



PICES-ICES WG53/WGSPF meeting (May 2026)

Activity 2: Food-web dynamics of small pelagic fish

Activity leaders: Susana Garrido (Portugal), Brian Hunt (Canada)



Objectives of the activity for 2024–2028 [with links to WG's ToR]

- Compile metadata on top predator diet databases from different regions
(ToR 1 & 2); Lead: S. Garrido, B. Hunt
- Review paper on SPF nutrition (e.g., energy density, fatty acids, lipid content, essential vitamins) as it related to top predator health
(ToR 1, 2 & 4); Lead: B. Hunt, H. Pethybridge
- Review of predator-prey allometric relationships of SPF—top predators using already available data on 29 species and data on tuna (albacore, bluefin) and billfish (swordfish) diet from the California Current System offered by Brad Erisman
(ToR 1, 2 & 4); Lead: F. Juanes
- Modification of ecosystem models to divide species into stanzas (life history stages of larger fish species that overlap with SPF during early life history) and compare outputs (ToR 1, 2, 4 & 5). Discuss as a study comparing select Ecopath models from different regions (e.g., ACT NOW project for European region, MICE model in the Northern Baltic);
Leads: J. Ruzicka, S. Garrido, D. Szalaj
- Application of semi-quantitative stomach fullness categories (from empty to full; categories 1–4) to examine, e.g., seasonal and diel variations in feeding, as well as spatial variation, using data available for multiple species (juvenile and adult) from Portugal, Bay of Biscay, and Spain
(ToR 2 & 4); Lead: S. Garrido
- Review and recommendations for best practice in evaluating larval fish diets using molecular methods
(ToR 2 & 4); Lead: S Garrido
- Further development of a paper on a global stable isotope-based trophic level comparison of SPF using Initial development conducted by Todd Miller and Ric Brodeur and connecting with CLIOTOP project on mesopelagic micronekton stable isotope
(ToR 1 & 2); Leads: R. Brodeur, H. Pethybridge, B. Hunt
- Assessment and characterization of SPF functional traits across freshwater, coast to offshore habitats, considering SPF feeding modes and predator-prey interactions context and using the existing trait database as a starting point
(ToR 1, 2 & 3).Leads: R. Brodeur, B. Hunt

Activity progress: results

Review of predator-prey allometric relationships of SPF—top predators using already available data on 29 species

(ToR 1, 2 & 4); Lead: F. Juanes

We are hopeful that connections at the meeting will lead to more data to fill large geographic gaps in south America and southern Africa. Either way we plan to submit the paper to the special issue.

and data on tuna (albacore, bluefin) and billfish (swordfish) diet from the California Current System offered by Brad Erisman.






I have not made progress on this deliverable but discussed data availability with Travis Richards at SPF meeting.



Activity progress: publications

Using the Diet Composition of Adult Chinook Salmon to Understand the Regional Structure of Salish Sea Forage Communities

Fisheries Oceanography, 2026; 0:1–15
<https://doi.org/10.1111/fog.70038>

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Acknowledgments

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Activity progress: meetings

American Fisheries Society Washington-BC chapters: Beyond Borders: Connecting Communities, People and Fish, Vancouver, BC, 11-13 March 2025.

- McLaskey A, Lerner JE, Hunt BPV. Forage fish nutrition as a driver of thiamine (vitamin B1) deficiency in Pacific Salmon.
- Troina GC, Riekenberg PM, van der Meer MTJ, Pakhomov EA, Hunt BPV. Applying compound-specific isotope analysis to investigate Pacific salmon open ocean habitat use and trophic overlap with non-salmonid mid-trophic level predators.
- Tabert, N., W. Duguid, W. Greentree, and F. Juanes. Salmon diets reveal historical trends in forage fish population dynamics.



Activity progress: meetings

PICES Annual Meeting, Innovative Approaches and Applications to Foster Resilience in North Pacific Ecosystems, Yokohama, Japan, 8-14 November 2025

- Surma S, Pakhomov EA, Hunt BPV, Aydin KY. Ecological importance of forage groups in the pelagic ecosystems of the subarctic Pacific.

Activity progress: results

Update of ECOPATH with stanzas: done for the Iberian coast, will be submitted At the Special Issue of the Symposium

Analysis of the semi-quantitative stomach fullness scale: Done for Portuguese data, maybe ready for the Special Issue

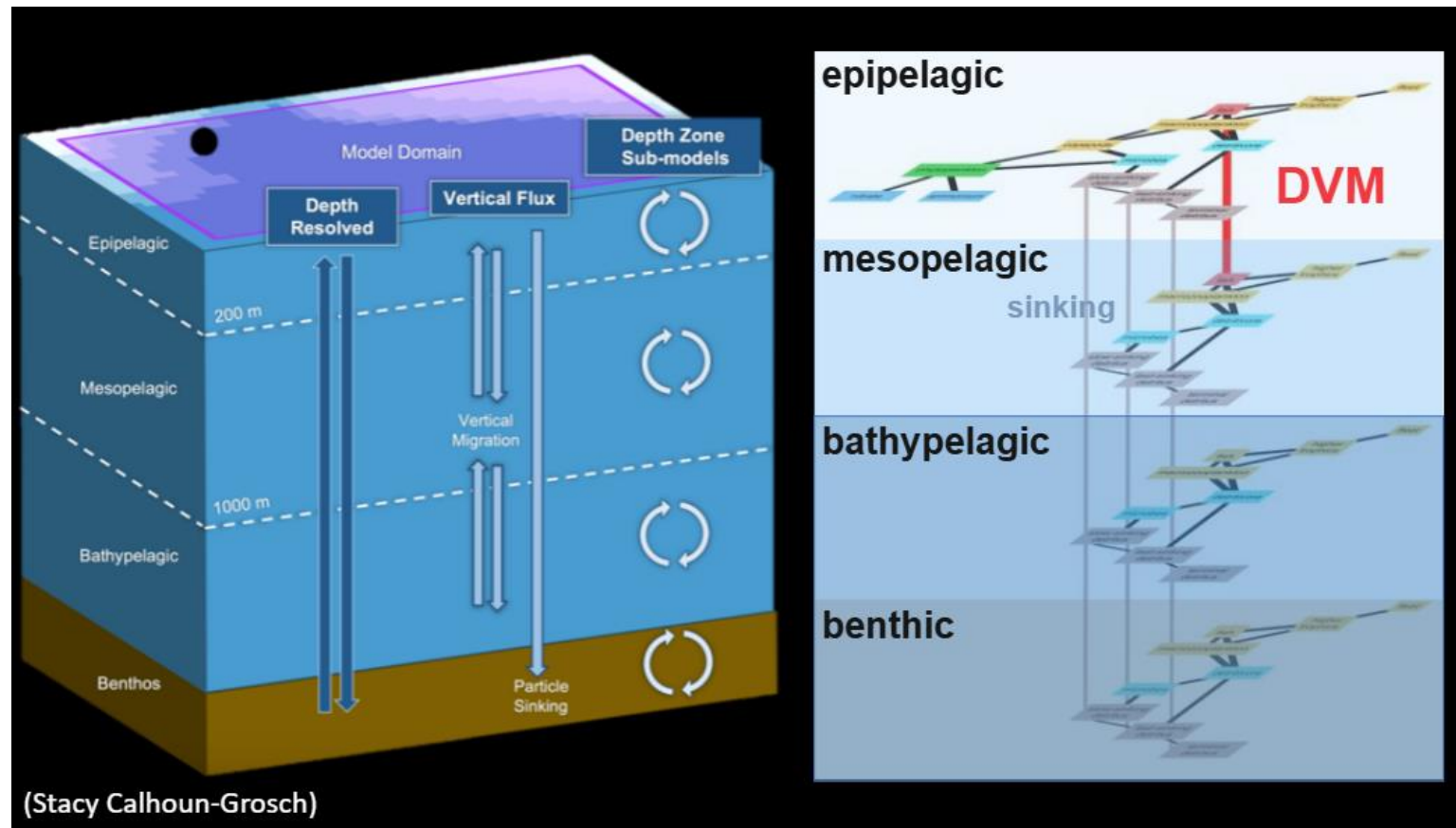
Metabarcoding of larval diet: In progress, will look for comparisons in different systems



Activity progress: results

Adapting ecosystem models to answer SPF / mesopelagic specific questions

Jim - inclusion of DVM





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Activity progress: results

Assessment and characterization of SPF functional traits across freshwater, coast to offshore habitats

Pelagic Species Trait Database

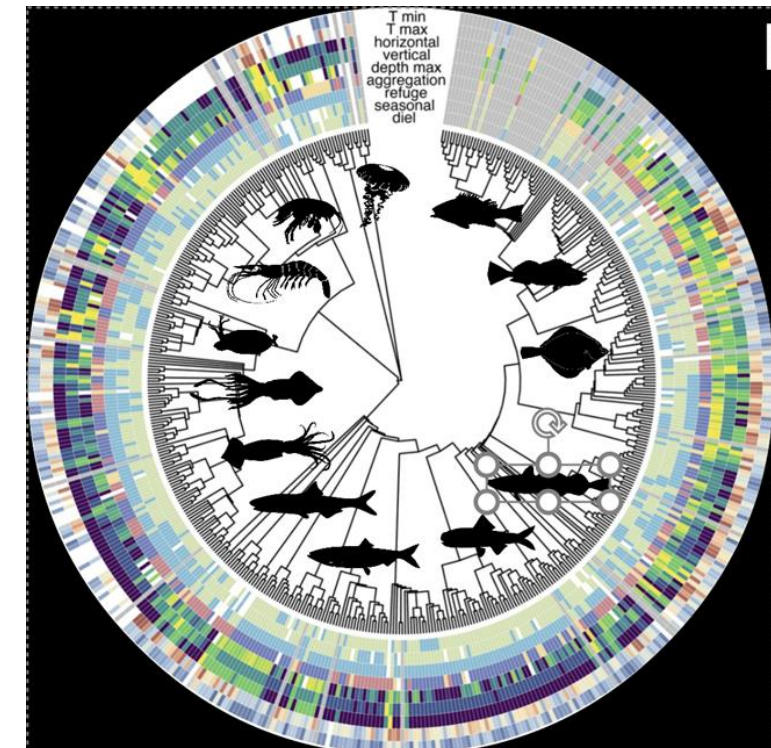
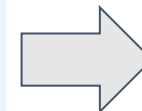
Version 3.1



Gleiber, Miram R.; Hardy, Natasha A.; Roote, Zachary; Krug-Macleod, Alana; Morganson, Caitlin J.; Tandy, Zackary; George, Iris; Matuch, Cindy; Brookson, Cole B.; Daly, Elizabeth A.; Portner, Elan J.; Choy, C. Anela; Crowder, Larry B.; Green, Stephanie J., 2022, "Pelagic Species Trait Database", <https://doi.org/10.5683/SP3/0YFJED>, Borealis, V3, UNF:6:1QVcn3b5pGkPebe+a65rg== [fileUNF]

Cite Dataset ▾

Learn about [Data Citation Standards](#).





Activity progress: meetings

Assessment and characterization of SPF functional traits across freshwater, coast to offshore habitats :

Workshop proposal

Canadian Institute of Ecology and Evolution (CIEE/ICEE) operates the **Living Data Project (LDP)**,

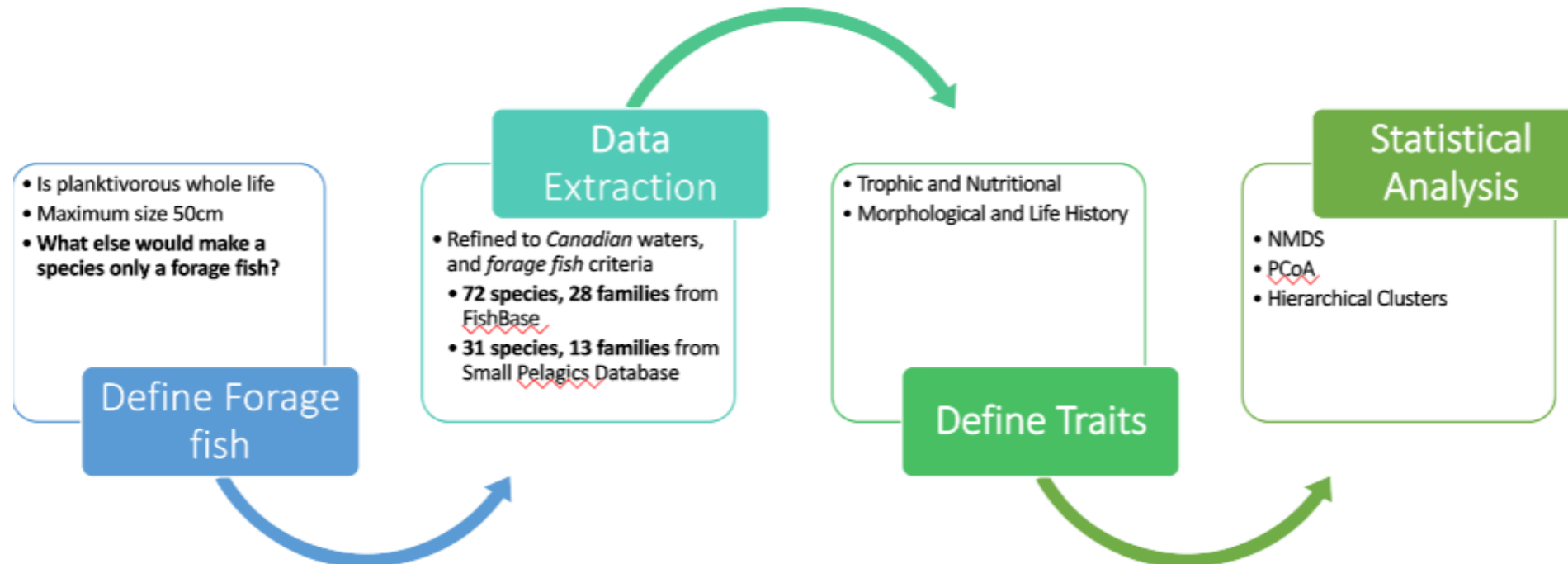
Enriching nutritional trait data deficiencies in aquatic ecology

Not successful; but brought a group and proposal framework together and intend to apply again.



Activity progress: results

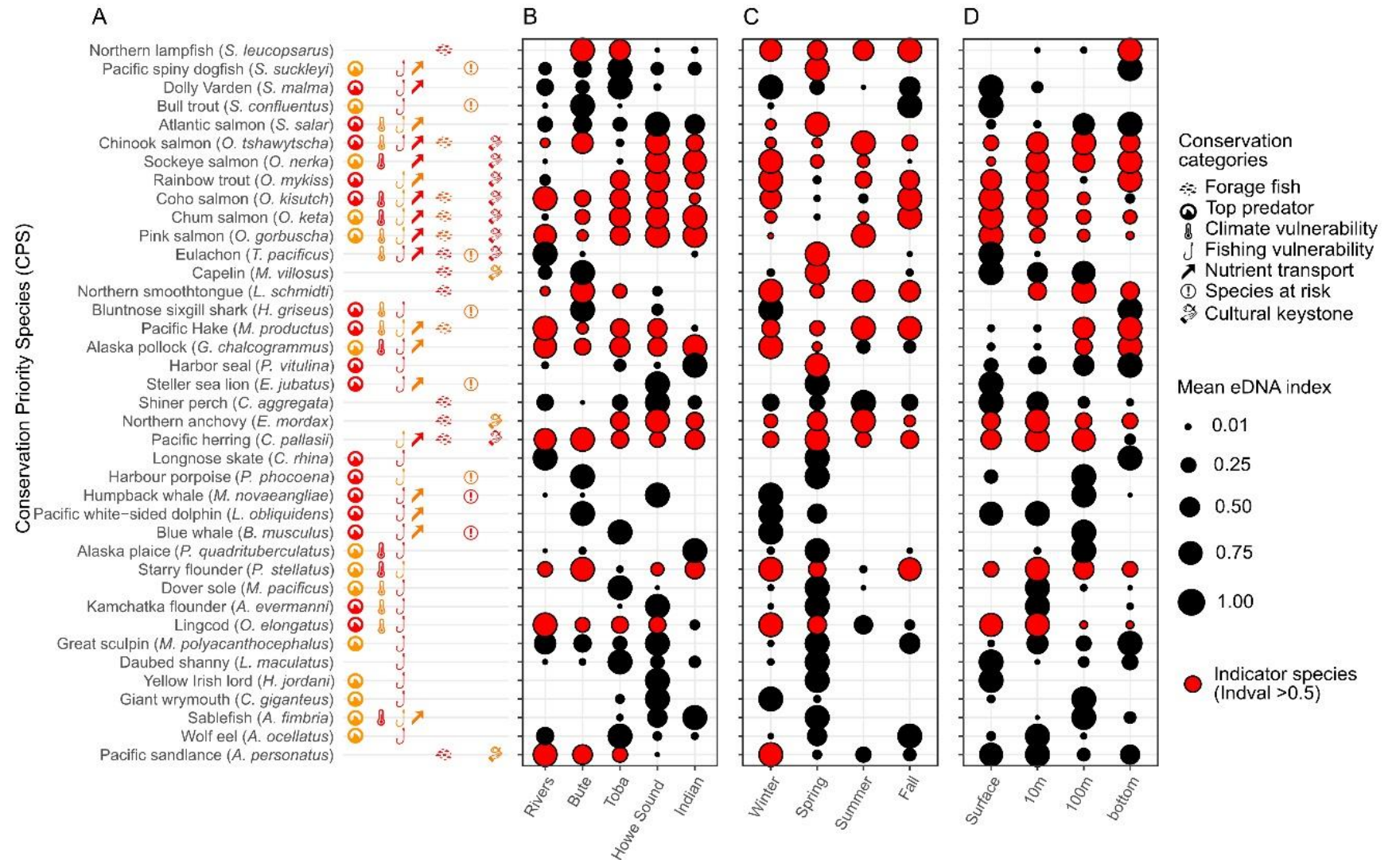
Assessment and characterization of SPF functional traits across freshwater, coast to offshore habitats - being trialed in British Columbia case study



Activity progress: results

*Functional Traits:
eDNA Metabarcoding
Identifies Fish
Conservation Priorities
in Deep-Water Fjords
of British Columbia,
Canada" Article*

Expansion of this
approach to dergedgin
risk assesment





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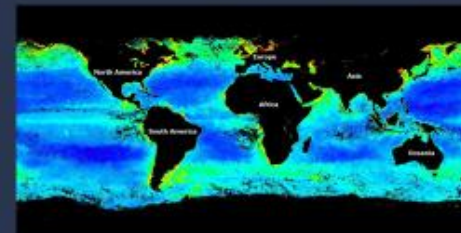
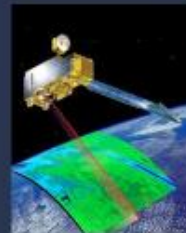


Activity progress: results

Update on global stable isotope-based trophic level comparison of SPF

Trophic comparisons - Methods

- Species/genera (with global distributions)
 - Forage Fish: Sardines, Anchovies, and Round herring
 - Mackerels: Chub and horse mackerel
 - Shark: Blue shark
- Ecosystems - Eastern and western boundary currents
- Trophic levels
 - $\delta^{15}\text{N}$ of baseline (copepods) and fish
 - Sample sizes of at least 10, fish size within 80% of maximum reported length (from FishBase)
 - Some TLs from the literature for Blue sharks
- Ecosystem Productivity – MODIS Aqua annual chlorophyll-a values from shelf-slope



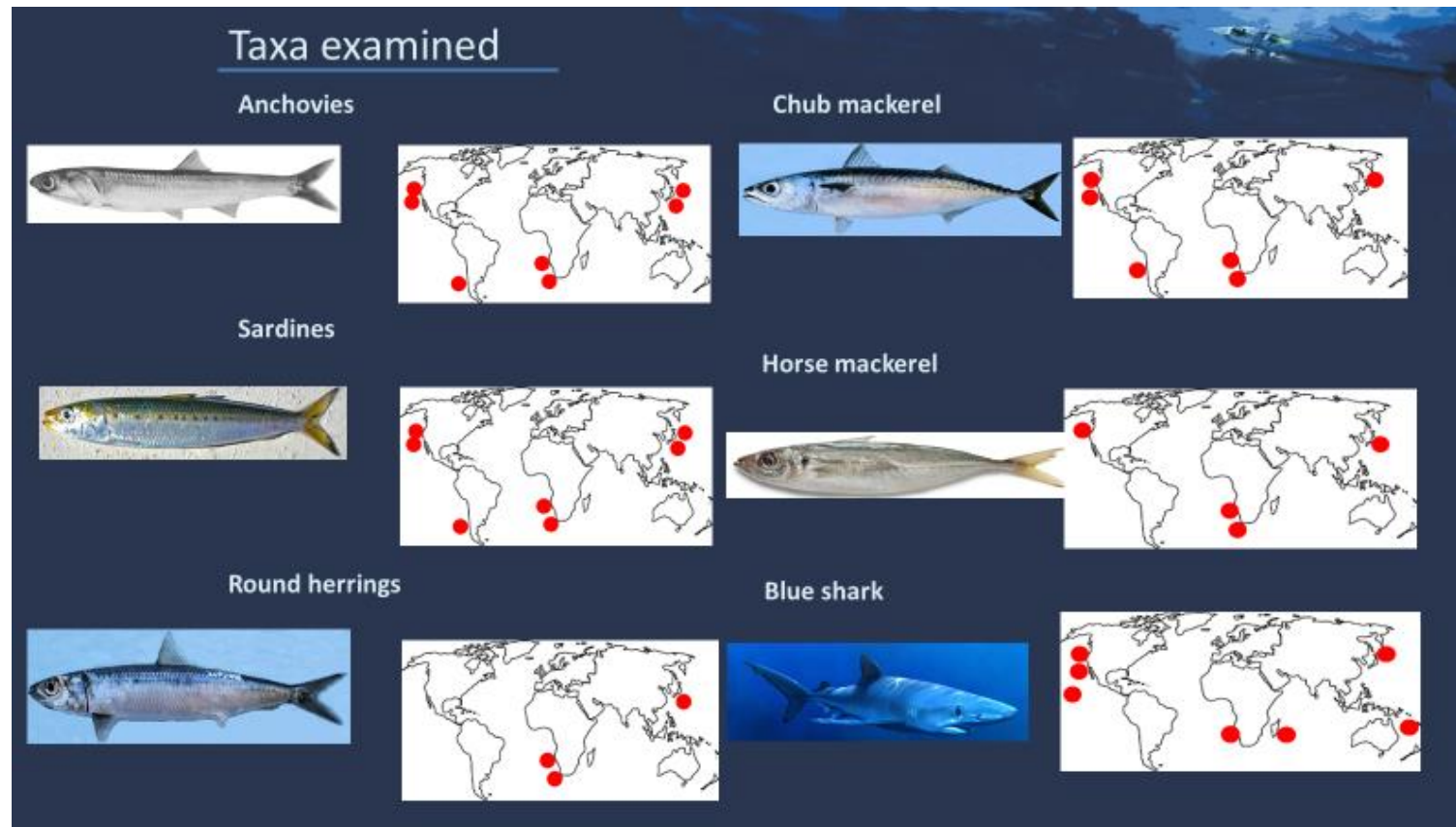


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Activity progress: results

Update on global stable isotope-based trophic level comparison of SPF





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Activity progress: discussion

Points for discussion of the activity

Potential for EU Horizon grant to fund comparative studies etc.?

Compile metadata on top predator diet databases from different regions



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Activity progress: discussion

Planned joint analyses (includes discussion topics and data needs)

- Nutrient data synthesis
- Feeding intensity; Susanna analysis of fisheries data
- Isotope data synthesis for regional comparison
- Potential applications of ecosystem SPF / micronekton tuned EwE models



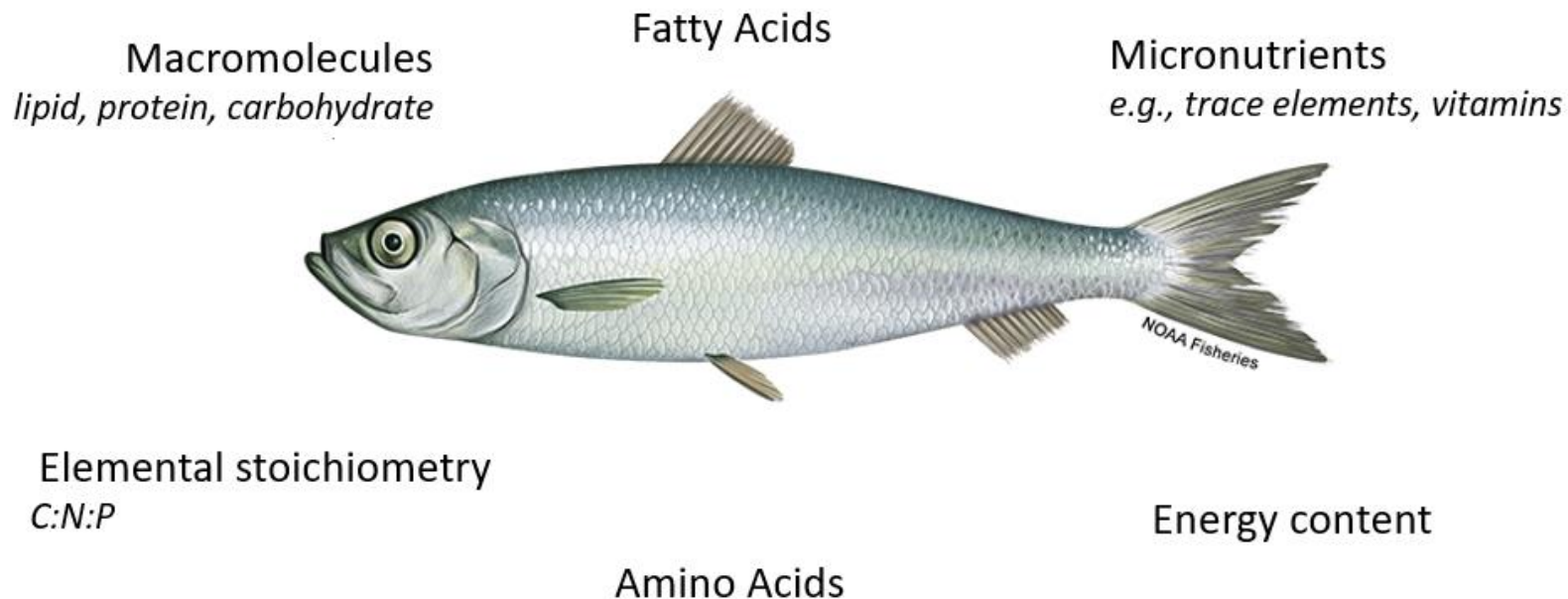
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Activity progress: discussion

Planned joint analyses (includes discussion topics and data needs)

- Nutrient data synthesis - this is what we are looking for



General points for WG meeting

List some points for the general discussion and opportunities for cross-activity collaboration

- shared SPF metadata platform - know what data exists across activities?

Ideas for how your activity can contribute to the Small Pelagics in 2050 Synthesis

- Survey design;
- EBM; model development