SESSION 2

Aquaculture

Chair: Graham Young
INTRODUCTION

Chair
Graham Young

Laura Hoberecht
NOAA Fisheries

AQ 101: an introduction to aquaculture in Washington

ABSTRACT: Marine aquaculture is vital for supporting our nation’s seafood production, rebuilding protected species and habitats, providing employment in coastal communities, and enhancing commercial and recreational fisheries. The United States imports about 90% of its seafood, with more than 50% coming from farmed products. By increasing domestic marine aquaculture production, we can maintain economic benefits while ensuring appropriate regulatory oversight. In Washington, commercial aquaculture includes shellfish (oysters, clams, mussels) and finfish (Atlantic salmon and steelhead); restoration aquaculture is used for pinto abalone, Olympia oysters, Pacific salmon, and bull kelp. Aquaculture is also used to enhance commercial, recreational, and tribal fisheries for Pacific salmon. Emerging species for aquaculture production in Washington include sablefish, purple hinged rock scallops, sea cucumbers, and macroalgae.

BIO: Laura Hoberecht has worked in the field of marine science for nearly 25 years. She received her BS in Food Science and Nutrition from UC Berkeley in 1993 and her MS and PhD in Aquatic and Fishery Sciences from the UW in 2001 and 2006, respectively. Laura currently works for NOAA Fisheries as one of two aquaculture coordinators in the West Coast Region.

Graham Young
WRAC & SAFS

BIO: Graham Young received his BSc (1975) and PhD (1980) from the University of Sheffield in England. After post-doctoral positions at the National Institute for Basic Biology, Okazaki, Japan (1980–1982) and UC Berkeley (1982–1989), he joined the faculty in the Department of Zoology, University of Otago, New Zealand, in 1989. In 2002, he joined the faculty at the University of Idaho, and then, in 2004, he was recruited to SAFS as Professor and Executive Director of the USDA-funded Western Regional Aquaculture Center (WRAC). In addition to his administrative responsibilities at WRAC, Graham teaches aquatic animal physiology and reproduction and maintains an active research program in fish reproductive physiology.
Kurt Grinnell
Jamestown K'Slallam Tribe

A tribal perspective: sustainable harvest over the next seven generations

ABSTRACT: Who were we? Who are we now? How will we preserve our culture and create economic development through aquaculture over the next seven generations? A brief history of the Jamestown K'Slallam Tribe on the Olympic Peninsula and our connection to the Salish Sea.

BIO: Kurt is a Jamestown Tribal member and has served on the Jamestown Tribal Council since 2004. As the Tribe’s Policy Representative for the Natural Resources Department, he brings to the Council a unique perspective on natural resource conservation. He represents the natural resource interests of the Tribe as the Vice Chairman of the Point No Point Treaty Council Board and as a Commissioner on the Northwest Indian Fisheries Commission (NWIFC). The NWIFC is a consortium of 20 Western Washington Treaty Tribes that deals with treaty rights issues that the Tribes have in common. As the Tribe’s representative, Kurt participates on the legal technical team at a policy level, on which the Tribe relies to manage its natural resources. He represents the Tribe on all fisheries issues that require policy involvement, co-management discussion, or tribe-to-tribe discussions. He is also the Chairman of the Tribe’s Natural Resource Committee.

Michael Rust
NOAA Fisheries Office of Aquaculture

Marine aquaculture in the US? Why should we care?

ABSTRACT: Is it economic development? ...for food or nutritional security? ...to move food production to a carbon neutral practice capable of dealing with climate change while improving the health of the oceans? Well yes, but I think the real reason we should care is for our own health.

BIO: After graduating from the University of Colorado, Mike spent two years in the Peace Corps, living in the Philippines. Upon returning to the United States, he earned MS degrees from the UC Davis. Upon graduation, he worked in Haiti, the Bahamas, Florida, and Quebec on various aquaculture projects before moving to Seattle and completing a PhD at the UW. He joined NOAA after completing a post-doc in Norway. At NOAA, he led the aquaculture research program at the Northwest Fisheries Science Center, where his focus was on nutrition and fish physiology. He chaired a joint NOAA/USDA initiative to identify options for replacing fish meal and fish oil in feeds for aquaculture and developed hatchery technology for numerous marine organisms. Mike is currently the Science Advisor for NOAA’s Office of Aquaculture. He works on the strategy of funding science, the communication of science to non-scientists, and how science informs policy and decision making.
Halley Froehlich
UC Santa Barbara

Global aquaculture issues

**ABSTRACT:** Although aquaculture is the fastest growing food sector on the planet, there are major scientific gaps concerning the consequences of aquatic farming in a larger, ecological food-system context, especially under a changing climate. My research aims to assess and quantify the global suitability and conservation potential of different forms of aquaculture by looking across land-sea linkages and scales of production. I will touch upon several findings and upcoming research, as well as highlight SAFS’s influence on my scientific trajectory. The interdisciplinary aquaculture research is intended to provide new insights to support integrative and adaptive strategies.

**BIO:** Halley Froehlich received her PhD from SAFS in 2015, advised by Tim Essington. She took an interdisciplinary approach, studying the non-lethal effects of hypoxia on exploited ecosystems and species. Halley had started her foray into fisheries through freshwater aquaculture at the University of California, Davis, where she received a BSc in Animal Biology. Fortuitously, her post-doctoral position at the National Center for Ecological Analysis and Synthesis brought these two worlds together—there, she has been studying the interactions and impacts of global aquaculture, fisheries, and climate change. Starting July 2019, Halley will be a tenure-track, Assistant Professor at the University of California, Santa Barbara.

Mackenzie Gavery
UW-JISAO

**Epigenetics: a molecular resource for advancing aquaculture**

**ABSTRACT:** Environmentally induced epigenetic changes are increasingly acknowledged as important mechanisms underlying developmental plasticity and physiological responses of organisms to environmental change. Because epigenetic change can occur quickly in response to environmental change and, in certain cases, can be inherited by future generations, epigenetic variation has the potential to facilitate rapid evolutionary change. Therefore, understanding how epigenetics influences phenotypes, the extent of epigenetic variation in natural populations, and the heritability of these marks are all potentially important considerations for advancing commercial and conservation aquaculture. General concepts and potential applications of epigenetic analyses in aquaculture species will be introduced.

**BIO:** Mackenzie Gavery graduated from Seattle University with a BS in Biology. After graduation, she worked as an analyst in Seattle’s biotech sector, where she supported the development of biologic therapies for genetic diseases. She completed her PhD at SAFS (2014), where she studied the role of epigenetics in mediating environmental responses in Pacific oysters. Currently, Mackenzie is a UW-JISAO post-doctoral researcher, investigating the impacts of hatchery rearing environments on the epigenome of Methow River steelhead trout.
Shellfish

Chair
Carolyn Friedman

Carolyn Friedman
SAFS

**BIO:** Carolyn Friedman is interested in the health of marine and freshwater shellfish. Her lab examines infectious and non-infectious diseases of wild and cultured marine invertebrates. She is also interested in ecosystem health, including population dynamics, genetics, and restoration. Her lab is also currently developing tools to control, diagnose, and model Withering Syndrome in farmed and wild abalone populations, and is examining the symbiotic relationship between the host bacterium and phage. Carolyn’s lab collaborates widely with researchers across the United States and globally.

Bill Dewey
Taylor Shellfish Farms

*Merging science and experience to shape policies that benefit Washington’s shellfish industry*

**ABSTRACT:** The scientific knowledge I garnered from SAFS, coupled with firsthand knowledge gained by years of working the tide flats and walking the halls in Olympia and Washington, DC, have proven to be an effective combination for influencing public policy. Knowledge and experience are applied to shape water quality, environmental, human health, aquaculture, and regulatory policy issues at the local, state, and federal levels to the benefit of Washington’s shellfish industry.

**BIO:** Since receiving his BS in Shellfish Biology from the UW in 1981, Bill Dewey has worked in shellfish farming. He is Director of Public Affairs for Taylor Shellfish Farms, the largest producer of farmed shellfish in the US, and he operates his own shellfish farm in Samish Bay. Bill has served on numerous boards and committees and currently serves on the Washington Marine Resources Advisory Council. He has received the Environmental Hero Award and the Joseph P. McCraren Award for Outstanding Contributions to the Aquaculture Industry. In 2006, the National Shellfisheries Association presented him with the David H. Wallace Award for promoting understanding, knowledge, and cooperation among industry members, the academic community, and all levels of government. As the only non-PhD recipient, it is the award of which he is most proud.

*Photo courtesy of Carolyn Friedman*

*Photo courtesy of Bill Dewey*
Colleen Burge  
Institute of Marine & Environmental Technology, University of Maryland Baltimore County  

Gone viral, the global emergence of an oyster-killing virus and its potential impacts on the shellfish industry

ABSTRACT: Shellfish aquaculture can be impacted by a variety of pathogenic diseases. Of particular concern to the shellfish aquaculture industry are the emerging viral pathogens, the Ostreid herpesvirus 1 (OsHV-1) and its variants, particularly the OsHV-1 µvars, which infect and kill Pacific oysters globally. In the past ten years, OsHV-1 µvars have spread rapidly, leading to heightened concern. In the United States, OsHV-1 has only been detected in California, primarily in Tomales Bay, where an OsHV-1 variant infects and kills Pacific oyster seed annually. In late 2018, an OsHV-1 µvar was detected in San Diego Harbor. I will provide an overview of OsHV-1 and current proactive OsHV-1 research conducted in partnership with the shellfish aquaculture industry.

BIO: Colleen Burge grew up on the shores of Hood Canal, learning marine aquaculture and ecology from a young age. She is an Assistant Professor at the Institute of Marine and Environmental Technology with dual appointments at the University of Maryland Baltimore County and the University of Maryland Baltimore. Colleen received her BS (2002) and PhD (2010) from SAFS. She held post-doctoral positions at Cornell University and subsequently at UW.
Teri King  
UW Washington Sea Grant  

**Seafood, it's not just for dinner**

**ABSTRACT:** The seafood of the Pacific Northwest leaps off the plate into the hearts and minds of residents in very subtle ways. Bivalves for Clean Water, the Shellfish Trail, Kids' Day at OysterFest and experiences like the Hama Hama Oyster Rama provide a unique way for community members to dive into the wonderful world of aquatic resources. Oysters, geoduck, and salmon—delectable to eat and educational tools.

**BIO:** Teri King, Washington Sea Grant’s Aquaculture Specialist, has a sustained record of accomplishments in Puget Sound marine outreach. She engages with stakeholders on a variety of issues, including seafood safety and aquaculture. She has an ability to bring people and issues together using novel approaches, such as Bivalves for Clean Water, Septic Socials, the Shellfish Trail, and *SoundToxins*. Teri dedicated 10 years to the Puget Sound Ecosystem Coordination Board, developing recovery actions for Puget Sound. She worked as a fisheries biologist for the Washington Cooperative Fish and Wildlife Research Unit and in the UW School of Fisheries in the aquaculture/genetics unit, studying salmon, trout, tilapia, sturgeon, clams, and oysters. Teri holds BS (1986) and MS (1990) degrees from the UW School of Fisheries.
Ron Hardy
University of Idaho

SAFS and finfish culture; progress in sustainable feeds

ABSTRACT: Although concern about sustainability of aquaculture feeds arose in the scientific community about 20 years ago, this was not a novel concern at the (then) College of Fisheries over 30 years earlier due to the foresight of Lauren “Doc” Donaldson. His pioneering work in fish nutrition, which began with his PhD research in the 1930s, created the foundation and inspiration for several generations of UW fish nutritionists, such as John Halver, who made the UW the world leader in the field. Their students continue leading the field to this day.

BIO: Ron Hardy is a Distinguished Professor in the Department of Animal and Veterinary Sciences, University of Idaho, and Director of the Aquaculture Research Institute. He received his BS in Zoology and PhD in Fisheries from the University of Washington. He was a Research Professor in the UW School of Fisheries until moving to Idaho in 1996. Ron is an internationally recognized expert on aquaculture, fish nutrition, and feed production technology, authoring over 300 scientific publications, book chapters, and popular articles on these topics. His current research interests include developing sustainable feed sources for the global aquaculture industry and investigating landscape genomics and adaptive capacity of fish.

Penny Swanson
NOAA Northwest Fisheries Science Center

BIO: Penny Swanson is an internationally recognized expert in fish reproduction and currently Director of the Environmental and Fisheries Sciences Division at the Northwest Fisheries Science Center, NOAA Fisheries and Affiliate Professor in SAFS. Penny oversees research programs in marine fish and shellfish biology and aquaculture, ecotoxicology, environmental chemistry, salmon hatchery technology, fish physiology, and harmful algal blooms. She earned a BA in Zoology from UW, an MS in Endocrinology and Reproductive Physiology from the University of Wisconsin, and a PhD in Zoology from UW in 1986. Before joining NOAA in 1990, she was a fellow of the Japanese Society for Promotion of Science at the School of Fisheries, Kitasato University, and a post-doctoral research associate in SAFS.
ABSTRACT: Large portions of some of the nation’s most depleted salmon and steelhead stocks have been removed from their natal rivers and lakes for rebuilding efforts. Captive broodstock programs for ESA-listed salmonids were initiated in the early 1990s and have incorporated a diversity of experimental collection, rearing, and reintroduction strategies to support conservation. Several improvements in husbandry practices have resulted in substantial amplification within one or two generations. However, challenges remain in minimizing hatchery-induced selection that can compromise rebuilding efforts. Further, quantifying the effects of captive rearing programs on natural productivity remains difficult, but is critical for determining the most appropriate applications of aquaculture for conservation.

BIO: Barry Berejikian completed his MS in 1992 under Don Rogers and his PhD in 1995 under the co-supervision of Steve Mathews and Tom Quinn at the UW School of Fisheries. Since then, he has been a Research Fisheries Biologist at NOAA’s Northwest Fisheries Science Center. Barry is currently the Program Manager for the Hatchery Reform Science Program and the Station Chief for the Manchester Research Station, a center for studying hatchery effects on anadromous salmonids and developing marine finfish and shellfish aquaculture for conservation, restoration, and food supply.
Steven Roberts
SAFS

**BIO:** Steven Roberts is the Kenneth K. Chew Endowed Associate Professor in SAFS. He received his PhD in Biology at the University of Notre Dame in 2002. Steven’s main research interest is the physiological response of aquatic species to environmental change with a particular focus on environmental epigenetics, reproductive biology, and aquaculture.

Kenneth K. Chew
WRAC and SAFS, Retired

**BIO:** Ken Chew, Professor Emeritus at the UW, spent 40+ years on the SAFS faculty, starting in 1962. He received his PhD in 1961 at UW and was asked to develop, along with other faculty members, the shellfish and aquaculture instructional program, which attracted many students over the years. He was able to bring the Western Regional Aquaculture Center program into the School. Ken’s national and international travel in support of shellfisheries and aquaculture are well known. In 2001, the UW established an endowed professorship in aquaculture in Ken’s name. And in 2014, NOAA established the Kenneth K. Chew Center for Shellfish Research and Restoration at Manchester, Washington.
SESSION 3

Fisheries Management

Chair: André Punt
Bill Clark
IPHC, Retired

100 years of SAFS leadership

ABSTRACT: Over the last hundred years, the science of fishery assessment and management has developed from near zero to today’s sophisticated assessments and management regimes. This development was the work of many scientists around the world, with SAFS faculty and graduates among the leaders. This talk will recount over a century of major advances in fishery management through the careers and achievements of four SAFS scientists: William F. Thompson, Milner Schaefer, Doug Chapman, and Rick Methot.

BIO: Bill Clark earned his PhD from the UW School of Fisheries in 1975. He studied population dynamics under the advisement of Jerry Paulik and Doug Chapman. Thereafter, he held positions at the UN Food and Agriculture Organization, SAFS, the Washington Department of Fisheries, and lastly, the International Pacific Halibut Commission, where he was the Senior Assessment Scientist until retiring in 2008. From 1979 to 2015, Bill served on the groundfish plan teams and scientific committees of the Pacific and North Pacific Fishery Management Councils.

Jim Balsiger
NOAA National Marine Fisheries Service

Gauging the impact of a changing climate on Alaska’s sustainable fisheries

ABSTRACT: I address current environmental changes that could have long-term impacts on vitally important fish stocks in Alaska’s federally managed waters, including the anomaly of higher than normal sea surface temperatures ranging from the West Coast and up to the Gulf of Alaska referred to as The Blob, ocean acidification, and historically low sea ice in the Bering Sea.

BIO: Jim Balsiger is the Regional Administrator for the Alaska Region of the National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service (NMFS)—a position he has held since May 2000. He began his career with NOAA in 1977 and has held numerous leadership positions in NMFS during his tenure, including serving as head of NOAA Fisheries from 2008 to 2010, and as Regional Science and Research Director at the Alaska Fisheries Science Center in Seattle. Jim also served as the federal US Commissioner for the International Pacific Halibut Commission for 18 years. In 2002, President Bush awarded him a Meritorious Award for sustained superior accomplishments throughout his career.
Melissa Haltuch  
NOAA Northwest Fisheries Science Center  

*A brief history of SAFS influence on California Current and Alaska groundfish fisheries*  

**Abstract:** This presentation creates a historical timeline of the influence of SAFS scientists on NE Pacific groundfish fisheries science and management. Scientists trained at SAFS have played key roles in increasing the scientific understanding of NE Pacific groundfish, and in overcoming management challenges during the past 100 years. The synergistic relationship between SAFS and the NOAA National Marine Fisheries Service has shaped the culture and scientific research with respect to NE Pacific groundfish, with SAFS graduates and post-docs working in positions ranging from field technicians through scientific leadership.

**BIO:** Melissa Haltuch (PhD, 2008) is a Fishery Research Biologist with the NOAA Northwest Fisheries Science Center and an affiliate faculty member at SAFS. Her research focuses on fisheries stock assessment methods, quantifying and projecting climate effects on fish stocks, and communicating scientific advice. Melissa leads stock assessments for US West Coast groundfish and serves on the North Pacific Research Board Science Panel. She was awarded the NMFS–Sea Grant Fellow in Population Dynamics while at SAFS. Prior to arriving in Seattle, Melissa worked for the US Department of State Office of Marine Conservation as a Knauss Sea Grant Fellow.

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Craig Rose  
NOAA, Retired  

*Improving fishing gear and methods to reduce bycatch and effects on habitat*  

**ABSTRACT:** The NOAA Conservation Engineering Program at the AFSC conducts research with the fishing industry to develop more efficient fish capture with reduced incidental effects. Key practices include industry collaboration and underwater observations of gear shape and fish reactions. Trawl modifications that let bycatch species escape (excluders) were developed for many fisheries, including halibut bycatch in cod fisheries and salmon bycatch in pollock fisheries. Raising herding cables ahead of flatfish trawls a few centimeters above the seafloor reduced their effects on seafloor ecosystems.

**BIO:** Throughout his career, Craig Rose has focused on cooperative research with the fishing industry to improve fishing gear and procedures to reduce bycatch and the effects of fishing on seafloor ecosystems. He moved to Seattle in 1977 to join NOAA’s NWAFC (predecessor of AFSC and NWFSC) as a cooperative education student. While working with NOAA, he completed his MS and PhD degrees in Fisheries at the UW. Becoming the sole researcher in Conservation Engineering (CE) at the AFSC in 1987, Craig built the CE program into a nationally and internationally recognized leader in fishing gear research and video and sonar systems to monitor fishing gear and observe fish behavior while encountering commercial fishing gears.
ABSTRACT: Management perceptions of salmon habitat have evolved over the last 60 years. Prior to the 1950s, habitat was not the focus of our management actions because of assumed abundance. During that time, rivers and estuarine habitats were lessened and simplified due to hydropower, agriculture, and development. During the 1950s and 1960s, habitat was filtered through the lens of river engineering, leading to additional floodplain loss and habitat simplification. By the late 1970s, the filter used to understand how salmon habitat changed included basic salmon needs. The 1980s and 1990s saw the development of our understanding of salmon habitat by life stage and species as well as physical processes associated with habitats. Today, we help define salmon habitat through large-scale concepts such as watershed processes, biocomplexity, and habitat connectivity.

BIO: George Pess has worked in fisheries since 1989, focusing on the examination of natural and land-use effects on salmon habitat and production. He has a BA in Economics and Environmental Science (Bowdoin College 1987), an MS in Forest Science (Yale University 1992), and a PhD in Aquatic and Fishery Sciences (UW 2009). George is Program Manager for the Watershed Program at NOAA’s Northwest Fisheries Science Center.
Melissa Krigbaum
SAFS

Economics matters for management

ABSTRACT: Effective management relies on understanding strategic decision making of harvesters and processors in tandem with understanding the population dynamics of the species they target. I will focus on the role that economic analysis plays in understanding behavioral responses to biological or managerial changes in a fishery as well as in achieving objectives beyond biological sustainability—such as efficiency, profitability, and community outcomes. I will provide an overview of the major questions facing fisheries economists, illuminate the economist approach to fisheries problems using economic tools, and emphasize the crucial opportunity for collaboration between ecologists and economists in the future.

BIO: Melissa Krigbaum is a graduate student at SAFS, studying fisheries economics under the advisement of Chris Anderson. Her research centers on the long-term profitability of West Coast sablefish fisheries and on incorporating economics into management strategy evaluations. She works as a contractor at the Northwest Fisheries Science Center, supporting the Economic Data Collection team, focusing on how the West Coast Groundfish Trawl Catch Share Program has influenced economic outcomes for processors. In 2013, Melissa graduated summa cum laude with a BA in Economics and a BA in Environmental Studies from the University of Southern California.

Michael Melnychuk
SAFS

The status of world fisheries

ABSTRACT: Although the status of fish stocks and fisheries around the world is enormously variable, some simple patterns emerge. In regions that have implemented strong fisheries management systems—including assessments, enforcement, and rebuilding plans—fishing pressure is generally maintained near target levels, and stocks that were overfished have begun to recover. In regions that lack effective management systems, stock status is generally thought to be poor and getting worse. Solutions are not necessarily transferable, and these latter regions pose challenges for global marine conservation and sustainably providing food security and other benefits from capture fisheries.

BIO: Michael Melnychuk is a Research Scientist in SAFS, working to identify management strategies and tactics that lead to successful conservation outcomes for marine populations and positive socioeconomic outcomes for the fisheries they support. This work relies on pairing stock status estimates compiled in the RAM Legacy Stock Assessment Database with assembled databases characterizing how management systems operate. Mike has also evaluated ecological impacts of catch share fisheries. His doctoral research at UBC focused on quantifying mortality patterns of juvenile salmon during their migration from southern BC rivers to the open ocean, using acoustic telemetry and mark-recapture models.
Tessa Francis  
University of Washington Tacoma  
*Linking science to decisions*

**ABSTRACT:** While many scientists conduct research that is relevant to ecosystem management, bringing scientific findings and knowledge to bear on actual decisions is not an automatic outcome of conducting applied science. Boundary spanning between knowledge and knowledge use requires iterative engagement and dialog with stakeholders and decision-makers. When the scientific knowledge is model-based, making those links can be even more difficult. I will offer some key characteristics of decision-relevant knowledge, based on the experience of the UW's Ocean Modeling Forum.

**BIO:** Tessa Francis is the Lead Ecosystem Ecologist at the UW Tacoma's Puget Sound Institute, and the Managing Director of the Ocean Modeling Forum. She is an aquatic ecologist, working to connect science to decision making in a variety of settings. Tessa currently leads several research projects related to conservation of forage fish, salmonids, and near-shore habitats in the Puget Sound and on the west coast of North America with agency, tribal and First Nations, industry, NGOs, and academic partners. Tessa holds a BA in Political Science from UC Berkeley and a BS in Wildlife Science and a PhD in Zoology and Urban Ecology from the University of Washington.

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Francisco “Cisco” Werner  
NOAA National Marine Fisheries Service  
*The legacy of SAFS and fisheries management: a NMFS perspective*

**ABSTRACT:** The relationship between SAFS and NMFS is deep and longstanding. Developments in fisheries science and their implementation have resulted in significant improvements in the status of our fisheries and are a global example of successful fisheries management. Scores of SAFS graduates work alongside NMFS scientists, or are part of the NMFS Science Centers and Regional Offices, and have jointly helped develop successful management strategies. New challenges, including rapidly changing ocean conditions, ecosystem and related socioeconomic considerations, are upon us and hence the need to continue to build on past successes requires continuous evolution. Next steps and considerations in building a “new legacy” will be discussed.

**BIO:** Francisco “Cisco” Werner is Director of Scientific Programs and Chief Science Advisor of NOAA’s National Marine Fisheries Service. His research has focused on the oceanic environment through numerical models of ocean circulation and marine ecosystems. Cisco has studied the effects of physical forcing on lower trophic levels and the subsequent effect on the structure, function, and abundance of commercially and ecologically important species, and he has contributed to the development and implementation of ocean forecasting systems. Cisco received his BSc in Mathematics and PhD in Oceanography from the UW.
Rod Fujita  
Environmental Defense Fund  

NGO perspective on the legacy of SAFS and fisheries management  

ABSTRACT: From its inception, SAFS provided a haven for some of the most important leaders of an intellectual revolution. This revolution changed the paradigm of natural resource use from uninformed exploitation to science-based management. SAFS has trained legions of experts who have worked to realize this vision of using data to estimate stock status and to determine sustainable yield over the last century. The School continues to support research on the frontiers of fisheries science while ensuring that new knowledge is applied to improve the performance of fisheries upon which billions of people depend for food and livelihoods.  

BIO: Rod Fujita received his PhD in Marine Ecology from the Marine Biological Laboratory in Woods Hole, Massachusetts, in 1985. He co-founded Environmental Defense Fund’s Oceans Program in 1990, which is now working to improve fisheries in 12 geographies that account for 2/3 of global catch. Research topics include data-limited stock assessment, adaptive fishery management, multispecies management, technology and fisheries, issues in aquaculture, and the psychological drivers of fishing behavior. Rod has authored over 70 scientific publications, numerous popular articles, and the well-received book, Heal the Ocean. In 2000, Rod was awarded a Pew Fellowship in Marine Conservation.

Walter “Wally” Pereyra  
Arctic Storm Management Group  

Industry perspective on the legacy of SAFS and fisheries management  

ABSTRACT: SAFS has had a profound influence on the evolution of sustainable fisheries management to the benefit of all industry stakeholders and seafood consumers. Its establishment in 1919 as the College of Fisheries was “at the urging of prominent members of the fisheries community,” which attests to the expectations the founders had for this new fisheries institution. This presentation will highlight the legacy of SAFS to the fishing industry over the past 100 years and our expectations for the future.  

BIO: Walter Pereyra is a graduate of U Maine (1958) and UW (1961/1967). He is Chairman of the Arctic Storm Management Group in Seattle, and senior partner in two catcher/processors that operate in the North Pacific fisheries. Wally has been in the seafood business for 41 years, beginning in 1977 when he helped launch US-USSR Marine Resources Co. He served as Chairman of NFI and was a member and Vice Chairman of the North Pacific Fishery Management Council. Prior to his fishing industry involvement, Wally was a groundfish scientist with NMFS’s Northwest and Alaska Fisheries Center, involved in resource assessment of the North Pacific groundfish resources. Wally also taught for two years at the Universidad Catolica de Valparaiso in Chile.