LAKES Letter

This issue focuses on inspiration that comes from the pursuit of art, music, and other hobbies, and the connections forged between them and science.

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IAGLR amidst COVID-19

A unique time that calls for inspiration and creativity

by Paul Sibley

As I write this piece in early May, it occurs to me that even my cat, sleeping contentedly on the floor beside me in our study, is affected by the COVID-19 pandemic. In his case, the effect is largely positive, as he seems very happy to have me around a lot more; but he is, of course, oblivious to the reasons underlying his newfound situation. It is surreal to witness in real time the staggering increase in disease numbers and deaths around the world, along with the realization that we will all be affected by this for years to come. People speak of "the new normal" and "changed society." Time will tell, but, like many of you, my experience has been one of personal and professional change as I confront the potential impacts of the COVID outbreak.

Those of us in academia will face significant changes over the next year. In Canada, some universities have already decided that fall courses in 2020 will be offered only virtually. My university has not reached this decision yet, but it is likely,



and I have already begun preparing for virtual delivery of my two courses. This will be challenging. One of the courses is 50% field-based and the other includes a weekly laboratory. Creativity will be the order of the day to ensure that the teaching goals are met. Research has been significantly curtailed, and we have been instructed that no new research projects can commence until it is safe to do so. Since no one really knows when that will be, I have had to delay the start of one graduate student from May to September (and possibly January), and another, who had already begun, is faced with the possibility of a completely different project.

This week I attended a conference in Ireland. How is that possible? The entire conference—over 1,600 attendees—was converted to a virtual platform and I "presented" my prerecorded talk virtually. This was my first large-scale virtual meeting, and I was skeptical about how successful it would be. Honestly, I was blown away by the organization and functioning of the conference. Yes, there were a few technical issues during live sessions, but these were minor. More importantly, the science was still the science; only the delivery platform had changed (along with a much-reduced carbon footprint). Glass of wine in hand, I could listen (and relisten) to presentations at my leisure. As we all become more comfortable using virtual technologies, many have suggested that the new conference normal will be virtual delivery. I don't believe that physical meetings will disappear, but I do believe that we will see changes marked by a gradual migration to virtual meeting platforms, perhaps beginning with hybrid models that combine in-person and virtual options.

Many of you are regular attendees at the annual IAGLR conference and were undoubtedly disappointed to hear that the face-to-face version of the conference was canceled for the first time in its 63-year history. Canceling the conference was simultaneously one of the most difficult and one of the easiest decisions I have had to make professionally. It was an easy decision when viewed through the lens of public and personal safety. It was difficult because membership engagement is a core goal of the association, and the annual meeting provides the ideal forum to discuss new ideas about large

continued

lake science and policy, exchange professional and personal stories, and renew friendships. It is in this spirit that the board of directors decided to hold the conference virtually this year—another first in our history.

This past Friday, the website for the virtual conference went live. The planning was both intimidating and exhilarating, but IAGLR has an incredibly dedicated group of individuals, from the conference planning committee to board members, who embraced the opportunity. Lessons learned from this experience will serve us well in the future. For example, we are in the early stages of planning for the State of Lake Ontario 2020 conference and are developing a contingency plan in case it, too, has to be delivered virtually.

As it is for many professional societies, the COVID-19 pandemic is testing the resilience of IAGLR. One of my (new) goals in my remaining time as president is to ensure that we emerge from the pandemic with the same strength we have always had. To this point, as part of the virtual meeting, I am convening a "COVID-19 panel" to discuss the current and future impacts of the pandemic on all of us in the IAGLR family. I am sure you all have interesting stories to share—we would love to hear about them.

I hope that each of you has been able to establish a comfortable routine; perhaps you have discovered new interests or rediscovered past hobbies to keep you busy. I miss my thrice-a-week hockey games but have been doing much more hiking (fol-

The science was still the science; only the delivery platform had changed.

lowing distancing protocols, of course). My house has never received a spring cleaning like it has this year. If we want to save lives, staying put is the right thing to do. We may be at this for a while, but it is a price I am willing to pay, and a situation my cat, now on the study chair, is happy to endure.

Paul Sibley is IAGLR president and a professor at the University of Guelph.

IAGLR calls for policy based on science

Through membership in the <u>Consortium of Aquatic Science Societies</u>, IAGLR continues to add its voice in support of policy based on science. The united front of these aquatic associations is making a difference, as seen in a recent case before the U.S. Supreme Court.

In a 6-3 ruling in April, the Court rejected an attempt to restrict the Clean Water Act to direct discharges of pollutants, which would have categorically excluded pollutants conveyed through groundwater. In County of Maui v. Hawaii Wildlife Fund, the Court determined that aroundwater that reaches surface water can be the "functional equivalent" of direct discharge into surface water. Last November, IAGLR joined CASS in filing an amici curiae brief with the Court in support of the Hawaii Wildlife Fund. Much of the marjority's opinion was consistent with what the societies wrote in the brief.

IAGLR also joined CASS in filing another *amici curiae* brief in support of multiple states that are asking the Court to issue a nationwide injunction to prevent the new Navigable Waters Protection Rule from going into effect. The 2020 rule will eliminate Clean Water Act protection for many aquatic ecosystems and thus will cause irreparable harm to those who benefit from and rely on the integrity of the nation's waters. The brief argues that the 2020 rule enables the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers to ignore available scientific tools and data when considering the extent to which actions will reduce Clean Water Act jurisdiction.

IAGLR also joined CASS in a comment letter to the EPA criticizing a proposed rule to "strengthen transparency in regulatory science." If enacted, the new rule would "undermine EPA's ability to use the best available science in its policymaking process and thus impede EPA's mission to protect human and environmental health."





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A GREAT SCIENCE TRADITION CONTINUES

CROSSING BORDERS

ART, SCIENCE, AND THE GREAT LAKES

by Anne Moser

While the idea of scientists and artists collaborating may sound like a 21st century concept, the history of these disparate disciplines working in tandem dates back thousands of years. Scientists have long used art to document and illustrate, while artists have sought out science as inspiration. We see it in the prehistoric art in the caves of southern France, the human anatomy drawings of the master Leonardo da Vinci, and the exquisite masterpieces by John Audubon. The link continues today, as scientists and artists connect deeply to mutually inform their work. Artists are studying scientific findings to accurately communicate their concerns and inspirations, while scientists are searching for ways to better translate their research through art to engage a broader public in their findings.

Recent education and outreach projects at the University of Wisconsin Sea Grant Institute (WSG) have taken this interdisciplinary approach by combining art and science to communicate Great Lakes research. We have taken inspiration from our work with children, who dive into scientific learning with an open mind, interdisciplinary nature, and artistic flair. The three projects featured here highlight opportunities where unique partnerships were forged and surprising common ground found between artists and scientists. Each exemplifies the crossing of disciplinary boundaries, with the goal of a more science-informed society, regardless of age, socioeconomic status, or education.

We welcome collaborations from across the Great Lakes watershed. Please contact the author at akmoser@aqua.wisc.edu.

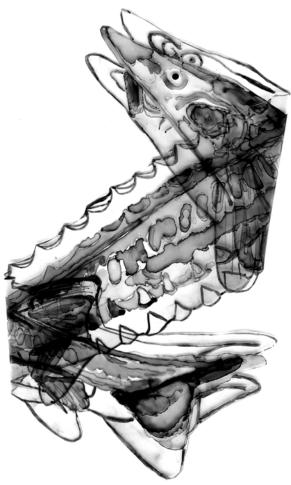
Anne Moser is the senior special librarian and education coordinator at the University of Wisconsin Sea Grant Institute.



THE POLY PLEDGE

In 2016, J. Leigh Garcia, at the time a student in the University of Wisconsin-Madison Master of Fine Arts program, approached the Wisconsin Water Library looking for information about plastic pollution and fish consumption. Although she was originally concerned about the impact plastic might have on her health, her library reference question eventually led to a public art installation on the UW-Madison campus. Leigh and a collaborator, Pete Bouchard, created a human-powered vending machine that dispensed reusable screen-printed shopping bags in exchange for pledges not to use plastic bags for one month. About 130 people took the pledge. WSG then held a symposium that featured Garcia and Bouchard talking about their artistic approach and the goals of their public performance. This artists' talk was paired with a science presentation by Loyola University Chicago Associate Professor Timothy Hoellein, who gave an overview of his research on the sources and impacts of anthropogenic litter (trash) around Chicago. - A.M.

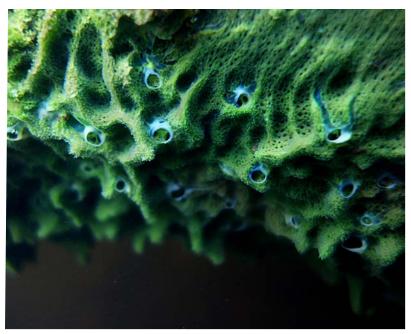




By artist Samantha Corbett

ANCIENT SURVIVORS

Inspired to generate dialogue and discussion between art and science, two professors at the University of Minnesota Duluth curated almost 50 black and white images of lake sturgeon to help tell the story of the Great Lakes. These artistic interpretations formed the basis of several outreach programs, including a collaboration with the Thelma Sadoff Center for the Arts in Fond du Lac, Wisconsin. During early 2019, the THELMA mounted an exhibition, pictured above, in conjunction with the winter sturgeonspearing season on Lake Winnebago. The exhibition included the artwork as well as artifacts and historical objects never previously collected in one place. Over 10,000 people learned the conservation story of an ancient fish brought back from the brink of extinction through newspapers, decoys and spears, audio recordings, scientific papers, sculpture, and drawings. - A.M.



Portrait of a Freshwater Sponge by Jonathan

UNDER THE SURFACE

At Northwest Passage in northwest Wisconsin, youth in mental health treatment have the opportunity to go under the surface as part of an innovative curriculum that blends art, science, and therapeutic healing using underwater photography. This WSG-funded project has resulted in a photography exhibition that has traveled to libraries, visitor centers, and other public spaces around Wisconsin, showing the power of water to heal and restore. As one visitor to a show noted, "This exhibit took my breath away. I am blown away by how these kids have overcome pain and hardship and channeled emotions and experiences into creating great art." - A.M.



Under the Surface by Hailey

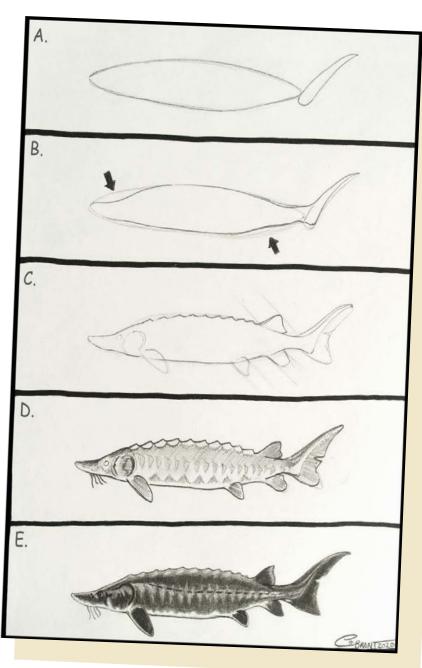
HOW TO SKETCH A LAKE STURGEON

by Cory Brant

Begin by finding photos or specimens of the species to work from. If you have access to an aquarium, you can work from live species. Many aquariums have live digital feeds that allow you to watch the fishes! Preserved specimens in a lab or museum are also an option, as are your own photos or fair use photos on the internet. I prefer a drawing paper that is heavyweight. For this drawing, I'm using 80 lb. acid-free paper and a collection of pencils noted below. Since I'm currently self-isolated due to the global COVID-19 pandemic, and since art supplies are low, I recently discovered that a cut piece of brown paper bag works great for drawing.

- A. Start by sketching two main shapes.

 Sturgeon are torpedo-shaped with a sickle-shaped tail and a unique snout that looks like the side of a shoe.
- B. Adjust your shapes based on the shape of a sturgeon. You will be erasing a lot at this stage as you work out the general body outline. A #2 or 2H pencil is best.
- C. While looking at references, continue to refine the outline of your sturgeon. Add the fins, gills, and the eye. Pay special attention to the fins' locations on the body, their shapes, and their proportions to one another.
- D. At this stage, make sure you are happy with the outline and fins. You can bold the outline with a softer graphite pencil like a 2B once you decide you like it. On big projects, I sometimes spend days adjusting things at this stage. Keep checking reference photos, and, while using softer pencils, shade in rough shapes and features like scutes, gills, or shadows. This is a good time to practice a technique called *hatching* that entails rapidly scratching closely spaced parallel lines to create tonal or shading effects.
- E. Now it's time for details and blending. At this point I like to use softer pencils, 2B-4B, and a blending stump (a tightly rolled piece of tissue works). I'm left-handed, so I like to work from right to left to minimize smudging (it happens anyway). Continue to sketch and blend, paying attention to lighter versus darker areas on the fish. Often the fins of a lake sturgeon appear dark with light edges. Scutes along the back can be shaded lighter while the mid-body region can be shaded dark to give the appearance of light shining down on the fish. Don't forget the four barbells (whiskers) on the snout! I often leave the belly white or lightly shaded. Have fun, and don't be afraid to add your own style!



Cory Brant is an associate researcher with the Great Lakes Fishery Commission. For more on Cory, see page 12.



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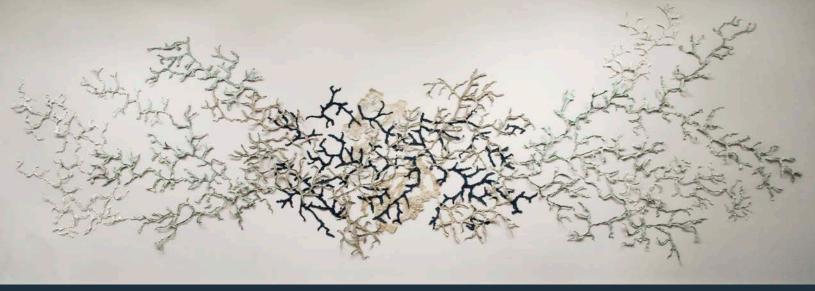


May Babcock and Megan Singleton, detail of *Ebb and Flow II*, 2017, 14 x 20 feet, handmade paper pulp, laser-cut handmade paper (abaca, cotton, Japanese knotweed, *Phragmites australis*, Eurasian watermilfoil, variable milfoil, inflated bladderwort, *Codium fragile*, *Heterosiphonia japonica*). Courtesy of May Babcock.

Waterways and local plants inspire papermaking artists

by May Babcock and Megan Singleton

In the summer of 2016, artists May Babcock and Megan Singleton collaborated to create the first of a series of seven installations titled *Ebb* and *Flow*. Rooted in hand papermaking processes, *Ebb* and *Flow* is based on research of dendritic waterways and plants found in local landscapes.



May Babcock and Megan Singleton, *Ebb and Flow*, 2016, 12 x 25 feet, handmade paper pulp from Mississippi River mud, abaca, cotton, *American lotus*. Courtesy of Megan Singleton.

The geomorphology and plant ecologies of these landscapes are the inspiration for the installations of handmade paper, in not only how it shapes the gallery space and the viewer's experience of it, but in the imagery and paper pulp used. As both site-specific and place-based installations, unique iterations of *Ebb and Flow* have been installed in both gallery and public spaces across the country, including the St. Louis Lambert International Airport, the Rhode Island State House, and Brown University.

Ebb and Flow II was created for the mural space at the Granoff Center, a Brown University building in Providence, Rhode Island. To reflect the state's ecologies, we based the artwork on the Narragansett Bay watershed and invasive plants. Through the spring season, we visited nine different sites around Narragansett Bay to collect plant fiber to make into pulp for the paper installation. The final plant list represented freshwater, riparian, and marine species. We were especially inspired by red seaweed (Heterosiphonia japonica), and the warm-red tones in the final installation are reflective of that. A taxonomy display of the plants collected and used for fiber was also created, and this portion of the installation was intermittently hidden or revealed depending on the sliding wall positioning. Adjacent to the organic line drawings of pulp, one can see the plant silhouette and its common and scientific name. The silhouette shapes are laser-cut from handmade paper sheets made from the plants they depict.

May Babcock is an interdisciplinary artist working in paper, print, and installation, based in Providence, Rhode Island. You can see more of her artwork via www.maybabcock.com and @maybabcock on Instagram. Megan Singleton is an interdisciplinary artist work-

ing in paper, sculpture, and installation, based in Saint Louis, Missouri. Her artwork can be viewed on www.megansingleton.com and @missmegansingleton on Instagram. Both artists are community educators and have extensive exhibition records nationally and internationally.



May Babcock and Megan Singleton, *Ebb and Flow II*, 2017, 14 x 20 feet, handmade paper pulp, laser-cut handmade paper (abaca, cotton, Japanese knotweed, *Phragmites australis*, Eurasian watermilfoil, variable milfoil, inflated bladderwort, *Codium fragile*, *Heterosiphonia japonica*). Moveable wall section is to the left of the artwork, and at times conceals the grid of plant silhouettes. Courtesy of May Babcock.

KUDOS

IAGLR promotes participation and excellence in research on large lakes of the world and their watersheds. As part of that effort, for more than 30 years the association has awarded scholarships and awards to students showing early promise in their research careers. Congratulations to this year's recipients!



TAYLOR BROWN (Cornell University) for receiving a 2020 Norman S. Baldwin Fishery Science Scholarship for "Contemporary Spatial Extent and Ecological Drivers of Larval Coregonine Distributions across Lake Ontario."



JOSIE MIELHAUSEN
(University of Guelph) for receiving the 2019 IAGLR
Best Poster Award for "Fish 'passability' in modified vortex rock weir systems," presented at IAGLR's 2019 conference in Brockport, NY.



JORDAN HOLTSWARTH
(University of Illinois Urbana-Champaign) for receiving a
2020 Norman S. Baldwin
Fishery Science Scholarship
for "An integrative taxonomic
and ecological assessment
of banded killifish across the
Great Lakes Basin."



POLLY PETERSON (University of Toledo) for receiving the 2020 David M. Dolan Scholarship for "Bayesian modeling applications for addressing algal bloom issues in Lake Erie."



LEON KATONA (Wright State University) for receiving the 2019 IAGLR Best Paper Award for "Variability in sediment and mussel-associated algal biomass along a depth gradient in Lake Ontario," presented at IAGLR's 2019 conference in Brockport, NY.



RENE SHAHMOHAMADLOO (University of Guelph) for receiving the 2020 IAGLR Scholarship for "Microcystins in the Great Lakes: Mechanisms of toxicity and risks from consumption of fish."



MEMBER PROFILE: CORY BRANT

Associate Researcher, Great Lakes Fishery Commission



My research primarily focuses on invasive sea lamprey in the Laurentian Great Lakes—from pheromones and physiology to the human dimension and history of the invasion and response. I recently published a book titled *Great Lakes Sea Lamprey: The 70 Year War on a Biological Invader* that tells the sea lamprey story through the lens of those who lived it. I'm also involved in cisco and whitefish restoration in the Great Lakes.

Describe your creative pursuit. As a kid, I remember pretending to discover new species around the yard, sketching and "describing" each new creature in my trusty field journal. These days I work with graphite, ink, and watercolors. I mainly illustrate freshwater fishes, along with the occasional portrait or landscape. A few years ago, I began sharing both science and art on social media, and it's since become a big part of my professional and personal life. After finishing up graduate school, the close friends I had made during my time at Michigan State University moved to different parts of the world in pursuit of new scientific adventures. This left me feeling isolated. Finding a group of like-minded artists became important to me, but social media was not where I expected to find it. Yet I discovered a highly engaged community of scientist artists on Twitter when I came across the hashtag #SundayFishSketch. Every Sunday, a group of wonderful fish nerds from around the world who like to draw fish share their work on Twitter using this hashtag. It was started by artist and scientist Rene Martin, @Lampichthys, a Ph.D. candidate at the University of Kansas studying the evolution of deepsea fishes. The #SundayFishSketch group is inclusive, global, supportive, and a regular reminder for me to stay involved and keep practicing my scientific art.

How does this pursuit influence your science? Art influences all aspects of my science and vice versa, especially as it relates to my communication and engagement efforts. Fishes are fascinating organisms that people don't get to see that often in detail: mysterious, unseen, and therefore easily overlooked. Bringing that detail to life in an illustration is a special thing that can hook folks to the science beyond the sketch. Art allows me to tell a visual story about my research—something we can rarely do in an academic journal.

Does it make you a better scientist, and if so, how? I'm certain it makes me a happier scientist. I work on complex and mostly negative environmental issues, and it can get overwhelming. When I focus on biological illustrations and all the details that make a certain species unique, it helps me settle my mind and process my emotions from the day, as well as understand and acknowledge the stress that can come along with being in academia. I've often thought of new research questions while illustrating, and regularly think of new things to illustrate while conducting research. I think both scientists and artists have a lot to gain by incorporating the other into their work. Both require a deep level of curiosity, experimentation, patience, and a high tolerance for failure. My illustrations connect me with my own creativity, allow me to communicate detailed science in a fun way, and channel my enthusiasm for fishes—their interesting shapes, diverse colors, fascinating habits, and connections with humans. Art helps me to be the best scientist I can be.



Small-mouth bass. Watercolor by Cory Brant, 2019.

DARRIN HUNT

PH.D. CANDIDATE, BIOLOGY, WAYNE STATE UNIVERSITY



music, and there was always a guitar around the house when I was growing

up. I was drawn to my dad's guitar and started playing before I was big enough to properly hold it, and when I was old enough, my parents gave me an electric guitar of my own. Shortly before so received a skateboard. These

that, I also received a skateboard. These two instruments have provided a lifelong lens through which I view the world.

Skateboarding in the 1980s was deeply intertwined with punk rock music, and naturally, I became aligned with a community of like-minded punk rock musicians. This led to my friends and I starting a band, and then another, until skateboarding and punk rock became our primary means of socialization. I still play music with my friends, and I would not give it up for anything. I am a better, more well-rounded scientist because of it.

HOW DOES THIS PURSUIT INSPIRE OR INFLUENCE YOUR

SCIENCE? By nature, punk rock is independent. It has separated itself from the rest of the music industry, and most of its enthusiasts would have it no other way. Much like punk rock music, skateboarding in the '80s and '90s was more of an act of resistance than a sport. Since that time, skateboarding and punk rock have evolved into multi-million dollar industries, and, while many resented this newfound popularity, I saw this as an opportunity to watch something unique happen—to see subculture become pop culture.

Observing the convergence of "our" subculture with "their" popular culture impacted me. Though I saw this evolution of punk rock and skateboarding as necessary, forward movement, I was concerned that the important do-it-yourself principles would not embed themselves in future generations the way they did with mine. These principles, which are centered in self-motivation and "stick-to-it-iveness," are important elements in shaping my character, and I have applied them in my career in the sciences.

DOES IT MAKE YOU A BETTER SCIENTIST, AND IF SO, HOW?

My work in the punk rock music scene has fortified me with the necessary independence to successfully plan and carry out my research goals. My successes in the arts had little to do with conventional measures. We did not care much about money or widespread acclaim. Our efforts were driven by self-satisfaction, and we felt lucky to be a part of something unique and special that was taking place in southeastern Michigan. This enthusiasm and resilience allowed me to remain strong in the face of failing experiments, while exploring unknown ecosystems and navigating the inherent self-doubt we all experience during graduate school.

When I first started my Ph.D., I wanted to compare the tolerances of various environmental toxins on resurrected and modern microcrustacean communities. I worked on this project for nearly two years, but I could not maintain my resurrected zooplankters for longer than a month. After much contemplation and discussion with my adviser, we decided to nix the project and revise my dissertation.

As of now, I am on the cusp of graduation. Though I lost two years working on a failing project, I sampled aggressively, made up for lost time, and put myself back on schedule for a timely graduation. I believe that recoveries such as these are, at least in part, thanks to the fortitude and resilience I garnered in my punk community.

VIDEOS

Visit the following links for a sample of Darrin's music:

Darrin Hunt, The South Wind, 2020, Recorded for Lakes Letter

Few and Far Between, Coming to Get You, 2011

Few and Far Between, Take Control, 2009

> King for a Day, Lazy, 1997

Roosevelt's Inaugural Parade, <u>Vendor</u>, 1995



My dissertation research has largely dealt with the invasion and establishment of nonnative bivalves in small stream (<30m wide) ecosystems. I have documented population densities and assessed the impacts of bivalve invaders (dreissenid and cyrenid) on native, benthic macroinvertebrate communities throughout the Great lakes and southeastern United States. My research has included natural history surveys in Michigan, Ohio, Georgia, and Puerto Rico. Additionally, I have conducted enclosed mesocosm experiments through several Great Lakes tributaries. I also co-manage Dr. Donna Kashian's lab.

MEMBER PROFILE



MEMBER PROFILE

JÉRÔME MARTY

Project Director, Council of Canadian Academies
Past President, Society of Canadian Limnologists & IAGLR

At the Council of Canadian Academies, I work at the interface between science and policy. Prior to joining the CCA in 2016, I was a research scientist at the St. Lawrence River Institute, where I worked on aquatic invasive species in the Great Lakes and on eutrophication in the St. Lawrence River. In 2019, I became the chair of Partnership Group for Science and Engineering and was nominated to the Science Advisory Board of the International Joint Commission. When not working, I can be found biking, paddling, or playing accordion.

My first exposure to the study of limnology consisted of spending hours observing diatoms under an electronic microscope in the laboratory of Dr. Antonella Cattaneo at the Université de Montréal. At that point, I was probably more fascinated by the geometry and beauty of these algae than by their ecology. While becoming a researcher, I maintained a connection with the arts because I believe it helped me to be more creative scientifically. Practicing music has provided me with a space where I could immerse myself and take a muchneeded break. Performing music in public may have taught me

how to better connect with my audience while delivering scientific presentations.

Recently, I have started to incorporate music into my public presentations and share ideas on the links between the arts and science. The <u>CreativeMornings</u> speaker series was an opportunity to talk about the importance of water as a resource and also about its beauty (by showing diatoms) and its role in shaping who we are today (by playing Les Raftsman, a loggers song that

preserves the memory of a hard life mixed with a certaine joie de vivre). This experience showed me that scientists may be able to convey effective messages to a wider audience in ways in which they were originally not trained to do so.

VIDEOS

Visit the following links for a sample of Jérôme's music:

Rose of Raby
Recorded for Lakes Letter on
Earth Day, 2020

<u>Les Raftsmans</u> The CreativeMornings (at ~4:30 mark in recording)



MEMBER PROFILE: CATHERINE MASSON

Ph.D. Candidate in Canadian Studies, Trent University



2020 is a significant year for parks and protected areas across large lake complexes. Canada is signatory to the landmark 1992 U.N. Convention on Biological Diversity and must protect 17% of terrestrial and inland water areas under Aichi Target 11 (2010) and Canada Target 1 (2015). I am undertaking a comprehensive global-to-local freshwater biodiversity review. The Trent University Canadian Studies Ph.D. program will enable me to make vital contributions as we move forward.

Watercolor portrait of Catherine Masson by her mother, Joan Masson.

Describe your creative pursuit.

Great Lakes open water swimming is my personal challenge. I will swim anywhere so long as conditions are safe. The lakes provide an everchanging panorama of color, light, temperature, sensation, and sound. Polished rocks roll beneath as the swimmer is raised by the crests and lowered in the trough of progressive waves. Flex, reach, rotate, roll, breathe, and again. Credit youthful training for older ability. The goal is to swim long term for health, well-being, and the good of the lakes. Come on in folks, the water's fine!

How does this pursuit influence your science? The beaches I recreate on are subject to the Canada–U.S. Great Lakes Water Quality Agreement. Together, oversight institutions, federal, provincial, state, indigenous, and local jurisdictions,

scientists, academics, nongovernmental organizations, and citizens all share responsibility for managing nutrients, pollution, and algae, assessing drivers and baselines, setting priorities, providing leadership, collaborating, and demonstrating flexibility. Knowing who and what keeps our lakes clean helps me swim nearshore waters with confidence.

Back on dry land, I work to advance large lake science and policy through scholarship, public policy research, strategic planning, management support, and communications. I contribute to Canada's climate, water, and fishery initiatives and evaluate international, national, and provincial environmental agreements. I travel widely across northern Ontario year-round and observe first-hand the daily exigencies facing remote and Indigenous communities.

Does it make you a better scientist, and if so, how? Open water swimming is the missing piece of my Great Lakes—St. Lawrence River intellectual inquiry. It is more profound and immediate than looking out from the shoreline, a boat, or an airplane (or at reports, spreadsheets, and websites). The principal aptitude for swimming in the wild is a 'feel for the water'—intent focus and total commitment to the opportunity that time and place present. This is the art of surrender rather than the science of stroke mechanics.

I resolve to navigate this realm with competence toward a deeper appreciation of the waters of our Great Lakes and mighty rivers and, in so doing, develop robust and usable guidance for governments, communities, and citizens—across generations and over horizons.



Fort William First Nation, Chippewa Park main beach in Thunder Bay, Ontario.

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Lakes Letter is published quarterly by the International Association for Great Lakes Research, a scientific organization made up of researchers studying the Laurentian Great Lakes, other large lakes of the world, and their watersheds, as well as those with an interest in such research.

Edited by Paula McIntyre, IAGLR Communications Director

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