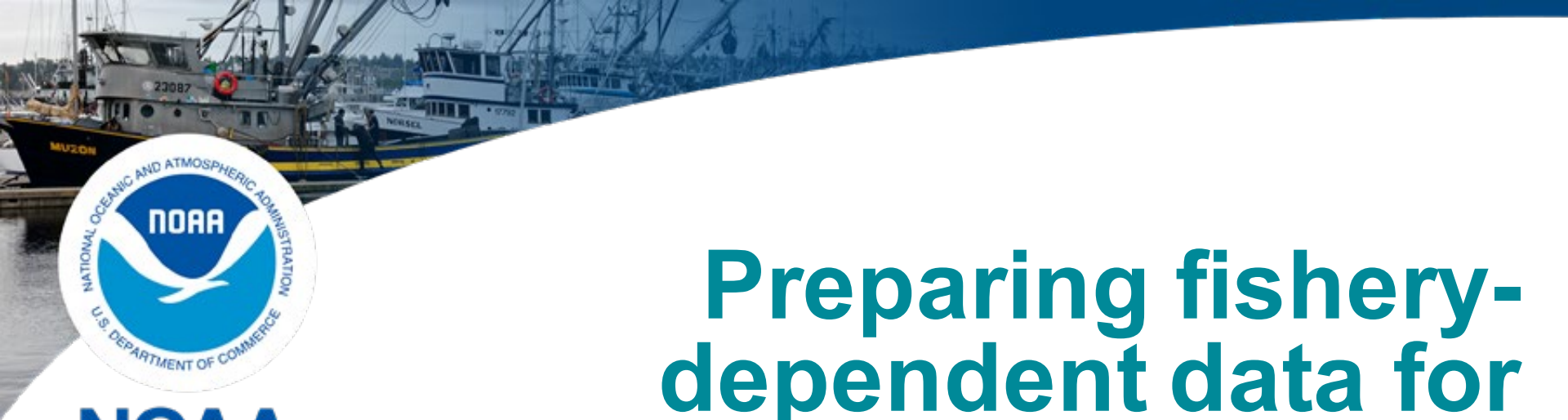
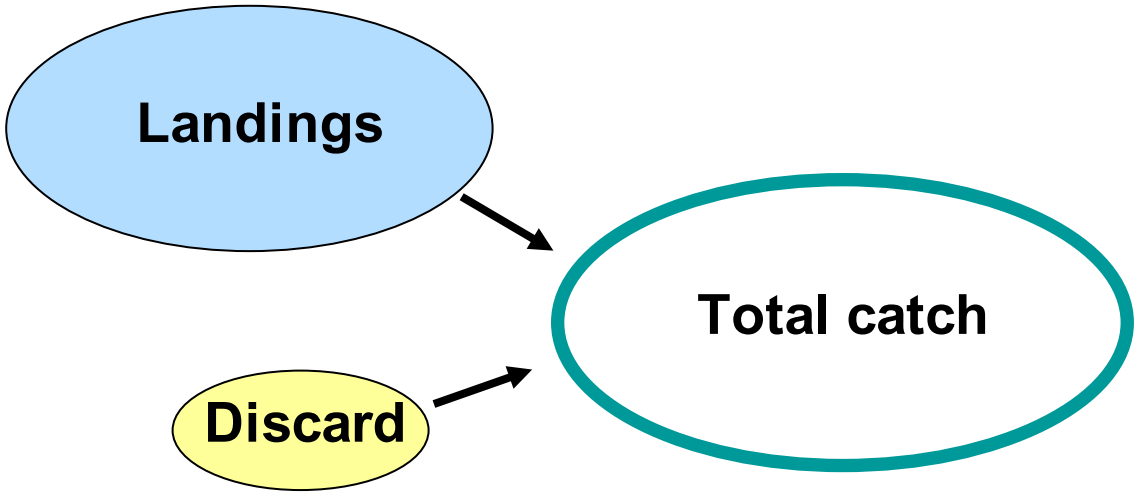


NOAA FISHERIES

Preparing fishery-dependent data for stock assessment models

FISH 576, Week 3

Categories of catch



Ways to incorporate discard data in the assessment model

2017 yelloweye model

2019 widow model

Option 1:
Discard added to landings within the same fleet

- Discard amounts are estimated by year for the entire modeling period *outside the model*.
- Discard amounts are added to landings in the same fleet.
- No discard length composition data added.
- Selectivity for the entire fleet estimated based on landings length compositions.

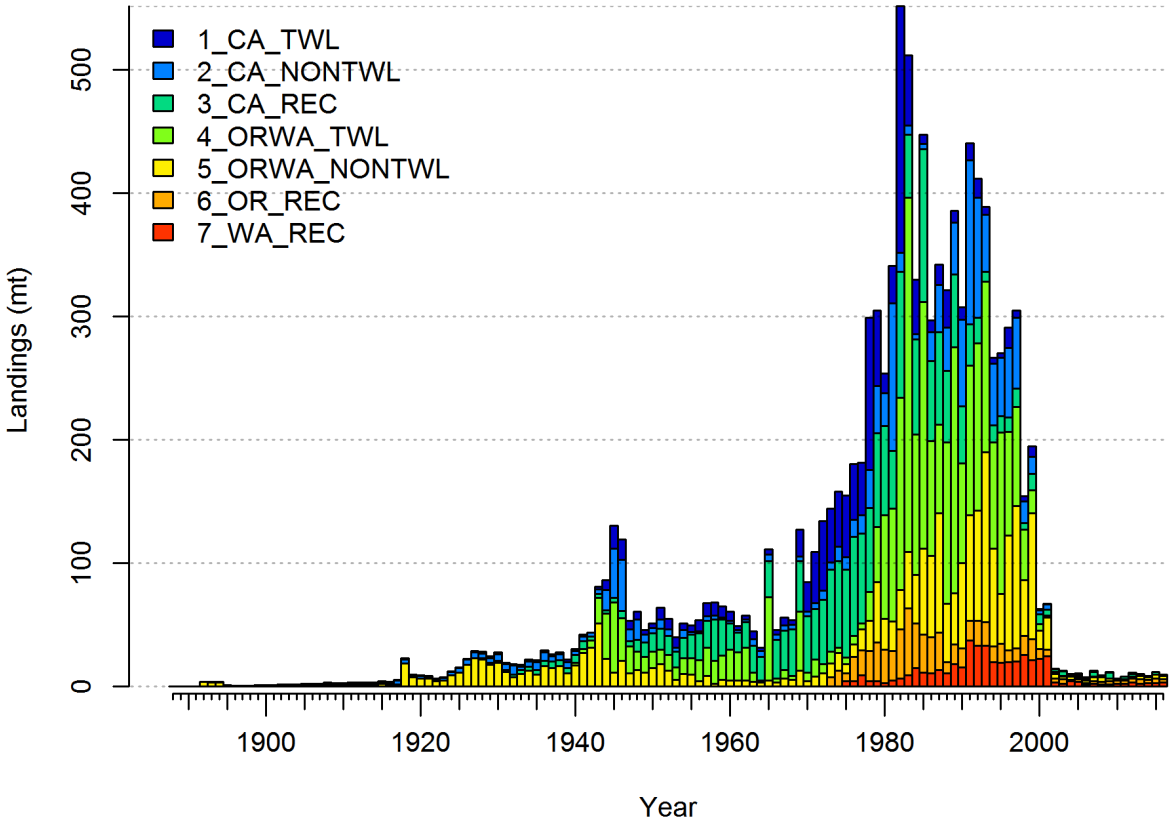
Option 2:
Discard included as a separate fleet

- Discard amounts by year are estimated *outside the model*.
- Discard amount by year are included as a separate (from landings) fleet.
- Discard length compositions added to the model.
- Separate selectivity curve is estimated for discard fleet based on discard length composition data.

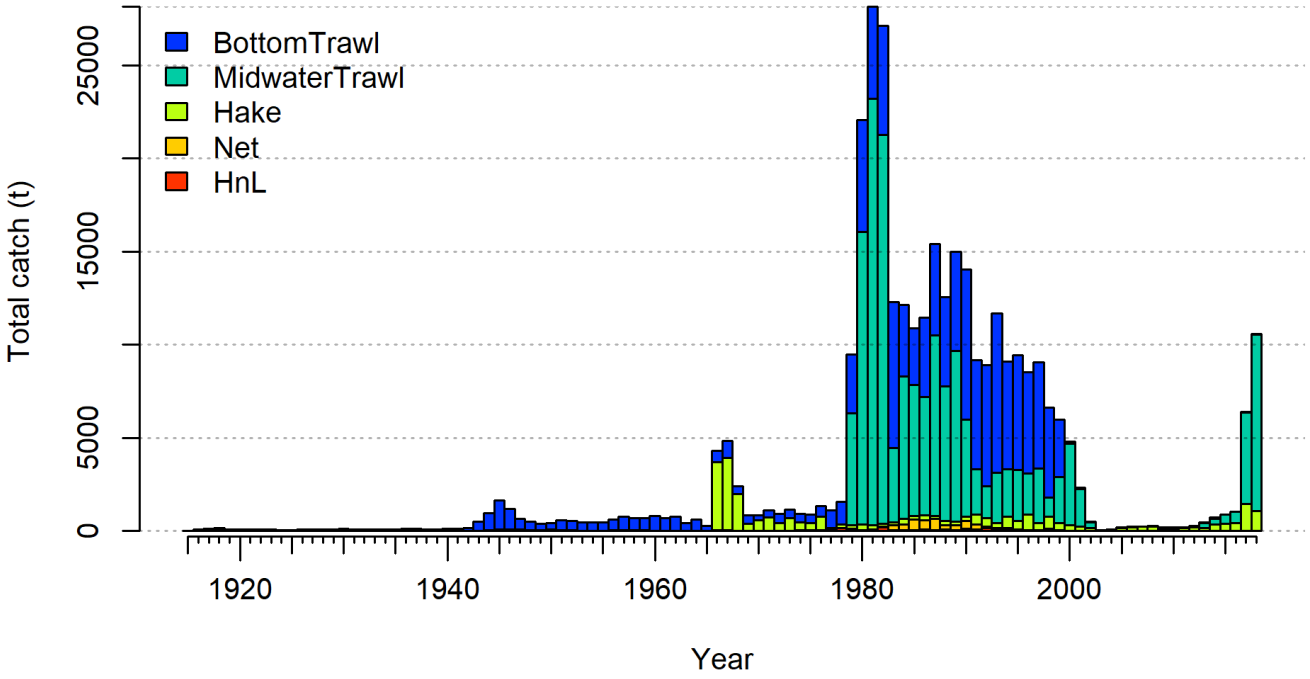
Option 3:
Discard estimated internally

- Discard rates/amounts are added to the model for existing fleets. No additional fleets added.
- Based on those discard rates/amounts, the model will estimate discards by year *internally*.
- Discard length compositions and mean weight are added to the model, within the same fleet but marked as discard.
- Selectivity section in control file is modified to estimate retention curve in addition to selectivity curve.

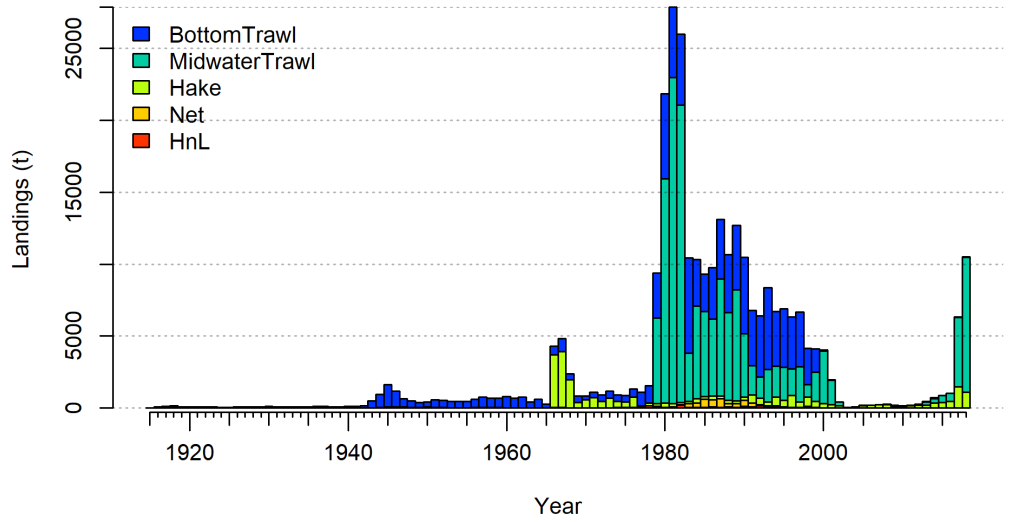
Yelloweye rockfish catch history

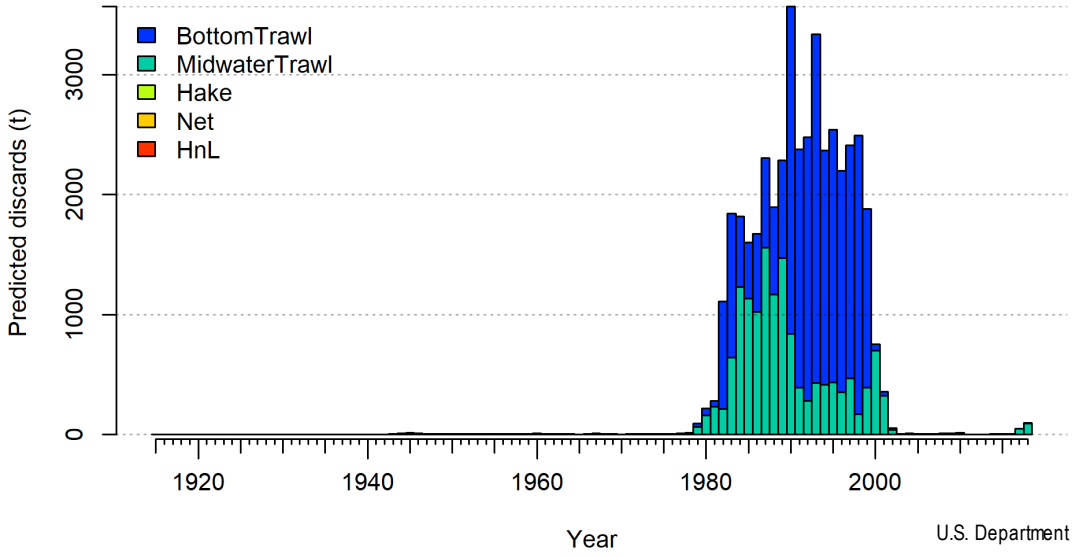


Widow rockfish catch history

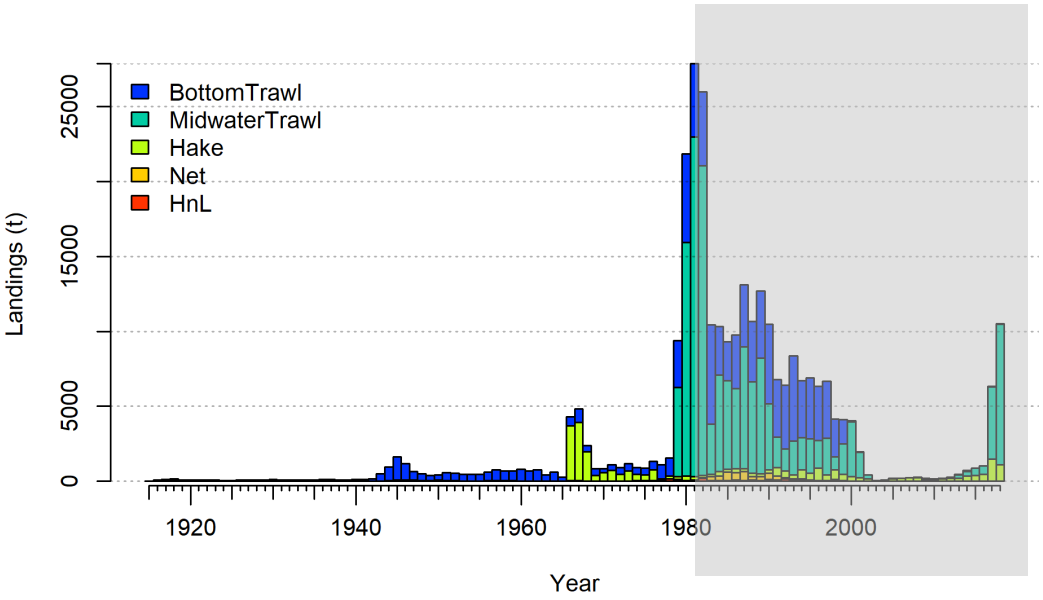


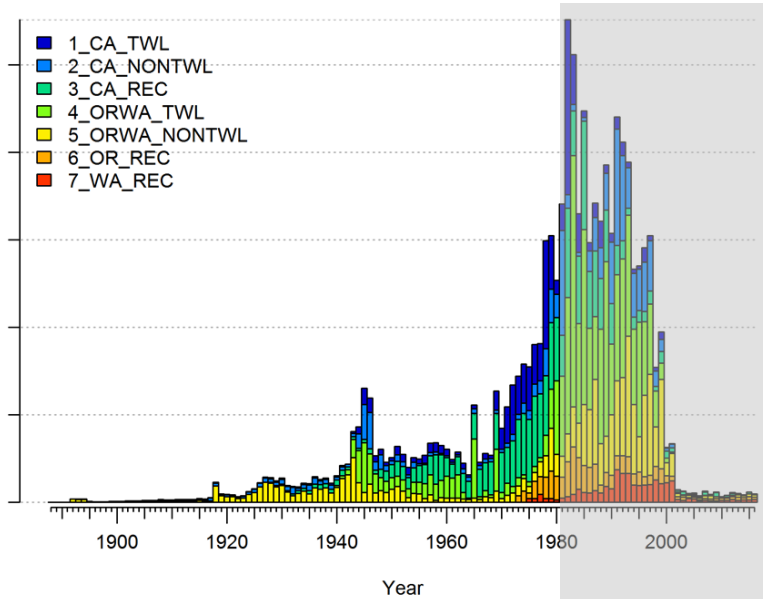
Widow rockfish catches





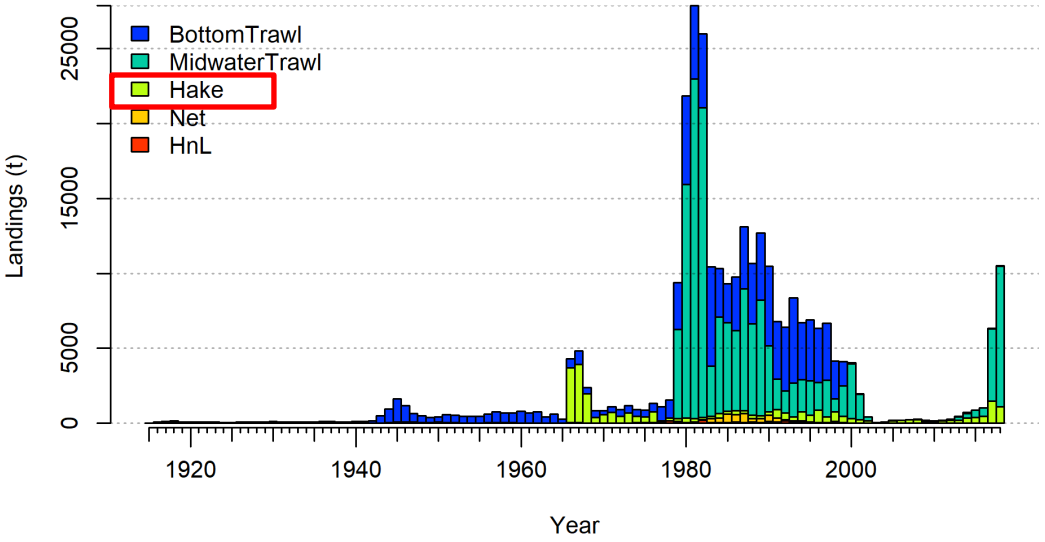
Sources of commercial landings data

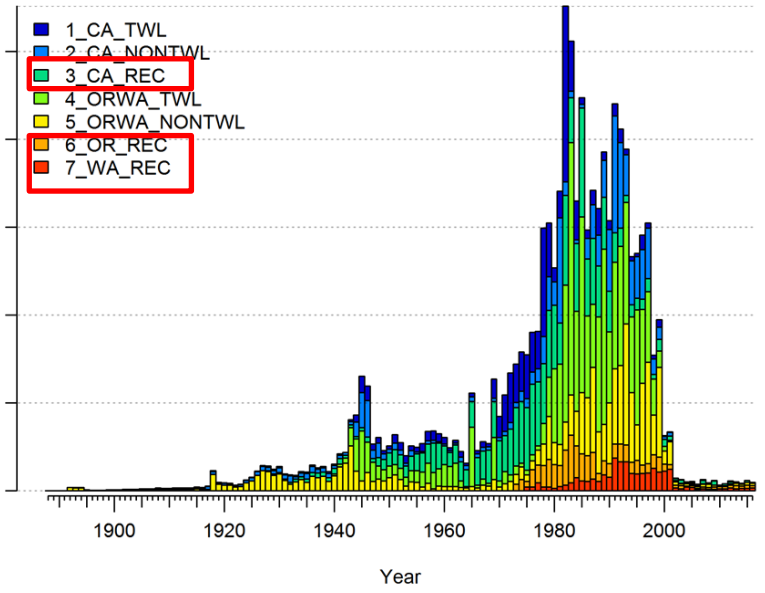




- **Recent period (1981 – present): Pacific Fisheries Information Network (PacFIN)**
- **Historical catch reconstructions have been conducted by state, and should obtained from individual state agencies (WDFW, ODFW and CDFW).**

Bycatch and recreational fishery sources

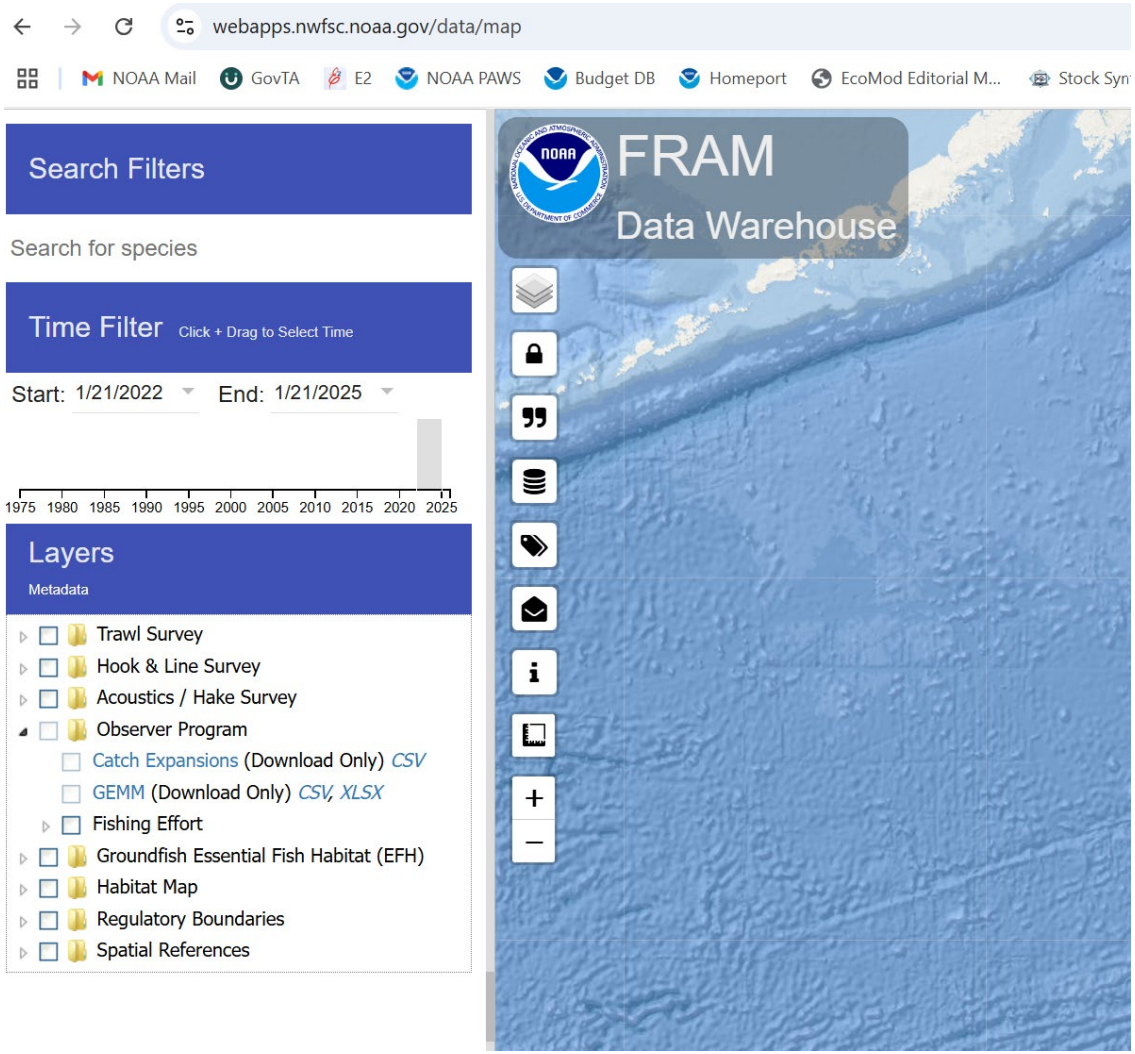




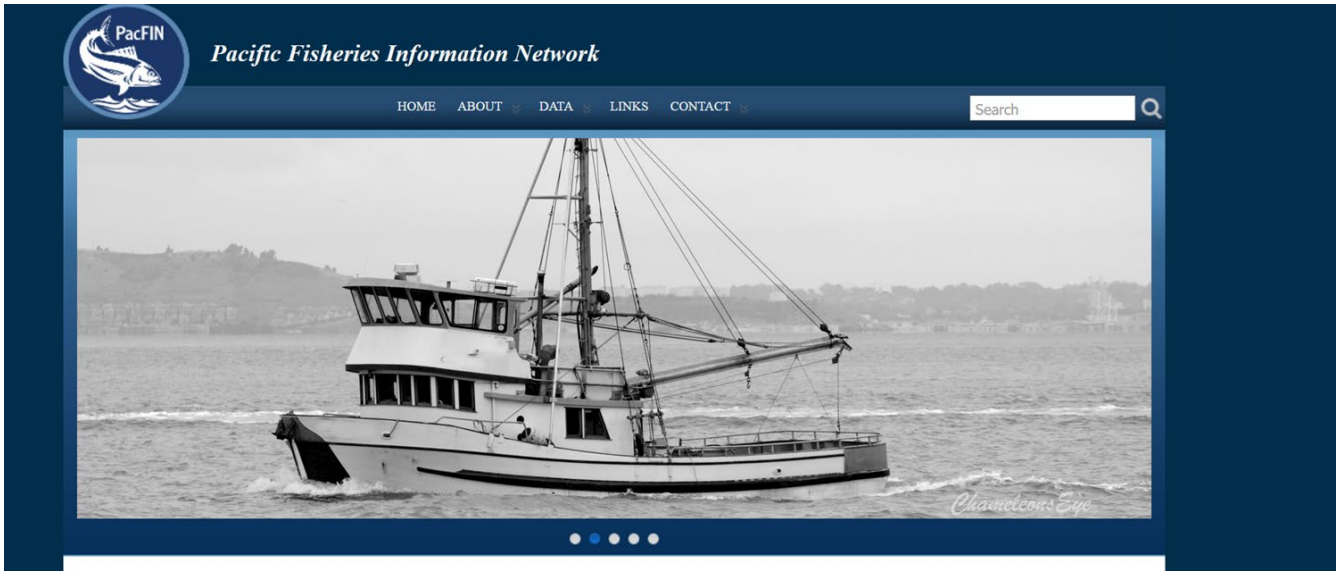
- **At-Sea Hake fishery – fully observed by ASHOP.**
- **Data to be requested.**

- **Recreational catches – Pacific Coast Recreational Fisheries Information Network (RecFIN)**

All catches by sources from 2002 forward are also available from GEMM



Accessing PacFIN data



- Request is submitted through “pacfintools” GitHub repository.
- Two files are provided – catch and biological data.

Navigating PacFIN catch data

- Plot landings by state, gear and fleet used in the previous assessment.
- PacFIN codes are on “pacfintools” GitHub page.
- Compare current landings with those in last assessments. Are they different? Why?
- While processing fishery data and aggregation level, keep in mind confidentiality rule (no finer than 3+ vessel aggregations).

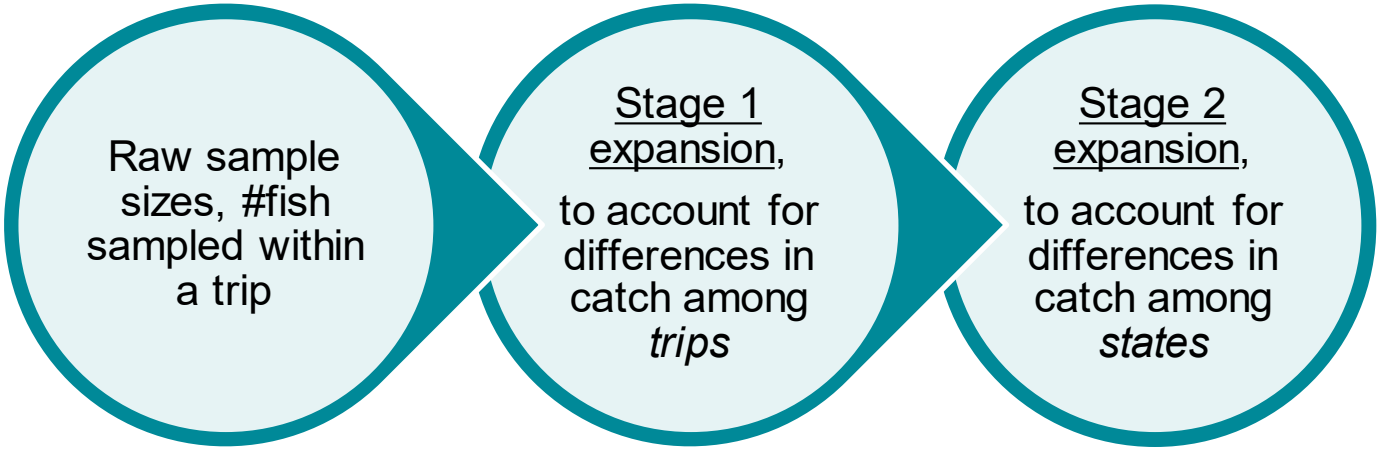
PacFIN biological data (BDS)

- Much more messy than catch file.
- Includes length, age, weight, maturity data for individual fish.
- State agencies have different sampling programs, report some elements differently.
- pacfintools – a set of functions we use to work up the commercial biological data to create comps in format needed for ss3 input file.

Processing PacFIN BDS data

- Fish size/age distributions are not uniform (ontogenetic movements, size/age specific distributions, etc.)
- Amount of catch varies by boat, area, etc.
- Fish numbers sampled for length/age within trip or state are not proportional to amount caught (usually set #fish per trip)
- To develop accurate length frequency distributions for assessment, we need to account for differences in catch among trips, and also among states.

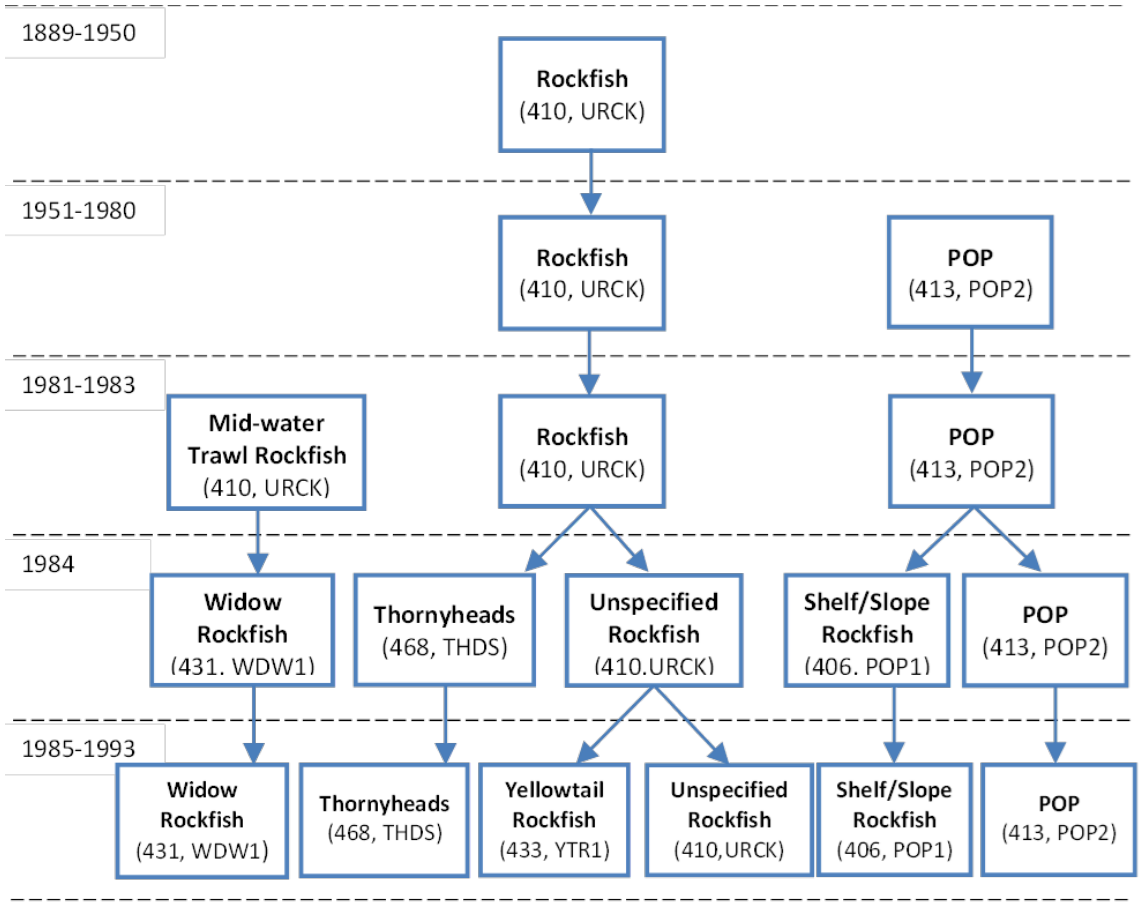
Processing PacFIN BDS data



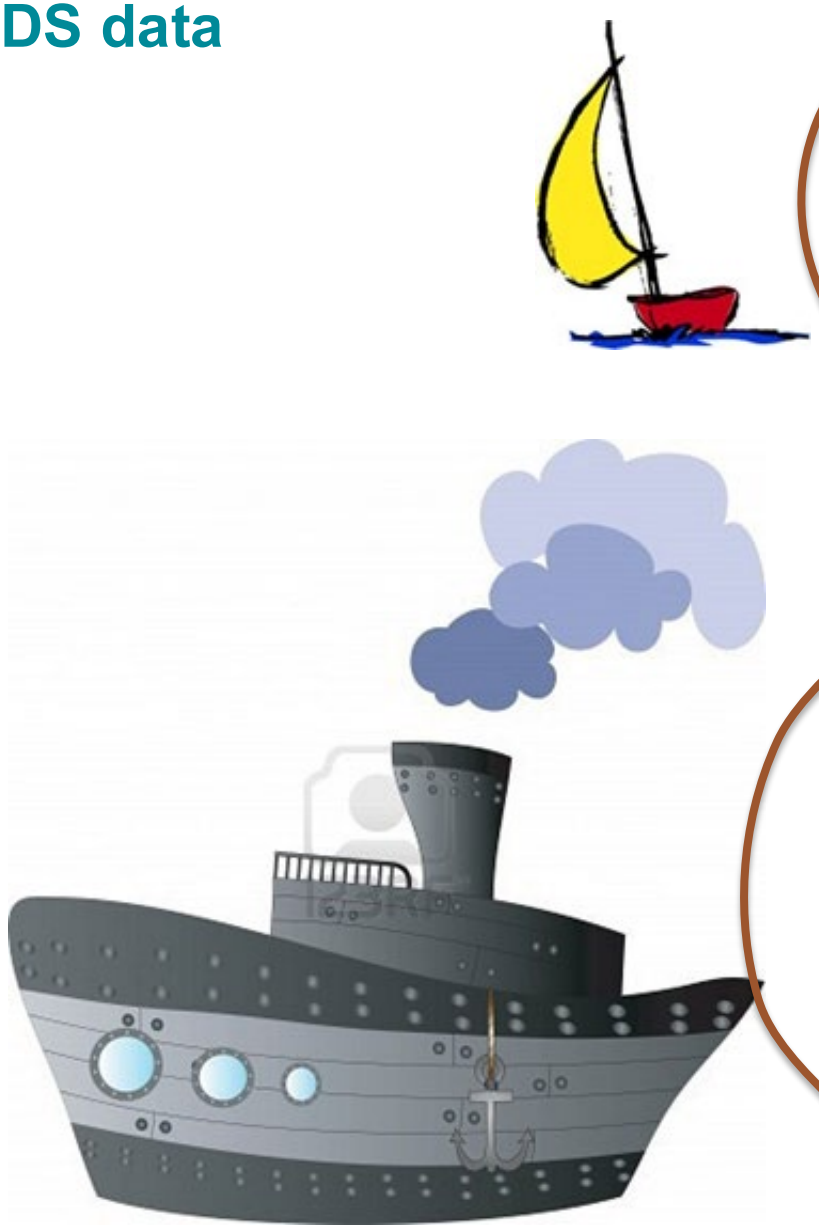
Process is similar to that of survey data, but in fishery-dependent data there are much more details to deal with.

Processing PacFIN BDS data

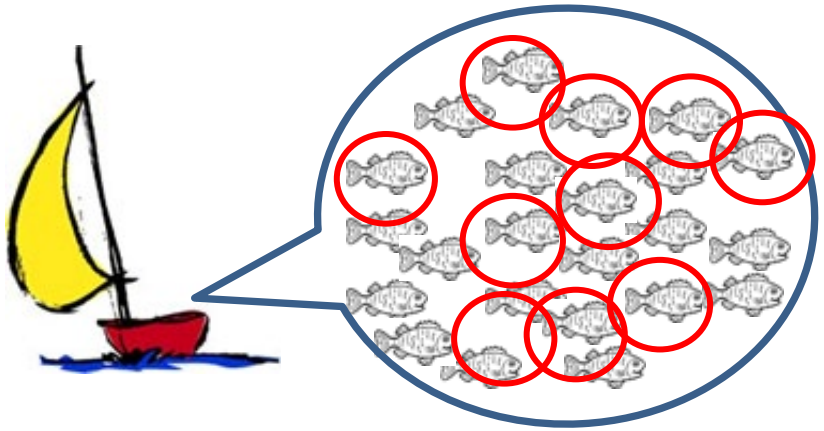
- Rockfish historically were landed in multi-species category
- This adds extra steps in compositional data expansion process

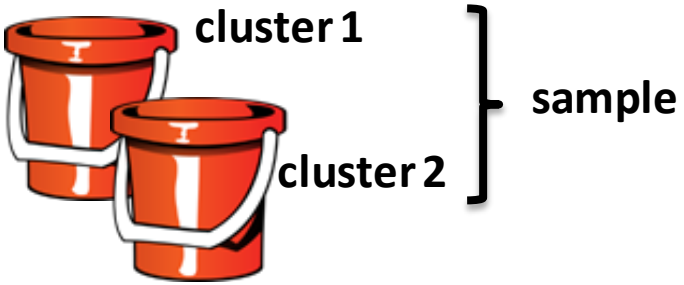


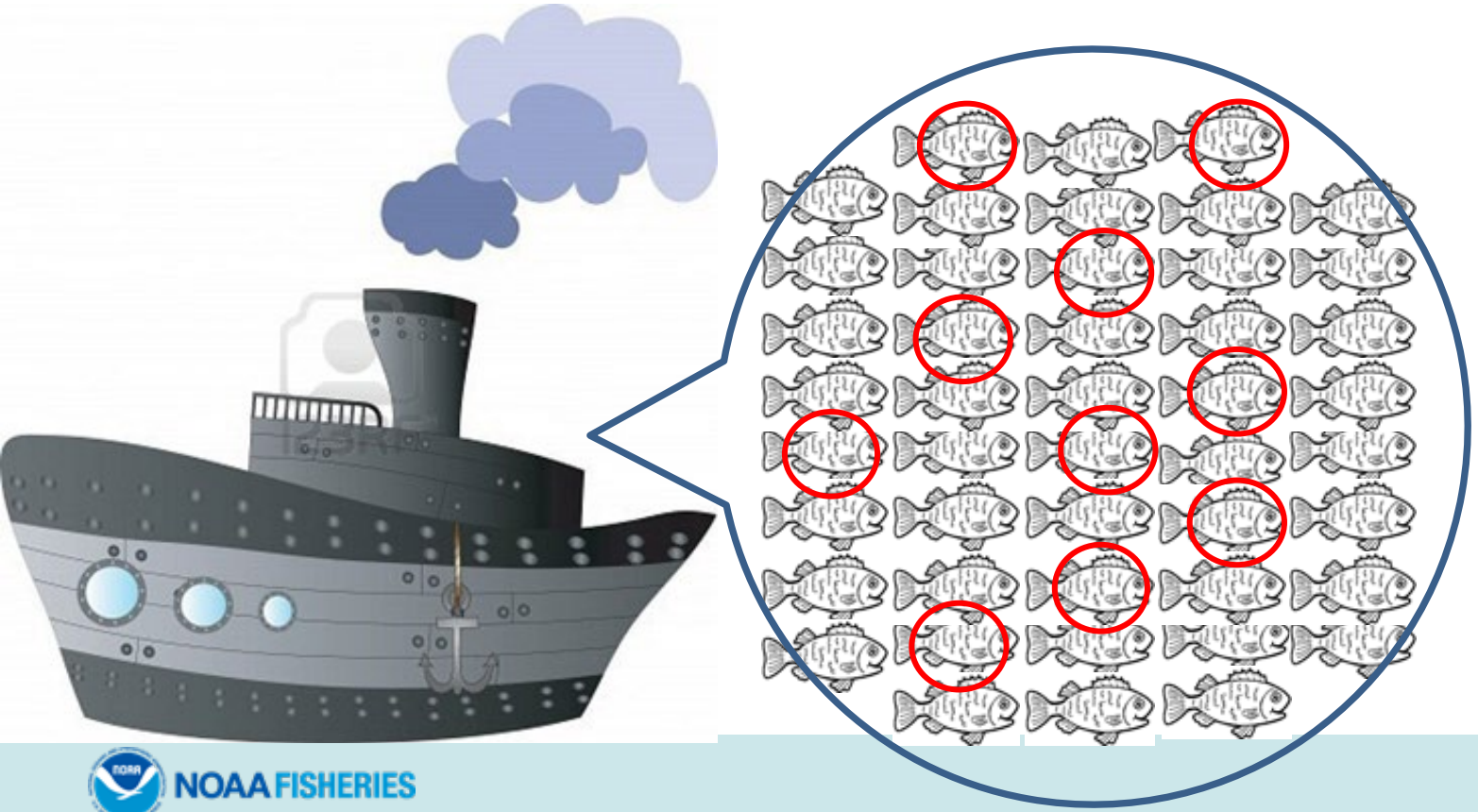
Expansion of PacFIN BDS data



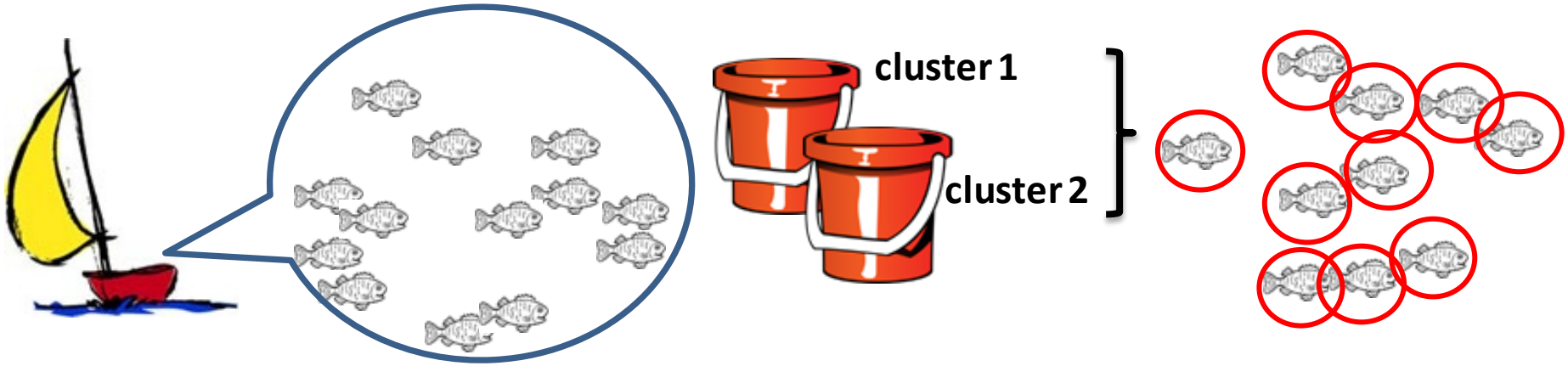
Single species market category







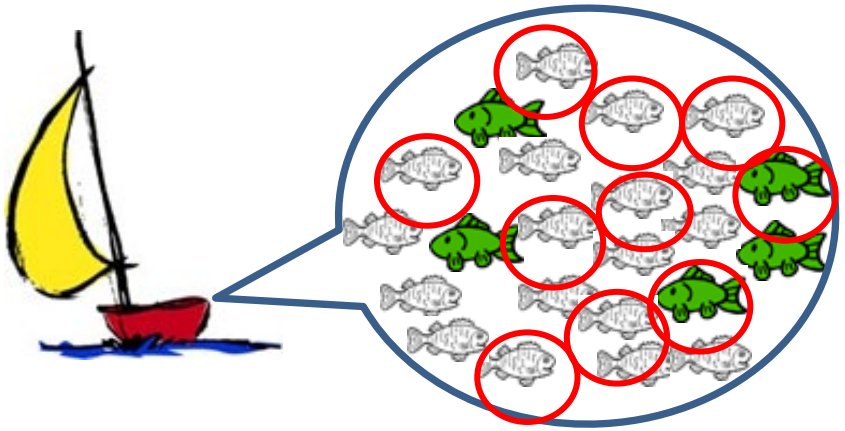
Single species market category

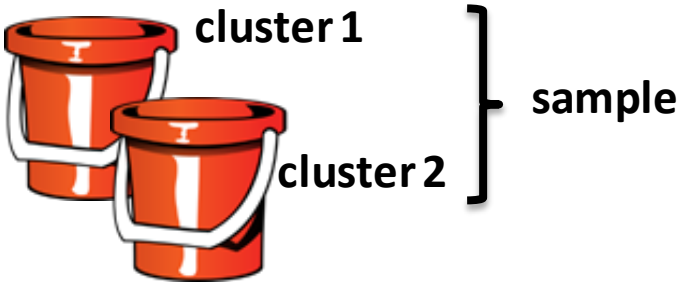


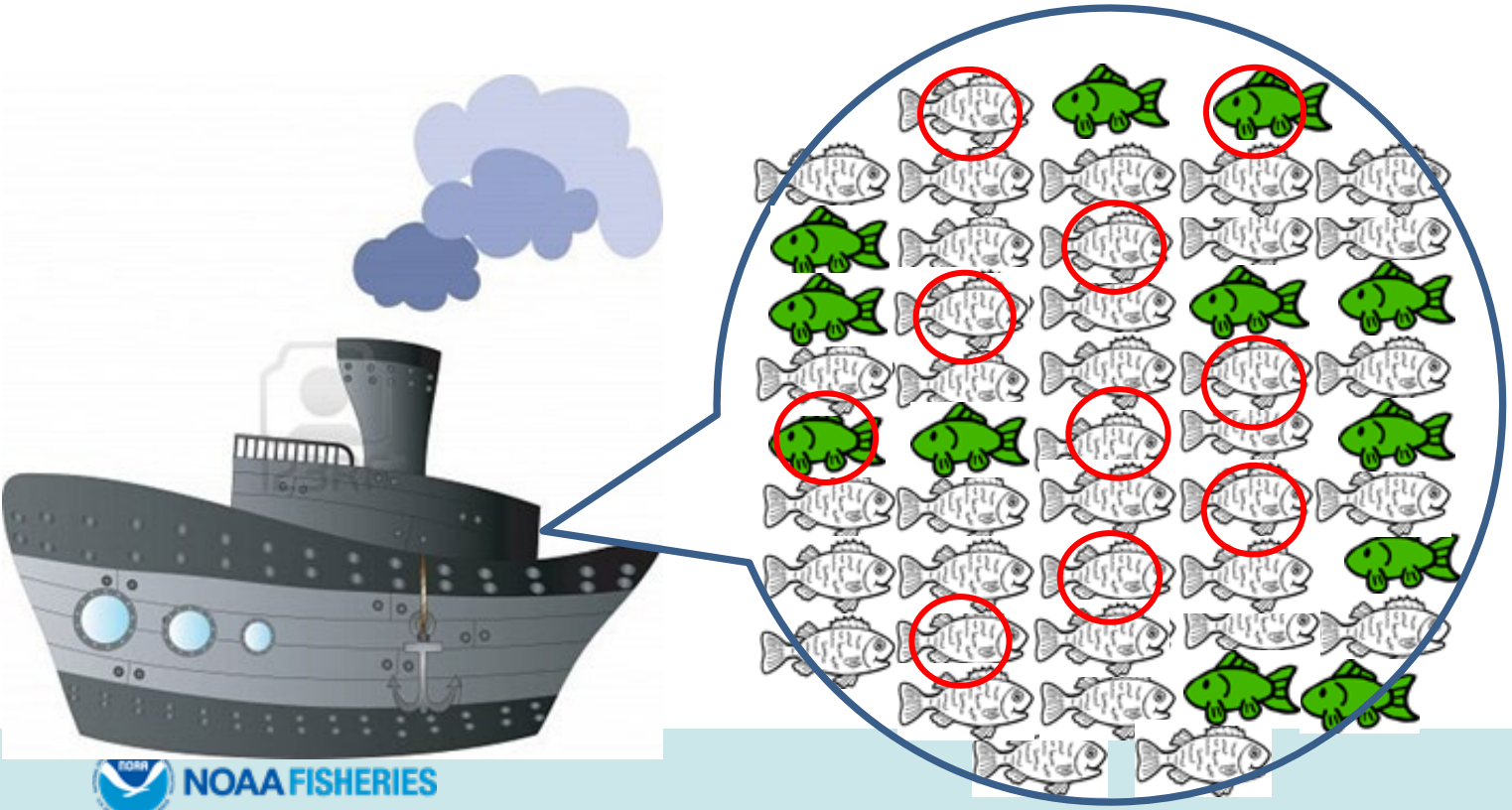
$$\text{Expansion factor 1} = \frac{\text{species(i) landed weight}}{\text{species(i) sampled weight}}$$

Fields in BDS file	
total_wgt	Total landed weight the market category
exp_weight	Use this when available instead of total_wgt
species_wgt	all fish of the same species in one cluster

Multi species market category







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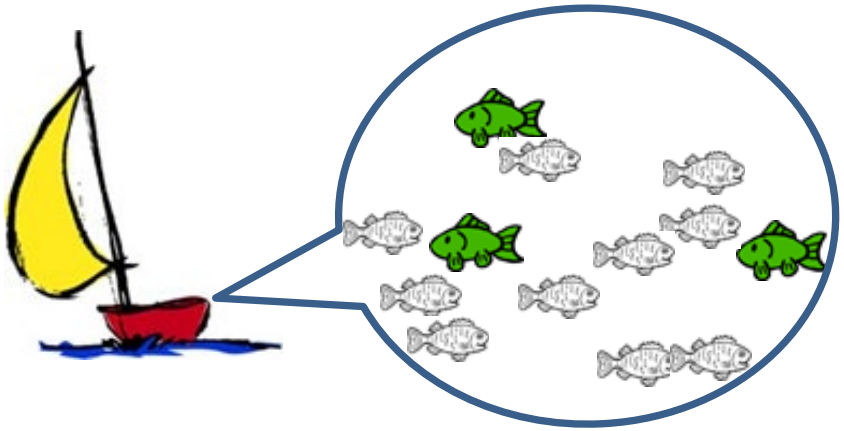
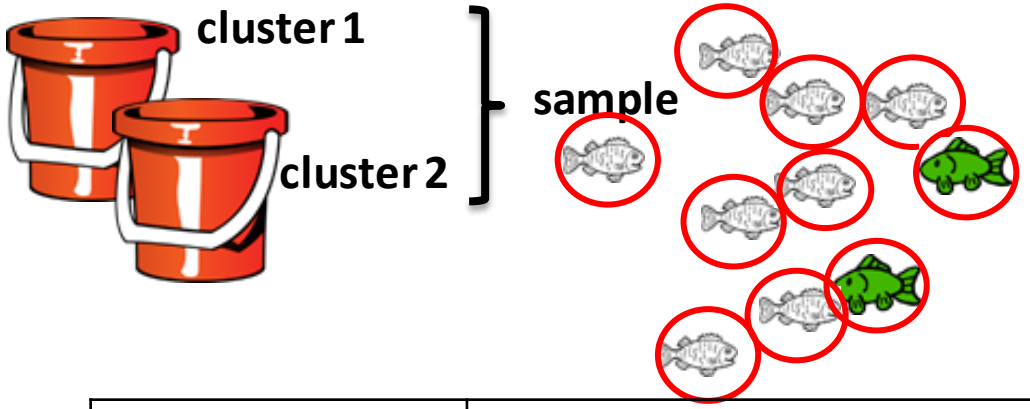


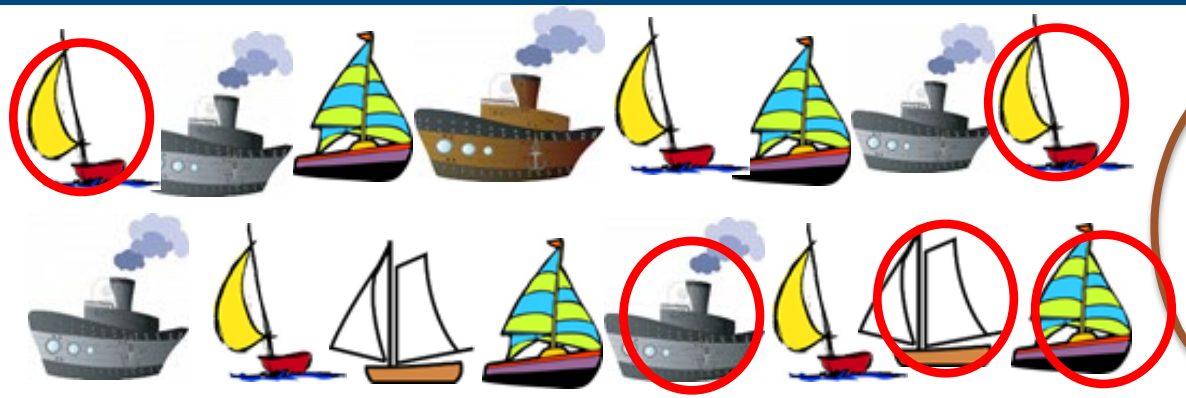


$$\%\ \text{species(i) in a sample} = \frac{\sum \text{species\_wgt}}{\text{all\_cluster\_sum}}$$

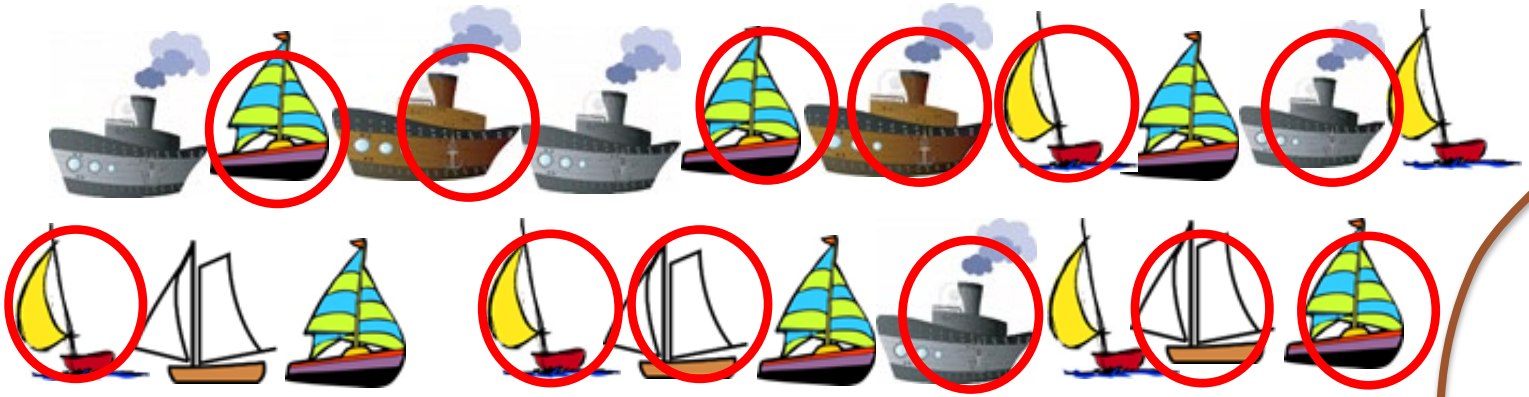
$$\text{species(i) landed weight} = \text{total\_wgt} \cdot \%\ \text{species in a sample}$$

$$\textbf{Expansion factor 1} = \frac{\textbf{species(i) landed weight}}{\textbf{species(i) sampled weight}}$$

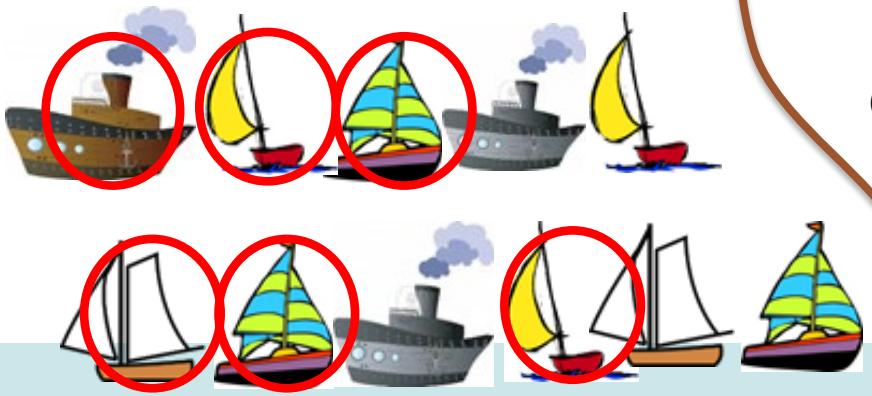
Fields in BDS file	
total_wgt	Total landed weight the market category
exp_weight	Use this when available instead of total_wgt
species_wgt	all fish of species (i) in one cluster
all_cluster_sum	weight of all species of the same market category in a sample



Washington

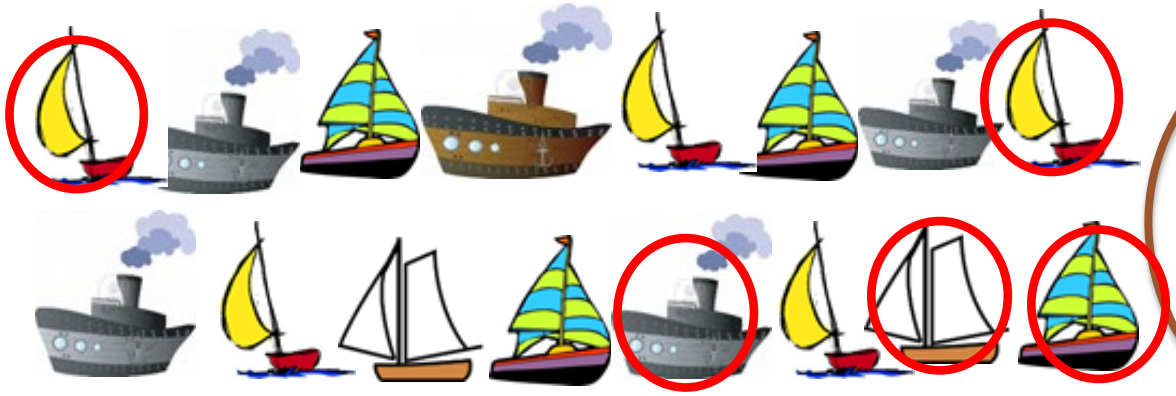


Oregon



California

NOAA FISHERIES

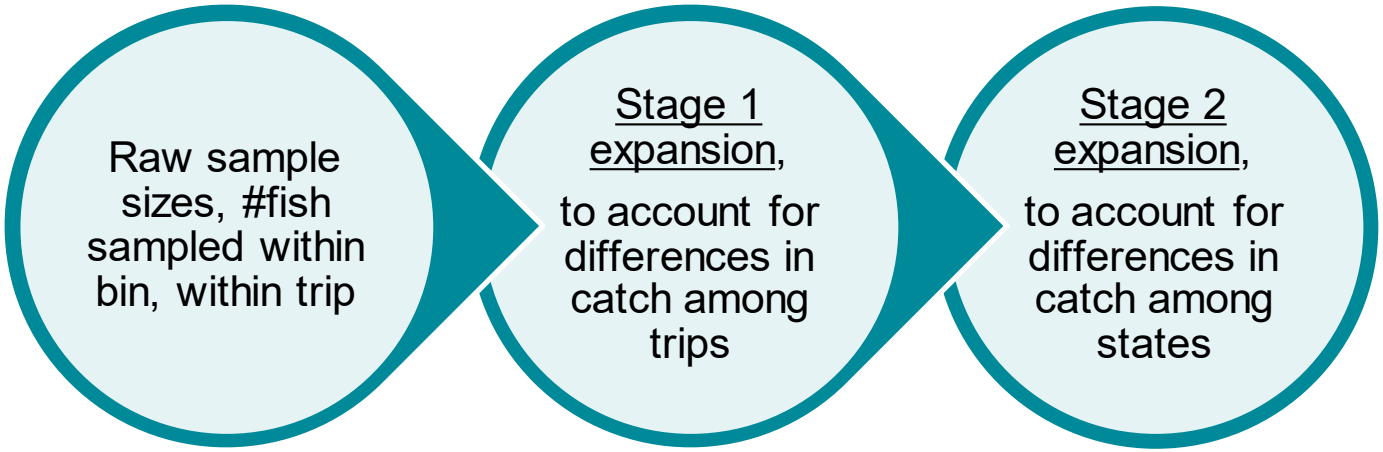


Washington

$$\text{Expansion factor}_2 = \frac{\text{Landed catch in each state}}{\text{Sampled catch in each state}}$$

Calculated for each state and each year

Putting everything together:



$$N_{b,y} = \sum_{s=1}^{s=k} \sum_{t=1}^{t=n} L_{b,t} \cdot \left(\frac{LC_t}{SC_t}\right) \cdot \left(\frac{LC_{s,y}}{SC_{s,y}}\right) \Bigg|_{\substack{b \in [1,2,\ldots 26] \\ y \in [1,2,\ldots n]}}$$

Summed within trip and state

Expanded #fish

Raw number of fish sampled

Expansion factor 1

Expansion factor 2

By bin, and year

What pacfintools does:

- filters the raw data stored in PacFIN, removes unusable records, samples from areas not included in the assessment, etc.
- expands samples taken from a sample to the trip, and then to state level catch,
- Formats compositions, in the format needed for ss3 data file.
- Calculates year-specific input sample sizes based on #trip and #fish.

Switch to pacfintools page on GitHub

https://github.com/pfmc-assessments/pacfintools