

eFEP Development

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April 14, 2016



NEFMC Process

- Phase I – decide on approach
- Phase II – develop example Fishery Ecosystem Plan (eFEP)
- Phase III – testing, verification, engage public (scoping)



SSC White Paper

Approaches to EBFM

1. Incremental or “evolutionary” → EAM
 - Works within existing FMP structure
 - Adds linkages among FMPs and effects of environmental components on each
 - In progress.
2. Holistic or “revolutionary” → true EBFM
 - Fully integrated FEPs for EPU
 - Adopts integrated analytical framework based on new tools, etc. Integrated ecosystem assessments
3. Blended:
 - Planning approach of #1, but uses analytical tools of #2 to set ecosystem-level goals and constraints



Phase I

- **Decide on approach**

April 2015: <http://s3.amazonaws.com/nefmc.org/2.-EBFM-procedure-discussion.pdf>

- Ecosystem Approach (EAFM) policy documents
 - Example Fishery Ecosystem Plan (eFEP)
 - Implemented Fishery Ecosystem Plan (iFEP)
 - Blended Fishery Ecosystem Plan (bFEP or Omnibus Amendment)
- EBFM/EAFM initiatives for other Councils and Countries
 - Summary: <http://www.nefmc.org/calendar/may-22-2014-ecosystems-based-fisheries-management-meeting>



NEFMC Approach

- To prepare:
 1. A policy describing goals and objectives, and approaches, for taking account of ecosystem processes in fishery management, and
 2. An example of a fishery ecosystem plan that is based on fundamental properties of ecosystem (e.g., energy flow and predator/prey interactions) as well as being realistic enough and with enough specification such that it could be implemented. The example should not be unduly constrained by current perceptions about legal restrictions or policies.



NEFMC Process

- To prepare:
3. With respect to number 2, it is understood that the example might not be implemented, but it should make clear what a fishery ecosystem plan would actually entail and it should focus debate. To the extent practicable, these documents should be completed in about one year. In consideration of these documents, the Council will adopt a plan for implementation. The EBFM PDT will have the technical lead in developing these documents and the EBFM committee will recommend the documents for Council consideration.



Phase II

- Develop Example Fishery Ecosystem Plan (eFEP)
- EBFM PDT technical lead
 - Progress report: Committee meeting in early April
 - Final report due at June Council meeting
- Strategic Goals and Objectives
 - Goals – measurable outcomes, involve compromises
 - Objectives (methods to achieve goals)
- eFEP Components – management structure



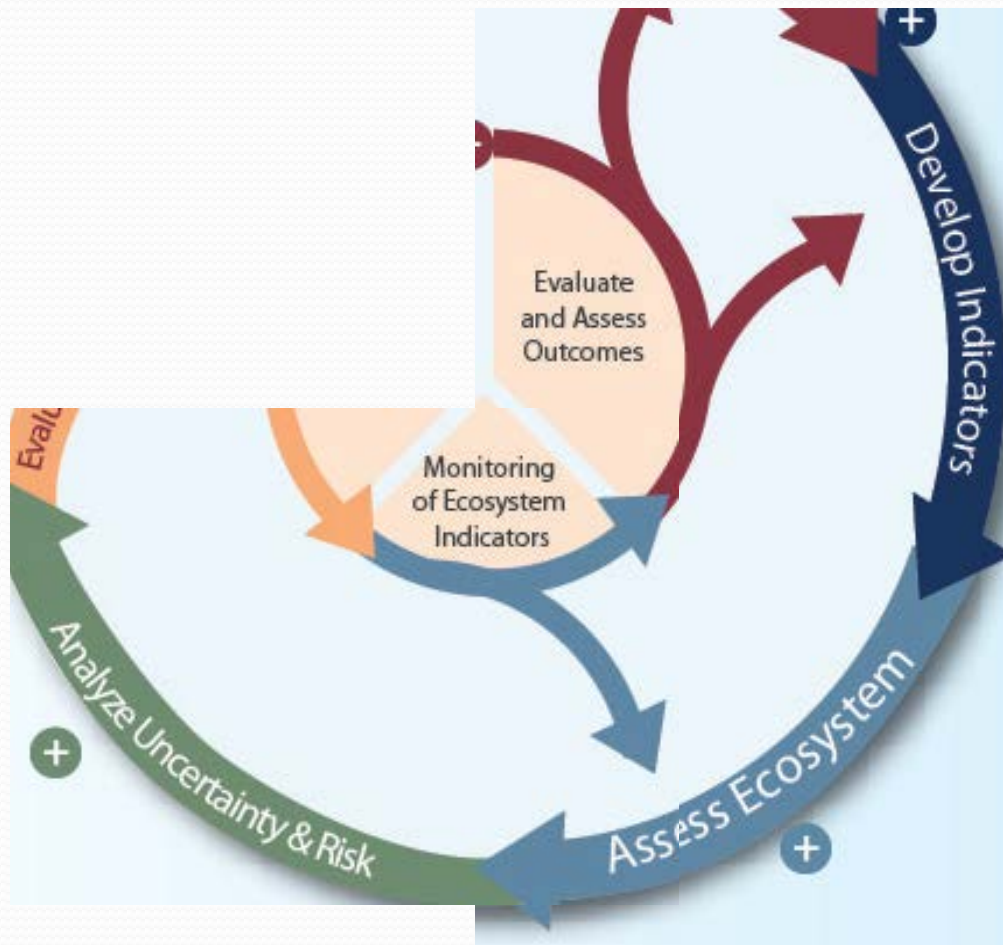
Phase II ?



Management Phase II – platform eFEP

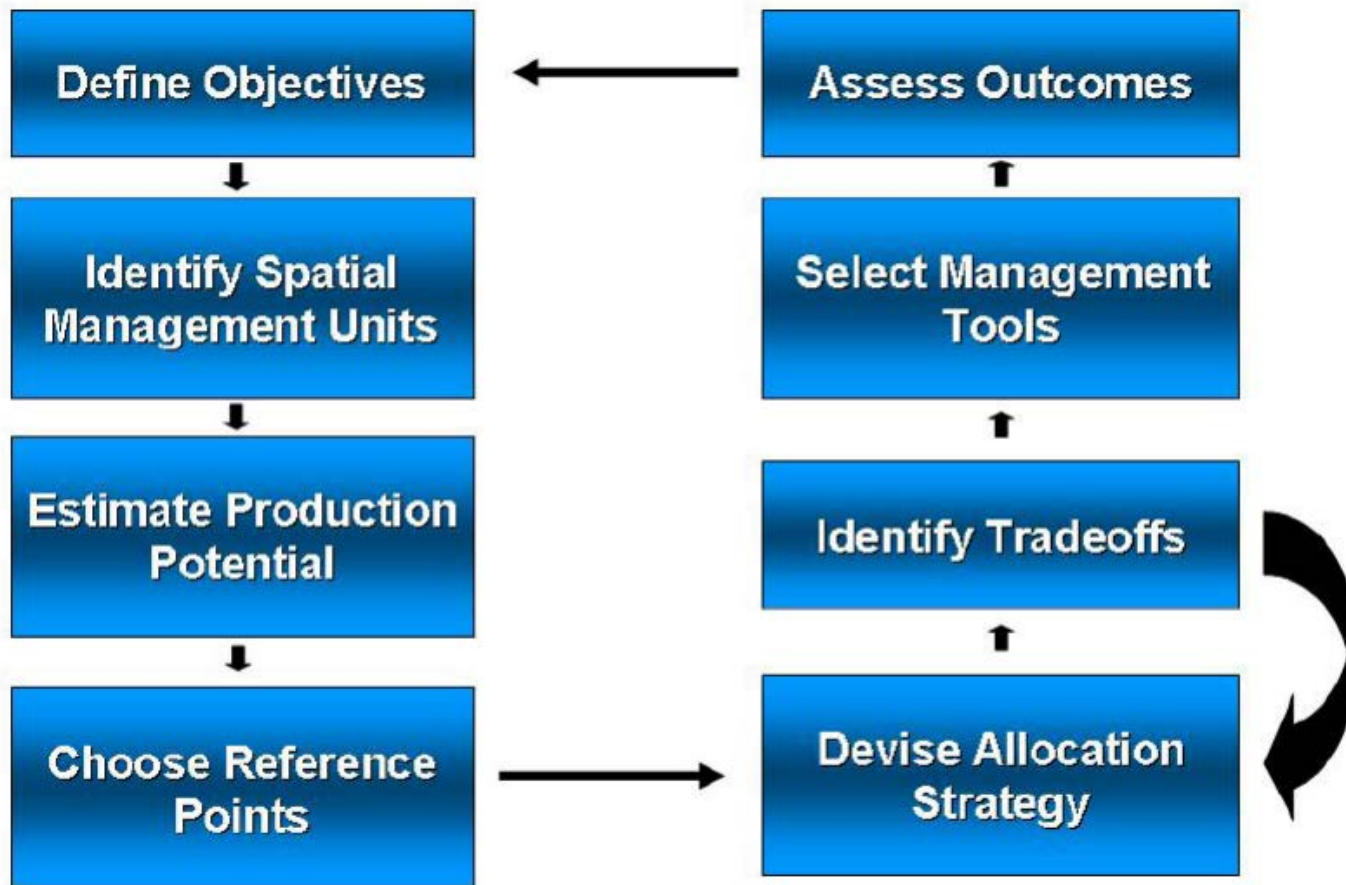


IEA/Science



SSC White Paper

EBFM Process



Example Fishery Ecosystem Plan Characteristics

- Account for trophic interactions
 - Multispecies ecosystem models (under development)
 - Focus on Georges Bank ecosystem
 - Integrated ecosystem assessment (advisory?)
- ‘Guild’ based catch limits (ACL)
 - Defines overfishing at ecosystem and guild level
- Overfished/depleted – actions to reduce risk to single species
- Place-based spatial management
 - Leveraging common values and experience to build buy-in and ‘ownership’



SSC: Focus during transition period

- Defining Ecosystem Production Units (EPU) which will serve as the basis of EBFM management units
- Identifying issues associated with the ecosystem components of each EPU that require attention under EBFM,
- Defining the EBFM objectives to be achieved for each EPU and the risks of not achieving these
- Designing management strategies to achieve the EBFM objectives and the processes to facilitate consensus
- Developing assessment tools required to monitor progress towards EBFM objectives

Draft discussion document describing scope and mechanisms

- Draft strategic goals and objectives
- FEP framework
- Scope
 - Area to be managed – Georges Bank EPU
 - Species included in eFEP



Fishery Ecosystem Plan Goals

To protect the ecological integrity of US marine resources as a sustainable source of wealth and well-being for current and future generations

● **Strategic Goals**

(Derived from Magnuson definition of OY as in Risk Policy Document):

- Optimize Food Provision through targeted fishing and fishing for species for bait
- Optimize Employment
- Optimize Recreational Opportunity
- Optimize Intrinsic (Existence) values
- Optimize Profitability
- Promote stability in both the biological and social systems



Fishery Ecosystem Plan Objectives

- Maintain/restore functional production levels (ecosystem, community scale emphasis)
- Maintain/restore functional biomass levels (community/species scale emphasis)
- Maintain/restore functional trophic structure
- Maintain/restore functional habitat



Fishery Ecosystem Plan Considerations

- Needs of fishermen – income, social objectives
- Community needs – employment, social objectives
- Recreational opportunity and satisfaction
- Needs of predators – sufficient prey items
- Competing/complimentary uses – energy extraction, bottom mining, transportation, aestheticism
- Place based, i.e. defined geography



Draft discussion document describing scope and mechanisms

- ABC and ACL advice accounting for trophic interactions
 - Multispecies models
 - Augmented by single species assessments and/or survey index trends
 - Estimation of uncertainty
 - Integrated Ecosystem Assessment models
 - Climate effects



Draft discussion document describing scope and mechanisms

- ABC and ACL advice accounting for trophic interactions
- Overview of modelling approaches
 - <http://www.nefsc.noaa.gov/publications/crd/crd1123/>

Draft discussion document describing scope and mechanisms

• ABC and ACL advice

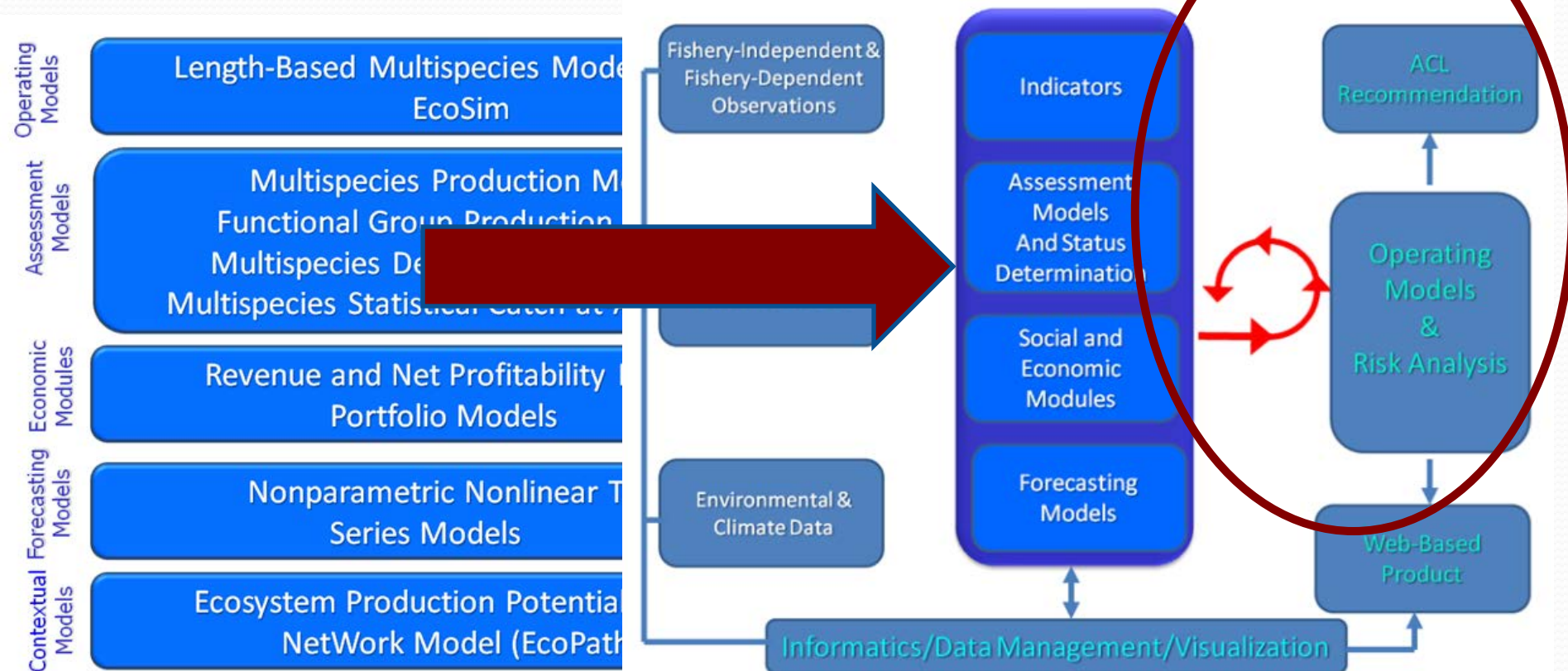


Figure 2. Complex multispecies statistical catch-at-age model applied to inform Figure 1. Prototype multispecies analysis for Georges Bank



Draft discussion document describing scope and mechanisms

- **ABC and ACL advice**
- Description of modelling framework
 - <http://www.nefsc.noaa.gov/ecosys/modeling/>
- “The models under development are designed to accommodate spatial structure and to incorporate consideration of climate variability and change.”
- “We are currently developing a prototype multispecies analysis for Georges Bank (Figure 1).”



Draft discussion document describing scope and mechanisms

- ABC and ACL advice

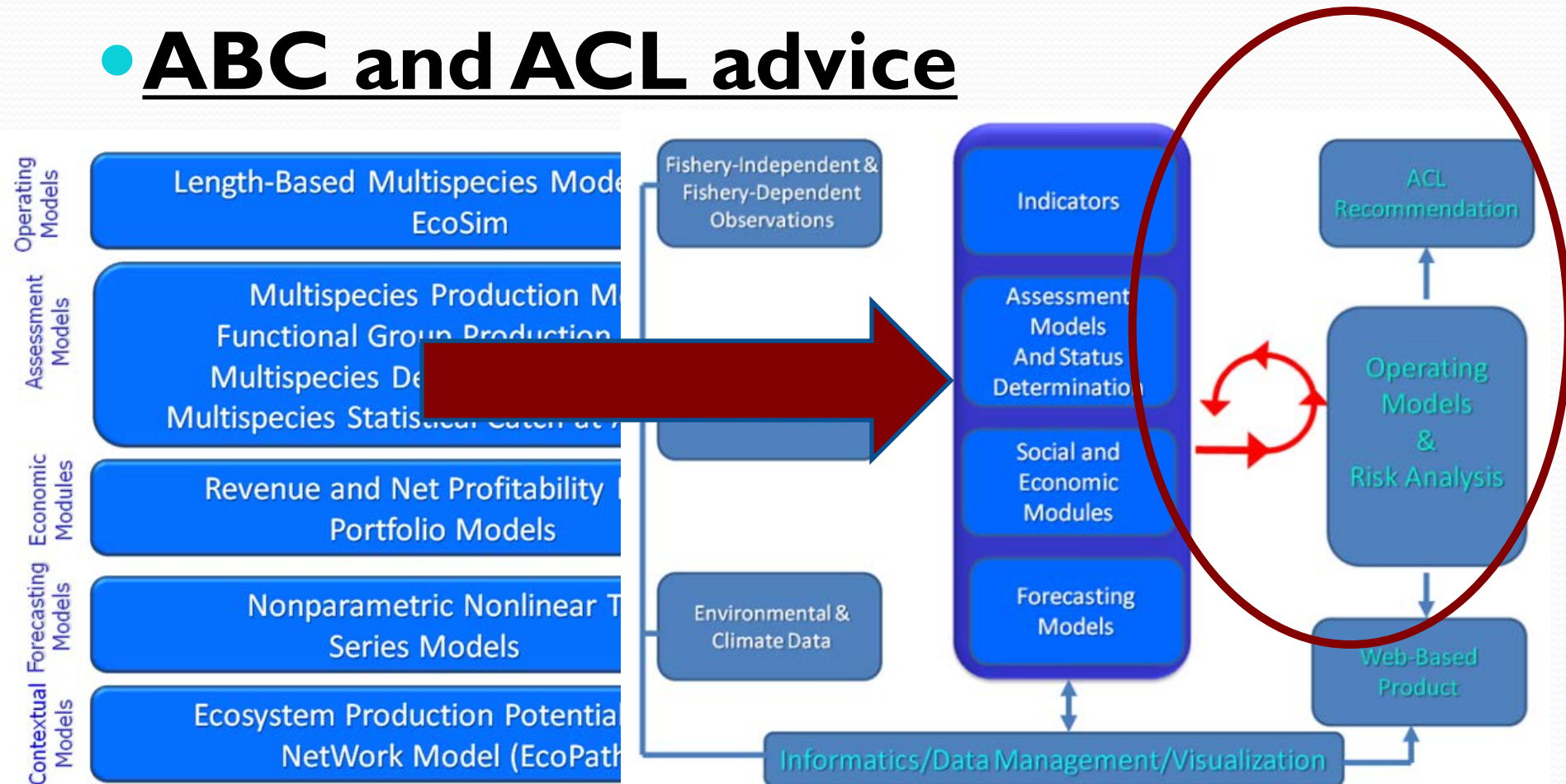


Figure 2. Complex multispecies statistical catch-at-age model applied to income. Figure 1. Prototype multispecies analysis for Georges Bank



Draft discussion document describing scope and mechanisms

- **ABC and ACL advice** accounting for trophic interactions
 - Ecosystem models’ “credibility will need to be established and the rigor of quality control/assurance and peer review will need to be at a comparable level as what is done for single species and protected species stock assessments.”
 - Link et al. 2010. Report of the 2nd National Ecosystem Modeling Workshop.



Draft discussion document describing scope and mechanisms

- **ABC and ACL advice** accounting for trophic interactions
- Peer review of NEFSC ecosystem modelling strategy (2011):
 - <http://www.nefsc.noaa.gov/ecosys/modeling/pdfs/cie-ebfm-model-review-summary-report.pdf>
- Diverse set of modelling methods
- Broader focus on direct fishing impacts on non-target species and habitats
- Input from economic and social sciences



Draft discussion document describing scope and mechanisms

- **Forage fish management**

- Catch control rule
 - Reduce risk to economically and ecologically important predators
 - Enhance productivity of predator stocks



Draft discussion document describing scope and mechanisms

● Overfished stocks

- When is a stock overfished?
- Survey indexed based?
- CPUE?
- What happens (options?) under guild-based catch limits?



Draft discussion document describing scope and mechanisms

- **Habitat protection**
 - Placed based planning
 - Framework and process
 - Links to productivity



Draft discussion document describing scope and mechanisms

● Management Strategy Evaluation

- Process to be applied
- How will it be analyzed?
- What is a general operational model that could be used?



Draft discussion document describing scope and mechanisms

- Place-based rather than species-based
 - Fishermen and other stakeholder interests more focused
 - Common community interests
 - Localized effects
 - More flexibility to fish
 - More robust to variability and climate change
 - Allow for adaptive fishing practices



Phase III

July 2016 to June 2017

- eFEP Management Strategy Evaluation
 - Operational model defined by Phase II
 - Participation by fishermen and interested parties
 - Evaluate tradeoffs and optimize outcomes
 - Verification of model
 - Testing



Tools

- Management strategy evaluation
 - Process to evaluate tradeoffs to meet competing goals
 - Requires involvement of commercial fishermen, recreational fishermen, and other interests
 - Evaluate the effect of management rules and how they adapt to new conditions
 - Performance measured against how well the management rules and process meet the balance of goals



Management Strategy Evaluation

- Predictive, probabilistic outcomes
 - Risk
 - Maintain high diversity
 - Robustness/sustainability
 - Optimized decisionmaking



Management Strategy Evaluation

Australia

