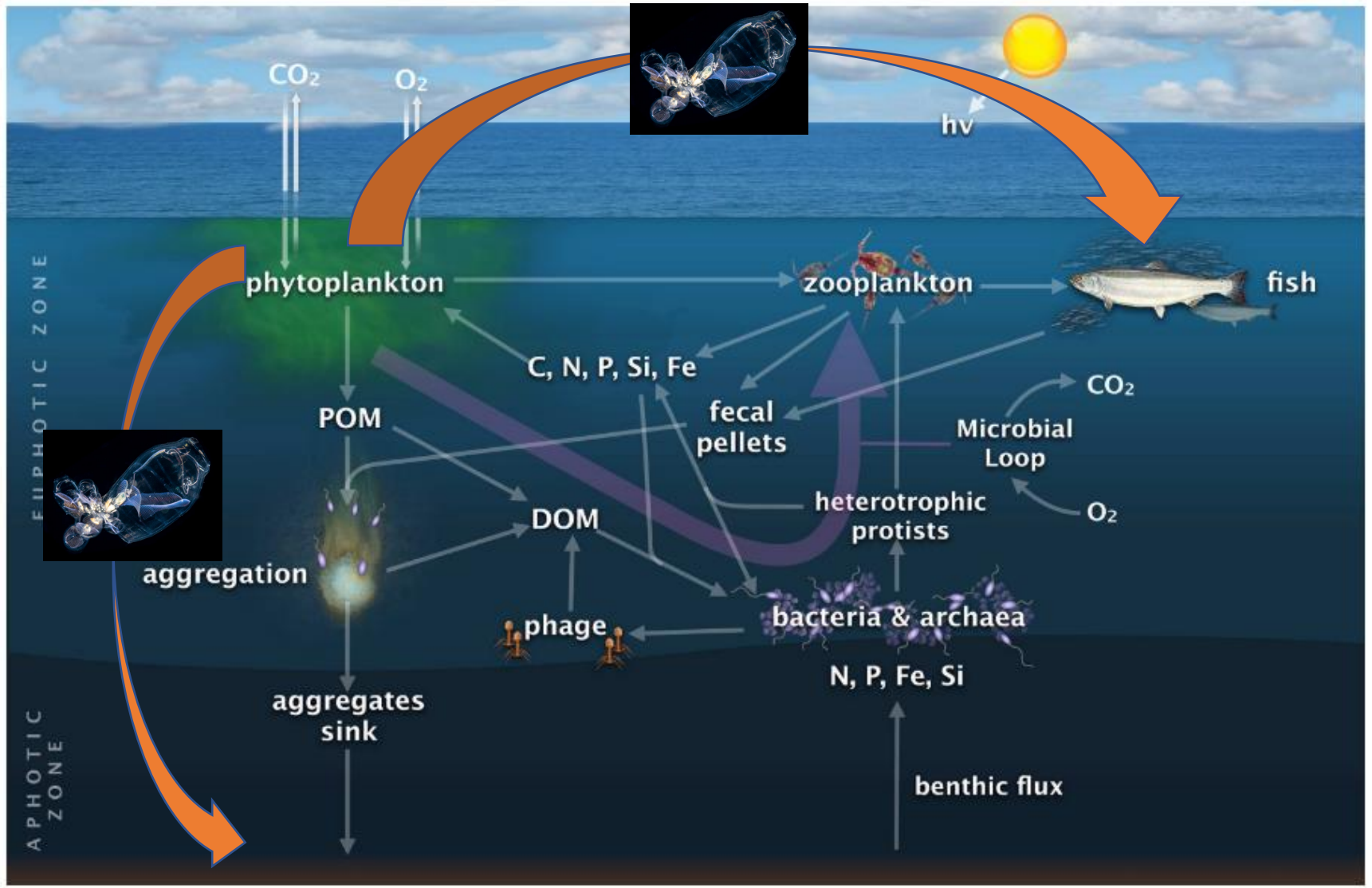


Doliolids - bypassing carbon and energy transfers of traditional food webs



Sutherland and Thompson 2021 Limnology and Oceanography

Impacts on fine scale interaction and the fate of carbon.



(Worden et al., 2015)

Acknowledgements

Carey Sweeney-Ton

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Award# 1851412

References

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