

Creating a Message:
a Building Block
for Communicating
Ocean Science



AGU 2010

Ocean Sciences Meeting

ASLO Student Workshop

25 February, 2010

Creating a Message:
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Ocean Science

Presenters

Janet Warburton

Arctic Research Consortium of the U.S.

Nora Deans

North Pacific Research Board

Francis Wiese

North Pacific Research Board

Jacquelyn Hams

Los Angeles Valley College

Mark McKay

Venture Academy/Delta VISTA

Maggie Prevenus

Kalama Intermediate School

With contributions from Elizabeth Eubanks



Workshop Goals & Agenda

Workshop Goal

To learn how to create your own message about your research that can be tailored to a variety of audiences.

Workshop Agenda

- Introduction to messages
- All about message elements
- Create your own message
- Expert advice --- panel presentation and discussion
- Where to find more
- Discussion and Closing



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Creating Your Message

Messages

“We don’t need more information. We need to know what it means. We need a story that explains what it means and makes us feel like we fit in there somewhere.”

Annette Simmons, *The Story Factor*





“Even if you have reams of evidence on your side, remember: **numbers numb, jargon jars**, and nobody ever marched on Washington because of a pie chart.

If you want to connect with your audience, tell them a story.”

Andy Goodman

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“In a two-hour speech,
people will remember a
two-minute story.”

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Messages Tips

What are the primary
points you want to
communicate?



Messages Tips

How do they affect the public's interest in health, safety and quality of life?



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Messages Tips

What everyday analogies
will help communicate
your message?



Audience

- Who is your audience?
- Tailor your message accordingly



Audience

- Marine researchers
- Marine resource management agencies
- Commercial and subsistence users
- Teachers and students in Alaska and beyond
- Alaska coastal communities
- General public

--NPRB Science Plan, pg. 151-152



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Research Summaries



Series based on Science Plan research
themes

-- Magazine style

Synopses

PROJECT 510

Skate life history and demography

Skates are cartilaginous fishes that feed mostly on smaller fishes and crustaceans. These benthic (bottom-dwelling) creatures are found throughout the world from continental shelves down to the abyssal (deep-water) zone. Skates are commonly taken as bycatch in groundfish fisheries in the Gulf of Alaska and eastern Bering Sea. The susceptibility of skates to fishing pressure has been well documented, but life history information required for stock assessments and implementation of sustainable management plans is largely unknown. The deleterious effects of fishing on North Atlantic skate populations are well documented. This project provides critical information on a vulnerable group.

WHY WE DID IT
To address this knowledge gap, we are studying the life history and demography of Aleutian (Bering and Chukchi) and long Alaskan skate populations.

FUNDING SUMMARY
Principal Investigators: David Ebert, Gregor Cailliet
Moss Landing Marine Laboratories

Year funded: 2005

Research period: June 2005 - July 2007

Budget: \$199,069

PROJECT 302, 536, 601

Consequences of Fur Seal Foraging Strategies

The abundance of northern fur seals (*Callorhinus ursinus*) in the Bering Sea—almost one million animals—makes them the most numerous species of marine mammal in North Pacific. During the breeding season (July through October), they move northward to rookeries on the Pribilof Islands in the Bering Sea and to Bogosof Island in the eastern Aleutians.

WHY WE DID IT
Fur seal populations in the Bering Sea have been plummeting since the 1950s. Today, pup production on the Pribilof Islands is just 29% of what it was 50 years ago. Leading hypotheses for the decline are that climate change or commercial fisheries have had negative impacts on the seals and/or that prey availability has declined. We wished to help find explanations for the decline.

FUNDING SUMMARY
Principal Investigators: Sonia Batten, Sir Alister Hardy
Foundation for Research and Ecology

Year funded: 2003

Research period: September 2004 - October 2005

Budget: \$240,000

PROJECT 414

Walleye pollock Berinca

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FUNDING SUMMARY
Principal Investigators: Robert Foy, Robert J. Fisher
Fishery Institute, University of Alaska Fairbanks

Year funded: 2004

Research period: May 2004 - January 2007

Budget: \$163,000

PROJECT 327

Estuarine ecology of chum salmon in Kuskokwim Bay, western Alaska

Chum salmon (*Oncorhynchus keta*) face lifelong challenges, but an especially critical period occurs when they are in the estuary—months of rivers—and begin to make their way out into the ocean, where they will spend several years before returning to their home streams to spawn. Adapt to marine water and adjust to a new environment with unfamiliar predators and prey.

WHY WE DID IT
We wanted to learn more about patterns of estuarine distribution, diet, condition, and growth of juvenile chum in Kuskokwim Bay, and to model the growth potential of migrating juveniles, food availability and use, length of residence, and growth of juveniles will allow us to develop and evaluate stronger hypotheses of population regulation served changing climatic conditions.

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FUNDING SUMMARY
Principal Investigators: Nicola Hillgruber, Lewis J. Holderson
University of Alaska Fairbanks

Year funded: 2003

Research period: May 2003 - January 2007

Budget: \$624,025

PROJECT 503

Arctic Ocean synthesis: analysis of climate change impacts in the Chukchi and Beaufort Seas with strategies for future research

The Arctic is changing: temperatures are going up, summer sea ice extent is decreasing. Rivers are melting more water, sea levels are rising, permafrost is eroding, and coastal erosion is increasing. Species ranges and timing of reproduction are changing, and hunting cultures may change. Marine mammals, as well as access to natural resources.

WHY WE DID IT
We know relatively little about the Arctic Ocean Bering Sea ecosystems because of their remote location. Because their fishery is declining, we need to know more about the biology and ecology of the Bering Sea. We are studying the life history and demography of walleye pollock in the Bering Sea to help understand the causes of population change in Pacific herring.

FUNDING SUMMARY
Principal Investigators: Gary Marty, University of California, Santa Barbara; Janice Odum, California Animal Health and Food Safety Laboratory System; Annette O'Connor, Iowa State University

Year funded: 2003

Research period: July 2003 - June 2006

Budget: \$68,198

PROJECT 312

Ice seal bio-monitoring in the Bering-Chukchi Sea region

Ice seals (*Phoca hispida*) are a keystone species in the Bering-Chukchi Sea region. They are important for the ecosystem and are also a critical component of the food web. We are studying the life history and demography of ice seals in the Bering-Chukchi Sea region to help understand the causes of population change in Pacific herring.

WHY WE DID IT
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FUNDING SUMMARY
Principal Investigators: Robert Foy, Robert J. Fisher
Fishery Institute, University of Alaska Fairbanks

Year funded: 2004

Research period: May 2004 - January 2007

Budget: \$163,000

PROJECT 506

Factors influencing the mortality of tagged walleye pollock captured using a trawl net

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Tube worm bed nurseries for flatfish

The central Gulf of Alaska around Kodiak has supported a commercial flatfish fishery for many years beginning with foreign fisheries that worked the area starting in the early 1960s. South of Kodiak, emergent structures created by polychaete tube worms dominate the low-relief benthic region. This tube worm habitat provides a nursery area for age-0 juvenile flatfish, particularly northern rock sole and Pacific halibut, both commercially important species. Project 301 set out to evaluate these emergent structures to better estimate the distribution and abundance of juvenile flatfishes around Kodiak.

Using video camera sleds, researchers assessed fish densities, habitat features, and fish-habitat associations on a fine spatial scale. They found juvenile flatfish associated with low to moderate worm tube densities, where fish may aggregate to feed on the worms or associated fauna. The structural complexity created by the tubes may also reduce the predation threat for flatfish. Yet if worm tube densities were too high and created a continuous turf, juvenile flatfish were nearly absent because they could not bury themselves and thus were more vulnerable. If shell material was added to the seafloor to enhance structural complexity, juveniles were attracted only when larger adult flatfish were scarce.



Qui quod ut eligniet ea planit latia sunt. (Photo Credit)

Scientists concluded that differential predation pressure may make two seemingly similar areas of seafloor vastly different in quality as perceived by juvenile flatfish. The study also showed how species react to predation pressure. Rock sole minimize activity and bury themselves, while English sole become more active to avoid predation. Pacific halibut had an intermediate reaction between the other two species. Knowing how individual species relate to different habitat types, and the vulnerability or resilience of particular bottom types helps managers make better decisions on how to protect it. Fishing impacts on these habitat types are being studied under project 710.

Where flatfish live in the eastern Bering Sea

Scientists are also studying flatfish habitat in the eastern Bering Sea under project 709. That retrospective study examines the spatial distribution of yellowfin sole, Alaska plaice, and arrowtooth flounder on the eastern Bering Sea shelf over 25 years, from 1982 to 2005. Researchers expect to analyze fish distributions relative to small-scale environmental features, climatic indices, demographic state of the population, and human harvest activities by the summer of 2009.

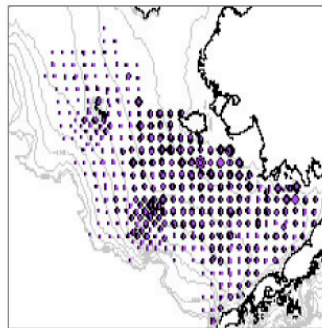


Figure 2.1 | Ullisi recab id que venimos et ellibust optati omnihit hil is con rehendis ex exca quis repere ressent auda voluptas qui quod ut eligniet ea planit latia sunt. Quis repere ressent auda voluptas qui quod ut eligniet ea planit latia sunt. Repere ressent auda voluptas qui quod ut eligniet ea planit latia sunt. (Photo Credit)



Yellowfin Sole
(Photo Credit)

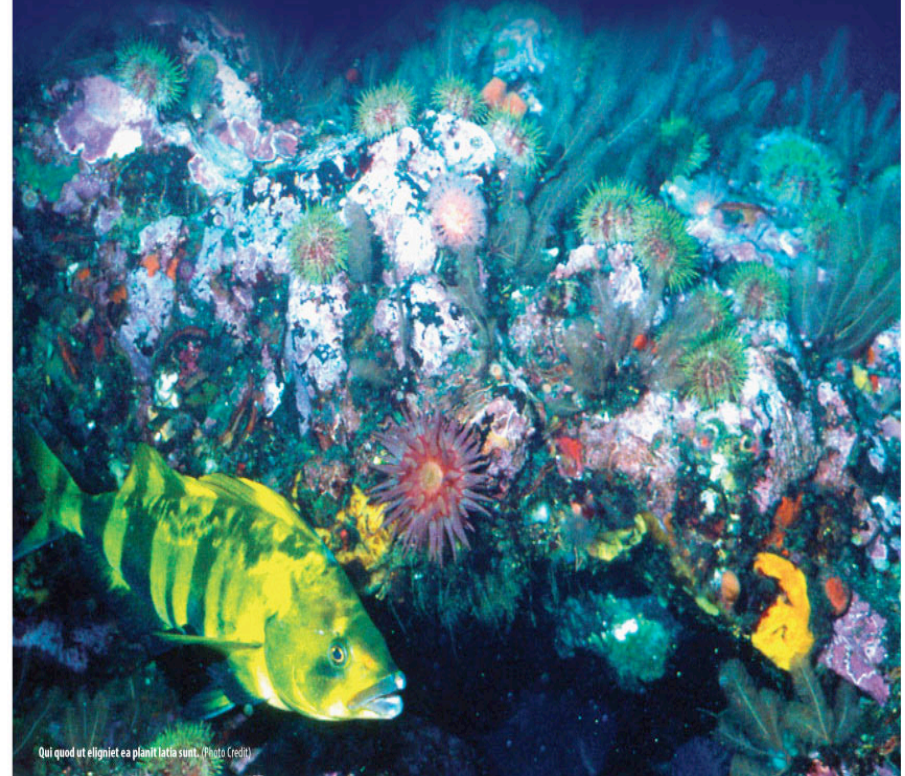
Biodiversity in Aleutian Coral Gardens

Project 304 examined deepsea coral distribution and habitat in the central Aleutian Islands. While mainly a mapping study using submersibles, scientists also wanted to assess the importance of coral and sponge habitat for commercially important species of fish, crab, and octopus. The study found that 64-72% of commercially important fish species were associated with corals or sponges.



Juvenile rockfish were the most abundant fish, followed by grenadiers and Pacific ocean perch. Crabs were not as abundant as fishes and among the eight species identified, deepsea Tanner crabs were the most abundant. Most shallow-water fishery management plan species (those living at depths of less than 1000 meters) appear to use sedentary, structure-providing invertebrates, such as hydroids, actinarians, bryozoans, and tunicates frequently and there is evidence that they may be essential to some species. Because commercial fisheries seek most of these shallower-water fish species, their associated emergent epifauna continue to be at high risk to disturbance from fishing gear.

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Qui quod ut eligniet ea planit latia sunt. (Photo Credit)

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UNDERSTANDING ECOSYSTEM PROCESSES IN THE

Bering Sea

AN HISTORIC PARTNERSHIP BETWEEN THE NORTH PACIFIC RESEARCH BOARD AND THE NATIONAL SCIENCE FOUNDATION




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Summer Fieldwork Highlights

Scientists were out and about in the Bering Sea during the first summer field season of the program, observing everything from zooplankton to whales.

Janet Duffy-Anderson did post-larval cod and pollock sampling, but catches were fairly light except near the Pribilof Islands. **Alexei Pinchuk** collected zooplankton specimens for nutritional energy sampling.



Seabird observers had a successful survey, and also reported an area of abundant fin whales, a few shorttail albatross, and several mottled petrels. **Patrick Ressler** collected extensive physical oceanography information, both vertically and while underway.



Anne Hollowed collected forage fishes for nutritional energy analysis. Marine mammal observers reported seeing good numbers of fin and humpback whales, sufficient to make abundance estimates.

Sarah Kruse and the LTK group are working on finalizing the household and LTK surveys. **Kerim Aydin** has made good progress on linking the FEAST and NPZ models. **Ken Coyle** reports some challenges with the ROMS model.

Cold on the Shelf: Bering Sea 2008

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In the News

UPCOMING EVENTS

- o **June-Sept** | Colony-based seabird studies, Pribilofs
- o **Oct 14-16** | BEST-BSIERP PI Meeting, Girdwood
 - o [Draft Agenda](#)
 - o [More Information](#)

2008 Calendar of Events

Cruise Calendar

PROGRAM UPDATES

- o **Best-Bizzerp WHAT?!** [Resources](#) (powerpoints, PDFs, photos) for explaining BEST-BSIERP are now available for download

BERING SEA BITS

- o **Jim Lovvorn** interview with

north pacific research board

2009 Calendar



featuring images from our 2008 Photo Contest



North Pacific Research Board

Building a clear understanding of the Gulf of Alaska, Bering Sea and Arctic Ocean ecosystems that enables effective management and sustainable use of marine resources



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Science at Sea

Since 2002, researchers funded by NPRB have worked in three large marine ecosystems: the Gulf of Alaska, the Bering Sea, and the Arctic Ocean.



What We Study

NPRB research themes focus on everything from physical oceanography and plankton to fishes, marine mammals and seabirds, as well as on people in coastal communities and those who make their living from the ocean.



Integrated Ecosystem Research

Scientists join forces in a coordinated approach to understanding how a marine ecosystem works — from the benthos to the atmosphere, and everything in between. They also study the socio-economic impacts of a changing marine ecosystem on humans and communities.



NPRB and the National Science Foundation recently launched a joint five-year, \$50 million project to further develop this understanding in the Bering Sea. NPRB also plans to launch an ecosystem study in the Gulf of Alaska.

North Pacific Research Board

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Traveling Exhibit

Creating a Message:
a Building Block
for Communicating
Ocean Science












Pop-up Traveling Exhibit

A HISTORIC PARTNERSHIP BETWEEN
THE NORTH PACIFIC RESEARCH BOARD AND
THE NATIONAL SCIENCE FOUNDATION







BEST-BSIERP *Bering Sea* PROJECT

Climate change and reduced ice cover significantly impact the Bering Sea ecosystem. We seek to understand the mechanisms that create and sustain this highly productive region, and how they may be altered over time.

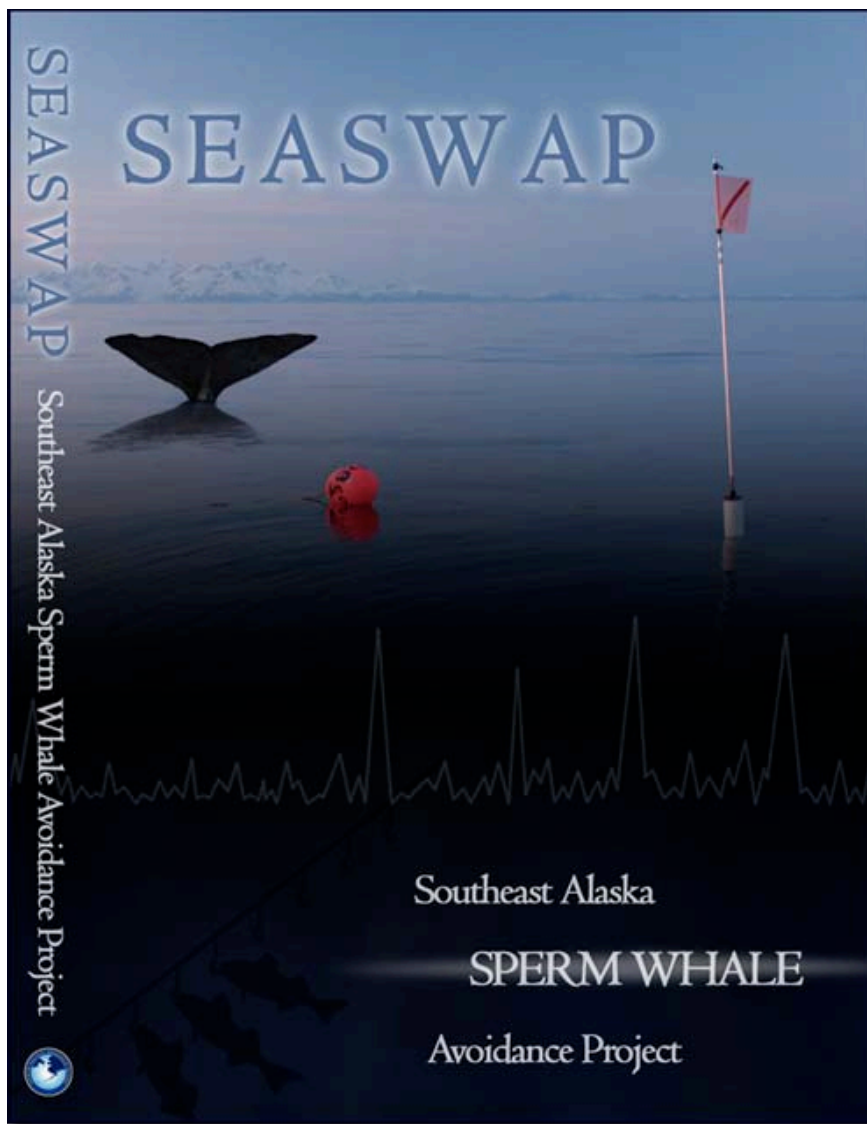


UNDERSTANDING ECOSYSTEM PROCESSES IN THE BERING SEA
2007-2012 • bsierp.nprb.org



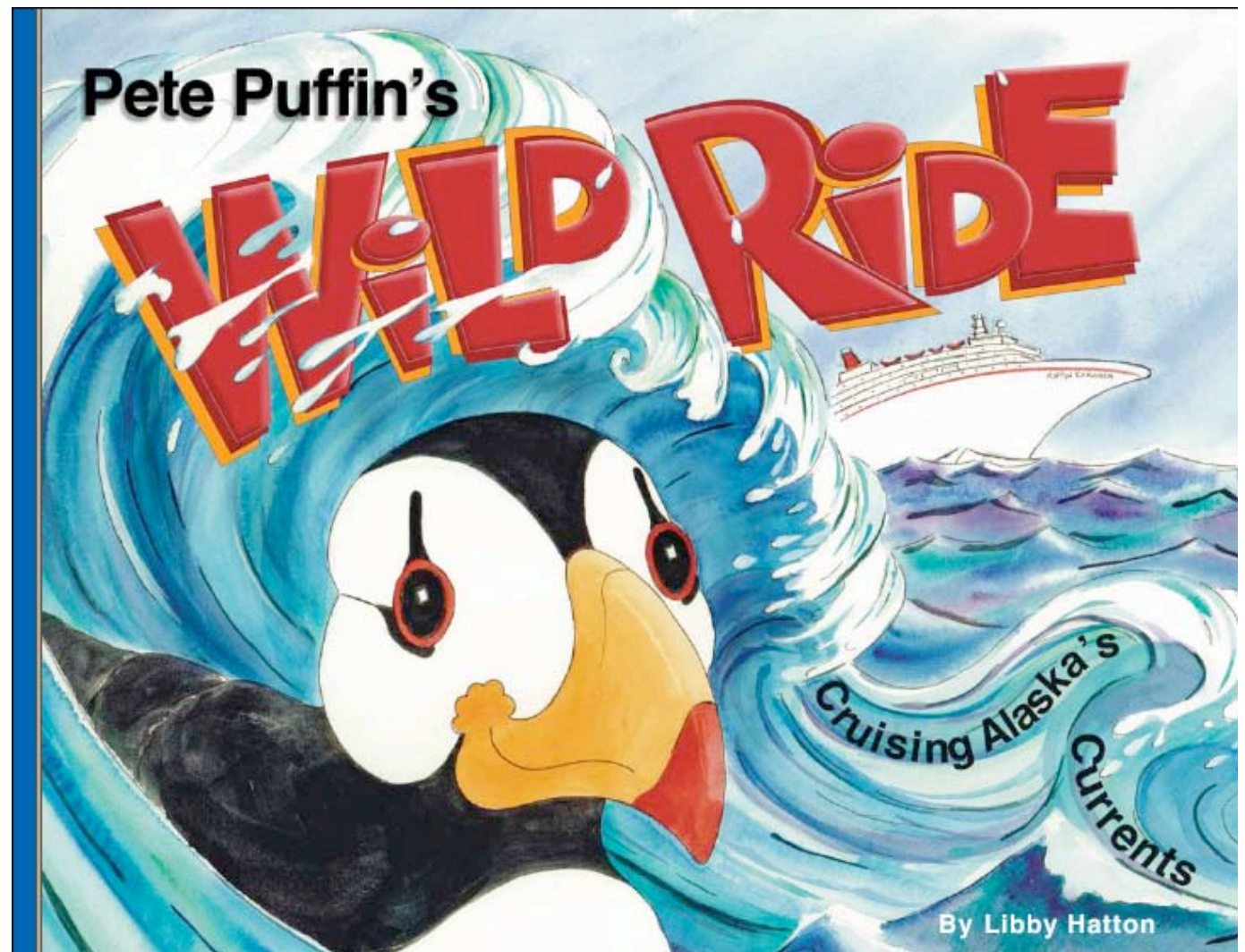
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Videos



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Books



Media



Message Elements

- Who
- What
- Where
- When
- Why



Activity

Now, it's your turn!

Create two phrases that
communicate your
research.



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UNDERSTANDING ECOSYSTEM PROCESSES IN THE

Bering Sea



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AT A GLANCE

- General Program Information
- Meet the Scientists
- Study Region Map
- Photo Gallery

NEWS + UPDATES

- In the News
- Scientific Cruises
- Media
- Teachers + Students

OUR FOCUS

- An Ecosystem Approach
- Human Communities
- Ecosystem Modeling
- Animal Stories

FOUNDATIONS

- History

Bering Sea Ecosystem Research: An unprecedented scientific effort between NPRB and NSF

SIX YEARS
93 SCIENTISTS
MILLIONS
OF CREATURES
ONE STORMY SEA



PROGRAM UPDATES

SAB Election Results
The votes for the **Scientific Advisory Board** have been tallied. Terms were randomly determined per the Program Management Plan. Congratulations to:

- **Kerim Aydin, Rolf Gradinger, Phyllis Stabeno** (1-year term)
- **Carin Ashjian, Rodger Harvey, Mike Sigler** (2-year term)

JOB OPPORTUNITY

OSU College of Oceanic + Atmospheric Sciences Research Associate (Postdoctoral)
Study the distribution and

Bering Sea Haiku

As the cold seas warm
scientists plunge in to find
where the fishes go.



Tips

- Stop speaking in code
 - Don't overdue "weasel words"
 - Avoid confusing words – "positive trends"
 - Use your words, not acronyms
 - Give examples and metaphors
- From "Improving How Scientists Communicate About Climate Change, Susan Joy Hassol, EOS, March 2008



Tips

Overused Phrases

- Perfect Storm
- Holy Grail
- Paradigm Shift
- The National Association of Science Writers



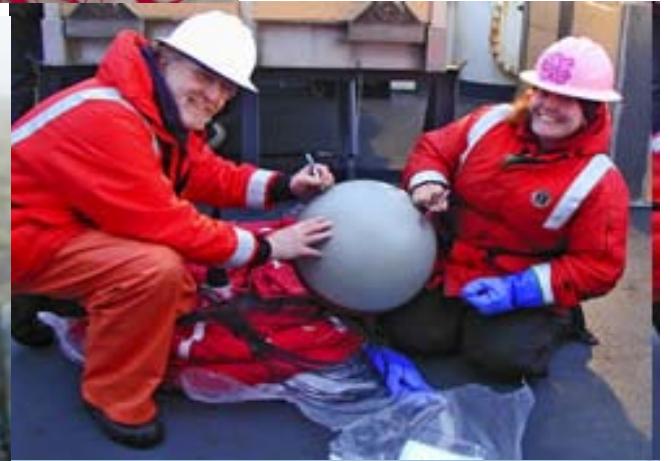
Advice from the Panel

- Scientists
- Educators
 - Middle school
 - High school
 - Informal



Science Stories from the Field

Cruise Logbook



YOU- THE RESEARCHER

Bridge the Gap - Make a Broader Impact

TEACHER/ CLUB LEADER

CONNECT with

- school districts*
- science teachers*
- school science clubs*
- scout groups*
- create a project*
- collect data*
- *collaborate on a Wikispace*

Volunteer

- host a class on your topic*
- participate in Career Day*



**Students/Kids -
Families**

Elizabeth Eubanks
St. Mark Catholic School, Boynton Beach,
FL
hooaca@yahoo.com

Activity 2

- Write a short message that describes your research
- Wad up your message and throw it to someone else in the room
- Pick up message and read aloud



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Resources

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COSSEE

NSF Ocean Sciences

- Helping scientists achieve broader impacts and share research with the public
- Promoting partnerships between ocean scientists and educators



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American Geophysical Union

- Communicating Your Science to the Public
- www.agu.org



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AAAS

- Communicating Science
Tools and Workshops
- www.aaas.org



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COSEE California

- Communicating Ocean Science Course
- Communicating Ocean Science for Informal Audiences Course
- www.coseeca.net



NSF Workshops

- Communicating on Climate Change: An Essential Resource for Journalists, Scientists, and Educators
- Metcalf Institute for Marine and Environmental literacy



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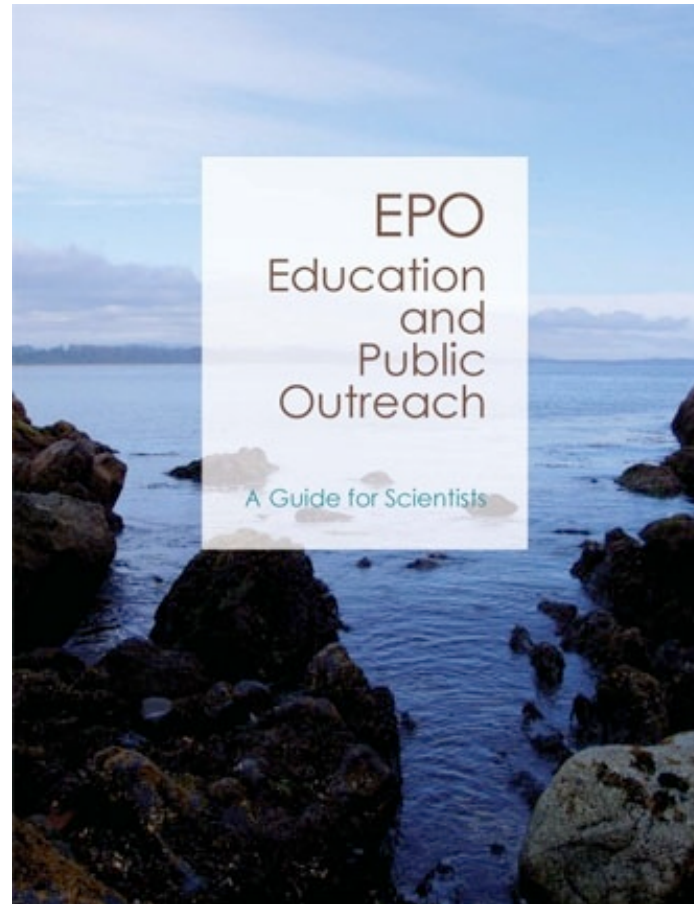
Ocean Observing

- The GoodmanCenter.com
 - Ocean Observing Storytelling & Datavisualization Workshop



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A Guide for Scientists



- Developed by the Centers for Ocean Science Education Excellence and TOS
- TOS website

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Scientifically Speaking



Discussion and Questions



Thank You!

