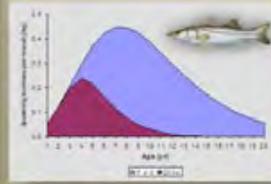


# Incorporating Uncertainty in Stock Assessments

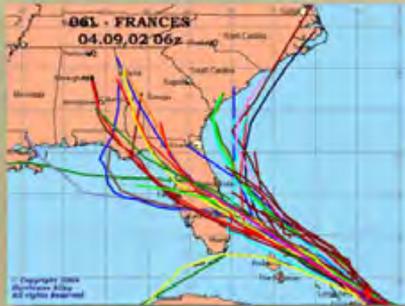


Report date: January 9, 2012

Florida Fish and Wildlife Conservation Commission  
Fish and Wildlife Research Institute

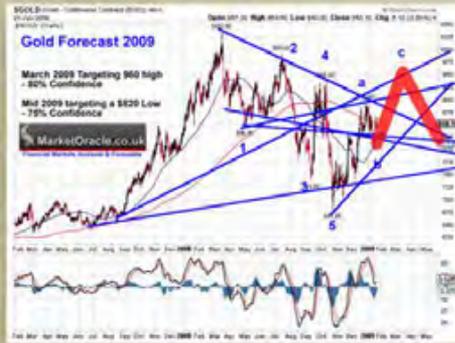
This presentation gives a review and discussion of how stock assessments provide results as probabilities and how that should be taken into consideration when making management decisions.

## Models are simplifications of the real world— uncertainty is a given



Hurricane trajectories

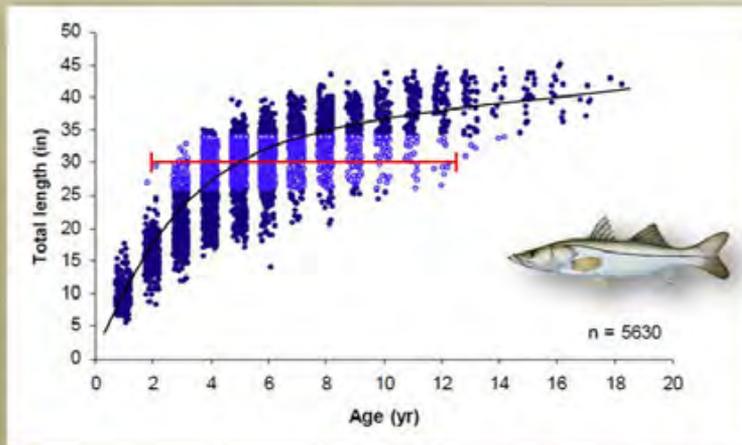
### Stock market predictions



Uncertainty is an intrinsic characteristic of fisheries stock assessments. Like other modeling procedures commonly used to forecast hurricane trajectories or fluctuations in the stock market fisheries stock assessment models are simplifications of very complex systems.

## Sources of uncertainty in stock assessments

- Variability in the data inputs

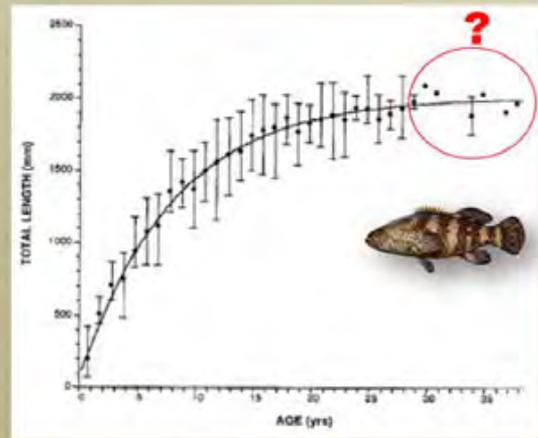


In their most basic form, stock assessment parameter inputs are estimates of central tendency (e.g. averages). However, there is a variability associated with these averages. This variability constitutes a level of uncertainty.

## Sources of uncertainty in stock assessments

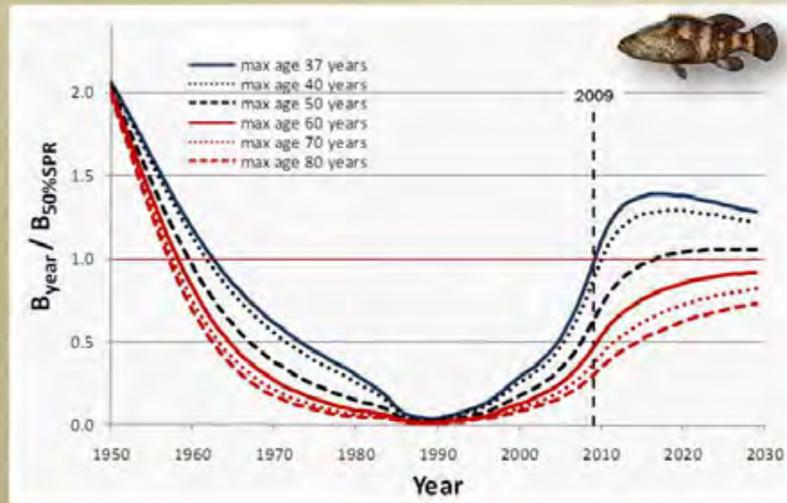
### Data gaps:

- Age and growth
- Reproduction
- Release mortality
- Etc.



For other stocks information on biology, life history, or important ecological processes is either non-existent, incomplete, or outdated.

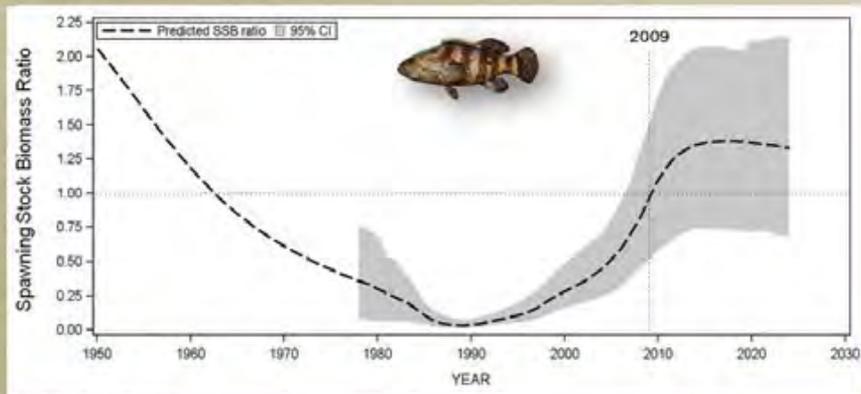
**Example: uncertainty in stock status given uncertainty in maximum age estimate**



For example, results of the last goliath grouper stock assessment was highly uncertain given uncertainty on goliath grouper longevity.

## Sources of uncertainty in stock assessments

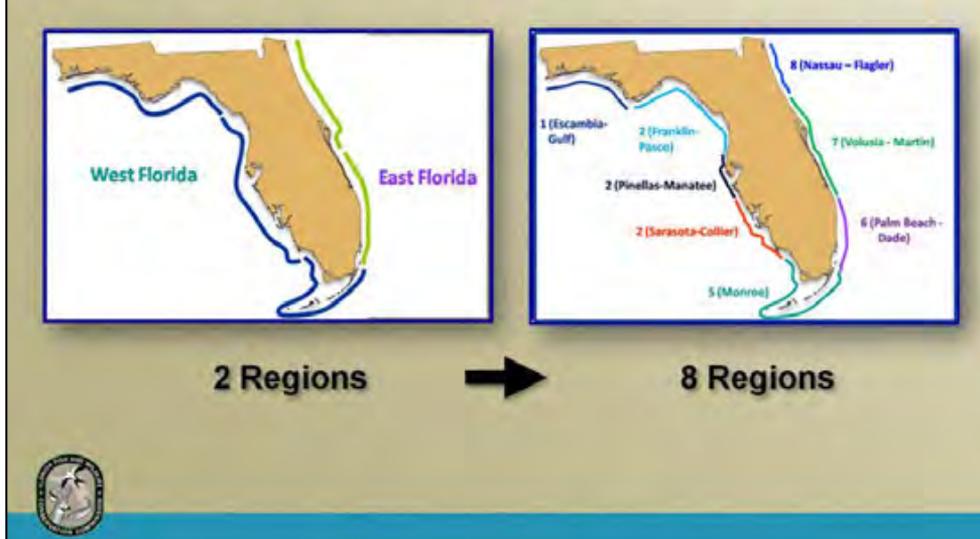
- Data quality or availability over time



The availability of reliable fisheries landings data from early stages of the fishery or the necessity to forecast future stock condition represent common sources of uncertainty in stock assessments.

## Sources of uncertainty in stock assessments

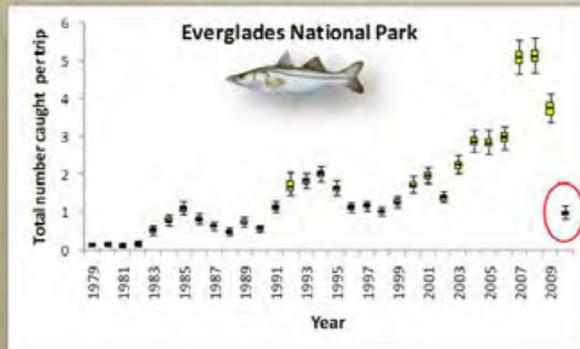
- Using data from one geographic area to apply to another



As is the use of data from one geographic area to “fill in” data gaps in other areas.

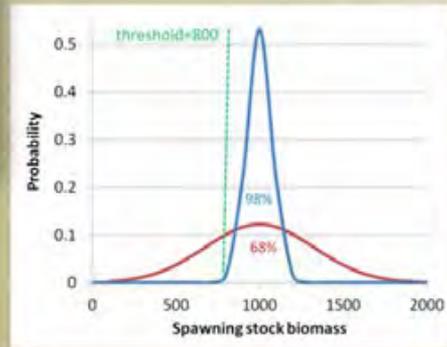
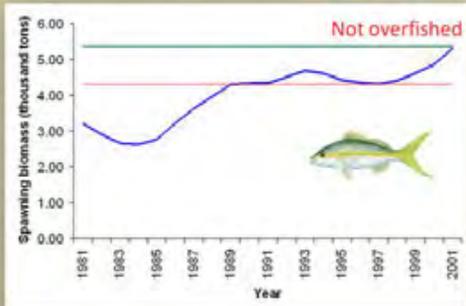
## Sources of uncertainty in stock assessments

- Environmental events: red tides, cold-kill events, etc.



The condition of the environment is generally assumed to be static in traditional stock assessments. Population-level impacts of episodic environmental events such as red tides or cold kill events are difficult to quantify and usually add an additional layer of uncertainty to stock assessment results.

## Assessment Uncertainty and Management Decisions



Given their inherent uncertainty stock assessment results should be interpreted as probabilities, not definite outcomes.