Agenda Item H.3.a
Supplemental SWFSC PowerPoint
(*Electronic Only*)
November 2015

Summary of current information available on Coastal Pelagic Species with emphasis on Northern Anchovy

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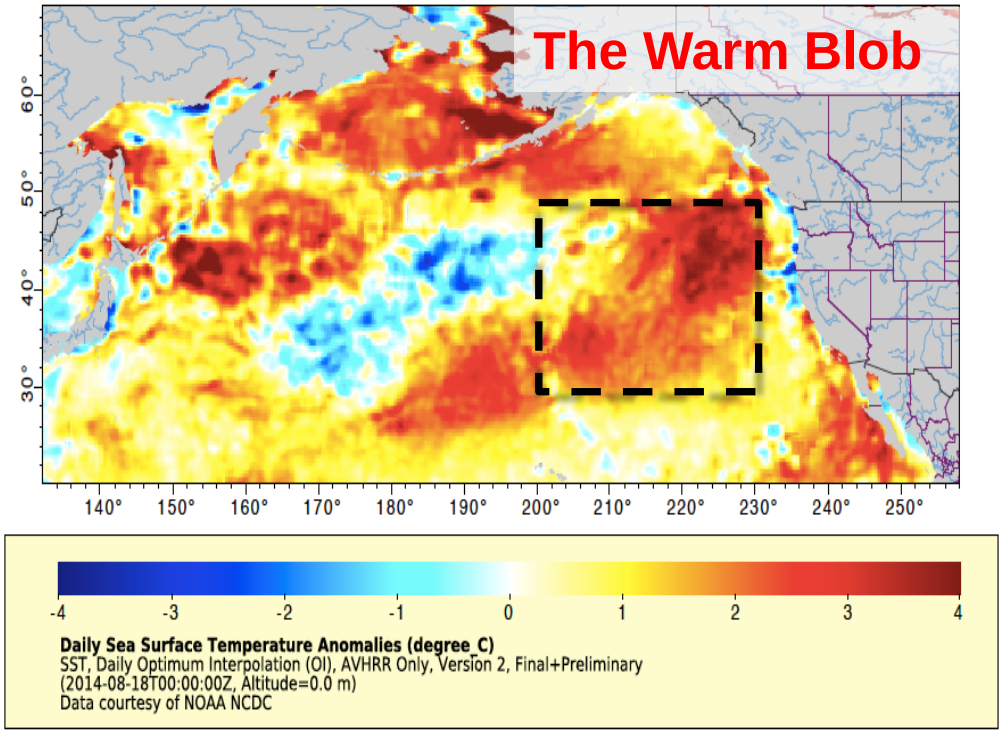
General Outline

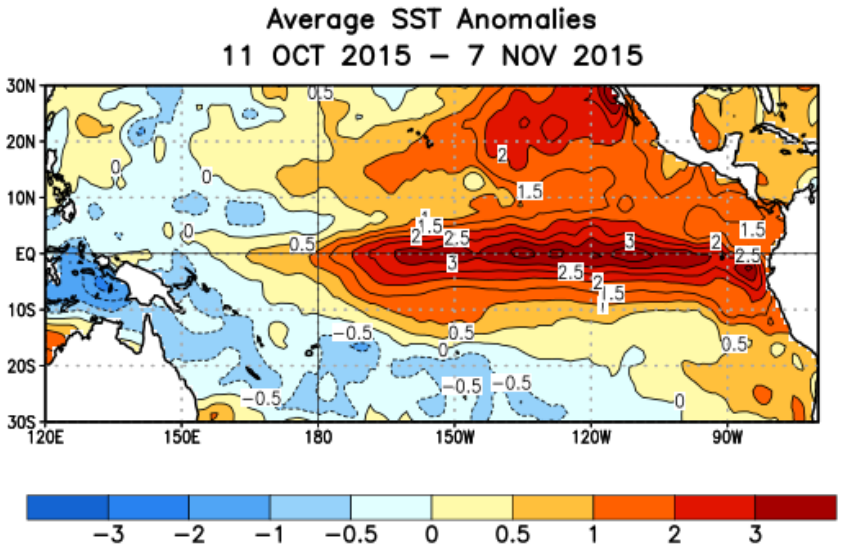
- Update of recent survey data on CPS with emphasis on northern anchovy in relation to environmental conditions observed in the California Current
  - Central subpopulation of northern anchovy
  - Northern subpopulation of northern anchovy
  - Pacific sardine and other CPS

- **Actions:**
  - hold a workshop in Spring 2016 to determine the most proper assessment method,
  - conduct a northern anchovy stock assessment intended for completion in Fall 2016.

Backdrop: well-known unusual conditions



El Niño



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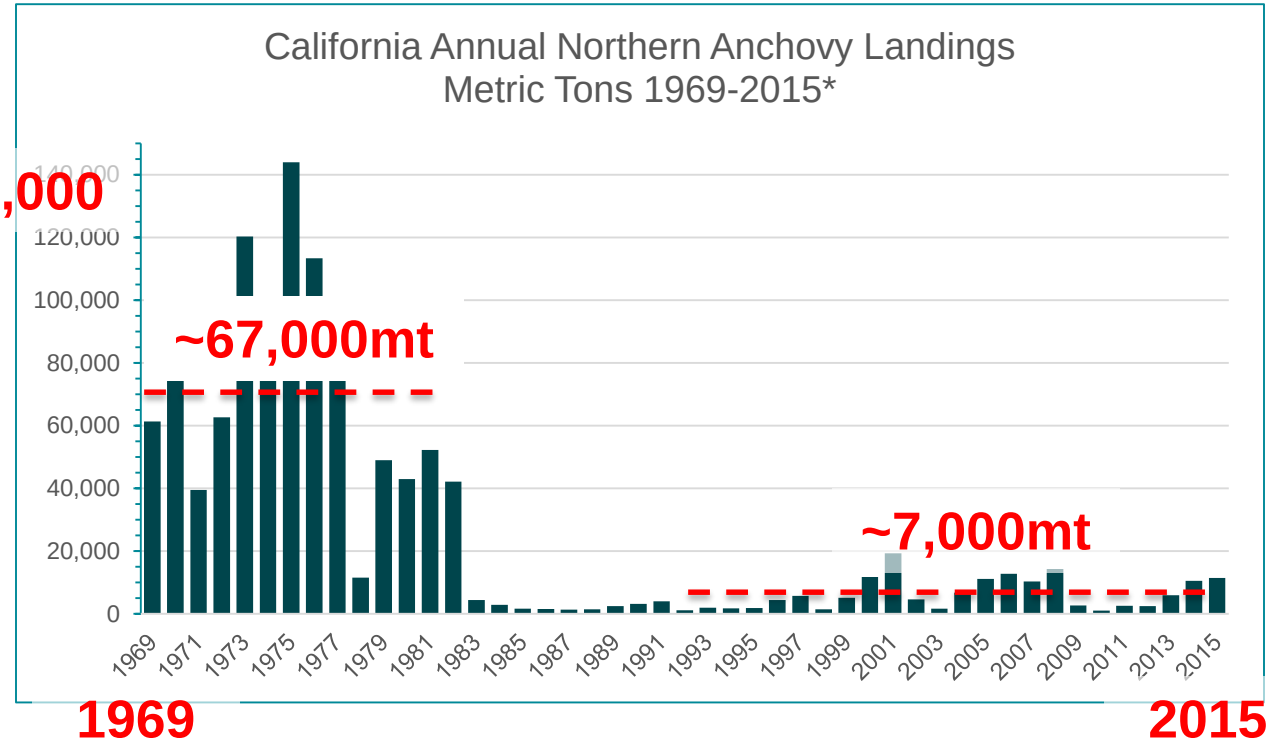
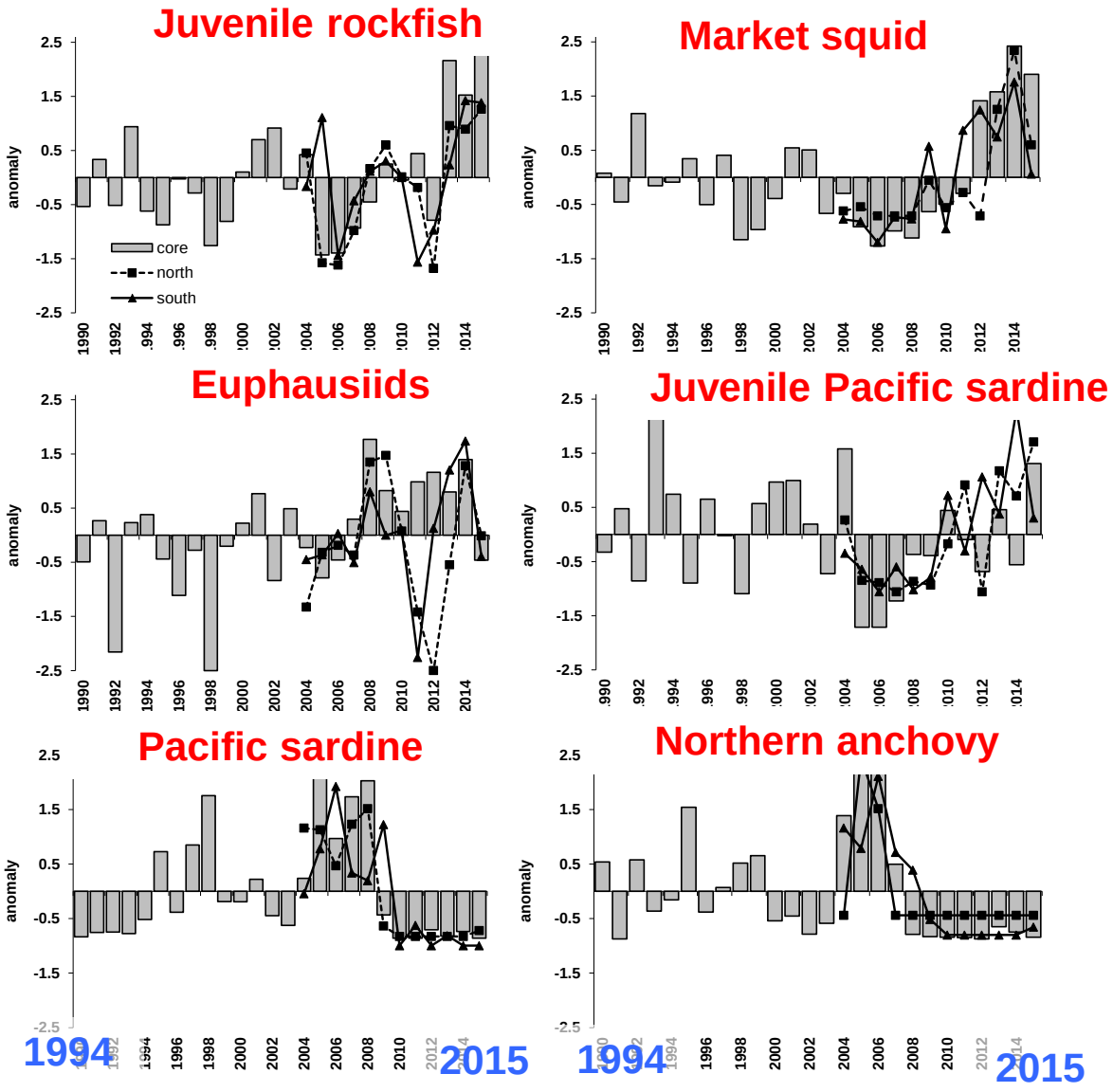
Central subpopulation of northern anchovy



Annual California Landings in metric tons from 1969 to 2015. Landings for 2015 are through November 3, 2015 reported on PACFIN.

- Since 1983 the average catch of northern anchovy by non-reduction fisheries has been ~7,000 metric tons (mt) compared to 67,000 mt by both reduction and non-reduction fisheries from 1969 to 1982
- 2015 landings: >14,000 mt (CDFW 11-12-2015)
- Last assessed 1995



Long-term standardized anomalies of several of the most frequently encountered pelagic forage species from rockfish recruitment survey in the core (Central California) region (1990-2015) and the southern and northern California survey areas (2004-2015, excluding 2012 for the northern area).

CUFES Spring Densities 2000-2015

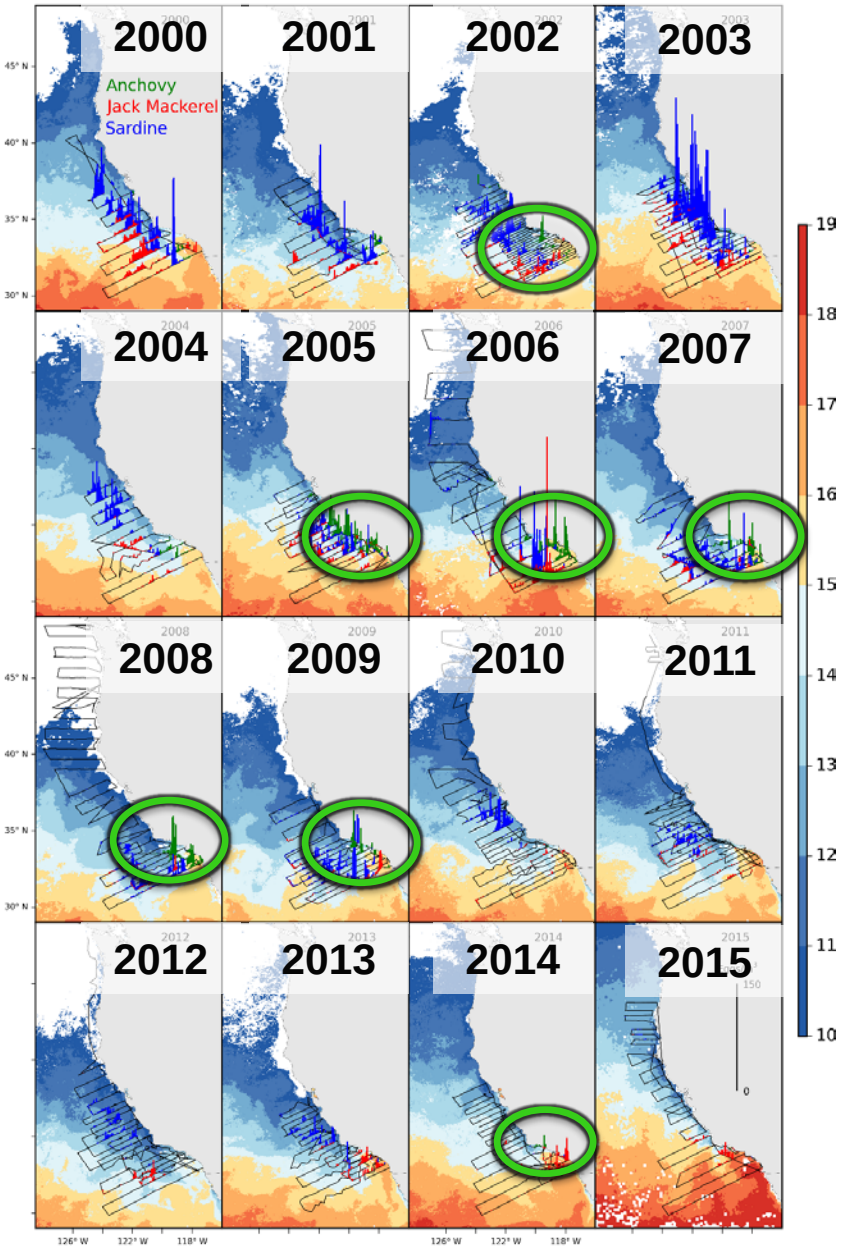
Density of eggs of

sardine (blue),
anchovy (green), and
jack mackerel (red)

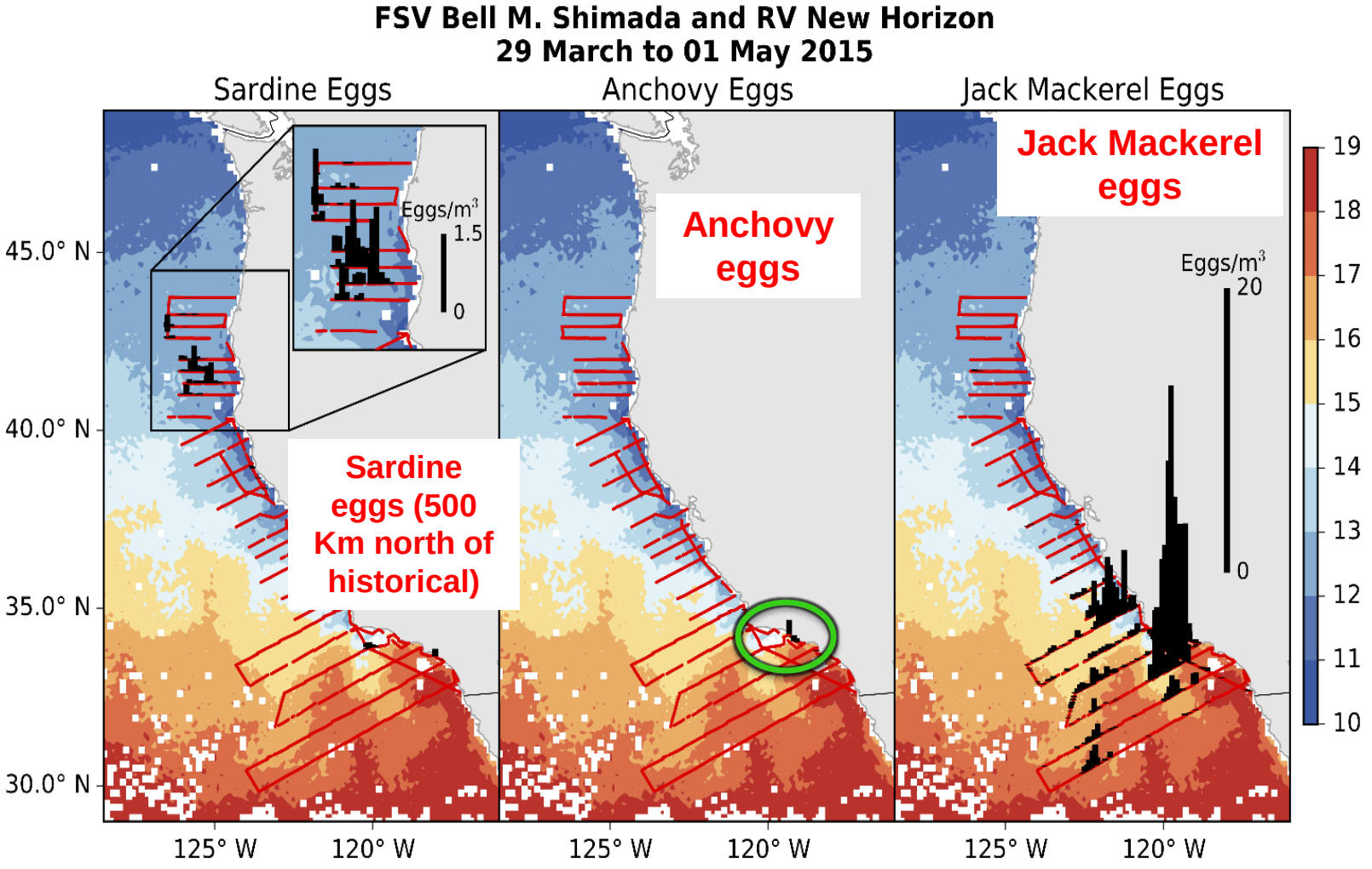
collected with the Continuous Underway Fish Egg (CUFES)

Samples overlain on satellite sea surface temperatures (°C) derived from a monthly composite of April Pathfinder 5.5-km resolution (2000-2008) or AVHRR 1.4-km resolution (2009-2015) imagery.

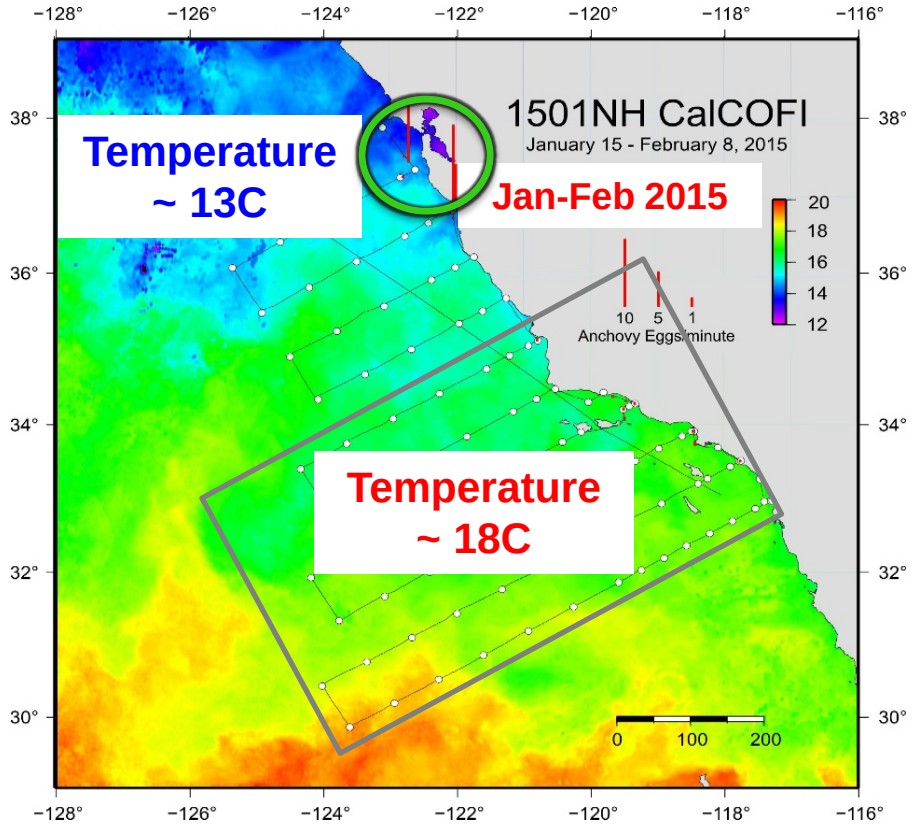
Ship track is shown by the black line.

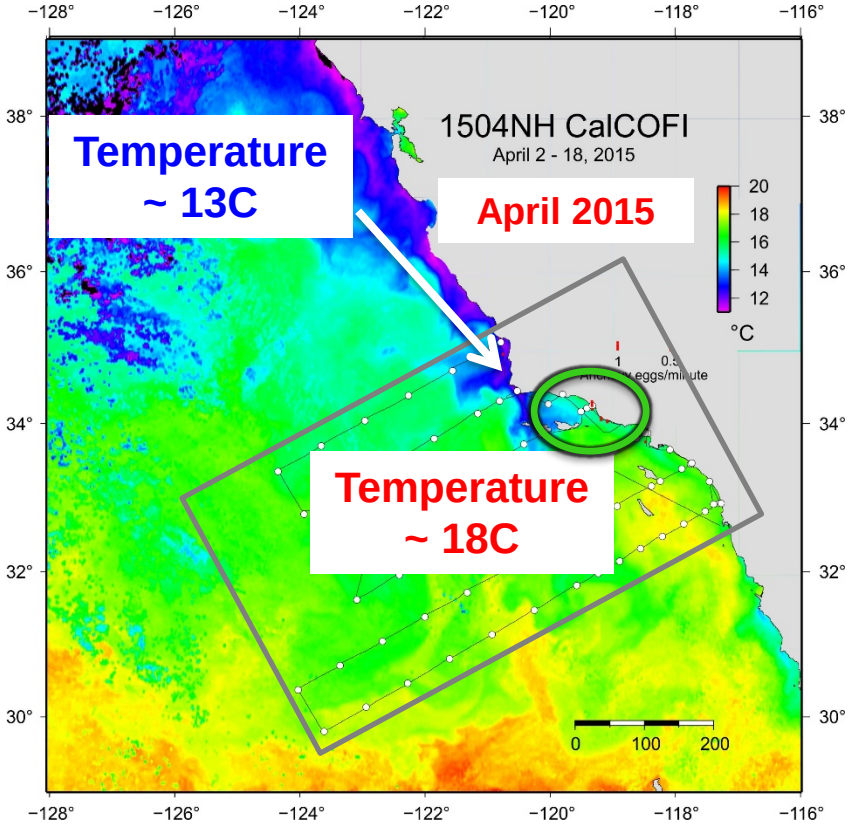


https://swfsc.noaa.gov/textblock.aspx?Division=FRD&ParentMenuId=218&id=1340



Density of eggs of sardine, anchovy, and jack mackerel collected with the Continuous Underway Fish Egg Sampler (CUFES) during the spring 2015 CalCOFI and Coastal Pelagic fish cruises overlaid on satellite sea surface temperatures (°C).



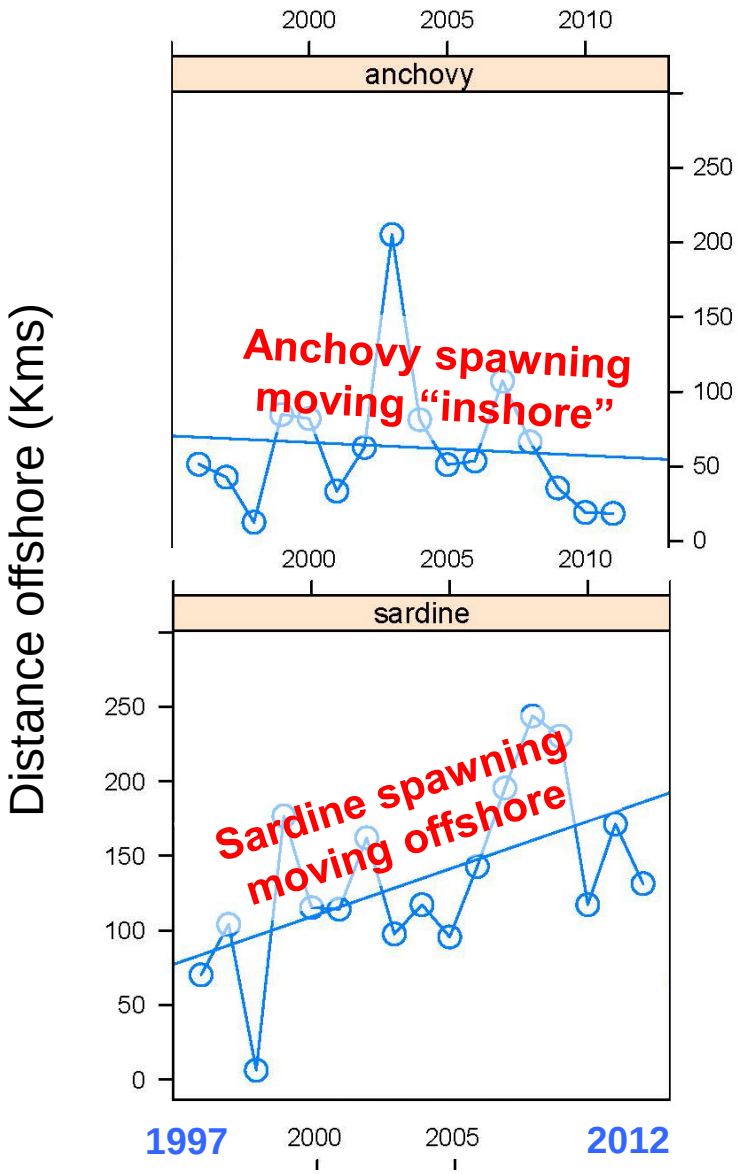


CalCOFI CUFES sampling of northern anchovy eggs/minute plotted over Sea Surface Temperature.

Anchovy spawning temperatures normally are between 13.5-15°C highlighted in dark blue and turquoise.

The grey box represents the standard CalCOFI sampling grid.

- Distance from shore of spawning observed in the CalCOFI surveys from 1997 to 2012.
- Anchovy distribution has shifted “inshore”, while sardine spawning distribution has moved offshore, as shown by the trend lines.



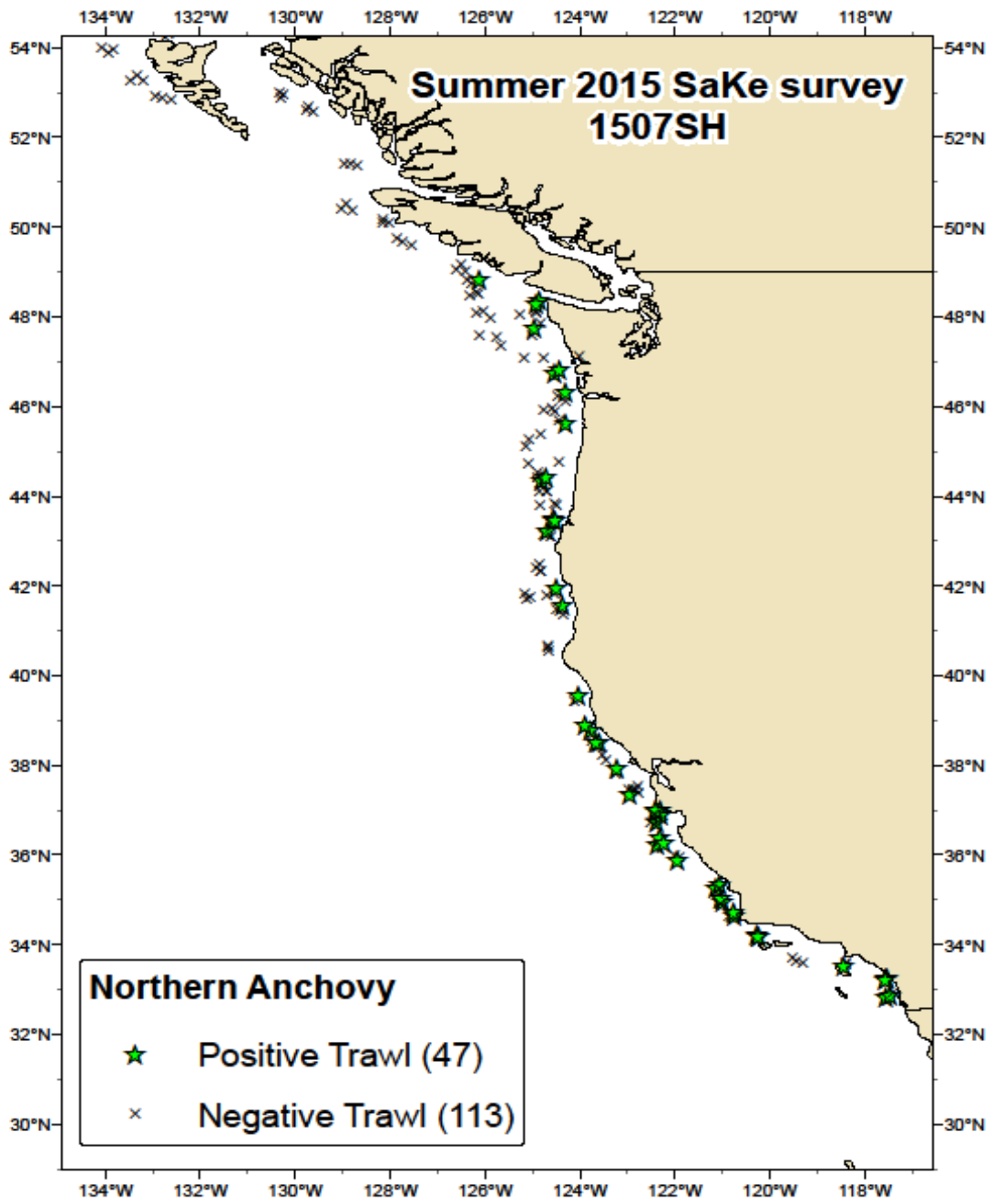
(http://www.nmfs.noaa.gov/pr/health/mmume/casealion2013_investigation.htm)

Juvenile and adult anchovy

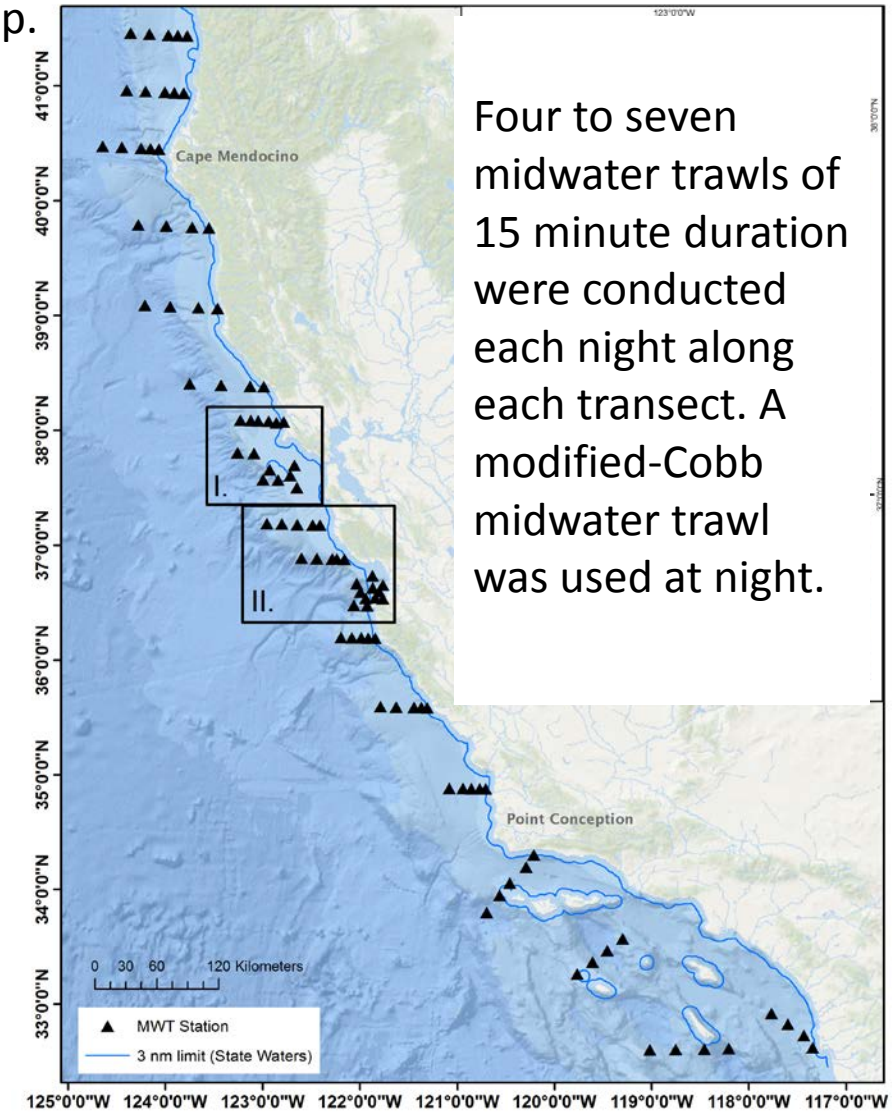
presence ★

absence X

in the 2015 Summer SaKe Survey from June 20-September 6, 2015.

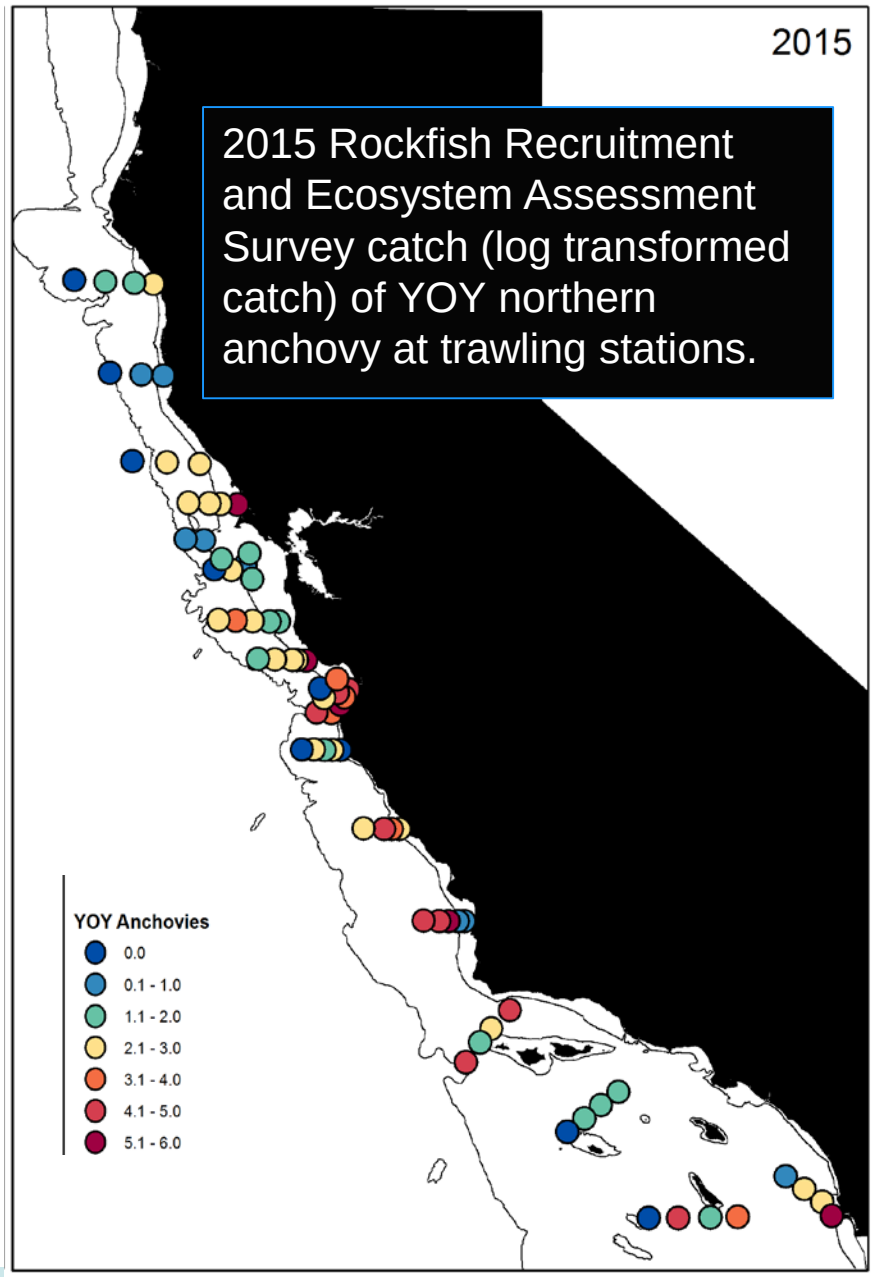


Rockfish Recruitment and Ecosystem Assessment Survey sampling map.

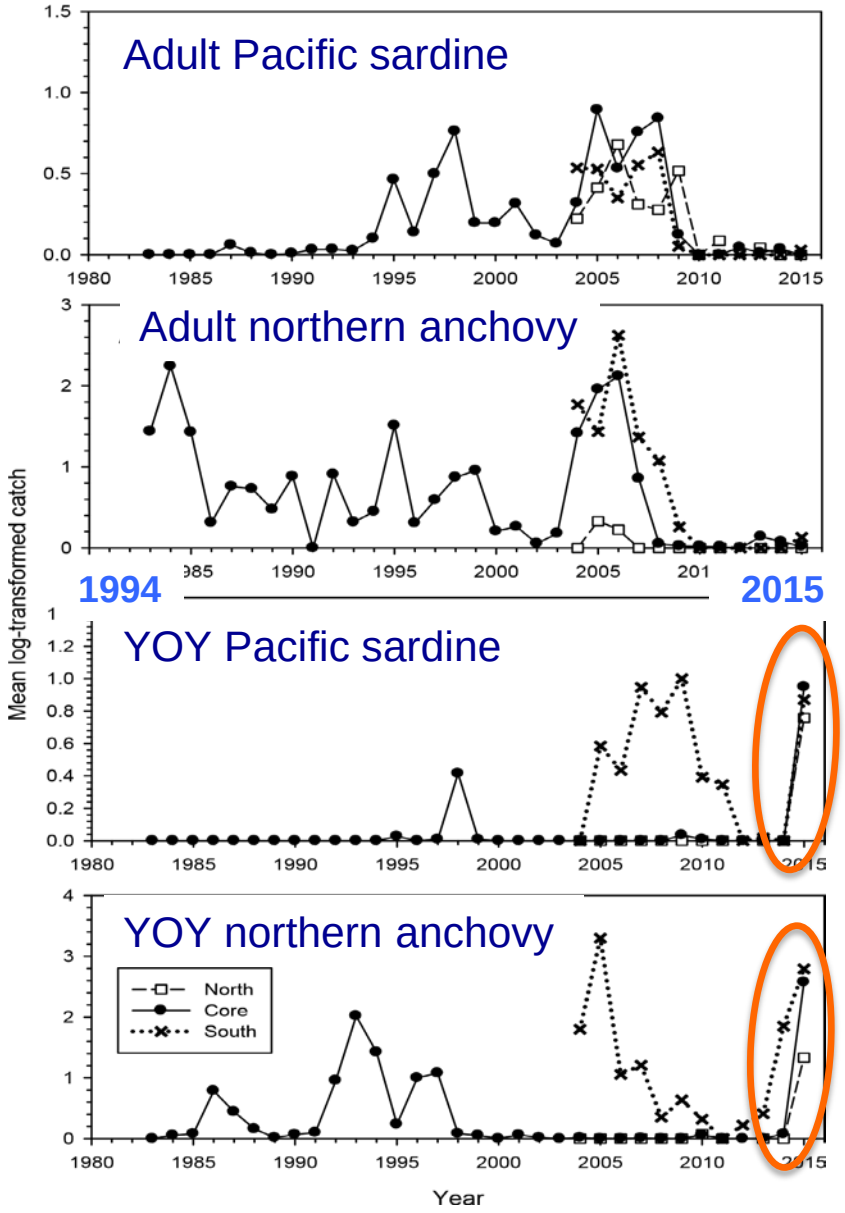


Four to seven midwater trawls of 15 minute duration were conducted each night along each transect. A modified-Cobb midwater trawl was used at night.

Core stations are from Point Reyes to Monterey (Boxes I and II), Stations north of Point Reyes are in the northern area, while stations south of Monterey are in the southern area.

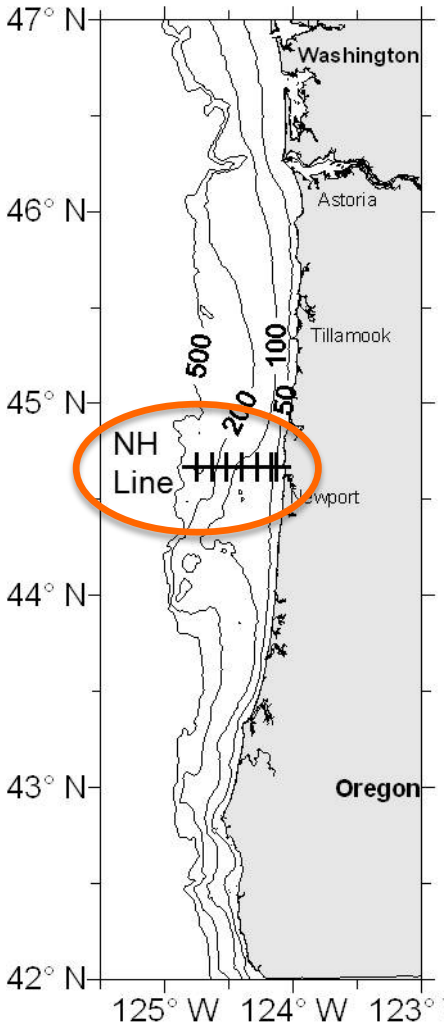


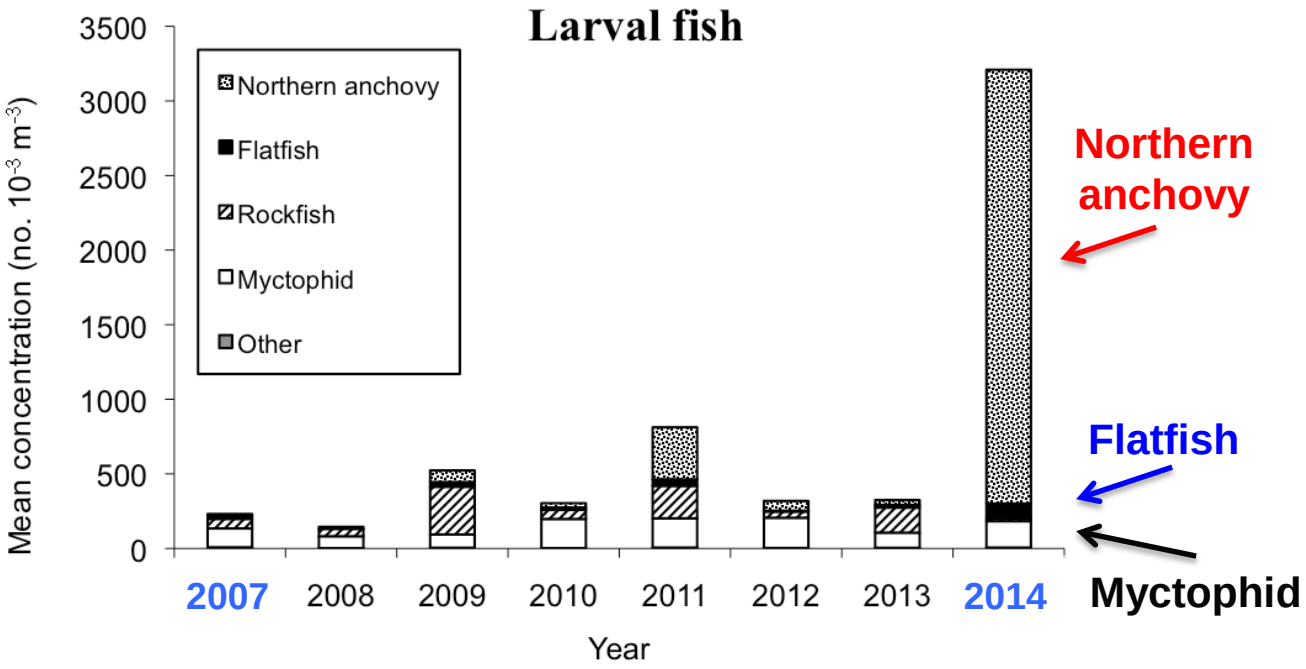
YOY Anchovies



Core (Central California) region (1990-2015) and the southern and northern California survey areas (2004-2015, excluding 2012 for the northern area).

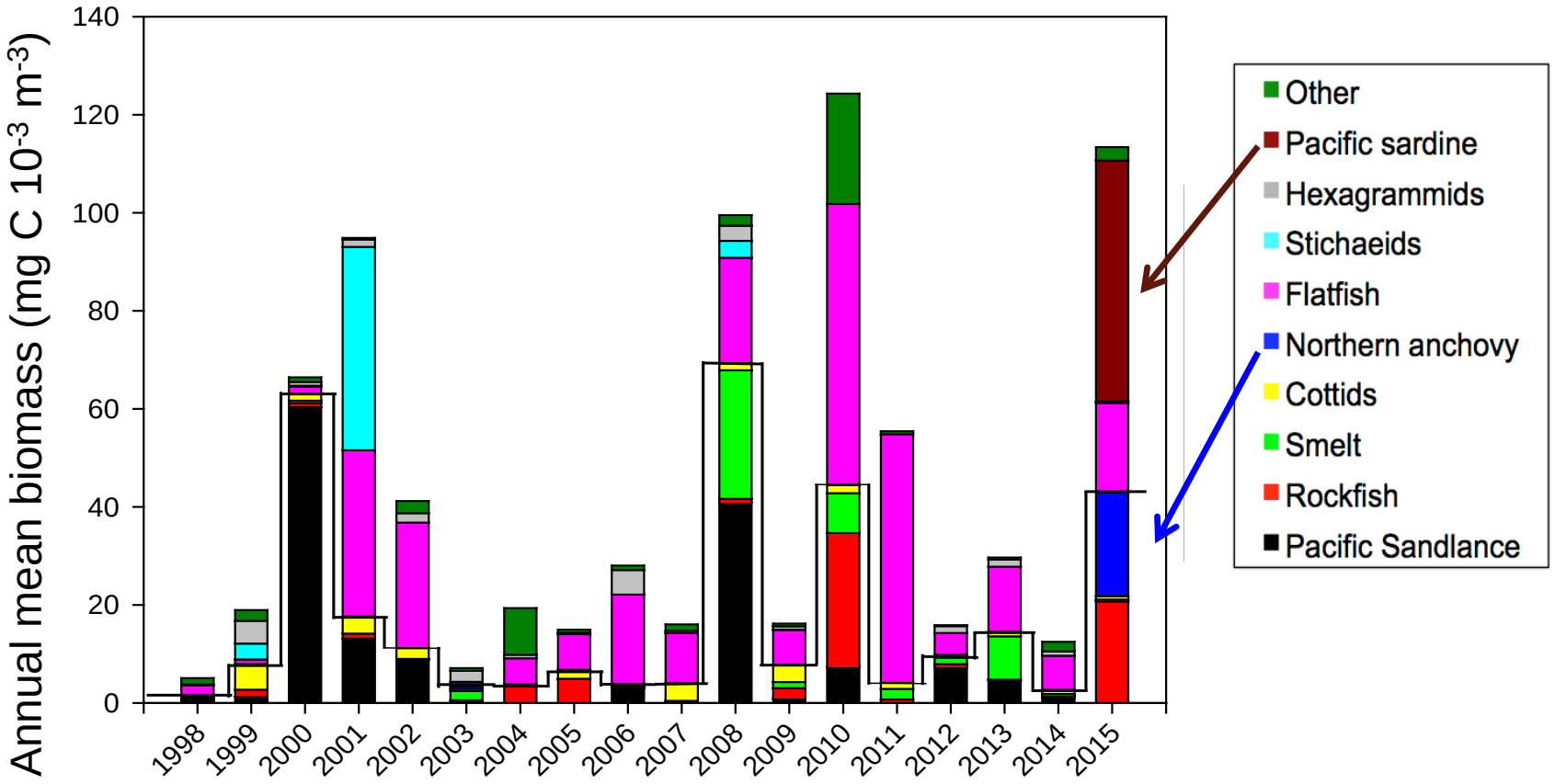
Northern subpopulation of northern anchovy





Mean concentrations (no. 10-3 m-3) of the dominant larval fish taxa collected during **June-July in 2007-2014 (summer)** along the Newport Hydrographic and Columbia River lines off the coast of Oregon.

Northern subpopulation of northern anchovy



Annual mean biomass (mg C 10^{-3} m^{-3}) of salmon prey taxa (below solid line) and five other dominant larval fish taxa (above solid line) collected during **winter (January-March) in 1998-2015** along the Newport Hydrographic (NH) line off the coast of Oregon. Figure reproduced from SOCC (2015) and used with permission of Ric Brodeur.

Next steps

1. Convene a workshop in Spring 2016 to determine the proper assessment method

1. Conduct a northern anchovy stock assessment intended for completion in Fall 2016.