Science, Service, Stewardship

Overview of Coastal Pelagic Species Management

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Magnuson-Stevens Fishery Conservation and Management Act (MSA)

- Primary law for conserving and managing marine and anadromous fisheries resources in Federal U.S. waters
  - 3-200 nautical miles off of California, Oregon and Washington
- Two major reauthorizations (1996 (SFA) and 2006 (MSRA))
  - Prevent/end overfishing (Annual catch limits)
  - Minimize bycatch
  - Protect fish habitat (EFH)
  - Achieve Optimum Yield
  - Best available science
  - Minimize adverse economic impacts on fishing communities

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MSA (continued): Regional Councils

- Established 8 Regional Fishery Management Councils
- Provides the primary fishery stakeholders a substantial role in managing U.S. fisheries in their regions
  - Commercial and recreational fishing industry
  - Federal and State agencies (CDFG, WDFW, ODFW)
  - Tribal representation
- Council Committees:
  - Scientific and Statistical Committee (Provides recommendation on max catch levels)
  - Habitat Committee
  - Management/Technical Teams
  - Advisory Panels
- Councils' role:
  - Prepare fishery management plans/amendments/regulations
  - Solicit public input on management decisions
  - Submit management recommendations to NOAA Fisheries

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Pacific Fishery Management Council

4 Fishery Management Plans

—Highly Migratory Species

- tunas, sharks, swordfish

—Coastal Pelagic Species

- sardine, mackerel, anchovy, squid

—Pacific Coast Groundfish

- 82 different species (rockfish, flatfish, roundfish, sharks/skates)

—Pacific Coast Salmon

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NOAA Fisheries (NMFS), Sustainable Fisheries Division

- Carry out Magnuson-Stevens Act mandates:
  - Work with the Regional Fishery Management Councils
  - Review, Approval and Implementation of management recommendations from the Council
- Ensure compliance of MSA actions with other statutes:
  - NEPA
  - ESA
  - MMPA
  - CZMA
  - Others
- Conduct consultations:
  - ESA and MMPA
    - Protected Resources Division, NMFS
    - U.S. Fish and Wildlife Service
  - EFH
    - Habitat Conservation Division, NMFS

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Coastal Pelagic Species (CPS) Fishery Management Plan (FMP)

- Outgrowth of the Northern Anchovy FMP (1978)
  - included the objective:

    "to maintain an anchovy population within the U.S. Fishery Conservation Zone of sufficient size to sustain adequate levels of predator fish, birds and mammals."

- Amendment 8 expanded scope of FMP to include more species (sardine, mackerel and squid) and changed name to CPS FMP (1999)

- Amendment 12; Prohibited the harvest of krill

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CPS FMP:
Goals and Objectives

- Promote efficiency and profitability in the fishery, including stability of catch
- Achieve OY
- Encourage cooperative international and interstate management of CPS
- Avoid discard
- **Provide adequate forage for dependent species**
- Prevent overfishing
- Acquire biological information and develop long-term research program
- Use resources spent on management of CPS efficiently
- Minimize gear conflicts

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CPS FMP: General background

- No overfished species / Overfishing not occurring
- In-season management controls and monitoring
- No bycatch issues; 99% other CPS
- Incidental catch provisions to reduce discard
- Precautionary management; emphasis on biomass over maximizing catch

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- 3 main fishing areas
  - So. Cal. (including Ventura/SB)
  - Central Cal.
  - Oregon/Washington
- 6 ports
  - ~ 12 processors/plants
- Fishing occurs near ports

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Capacity Restrictions/ Vessel Number Limitations

-Federal Limited Entry (All CPS finfish)

- South of 39° N. latitude (Pt. Arena, CA)
  - CPS permit (>5mt); 65 permits; 30 vessels in 2011
- North of 39° N. latitude – Open Access

-Washington and Oregon Sardine Limited Entry

- Oregon: 25 permits; 17 vessels in 2011
- Washington: 25 permits; 7 vessels in 2011

-California Squid Limited Entry

-Washington Anchovy Catch Limits

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CPS FMP: Stock/fishery categories

- Actively managed
  - Pacific sardine, Pacific mackerel
- Monitored
  - northern anchovy (2 subpopulations), market squid
- Prohibited harvest species (2009)
  - Krill
- Ecosystem Component (2011)
  - Pacific herring, jacksmelt

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Actively managed stocks:

Pacific sardine and Pacific mackerel

- Stocks and fisheries with biologically significant levels of catch or other biological or socioeconomic considerations requiring relatively intense harvest management

- Annual stock assessments
  - Best available/most recent data (annual research surveys and catch)
  - Stock assessment review process (Independent and SSC review)

- Annual specifications/management measures
  - Annual Council review and recommendation process
  - Annual NMFS review and rulemaking process
  - Harvest Guideline control rule
    - Maximum directed commercial harvest level
    - Maintain spawning biomass, consistent/level catch, forage

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Monitored stocks:

anchovy, jack mackerel, squid

- Stocks and fisheries not requiring intensive harvest management or state management exists
- Monitoring of landings and available abundance indices are considered sufficient to manage the stock (no formal stock assessments)
- Multi-year management
- Precautionary harvest levels based on 75% reduction from maximum level

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Actively managed species:
Harvest Control Rule

$$HG = (BIOMASS_{(1+)} - CUTOFF) \bullet FRACTION \bullet DISTRIBUTION$$

BIOMASS: The estimated stock biomass age one and above

CUTOFF: This is the biomass level below which no commercial fishery is allowed. Purpose is to protect the stock when biomass is low.

FRACTION: Percentage of the stock available to the fishery when BIOMASS exceeds CUTOFF

DISTRIBUTION: The portion of biomass estimated in the EEZ. Used to prorate the biomass used to calculate the target harvest level to account for the transboundary nature of the resource.

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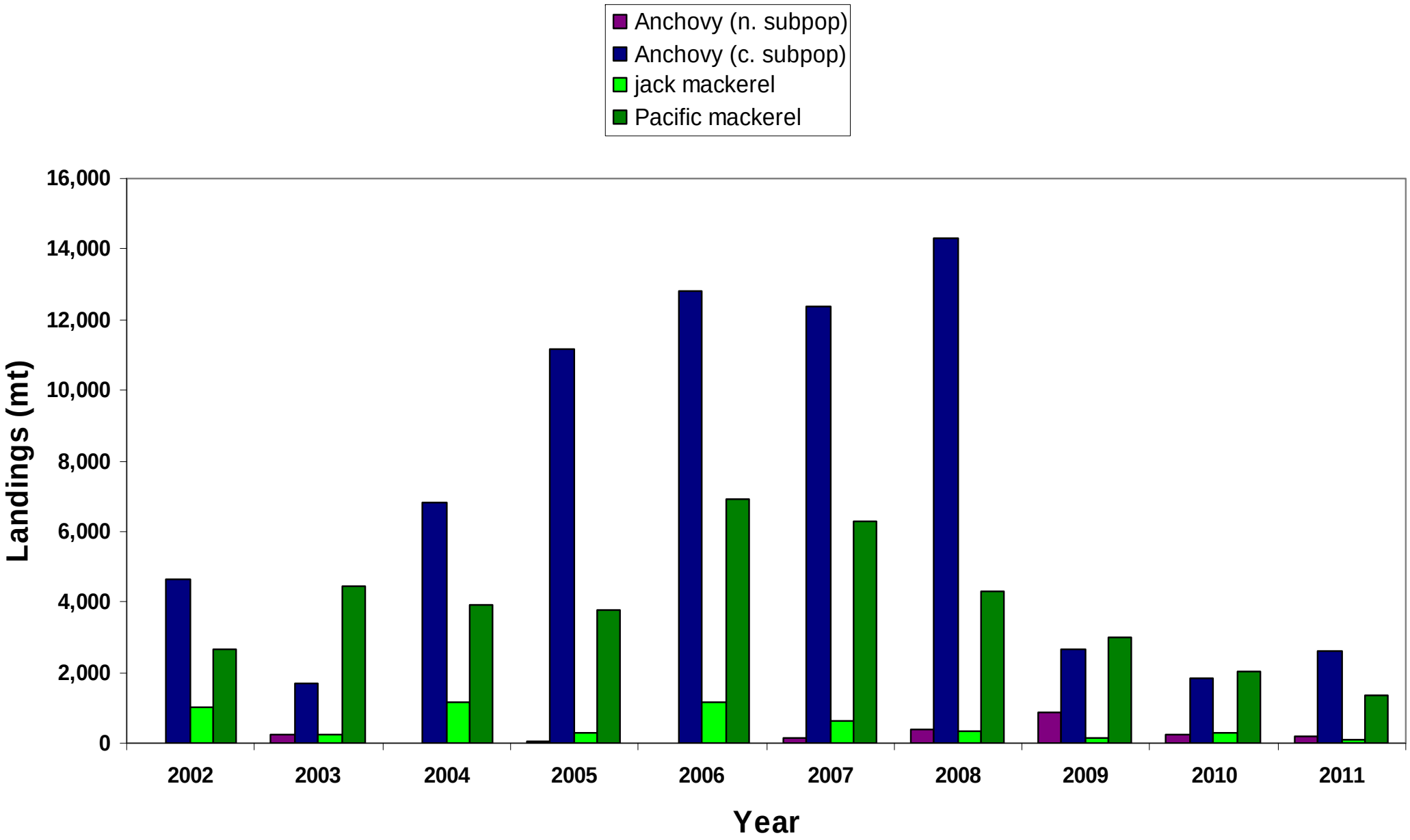
Harvest Control Rule: 2012 Pacific Sardine

$HG = (BIOMASS_{(1+)} - CUTOFF) \bullet FRACTION \bullet DISTRIBUTION$

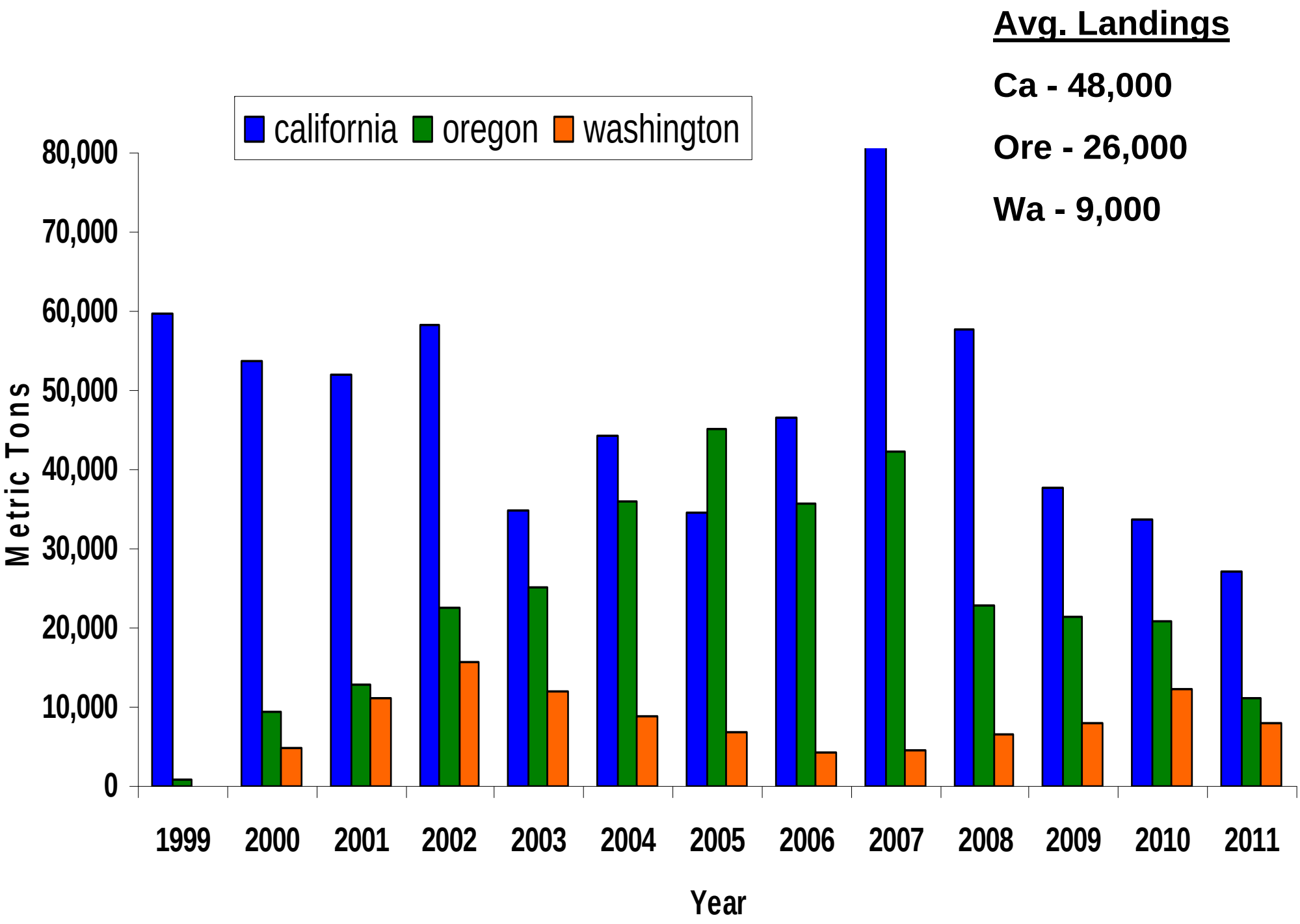
$HG_{2012} = (988{,}385 - 150{,}000) \bullet 15\% \bullet 87\%$

$HG_{2012} = 109{,}409$ mt (~10% of biomass)

OFL=154,781


Anchovy (n. subpop)
Anchovy (c. subpop)
jack mackerel
Pacific mackerel
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Landings (mt)
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Year

Pacific Sardine Landings



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Quotas and Landings

Stock	Maximum fishing level (mt)	Quota (mt)	Average Landings
jack mackerel	126,000	31,000	539
northern anchovy (ns)	39,000	9,750 (1,500)	216
northern anchovy (cs)	100,000	25,000	7,000
Pacific sardine (2012)	154,791	109,409	85,000
Pacific mackerel (2012)	44,336	40,514	3,868

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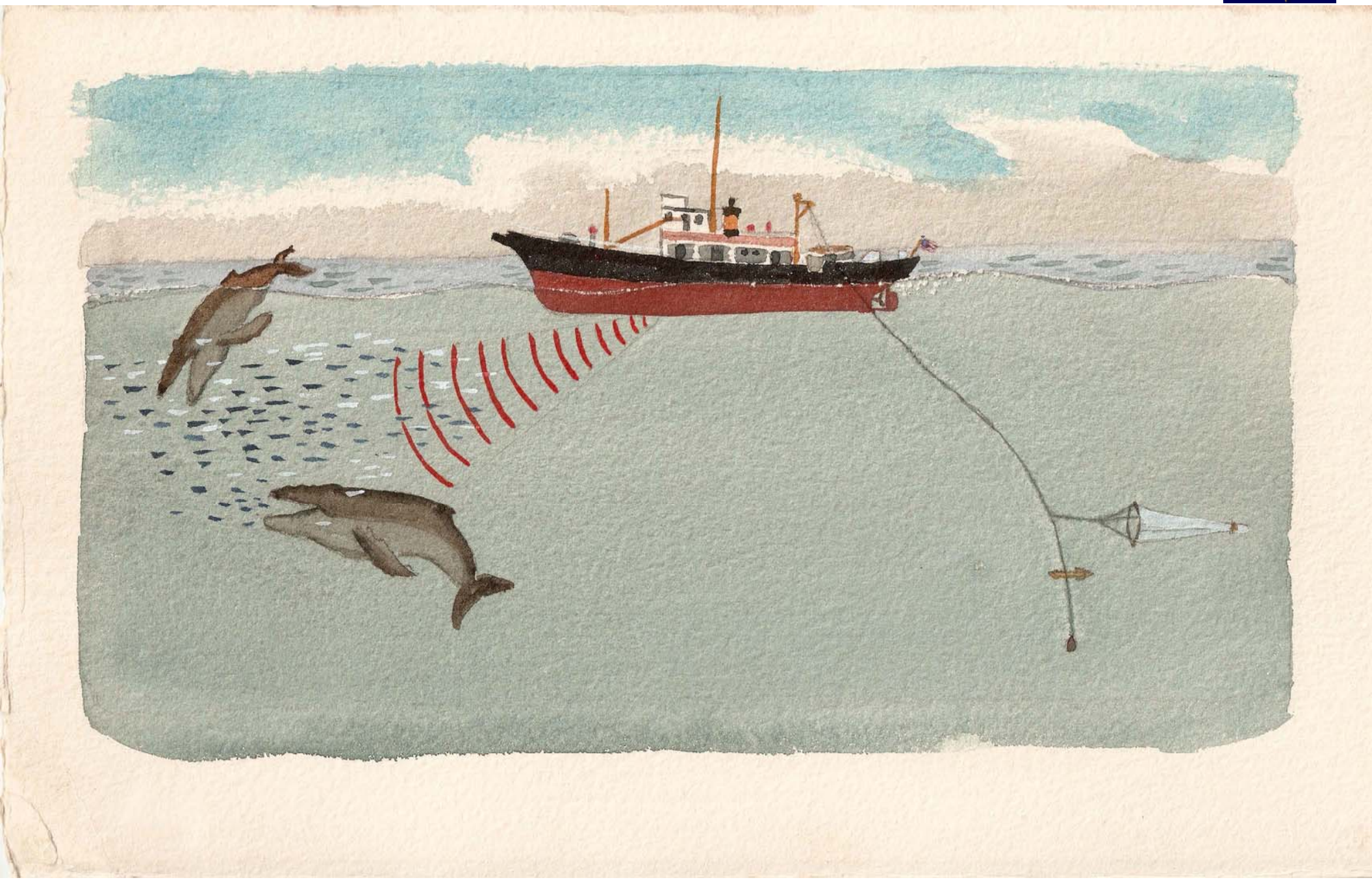
Research: Forage/Predators

- Forage Monitoring
  - SWFSC Fisheries Resources Division: CalCOFI Monitoring Program
  - SWFSC Fisheries Resources Division: Acoustic/Trawl Coastal Pelagic Species (CPS) Ecosystem surveys.
  - SWFSC Fisheries Ecology Division: Juvenile Rockfish Survey
- Fish Predator Monitoring
  - SWFSC Fisheries Ecology Division: Salmon Ocean Ecology Monitoring
  - SWFSC Fisheries Resources Division: HMS Surveys
  - SWR/SWFSC Fisheries Resources Division: Drift Gillnet Observer Program
- Marine Mammal Monitoring
  - AFSC, National Marine Mammal Laboratory (NMML) California Current Ecosystems Program
  - SWFSC Protected Resources Division: Cetacean Ship Surveys of CCLME
  - SWFSC Protected Resources Division: Pinniped Aerial Surveys
  - SWFSC Protected Resources Division: Harbor Porpoise Aerial Surveys

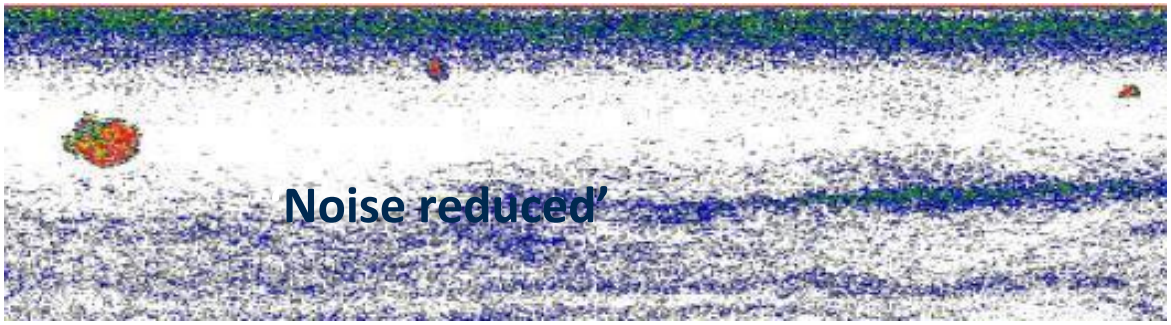
“Investigate the sardine in relation to its physical and chemical environment, its food supply, its predators and its competitors”

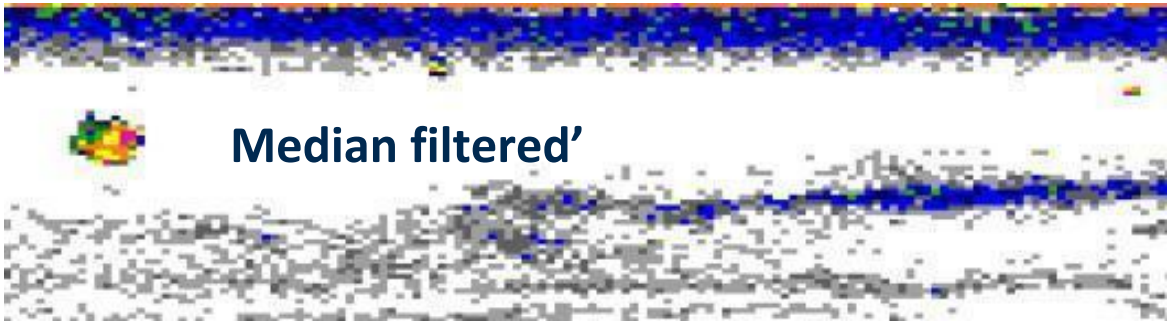
California Cooperative Oceanic Fisheries Investigations, technical committee ***1947***

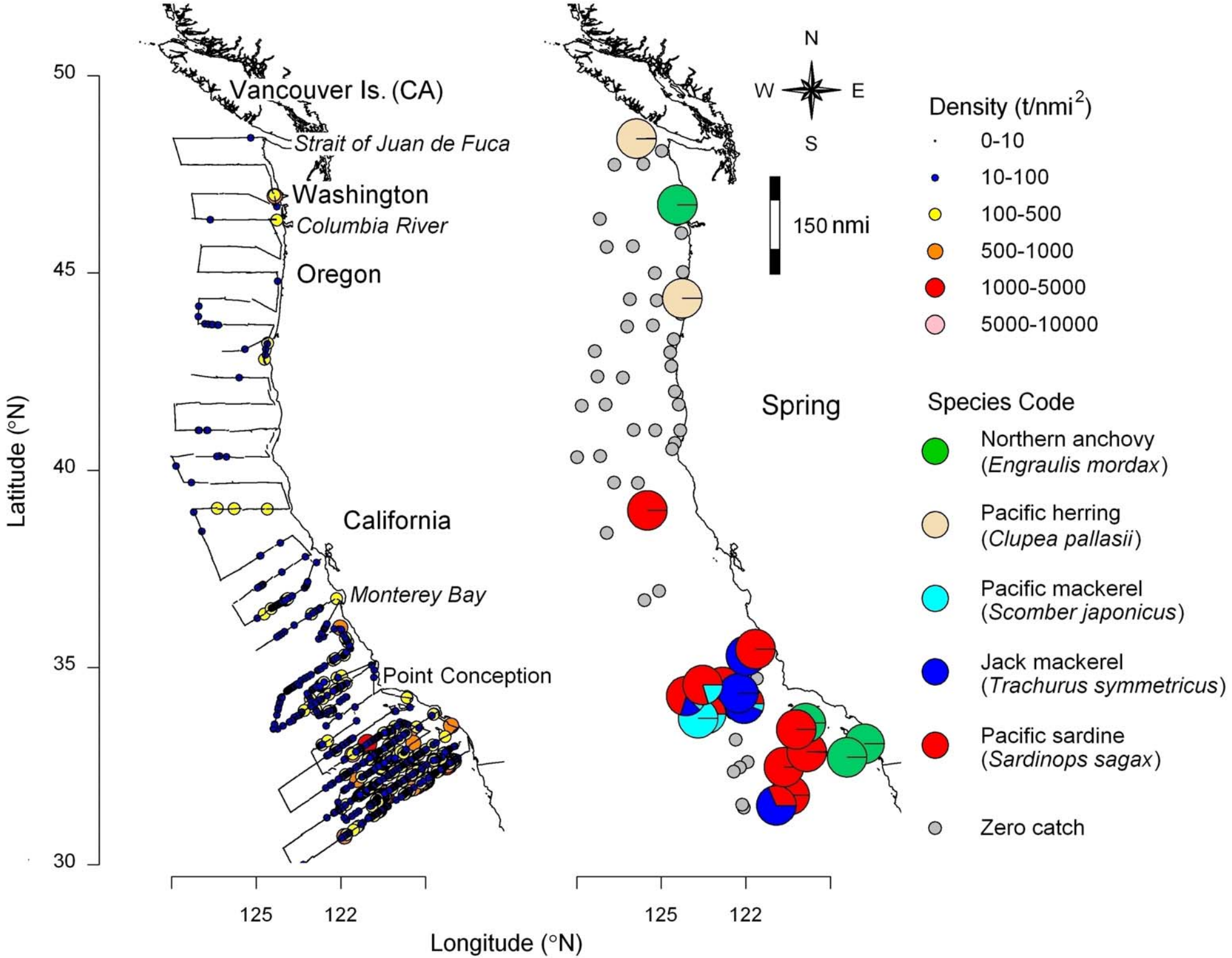


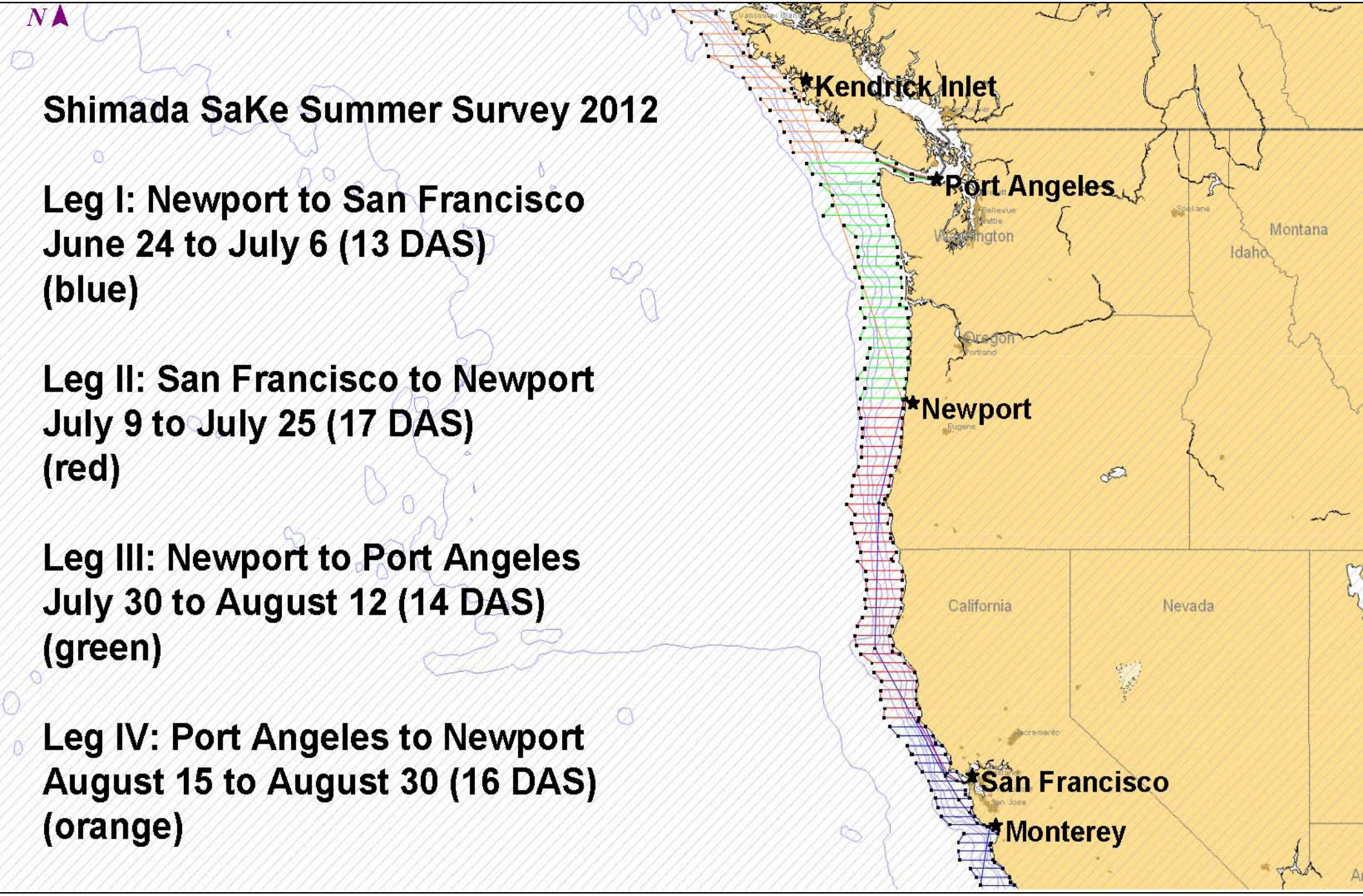
Acoustic Trawl Survey of CPS

Multi-frequency acoustic target identification






Vancouver Is. (CA)
Strait of Juan de Fuca
Washington
Columbia River
Oregon
California
Monterey Bay
Point Conception
50
45
40
35
30
Latitude (°N)
125
122
Longitude (°N)
N
W
E
S
150 nmi
Spring
Density (t/nmi^2)
0-10
10-100
100-500
500-1000
1000-5000
5000-10000
Species Code
Northern anchovy (*Engraulis mordax*)
Pacific herring (*Clupea pallasii*)
Pacific mackerel (*Scomber japonicus*)
Jack mackerel (*Trachurus symmetricus*)
Pacific sardine (*Sardinops sagax*)
Zero catch



Shimada SaKe Summer Survey 2012

Leg I: Newport to San Francisco
June 24 to July 6 (13 DAS)
(blue)

Leg II: San Francisco to Newport
July 9 to July 25 (17 DAS)
(red)

Leg III: Newport to Port Angeles
July 30 to August 12 (14 DAS)
(green)

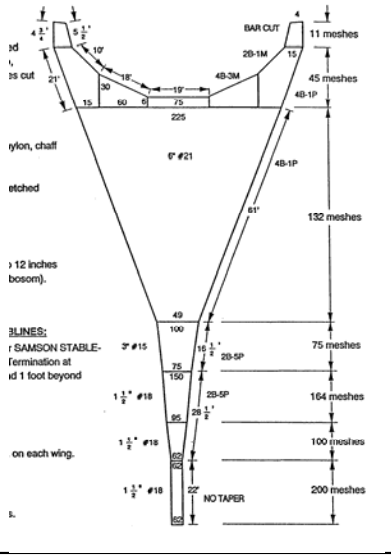
Leg IV: Port Angeles to Newport
August 15 to August 30 (16 DAS)
(orange)

YOUNG OF THE YEAR ROCKFISH SURVEYS 30th year

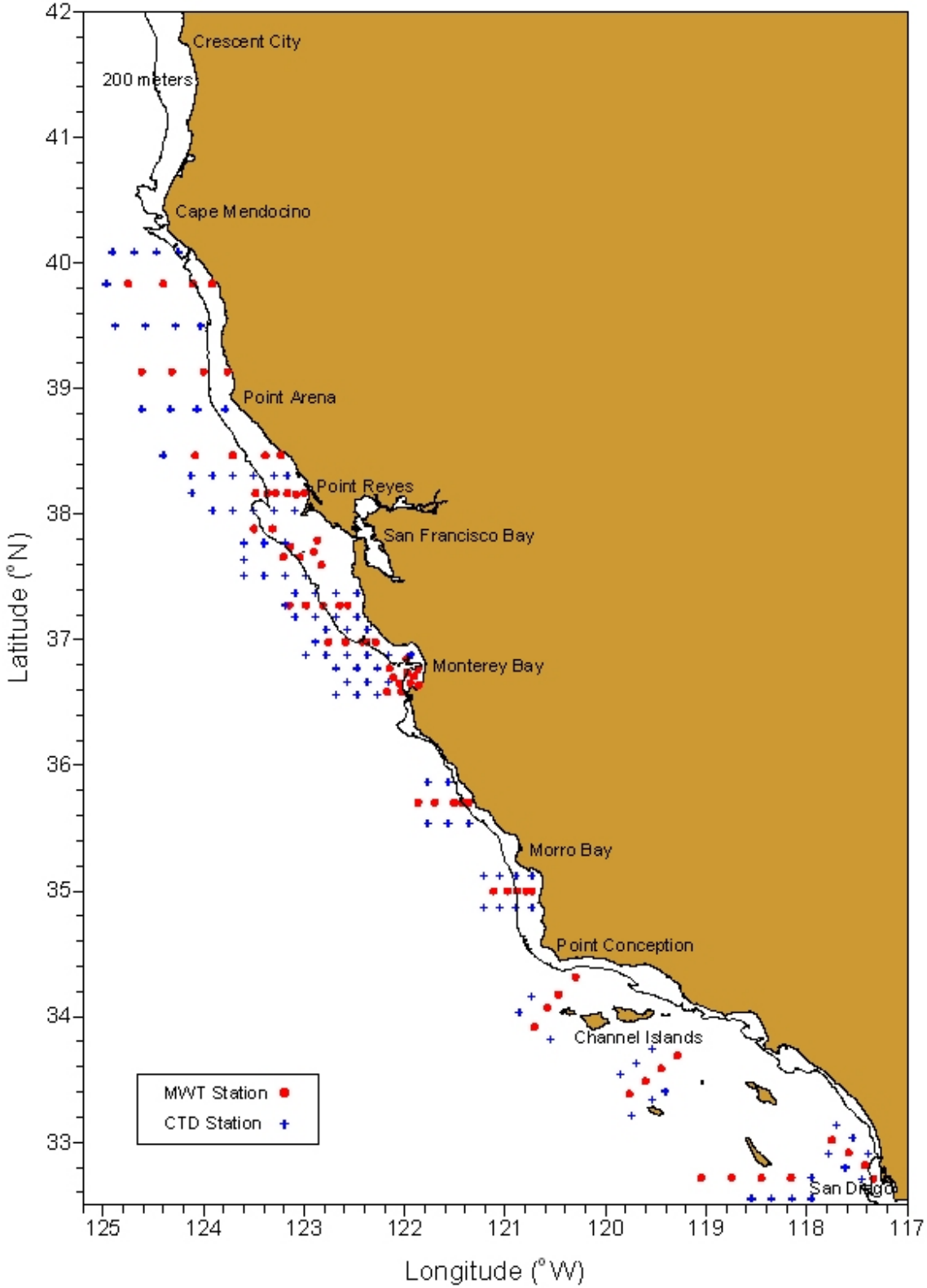
Surveys conducted since 1983 aboard the NOAA Ship *David Starr Jordan*

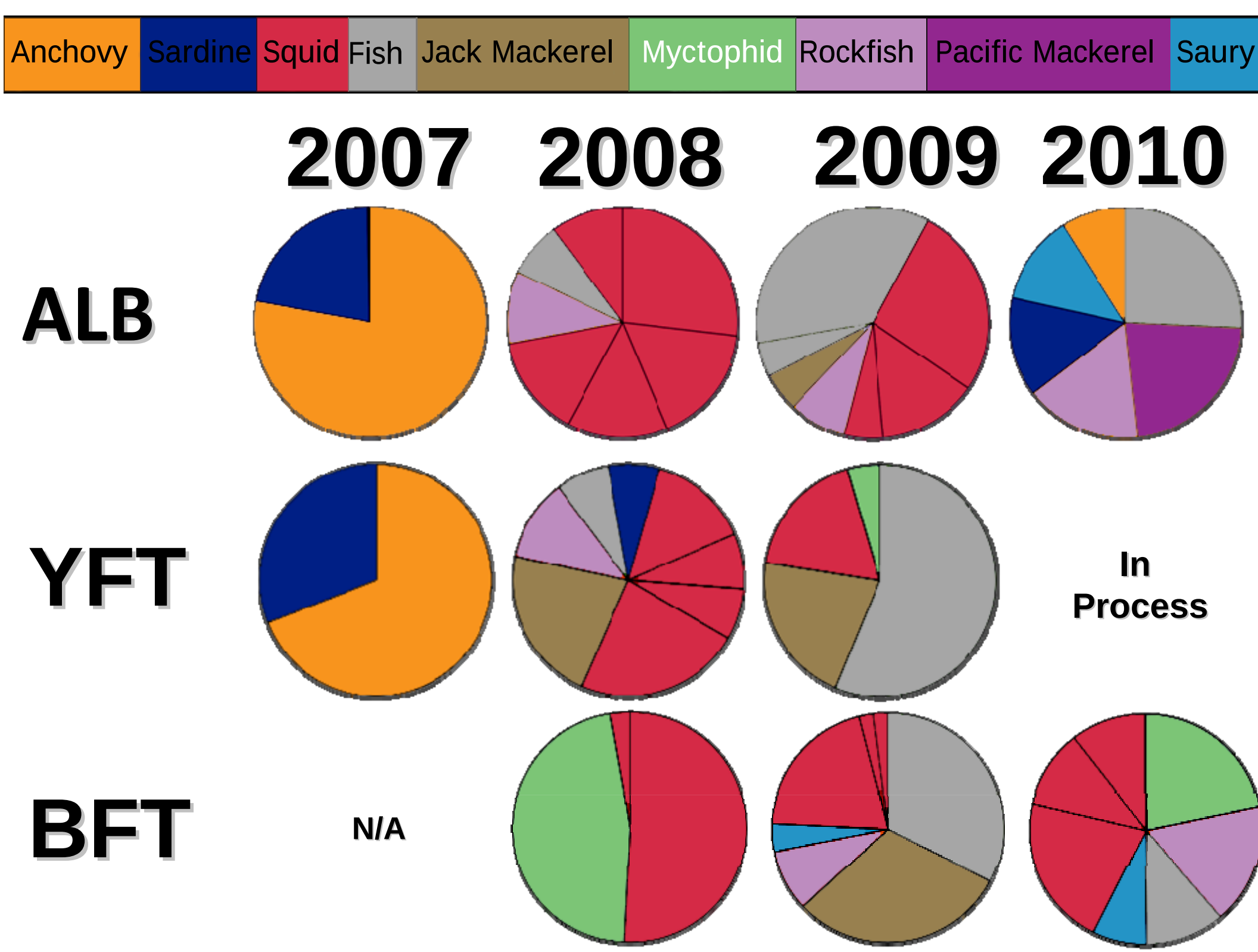
Samples are sorted at sea

Trawling at night



Standardized gear


Crescent City
200 meters
Cape Mendocino
Point Arena
Point Reyes
San Francisco Bay
Monterey Bay
Morro Bay
Point Conception
Channel Islands
San Diego
MWT Station
CTD Station
Latitude (°N)
Longitude (°W)
42
41
40
39
38
37
36
35
34
33
125
124
123
122
121
120
119
118
117


Anchovy
Sardine
Squid
Fish
Jack Mackerel
Myctophid
Rockfish
Pacific Mackerel
Saury
2007
2008
2009
2010
ALB
YFT
BFT
N/A
In Process

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Questions?