



AYK SUSTAINABLE SALMON INITIATIVE

Project Synopsis

NORTON SOUND AREA



(Christian E. Zimmerman)

PROJECT 803

PRINCIPAL INVESTIGATOR

Kelly M. Burnett
*United States
Forest Service*

CONTRIBUTING ORGANIZATIONS

*Alaska Department
of Fish and Game*

Earth Systems Institute

*LGL Alaska Research
Associates, Inc.*

Oregon State University

*United States
Geological Survey*

*University of Alaska
Fairbanks*

RESEARCH PERIOD

May 2008 -
March 2011

BUDGET

\$456,642.00

WORK-IN-PROGRESS LANDSCAPE PREDICTORS OF COHO SALMON

USING GEOGRAPHY TO PREDICT ABUNDANCE

Habitat quality and quantity are important factors that affect the abundance and distribution of salmon in freshwater. Knowledge about how these variables affect salmon in the Arctic-Yukon-Kuskokwim region is minimal, however. Without more information, it is difficult to predict effects of habitat change or to know whether observed changes in abundance are caused by freshwater factors. Field surveys are critical for contributing to such knowledge, but they are feasible in only a small portion of the AYK salmon-bearing streams. In other regions, modeling approaches have been successful alternatives in identifying factors affecting production, setting management goals, and planning restoration efforts.

OUR OBJECTIVES

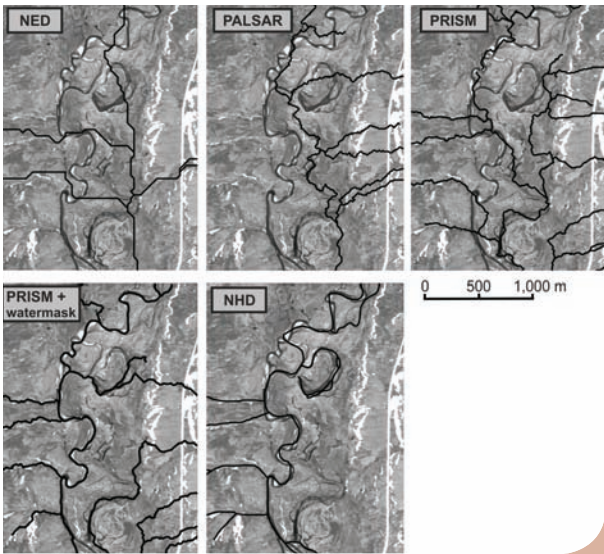
Develop and apply modeling approaches that focus on juvenile Nome River coho salmon, and relate field-measured habitat and fish data collected over small areas to digital geospatial data obtained over much larger areas.

Create high-resolution geospatial terrain and stream data using new satellite imagery and analytical tools, and analyze this data in a GIS-based system to predict habitat attributes and fish abundances in streams where surveys have not been conducted.

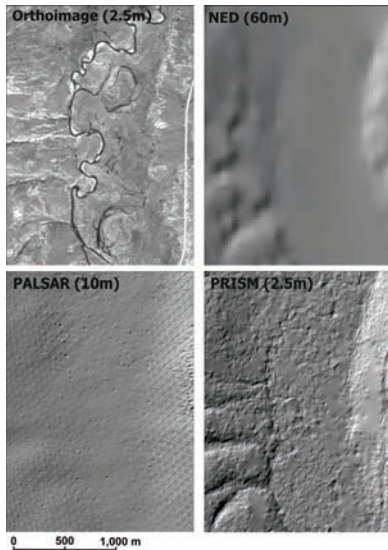
**RESEARCH
FRAMEWORK:**
SYNTHESIS &
PREDICTION –
PRIORITY #10

SNAPSHOT

This project will collect data on the physical, hydrological, and geographical features of streams in the Nome River watershed using satellites and ground surveys. This data will be combined with juvenile coho salmon abundance estimates to develop models that will allow researchers to map habitat and estimate relative fish abundances using landscape features of local areas, and of the surrounding basin.



The PRISM 2.5-m digital ortho-rectified imagery overlain with streams from different sources: generated from (a) 60-m National Elevation Data (NED) DEMs; (b) 10-m PALSAR-derived DEMs; (c) 2.5-m PRISM-derived DEMs without the PRISM water mask; (d) 2.5-m PRISM-derived DEMs with guidance from the PRISM water mask; and (e) the 1:100,000-scale National Hydrography Data (NHD). (Burnett, USFS)



Comparing PRISM 2.5-m digital ortho-rectified imagery with hillshades produced from the 60-m National Elevation Data, 10-m PALSAR-derived DEMs, and 2.5-m PRISM-derived DEMs. (Burnett, USFS)

AYK SSI Mission: *To collaboratively develop and implement a comprehensive research plan to understand the causes of the declines and recoveries of AYK salmon.*

ARCTIC-YUKON-KUSKOKWIM SUSTAINABLE SALMON INITIATIVE

BERING SEA FISHERMEN'S ASSOCIATION
 110 W. 15TH AVENUE
 ANCHORAGE, AK 99501
 (907) 279-6519

HOW WE WILL DO IT

We will create digital elevation models from two types of satellite imagery and use them, along with additional imagery in the Nome River basin, to identify stream networks, hydrographic and geomorphological features, and ice characteristics that determine juvenile coho salmon winter habitat. We will conduct summer field surveys to estimate juvenile coho salmon abundances by age class, and winter surveys to ground-truth ice cover estimates. We will also collect data on stream physical characteristics at each survey site. We will then develop statistical relationships to estimate relative abundances of juvenile coho salmon from the physical characteristics of each site as well as from landscape characteristics of the surrounding basin.

REPORT COMPLETION

May 2011