Outreach and Education for the Alaska Ocean Observation System Prince Williams Sound Field Experiment:

Sound Predictions 2009

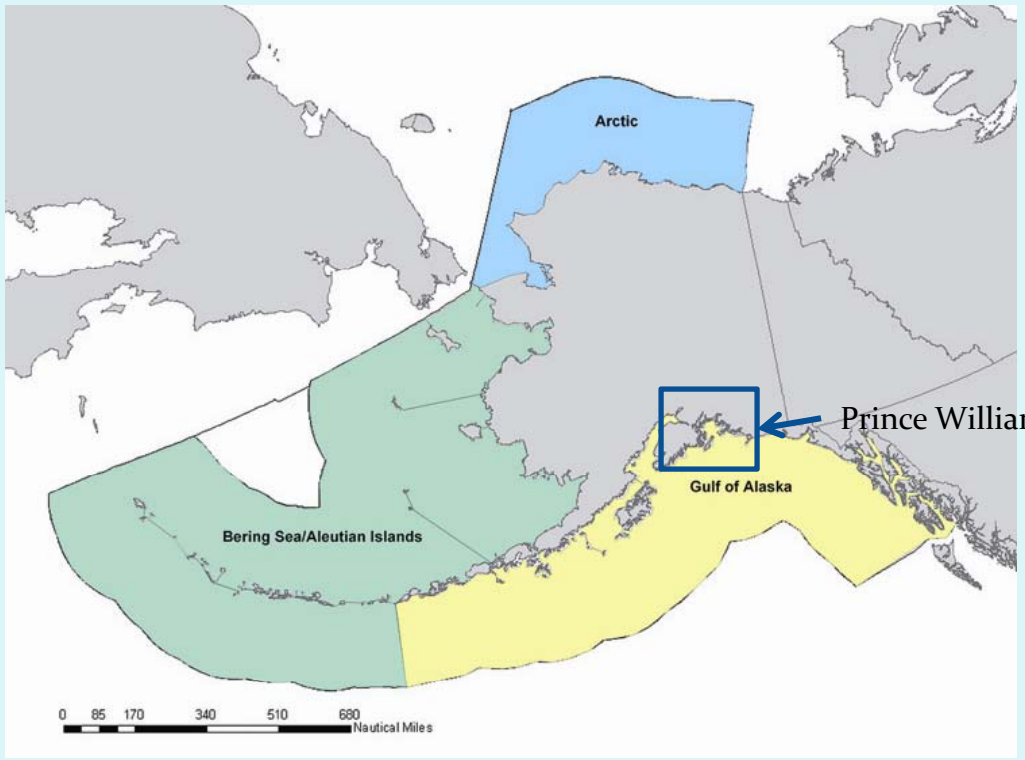
COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF



COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF

Prince William Sound, Alaska

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF

Summer, 2009: A Field Experiment was Planned in PWS for the AOOS

- How well can our models predict atmospheric and oceanic water properties, wave conditions, and circulation patterns in different areas of the Sound?
- Has the circulation model forecast skill for the central basin improved from those in 2004?
- Duration: 15 days, July 19 – August 3
- 15 partner organizations, data collection and computer processing at multiple locations.

The Outreach and Education Team

- AOOS: Molly McCammon, Nora Deans, Caroline Rosner, Darcy Dugan
- COSEE Alaska: Marilyn Sigman
- Alaska Sea Grant/MAP: Tori Baker
- Prince William Sound Science Center: Leslie Abramson (NOAA intern), Lindsay Butters, Alice Douwang
- Stephanie Hoag, educational consultant
- The scientists: Carl Schoch, Scott Pegau, Yi Chao

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF

"The 2009 Prince William Sound Field Experiment"

Was Branded

"Sound Predictions 2009"

Opportunity: The Stakeholders

Commercial Fishing

Coast Guard
Search-and-Rescue

Tourism & Recreation

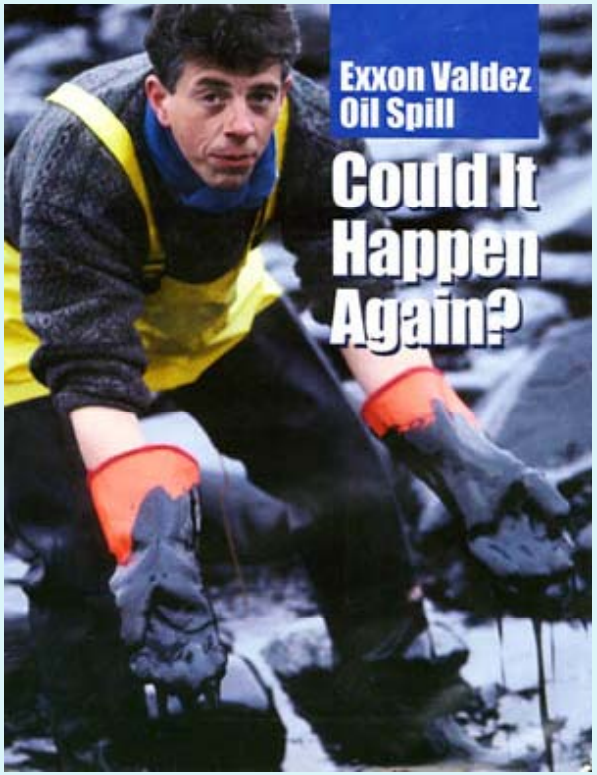
CoSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF



1989

CoSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND
SCIENCE CENTER
CORDOVA, ALASKA

NSF

Opportunity: The Toys

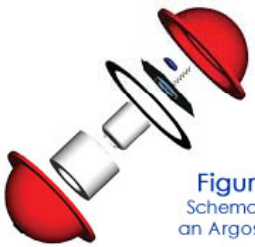


Figure 1
Schematic of an Argosphere

Figure 2
SVP Drifter

Figure 3
Micro star Drifter

Drifters

Glider

AUV

HF Radar

Moorings

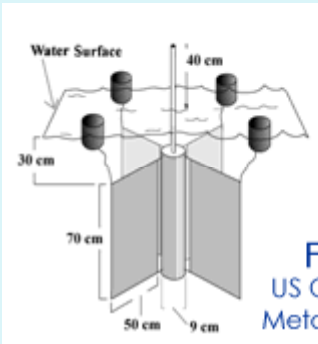


Figure 4
US Coast Guard Metocean SLDMB

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

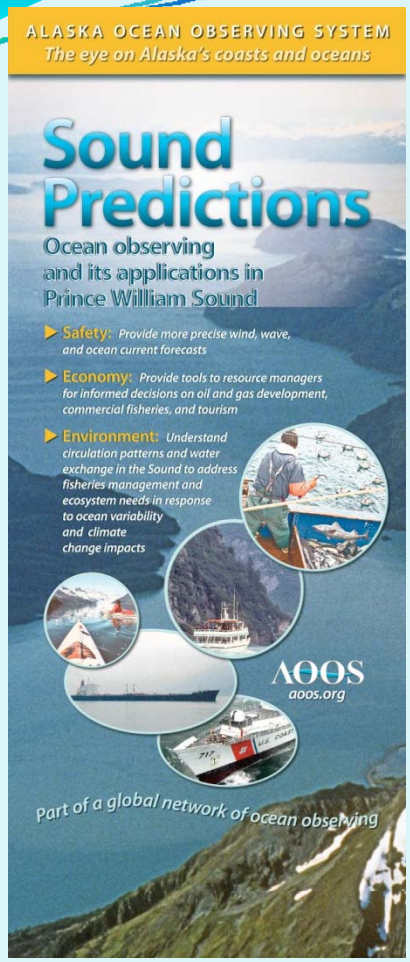
AOOS
Alaska Ocean Observing System

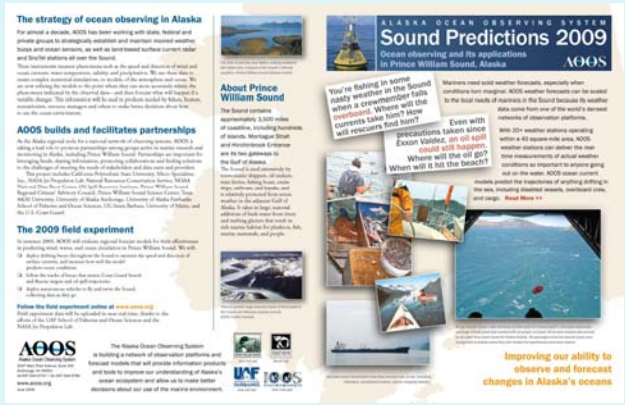
Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF

Media Products





<u>Exhibit & Rack Card</u>

Press Event

Valdez Community Event

Alaska Ocean Fest, June

<u>Brochure</u>

Mail-out

Online

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE WWW.COSEEALASKA.NET

AOOS Alaska Ocean Observing System

Sea Grant Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER CORDOVA, ALASKA

NSF

Newspaper Centerfold for Ferry and Cruise Ship Passengers


DELTA SOUND CONNECTIONS

SUMMER 2009

Alaska's Prince William Sound and Copper River Delta


DELTA-SOUND CONNECTIONS

IT'S 3am and a FISHERMAN NEEDS TO KNOW WHAT the WEATHER WILL BE LIKE for PRINCE WILLIAM SOUND OVER the next 48-HOUR FISHING WINDOW.

How hard is the wind blowing? Should I go out? Where will oil go if it spills? How high is the next high tide?

ALASKA OCEAN OBSERVING SYSTEM

Prince William Sound Field Experiment 2009

A demonstration of ocean observing

Goals of the Ocean Observing System

Instruments

Prince William Sound and Surroundings

COSEE CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE

ALASKA PEOPLE, OCEANS AND CLIMATE CHANGE WWW.COSEEALASKA.NET

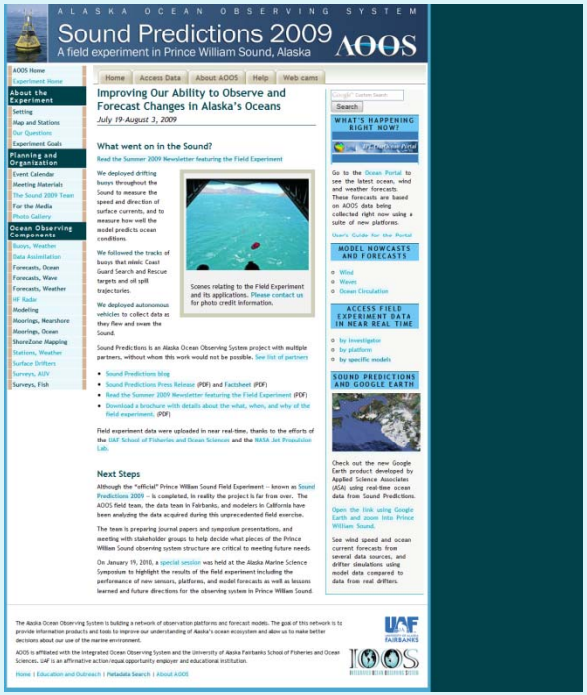
AOOS Alaska Ocean Observing System

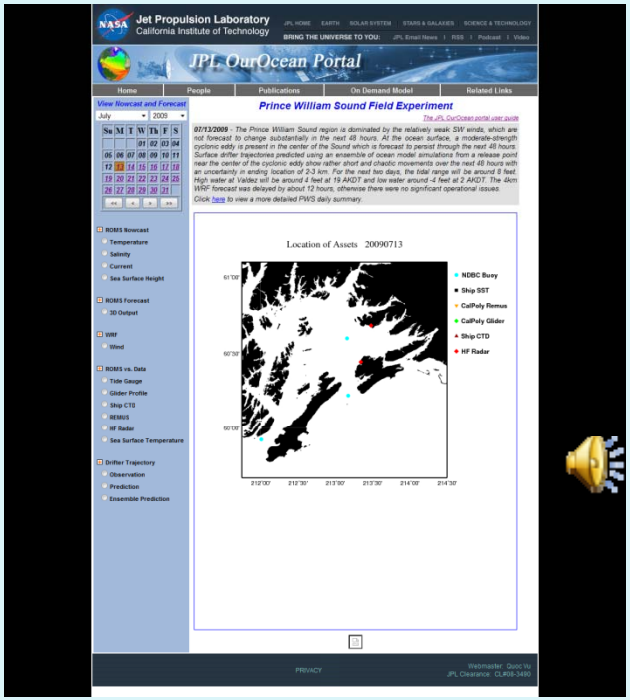
Sea Grant Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER CORDOVA, ALASKA

NSF

AOOS Outreach Webpages and JPL Data Portal



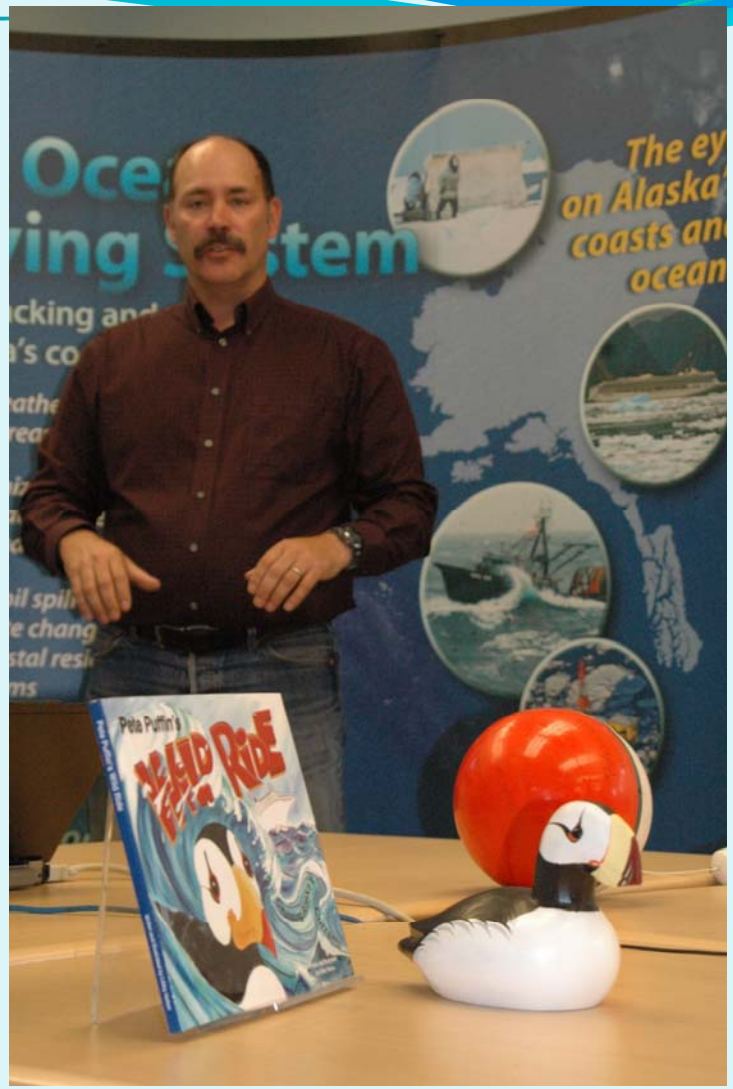


http://www.aoos.org

http:ourocean.jpl.nasa.gov/PWS

COSEE CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
ALASKA PEOPLE, OCEANS AND CLIMATE CHANGE WWW.COSEEALASKA.NET
AOOS Alaska Ocean Observing System
Sea Grant Alaska
PRINCE WILLIAM SOUND SCIENCE CENTER CORDOVA, ALASKA
NSF

Kick-off Press Event & Press Packets in Anchorage on July 16



CoSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF

Media + Community Event in Valdez

Scientist Presentations

Boat Tour in the Harbor

Build-your-own ATV Activities in the Harbor

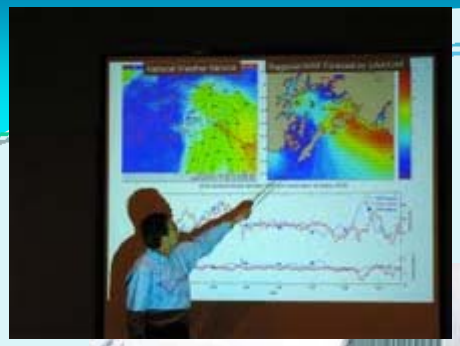
CoSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF



Alaska Sea Grant
Marine Advisory Program Office
Downtown Cordova

Open House Event in Cordova

Community Information Center in Cordova

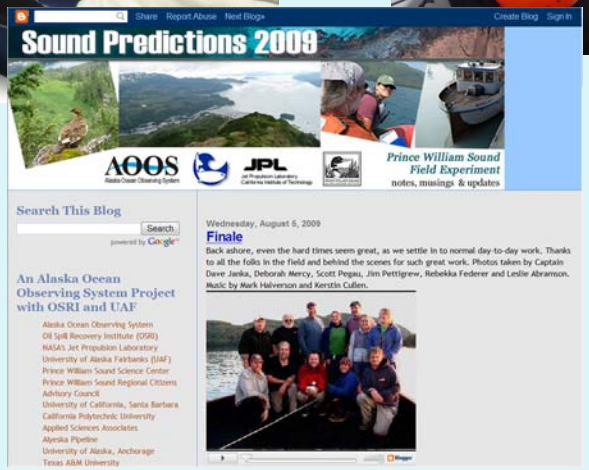
COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF



Scientist Blogs

Podcast Sound Tracks

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF

Challenges

- **Before and during the experiment:** How to translate a complex experiment about a complex environment into accurate and significant understandings about the nature and purposes of ocean observing.
- **After the experiment:** How to use the experiment to increase awareness and use of AOOS data and information by non-scientists, e.g., educators, the fishing community, recreational boaters.

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

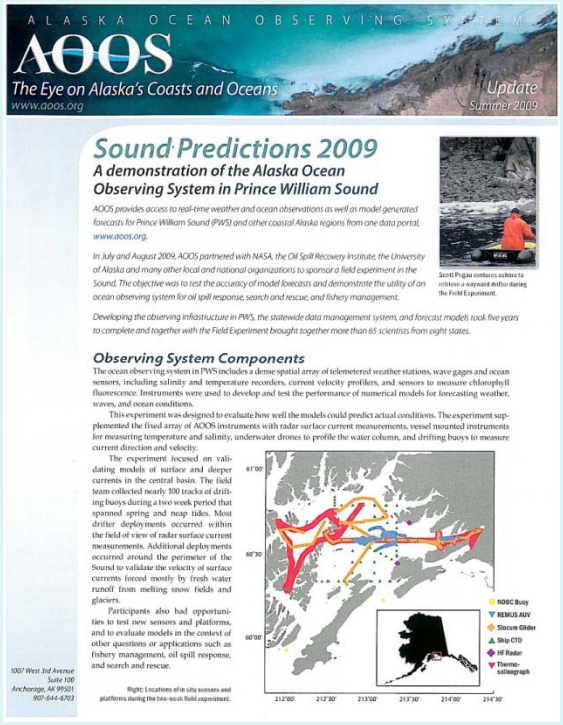
NSF

Podcasts & Videos

- Two 9-minute "Ocean Gazing" podcasts produced by Ari Daniel Shapiro, COSEE NOW (online)
- Ten short videos produced by Deborah Mercy, Alaska Sea Grant (available online)
  - Overview of the Experiment by Scott Pegau
  - AUVs: Slocum Glider and Remus "Torpedo"
  - Scientists talking about their work; including four female graduate students or early career scientists

COSEE CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
ALASKA PEOPLE, OCEANS AND CLIMATE CHANGE WWW.COSEEALASKA.NET
AOOS Alaska Ocean Observing System
Sea Grant Alaska
NSF

“What We Did and Learned” Newsletter



ALASKA OCEAN OBSERVING SYSTEM

AOOS

The Eye on Alaska's Coasts and Oceans

www.aoos.org

Update

Summer 2009

Sound Predictions 2009

A demonstration of the Alaska Ocean Observing System in Prince William Sound

AOOS provides access to real-time weather and ocean observations as well as model generated forecasts for Prince William Sound (PWS) and other coastal Alaska regions from one data portal, www.aoos.org.

In July and August 2009, AOOS partnered with NASA, the Oil Spill Recovery Institute, the University of Alaska and many other local and national organizations to sponsor a field experiment in the Sound. The objective was to test the accuracy of model forecasts and demonstrate the utility of an ocean observing system for oil spill response, search and rescue, and fishery management.

Scott Pegau ventures ashore to retrieve a wayward drifter during the Field Experiment.

Developing the observing infrastructure in PWS, the statewide data management system, and forecast models took five years to complete and together with the Field Experiment brought together more than 65 scientists from eight states.

Observing System Components

The ocean observing system in PWS includes a dense spatial array of telemetered weather stations, wave gages and ocean sensors, including salinity and temperature recorders, current velocity profilers, and sensors to measure chlorophyll fluorescence. Instruments were used to develop and test the performance of numerical models for forecasting weather, waves, and ocean conditions.

This experiment was designed to evaluate how well the models could predict actual conditions. The experiment supplemented the fixed array of AOOS instruments with radar surface current measurements, vessel mounted instruments for measuring temperature and salinity, underwater drones to profile the water column, and drifting buoys to measure current direction and velocity.

The experiment focused on validating models of surface and deeper currents in the central basin. The field team collected nearly 100 tracks of drifting buoys during a two week period that spanned spring and neap tides. Most drifter deployments occurred within the field of view of radar surface current measurements. Additional deployments occurred around the perimeter of the Sound to validate the velocity of surface currents forced mostly by fresh water runoff from melting snow fields and glaciers.

Participants also had opportunities to test new sensors and platforms, and to evaluate models in the context of other questions or applications such as fishery management, oil spill response, and search and rescue.

Right: Locations of in situ sensors and platforms during the two-week field experiment.

NDBC Buoy
REMUS AUV
Slocum Glider
Ship CTD
HF Radar
Thermo-salinograph

61°00'
60°30'
60°00'
212°00'
212°30'
213°00'
213°30'
214°00'
214°30'

1007 West 3rd Avenue
Suite 100
Anchorage, AK 99501
907-644-6703

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

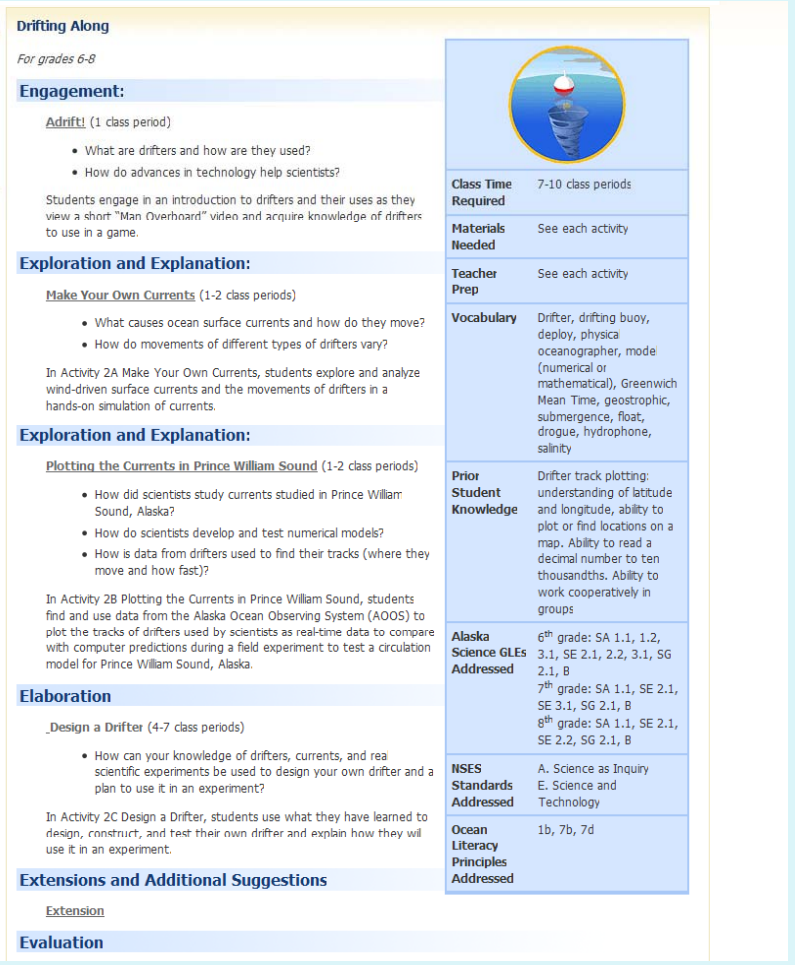
AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF

4 Middle School Teaching Activities



"Drifting Along" Activity

CoSEE CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
ALASKA PEOPLE, OCEANS AND CLIMATE CHANGE WWW.COSEEALASKA.NET

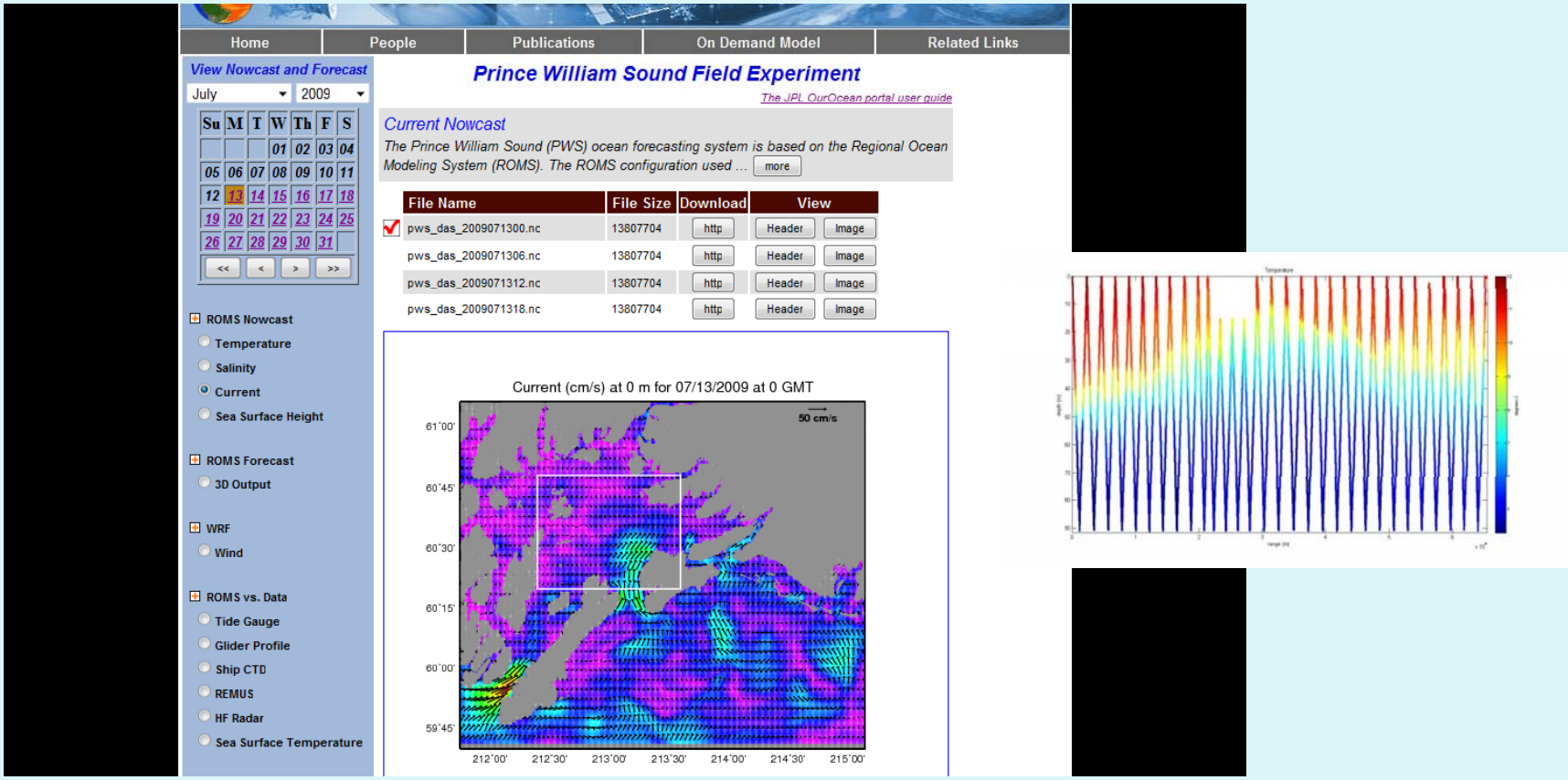
AOOS Alaska Ocean Observing System

Sea Grant Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER CORDOVA, ALASKA

NSF

The Activities Use Cool Toys & Data from the Experiment



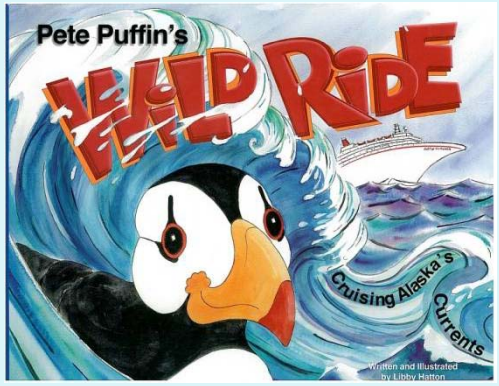
CoSEE Alaska — Centers for Ocean Sciences Education Excellence — People, Oceans and Climate Change — www.coseealaska.net

AOOS Alaska Ocean Observing System

Sea Grant Alaska

Prince William Sound Science Center, Cordova, Alaska

NSF



Coming Soon!
Lesson plans for Grades 2-6

COSEE ALASKA
CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE
PEOPLE, OCEANS AND CLIMATE CHANGE
WWW.COSEEALASKA.NET

AOOS
Alaska Ocean Observing System

Sea Grant
Alaska

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA, ALASKA

NSF