

The Role of Data and Uncertainty in Fisheries Management

Luiz Barbieri

Florida Fish and Wildlife Research Institute
GMFMC and SAFMC SSC's

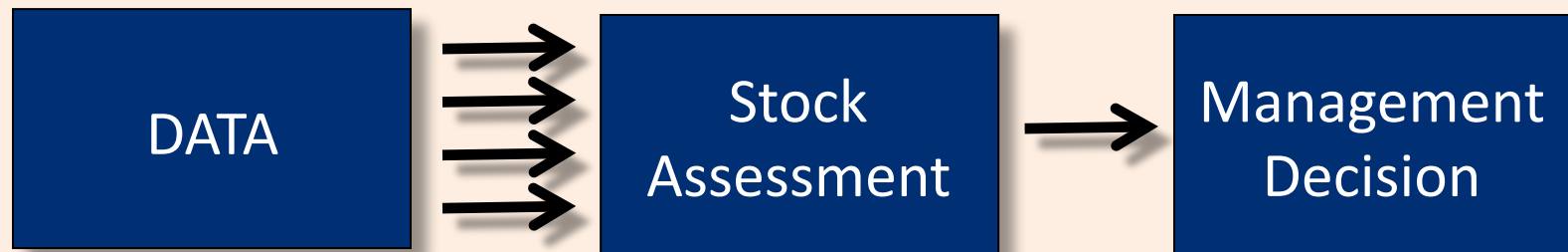


PRESENTATION OUTLINE

- Science-Management framework
- SEDAR process
- Types of data
- Stock assessments
- Biological reference points
- Uncertainty and buffers (ABC and ACL)



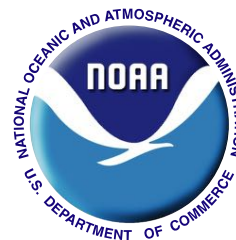
SCIENCE-MANAGEMENT FRAMEWORK



Council Policy Development Process

SEDAR ASSESSMENT PROCESS

South
East
Data
Assessment
Review



SEDAR WORKSHOPS

- 1) Data Workshop
- 2) Assessment Workshop
- 3) Review Workshop



TYPES OF FISHERIES DATA

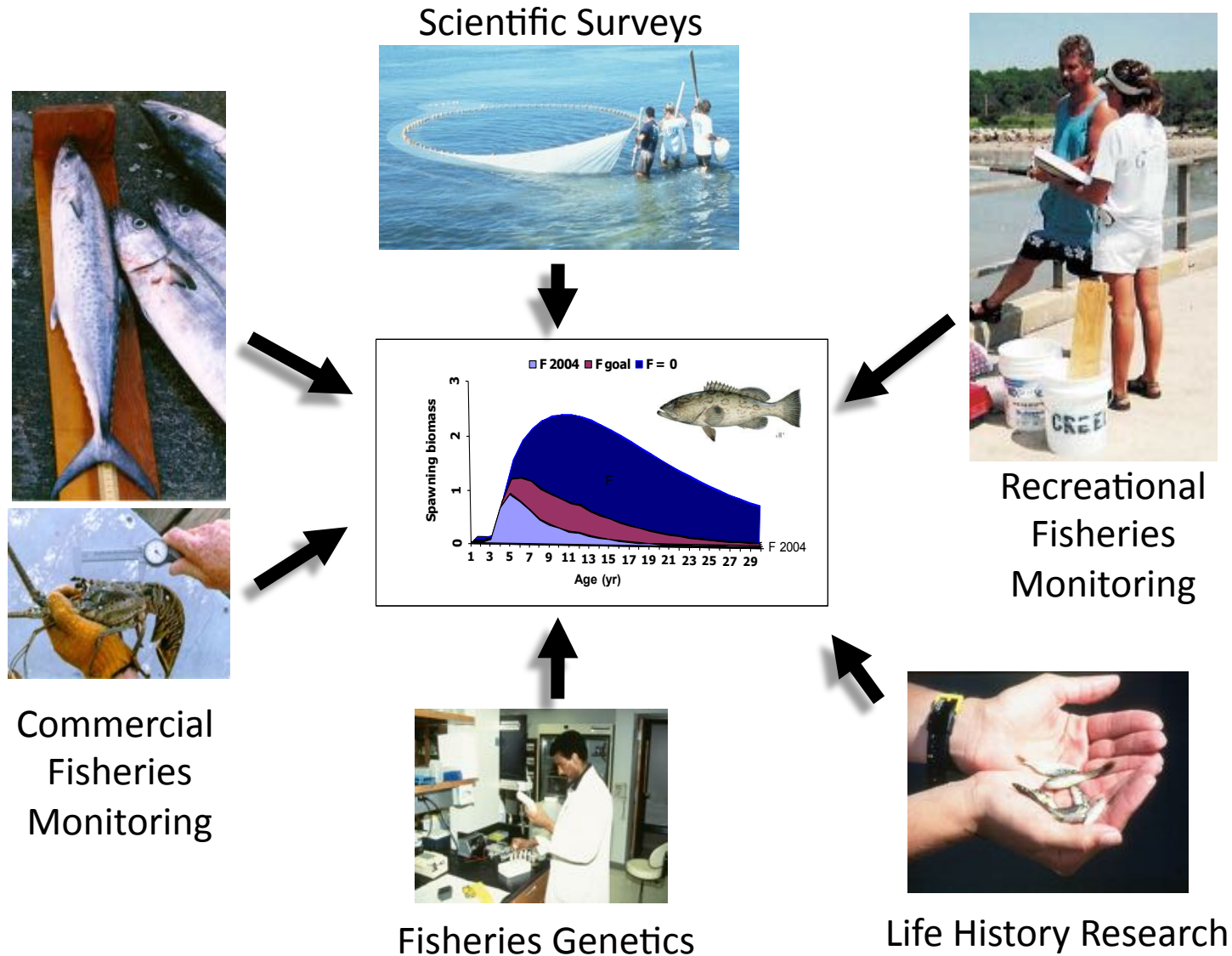


- **Fishery-Dependent:** are derived from the commercial or recreational fisheries.



- **Fishery-Independent:** are collected directly by scientists, i.e., derived from activities that do not involve the commercial or recreational fisheries.

STOCK ASSESSMENT – DATA INTEGRATION



STOCK ASSESSMENT – POPULATION DYNAMICS

$$B_{t+1} = B_t + (G_t + R_t) - (Y_t + D_t)$$

Where:

B = stock biomass

t = time (conventionally measured in years)

G = somatic growth of individuals

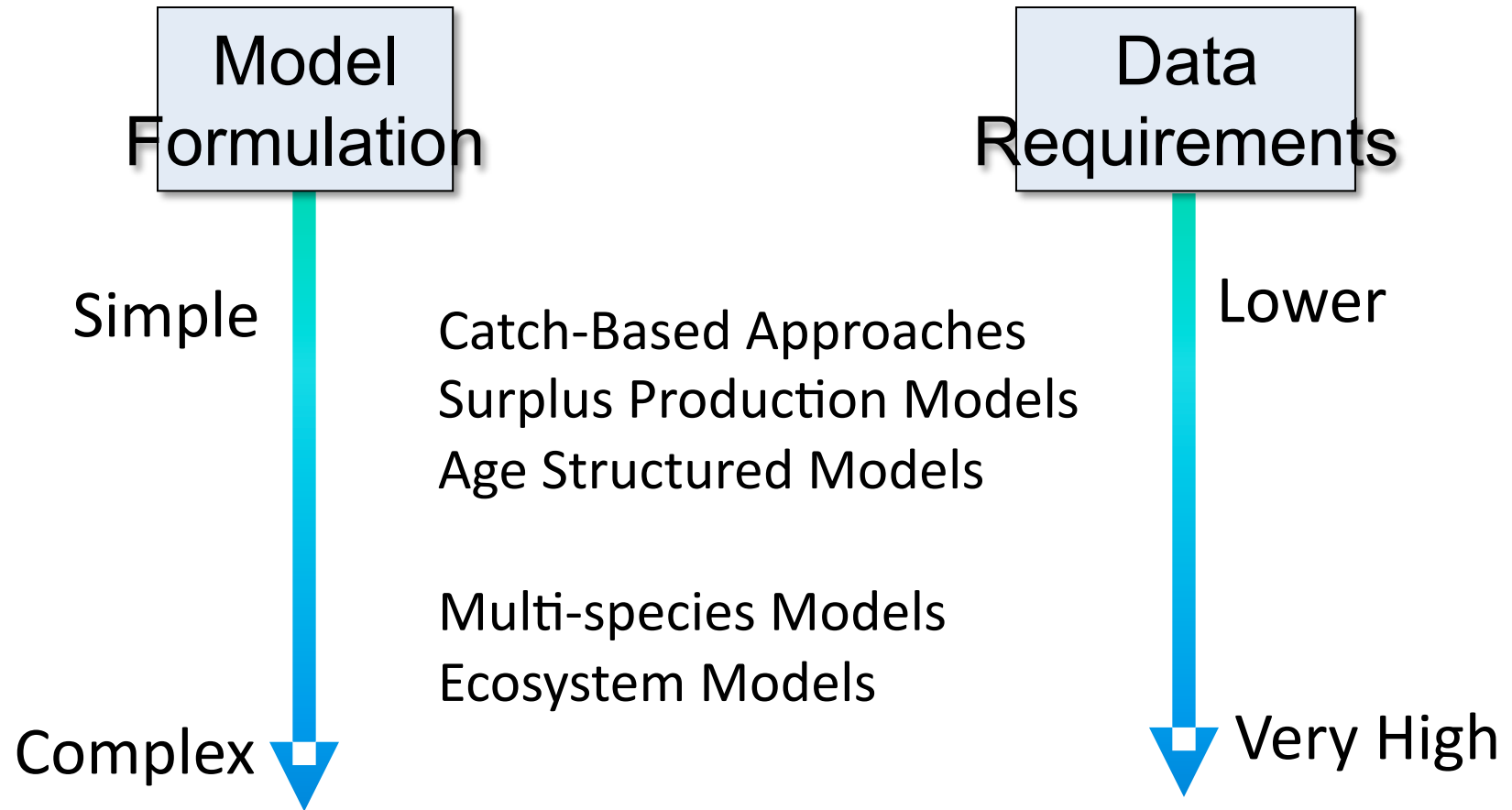
R = biomass increase due to recruitment (addition of young individuals to the stock)

Y = yield (catch in weight) from fishing

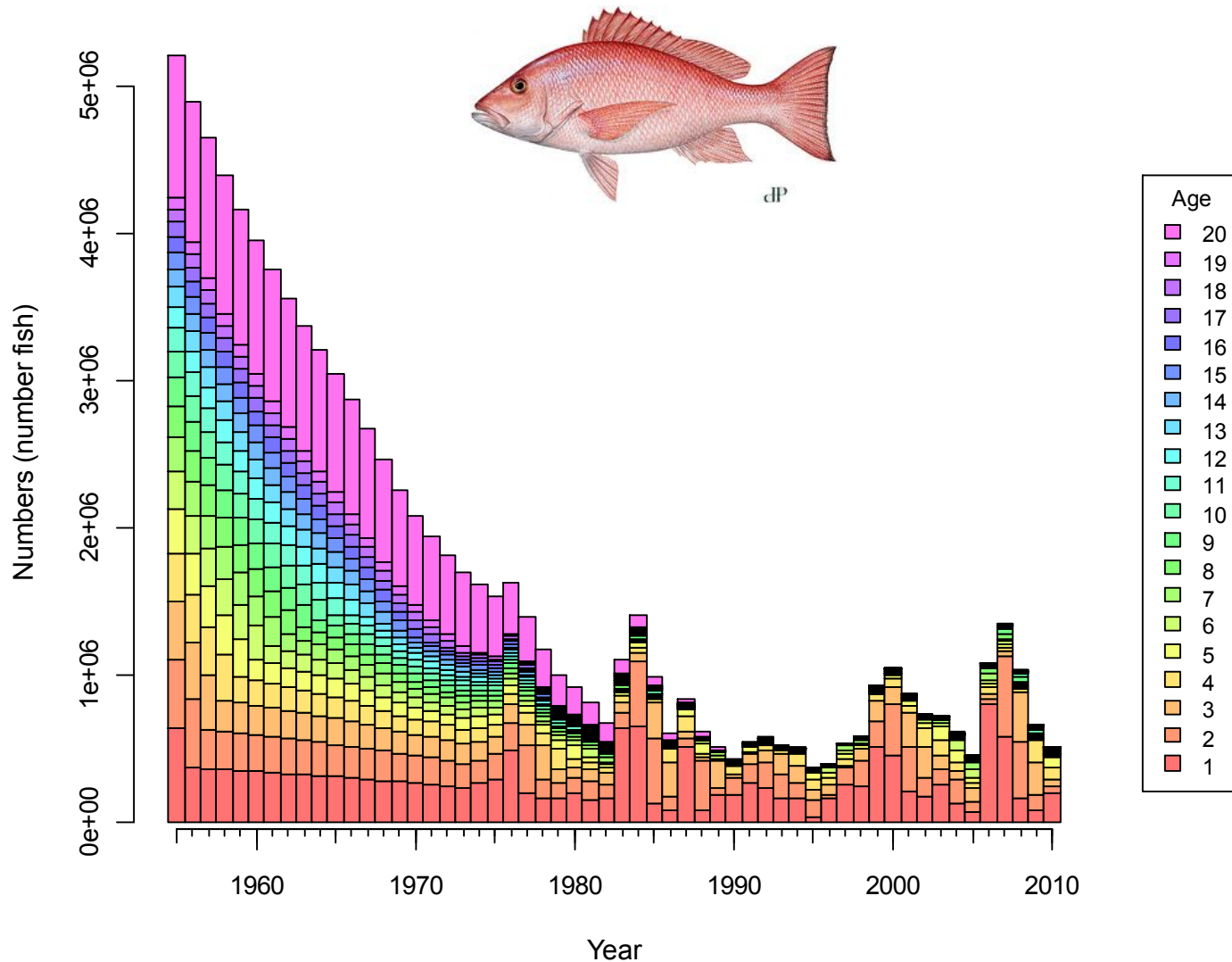
D = loss of biomass from deaths due to other causes



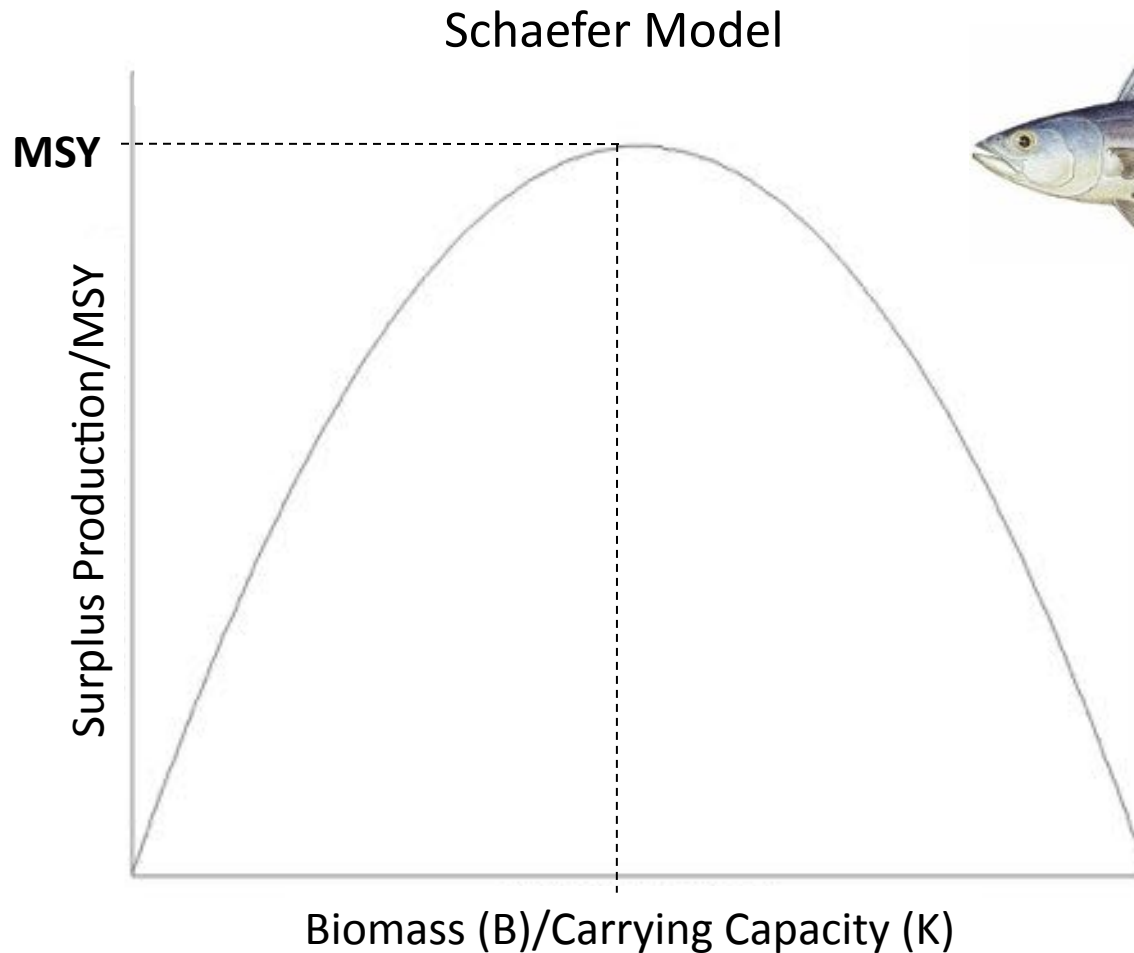
STOCK ASSESSMENT – MODEL CHOICE



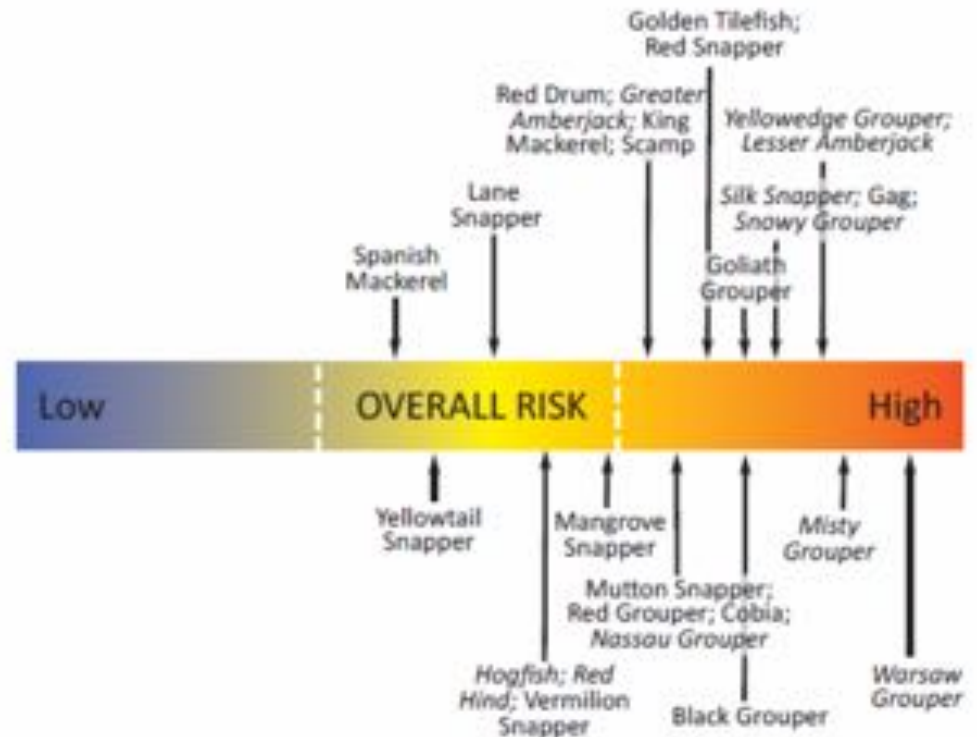
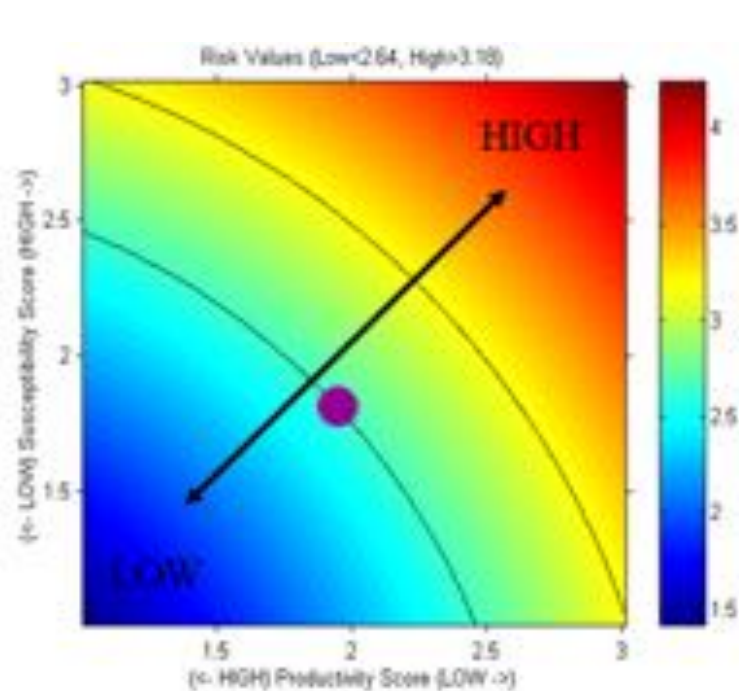
AGE-STRUCTURED ASSESSMENT MODELS



SURPLUS PRODUCTION MODELS



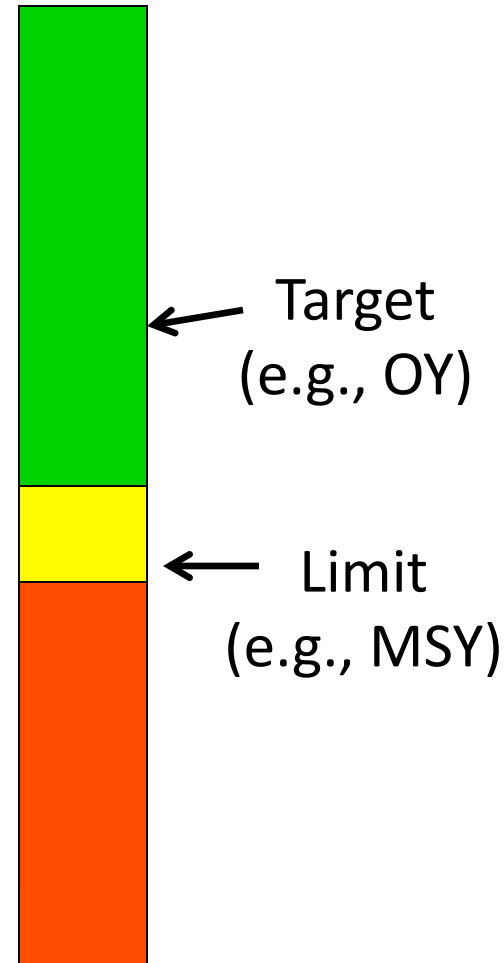
PSA : PRODUCTIVITY-SUSCEPTIBILITY ANALYSIS



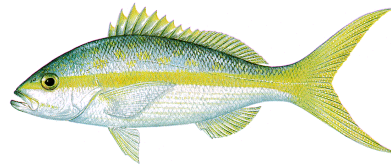
- Use assessment of a stock's vulnerability to guide catch level recommendations in data-poor situations

BIOLOGICAL REFERENCE POINTS

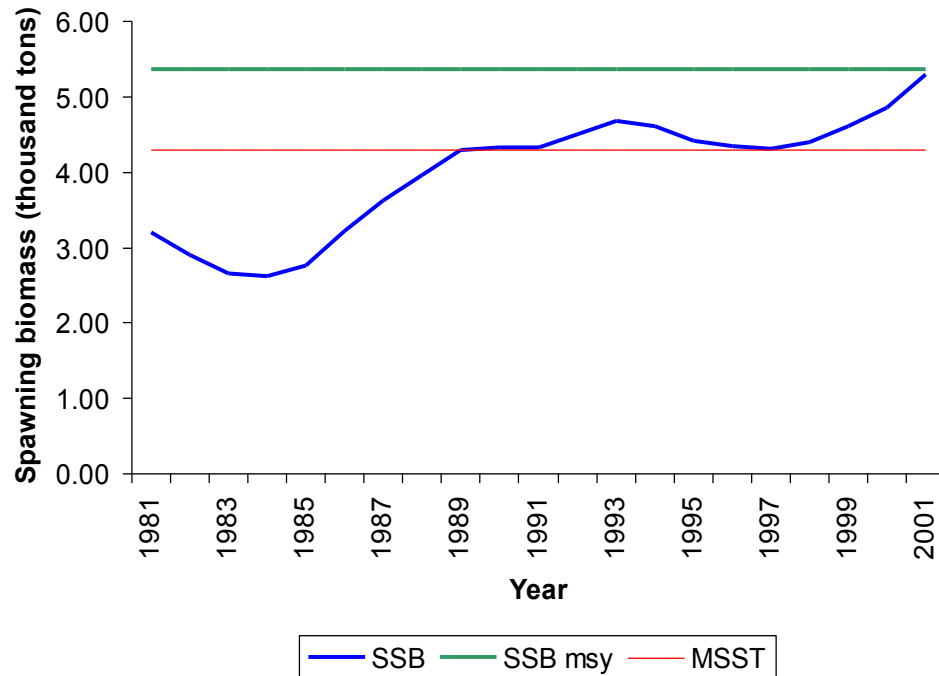
- Biological Reference Points: are benchmarks for gauging the status of a stock or fishery.
- Limit reference points: the maximum degree of safe exploitation.
- Target reference points: the degree of exploitation sought by management.



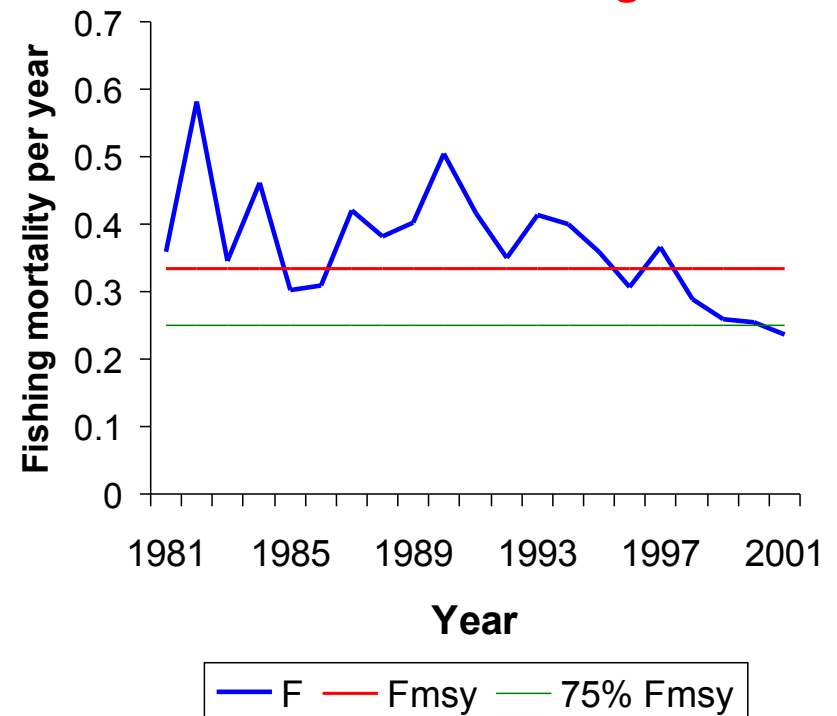
BIOLOGICAL REFERENCE POINTS – STOCK STATUS



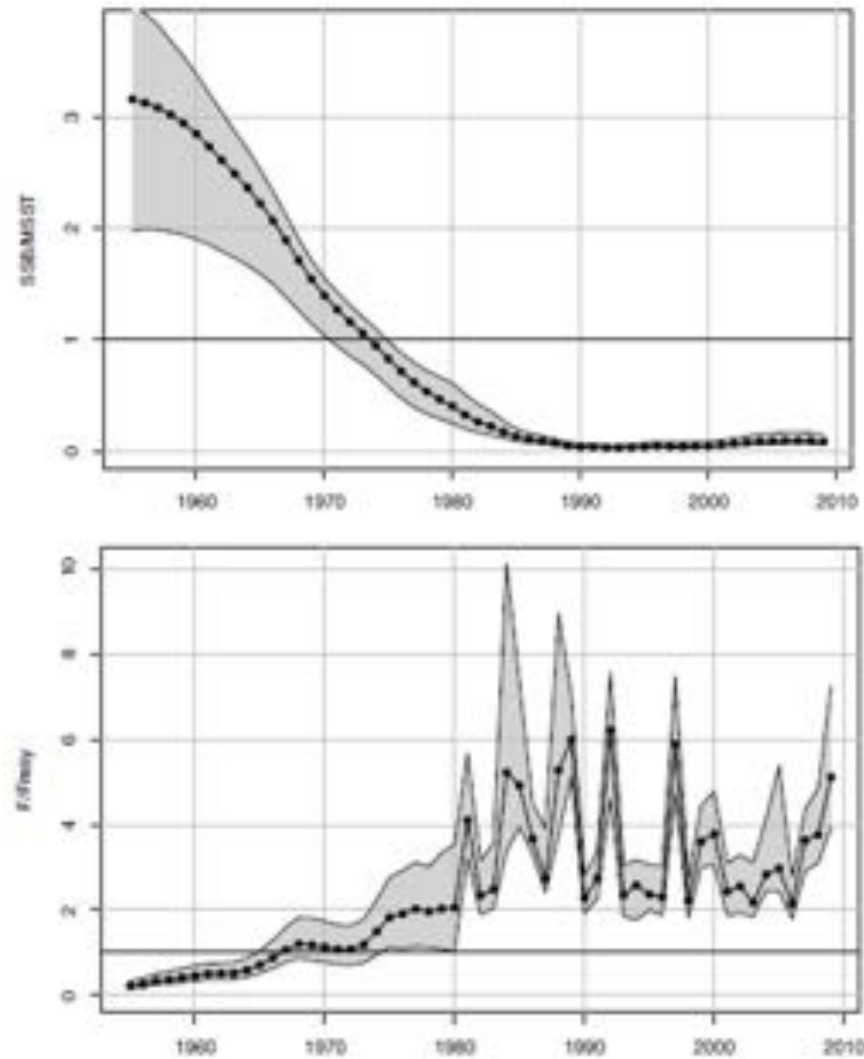
Not overfished



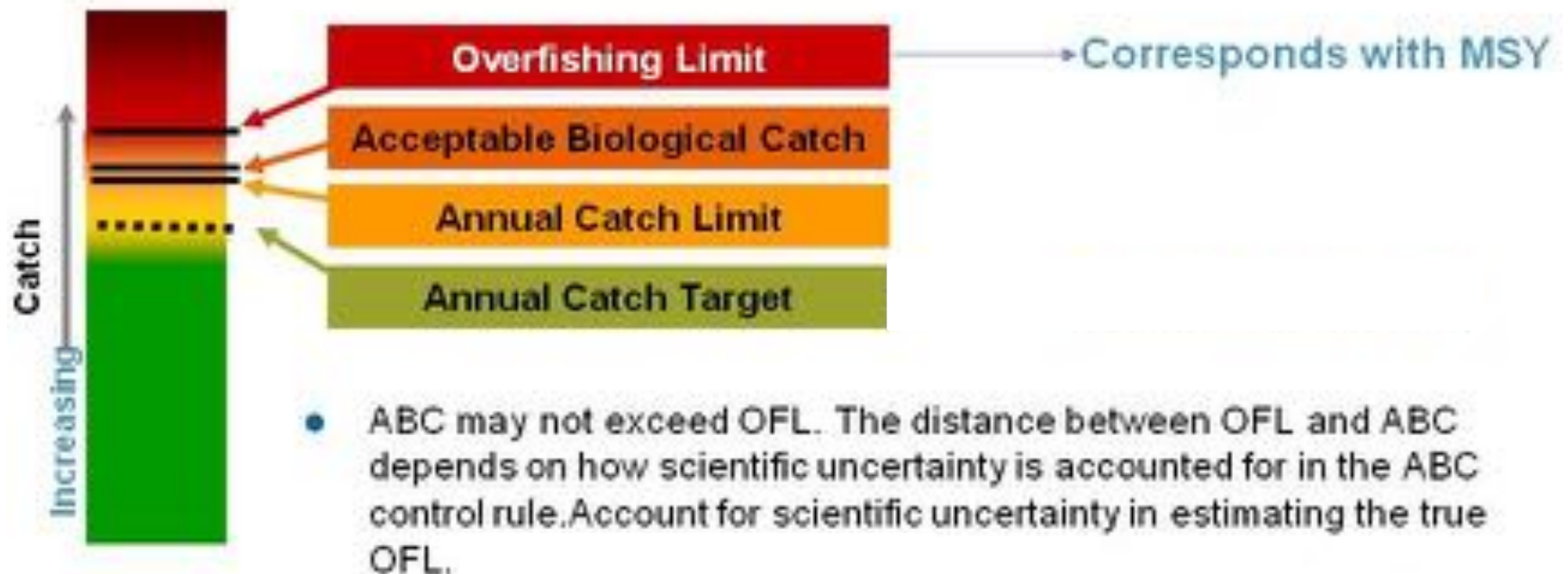
Not undergoing overfishing



STOCK ASSESSMENT UNCERTAINTY



UNCERTAINTY AND CATCH LEVEL RECOMMENDATIONS





Questions?

