Update on the Dolphin Management Strategy Evaluation

South Atlantic Fishery Management Council June 2024

Acknowledgements

MSE Team

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Beyond Our Shores Foundation: Wess Merten
SERO: Nikhil Mehta
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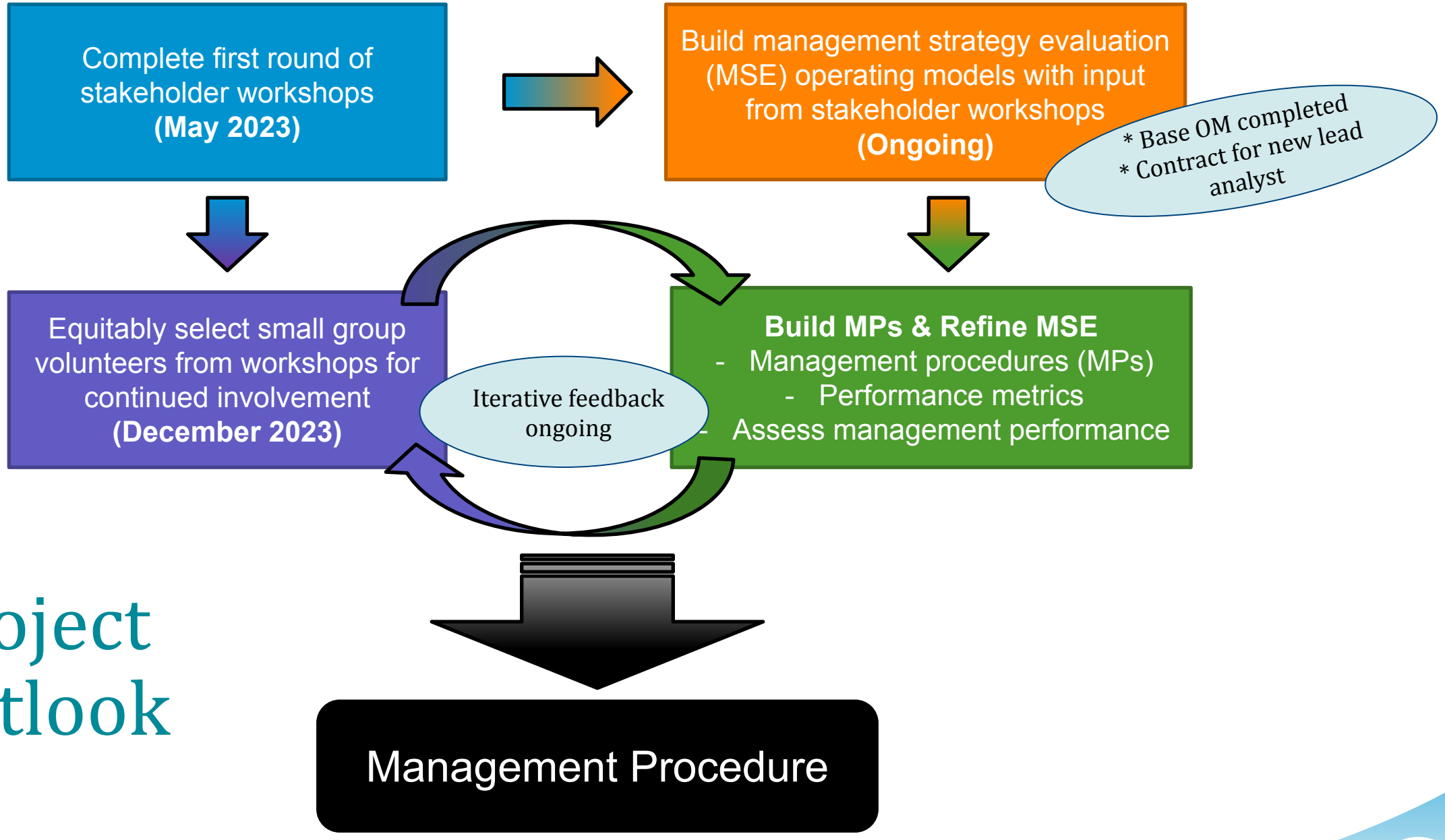
Stakeholder working group & workshop participants

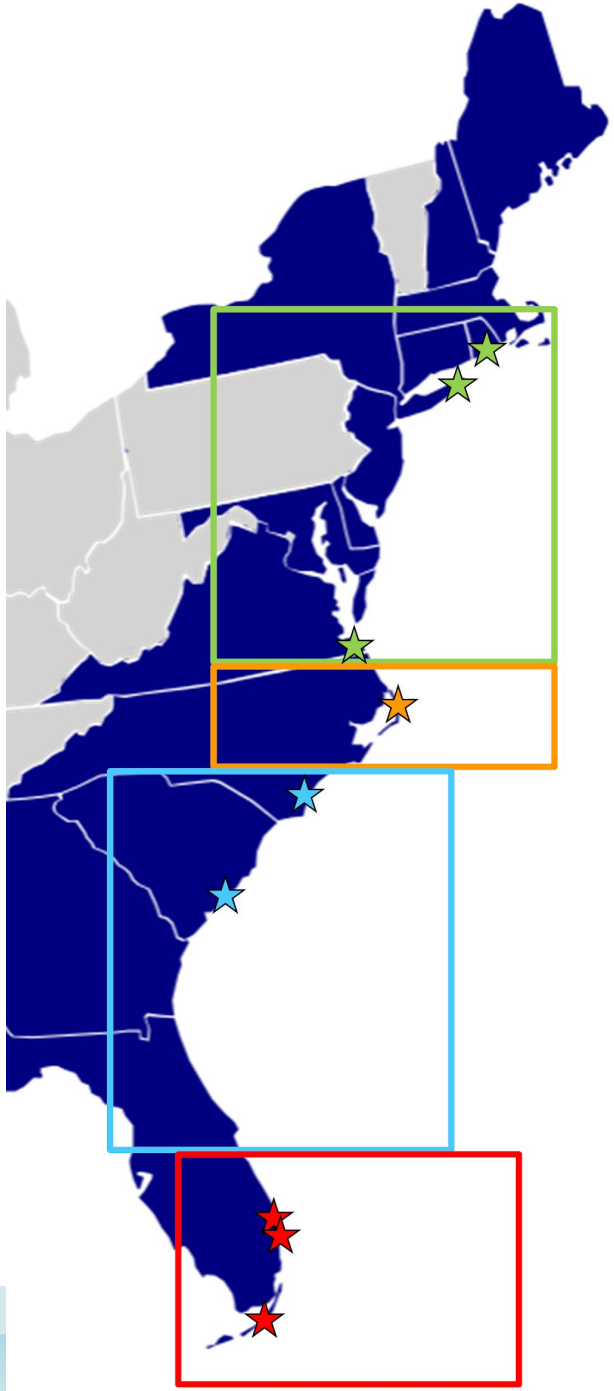
Project outlook



MSE Modeling Dynamics

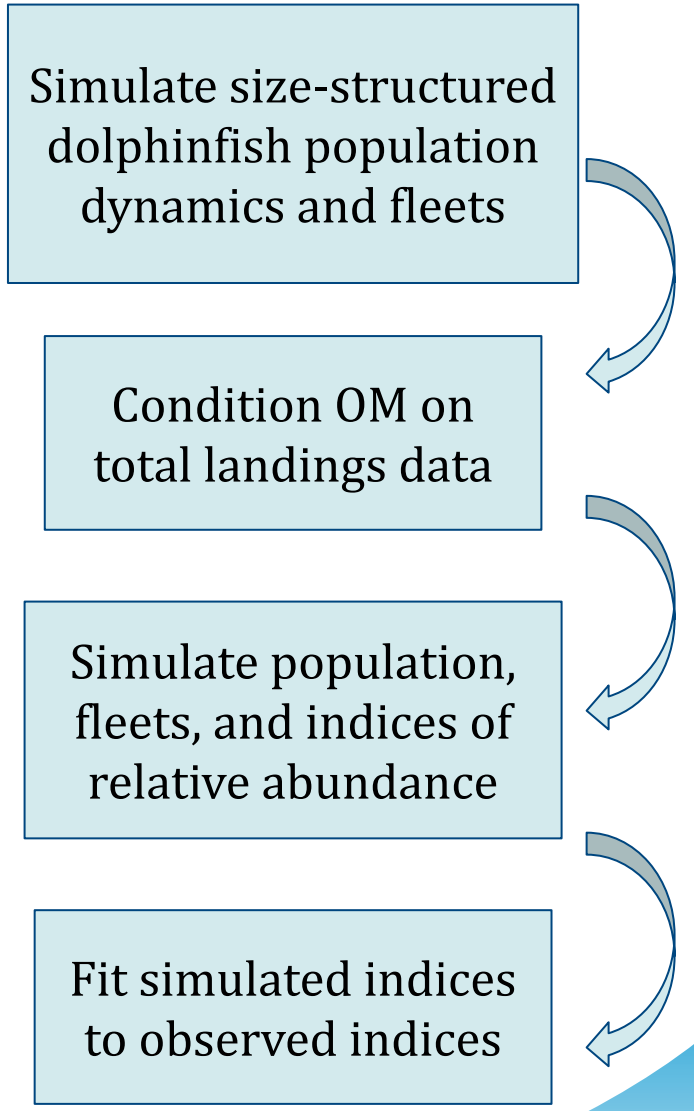
- MSE is designed to reflect feedback from stakeholders

Modeling decision	Stakeholder feedback
spatial OM (7 regions, 4 of which make up the US Atlantic)	regional fishery and stock dynamics; regionally specific management objectives
seasonal time-step	seasonal availability
multiple fleets for each sector and region	different fishery dynamics among sectors
length-based operating model	size-based management objectives; currently length-based management
seasonal (time-varying) movement matrices	proposed changes to fish movement and availability over time
calculation of fleet CPUE	management objective to increase catch rates

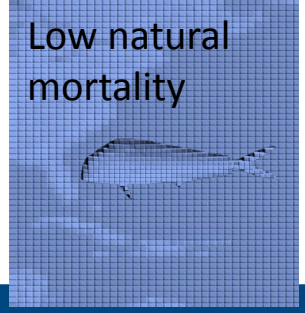


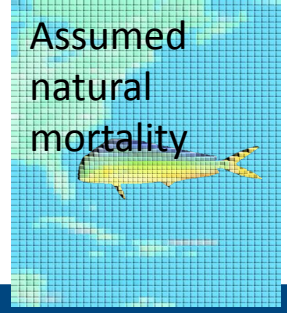
OM dynamics

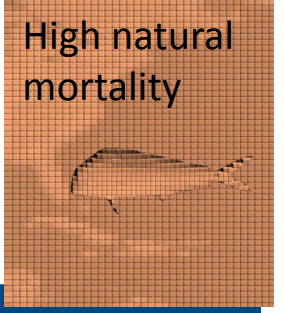
- Simulates a hypothetical reality for the management system:
  - Projects population, fisheries, and environment forward during historical period: 1986-2022
  - Population: # of fish = fish that survived, grew, moved (or didn't) + new fish
  - Catch (landed or discarded): # of fish that did not survive fishing
- We get the OM to approximate reality using: literature, expert opinion, conditioning on data (Figure)



Key uncertainties



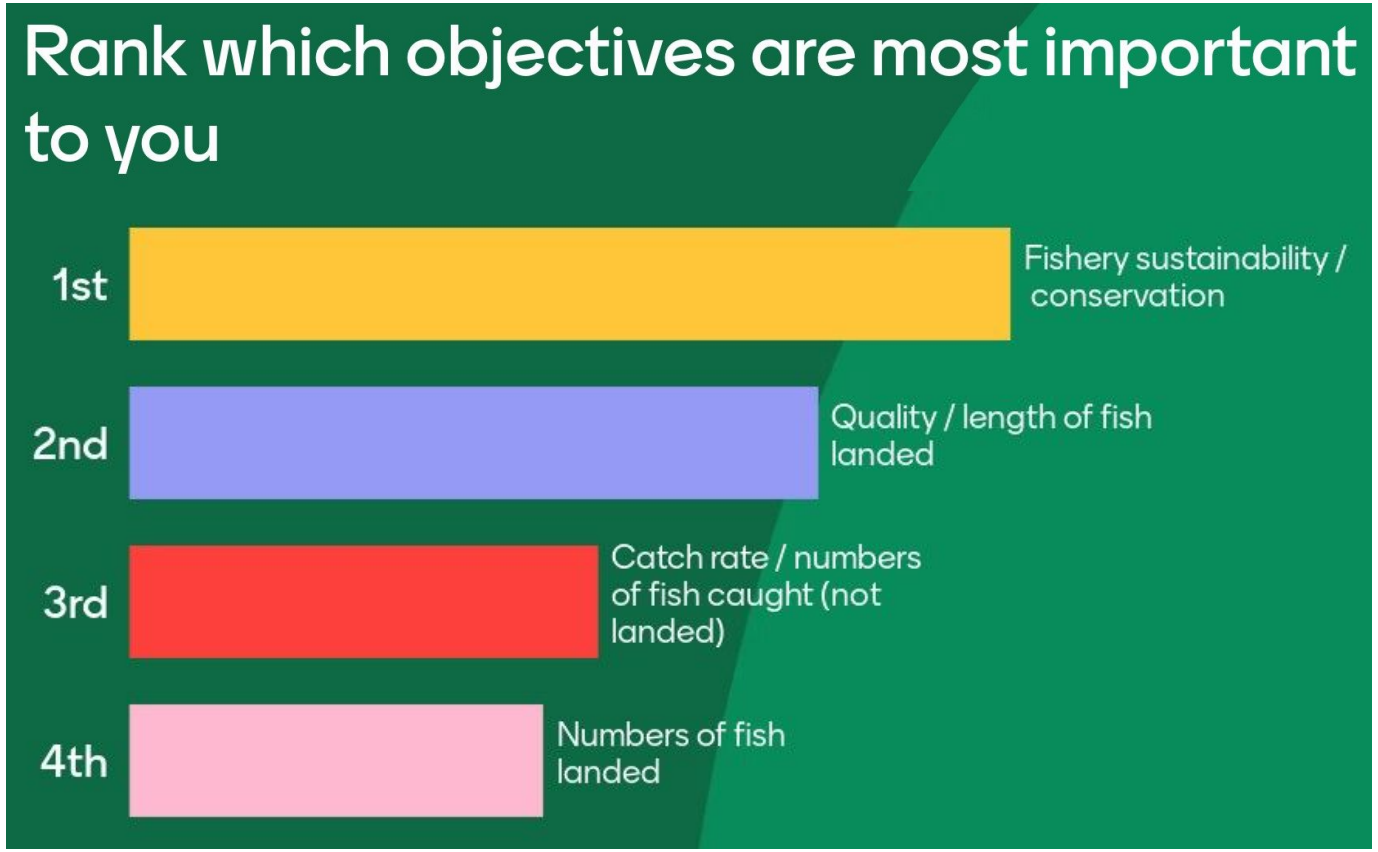


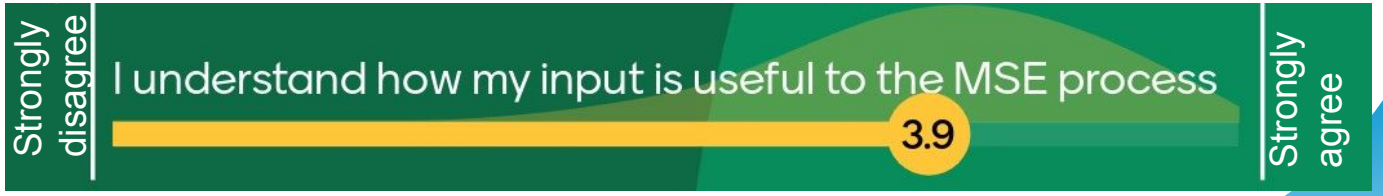


Uncertainty / Hypothesis	How it will be incorporated
Uncertain life history parameter (e.g., natural mortality);	Hi, average and Lo values of parameters
Uncertain data (e.g., recreational and international catch)	Hi, average and Lo historical *and* future data
Uncertain productivity	Alternate spawner-recruit relationship, potentially including changes with space and time
Shifting movement or migratory patterns over time	Alternate movement matrices that are informed by tagging data (Beyond Our Shores Foundation) and expert judgement
Shifting historical and future availability	Stakeholder input to design OMs with unique patterns in availability, catchability, hyperstability/depletion, and selectivity over space and time (historical *and* future)
Uncertain trend in abundance / size	Unique OMs that assume alternate movement and/or exploitation patterns
Climate change impacts	Multiple OMs that induce alternate movement and/or productivity shifts or regimes in the future
Compliance	Test MPs against induced implementation error simulating noncompliance

Stakeholder Small Group Meetings

1. MSE 101
2. Management Objectives
3. State of dolphin science
4. Operating Models





Tentative timeline

Time	Activity: Communication	Activity: Model development
Now – Winter 2023/2024	- Selection of small stakeholder group (Dec 2023)	- Build OM framework
Spring 2024	Meetings with small group: - introduce MSE and MP concepts, - Discuss operationalization of conceptual management objectives - Present OM structure and OM uncertainty grid - Consider form and parameterization of candidate MPs	- Condition base-case OM - Set up contract for new MSE developer
Summer 2024		- Onboard new MSE developer - Convert base OM platform, if necessary - Develop projection model and MSE wrapper code - Develop simple, proof-of-concept, candidate MPs
Fall 2024 – Winter 2025	Primary demonstration with stakeholder group and managers: - Demonstration of simple MP - Develop performance metrics, iterative feedback	- Define alternate OM grid - Build / condition alternate OMs - Develop candidate MPs and performance metrics
Spring 2025	Secondary demonstration of refined candidate MPs to stakeholders and managers	- Revise candidate MPs and performance metrics - Continued candidate MP revision - Develop data visualization tools
Summer – Fall 2025	Presentation of top performing candidate MPs	- Satisficing, refinement, and elimination of poorly-performing MPs - Report out on results

Then what?

	Stakeholders	Modeling team	SSC	Council
Operating models	Advise on OM structure and key uncertainties	Construct	Adopt	Advise
Management objectives	Advise	Quantify	Advise on biological 'must-pays' e.g. not overfishing and rebuilding	Adopt
Management Procedures	Advise	Test and refine	Advise	Adopt and implement management procedure based on performance

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