

# Setting Reference Points for Information-limited Stocks in the U.S.

Andrew B. Cooper

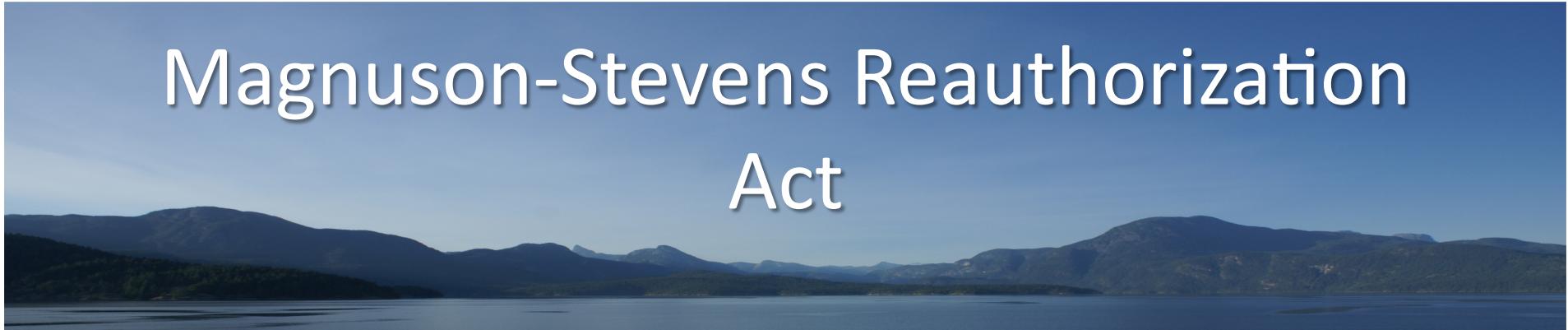
Simon Fraser University

School of Resource and Environmental Management

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# Information poor vs. Data poor



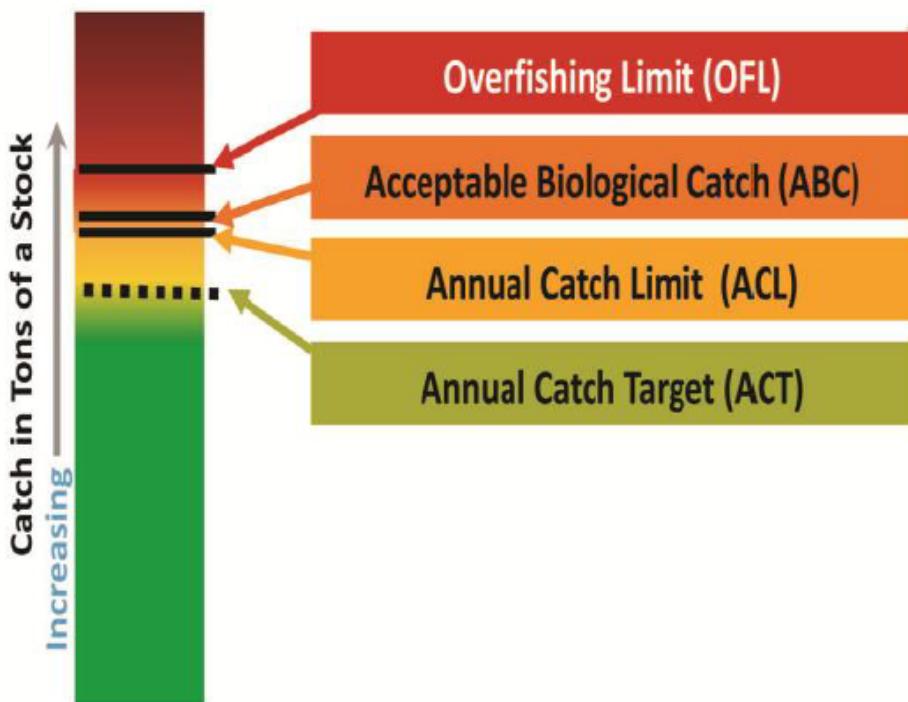
# Magnuson-Stevens Reauthorization Act

- Mandated science-based thresholds for all fisheries
- Thresholds must be based on weight or number, not just fishing mortality
- Lack of information can not be used as an excuse to avoid setting thresholds
- Management measures must constrain catch below these thresholds with a greater than 50% probability

# Magnuson-Stevens Reauthorization Act

## Reference Points

**OFL > ABC > ACL > ACT**

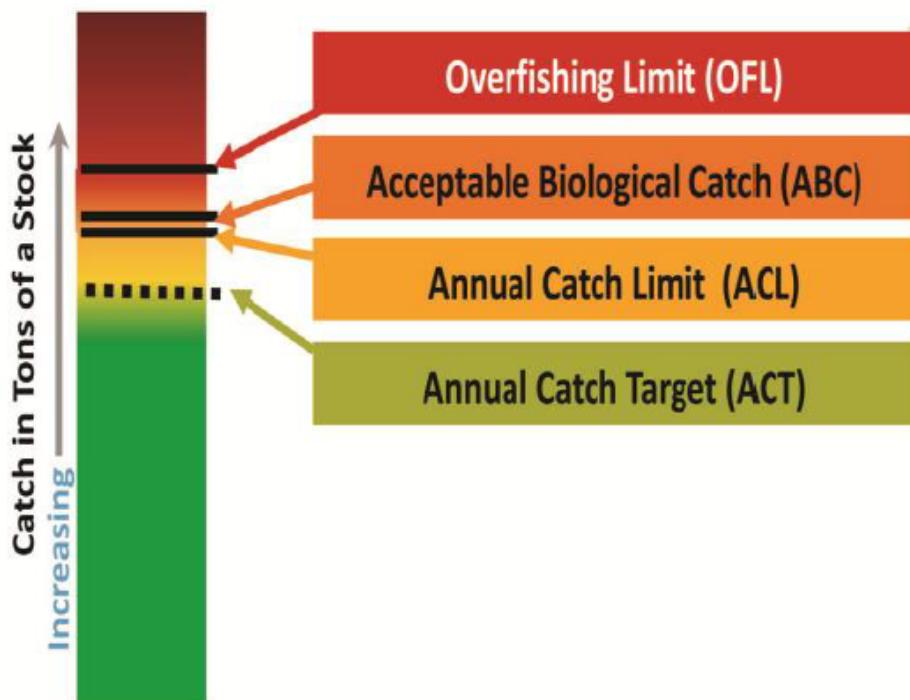


Based on science  
( $\sim B_{current} * F_{msy}$ )

# Magnuson-Stevens Reauthorization Act

## Reference Points

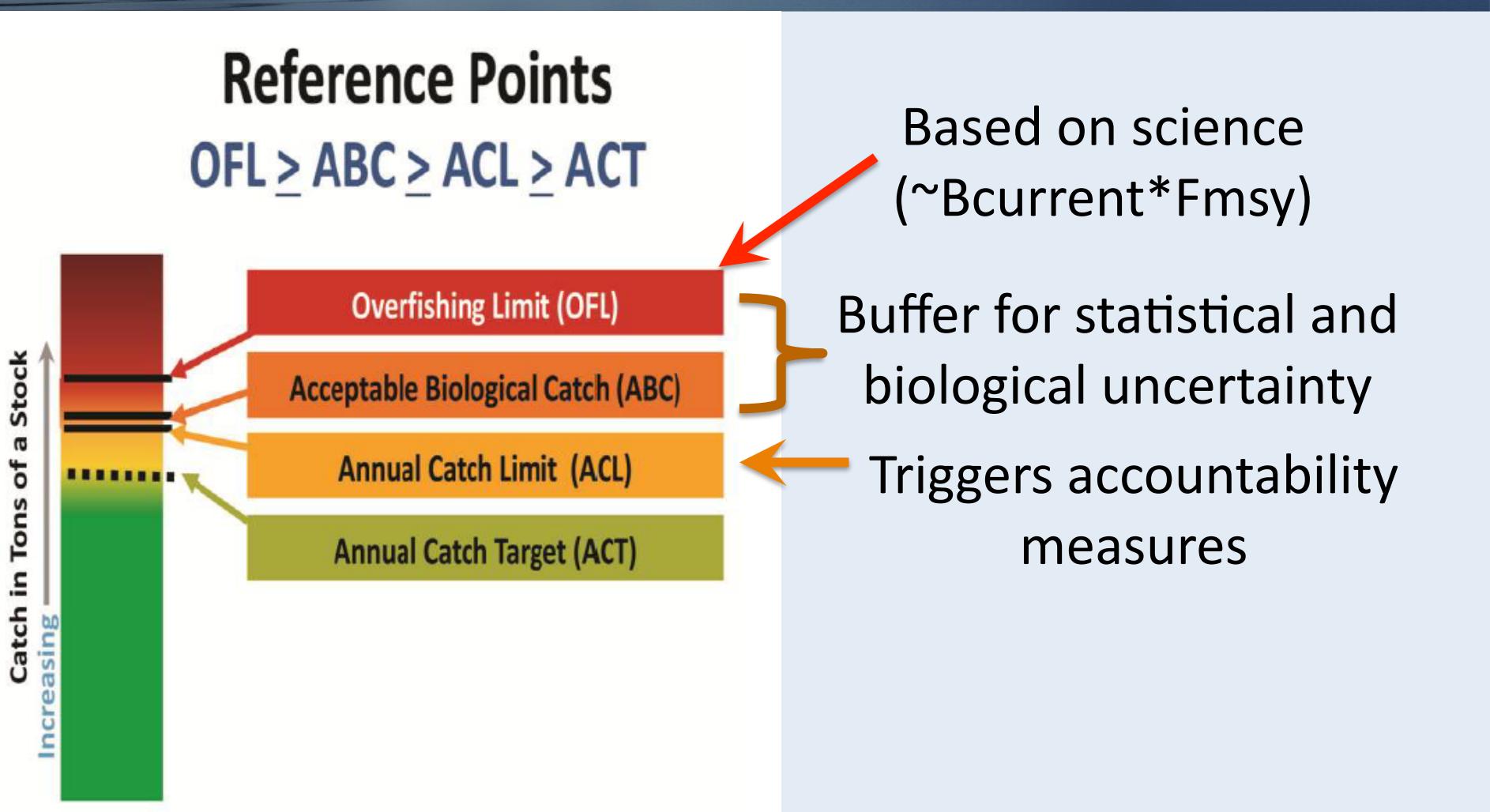
**OFL > ABC > ACL > ACT**



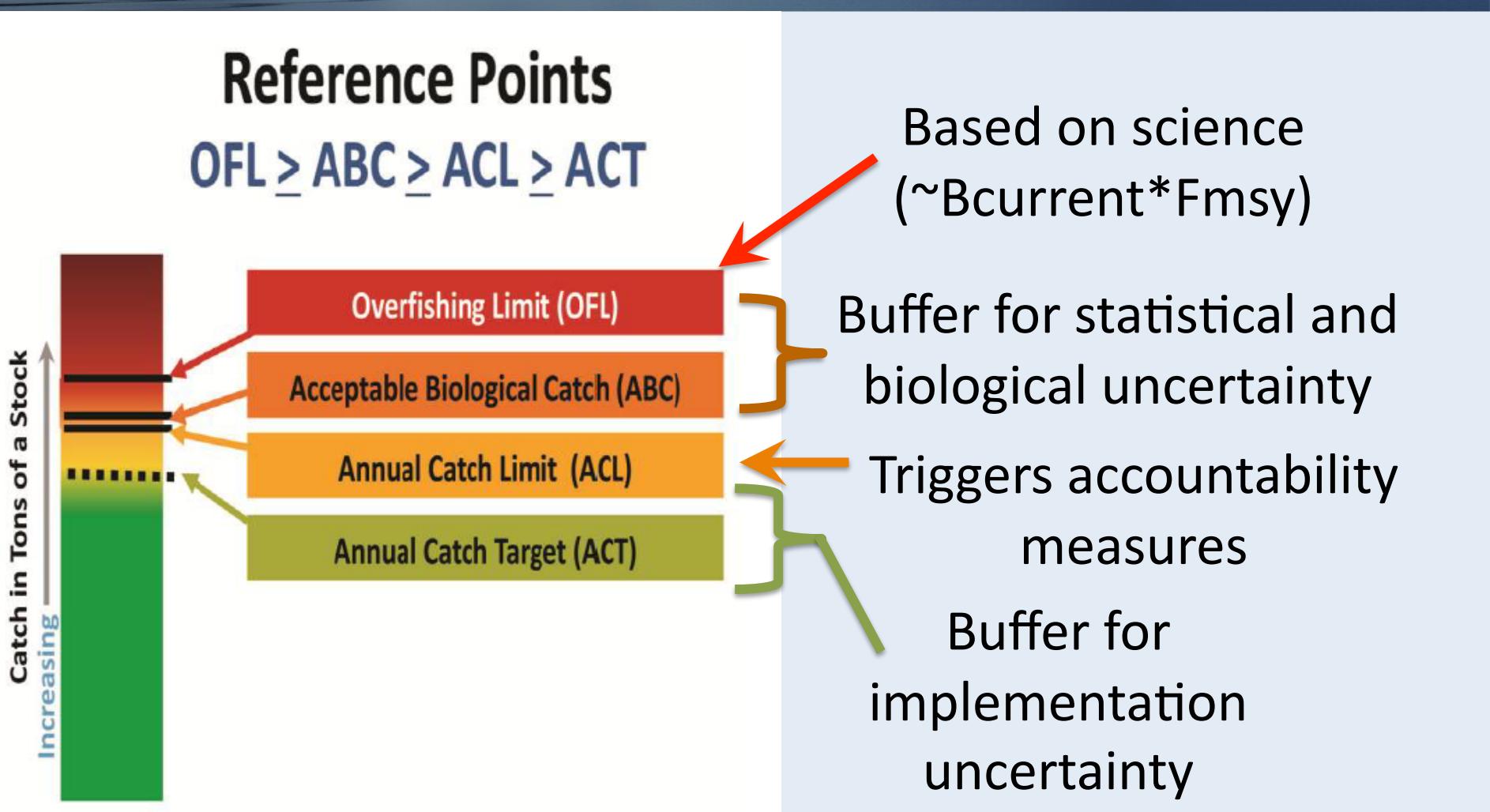
Based on science  
( $\sim B_{current} * F_{msy}$ )

Buffer for statistical and biological uncertainty

# Magnuson-Stevens Reauthorization Act

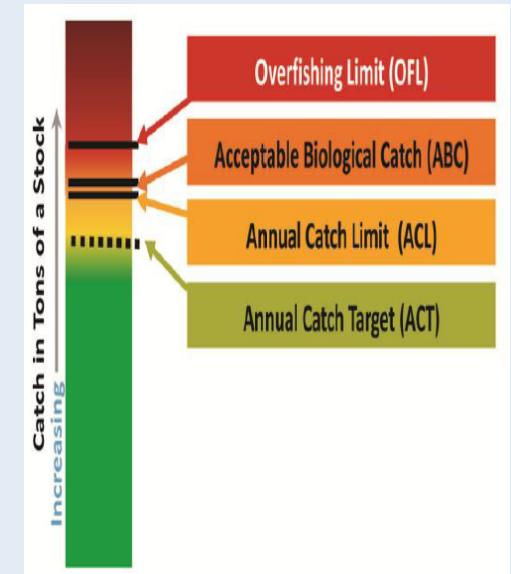


# Magnuson-Stevens Reauthorization Act



# Allowable Biological Catch Control Rule

- ABCs are required for *all* fisheries
- Buffer between OFL and ABC should shrink as information improves
- Should maintain acceptable probability of overfishing
- The shrinkage should be consistent across fisheries





# ABC Control Rule in the South Atlantic

- Buffer for assessed stocks based on rankings of:
  - Quality of assessment output
    - $F_{msy}$  vs. proxy
    - $B_{current}$  vs.  $B_{current}/B_{msy}$
  - Characterization of uncertainty
    - Surplus production vs. age structured
    - Bayesian vs. sensitivity analyses
  - Stock status (relative to  $B_{msy}$ )
  - Productivity – Susceptibility Analysis



# ABC Control Rule in the South Atlantic

- When only reliable landings and life history are available
  - OFL derived from Depletion-Based Stock Reduction Analysis (DB-SRA)
  - Buffer for ABC determined by the same 4 factors as assessed species



# ABC Control Rule in the South Atlantic

- When only a limited number of years of reliable catch are available, use Depletion-Corrected Average Catch (DCAC) to calculate ABC
- If cannot use DCAC due to unreliable catch data, base ABC on the median of observed landings over the most recent time periods or 3<sup>rd</sup> highest (depending on situation)

# Dolphinfish



- Very fast growing, highly sensitive to water temperature
- Short-lived (less than 5 years),  
Mature at 4-5 months
- Mostly a recreational fishery
- No up-to-date assessment
- ABC based on mean catch

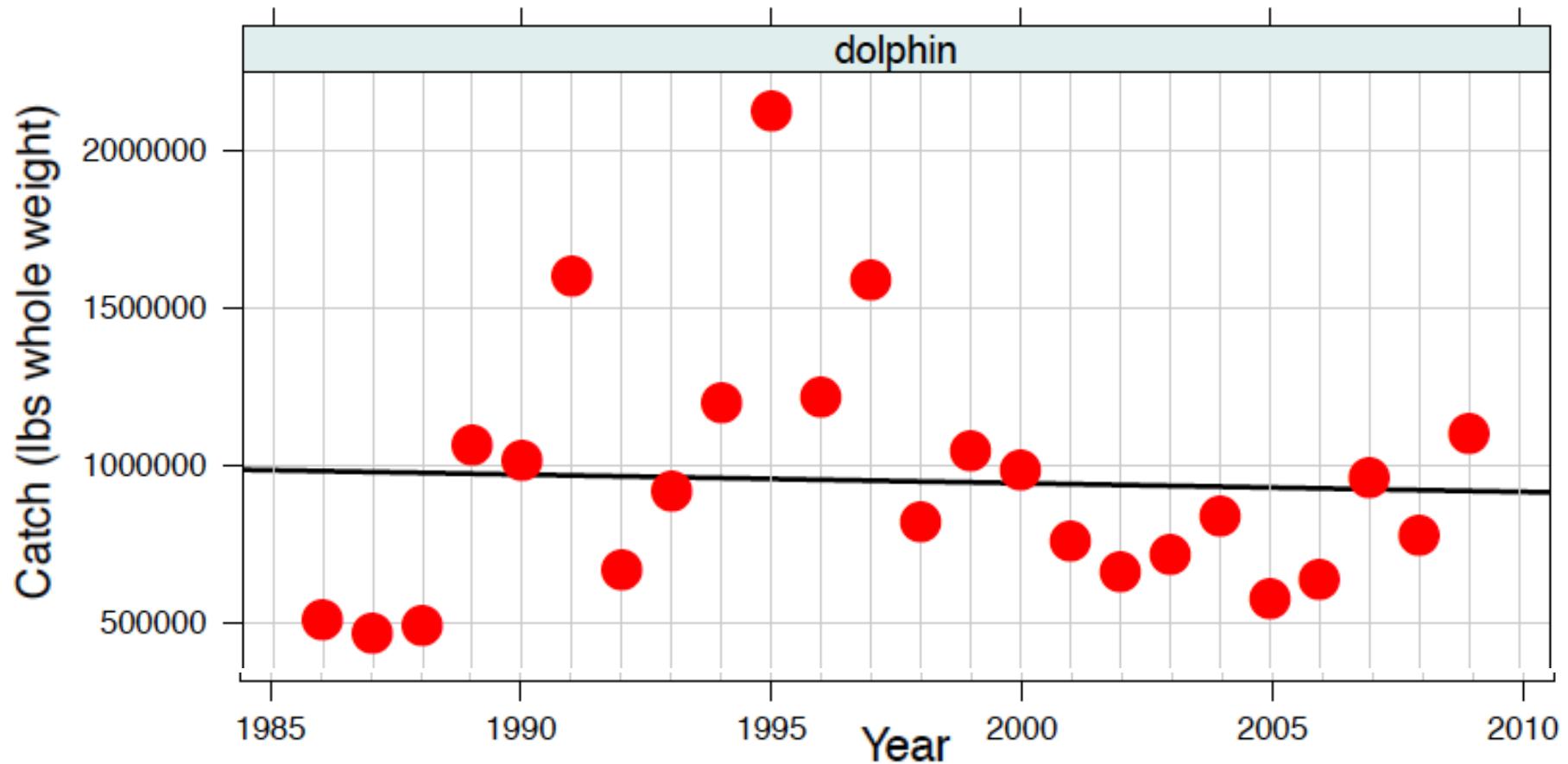


DOLPHIN (male)

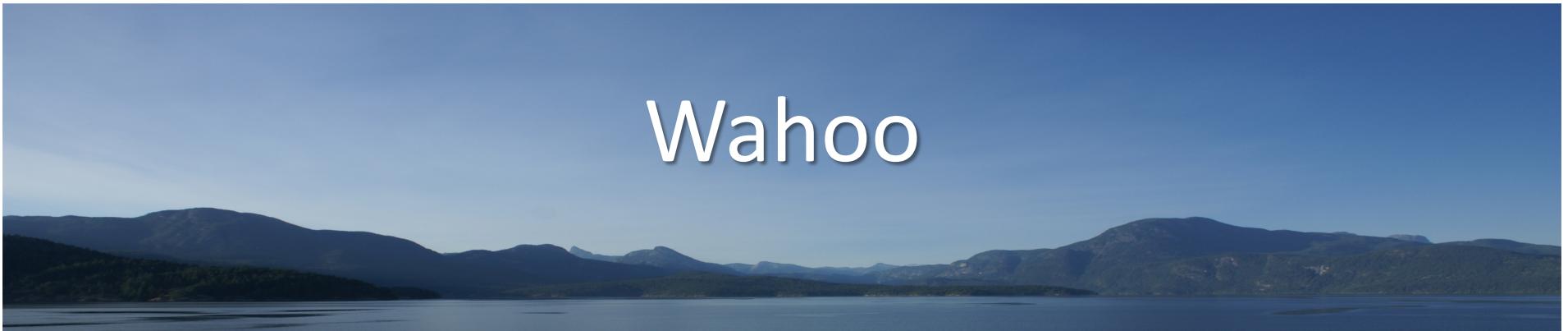
*Coryphaena hippurus*

# Dolphinfish

Catch Totals 1986 – 2009



# Wahoo



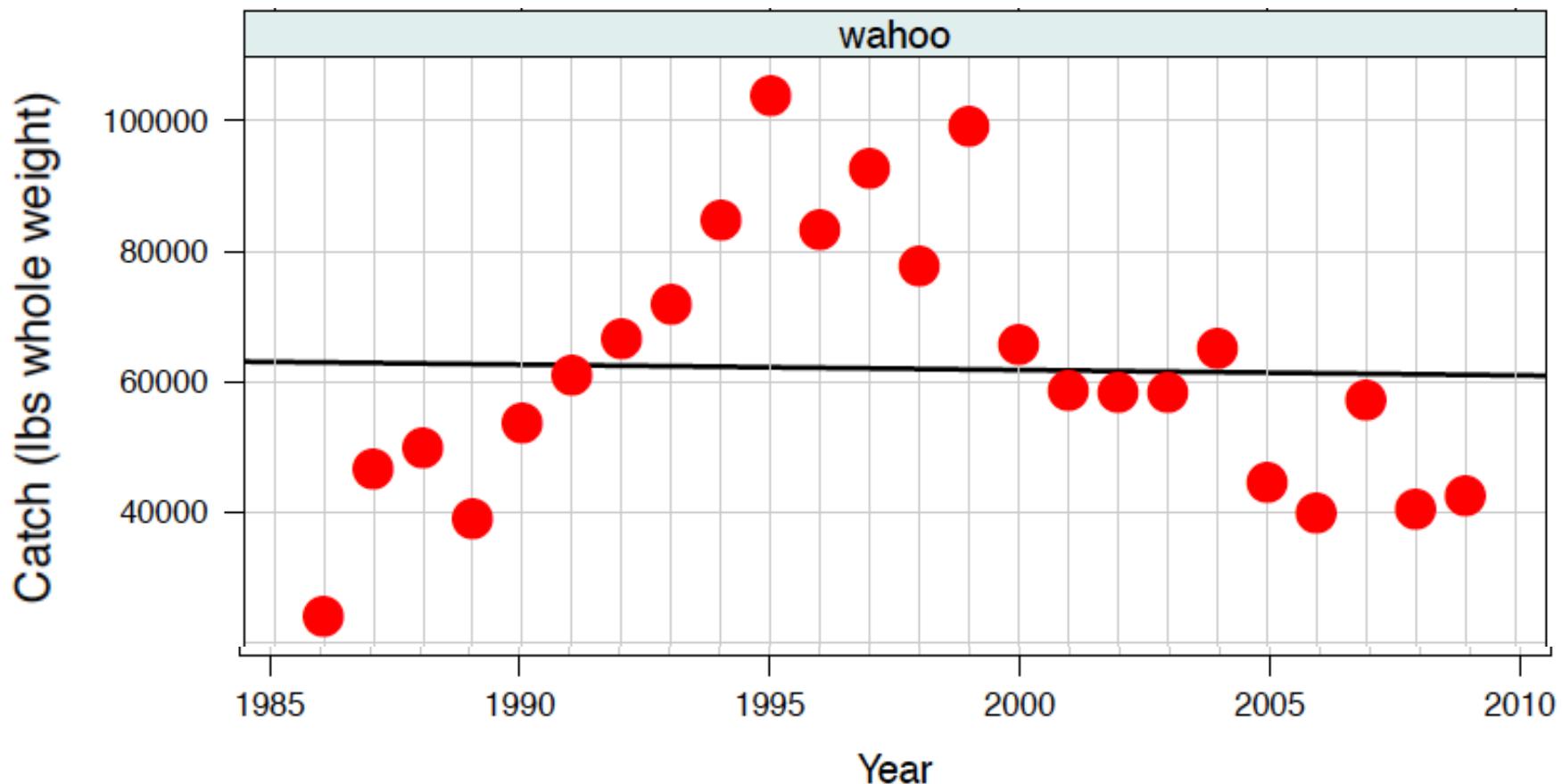
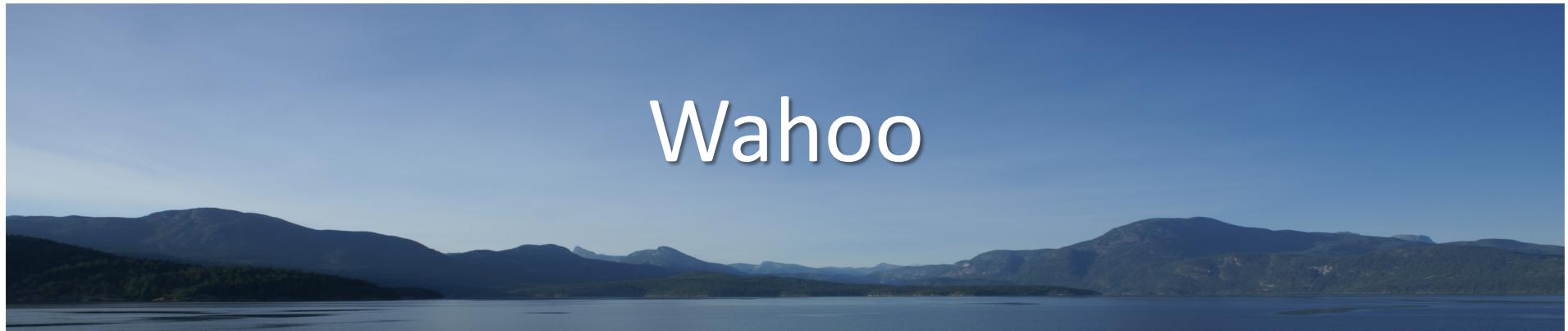
- Fast growing
- Mature within the first year
- Mostly a recreational fishery
- No stock assessment available
- ABC based on mean landings



WAHOO

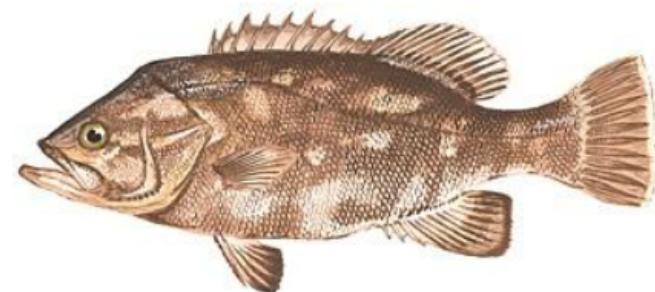
*Acanthocybium solandri*

# Wahoo



# Wreckfish

- ABC currently based on median landings because full stock assessment is out of date (2001)
- DB-SRA and DCAC recommended
- Deep-water species



DR  
Wreckfish      *Polyprion americanus*

# Species Complexes

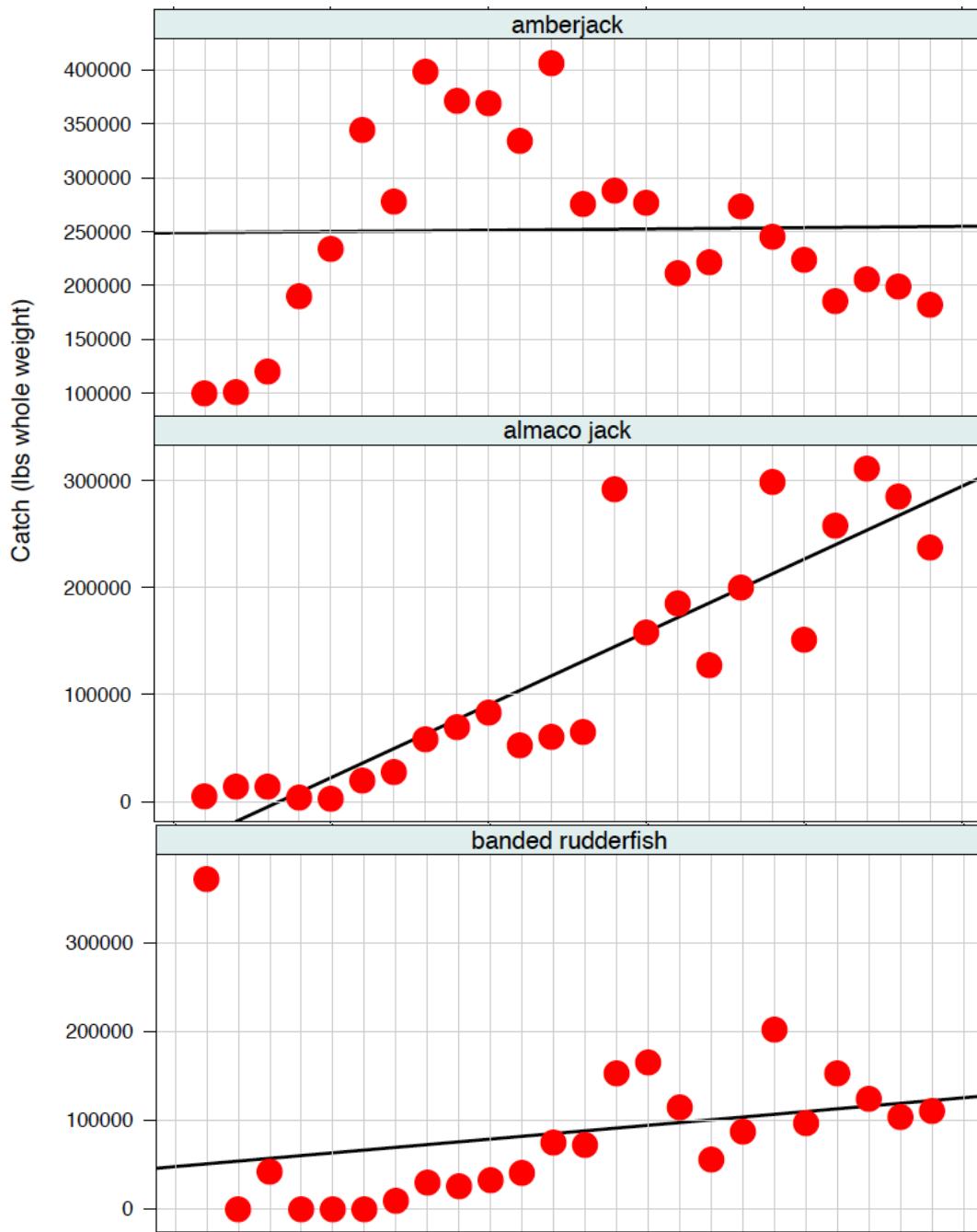


## **Complex 1 Deepwater**

Black snapper (bs)  
Blackfin snapper (bf)  
Blueline tilefish (bt)  
Misty grouper (mg)  
Queen snapper (qs)  
Sand tilefish (st)  
Silk snapper (ss)  
Yellowedge grouper (yg)

## **Complex 2 Jacks**

Almaco jack  
(aj)  
Banded rudderfish  
(br)  
Lesser amberjack  
(la)



# Species Complexes



## Complex 3 Snappers

Cubera snapper (cs)  
Dog snapper (ds)  
Gray snapper (gs)  
Lane snapper (ls)  
Mahogany snapper (ms)

## Complex 4 Grunts

Margate (mg)  
Tomtate (tt)  
Sailors choice (sc)  
White grunt (wg)

# Species Complexes

## Complex 5 Shallow- water Groupers

Coney (cg)  
Graysby (gg)  
Red hind (rh)  
Rock hind (ro)  
Yellowfin grouper  
(yg)  
Yellowmouth grouper

## Complex 6 Porgies

Jolthead porgy (jp)  
Knobbed porgy (kp)  
Saucereye porgy  
(sp)  
Scup (cp)  
Whitebone porgy



# Pacific Fisheries

- DCAC
  - Used for species with erratic or incomplete catch histories
  - Six rockfishes (*Sebastodes* spp.)
    - blue, blackgill, gopher, honeycomb, Mexican, and squarespot
  - One elasmobranch (soupfin shark)



# Pacific Fisheries

- DB-SRA
  - Applied to nearly half the species in their Groundfish fishery management plan
  - 34 rockfishes (*Sebastodes* sp.)
  - Four flatfishes (Pacific sanddab, rex sole, rock sole, and sand sole),
  - One roundfish (kelp greenling)
  - Two elasmobranches (leopard shark and dogfish)
  - One complex (grenadiers)



# Caribbean Fisheries

- Lack of reliable catch data (short time series and/or large uncertainty)
  - Caribbean mutton snapper
  - Caribbean yellowfin grouper
- Lack of reliable indices and reliable catch
  - Caribbean queen conch
  - Caribbean queen snapper
  - Caribbean silk snapper
  - Caribbean redtail parrotfish