



*68th Annual
Shellfish Growers
Conference and Tradeshow*



*Vancouver, Washington
September 22-25, 2014
at the Hilton Vancouver*



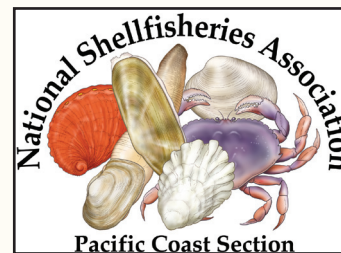
Pacific Coast Shellfish...It's the Water

Welcome to the 68th Annual Shellfish Growers Conference and Tradeshow. Over the next three days growers, researchers, agency staff, industry partners, and students will explore new research findings, consider public policy issues facing the shellfish industry, share stories and learn from each others' experiences.

Whether you find yourself presenting or listening to presentations, both sides are hard work! Remember to take some time to enjoy yourself. Luncheons, a pub crawl and poker run, a bivalvathon competition, and an awards banquet await. The Hilton Vancouver also offers a pool, a workout room, and a hot tub. May all of these options provide time for networking and engaging in a little fun.

A hearty thank you is in order to this year's conference planning committee, volunteers, growers, sponsors, tradeshow exhibitors, auction donors, and sponsors who have contributed their services and energy in making the events over the next few days memorable, educational, and successful.

Thank you, also, for your part in the health and future of the aquaculture industry. At this conference, you join a representative population which over the past year has given thousands of hours of hard work and dedication to advancing the shellfish industry. Hours researching, volunteering, attending festivals, fundraising, building, farming, planning, organizing, marketing, teaching, and advocating. What creates such a dedicated and skilled army? Well, as this year's t-shirt boldly suggests, it must be the water. Welcome.



2014 Annual Conference Planning Committee

Margaret P. Barrette, PCSGA Executive Director
Connie Smith, PCSGA Projects Manager
Ashley Fisher, PCSGA Outreach Coordinator
Brett Dumbauld, NSA-PCS Chair, USDA-ARS
P. Sean McDonald, NSA-PCS Vice-Chair, University of Washington
Ralph Riccio, NSA-PCS Secretary, Jamestown S'Klallam Tribe
Bethany Stevick, NSA-PCS Treasurer, Washington Department of Fish and Wildlife
David Fyfe, NSA-PCS Member at Large, Northwest Indian Fisheries Commission
Chris Burns, NSA-PCS Member at Large, Jamestown S'Klallam Tribe
Sarah Dudas, NSA-PCS Member at Large, Vancouver Island University

Sunday, September 21

2:00-6:00 PCSGA Board Meeting, Hemlock/Oak Room. PCSGA members welcome.

Monday, September 22

9:00 Schley Golf Scramble. Meet at the Green Mountain Golf Course. Pre-registration required.
10:00 Food Innovation Center Tour. Meet in the hotel lobby at 9:15 to carpool. Pre-registration required.
2:00 PCSGA Annual General Membership Meeting & Climate Solutions Workshop, Heritage DC
6:00 Dinner on your own

Plenary Session, Heritage Ballroom

Conference Welcome

- 9:00 Margaret P. Barrette, PCSGA and Brett Dumbauld, USDA-ACS
- 9:15 Keynote Address, *Aquaculture Adaptation to Climate Change*, Dr. Edward Allison, University of Washington
- 10:00 *Niche Marketing Cultured Oysters*, Bob Rheault, East Coast Shellfish Growers Association
- 10:15 *Product Marketing and Meeting Consumer Demand*, John Finger, Hog Island Oyster Company and Adam James, Hama Hama Company
- 10:30 **Coffee break sponsored by *Heritage Bank***
- 10:45 *Alaska Shellfish Industry Development*, Matt Catterson, Alaska Division of Economic Development
- 11:00 *Thinking Macro*, Norm Abell, Acacia Pacific Investments
- 11:15 *Getting Credit for Growing Shellfish*, Jesse G. DeNike and Peter Dykstra, Plauché and Carr, LLP
- 11:30 *Maximizing Marketing Potential: Gaining Advantages in Foreign Markets Using State and Federal Resources*, Joe Bippert, Washington Department of Agriculture
- 11:45 Q&A

Luncheon and Presentation

Modern Alchemy: Tomorrow's Culinary Choices Today

Ana Kinkaid and Peter Schlagel, co-editors of yourculinaryworld.com

How Others View the Shellfish Industry

Moderator: Paul Dye, The Nature Conservancy

- 2:00 *Fact or Fiction: Public Perceptions of Shellfish Farming in the Pacific Northwest*, Bobbi Hudson, Pacific Shellfish Institute
- 2:15 *Humboldt Permitting Process*, Commissioner Mike Wilson, Humboldt Bay Harbor, Recreation, and Conservation District
- 2:30 *Nature Conservancy and Shellfish Growers: A Natural Partnership*, Paul Dye, The Nature Conservancy
- 2:45 *Geoduck Aquaculture in Puget Sound: Next Steps Toward Understanding Social and Policy Dimensions*, Clare Ryan and P. Sean McDonald, University of Washington

- 3:00 **Coffee break sponsored by *Duncan and Associates, Inc.***

States' Efforts to Promote and Support the National Shellfish Initiative

Moderator: Laura Hoberecht, NOAA Fisheries

- 3:15 Washington: Julie Horowitz, Washington Governor Inslee's Office
- 3:30 Oregon: State Representative Caddy McKeown, District 9
- 3:45 California: Diane Windham, CA Aquaculture Coordinator, NOAA Fisheries
- 4:00 Alaska: Julie Decker, Alaska Fisheries Development Foundation
- 4:15 Hawaii: Amanda Lowrey, Hawaii Department of Health
- 4:30 East Coast: Bob Rheault, East Coast Shellfish Growers Association
- 4:45 Q&A

6:30 - Opening Night Tradeshow Reception, Heritage Pre-function Space
Sponsored by *Norplex, Inc.*

7:30 - 2014 Shellfish Growers Bivalvathon - NSA Fundraiser

8:30 - Pub Crawl and Poker Run

Concurrent Session A, Heritage A

Down on the Farm *and* Nursery: Shellfish Growers' Trials, Tribulations, and Achievements

Moderator: Ian Jefferds, Penn Cove Shellfish

Concurrent Session B, Heritage DC

Cutting Edge Developments in Genetic Research

Moderator: Joth Davis, Baywater Inc.

9:00	<i>Oyster Farming Must Be Easy</i> , Don Gillies, Stony Point Oyster Co.	<i>Breeding Oysters for the West Coast in Changing Ocean Conditions. An Update on the Collaborative Molluscan Broodstock Program</i> , Evan Durland, Oregon State University
9:15	<i>Micro Algae Concentrates Can Eliminate the Algae Bottleneck, Increase Yields and Ensure Reliability of Hatchery Production</i> , Eric Henry, Reed Mariculture, Inc.	<i>Improved Analysis of Crossbreeding Trials to Increase the Yield of Farmed Pacific Oysters</i> , Xiaoshen Yin, University of Southern California
9:30	<i>Bivalves and Palm Trees</i> , Kathleen Nisbet and Provan Crump, Hawaiian Shellfish Farm	<i>Second-Generation Linkage Maps Reveal Errors in the Assembly of the Pacific Oyster Genome and Permit Mapping of the Genetic Bases of Production Traits</i> , Dennis Hedgecock, University of Southern California
9:45	<i>Farming at the Extremes in Alaska</i> , Margo Reveil, Jakolof Bay Oyster Co.	<i>Development of Third-Generation, High Density, Linkage Maps for the Pacific Oyster</i> , Alberto Arias Perez, University of Southern California
10:00	<i>Raising Tumbled Oysters in South Australia</i> , Ian Jefferds, Penn Cove Shellfish	<i>Characterizing Genome-wide DNA Methylation Patterns to Increase Understanding of Epigenetic Variation in the Pacific Oyster</i> , Claire Olson, University of Washington
10:15	Q&A	<i>Advances in Rock Scallop Crassadoma gigantea Culture: Seed Production and Induction of Triploidy</i> , Molly Jackson, University of Washington
10:30	Coffee break sponsored by Nisqually Indian Tribe	Coffee break sponsored by Commencement Bay Corrugated/May Packaging and Associates
	Roundtable on Workforce Development Led by: Cheryl Fambles, Pacific Mountain Workforce Development Council	Restoration and Protection Efforts Moderator: Betsy Peabody, Puget Sound Restoration Fund
10:45	Roundtable on Workforce Development, continued	<i>Native Oyster Stocks for Restoration: Does Local Adaptation Affect Ostrea lurida Outplanting?</i> Jake Heare, University of Washington
11:00	Roundtable on Workforce Development, continued	<i>A Comparison of Breeding Methods for the Olympia Oyster, Ostrea lurida, Using Microsatellite Markers</i> , Katherine Jackson, University of Washington

Concurrent Session A, Heritage A

Concurrent Session B, Heritage DC

11:15 Roundtable on Workforce Development, continued

Adaptation of Restoration Practice: Native Oyster Habitat and Population Metrics Provide Feedback and Guidance for Enhancement Techniques
Brian Allen, Puget Sound Restoration Fund

11:30 **Lunch on your own**

A Novel Technique for Evaluating the Feeding Physiology and Behavior of Bivalve Larvae
Matthew Gray, Oregon State University

11:45

Olympia Oyster Restoration: History and Politics
Nina Cammer Sullivan, The Evergreen State College

12:00

Lunch and NSA Annual Meeting
Little Italy's Trattoria, 901 Washington Street

Reality, Challenges, and Rewards: Shellfish and Public Health

Moderator: Miranda Ries, National Fish and Oyster Co.

Clams, Cucumbers and Crabs – OH MY!
Moderator: Bob Sizemore, WA Department of Fish and Wildlife

1:30 Interstate Shellfish Sanitation Conference Update, Maryanne Guichard, ISSC

Age Estimation and Shell Morphology of the Pacific Geoduck Panopea generosa in California, Gabriela Navas, Moss Landing Marine Laboratories

1:45 *Next Steps for Vibrio parahaemolyticus Management in Washington*, Laura Wigand, Washington Department of Health

Inorganic Arsenic Levels in Geoduck Tissues: an Age Comparison, Bethany Stevick, Washington Department of Fish and Wildlife

2:00 *Recent Studies on Vibrio parahaemolyticus Reduction in Shellfish*, Dr. Yi-Cheng Su, Oregon State University

Pilot Trial to Assess the Vertical Distribution of Pacific Herring (Clupea pallasii) Spawn in Dabob Bay and Implications for Geoduck Fishery Management, Bob Sizemore, Washington Department of Fish and Wildlife

2:15 *Public Health Challenges of Expanding the Shellfish Industry in Hawaii*, Amanda Lowrey, Hawaii Department of Health

The Sustainability of the California Sea Cucumber and Red Sea Urchin Dive Fisheries in the San Juan Islands, USA, Henry Carson and Michael Ulrich, Washington Department of Fish and Wildlife

2:30 *An FDA Coos Bay Dye Study and the Future Role of Viruses in Growing Area Management*, Alex Manderson, Oregon Department of Agriculture

Investigating Long-term Change in Intertidal Invertebrate Populations at Kukutali Preserve, Puget Sound, Washington, Courtney Greiner, Swinomish Indian Tribal Community

Know Thy Enemy: Invasive Tideland Species

Moderator: Ken Wiegardt, Wiegardt Bros, Inc.

2:45 *Japanese Eelgrass Management in Willapa Bay for 2014: Treatment Success, Non-target Impacts and Ecological Implications*, Kim Patten, Washington State University

Potential Effects of Non-Native Eelgrass on Bay Clam Populations in Netarts Bay, OR, Anthony F. D'Andrea, Oregon Department of Fish and Wildlife

(session continues, next page)

(session continues, next page)

Concurrent Session A, Heritage A

Concurrent Session B, Heritage DC

3:00 *Manila Clam Recruitment, Survival, Growth, Condition and Harvest Efficiency in Willapa Bay as Affected by Gravel Type, Crushed Shell, and Lime Amendment, Zoster japonica Control and Predator Protection*, Kim Patten, Washington State University

Dietary Lipid Affects the Nutrition and Condition of Red King Crab Larva (*Paralithodes camtschaticus*), Asia Beder, University of Alaska Fairbanks

3:15 **Coffee break sponsored by Rock Point Oyster**

Coffee break sponsored by Pacific Seafood

Ocean Conditions: Climate Change, Ocean Chemistry, Acidification

Moderator: Alan Barton, Whiskey Creek Shellfish Hatchery

3:30 *Non-target Effects of Imazamox on Native Eelgrass Following Operational Application to Control Japanese Eelgrass in Willapa Bay, Washington*, Chris Grue, University of Washington

Seasonal Variation of the Genus Dinophysis Within Puget Sound, Washington: Understanding Harmful Algal Blooms Through Species Identification, Jennifer Runyan, The Evergreen State College

3:45 *Narrowing the Search for Invasive Green Crab: Habitat Mapping with Implications for Monitoring Efforts*, Jeff Adams, Washington Sea Grant, and P. Sean McDonald, University of Washington

Short Term Effects of Ocean Acidification on Oyster Predation by Japanese Oyster Drills, *Ocenebrellus inornatus*, Derek King, The Evergreen State College

4:00 *Brain and Plasma Cholinesterase Activity in White Sturgeon Exposed to Carbaryl: Implications for Monitoring Exposure in Green Sturgeon*, Alexandra Troiano, University of Washington

Examination of Bivalve Shell Degradation for Alkalinity Regeneration Purposes, Lisa Abdulghani, The Evergreen State College

4:15 *Understanding Intertidal Habitat Use by Fish and Crab Species in Pacific Northwest Estuaries*, Daniel Sund, Oregon State University

Elevated Temperature and PCO₂ Alter Attachment Strength of Two Mytilus Species, Laura Newcomb, University of Washington

4:30 *The Dirty Secret on Burrowing Shrimp Growth: Verification of Two Alternative Methods of Age Determination in the Burrowing Shrimp N. californiensis*, Natalie Coleman, Oregon State University

Turning the Headlights on High: Improving OA Observation Systems in Support of Pacific Coast Shellfish Growers, Jan Newton, University of Washington

4:45 *Burrowing Shrimp Recruitment to Coastal Estuaries and Shellfish Aquaculture Beds*, Brett Dumbauld, USDA-ARS

Alexandrium Cyst Survival in the Sediment, Kirsten Feifel, Washington Department of Natural Resources

5:00 *Interaction Between Exposure to Imidacloprid and Dissolved Oxygen in Effecting Mortality of Burrowing Shrimp in Willapa Bay Sediment*, Joshua Abel, University of Washington

Potential Linkage Between Apparent Early Recovery of Endangered Black Abalone (*Haliotis cracherodii* Leach, 1814) *Populations at San Nicolas Island, California, and a Fourteen-Year Hiatus in Long-Term Warming of the Coastal Ocean off California*, Glenn VanBlaricom, University of Washington

6:30 Grand Awards Banquet, Heritage Ballroom

Student and Industry Awards, Silent Auction

Sponsored by **Confluence Environmental Company** and **Plauche & Carr, LLP**

Concurrent Session A, Heritage A

Planning for the Future: The Basics

Led by: Carl Sohn, Northwest Farm Credit Services

9:00 *Planning for the Future: The Basics*, continued

9:15 *Planning for the Future: The Basics*, continued

9:30 *Planning for the Future: The Basics*, continued

9:45 *Planning for the Future: The Basics*, continued

State Agency Projects Update

Moderator: Kyle Lentz, Chelsea Farms

10:00 *Protecting the Commercial Shellfish Industry and the Public's Safety: Benefits and Challenges*, Mike Cenci, Washington Department of Fish and Wildlife Police

10:15 *Current and Historic Forage Fish Surveys*, Phillip Dionne, Washington Department of Fish and Wildlife

10:30 *Life After the China Ban on Geoduck*, Jerrod Davis, Washington Department of Health

10:45 *PSP in the Last Frontier: Biotoxin Management in Alaska*, Kimberly Stryker, Alaska Department of Environmental Conservation

11:00 *No Discharge Zone, Pump Don't Dump*, Amy Jankowiak, Washington Department of Ecology

11:15 **Coffee break**

Public Engagement, Education, and Outreach

Moderator: Aimee Christy, Pacific Shellfish Institute

11:30 *Convincing Folks to Keep it Clean by Getting their Hands Dirty!* Aimee Christy, Pacific Shellfish Institute and Breanna Trygg, Pacific Education Institute

11:45 *Tales of a Talking Oyster: Engaging Tideland Owners to Monitor Fecal Coliform and Vibrio parahaemolyticus Bacteria in their Shellfish*, Teri King, WA Sea Grant

12:00 *Community Shellfish Farms: A Springboard for Multiple Outreach Opportunities in Watershed Protection Districts*, Derek King, Puget Sound Restoration Fund

12:15 *Place-Based Marine Education: Reinforcing Student Understanding Through a Local Framework and Contextualized Data*, Alexandra Doty and P. Sean McDonald, University of Washington

Concurrent Session B, Heritage DC

Shellfish-Estuary Interplay

Moderator: Andy Suhrbier, Pacific Shellfish Institute

Effects of Benthic Intertidal Organisms on Marine Water Properties, Micah Horwith, WA DNR

Using Qualitative Models to Evaluate Environment-Aquaculture Linkages in South Puget Sound & Willapa Bay, Washington, Jonathan Reum, WA Sea Grant

Eelgrass and Oyster Aquaculture Interaction at a Landscape Scale in Willapa Bay, WA, Brett Dumbauld, USDA-ARS

Impact of Imidacloprid on Benthic Invertebrates on Large Plots, Steven Booth, Pacific Shellfish Institute

Wanted: Compiled West Coast Shellfish Resources and Farms on GIS, Andrew Suhrbier, PSI

Shellfish Health Management

Moderator: Ralph Elston, AquaTechnics

Microorganisms Associated with Sea Star Wasting Disease, Colleen Burge, University of Washington

Update – Shellfish Diseases and Regulations, Ralph Elston, AquaTechnics

A Simple Technique to Reduce Oyster Mortality and Decrease Vibrio Levels During the Summer Growing Season, Teri King, Washington Sea Grant

A special thank you to:

Student Sponsors

Bill Dewey, Chuckanut Shellfish
Dan Cheney, BioAquatics International LLC
Dave Steele, Rock Point Oyster
Kurt Johnson, Taylor Shellfish

Shellfish Donors

Calm Cove Oyster
Ekone Oyster
Northern Oyster
Oregon Oyster
Penn Cove Shellfish

Tradeshow Exhibitors

Aaron Packaging

Bryan Thulin
7817 S. 210th Street, #B-101
Kent, WA 98032
(253) 872-4994
www.aaronpackaging.com

Englund Marine & Industrial Supply

Dale Murff
PO Box 296
Astoria, OR 97103
(800) 228-7051
www.englundmarine.com

Reed Mariculture

Tim Reed
900 E. Hamilton Ave. Suite 100
Campbell, CA 95008
(831)-768-3830
www.reedmariculture.com

Alaska Packaging Inc.

Debra Jones
200 E. Washington Ave.
Burlington, WA 98233
(360) 333-5571
www.akpackaging.net

Fiberglass Marine Products

Richard Knannlein
393 Dahman Rd. SE
Shelton, WA 98584
(360) 426-9757
www.fiberglassmarine.com

Seattle Marine & Fishing Supply Co.

Tom Delius
2121 W. Commodore Way
Seattle, WA 98100
(206) 285-5010
www.seamar.com

Aqua-Pacific Wire & Mesh Supply

Peter Haslip
2220B McCullough Road
Nanaimo, BC Canada
(250) 751-3772
www.aquapacificwire.com

Hoopers Island Oyster Aquaculture Co.

Johnny Shockley
2500 Old House Point Road
Fishing Creek, MD 21634
(443) 521-4301
www.cgoysters.com

Snow & Company Inc.

Brett Snow
5302 26th Ave NW
Seattle, WA 98107
(206) 953-7676
www.snowboatbuilding.com

Bel-Art Products

Eva Winther
2024 Broad Street
Pocomoke City, MD 21851
(443) 880-3392
www.belart.com

**Humboldt Bay Harbor, Recreation
and Conservation District**

Jack Crider
PO Box 1030
Eureka, CA 95502
(707) 443-0801
www.humboldtby.org

Stony Point Pictures

Keith Cox
4335 Sunnyslope Ave.
Sherman Oaks, CA 91423
(323) 707-4964
www.stonypix.com

Christensen Net Works

David Berggren
401 Lincoln Street
Everson, WA 98247
(360) 966-9622
www.christensennetworks.com

NANOOS

Amy Sprenger
1013 NE 40th
Seattle, WA 98105
(206) 543 0061
www.nanoos.org

Taylor Shellfish Farms

Dave DeAndre
SE 130 Lynch Rd
Shelton, WA 98584
(360) 426-6178
www.taylorshellfishfarms.com

**Commencement Bay Corrugated
May Packaging and Associates Inc.**

Mike Jackson
PO Box 126
Wauna, WA 98395
(253) 312-7511
www.cbcbox.com

Norplex Inc

Jerry Sanford
PO Box 814
Auburn, WA 98002
(800) 929-2960
www.norplexinc.com

Thunderbird Plastics Ltd.

Steve Call
2190 Greentree Rd.
Lake Oswego, OR 97034
(503) 744-9112
www.thunderbirdplastics.com

Confluence Environmental Company

Chris Cziesla
146 N Canal Street
Seattle, WA 98103
(206) 397-3741
www.confenv.com

Pentair Aquatic Eco-Systems Inc.

Steve Oh
2395 Apopka Blvd.
Apopka, FL 32703
(407) 992-5565
www.pentairaes.com

Washington Farm Bureau

David Pearson
975 Carpenter Road
Lacey, WA 98516
(360) 528-2918
www.wsfb.com

Duncan & Assoc. Insurance Brokers

Heidi Duncan
2111 Harrison Ave. NW
Olympia, WA 98502
(360) 352-7588
www.duncanins.com

Save the date

*2015 Annual Conference and Tradeshow
Hood River, Oregon - September 20-24*