

# A Seascape Genetics Approach to Resolving Population Structure of Bering Sea and Aleutian Island Blackspotted Rockfish (*Sebastes melanostictus*)

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## Introduction

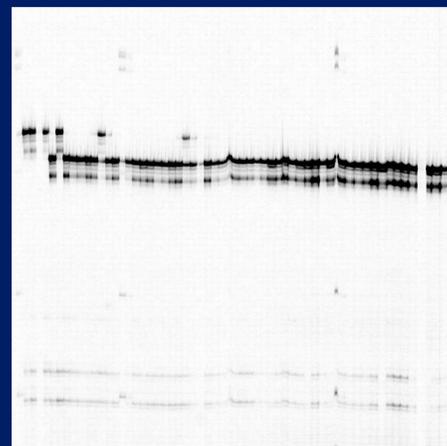
- ❖ Rockfish (*Sebastes spp.*) are economically and ecologically important species in the Eastern Pacific Ocean and Bering Sea.
- ❖ Some Aleutian Island passes may form boundaries—due to both depth and currents—to gene flow between populations of blackspotted rockfish.
- ❖ The Alaska North Slope Flow (ANSF) current runs along the north side of the Aleutian Islands and feeds into the Bering Slope Current (BSC), which may facilitate gene flow between the Aleutian Islands and the Eastern Bering sea Slope.
- ❖ Identification of genetically distinct populations is important for maintaining the health and diversity of commercially important species.
- ❖ Landscape genetics is a discipline that analyzes the influence of environmental and geographic features on the genetic structure of populations. Seascape genetics includes an oceanographic component.
- ❖ I will use seascape genetics techniques to discern population structure of blackspotted rockfish along the Aleutian Islands and Eastern Bering Sea slope.

## Previous Work

- ❖ A preliminary study of blackspotted rockfish showed evidence of genetic Isolation-by-distance (IBD) along the Bering Sea – Aleutian Island (BSAI) shelf Break.
- ❖ Studies indicate that Samalga and other Aleutian Island passes represent physical and biogeographic divisions in the Aleutian Island ecosystem.



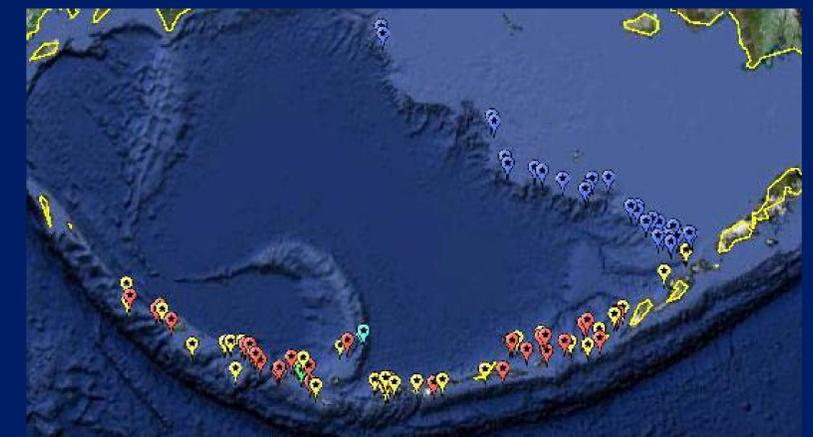
Rougheye rockfish above, blackspotted rockfish below (difference is not always obvious)



Acrylamide Gel Electrophoresis results for 56 samples at the  $\mu$ Sma6 microsatellite locus. The uppermost band are rougheye. The second dark band are blackspotted

## Materials and Methods

- ❖ Samples were collected between 1994 and 2010 in the Bering Sea and Aleutian Islands area as well as in the gulf near the Aleutian Islands.
- ❖ DNA extractions were performed on blackspotted and rougheye rockfish tissue samples.
- ❖ Polymerase Chain Reaction (PCR) is performed on a thermal cycler to amplify target microsatellite loci.
- ❖ The  $\mu$ Sma6 microsatellite locus in conjunction with a Single Nucleotide Polymorphism (SNP), is used to confirm species identification and exclude rougheye and hybrid individuals.
- ❖ Additional multivariate microsatellite loci are being screened for utility in determining population structure.
- ❖ Acrylamide gel electrophoresis is performed on Li-Cor DNA sequencers.
- ❖ Data from genotyping will be analyzed to resolve population structure, and results will be combined with known geographic and oceanographic data to determine how blackspotted rockfish population structure is influenced by the BSAI seascape.



Locations of hauls where samples were taken in 2010

## Acknowledgements

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