

## What are groundfish?

- Group of fish that live near the bottom of the ocean and consist of over 90 managed species
- Includes 4 different types of species:



### Roundfish

- Examples: Pacific whiting (hake), lingcod, cabezon, and Pacific cod

### Flatfish

- Examples: Pacific sanddab, Dover sole, Petrale sole, Starry flounder, and English sole

### Rockfish

- Examples: widow, yellowtail, canary, and vermilion rockfish

### Skates and Sharks

- Examples: leopard shark, soupfin shark, spiny dogfish, longnose skate, and big skate

\*Photo credit: Rick (Creative commons flickr), Ben Cantrell, Ron DeCloux, Isaac Miller

## Why are they important?

- Commercial, recreational, and tribal fishing
  - Oregon's highest value fisheries are (2016 ODFW Report):
    - Dungeness crab (\$51.3M)
    - Pink shrimp (\$25.1M)
    - Groundfish (\$16.8M; not including sablefish and whiting)
    - Sablefish (\$15.1M)
    - Pacific whiting/hake (\$8.7 million in 2016 as compared to \$16.1 million for the previous five-year average)
- Seafood and processing market
  - Pacific whiting/hake (*Merluccius productus*)
    - Surimi, fish oil, and fish meal
  - Pacific halibut
- Large part of the ecological benthic community and food web

## How do we know this fishery is being managed well for the future?

### Should NOAA monitor inshore groundfish communities?

We need to critique the current stock assessment methods to determine whether or not the distributions and abundances of all groundfish species are being accurately assessed and later regulated.

## How we are going to critique current fishery management

- Current management regulations for the Pacific coast groundfish fishery are made by the NOAA Northwest Fisheries Science Center (NWFS) and the Pacific Fishery Management Council.
- These regulations are informed by the NOAA NWFS Fishery Resource Analysis and Monitoring (FRAM) division and their biannual U.S. West Coast Bottom Trawl survey (referred to as FRAM study throughout).

We will compare the results of the biannual FRAM study aimed at adult groundfish to our monthly Newport Hydrographic (NH) line study that is closer to shore, shallower, and aimed at juvenile groundfish (Figure 2 and Figure 3).

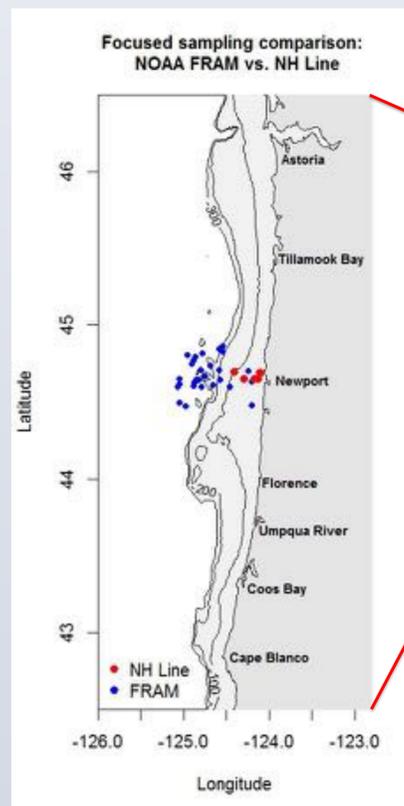


Figure 2. Closeup of sampling stations that will be compared in this study. Blue shows stations from the 2015 FRAM U.S. West Coast Bottom Trawl survey that are within a latitude threshold of 13'12" away from the average Newport Hydrographic (NH) line latitude (44°40'12"). NH line stations are shown in red.

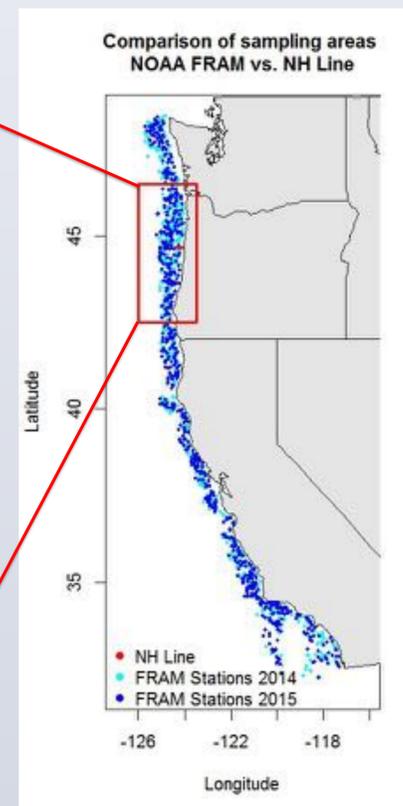


Figure 3. Groundfish sampling stations along the Pacific coast. Light blue and dark blue are from the FRAM U.S. West Coast Bottom Trawl survey during 2014 and 2015, respectively. Red line shows the Newport Hydrographic (NH) line, and red box gives perspective for Figure 2.

## Our (NH Line) sampling method

- Six stations based on depth (~30, 40, 50, 60, and 80 m)
- Conductivity, Temperature, Oxygen and Depth profile (CTD; Seabird SBE 19+) taken before tow
- Two meter wide beam trawl equipped with 2.5 x 3mm mesh liner, high definition video camera, paired odometer wheel system, and tickler chain (Figure 4)
- Catch sorted at sea
  - Fish >150 mm standard length (SL) identified, measured, and discarded
  - Fish ≤150 mm SL flash frozen at sea, stored at -80°C in lab, and later identified, weighed, and measured



Figure 4. Two meter wide beam trawl used in NH line study.

## Possible Outcomes

- The FRAM study and the NH Line study have similar results meaning:
  - Species found at sampling stations are similar
  - Distribution and abundance of species are similar
  - Age classes of fish sampled are similar
- The two methods (FRAM study and NH line study) have different results (not as above)

## What would these outcomes mean for future management?

- If the studies have similar results, then the FRAM groundfish stock assessment is accurate and should continue with business as usual.
- If the studies show different results, then the FRAM groundfish stock assessment should be altered to better represent the fish populations.

## Innovation and quality control in fishery management:



## Acknowledgements

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