What is MSE?

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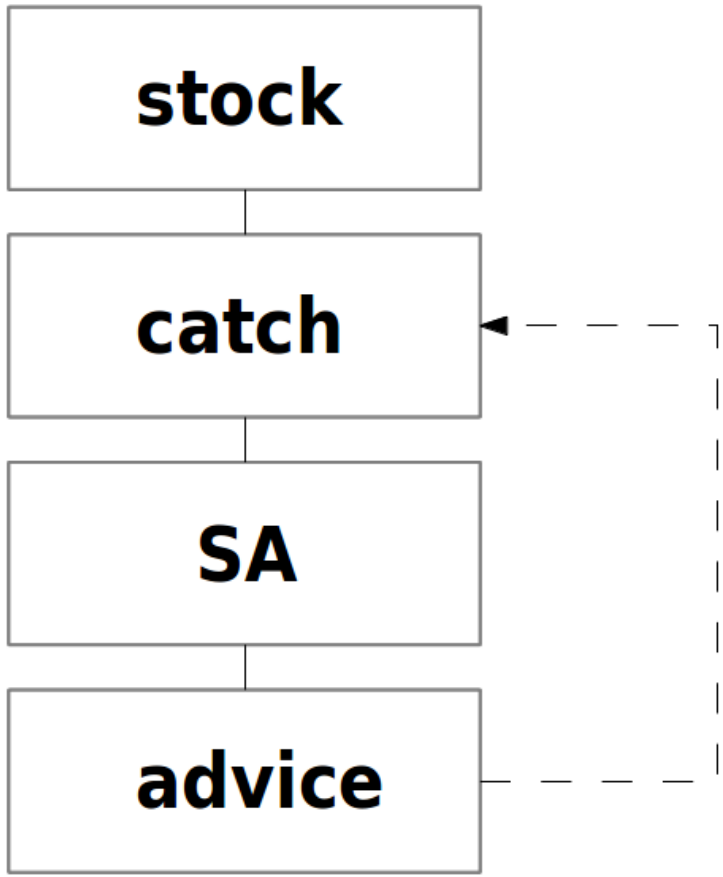
What is MSE?

Testing the **performance** of a **Management Procedure** to deliver a set of **objectives** under **uncertainty** and for a range of scenarios.

SA-based SC advice



SA-based SC advice

- Best stock assessment
- Comparison with reference points
- Yearly assessment + advice

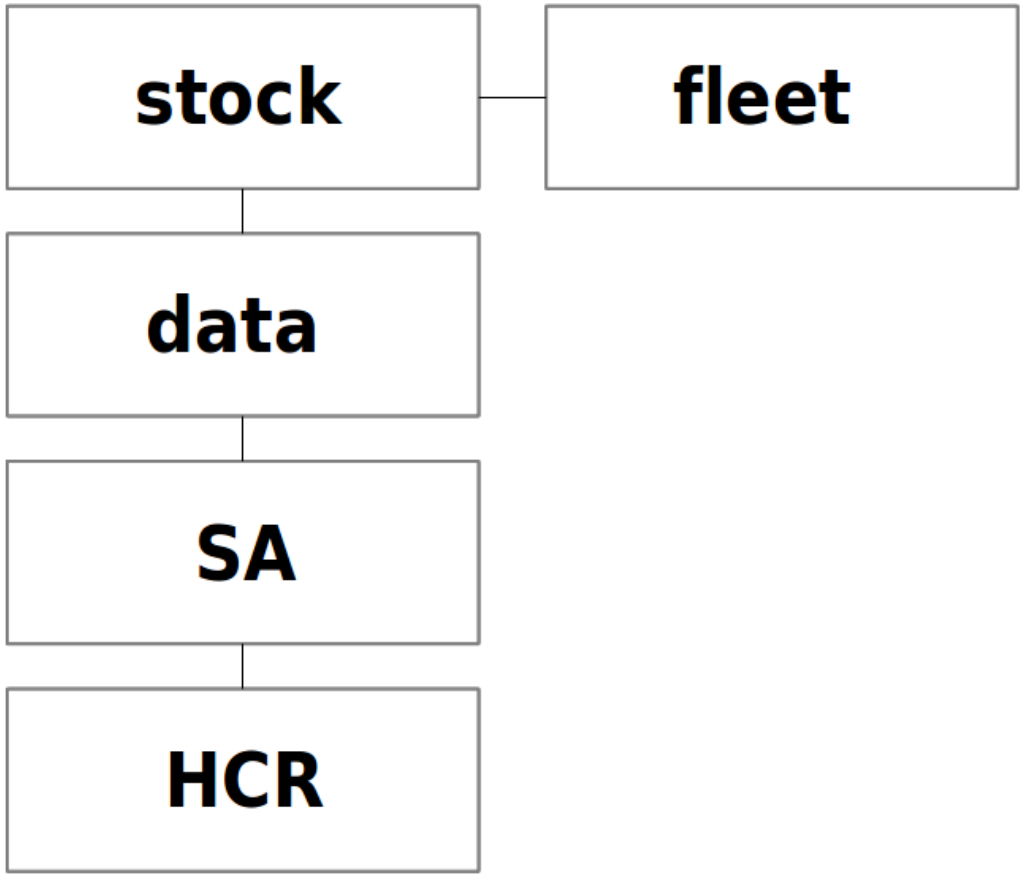
SA outputs

SA-based SC advice

Problems

- SA uncertain or wrong
- Inter-annual changes in SA
- Short time horizon
- Management objectives unclear
- Stakeholder distance

MSE in a nutshell



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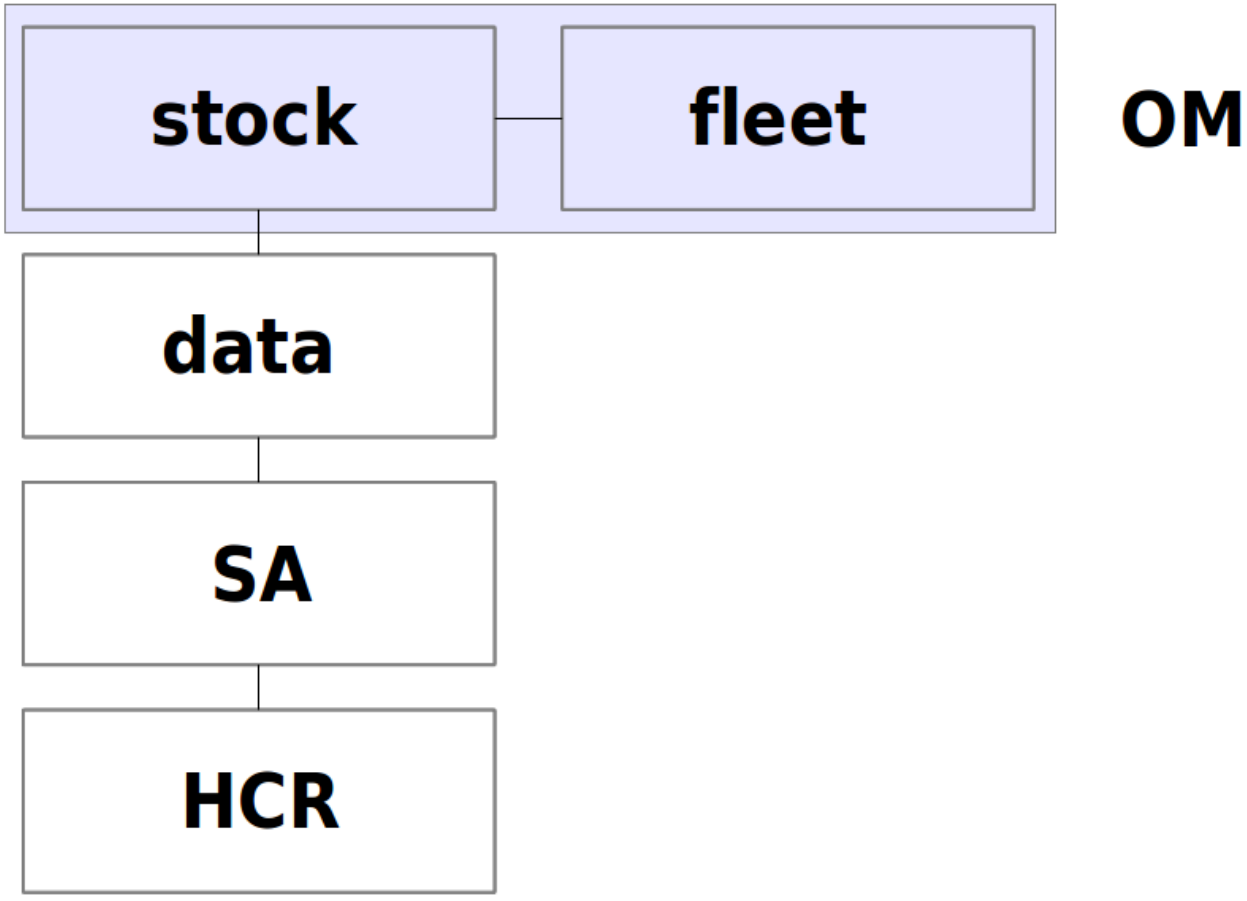
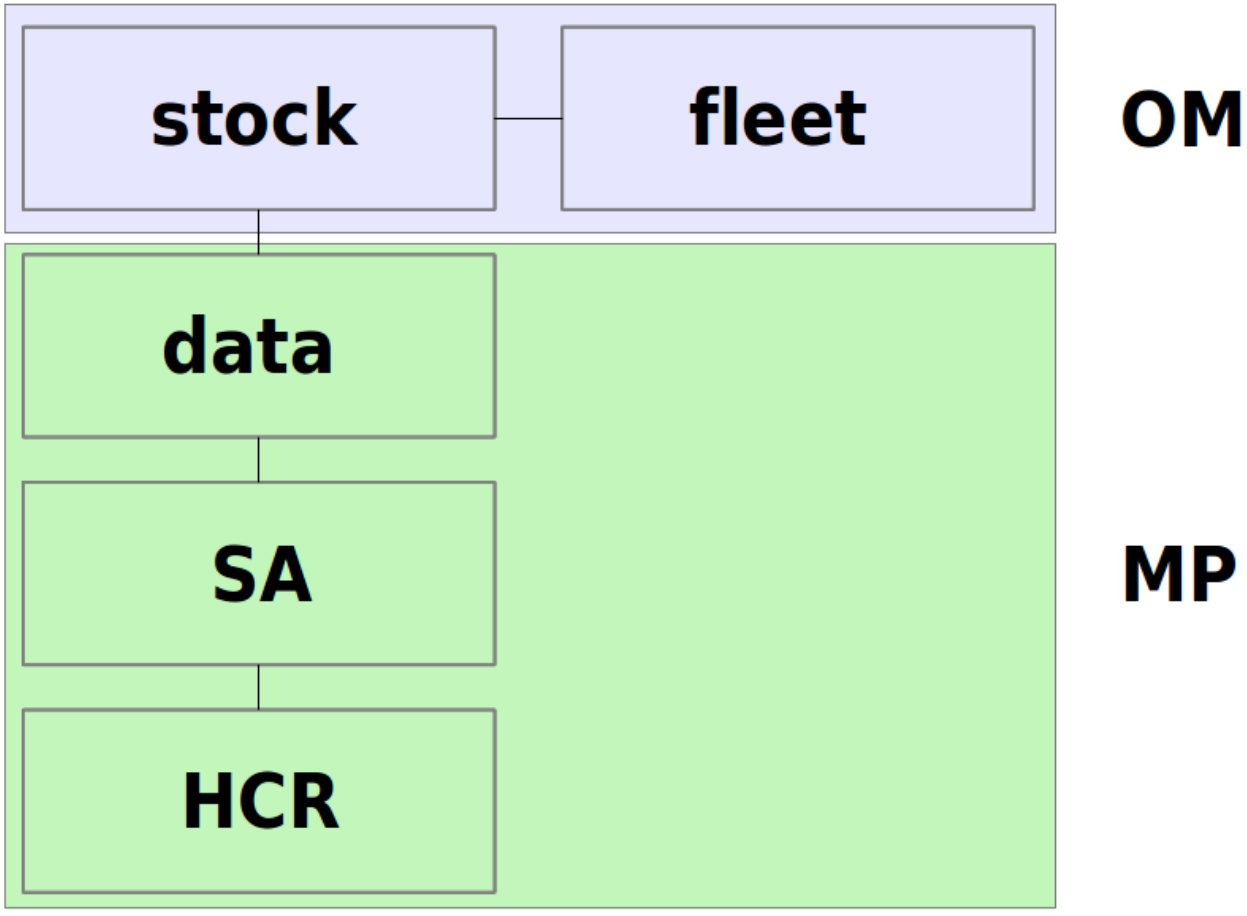


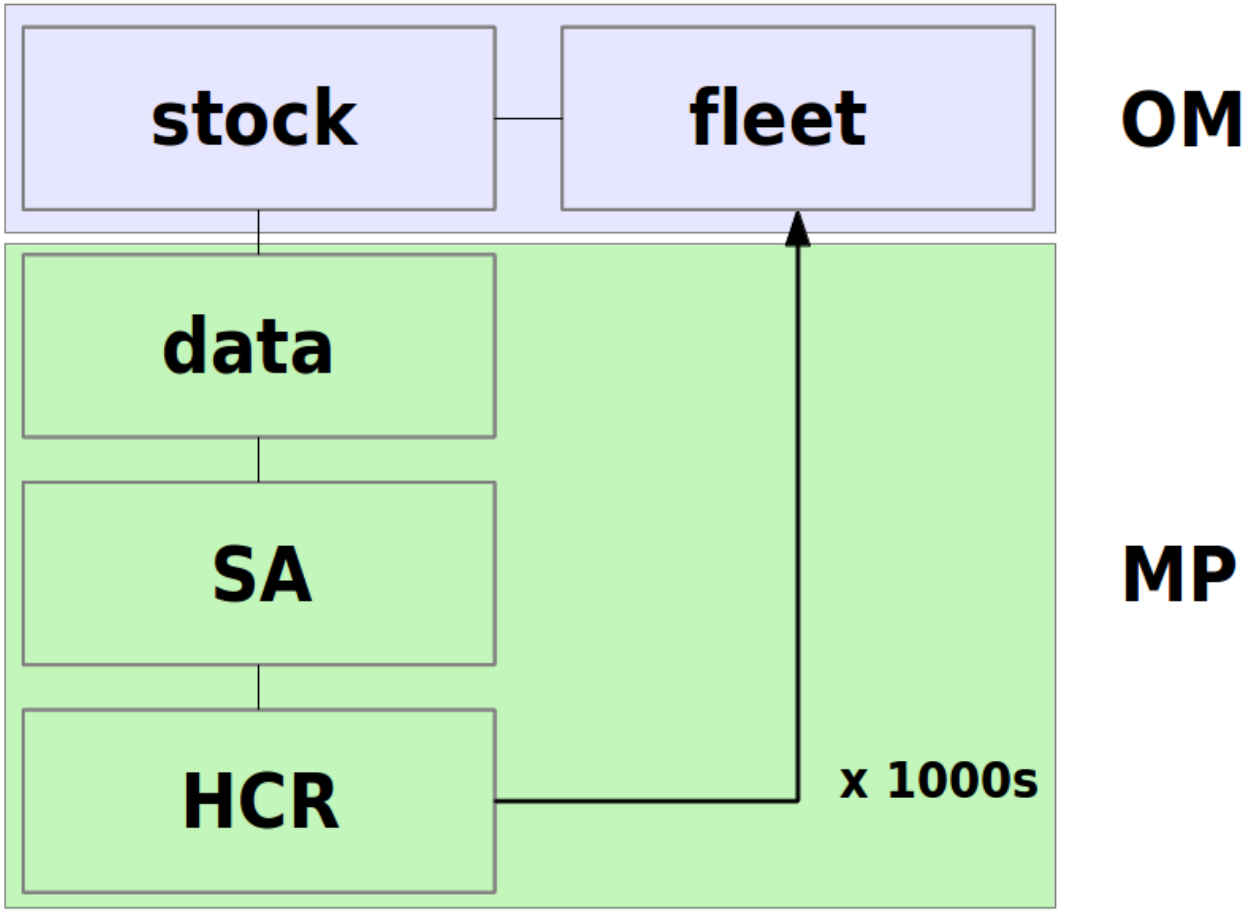
MSE in a nutshell

iotc ctoi



Joint Research Centre

MSE in a nutshell



MSE output

- Performance of Management System under uncertainty

The 6 STEPS

1. Specify & prioritize objectives
2. Quantify them as performance measures
3. Develop a set of OMs
   - Condition on data
4. Identify candidate MPs (SA + HCR)
5. Simulate the future
   - Generate data
   - Determine management action
   - Apply to fleet and stock
6. Summarize performance of MPs
7. Select best MP

OM

iotc ctoi

Feedback control

- Lag in management in RFMO using SA

Objectives

- Unclear

Decision rules

iotc ctoi

- Agree rules of game before start playing
- Data + Decision rule + Management

Example HCR

- ALB CPUE
- ALB SP

Testing decision rules under uncertainty

Advantages

- Evaluation of risk
- Robust performance over tracking noise in data
- Limits catch variability
- Consistent with PA
- Interaction among scientists, managers & stakeholders
- Default management if no agreement
- Less haggling for short term benefits

Disadvantages

- Lengthy complex development (but less and less so)
- Overly rigid
- Autopiloting?
- Poor data, poor models
- Choosing scenarios, test cases

Prediction is very difficult, specially if it is about the future

– Niels Bohr

Limitations

- Not all possible scenarios covered

Risk

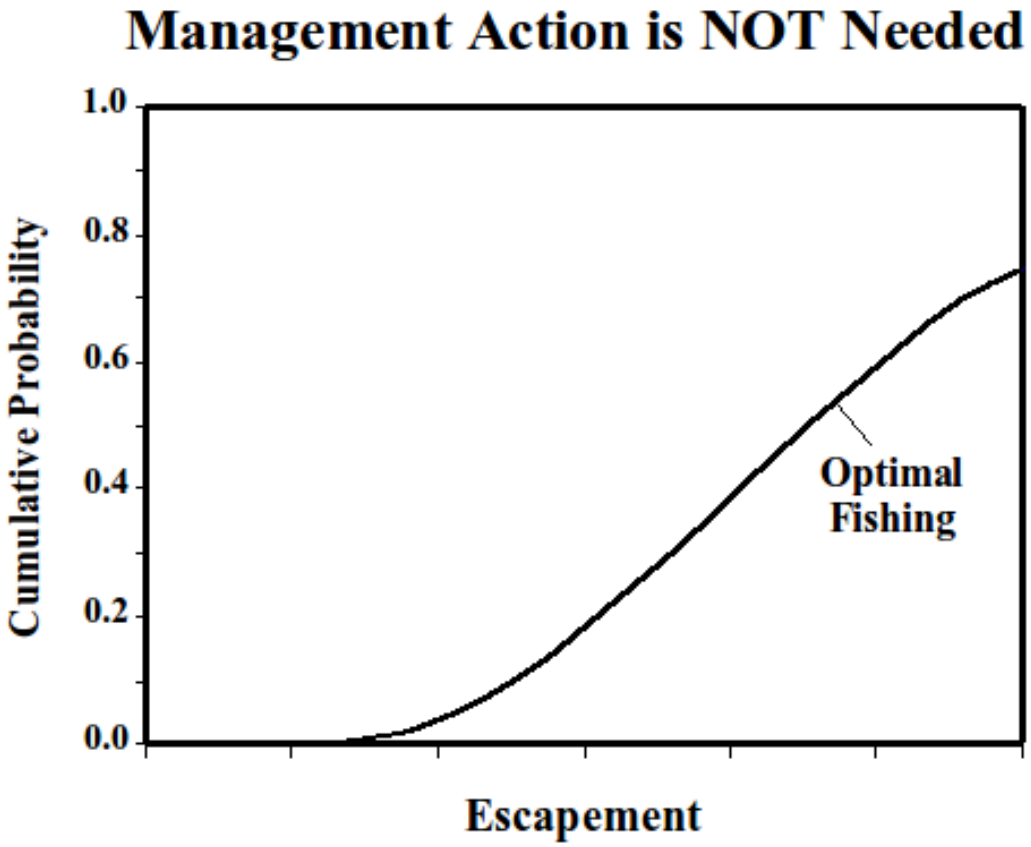
Probability of some undesired event happening

- Farmer: sell your crop or sell later at (possibly) higher price?
- Investment: Keep shares while they rise or sell before they fall?

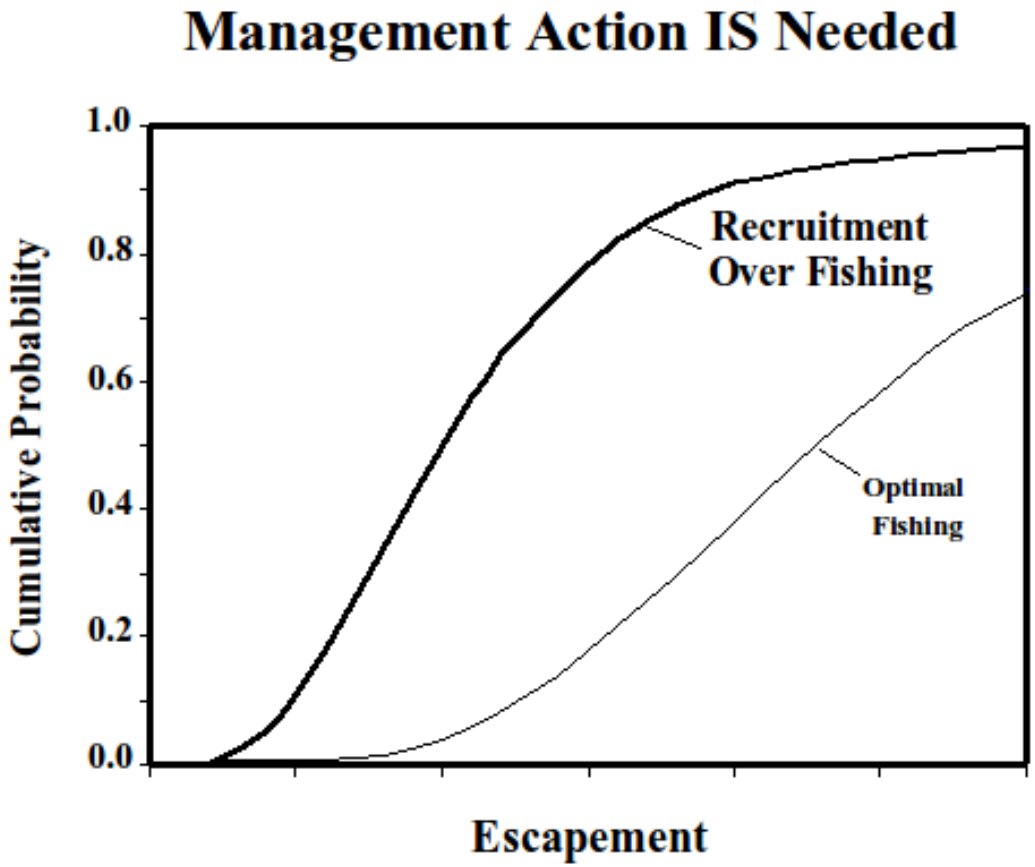
Dilemma of low biomass

- Low SSB for last 2 years:
  - Weak year class (no action), or
  - Start of overfishing
- Risk for manager:
  - Restrict fishery without need, vs
  - Not protecting overfished stocks

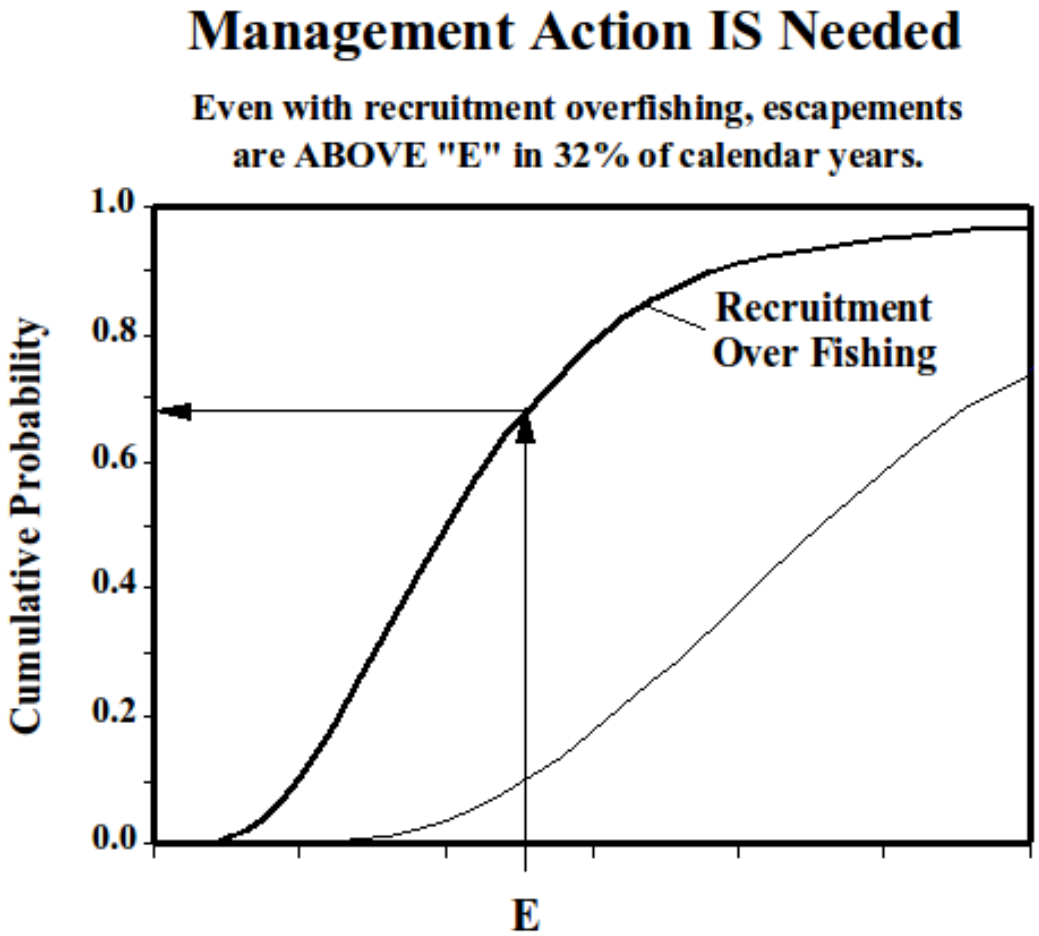
Dilemma of low biomass



Dilemma of low biomass



Dilemma of low biomass



Trade Offs

- Compatible objectives
- CCSBT

QUESTIONS?

A brief history of MSE

- IWC NMP (1974): B, K, MSY, C limits
- Arguments on parameters and uncertainty
- IWC RMP (1992)

MSE at IOTC

- Current setup

MSE at IOTC

- Current status

MSE at IOTC

- Future work


KEEP
CALM
AND
DO
MSE

Practical session

NOTES

- Robust to uncertainty
- Plausible uncertainty

Definitions

- Risk
- Uncertainty
- Simulation