Myctophids and their importance in the northern California Current ecosystem

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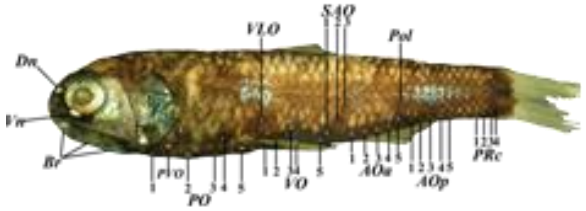
Oceanic lanternfishes (Family Myctophidae)





Important to marine ecosystems due to:

–substantial biomass and circumglobal distribution

–diel vertical migration

–intermediate body sizes

–facilitate transfer of energy to higher trophic levels and the deep sea

Myctophidae – Lanternfishes

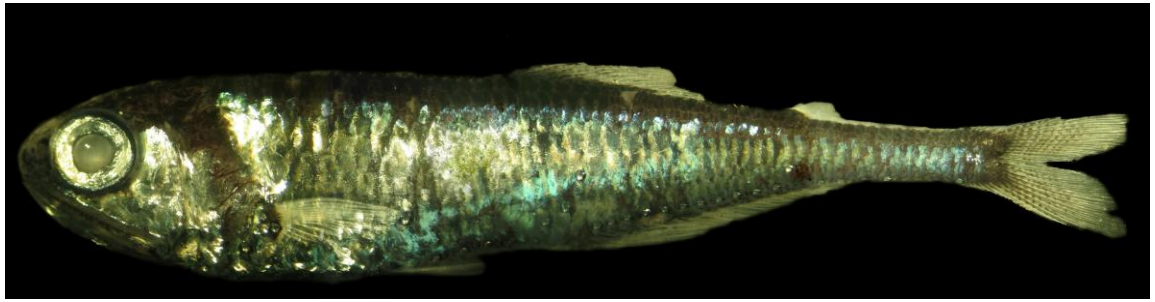


Aggregation of *Tarletonbeania crenularis* in Astoria Canyon, OR (June 2001) ROV *ROPOS*

California headlightfish
Diaphus theta



Bluelight lanternfish
Tarletonbeania crenularis



Northern lampfish
Stenobrachius leucopsarus

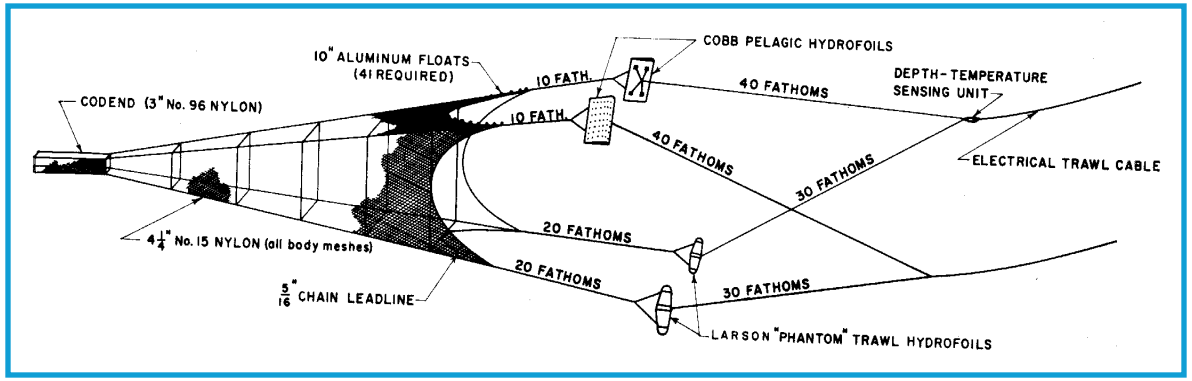


Juvenile Fish Surveys (2004-2012)



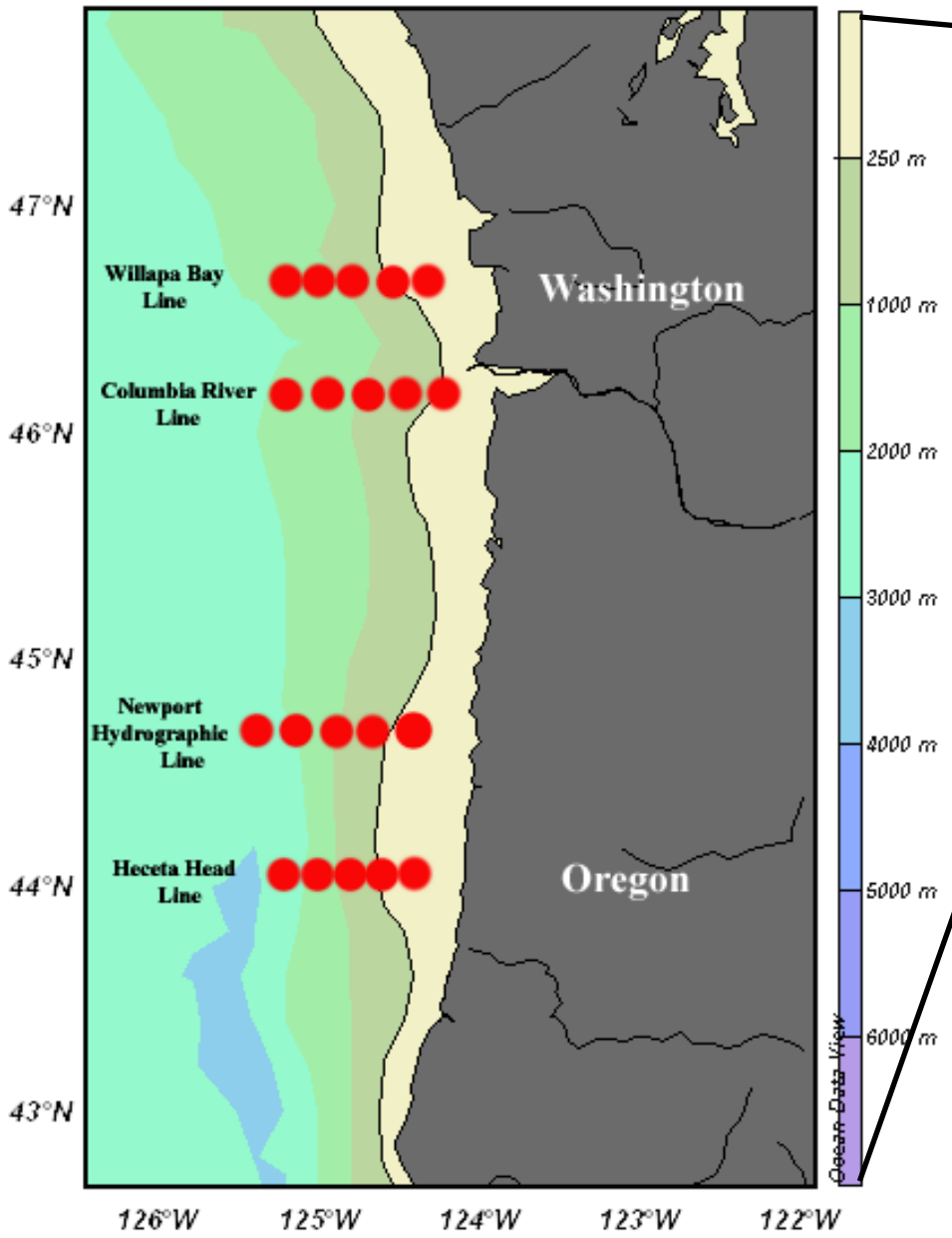


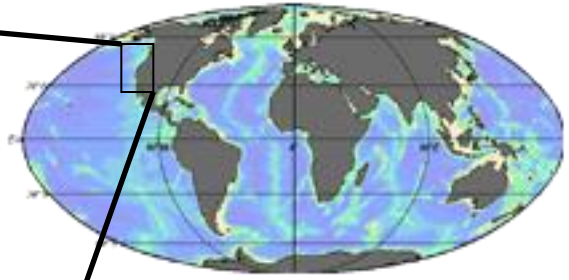




Night-time collections using large midwater (Nordic) trawl with fine-mesh liner (3.0 mm)

Sampling Area (2004-2012)





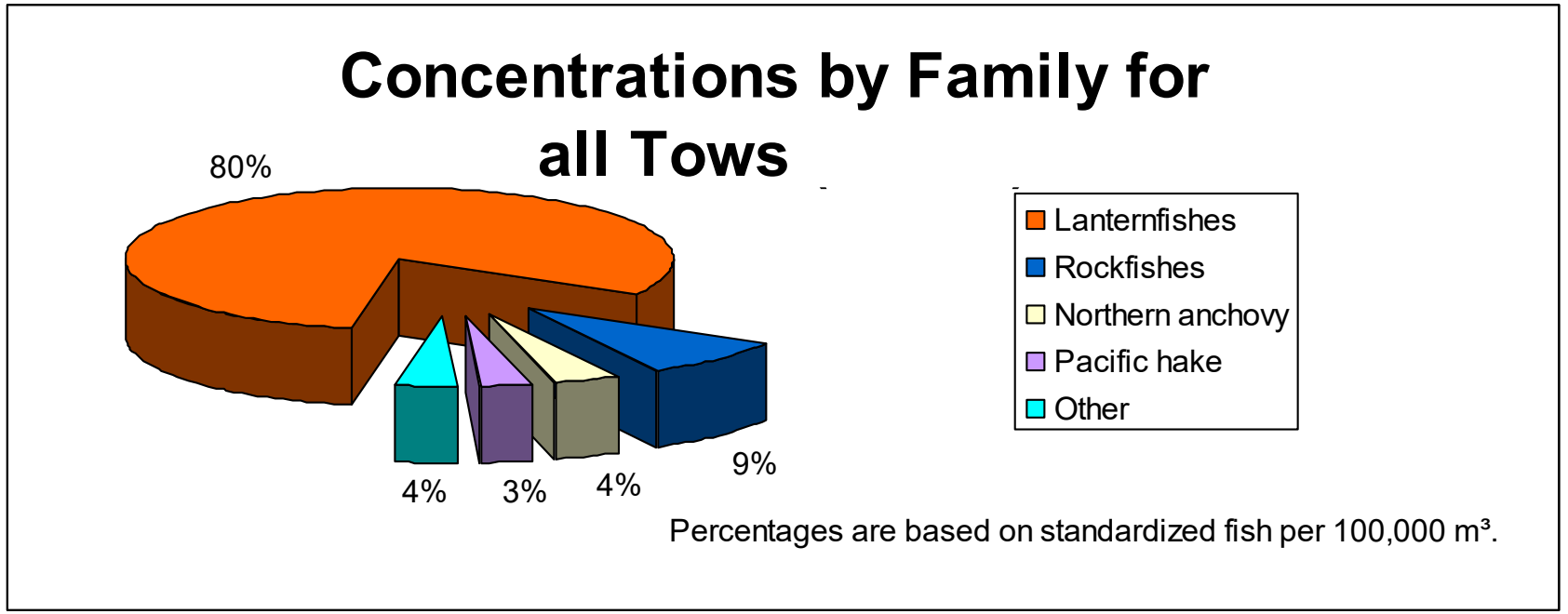


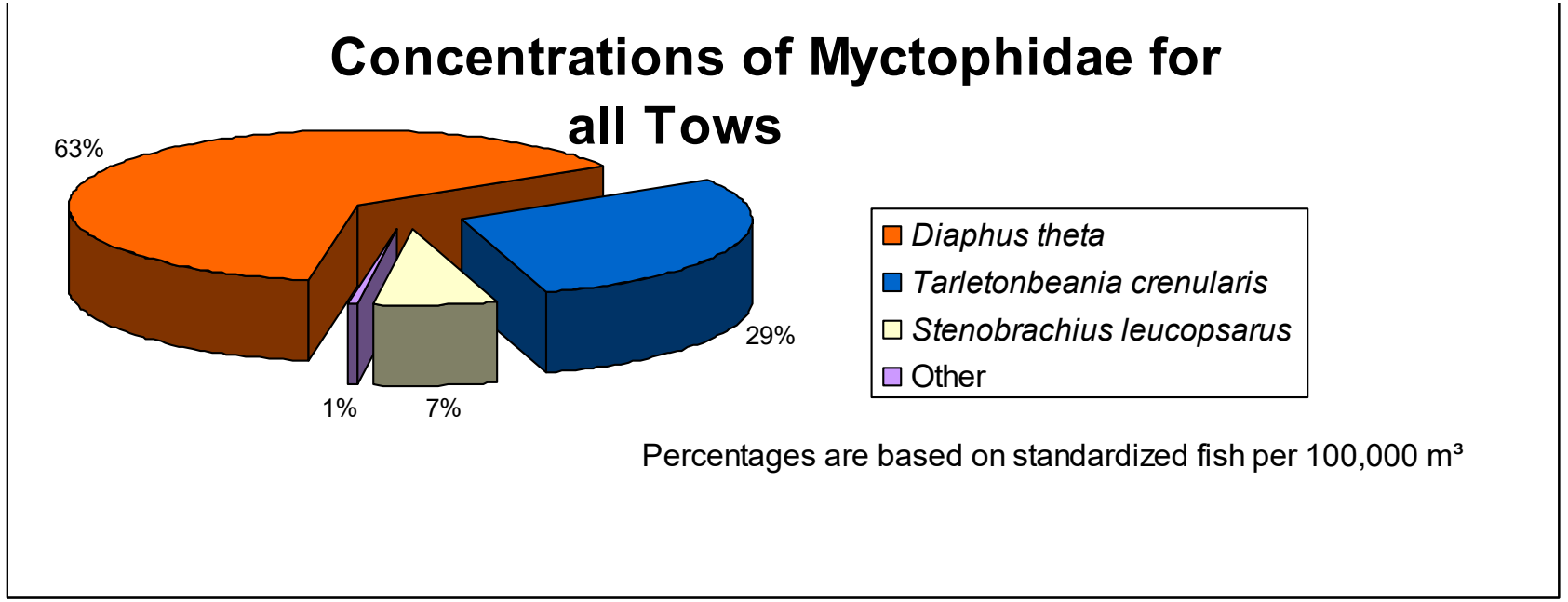
F/V Piky

- 4-5 cruises/year between May and November

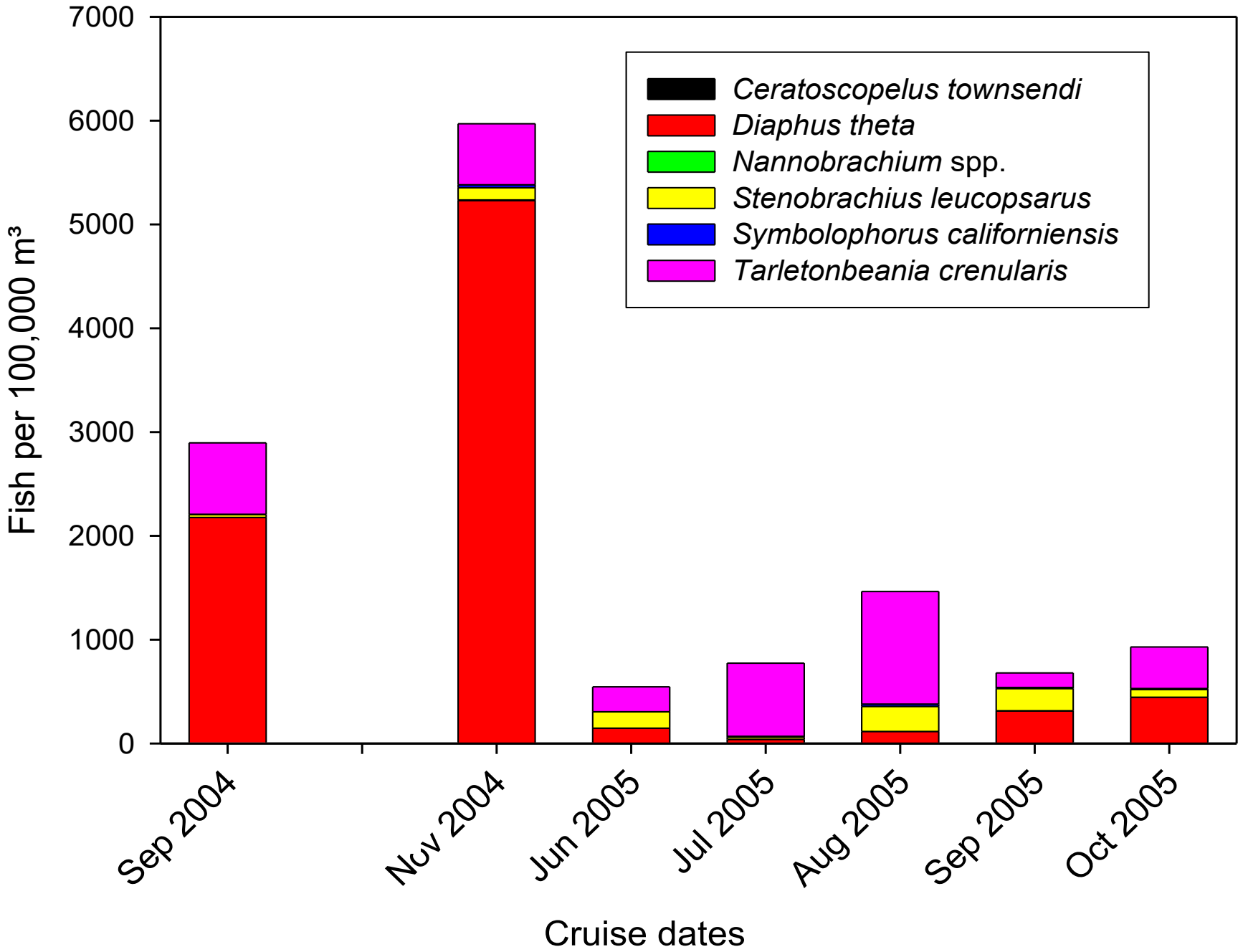
- Total of 544 tows

Ichthyofauna in all Surveys Combined



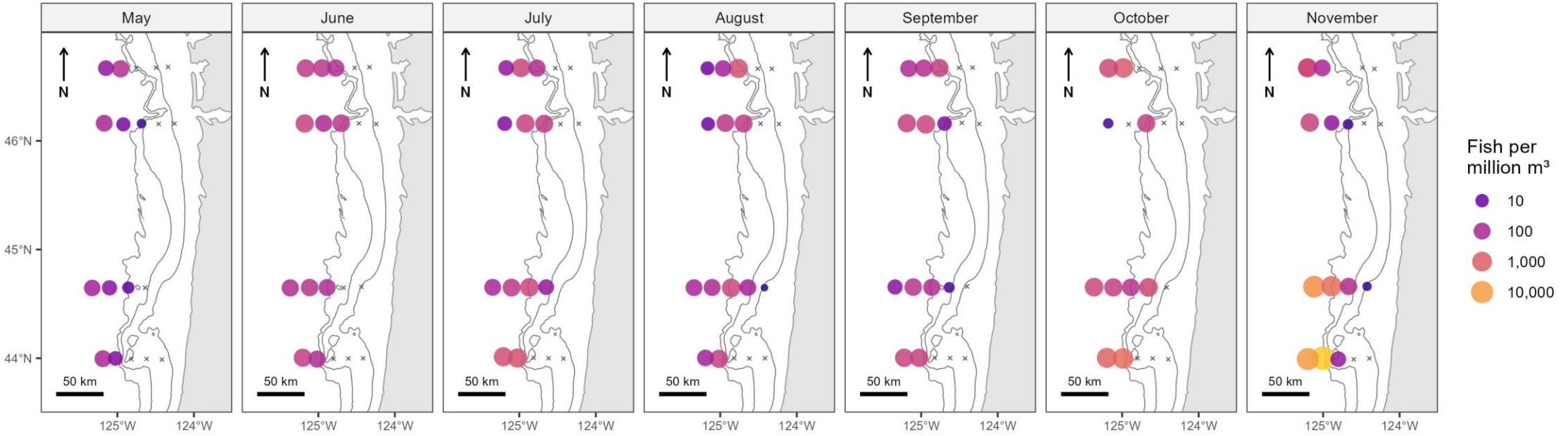


Myctophidae Concentrations by Cruise

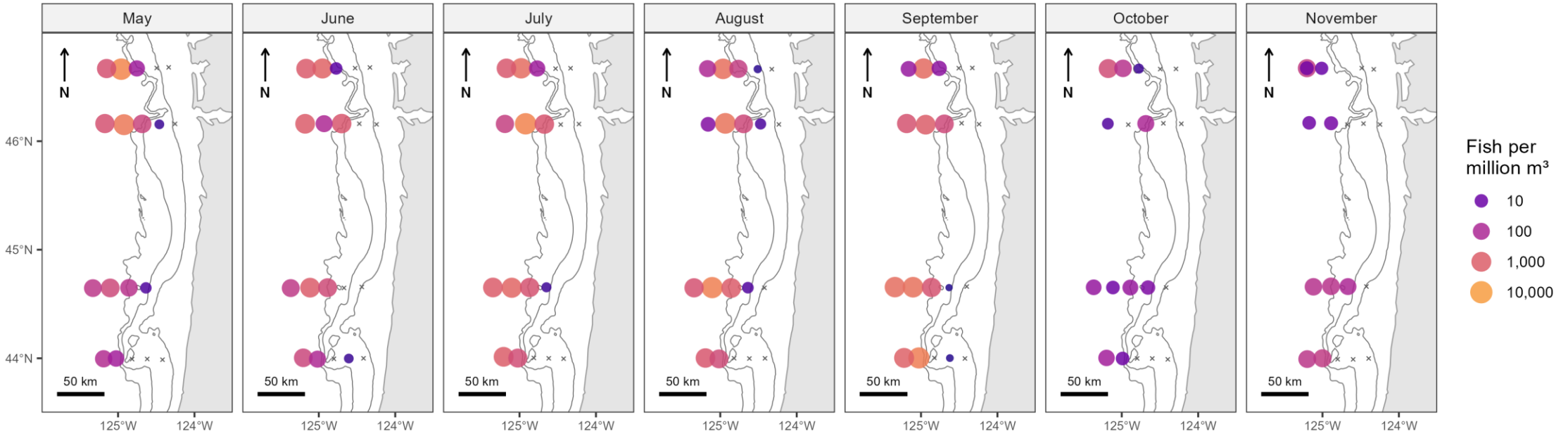


Mean density at each station by month, all years pooled;
x = sampled, none caught

Diaphus theta

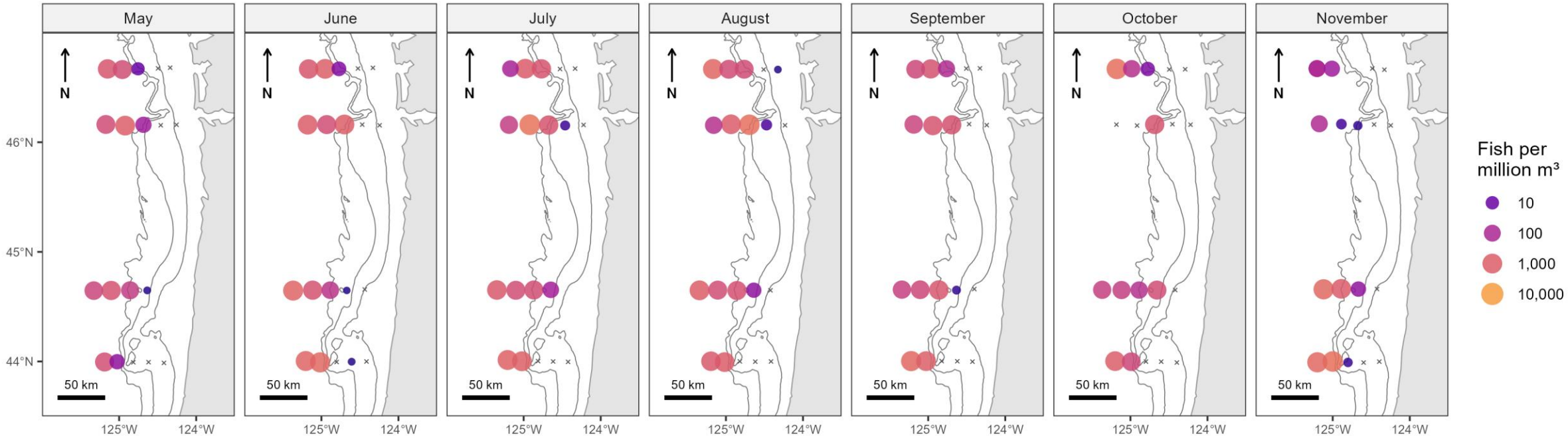


Stenobrachius leucopsarus



Mean density at each station by month, all years pooled;
x = sampled, none caught

Tarletonbeania crenularis



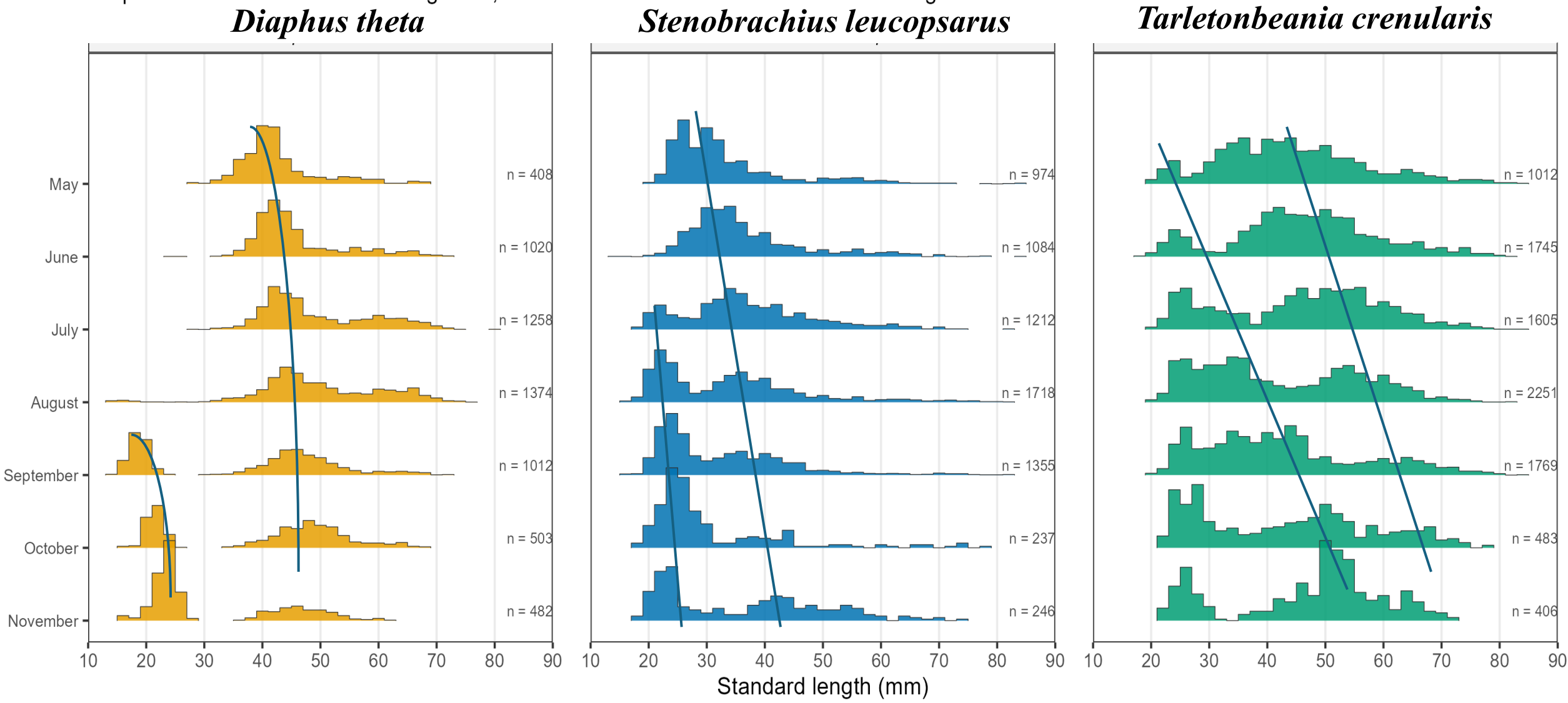
Size Frequency Distributions

- Spawns all year long
- Maximum age 17 months

Bystydzieńska et al. 2010 JFB

Length distributions by month, all years pooled

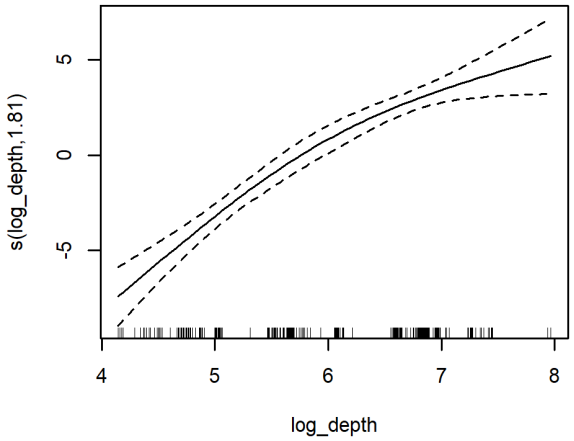
Proportion of fish in each 2 mm length bin; October & November each come from a single cruise



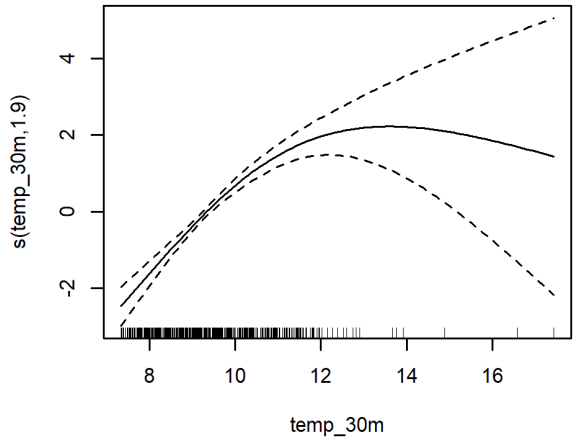
Habitat Analysis – GAM with Environmental Variables

T. crenularis Presence/Absence

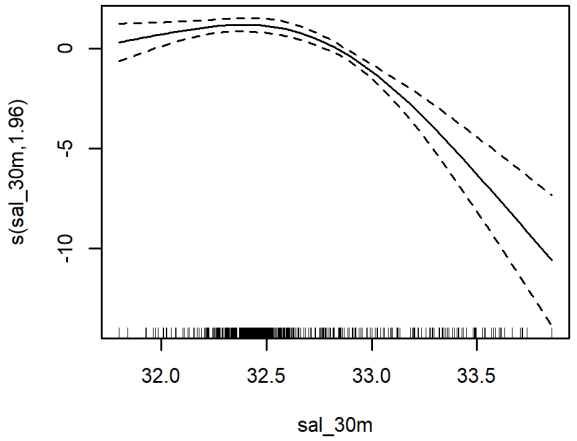
log Depth



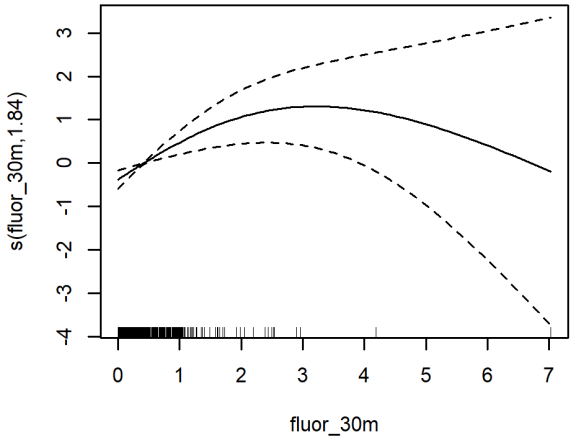
Temp. 30 m



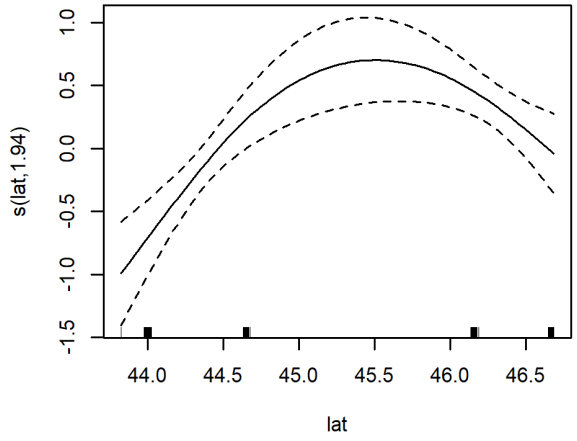
Sal. 30 m



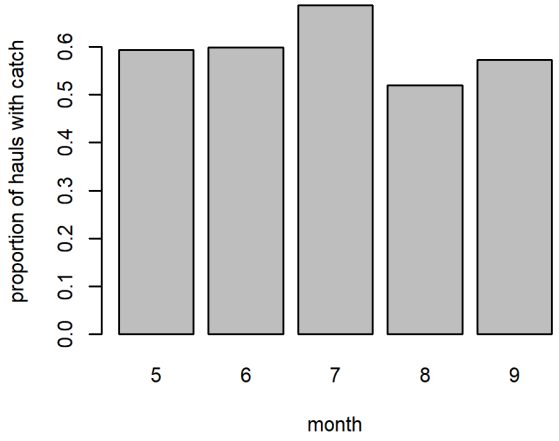
Chlor. 30 m



Latitude

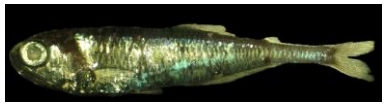


Month



Micronekton Community Cluster Analysis

Tarletonbeania crenularis



Diaphus theta



Sebastes spp.

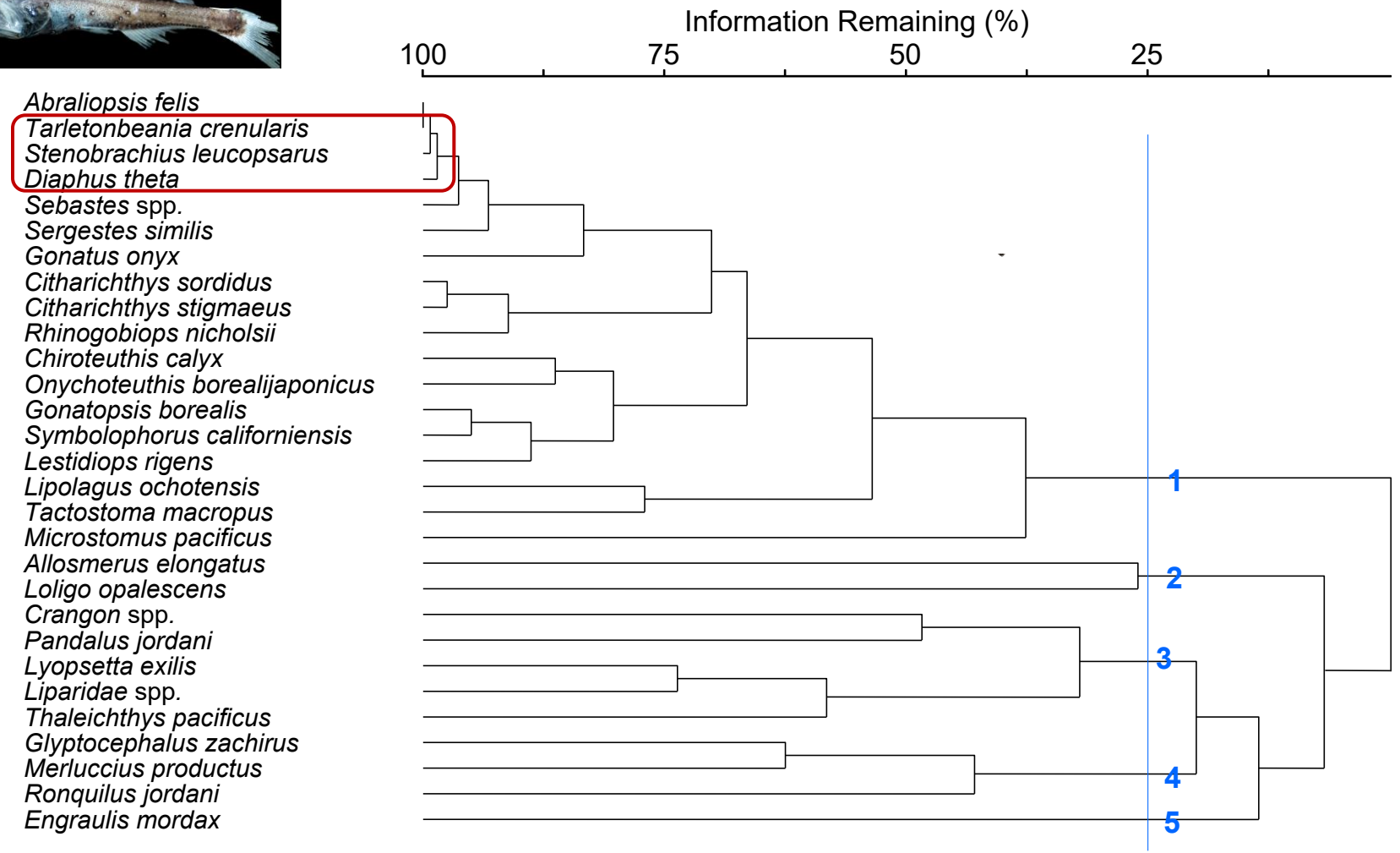


Abraliopsis felis

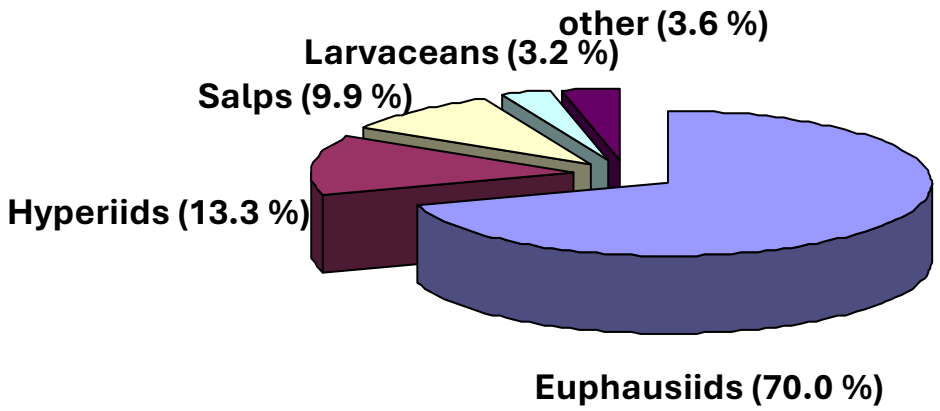


Stenobrachius leucopsarus

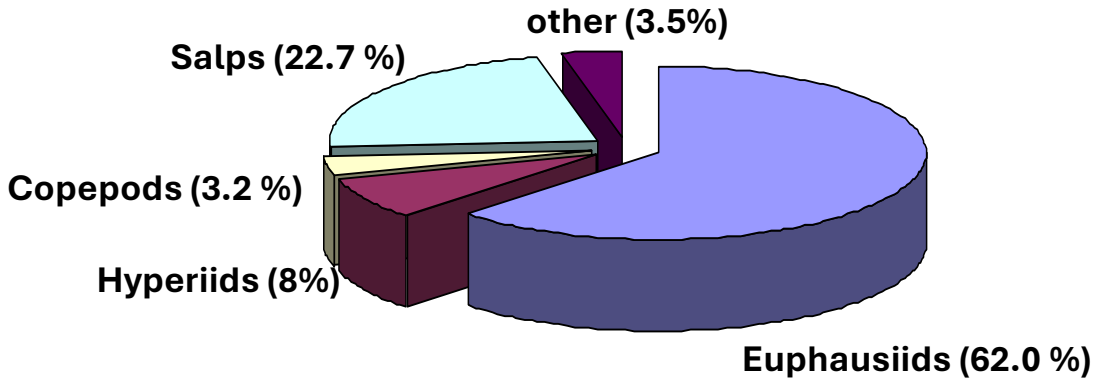




Composition of Myctophid Prey (% wet weight)



T. crenularis



D. theta

Vol. 373: 81–96, 2008
doi: 10.3354/meps07678

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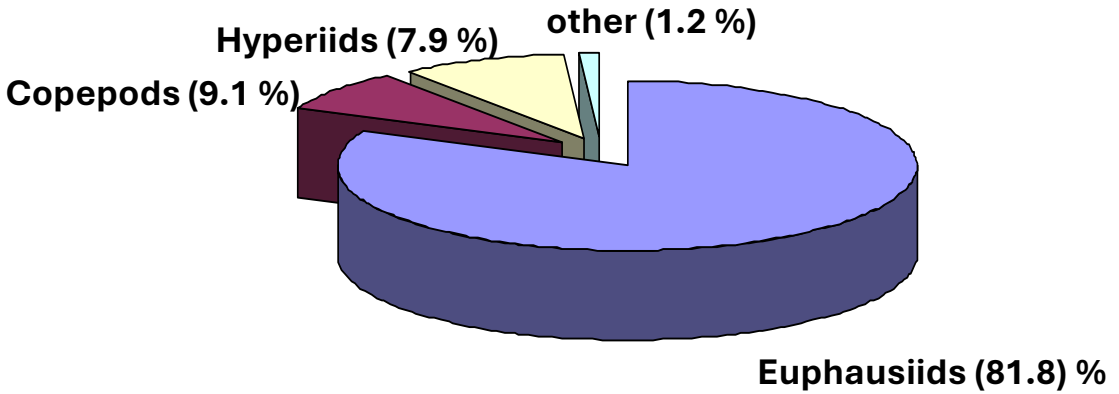
Published December 23

Trophic ecology of three dominant myctophid species in the northern California Current region

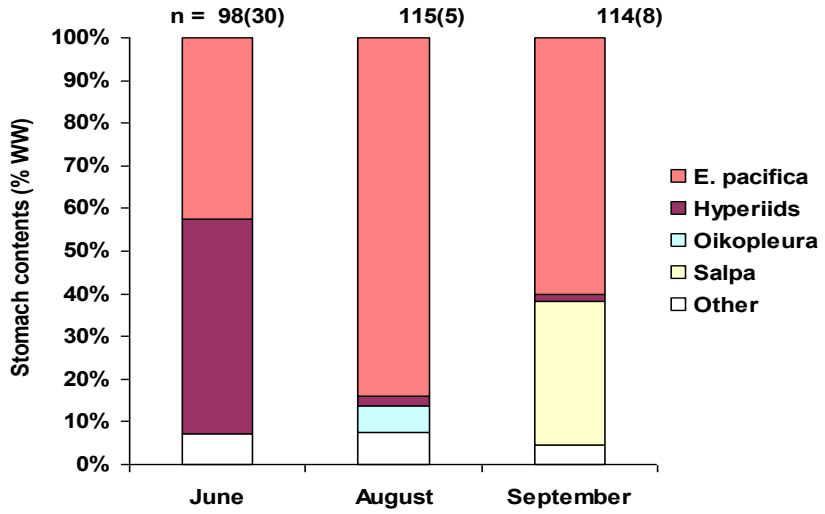
Andrey V. Suntsov[1,2,*], Richard D. Brodeur[1]



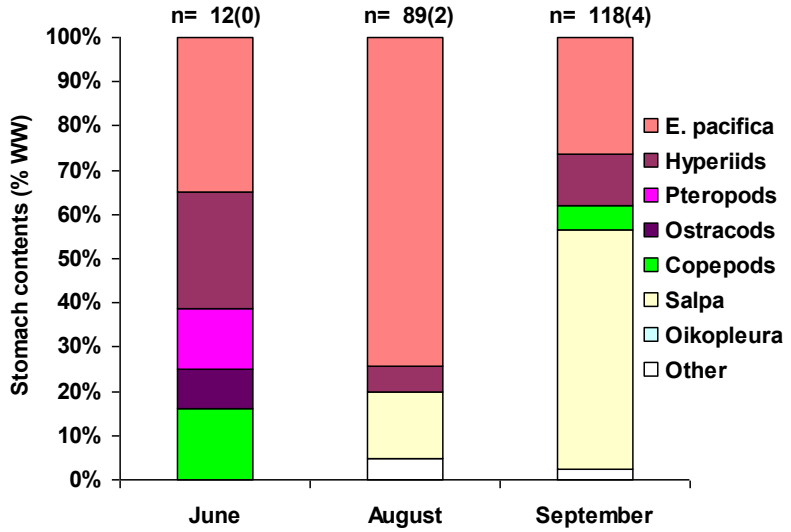
S. leucopsarus

Seasonal Variability in Diet (% wet weight)

T. crenularis

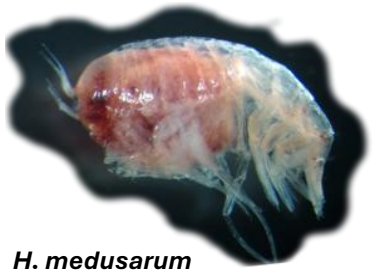


D. theta

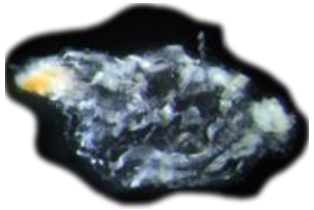




E. pacifica



H. medusarum

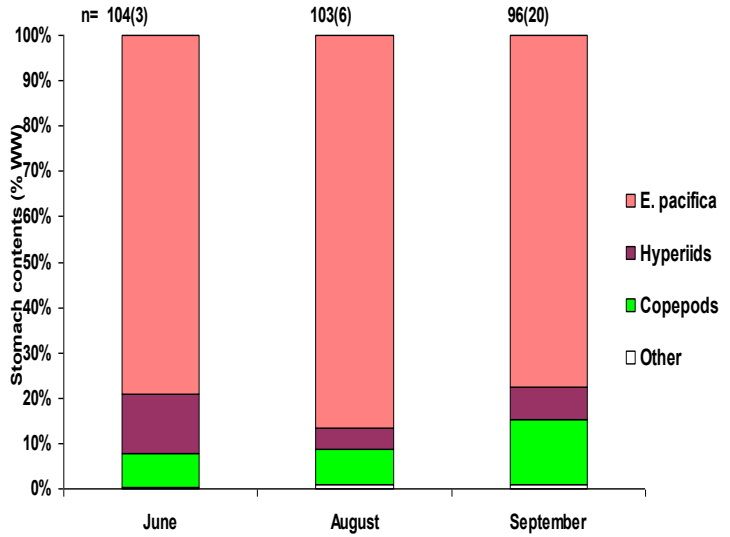


Salpa sp.

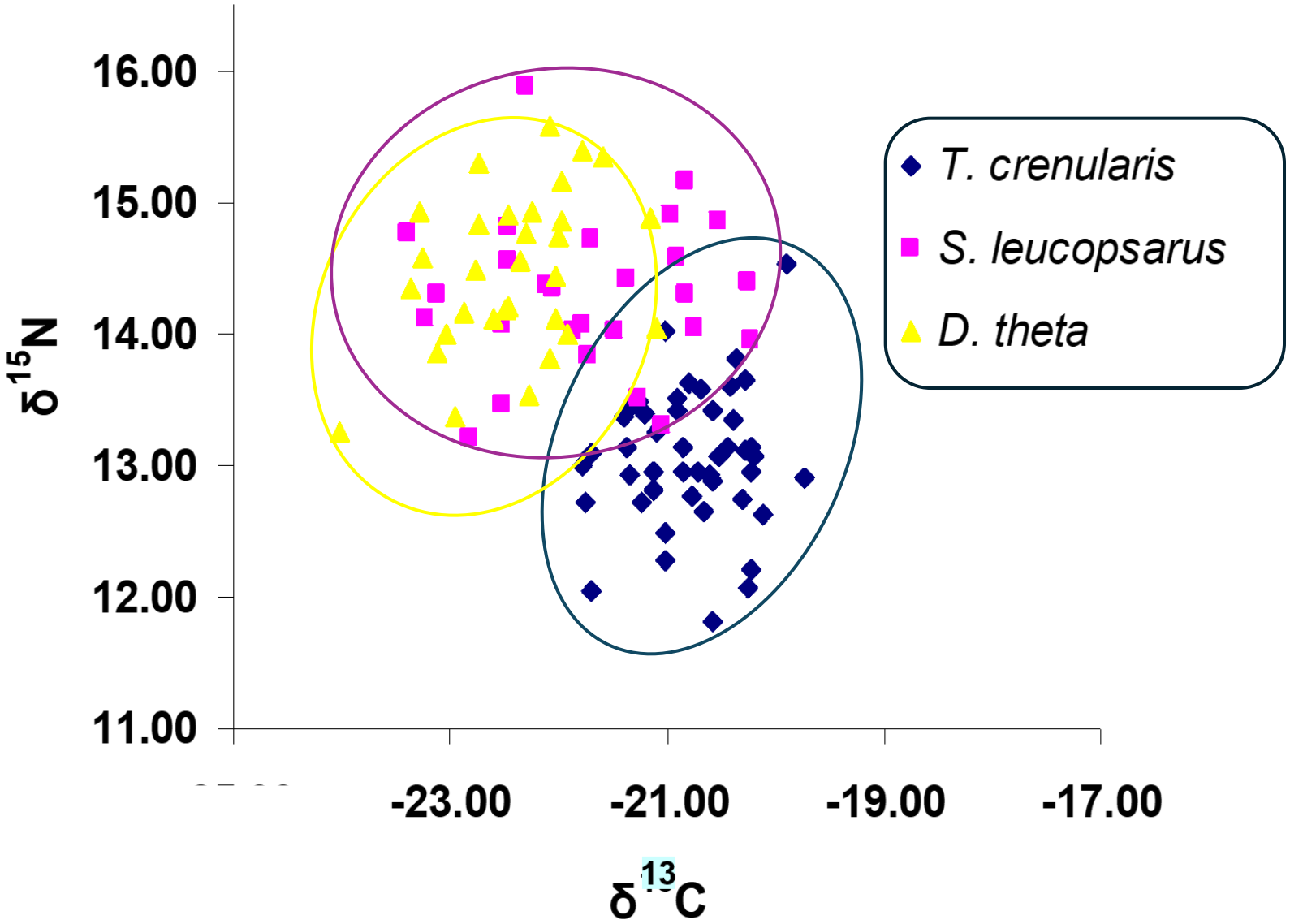


copepods

S. leucopsarus

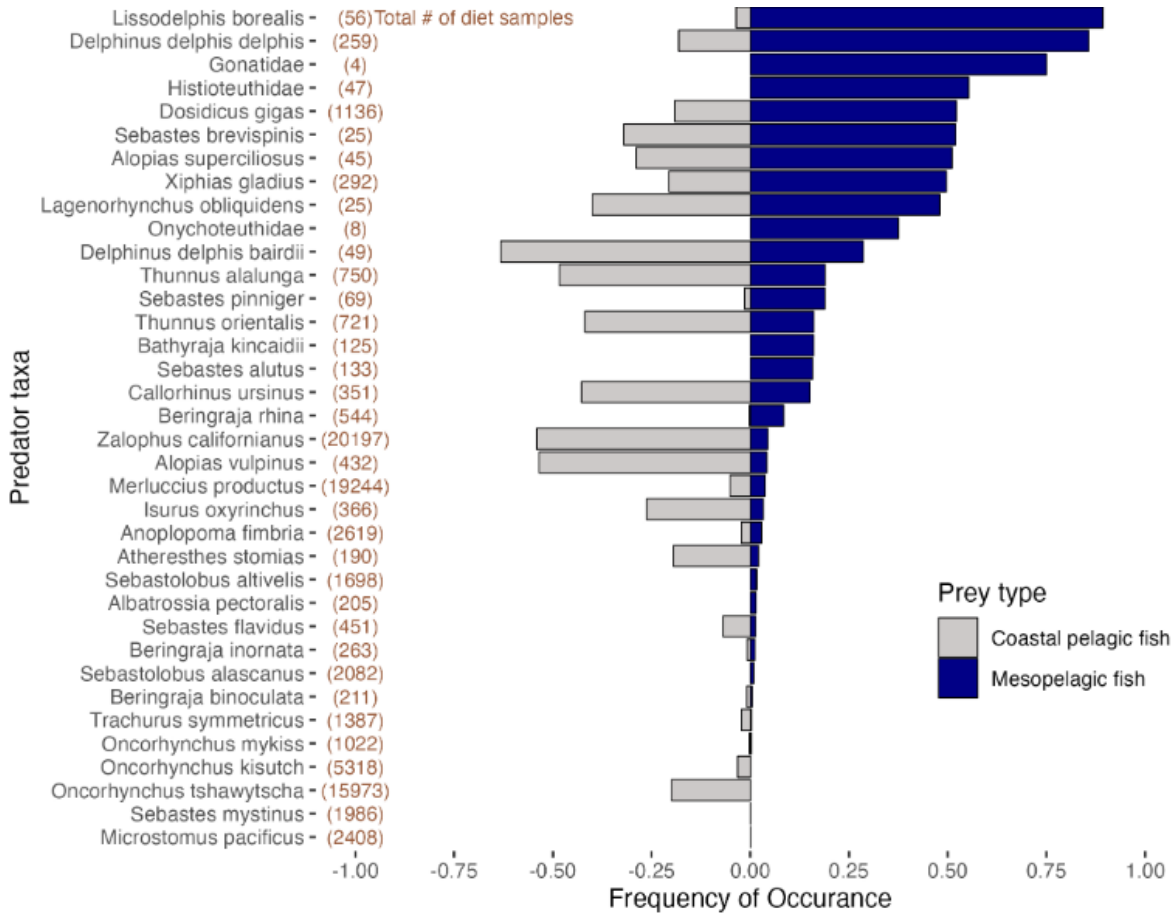


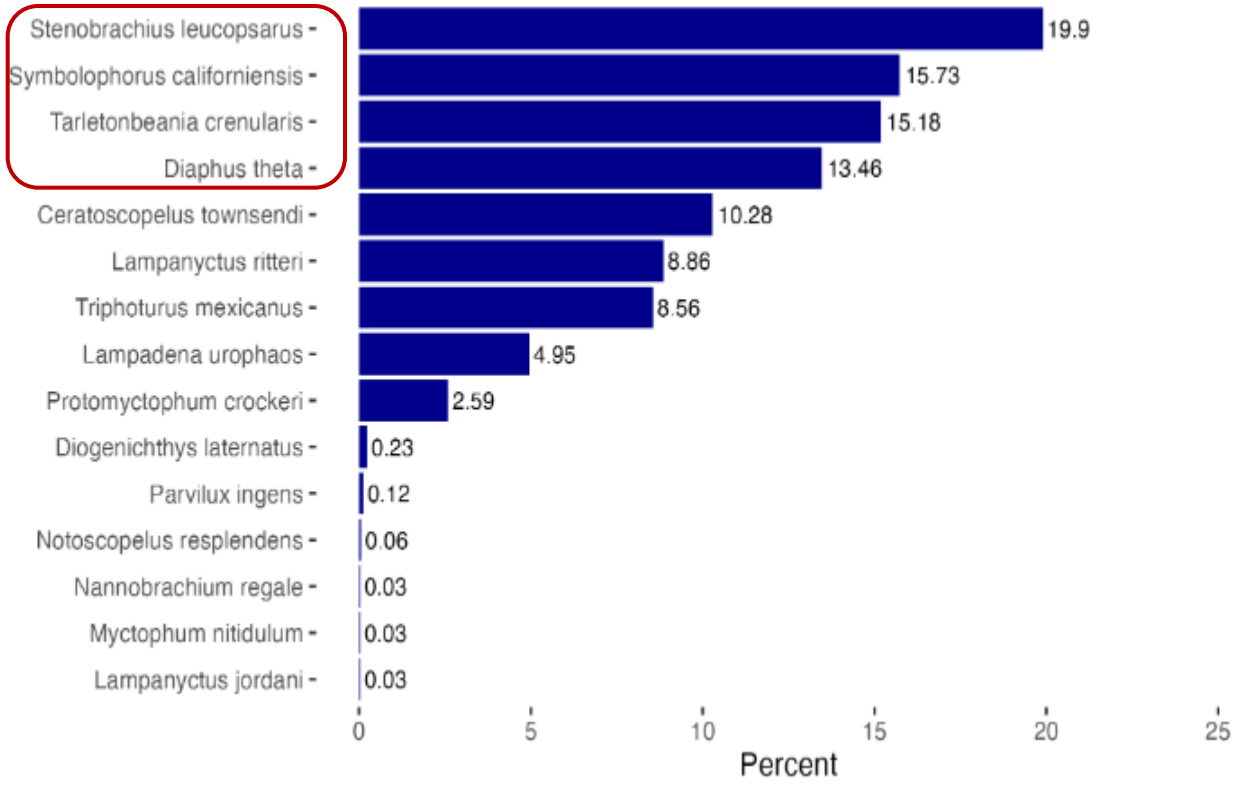
Stable Isotope Values of Myctophid Species



Brodeur and Suntsov Unpub.

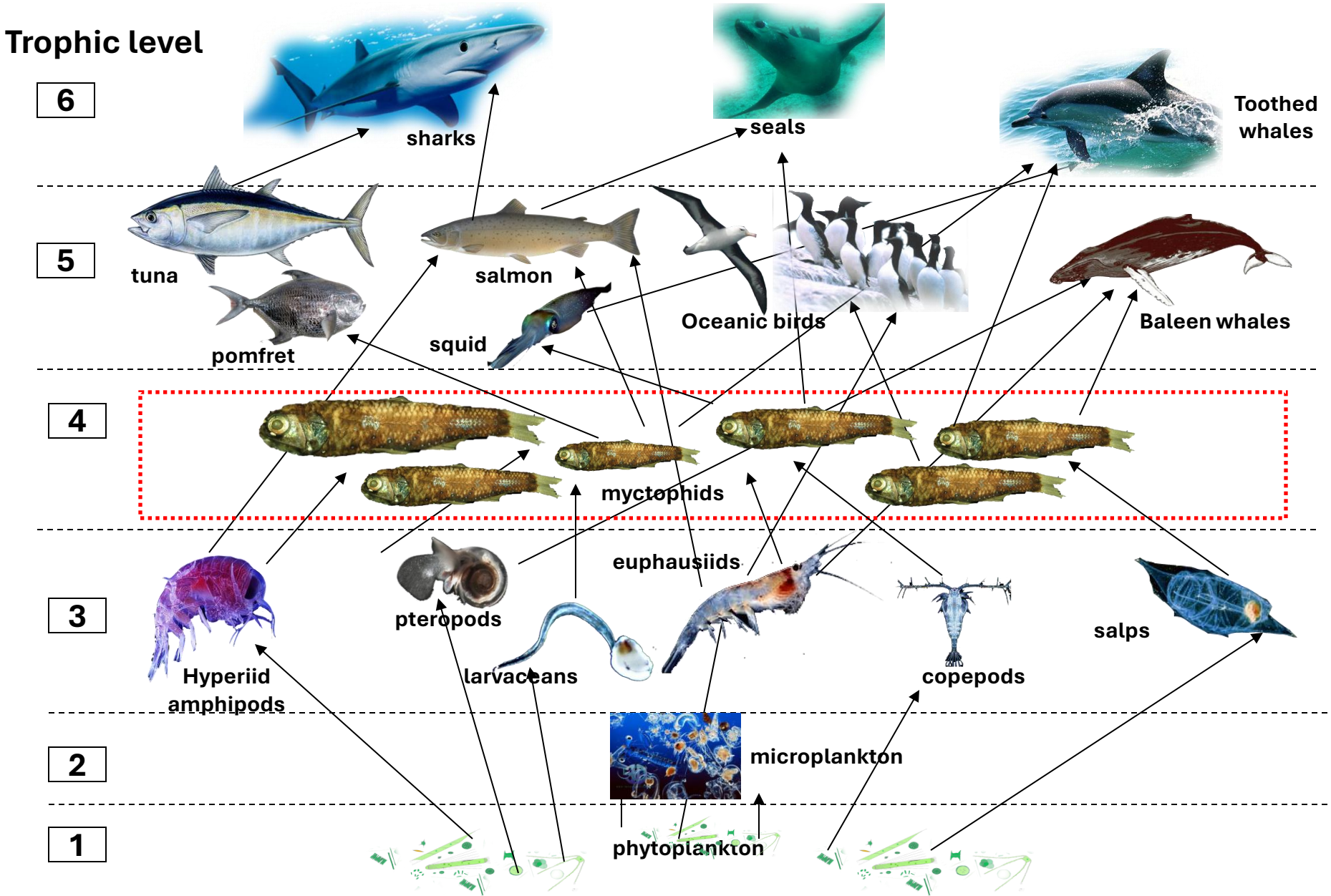
Predators of Myctophid Species in California Current



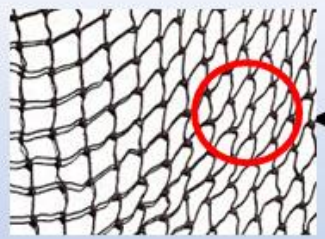


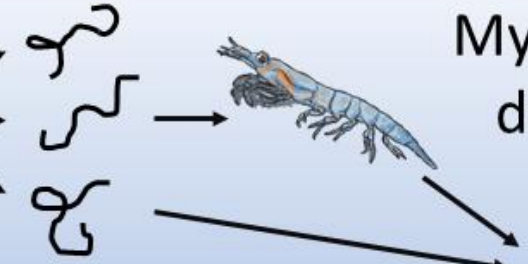
Iglesias et al. (2023) Mesopelagic fishes are important prey for a diversity of predators.
Front. Mar. Sci. 10:1220088

Myctophidae in the oceanic food web



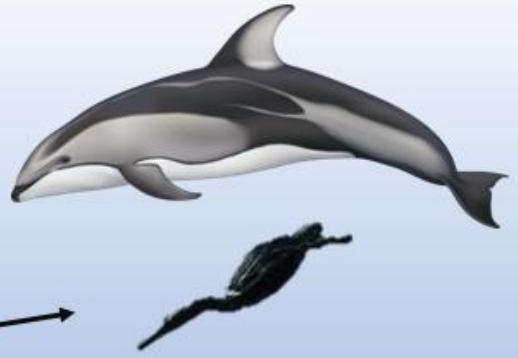
epipelagic zone





Marine debris breaks down and becomes bioavailable

Myctophids ingest microplastics directly or indirectly through zooplankton





Myctophids are an important food source for seabirds and marine mammals

Vertical migration transports microplastics to mesopelagic food webs

mesopelagic zone

Microplastics bioaccumulate in commercially important fisheries and potentially our seafood









Egested fecal pellets containing microplastics sink to the sea floor

O. Boisen, OSU

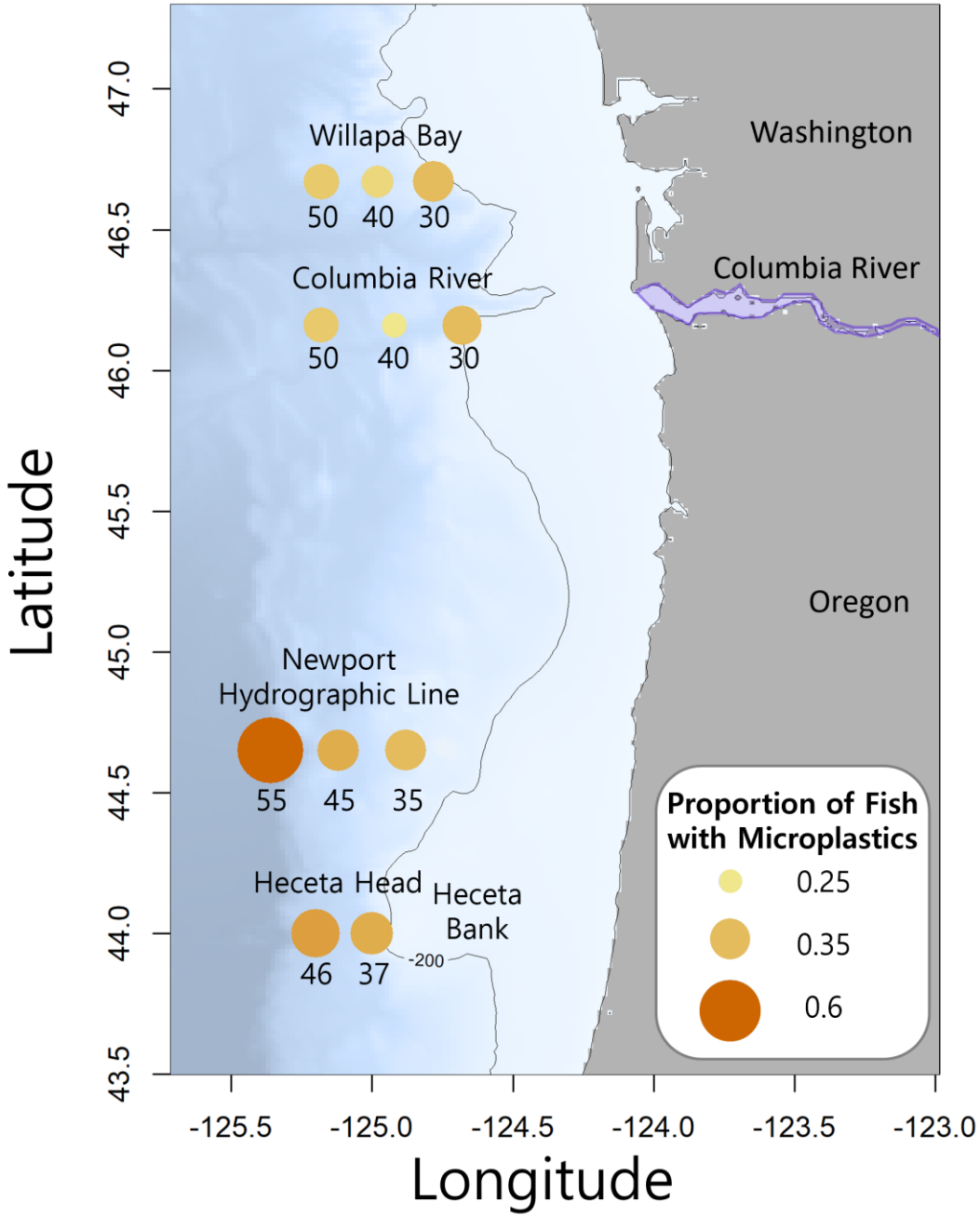
frontiers | Frontiers in Marine Science

Spatial patterns of microparticle ingestion by myctophids near a major river mouth in the northeast Pacific Ocean

Olivia C. Boisen[1*], Richard D. Brodeur[1], Susanne M. Brander[1,2†] and Scott A. Heppell[1*†]

TYPE Original Research
PUBLISHED 16 August 2024
DOI 10.3389/fmars.2024.1426136

1) ~34% of myctophids had either synthetic or other anthropogenic particles retained in their GI tract
2) microparticle ingestion was higher in an active-feeding species of myctophid (*Tarletonbeania crenularis*) than an inactive-feeding species (*S. leucopsarus*)
3) Species and standard length were the best predictors of microparticle consumption in best-fit model.



Myctophids are Important to Coastal Systems

- Migratory mesopelagics
  - mesopelagic fish that migrate between open ocean and coastal systems
  - coastal species undergo large distributional changes/expansion that takes them into the open ocean fringes
- Absolute abundance
  - vast source of energy for coastal species migrating to open ocean system (salmon, mackerel, etc.) and highly migratory species in the open ocean (tuna, squid)

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Olivia Boisen – Oregon State University
Toby Auth – CIMERS
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.... And thank you all for coming!