73rd Annual Shellfish Growers Conference and Tradeshow

Red Lion Hotel on the River
Portland, Oregon
Sept. 17 - 19, 2019
Welcome to Portland!

We are glad you’re here for the 73rd Annual Shellfish Growers Conference. We have a very full three days planned for you, including time to ‘rock out' to climate-inspired music, a presentation on the anthropogenic stressors on aquaculture, and opportunities to practice your conversational French.

The conference planning committee has pulled together a wonderful group of thoughtful and interesting speakers in hopes to inspire your work with shellfish – whether on the farm, in the office or at the lab. We have two different crab-related workshops, a discussion about proposed changes to the National Shellfish Sanitation Program, and sessions focused on ocean acidification, disease, sea cucumbers, and public heath – just to name a few.

This conference is not only a time to celebrate our collective accomplishments, but it also offers a unique chance to build relationships with a diverse group of shellfish-minded folks. One of the best opportunities to network is during break time. Let’s use this time together to not only learn for ourselves, but to strengthen our community and cultivate the next generation of shellfish leaders and researchers.

Share your musings about the conference on social media using the hashtag #shellfish73. And please let us know what you think about this conference by filling out a survey using the link below. We do listen to your input with the hopes of making future conferences better than the previous one.

Thank you for taking time to be here with us. Thank you for asking good questions, for being open to learning, and for engaging with all aspects of West Coast shellfish.

Please complete the post-event survey online or pick-up a hard copy at the registration table. www.surveymonkey.com/r/shellfish73

Thank you in advance for your comments and suggestions.

Monday, September 16

8:00 Schley Golf Scramble Heron Lakes Golf (Greenback Course) Pre-registration required
12:00 Lunch on your own
1:00 PCSGA Board Meeting Washington Room Open only to PCSGA Grower Members in good standing
4:00 Break
4:15 PCSGA Annual General Meeting (AGM) Washington Room Open only to PCSGA Grower Members in good standing
6:00 Dinner on your own
7:30 BINGO! It takes Balls to Play Washington Room Pre-registration encouraged

Tuesday, September 17

9:00 Conference Welcome Margaret Pilaro, PCSGA and P. Sean McDonald, University of Washington
9:15 Keynote Speaker From local to global, exploring the future for shellfish in a multistressor world, Halley Froehlich, School of Aquatic and Fisheries Sciences, University of Washington
10:00 Addressing Ocean Acidification: State Updates and Progress Moderator: Rich Childers Pacific Coast Region Update: Jennifer Hennessey State Updates: Charlotte Regula-Whitefield (OR), Jennifer Hennessey (WA), Justine Kimball (CA)
10:15 Dixie Chicks: Women and the new southern oyster, Beth Walton, Oyster South
11:15 Coffee Break Sponsored by Hama Hama Company
12:00 Opening Day Luncheon Luncheon Speaker Can You Hear Climate Change? Judy Tweedt, University of Washington
12:00-1:00 Concurrent Session A, Grand Ballroom Salon 4 Ocean Conditions: Climate Change, Ocean Chemistry, Acidification Moderator: Dave Fitzpatrick, Kilisut Harbor Shellfish 2:00 Impacts of ocean acidification and warming on early life stages of pinto abalone (Haliotis kamtschatkana) in Washington state, Eileen Bates, University of Washington 2:15 Influence of ocean acidification on Pacific oyster (Crassostrea gigas) DNA methylation, Yaamin R. Venkataraman, University of Washington 2:30 Has ocean acidification a real effect on razor clam populations in Washington? An isotopic investigation, Yongwen Gao, Makah Fisheries Management 2:45 Parental exposures prior to spawning influence larval gene expression in the Olympia oyster (Ostrea lurida), Laura H. Spencer, University of Washington

Coffee Break Sponsored by Duncan & Associates

Tuesday continues...
Tuesday, September 17, Continued

Concurrent Session A, Grand Ballroom Salon 4

Ocean Conditions Continued...
Moderator: Dave Fitzpatrick, Kilisut Harbor Shellfish

3:45
Does it matter where my parents grew up?
Lindsay M Alma, University of Washington

4:00
Transregenerative effects of Olympia oyster larvae,
Sara Boles, University of California - Davis

5:00
A protein inventory reveals mechanisms of temperature impact on oyster development,
Shelly Trigg, University of Washington

5:15
A property inventory reveals mechanisms of temperature impact on oyster development,
Shelly Trigg, University of Washington

5:45
A property inventory reveals mechanisms of temperature impact on oyster development,
Shelly Trigg, University of Washington

6:15
Opening Night Tradeshow Reception
Grand Ballroom East Salon

Dinner on your own

National Shellfisheries Association Student Fundraiser: Put It In Your Pie Hole!
Does golf spark your competitive side, but messy slapstick speaks to your heart? This year you can have both!
Support students in our industry by combining your golf skills with your pie throwing skills in this biathlon of obscure sports. Your money and time helps fund student attendance and presentations!

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Norplex, Inc. for generously hosting the Hospitality Suite, year after year!
Hospitality Suite located in the Presidential Suite 216 and open until midnight

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Ian Jefferds, Penn Cove Shellfish LLC
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Concurrent Session B, Grand Ballroom Salon 1

Continuing to Crank Crab: Dungeness Crab Population Dynamics and Ecosystem Services
Moderator: Julie Barber, Swiminish Tribe

3:45
Welcome and overview of PNWCRG

4:00
Effects of high CO2 on Dungeness crab, Paul McElhany, NOAA Northwest Fisheries Science Center, Mukilteo Field Station

4:15
Unraveling the trophic ecology of wild and captive juvenile Dungeness crab (Metacarcinus magister) using fatty acid biomarkers, Aaron Galloway, Oregon Institute of Marine Biology

4:30
Big fishery, big data, and little crabs: Using a genomic approach to examine larval recruitment patterns of Dungeness crab (Cancer magister) in the California Current Ecosystem, Elizabeth Lee, Oregon State University

4:45
Growth and abundance of juvenile and sub-adult Dungeness crabs in the South Slough Estuary, Michael Thomas, University of Oregon

5:00
Tracking larval and juvenile Dungeness crab in the southern Salish Sea: Two years of results and plans for future research, Claire Cook, Swiminish Tribe

5:15
Discussion: Light trap network update & observations from the summer’s efforts

5:45
Discussion: Overview of results from research objectives discussed at first meeting of PNWCRG & current issues/trends

6:15
National Shellfisheries Association Student Fundraiser: Put It In Your Pie Hole!
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Wednesday, September 18

Plenary Session, Grand Ballroom

7:30
Aussie Wakeup! Hosted Breakfast, Hands-on Tool School, and Innovation Showcase
Sponsored by SmartOysters, SEAPA, and Sedwyn Pty Ltd.

9:15
John Lentz Profiles in Innovation Speaker Series
Ostrea Ex Machina, Eric Marrais, Grinnocen
International, France

10:00
The Great Experiment: A collaborative communications strategy to improve public perceptions about US marine aquaculture, Kimberly Thompson, Aquarium of the Pacific

10:15
Coffee Break Sponsored by
Pacific States Marine Fisheries Commission

Concurrent Session A, Grand Ballroom Salon 4

Down on the Farm: Shellfish Growers Trials, Tribulations, and Triumphs
Moderator: Ian Jefferds, Penn Cove Shellfish

10:30
New Alaskan FLUPSY design, Eric Wyatt, Blue Starr Oyster Co.

10:45
Toxic Algae: Observations from Case Inlet, Nyle Taylor, Taylor Shellfish Farms

11:00
Cruise In: Bringing the people to the party, Trevor Sande, Marble Seafoods

11:15
Training of entry level workers, Bob Rheault, East Coast Shellfish Growers Association

Estuarine Habitat, Ecosystem Services, Multitrophic Interactions
Moderator: Sandy Zeiner, Northwest Indian Fisheries Commission

11:15
Eye in the Sky: The potential of unmanned aerial systems (UAS) as a tool to map eelgrass habitat in Oregon estuaries, Anthony D’Andrea, Oregon Department of Fish and Wildlife

11:45
Olympia oyster (Ostrea lurida) recruitment behavior in Puget Sound, Brian Allen, Puget Sound Restoration Fund

12:00
Lunch on your own

ISSC Proposal Review - Working Lunch
Hospitality Suite - Presidential Suite 216
Lunch pre-order required - $20

Concurrent Session B, Grand Ballroom Salon 1

Wild Stock Management
Moderator: Elizabeth Tobin, Jamestown S’Klallam Tribe

10:30
An analysis of environmental factors influencing spatial clustering of Salish Sea clam species, James Mc Ardle, Swinomish Indian Tribal Community

10:45
The recovery of harvested geoduck tracts in Puget Sound, Henry Carson, WA Dept. of Fish & Wildlife

11:00
Relative recruitment reconstructions of Washington State geoduck populations, Bethany Stevick, WA Dept. of Fish & Wildlife

Bivalve Reproduction
Moderator: Mackenzie Gavery, University of Washington

11:15
Population trends and reproductive cycles of the Pismo clam (Tivela stultorum) in California, Alexandra Marquardt, California Polytechnic State University

11:30
Applying cutting-edge technology for reproductive control in bivalves, Mackenzie Gavery, University of Washington

11:45
Gonad maturation of the Mediterranean mussel (Mytilus galloprovincialis) and Olympia oyster (Ostrea lurida) in three locations within the Puget Sound, WA, Trevor Derie, University of Washington

12:00
Lunch and NSA Annual Meeting

Wednesday continues...
### Wednesday, September 18, Continued

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<th>Concurrent Session A, Grand Ballroom Salon 4</th>
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<td><strong>Estuarine Habitat Continued...</strong></td>
<td><strong>Sea Cucumbers on the Move</strong></td>
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<td>Moderator: Sandy Zeiner, Northwest Indian Fisheries Commission</td>
<td>Moderator: Karl Mueller, Lummi Nation &amp; Andy Suhbrie, Pacific Shellfish Institute</td>
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<td>2:00</td>
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<tr>
<td>Estuarine habitat use by higher trophic-level fish and decapods, Jennifer Ruesink, University of Washington</td>
<td>Population genetics of Paratubificus californicus across the Pacific Coast of North America, Natalie Lowell, University of Washington</td>
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<td>Characterizing the habitat function of bivalve aquaculture using underwater video, Bridget Ferriss, NOAA Fisheries</td>
<td>Genetic identification of Paratubificus californicus in the classroom: Using place-based research to advance genomics literacy at Tribal Colleges, Destinee Hutchison, Northwestern Indian College</td>
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<tr>
<td>Growing oysters in the context of ecosystem restoration: Challenges and opportunities, Phil Bloch, Confluence Environmental Company</td>
<td>Population genetic structure and connectivity of Paratubificus californicus in the northeastern Pacific Coastal region, Amanda Xueeb, University of Toronto</td>
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<tr>
<td>In SITU filtration rates of Olympia oyster (Ostrea lurida) habitat and Pacific oyster (Crassostrea gigas) aquaculture, Althea Marks, California State University Fullerton</td>
<td>Sea cucumber co-culture trials in Washington state, from nursery to growout, Andy Suhbrie, Pacific Shellfish Institute</td>
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### Sea Cucumbers on the Move

**Moderator: Karl Mueller, Lummi Nation & Andy Suhbrie, Pacific Shellfish Institute**

- **Update on progress of MBP and ensuring long-term support for Pacific oyster breeding and genetics on the US West Coast**, Chris Langdon, WA Dept. of Fish & Wildlife
- **MBP OSHV-1 Resistance Breeding Program**, Konstantin Divilov, Oregon State University
- **Pest Management**
  - **Moderator:** Chris Gruie, University of Washington
  - **Invasive tunicates as biofouling agents of longline bivalve aquaculture**, Zofia Knoerke, University of North Carolina at Chapel Hill
  - **Is tabulate a viable alternative for the control of Burrowing shrimp on shellfish beds in Washington state**, Kylie Sahota & Jonathan Schroeder, University of Washington
  - **Human Influences on Urbanized Estuaries**
    - **Moderator:** Sara Grant, PCGSGA
    - **Microplastic contamination across an urban gradient**, Lyda Harris, University of Washington
    - **Incorporating human dimensions into shellfish aquaculture management in an urbanized estuary**, P. Sean McDonald, University of Washington

### Wednesday, September 18, Continued

| 6:00 | Grand Awards Banquet in the Grand Ballroom |
| 6:00 | Cocktails @ 6:00 |
| 6:30 | Dinner @ 6:30 |
| 6:30 | Student & Industry Awards and Silent Auction |
| 6:30 | **Sponsored by Plauché & Carr LLP and Rock Point Oyster Co.** |

### Thursday, September 19

<table>
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<th>Plenary Session, Grand Ballroom</th>
<th>Oil Spill Response System NOAA Seafood Inspection's Oil Spill Response System, Whitney Moore, NOAA</th>
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<tbody>
<tr>
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<td>Research Goals Workshop West Coast Shellfish Research Goals and 2020 Priorities</td>
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<tr>
<td>9:15</td>
<td><strong>Moderator:</strong> Bobbi Hudson, Pacific Shellfish Institute</td>
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<tr>
<td>10:15</td>
<td><strong>Shellfish Shorts - 5 Minute Talks in 'Ignite' Format</strong></td>
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<td><strong>Moderator:</strong> P. Sean McDonald, University of Washington</td>
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### Coffee Break Sponsored by Hama Hama Co. and Duncan & Associates

### Human Health Issues

**Moderator: Bobbi Hudson, Pacific Shellfish Institute**

- **Cold chain performance for Washington state and Chesapeake Bay farmed oysters**, Bobbi Hudson, Pacific Shellfish Institute
- **Pest Management**
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  - **Incorporating human dimensions into shellfish aquaculture management in an urbanized estuary**, P. Sean McDonald, University of Washington
- **Oyster filtration of Labyrinthula zosterae in changing coastal region**, A. Elston, AquaTechnics Inc.
- **In vitro PTX accumulation and depuration in field exposed Rock scallops (Crasostoma gigas)** - A prerequisite for culture, Katie Houle, Pacific Shellfish Institute
- **Effects of Bitter Crab Disease on the gene expression of Alaskan Tanner crabs**, Grace Crandall, University of Washington
- **Eradication failure and the hydra effect**: Using scientific collaboration to build resiliency at a CA shellfish farm, Gary Fleener, Hog Island Oyster Co.

### European Green Crab on Pacific Shores: An Update on Status, Trends, and Action

**Moderator:** P. Sean McDonald, University of WA

- **Ocean ecosystem indicators forecast year class strength of invasive European green crab (Carcinus maenas)** in Oregon estuaries, Sylvia Yamada, Oregon State University
- **Eradication failure and the hydra effect**: Overcompensation following intensive harvest of the invasive European green crab, Catherine De Rivera, Portland State University
- **Modernizing laboratory analytical methods for amnesic shellfish poisons (ASP) and diarrhetic shellfish poisons (DSP)**, Dave Ikeda, WA Dept. of Fish & Wildlife
- **2019 Vibrio parahaemolyticus environmental sampling review**, Grace Workman, WA Dept. of Health
- **West Coast European green crab disease**, Kate Sherman, Pacific States Marine Fisheries Commission
- **Range expansion of European green crabs in British Columbia**, Sylvia Yamada, Oregon State University

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**Moderator:** P. Sean McDonald, University of WA

- **Cold chain performance for Washington state and Chesapeake Bay farmed oysters**, Bobbi Hudson, Pacific Shellfish Institute
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