# California Management of Forage Fish Species

Deb Wilson-Vandenberg
Senior Environmental Scientist
California Department of Fish and Game

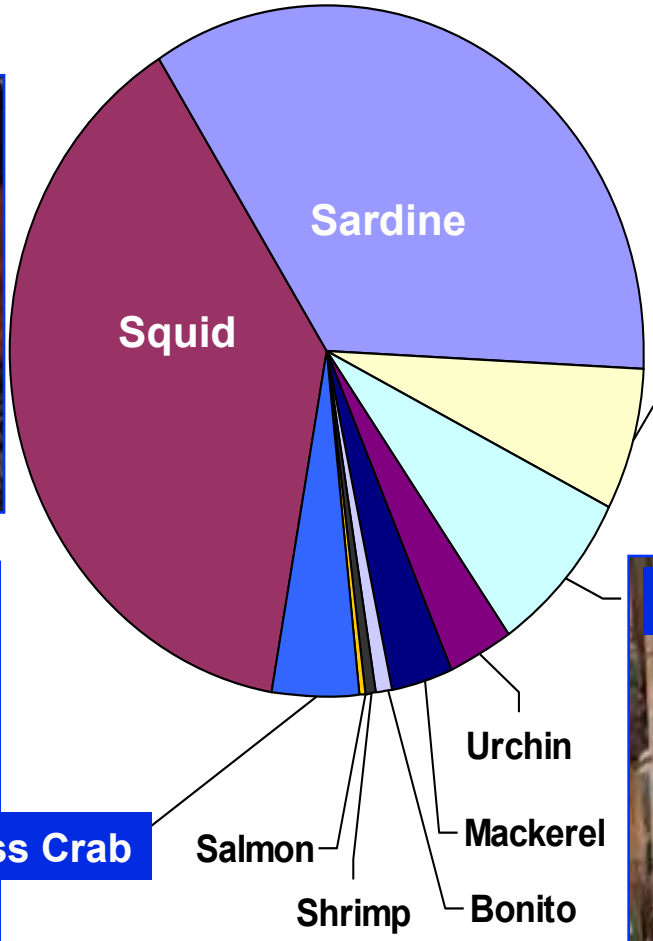
# Overview

- State Management Authorities
- Major forage species under state management (Market squid and Pacific herring)
- State Objectives Relative to Forage Fish
- Fish and Game Commission policies

# State Management Authorities

- Guided by the Marine Life Management Act since 1998
  - More management authority to the Fish and Game Commission (particularly for commercial fisheries)
  - Highest priority is on sustainable resources
  - Ecosystem-based management founded in sound science – consider needs of communities
  - Direction for emerging fisheries
  - Use Fishery Management Plans

# 2009 Important Commercial Fisheries



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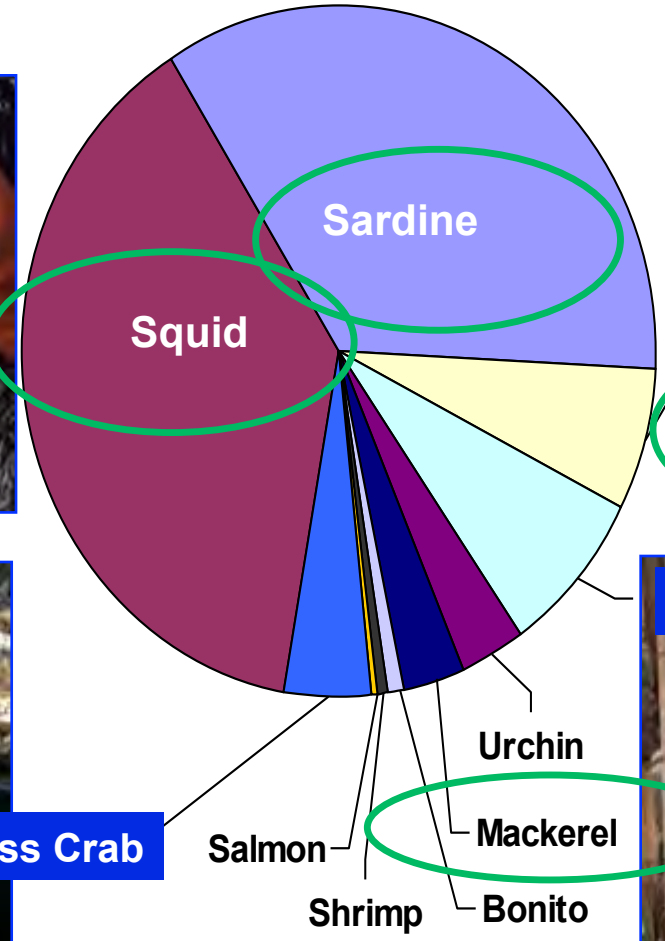
# 2009 Important Commercial Fisheries



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# Market Squid

AK

Canada

Range

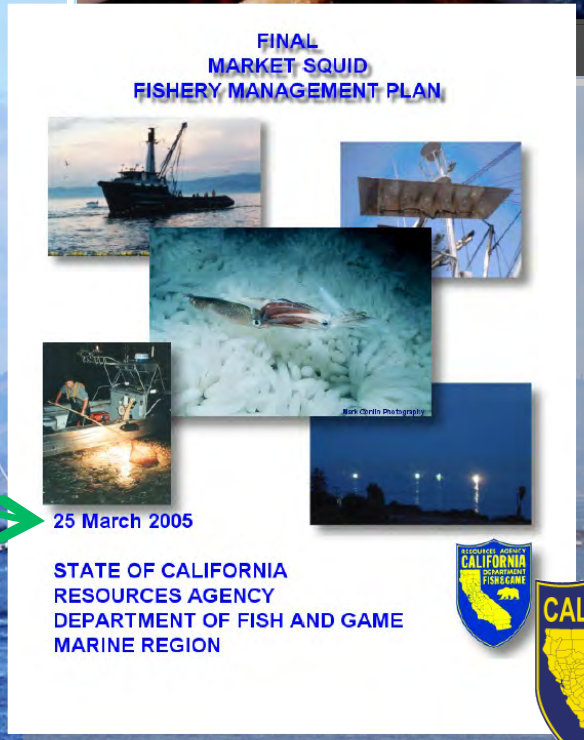
US

Major

Fishing Grounds

Mex

# Market Squid Management



FINAL
MARKET SQUID
FISHERY MANAGEMENT PLAN

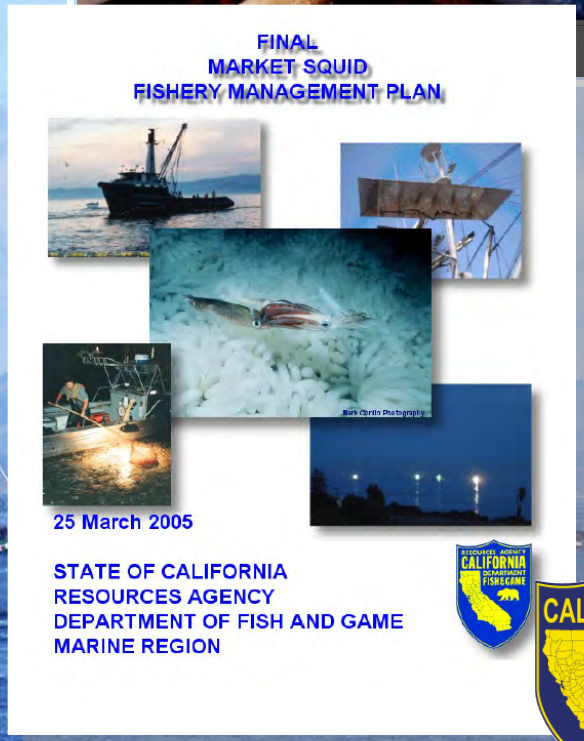
25 March 2005

STATE OF CALIFORNIA
RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
MARINE REGION

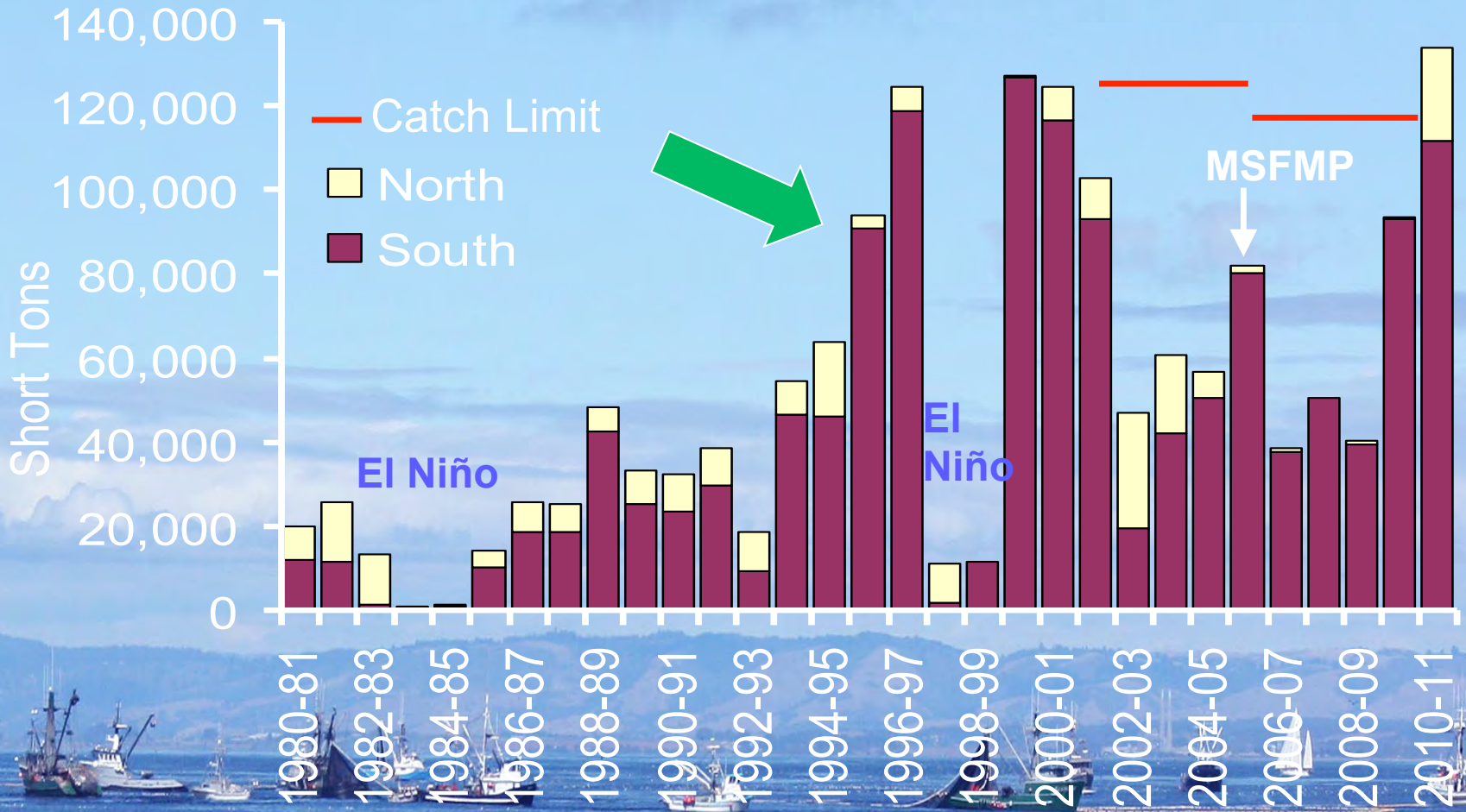
# Market Squid Management

## MSFMP Goals

- Ensure long-term resource conservation and sustainability
- Reduce the potential for overfishing
- Management responsive to environmental and socioeconomic changes and ecosystem needs



# Landings: Northern and Southern CA by Season



# MSFMP Tools

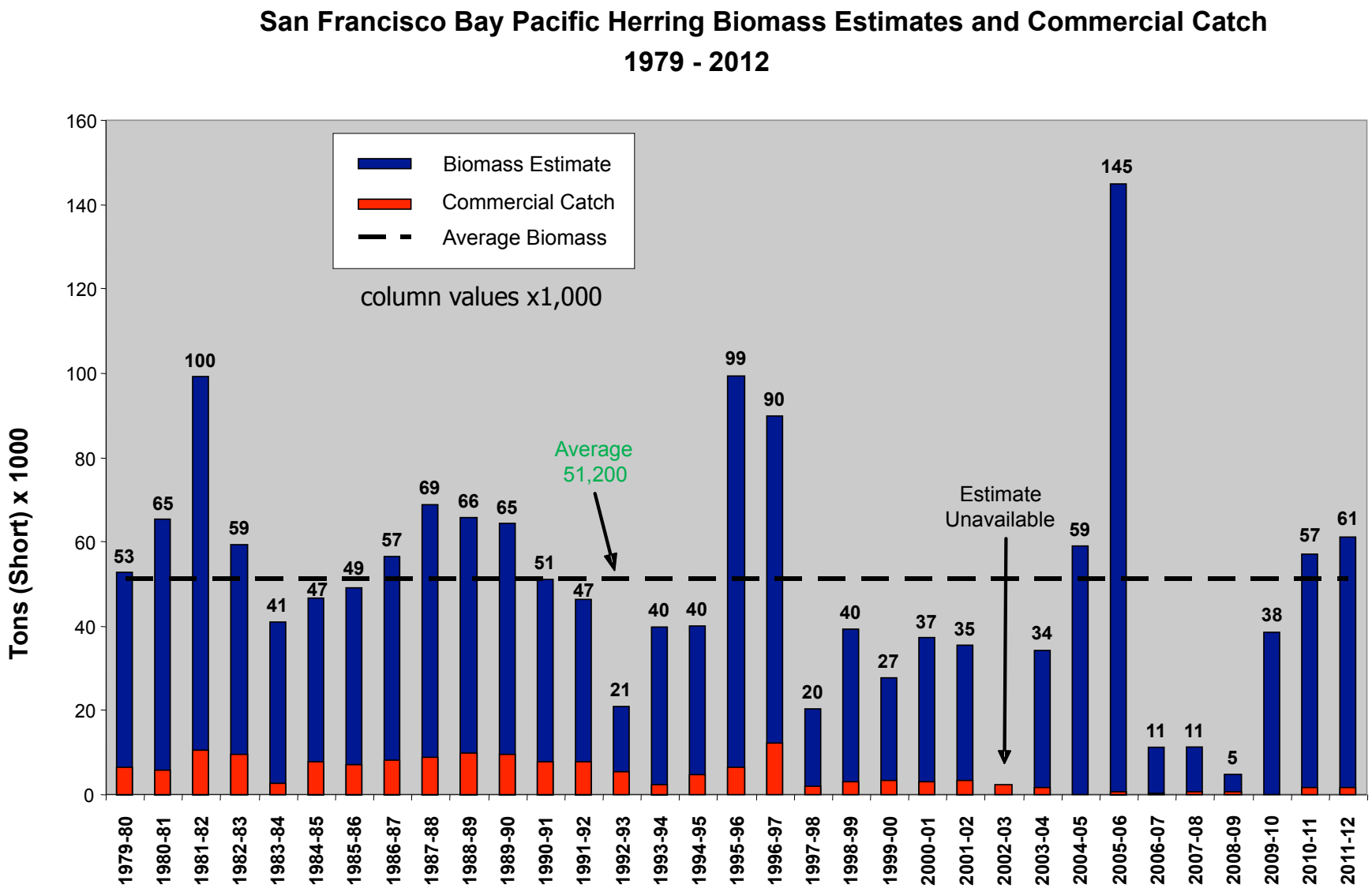
- Seasonal catch limit – prevent over-expansion
- Weekend closures - uninterrupted spawning
- Lights shields/ limit wattage - to minimize effects on coastal communities (birds and people)
- Monitoring program – monitor fishery/ resource
- Restricted Access – limit participation
- Spatial closures – MPAs, gear restrictions and to offer seabird protection

# Pacific Herring Fishery

## Management

- Primary spawning and fishing areas: San Francisco, Tomales, and Humboldt Bays, & Crescent City Harbor
- DFG has conducted annual assessments of the herring spawning population in San Francisco Bay since 1972
- Fishing quotas are intended to provide for a sustainable fishery and are limited to 20% maximum take of the spawning biomass
- Harvest levels are based on a peer reviewed model, ocean conditions, growth rates, year-class strength and recruitment
- Quotas are the primary management tool -- with monitoring, seasonal closures and restricted access

# Pacific Herring Fishery



# State Objectives Relative to Forage Fish

Yellowtail rockfish, *Sebastes flavidus*, young-of-the-year, Platform Irene, © Rick Starr

- Recognized need to protect forage fish (managed or unmanaged)
- No new fisheries for forage species without sufficient science so they can be sustainable
- Existing fisheries are part of ecosystem-based management

# Fish and Game Commission Policies

Yellowtail rockfish, *Sebastes flavidus*, young-of-the-year, Platform Irene, © Rick Starr

- Emerging Fisheries
- New DRAFT Fish and Game Commission Policy on Forage Fish
  - Final Draft at Marine Resources Subcommittee – August 10, 2012
  - Collaborative effort with FGC, CDFG, Industry and Environmental Organizations
  - Discussion – Fish and Game Commission meeting, October 3-4, 2012 Sacramento

# Marine Region Activity

- 1998: Five staff for squid
  - Market Squid Logbooks
  - Fishery-dependent samples
  - Numerous publications

- 2002: Squid project absorbed into CPS project due to staffing shortages
- 2005-06: Maintain a Restricted Access program
- 2011-12: Seven staff for CPS (squid) and HMS
  - Logbook and dock-side monitoring continues

# Pacific Herring Fishery

## Status of the Population

- The 33 year average spawning biomass for San Francisco Bay is 51,200 tons. (2011-12 season = 61,000 tons)
- The fishery has shown 3 years of increasing biomass following a historic low of 4,800 tons in 2009-2010
- Ongoing age structure concern: few fish over 4 years of age. As a result DFG will continue to recommend conservative quotas for stock rebuilding (4% of stock)
- The Department is currently working to develop a fishery model for Pacific herring

# Coastal Pelagic Species (CPS)

- Pacific Sardine
*Sardinops sagax*

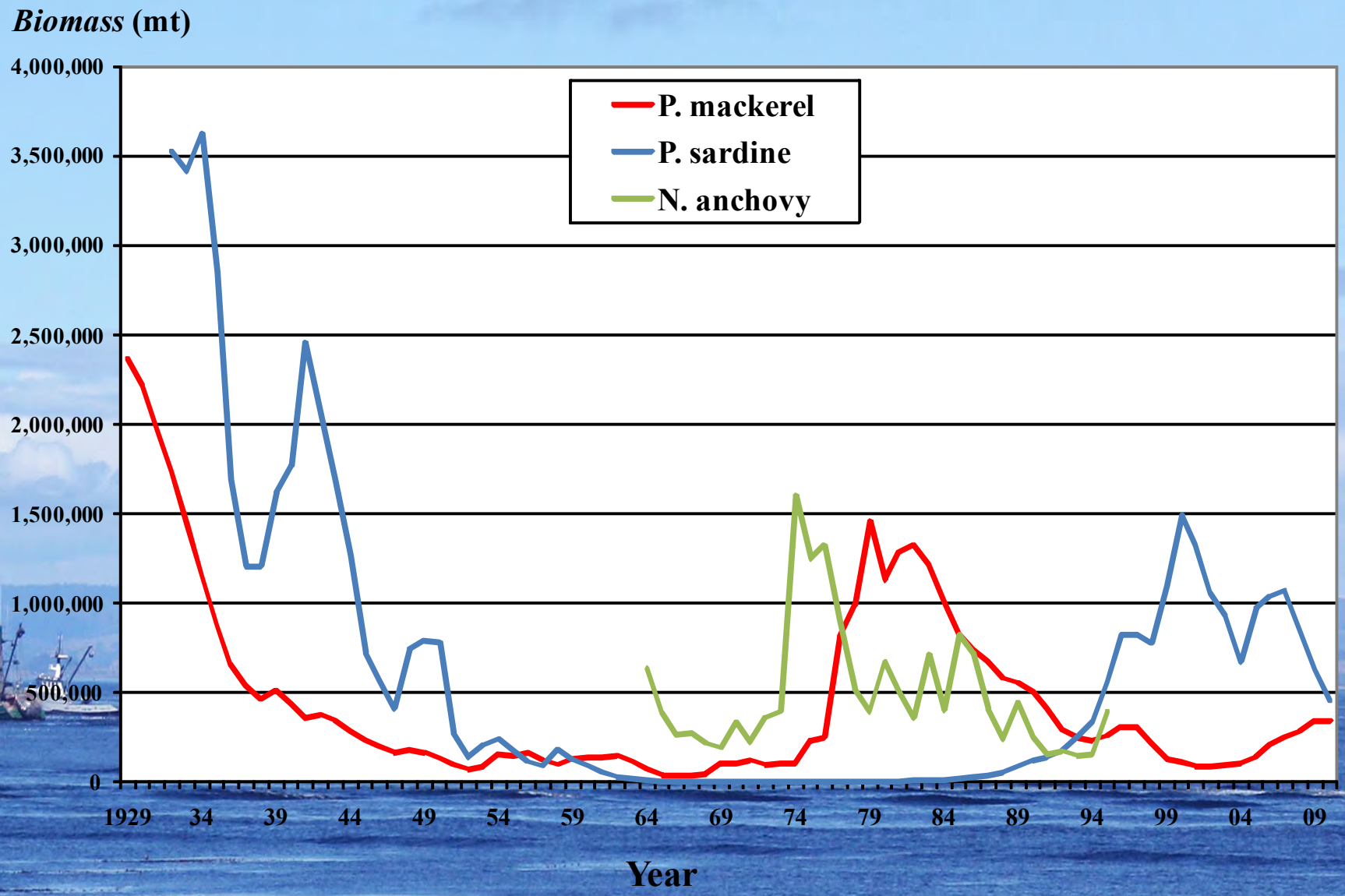
- Pacific Mackerel
*Scomber japonicus*

- Jack Mackerel
*Trachurus symmetricus*

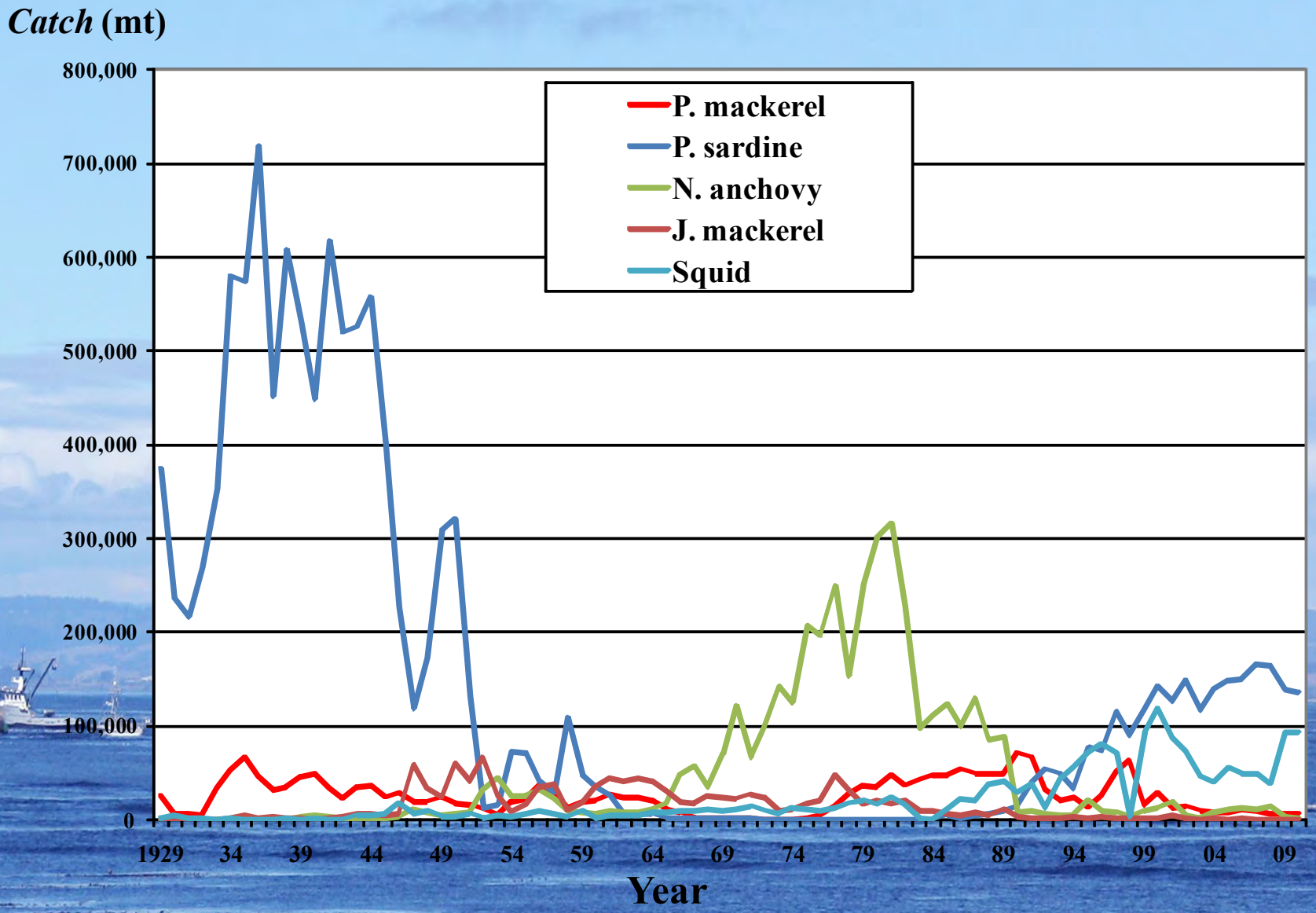
- Northern Anchovy
*Engraulis mordax*

- Market Squid
*Loligo opalescens*

# *CPS Biomass Time Series*



# *CPS Catch Time Series*



# Pacific Fishery Management Council Actions on Forage Fish June 2012

- Established an objective for their approach to forage species

*It is the Council's intent to **recognize the importance** of forage fish to the marine ecosystem off our coast, and to **provide adequate protection** for forage fish. We declare that our objective is to **prohibit the development of new directed fisheries on forage species** that are not currently managed by our Council, or the States, until we have an adequate opportunity to **assess the science** relating to the fishery and any potential impacts to our existing fisheries and communities.*

# Pacific Fishery Management Council Actions on Forage Fish June 2012

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- Reaffirm priority that the Ecosystem Plan Development Team completes  Draft Fishery Ecosystem Plan (FEP) for Council

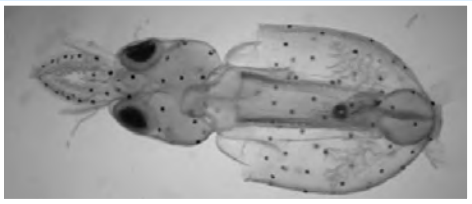
- Revise the federal List of Fisheries with input from the states and include application guidelines in the FEP [& into the LOF federal regulations?]

- EPDT and other advisory bodies work on process of amending fishery management plan(s) to incorporate forage species

# Pacific Fishery Management Council Timeline on Forage Fish

- June 2012 – adopt objective and plan of action
- November 2012 – Ecosystem Plan Development Team delivers Draft Fishery Ecosystem Plan to Council for review and comments
- March 2013 – Council receives revised Plan and adopts final Plan
- March 2013 – EPDT completes revision of List of Fisheries
- June 2013??– EPDT and other advisory bodies work on process of amending fishery management plan(s) to incorporate forage species

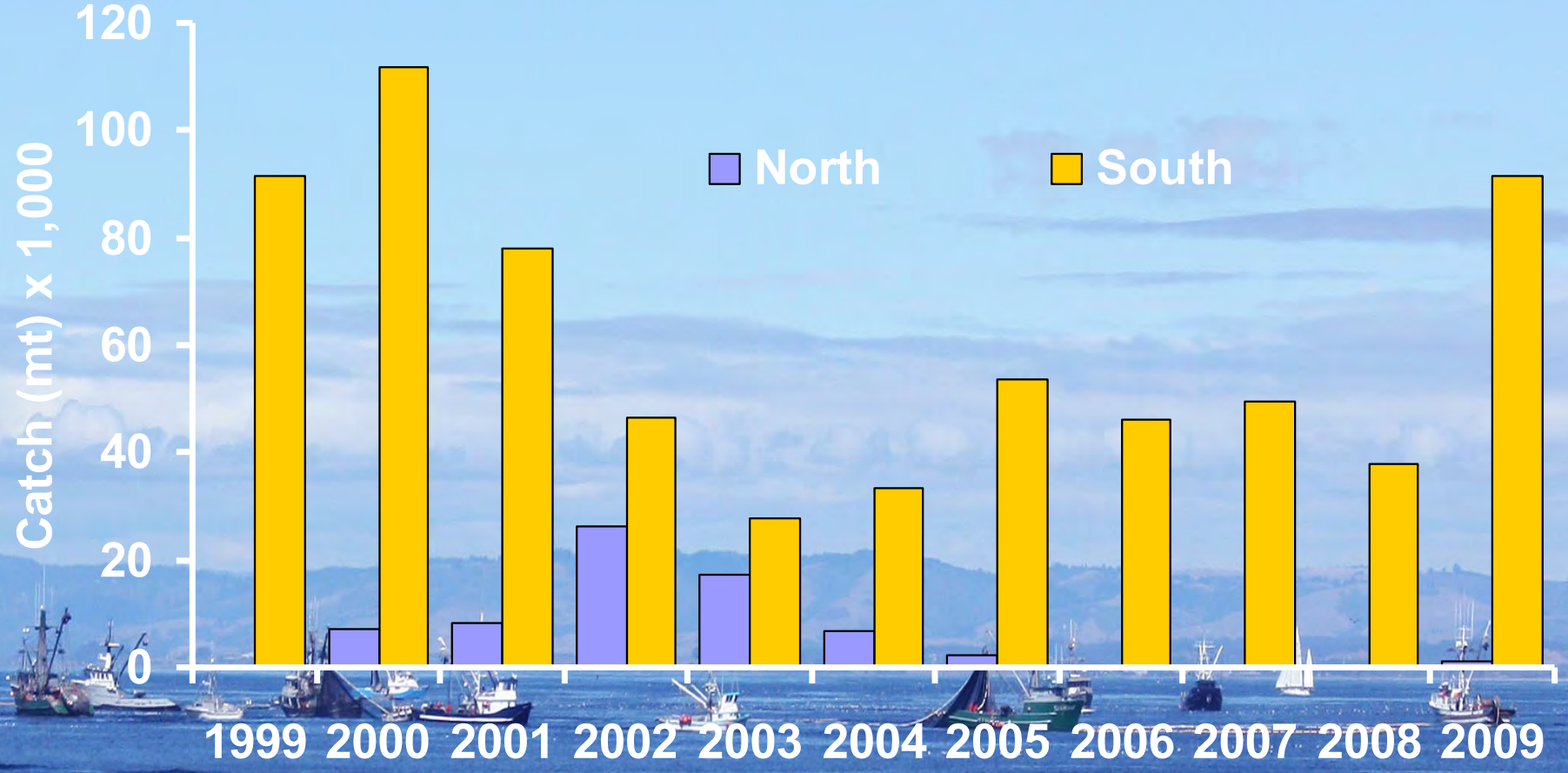
# Development of MSFMP



- 1997: SB 364 – Interim laws; Moratorium on vessels
- 1998-2000: Two advisory committees
  - SFAC – Squid Fishery Advisory Committee
  - SRSC – Squid Research Scientific Committee
- 1998: DFG Monitoring and Research Program
- 2000: Interim measures by Commission
- 2001: SB 209 - Management to Commission
- 2001: Report to the Legislature
- 2001: Notice of Preparation filed; 2 public meetings
- 2002: Preliminary Draft MSFMP
- 2003: 2nd Draft MSFMP
- 2004: 3rd Draft MSFMP (April); 4th adopted December.

# Market Squid

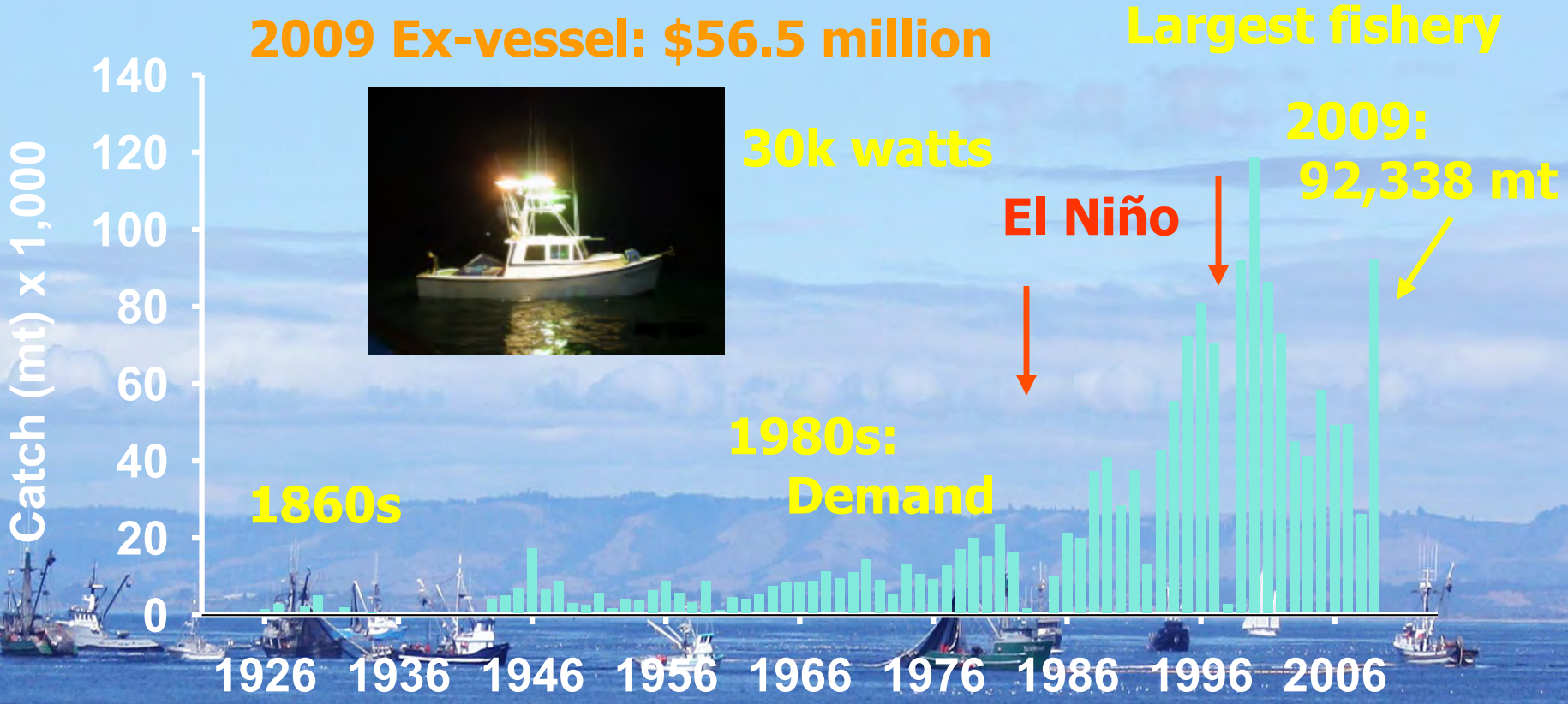
## CA Landings North and South of Pt. Conception




Data from CDFG Landing Receipts

# Market Squid

## Annual CA Landings 1926–2009

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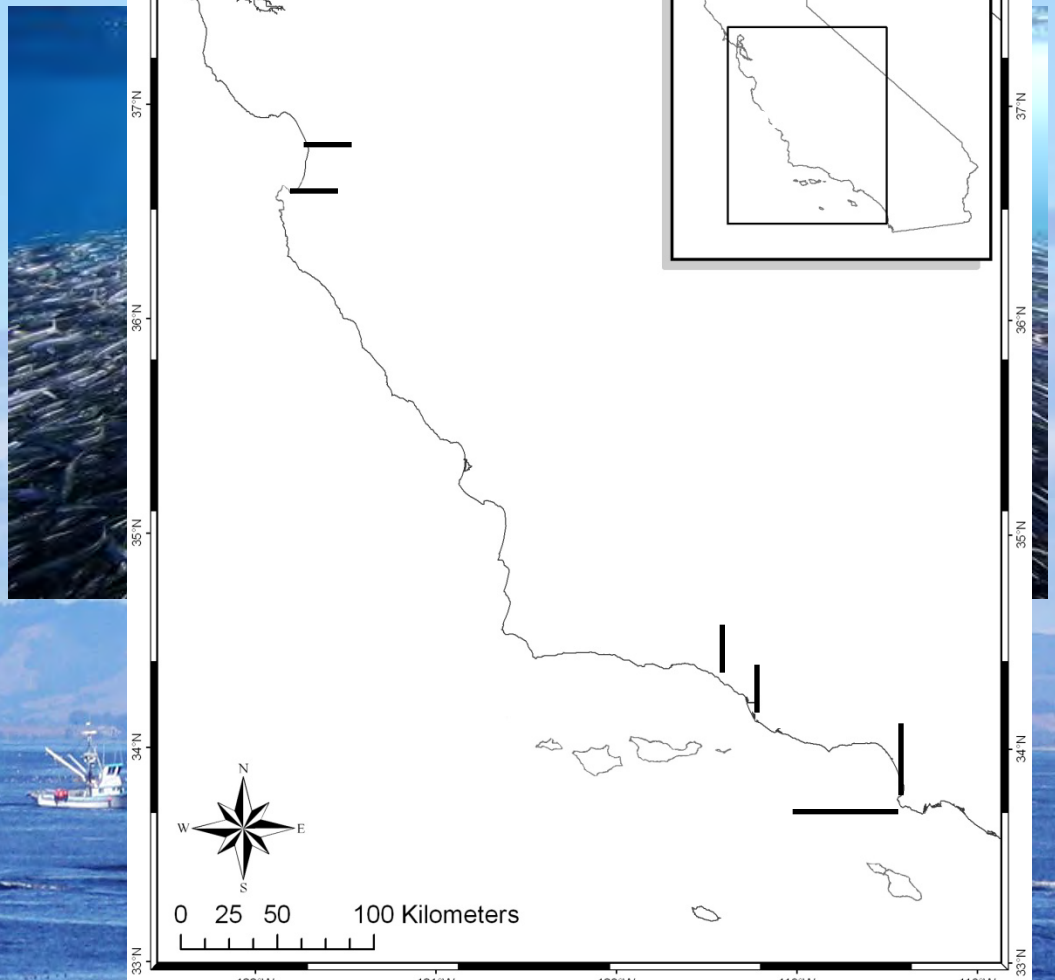
- Ecology
  - Schooling
  - Forage fish
  - Fluctuate
- Fishery
  - Gear
  - Ports
  - Use
- Management
  - Federal FMP
  - State FMP
  - Permits