



74th Pacific Fisheries Technologists Conference

**The Westmark Sitka
330 Seward Street
Sitka, AK, USA
February 18 – 21, 2024**

Lifting All Boats!





PFT 2024 PROGRAM BOOK

TABLE OF CONTENTS

PRESIDENT'S WELCOME	1
PFT 2024 ORGANIZING COMMITTEE	2
SPONSORS	4
KEYNOTE SPEAKER BIOGRAPHY	8
INVITED SPEAKER BIOGRAPHIES	10
PROGRAM OUTLINE	17
ORAL PRESENTATION ABSTRACTS.....	23
POSTER PRESENTATION ABSTRACTS.....	47
BLANK PAGES FOR NOTES	53
PFT CONSTITUTION	58
PRESENTER ABSTRACT INDEX.....	61
NETWORKING PASSPORT	62
LIST OF PFT 2024 ATTENDEES	63



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Welcome to the 74th PFT Conference!



I am privileged and honored to welcome you to the 74th annual Pacific Fisheries Technologists (PFT) Conference, and humbled by the trust placed in me to serve as this year's President. This year, we are excited to be welcomed by the small fishing community of Sitka, AK, widely considered to be one of Alaska's most beautiful townships and hosting the event at the beautiful Westmark hotel from February 18-21.

Sitka, and Southeast Alaska generally, is fueled by fishing. Most communities are

inaccessible unless flown or floated in, and most have intimate ties to commercial seafood harvest of all sizes. We will truly be in a place which relies on the great work done by PFT participants. This year, we will be welcoming some exciting speakers honoring our theme and phrase for the year, 'lifting all boats', from the metaphorical expression 'a rising tide lifts all boats'. PFT participants comprise a wide swath of the seafood and aquaculture sector, from academics in the hard sciences, to public servants, to NGO's and private industry, all of whom contribute to efforts benefitting all, 'lifting the boats' of all within this vitally important space.

I have been fortunate enough to participate in this conference since 2020, and can speak firsthand about the intense impact this event can have in bringing together professional leaders from across the field with the bright and burgeoning minds who will take the reigns as we sail into the future. While new challenges continue to arise, I am always impressed with the brilliant and inspired work being done across the board, and I look forward to having the chance to showcase some of these projects and efforts in the technical realms of sustainability, quality, safety, innovation, and more.

Welcome to Sitka!

















John Burrows
74th PFT President



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

PFT 2024 ORGANIZING COMMITTEE

<p>John Burrows President 2024</p> 	<p>Garrett Evridge Scientific Program Director</p> 	<p>Rosalee Hellberg Student Competition Chair</p> 	<p>Sue Hansell Treasurer</p> 
<p>Virginia Ng Past President, 2023</p> 	<p>Christina DeWitt Past President, 2022, Keeper of the Check Book</p> 	<p>Laurice Churchill Advisor for Regulatory Affairs</p> 	<p>Heather Johnson-Smith Registration and Hospitality</p> 
<p>John Boyce British Columbia Rep</p> 	<p>Carmen Maria Lopez Saiz Mexico Rep</p> 	<p>Briana Hurley California Rep</p> 	<p>Jung Kwon Oregon Rep</p> 
<p>Jae Park Special Advisor Past President, Oregon</p> 	<p>Bruce Odegaard Special Advisor, Past President, Washington</p> 	<p>Craig Holt Webmaster</p> 	<p>Marlin 'Keith' Cox Alaska Rep</p> 



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Evelyn Watts
Member-at-Large



Area Representatives:

Alaska – Keith Cox
British Columbia – John Boyce
Washington – Bruce Odegaard
Oregon – Jung Kwon
California – Briana Hurley
Mexico - Carmen Maria Lopez Saiz
Representative at Large – Evelyn Watts



2024 SPONSORS



PLATINUM SPONSOR:



Wild, Natural & Sustainable®



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

GOLD SPONSORS:



A Zep Company





PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

SILVER SPONSORS:



SWAG/GOODY BAG DONATORS:



WESMAR
COMPANY, INC.





KEYNOTE SPEAKER



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Dr. Robert “Bob” Gerlach

State Veterinarian for Alaska

Manager of Alaska Fish Monitoring Program



Dr. Gerlach received his B.S. in Veterinary Science at the Pennsylvania State University and his VMD from the University of Pennsylvania. He completed a post-doctoral fellowship at Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM, studies focused on toxicological impact of contaminants and radionuclides on respiratory physiology and health. He moved to Alaska in 1987 and worked as a private practitioner until starting work for the Department of Environmental Conservation coordinating the Fish Safety Monitoring Program in 2001 and as the State’s Fish Advisory Program Coordinator. The spring of 2003 he accepted the

position of State Veterinarian in addition to managing the Fish Monitoring Program. He is responsible for is coordinating multiple programs that are protective of both animal and human health, which in turn safeguards the health and food capacity of Alaska's livestock, and prevents the transmission of animal disease to humans. The Office of the State Veterinarian implements a “One Health” strategy to manage all these diverse programs recognizing that human, animal and environmental health are interdependent and intricately linked, so the collaboration with many state and federal partners is crucial to ensure success.

Abstract

Environmental contaminants are being detected globally and they are transported long distances to threaten the health of ecosystems in Alaska. The health and wellbeing of Alaskan fisheries has been a major concern for the general public and has raised many questions regarding the benefits of consuming fish as part of a healthy diet. Recent articles focusing on the concentration of mercury, pesticides, PCBs, other organic pollutants as well as radiation in fish harvested in Alaska have been of particular interest in commercial markets and to Alaskan residents. This is especially an issue for those living in rural areas, who eat much more fish than people in other parts of the United States. The Alaska Department of Environmental Conservation’s Fish Monitoring Program in collaboration with many partners collects fish from across the state, characterizes and tracks environmental contaminant levels in fish tissue. This information is important to subsistence and sport fisherman, industry, regulators, and scientists. This information is being used so that the public can make informed decisions about fish consumption and the impact of environmental contaminants on commercial and subsistence fisheries in Alaska.



INVITED SPEAKERS



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!



Rachel Baker

Deputy Commissioner
Alaska Department of Fish and Game

Rachel represents the State of Alaska's interests in federal fisheries management issues, including participation on the North Pacific Fishery Management Council on behalf of the Commissioner.

Rachel has more than 15 years of experience working to develop and implement fisheries policy and management programs for commercial, recreational, and subsistence fisheries of Alaska.

Prior to joining the Alaska Department of Fish and Game in early 2019, Rachel worked for the National Marine Fisheries Service in Juneau as an analyst and regulatory specialist for Alaska's federal halibut, groundfish and crab fisheries.

Rachel began her fisheries career as an economist with the ADF&G and later worked as an analyst and fishery manager for the New Zealand Ministry of Fisheries and for the National Marine Fisheries Service headquarters office in the Washington, DC area.



Lisa Weddig

Chief Food Safety Officer
National Fisheries Institute

Lisa Weddig is NFI's Chief Food Safety Officer. She serves as the primary liaison for regulatory issues, food safety and labeling developments and seafood fraud concerns for the association members. Lisa's mission is to ensure that NFI members have the information necessary to understand and implement regulatory requirements to avoid compliance issues down the road. Lisa represents NFI member interests as a

member of the Executive, Steering, and Training Materials Committees of the Seafood HACCP Alliance and has served as an industry advisor to the U.S. Codex Delegations of the Fish and Fisheries Products and Food Hygiene Codex committees.

Prior to joining NFI in 2007, Lisa spent 18 years with the Food Products Association (now known as Consumer Brands Association after a merger with Grocery Manufacturers Association) holding various positions in thermal processing, HACCP, food safety and educational support for association members. Lisa started her food industry career as the Technical Director for Bunker Hill Foods, a Virginia meat canning company. Lisa earned a B.S. in Food Science from Virginia Tech in Blacksburg, Virginia and a M.S. in Nutrition Education from Hood College in Frederick, Maryland.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!



John Reuther

Director Of Innovation
Eurofins Central Analytical Laboratories

John earned his Bachelor's Degree in Chemistry from the University of New Orleans in 1976.

John is a career analytical chemist with 45 years' experience in analysis of a broad variety of food, agricultural commodities and byproducts, feed ingredients, fats and oils including olive oil, minerals, soil, water, and marine tissue samples. Responsibilities have included laboratory operations, cost control, laboratory design and construction, quality assurance planning, LEAN process design, and various analytical projects management.



Noëlle Yochum

Trident Seafoods
Senior Manager, Fishing Innovation and Sustainability

Noëlle is the Senior Manager of Fishing Innovation and Sustainability for Trident Seafoods. Prior to this, she led the Conservation Engineering group at the Alaska Fisheries Science Center (NOAA Fisheries). In both capacities, her focus is on collaborative research with fishing industry, technology, and research partners to find innovative ways to evaluate and mitigate incidental impacts of fishing and to promote sustainable practices; this is done through field and laboratory research, and the development of new technology and innovative applications of existing technology.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!



Tommy Sheridan

Associate Director

UAF Alaska Blue Economy Center

Tommy is a fisheries expert, researcher and educator based out of Cordova, Alaska. He has lived, worked, studied and taught in and from Alaska for the past two decades, with a focus on commercial fishery management and salmon hatchery operations. He is an active public servant for several local, statewide and international bodies, and was appointed as a United States Representative to the North Pacific Anadromous Fish Commission in 2020. He continues to serve the commission as Alaska's commissioner.



Angela Bowers

Assistant Professor

University of Alaska Southeast

Angela has been working with Pacific Salmon since 2006, when she was fortunate enough to find her dream job working at a remote hatchery here on Baranof Island and has been working in aquaculture and teaching people about it ever since. Before coming to the University of Alaska system, she worked as the Aquaculture director at the Sitka Sound Science Center and worked for Northern Southeast Regional Aquaculture Association (NSRAA), spending

several years as the manager of Medvejie Hatchery. She studied Biology and Spanish at the University of Wisconsin-Eau Claire and has her Graduate Certificate in Fisheries Management from Oregon State University.

When not sharing her knowledge and love for Pacific Salmon and Aquaculture with others, she can be found exploring Southeast Alaska with her daughter Wren, camping, fishing, or wandering in the woods looking for mushrooms or things to photograph.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!



Christopher Sannito

Kodiak Seafood and Marine Science Center
Marine Advisory Program
Seafood Technology Specialist



Erlingur "Elli" Gudleifsson

Research Faculty
UAF Alaska Blue Economy Center

Erlingur Gudleifsson works with the University of Alaska Fairbanks (UAF) Alaska Blue Economy Center (ABEC) to promote the transfer of scientific and technical knowledge in the fields of fisheries, energy, and innovation from Iceland to Alaska. Erlingur has been a member of Iceland Ocean Cluster's (IOC) advisory team since 2018 and will be based at IOC's Ocean Cluster House. Gudleifsson has extensive experience and knowledge in the fields of marine product innovation and full utilization. In addition, ABEC Associate Director Tommy Sheridan will bring

two decades of experience within Alaska's seafood industry to this endeavor. UAF is the first American university to work officially within the IOC's walls, and is a leader in Arctic research, marine biology, and the development of rural energy infrastructure."



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!



Susan Marks

Alaska Seafood Marketing Institute/RFM
Sustainability/Certification Advisor

Susan is the Sustainability and Certification Advisor for the Alaska Seafood Marketing Institute (ASMI). In this role, she serves as the internal leader and subject matter expert on sustainability and certification in the seafood marketplace, represents Alaska at industry conferences and speaks to relevant issues that help leverage and expand ASMI's sustainability thought leadership. She also manages marketing, outreach and communications for the Responsible Fisheries Management (RFM) Certification Program and implements strategies for global awareness and recognition.

Prior to her role with ASMI, she worked with the Marine Stewardship Council (MSC) and the Monterey Bay Aquarium Seafood Watch program. In these roles she worked with major seafood buyers in the retail and foodservice sectors and consulted with corporate partners and their supply chains to develop and implement sustainable seafood programs, initiatives and commitments. Susan's experience in both for profit businesses and NGOS, affords her the unique view of all stakeholders when it comes to understanding how seafood certification and assessment programs are integrated into corporate sustainability and sourcing policies. A Seattle native, Susan has a BA in Communications from Washington State University.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!



Angela Anandappa

Alliance for Advanced Sanitation

Dr. Angela Anandappa is a food industry leader specializing in innovation and food safety. She has worked on product development, scaleup, launches and manufacturing for over 20 years. She consults on food safety systems implementation and management, with a focus on biotechnology to transform the food system and develop safe, nutritionally sound alternatives to traditionally produced foods. She leads the Alliance for Advanced Sanitation which provides scientific research, workforce development, and food safety consulting services to manufacturers and retailers.



PROGRAM OUTLINE



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

AGENDA

Note: Asterisk (*) indicates presentation is part of student competition.

ALL TIMES LISTED ARE IN ALASKA TIME (AKST), 1 hour behind PACIFIC. Please keep that in mind if joining remotely.

Sunday, February 18, 2024

8:00 – 9:00 PM	PFT Executive Meeting
8:00 – 10:00 PM	Registration
9:00 – 10:00 PM	President's Reception presented by SPA
10:00 PM – Midnight	Cards and Social Hour

Monday, February 19, 2024

WELCOME!

8:00 – 11:00 AM	Registration
8:00 – 9:00 AM	Breakfast
9:00 AM	Opening and Welcome John Burrows 74 th PFT President, Seafood Technical Director, Alaska Seafood Marketing Institute
9:15 AM	Keynote Robert Gerlach Alaska State Veterinarian, Alaska Dept. of Environmental Conservation

Session I: Regulatory

Moderator: Bruce Odegaard

9:45 AM	<i>Regulatory Update: FDA's Food Traceability Rule: One Year Down, Two To Go</i> Lisa Weddig Chief Food Safety Officer, National Fisheries Institute
---------	--



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

10:30 AM *Residual chemical contaminants in fish and other seafood products: analytical technologies and regulatory roadmap*
John Reuther
Eurofins Central Analytical Laboratories, New Orleans, LA

11:05: Break

Session II: Bycatch

Moderator: Christina DeWitt

11:15AM *Stock assessments and infographics: evolving expectations for public participation in fisheries management*
Rachel Baker
Deputy Commissioner, Alaska Department of Fish and Game

11:50 AM *Technological Innovation in Bycatch Reduction: Challenges, Successes, and the Future*
Noelle Yochum
Sr. Manager, Fishing Innovation & Sustainability, Trident Seafoods

12:15 PM* **A Meta-Analysis of Seafood Species Mislabeling Rates in the United States**
Sarah Ahles
Chapman University

12:45 PM Lunch presented by AFCO

Session III: Nutrients and Contaminants

Moderator: Frances Bursch

1:45 PM *Nutrients and Contaminants in Alaskan Commercial Fish*
Christoff Furin
Research Analyst, Alaska Department of Environmental Conservation

2:30 PM *Seafood Superstars: Unleashing the Nutritional Potential of West Coast Groundfish*
Jana Hennig
Executive Director, Positively Groundfish

3:00 PM* **Metabolic Health Impacts of Seaweeds Pacific Dulse and Nori in Diet-Induced Obese Mice**
Hailey Zhou
Oregon State University

3:30 PM *Microplastics Threaten Our Oceans, Our Food, and Ourselves*
Angela Anandappa
Alliance for Advanced Sanitation

4:00 – 5:30 PM

Poster Session Presented by SIRF

General Presentations:

- *Evaluation of the impact of raw shrimp (Pandalus jordani) quality on processing wastewater*
 - Christina DeWitt, Oregon State University



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

- *Antiproliferative Effect from Caulerpa sertularioides Extracts in Human Cancer Cell Lines*
 - Carmen María López Saiz, University of Sonora
- *Physical and structural properties of hydrogels prepared from chitosan and squid (Dosidicus gigas) gelatin*
 - Josafat Marina Ezquerro-Brauer, University of Sonora
- *Cathepsin D from Dosinia white clam (Dosinia ponderosa) from the Gulf of California*
 - José Luis Cárdenas López, University of Sonora

Student Competition

- *Optimization of PCR-based methods for the detection of canned tuna species*
 - Chloe Castanon, Chapman University
- *Antiproliferative activity of compounds isolated from the exoskeleton of white shrimp (Litopenaeus vannamei) in prostate cancer line*
 - Hector Enrique Trujillo Ruiz, University of Sonora
- **Chemical characterization of compounds presents in extracts and fractions with antiproliferative potential obtained from white shrimp (Litopenaeus vannamei) muscle**
 - Sandra Carolina De La Reé Rodríguez, University of Sonora

5:30 PM Sitka Science Center – tour, presentation, and reception, presented by ABEC

8:00 PM – Midnight Cards and Social Hour in Hospitality Suite

Tuesday, February 20, 2024

8:00 – 11:00 AM Registration

8:00 – 9:00 AM Breakfast

Session 4: Machine Vision Systems/Technology

Moderator: Jae Park

9:00 AM *Near Infra-Red (NIR) Spectroscopy Use in Fishmeal and Fish Oil Processing Facilities*

Senya Joerss

Technical Manager, Supplements, Trident Seafood



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

9:40 AM *A peak at the science behind the curtain at CQ Foods*
Keith Cox
Certified Quality Foods

10:15 AM *The Value of Accurately Measured, Visible, and Trusted Condition-Intelligent Data in the Catching and Processing of Wild Caught and Farmed Seafood.*
Claes Nystrom
Infratab

10:40 AM Break

Session 5: Surimi

Moderator: Carmen María López Saiz

10:50 AM *Evaluation of green crab on surimi quality*
Christina DeWitt
Oregon State University

11:35 AM *Fish Oil Refined from Fish Viscera can Enrich Surimi Seafood*
Jae Park
Oregon State University Surimi School

12:05 PM Lunch presented by OSU Surimi School

Session 6: Mariculture and Hatcheries

Moderator: Tommy Sheridan

1:05 PM *Integrating Mariculture Species into Alaska's Salmon Aquaculture Sites: A resource for aquaculture organizations, the environment, and a unique teaching tool for students in Southeast Alaska*
Angela Bowers
University of Alaska Southeast

1:45 PM *Alaska salmon hatcheries 2.0: leveraging Alaska's salmon hatchery system for broader benefit to the State*
Tommy Sheridan
University of Alaska Blue Economy Center

DISCUSSION PANEL, TIME ALLOWING (presentations are connected)

Session 7: Quality and Logistics

Moderator: Lisa Weddig

2:30 PM *Consumer acceptability and shelf-life assessment of three species of frozen seafood over two years' time using sensory properties, consumer acceptability and purchase intent*
Ann Colonna and Jamie Doyle
Oregon State University Food Innovation Center

3:15 PM *Installation and Operation of a Steam Cooking Skid in an Alaskan Processing Plant*
Chris Sannito
University of Alaska Kodiak Seafood and Marine Science Center



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

3:50 PM	<i>Collaboration for greater value in our supply chains</i> Frances Bursch BBRSDA
4:30 – 5:30 PM	PFT General Meeting
6:30 PM	Cocktail Reception presented by Pacific Seafood
7:30 – 9:00 PM	PFT Banquet & Student Awards presented by BioMedix
9:00 PM – Midnight	Cards and Social Hour

Wednesday, February 21, 2024

8:00 – 8:30 AM	Registration
8:00 – 9:00 AM	Breakfast

Session 8: Origin

Moderator: John Burrows

8:15 AM	<i>Responsible Fisheries Management (RFM) Certification Program: The Origin of Your Seafood Matters: The Origin of Your Seafood Matters</i> Susan Marks, Sustainability Consultant, ASMI, Responsible Fisheries Management
9:00 AM	<i>Investigating differences in value between Alaskan and Icelandic cod fisheries</i> Erlingur Gudleifsson University of Alaska Blue Economy Center
9:30 AM	Closing Remarks and Passing of the Gavel
10:00 AM	End of conference



ORAL ABSTRACTS



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Regulatory Update: FDA's Food Traceability Rule: One Year Down, Two To Go

Presenter: **Lisa Weddig**, Chief Food Safety Officer, National Fisheries Institute

Abstract:

FDA's FSMA 204 Food Traceability rule will have a major impact on the seafood supply chain – from the harvest waters and growing areas all the way to U.S. restaurants and retail establishments. FDA has provided three years to fully implement the requirements for the rule with the target compliance date of January 20, 2026.

The National Fisheries Institute has spent Year One of the implementation period providing education for members and others in the seafood industry, as well as working with FDA to clarify the requirements. Year Two will focus on facilitating and introducing tools necessary to help the industry with understanding how to implement the rule.

Because the rule is broad reaching, seafood companies will not be able to successfully implement the rule in a vacuum. Conflicting and/or lack of information about the requirements can hamper implementation. This presentation will focus on the resources that are available to the seafood industry to facilitate implementing this challenging rule – lifting all boats.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Residual chemical contaminants in fish and other seafood products: Analytical technologies and regulatory roadmap

Authors: John Reuther*, Victoria Siegel, Sarah King
Eurofins Central Analytical Laboratories

Abstract:

The progression of robust analytical technology for the evaluation of chemical residues in food has been very successful in supporting modern regulatory requirements over the last 20 years. Mirroring technology in environmental sample analysis, improvements in instrumental techniques such as GC-MSMS, GC-HRMS, LC-MSMS have resulted in significantly fewer interferences, better global interlaboratory precision, and better throughput efficiencies.

Regulatory concerns over residues of chemical contaminants in seafood will continue to focus on persistent organic pollutants, heavy metals, radioactivity. It is expected that regulations will continue to align with the capability of analytical methodologies to allow rugged compliance monitoring by both government and private laboratories.

Presenter*



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Stock assessments and infographics: evolving expectations for public participation in fisheries management

Presenter: **Rachel Baker**, Deputy Commissioner, Alaska Department of Fish and Game

Abstract:

Alaska's fisheries management is based on science and informed by extensive public input. We invest significant resources in world-class management programs to maintain sustainable and abundant fisheries that support fisheries participants and Alaska communities. These investments have been tremendously successful—Alaska produces 60% of the fish caught in waters off the coasts of the United States, with harvest of 5 to 6 billion pounds of seafood each year.

While fish and shellfish stocks naturally fluctuate in abundance over time, changing ocean and climate conditions are bringing long-standing fisheries challenges to the fore and creating new challenges for Alaska fisheries participants, scientists, and managers. Bycatch in commercial fisheries is one long-standing fisheries challenge that has received increased focus in recent years. Bycatch is defined as fish that are harvested in a fishery but are not sold or kept. Bycatch occurs when fishermen unintentionally catch fish, or other marine species, they do not want, cannot sell, or are not allowed to keep. All fisheries have bycatch and Alaska's fishery management programs prioritize efforts to minimize bycatch, particularly if there are potential conservation concerns. Even if bycatch is not a conservation concern, the public generally regards bycatch minimization as desirable from a social and cultural perspective. However, bycatch restrictions typically increase costs to fishery participants by limiting fishing or reducing fishing efficiency. In Alaska, fisheries managers balance conservation, economic and social factors when establishing bycatch regulations to ensure harvests are sustainable while optimizing harvests and benefits from fisheries.

Public interest in fisheries bycatch has highlighted strengths and challenges for Alaska's fishery management programs. In particular, the complexity and quantity of scientific and policy information supporting fisheries management decisions can make it difficult for the public to effectively participate in the decision-making process. This has resulted in continued requests to produce information and resources in a format that is understandable and easily accessible. In response to these requests, the Alaska Department of Fish and Game and the Alaska Seafood Marketing Institute have partnered to produce outreach and education materials for key fisheries management issues, including bycatch. We aim to produce print and web-based products that provide clear and concise information about Alaska fisheries management issues of interest to ensure that our management processes are transparent and accessible to the public.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Technological Innovation in Bycatch Reduction: Challenges, Successes, and the Future

Presenter: Noëlle Yochum, Sr. Manager, Fishing Innovation & Sustainability,
Trident Seafoods

Abstract:

Technological innovation is happening all around us, from self-driving cars to refrigerators that can grocery shop. The pace of innovation on fishing vessels has been relatively slow, limited by the challenging operating conditions. Technology on these platforms must contend with and be resilient to conditions that are wet, salty, dirty, deep (high pressure environment), and rugged. Moreover, the bespoke nature of technological requirements by fishery (and fishery sub-sectors) results in small markets to bear the burden of research and development costs.

Regardless, technological innovation is occurring in the fishing domain, including in efforts to reduce incidental unwanted catch ('bycatch'). Each phase of the fishing process, from selecting the location to deploy fishing gear to retrieving the gear, presents opportunities for technological innovation for bycatch mitigation. For example, live-feed cameras are being used to inform captains about what is going into their gear in real time. This aids their decisions on fishing duration and location to avoid bycatch. In this presentation I will share some successes in technological innovation in support of fisheries sustainability and efficiency and glimpses at innovation on the horizon.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

STUDENT COMPETITOR

Title: A Meta-Analysis of Seafood Species Mislabeling Rates in the United States

Authors: Sarah R. Ahles^{1*}, Christina DeWitt², Rosalle Hellberg¹

¹Chapman University

²Oregon State University

Abstract:

"Seafood is vulnerable to species mislabeling due to factors such as complex global supply chains, varying prices, and similar appearance of species. Numerous studies have been published reporting a range of mislabeling rates for various forms of seafood. However, these studies oftentimes focus on lesser-consumed species that are vulnerable to species mislabeling. As a result, the overall mislabeling rate of commercially sold seafood in the U.S. remains unknown, especially for the most consumed species.

***Presenter and Student Competitor**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Nutrients and Contaminants in Alaskan Commercial Fish

Authors: Christoff Furin^{1*}, Robert Gerlach¹, John Burrows²

¹Fish Monitoring Program, Office of the State Veterinarian, Alaska Department of Environmental Conservation

²Alaska Seafood Marketing Institute

Abstract:

Alaska provides a significant portion of seafood to the U.S. and International markets. Seafood is also an important subsistence and cultural resource to many people in Alaska. Concerns about the safety and contaminant load of fish and other seafood products are growing. Analytical methods to measure elements, such as mercury and selenium, and other more complex chemical compounds continually improve, resulting in lower detection limits and often, regulatory limits follow. This can present a challenge in public perception and the marketing of seafood in global markets. Marine fish and shellfish provide a nutrient dense, high protein food that is also a main source of essential fatty acids, such as DHA and EPA. Currently available nutritional information for foods mainly comes from USDA's SR Legacy database and is limited to market basket samples that are mixed species, not region specific, and are outdated. An Alaska specific dataset of both nutrients and contaminants in seafood would benefit consumers and all parts of the Alaska seafood industry. Making this information accessible would go a long way to increase consumer confidence and demonstrate the high quality and safety of Alaska's fish and shellfish. This project, funded by NOAA (S-K grant), ADEC, and ASMI, evaluates several species of marine fishes for nutrient content (calories, proximate, vitamins, minerals, fatty acids, and amino acids) and contaminant load (metals, PFAS, PCBs, OC pesticides, and PBDEs). Preliminary results show low contaminant levels and high-quality nutrient content.

***Presenter**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Seafood Superstars: Unleashing the Nutritional Potential of West Coast Groundfish

Presenter: Jana Henig, Executive Director, Positively Groundfish

Abstract:

Positively Groundfish is a broad cross-sector collaboration between fishermen, processors, environmental non-profits, and supported by academia, who have rallied around a shared mission to revitalize market demand for sustainable but severely underutilized West Coast groundfish species. In our pursuit to better promote West Coast groundfish, we wanted to leverage health and nutrition as a strategic marketing platform. Consumer insights from previous studies highlighted "health" as a key factor influencing seafood purchases, surpassing sustainability and product origin.

Remarkably though, no species-level nutrient information existed for west coast groundfish species.

Thus, we undertook a comprehensive nutrient analysis for 10 key groundfish species, which revealed exceptionally high nutrient levels, and positions these species as nutritional powerhouses, even compared to other popular seafood and marketed "superfoods." We also conducted a survey of 1,600 consumers to better understand attitudes toward seafood healthfulness, and pinpoint the most compelling communication strategies, and the most health-conscious demographics primed for engagement. Armed with newfound nutrient information and consumer insights, we crafted an extensive outreach campaign spanning PR, social media featuring a video series with nutrition experts, newsletters, conferences, fitness events, and collaborations with healthcare providers.

This project taught us that a) groundfish species have very high nutrient levels; b) that the health benefits associated with these nutrients are highly valued by consumers; c) the wider industry is interested in promoting these. With a focus on nutrition, we have the potential to captivate a new audience, foster interest in groundfish, and promote increased seafood consumption, edging closer to the USDA's dietary guidelines and contributing to public health.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

STUDENT COMPETITOR

Title: Metabolic Health Impacts of Seaweeds Pacific Dulse and Nori in Diet-Induced Obese Mice

Authors: Leyi Zhou^{1*}, Elizabeth Ihms², Stephanie Nuss², Woojae Jung¹, Yongcheol Lee¹, Brian Dolan², Luke Weinstein³, Natalia Shulzhenko², and Jung Yeon Kwon^{1,4}

¹Department of Food Science and Technology, Oregon State University, Corvallis, OR, USA

²Department of Veterinary Biomedical Science, Oregon State University, Corvallis, OR, USA

³Department of Comparative Health Sciences, Oregon State University, Corvallis, OR, USA

⁴Seafood Research and Education Center, Oregon State University, Astoria, OR, USA

Abstract:

Seaweeds are a highly nutritious and sustainable crop, with components exhibiting various bioactivities and health benefits. Pacific dulse (*Devaleraea mollis*) seaweed holds great cultivating potential in Oregon, yet its bioactive health benefits remain largely unexplored, while nori (*Pyropia spp.*) has been widely consumed and researched globally. In this study, we aimed to evaluate the metabolic health impact of whole Pacific dulse and nori supplementation in diet-induced obese mice.

***Presenter and Student Competitor**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Microplastics Threaten Our Oceans, Our Food, and Ourselves

Presenter: Angela Anandappa, Alliance for Advanced Sanitation

Abstract:

The once unthinkable reality of "fish scoliosis" is now a grim harbinger of a growing crisis. Microplastics, ubiquitous in our oceans and terrestrial ecosystems, are wreaking havoc on marine life, human health, and the very foundation of our food chain. These insidious particles, a thousandth the size of a grain of salt, are not merely choking our ecosystems; they are altering fish brain chemistry, disrupting neural systems, and silently terrorizing entire swaths of aquatic and terrestrial life.

This presentation delves into the emerging science of microplastic contamination in seafood, exposing the human health risks associated with consuming plastic-laden marine life. We will explore the insidious ways these invisible predators invade and harm our oceans' inhabitants, and discuss critical steps we can take to protect our food supply, restore the health of our ecosystems, and ensure a sustainable future for ourselves and the planet.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Near Infra-Red (NIR) Spectroscopy Use in Fishmeal and Fish Oil Processing Facilities

Presenter: Senya Joerss, Technical Manager, Supplements, Trident Seafood

Abstract:

There is an increasing interest to adopt NIR technologies that will accurately measure quality nutrients for seafood products at the manufacturing level. Third-party testing laboratories are limited for seafood manufacturers in remote areas of Alaska, and logistics are challenging. Once a product is made, there is little to no opportunity to reformulate so inline, real-time testing is advantageous from both a quality and profitability standpoint. Understanding how to implement, utilize, and maintain NIR technologies is critical to continue to produce accurate data which guides manufacturing processes and product quality outcomes.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: A peak at the science behind the curtain at CQ Foods

Presenter: Marlin 'Keith' Cox, Certified Quality Foods

Abstract:

Science plays a vital role in driving our quest for answers to life's mysteries. It takes the lead in our pursuit of the unknown. Today, let's dive into the exciting journeys our company has embarked on and the discoveries we've made. Our product lineup includes a variety of offerings like shrimp, chicken, flounder, salmon, and more. With the aid of advanced technology, our research has picked up speed, moving beyond the confines of traditional electrical engineering. We're blending the worlds of bioimpedance and technology to create a cutting-edge scientific tool, perfect for exploring new ideas and frontiers.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: The Value of Accurately Measured, Visible, and Trusted Condition-Intelligent Data in the Catching and Processing of Wild Caught and Farmed Seafood.

Authors: Therese Meyers¹, **Claes Nystrom***

¹Infratab

Abstract:

Seafood is subject to widespread mislabeling and close to half of harvested fish is wasted due to challenges in evaluating freshness. We present development of a fast, non-destructive, and easy-to-use handheld multimode spectroscopic system for fish species identification and quality assessment. It uses the fusion of visible near infra-red (VIS-NIR), short wave infra-red (SWIR) reflectance and fluorescence (FL) spectroscopy. The instrument has four data modes; fluorescence with 365 nm and 395 nm excitations, diffuse reflectance in the visible range of ~450-950 nm and SWIR reflectance covering ~900-1700 nm with a tungsten bulb illumination source. The device is compact, battery operated and takes all the spectral data in a fixed sequence that takes seconds. The data provides the ability to classify along four separate axes; species identification, freshness assessment, farmed vs wild caught and frozen-then-thawed vs fresh. For the species identification, ground truth is DNA sequencing and for freshness assessment the number of days after catch. We used large datasets as inputs in AI learning prediction and developed a submodel technique to identify the species of fish fillets and applied it to 44 fish types. We also predicted fish freshness within +/-1 day with 95%+ accuracy for 4 fish species and observed promising features that distinguish farmed from wild salmon. Results show multimode spectroscopy significantly improves the accuracies of the stand-alone FL, VIS-NIR and SWIR single-mode spectroscopies across all four axes. The AI models can be run on the device with edge computing after training on a cloud processor.

***Presenter**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Evaluation of green crab on surimi quality

Authors: Christina A. Mireles DeWitt^{1*}, Shin Young Park², Angee Hunt¹, Denise Skonberg³

¹Oregon State University, Coastal Oregon Marine Experiment Station, Seafood Research & Education Center, Astoria, OR.

²Gyeongsang National University, Department of Seafood Science and Technology/Institute of Marine Industry, Gyeongsang National University, Tongyeong 53064, Korea

³University of Maine, School of Food and Agriculture, Orono, Maine

Abstract:

"The green crab (*Carcinus maenus*), an invasive species on the Pacific and Atlantic coasts with limited marketability, was investigated as a potential value-added ingredient in surimi products. Pacific whiting surimi seafood was formulated with 0 or 3% washed raw green crab (meat and guts) mince with 2% salt (SS0 vs SS3). In addition, Pacific whiting surimi was formulated with 3, 4.5, and 6.5% raw green crab without salt, which was replaced with the following adjunct ingredients: 4% potato starch, 6% corn starch, and 2% dried egg white (SA3, SA4.5, SA6.5, respectively). Three cook treatments were employed: a water bath at 90°C for 30 minutes (WB1), a water bath at 30°C for 2 hours followed by a water bath at 90°C for 30 minutes (WB2), and ohmic heating to an internal temperature of 90°C (OH). Cooked gel moisture, color, shear stress (gel strength) and shear strain (deformability), and water retention, were measured. Moisture content ranged from 76.4-75.5%, confirming comparable solids content. All formulations had high water retention ability (0.74-0.75) and there was no significant ($p > 0.05$) effect of formulation or cook treatment. SS0 treated by OH had significantly higher gel strength than all other treatments. In general, all OH treated formulations were higher in gel strength than WB. For all WB treated formulations SA > SS in gel strength ($p < 0.05$). Breaking force for WB1 was similar ($p > 0.05$) to WB2 within formulation. Deformability was not impacted by WB type. However, WB did positively enhance ($p < 0.05$) SS0 and SS3 deformability when compared to OH. Addition of adjuncts significantly ($p < 0.05$) decreased deformability. Level of crab had no effect ($p > 0.05$) on deformability. While OH enhanced gel strength, WB enhanced deformability. Color was significantly influenced by addition of crab and adjuncts. Within formulation, there was no cook treatment effect on Whiteness value. Whiteness value decreased significantly from an average of 67, 47, 39, 33, and 26 for SS0, SS3, SA3, SA4.5, and SA6.5, respectively. Addition of green crab to surimi significantly impacted color turning it a light toffee color. This suggests that products formulated with green crab would need to find a means to make the color a positive market attribute. Qualitatively, addition of crab did seem to increase crab flavor. Unfortunately, it was also noted that many gels made with green crab had inclusions suggesting the ingredient did not properly mix into the batter. To make this resource



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

viable as an ingredient for surimi products, future efforts should first focus on preventing inclusions in the batter."

***Presenter**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Fish Oil Refined from Fish Viscera can Enrich Surimi Seafood

Authors: Supattra Supawong¹ and **Jae W. Park**^{2*}

¹Department of Food Science and Technology, Faculty of Science and Technology, Thammasat University, Pathumthani, 12121, Thailand

²OSU Seafood Research & Education Center, Oregon State University, 2001 Marine Drive #253, Astoria, OR 97103, USA

Abstract:

Introduction

Fish oil was extracted from Gourami fish (*Trichopodus pectoralis*) viscera and refined (degummed, neutralized, and deodorized). The yield of fish oil after refining was 32%. The total saturated and unsaturated fatty acids in the refined oil amounted to 39% and 61%, respectively. The combined omega-3 fatty acid content of the refined oil was 44.8 mg/g. The overall safety regarding heavy metals and microbial content was lower than the NSRL set according to California Proposition 65. The refined oil was added to surimi seafood paste at three levels (0, 1, and 2%) and subjected to water bath heating or high-pressure processing followed by water bath heating. The lightness of the surimi gel was improved by adding refined fish oil. The addition of refined oil at 1% did not change the texture. Although fish oil at 2% decreased the breaking force of surimi gel, the breaking force of surimi gel with fish oil was enhanced by high-pressure processing followed by heating. No difference in distance to rupture was found between the surimi gels with various fish oil contents. Fish oil addition resulted in an increased concentration of omega-3 fatty acids in surimi gel. This study demonstrated that the 1% addition of fish oil produced from fish viscera did not alter texture and color and could nutritionally enhance surimi seafood with health-beneficial omega-3 PUFAs.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Cathepsin D from Dosinia white clam (*Dosinia ponderosa*) from the Gulf of California

Authors: Cadena-Cadena, F.¹, Ezquerro-Brauer, J.M.¹, Cinco-Moroyoqui, F.J.¹, Rouzaud- Sández, O.¹, Rivero-Espejel I. A.², López-Zavala, A.A.³, Santacruz-Ortega, H.⁴ and **Cárdenas-López, J.L.^{1*}**

¹Depto. de Investigación y Posgrado en Alimentos, Universidad de Sonora, Hermosillo, Son.

²Centro de Graduados e Investigación en Química, Instituto Tecnológico de Tijuana, Tijuana, Baja California.

³Depto.de Ciencias Químico-Biológicas, Universidad de Sonora, Hermosillo, Son.

⁴Depto. de Investigación en Polímeros y Materiales, Universidad de Sonora, Hermosillo, Son., MÉXICO.

Abstract:

Dosinia white clam (*Dosinia ponderosa*), is one of the three main clams captured in northwest Mexico, with Gulf of California states accounting for 88 % of the total 12,333 tons of captured in the country in 2020. The other two species are chocolata clam (*Megapitaria squalida*) and red clam (*Megapitaria aurantiaca*). These marine invertebrates have enzyme systems that are very active in acid pH. Cathepsin D is one of the most important aspartic enzymes, it participates in protein turnover and many metabolic processes involve this kind of acid proteolysis. Cathepsin D from hepatopancreas of white clam was purified using pepstain agarose affinity chromatography and some main characteristics were studied. The activity of the enzyme was followed in a general protease assay using acid denatured hemoglobin, and also with a cathepsin D specific assay using N-Ac-Arg-Gly-Phe-Phe-Pro-7-AFC fluorogenic substrate coupled with dipeptidyl peptidase. A 36 fold purification was achieved with 22 % yield of the original activity. The purified enzyme had an estimated molecular weight of 36 kDa and an isoelectric point of 7.2. Optimal pH was 3 and optimal temperature was 50°C. Activity remained above 50% for 2 hours up to 40°C, and at 50°C it only remained above 50% for 30 min. As for pH, 80% of activity remained up to 2 hours between pH 3 and 6. These parameters are important for the utilization of this enzyme, and also for understanding its adaptations suffered in the environment of the Gulf of California, which could be of importance for the cultivation of Dosinia white clam."

***Presenter**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Integrating Mariculture Species into Alaska's Salmon Aquaculture Sites: A resource for aquaculture organizations, the environment, and a unique teaching tool for students in Southeast Alaska

Presenter: Angela Bowers, University of Alaska Southeast

Abstract:

"Harvesting salmon and other food from the ocean is an integral part of the culture and economy in the State of Alaska. A large contributor to the state's commercial salmon harvest is its Private Non-Profit (PNP) salmon hatcheries. This program started in response to historically low salmon abundance in the early 1970s and now contributes nearly 1/3 of commercially caught salmon, with 30 hatcheries releasing 1.7 billion salmon each year. These fish are reared each spring in ocean net-pens for a few months before their release, providing the space, nutrients, and infrastructure to integrate lower trophic level species such as seaweed and shellfish. For the past 5 winters students and faculty from the University of Alaska Southeast have outplanted Sugar kelp (*Saccharina latissima*) and Ribbon kelp (*Alaria marginata*) near rearing chum (*Oncorhynchus keta*) and pink (*Oncorhynchus gorbuscha*) salmon to try to determine the feasibility and measurable benefits of this form of Integrated Multi-Trophic Aquaculture (IMTA). Kelp growth, nitrite, nitrate, ammonia and dissolved phosphorous as well as dissolved oxygen and salinity are measured bi-weekly. As part of this work students not only learn about kelp farming and sustainable forms of aquaculture but they also gain skills using oceanographic equipment, operate small vessels and they get to work closely with industry professionals. This work has led to a project looking at site suitability at hatchery release sites state-wide, and with funding from the Alaska Blue Economy Center (ABEC) we have shipped Acoustic Doppler Current Profilers and loggers to measure oxygen, salinity, temperature, and light attenuation to determine the suitability for other sites around the state to integrate mariculture species. This project will provide the baseline data necessary to be able to measure benefits for the rearing and released salmon as well as associated environmental benefits. All of this work supports aquaculture workforce development, increases the sustainability of salmon enhancement aquaculture in Alaska, improves food security and provides industry with a proof of concept important for demonstrating the potential economic and environmental benefits for IMTA in Alaska.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Alaska salmon hatcheries 2.0: leveraging Alaska's salmon hatchery system for broader benefit to the State

Presenter: Tommy Sheridan, University of Alaska-Fairbanks Blue Economy Center

Abstract:

Alaska's salmon hatchery system, implemented in response to depressed salmon runs throughout the state during the 1960s and 1970s, resulted in the development of an innovative program that today involves 30 salmon hatcheries and over 100 release locations in Cook Inlet, along the Kodiak Archipelago, across Prince William Sound, and throughout Southeast Alaska. Alaskan hatchery production has exceeded its founding expectations, and is a cornerstone of Alaska's Blue Economy, bringing significant economic benefits to each region's industry and communities. For example, in 2015, the share of Alaskan hatchery fish harvested in commercial common property fisheries increased to 30% of the statewide harvest value, with the first wholesale value of the commercial hatchery harvest nearing \$350 million. However, ageing energy infrastructure at Alaska's salmon hatcheries, uncertainties related to the impacts of climate change on the state's salmon production, and other economic considerations, are leading Alaskan stakeholders to question how the state's hatcheries could be leveraged further for economic development. This presentation will introduce how Alaskan salmon hatcheries are engaging with research and innovation, with a focus on mariculture-related activities, and exploration of renewable energy opportunities in their vicinity. Alaska Blue Economy Center's Tommy Sheridan will lead this presentation, which will be accompanied by a panel discussion with local fisheries experts Angela Bowers and Scott Wagner."

***TIME ALLOWING, a panel of will follow this presentation**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Consumer acceptability and shelf-life assessment of three species of frozen seafood over two years' time using sensory properties, consumer acceptability and purchase intent

Authors: Ann Colonna^{1*}, Christina DeWitt², Jamie Doyle^{3*}, Tyson Rasor⁴

¹Oregon State University/Food Innovation Center

²Oregon State University/Coastal Oregon Marine Experiment Center

³Oregon State University/Oregon Sea Grant

⁴Ecotrust

Abstract:

Past research shows that consumers find frozen seafood to be as good as, if not better than fresh (never frozen) products. This project builds on these findings by determining the shelf life (nutrient density, oxidation, texture) and consumer acceptability of three frozen seafood products stored in two different freezers, commercial/industrial (-30C) and home (-18C) over two years.

Five shelf life tests were conducted with over 600 target market consumers from the Portland, Oregon Metro area who were users and likers of seafood. The test dates were conducted at times 0 months, 6 months, 12 months, 18 months and 24 months. At each time point, the seafood was tested by 120 unique consumers who were not aware they were testing frozen seafood or of the storage period. Samples were blind coded and served in a randomized order to prevent order bias in assessments. After 24 months, results show that all attributes tested including the appearance, aroma, texture, flavor, sweetness, firmness, moisture content, aftertaste and overall quality were liked equally or more than at time 0 months. There were no significant differences in the overall liking of the albacore or Coho salmon over 24 months. All mean liking scores of both species were rated above 7.0 (like moderately) on the 9-point hedonic scale; a score considered very favorable by industry standards. Unique to these results, the sablefish overall liking mean scores were also at 7.0 or above at all timepoints, but mean overall liking scores increased significantly over time. The highest mean liking score for the sablefish, stored in a commercial freezer, was 8.06 (like very much) on the 9-point hedonic scale, at timepoint 24 months. This mean liking score at 24 months was significantly higher than the score of 7.13 at timepoint 0 months, demonstrating that not only was the sablefish stored in a commercial freezer for 24 months well liked, it was liked significantly more than the product stored frozen for only one week. This talk will uncover valuable insights about what will increase consumer confidence and purchase intent of frozen seafood, as well as any deterrents to buying more frozen product. The ability to store samples longer and transport them frozen has a huge sustainability impact for the global seafood industry.

Presenters*



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Installation and Operation of a Steam Cooking Skid in an Alaskan Processing Plant

Presenter: **Chis Sannito**, University of Alaska, Kodiak Seafood and Marine Science Center

Abstract:

Seafood processing plants that do cooking and or water blanching processes require ample amounts of consistent hot process water. Indirect heating methods can result in only around 85% efficiency. Another option is a direct steam injection heating valve system which transfers 100% of the steam energy to the process water. Advantages of this type of system include the ability to achieve and maintain ultra precise and consistent temperatures, minimal maintenance, and a minimal footprint on the production floor. This type of valve coupled with a recirculating cook tank allows for various processes such as seaweed blanching, sea cucumber cooking and crab cooking. This discussion will cover the installation and operation of a small skid mounted system used to blanch seaweed, cook crab and sea cucumbers.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Collaboration for greater value in our supply chains

Presenter: Frances Bursch, Bristol Bay Regional Seafood Development Association

Abstract:

In a hard year for seafood like 2023, understanding where value is lost and how to maximize it becomes paramount. Of the many factors that influence value, the PFT group is perhaps best positioned to address product quality and efficiency in the seafood supply chain. In the supply chain for wild seafood, product changes hands at least a few times and sometimes many times. Everyone involved has an interest and a value they expect in return for their role and it is in everyone's interest. Seafood industry nonprofits are important collaborators and can plug into different points of the supply chain to share, utilize and incubate science and technology. These organizations also need the expertise of the industry members we rely on to bring our shared products to market. This presentation will explore existing partnerships and possible opportunities to address the needs most pressing needs facing industry stakeholders in 2024."



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Responsible Fisheries Management (RFM) Certification Program: The Origin of Your Seafood Matters

Presenter: **Susan Marks**, Alaska Seafood Marketing Institute, Responsible Fisheries Management Program

Abstract:

- Set context by explaining differences between Assessment Programs (e.g. Seafood Watch), and Certification Programs (e.g. RFM, MSC)
- Certification/Sustainability today – pulse point on what the major areas of focus are (e.g. Social, IUU, etc)
- Brief history/timeline of RFM Program
- RFM Updates since 2020 PFT
 - New owners
 - Geographic expansion – reasons & goals of program
 - Strategic partners (e.g. ASMI)
 - Growth of the program
 - Future of the program
- Why RFM – Why origin matters / point of differentiation for the RFM program
 - Discuss RFM consumer research & ASMI consumer research regarding this topic



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Investigating differences in value between Alaskan and Icelandic cod fisheries

Presenter: Erlingur Gudleifsson, University of Alaska Fairbanks, Alaska Blue Economy Center

Abstract:

"This research seeks to investigate the longstanding myth suggesting that Alaska catches twice the quantity of cod as Iceland but earns only half the value.

This presentation will articulate an examination of public figures, including ex-vessel, export, wholesale values, and consumer prices, which reveal a nuanced reality. Contrary to expectations, consumer prices between Atlantic and Pacific cod, particularly processed cod filets in the US market, showed limited differences. The myth's second half, addressing the value of fisheries, proved complex due to multiple indicators. While Iceland claimed higher prices at earlier stages of the value chain, consumer and wholesale prices for high-end processed products demonstrated similarities. Comparing ex-vessel prices between Alaska and Iceland raised questions about the comparability of the data, given differences in eco-systems and landed fish states. Export proportions varied significantly, indicating Iceland's stronger focus on cod exports. Notably, our analysis unveiled that Iceland claims considerably higher international prices for cod than Alaska, supporting the myth's value disparity claim. The investigation urged a comprehensive understanding of the entire value chain in Alaska's cod fisheries for informed decision-making. Despite challenging the myth's quantitative aspect, the qualitative differences in value creation warrant further exploration, emphasizing the need for deeper analysis and collaboration with large fisheries for accurate comparisons. This research contributes to the ongoing discourse on value creation within the Alaska groundfish sector, emphasizing the importance of optimizing processes for sustainable and thriving fisheries in the Arctic."



POSTER ABSTRACTS



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Evaluation of the impact of raw shrimp (*Pandalus jordani*) quality on processing wastewater

Authors: Christina A. Mireles DeWitt*, Shin Young Park

Abstract:

The ocean pink shrimp (*Pandalus jordani*) is a crucial economic resource, commercially harvested off the west coast and supporting numerous rural fishing communities. Found from Unalaska to San Diego, its highest population density occurs off the central Oregon Coast. Typically processed as a ready-to-eat cooked and peeled product, the harvesting process, targeting mature adults, unintentionally captures juveniles, shrimp with roe, and may cause damage.

This study assessed how quality factors, such as maturity status and damage, in raw shrimp contribute to Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), and Oil and Grease (O&G) at different processing stages.

Shrimp, harvested by a commercial trawler, were stored on ice for less than 48 hours. The study involved sorting ice shrimp into treatment groups based on maturity status (control: CN, juvenile: JV, tiny juvenile TJ, shrimp with intact roe: RS) or damage (severe broken with intact exoskeleton: SB, severe broken without intact exoskeleton: SBM) for five pilot studies, exploring the impact on wastewater quality during processing. When compared to control (CN), damage (SB) significantly ($p < 0.05$) increased BOD, O&G, and TSS in marinade water, while lower maturity (JV) increased O&G. The presence of roe significantly increased ($p < 0.05$) wastewater BOD when compared to CN, but not TSS; furthermore, O&G was notably lower ($p < 0.05$). Given that roe has more oil than muscle, the increased oil from roe substantially contributes to BOD rather than O&G. Lower maturity and damaged shrimp significantly contributed to meat loss through peelers, with magnitude differences up to 4.4x from CN. Shrimp maturity and damage play a significant role in influencing wastewater characteristics during commercial cooking and peeling processes.

***Presenter**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: Antiproliferative Effect from *Caulerpa sertularioides* Extracts in Human Cancer Cell Lines

Authors: Carmen María López-Saiz¹, Maribel Plascencia-Jatomea¹, Edgar Sandoval-Petris², Idalia Osuna-Ruiz³, Rosalío Ramos-Payan².

¹Departamento de Investigación y Posgrado en Alimentos, Universidad 1de Sonora, Encinas y Rosales, Hermosillo, Sonora, 83000. México.

²Facultad de Ciencias Químico Biológicas, Universidad Autónoma de Sinaloa, Ciudad Universitaria, Ave. De las Américas y Josefa Ortiz de Domínguez, Culiacán, Sinaloa, 80010. México.

³Unidad Académica de Ingeniería en Biotecnología, Universidad Politécnica de Sinaloa, Carretera Municipal Libre Mazatlán Higuera Km 3, Mazatlán, Sinaloa, 82199. México

Abstract:

The macroalgae group such of *Caulerpa* genus has been evaluated in different studies and has been reported as a source of molecules with pharmacological potential in their chemical composition. *Caulerpa sertularioides* macroalga has been proven as antioxidant, cytotoxic, proapoptotic and anti-invasive. Therefore, the objective of this study was to evaluate the antiproliferative effect of compounds isolated from *Caulerpa sertularioides* in different human cancer lines. The molecules were isolated by serial extraction with different solvents (hexane, acetone, methanol and water). Cell viability of normal cells (retinal pigmented epithelium) and cancer cells (cervix, colon, breast, lung, prostate) was assessed using the standard assay was carried out using the standard MTT assay. The extraction yields of *Caulerpa sertularioides* were 29.6% (water), 13.5% (methanol), 2.8% (acetone) and 1.2% (hexane). The hexane and acetone extracts were able to statistically reduce prostate, cervix, colon, breast, and lung cancer cell lines growth, being breast and cervix cell lines the more susceptible. Therefore, both hexane and acetone extracts could be a source of compounds with antiproliferative activity; however, further studies are required to determine the compounds responsible for said activity.

***Presenter**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

STUDENT COMPETITOR

Title: Chemical characterization of compounds presents in extracts and fractions with antiproliferative potential obtained from white shrimp (*Litopenaeus vannamei*) muscle

Authors: Sandra Carolina De La Reé Rodríguez^{1*}, Carmen María López Saiz¹
Armando Burgos Hernández¹ María Isabel Medina Méndez²

¹Departamento de Investigación y Posgrado en Alimentos, Universidad de Sonora.

² Química de Productos Marinos, Instituto de Investigaciones Marinas.

Abstract:

Marine organisms constitute an important source of compounds with antiproliferative activity. The lipid fractions obtained from the muscle of Pacific white shrimp (*L. vannamei*) have shown antiproliferative potential against breast adenocarcinoma (MDA-MB-231), however, the composition of these fractions is still unknown. The aim of this work was to chemically characterize extracts and fractions with antiproliferative potential obtained from *L. vannamei*. The extraction was carried out with chloroform (1:5 p:v), then using a separatory funnel, hexane and methanol (1:1) phases were obtained. To identify and quantify the lipid of the crude extract and the phases, TLC (neutral lipids) and HPTLC (polar lipids) were performed. Methanolic phase was subjected to open column chromatography to obtain purified fractions. Chloroform extract, methanolic and hexanic phases, and the fractions were analyzed by GC-FID to obtain the fatty acid profile, and HPLC-FLD/DAD to quantify the presence of tocopherol/carotenoids. From the chloroform extract (9.7 ± 0.05 mg), most compounds were soluble in methanol (7.38 ± 0.14 mg), it was also observed that the extracts contain mostly free fatty acids, cholesterol, and polar lipids. The highest quantity of cholesterol was identified in hexanic phase (69.92%) and polar lipids were concentrated in methanolic phase (68.11%). Regarding the two fractions with the highest antiproliferative activity (C3 and C4), the major fatty acids were PUFA's, specifically EPA and DHA (31.72 and 70.41%, respectively), free and esterified astaxanthin was also identified, with no presence of tocopherol. Therefore, fractions with antiproliferative potential contain free fatty acids and astaxanthin.

*Presenter and Student Competitor



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Title: "Physical and structural properties of hydrogels prepared from chitosan and squid (*Dosidicus gigas*) gelatin"

Authors: Josafat Marina Ezquerro-Brauer¹, Santiago P. Aubourg, Wilfrido Torres-Arreola, Maribel Plascencia-Jatomea, Uriel Ramírez-Campas

Abstract:

This study focused on the obtention of novel chitosan (CH)/squid (*Dosidicus gigas*) gelatin (SG) hydrogel by employing the casting method. For it, a suspension of commercial CH (85% deacetylated, viscosity > 400 mPa.s, and molecular weight of 570.3 kDa) hydrogel was mixed with SG; glutaraldehyde is used as a crosslinking agent (50% in a 99:1 (v/v) ratio concerning the total solution). SG was obtained from squid arms collagen by extraction with 0.5 M NaOH followed by 0.2 M HCl and thermic treatment. The following systems (M1-M3) were comparatively evaluated: 0.5 mg CH/mL (M1), 0.4 mg CH/mL+0.2 mg SG/mL (M2), and 0.25 mg CH/mL+0.5 mg SG/mL (M3). Hydrogel systems exhibited lower ($p < 0.05$) viscosity and stability in aqueous media at pH 7.2 according to the following system sequence: M1 $>$ M2 $>$ M3. Hydrogels with SG showed higher ($p < 0.05$) antioxidant activity (DPPH and ORAC assays) according to the following system sequence: M3 $>$ M2 $>$ M1. The infrared (FTIR) and proton-nuclear magnetic resonance (^1H -NMR) spectra corresponding to M1 and M3 systems suggested that hydrogen bonds produce the main interactions between CH and SG. It is concluded that gelatin obtained from squid arms might be a valuable additive in preparing bioactive CH hydrogels.

***Presenter**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

STUDENT COMPETITOR

Title: Optimization of PCR-based Methods for the Detection of Canned Tuna Species

Authors: Chloe Castanon^{1*}, Denise Hernandez, Rosalee S. Hellberg¹

¹Chapman University

Abstract:

The susceptibility of tuna species mislabeling can be attributed to their high consumer demand, complex global supply chain, and diverse price range. Previous studies have optimized sequencing-based techniques for species identification by targeting a short fragment of DNA known as the mitochondrial control region (CR), commonly referred to as CR mini-barcode. However, the limited retrieval of DNA from canned tuna products reduces the effectiveness of sequencing. This study aimed to optimize canned tuna species identification by evaluating whether the use of species-specific PCR combined with sequencing is more effective than sequencing alone. Two species-specific PCR methods were compared: real-time PCR and multiplex PCR. A sample set of 24 commercial canned tuna products was collected, including cans labeled as albacore tuna, skipjack tuna, yellowfin tuna, and light tuna. DNA was extracted in duplicate from each can, followed by analysis with DNA mini-barcoding, real-time PCR and multiplex PCR. DNA mini-barcoding enabled tuna species identification for 41% of the 24 canned samples. Multiplex PCR allowed for tuna species identification in 35% of samples, while real-time PCR was able to detect tuna species in 100% of canned samples. Overall, real-time PCR emerged as the most effective method for identifying tuna species in canned products, consistently detecting at least one species in each canned sample run thus far. The combination of real-time PCR and DNA mini-barcoding is recommended to allow for rapid screening of target species along with sequencing-based confirmation.

***Presenter and Student Competitor**



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

STUDENT COMPETITOR

Title: Antiproliferative activity of compounds isolated from the exoskeleton of white shrimp (*Litopenaeus vannamei*) in prostate cancer line

Authors: Trujillo-Ruiz HE^{1*}, López-Saiz CM¹, Burgos-Hernández A¹, Martínez-Cruz O¹, Silva-Campa E², Carbonel-Barrachina AA³

¹ Departamento de Investigación y Posgrado en Alimentos. Universidad de Sonora, Encinas y Rosales s/n. Hermosillo, Sonora, 83000. México

² Departamento de Investigación en Física. Universidad de Sonora, Encinas y Rosales s/n. Hermosillo, Sonora, 83000. México

³ Escuela Politécnica Superior de Orihuela, Universidad Miguel Hernández de Elche, 03312, Alicante, España

Abstract:

Prostate cancer is the second type of cancer with the highest incidence in men. Current treatments are not completely effective nor specific, therefore, there is a need for the search of new alternatives that might help treat this disease. The exoskeleton of white shrimp (*Litopenaeus vannamei*) is a viable option for the search for this type of compounds. The objective of this work is to identify the compounds from the *L. vannamei* exoskeleton responsible for the antiproliferative activity on prostate cancer line 22Rv-1. Serial extraction (hexane and acetone) of white shrimp exoskeleton was performed, and cell viability was analyzed (MTT Assay) in the prostate adenocarcinoma line (22Rv-1) and healthy retinal cells (ARPE-19). The hexane extract presented higher antiproliferative potential ($9,498 \pm 3,526$ cell viability, at 200 $\mu\text{g/mL}$), without presenting a cytotoxic effect against healthy retinal cells (ARPE-19). The extract was subjected to open column chromatography to separate the compounds responsible for the activity and fractions monitored using thin layer chromatography; 19 fractions were obtained and analyzed for their biological activity. Fraction H3 presented greater antiproliferative potential with 8.947 ± 4.82 cell viability (at 200 $\mu\text{g/mL}$). The compounds in the hexanic extract of the exoskeleton have antiproliferative potential, capable of preventing cell proliferation of 22Rv-1 without damage healthy retinal cells (ARPE-19); further research is needed to determine the molecules responsible for the biological activity.

*Presenter and Student Competitor



NOTES



NOTES



NOTES



NOTES



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

PACIFIC FISHERIES TECHNOLOGISTS CONSTITUTION

NAME OF ORGANIZATION

The name of the organization shall be "**PACIFIC FISHERIES TECHNOLOGISTS**".

PURPOSE OF ORGANIZATION

The purpose of the organization shall be to provide a medium of exchange of technical and scientific information among fisheries technologists, and those interested in fisheries technology, by holding meetings for the presentation of papers and discussions of technical scientific matters relating to the fisheries industries and to collaborate with research institutes, universities, and governmental agencies engaged in fisheries work.

MEMBERSHIP

Membership shall be open to anyone interested in fisheries technology. Emeritus members shall be: (1) currently retired, (2) active participants in past PFT meetings, (3) recommended by any PFT member, (4) designated by the Executive Committee, (5) identified in the membership database. All past Presidents, Secretaries, Treasurers and technical program chairs shall automatically become emeritus members upon retirement.

ATTENDANCE AT MEETING

There shall be two kinds of meetings: "Open" and "Members Only". Visitors shall be welcome to all "Open" meetings but shall be excluded from "Members Only" meetings. A quorum for the transaction of any business, including the election of officers, shall be two-thirds of the membership attending the meeting.

MEETINGS

The regular annual meeting will be held in a six-year rotation in the following order: (1) British Columbia, (2) Alaska, (3) Mexico, (4) California, (5) Oregon, and (6) Washington. The membership may decide to insert another location in this sequence on a one-time basis. Duration and time of meeting shall be left to the discretion of the Executive Committee. Special meetings may be held at any time or place at the discretion of the Executive Committee.

OFFICERS

The officers of the organization shall consist of a President, Secretary, Treasurer, Technical Program Chair and an Executive Committee of Regional Representatives who shall reside in British Columbia, Washington, Oregon, California, Alaska, Hawaii, and Mexico respectively. There shall be an At-Large Representative who may reside anywhere within the membership range of this organization. The President, Secretary, Treasurer, Technical Program Chair, Keeper of the Checkbook, past President, past Secretary, and past Treasurer shall be the 9th, 10th, 11th, 12th, 13th, 14th, and 15th members of the Executive Committee.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

DUTIES OF THE OFFICERS

President - The President has the responsibility for establishing the time and place of the annual meeting, for arranging and presiding at all meetings, and for the content of all meetings.

1. **Secretary** - The Secretary is the chief assistant of the President. The Secretary is responsible for maintaining and distributing a current membership list, any correspondence needed with respect to PFT meetings and assist, as needed, in planning and arranging of annual meetings.
2. **Treasurer** - The Treasurer is responsible for collecting dues, maintaining the treasury, and for registration at the annual meeting. Other responsibilities include: payment of all bills in a timely manner, maintaining proper and up-to-date financial records, and transfer funds and final annual balance sheet to Keeper of the Checkbook. Also assist the President, as necessary, in planning and arranging of annual meeting.
3. **Keeper of the Checkbook** - The Keeper of the Checkbook has the responsibility of maintaining financial records, carrying out a yearly audit and arranging for advance transfers of funds to the local treasurer, as needed, for planning and execution of annual meeting. The office of Keeper of the Checkbook will provide stability for long term purposes and demands of the treasury.
4. **Area Representatives and Representative-At-Large** - The Representatives are responsible for assisting the President by arranging for speakers, maintaining liaison with members in their areas, and advising the President and Secretary of conflicting meetings.
5. **Executive Committee** - The Executive Committee is the governing body of the PFT and has the primary responsibility of recommending a slate of new officers for approval by the membership.
6. **Technical Program Chair** – The Technical Program Chair is responsible for soliciting presentations and scheduling the oral and poster presentations during the annual meeting.

NOMINATIONS

The outgoing Executive committee shall nominate the next President, Secretary, Treasurer, Technical Program Chair, Keeper of the Checkbook, and Regional Representatives. No one who has held the office of President, Secretary, or Treasurer may be nominated for any of these offices until the expiration of two years after they have held such office. Additional nominations may be made from the floor.

ELECTIONS

Elections shall be carried out at the annual Business Meeting and presided over by the Executive Committee. Voting shall be by a show of hands. The President will cast the deciding vote in case of a tie and announce the names of the elected officers.

DUES

Annual dues shall be ten (\$10.00) dollars per year. Annual dues will be waived for emeritus members who have retired from active work. The Executive Committee will decide registration charges for the annual meeting. Membership in good standing may be maintained by paying the annual dues. Members, except emeritus members who have not paid dues for two consecutive years will be removed from the mailing list.



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

AMENDMENT OF THE CONSTITUTION

Amendment of the constitution may be effected by a two-thirds vote of members at any annual meeting.

Amended February 14, 1978

Amended March 31, 1981

Amended February 28, 1984

Amended May 29, 1987

Amended February 3, 1993

Amended February 8, 1994

Amended February 24, 1998

Amended February 25, 2003

Amended February 25, 2003

Amended February 25, 2003

Amended February 25, 2003

Amended February 20, 2007

Added California to rotation

Increased dues to \$5.00/year

Added Alaska to rotation

Exempted emeritus members from paying annual dues and defined Emeritus members

Added office of Treasurer, Permanent Treasurer, and increased dues to \$10.00/year.

Added Mexico to rotation

PFT members voted in favor of filing as a non-profit organization. The Permanent Treasurer position has been dissolved. There will be a Keeper of the Checkbook

Changed list of meeting locations from five-years to six-years and put in order of current sequence

Added description and requirements for emeritus members

Added Keeper of the Checkbook to Executive Committee and included a description of duties

Emeritus member information added under MEMBERSHIP

Added Technical Program Chair to Executive Committee.

Deleted term of Permanent Treasurer to correspond to 2/24/98.

Reviewed: October 4, 2013



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

PRESENTER ABSTRACT INDEX

First Name	Last Name	Abstract Page Number
Angela	Andanappa	31
Angela	Bowers	38
Ann	Colonna	34
Carmen María	López-Saiz	58
Chloe	Castanon*	50
Chris	Sannito	41
Christina	DeWitt	35,46
Christoff	Furin	28
Claes	Nystrom	34
Erlingur	Gudleifsson	44
Frances	Bursch	42
Hector Enrique	Trujillo-Ruiz*	51
Jae	Park	36
John	Reuther	24
Josafat Marina	Ezquerro-Bauer	49
José Luis	Cárdenas-López	37
Leyi	Zhou*	30
Lisa	Weddig	23
Marlin “Keith”	Cox	33
Noëlle	Yochum	26
Rachel	Baker	25
Robert	Gerlach	8
Sandra Carolina	De La Reé Rodríguez*	48
Sarah	Ahles*	27
Senya	Joerss	32
Susan	Marks	43
Tommy	Sheridan	39

* STUDENT COMPETITOR



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2024

Lifting All Boats!

Networking Passport

Rules

1. Find people who fit the following descriptions and have a conversation with them.
2. After the conversation, have them write their name in the Passport space.
3. You cannot use the same person for more than one Passport space. You cannot sign your own name in any of the spaces.
4. All Passport spaces must be filled out.
5. Upon completion of all Passport spaces, turn in this page to John Burrows by 7:00 PM on Tuesday, February 20, 2024.
6. Pages will be entered into a raffle for a prize. Winner will be announced during the Tuesday night banquet dinner.

Your Name: _____

A PFT Sponsor	Asks for help killing spiders	Same Birth Month as You	From the Seafood Industry
Stands during presentations	A former PFT President	A Student from a Different State or Country as You	Has a pet
Doesn't like snow or cold	Born and raised in Alaska	Wearing a University Logo	Published a study in 2023
Has a Poster Presentation on Monday at PFT	In the PFT 2024 Organizing Committee	Wearing a hat or fishing boots	Gave an Oral Presentation at PFT 2024



PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2023

Ready About!