

Session 1 Recap

How to incorporate ecosystem indicators into stock assessments



Trigger Question Categories:

- **Indicator selection for assessments and model improvements**
- **Responsiveness/Ability to address environmental anomalies**
- **Adaptivity of management framework**

Summary Points: **RED** Group [Auditorium]

- **Indicator selection for assessments and model improvements**
 - Accept balance between model fit improvement and mechanistic understanding.
 - Periodic, if not regular, renewal of indicator validity is required.
 - Adequate prediction requires mechanistic understanding and some statistical relation.
 - Thresholds are case specific; framework could be standardized.
- **Responsiveness/Ability to address environmental anomalies**
 - Modeling vs management alternatives time dependent. Repeatability/frequency further determines tool used to incorporate an event.
 - Multiple methods for incorporating (mort, growth, rep) time blocks situation dependent.
 - Short term predictions should be done (MSE) ideally modeling event process.
- **Adaptivity of management framework**
 - Provide alternatives (flexible) for non-traditional, data limited, multi-spp complex/fisheries.
 - Stationarity still assumed in most (all?) regions because understanding ecosystem variability vs production shift takes time. Precautionary approach followed by assuming changing conditions persist.

Summary Points: **BLUE** Group [Raven]

- Indicator selection process: **Strong mechanistic basis is most important**, forecasting least. Need to be able to connect indicator to biology of stock for **communication and buy-in** from Council members, stakeholders
 - Cast a wide net early on for potential new indicator ideas, from scientists, assessment authors, and stakeholders. Helps with buy in and credibility. Ok to discard an indicator if not proving to be a driving factor for assessment. Most Councils do not use for forecasting; difficulties predicting episodic events.
- Responsiveness to envtl anomalies: hard to tell in real time whether short term or regime shift. **Need tools in place to buy time** to evaluate, respond.
 - Post assessment adjustments to harvest levels, MSEs (but labor intensive and need to prioritize), also need avenue (and monitoring) for assessment authors to elevate concerns outside of typical cycle
- Adaptivity: **Regional process critical**; opposed to national requirements but guidance, best practices, communication and crossover among scientists, regions
 - Vast differences by Council in assessment frequency, capacity, data quality, trust and credibility.
 - Concerns about capacity limitations; especially **need more stock assessment authors** and those who train them, and **better data systems** and handling practices to increase efficiency

Summary Points: GREY Group [Raven]

- **Indicator selection for assessments and model improvements**
 - Can it easily be communicated? Should be transparent and inclusive
 - Incorporate LKTK where appropriate
 - Different indicators in data rich vs. data poor systems--challenges for different Councils/regions based on data availability and number of species to manage
 - Indicators can be useful for decision processes outside of stock assessments--even if not useful in the assessment model can be informative e.g. useful for assessment of risk.
- **Responsiveness/Ability to address environmental anomalies**
 - When it's happening you don't know if short-term or start of something longer
 - How do you determine when a regime shift has occurred?
 - Matching time series to life history of species- (e.g. short term data useful for short-lived species)
 - Doesn't have to be time series can be a state (high/low)
 - Environmental factors have economic and operational impacts and may be more common in future - hurricanes/typhoons, HABs, etc
- **Adaptivity of management framework**
 - Any national guidance needs to take into account regional differences
 - Different regions have differing data availability, are at different starting points and have different current issues (e.g. Climate change impacts/warming (so far) have been more impactful in northern regions)
 - MSA says in multispecies fishery, manage to the least productive stock- but sometimes don't have data to determine which species is more vulnerable than others
 - In areas with higher diversity and more specialization are species more at risk managed as complex than they would be elsewhere with less diversity/less specialization.

Summary Points: **GREEN** Group [Pink Salmon]

We ended up primarily approaching the question of how to effectively incorporate ecosystem indicators into stock assessments from the perspective of scientists engaged in the RFMC process and communicating the science to stakeholders.

- **Mechanism matters—especially for stakeholder buy-in. Reducing variance might not resonate with many stakeholders, but many more people will understand, for example, the relationship between predator and prey abundance driving good and bad years.**
- **Engagement of stakeholders can bring a lot of empirical data to the table. Their observations could be compelling to scientists who are exploring mechanistic relationships, and there is often increased stakeholder satisfaction when their ideas are explored by scientists.**
- **Ideas were explored for how best to formally engage stakeholders, from MSEs to Fishery Performance Reports. Effectively communicating tradeoffs of different management strategies can result in stakeholder understanding and buy-in.**

Summary Points: **YELLOW** Group [Eagle]

- **Indicator selection for assessments and model improvements**
 - **Criteria for inclusion of indicators in an assessment may vary based on the reviewer**
 - **Further focus could also be given to the downstream effects of incorporating an indicator in terms of its effects on management decisions.**
 - One method to assess the value of an indicator being considered may be the degree to which its inclusion improves model fits to other data
- **Responsiveness/Ability to address environmental anomalies**
 - short-term economic anomalies, such as those lasting for one year or less, would be expected to have long-term consequences for a stock.
 - MSEs useful to accommodate expectations of assessment frequency, while also allowing for consideration of exceptional circumstances
 - social and economic drivers that could influence the desire to change status determination criteria
- **Adaptivity of management framework**
 - Regional differences make national guidelines complicated
 - Focus should be on stocks that are doing well rather than all efforts on overfished stock non responsive to rebuilding plans
 - However some defensible definitions of terms like “environmental anomaly” or “exceptional circumstances” should be discussed, such that risk management can be appropriately applied considerate of Council and SSC requirements under the Magnuson-Stevens Act

Overall Session Findings: Indicator selection for assessments and model improvements

- Mechanistic basis highlighted
- Communication with stakeholders is extremely important both for information exchange and trust in the process and the science
- Model fit important criteria
- Indicators will vary with data availability
- Region/stock variability but framework needed?

Overall Session Findings: Responsiveness/Ability to address environmental anomalies

- Difficult to determine if it is a short-term anomaly or a recurring event
 - How to determine if it is in fact a regime shift?
- Data collection and time series should be matched to life history of species
- MSEs useful but also labor intensive and should be prioritized; communication of results is key

Overall Session Findings: Management Framework

- Need additional flexibility in management framework
 - data limited situations
 - multi-species fisheries
 - smaller scale fisheries
 - ability to respond to climate change
- Regional versus national focus important but with communication and coordination across regions
- Regional differences in assessment frequency, data availability and capacity