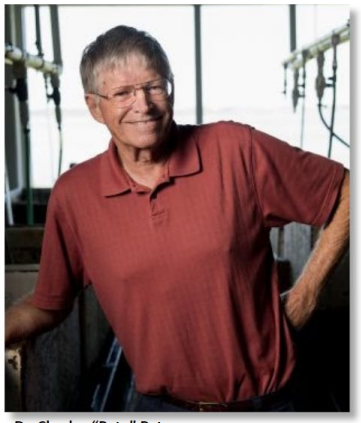
Alaska Marine Science Symposium January 26, 2021

Keynote Presentation for Gulf of Alaska Day

A legacy of leadership that paved the way for Gulf of Alaska ecosystem research, honoring the "Petes"

Molly McCammon, Phil Mundy, Robert Spies, Jeep Rice, and Jim Bodkin

Honoring the "Petes"



Dr. Charles "Pete" Peterson

Dr. Pete Hagen

Abstract

Two leaders in understanding and advancing recovery of injured resources from the *Exxon Valdez* Oil Spill (EVOS) passed away in 2020. Both were called Pete, and both contributed to the evolution of EVOS studies, from assessing the damages caused by the spill to developing a legacy program of marine science across the Gulf of Alaska. Charles "Pete" Peterson was instrumental in shifting the paradigm of looking at the recovery of individual species to examining the recovery of spill-affected communities and ecosystems. Pete Peterson was fundamentally a nearshore ecologist who conducted seminal work on the physical and ecological processes driving coastal biological communities. He was a long-serving member of the EVOS Trustee Council Science Panel where he was able to guide the development of long-term monitoring efforts designed to promote collaboration among researchers of many disciplines and aspects of the Gulf of Alaska ecosystem, ranging from ocean physics to marine birds, whales, and intertidal organisms. Pete Hagen, as the NOAA liaison to the EVOS Trustee Council, was a strong proponent for research to understand recovery from oil spills. His tireless efforts guided the development of multidisciplinary research programs supported by the EVOS Trustee Council and advocated for science that addressed ecological and societal needs, as well as those specific to agency mandates. He played a critical role in the administration of funding to allow research activities to succeed. We will reflect on the contributions of the "Petes" and how their leadership has led to a better understanding of the Gulf of Alaska ecosystem

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Speaker Transcripts next page:

MOLLY MCCAMMON, SENIOR ADVISOR, ALASKA OCEAN OBSERVING SYSTEM (AOOS)

Molly McCammon is the AOOS Senior Advisor, after having served as the Executive Director since AOOS's inception in 2003. She serves on the IOOS Federal Advisory Committee and is co-chair of NOAA Science Advisory Board's Ecosystem Science and Management Working Group. Prior to her position at AOOS, she served for 10 years as the Executive Director of the *Exxon Valdez* Oil Spill Trustee Council, managing the restoration program following the 1989 oil spill.

Today's keynote is a bit different than others - we are taking this day to honor two leaders in understanding and advancing recovery of injured resources from the *Exxon Valdez* Oil Spill who passed away in 2020. Both were called Pete, and both contributed to the evolution of *Exxon Valdez* oil spill studies as well as integrated ecosystem science in Alaska. In fact, the first ever cross-disciplinary marine science meeting occurred in the winter of 1994 and has occurred every year with what we now know as the Alaska marine Science Symposium.

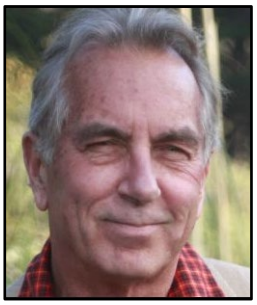
Instead of 1 speaker, we will hear from 4 of their colleagues who have all themselves made enormous contributions to Alaska marine science following the spill. They will reflect on the contributions of the "Petes" and how their leadership has led to a better understanding of the Gulf of Alaska ecosystem.

These are Bob Spies, Phil Mundy, Jim Bodkin and Jeep Rice. You can find their biographies on the AMSS website. I myself, was director of the *Exxon Valdez* Oil Spill Trustee Council for about 10 years during its formative years.

I'd like to read some introductory words written by Jim Bodkin that I think aptly introduce this session:

> *A ship drifting off course began what would soon come to be known as one of the worst environmental catastrophes in our country's history. Millions of gallons of crude oil would soon spread across the pristine waters of the Gulf of Alaska, oiling many miles of shoreline and killing untold millions of plants and animals, and altering both the structure and function of this large marine ecosystem for decades to come. Two young scientists at the time, sharing the name of "Pete", would dedicate much of their careers to understanding the effects of the Exxon Valdez oil spill, but more importantly, would work tirelessly toward turning the disaster into a legacy of learning through science that would ultimately benefit and aid in the restoration of the injured Gulf and the humans that rely on and value it. Pete Peterson and Pete Hagen fought diligently, using science, law and*

policy, to honestly understand and represent both the acute and chronic effects of the spill through thoughtfully designed, well executed and defensible study. Over the course of time, the "Pete's" were pivotal in directing the course of Exxon Valdez oil spill science and management in the Gulf of Alaska toward a legacy marine science program, "Gulf Watch Alaska" and "Herring Research & Monitoring", that has helped transform a tragedy of the past to a treasure in the present. The fruits of their labor will continue to grow as the science they advocated provides answers to current and as yet unanticipated questions. Their work will be remembered with deep appreciation and gratitude. In some large part, thanks to the "Petes", the ship's course has been corrected.



BOB SPIES, SENIOR SCIENTIST, APPLIED MARINE SCIENCES, Inc.
Bob Spies has 35 years experience in applied marine ecology and its application to management. He has investigated the fate and effects of radionuclides, petroleum hydrocarbons, and chlorinated hydrocarbons in marine ecosystems. Bob served as Chief Scientist for the *Exxon Valdez* Oil Spill Trustee Council (1990 - 2002) and editor for "Long-term Ecological Change in the Northern Gulf of Alaska" (Elsevier, 2007).

<u>Introduction of Pete Peterson</u>

- I was privileged to have worked closely with both Petes in Alaska during the *Exxon Valdez* years.They were outstanding people and scientists and I will miss them. I will let you know a little about Pete Peterson's background, his contributions to Alaskan marine science, and what he was like as a friend and colleague. Then I will turn it over to my friend Phil Mundy to tell you about Pete Hagen.

- Pete Peterson had a full and productive academic, teaching and research career on the Atlantic coast, mainly at the University of North Carolina, where he mentored 50 graduate and post-doctoral students. But I will mainly dwell on his invaluable contributions to Alaskan marine science, as we knew him mainly for his advice to the Trustee Council during the damage assessment and restoration programs for the *Exxon Valdez* Oil Spill and his testimony in the private plantiff's trial for damages from the Exxon-Mobile Corporation.

- Pete had a great academic pedigree: cum laude from Princeton working with the pioneering population ecologist Robert MacArthur, as a Ph.D. student of the renowned intertidal ecologist Joe Connell at UC Santa Barbara and then faculty positions at University of Maryland and finally 43 years at University of North

Carolina, retiring in 2019 as a full Professor. He lived just 15 months beyond retirement. He was awarded a prestigious Pew Fellowship and had several awards from the state of North Carolina for his contributions to local marine conservation efforts.

- Peterson was involved from the start in the oil spill program and we first met in 1989 as reviewers for the studies of damage. His background in intertidal ecology was very useful, but what was immediately apparent was his ability to communicate effectively. Actually, he was beyond effective, he was compelling. He could move a crowd. A well structured series of points, an elegant delivery and ending with a seemingly inescapable conclusion—he was outstanding. The attorneys loved him. People were reluctant, to speak before or immediately after him. Even if you did not agree with him on a particular issue you might be more than a little reluctant to challenge him in debate. So, smart and articulate, yes without a doubt. But there was another side to him a hard-working reviewer to whom I could hand off a inches thick final report on the intertidal study and who would have an exhaustive, lengthy review back in a few weeks—an effort that must have kept him busy at night and on the weekends while still meeting all his other commitments as a full professor, doing his own research in coastal North Carolina, publishing, teaching and mentoring students. Pete was a reviewer for *Exxon Valdez* oil spill studies for more than 20 years. He read and commented intelligently on hundreds of reports, proposals and publications. He came to Alaska frequently and made his *Exxon Valdez* oil spill efforts a priority among his many other commitments both at his University, but also in various government boards, committees and commissions. It was all for his goal of improving the human understanding and management of marine nearshore ecosystems.

- I especially appreciated Pete's strong endorsement and advocacy of two overarching goals for the *Exxon Valdez* oil spill science program: an ecosystem based approach to restoration research and for long-term monitoring. He was a very strong voice for the former early in the program, particularly in 1993 following the crash of the Prince William Sound Pacific Herring population and weak returns for pink salmon. He was a strong voice for the SEA, APEX and NYP ecosystem programs and particularly effective with the Trustee Council in advocating for these programs. And then around the year 2000 Pete helped us greatly in our advocacy for long-term monitoring in the Gulf of Alaska, now Gulf Watch.

- Pete was also a memorable presence in other ways, for example his sartorial habits. The old running shoes, the corduroy levis, the thread bare red sweater and in winter the red and black checked wool lumberjack coat. I have not been able to remember him wearing anything else. It made him easy to spot in the

local Thai restaurant in Anchorage where we would meet with other biologists after a day of formal meetings, then exercise (he was a great swimmer)—relaxing with a beer, sidewalk noodles and sharing news of families and friends. In any case dressed in his usual attire one March morning, waiting in front of the EVOS office in downtown Anchorage one of Anchorage's finest asked Pete to "move along". So Pete took a couple of trips around the block before the rest of us showed up and the front door was opened by Cherri Womac. Another EVOS stalwart we recently lost.

- So we were lucky to have worked with Pete and he paid us many times over with his contributions to marine science in Alaska.

PHIL MUNDY, DIRECTOR, AUKE BAY LABORATORIES, NMFS, Retired
Phil was the director of the Alaska Fisheries Science Center's Auke Bay Laboratories Division from 2005-2017. Previously he served as Science Director for the *Exxon Valdez* Oil Spill Trustee Council. At the EVOSTC Phil led the development of long-term monitoring programs and helped launch the North Pacific Research Board.

Thanks Bob. Those of us who worked with Pete Peterson will never forget that red sweater. Indeed it was an honor to work with you and Pete Peterson on the Restoration Program. It is also an honor to be given this time to remember my friend and fellow fisheries scientist Pete Hagen.

- Pete Hagen grew up in Seattle, fishing with his family on Puget Sound and working in seafood processing and commercial fishing, which sent him to the University of Washington (UW) for his bachelor's degree, and then on to the University of Alaska for M.S. and Ph.D. degrees. During his decade-long career with the Alaska Department of Fish and Game (ADFG), Pete established and directed the Mark, Tag, and Age Laboratory (MTA) in Juneau which provides information necessary for to implement sustainable fisheries management. At the National Marine Fisheries Service, Pete's portfolio covered the *Exxon Valdez* Oil Spill Trustee Council, the U.S. Canada Pacific Salmon Treaty, the North Pacific Research Board, the North Pacific Fishery Management Council, and the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative. He became well-known and respected in Alaska and western Canada for his ability to explain science to policy makers and for his mastery of federal and state budgets and regulations.

Pete joined another part of NMFS, Auke Bay Laboratories, as Deputy Director and he later served two years as acting Laboratory Director. Even so, Pete's career in science and management was only a part of the rich life he enjoyed in Alaska. The photo on screen illustrates Pete's spirit and it captures the happiness his family gave him. He was a devoted husband to Sara and the proud father of Annie.

- On screen are two examples of publications from Pete's career. Using halibut ear bones, otoliths, sampled as long ago as 1914, Pete constructed a time series of observations on growth at age in halibut spanning nine decades of the 20th Century. The standardized observations made it possible to statistically compare patterns of growth among decades, and to compare changes in growth to changes in environmental and biological factors that contribute to growth. Such long time series of biological observations supported the feasibility of the ecological approach to restoration of injured species adopted by the *Exxon Valdez* Oil spill Trustee Council. The Council recognized that determining the recovery of any oil-damaged species required not only a knowledge of the temporal trend in the species' abundance, but also of the temporal trends of the species' predators, prey and environmental drivers. Pete Hagen was among those scientists who demonstrated the feasibility of the *Exxon Valdez* Oil spill Trustee Council's ecological approach to restoration of injured species by showing it was possible to measure and compare decadal patterns of growth at age in a keystone predator in the Gulf of Alaska.

- Pete's experience in taking and interpreting large numbers of measurements from halibut otoliths was put to work at ADFG to create an operational program with the goal of permanently thermally marking the ear bones of all hatchery salmon prior to their release into salt water. Thanks to Pete's leadership of the Mark, Tag, and Age Laboratory, funding from *Exxon Valdez* Oil spill Trustee Council, and the efforts of the many dedicated scientists and technicians who marked, gathered and read the otoliths, as of 2002 close to one billion hatchery fish were being marked annually in Alaska, and estimates of hatchery-wild stock composition were being provided for more than 200 sampling strata to aid in in-season harvest management. *Exxon Valdez* Oil spill Trustee Council pilot projects helped ADFG establish the proof of concept for thermal mass marking as an operational fishery management tool in Prince William Sound, since wild pink salmon was an oil-injured species.

- During his time at NMFS Pete was well known to scientists in Alaska and western Canada for his abilities to turn good ideas into funded projects, and to

keep good projects funded. Pete was a master of the interdisciplinary and multicultural communication skills that allowed the complex processes of the Restoration Program to properly function. As such he was highly respected within the public process of the *Exxon Valdez* Oil Spill Trustee Council by both scientists and policy makers, as well as by members of the public. Pete could produce temperate solutions in the tense situations created when allocating funding among competing interests due to his gift of equanimity. His equanimity was displayed by carefully exploring all sides of each issue, which created a fair process for all concerned. Coming as it did near the peak of his 34-year career in Alaska, Pete's untimely and unexpected death was a major loss to the community of the Alaska Marine Science Symposium.

JIM BODKIN, ALASKA SCIENCE CENTER, USGS, Scientist Emeritus
Jim led the Coastal Ecosystems research program from 1991 until his retirement in 2013. He accepted an emeritus position and continues to pursue his research interests in coastal marine ecology, long-term ecological monitoring, and the recovery of injured resources from the *Exxon Valdez* oil spill.

Personal reflection of our interactions with the "Petes" From our Perspective

- The following is a tribute to the "Petes" from our perspective: Brenda Ballachey and myself;

- The *Exxon Valdez* Oil Spill plunged marine sciences in the Gulf of Alaska into uncharted waters.In the decades prior to 1989, science in Alaska's oceans focused on species over the continental shelf, with little emphasis in the nearshore or in Prince William Sound, where most of the spilled oil would be deposited and persisted, and where injury would be most evident. Further, prior studies generally did not consider linkages among species or their role in ecosystem function, and thus were unable to provide a comprehensive basis for understanding the full range of spill effects. But almost overnight, an unprecedented environmental catastrophe initiated a massive response, one that required science to assess injury and recovery, that in some cases would take decades. The development and integration of ecosystem studies across a relatively pristine marine ecosystem would eventually come to change the course

of oil spill science across the globe, well into the 21st century.

- As scientists engaged in coastal marine research in Prince William Sound, focused on sea otters, their recovery from the fur trade and the ecological consequences, the oil spill was a bit of a train wreck, but one that posed new opportunities. Although sea otters were one of the few species with some abundance data prior to the spill, the data were incomplete and determination of defensible loss estimates was challenging, at best. But one of the "Petes", Dr Peterson, a nationally recognized expert in coastal marine ecosystems and a member of the *Exxon Valdez* Science Team, along with Bob Spies, recognized how acute, chronic and indirect spill effects might be best demonstrated by sea otters and by extension, applied to other injured resources. Through Pete Peterson's support and guidance, we developed a research program that would illustrate a pathway from oil sequestered in beaches where sea otters fed, to their chronic injury and delayed recovery, and the realization that damages from chronic effects may in fact exceed those of acute oiling. The breadth of his vision would eventually lead to a publication in Science in 2003 that would synthesize the variety of mechanisms at play in ecosystem and species injury caused by marine oil spills. This paper would extend the concept of ecotoxicology across marine food webs, from kelps to whales and alter the course of how science evaluates the full range of impacts of spilled oil.

- Pete Hagen, a marine scientist with significant contributions to the conservation and management of fisheries in Alaska, played an equally decisive role in the transition from damage assessment, to ecosystem recovery and eventually to the Gulf Watch Alaska long term monitoring and research program. We shared with Pete Hagen a common scientific interest in the use of annuli to estimate the age of long- lived species; layers in the teeth of sea otters and layers in otoliths (or ear bones) in halibut that Phil Mundy described, and Pete always wanted to hear the latest news from the sea otter community. While Dr Hagen represented NOAA, with authority over fisheries and marine mammals on the continental shelf, he was always ready to support and advocate for the nearshore, recognizing the large effect of the oil spill in this ecosystem, and the value of integrating science across the Gulf of Alaska. Regardless of the pressures coming from various organizations and interests, Pete believed in the truth of science and we will always appreciate his interest in, and support for studies in the nearshore.

- At times it was a torturous road, from the futility and conflict inherent in assessing injury to species with little or no baseline data; to the development of ecosystem

research for evaluating complex pathways of injury and delayed recovery; and leading eventually to the implementation of Gulf Watch Alaska, a program that will allow detection of trends in hundreds of marine species and provide new insights into the relations and mechanisms that drive those trends. The Gulf Watch program is extending data sets that, often extend over many decades. These time series are preparing science and management for ongoing changes, as well as unexpected perturbations in the Gulf of Alaska. We owe deep appreciation and gratitude to the "Petes" for the significant role they collectively played in navigating the obstacles and opportunities on the road from the *Exxon Valdez*, and for their vision of the destination to which that road would lead.

JEEP RICE, PROG. MGR., AUKE BAY LABORATORIES, NMFS, Retired
During a federal career spanning more than 40 years, Jeep focused on understanding the long-term fate and biological effects of oil in the marine environment. His *Exxon Valdez* oil spill research and extensive publications led to a new paradigm, that very low concentrations of oil in the environment could negatively impact marine organisms and compromise their habitats.

<u>Personal reflection on the "Petes" contribution to science</u>

- Both Petes had great careers, and their sustained contributions to the Trustee science process was huge, but it needs to be put into perspective……
- The *Exxon Valdez* oil spill was a game changer: 911 was a game changer; you probably know exactly where you were when you heard the news. The *Exxon Valdez* oil spill was an environmental game changer, and for Alaskans, you probably know where you were at when you first heard the news.
- The *Exxon Valdez* oil spill was historic; the largest spill in US waters at the time; the largest cleanup response in history at the time, and largest environmental damage assessment in history at the time. There was no historic road map to organize such a huge scientific enterprise, how to manage it, and how to figure things out.
- Developing that "road map" is a very complicated process - there are a lot of moving parts to the process. Science just does not "happen". Scientists doing the work and Trustees approving the research had visibility, but there are many behind the scenes that made this new process work. The science was complicated. Very complicated. The study of previous oil spills was largely

anecdotal; chemistry of the toxicity was not understood; biological effects on reproduction, growth, were not documented. In the earlier spills, once all the oil was cleaned off the beaches and the dead birds picked up, the spill event was pretty much over... *Exxon Valdez* changed that.

- A rigorous scientific process needed to evolve. Well thought out proposals. Peer review. Transparent. Productive. And, Accountable. For a research effort of this scale, under emergency conditions, there was no road map.
- Both Petes worked tirelessly, passionately, and relatively invisible. Pete Hagen understood good science, and was able to translate the gobbley gook at times to lawyers and administrators to get approvals, guided contracts to keep money flowing to various state and non-federal entities. Pete Peterson was instrumental in the review process, a quality control check to ensure good science, and to suggest and push for a transition from the early species oriented studies to more of a long-term ecosystem research effort, which would have the most benefit to the science of Alaska environment. Pete Hagen advocated the same from within the agency, Pete Peterson advocated strongly from the Science panel as a lead reviewer.
- The *Exxon Valdez* oil spill was a game changer in spill science by identifying damage to the environment and to species, in several well documented examples. Most importantly, the damage and the recovery was followed and documented over a long period of time. Several of us understood this was a big deal in science, but it was Pete Peterson who assembled several key scientists and reviewed their accumulated findings after the 10-year anniversary, when the uniqueness and significance of the science coming out of *Exxon Valdez* research was emerging. Pete's leadership in a key article in the journal Science exposed to the world the quality and extent of the science that exposed the long term effects coming from an oil spill, which had never been documented before as well as Pete Peterson's review article... damage assessments were forever changed.
- Lastly, to serve as long and as diligently as both Pete's did in their respective roles, with little visibility or recognition, requires a passion and dedication for science. We honor their service to the understanding of oil spill and ecosystem science that has served Alaska so very well. Those legacy studies continue today, through warm and cold years, through good and bad years. No other region in the world has as many long-term environmental studies, from plankton to whales, that are coordinated and tied together for as long as the *Exxon Valdez* legacy studies that continue today in the present Long-Term Monitoring program.

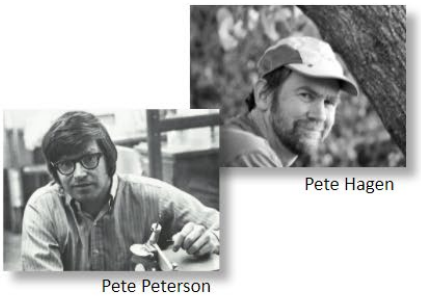
Student Scholarships

In the honor of Pete Peterson and Pete Hagen, a scholarship has been established to support students that demonstrate excellence in improving our understanding of factors important to recovery from oil spills in Alaskan waters. A one-thousand-dollar scholarship will be awarded to a graduate-level student and a five-hundred-dollar scholarship to an undergraduate or high school student that demonstrates excellence in studies related to oil spill recovery, ecosystem science, or connecting environmental research to societal benefit within Alaskan waters.

We seek applications for these awards. The application must include a five hundred to one thousand word essay from the student describing how their research interests and activities address the themes above and a nomination letter from a researcher or teacher supporting the student's application.

Complete applications must be received by March 26, 2021. Applications and questions should be sent electronically to Scott Pegau at wspegau@pwssc.org. The applications will be evaluated, and awards provided directly to the student.

Announcing Student Scholarships in Honor of the "Petes"



Pete Hagen

Pete Peterson

- Excellence in improving our understanding of ecosystems, oil spill recovery, and connecting research to societal benefits
  - $1000 Graduate Student
  - $500 Undergraduate or High School
  - Applications due **March 26, 2021**
- For more information on applying, please contact Scott Pegau at:
  - wspegau@pwssc.org
  - 907-424-5800 ext 222