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Summer flounder Management Strategy Evaluation Model overview

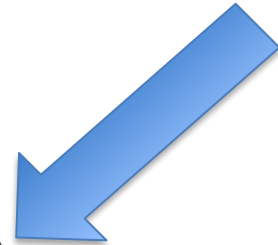
Use of models in fisheries and conservation

- How many are there?
- Estimating extinction risk.
- How many can we harvest?
- System relationships and dynamics
 - ecological
 - economic
- How well are hypotheses supported by data?
- Designing monitoring programs
- Comparing among policy options
- Evaluating management performance

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“Stock
assessment”



Simulation studies

Simulation is used for many purposes in fisheries analyses:

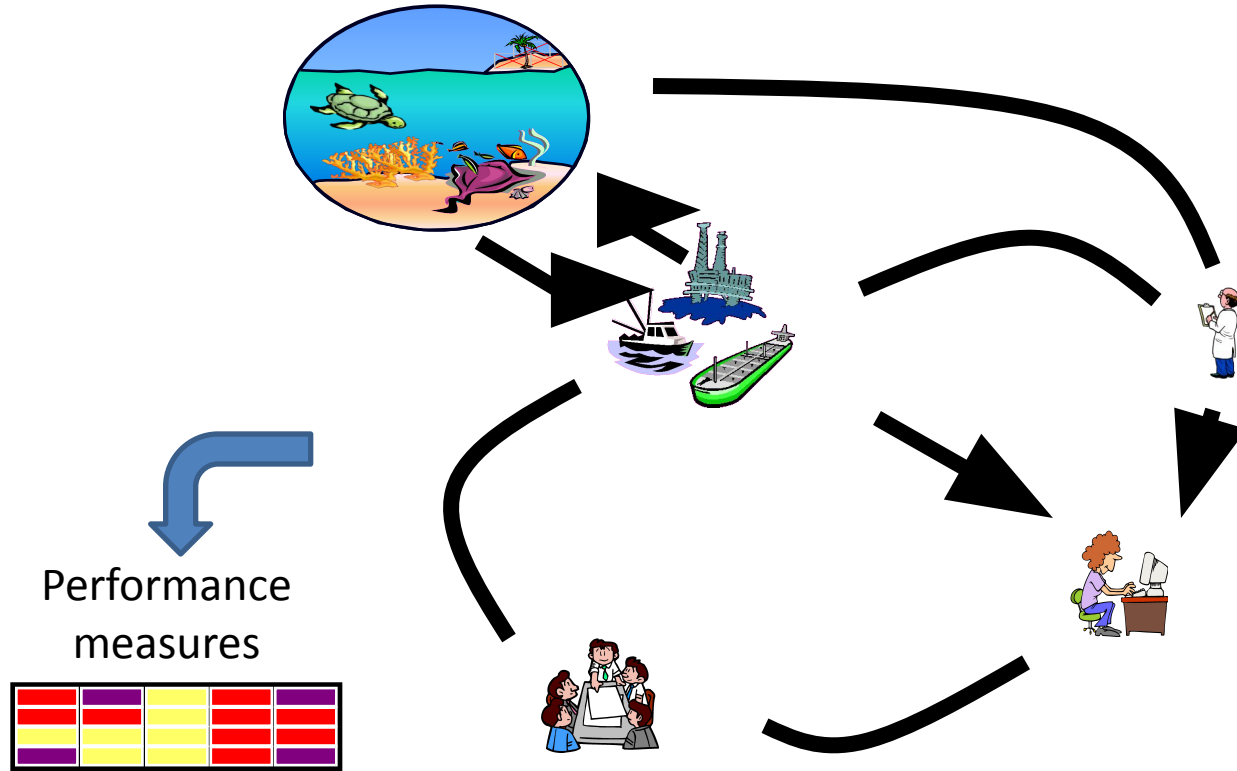
- Randomization tests
- Projection of models
- Simulation-estimation analyses
 - using simulation to understand the properties of an estimation method
- Management Strategy Evaluation
 - using simulation to understand the properties of a management system (although the results often include the ability to estimate key model assessment outputs).

What is Management Strategy Evaluation?

Process for:

- Comparing the performance of management strategies under multiple (& often conflicting) management objectives
- Examining impacts, tradeoffs, & robustness of management strategies.
- MSEs include analytical simulation frameworks but can (should) be more than this.

Management Strategy Evaluation



By simulating the system, we can evaluate the performance of our management strategies against the known 'truth'.

We can't do this in the real world because we don't actually know what the truth is.

Options that don't work in the ordered confines of a computer will probably not do well in the real world.

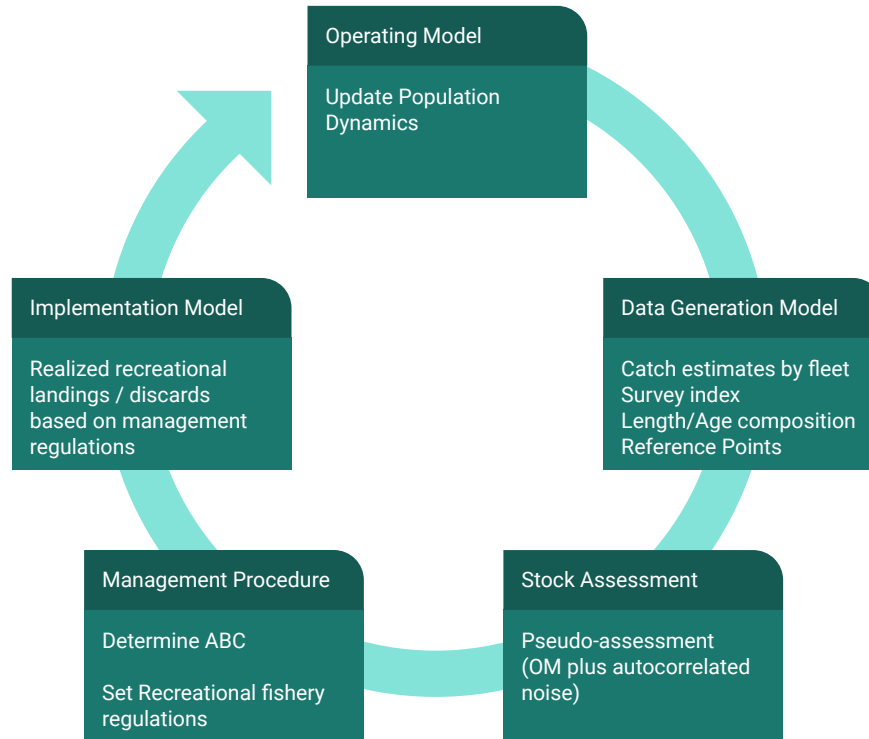
Why do MSEs?

- Evaluate full management cycle
- Compare relative effectiveness of management strategies for **achieving multiple management objectives**, and to quantify tradeoffs.
- Identify sensitivity of management performance to system drivers and key uncertainty
- Pathway for formal decision analysis
- Simulation cheap, Experimentation expensive
- Play out ‘what if’ scenarios when
 - Truth is known
 - No real negative consequences of poor options



(Image HT: J. Deroba)

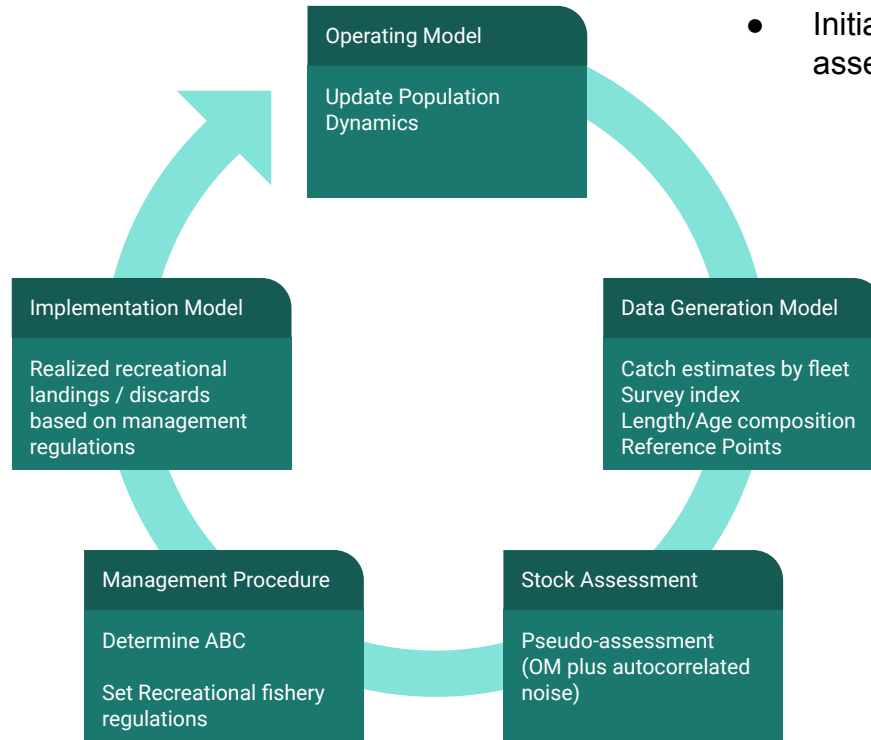
MSE: Compare performance of alternative policy options, quantify tradeoffs among objectives



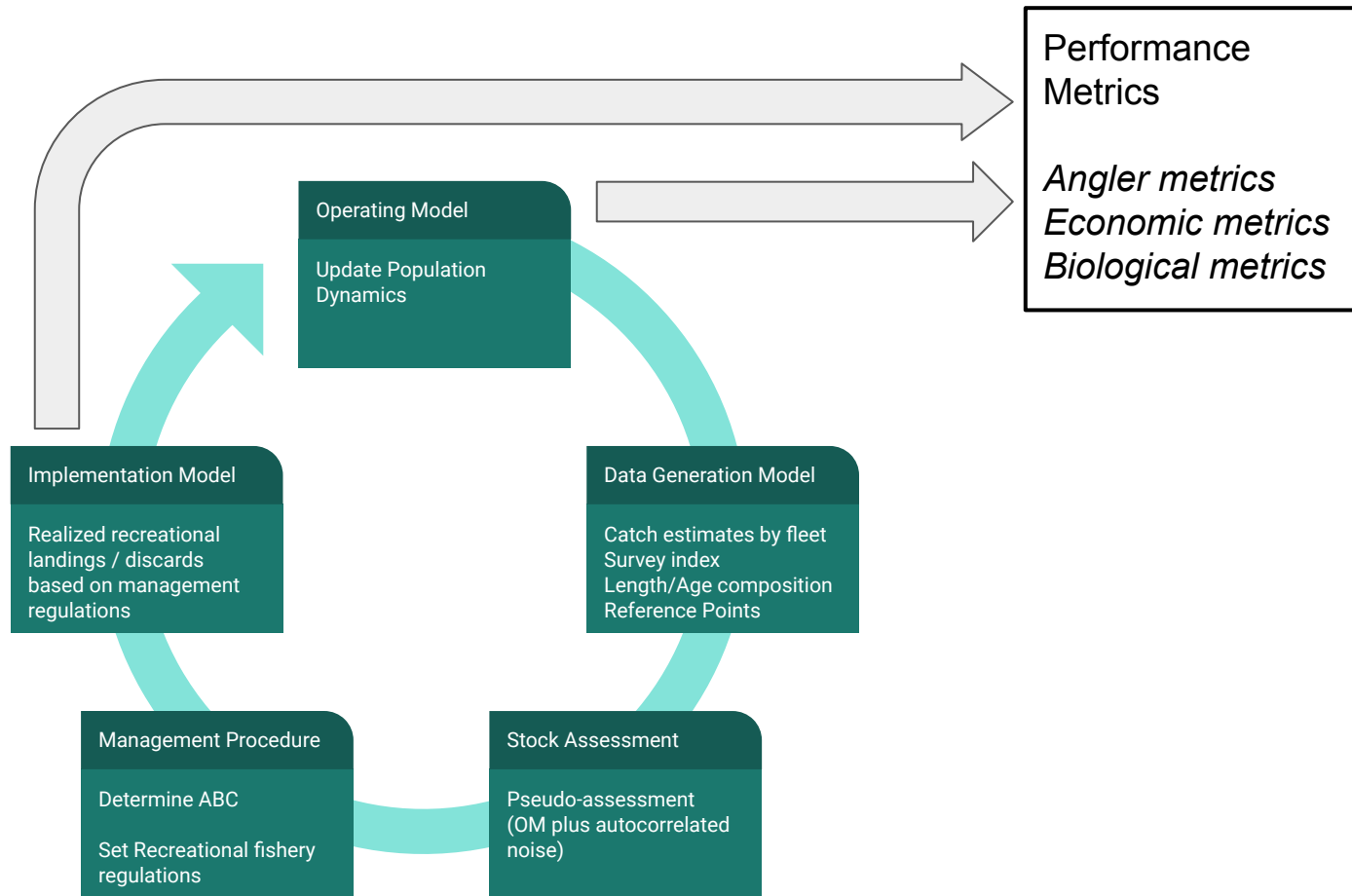
Model overview

Each advice time-step...

- Age and sex-structure
- Length-based fishing mortality
- Multiple fleets
- Initialize based on current assessment



Model overview



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