



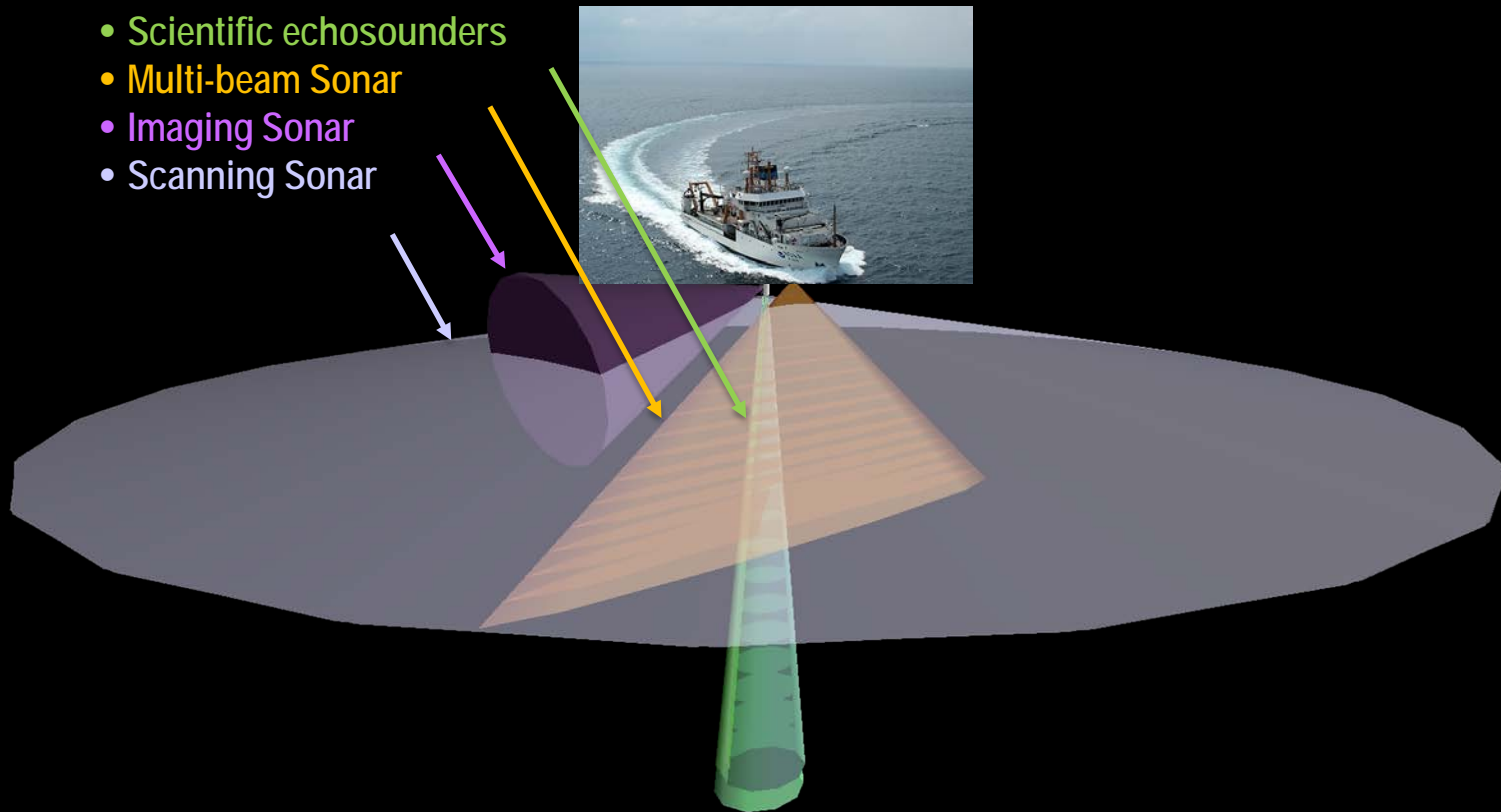
**NOAA**  
**FISHERIES**  
SWFSC

# Measurements and Extrapolations of Nearshore CPS Biomass

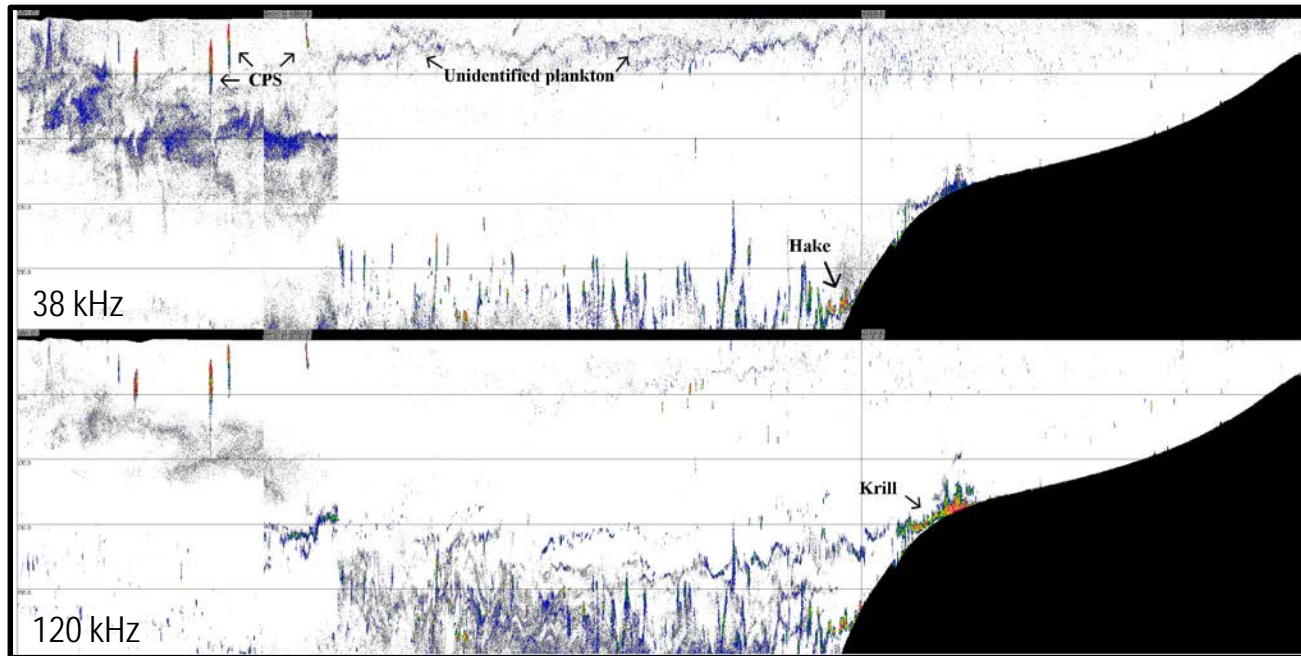
3 April 2019

# NOAA Fisheries Survey Vessel

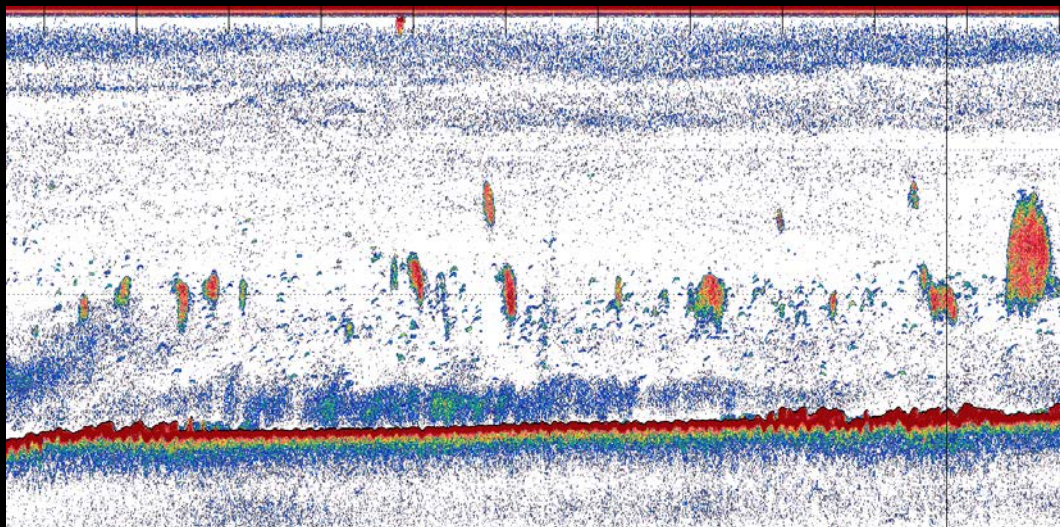
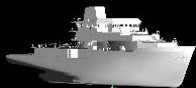
- Scientific echosounders
- Multi-beam Sonar
- Imaging Sonar
- Scanning Sonar



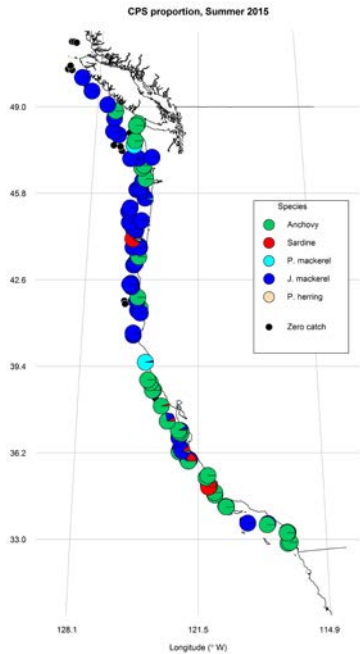
# Echo Classification



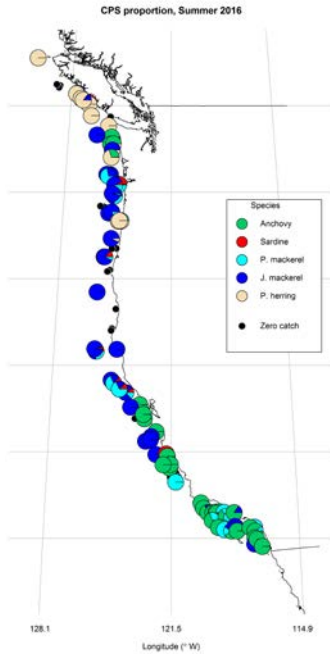
# Acoustic-Trawl Surveys



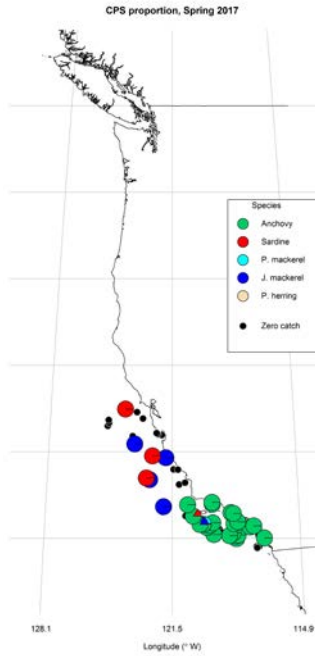
# Recent trawl sampling effort



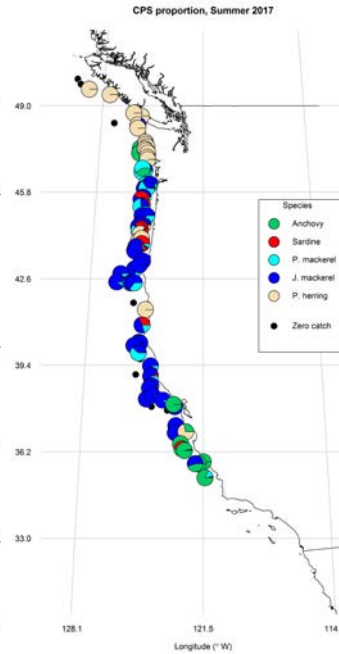
Summer 2015



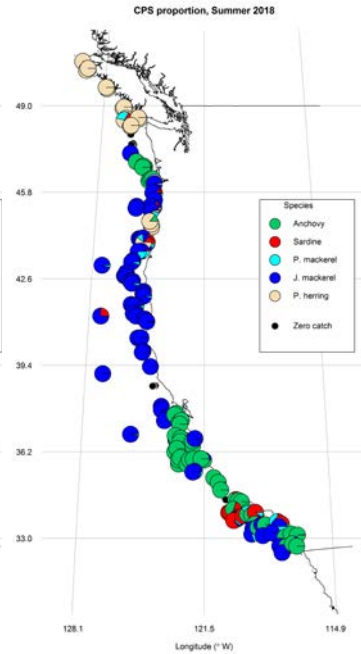
Summer 2016



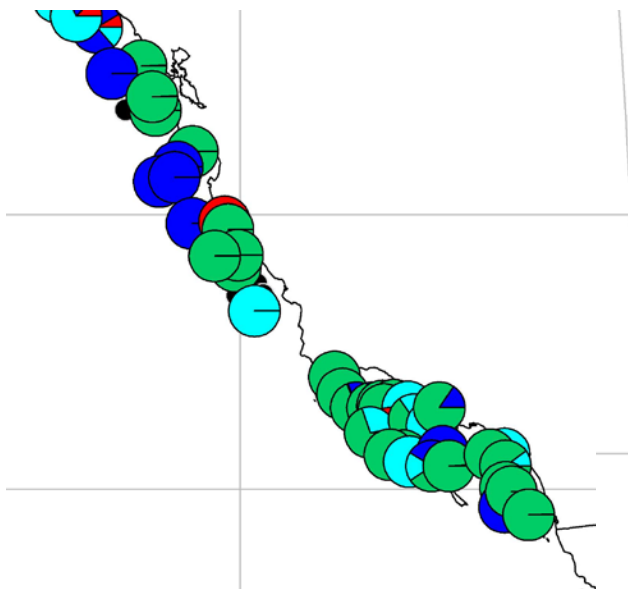
Spring 2017



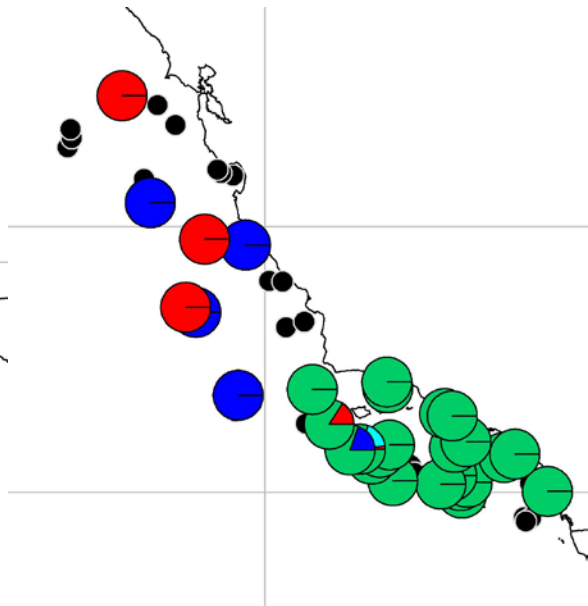
Summer 2017



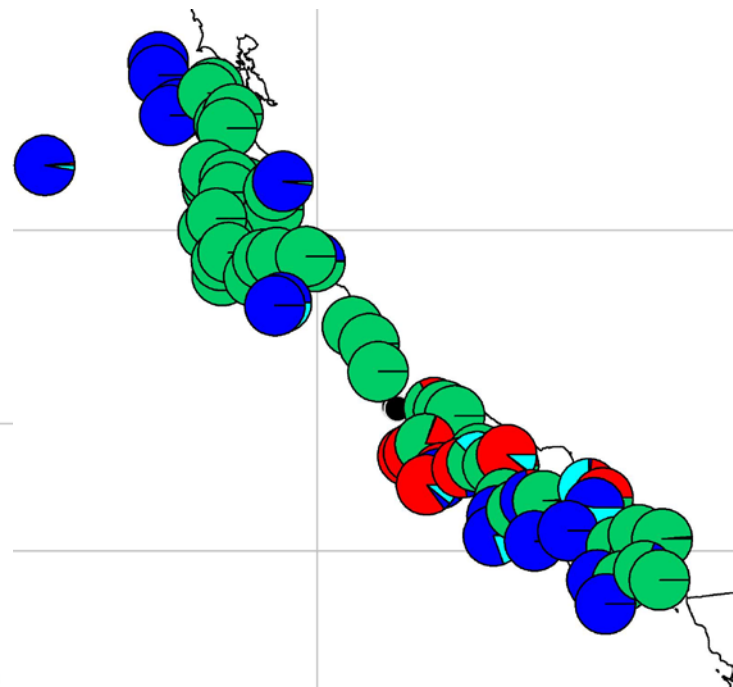
Summer 2018



Summer 2016



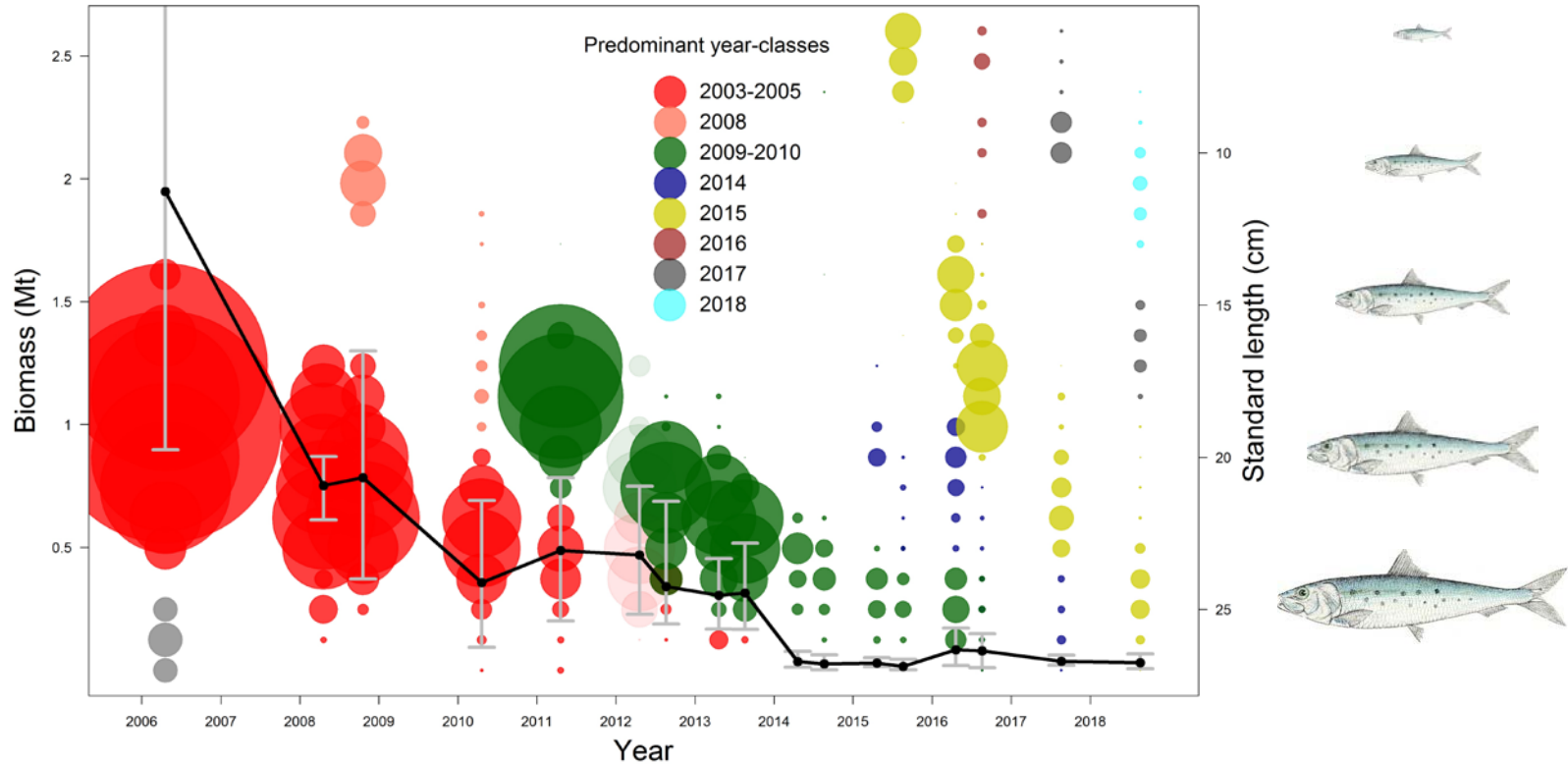
Spring 2017



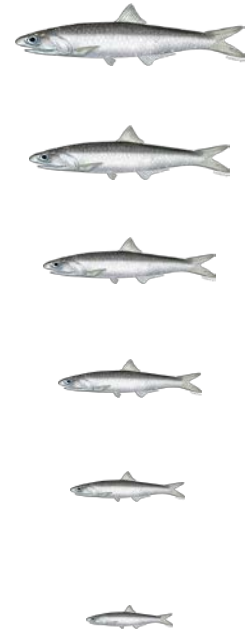
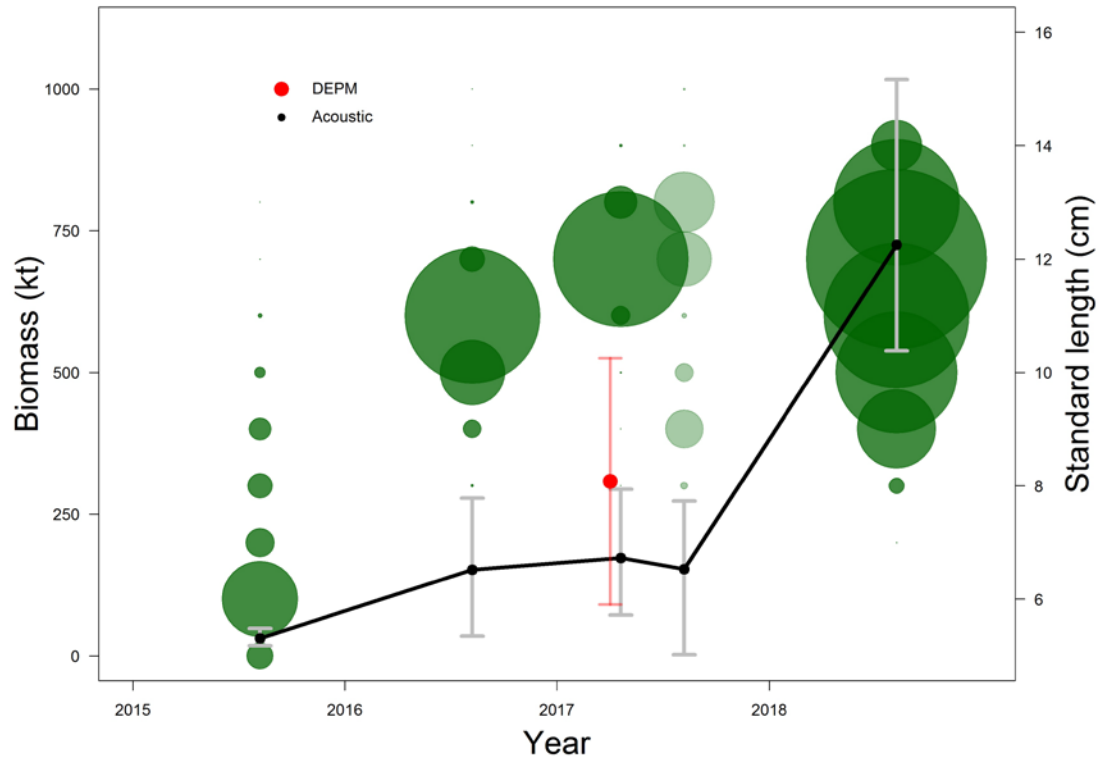
Summer 2018



# Sardine Lengths and Biomass

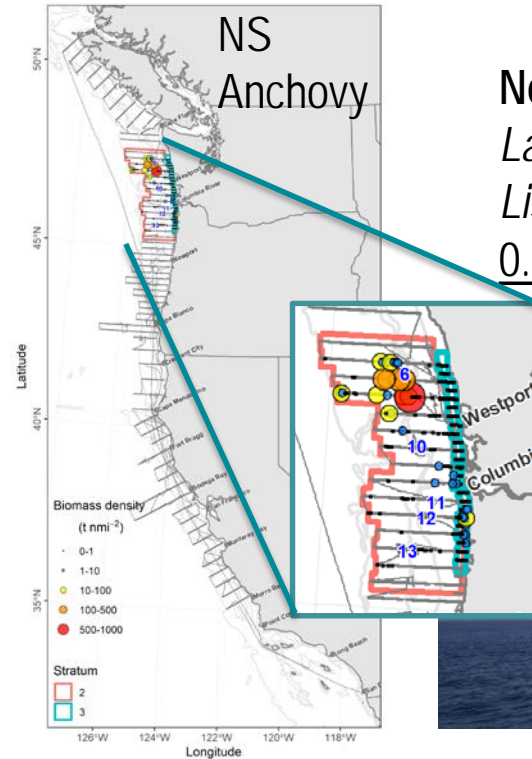
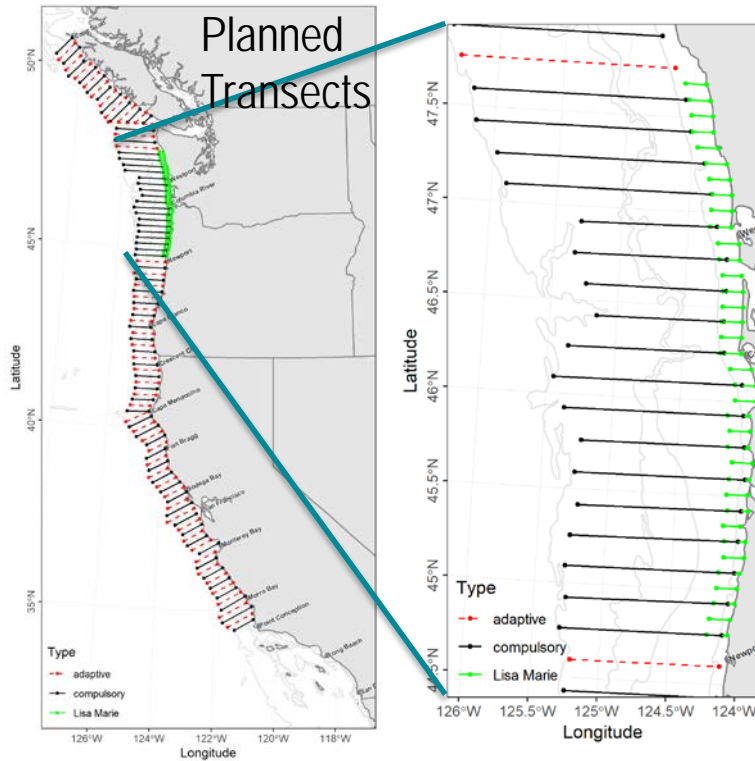


# Anchovy Lengths and Biomass





# Summer 2017 Nearshore Measurements



**Northern stock anchovy**

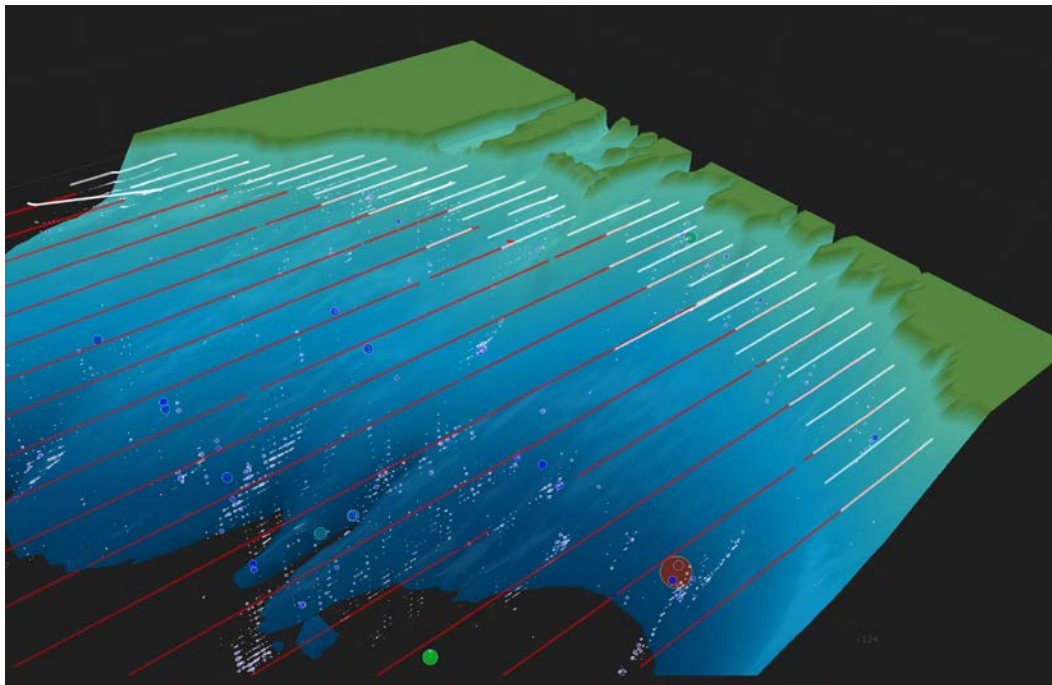
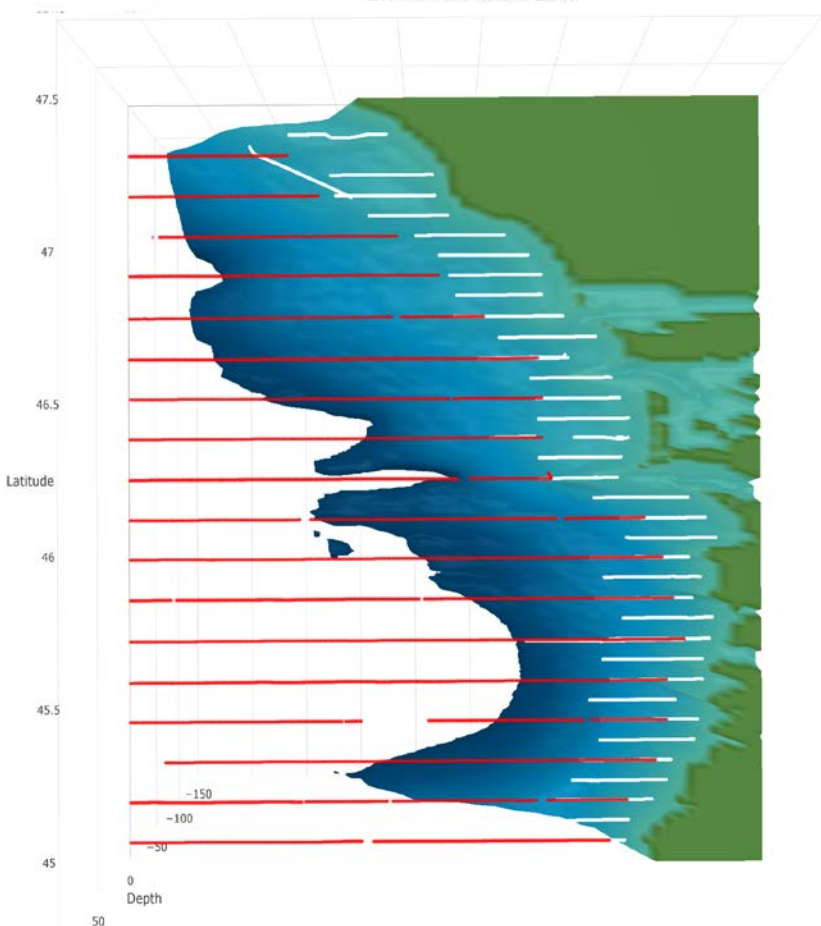
*Lasker* – 22,607 t (CV=64%)

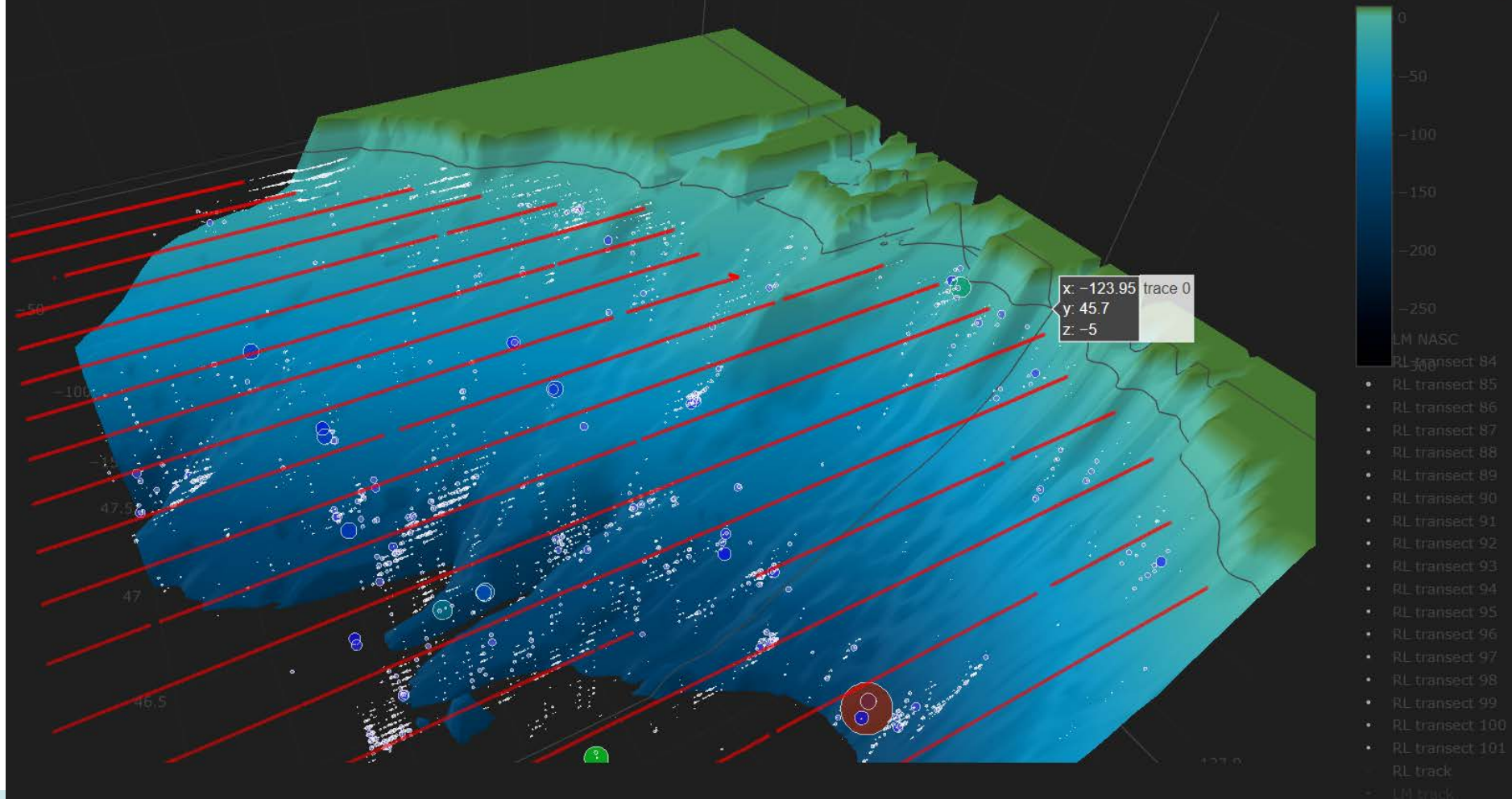
*Lisa Marie* – 102 t (CV=34%)

0.5% more anchovy nearshore



# Summer 2017 Nearshore Measurements



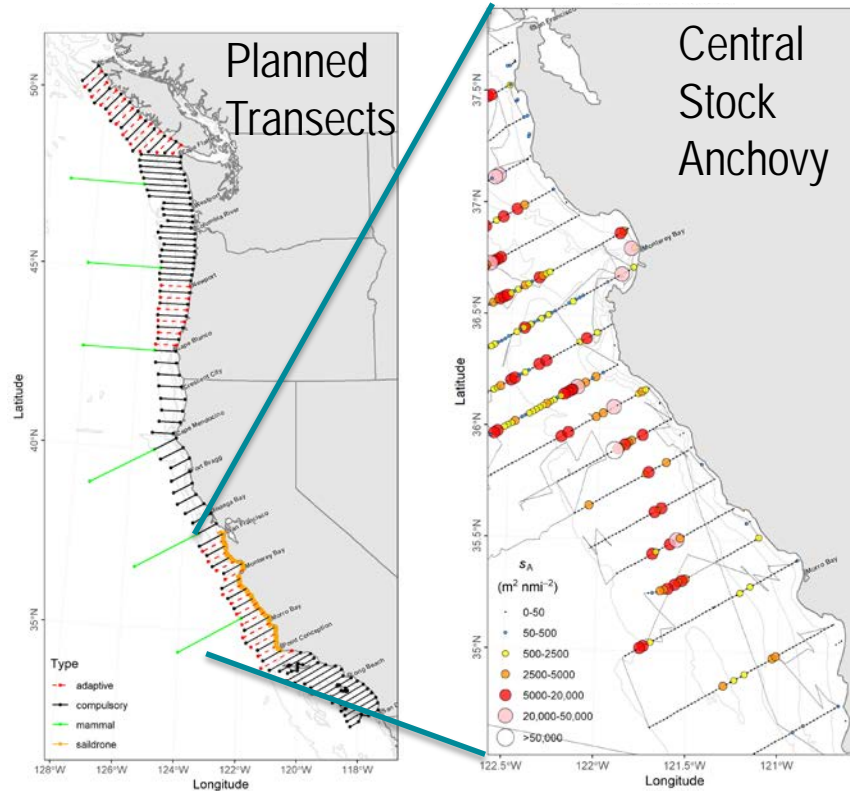




# Summer 2018 Nearshore Measurements

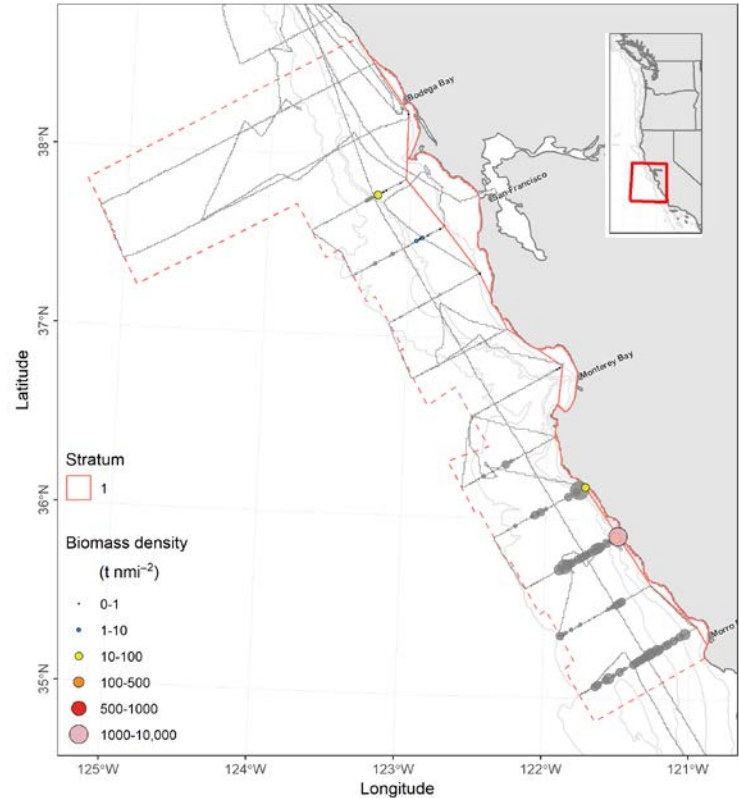


Central stock anchovy  
*Lasker* – 716,887 t (CV~17%)  
*Saildrone* – 6,939 t (CV=71%)  
1% more anchovy nearshore



# Nearshore Extrapolations

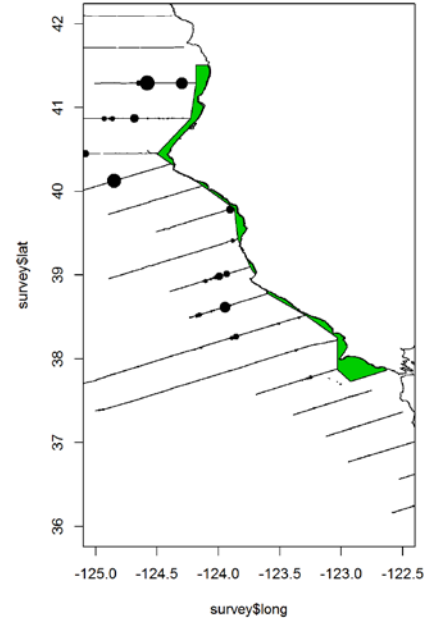
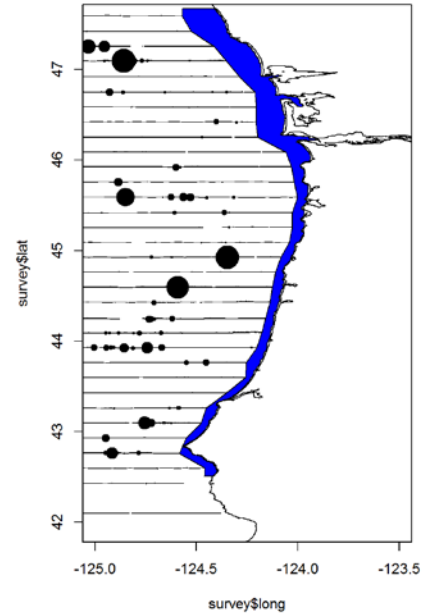
1. Distances were calculated for the projections of each transect to the 5-m isobath.
2. The biomass densities along these **unsampled transect extensions** were assigned the **values measured** along the sampled transects, equal distances from the eastern ends of the transects.



Central Stock Northern Anchovy

# Nearshore extrapolation area

"Nearshore" - the unsampled area between the east end of the acoustic transects, sampled either by saildrone or *Lasker*, and the 5-m isobaths.

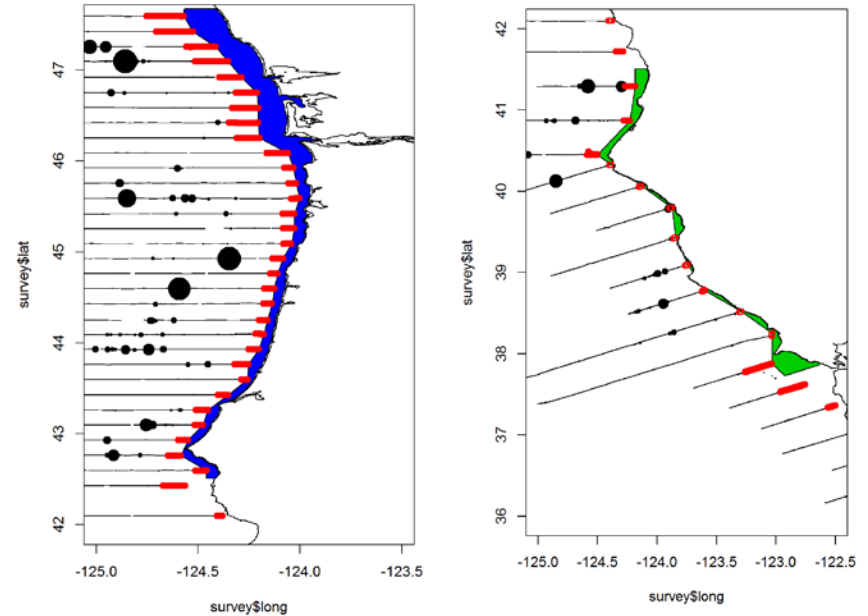


Nearshore strata examples in the 2017 summer survey

# Nearshore biomass “data”

The biomass density data used to calculate the abundance in the nearshore strata are taken from an interval in the nearest acoustic transects, with a length equal to the distance between the transect endpoint and the 5-m isobath.

The intervals in red have the same length as the distance to the 5-m isobath – their density is assumed to reflect the near-shore density





# Nearshore Extrapolations results

The extrapolated values depend on the nearest measurements (acoustic and trawl samples) to the unsampled areas, which primarily depend on the stock distributions at the time of the survey.

|             | NS Pacific<br>Sardine |           | SS Pacific<br>Sardine |           | NS Northern<br>Anchovy |           | CS Northern<br>Anchovy |           | Pacific<br>Mackerel |           | Jack<br>Mackerel |           | Pacific<br>Herring |           |
|-------------|-----------------------|-----------|-----------------------|-----------|------------------------|-----------|------------------------|-----------|---------------------|-----------|------------------|-----------|--------------------|-----------|
|             | Biomass<br>(t)        | CV<br>(%) | Biomass<br>(t)        | CV<br>(%) | Biomass<br>(t)         | CV<br>(%) | Biomass<br>(t)         | CV<br>(%) | Biomass<br>(t)      | CV<br>(%) | Biomass<br>(t)   | CV<br>(%) | Biomass<br>(t)     | CV<br>(%) |
| Summer 2017 | 142                   | 57        |                       |           | 19                     | 42        | 45,446                 | 28        | 548                 | 43        | 971              | 38        | 7,372              | 64        |
| Summer 2018 | 308                   | 86        | 1,870                 | 74        | 1,310                  | 84        | 4,110                  | 56        | 1,320               | 75        | 9,954            | 75        | 8,449              | 52        |

# Questions?

