

Vanishing Ice:

Art as a Tool for Documenting Climate Change

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Artist-Naturalists in Interdisciplinary Exploration

The work of artists as naturalists, scientists, documentarians, and explorers has long been part of an interdisciplinary approach to scientific studies. As museum educators, we have gained inspiration from the exhibition *Vanishing Ice: Alpine and Polar Landscapes in Art, 1775-2012* (Matilsky, 2013) and discovered how historical and contemporary artists document and communicate the stunning landscapes of alpine and polar regions, portraying dramatic alterations resulting from climate change. Here we present projects to introduce upper elementary students to the important role that artist-naturalists play in science, while exploring three themes: relationships of people to the land, art as a pedagogical tool in exploratory and scientific expeditions, and art as activism.



Figure 1 (far left). Samuel Nussbaumer, *Vue prise de la voûte nommée le Chapeau du glacier des Bois et des Aiguilles du Charmoz* (View of the Glacier des Bois and the Needles of Charmoz), 2005, color photograph.

Figure 2 (above). Jean-Antoine Linck, *Vue prise de la voûte nommée le Chapeau, du glacier des Bois et des Aiguilles du Charmoz* (View of the Glacier des Bois and the Needles of Charmoz from the arch, called the Cap), 1799, colored etching, (Bibliothèque de Genève; info.bge@ville-ge.ch) photograph by H. J. Zumühl.

Throughout time, artists have extensively documented the evolving cultural, economic, spiritual, and artistic connections between humans and ice-clad lands. Indigenous knowledge shaped cultures of Arctic and alpine regions, and many expeditions benefited from this knowledge about food, clothing, shelter, and weather conditions (Cruikshank, 2001; Matilsky, 2013). Commerce motivated many early Western expeditions, from Dutch and American whalers to mariners searching the Arctic for fashionable seal fur and potential Northwest trade routes (Matilsky, 2013). Scientific, literary, and artistic interest spurred tourism in alpine regions in the 1800s, drastically altering local economies. Similarly, travel to Antarctica has profoundly transformed a historically uninhabited region into an important scientific site and a highly prized tourist destination.

The role of artist documentarians often intersects that of naturalists, scientists, environmental activists, and explorers. From early alpine and polar expeditions of the late 1700s to current scientific travel, artists have embarked on or been contracted to join expedition teams to provide unique perspectives and revealing imagery. As Matilsky (2013) notes, "The artist-explorer, working alongside scientists in the extreme climates of the Arctic and Antarctica [and alpine regions], introduced the public to an alien but alluring environment"

(p. 112). For instance, photographer Carleton Watkins and painter Albert Bierstadt were essential members of United States Geological Survey teams that surveyed western American landscapes. Similarly, glaciologist Samuel Nussbaumer photographed a massive Mount Blanc glacier (Figure 1) in 2005 to compare with Jean-Antoine Linck's 1799 etching of the same vista (Figure 2), thereby documenting dramatic ice reductions (Matilsky, 2013).

Currently, the American National Science Foundation Antarctic Artists and Writers program promotes artists' travel to Antarctica to record its natural and cultural significance (Matilsky, 2013, pp. 105-106). As artist David Buckland asserts, "[W]e have a huge possibility for communication that is completely different from other modes of communication like journalism and science. It's a different way of engaging people. In this way, you engage emotionally" (Buckland & Lertzman, 2008, p. 113).

In the following sections, we consider artists' roles in historic and contemporary expeditions. Through works of art and suggested projects, we examine how artists and scientists together document changing landscapes and address the rapidly increasing problem of climate change.



Figure 3. Edward Adrian Wilson, *Paraselene January 15, 1911, 9:30 pm Cape Evans McMurdo Sound*, illustration from Robert Falcon Scott's *Last Expedition, 1912*, Private collection.

Historic Expeditionary Artists

Before photography, sketching was the primary way artist-naturalists visually described the world. Expeditionary artists drew the lands, animals, people, and plants encountered on their journeys. Expedition members noted details of weather conditions, animal sightings, contact with Indigenous people, and daily activities. These artistic renderings and documentation were often published or exhibited in museums so the general public, scientists, and sponsors could visualize and learn about expedition findings.

Edward Adrian Wilson joined Captain Robert Falcon Scott on his expeditions to Antarctica in 1901-1904 and 1910-1912, a journey on which they—and others—perished. Wilson served as artist-naturalist, assistant surgeon, vertebrate zoologist, and Chief of Scientific Staff. His annotated drawings and watercolors include extraordinary studies of gem-like ice crystals that contributed to research on the physics of ice, intimate portraits of wildlife—in particular the breeding biology of the Emperor penguin, and stunning landscapes of Antarctica (Edward Wilson of the Antarctic, n.d.; University of Cambridge, 2014). In the poignant moonlit landscape *Paraselene January 15, 1911, 9:30 pm, Cape Evans McMurdo Sound* (Figure 3), Wilson captures the optical phenomenon of paraselene, or double halo, caused by light reflecting and refracting through ice crystals in the atmosphere. Five sets of skis and poles are staked in the ice. Matilsky (2013) observes, “At the time of the work’s execution, [Wilson] had no way of knowing his ultimate fate and that of his comrades, but the drawing stands as a premonition—and memorial—of their tragic demise” (p. 96).

A striking example of artist and scientist collaboration in alpine regions is that of Joseph Bettannier and Louis Agassiz. A professor at the University of Neuchâtel, Agassiz studied alpine glaciers and published a series of essays, *Etudes sur les Glaciers (Studies on Glaciers, 1840)*, illustrated by Joseph Bettannier. The lithograph, *Hugi’s hut on a medial moraine of the lower Aar glacier* (Figure 4), documents the confluence of two glaciers, including a stone shelter constructed in 1830 by Franz Joseph Hugi. When Agassiz measured it 10 years later, he found the glacier had moved the hut 4,600 feet downhill. Agassiz conjectured that glaciers were not static and northern Europe was once covered with a massive ice sheet that retreated during a warm period. With Bettannier’s meticulously detailed drawings to support his research, Agassiz could provide convincing evidence that glaciers advanced and retreated (Matilsky, 2013, p. 26)



Figure 4. Joseph Bettannier, *Hugi’s hut on a medial moraine of the lower Aar glacier*, from Louis Agassiz, *Etudes sur les glaciers (Studies on Glaciers)*, 1840, lithograph, Courtesy of Linda Hall Library of Science, Engineering and Technology, Kansas City, Missouri.

Contemporary Expeditionary Artists

The spirit of early expeditions has been revived through the Cape Farewell Project, funded and organized by artist David Buckland (Buckland & Wainwright, 2010). (See Figure 5). The project is an “open invitation” (Buckland & Lertzman, 2008, p. 114) to visual artists, writers, musicians, and other artists to work alongside scientists in climate change “hotspots” (Buckland, 2012, p. 137). Initially, Buckland envisioned the project would communicate scientific findings about climate change differently; but as the project evolved, the objective became one of cultural change. As Buckland (2012) states,

Climate change is truly a cultural challenge, it affects all of us and we all need to become part of the solution, but perhaps we should approach it more in the spirit of an expedition that encompasses the optimism of moving forward. (p. 140)

Musicians, composers, sound artists, and scientists in the Cape Farewell Project transform scientific acoustical data represented in charts and graphs into sonic creations, demonstrating the relationship of sound and sight (Bal, 2003; Cox, 2011). For example, Ryiuchi Sakamoto’s symphonic interpretation of digital information represents millions of years of geological data. Paul D. Miller’s (aka DJ Spooky) “acoustic portraits of ice” (Matilsky, 2013, p. 108) explores the transformational qualities of ice through sound. These soundscapes provide alternate ways of telling the scientific story of climate change, while encouraging people to think differently about how their everyday actions contribute to climate change.

Artists have used the inspiration of scientific data to create graphically compelling artwork. Anna McKee, an expeditionary artist, interprets technologies such as ice penetrating radar (IPR) and ice core samples from the West Antarctic Sheet Divide in her work, *Depth Strata V* (Figure 6). IPR measures ice thickness and reveals optimal locations for drilling ice cores, which are examined for bubbles of air—especially carbon dioxide and methane—trapped in ice over thousands of years. Ice cores make climate history visible and have exposed the steep rise of carbon dioxide in Earth’s atmosphere since the Industrial Revolution. Matilsky (2013) says of McKee’s blend of art and science: “The artist creates an abstract, vertical icescape composed of multicolored layers of ‘scientific data’” (p. 107). McKee elegantly overlays the patterns and shapes of an ice core and the amoeboid shapes of trapped gasses.



Figure 5 (above). David Buckland, *Burning Ice*, 2004-2005, archival inkjet print of projection on the wall of a glacier, Courtesy of David Buckland.



Figure 6 (left). Anna McKee, *Depth Strata V*, 2011, etching, collography, and chine-collé, Courtesy of Anna McKee and Francine Seders Gallery.



Figure 7. Lita Albuquerque, *Stellar Axis Constellation 1*, 2006, archival inkjet print by Jean de Pomereu, Courtesy of Whatcom Museum, gift of Jean de Pomereu.

Vast white surfaces of ice provide a novel canvas for site-specific installations. Lita Albuquerque creates sculptures in the landscape that “draw attention to the beauty of the site and human relationship to the cosmos” (Matilsky, 2013, p. 110). In *Stellar Axis Constellation 1* (Figure 7), she collaborates with astronomer Simon Balm and photographer and research writer Jean de Pomereu. Ninety-nine ultramarine spheres meticulously placed on the Ross Ice Shelf correspond with the brightest stars at 77 degrees latitude south. The spheres map positions of the stars on the summer solstice at noon, portraying the configuration of the night sky on the ice when 24-hour daylight obscures the view.

Though many expeditionary artists today use photography or other digital media for documentation, some prefer quick observational drawing, or *en plein air* sketching, which engages them in subject matter with minimal equipment. Nerys Levy has traveled to both the Arctic and Antarctica, filling sketchbooks with lively, expressive, mixed-media watercolors (Figure 8). Levy states, “very rapid sketches were the only way for me to document the region’s fauna and flora. After 3 minutes of exposing my fingers to the cold, I risked frost bite—and more” (Whatcom Museum, 2013).

Maria Coryell-Martin, whose art was featured in the Vanishing Ice companion exhibit Washington’s Changing Climate, specializes in expeditionary art (Figure 9) of polar and glaciated regions. Coryell-Martin sees art as “a tool for exploration, for scientific inquiry, and for communication, for connecting across cultures, across communities, [and] across language barriers” (KCTS 9, 2012). In 2013, Coryell-Martin joined University of Washington scientist Kristin Laidre in Greenland to investigate the effects of vanishing sea ice on polar bears and narwhals. When asked about the benefits of artist-scientist collaborations Coryell-Martin replied:

The Arctic is a remarkable and stunning environment that is rapidly changing. Collaborating with Kristin has given me the opportunity to witness and help illustrate this region that so few people can access. Her research brings deeper meaning to my sketches and paintings, as they go beyond being just environmental portraits to having a story within a scientific context. Working together, we can use art as a hook for scientific outreach and to inspire appreciation and stewardship for the Arctic. (personal communication, November 25, 2013)

Growing knowledge about the impact of climate change on alpine and polar ecosystems generates art that highlights the role

of people as environmental stewards. Contemporary polar artists use their art as a tool for conveying the critical condition of the cryosphere responding to climate change. For example, much of Alexis Rockman’s art depicts nature at its intersection with the human-made world. In *Adelies* (Figure 10), Rockman portrays the threatened Adelie penguin atop a mammoth cube of ice in an “unusual composition to suggest their precarious status” (Matilsky, 2013, p. 94). Rockman states that his placement of the adorable yet vulnerable birds adrift, and in isolation from the mainland, was a way of emphasizing “fragmentation and scarcity” (Rockman, as cited in Matilsky, 2013, p. 94).

Contemporary expedition artists document, interpret, and communicate scientific studies of alpine and polar ice, provoking behavioral and cultural changes to support environmental stewardship. In the following projects, we introduce possibilities for observing, documenting, and understanding a particular place differently through artistic practices.

Projects: In the Footsteps of Expeditionary Artists

■ Artist-Naturalists: Documenting Through Observational Journals

Engage students in discussion about expeditions and expeditionary artists. Select a historic illustration from the Vanishing Ice website (Whatcom Museum, 2013); for example, Sir John Ross, *Snow Cottages of the Boothians*, or Frederick William Beechey, *HMS Hecla in Baffin Bay*. Ask students: What do you think of when you hear the word “explorer” or “artist”? How did artists get to the poles? What challenges and dangers confronted artists and explorers? Does the image tell a story? What do you think the story is?

Watch the 3-minute video *Audio Postcard, Imaging the Arctic* (Ahearn, 2013). Ask students to note the goals of the scientist and the artist in this expedition. What are they studying? How did they prepare? What tools for recording and measuring were used? How did they travel? What challenges did they face? How does a contemporary expedition differ from one made 200 years ago?

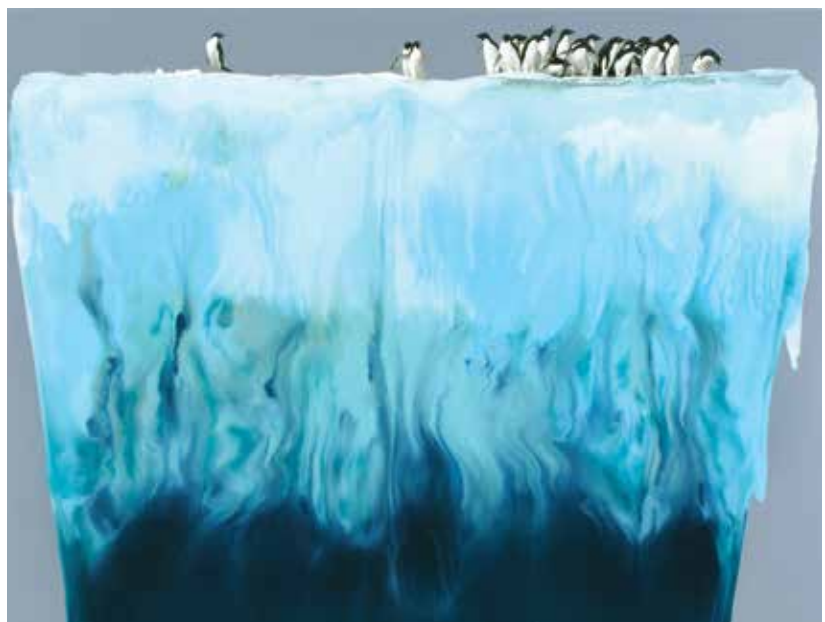
Plan an expedition with your class. Discuss how artist-naturalists use their senses to see, taste, touch, smell, and listen carefully to the environment. Share the artist-naturalists tools and how observational drawing helps them vividly remember what they see. Discuss possible expedition locations and goals. Create portable painting



Figure 8 (top). Nerys Levy, *Antarctic sketchbook: Penguins and Elephant seals, Penguin Island, Antarctic Peninsula, December 2007*, Watercolor and water-soluble ink, Courtesy of Nerys Levy.

Figure 9 (middle). Maria Coryell-Martin, *Sketching in Greenland*, courtesy of Maria Coryell-Martin.

Figure 10 (bottom). Alexis Rockman, *Adelies*, 2008, oil on wood, Courtesy of Robin and Steven Arnold.



and sketching art kits, including paper, pen, pencil, small watercolor sets, measuring tools, journals, and cameras.

On the expedition, ask students to record the date, time, weather conditions, sights, sounds, and smells in their journals. Collect specimens to identify and classify later. Have them map their journey, sketching landmarks to note where objects were found. Students can take turns being an expeditionary photographer, videographer, artist, and scientist.

■ Soundscapes

Invite students to explore soundscapes through listening to the works of sound artists (DJ Spooky, 2010; Leonard, n.d.). Compare these recordings with the sounds of Antarctica (Leonard, 2014; Watson, 2012) and animals in the Arctic Chukchi Sea (Stafford, 2011). Discuss the relationship between the sound art they hear and the recorded sounds from the poles. What differences or similarities do they notice? What sounds make them want to listen to a recording again? What emotions do the sounds elicit? What images come to mind?

Take a walk through the schoolyard, neighborhood, or nearby park or forest. Ask students to walk together quietly, listening closely for sounds. Stop every 3-5 minutes so students can discuss in pairs what they noticed. Ideally, walk together for 30 minutes.

Gather recording devices (digital recorders, smartphones or tablets with recording apps, or tape recorders). Repeat the walk, asking students to record sounds they hear. Download digital soundscapes on a school computer for listening and modification. Repeat this soundscape activity several months later in order to compare the recordings over time.

Discussion and Assessment

Learning Goals:

- Reflect and respond to artistic interpretations of climate change based on the artists' observations and scientific data
- Create art that experiments with forms and materials and demonstrates understanding of a climate change issue
- Present artworks and evaluate how the experience deepened understanding of climate change
- Connect learning about interdisciplinary artists to historical, scientific, and social contexts of climate change

Share student expeditionary journals and recordings and discuss: How did the weather, people passing by, animals, plants, and ambient noise affect the experience? Compare data gathered through sketches, photographs, videos, journal entries, soundscapes, and specimens. What are the benefits and drawbacks of each documentation method? Did taking walks, sketching, recording, or listening to others' recordings make you listen and look differently or lead to further investigation? How does listening to the soundscapes make you remember the walk differently? What similarities or differences are there between your recordings and the sound artists' and researchers' recordings? Attend to students' contributions to class discussion, their reflective comments in discussion, and their participation.

Reinforce the importance of sharing expeditionary observations and creations with others. Guide students through selection of representative soundscapes and journals. Invite another class to visit and engage

them in discussion questions. Have your students share how to create expeditionary journals and make soundscapes. Consider students' explanations of how they would record their experiences through journals and soundscapes differently as a self-analysis of their projects. Some options for sharing students' work include exhibiting journals, expeditionary tools, specimens, and soundscape recordings in the school or local library; or creating an expedition blog to share on the school district website.

Final Note

Artists contribute to the study of climate change through observation, documentation, interpretation, creation, and communication. Through these actions, artists help people think differently about the lands on which they live and how they can be environmental stewards through their everyday actions. Working together, artists and scientists address global changes, including climate change and vanishing ice.

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ONLINE RESOURCES

Vanishing Ice exhibition website:
www.vanishing-ice.org

Rich educational resource including images of works of art from the exhibition, artist interviews, teacher resources, and links to further online resources.

Cape Farewell Project:
www.capefarewell.com

Includes information about the Cape Farewell Project, including artist images and interviews, sound and video clips, climate change information, and further resources.

United Nations Climate Change portal: www.un.org/climatechange

Information about international climate change summits, scientific information, and personal stories related to climate change.

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