

COLLEGE MATTERS

Volume 14 // Issue 2 // December 2022

Ending Helicopter Research

*An Archeologist's M̓núxvit
Approach to Ancestral Work*

A Mobile Marine Classroom

The **Paradigm Shift** Issue

We respect and acknowledge that the College's office and its registrants operate within the traditional territories of the Indigenous Peoples of BC.



COLLEGE OF
APPLIED BIOLOGISTS
Professional Accountability



The ***Compliance Plan*** has been updated to reflect the activation of Reserved Practice on September 1, 2022. The College encourages all registrants to become familiar with this document.

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The College of Applied Biologists is the regulator of applied biology professionals in British Columbia. Established by government legislation in 2003, the College protects the public interest by ensuring that applied biology professionals—Registered Professional Biologists (RPBios), Registered Biology Technologists (RBTechs), Applied Biology Technicians (ABTs) and Applied Biology - Limited Licensees (AB-LLs)—meet rigorous standards of professional and ethical competency.

OUR VISION

Responsible resource management supported by accountable and trusted professionals.

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COLUMNS

- 3 *Message from the President:*
Presidential Ponderings:
Traditional Knowledge and Western Science
- 4 *Message from the Chief Executive Officer:*
Managing Together for Biodiversity

ANNOUNCEMENTS

- 5 Introducing New College Staff and Editorial Board Member

FEATURE ARTICLES

- 7 Ending Helicopter Research through Meaningful Collaborations
- 10 Haítzaqv Archeologist Practices M̓núxvit Approach to Ancestral Work
- 15 *Na Malsga Aks*—The Story the Water Tells

OPINION

- 18 Voting Matters
- 19 Government of Canada's Notice of Intent—Labelling of Toxic Substances

Cover photo: A Great Blue Heron on the Coburg Peninsula in the Esquimalt Lagoon Migratory Bird Sanctuary in Colwood, BC, in early September by Alayna Fairman

Back cover photos by Manteo Eldorado Resort
Christine Houghton's photo by Naomi Maya Photography

***Disclaimer:** the opinions expressed in *College Matters* do not necessarily represent those of the College, its Council, or other registrants.



By Alexandra de Jong Westman, RPBio, President

Presidential Ponderings: Traditional Knowledge and Western Science

IN RECENT YEARS, there has been a conscious movement in federal and provincial regulatory processes to acknowledge and integrate Indigenous Science into Western Science processes. Typically, these Traditional Indigenous ways of knowing and seeing are collectively referred to as Traditional Knowledge, but truly, when you consider the history of scientific theories and theorizing, all paradigms, fields of study and trains of thought are derived from some sort of traditional knowledge.

Science, simply put, is the rational perception of reality that is dynamic in nature and that can gradually change over time. We, as practitioners of applied biology living in a paradigm of Western Science, may forget that all philosophies of knowing and understanding have given rise to technologies including hunting, fishing, plant cultivation, medicine gathering, art and healing.

“Every culture and every society has its own science, and its function is sustaining its mother society and culture” (Yamada, 1970).

Weaving together those various trains of thought so eloquently described in *Knowing Home: Braiding Indigenous Science with Western Science, (Book 1)* edited by Gloria Snively and Wanosts’a7 Lorna Williams from the University of Victoria, raises the point that “...many educated people today believe that Indigenous cultures are unscientific because they are based on magical or spiritual beliefs and/or because they lack the benefit of the Western scientific method of empirical observation and experiment” (p. 88).

As practitioners, if we have ever had the honour of attending gatherings with Indigenous Elders and/or Knowledge Keepers, it is quickly apparent that the stories and understanding of the lands and waters, which these Indigenous Peoples have

cared for and protected, are built on generations of repeated experimentation and observation. In fact, the stories comprise a database of years of knowledge and observation and repetition that are the envy of many academic researchers.

However, misconceptions can lead to misunderstandings that mask these similarities:

“...both knowledge systems [Indigenous and Western] were developed from culture-based ways of experiencing and making sense of nature, and each knowledge system in its own cultural way relies on empirical data, observation, curiosity, experimental procedures, rationality, intuition, predictability and knowing of cause-and-effect relationships” (p.82).

There is a propensity to go on and on about the differences between Indigenous Science and Western Science. However, when we instead give the

credibility and gravitas to the exploration of basic questions—the philosophies of thought and perception, human feeling and knowing and the interconnectedness and relationships of people to the earth, waters and the cosmos—this living body of knowledge is suddenly not so different than Western Science philosophies. [CMG](#)

“Every culture and every society has its own science, and its function is sustaining its mother society and culture.”





Managing Together for Biodiversity

By Chistine Houghton, Chief Executive Officer

THE UNITED NATIONS' Sustainable Development Goal 15 is to “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss” ([United Nations Department of Economic and Social Affairs, Sustainable Development](#)). How we meet this goal—and it must be *how* not *if*—will require that we look beyond economic benefits to the long-term benefits of environmental sustainability.

While not perfect, here in British Columbia we have taken some important steps. One was the recognition of applied biology professionals as critical to sustainable resource management. Being the first jurisdiction in the world to bring reserved practice—or practice rights—into force, the province has clearly indicated that it puts a priority on ensuring that a qualified, competent and accountable applied biology professional is assessing, interpreting and recommending mitigation measures or alternative solutions as it relates to impacts on the receiving environment.

But applied biologists are only part of the answer. There is much we can learn from the people who have lived here for well over 10,000 years and who have successfully and sustainably cared for the lands and waters. That knowledge has been passed down from generation to generation and it plays a critical role in meeting the United Nations' Goal 15.

The Government of Canada offered concrete recognition of this Knowledge with [\\$800 million in funding for four large Indigenous-led conservation projects](#) covering almost one million square

kilometres in British Columbia, Northwest Territories, northern Ontario and Nunavut.

The BC project is being led by 17 Nations of the North Pacific Coast that will develop a unique model designed to provide sustainable funding for community-led conservation projects in the Great Bear Sea. These projects are working towards a vision that reestablishes and protects healthy marine ecosystems and restores Indigenous governance and stewardship.

As well, the Province has stepped up in the wake of the BC Supreme Court's decision, which required the Province and Blueberry River First Nations (Blueberry) to work together to develop land management processes in Blueberry territory.

[The Province has so far committed \\$35 million for Blueberry](#) to undertake activities to “heal the land” while creating employment opportunities for Blueberry River First Nations members.

And at our 2022 Conference, delegates heard of collaborative initiatives between First Nations and registrants of the College in wildlife management and beginning the work to address cumulative effects, which have resulted in better results in environmental stewardships that have benefited all of us.

Indigenous stewardship of the lands and waters goes back from time immemorial; regulated applied biology professionals have only been around for twenty years (and with reserved practice, only since September 1, 2022). But by listening and learning from Indigenous Peoples, and working collaboratively, we can all play a part in meeting the United Nations' Sustainable Development Goal 15. [CM](#)

Introducing New College Staff and Editorial Board Member



Stephani Horstman is a second-year law student at University of Victoria Faculty of Law. She is working at the College during the Fall of 2022 as part of the law co-op program. The first project she has been working on is updating the Bylaws to comply with the *Professional Governance Act* amendments that went into effect in June 2022. The second is developing a framework for an upcoming legal requirements course for applicants to the College.

Stephani is working on her Concentration in Environmental Law and Sustainability (CELS). In addition to CELS and the co-op program, she is involved in many law clubs, such as the Environmental Law Club, Animal Law Club and is co-president of the UVic chapter of OUTLaws. Stephani is also on the organizing committee for the annual Indigenous Perspectives Camp. She earned her Bachelor of Science in Computer Science and Mathematics from Montana State University in 2012. After working as a software developer in both Canada and the US, she applied for law school with the goal of working in legislation and policy related to biodiversity.

Stephani is a recent immigrant to Canada and lives with her wife and two pet rabbits on Vancouver Island. She loves all things in nature (except ticks) but has a special interest in salmon and fungi. [CM](#)



Cheng Kuang, RBTech, is a water quality consultant with Lorax Environmental Services Ltd., who resides in Vancouver, BC. She is a new registrant with the College, currently serving as a member of the Editorial Board Working Group. She will be responsible for soliciting articles from potential contributors for publication in *College Matters* and providing support in the editorial review process.

Cheng is an environmental scientist and chemical oceanographer by training. Her graduate research explored biogeochemical processes that govern trace metal and nutrient cycling in coastal waters. Her work at Lorax is focused on evaluating the impact of mining practices on aquatic health and surface water quality. She has been involved in projects related to baseline monitoring, environmental effects assessment, development of site-specific water quality targets and mine closure planning.

Cheng moved to BC from China in 2011 to pursue a degree in Environmental Sciences. After graduation, she was motivated to build a career that helps industries and communities lower their environmental impact, protect aquatic habitats and conserve natural resources. In her free time, she enjoys reading and exploring the wilderness of BC. [CM](#)

COLLEGE MATTERS

The College of Applied Biologists Editorial Board Working Group is not attempting to define Indigenous Knowledge in presenting these feature articles. Rather, the feature articles present work which aligns with some existing definitions of Indigenous Knowledge. The College recognizes and respects that Indigenous Knowledge and professional applied biology are complementary practices in stewarding and protecting our natural resources.

The **Paradigm Shift** Issue

FEATURE ARTICLES

Article notes & references are on page 20

Ending Helicopter Research through Meaningful Collaborations

By M. Fernanda Adame Vivanco, PhD, MSc
Senior Research Fellow, Griffith University, Brisbane, Australia

“HELICOPTER RESEARCH,” “NEO-COLONIAL research” or “parachute research” is the practice of scientists from wealthy nations flying to a developing nation, collecting samples and flying out, travelling back to their countries where they publish their results with little or no involvement of locals¹. Helicopter research is not new; it started over two hundred years ago with Alexandre von Humboldt, who explored tropical and subtropical America. Later, other explorers followed; in 1831, Charles Darwin sailed to South America, where he visited the rainforests of Brazil, the grasslands of Argentina, the mountains of Chile and the islands of Ecuador. During his five-year trip, he collected thousands of plants and animal specimens. Back in England, Charles Darwin published the *Origin of Species*, one of the most important scientific documents in modern history. There is hardly any

mention of the civilizations inhabiting America at that time, except when he referred to them as the “naked savages.” Today helicopter science is pervasive in most research fields, including environmental sciences¹.

I was born and raised in Mexico City; I studied at the National University of Mexico (UNAM) and worked at the Centre for Research and Postgraduate Studies (CINVESTAV) in Merida, Yucatan. Hosting international scientists was common throughout my time studying and working. When they arrived, we made sure to be perfect hosts. We showed them around, shared our knowledge with them, showed our data, explained the local culture and many times, told them where and how to sample. They would come, and we would take them to the field to the fantastic natural locations we have in Mexico, to volcano lakes in the middle of the desert, to mangroves inhabited by

“Partnering with local people is necessary to create accurate and meaningful science.” Photo by F. Adame.





Fernanda Adame while working with Ngugi Elder at Minjerrabah Island, Queensland, Australia. Photo by F. Adame.

thousands of flamingos, to sinkholes surrounded by rainforests. Time and time again, they came, got some samples and flew back where they published papers that none of us were invited to participate in as co-authors. Many of these foreign scientists probably had the best intentions, and they certainly contributed to the scientific knowledge of these places. In most cases, they also gave talks or workshops, which were always appreciated. Nevertheless, it never felt like a true collaboration.

Meaningful collaborations instead of helicopter research can dramatically improve opportunities for researchers of the Global South. In 2010, while I was an early career researcher, I was invited to work with a recognized professor coming from the United States, J. Boone Kauffman. Together, we went to Sian Ka'an, a beautiful Biosphere Reserve on the Caribbean coast. I showed him around and explained why the mangroves in this region were so unique, why there are no rivers, only groundwater low in nutrients that creates miniature forests, where trees are not taller than my knees. Professor Kauffman

showed me how to sample the carbon stored in the mangroves and taught me the importance of these measurements. At the end of the field trip, he suggested that I be the lead author of the manuscript from the data we collected. I was surprised but very honoured and grateful. Today, ten years later, this is still my most cited manuscript², and it launched my career as an expert in the field.

After my successful project in Sian Ka'an, I was given the opportunity to lead another project at La Encrucijada Biosphere Reserve on the border of Mexico and Guatemala. During the field trip, I was helped by the rangers, which were members of the local community. One of them was Leonardo Castro, a knowledgeable ranger who took me throughout the Reserve, helping me to choose which sites to sample. He explained how the mangroves had recently changed and the threats the forests face due to illegal fires and erosion from the catchment. After the field trip, I contacted him and showed him the results of our analyses. He explained how a large fire in the Reserve a few

years ago and a volcanic eruption a hundred years ago could explain the layers of ash found in the sediment cores. His knowledge was invaluable to the study's design and the interpretation of the results, and he is a well-deserved co-author of the manuscript we published³. Partnering with local people is necessary to create accurate and meaningful science.

Now I live in Brisbane, Australia, where I work with various partners, including First Nations. For one project, I worked with Geosciences Australia, ground-truthing satellite images of the variation of surface water in freshwater wetlands. I travelled around the country to Quandamooka in Queensland, the Gwydir wetlands, New South Wales, and Kakadu National Park in the Northern Territory. I engaged and collaborated with the Bininj/Mungguy, Ngugi and Kamilaroi Traditional Owners of these places. Through them, I understood the long-term changes in the wetlands and ensured that the data from satellite images were accurate and representative of what was seen on the ground. Importantly, I learnt the cultural values of these places and what scientific studies were needed to improve their protection and management. Science can only have an impact when we know the needs of the local people and incorporate their knowledge and values.

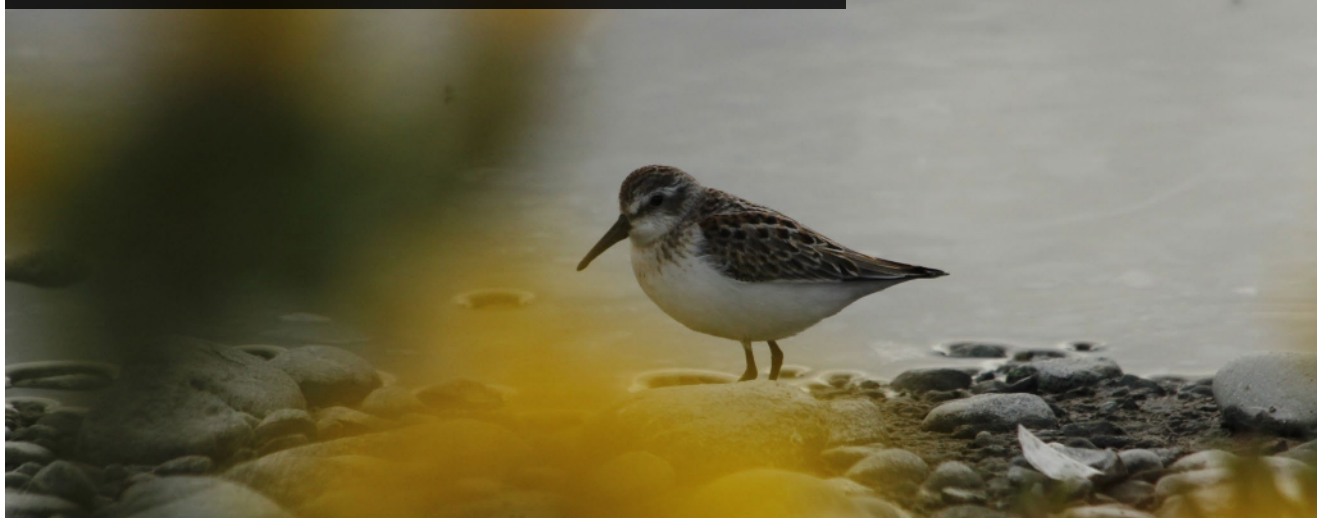
“Science can only have an impact when we know the needs of the local people and incorporate their knowledge and values.”

Throughout my research career, I have learnt the importance of creating meaningful collaborations, both internationally and locally. Every time I start a project in a new location, I make sure to learn who is working or living at each site. I contact and visit them in person to find common ground and suggest collaborating. I offer something to them (data, sample analyses, information, co-authorship), and I take note of their input, even if it does not follow conventional science rules. For example, they usually help me choose field sites and explain their seasonal and long-term changes. Afterwards, I contact them to show the preliminary results to get their input to interpret them. I am always amazed by how people's views differ from my narrow scientific perspective. Time and time again, I realize how my research is so much better with the help of local people. Ending helicopter research is not about charity; it is about fairness, making valuable scientific contributions, and achieving excellence in research. [CMF](#)

More information:

- > <https://enlighten.griffith.edu.au/minierribahs-changing-wetlands/>
- > <https://wetlandwander.net/>

A sandpiper searching for food along the Coburg Peninsula at the Esquimalt Lagoon Migratory Bird Sanctuary in Colwood, British Columbia, in late August. Photo by Alayna Fairman.



Haítzaqv Archeologist Practices M̓núxvit Approach to Ancestral Work

By Emilee Gilpin
Coastal First Nations

HAÍŁZAQV ARCHEOLOGIST Q̓ÍXITASU Elroy White and his nephew Charlie Brown cruise through their territory by boat, visiting old stone fish traps and culturally modified trees, scanning the bases of bluffs for rock paintings, carvings or evidence of burial sites.

Each visit or new archeological find connects them to their Haítzaqv ancestors, reminding them continuously of their intergenerational presence and spiritual and cultural rights and fortitude.

“I’m an independent archeologist. I live and operate out of Bella Bella,” says Q̓íxitasu, as he and his skipper wait for his nephew who jumped on shore. “Charlie is looking at the base of this bluff for rock paintings, carvings and burial boxes.”

These are all artifacts they’ve found throughout their Haítzaqv (Heiltsuk) territory, some identified by other archeologists before, marked or mismarked on maps, some they are identifying for the first time. What matters after the find, Q̓íxitasu says, is the interpretation one makes of it.



Haítzaqv archeologist Q̓íxitasu Elroy White observes rock bluffs looking for the evidence of burial sites or other artifacts. Photo provided by Coastal First Nations.

More than just looking

Q̓ix̓itasu has a Master of Arts in the Department of Archeology from Simon Fraser University. His thesis, “Heiltsuk Stone Fish Traps: Products of my Ancestors’ Labour,” incorporates local Haítzaqv political and cultural entities and the stories from 12 Haítzaqv oral historians.

“According to Heiltsuk oral history, we have used and occupied this diverse marine environment and landscape, including rivers and offshore waters, since time immemorial,” writes Q̓ix̓itasu in the introduction of his thesis.

“We are reminded continuously of our ancestors’ presence. Old village sites, rock art visible on cliff faces and carvings on slippery rock surfaces, scars from bark strips on cedar trees, burial sites and stone fish traps are the remnants of their tenure.”

Archeological evidence validates Haítzaqv oral history—the excavations at an ancient Haítzaqv village site of Máwás (Namu)

reveal 10,000 years of continuous occupation; an excavated settlement site on Triquet Island dates 14,000 years ago, during the last ice age.

While archaeologically ancestral sites and artifacts tell a story of the presence and continuous use and occupancy of a Nation group, Q̓ix̓itasu says that from a Haítzaqv perspective, there’s more ceremonial, cultural and social information that’s shared internally.

“Anybody can look and find. The important part of being an archeologist is that you do the analysis, the lab work, the reporting and then you come up with an interpretation,” he says. “My work includes way more important parts than just looking, searching.”

Q̓ix̓itasu practices what he has come to identify as a M̓n̓úxvit approach to the work. M̓n̓úxvit is a Haítzaqv word that loosely translates to English as “uniting, becoming one.”

There were many times throughout his studies and field work he realized his cultural protocols and context governed his

Traditional Knowledge: the Bridge between Disciplines


By Eva-Maria Boehringer, RPBio

On the surface, archaeology and biology are two very different disciplines: the former studies human history and pre-history through material remains, while the latter investigates the function of living organisms, their habitats and the ecosystems that sustain them.

Especially when viewed through the lens of western science, these two fields don’t seem to share any commonalities. However, when we apply the broader scope of Traditional Knowledge (TK), the bridge becomes clearly visible, and we can see that both disciplines fit under the same umbrella.

TK uses a placed-based, cultural approach to the collection and interpretation of information, using wisdom and knowledge that has evolved over thousands of years of living as part of the environment. This knowledge, which is passed down orally through storytelling and mentorship, is broad, holistic, place-based, relational and intergenerational.

When it comes to the practice of biology, western science views ecosystems as intact in the absence of humans; in fact, to fully restore an impacted system means to bring it back to how it functioned before human-caused impacts occurred. TK tell us that humans are an integral part of the natural world and that we are just one more component of a vast and complex system. All living systems, including species, habitats and their interactions, tell a story over time about changes in the environment, just like archaeological sites and artifacts tell a story over time of the presence and continuous use of an area.

Western science and TK both recognize that knowledge is always growing and changing, that observations are critical for recognizing patterns and causality in nature, and that ecological systems are complex. By learning about TK, and how this expert knowledge about a specific ancestral region is used in day-to-day life, we gain a more holistic understanding of our environment and the relationships among all beings, including humans, who are a part of, not separate from, the whole. 

work differently than other archeologists. In his research and work, Q̓íx̓itasu combines many approaches, practicing a new, yet ancient methodology, uniting many ways of doing things into one. He consulted Rory Housty, a Haítzaqv̓la (Haítzaqv language) speaker and teacher, and Elizabeth Brown, his mother-in-law (fluent Haítzaqv speaker), explaining his methodology, to find the appropriate Haítzaqv term for his practice.

“The fact I use a Haítzaqv word empowers me. That’s how my ancestors would have done it, they wouldn’t have used an English word. I use our language to help interpret these sites created by my ancestors rather than the English words that tend to lose their meaning,” he says.

When Q̓íx̓itasu and Charlie arrive to a burial site and point to some of the artifacts resting there—a rattle, pieces of a box with formline drawings—, Q̓íx̓itasu chants. “I have ancestry

here, I have protocols I must follow,” he says. Sometimes, it’s his nephew who gives him the nudge if he forgets to sing. Younger generations are often taking up protocols others do out of habit or respect, he says, but they really mean it.

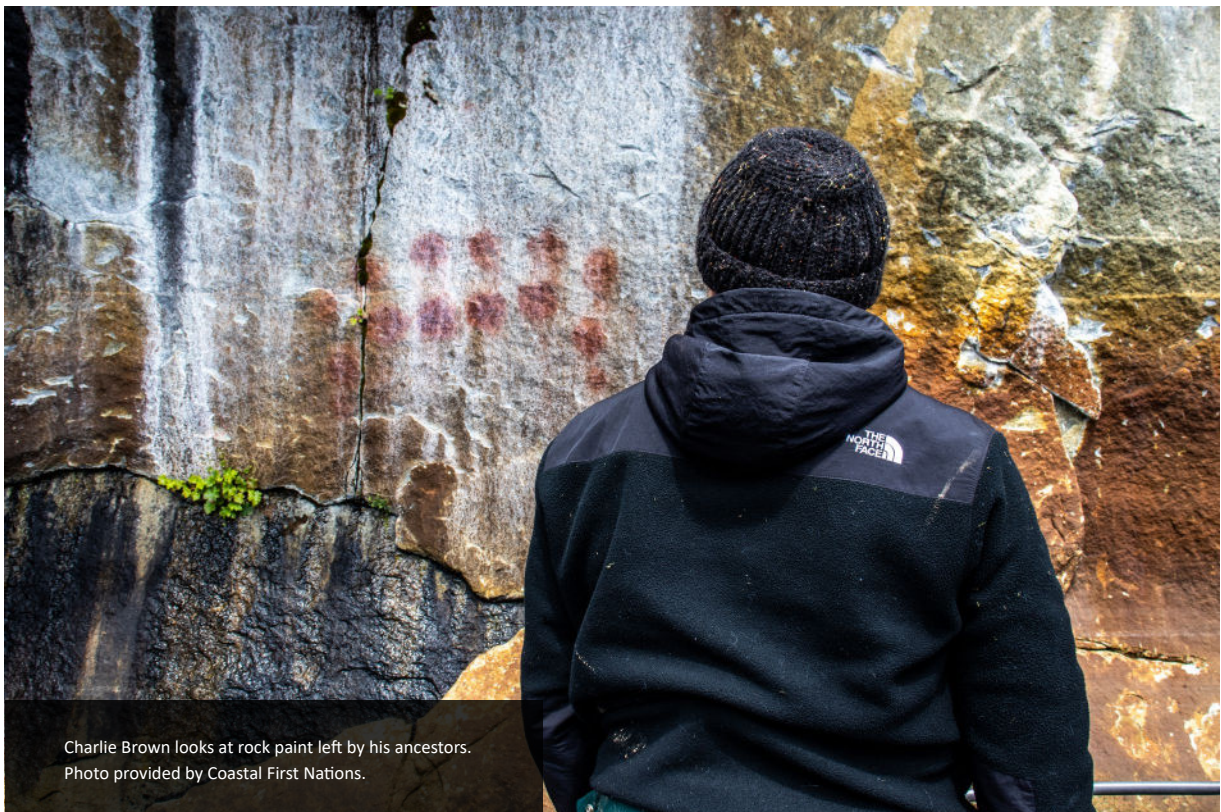
“In his research and work, Q̓íx̓itasu combines many approaches, practicing a new, yet ancient methodology, uniting many ways of doing things into one.”

“We do that when we come to a village where we know a song came from, or we’ll do a dance on the bow, we’ll chant, it’s so empowering, it brings life back to these places.”

Charlie, Q̓íx̓itasu’s nephew, who’s the co-founder of a growing Haítzaqv art and clothing company HstryMkers, says it’s not that they “don’t like outsiders coming in,” but having Haítzaqv

people identifying their own ancestral artifacts charges the work with a different meaning.

“Nobody in the world will have the connection we have to any of this. They won’t have that feeling we get when we



Charlie Brown looks at rock paint left by his ancestors. Photo provided by Coastal First Nations.



Haítzaqv member Charlie Brown says having his people identifying their own ancestral artifacts charges the work with a different meaning. Photo provided by Coastal First Nations.

put our hands on the rock, they won't have that cultural connection," Charlie says.

The tangible and intangible

Other major differences Óíxítasu encountered in his research was the way that people were documented, analyzed or cited by archeologists.

"Everything was from the scientific approach. It was acceptable to be going into burials and taking things that didn't belong to them for their analysis and later for their own interpretation," he says. "Often they would throw in a tokenism about the Haítzaqv or wrongful interpretation to Kwakwaka'wakw or Haida, Tlingit, etc."

In his research, Óíxítasu would come across information that wasn't appropriately sourced. He'd find the name of the person who conducted the research but not always the person who provided the knowledge.

"Any researcher, we're trained to build on what's already existing, but that also includes the oral history, who said it before," he says. "I knew when I wrote my thesis I would quote people perfectly, the way we do it in our potlatch."

"When you're sharing knowledge in a potlatch, you say 'this song belongs to, this history belongs to,' and you have to say the name, you can't blurt out information without acknowledging that sort of thing," he says.

He doesn't fault the "people who did the work previous to us," he says, but a place-based cultural interpretation adds important information to the pre-existing database. His work extends beyond the physical artifacts, the main focus for many archeologists—it's about the tangible and the intangible, he says.

"The rest, the socio-cultural part of it, what's embedded in that, how it was used, why it was used, where it was used, when it was used, how long it was used are all important," he says. "All of the artifacts, village sites, products of my ancestors' labour, are all reinterpreted as Łáxváí."

Łáxváí means strength or right of descent, he says. It's a term and concept fundamental to the potlatch governance system and remains rightfully present in his work. Óíxítasu uses his culture, potlatch knowledge and history and puts it into the reinterpretation of these artifacts.

"All of those physical tangible artifacts were made through Łáxváí, through the strength and right of these people to make an

artifact. Selection of these places wasn't based on preference, it's because an ancestor descended down and the descendants inherited it," he says.

Finding balance

Q̓íx̓itasu admits to sometimes feeling isolated in the work. He's proud to be an archeologist, he says, and he fits in with others in his field to an extent. But there are aspects of his M̓núxvit approach that others can't relate to. He'd love to work with more archeologists from neighbouring Nations, he says, and compare their finds, culturally-based approaches and interpretations.

"I have struggles internally and externally, and have to find that balance," Q̓íx̓itasu says. "That balance is the M̓núxvit approach."

He engages with other archeologists, reaching out to ask technical questions about lab work or keeping up to date with "what's new in western science we don't know here in the village," he says. Q̓íx̓itasu has named his independent business Central Coast Archeology (CCA), since that's the region he works in, his ancestral homelands and waters. Recently, he's been learning how to fly a drone, accessing new technology to offer more expansive views of their lands, waters and ancestral markings.

He hopes he and others doing the work can inspire youth in the community. He often works with youth in land-based healing outings, bringing them to visit sites, sharing stories, songs, artifacts.

"They're so used to seeing all these graduate students and outside people coming in and doing the work," he says. "We're doing it ourselves. It's a great sense of accomplishment that we're doing this where our ancestors were."

Q̓íx̓itasu says they don't publish their findings and rarely share outside of the community. It's work they do internally, he says, "almost like what we do in our potlatches, sharing our oral history."



Elroy White's tattoo proudly represents his organization 'Central Coast Archeology'. Photo provided by Coastal First Nations.

"If anybody wants to learn about rock art locations, interpretations and analysis, they don't have to go to the arch branch or main library, they come to the source, the culture centre or the HIRMD office," he says.

Q̓íx̓itasu says he never uses the word "decolonize" but he's been told that that's what he's doing.

"People tell me, 'you're decolonizing archeology,'" Q̓íx̓itasu says. "I don't know that. I'm just doing what I think is right and don't care what other people say. We're just rewriting history, that's all we're doing." ^{CM}

Published with Coastal First Nations' permission.

More information:

> <https://coastalfirstnations.ca/>

1. Heiltsuk Integrated Resource Management Department



Na Malsga Aks—The Story the Water Tells

By Kunkel, T., Shaw, K., Lyons, L., Quinlan, D., Bastin, H., Oskey, S.
Coast Mountain College

NORTHWEST BRITISH COLUMBIA (BC), with its rugged geography, proximity to the Pacific Ocean and variable climate, is in many ways the ideal setting for a college that offers place-based instruction to budding biologists.

Experiential Place-Based Learning

The strategic goal of Coast Mountain College (CMTN) is to become the college of choice for Experiential Place-Based Learning (EPBL). Taking advantage of the Pacific Northwest, its ecosystems and unique Indigenous cultures, the College is well on its way to achieving this goal by its target date of 2027. Experiential Place-Based Learning (EPBL) is about the land and complements CMTN's goal of creating adventurous pathways to transform lives through learning.

“Experiential Place-Based Learning (EPBL) is about the land and complements CMTN's goal of creating adventurous pathways to transform lives through learning.”

Coast Mountain College has worked hard to find creative ways to move its courses from the classroom into the field. The College offers a number of terrestrial field schools—Adventures in Northwest Watersheds, Icefields to Oceans, Coast Mountain Ecology, among others. Terrestrial field schools are relatively easy to implement; marine-based field schools... not so much. CMTN faculty and administrators had

a vision for a mobile marine classroom—a classroom on water with up-to-date technology—but for a long time the vision seemed to be out of reach.

Until recently, CMTN used the *Sea Lemon*, a 19' boat leased from the Department of Fisheries and Oceans that comfortably held four people. The drawback to the *Sea Lemon* was that, for a course with more than four students, much precious field time was spent ferrying cohorts back and forth to the site. Besides this limitation, the boat was not intended for use as a classroom and lacked the technology to fully support the needs of the Applied Coastal Ecology (ACE) Program.

Then, in 2019, Coast Mountain College received a \$250k grant from the BC Ministry of Advanced Education and Skills Training and a \$12k grant from Co-operative Education and Work-Integrated Learning Canada (CEWIL Canada). The grants enabled the College to purchase a 27' boat plus additional outdoor classroom and camping equipment for the ACE program.

The long-awaited mobile marine classroom was becoming a reality! The new boat could be outfitted with a crane and winch to lower sampling equipment for benthic cores, grab samples, traps and plankton tows. A remote underwater vehicle (ROV) could be purchased, as well as a side scan sonar and a single-beam echo sounder. Faculty and staff at CMTN were excited—this outdoor classroom would allow students to put theory into practice in marine environments using state-of-the-art equipment.

The Applied Coastal Ecology (ACE) Program

For more than 20 years, the ACE Program has prepared students for careers in coastal natural resources management, ecosystem restoration, environmental monitoring and related fields. The program balances foundational learning (e.g., biology, geography, chemistry and oceanography) with specialized courses in areas such as salmon, ground fish and shellfish

management; stream habitat restoration; rainforest ecology; and wildlife management.

Students in the ACE program receive important technology training in computer database management, GIS mapping, surveying, technical writing and presentation. They participate in real-world, community-based projects where they gain employment-ready experience and, ultimately, a strong sense of how coastal ecosystems react to anthropogenic stressors, ways of mitigating these impacts and methods of reclaiming and restoring ecosystems.

With a new mobile marine classroom, students would be able to practise coastal natural resources management, ecosystem restoration and environmental monitoring with the tools and technology they will use when entering the workforce.

Building capacity

The Pacific Northwest is currently poised for economic growth estimated at approximately \$18.7 billion, and the demand for graduates to support this development is strong. Building capacity in the skills required to conduct environmental assessments and to participate in other aspects of the proposed developments, particularly for local First Nations, is an integral part of the ACE program.

Many ACE graduates currently work in management positions with local First Nations (including Metlakla, Northcoast Skeena, Gitxaala, Nisga'a, Tsleil-Waututh and Lax Kalaams), provincial and federal governments, environmental consultants, port authorities and other supporting industries. Proud as it was of this track record, CMTN was anxious to expand its reach with its new and more effective mobile marine classroom.

The process

Securing the funding was only the starting point. The College struck a Boat Purchase Committee to determine the type of vessel needed, its usage and the costs associated with operating it. The committee put together a business case, which CMTN President's Council approved; but then Covid-19 interrupted the process until 2021, when a subcommittee convened to continue the work of securing a 27' boat and the outdoor classroom equipment (e.g., Blue ROV2, drones, underwater cameras, gravity corers, hydrophone, binoculars, safety equipment) that was required.

After much research, the subcommittee settled on a boat, the *Honey Bee*, and hired a marine survey company to perform a stability test and assess the overall condition of the vessel. The boat was pronounced capable of carrying 12 passengers (two instructors and ten students) and the repairs and modifications



Chair of the Coast Mountain College Board of Governors, X'staam Hana'ax (Nicole Halbauer). Photo provided by Coast Mountain College.

recommended during the survey were completed. Meanwhile, excitement was building. The long awaited mobile marine classroom was nearly ready to launch!

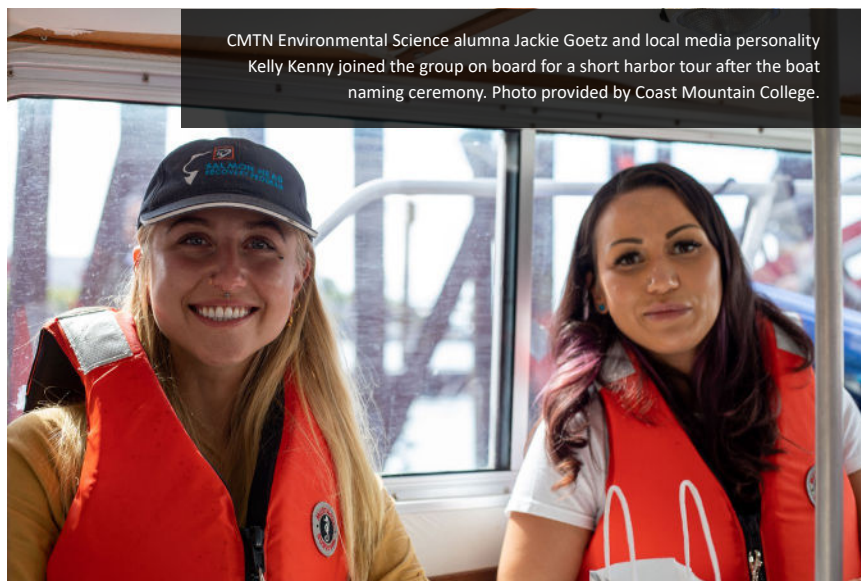
Indigenization

Since 1995, local Indigenous communities within the College region have supported and guided the College's ability to provide and grow Indigenous culture and knowledge into the student experience. CMTN is committed to incorporating the Calls to Action and Indigenization set forth by Canada's Truth and Reconciliation Commission with increasing depth and breadth, and to transforming the College's teaching and learning to be responsive to Indigenous learners and communities.

The Prince Rupert campus sits on the unceded territory of the Coast Tsimshian people and CMTN's field schools are held on their lands. With the acquisition of the *Honey Bee* came a new opportunity for Indigenization. CMTN's First Nations Access Coordinator, Sharon Oskey, worked with Elders in Prince Rupert to find a new Indigenous name for the boat. After much discussion and consultation, the Elders suggested *Na Malsga Aks*, which, in the Ts'msyen language, translates as "the story the water tells."

The CMTN subcommittee loved the name, as did many others, so a naming ceremony was planned for August 22, 2022 at the Prince Rupert waterfront. A crowd of more than 25 people looked on as Elder Murray Smith and Elder and Language Holder Velma Nelson, dressed in their regalia, used cedar branches to cleanse the boat and called out the name three times in a traditional Indigenous naming ceremony.

North Coast Member of the Legislative Assembly (MLA) Jennifer Rice, Parliamentary Secretary for Emergency Preparedness, represented Anne Kang, Minister of Advanced Education and Skills Training, at the dedication. Ms. Rice told the crowd that it was the Coastal Ecology Program that, more than 20 years ago, offered her adventure and a trek to a new life in Prince Rupert. "The new equipment will continue to teach the future stewards of the North Coast region," she said. Following the dedication, Ms. Rice and nine other guests enjoyed a tour of the harbour in the new boat.



CMTN Environmental Science alumna Jackie Goetz and local media personality Kelly Kenny joined the group on board for a short harbor tour after the boat naming ceremony. Photo provided by Coast Mountain College.

Going Forward

Na Malsga Aks and its state-of-the-art equipment will ensure that students of the ACE Program are well prepared for the workforce and equipped to help protect the sensitive environments of the Northwest Coast region for years to come.

As MLA Rice said in her address at the naming ceremony, "Here on the North Coast, we're fortunate to be surrounded by the complex ecosystems that make our region so unique.... The mobile marine classroom is a significant tool for carrying out the necessary work in protecting and monitoring this important coastal environment and training the future stewards of our Northwest region."

In the weeks following the dedication ceremony, College students have been active in the Aquatic Invasive Species Program, a partnership of CMTN, Fisheries and Oceans Canada and the Port of Prince Rupert. In early September, the students launched and examined settlement plates, which yielded invasive tunicate species, and trapped a number of invasive European green crabs (*Carcinus maenas*).

Program co-founder and current Coordinator Ken Shaw says, "We have reached the stage where we can confidently say that we offer the only diploma-level program in Coastal Ecology in North America with a range of practical experiences from the near shore, intertidal and oceanographic environments." And all this is thanks to the new mobile marine classroom, *Na Malsga Aks*. [CMTN](#)

Voting Matters

Disclaimer: the opinions expressed in **College Matters do not necessarily represent those of the College, its Council, or other registrants.*

By Cairine Green, B.A., M.Ed.

EVERY YEAR, THE College of Applied Biologists holds an election to choose new members from among their peers to serve on the College Council¹, the governing body that sets policy, administers provincial statutory standards of practice, and provides overall direction and support on behalf of its registrants. Annual elections, therefore, are key to the role of Council in College governance and critical to the ongoing development of the organization, the profession and the registrants.

As a former Lay College Council member for six years and as Chair of the Nominations Committee for two years, I had a bird’s eye view of how important the nomination and election processes are to the general well-being of the College and its registrants. That registrants have a critical voice, through the election process, to influence and guide the future of the College and their own professional development, is a significant privilege and responsibility.

Noteworthy is that the College of Applied Biologists boasts a register of over 3,000 registrants, equivalent to the populations of several of British Columbia’s regional districts, which are part of the fabric of local government across the province. As publicly elected bodies, they reflect representative democracy and we know that the more effective local government is at public engagement, the more likely voters will be informed and more willing to participate during a municipal or local election.

I suggest that the local government analogy is relevant when exploring registrant engagement and participation within the College—local governments are closest to its people, just as the College Council is close to its registrants. Therefore, a high level of registrant engagement not only leads to well-informed


professionals but also motivates registrants to participate in annual elections, either as candidates or as voters.

There is an undeniable correlation between the level of registrant engagement and the level of voter participation at election time. The opportunity for registrants to guide the future of the College through an annual election of Council members reflects the very best principles of a representative democracy.

Additional opportunities for College registrants to become more engaged and learn more about their profession, Council governance and College administration, are available through participation as a volunteer on one of the College’s five statutory

committees. Such volunteer activities not only provide participants with a deeper dive into the regulatory landscape in which the College operates but can also support candidate recruitment for elected College Council positions.

The ongoing health of the College of Applied Biologists depends on you, the

registrants. It’s important, then, to get involved, to get informed and to get out and vote during the annual election of College Council members. Remember, as a voting registrant, you have a unique opportunity and a stake in the election each year to help shape the future of the College of Applied Biologists and, ultimately, the future of the applied biology profession. As Jane Goodall once said, “What you do makes a difference; you have to decide what kind of difference you want to make.” 

“That registrants have a critical voice, through the election process, to influence and guide the future of the College and their own professional development, is a significant privilege and responsibility.”

1. Due to [changes to the Professional Governance Act](#), the College Council will become the College Board, and the positions of President, Vice President and Councillor will be changed to Chair, Vice Chair and Board member prior to elected registrants taking office in 2023.

Government of Canada's Notice of Intent— Labelling of Toxic Substances

By Mathew Coady, RPBio, MREM


ON OCTOBER 29, 2022, Environment and Climate Change Canada (ECCC) and Health Canada issued a [*Notice of Intent*](#) informing Canadians that the Government of Canada is evaluating labelling options for select products for some of the toxic substances identified in Schedule 1 of the Canadian Environmental Protection Act (CEPA) (Government of Canada, 2022). Chemicals added to Schedule 1 are those that have undergone a risk assessment and that may have an immediate or long-term harmful effect to the environment or constitute a danger to humans or the environment (Government of Canada, 2017).

As an environmental consultant that has completed multiple chemical risk assessments of municipal wastewater, I am aware that many Schedule 1 substances are readily abundant in our sewers. This includes chemicals banned decades ago in Canada, such as polychlorinated biphenyl (PCBs) and dichlorodiphenyltrichloroethane (DDT), that leach into our sewers from land-based contamination. Other Schedule 1 substances that are present in our sewers include chlorinated alkanes and polybrominated diphenyl ethers (PBDEs), flame retardants that are added to consumer goods (e.g., furniture) for safety purposes, which can enter sewers through laundry water contaminated household dust (Schreder and La Guardia, 2014), as well as per- and polyfluorinated substances (PFAS) that are abundant in landfill leachate, which is commonly directed to municipal wastewater plants (WWTPs) for treatment (Lang et al., 2017).

Each of the above referenced chemicals or chemical classes are environmentally persistent halogenated compounds. It is the very strong chemical bond between carbon and the halogen (e.g., chlorine, bromine, fluorine) atoms that results in these compounds being resistant to degradation under normal environmental conditions. Unfortunately, this property also makes these compounds difficult to treat using conventional WWTP technology, and concentrations released to aquatic receiving environments commonly remain elevated. Once in the environment, these persistent compounds are given opportunity to interact with living organisms and, in many cases, these compounds can bioaccumulate and biomagnify. In the Salish Sea, for example, each of the above referenced chemicals/chemicals

classes has been identified as a concern for the Southern Resident Killer Whale (SRKW) population (ECCC, 2020). Many of these Schedule 1 halogenated compounds have been documented to contaminate environments far away from their sources, such as the Arctic, through long-range atmospheric transmission (Kirk and Gleason, 2015). Due to their rampant use and environmental persistence, halogenated compounds like PFAS are exceeding safe planetary limits (Cousins et al., 2022).

Canadians should be given the right to choose products that are safe for humans and the environment, and the Government of Canada's labelling initiative is a positive first step. However, wording in the Notice of Intent is that only "some" Schedule 1 substances and select flame retardants are being considered for labelling; and as mentioned earlier, only those substances identified to meet the Government of Canada's definition of "toxic" following a risk assessment are added to Schedule 1. Unfortunately, this likely means that many environmentally persistent halogenated compounds won't be considered for consumer labelling. For example, Schedule 1 only lists two specific PFAS and a division of PFAS, and the majority of the 4,700 known PFAS will therefore be exempt from labelling. To date, the Government of Canada has only assessed the risks associated with 24 of the hundreds of halogenated flame retardants in Canadian goods. Lastly, as a professional risk assessor, it is admittedly difficult to know the full impact of chemicals to our health and the environment as there are so many elements of the risk equation that are currently outside of our realm of understanding (e.g., synergistic effects of exposures to other chemicals and non-chemical stressors, such as a changing climate).

The public engagement for the Notice of Intent is an opportunity for Canadians to ask the Government of Canada to do more with improving chemical ingredient transparency and reducing the levels of halogenated compounds in our homes, workplaces and the environment. More information on the Notice of Intent can be found below, and public feedback on the Notice of Intent can be emailed to Substances@ec.gc.ca until January 12, 2023. 

Notes & References

Presidential Ponderings: Traditional Knowledge and Western Science — Page 3

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Ending Helicopter Research through Meaningful Collaborations — Page 7

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COLLEGE MATTERS

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