

DATA AS ART:

An Exhibition of the Issues
that Lakes Face

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“What are the sciences? Only categories for thinking. Sciences can be taught separately, but they can't be used separately, either for seeing land or doing anything with it. What is art? Only the drama of the land's working.”

— Aldo Leopold, North American Wildlife Conference 1942

“If you've seen one lake, you've seen one lake.”

— A phrase heard often at a GLEON (Global Lake Ecological Observatory Network) meeting

Art is a way to connect our science to the broader public. Science-art collaborations can be effective for transmitting concepts and reshaping misconceptions (Arce-Navario 2016). Art can act as a framework for visual and social experiences, which can create empathy toward the natural environment, generating appreciation and concern simultaneously (Marks et al. 2016). Underlying the goal of making emotional and aesthetic connections is that people are more willing to invest in conserving what they appreciate and value (Curtis 2009). The Association for the Sciences of Limnology and Oceanography (ASLO) has made efforts to help bridge the gap between science and art through projects such as the “WaterMarks: Where Art Meets Science” initiative. This was first introduced by Ajit Subramaniam at the 2018 meeting in Victoria, British Columbia and a similar series of presentations, dialogs, and activities were held in 2019 in Puerto Rico (Elder and Miller 2019). Continuing these transdisciplinary conversations will make important contributions to our outreach and public education efforts.

Anthropogenic impacts on lakes are broad and highly relevant to the challenges we face as a society. For most but not all lakes, climate change is recorded as warmer water temperatures (O'Reilly et al. 2015). Higher temperatures are linked to increasing algal blooms in

general (Ho et al. 2019), as well as harmful algal blooms that create toxic water conditions (Hayes et al. 2020). Reductions in ice cover have been widely documented, which can affect many aspects of lake ecosystems. Atmospheric warming leads to glacial melting, impacting meltwater lakes (e.g., Olson et al. 2018; Fariás-Barahona et al. 2020). These climate stories can be complex, compounded by other anthropogenic impacts. Interactions and legacy effects can create unique and persistent problems (Watras et al. 2020). The situation becomes more convoluted because responses can vary by lake—climate change reduces mixing and decreases nutrient availability in Lake Tanganyika (O'Reilly et al. 2003) but is contributing to enhanced mixing and increased nutrient availability in Lake Baikal (Swann et al. 2020). In some ways, it is not surprising that the majority of the public gives climate scientists low marks for their understanding of climate change (Pew Research Center 2016). Only 40% of U.S. adults trust climate scientists “a lot” to give full and accurate information, while the remainder trust them somewhat, not too much, or not at all (Pew Research Center 2016).

A new art exhibition *Alice Hargrave: The Canary in the Lake*, available virtually and in person from 04 March through 16 May 2021, aims to help citizens connect to lakes around the world while highlighting anthropogenic impacts on aquatic ecosystems. Climate change is an overarching theme, and the exhibition explores how climate warming alters other aspects of lake ecosystems. The inspiration for this exhibition came from a desire to illustrate how diverse and unique lakes can be. O'Reilly was interested in exploring ways to help the public understand the dynamic nature of lakes, rather than perceiving them as flat two-dimensional surfaces that appear unchanging. The scientist–artist collaboration was initiated when O'Reilly met Alice Hargrave during her *Paradise Wavering* exhibition at University Galleries of Illinois State University. Hargrave's *Paradise Wavering* exhibition included works that incorporate the wavelengths of the songs of threatened bird species depicted with the colors of the birds, using data from the Cornell Lab of Ornithology. The artist uses color to evoke memories, reminiscent of how photographs age over time. The new *The Canary in the Lake* project was launched with funding from The Andy Warhol Foundation for the Visual Arts, procured by Kendra Paitz, Director and Chief Curator at University Galleries of Illinois

State University, where the exhibition is being held. A 1-month residency at Flathead Lake Biological Station allowed Hargrave to immerse herself in creating the artwork as well as providing opportunities to engage with scientists, including a field trip out sampling the lake.

The artwork was created using data sets from various lakes across seven continents and represents a range of environmental issues. The data include published and unpublished datasets, much of it gathered through connections with members of the Global Lake Ecological Observatory Network (GLEON) after Hargrave and O'Reilly attended the 2019 annual meeting. Each work transforms scientific data into unique patterns using colors, local lore, and vintage photos associated with the lake to create “lake portraits.” These prints, on semi-transparent fabric, soar 10 ft into the air and are hung in a multilayered installation called “The Conference of the Lakes,” in reference to Farid ud-Din Attar's 12th century poem, “The Conference of the Birds.” This poem describes the difficult journey that must be taken to reach enlightenment, along with the excuses that can hinder progress—in much the same way humanity has been making excuses for not tackling the climate crises. It underscores the ideas of individuality that are present in the lake portraits, as well as the idea that people have the ability to evolve, and that the journey can be one of success if surmounted as a group (e.g., a conference) rather than by individuals with selfish shortsighted goals. Simultaneously, the title is a nod to the gathering of scientists at their own conferences. The patterns create an image of something invisible, whether that be experiential or climate shifts that one cannot see in real time. The combination of the different lakes together in their “conference” is striking, as the incredible range of lake colors (from pink to brown to blue to green) hearkens to their uniqueness (Fig. 1).

Our hope is that this exhibition engages the public and students; helping them to explore the uniqueness of each lake and to recognize that there are many concurrent stressors. Contextual information about the lake and the data is provided for each piece, which allows for increased personal meaning (Keller et al. 2020). Environmental art can be particularly effective in group settings, as a way to generate discourse and communication (Grant et al. 2015), so we encourage instructors to take advantage of the virtual programming that is available for this exhibition. If you are teaching limnology,

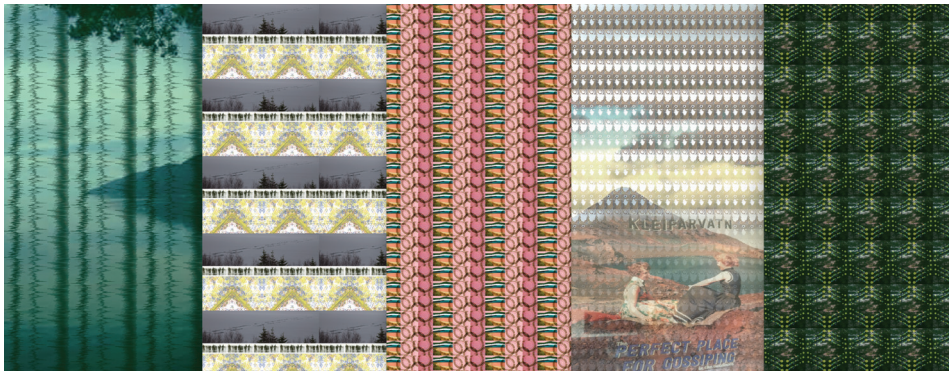


FIG. 1. A compilation showing the artwork for five of the lakes. Each lake hangs as one individual panel on semitransparent fabric.

environmental science, water resources, or other similar courses, a virtual tour or classroom visit could be a way for your students to experience scientific data in a new way that aligns with your existing curriculum and goals. Exhibition tours are available virtually for individuals or classes, and Catherine O'Reilly and Alice Hargrave are available to do virtual visits to classrooms. There is a list of related readings, with a relevant scientific paper for each of the lakes, often the paper from which the data were taken to create the art. Activities and updates, including a virtual panel discussion, are announced on the website for University Galleries of Illinois State University as they are scheduled (<https://galleries.illinoisstate.edu/exhibitions/2021/alice-hargrave/>). Appointments to tour the exhibition and requests for classroom visits can be made by emailing galleries@illinoisstate.edu or calling 309-438-5487. Opportunities for the exhibition, or parts of it, to travel are available, and as this work quickly became addictive, we hope to continue expanding the lakes and issues that are incorporated.

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