Second Pacific Northwest
Indigenous Aquaculture Summit Recap
September 15, 16, 17 and 18, 2025

Day 1: Welcome Reception

The Jamestown S'Klallam Tribe and the Kurt Grinnell Aquaculture Scholarship Foundation hosted a welcome reception at the Tribe's Red Cedar Room and Tribal Plaza. The reception offered an array of aquaculture reared seafood including manila clams provided by Taylor Shellfish, Steelhead provided by Pacific Seafoods, (raised via a joint venture with the Coleville Tribe) and fresh oysters provided by Hama Hama Oyster Company. The Kurt Grinnell Aquaculture Scholarship Foundation provided additional food. Tribal Chair Ron Allen and Vice Chair Loni Grinnell Greninger welcomed the attendees with prayer and song. The reception provided an opportunity for attendees to meet one another and learn more about aquaculture interests and expertise.

Day 2 and 3.

Welcome Address: Chairman Ron Allen, Jamestown S'Klallam Tribe

Tribal Chairman Allen gave a warm welcome to the PNWIAS delegates. He described the history of the Jamestown S'Klallam Tribe (JST) and decades-long effort to regain U.S. recognition of the Tribe and purchase the land and build the site we see today.

Chairman Allen addressed how aquaculture dovetails with the Tribes history and culture. The JST historically was a seafaring Tribe, and seafood was a prime food source. The JST guarded its traditional lands and gave up much of its rights in the Point No Point Treaty.

Chairman Allen also noted that Kurt Grinnell's great, great grandfather signed the Treaty on behalf of the JST.

Kurt Grinnell, he said, recognized how important aquaculture was for the Tribe's long-term future and food security. Tribal Members simply could no longer catch enough salmon to make a living ended up selling their boats and entered into fields like construction.

Eventually, Kurt established Jamestown Seafood, and despite his passing, the JST's commitment to aquaculture remains strong, and is a perfect fit with the Tribe's vision to utilize seafood in accord with historic rights and practices, he said.

Loni Grinnell Greninger, Vice Chair, Jamestown S'Klallam Tribe The story of Aquaculture Through S'Klallam Language

Loni Grinnell gave an in-depth presentation about the JSTs reliance on seafood and the ocean and showed that relationship through words for animals and tools used to harvest or capture seafood. She gave a quick history of the JSTs recovery of traditional harvesting rights and noted that the JSTs involvement in aquaculture began around 2010. The words alone demonstrate the JSTs long history and tradition of marine resource use as well as the Tribe's view and philosophy regarding the relationship of these resources to the earth and the spiritual dimensions of the relationship. Loni noted that there are words for many kinds of seafood and for tools for harvesting marine resources -- nets, floats, spears, etc. And there are words for how seafood is cooked and well as many kinds of tools essential to preparing seafood. The Salish Tribes recognized only three seasons Summer, Spring and Fall.

Jaiden Grinnell Bosick, President, Kurt Grinnell Aquaculture Scholarship Foundation

Jaiden gave a presentation about the KGASF. She noted the KGASF is a non-profit organization founded shortly after Kurt Grinnells tragic death. She noted her father's commitment to aquaculture but moreover, to his community, family, colleagues, and, of course, the Jamestown S'Klallam Tribe where he was the Vice Chair for many years. Jaiden noted that since KGASF's inception, over $100,000 has been awarded to Tribal and First Nation students enrolled in colleges, universities, and trade schools where the students are studying aquaculture, fisheries, or natural resource sciences. The KGASF also supports events like the PNWIAS and supports high school and college student travel and housing to attend the PNWIAS or other events where aquaculture is the focus.

Dave'y Lumley, Yakama Nation Yakama Nation's Pacific Lamprey Project Using Hatchery Methods to Restore Lamprey within the Columbia River Basin

Dave'y Lumley gave a presentation about the Yakama Nation's efforts to use aquaculture techniques to restore Pacific lamprey populations in their historic range in the Upper Columbia River Basin. Dave'y noted that the Yakama people historically relied on lampreys as an important food source and that this fish was culturally important to the Tribe.

Lampreys are a very old species – 40 million years old -- and there are over 40 species of lamprey worldwide. The Tribe has been using hatchery techniques and fisheries science to restore lampreys that have been extirpated from much of their range – due to habitat issues, dams, water quality issues, etc.

The lamprey project has a small staff and budget, but the Tribe sees this as a long-term effort. Dave'y gave some information about the lamprey's complicated life history which, like salmon are anadromous and the adults die after spawning. The lampreys build gravel nests like salmon and after the eggs hatch the larval and juvenile stage is one where they live in muddy river bottoms and they feed on organic materials in the benthos. After hatching the larvae remain in the muddy stream benthos anywhere to 10 mm to 200 mm long. At a length of 100 mm to 200 mm the juveniles undergo a transformation that prepares them for saltwater, and they begin their downstream migration.

After 3-7 years in freshwater, the lampreys migrate out to sea over many dams and there in the ocean they prey on large fish by clasping onto the fish with their sucker-like mouths, rasping through the skin of the fish and the use the bodily fluids of these fish for sustenance. After the fish grow and mature at sea, they make their upstream migration spawn and die thus completing the life cycle. The size of lampreys at the time of returning to freshwater is usually from 330 mm to 800 mm.

The Tribe collects lampreys at several dams – Bonneville, John Day, and The Dalles. The lampreys are held overwinter and then used to produce eggs. The sex of the lampreys cannot be determined until the time of spawning. Eggs and milt are collected and eggs fertilized each week for several weeks. The Yakima hatchery uses a combination of well and river water. Fine sediment is kept in the tanks and fine screens are used to prevent the larvae from leaving the holding tanks. Larvae are fed a diet of active dry yeast and whole wheat flour.

The Yakama Nation aims to keep working to enhance and restore lamprey populations in the Upper Columbia River. They were an important food source for the Tribe, and they are important ecologically as they serve to transport marine-based nutrients to freshwater ecosystems.

Luke Oliver, University of Idaho Kootenai Tribe of Northern Idaho Burbot Conservation Program

Luke Oliver highlighted how the Kootenai Tribe teamed with the University of Idaho as well as state and federal agencies to begin restoration efforts to retore Burbot in the Kootenai Basin. Modifications of the Kootenai River in the 1970s caused a significant decline in Kootenai sturgeon and burbot populations. After the completion of Libby Dam in 1975, the Tribe's ability to exercise their treaty-reserved fishing rights was all but eliminated.

In response to this burbot and sturgeon crisis, the Tribe partnered with the British Columbia Ministry of Environment, Idaho Department of Fish and Game and the University of Idaho to investigate burbot aquaculture.

In 2014, the multi-million-dollar Twin Rivers hatchery facility was built at the confluence of the Kootenai and Moyie rivers to produce both burbot and sturgeon. The dedication was a joyous occasion with drumming, celebrating, speakers and tours of the new 35,000-square-foot hatchery. To bring about recovery, a rigorous scientific approach was taken with key success milestones.

The Tribe's burbot program is focused on re-establishing a natural reproducing, self-sustaining population, using genetically similar stock from within the subbasin. Since the creation of the burbot aquaculture program, the burbot population in the river has grown from an estimated fifty fish to more than 50,000.

The success of the program allowed the re-opening of a harvest fishery in 2019, but it is dependent on transfers of burbot from the Tribal hatchery to north Idaho and Canada. Since 2014, Canadian Food Inspection Agency regulations superseded past regulations involving international transports, causing issues, and blocking Canadian releases from 2019 to 2021. The goal is to establish sufficient populations to support a Kootenai Tribal fishery.

Conservation Hatcheries to Support Steelhead Populations in Hood Canal: Barry Berejikian

Dr. Berejiklian highlighted NOAA's efforts to recover dangerously imperiled populations of steelhead in Hood Canal drainage basins. This was a unique research project because it began with several premises. First, the object was to do no harm to natural genomes in the populations. Second, all spawning in the supplementation effort was intended to take place in natural environments. Eggs were collected in the field and then reared to age 2 in very low-density situations. Once ready to release, smolts were introduced into the study areas.

NOAA used a17-year, replicated, before-after-control-impact experiment involving seven natural steelhead populations from the same geographic region and compared three conservation hatchery-supplemented populations to four non-supplemented (control)

populations. Spawn timing varied among the populations with the average median spawn day ranging from late February to the middle of May. Among-population diversity in spawn timing persisted throughout the study period, and there was no evidence for changes in spawn timing across the study period for either the control or supplemented populations. For the supplemented populations, releases of hatchery-reared smolts and adults from the conservation hatcheries caused a substantial increase in the number of redds (spawning nests made by female steelhead) constructed.

Unfortunately, after supplementation ended, redd abundance returned to levels only slightly greater than before supplementation. In contrast, the control populations that received no hatchery steelhead had moderately lower redd abundance in the after period compared to the before period. Taken together, the results suggest that the conservation hatcheries contributed to a marginal improvement in adult abundance relative to the control populations.

This and the few previous studies that have included non-supplemented reference populations suggest that neutral-to-positive population-level demographic benefits should be expected for carefully planned conservation hatchery programs. Some factors found to affect the results were that the Hood Canal bridge was shown to be a cause of juvenile mortality. Further sea surface temperatures have risen during the study period, and this adversely affects growth and survival of juvenile salmon.

So, You Want to Build a Hatchery: Jakeb Holy and Jesse McMahan Chehalis Tribe and Chehalis Natural Resource Department

Jesse and Jakeb gave a concise history of the Chehalis Tribe's efforts to supplement salmon using a hatchery. A major issue for the Tribe was where to site a hatchery so that the Tribal Members could take advantage of returning fish to maximize their catch. In addition, the cost of building a new hatchery was simply prohibitive.

The Chehalis Tribe's hatchery is on the Black River. The need for a hatchery was due in large part to the fact that the Chehalis River was very degraded via agricultural and forestry practices.

At the outset there were many questions that had to be answered such as, "what did the Chehalis Tribe want and need?" To answer the question Tribal elders, the Tribal Council, and members themselves were queried. They also had to decide on what species to produce such as steelhead, chinook, lamprey, or even mussels, all of which were at very low levels in the Black River.

Due to low summer flows and declining water quality during the summer, the hatchery needed to use both surface and groundwater. The exact location to build the hatchery was

also an important decision because it needed to be placed in an area where returning salmon or other species were readily available for Tribal Harvest. As a result, the location most favored would be at the upstream end of Tribal lands so the maximum number of Tribal Members could take part in the harvest.

Some of the estimates to build a new hatchery were exceedingly high so the alternative was to use an existing dairy farm structure that was being retired as the foundation for the hatchery. Rather than build a new hatchery which was cost prohibitive, practical considerations drove the effort to improve the existing hatchery. And, due to costs, a decision was made to construct the hatchery in stages. Federal and non-profit funds are critical to the construction of the hatchery.

Tribal Innovations in Mariculture: A look inside the Alutiiq Pride Marine Institute, Brianna Murphy

Brianna noted the Alutiiq Pride (AP) is part of the Chugach Marine Resource Commission. Her presentation highlighted some of the marine organisms being raised at AP and then turned to a major effort to raise kelp in Alaska. The effort was remarkably successful, but Brianna noted that like elsewhere, the issue is how to market kelp. The lack of mature markets is a true economic impediment that must be solved. Brianna also noted that Alaska is a state where views on aquaculture seem to be very dynamic and are evolving in a positive way.

Expanding Market Access and Export Opportunities Through the Intertribal Agriculture Council's American Indian Foods Program. Latashia Redhouse, Dine Nation, American Indian Foods Program

Latisha highlighted the American Indians Food Program. The AIFP can help certify products as being authentic Indigenous produces and can also help market and promote these products at trade fairs both domestic and international. Companies wishing to market their product must be 51% or more Tribal owned.

The program is a good, cost-free way to find new markets and distribution channels, spread product awareness, attain recognized marks of authenticity, and establish knowledge of marketing and sales tools needed by many Tribal businesses. Som of the recognized producers who have used the program in clude: Gray Fox Farms, San Xavier Co-Op, Seka Hills, One Farm Poultry.

- The program is also available to Arts and crafts, beverages, tourism, and food production. Native agriculture doubled over 5 years. The program can support local

Tribal food systems, which, in turn, help in advancing tribal sovereignty and empowering communities.

- Some of the other things AIFP can help with include
  - Storytelling as a tool (and authenticity) services and resources
  - Market evaluation and research
  - Market plan development/ support
  - Labelling and shipping considerations
  - Networking
  - Reimbursement on eligible international marketing activities

Mariculture Permitting for Tribes, Alaska Study: Noah Meyer, Alaska Sea Grant

Noah compared the consultation process used by State and Federal agencies when issuing various permits that have the potential to affect Tribal rights and resources of historic and current interest to Tribes. In general, consultation with Native groups in Alaska is very inconsistent. And when native groups are consulted, they may be reluctant to provide information. A suggested solution might be to make comments submitted to be confidential. Better tools are needed for both regular citizens and Tribal Members to comment on proposed actions that affect marine resources. Noah suggested that laws and rules be changed so that consultation is mandatory.

Economic Models of Restorative Aquaculture: Tiffany Waters, Chinook Indian Nation, The Nature Conservancy

Tiffany noted that aquaculture has grown tremendously over the past decade. Currently, aquaculture produces more seafood than wild caught fisheries and aquaculture continue to grow whereas wild harvest simply lacks the capacity to grow any further. Aquaculture is the most sustainable and efficient ways to produce seafood.

Tiffany gave a summary of the evolution of The Nature Conservancy's approach to aquaculture and focus on aquaculture regarding Indigenous peoples and, in particular, examine the opportunities to restore marine resources through aquaculture.

TNC generally approaches aquaculture as a) place-based interventions, b) try to fill critical science gaps to ensure conservation benefits derive from their efforts, and c) attempt to catalyze market demand for seaweed and shellfish. TNC collaborated with Indigenous Australians to create a costed model for economically viable seaweed aquaculture. The model is now being adapted for U.S. dollars and operations in the U.S. rather than Australia. Tiffany noted that several factors can help make such endeavors feasible, including seed money provided by foundations and utilizing agriculture-tourism to help defray costs.

Time Immemorial – The Fishing History of the Lummi People and Hatchery Fish are Treaty Fish: Lisa Wilson, Lummi Indian Business Counsil, and Vice Chair of the Northwest Indian Fisheries Commission

Lisa Wilson highlighted the historic dependence of the Lummi People on seafood – salmon, shellfish, and other marine resources and with the coming of Europeans how access to these resources was limited if not lost for many years. She noted the long history of settlers and state and federal governments of the U.S., ignoring federally guaranteed Treaty rights.

The Lummi people, as part of the Point Elliott Treaty, ceded their rights to huge land areas in exchange for the guaranteed right to fish and collect shellfish in their usual and accustomed areas.

Lisa showed a video she produced as her capstone project at the NW Indian College. The video included an interesting piece where several Lummi Chief's and elders appeared on the Dick Cavett Show. She noted early efforts of the Lummi people, guided by Dr. Wallace Heath of W. Washington State College (now Western Washington University) to establish a shellfish farm comprising some 750 acres of diked area constructed in 1970-1971. This was part of larger effort by the Lummi Tribe to reassert tribal rights and sovereignty.

The programs fostered by the Lyndon Johnson Presidency helped very much as agencies like the Economic Development Administration, the Office of Economic Opportunity, and the Community Action Program, which provided most of the funding for the Lummi Aquaculture Project.

The Lummi's historic rights to fish and hunt were given up in exchange for ceding lands to the federal government. Nonetheless, the Lummi Aquaculture project faced a lot of opposition by local non-Indian land in-holders (land owned by non-Indians but within the Lummi Reservation area) and some of the Lummi Members themselves who favored the development of a magnesium oxide plan.

The Lummi people are very invested in aquaculture and formed a Lummi Indian School of Aquaculture as part of the NW Indian College. The Lummi Tribe raises geoduck, oysters, manila clams, and they operate a salmon hatchery.

Lisa noted that several not-for-profit organizations are attempting to shut down Tribal and State salmon hatcheries. Lisa noted that because of habitat degradation and urban growth, wild salmon production cannot support historic Tribal fisheries.

For that reason, in *U.S. v Washington II,* the courts found that hatchery fish were also Treaty Fish to which the Tribes had a right of harvest. Moreover, good habitat is essential for good salmon populations and meaningful Tribal harvest rights. However, due to environmental

factors, habitat loss and degradation, dams, urban development, forestry practices, etc. hatchery produced fish now make up the vast majority of salmon harvested in Washington.

As the State and Federal government cut hatchery production the Tribe's historic fishing rights are becoming more precarious. The Lummi's and many other Tribes are now dependent on salmon hatchery production. For the Lummi's and many other Tribe's salmon harvest is part of their cultural identity.

Intertribal leadership in Natural Resource Management: Annette Jarosz, Chugach Regional Resources Commission; and Allison Carl, Alutiiq Pride Institute and KGASF Scholar

Annette noted that the CRRC is a tribal consortium of seven South Central Alaska Tribes, established for the purposes of management and advocacy in the preservation of natural resources and subsistence opportunities for the native peoples of Southcentral Alaska. Seven Member Tribes range from the Copper River Delta to Cook Inlet.

These Indigenous groups recognized that self determination and community development were dependent on natural resources. The Alutiiq Pride Marine Institute (AMPI) is part of the CRRC and has 35 employees. APMI cultures several different bivalve and gastropod species in collaboration with numerous entities with the goal of enhancing shellfish populations and mariculture opportunities throughout the Northern Pacific region. Species include Razor Clams, Purple Hinged Rock Scallops, Pinto Abalone, Geoducks, Littleneck (Steamer) Clams, Softshell Clams, Butter Clams, Oysters, Cockles, and Chitons (Bidarkis).

Major aspects of the work involve efforts to reintroduce organisms where they were previously abundant.

Major impacts on marine resources occurred due to the Exxon Valdez oil spill and major earthquakes in the 1960s which destroyed some areas, the reintroduction of sea otters, climate change and changing temperatures and ocean acidification.

A model used but APMI includes developing broodstock, learning hatchery production techniques, producing juveniles, out planting the juveniles, and then monitoring populations to gauge success. APMI is using some unique methods to mark and age mollusks using a dye (Calcein marking). This is used to distinguish between natural wild production and hatchery supplementation. In addition, in some species like sea cucumbers, DNA methylation is being investigated to age these invertebrates. APMI is also examining the effects of microplastics, PSP and hydrocarbons on several marine organisms.

A recent effort is the development of Alaskan King Crab mariculture. In addition, efforts are underway to culture California Sea Cucumbers (which are found in Alaksa) as well as Kelp. Annette showed that there are opportunities for growing kelp (bull kelp, sugar kelp, and ribbon kelp) in Alaska.

However, like elsewhere, seed stock is an issue and the market for kelp is still in its infancy and a lot of development will be needed to make it commercially viable. Kelp aquaculture also has the added benefit of mitigating ocean acidification as kelp, like other plants, absorbs carbon dioxide as part of the photosynthetic process.

Propagating Native Species at the Chew Center to Rebuild Abundance and Connection: Ryan Crim, Colville Confederated Tribes, Puget Sound Restoration Fund

Ryan Crim summarized some of the species being reared at the Chew Center in Manchester. He noted that the life history of many of the species raised there is complicated. For example, the Olympia Oyster exhibits alternating hermaphrodism and asynchronous spawning and brood the gametes internally. Olympia oysters were widely distributed along the West Coast with 4-5 distinct populations. PSRF collect wild broodstock and the specimens spawn for about 4-week sand shells and via singles.

Ryan also talked about Pinto abalone which exhibit distinct male and females rather than being hermaphroditic. They use hydrogen peroxide to stimulate spawning.

Basket cockles were also discussed, and this species exhibits simultaneous hermaphroditic broadcast spawning. They grow very slowly.

Bull kelp is produced by PSRF or restoration purposes throughout the Salish Sea area. PSRF also cultures basket cockles, sea cucumbers, and littleneck clams.

Ryan noted that some of the policies and philosophies that guide PSRF do no harm, pay attention to genetic diversity and careful genetic selection, do not introduce pathogens. Also, a lot of attention is given to place, the people who use various sites, and the condition of the habitat and the species residing there.

Ryan noted that many Tribes and Organizations are involved in efforts to restore and manage marine resources, including broodstock development, hatchery techniques, and unique marking methods for mollusks. It discusses the cultivation of species such as Alaskan King Crab, California Sea Cucumbers, kelp, Olympia oysters, and basket cockles, emphasizing genetic diversity and habitat care. Community engagement is promoted through outreach, education, and cultural activities, while innovative programs repurpose harmful algal mats to benefit both shellfish and cannabis growers. Overall, the initiatives

blend scientific research, cultural preservation, and sustainable practices to rebuild abundance and ecosystem health in coastal communities.

Prioritizing Cockles: Cultural Connection and Current Research: Azure Boure, Suquamish Tribe Council Member and Elizabeth Unsell, Suquamish Tribe Fisheries

Azure and Elizabeth talked about their Tribe's efforts to bring back cockle populations. Cockles are environmentally sensitive, and their abundance has declined significantly over the past few decades. They produce cockles in the hatchery and send them to a FLUPSY once they are large enough. Once they are larger, they are outplanted on beaches.

The Tribes have attempted to engage the Tribal Community via cockle bakes for kids. They have also completed some genetic characterization of the cockle populations through work funded by the BIA and subtidal surveys. Several species of birds seem to prey on the cockles, and they have found that mesh coverings help reduce losses.

The Suquamish Tribe is working with the Tribal schools and community outreach to the Suquamish Community. They are also using elders to work with young people so that there is intergenerational education about Suquamish culture and history.

Healthy Beds, Healthy Yields: Managing Seaweed to Benefit Shellfish and Cannabis, Nick Browne, Squaxin Island Tribe and Duane Fagergren, Calm Cove Oyster Company

Nick Brown and Duane Fagergren described a unique program that benefits both oyster growers and Cannabis growers. Duane Fagergren noted that in many areas of Puget Sound, mats of algae can smoother oyster beds. These algal mats are difficult to remove mechanically as doing so results in damage and mortality to oysters and manila clams.

As a result, the mats must be removed by hand. And when they are collected, disposing of the material was problematic. However, Duane teamed up with the Squaxin Island Tribe, and they used algal mats to enhance composts. The resulting algal mat compost mixture was found to significantly increase the quality of cannabis. The increased quality included enhanced soil fertility, increased plant growth hormone, increased cannabis aroma and flavor, increased number of buds per plant and the amount of THC and other desired compounds in cannabis.

Both Duane and Nick noted that there will likely be other opportunities to establish win-win situations with shellfish growth, the removal and use of harmful algal mats. The compost they produced included potting soil, plant nursery residuals, cannabis harvest waste and of course, seaweed.

Comparing Land-Based and Net-Pen Culture of Sablefish Assessing Integrated Multi-Trophic Aquaculture Approach Using Giant Red Sea Cucumbers: Jim Parsons, Jamestown (Tribe) Seafood

Thanks to NOAA's commitment to research and development over several decades led by

scientists at Manchester and Montlake sablefish became part of the aquaculture options for native species culture in Puget Sound. This study is built upon a Sea Grant funded project conducted by the late Kurt Grinnell and the University of Washington. All work in this project occurred at NOAA's Manchester Research Station.

This project demonstrated the following notable conclusions: (a) Effective vaccines against pathogenic *Aeromonas salmonicida* allow rearing of sablefish in marine waters with high survival (~95%); (b) • High value markets exist for freshly harvested and live sablefish, particularly during periods when wild-capture fisheries are not operating; and (c) Giant red sea cucumbers are effective detritivores and can enhance marine aquaculture operations.

Update on the Swinomish Indian Tribal Community Clam Garden, Joe Williams, Swinomish Trieb and Courtney Greiner, Swinomish Fisheries.

Joe gave a quick history of the establishment of the Swinomish Tribe's Clam Garden. The Tribe with much support by foundations and organizations like Sea Grant brought together over 150 people from all over the Pacific area (Hawaii, Alaska, Canada, etc.) to build the clam garden. Large boulders formed the outline of the garden similar to structures that were used in the Salish Sea area for thousands of years.

Chugach Regional Ocean Monitoring Program – Developing Techniques and Capacity for Monitoring Efforts to Support Informed Subsistence Harvests: Allison Carl, Alutiiq Pride Marine Institute and KGASF Scholar

Allison Carl gave an update on work being undertaken by APMI to sample water for harmful algal blooms (HABs). In addition, Allison gave a description of her thesis work which is using Environmental DNA to determine species presence and abundance.

This methodology involves taking water samples and then using polymerase chain reaction to identify small bits of DNA from species of interest. She noted that often herring populations are difficult to locate or monitor but E-DNA is a means to track these populations. Alison also described other sampling and monitoring programs being carried out by APMI to monitor algo blooms, both toxic and non-toxic, ocean acidification. With regard to toxic algae, she noted that cooking seafood does not destroy the toxins (domoic acid, saxitoxin, etc.).

Bellingham Technical College (Zoom presentation), Brittany Palm.

BTC was founded in 1974 and is the smallest technical college in Washington. Each year about 4,000 students enroll. Many of these students have many challenges to overcome – balancing work, managing limited financial resources, family care, etc. The BTC focuses on work engagement.

A key focus of BTC is on workforce support. Studies suggest that there are about 10,000 jobs in the blue economy and $500 million in wages and $1.2 Billion total is at stake. We know that wild fish cannot supply the demand so we must depend on Aquaculture.

BTC has its own salmon hatchery that has been in operation for over 40 years. BTC operates two hatchery facilities in the PNW. Washington has the largest network of hatcheries in the U.S. and perhaps the world. Students learn by doing first and then reading to get the background on what they are working towards – and many students are working so the focus is on "earn while you learn."

BTC also works with salmon in the classroom. The hatchery chinook they raise are released on Whatcom Creek and since inception has released 3 million chinook BTC is in the top ten of two-year college programs in the U.S. With regard to aquaculture BTC received $150,000 workforce grant focused on a shellfish breeding program and seaweed, the latter of which could help reduce ocean acidification.

And BTC really focuses on non-traditional students – many may be older, going into a second career, and many are parents with lots of demands on their time and attention. Often these students are involved in family care. Many students are veterans. BTC offers four Associate of Arts degrees in fisheries and aquaculture, and they offer a number of professional certificates.

Day 4

The final day of the conference began with a briefing to prepare for field visits. The field visit locations included sites listed below.

1. The US Fish and Wildlife Service Quilcene National Fish Hatchery (chinook and coho salmon)
2. Troutlodge, Bonney Lake, where broodstock are held to produce genetically improved live-egg production.
3. Riverence, located near Rochester, Washington where broodstock is held in a recirculating aquaculture system and other tanks to produce genetically improved eggs.

4. Jamestown Seafood Company at Point Whitney near Brinnon, Washington where visitors were shown how microalgae are produced and delivered to oysters being grown for sale and distribution to other growers, primarily Puget Sound Tribes.
5. Hama Hama Oyster Company located in Lilliwaup, Washington on Hood Canal. Visitors were shown oyster beds and methods for growing single oysters for subsequent wholesale and retail sales.
6. Suquamish Tribe's Seafood Processing facility located in Poulsbo Washington where visitors could learn about the Tribe's sophisticated processing of various types of local seafood for distribution and retail sales.
7. Chew Center Olympia Oyster Hatchery located at NOAA Manchester's grounds in Manchester Washington where visitors learned about the Puget Sound Restoration Funds efforts to culture many native species with the aim to repopulate and restore these species in the historic range.