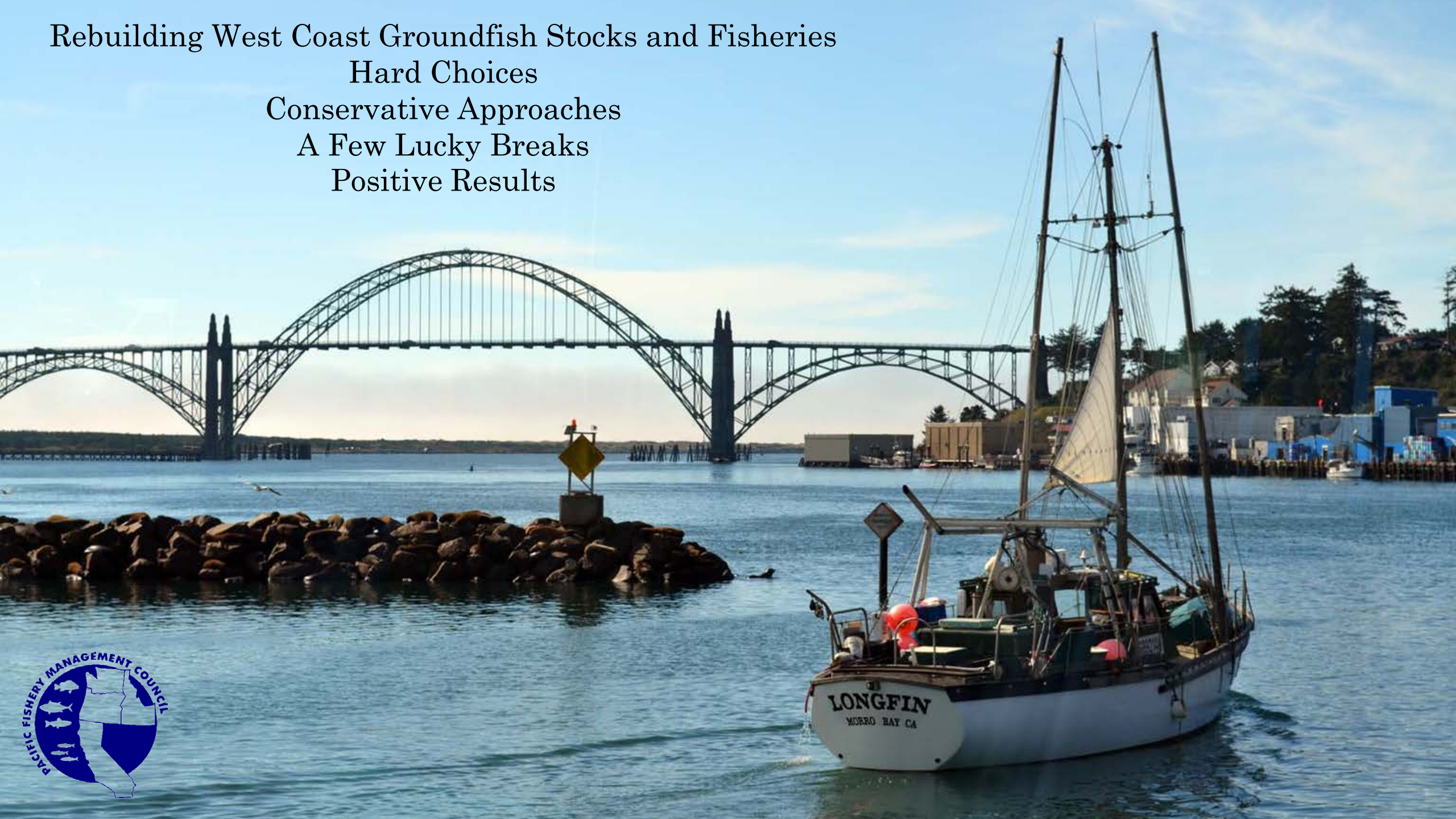
Rebuilding West Coast Groundfish Stocks and Fisheries

Hard Choices

Conservative Approaches

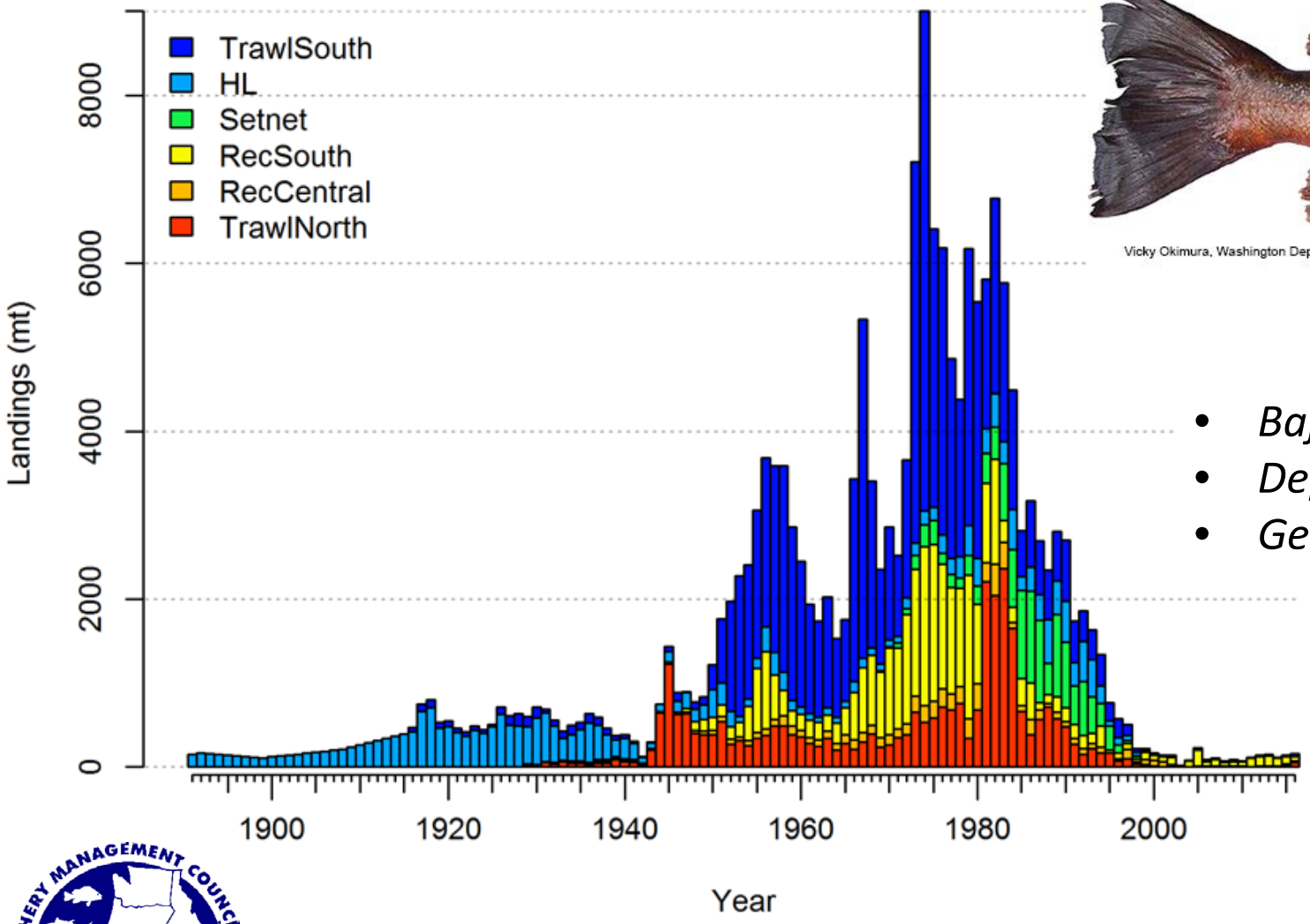
A Few Lucky Breaks

Positive Results

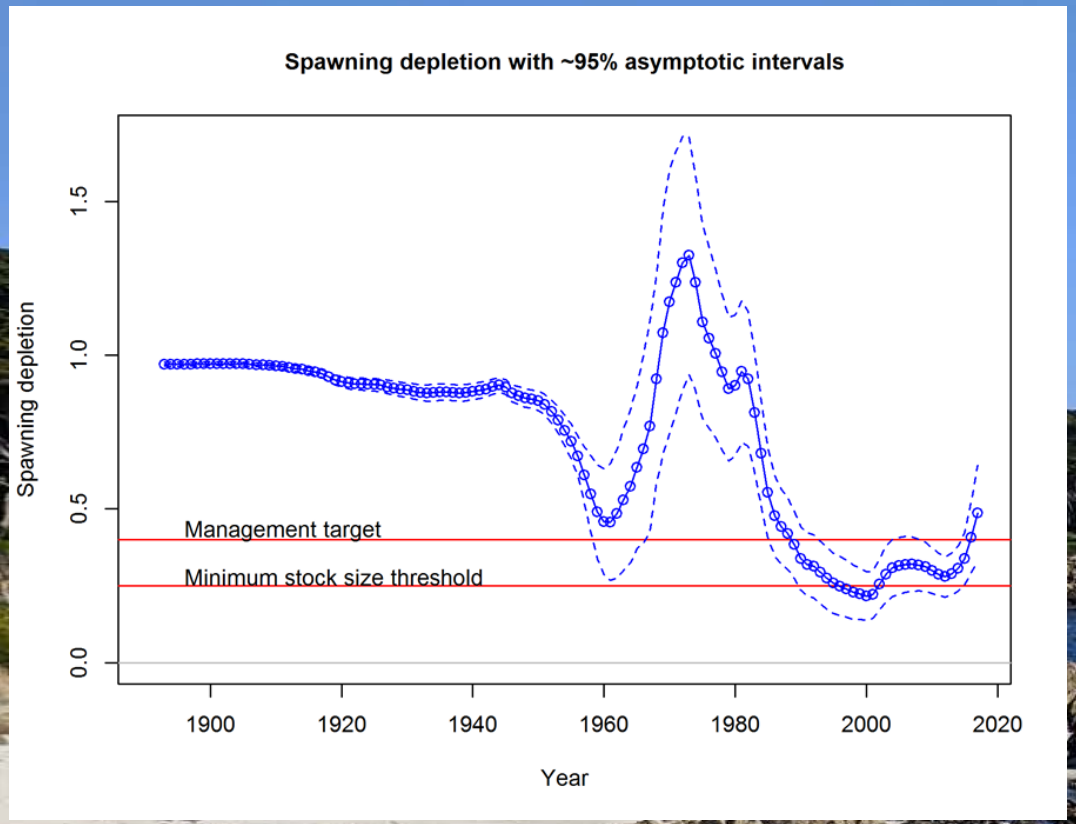


Bocaccio

Sebastes paucispinus



- *Baja California to Gulf of Alaska*
- *Depth Range 15-180 fm (~30-300 m)*
- *Generally High Density 80-100 fm (~90-180 m)*



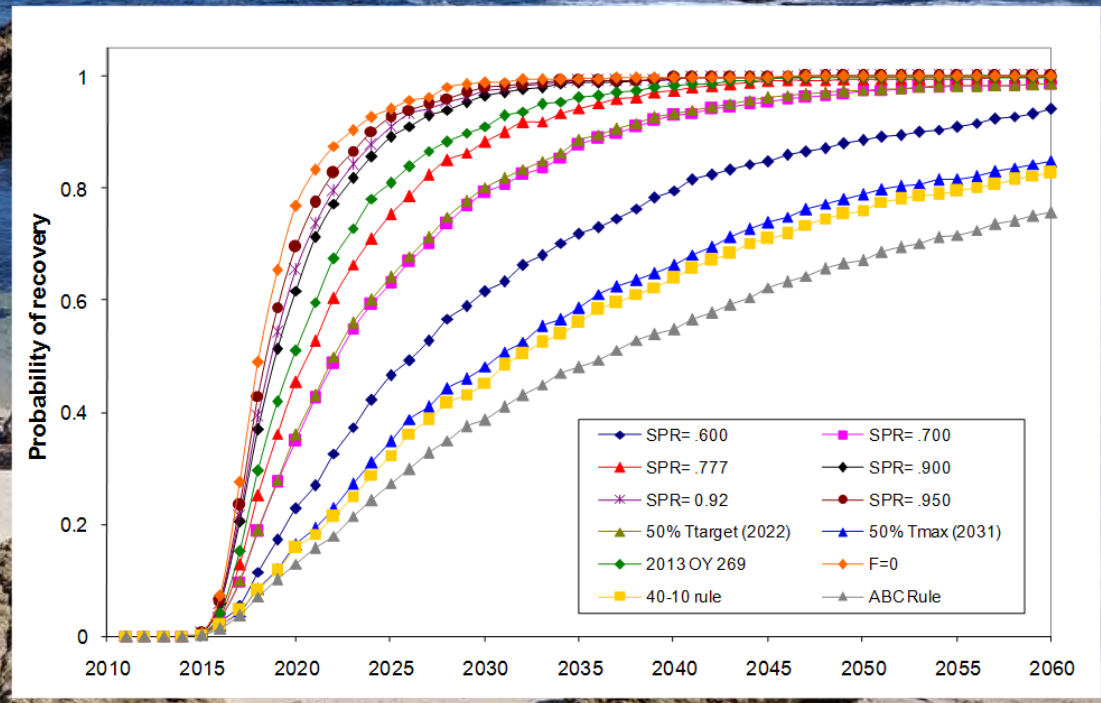
Declared Overfished South of Cape Mendocino CA in 2000

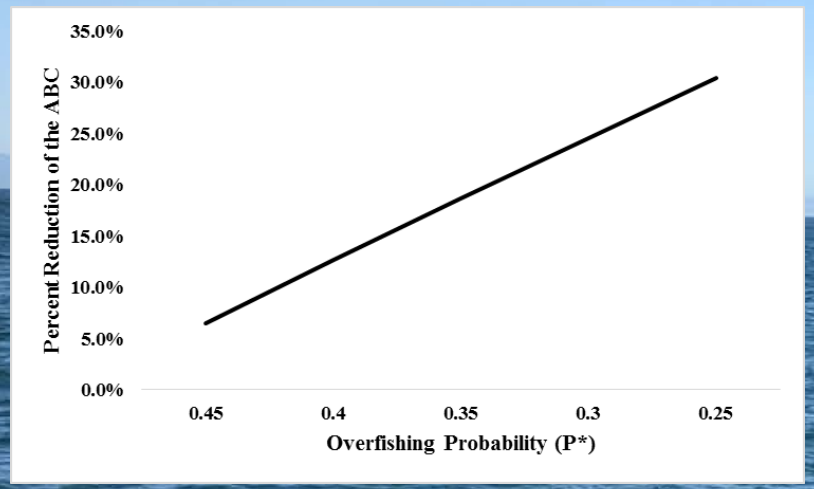
T_{MIN} = Time to Rebuild in the Absence of Fishing = 2018

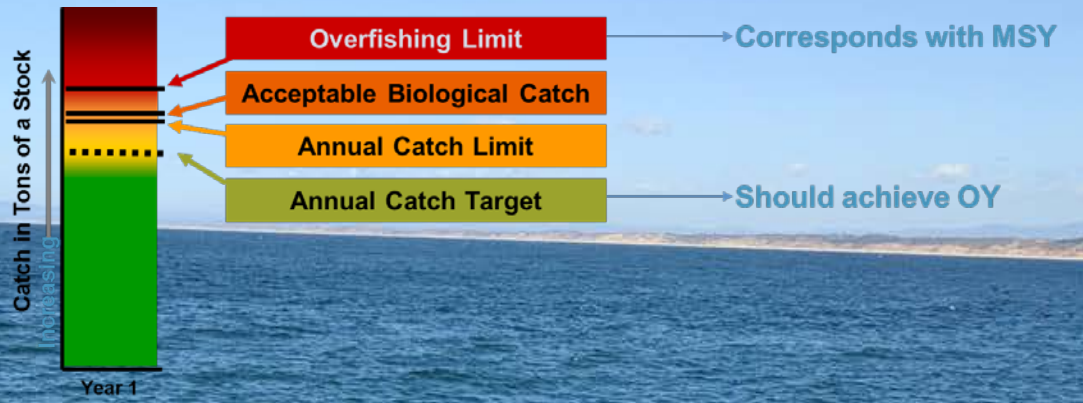
T_{TARGET} = Target Time to Rebuild with 50% Probability = 2026

T_{MAX} = Maximum Time to Rebuild (T_{MIN}+ mean generation time) = 2031

Declared Rebuilt in 2017



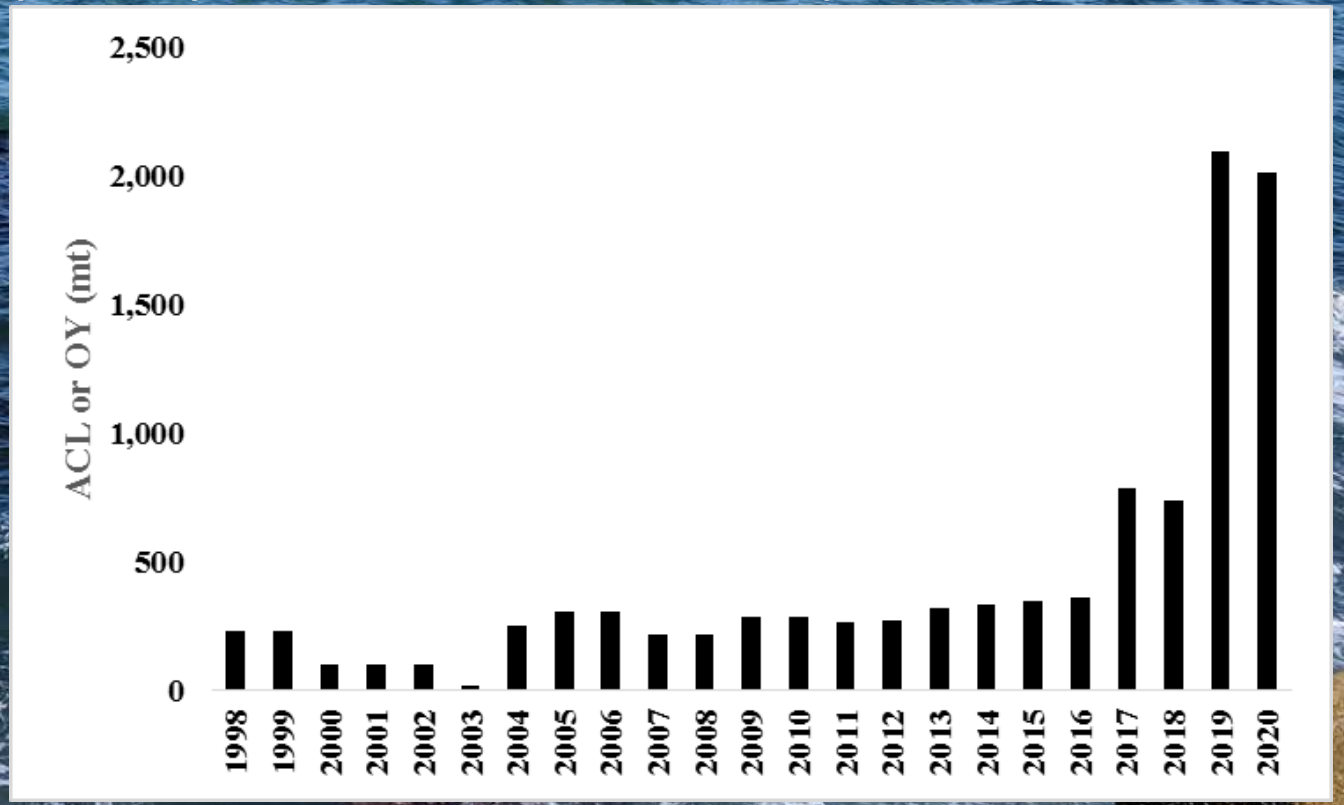


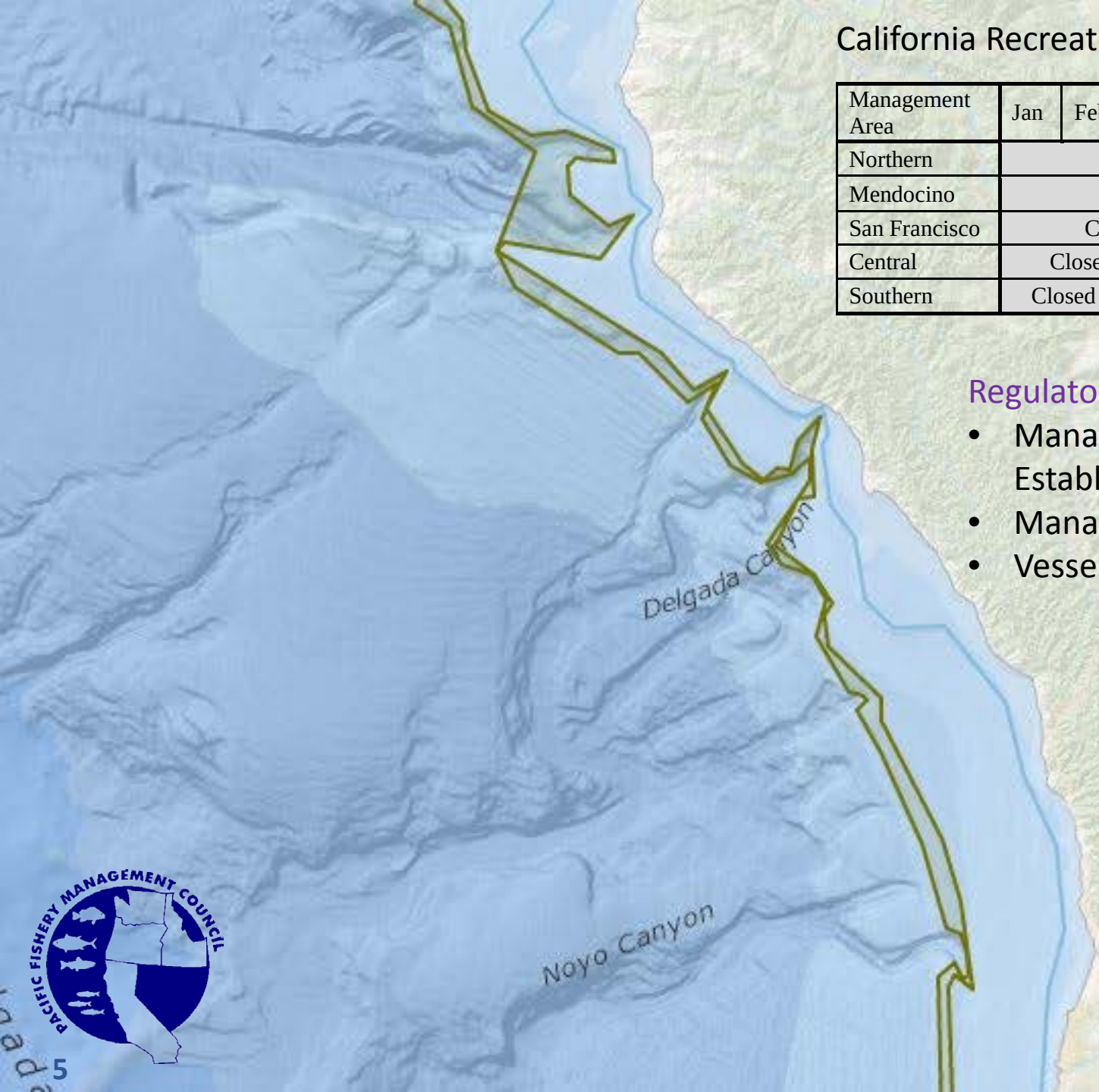


Bocaccio Harvest Control Rules

Rebuilding "ACL" Harvest Control Rule: ABC (P* = 0.45), ACL (SPR = 77.7%)

Rebuilt (Default) Harvest Control Rule: ABC (P* = 0.45), ACL = ABC





California Recreational Fishery Seasonal Closures and Depth Restrictions

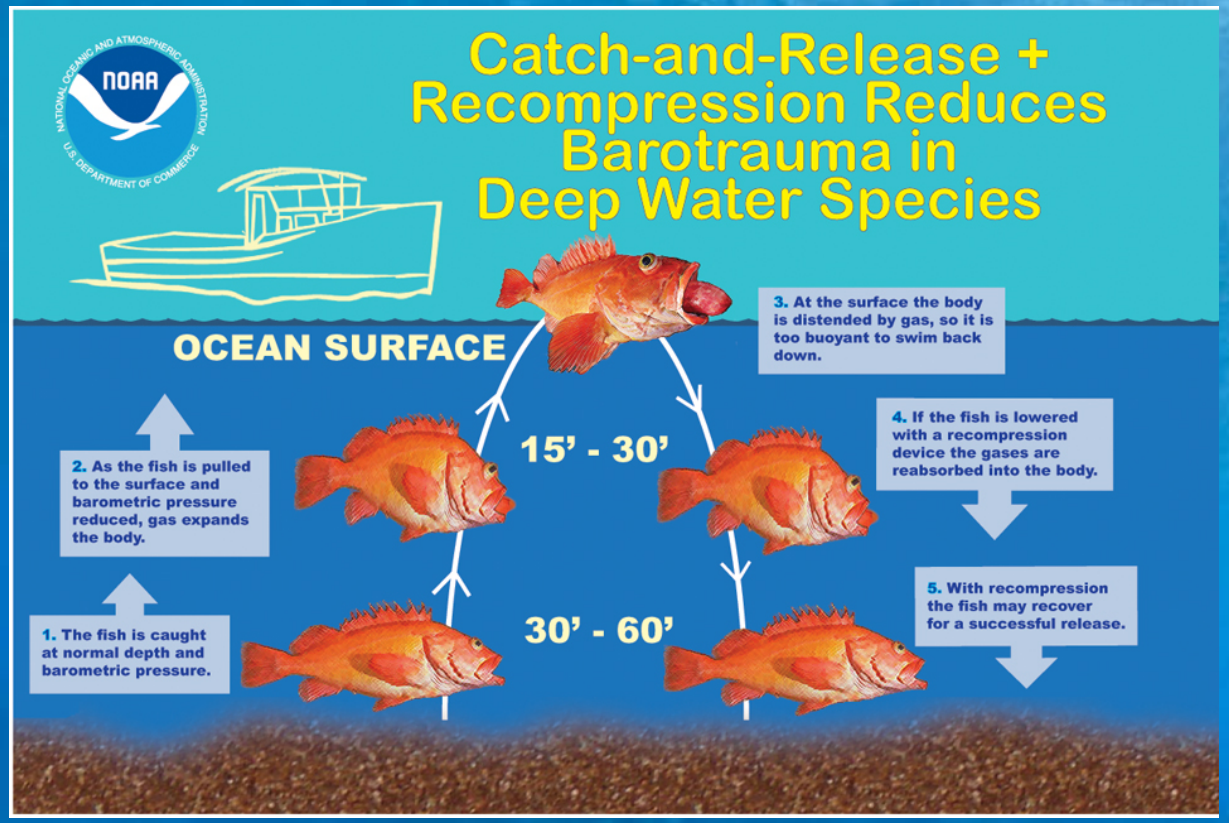
Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <20fm						All Depth	
San Francisco	Closed				April 15 – Dec 31 <40fm							
Central	Closed				April 1 – Dec 31 <50fm							
Southern	Closed				Mar 1 – Dec 31 <75 fm							

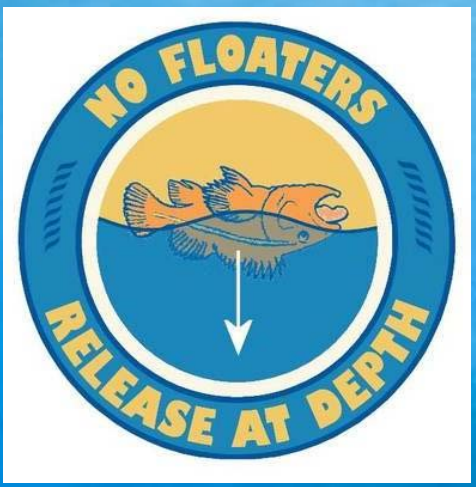
Regulatory and Enforcement Challenges

- Management Lines Approximating Multiple Depth Contours Established in Regulation
- Management Line Enforceability Important
- Vessel Monitoring Systems Required for Commercial Fleets

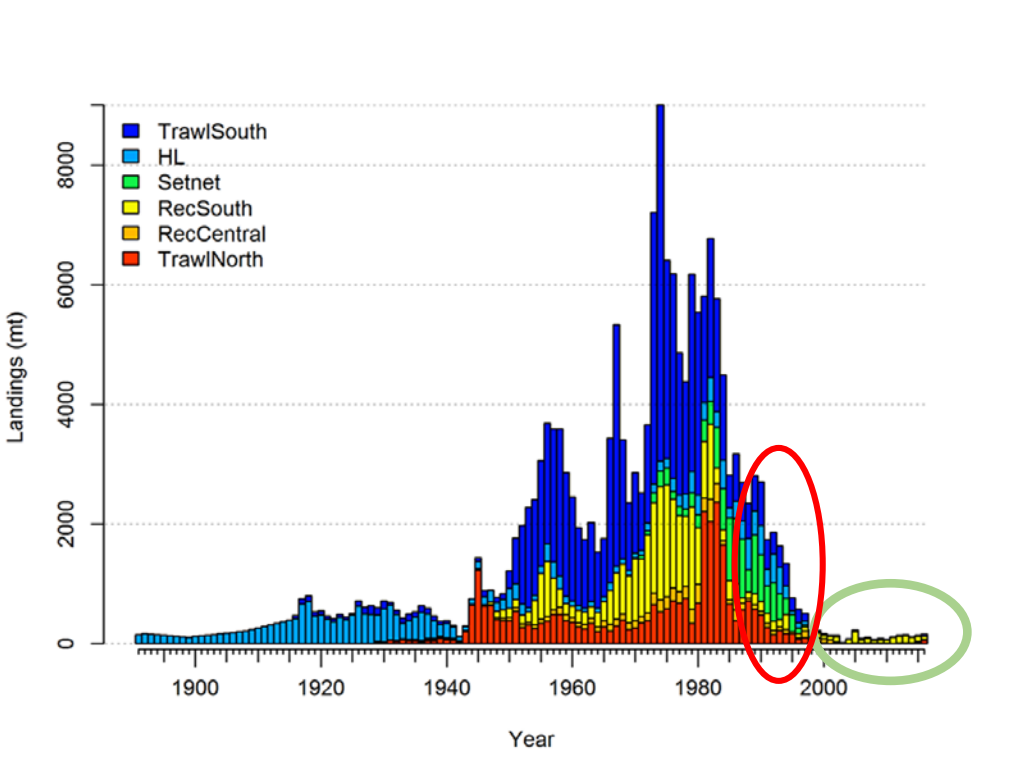
Inseason Management is Critical

- Catch Monitored Continuously
- Pacific Council's Groundfish Management Team Tracks Catches Relative to Sector Harvest Guidelines
- Pacific Council Reviews Fishery Performance at Each of Five Council Meetings per Year with the Ability to Revise Regulations to Achieve But Not Exceed ACLs


Catch-and-Release + Recompression Reduces Barotrauma in Deep Water Species
OCEAN SURFACE
1. The fish is caught at normal depth and barometric pressure.
2. As the fish is pulled to the surface and barometric pressure reduced, gas expands the body.
3. At the surface the body is distended by gas, so it is too buoyant to swim back down.
4. If the fish is lowered with a recompression device the gases are reabsorbed into the body.
5. With recompression the fish may recover for a successful release.
15' - 30'
30' - 60'


NO FLOATERS
RELEASE AT DEPTH

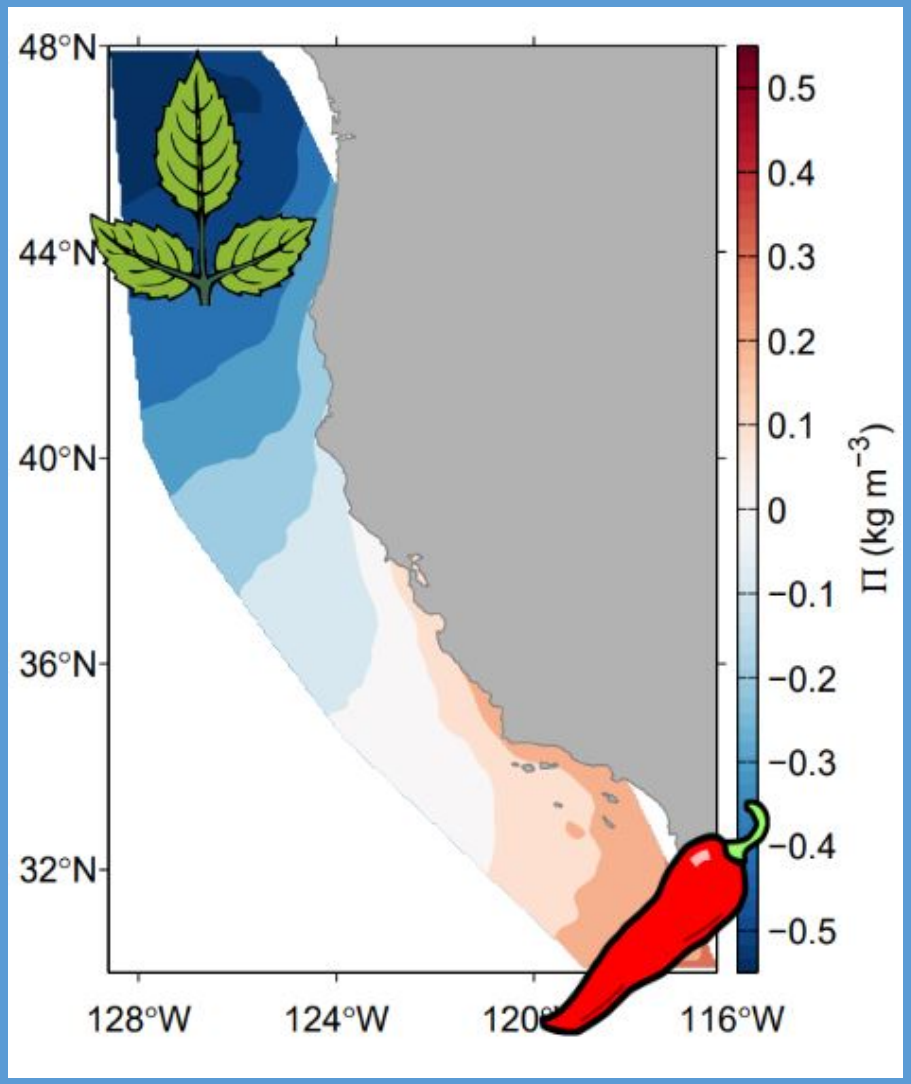
Environmental Factors



We Caught a Break

Reduced harvest since 1999 was coupled with favorable “minty” ocean conditions producing strong recruitment events.

Source waters of the California Current, for which sea level has been a historical indicator are a major driver of rockfish recruitment (minty- lower relative sea level; spicy – higher)



Pacific Subarctic Water (PSUW) originates from Gulf of Alaska region, tends to be cooler, lower salinity, and higher in oxygen and nutrients (minty).

By contrast, Pacific Equatorial Water (PEW) reflects the poleward reach of the more subtropical waters of the California undercurrent, waters tend to be warmer, more saline, low oxygen, nutrient poor (spicy).

Schroeder, et al., (2019) Source water variability as a driver of rockfish recruitment in the California Current Ecosystem: implications for climate change and fisheries management, Can, J. Aquat. Sci.

9 of 10 West Coast Groundfish Stocks Rebuilt Since 1999

- **Recreationally Important Stocks**
  - **Bocaccio S of 40°10’ N lat. (Rebuilt in 2017)**
  - **Canary Rockfish (Rebuilt in 2015)**
  - **Cowcod S of 40°10’ N lat. (Rebuilt in 2019)**
  - **Lingcod (Rebuilt in 2005)**
  - **Yelloweye Rockfish (Still Rebuilding; Target Year = 2029)**
- **Commercially Important Stocks**
  - **Darkblotched Rockfish (Rebuilt in 2017)**
  - **Pacific Ocean Perch (Rebuilt in 2017)**
  - **Pacific Whiting (Rebuilt in 2003)**
  - **Petrale Sole (Rebuilt in 2015)**
  - **Widow Rockfish (Rebuilt in 2011)**