How well (or not) do ABCs include ecosystem effects?

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Steps for Calculating ABC

• Stock assessment

• OFL (Overfishing Limit)

• ABC (Acceptable Biological Catch)
MAFMC methods for selecting ABCs

• Analytically derived OFL probability distribution
• Assessment team-modified OFL probability distribution
• SSC-modified OFL probability distribution
• OFL cannot be specified given current state of knowledge
Ecosystem in Stock Assessments

• $OFL \sim \text{Biomass}_p \times F_{\text{lim}}$

• Uncertainty in the OFL is estimated

• ABC is calculated using the Council’s Risk Policy
Probabilistic Approach
Control Rules

- For all levels except “…” the ABC is selected using the Council’s risk policy for acceptable probability of overfishing.
Projected biomass and $F_{\text{lim}}$ are usually based on “historical” estimates.

Ecosystem effects could be included in uncertainty.

Ecosystem effects could be included in SSC’s decision of whether a species is typical or atypical.

Currently, we do not have any stocks in these categories.
Ecosystem effects could be included in uncertainty.
Ecosystem effects could be included in determining whether a species is typical or atypical.
Currently, we do not use the “atypical” category very often.
OFL cannot be specified given current state of knowledge

- Very challenging problem

- Currently, about ½ of the MAFMC stocks fall into this category

- Could develop other data-poor approaches that estimate OFL
Methods for Including the Ecosystem

• A few multispecies assessments, but they are not used for management (as far as I know)
• Ecosystem Cap in Alaska
• Bycatch caps or sector-specific catch limits
• Proposed ecosystem-based (temperature) caps for sardine (Pacific)
What approaches have been taken within US and internationally to account for species and/or technical interactions in stock assessments and specification of annual catch limits?

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