

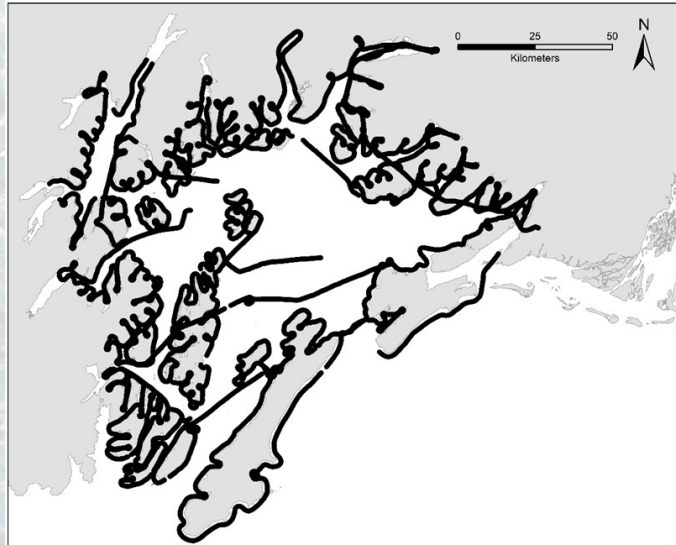
1



2

## Methods

- Coastline flown
- 1000 ft
- Identify species, school size, age of herring
- Majority of fish observed are juvenile (age-1) herring, then sand lance, adult herring, and occasionally capelin.
- PWSRCAC sponsored work supplemented previous efforts



3

## Validation

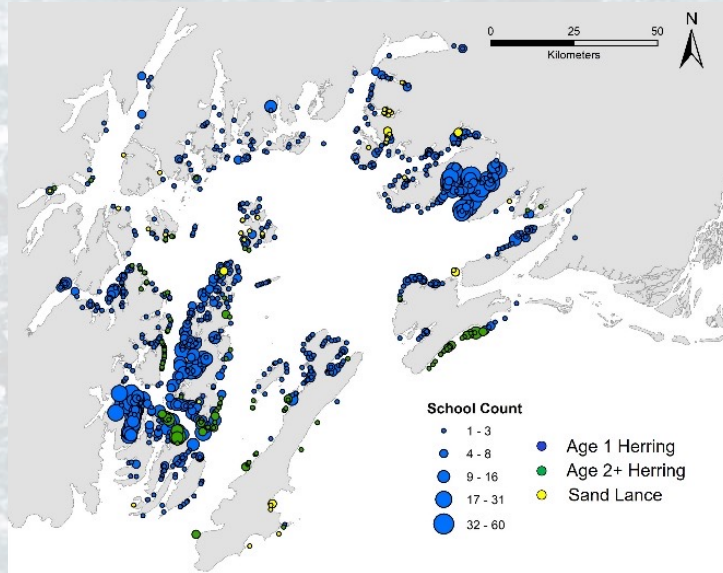
- Correctly identify
  - Herring 90-95%
  - Sand lance 74-85%
  - Herring age 75-90%
  - Range based on three different interpretations of the same data
  - How to interpret mixed schools and age-0 fish



4

## Results

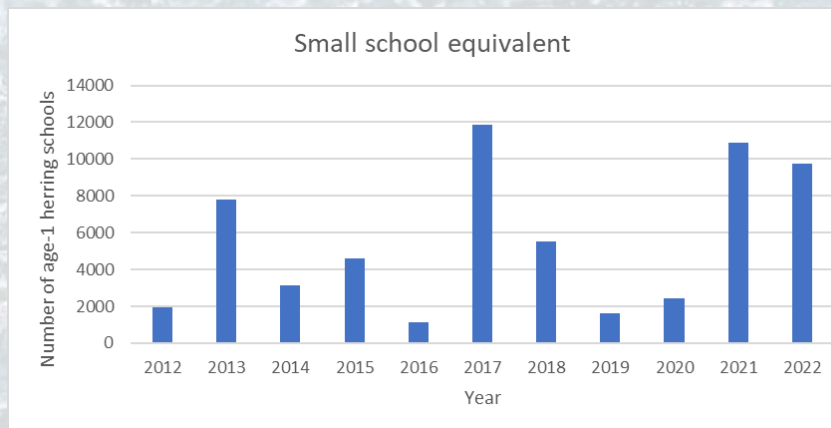
- Large number age-1 herring in 2022
- Unusually clear weather at beginning of survey
  - May bias results high



5

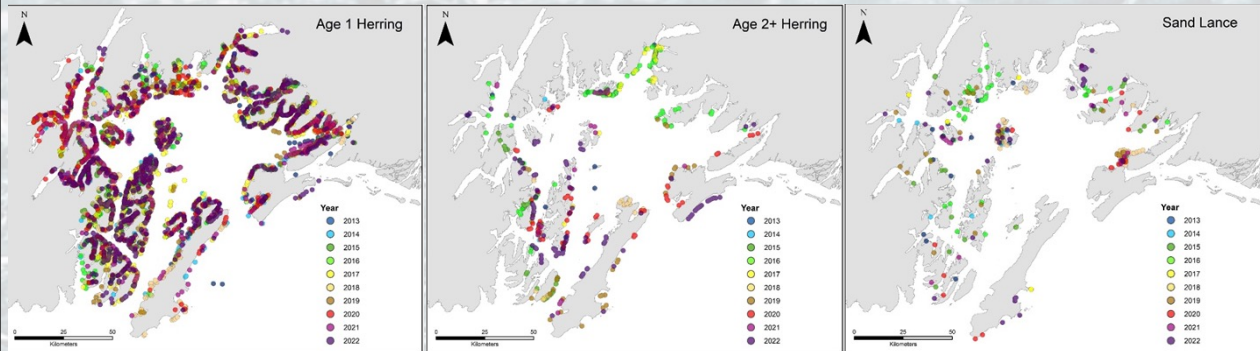
## Results

- Corrected for the school size
- Expecting larger year class joining the spawning biomass in 2023



6

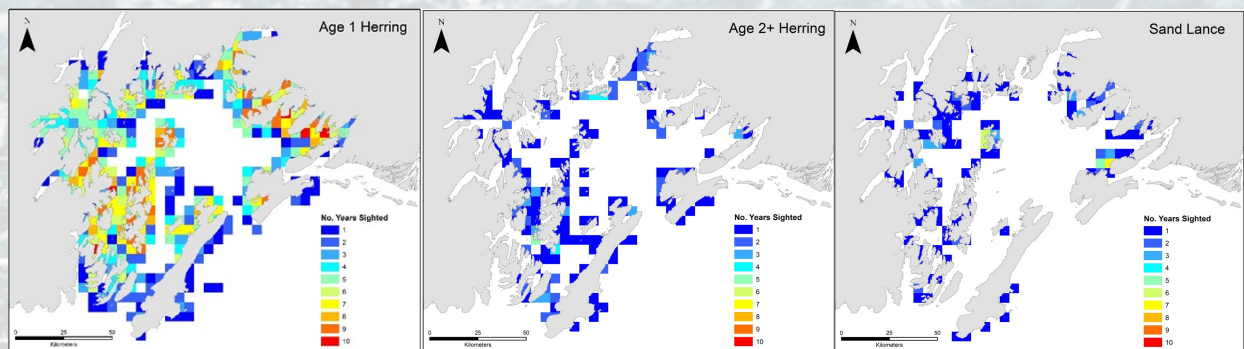
## Results



- 10 years of data
- Juvenile herring everywhere
- Sand lance more concentrated

7

## Results

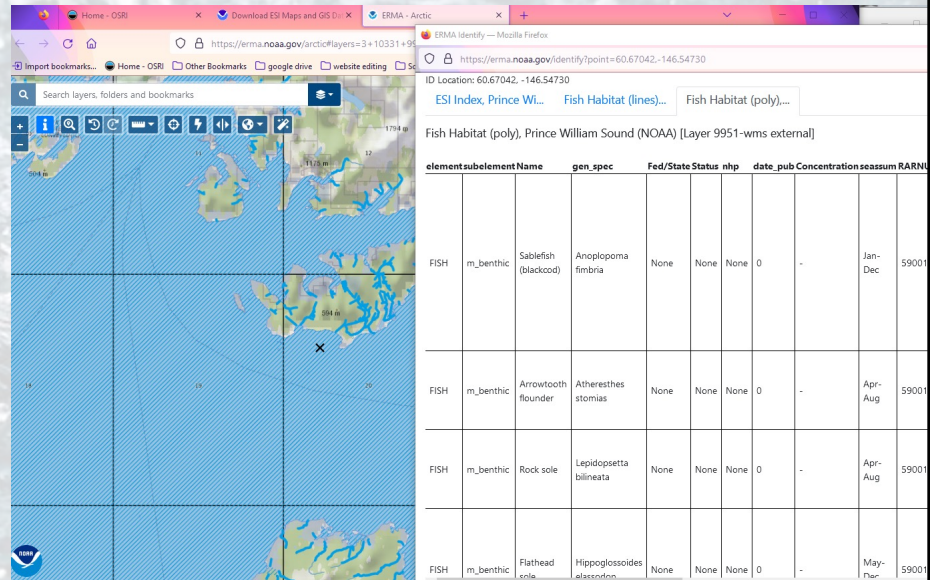


- Persistence
  - Juvenile herring near spawning and along water circulation
  - Adult herring and sand lance in a few areas

8

## Recommendations

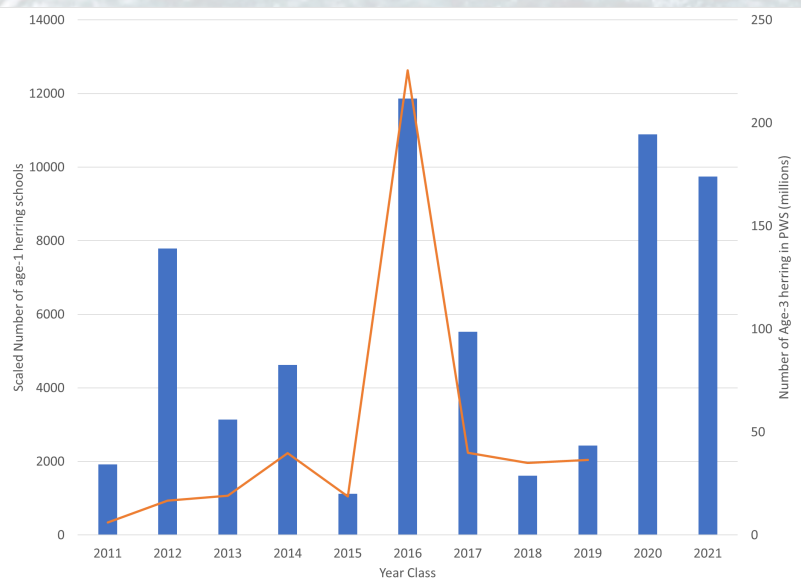
- Update ESI data layers
- 1988 year class of age-1



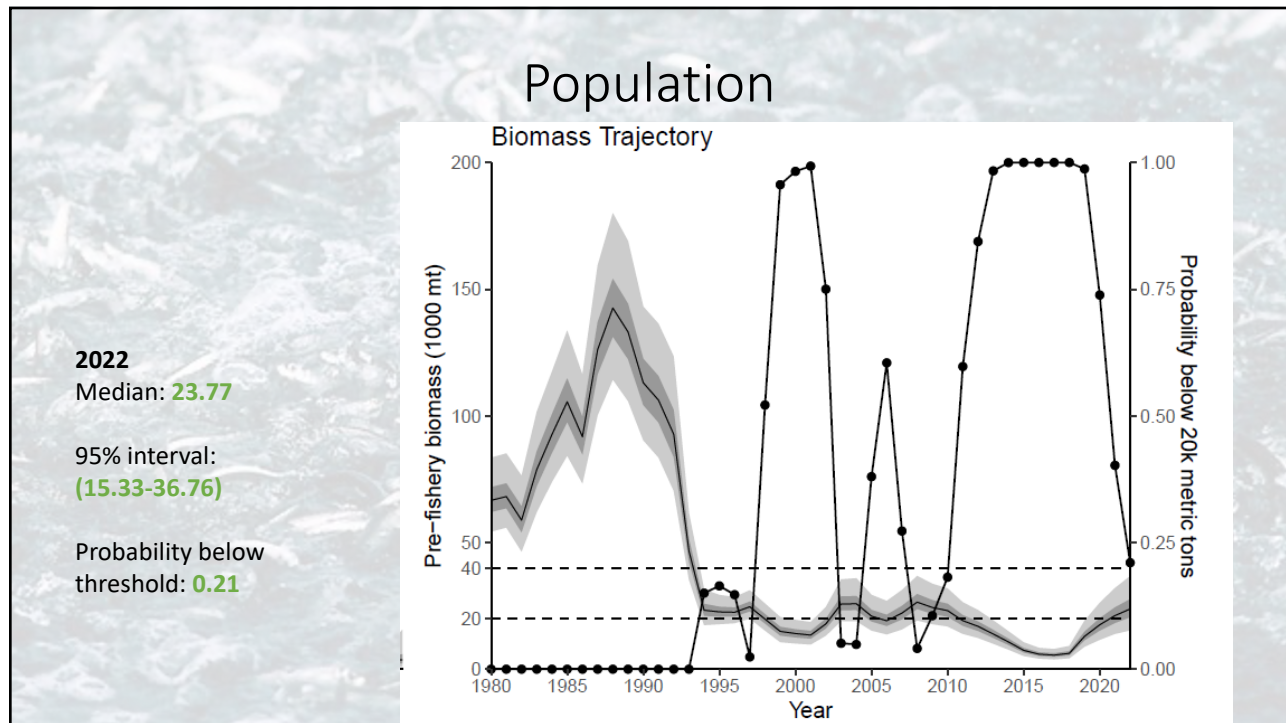
9

## Prediction

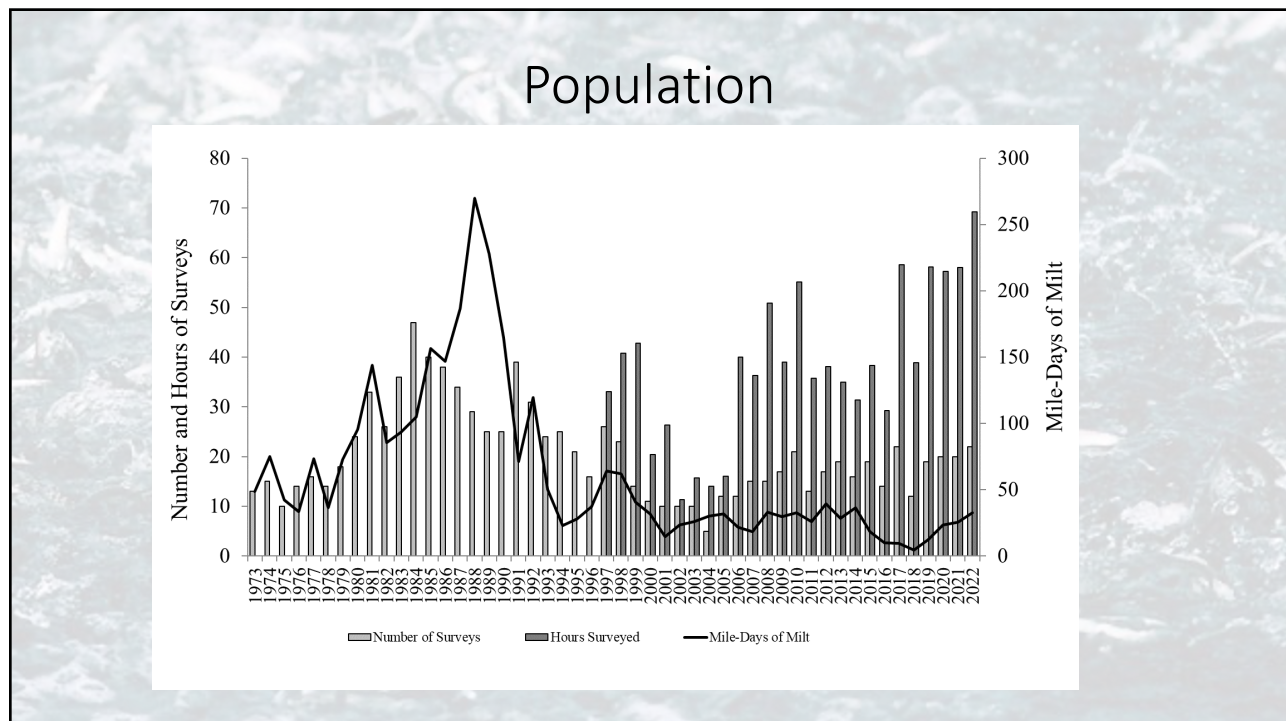
- Rank order
- 2012
- 2<sup>nd</sup> largest since 2011



10



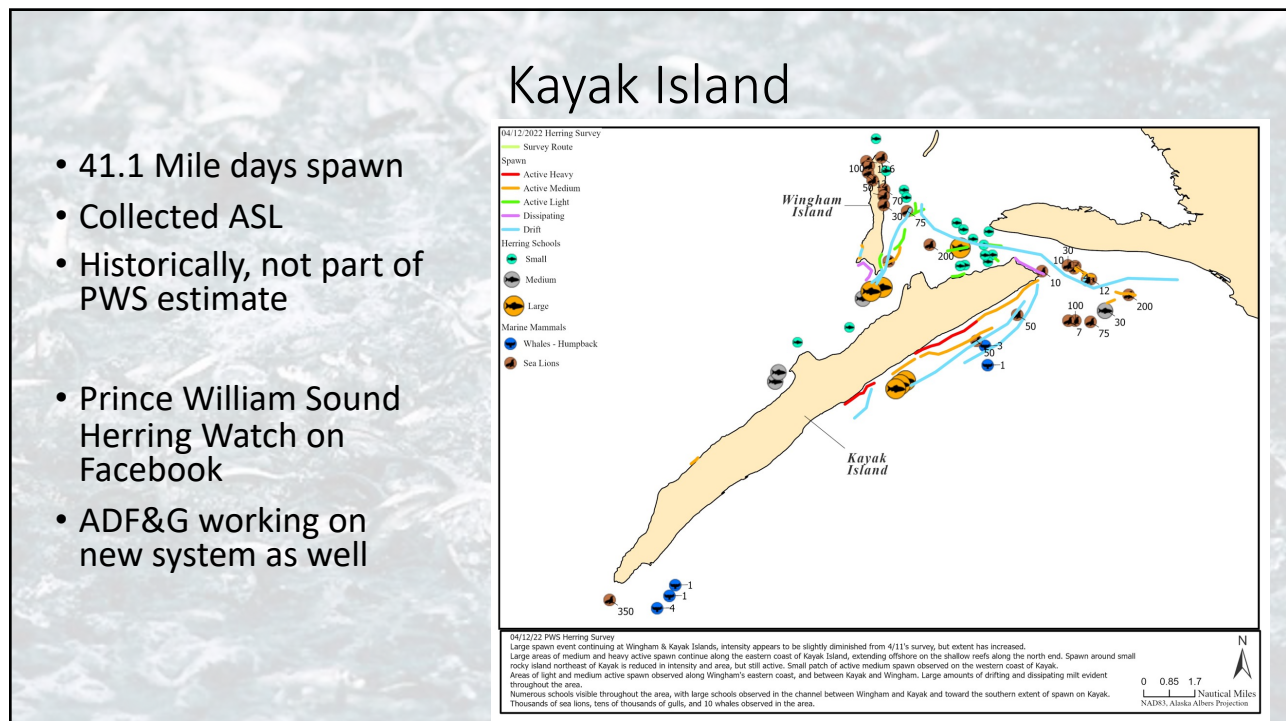
11



12

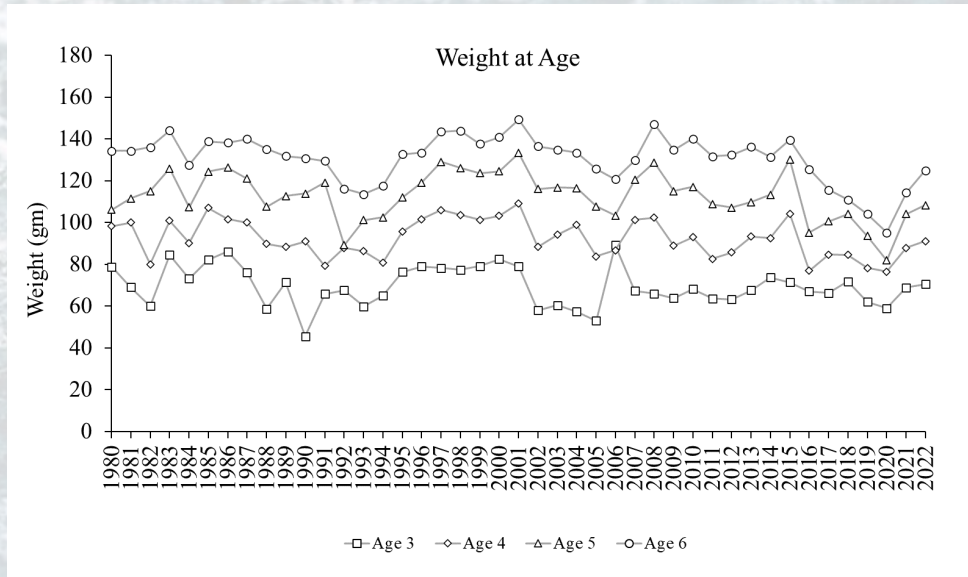


13



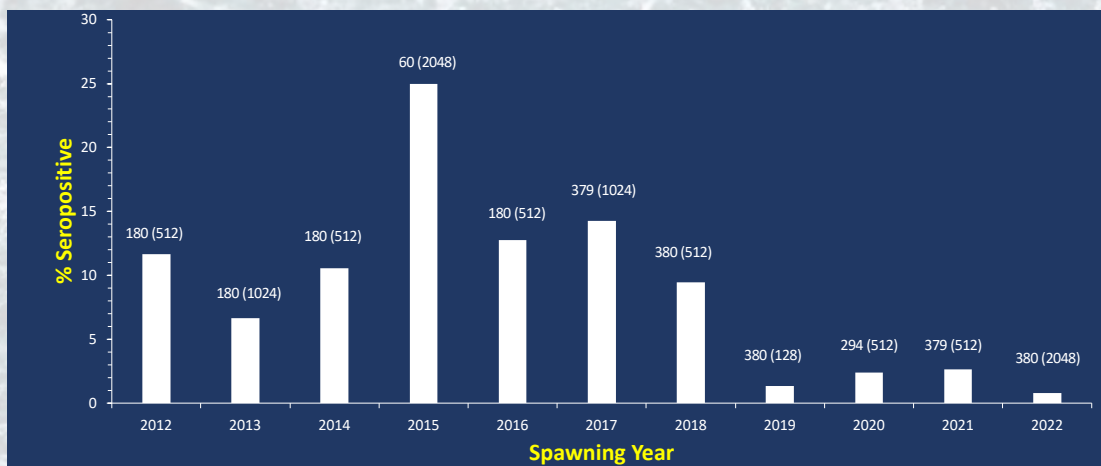
14

## Condition



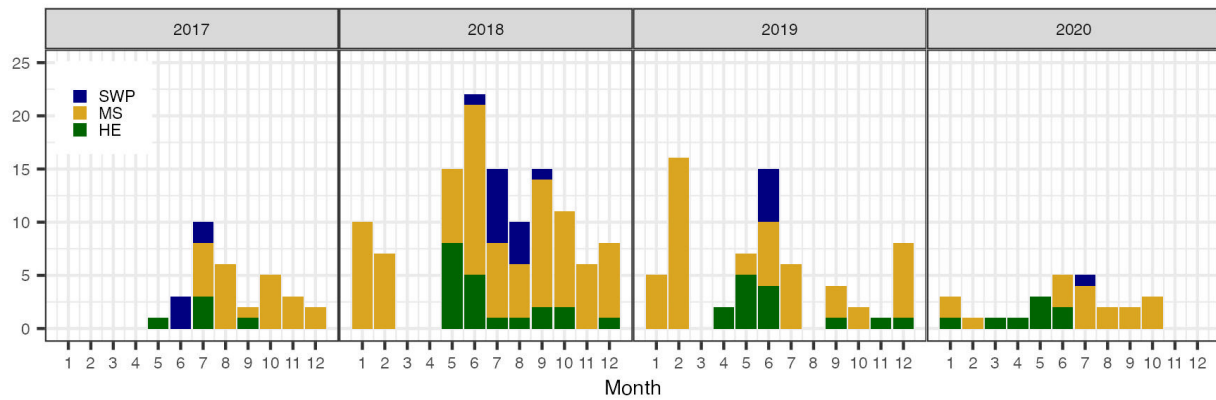
15

## VHSV seropositive



16

## Tagging

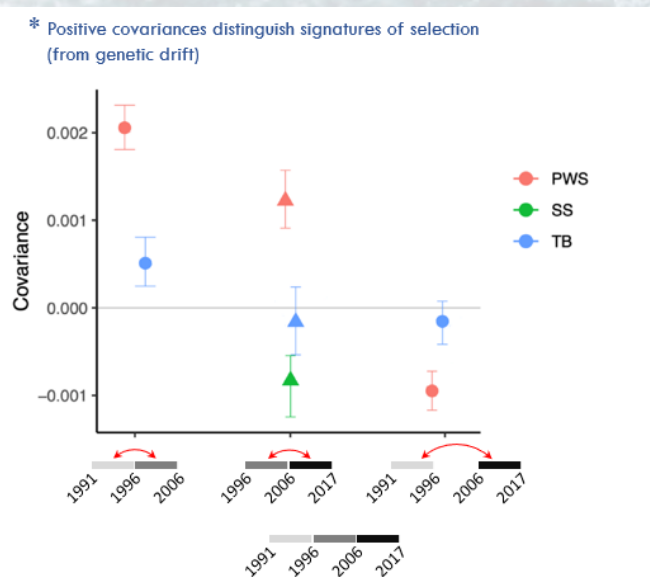


- Returns to PWS

17

## Genetics

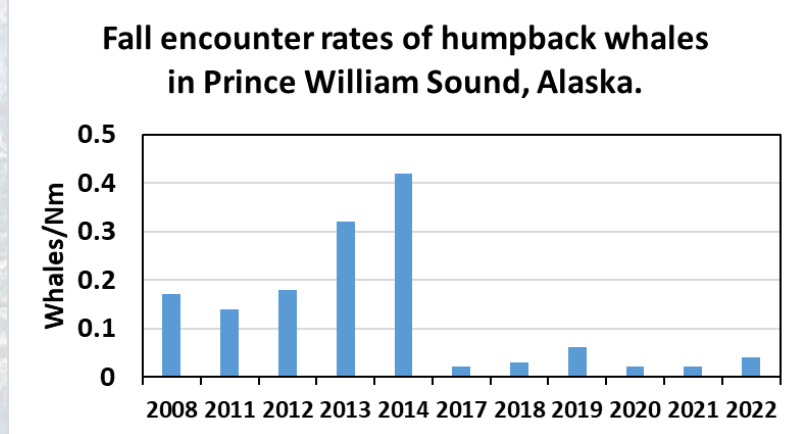
- Many aspects to the work
- Looking for genetic changes related to oil exposure
- Only PWS shows footprint of polygenic selection through time



18

## Whales

- Whale numbers took a dramatic drop after 2014
- Range of estimates and error bars are very large
- Number seen by the aerial survey up in 2022



19

## Future

- Modeling
  - Examining alternate control rules
- ADF&G surveys
- Disease
- Interactions with salmon
- Pollock and groundfish

20