BC OAH Action Forum

ABSTRACTS

British Columbia Ocean Acidification and Hypoxia Action Forum

Vancouver Island Conference Center, Nanaimo, British Columbia
March 3rd, 2026

Guest Speakers

Myron Roth

Director, Climate Risk Management, Province of British Columbia
Co-Chair, BC OAH Action Plan

Myron Roth is the Director of Climate Risk Management with the BC Ministry of Energy and Climate Solutions, where he leads a team of climate adaptation and resilience specialists. A marine biologist and professional agrologist, he is a strong advocate for sustainable seafood with over 30 years of seafood development experience across both Canadian coasts and international settings. In 2017, he launched OASISS (Ocean Acidification Shellfish Industry Seed Supply) a pioneering ocean change monitoring and adaptation initiative, and in 2021, the BC Ocean Acidification & Hypoxia Action Plan, which he co-chaired. He holds a BSc in Zoology from UBC and a PhD from the Institute of Aquaculture, University of Stirling, Scotland.

Abstract: The 2023 BC Ocean Acidification and Hypoxia (OAH) Action Plan was developed in response to BC's Preliminary Strategic Climate Risk Assessment (2019), which identified ocean acidification as a significant climate-related threat to the province. Guided by an Advisory Committee, the planning process convened four workshops with 172 participants representing 88 organizations. The Action Plan outlines 5 goals, 15 objectives, and 62 actions aimed at improving understanding, raising awareness, and building resilience to OAH in BC's coastal waters.

Released concurrently, the Climate Ready BC Seafood Program provided $2 million to support priority activities aligned with the Action Plan across four program areas. Eleven proposals from industry associations, research institutions, Indigenous communities and organizations, and non-profits were selected for funding, collectively advancing all five Action Plan goals.

The goal of the Forum is to bring together BC's OAH community to reflect on the outcomes of the Climate Ready BC Seafood Program and consider related initiatives, including OA observing and data management, the state of OA knowledge in Canada, the Coastal Marine Strategy, and First Nations perspectives on ocean-related climate change, and – in plenary – identify actions, priorities, and next steps to advance the BC OAH Action Plan.

Guest Speakers

Jessie Turner

Executive Director, International Alliance to Combat Ocean Acidification

Jessie Turner is the Executive Director of the International Alliance to Combat Ocean Acidification (OA Alliance). A voluntary initiative of national and subnational governments, the OA Alliance works to raise ambition for climate action and transform the global response to climate-ocean change.As Executive Director, Jessie sets the strategic direction of the OA Alliance and develops and carries out annual programming, including contributions to international convenings. She also establishes partnerships across a variety of disciplines and coalitions, deploys communications strategies across multiple scales, and supports members in the development of practicable ocean acidification adaptation and resilience strategies.Jessie served as lead facilitator to the Pacific Coast Collaborative (PCC)'s Ocean Acidification and Hypoxia Working Group between 2014 and 2023. The PCC is a collaboration between the U.S. states of California, Oregon, Washington, and the Canadian Province of British Columbia working together on climate issues that impact the North American West Coast region.

Abstract: BC's OAH Action Plan is the first Provincial OA Action Plan in the world, setting an example for subnational and national governments around the word. As envisioned by the OA Alliance, OA Action Plans help governments: take inventory; prioritize needs and make recommendations; and align policies and investments in the face of climate-ocean change. This is especially important for achieving climate resilient fisheries and aquaculture, climate smart conservation, coastal resilience and habitat restoration, effective upgrades of infrastructure, and evaluation of marine carbon dioxide removal strategies. Hear more about the leadership shown by British Colombia and the impact the OAH Action Plan has had in Canada and across the world.

Harley Chappell

Chief of the Semiahmoo First Nation

Harley Chappell is the chief of the Semiahmoo people, located in south Surrey B.C. He serves as chair of the shared waters alliance, who's sole objective is to revitalize traditional shellfish harvest in Semiahmoo bay.

Guest Speakers

Jordan Watson

Director, Canadian Integrated Ocean Observing System (CIOOS)

Dr. Jordan Watson leads the Pacific Region of CIOOS, bringing a background that spans oceanography, fisheries modeling, and scientific leadership across the Pacific Ocean.

Taimaz Bahadory

Application Developer, Canadian Integrated Ocean Observing System (CIOOS)

Dr. Taimaz Bahadory is an oceanographer and application developer with specialties in ocean gliders, data visualisation, and data management.

Yayla Sezginer

Data Management Specialist, Canadian Integrated Ocean Observing System (CIOOS)

Dr. Yayla Sezginer is a biological oceanographer with a research background the biological carbon pump and high resolution in-situ data acquisition.

Abstract: The CIOOS Pacific team will give an overview of the Canadian Integrated Ocean Observing System and how its efforts to make ocean data more accessible have made it a valuable component of the BC OAH Action Plan. In addition to serving as a hub for Canada's ocean data, CIOOS Pacific is working with regional partners to develop an interactive data application / visualisation tool that provides users with access to the latest information about the regions changing oceanographic data, including characteristics relevant to ocean acidification and hypoxia.

Guest Speakers

Charles Hannah

Research Scientist at the Institute of Ocean Sciences, Fisheries and Ocean Canada

Dr. Charles Hannah is a research scientist in physical oceanography with DFO at the Institute of Ocean Sciences in Sidney British Columbia. His research usually revolves around the questions, 'Where is the water going, where does it come from, and what happened on the way?' Dr. Hannah maintains an array of subsurface moorings that extends from the west coast of Vancouver Island to Dixon Entrance. These measure temperature, salinity, and oxygen at different depths and ocean currents through the water column. He has been drawn into the field of oxygen and hypoxia because of the need to explain the recent extreme oxygen events (hypoxia) on the B.C. continental shelf.

Abstract: This talk is about declining oxygen concentrations in the subsurface waters of British Columbia. The first part of the talk will report on the observed trends in subsurface oxygen at 13 locations in British Columbia waters. The second part will tell a story about oxygen concentrations in the north Pacific and where the subsurface oxygen on the BC self comes from.

Guest Speakers

Kristina Barclay

Tula Foundation; Canadian Ocean Acidification Community of Practice

Dr. Kristina Barclay is a Co-Lead of the Canadian Ocean Acidification Community of Practice (OA CoP), facilitating OA initiatives and knowledge mobilization across Canada since 2020. She represents Canada on the Steering Committee for the Global Ocean Acidification Observing Network's North American Hub, as well as the UN Decade Ocean Acidification Research for Sustainability Programme's Framework for Action Working Group. Kristina has conducted research in the Pacific northwest for over 15 years, with a background in ocean acidification impacts to mollusc shells and human impacts on crab abundances using fossil, archaeological, historical, and modern data. She has both an M.Sc. and Ph.D. in Palaeontology from the University of Alberta.

Abstract: With an extensive coastline and three distinct, but connected ocean basins situated at high latitudes, Canada is highly vulnerable to ocean acidification. The Canadian Ocean Acidification Community of Practice recently led a synthesis paper on the current state of ocean acidification knowledge across Canada, including scientific knowledge and assets (monitoring, modelling, and biological studies), as well as socioeconomic and policy considerations and examples of ocean acidification actions in Canada. We then provide nine major recommendations for ocean acidification actions needed in Canada, as well as pathways for enhancing capacity and inclusion of ocean acidification knowledge for decision-making and climate mitigation and adaptation planning.

Guest Speakers

Charlie Short

Executive Director, Coastal Marine Stewardship Branch, Ministry of Water Land and Resource Stewardship, Province of BC

Charlie Short is currently an Executive Director for the Coastal Marine Stewardship and Fisheries Branch in the Ministry of Water, Land and Resource Stewardship. The Branch focuses on marine policy, governance, marine ecosystem-based management and monitoring, marine fisheries, aquaculture and wild salmon and marine spatial planning and marine protected area network design and implementation. In addition to his role with the provincial government, Charlie is a sessional instructor in the Department of Geography at the University of Victoria and a visiting instructor for the Master's Program in Coastal and Marine Management at the University Centre of the Westfjords in Iceland. Charlie has a MSc in Marine Ecology and BSc in Geography from the University of Victoria.

Abstract: This presentation highlights BC's Coastal Marine Strategy, co-developed with many First Nations to guide long-term stewardship of coastal ecosystems and ocean-based economies. It summarizes the Strategy's collaborative development, broad engagement, and key early implementation priorities for 2025–2028. The presentation will also highlight some projects taking shape across the coast that are strengthening climate resilience in coastal ecosystems and communities.

Trent Moraes

Deputy Chief, Skidegate Band Council, Indigenous Coastal Climate Coalition, and the BC Disaster and Climate Risk and Resilience Assessment First Nations Committee

Trent is a Haida from Skidegate, Haida Gwaii. He is an elected member of the Skidegate Band Councilor and is the current Deputy Chief Councilor. Trent is the Co-Chair of the Indigenous Climate Adaptation Working group. He is also a member of the Indigenous Coastal Climate Coalition, and the BC Disaster and Climate Risk and Resilience Assessment First Nations Committee, in additional to several other groups, mostly dealing with energy and electricity.

Climate Ready B.C. Seafood Program (CRBS) Recipients

Baynes Sound Mooring Enhancement

Ocean Networks Canada, CRBS Project

Presenter: Kohen Bauer

Ocean Networks Canada (ONC) operates a long-term ocean observing station in Baynes Sound—one of British Columbia's most productive shellfish regions. Supported by the ClimateReady BC Seafood Program, the project upgraded this observatory from a set of fixed-depth sensors to a profiling mooring that measures key ocean acidification and hypoxia (OAH) indicators (pH, pCO2, dissolved oxygen, temperature, salinity) throughout the full water column. This enhancement overcomes severe biofouling and maintenance challenges, improves data reliability, and expands spatial resolution, enabling a more complete understanding of local biogeochemical variability and its drivers. Continuous, high-quality, fine-scale OAH observations are important for the detection of corrosive and/or low-oxygen events and will benefit shellfish growers, researchers, and policymakers by improving data reliability and continuity. We share key lessons learned, including those related to sensor performance, technological readiness, and maintenance logistics, to help guide future observatory designs and strengthen B.C.'s overall capacity for sustained, high-resolution OAH observing. By being more intentional in how this observatory is designed, operated, and integrated into regional monitoring efforts, we aim to realize its full potential as a sentinel for coastal change in Baynes Sound, one that provides high-quality data to inform adaptation, resilience, and stewardship across the region.

Harvesting pCO2: Bridging the gap between fish harvesters and ocean science for a sustainable BC coast

T Buck Suzuki Environmental Foundation, CRBS Project

Presenter: Alaina Pyde

Our team at the T. Buck Suzuki Environmental Foundation is leading a citizen science ocean acidification and hypoxia (OAH) data collection project in partnership with the United Fishermen & Allied Workers Union (UFAWU), Hakai Institute, and Burke Analytics. By leveraging the on-the-water knowledge and operational expertise of commercial fishers, this project expands coastal monitoring capacity while strengthening engagement between science, industry, and conservation organizations. Using FOAM (Field Ocean Acidification Monitoring) kits deployed in December 2024, we have spent the past year collecting high-quality surface data and refining deeper-water sampling protocols. To date, the project has generated over 80 discrete samples alongside continuous environmental measurements, providing an increasingly robust picture of local oceanographic conditions and their seasonal fluctuations.Findings demonstrate that time-series sampling yields the strongest datasets. Fisheries that naturally align with repeat sampling—such as trap-based crab fisheries—are therefore critical partners. We recommend continued sampling to strengthen long-term datasets and increased capacity for data management and interpretation. This project demonstrates the value of cross-sector collaboration, and we seek to continue to build on these partnerships in future phases of the work.

Oceanographic monitoring across British Columbia by the Small Ship Tour Operators Association (SSTOA)

Wilderness Tourism Association of BC, CRBS Project

Presenter: Russel Markel, Outer Shores Expeditions

Climate change impacts are a major concern to coastal communities that depend on coasts and oceans for their livelihoods, food security, and cultural identities. Observations of environmental conditions in nearshore areas, including temperature, oxygen, pH, and salinity, are needed to improve understanding and predictions of how changing ocean chemistry impacts coastal ecosystems and people. The Wilderness Tourism Association's Small-Ship Tour Operators (SSTOA), in collaboration with oceanographers at Oregon State University and the Sexton Corporation, have embarked on a large-scale, industry-led, citizen science project that harnesses the capacity and broad geographic range of the marine tourism industry. The SSTOA's fleet of 11 expedition tourism vessels deployed oceanographic sensors that measure depth, temperature, salinity, and dissolved oxygen profiles in nearshore coastal areas. Working through some technical challenges, six vessels deployed sensors over 100 times between June-October 2025. SSTOA has developed data protocol agreements with several First Nations and have reached more than 500 guests. Project partners are now updating the sensors for improved application and streamlining data management, analysis, and reporting. Building on this pilot, the SSTOA will continue to contribute data on spatial and temporal variability in environmental conditions to inform stewardship and conservation of coastal areas.

Identifying thresholds in B.C. shellfish vulnerability to ocean acidification

University of British Columbia, CRBS Project

Presenter: Christopher Harley & Georgia Hall

The Harley and Moore Labs at the University of British Columbia, in partnership with the Hakai Institute, are establishing thresholds of vulnerability to ocean acidification (OA) in BC shellfish (blue mussels, Pacific oysters, and Dungeness crabs). While crab data are still under review, experiments with bivalves found that the effects of OA are species specific, and depend on the variable of interest. Pacific oyster growth declined linearly with increasing OA, but blue mussel growth received minor benefits from mild OA exposure before declining. Shell strength showed a threshold of vulnerability for both oysters and mussels, although the mussel threshold occurred at a lower pH, indicating more resilience to OA for this species. Both species showed similar thresholds for shell erosion, affecting overall aesthetics and marketability. Neither oysters nor mussels showed an increase in vulnerability to heatwaves after exposure to OA. Additionally, mussels became more susceptible to predation by mottled sea stars under higher OA conditions, although this relationship was complex. These results indicate that shellfish growers may need to adjust management techniques as the climate changes to accommodate shellfish that grow slower and have weaker, less attractive shells, while protecting against a potential increase in susceptibility to predation.

Hypoxia Monitoring in Ahousaht Territory

Maaqutusiis Hahoulthee Stewardship Society (MHSS), CRBS Project

Presenter: Hanna Meyer and Ryan Teremy

This presentation summarizes a Nation-led hypoxia monitoring program conducted by the Maaqutusiis Hahoulthee Stewardship Society (MHSS) of the Ahousaht Nation in Clayoquot Sound. The project involves year-round, full water column monitoring at 16 fjord-type inlet sites within Ahousaht territory to assess how large-scale atmospheric and oceanographic forcing influences dissolved oxygen availability. Monthly measurements of conductivity, temperature, depth, and dissolved oxygen are collected using a multiparameter water probe, providing a high-resolution dataset that supports both local stewardship and regional scientific research. The data collected by MHSS contributes to a hydrodynamic–biogeochemical model managed by Fisheries and Oceans Canada and augmented by other Nations and community organizations. Results indicate increasing marine hypoxia and elevated sea surface temperatures, leading to compressed habitat for pelagic fish and increased physiological stress for shellfish and crustaceans. These changes pose growing risks to marine ecosystems and community access to culturally important seafood. Long-term, the monthly, year round data provided through Nation-led monitoring is essential for detecting spatial and temporal trends, strengthening Ha'wiih decision-making, and informing adaptive fisheries management. The integration of community-owned data and predictive modeling supports proactive planning and long-term food security under future ocean conditions.

Advancing Ocean Monitoring Tools

North Island College, CRBS Project

Presenter: Logan Zeinert

North Island College's Climate Ready BC Seafood project aimed to deploy a real-time ocean acidification (OA) sensor package that combined established sensors with new lower-cost sensors. We aimed to assess under what conditions low-cost sensors can provide adequate monitoring of OA to help industries and communities adapt to OA. The project team partnered with Semiahmoo First Nation, the Salish Sea Indigenous Guardians Association (SSIGA), World Wildlife Fund (WWF) and Arocha to collect water quality data inside and outside an eelgrass bed in Semiahmoo Bay (SE Boundary Bay). These locations are important sites for juvenile fish and invertebrates, especially as the adults of these species are often important for First Nations and fisheries. This site has several different characteristics and has limited shore-power. This challenged the requirements of the sensor package and we adapted our deployment to enable the data collection in these environments. Our deployment was challenged by several setbacks in sensor calibration and part availability, thus the deployment was delayed. However, several NIC students were able to be involved in the project, including the deployment, and all sensors from both deployment locations were retrieved after six months. Data was retrieved from all sensors, allowing comparison of water quality between the sites.

Assessing the role of eelgrass in Semiahmoo Bay in building resilience to ocean acidification and hypoxia

Salish Sea Indigenous Guardian Association (SSIGA) and Semiahmoo First Nation, CRBS Project

Presenter: Jacklyn Barrs

Traditional shellfish harvest has been prohibited in Semiahmoo Bay since the 1960s owing to concerns over water quality. Ocean acidification and hypoxia (OAH) present additional threats to shellfish populations in the bay, however, there is evidence to suggest that seagrass can improve water quality and may play a role in buffering OAH. In this project led by the Salish Sea Indigenous Guardians Association and Semiahmoo First Nation, Indigenous knowledge and western science approaches have been used to investigate the role that eelgrass might play in building resilience to OAH. Over two years, we have gathered baseline information on the health and extent of the eelgrass meadow in the bay, and assessed water quality and eelgrass meadow use as habitat for bivalves and fish. We also collaborated with North Island College and University of Calgary to install and test pH and pCO2 sensors in the bay and assess if the eelgrass has any role in localized mitigation of OAH. Project results will be used to guide management activities that address the main threats to shellfish populations, with the ultimate goal of revitalization of shellfish harvest in Semiahmoo Bay.

Increasing knowledge transfer, collaboration, and scientific understanding of nearshore marine health in Clayoquot and Northern Barkley Sounds

Redd Fish Restoration Society, CRBS Project

Presenter: Emily Fulton

This project was established to increase knowledge transfer, build new collaborative relationships, and invest in the continuation and expansion of nearshore habitat health and oceanographic monitoring in Northern Barkley and Clayoquot Sounds. We focused on using standardized methods for surveying, and prioritizing training and engagement opportunities for local First Nation Guardians and stakeholders. Partnering with 4 local nuučaanuł Nations, we monitored and mapped 28 important kelp areas, as well as 54 stations selected for oceanographic data collection. Data from both monitoring initiatives are currently being analyzed. Results will be presented in accessible formats to each Nation and community, and used to inform priorities for nearshore marine habitat restoration, conservation, and future co-benefitting research programs. This project has highlighted the need for further investment in long term monitoring programs that offer direct benefit to the Nation whose territory the work is being conducted, as well as more effort placed on creating accessible opportunities for science dissemination.

Genomic selection for oysters resilient to ocean acidification

Vancouver Island University, CRBS Project

Presenter: Timothy J. Green

Ocean acidification (OA), driven by upwelling and climate change, is negatively impacting marine calcifiers in British Columbia, Canada. OA interferes with calcification, causing increase mortality and reduced growth rate in shellfish such as the Pacific oyster. Variation for OA tolerance exists within the broodstock enhancement program at Vancouver Island University (VIU). By identifying the genetic mechanism that underpins OA tolerance, the B.C. shellfish grower's association (BCSGA) hopes to be able to implement genomic selection for OA tolerance in Pacific oysters to future-proof the shellfish farming industry against climate change. This project assessed the average growth rate of 475 oysters from 19 pair-mated families under experimental OA conditions using the Fisheries and Oceans Climate Change and Ocean Acidification Laboratory (FOCCOAL) at the Pacific Biological Station in Nanaimo. A genome-wide association study examining these 475 oysters led to the detection of a quantitative trait locus (QTL, or genetic mutation) on chromosome 6 of the Pacific oyster genome that was associated with a doubling in growth rate under experimental OA conditions. This knowledge has been used by the VIU broodstock enhancement program to undertake marker-assisted selection to identify Pacific oyster broodstock with increased growth rate under OA conditions during the 2025 hatchery season.

Ocean acidification monitoring to protect the local British Columbia shellfish growers' Pacific oyster seed supply

Nova Harvest, CRBS Project

Presenter: Angela Fortune and Shannon Mendt

Nova Harvest Ltd. is a BC-based shellfish hatchery focused on sustainable oyster seed production and building climate resilience in aquaculture. In partnership with the Bamfield Marine Sciences Centre (BMSC), the Hakai Institute, and the BC Shellfish Growers Association (BCSGA), we supported an ocean acidification (OA) monitoring project using a Burke-o-Lator (BoL) system. The goal was to advance science-based hatchery practices, enhance food security, and improve the adaptability of BC's shellfish industry to changing ocean conditions. The project aimed to increase OA monitoring capacity in Barkley Sound. By operating the BoL system at BMSC, the project delivered real-time seawater chemistry data to guide hatchery decision-making, support collaborative research, and safeguard the long-term sustainability of oyster seed production. To date, the project has achieved several key outcomes. Two years of continuous OA data have been collected in Barkley Sound, filling a critical monitoring gap. Nova Harvest uses this data daily to adjust hatchery practices in response to fluctuating ocean conditions. Shellfish larval experiments are capable of using both real-time and discrete water chemistry data. Collaboration between BMSC and Hakai researchers continues, and the BoL has been integrated into hands-on student training at BMSC.

Models, mesocosms, and field work to assess kelp mitigation to OAH impacts

SciTech Environmental Consulting, CRBS Project

Presenter: Edward Gregr & Chris Neufeld

In partnership with a multidisciplinary team of marine experts and the Mamalilikulla First Nation Guardians, we characterised the ocean chemistry in the Broughton Archipelago and examined whether wild bull kelp forests (*Nereocystis luetkeana*) could create a 'halo effect' by locally increasing pH and dissolved oxygen. Our fieldwork produced over 200 discrete water samples and 145 days of near continuous ocean chemistry data from 2 moorings. Mooring data showed effects of semi-diurnal tidal effects, as well as daily effects of photosynthesis, along with evidence of freshwater input from Knight Inlet and episodic mixing attributable to local weather events. Results of the water sampling program will be presented, including a Salinity/Alkalinity curve for the region, the seasonal pattern of pH, and the differences in pH inside and outside kelp beds. To estimate the ecosystem-level effects of carbon drawdown by autotrophs, we developed a mechanistic model of *Nereocystis* growth and embedded it in a simple oceanographic box model. We compared our model outputs to water chemistry patterns observed at the moorings to evaluate model performance. We will show how our approach, using both observed and literature-based parameters, can predict the contribution of *Nereocystis* beds to local changes in water chemistry over the course of a growing season.