Apr 30th, 1:30 PM - 3:00 PM

Temporal and spatial variation in springtime ichthyoplankton assemblages in Puget Sound: the search for an ecological baseline

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Photos by Alan Lovewell & Alicia Godersky

Benefits of larval studies

- Enables sampling of communities vs. particular habitats
- Useful estimate of adult abundance
- More feasible, less costly than sampling adults
- Serve as strong indicators of ecosystem health

Interest in evaluating change over time, managing sustainable fishing in Puget Sound

Need to establish a baseline to evaluate change

Rely on data from commercial harvest but limited to earliest records

One historical survey in Puget Sound in 1967 (Waldron)

Photo credit: NOAA Observer Program, News Tribune Blog, All Star Charters

Questions

I. Is there spatial and temporal variation in Puget Sound ichthyoplankton assemblages between 1967 and 2011 surveys?

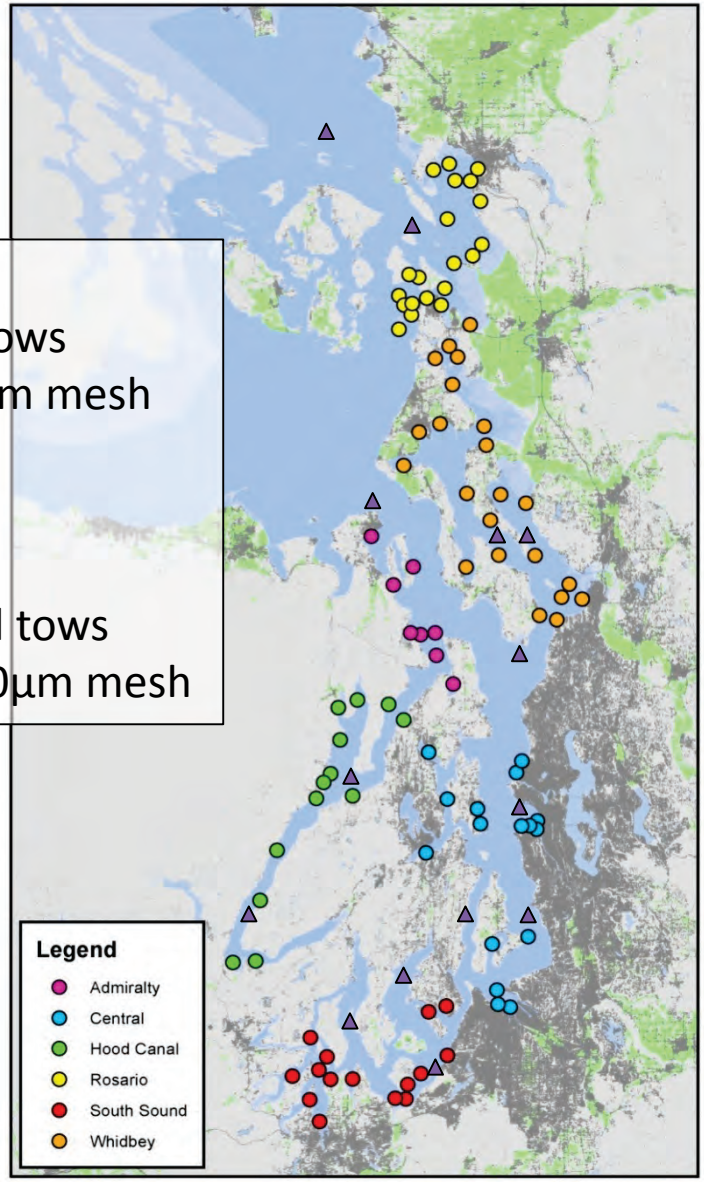
II. Do changes observed in Puget Sound extend to larger temporal and spatial scales?

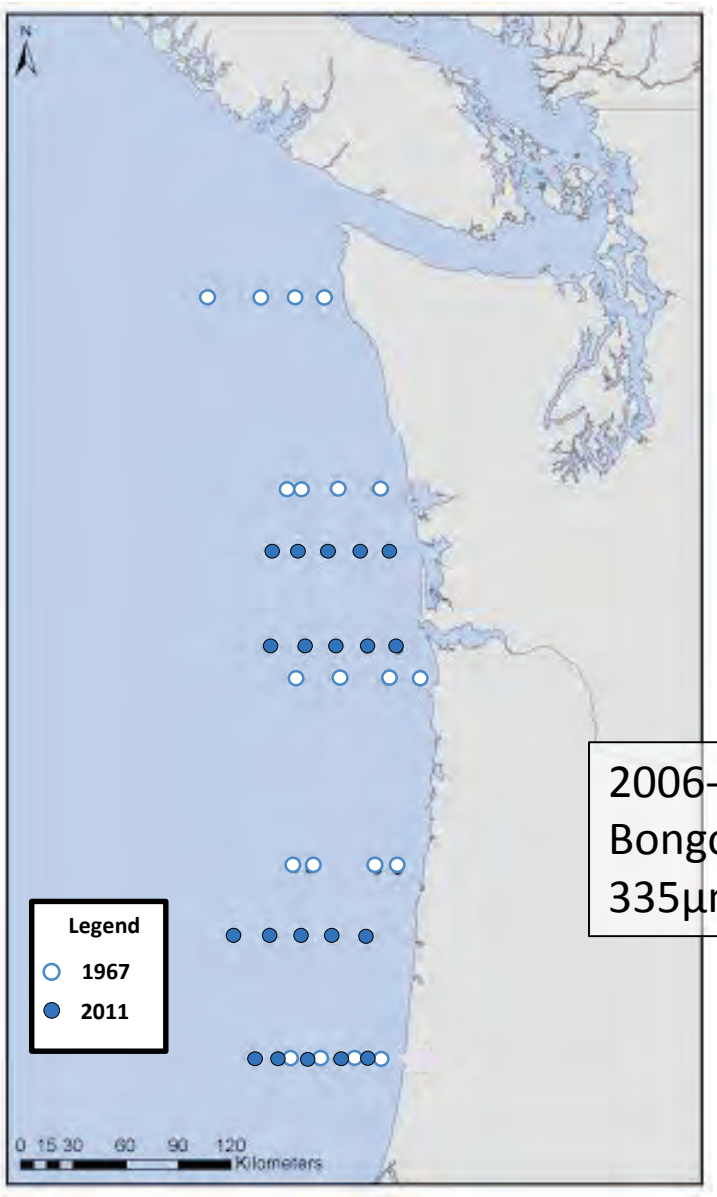
   i. Are changes similar along the Washington coast?
   ii. How does 2011 compare in a longer time series (2006-2012)?

Sites: Puget Sound & Washington coast

Historical:
Oblique tows
500-700µm mesh

2011:
Vertical &
horizontal tows
250 & 500µm mesh





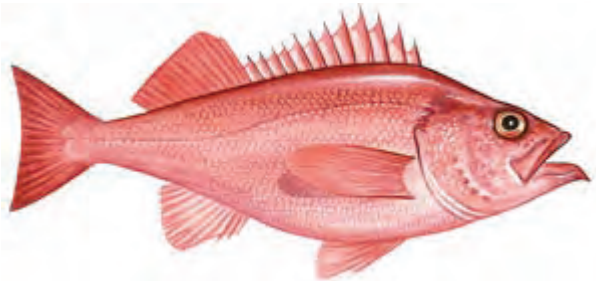
2006-2012:
Bongo nets
335µm mesh

Common families

Clupeidae (herring)

Ammodytidae
(sand lance)

Merlucciidae (hake)



Scorpaenidae
(rockfish)

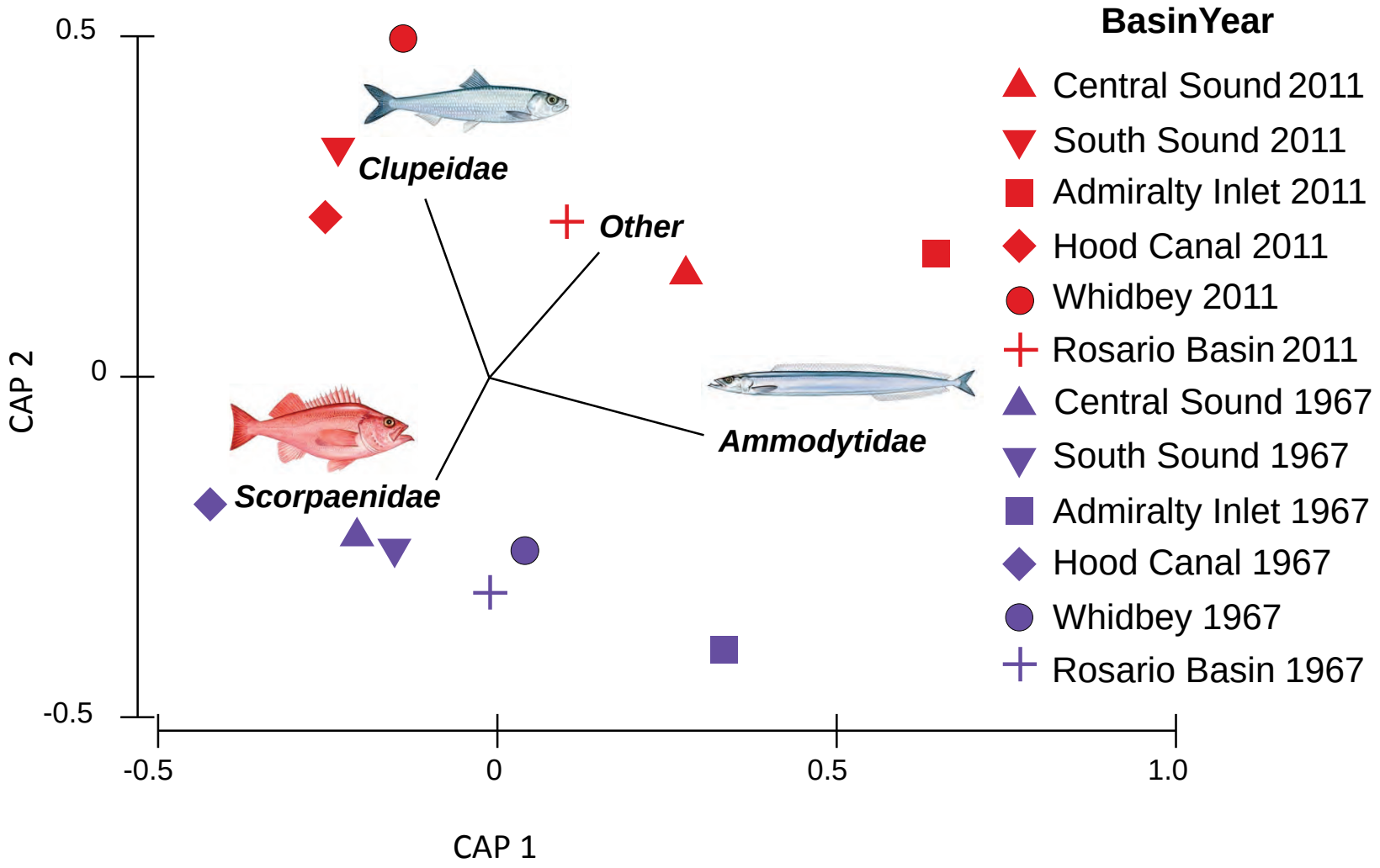
Gadidae (cods)

Pleuronectidae
(flatfish)

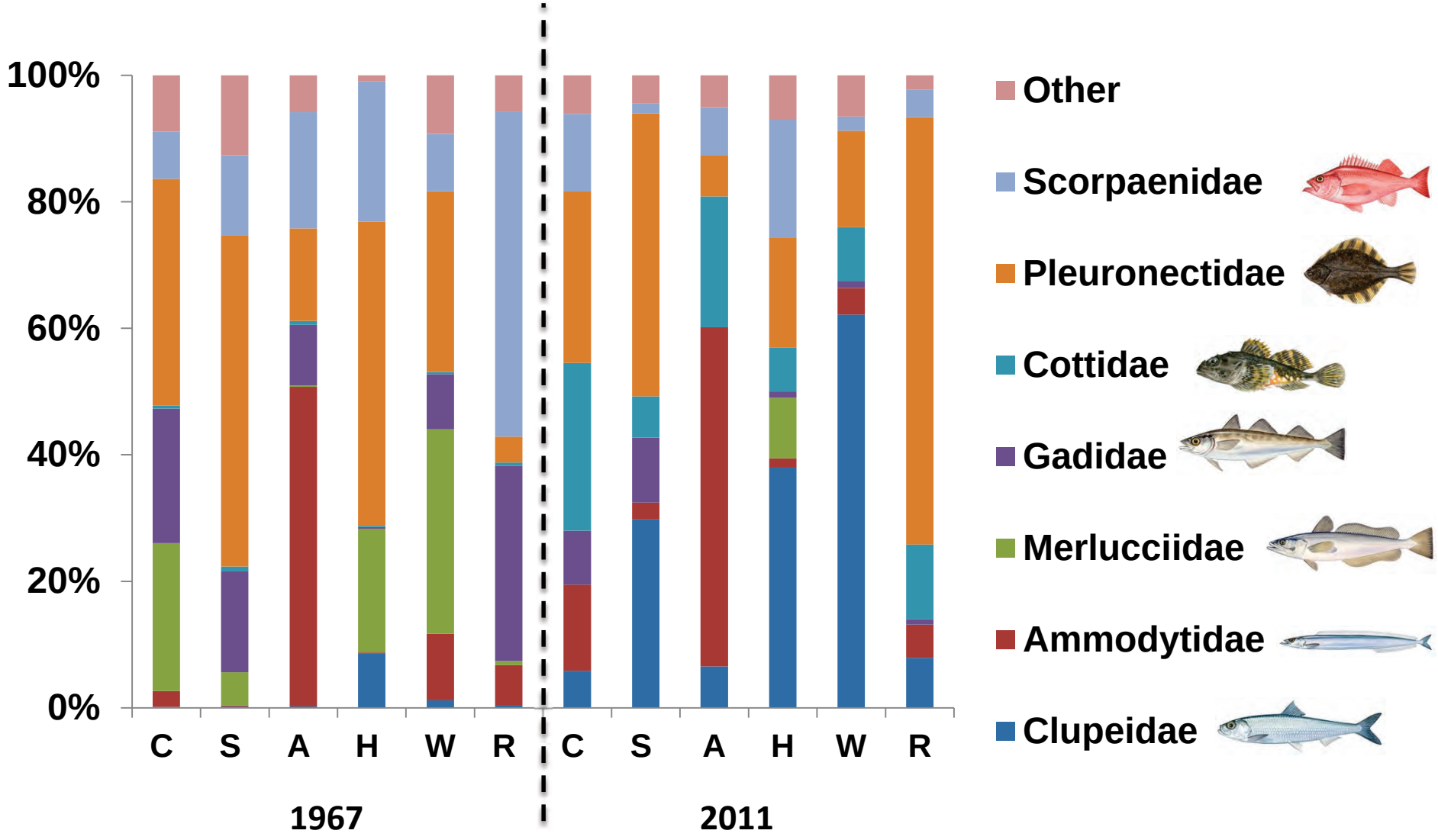
Cottidae (sculpin)

http://www.scandfish.com/ig/gallery

Families contributing to year differences



Composition changes by basin



Non-dominant family changes in 2011

Absent

Blenniodei
(blenny)

Merluccidae (hake)

Cyclopteridae
(lumpsucker)

Bathylagidae
(deep-sea smelt)

Present

Liparidae
(snailfish)

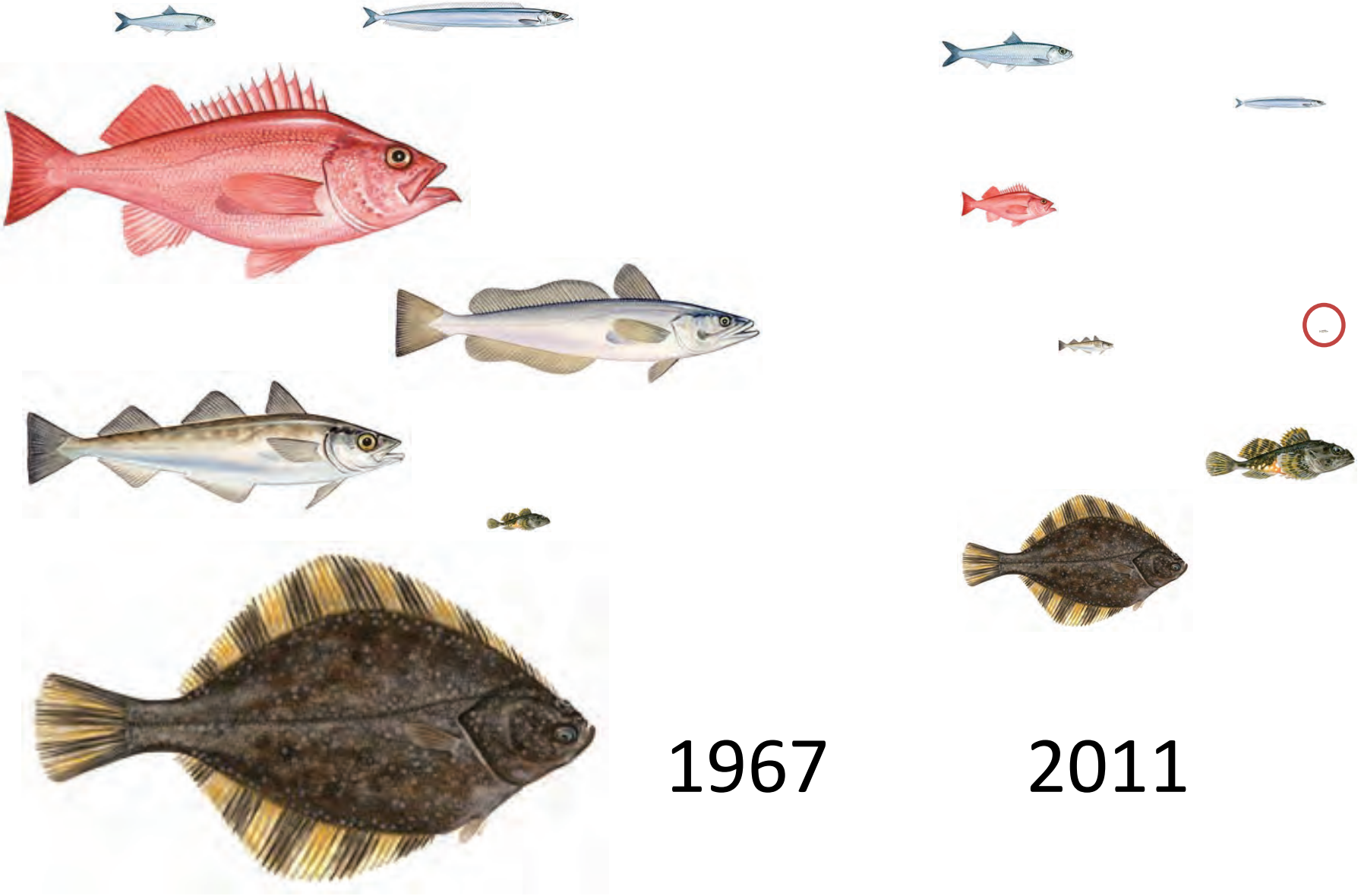
Gobiesocidae
(clingfish)

Cryptacanthodidae
(wrymouth)

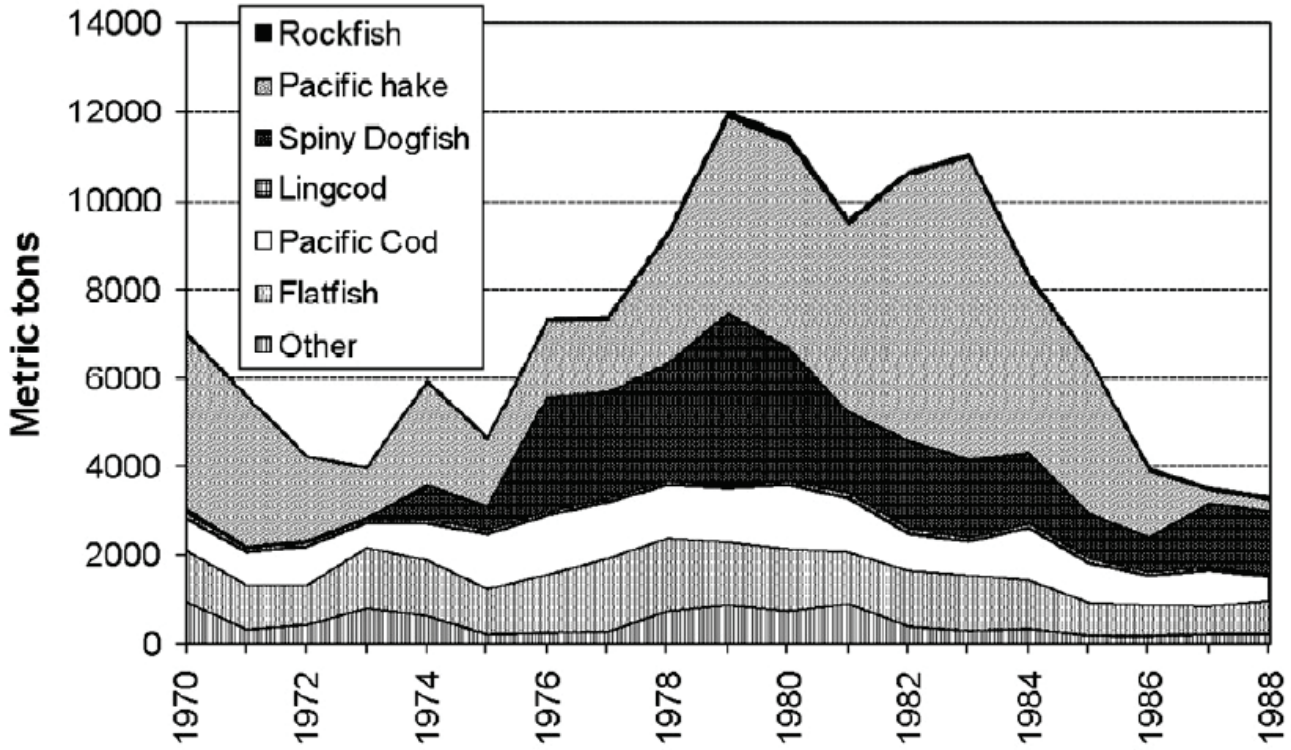
Pholidae (gunnel)

Bathymasteridae (ronquil)

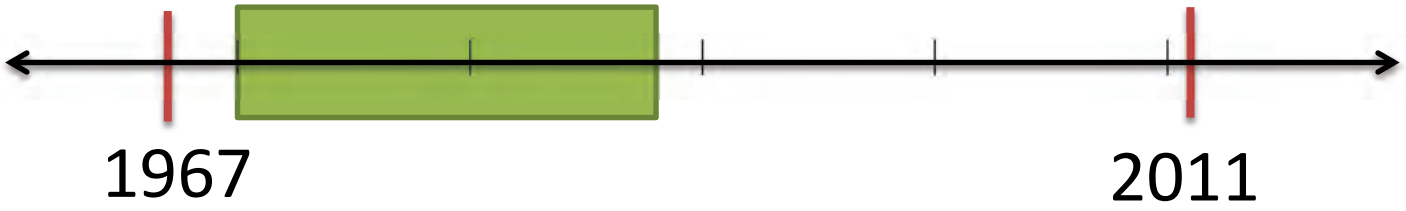
Changes in density



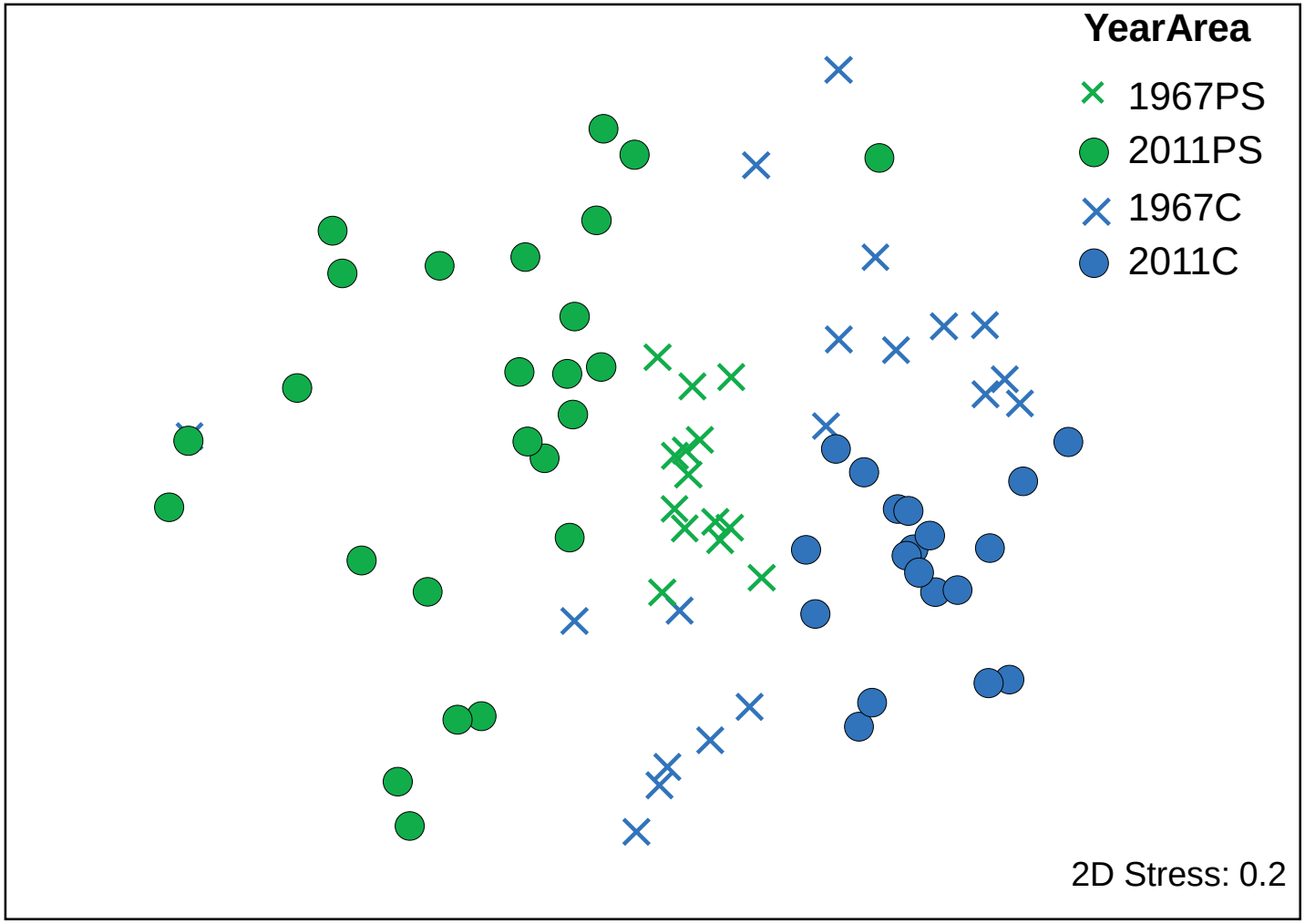
Commercial harvest reflects depletion



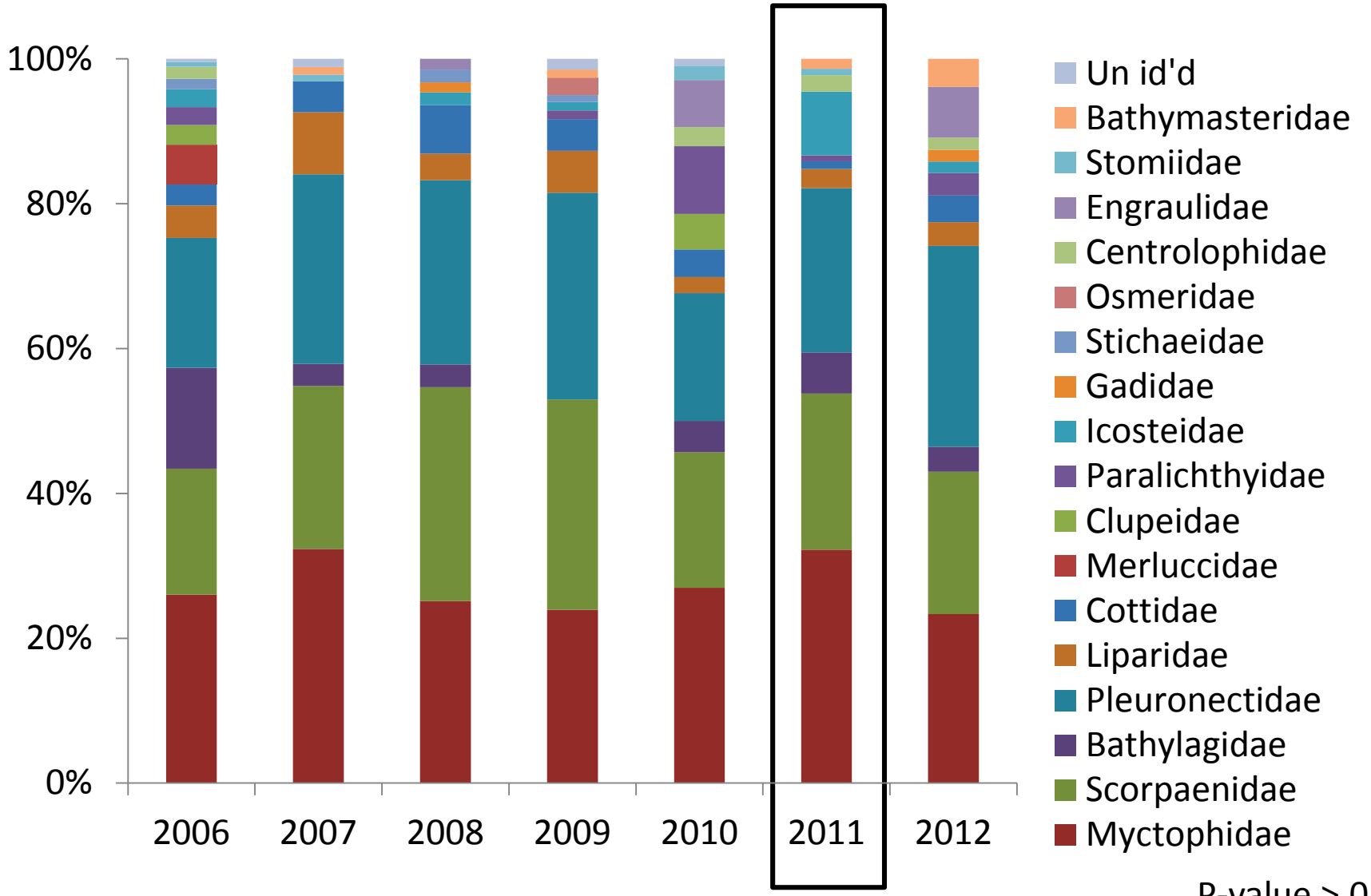
Williams et al. 2010



Different assemblage on WA coast

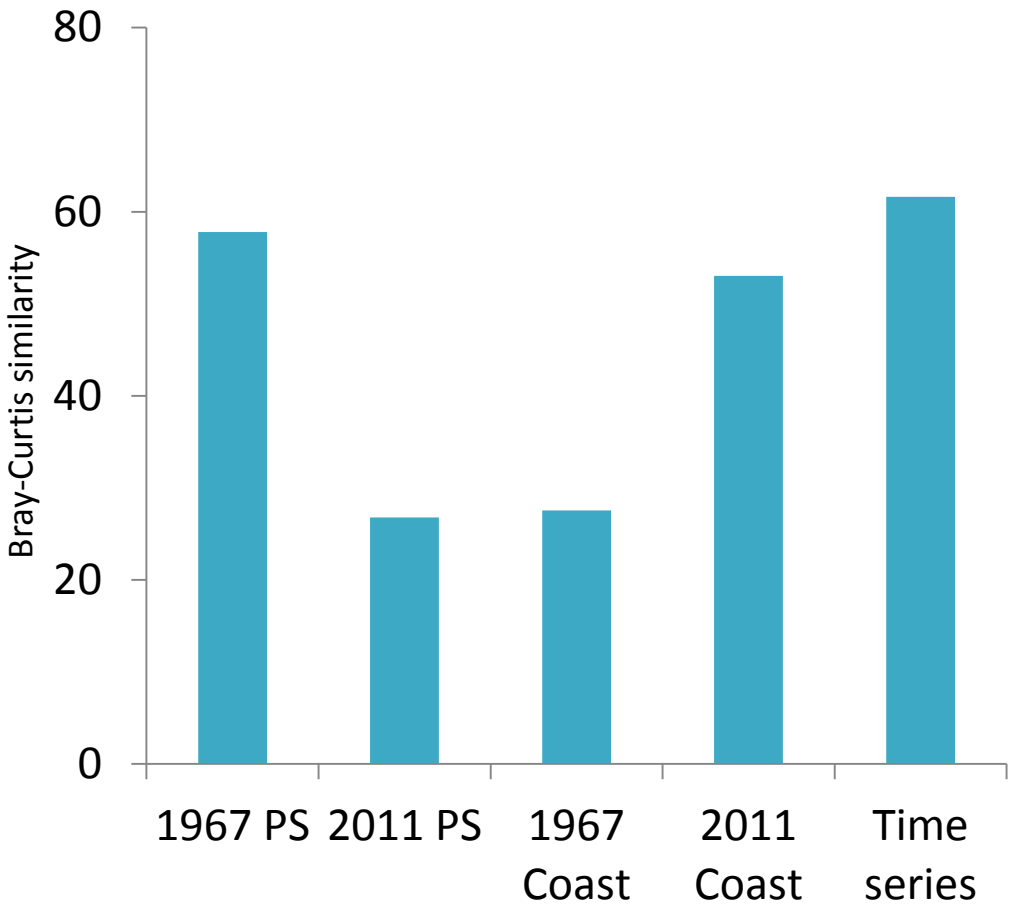


2011: not anomalous of recent years



P-value >.05

Conclusions



I. Significant temporal & spatial variation, shifting communities

II. Changes observed in Puget Sound do not extend to WA coast

III. 2011 is representative of variation among recent years

Food web impacts

- Altered distribution
  - Potentially fewer larvae available as a prey item
  - Changes are not uniform, unique to each basin
- Varied composition
  - Fewer larvae may lead to less adults
  - Change in timing of prey availability
- Evidence for a shifted baseline
  - What point in time is the Puget Sound ‘healthy’?

Acknowledgments

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Watershed Program (NWFSC)

Larval Rockfish

Thank you!

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Join us!

Meet the session's presenters after 5pm at

Rock Bottom Brewery on 5th & Union St.

for continued discussion over drinks