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## RESEARCH PERIOD

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## FUNDING

Exxon Valdez Oil Spill  
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This project is part of the *Herring Research and Monitoring* program. The purpose of this study is to improve predictive models of herring stocks in Prince William Sound through observations and research.



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# HERRING RESEARCH AND MONITORING PROGRAM

## BACKGROUND

In the decades prior to 1990 there was a robust Pacific herring population in Prince William Sound (PWS). Not only are these forage fish a key link in the complex food web of Prince William Sound, but they supported a lucrative early season commercial fishery that brought the communities of the Sound to life each spring. In 1993 that fishery collapsed. While there is debate about the cause of the collapse, our interest is in what prevents the herring population from recovering.

## METHODS

The Herring Research and Monitoring program (HRM) is a mix of monitoring studies that provide data necessary to understand changes in the PWS herring population. These process studies help us understand why populations may change or address assumptions in the population model. The first phase of the program focused on the overwinter survival of young herring and addressing assumptions in the model and measurements. The second phase is focused more on adult herring and the connections between herring condition and recruitment and environmental conditions. This work is connected to the Gulf Watch Alaska program that examines other important environmental factors in the region.

## WHAT WE HAVE LEARNED

Key findings have included the determination of the collapse of herring in PWS as unusual in magnitude and duration when compared to other herring populations around the world. We found that juvenile herring must reach a critical length before they convert their energy allocation from growth to fat storage needed to survive the winter. Checking scales of fish that reached spawning age showed the fish that reached spawning age had all reached that critical length. We learned that there are differences in diets and energy content among years, and that the fish were in the best condition when more of their diet was from organisms outside PWS. The genetic structure of PWS herring was found to be like those populations to the east of PWS, but different from those to the west. New tools were developed for detecting antibodies for viral hemorrhagic septicemia, an extremely deadly disease for herring.



*Checking egg development in a female herring.*

We will continue to collect the measurements necessary to determine changes in the PWS herring population, observe where herring go after spawning, and determine when herring mature and become part of the spawning population. We continue to work on examining diseases and their role in limiting the herring population. Additional effort is being spent examining how the herring condition and recruitment is dependent on environmental factors, such as food availability and predator populations.