PACIFIC FISHERIES TECHNOLOGISTS CONFERENCE 2026

Charting the Future: Innovation and Collaboration for Tomorrow's Fisheries

San Pedro, California
February 22 - 25, 2026

PFT 2026 PROGRAM BOOK

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Welcome to the 76th PFT Conference!

Welcome to the 76th Pacific Fisheries Technologists (PFT) Conference! It is my great pleasure to welcome you to this year's gathering held from Sunday February 22nd thru Wednesday the 25th, 2026 in the vibrant coastal community of San Pedro, California. With its rich maritime heritage and dynamic port setting, San Pedro offers an ideal backdrop for our discussions on the future of fisheries science and technology.

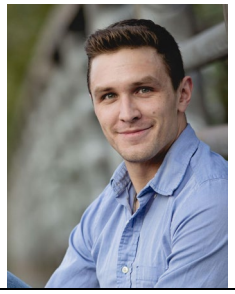
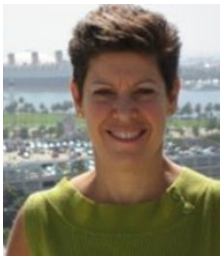
Our 2026 theme *"Charting the Future: Innovation and Collaboration for Tomorrow's Fisheries"* highlights the importance of working together to address the environmental, technological, and social challenges facing our field. This conference is a space to share ideas, explore new research, and strengthen the partnerships that drive sustainable fisheries and resilient coastal communities.

As a proud member of PFT since 2006, I've seen firsthand the value of the connections, knowledge, and innovation that emerge from these gatherings. We are excited to host a diverse lineup of speakers and sessions that reflect the depth and breadth of our industry. Whether you're joining us from academia, government, or the private sector, your contributions are vital to shaping the future of fisheries.

Thank you for being part of PFT 2026. I look forward to the conversations, connections, and inspiration that will emerge during our time together in San Pedro.

Rosalee Hellberg
PFT President 2026

ORGANIZING COMMITTEE

Rosalee Hellberg President 	Carmen Maria Lopez-Saiz Past President 	Briana Hurley Program Director 	Christina DeWitt Treasurer & Secretary 	
Angee Hunt Student Competition Chair 	Alex Gerber Administrative Support 	Virginia Ng Advisor for Regulatory Affairs 	Démian A. Willette,Ph.D. Sponsorship Chair 	
Ann He Advisor for Industry 	Craig Holt Webmaster 	John Burrows Alaska Representative 	John Boyce British Columbia Representative 	
Brandii O'Reagan Washington Representative 	Angee Hunt Oregon Representative 	Laurice Churchill California Representative 	Jesús Chan Mexico Representative 	Jon Bell Member At Large 

CONFERENCE AGENDA

SUNDAY FEBRUARY 22, 2026

3:00 - 5:00 pm **Registration** – Galleti Room

5:00 - 6:00 pm **PFT Executive Meeting** – Madeo Room

6:00 - 8:00 pm **PFT President's Reception** – Plaza area (outside Madeo Room)

8:00 pm - Midnight **Cards and Social Hour** – Hospitality Suite

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MONDAY FEBRUARY 23, 2026

8:00 - 11:00 am **Registration** – Galleti Room

8:00 - 9:00 am **Breakfast** – Madeo Room

SESSION 1 – Keynote, Abalone & Seaweed – Madeo Room
Moderator – Christina DeWitt, Oregon State University

9:00 - 9:10 am **Opening Remarks** – Rosalee Hellberg, PFT President

9:10 - 9:40 am **A Personalized History of the US West Coast Tuna Industry** – Jon Bell (NOAA), *Keynote Speaker*

9:40 - 10:10 am **California's Abalone Fishery and Kelp Forest Restoration** – Tom Ford (The Bay Foundation), *Invited Speaker*

10:10 - 10:35 am **New Seaweed Food Safety Guidance** – Michael Ciaramella (New York Sea Grant, Cornell Cooperative Extension), *Invited Speaker*

10:35 - 10:45 am **Coffee Break**

SESSION 2 – Fish Oil – Madeo Room
Moderator – Jesús Enrique Chan Higuera, University of Sonora

10:45 - 11:10 am **Shrimp Oil Recovery from Wastewater: A Sustainable Path to Value-Added Applications** – Angee Hunt (Oregon State University), *Invited Speaker*

11:10 - 11:35 am **Fish Oil Quality Control: Standards and Science** – Zhengfei Lu (Herbalife), *Invited Speaker*

11:35 - 12:00 pm **Labeling Guidance for Fish Oil** – Senya Joerss (REJIMUS), *Invited Speaker (Virtual)*

12:00 - 1:00 pm **Lunch** – Madeo Room

SESSION 3 – Seafood Authentication and Conservation – Madeo Room
Moderator – John Burrows, Alaska Seafood Marketing Institute

1:00 - 1:20 pm **AI-guided selection of mitochondrial markers and development of a portable qPCR assay GadiChip-qPCR) for rapid gadiform species authentication in surimi seafood** – Si Hong Park (Oregon State University), *Technical Presentation*

1:20 - 1:40 pm **Comparison of DNA Barcoding Approaches to Identify Rockfish (*Sebastes* spp.) on the Commercial Market** – Celina Garcia (Chapman University), *Student Presentation*

1:40 - 2:00 pm **Aquaculture Work and OurPartnerships within the White Abalone Captive Breeding Program and the Pycnopodia (Sunflower Star) Conservation Programs** – Wyatt Patry and Olivia Cleek (Cabrillo Aquarium), *Invited Speakers*

SESSION 4 – Cabrillo Marine Aquarium Tour

2:15 pm **Cabrillo Marine Aquarium Tour** (3720 Stephen M White Dr, San Pedro, CA 90731) – (15 min walk)

SESSION 5 – Poster Session & Cookies – Madeo Room
3:30 - 5:00 pm, *Moderator – Angee Hunt, Oregon State University*

Poster Presentations

Optimization of DNA Extraction for Tuna Species Identification – Grace Cho and Adriana Ten Cate (Chapman University), *Student Presentation*

UVC Inactivation of *Listeria monocytogenes* in Salmon Juice on Food Contact Surfaces – Gary Maloncon (Chapman University), *Student Presentation*

White shrimp carotenoids (peneaus vannamei) and docetaxel enhance apoptosis through the extrinsic and intrinsic pathways in human prostate cancer cells – Carmen Maria López-Saiz (University of Sonora)

Valorization of Cannonball Jellyfish (Stomolophus meleagris) Proteins through Enzymatic Hydrolysis and Antioxidant Assessment – Jesús Enrique Chan Higuera (University of Sonora)

Poster Presentations (cont'd)

Artificial Intelligence (AI)-Based Automated Classification of Commercially Important Ark Shell Species – Seung-Min Yang (Kyung-Hee University)

Effect of ultrasound treatment prior to enzymatic hydrolysis of collagen and its antioxidant activity in common octopus (*Octopus vulgaris*) – Angel E. Tapia-Vasquez (University of Sonora)

DINNER ON YOUR OWN

8:00 - 10:00 pm **Cards and Social Hour** – Hospitality Suite

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TUESDAY FEBRUARY 24, 2026

7:30 - 11:00 am **Registration** – Galleti Room

7:30 - 8:30 am **Breakfast** – Madeo Room

SESSION 6 – AltaSea at the Port of Los Angeles

AltaSea is dedicated to accelerating scientific collaboration, advancing an emerging blue economy through business innovation and job creation, and inspiring the next generation, all for a more sustainable, just and equitable world.

8:30 - 8:50 am **Travel to AltaSea** (2451 Signal St, San Pedro, CA)
Options: Walk (~ 20 min) Shuttle (10 Min)

9:00 - 10:00 am **AltaSea Blue Economy Intro & Tour** –Terry Tamminen (AltaSea President and Chief Executive Officer)**,** *Invited Speaker*

10:00 - 10:45 am **The Status of Kelp Breeding in the USA** – Kelley DeWeese PhD (Research associate, Nuzhdin lab, located at AltaSea)**,** *Invited Speaker*

10:45 - 11:00 am **Break**

11:00 - 11:50 am **Pacific Fish Technologists Conference Feb 2026 California's Marine Pelagic Fisheries Monitoring** – Michelle Horeczko (California Department of Fish and Wildlife, located at AltaSea), *Invited Speaker*

11:50 am - 12:10 pm **Travel back to the Doubletree**
Options: Walk (about 20 min) or Shuttle

12:15 - 1:15 pm **Lunch** – Madeo Room

SESSION 7 – Seafood Innovation for Health and Sustainability – Madeo Room
Moderator – Carmen Maria Lopez-Saiz, Universidad de Sonora

1:20 - 1:35 pm **Preserving Heritage, Creating Opportunity: Value-Added Seafood and Market Innovation in Louisiana** – Evelyn Watts (Louisiana State University AgCenter and Louisiana Sea Grant), *Invited Speaker*

1:35 - 1:55 pm **Enhancement of the antiproliferative effect of docetaxel by carotenoids from the by-products of the white shrimp (Penaeus vannamei) in prostate cancer cells** – Hector Trujillo Ruiz (University of Sonora), *Student Presentation*

1:55 - 2:15 pm **Influence of Cannonball Jellyfish (Stomolophus meleagris) Addition on the Physicochemical and Sensory Attributes of Dried Durum Wheat Spaghetti** – Jesús Enrique Chan Higuera (University of Sonora), *Technical Presentation*

2:15 - 2:35 pm **Bioactivity and in Silico Insights of Collagen-Derived Peptides from Jellyfish (Stomolophus sp. 2)** – Laura Hernández-Aguirre (University of Sonora), *Technical Presentation (Virtual)*

2:35 - 3:00 pm **Translating Pacific Dulse (*Devaleraea mollis*) into a Sustainable Functional Food for Metabolic Health** – Jung Kwon (Oregon State University), *Invited Speaker (Virtual)*

3:00 - 3:10 pm **Coffee Break**

SESSION 8 – Seafood Systems: Safety, Quality, and Social Context – Madeo Room
Moderator – Ann He, Seafood Products Association

3:10 - 3:35 pm **Food Safety Culture and its Impact on Pest Management** – John Boyce (Cultivate SA), *Invited Speaker*

3:35 - 4:00 pm **Identification of pH-Sensitive Frequency Bands in Multifrequency Bioimpedance Phase Measurements of Pacific Halibut Muscle** – Christina DeWitt (Oregon State University), *Invited Speaker*

4:00 - 4:30 pm **The Smell of Money' Documentary Presented by the Port of Los Angeles** – Video

4:30 - 5:00 pm **PFT General Meeting** – Madeo Room

5:00 - 6:00 pm **Cocktail Hour** – Madeo Room

6:00 - 8:00 pm **PFT Banquet & Student Awards** – Madeo Room

8:00 - 10:00 pm **Cards and Social Hour** – Hospitality Suite

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WEDNESDAY FEBRUARY 25, 2026

8:00 - 9:30 am **Registration** – Madeo Room

8:00 - 9:00 am **Continental Breakfast** – Madeo Room

SESSION 9 – Regulatory Updates – Madeo Room
Moderator – Virginia Ng, Washington State Department of Agriculture

9:00 - 9:30 am **Aquaculture Opportunity Areas in California** – Celia Barroso and James Morris (NOAA), *Invited Speaker*

9:30 - 10:00 am **State Collaborations with the U.S. Food and Drug Administration** – Virginia Ng (Washington State Department of Agriculture)

10:00 - 10:15 am **Coffee Break**

10:15 - 10:45 am **Low Probability, High Impact: What Cesium in Shrimp Teaches Us About Novel Hazards** – Jon Woody (National Fisheries Institute), *Invited Speaker (virtual)*

10:45 - 11:15 am **Seafood Initiative of the White House, Updates to the Office of Seafood, Summary and Updates to the Traceability Rule** – Brent Higgs (FDA Division of Seafood Safety | Seafood Processing and Technology Policy Branch Team), *Invited Speaker (virtual)*

11:15 - 11:45 am **2027 PFT** – Angee Hunt

11:45 - 12:00pm **Closing Remarks** – Rosalee Hellberg

INVITED SPEAKERS

Dr. Jon Bell
Director
NMFS' NSIL

Dr. Jon Bell has been the Director of the National Seafood Inspection Laboratory (NSIL) for the National Marine Fisheries Service (NMFS) for over 11 years. NSIL is an ISO 17025 certified laboratory, and provides microbiological and chemical analytical services to ensure seafood product quality and safety in support of the agency's Seafood Inspection Program, Office of Sustainable Fisheries, and other NOAA Fisheries goals and objectives. Previously Dr. Bell served the seafood industry in Louisiana as a Sea Grant Seafood Specialist and Extension Professor in the LSU AgCenter Food Science Department. Jon's research and outreach activities focused on postharvest handling and processing for both seafood safety and quality improvement. Dr. Bell also has extensive experience in the canned tuna industry, working in canneries as well as corporate Procurement and Quality Assurance departments.

Tom Ford
CEO of The Bay Foundation
Director of the Santa Monica Bay National Estuary Program
Co-Executive Director of the Coastal Research Institute at Loyola Marymount University

Tom Ford facilitates, manages, and promotes a program to comprehensively manage the coastline of Los Angeles County, including Santa Monica Bay and its tributaries. Tom has spent the past 25 years developing the internationally recognized Palos Verdes Kelp Restoration Project. Other current efforts involve method development for; the restoration and recovery of abalone, offshore eelgrass restoration; remote oceanographic monitoring; and living approaches to coastal resilience e.g., sand dunes and breakwaters.

Tom started his career on the eastern seaboard, where he worked as a commercial quahog fisherman and sea turtle biologist while earning his undergraduate degree at the University of Rhode Island. Tom arrived in Los Angeles in 1998, completing his graduate work at UCLA in 2005.

Michael Ciaramella, M.Sc., Ph.D.
Seafood Safety and Technology Specialist
New York Sea Grant, Cornell Cooperative Extension
mc2544@cornell.edu

Michael Ciaramella, a native of Pennsylvania, holds a bachelor's degree in marine science and biology from Rider University and a master's degree in aquatic health sciences from the University of Prince Edward Island, where his research focused on the nutritional status of American lobsters. He later taught marine science in the Florida Keys before earning a Ph.D. in Food Science from Mississippi

State University, where he studied the effects of stress on farmed catfish.
Michael currently serves as the Seafood Specialist for New York Sea Grant and Cornell
Cooperative Extension and is the Director of the Seafood HACCP Alliance. In this role, he develops programs, workshops, training, and resources to help the seafood industry produce safe, wholesome, and sustainable seafood and seaweed products for an evolving consumer market. He collaborates with seafood producers, regulatory agencies, and food and nutrition professionals on issues related to seafood and seaweed safety, quality, nutrition, and marketing. His current efforts include managing a national seafood safety training program, coordinating statewide initiatives to foster cross-sector communication, and developing resources to support the growing interest in domestic seaweed production and processing.

Angee Hunt
Assistant Professor
Oregon State University

Angee Hunt is an Assistant Professor in Food Science and Technology at Oregon State University, specializing in sustainable seafood processing. Her research focuses on maximizing seafood resource utilization while minimizing environmental impact, bridging innovation with sustainability across the seafood supply chain.
She earned a Master of Science in Food Science from Kansas State University and brings more than 20 years of experience as a faculty research assistant at Oregon State University's Seafood Research and Education Center, where she led numerous projects on seafood quality and processing.
In her current role as Assistant Professor, her research and outreach advance sustainable innovation in seafood processing, with a focus on maximizing resource utilization, strengthening resilient food systems, and driving value-added product development.

Dr. Zhengfei Lu
Principal Scientist
Herbalife

Dr. Zhengfei Lu is a Principal Scientist at Herbalife, where he leads a quality control scientist team focused on analytical method development, validation, and external scientific engagement. He holds a Ph.D. in Experimental Pathology from the University of Southern California (2014) and a medical degree from Peking University (2008), and brings more than 20 years of combined experience in molecular biology and analytical chemistry.
Beyond his role at Herbalife, he serves on the USP Expert Committees for Botanical Dietary Supplements and Herbal Medicines (2020–2025) and Non-Botanical Dietary Supplements (2025–2030), and is actively involved in AOAC INTERNATIONAL activities, including serving as a guest editor for the Journal of AOAC INTERNATIONAL.
Dr. Lu's research has been published in peer-reviewed journals including Food Chemistry, Planta Medica, and the Journal of AOAC INTERNATIONAL, and his publications have been cited over 1,000 times in books and journal articles related to food and dietary supplement quality and safety.

Senya Joerss
Business Development Director
REJIMUS, Inc.

As the Business Development Director at REJIMUS, Inc., Senya leads sales growth in supporting brands that prioritize product safety, regulatory readiness, and long-term integrity. She leverages her deep industry background to help companies integrate compliance strategies into their growth, marketing, and commercialization efforts. Through REJIMUS, she helps guide clients through regulatory unknowns to deliver regulatory excellence rooted in real-world experience.
With 19 years in the food industry, Senya brings a rare combination of technical, regulatory, and commercial expertise. She holds a biology degree from Iowa State University, is a Certified Food Scientist (CFS), and has built her career across nutritional labeling, stability studies, USP Verification, global compliance, and contract manufacturing oversight. Her background includes technical sales with Eurofins Scientific and nearly a decade at Trident Seafoods managing compliance for fish oil supplements and value-added products. A former president of the Cascadia Institute of Food Technologists, she frequently presents on seafood nutrition, omega-3 fatty acids, sensory science, NIR technologies, and FTC marketing and labeling compliance, making her a respected educator and thought leader in food science and regulatory compliance.

Olivia Cleek
Cabrillo Marine Aquarium

Olivia is an aquarist at Cabrillo Marine Aquarium where she provides care for endangered and sensitive species such as white abalone, sunflower sea stars, and Pacific seahorses. She received her undergraduate degree in Zoology from Ohio State University and is two-weeks away from defending her master's thesis with Oregon State University on the presence and distribution of basking sharks in the Northeast Pacific Ocean. She has worked in animal husbandry for 10 years at facilities like the Columbus Zoo and Aquarium, Waikiki Aquarium, and the California Science Center and is eager to continue working in marine endangered species conservation in southern California.

Wyatt Patry
Curator of Aquaculture & Conservation
Cabrillo Marine Aquarium

Wyatt Patry is an experienced and accomplished professional in public aquaria, currently serving as a Curator of Aquaculture & Conservation at Cabrillo Marine Aquarium. Working over the past 20 years at renowned institutions like the Monterey Bay Aquarium and the Aquarium of the Pacific, Wyatt has a proven track record in leading aquaculture efforts, conservation programs, and innovative exhibit development. Most recently Wyatt brought mass culture of ctenophores to science & aquariums worldwide(Patry et al 2020) and optimized culture of Mahi mahi for exhibit

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Terry Tamminen
President and Chief Executive Officer
AltaSea

From his youth in Australia to career experiences in Europe, Africa, China and across the United States, Terry has developed expertise in business, farming, education, non-profit, the environment, the arts, and government. Governor Arnold Schwarzenegger appointed him Secretary of the California Environmental Protection Agency and later Cabinet Secretary, the Chief Policy Advisor to the Governor, where Terry was the architect of many groundbreaking sustainability policies, including California's landmark Global Warming Solutions Act of 2006, the Hydrogen Highway Network, and the Million Solar Roofs initiative. In 2010 Terry cofounded the R20 Regions of Climate Action, a new public-private partnership, bringing together sub national governments; businesses; financial markets; NGOs; and academia to implement measurable, large-scale, low-carbon and climate resilient economic development projects that can simultaneously solve the climate crisis and build a sustainable global economy. He also provides advice through 7th Generation Advisors to Pegasus Capital Advisors, the Green Climate Fund and numerous global businesses on sustainability and "green" investing, as well as assisting governments and philanthropists with climate solutions, including Fiji, India, Rockefeller Brothers Fund, and the Leonardo DiCaprio Foundation. An accomplished author, Terry's books include "Cracking the Carbon Code: The Keys to Sustainable Profits in the New Economy" (Palgrave Macmillan). In 2011, Terry was one of six finalists for the Zayed Future Energy Prize and The Guardian ranked Terry No. 1 in its "Top 50 People Who Can Save the Planet."

Kelly DeWeese, PhD
Research Associate
Nuzhdin Lab Molecular and Cellular Biosciences
University of Southern California

Kelly DeWeese is a computational biologist specializing in brown algae genomics. She recently completed her PhD in Molecular Biology at the University of Southern California, where her research focused on developing genomic tools to support the sustainable aquaculture and restoration of native US kelp species. Her work, supported by multiple Department of Energy ARPA-E MARINER awards, includes assembly and annotation of reference genomes for North American populations of sugar kelp and giant kelp, and development of computational pipelines to identify genetic variants linked to reproduction. Now a Research Associate at USC, she is funded by an SBIR to commercialize reproductive control in cultivated kelp species to advance breeding efforts.

Michelle Horeczko
Senior Environmental Scientist Supervisor
California Department of Fish and Wildlife

Michelle Horeczko is a Senior Environmental Scientist Supervisor with the California Department of Fish and Wildlife (CDFW) based out of the Department's fisheries lab in San Pedro, located on the AltaSea campus in the Port of Los Angeles. She has 30 years of experience managing commercial and recreational fisheries in California's marine waters and has been part of CDFW's Pelagic Fisheries and Ecosystems program for over a decade, engaging in a variety of roles in monitoring and policy work for highly migratory and coastal pelagic species. Currently Michelle leads the commercial fishery monitoring unit for coastal pelagic finfish and market squid fisheries, which includes dockside sampling, age and growth studies, and collaborative field work to support stock assessments. When not in the lab, Michelle enjoys hiking, beach camping, and spending time with her family and border collie.

Evelyn Watts
Associate Professor and Seafood Extension Specialist
LSU AgCenter and Louisiana Sea Grant

Evelyn Watts is the Grace Drews Lehman Professor in Human Ecology, an Associate Professor, and a Seafood Extension Specialist with the LSU AgCenter and Louisiana Sea Grant. She serves as Research Director of the LSU AgCenter Seafood Processing Demonstration Laboratory. Her work focuses on applied research and extension programs that enhance seafood safety, quality, and by-product recovery to support Louisiana's seafood industry.
Dr. Watts provides technical assistance on regulatory compliance and best practices for handling, processing, packaging, and storage. She is actively involved in professional organizations including the International Association for Food Protection, Phi Tau Sigma, AFDOSS, the Louisiana Marine Extension Project, the Aquatic Foods Conference, National Seafood HACCP Alliance, and the Guatemalan Veterinary Medicine Professional Society.
With over twenty years of experience in food industry and academia, Dr. Watts specializes in seafood technology, food safety and regulatory frameworks. She teaches extensively across food sectors and is a lead instructor for Sanitation Control Procedures for Fish and Fishery Products, Seafood HACCP, Meat and Poultry HACCP, the Better Process Control School, and FSPCA Preventive Controls for Human Foods.
Dr. Watts earned her D.V.M. and Masters from the University of San Carlos in Guatemala and her Ph.D. in Food Science from Louisiana State University. Her contributions have been recognized through multiple LSU AgCenter and university-wide awards.

Dr. Jung Kwon
Associate Professor
Oregon State University

Dr. Jung Kwon is an Associate Professor of Food Science and Technology at Oregon State University. She earned her Ph.D. in Food Science from Purdue University and completed postdoctoral training in Nutritional Science and Toxicology at the University of California, Berkeley, and in Molecular Medicine at the University of Massachusetts Medical School. Dr. Kwon's research explores the nutritional and biological effects of diverse dietary resources on human health at both cellular and physiological levels, with a particular emphasis on aquatic foods. Her work focuses on harnessing underutilized and sustainable dietary resources to enhance the effective use of harvested foods, advance a resilient and sustainable food system, and promote human health. Through her research, Dr. Kwon contributes to the development of nutritional guidelines and biomedical applications aimed at improving health outcomes and preventing disease.

John Boyce
Core Team Member
Cultivate SA

John has over 45 years of experience in various aspects of food production, food safety, quality assurance, sanitation, training, and auditing. He spent twenty-five years with Trident Seafoods, starting as a crab fisherman and then working in roles as plant manager, corporate HR, regulatory compliance, national account sales, FSQA, and then as the Director of Training and Development for the company. He worked as a technical sales rep for four years with Diversey, helping clients with their sanitation programs. John spent eight years with AIB International, providing GMP and HACCP audits all over the world. He is now an independent food safety consultant based in Vancouver, British Columbia. He's currently serving as the Vice Chair of the Seafood Quality & Safety Professional Development Group (PDG) of the International Association for Food Protection (IAFP) and is also on the DEI council for IAFP. He enjoys working with clients to help them ensure food-safe products and he's a core team member at Cultivate SA, helping companies assess and change their food safety cultures.

Dr. Christina DeWitt
Director of the OSU Seafood Research & Education Center
Professor of Food Science & Technology at Oregon State University.

Dr. Christina A. Mireles DeWitt is a food chemist with deep experience in seafood quality and processing, her work bridges applied research with real-world industry needs.

Dr. DeWitt's research and extension programs address critical challenges in fish quality and valuation, with a particular focus on sensory, biochemical, and processing drivers of product performance. Her current work on chalky Pacific halibut integrates quality characterization and measurement technologies with stakeholder insights to improve handling practices, reduce variability, and strengthen market confidence in this high-value species.

She has led more than 70 industry workshops, supporting processors, harvesters, and regulators to adopt practical solutions that enhance seafood quality, safety, and utilization. Dr. DeWitt also serves on the Executive Committee of the Seafood HACCP Alliance and as Co-Editor-in-Chief of the *Journal of Aquatic Food Product Technology*.

Celia Barroso
California Regional Aquaculture Coordinator
NOAA Fisheries

Celia Barroso is the California Regional Aquaculture Coordinator for NOAA Fisheries where she facilitates sustainable aquaculture development in and off of California through public, private, federal, state and local government engagement. She is based in Long Beach, California, and has worked with NOAA Fisheries since 2012. Prior to her role in aquaculture, her role focused on international highly migratory species (e.g., tuna, billfishes, sharks) management.

Jon Woody, CAPT, USPHS (Ret.)
Chief Science Officer
National Fisheries Institute

Jon Woody leads scientific and regulatory affairs in support of member companies. He brings more than 28 years of food safety and regulatory experience, including 24 years in senior leadership roles at the U.S. Food and Drug Administration (FDA).

Early in his FDA career, Jon led national retail food safety initiatives, supporting development of the Food Code and advancing active managerial control strategies across the retail sector. He later led development of the FSMA Intentional Adulteration rule and provided executive leadership supporting implementation of the FSMA 204 Food Traceability Rule. Jon also served as Director of FDA's Food Defense and Emergency Coordination Staff and subsequently as Director of Preparedness and Emergency Programs, overseeing national food defense policy and emergency response coordination.

During his FDA tenure, Jon was deeply involved in food fraud prevention and response efforts. He contributed to federal response activities related to high-profile incidents, including melamine contamination in milk powder, the Peanut Corporation of America outbreak, and lead contamination in cinnamon.

Brent Higgs
FDA DSS

Brent Higgs has been a Biologist with the Food and Drug Administration's Division of Seafood Safety (DSS) since January 2023. He is responsible for conducting technical reviews of FDA compliance cases in support of regulatory action based on violations of the seafood HACCP regulation [21 CFR 123] and Good Manufacturing Practices [21 CFR 117]. Additionally, Brent reviews economic fraud/short weight cases, research fish to support updates to The Seafood List and Seafood Hazards guide and serves as a member of the Natural Toxin (NT) and Scombrotoxin Fish Poisoning (SFP) Illness Response Workgroup. Brent started with the FDA in 1999. From this time, he has held the positions of Consumer Safety Officer, Food Specialist inspecting foreign and domestic products, and Training Officer in the Office of Training Education and Development. As a Training Officer he was responsible for the agency's Seafood and Shellfish courses.

ORAL ABSTRACTS

Keynote Presentation

Jon Bell

National Seafood Inspection Lab (NSIL)

This keynote presentation will cover a couple of somewhat adjacent subjects: first, a non-authoritative review of notable events in the history of the fishing industry in San Pedro, CA over the years, including personal remembrances of growing up nearby and then working for StarKist Seafood after they closed the tuna cannery in Terminal Island. I will also provide highlights of the recent publication of A Personalized History of the U.S. West Coast Tuna Industry, including some of the personal vignettes and remembrances from the book. However, the authors of the book, John DeBeer and yours truly, were more involved in the canned tuna industry in San Diego, Samoa and elsewhere than San Pedro/Terminal Island.

California's Abalone Fishery and Kelp Forest Restoration

Tom Ford*

The Bay Foundation

Abalone are of great economic, ecological and cultural significance. Harvest from kelp forests have supported human populations for ~15,000 years along the west coast of North America. The latter half of the 20th century experienced declines in abalone landings. Losses of giant kelp canopy approached 80% over the same period off the Palos Verdes Peninsula. In 1997, California's commercial abalone fishery was closed and strong El Niño conditions caused dramatic declines in giant kelp forests in southern and central California. These coinciding events catalyzed interest in the restoration of kelp forests and the restoration and recovery of abalone. Since 2013, The Bay Foundation led Palos Verdes Kelp Restoration Project has revitalized 32.67 hectares of former kelp forest. Over 14,000 hours of diving directed at reducing purple urchin densities, has resulted in the resilient return of the giant kelp community; demonstrated by increased biodiversity, biomass and direct benefit to the sea urchin fishery. The improved condition of the kelp forest encouraged use of the Peninsula for method development for abalone restoration. Since 2018, 43,227 abalone have been outplanted to Palos Verdes, Point Loma, Catalina Island, and the mainland coast of Santa Barbara.
Red and white abalone are captive bred and outplanted to the ocean in modules.
Monitoring involves oceanographic sensors, time lapse cameras, and SCUBA based surveys.
Early results describe low initial mortality. An expanding collaboration, increased production of abalone, and refinement of outplant techniques and strategies support the advancement of this effort.

Charting a Safe Future for Seaweed in the U.S. Food System

Michael Ciaramella, MSc., PhD., New York Sea Grant/ Cornell Cooperative Extension;
Jennifer Perry, *University of Maine;*
Amanda Shore, *Farmingdale State College;*
Anoushka Concepcion, *Formerly Connecticut Sea Grant;*
Indu Upadhyaya, *University of Connecticut Extension;*
Zachary Gordon, *Connecticut Sea Grant, UConn Extension;*
Catherine Janasie, *The University of Mississippi;*
Christina DeWitt, *Oregon State University;*
Razieh Farzad, *Florida Sea Grant, University of Florida;*
Brian Himelbloom, *University of Alaska Fairbanks – Kodiak*

Introduction: Macroalgae, commonly known as seaweeds, are photosynthetic organisms found in marine and freshwater environments. They serve a wide range of purposes, including use in food, animal feed, biofuels, fertilizers, pharmaceuticals, and cosmetics. In the U.S., growing awareness of seaweed's health benefits, sustainability, and culinary versatility is driving increased demand, resulting in more seaweed products, restaurant offerings, and cookbooks.

Objective(s): Despite its rising popularity, seaweed as a food commodity in the U.S. lacks comprehensive food safety guidance. The objective of this work is to develop a *Seaweed Food Safety Guidance* document to help stakeholders identify and mitigate key food safety hazards, thereby supporting the safe growth of the seaweed industry.

Materials & Methods: The guidance document was developed by synthesizing existing resources and scientific publications. It was designed to accommodate the diversity of seaweed species, production environments, and regulatory frameworks, ensuring flexibility and applicability.

Results & Discussion: The resulting *Seaweed Food Safety Guidance* provides a framework for regulators, producers, processors, and retailers to assess and manage risks associated with seaweed products. As domestic aquaculture expands, this guidance supports safe practices, regulatory compliance, and consumer confidence. It promotes consistency and safety across regional and national markets, contributing to sustainable food production and economic growth.

Conclusion: Clear national guidance is essential for the safe development of the seaweed industry in the U.S. The Seaweed Food Safety Guidance document offers a practical tool to support stakeholders in managing food safety risks, fostering industry growth, and ensuring public health protection.

Shrimp Oil Recovery from Wastewater: A Sustainable Path to Value-Added Applications

Angee Hunt, Joey Cardinalli

Oregon State University

Shrimp processing generates wastewater containing oils and solids that elevate biological oxygen demand (BOD), harming aquatic ecosystems. Recovering shrimp oil offers dual benefits: reducing environmental impact and creating value-added products for nutraceutical, cosmetic, and food applications. This project targeted oil recovery from Pacific pink shrimp (Pandalus jordani) marinade wastewater.

Objectives were to develop a recovery method, evaluate storage stability, and model shelf life. Oil was recovered using solvent extraction, heating, and centrifugation. Based on yield and ease of recovery, centrifugation was selected as the optimized technique. Samples were stored at 4 °C and 20 °C under dark conditions, with oxidative stability monitored over three weeks using peroxide value (PV) for primary oxidation and thiobarbituric acid reactive substances (TBARS) for secondary oxidation. Data were fitted to Arrhenius-based models.

Centrifugation yielded the highest recovery. Shelf-life predictions indicated ~24 days at 4 °C (PV) and ~21 days (TBARS). PV modeling was more accurate for primary oxidation. Testing at day 23 of 4 °C storage confirmed PV values (4.76 meq O_2/kg oil) remained below the acceptable limit of 5 meq O_2/kg oil. Oil recovered after cooking may contain lower EPA, DHA, and astaxanthin compared to cold-water recovery, suggesting early recovery during marination provides higher quality oil.

Predictive shelf-life models support quality management and validate shrimp oil recovery from wastewater as feasible and sustainable. Centrifugation was the simplest and most effective process. Incorporating recovery during marination offers a key step toward maximizing oil quality from Pacific pink shrimp, with potential applications in food, nutraceutical, and cosmetic industries.

Fish Oil Quality Control: Standards and Science

Zhengfei Lu

Herbalife, Torrance, CA USA

Fish oil remains a leading source of omega-3s, yet quality can vary widely from harvest to finished product. This talk will review fish oil quality control from both a standards and practical laboratory perspective. We will briefly position fish oil in the current omega-3 market and explain its omega-3 chemistry and species-related differences. Key risks and quality control pillars will be mapped across the product lifecycle: harvest and handling, storage and transportation, refining and concentration, and final dosage forms. Using this risk map, we will discuss analytical technologies for assessing identity, potency, contaminants, and stability. Finally, we will highlight emerging analytical tools and evolving standards that can strengthen future fish oil quality programs.

Fish Oil & Omega-3 Dietary Supplement Labeling Basics

Senya Joerss

REJIMUS, INC

Introduction: Fish oil and omega-3 dietary supplement products - originating with the traditional cod liver oil pourable - continue to provide essential fatty acids that are often missing from the American diet, which is still low in seafood consumption. There is a continued interest to create fish oil and concentrated omega-3 products from a variety of seafood sources as consumers are paying more attention to ethical sourcing, transparency, sustainability, to fill their nutritional needs. Dietary supplement product labeling differs from seafood nutrition food labeling and without uniformity in labeling by all companies/brands, consumers are often confused by the options available at the retail level.
Objectives: 1) Discuss the evolution of product availability and the key differences between fish oil vs. omega-3 concentrates. 2) Help seafood industry better understand the basics of what to include on final fish oil and omega-3 dietary supplement product labels. 3) Provide examples of labels that are confusing to consumers and could be deemed misleading to the average consumer. 4) Introduce Panelgea® nutritional labeling/supplement facts panel generation tool.
Materials and Methods: REJIMUS, Inc. has a team of regulatory experts who work with leading food/beverage/dietary supplement companies to provide complete and vetted labeling services for US compliant marketing. Copycat labeling is a high-risk marketing practice in the age of educated global competitors and financially motivated legal attorneys. Collaborating with trained external partners to understand labeling risk is key to maintain brand reputation and consumer trust. Dietary supplement labeling best practices were gathered from real life marketing examples for educational purposes.
Results and Discussion: REJIMUS identified the following as key criteria for successful dietary supplement product formulation, labeling, and branding:
1) Identify if the fish oil extracted is safe for use as a food ingredient and if other ingredients are needed to maintain stability and sensory attributes. 2) Determine what final ingredient form will be marketed in a final dietary supplement product. 3) Qualify your ingredient suppliers & manufacturing facility or partner facilities to verify they are approved to manufacture/distribute quality dietary supplement products and ingredients. 4) Determine appropriate methods and specifications for ingredient and final product testing for release to avoid recalls. 5) Plan for strategic marketing and sales promotion with complete and vetted claims, content, and final product review.
Conclusions: Fish oil and omega-3 products have been marketed for decades across the globe. The foundation for accurately measuring fish oil and omega-3 attributes and promoting them on final dietary supplement labels is complex and requires initial investment to maintain trust by end consumers for new and existing brands. Successful mitigation of false or misleading marketing is a priority for all seafood industry to continue to thrive. REJIMUS, Inc. as a quality partner, can provide strong quality and regulatory support to dietary supplement brands as regulations evolve. Labeling is just one aspect of fish oil and omega-3 compliance, and tools like Panelgea® are available to help seafood industry maintain uniformity as leaders in promoting new and innovative seafood products for American consumers.

AI-guided selection of mitochondrial markers and development of a portable qPCR assay (GadiChip-qPCR) for rapid gadiform species authentication in surimi seafood

Seung-Min Yang[a], Jae W. Park[b], Eiseul Kim[a], Si Hong Park[a,*]

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OSU Seafood Research and Education Center, Oregon State University, Corvallis, OR, USA

Authenticating species in surimi seafood remains challenging due to the loss of morphological traits and the genetic similarity among gadiform species. Here, we introduce an artificial intelligence (AI)-guided framework that replaces empirical marker selection with a quantitative, data-driven evaluation. Using supervised machine learning to evaluate multiple mitochondrial loci, cytochrome c oxidase subunit I emerged as the most discriminative marker for gadiform species classification, achieving an accuracy of 0.950. This marker was then integrated into a portable microfluidic qPCR platform, termed the GadiChip-qPCR, which enables on-site identification of six important gadiform species within 30 minutes. The assay exhibited 100% species specificity and high sensitivity, with detection limits of 10^{-4} ng for five species and 10^{-3} ng for *Micromesistius poutassou*. Field validation of fifty commercial surimi seafood demonstrated perfect concordance between molecular detection and labeling. This study establishes a new paradigm for reliable and regulator-ready surimi seafood authentication through AI-driven marker optimization.

Comparison of DNA Barcoding Approaches to Identify Rockfish (*Sebastes* spp.) on the Commercial Market

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Rockfish (*Sebastes* spp.) are vulnerable to mislabeling due to their visual similarity and variable market value. After rockfish are filleted and skinned, species identification based on taxonomic features becomes difficult or impossible, further incentivizing seafood fraud. In such instances, DNA-based identification methods are commonly used to authenticate species. The mitochondrial gene regions, cytochrome *c* oxidase subunit I (COI) and cytochrome *b* (cyt *b*), have been widely used in the identification of various fish species. Both markers have been reported to differentiate *Sebastes* spp., but there is limited research comparing the performance of these markers in identifying rockfish sold in the United States commercial market. This study compared COI and *cyt* b markers for the DNA barcoding of rockfish species. A total of 70 commercial rockfish samples were collected online and from retailers in Southern California. The samples underwent DNA extraction, amplification, and sequencing using primers targeting the COI and cyt *b* regions. While both regions showed 97% amplification rates, COI had a slightly higher sequencing success rate (100%) as compared to cyt b (97%). The sequencing quality scores were higher with the COI primers (95.1-100%) compared to the cyt *b* primers (28.8-100%). Additional analysis will determine which genetic marker provides the greatest species-level differentiation rates, with the goal of ensuring accurate labeling and supporting regulatory compliance, thereby reducing seafood fraud.

Student Competition Participant

Cabrillo Marine Aquarium Tour

Olivia Cleek & Wyatt Patry

The Aquatic Nursery at Cabrillo Marine Aquarium has supported Southern California marine conservation for over two decades. Established in 2004, the Aquatic Nursery is a dedicated space for advancing larval rearing techniques for species of conservation concern. Today, the Nursery plays an active role in the recovery of several ecologically and commercially significant marine species. Cabrillo Marine Aquarium was the first facility to successfully rear and release the endangered giant seabass (Stereolepis gigas), actively contributes to recovery planning for the ecologically important sunflower sea star (Pycnopodia helianthoides), and supports propagation efforts for the Pacific seahorse (Hippocampus ingens). Our largest and most resource-intensive initiative, however, is the recovery of the endangered white abalone (Haliotis sorenseni). Following population collapse driven by overfishing, recovery now relies on captive spawning, larval culture, and strategic outplanting. As an active partner in Bodega Marine Lab's White Abalone Breeding Program, the Aquatic Nursery maintains broodstock, supports spawning events, rears larvae for eventual ourplanting, and refines husbandry protocols to improve survivorship and genetic representation. Collectively, these efforts demonstrate how applied aquaculture within public aquaria can directly support fisheries recovery and marine conservation.

The Status of Kelp Breeding in the USA

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Kelp is one of the few remaining clades where basic biological knowledge and applied insights inspire remarkable discoveries due to a severe shortage of modern-molecular data. Over the past seven years, ARPA-E and NOAA have invested more than $12M to decipher kelp systems in support of sustainable ocean farming at the University of Southern California, University of Wisconsin, Woods Hole oceanographic Institution and the University of Connecticut . Through this support, members of our team have cultured thousands of biodiverse kelps from meiospore to multicellular thalli many meters in length, along with hundreds of bacterial and dozens of fungal species sampled from kelps (now preserved in Kelp Ark, LLC - a nonprofit public seed bank funded by Grantham Environmental Trust). The team has also assembled and annotated high-quality genomes of *Macrocystis pyrifera* (the giant kelp) and *Saccharina latissima* (the sugar kelp) and associated microorganisms. In addition, we have developed methods to culture kelps on agar plates, reducing the complexity of 3D interactions to 2D and enabling easier microbial and media manipulations. We have genetically transformed kelps with GFP using agrobacteria and established microscopy approaches to analyze kelp subcellular structures and their responses to environmental and microbial manipulations. We have also engineered a large-scale "brown-house", where macroscopic kelps and organisms associated with them can be maintained in controlled land-based recirculation tank systems, where we have closed reproductive cycles. While these advances were originally driven by the applied goal of harnessing kelp farming to address biofuel applications—a noble pursuit—they now provide a foundation for advancing the basic science underlying these practical achievements for improved feeds, food, phycocolloids, plant biostimulants and nutraceutical applications.

California's Marine Pelagic Fisheries Monitoring

Michelle Horeczko

California Department of Fish and Wildlife, Marine Region Fisheries Lab, Berth 58, 2451 Signal Street, San Pedro, CA 90731

Pelagic fish populations in California's marine waters support lucrative fisheries of domestic and international importance. The California Department of Fish and Wildlife's (CDFW) role in management of coastal pelagic (CPS) and highly migratory (HMS) fish populations has a rich history dating back to the early 1900's. Today we continue this legacy to sustainably co-manage pelagic fisheries in partnership with NOAA Fisheries. Highly migratory and coastal pelagic species are managed under the Pacific Fishery Management Council's respective HMS and CPS Fishery Management Plans, while management of market squid is deferred to the State of California under the recently amended Market Squid Fishery Management Plan. CDFW's monitoring and data collection supports management through dockside and electronic catch monitoring, age and growth studies, and fishery dependent and independent research in partnership with NOAA's Southwest Fisheries Center and the wetfish industry to enhance and support stock assessments. More recently, CDFW has collaborated with State health agencies to monitor domoic acid levels in commercially caught coastal pelagic species that may be destined for human or animal consumption.

Preserving Heritage, Creating Opportunity: Value Added Seafood and Market Innovation in Louisiana

Evelyn Watts

Louisiana State University AgCenter and Louisiana Sea Grant

Louisiana's seafood industry is adapting to shifting markets, evolving consumer expectations, and increasing demand for value added, locally sourced products. This presentation highlights applied strategies for moving seafood beyond the dock through micro processing, direct marketing, and consumer driven product innovation. Drawing on case studies from the Beyond the Boat program, it explores opportunities tied to sustainability, quality preservation, underutilized species, and emerging trends such as ready to cook products, customization, and experiential marketing. Emphasis is placed on practical outreach models, demonstration facility, and partnerships that support fishermen, processors, and rural communities while preserving seafood heritage and improving economic resilience.

Enhancement of the antiproliferative effect of docetaxel by carotenoids from the by-products of the white shrimp (Penaeus vannamei) in prostate cancer cells

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Aquaculture industry generates large volumes of byproducts that are discarded, leading to environmental concerns and the loss of valuable resources. Among these, byproducts from white shrimp (*Penaeus vannamei*), like exoskeleton and cephalothorax, represent more than 50% of the organism's total weight, making them an abundant source of residual biomass. Several studies have shown that these byproducts contain diverse bioactive compounds with biological activities, including anticancer potential. The objective was evaluate the effect of compounds extracted from *P. vannamei* byproducts and to assess their use as adjuvants in combination with a specialized anticancer drug. Cell viability was evaluated using MTT assays, morphological changes were analyzed by fluorescence microscopy. The type of cell death was determined by flow cytometry, with caspase activation and reactive oxygen species generation using DCFH-DA assay. The results demonstrated that compounds derived from the shrimp exoskeleton exhibit strong antiproliferative activity against human cancer cell lines, particularly the 22Rv1 prostate adenocarcinoma cell line. When combined with docetaxel, these compounds enhanced the cytotoxic effect, significantly reducing cell viability. Individual IC_{50} values were 10.59 µg/mL for the active fraction and 68.11 µg/mL for docetaxel, while the combination showed lower IC_{50} values. Morphological analysis using DAPI and phalloidin staining revealed typical apoptotic features, including reduced cell size, membrane blistering, and chromatin condensation. Flow cytometry confirmed a high percentage of apoptotic cells, reaching up to 99% with the combined treatment. Additionally, the compounds activated caspases 3, 8, and 9, indicating the involvement of intrinsic and extrinsic apoptotic pathways, accompanied by increased ROS production.

Student Competition Participant

Influence of Cannonball Jellyfish (*Stomolophus meleagris*) Addition on the Physicochemical and Sensory Attributes of Dried Durum Wheat Spaghetti

Jesús Enrique Chan Higuera[1]*, Isabel Paz Higuera[2], Mariela Menchaca Armenta[1], Jesús Enrique Gerardo Rodríguez[1], Alejandra Montserrat Preciado Saldaña[1]

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Introduction: The incorporation of cannonball jellyfish (*Stomolophus meleagris*), an abundant and undervalued marine species in Mexico, represents a sustainable strategy to improve the nutritional quality of widely consumed foods while promoting responsible use of marine resources.

Objectives: This study aimed to develop and characterize a dried pasta with enhanced nutritional and functional properties by incorporating dehydrated ground cannonball jellyfish and wheat bran into durum wheat semolina.

Materials and Methods: A factorial experimental design was applied, considering the ingredients and their levels of incorporation as main factors. The evaluated response variables included total protein content, ash content, optimal cooking time, cutting force, water absorption, and cooking loss. An affective sensory analysis was also conducted to assess consumer acceptance of the pasta formulations.

Results and Discussion: The incorporation of *Stomolophus meleagris* significantly increased protein content while preserving adequate cooking quality and structural integrity. The technological properties of the pasta remained within acceptable ranges despite the inclusion of non-traditional ingredients. Sensory analysis indicated acceptable consumer perception, supporting the feasibility of jellyfish incorporation into cereal-based products.

Conclusion: Cannonball jellyfish can be successfully incorporated into dried pasta to enhance protein content without compromising technological or sensory quality, offering a practical approach for developing value-added foods from underutilized marine resources.

Bioactivity and in Silico Insights of Collagen-Derived Peptides from Jellyfish (Stomolophus sp. 2)

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Introduction: Jellyfish have emerged as a promising source of bioactive compounds and have gained increasing interest in the biotechnology field.

Objectives: In this study, the antioxidant and antimutagenic activities, as well as the genotoxic potential, of peptides obtained from collagen hydrolysates of the blue cannonball jellyfish (Stomolophus sp. 2) were evaluated.

Materials and Methods: Collagen was extracted from jellyfish mesoglea and enzymatically hydrolyzed to obtain collagen hydrolysates, which were fractionated into three groups according to molecular weight (>10 kDa, 10–3 kDa, and <3 kDa). Antioxidant activity was evaluated using the ABTS assay, antimutagenic activity was determined against aflatoxin B1, and genotoxicity was assessed at different concentrations. In addition, peptide sequences were analyzed using in silico tools.

Results and Discussion: The low-molecular-weight fraction (<3 kDa) showed the highest biological activity, with an ABTS radical scavenging capacity of 8993 ± 5.2 µmol TE/g and a mutagenic inhibition rate of 88% against aflatoxin B1. This fraction did not show genotoxic effects at a concentration of 100 ppm, indicating its potential safety for further applications. Additionally, in silico analysis identified 15 distinct peptide sequences in the collagen hydrolysates, of which ten were predicted to have high bioactive potential.

Conclusion: These results indicate that peptides derived from Stomolophus sp. 2 collagen, particularly those with molecular weights below 3 kDa, exhibit notable bioactivity and represent a valuable resource for future studies focused on molecular characterization and the development of bioactive food supplements.

Translating Pacific Dulse (*Devaleraea mollis*) into a Sustainable Functional Food for Metabolic Health

Jung Kwon[1]

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Seaweeds have gained increasing recognition as highly nutritious and sustainable crops. Their diverse biochemical components exhibit a wide range of bioactivities, including anti-inflammatory, anti-diabetic, and cardiovascular health benefits. One particularly promising species is Pacific dulse (*Devaleraea mollis*). Although Pacific dulse has strong potential for cultivation along the Pacific Coast, its bioactive health effects remain largely unexplored.

Over the years, my research group has focused on elucidating the health benefits of Pacific dulse and its key components, including peptides and polysaccharides. Using integrated *in vitro*, *in silico*, and *in vivo* model systems, our studies demonstrate that Pacific dulse improves metabolic health outcomes, including glycemic management, markers of hepatic steatosis, and lipid metabolism, and induces beneficial shifts in the gut microbiome under Western-diet conditions. A clinical study to evaluate the metabolic health benefits of dulse consumption in human population is currently underway.

Recently, we have established a collaborative project with UC Davis and the University of Alaska Fairbanks to promote Pacific dulse cultivation and consumption through integrated research, development, and outreach efforts. Teams from Alaska, California, and Oregon are working collaboratively to optimize dulse production, characterize its nutritional and health benefits, and conduct consumer outreach to support dulse production and consumption across the Pacific coastal region and beyond.

Sanitation is critical to the success of your IPM program

John Boyce

Cultivate SA, Core Team Member

One role of sanitation is often overlooked. Believe it or not, the folks that clean our plants or our vessels play a key role in the success of our IPM (Integrated Pest Management) program. In addition to the primary tasks of cleaning, employees should be working to deny pests ingress to our facility and to limit the food, water, and shelter that pests need to survive and breed. It is thus vital that each and every employee understands the signs of pest activity and the need to report what they see. Further, they need to understand the risks associated with their own behaviors, such as the common problem of doors being left wide open at night during the sanitation shifts or hatches left open onboard processing vessels.

Do engaged, informed, and empowered sanitation workers act as a predictor of success for an integrated pest management program? Indeed, imagine having a frontline sanitation team upon which you can rely to manage existing risks and to identify new ones through peer observations. And one that, because of its food safety risk management behaviors, dramatically reduces the potential of product contamination due to pest activity. We can achieve that engagement by looking at the shared values, norms, and beliefs prevailing in the company about food safety (and particularly looking at the culture of the sanitation crew) and actively working to improve that culture.

Identification of pH-Sensitive Frequency Bands in Multifrequency Bioimpedance Phase Measurements of Pacific Halibut Muscle

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Introduction: Chalkiness is a quality defect in Pacific halibut (*Hippoglossus stenolepis*) characterized by abnormal muscle texture and chemistry, and is commonly associated with elevated muscle pH. Multifrequency bioimpedance offers a non-destructive approach for detecting muscle condition in whole fish, but signal interpretation is complicated by frequency dependence, anatomical location, and fish size.

Objectives: The objective of this study was to identify anatomical measurement locations and frequency bands in multifrequency bioimpedance phase data that exhibit robust sensitivity to muscle pH, providing a foundation for bioimpedance-based detection of chalky muscle in whole halibut.

Materials and Methods: Whole halibut (n = 45) were evaluated within 3 h of off-loading following an eight-day fishing trip. Bioimpedance phase was calculated from complex impedance data collected across 98 frequencies (90–995 kHz) at four anatomical locations. Replicate measurements were quality-screened using robust statistical and physical thresholds. Frequency-specific and band-level pH sensitivity was evaluated using linear and mixed-effects models with fish included as a random effect.

Results and Discussion: Bioimpedance phase exhibited a consistent positive association with pH across frequencies, with sensitivity varying by frequency and anatomical location. Dorsal measurements showed the strongest and most consistent pH response. pH-sensitive frequencies clustered into contiguous regions rather than isolated points, with prominent bands near 410–500 kHz and 585–692 kHz. An eight-frequency band spanning 585–692 kHz provided the most precise and statistically robust pH response. Fish size, particularly fork length, explained substantial variance and moderated pH sensitivity, while temperature had no detectable effect.

Conclusions: A defined high-frequency dorsal bioimpedance band captures a composite physiological signal related to muscle pH and fish geometry. These findings support continued development of bioimpedance-based approaches for non-destructive detection of chalky muscle in Pacific halibut.

IDENTIFYING AQUACULTURE OPPORTUNITY AREAS IN FEDERAL WATERS OFF OF SOUTHERN CALIFORNIA: A FOUNDATION FOR OFFSHORE AQUACULTURE DEVELOPMENT IN U.S. WATERS

Celia Barroso*

NOAA Fisheries West Coast Region

Introduction: NOAA Fisheries recently completed a multi-year, cross-agency effort to identify Aquaculture Opportunity Areas (AOAs) in U.S. federal waters off Southern California. This innovative planning process leveraged marine spatial planning, comprehensive scientific analysis, and stakeholder engagement to identify areas that are environmentally, socially, and economically suitable for responsible offshore aquaculture development.

Objective: The primary objective of this effort was to identify Aquaculture Opportunity Areas in U.S. federal waters off Southern California. This presentation will detail the NOAA Fisheries' approach to develop the Draft and Final Programmatic Environmental Impact Statements (FPEIS) for identifying these AOAs, including the process for interagency coordination and stakeholder input.

Materials and Methods: The multi-year, cross-agency effort employed a planning process that leveraged marine spatial planning, comprehensive scientific analysis, and stakeholder engagement. The sites were informed by a NOAA Technical Memorandum: *An Aquaculture Opportunity Area Atlas for the Southern California Bight*. This process culminated in the development of the Draft and Final Programmatic Environmental Impact Statements (FPEIS).

Results and Discussion: The AOAs identified within the Southern California Bight are considered potentially suitable for the development of shellfish, macroalgae, and finfish aquaculture.

Conclusion: The FPEIS and accompanying science products provide a foundation for efficiencies in the permitting and environmental review process for future aquaculture operations sited within the Southern California AOAs.

State Collaborations with the U.S. Food and Drug Administration

Virginia Ng*

Washington State Department of Agriculture

The Manufactured Food Regulatory Program Standards (MFRPS) establishes a national Integrated Food Safety System (IFSS) whereby standards help federal and state programs better direct their regulatory activities toward reducing foodborne illness. States that voluntarily enroll in MFRPS implement strategic plans to ensure continuous improvement and movement toward compliance, and can receive funding for FDA contract inspections. Currently, there are 38 states that are enrolled in this Program, however, due to the rapidly evolving food safety landscape, the Better Regulatory Inspections for Dynamic Government Efficiency (BRIDGE) Project is currently engaging states and stakeholders on conversations towards improvement. The BRIDGE Project aims to transform the current domestic food safety partnership framework and focus on three core elements: information integration, leveraging oversight, and collaborative efficiency. In the next few years, FDA and their stakeholders will conduct proof of process to align and optimize operations and inspection approaches that will become the new partnership infrastructure for decades to come.

Low Probability, High Impact: What Cesium in Shrimp Teaches Us About Novel Hazards

Jon Woody*

National Fisheries Institute

Introduction: In 2025, the U.S. Food and Drug Administration (FDA) detected cesium-137 in imported shrimp, prompting import alerts, recalls, and intensified regulatory scrutiny. While radiological contamination in seafood is rare, the incident highlighted vulnerabilities in hazard identification models traditionally focused on microbiological, chemical, and physical hazards.

Objectives: This presentation examines the cesium shrimp incident from an industry and regulatory perspective to identify lessons for hazard detection, supplier verification, and regulatory preparedness. The analysis evaluates implications for seafood technologists in light of FDA's 2026 Human Foods Program priorities emphasizing imported seafood safety and enhanced surveillance.

Materials & Methods: Public FDA enforcement actions, regulatory communications, and industry response measures were evaluated. Observations were compared against current seafood safety control frameworks, including Seafood HACCP, and emerging FDA priority deliverables.

Results & Discussion: The incident demonstrated FDA's capacity for rapid regulatory action and interagency coordination, while revealing detection limitations for non-traditional contaminants. Findings suggest increasing regulatory emphasis on upstream hazard intelligence, expanded analytical screening, and strengthened foreign supplier engagement. These trends map with FDA priorities promoting risk-based import oversight and advanced data analytics. For seafood processors and technologists, the event underscores the need to evaluate supplier monitoring, environmental hazard awareness, and contingency planning for low-probability, high-impact hazards.

Conclusions: Novel hazards are likely to emerge with increasing globalization and environmental complexity. The cesium shrimp incident provides a model for strengthening hazard anticipation strategies and reinforces the importance of integrating emerging risk surveillance into seafood safety systems.

Seafood Initiative of the White House, updates to the Office of Seafood, summary and updates to the Traceability Rule

Brent Higgs

FDA Division of Seafood Safety, Seafood Processing and Technology Policy Branch Team

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Mr. Higgs will be discussing the updates that have occurred with FDA's Seafood Program over the past several years. He will discuss the updates to the guidance for Scombrotoxin (histamine), the draft guidance for industry; Recommendations for collecting samples for testing foods subject to Detention without Physical Examination, updates to the National Shellfish Sanitation Program Guide, the Seafood List, and FY26 Appropriations Bill Section 777. Each area will be discussed briefly to give you a better understanding for what the agency has been accomplishing.

POSTER ABSTRACTS

Effect of ultrasound treatment prior to enzymatic hydrolysis of collagen and its antioxidant activity in common octopus (*Octopus vulgaris*)

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Introduction: Octopus muscle contains highly cross-linked collagen, which makes it difficult to obtain useful by-products. Ultrasound treatment can modify protein structures by generating sound waves that are converted into energy by transducers. This energy promotes bond disruption, facilitating collagen hydrolysis. Collagen hydrolysates can exhibit biological activities, such as antioxidant capacity. The biological potential of peptides makes them valuable for industrial applications.

Objective: The aim of this study was to evaluate the antioxidant activity of the collagen hydrolysates subjected to ultrasound treatment.

Material and Methods: Collagen was extracted from octopus muscle using acetic acid and pepsin. Samples were treated with ultrasound pulses at 80% amplitude for 0, 15, and 30 minutes, and then subjected to enzymatic hydrolysis. The resulting peptides were analyzed using the ninhydrin assay. Antioxidant activity was evaluated using ABTS and FRAP assays.

Results and Discussion: From 100 g of muscle, a collagen extraction yield of 2.0% was obtained. Increasing ultrasound treatment time enhanced peptides yield. Moreover, samples treated with ultrasound exhibited higher antioxidant activity compared to the control.

Conclusion: Applying ultrasound treatment prior to the hydrolysis of *Octopus vulgaris* collagen increased peptide yield and antioxidant activity.

Artificial Intelligence (AI)-Based Automated Classification of Commercially Important Ark Shell Species

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Introduction: Manual classification of ark shells based on external morphology is labor-intensive and often impractical during periods of high demand and labor shortages, potentially affecting seafood safety, processing efficiency, and economic value.

Objective(s): This study aimed to develop and evaluate an artificial intelligence (AI)–based image classification approach for automated identification of commercially important ark shell species.

Brief Materials & Methods: Three ark shell species (*Tegillarca granosa*, *Anadara broughtonii*, and *Anadara kagoshimensis*) were first identified using polymerase chain reaction (PCR) analysis. A dataset of 1,400 labeled shell images was constructed and used to train and evaluate three convolutional neural network (CNN) models: VGGNet, Inception-ResNet, and SqueezeNet. Model performance was assessed under three classification scenarios involving four bivalve species, three ark shell species, and a combined six-class dataset.

Results & Discussion: SqueezeNet achieved the highest training accuracy across all classification scenarios, while Inception-ResNet demonstrated superior validation performance. Overall model accuracy was comparable to or exceeded that reported in previous studies, indicating robust classification performance across multiple species sets.

Conclusion(s): The results demonstrate the feasibility of AI-based image analysis for rapid and reliable ark shell classification. This approach has strong potential to enhance seafood safety, improve processing efficiency, and support value-added applications in the seafood industry.

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UVC Inactivation of *Listeria monocytogenes* in Salmon Juice on Food Contact Surfaces using the Contamination Sanitation Inspection and Disinfection (CSI-D+) Device

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Introduction: *Listeria monocytogenes* is a severe foodborne illness-causing pathogen in the United States, resulting in an average of 1600 cases of listeriosis per year, with a 94% hospitalization rate according to the CDC. The Contamination Sanitization Inspection and Disinfection (CSI-D+) device is a UVC-emitting handheld system that represents a novel approach to detecting invisible residue and disinfecting food contact surfaces.

Objective: This study aimed to evaluate the disinfection module of the CSI-D+ device targeting *L. monocytogenes* within salmon residue on food contact surfaces.

Methods: The food contact surfaces tested included stainless steel (304) and polyethylene. Raw salmon juice was inoculated with *L. monocytogenes* strains 1/2a, 1/2b, and 4b on the food contact surfaces and then exposed to the 275 nm germicidal wavelength of the CSI-D+ disinfection module for 30 and 45 s.

Results: The average *L. monocytogenes* percent reduction for all strains, surfaces, and time combinations was 49.6%, with log reductions ranging from 0.2 to 0.4 log CFU/ml. The highest log reduction of 57.7% (0.4 log CFU/ml) was observed on the polyethylene surface following the 45 s treatment for *L. monocytogenes* 1/2b. An interaction effect was found between food contact surface and strain type.

Conclusion: The CSI-D+ device was able to reduce *L. monocytogenes* strains 1/2 a, 1/2 b, and 4b on contact surfaces of stainless steel and polyethylene within salmon juice residue. These findings suggest that the CSI-D+ has potential as an additional hurdle for controlling contamination in food processing areas.

Student Competition Participant

Optimization of DNA Extraction for Tuna Species Identification

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Introduction: Canned tuna is susceptible to species mislabeling, which poses health risks and fosters distrust among consumers. DNA extraction is fundamental in the species identification process; however, long incubation times significantly impact efficiency. By reducing the time required for DNA extraction, tuna species can be analyzed more efficiently while still maintaining the ability to properly identify samples.

Objective: This study aimed to optimize DNA extraction of canned tuna by comparing the current protocol to one that uses a shorter incubation time.

Materials and Methods: A total of 24 tuna samples, including albacore, skipjack, light, and yellowfin, were analyzed in duplicate for each respective incubation time. DNA extraction was performed using the DNeasy Blood and Tissue Kit (Qiagen) using two different lysis incubation times: 2 h and 20 h. PCR was performed on the DNA extracts, followed by gel electrophoresis to determine the success of amplification.

Results: PCR amplification results indicated comparable amplification success for skipjack and yellowfin tuna DNA extracted using 2-h and 20-h incubation times. No observable differences in amplification presence or intensity were detected for skipjack tuna, while yellowfin samples are still under analysis.

Conclusion: The findings suggest that shorter DNA extraction incubation times may be sufficient to support reliable and efficient PCR amplification for tuna species identification. This optimization in the incubation protocol could reduce the testing time while also maintaining analytical effectiveness in canned tuna authentication. Analysis of remaining samples is ongoing to confirm the consistency of these results across multiple tuna species.

Student Competition Participant

White shrimp carotenoids (peneaus vannamei) and docetaxel enhance apoptosis through the extrinsic and intrinsic pathways in human prostate cancer cells

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Docetaxel is a used drug in the treatment of prostate cancer, although its side effects negatively impact quality of life due to its nonspecific nature. In contrast, carotenoids isolated from the exoskeleton of the white shrimp (Penaeus vannamei), such as violaxanthin and neoxanthin, exhibit antiproliferative activity in prostate cancer cells (22Rv1) without harming healthy tissue cells. The objective of this study was to test the effect of combining the active fraction of the exoskeleton (H4), which contains violaxanthin and neoxanthin, with docetaxel on cell viability and morphology. Cell viability (MTT assays), morphological changes (fluorescence microscopy), the type of cell death (flow cytometry), and the caspase activation pathway were evaluated. The combination of the H4 fraction with docetaxel demonstrated a synergistic effect, which significantly reduced cell proliferation from individual IC_{50} values of 32.68 µg/mL (H4) and 68.11 µg/mL (docetaxel) to IC_{50} values of 0.103 (H4) and 0.113 (docetaxel), induced cell death by apoptosis in 99.67% within 24 hours, while the individual treatments caused 8.09% (H4) and 10.38% (docetaxel), caused characteristic morphological changes such as decreased size, blister formation, and chromatid condensation, and activated caspases 3, 8, and 9, which are responsible for sending signals to execute apoptosis processes via the intrinsic and extrinsic pathways. The results demonstrate that the compounds present in the shrimp exoskeleton, in combination with docetaxel, have a synergistic effect on the viability of 22Rv1, cause morphological modifications in the cytoskeleton and nucleus, and induce apoptosis through the activation of caspases by the intrinsic and extrinsic pathways.

Valorization of Cannonball Jellyfish (Stomolophus meleagris) Proteins through Enzymatic Hydrolysis and Antioxidant Assessment

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Introduction: Marine organisms have gained increasing attention as alternative sources of bioactive compounds. Among them, jellyfish represent an underutilized resource with potential applications in food and health-related products.

Objectives: This study aimed to obtain and characterize protein hydrolysates from cannonball jellyfish (Stomolophus meleagris) and to evaluate their antioxidant activity according to molecular weight.

Materials and Methods: Proteins were extracted from jellyfish through a controlled solubilization and precipitation process, followed by enzymatic hydrolysis. The resulting hydrolysates were fractionated by ultrafiltration using 3 kDa membranes, obtaining two fractions: peptides above and below 3 kDa. The protein extract and hydrolysates were evaluated by in vitro digestibility assays, SDS-PAGE electrophoresis, and antioxidant activity using DPPH, ABTS, and FRAP assays.

Results and Discussion: The digestibility of the jellyfish protein extract was lower than that of commercial porcine gelatin but comparable to values reported for other marine species. Electrophoretic analysis showed high-molecular-weight proteins in crude extract, while hydrolyzed fractions exhibited reduced band intensity, confirming peptide size reduction. Antioxidant activity was higher in the low-molecular-weight hydrolysates, indicating improved free radical scavenging capacity.

Conclusion: Cannonball jellyfish is a viable source of protein hydrolysates with antioxidant activity, particularly in low-molecular-weight fractions, supporting its potential use in functional food and supplement development.

Student Competition Participant

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DISCOVER SAN PEDRO

History of San Pedro Fishing Industry

For much of the last 100 years, San Pedro and Terminal Island were home to the largest fishing industry in the United States. In 1937, the San Pedro fishing fleet numbered nearly 500 boats. Today the fleet down to less than a few dozen boats. None of the over 15 canneries that once occupied San Pedro and Terminal Island are left. The last closed in 2001. Most of the work has moved offshore to low-wage countries, first to American Samoa, Puerto Rico and the Philippines and now to Southeast Asia. In San Pedro, a small tenacious fleet of commercial fishing vessels still exists.

Fishing Industry Memorial

510 S. Harbor Blvd. San Pedro, CA 90731

In 1892 Southern California Fish Corp. was the first cannery in Los Angeles Harbor. In 1903 a technique of preparing and canning was developed to can sardines, mackerel, bluefin tuna, yellowfin tuna and albacore. In 1912 the first fresh fish market was introduced in San Pedro and along with other markets that followed, they eventually supplied fresh and iced fish throughout our nation.

Before long, flotillas of purse seine boats were sailing down from northern waters to fish in San Pedro. By 1920 there was a large fleet of fishing boats and methods of fishing such as purse seine, lampara, jig, live bait, gill net, mackerel scoopers and long line boats. Los Angeles Harbor became the largest fishing port in the nation. The fishing industry in San Pedro was originated primarily by European and Asian fishermen each bringing fishing knowledge from their native lands.

In 1935, following the depression, 6,000 people were directly employed in the fishing industry. Its payroll was the largest in San Pedro, approximately three-quarters of a million dollars per month. The industry was at its peak during World War II. During the fifties, sardines and mackerel gradually diminished causing the decline of the industry in San Pedro.

In 1992 the Fishermen's Fiesta Committee planned to erect a Fishermen's Memorial. In 1995, a new Volunteer Committee of fishermen's descendents and fishermen was formed to see the project to completion. This beautiful Memorial was then conceived with a Bronze Fisherman and a Memorial Wall to preserve the history of the Fishing Industry. With the assistance of our city's 15th District Councilman, Rudy Svorinich Jr., L. A. Department of Recreation and Parks, L. A. Cultural Affairs Department and through the generosity of the community of San Pedro this Memorial became a reality.

Los Angeles Maritime Museum

Berth 84 at the foot of 6th Street, San Pedro, CA 90731

Built in 1941, this Public Works Administration (WPA) "Streamlined Moderne" building was the base for an auto ferry which crossed the channel at regular intervals from San Pedro to a sister building on Terminal Island. It served navy personnel, fishing industry employees, and people who wished to avoid the long circuitous route through Wilmington and Industrial Long Beach. With the completion of the Vincent Thomas Bridge in 1963, ferry operations ceased, and the building became an overflow office for the Harbor Department.

Saved from demolition by historically-minded citizens, the building has been beautifully restored, and now houses the Los Angeles Maritime Museum. Exhibits highlight the history of Los Angeles and include ship and boat models, the fishing and canning industry, the US Navy, figureheads, and an amateur radio station.
Try your hand at tying any of the 64 types of seaman's knots on display. Grip the wheel of a 19th-century sailing ship. Visitors can views an old fishing boat and a tugboat while watching ships in the harbor, or participate in classes on such topics as small boat handling, scrimshaw, celestial navigation, and ship model building.

Hours: Wednesday – Sunday 12:00 – 5:00 p.m. (last entry 4:30 p.m.)
Closed Monday – Tuesday

Alta Sea

2451 Signal Street San Pedro CA 90731

The Port of Los Angeles City Dock No. 1, home of the AltaSea campus, was constructed in 1913 and successfully brought the Los Angeles waterfront to the international stage, with people, goods and ideas flowing in and out to the world. The AltaSea project began with a grant from the Annenberg Foundation to conduct a visioning study for the new home of the Southern California Marine Institute (SCMI), which was to be moved from its Terminal Island headquarters. Work on the project initially focused on securing a 50-year lease with the City of Los Angeles. The lease was executed and included a $57 million capital investment for site rehabilitation by the Harbor Department. Soon after, AltaSea convened a group of top Los Angeles business leaders, civic leaders and philanthropists to create a Board of Trustees to oversee the organization, construction project and capital campaign. AltaSea assumed its status as a stand-alone nonprofit corporation and the Board of Trustees approved the Gensler-designed campus plan.AltaSea will build on that legacy. AltaSea at the Port of Los Angeles is dedicated to accelerating scientific collaboration, advancing an emerging Blue Economy through business innovation, and job creation, and inspiring the next generation, all for a more sustainable, just, and equitable world.