S4: Comparison of methods for assessment of small pelagic fish populations

#### **Convenors:**

Miguel Bernal (FAO, General Fisheries Commission for the Mediterranean )

Jennifer Boldt (Department of Fisheries and Oceans, Canada)

Momoko Ichinokawa (National Research Institute of Fisheries Science, FRA, Japan)

Reidar Toresen (Institute of Marine Research, Norway)



#### International Symposium

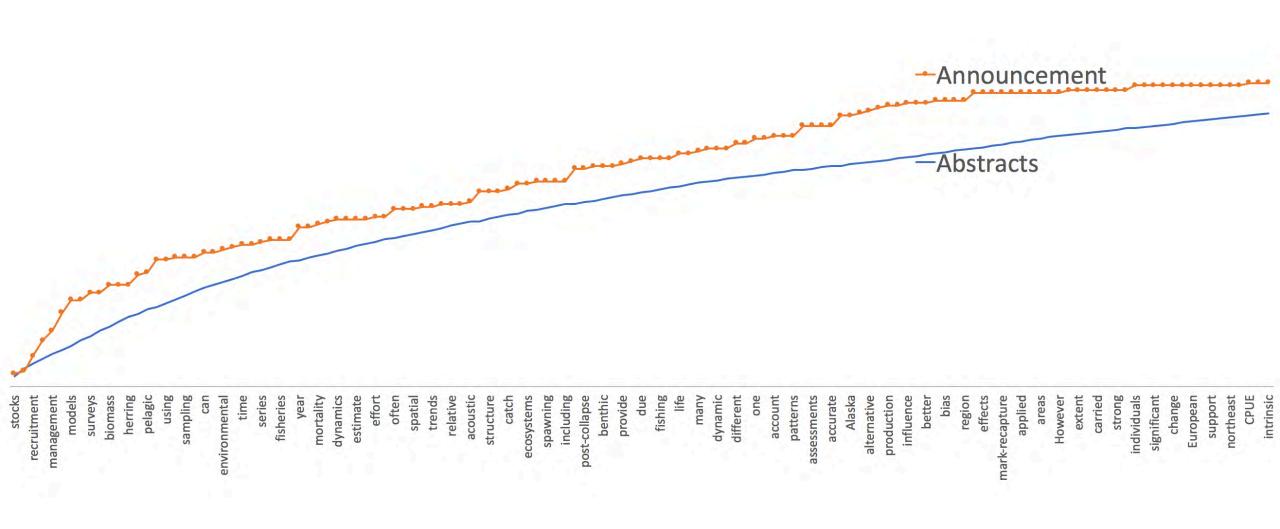
Victoria, BC, Canada March 6-11, 2017

Drivers of dynamics of small pelagic fish resources

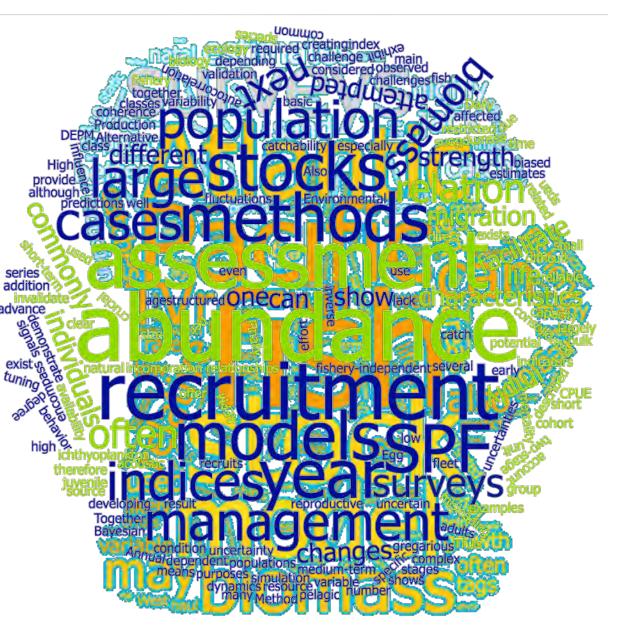


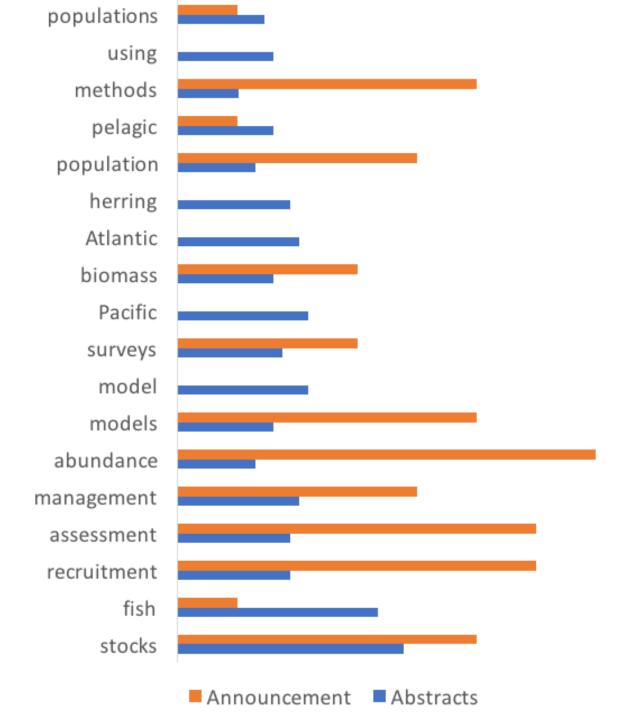






#### S4 Words words







## Summary

Herring

Menhaden

Anchovy (EU)

Sand lance biology

Sardine habitat

Innovative sampling

Jack mackerel Intl mgt

#### Presentations

4

2

1

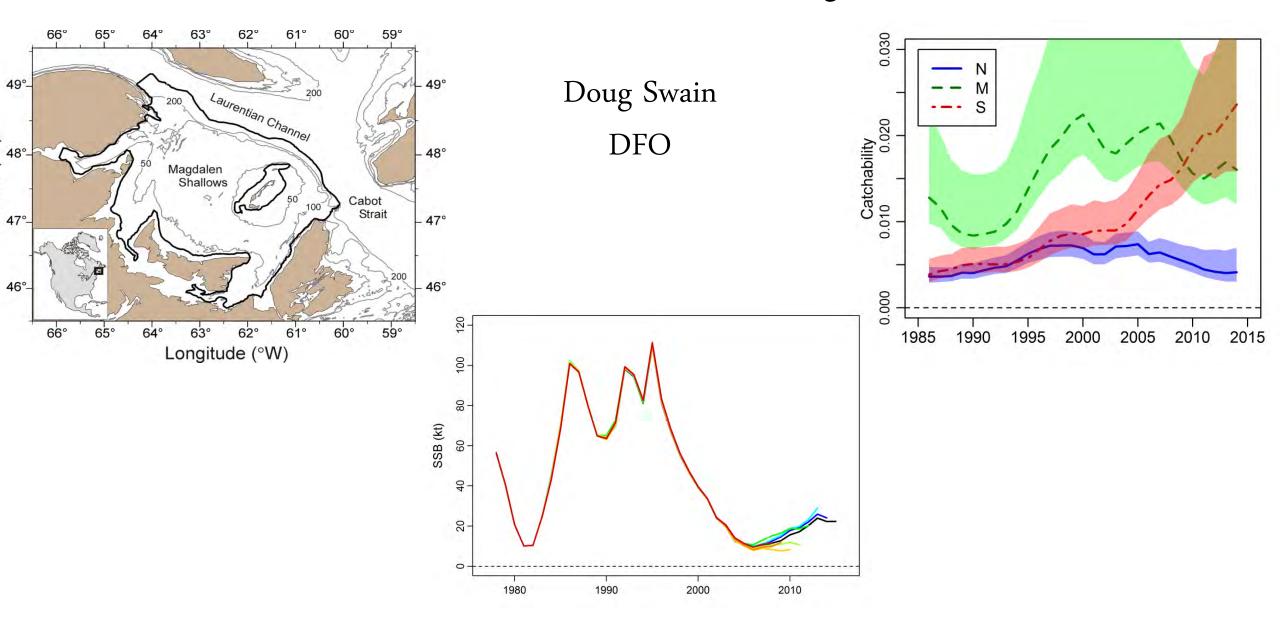
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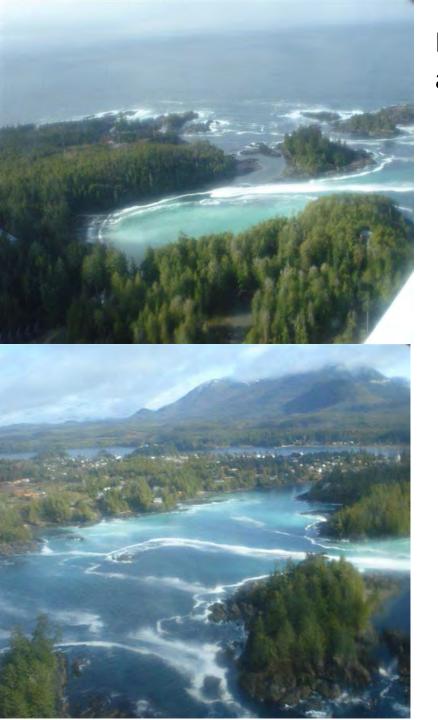
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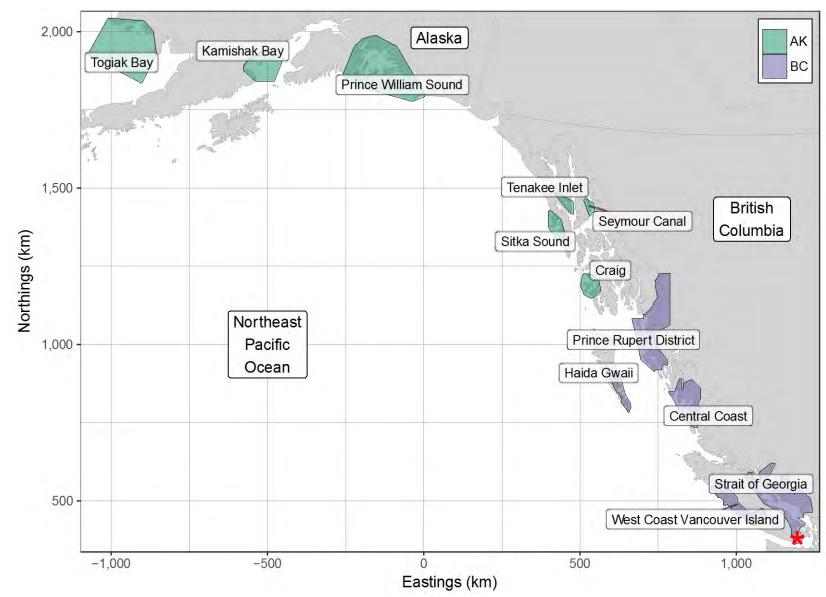


## S. Gulf of St. Lawrence herring

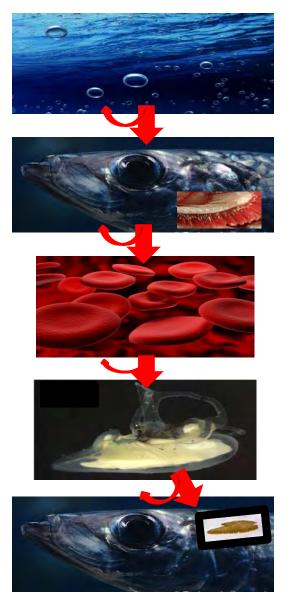




Pacific herring stocks in the northeast Pacific Ocean that are assessed with age-structured assessment models

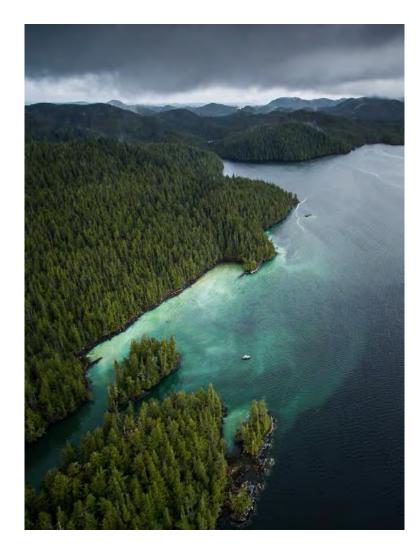


# E. Pacific herring otolith chemistry and population structure Wade smith



- Environmental variation at multiple spatial scales
- Otolith composition ID spawning groups at regional and local scales





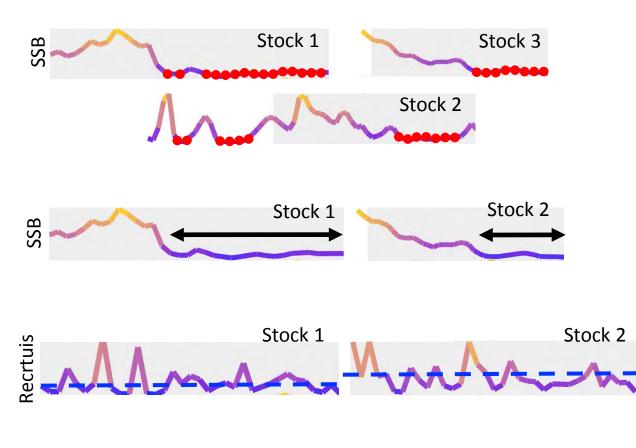
## Insights into the dynamics of Atlantic and Pacific herring following population collapse

### John Trochta

Univ. Washington

RECOVER WHEN?



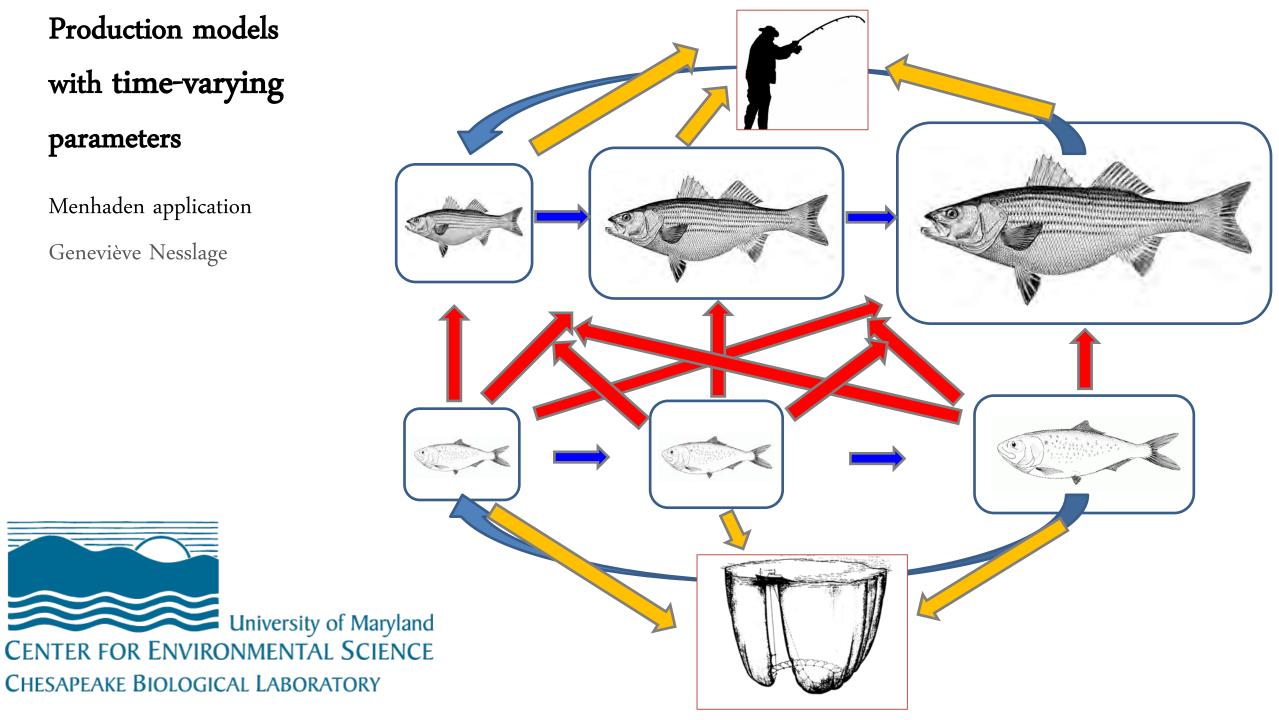




## Production models with time-varying parameters

Menhaden application

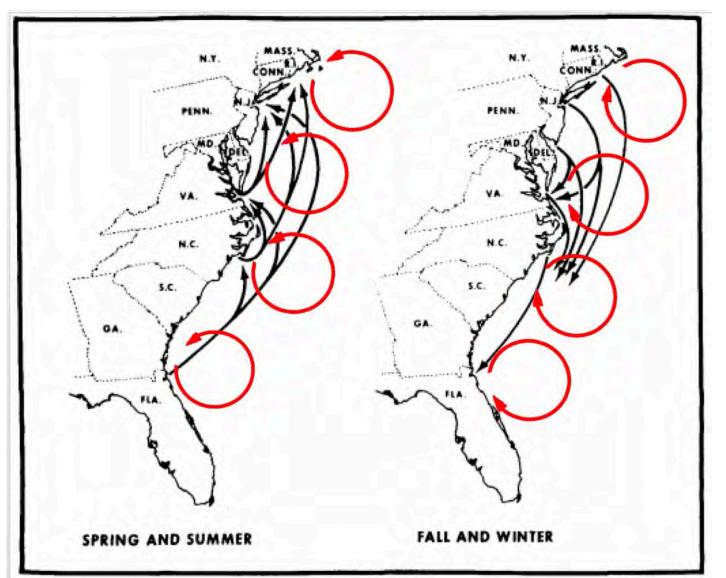
Geneviève Nesslage



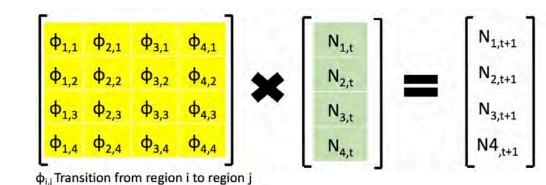
### Atlantic menhaden movement

Emily Liljestrand



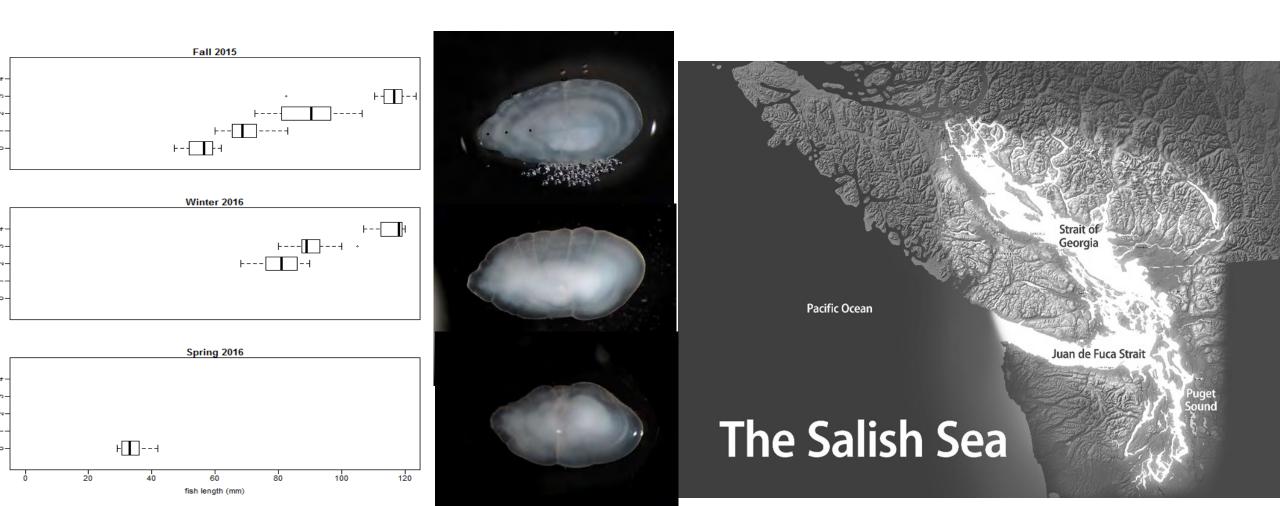


- Estimated migration and mortality of adult
- Atlantic menhaden with data from a largescale markrecapture study
- Monthly time step



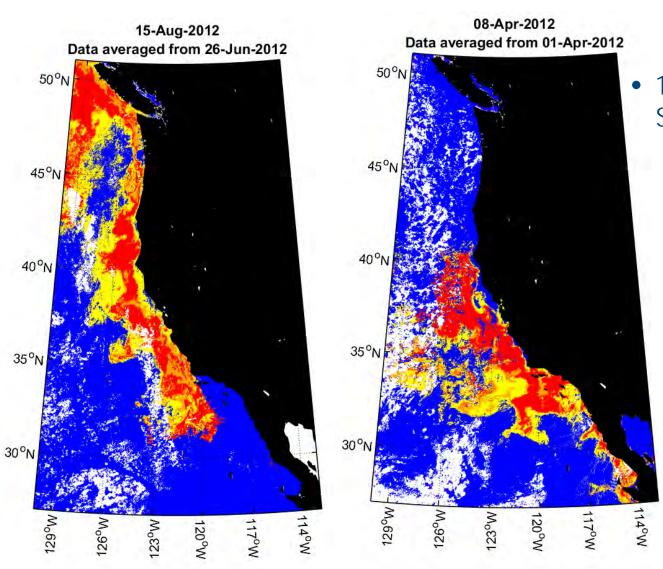
# Pacific sand lance: assessment of benthic habitat, population structure, distribution and response to environment

Matt Baker

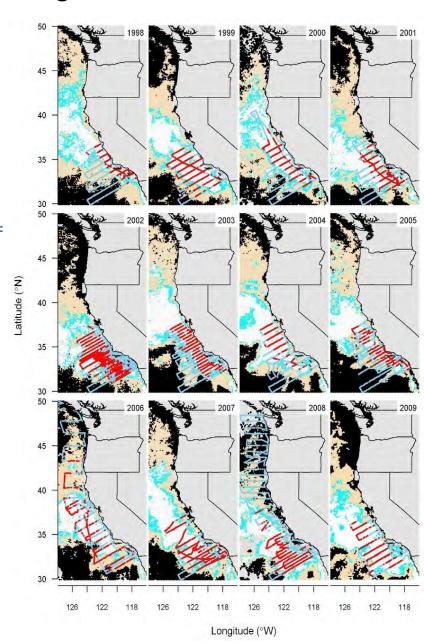


## Sardine habitat modeling for survey planning





- 12 years of CUFES Surveys
  - Egg presence = adult proxy
  - Satellite based
  - Gam



## Direct surveys and assessment of the Bay of Biscay anchovy and management advice

Guillermo Boyra, Andres Uriarte

- BIOMAN DEPM, PELGAS acoustics
- TAC Calendar changes to match fishery timing
- Bayesian approach accounting for uncertainty in M etc
- New recruit survey on juveniles
  - TAC schedule back to normal calendar

A Guide to Making Your Science Matter

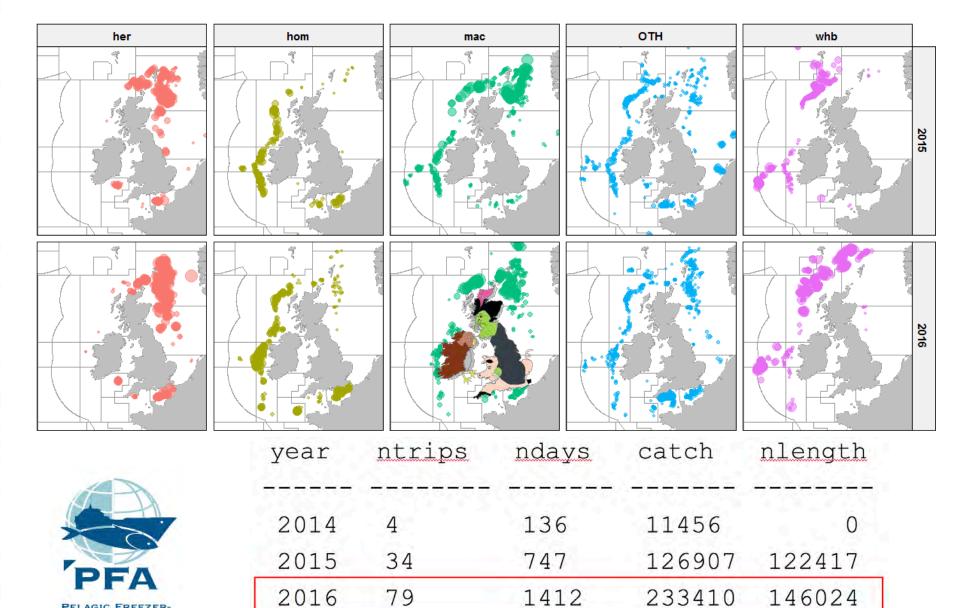
# ESCAPE from the

Foreword by Donald Kennedy

Nancy Baron

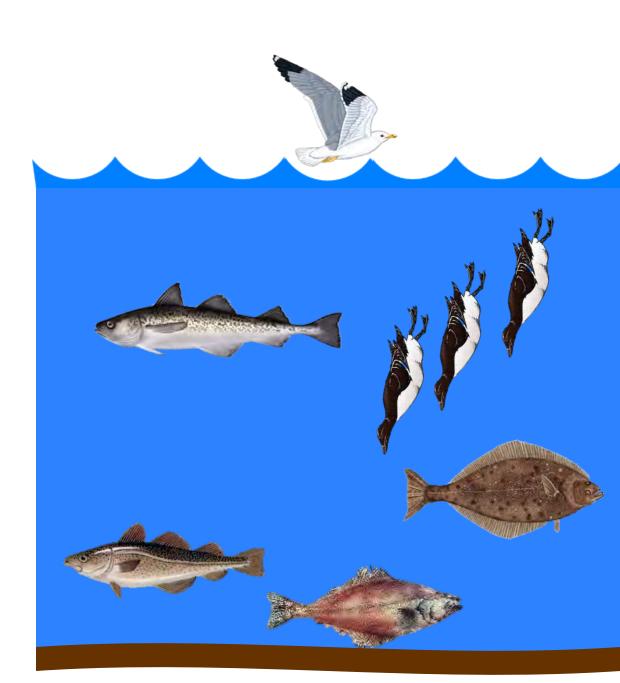
## Self sampling insights

Martin Pastoors



Using alternative samplers to analyze forage fish trends in the Gulf of Alaska Stephani Zador

• Innovative ways to evaluate difficult to survey species...



## Jack mackerel management in SPRFMO Area

#### Points covered

- 1. Big area, important fisheries
- 2. Complex organizational task to create a Commission
- 3. Science endeavor to manage the region's fisheries

