Activity 7: Advanced technologies and methodologies for assessing small pelagic communities

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Background

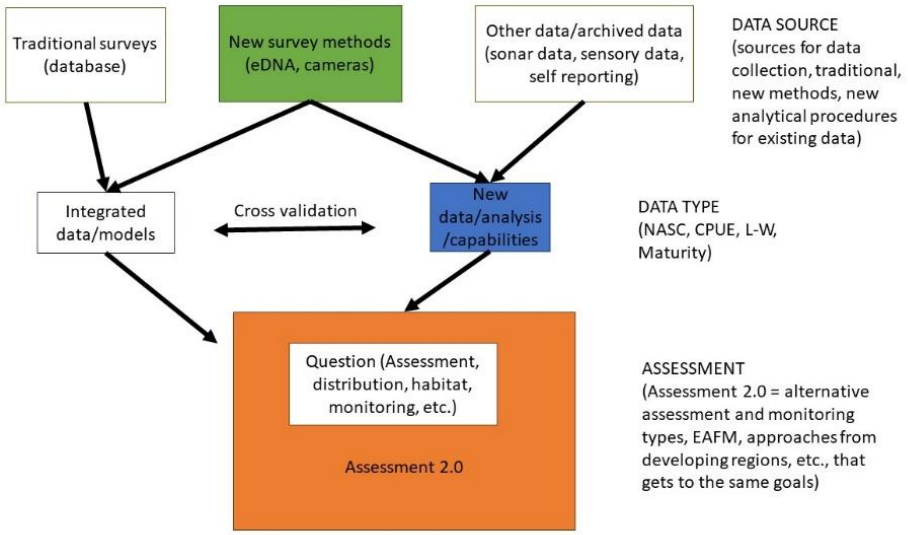
Surveying small pelagic communities is difficult due to a number of reasons, including their inherent variability (*e.g*., potentially large interannual fluctuations in population size), their schooling behavior, their broad and patchy distributions and the close linkages to oceanographic conditions (*e.g*., their distributional responses to temperature). These features have led to gaps in our ability to produce accurate abundance indices, and to understand habitat use, distributions and other biological and ecological aspects of small pelagic species' life history. Activity 7 will build on work carried out during the 2020–2024 working group term, exploring methods for conducting surveys for small pelagic fishes (SPF). There have been many recent advances in both technology and statistical methods that may allow for more precise and accurate data to be collected on all aspects of small pelagic forage communities and their ecosystems. Many of the technological advances have permitted increased data collection with improved efficiency, potentially resulting in savings of both time and resources (*e.g*., vessel days). In general, Activity 7 will provide a forum for exploring and communicating these advances (WG's *ToR 1*).

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

- Review of survey methods currently used to assess small pelagics (continuing compilation of metadata of global surveys for small pelagic species). – *ToR 2, 3 & 4*
- Review methods for improving, measuring or correcting existing sampling methods for potential gear selectivity and sampling bias (*e.g*., selectivity-related studies for correcting trawl catch length composition, modifying or designing trawls with improved retention or determining environmental linkages to gear or survey availability). – *ToR 2, 3 & 4*
- Review applications of new technologies to complement traditional/existing surveys (*e.g*., using eDNA, satellite data, cameras, industry data or other technologies to provide more efficient, wider or better integrated abundance indices; additionally, review applications of new technologies to better characterize the pelagic ecosystem or habitat. – *ToR 2, 3 & 4*
- Research new technologies that can be used to develop new surveys or augment existing monitoring efforts, and examine new tools that can provide data to support small pelagic assessment (*e.g*., sonar surveys, drone surveys, uncrewed surface vessels). – *ToR 2, 3 & 4*
- Review novel data processing and data analysis methods. – *ToR 2, 3 & 4*
    - Recent advances in data processing (*e.g*., machine learning, cloud computing) for untapping the potential in the large wealth of historical and future data, for example, improved utilization of opportunistic acoustic data collected from fishing vessels.
    - Data analysis using new statistical approaches brings opportunities to leverage computing power to more efficiently analyze big data, improve classification of acoustic data using Bayesian techniques, and integrate historical data sets and new data inputs within joint modeling frameworks (*e.g*., VAST can allow for the combination of different survey and non-survey data into index standardization models).

Deliverables and anticipated timeline

Deliverable/objective	Timeline
Convene topic session or workshop on advanced technologies in 2026 Symposium (SPF-2026)	May 2026
Review paper on comparative survey design, existing survey methods and modeling methods	May 2026 – present draft at SPF-2026



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