



Herring Declines in Prince William Sound and Lynn Canal A Question of Fish Condition?

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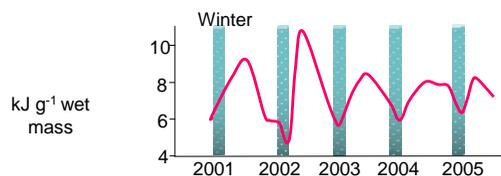
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Premise

Body composition of herring undergoes dramatic seasonal cycles as shown for Lynn Canal herring below. Throughout the summer, herring amass large energy depots to sustain them through the winter, during which energy depots are depleted.



Hypothesis

Herring from depressed stocks may not obtain sufficient early winter energy stores for either:

1. Overwinter survival of juveniles, or
2. Reproductive investment of adults

Methods



Collected herring in early and later winter to measure energy stores and calculate overwinter energy depletion in three stocks of herring.

Measured age, gender, maturity index, gonadosomatic index (GSI) and weighed stomach contents.

These are preliminary data, we are collecting more this winter.

Study Sites:

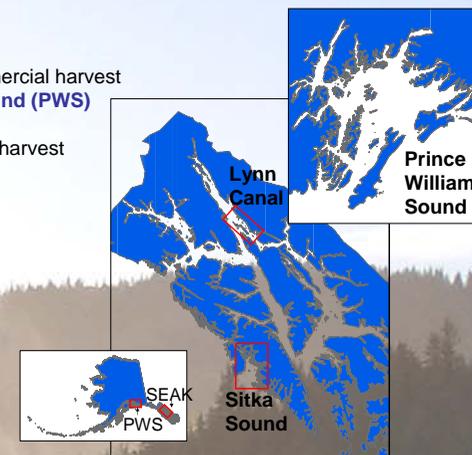
Depressed with no commercial harvest

1. **Prince William Sound (PWS)**

2. **Lynn Canal (LC)**

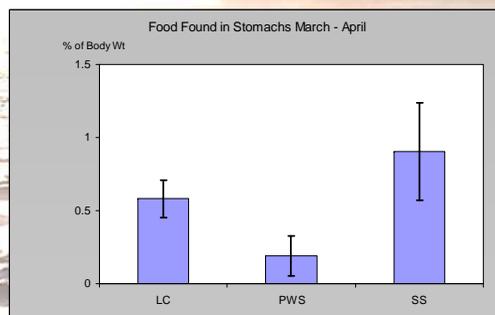
Healthy with commercial harvest

3. **Sitka Sound (SS)**



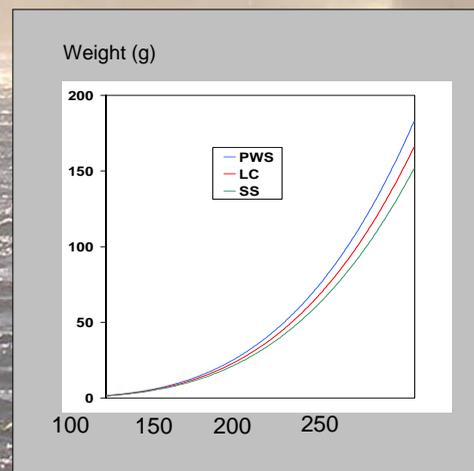
Preliminary Results

Foraging Success



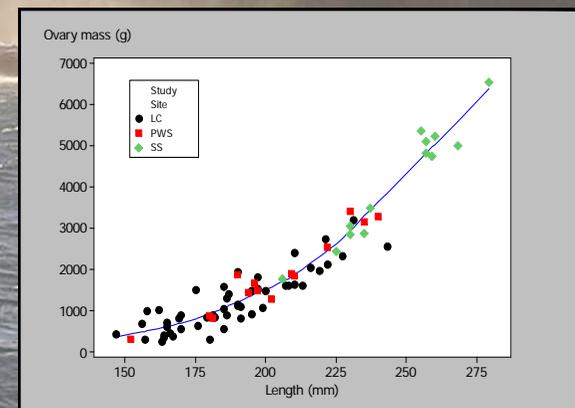
In Sitka Sound (SS) fish that were found to be eating had more food in their stomachs than either Lynn Canal (LC) or Prince William Sound (PWS). This figure shows the average weight of the stomach contents expressed as a percentage of body mass for herring sampled in late March and early April. The number of fish found to be eating increased at all sites between January and March.

Weight at Length



There are significant differences in the allometry of wet mass and length. Fish from PWS are consistently heaviest at length and Sitka Sound herring are the lightest. This suggests density dependent effects on weight.

Ovary Weights in Mature Fish



Allometries relating ovary mass to fish length are identical among the stocks as shown in this figure that relates the total mass of mature ovaries to the female length

Project is Underway

These data are part of an ongoing study funded by the EVOS Trustees. Chemical Analysis of the fish is underway, studies occurring this winter include repeating these analyses and development of a bioenergetic model.

Acknowledgements

Funding provided by Exxon Valdez Oil Spill Trustee Council
Many thanks to: John Moran, Keith Cox, Fletcher Sewall, Wyatt Fournier, Dave Csepp