



Accounting for Survey Gear Change in Statistical Catch-at-Age Assessment Models

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Goal: Determine how alternative approaches for accommodating changes in long-term fisheries-independent surveys influence the accuracy, precision, and reliability of statistical catch-at-age (SCAA) models used to inform fisheries management decisions.

- Objectives:**
1. Evaluate how alternative approaches for accommodating survey gear changes affect SCAA model performance, including model convergence and accuracy/precision of key management predictions.
 2. Compare in-model versus out-of-model use of gear comparison data.
 3. Assess the influence of gear comparison study design (e.g., duration, sampling intensity, obs. error).
 4. Determine whether optimal approaches for handling survey changes differ across species with contrasting life histories.

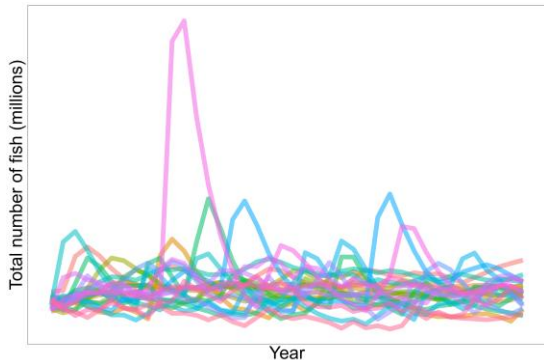
Management Implications: This project will provide fisheries managers with practical guidance on how to accommodate changes in long-term fisheries-independent surveys without compromising the reliability of stock assessment outputs. By identifying approaches that maintain accuracy and precision in key management metrics such as abundance, spawning stock biomass, and fishing mortality, the research supports more defensible harvest advice following survey modifications.

- Methods:**
- Simulate fish populations with known dynamics (e.g., recruitment, mortality), fishery harvest, and fishery independent survey catches under controlled scenarios representing different life histories, survey types, and levels of process and observation error.
 - Simulate catches from gear comparison studies of varying durations, intensities, and level of observed error
 - Fit SCAA model to simulated data sources, incorporating alternative representations of the fishery independent surveys and their associated gear change.
 - Quantify SCAA model performance by comparing estimated parameters to true values and evaluating model convergence and parameter identifiability among scenarios.

- Current Status:**
- Simulation and assessment models have been coded in R and code extensively checked to ensure models are operating as intended and capable of running a wide range of scenarios.
 - Planned scenarios have been identified with simulations be conducted in early 2026.



Caption: AI generated image depicting two research vessels of varying age pulling trawls collecting fish. Differences between the vessels (e.g., power) are likely to lead to differences in catch efficiency, which should be accounted for in assessment models.



Caption: Example output of simulated population dynamics from operating model conditioned on walleye life history characteristics.

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