BLURRING THE EDGES OF DISCIPLINES:
BRINGING ART AND SCIENCE TOGETHER

Anne K. Moser
UW-Madison, Wisconsin Water Library
1975 Willow Dr., 2nd floor
Madison, WI 537106
akmoser@aqua.wisc.edu

Abstract
Wisconsin Sea Grant (WSG)-supported research is ultimately relevant to people of all backgrounds, regardless of age, socioeconomic status, or education level. WSG seeks out a diversity of collaborators to reach a diverse range of audiences with its outreach and education efforts with the ultimate goal of inspiring a science-informed society. As an outreach component of WSG, the Wisconsin Water Library has held several events in recent years with an art and science focus. This paper highlights recent multidisciplinary activities where unique collaborations were forged and surprising common ground was found between artists and scientists approaching wicked problems related to water. The paper will place these projects in the context of libraries and scientific illustration in general and will detail the purpose, partnerships, successes and challenges of two recent and one future projects.

Keywords: Art and Science; scientific illustration; medical illustration; artists' books; science—social aspects; marine debris; communication in science.

Context
While the idea of scientists and artists working together may sound like a 21st century concept, the history of these two disciplines working in tandem or as one is a long one. In a way, we may consider it to have been in practice for more than 30,000 years. In prehistoric history, humankind strove to document the world around them and as we move forward through time, this collaboration expanded to the surgical theater, the laboratory, and the natural world.

1) We start this story in the caves of southern France. In the Chauvet-Pont-d'Arc Cave, we see evidence of humans drawing what they observed around them. The cave is filled with some of the world’s best preserved figurative cave drawings (http://whc.unesco.org/en/list/1426). The drawings include representations of at least thirteen distinct animal species. These cave drawings, and many others in this region and beyond, show one of human’s first stab at documentation, a time-honored tradition in science.

Anatomical Illustration
Documentation was also one of the reasons that artists were invited into the clinical, surgical and post-mortem theaters. Physicians needed anatomical drawings because there were no MRIs or x-rays or machines to document what the pioneers in medicine were observing (https://www.ncbi.nlm.nih.gov/pubmed/100890383). The image of the skull (below) is an example of how artists first documented the human form. The great artist, scientist, and inventor Leonardo da Vinci drew this sketch with precision in the years around 1488-1489 with a keen eye toward the dimensions. Though the full story of da Vinci’s fascination with the human body is not known, we are lucky to have collections of his sketches and drawings to see examples of what early practitioners of the new science of medicine were seeing and experiencing.
We can contrast his rendering with this second example just one hundred years later. We see how far anatomical illustration and our understanding of the human body had advanced.
It is helpful to remind ourselves how far medicine and imaging of the human form have advanced. We can see that progress when with a look at images taken with (fMRI) Magnetic Resonance Imaging and computational models.

![Figure 3. Source: Getty images (2017).](image)

**Medicinal Herbs Illustration**
Scientific illustration of plants was another important development in the advancement of medicine and a second example where artists and scientists work in tandem. These illustrations gave early practitioners of medicine the means to identify drugs to treat a wide range of ailments. Before the pharmaceutical industry produced our drugs, society relied on plant life found in surrounding fields and forests to treat common (and not so common) pains and aches. Today, these drawings are considered art masterpieces and the detail and accuracy are astounding.

![Figure 4. Köhler's Medizinal-Pflanzen in naturgetreuen Abbildungen mit kurz erläuterndem Texte](image)

*Source: [http://biodiversitylibrary.org/page/303628](http://biodiversitylibrary.org/page/303628)*
Biological Illustration

Early biological illustrations have also produced art works considered to be masterpieces that were created for scientific purposes. The body of work by the great John J. Audubon is an excellent example. As we see below, his illustration of the Great Blue Heron, when paired with a modern photograph, reveals mastery as both a painter and a scientist.
We see the same beauty and scientific accuracy if we turn our eyes to the underwater world. This illustration of the Flying Gurnard (a favorite of the author of this paper) is an excellent example.
We have included a favorite fish found in the Upper Midwest - the sturgeon - to illustrate the same artistic mastery and scientific accuracy of a species found throughout freshwater ecosystems.

Figure 9. *Fauna Boreali-Americana; or the Zoology of the Northern Parts of British America*. John Richardson, 1836. White sturgeon (top) and Lake Sturgeon (bottom)
Source: https://archive.org/details/faunaborealiamer01rich

Figure 10. Source: Tennessee Aquarium

How is scientific illustration used today?
Kalliopi Monoyios (Kalliopi Monoyios 2015. 5 Reasons Your Camera Won’t Steal My Job. https://blogs.scientificamerican.com/symbiartic/httpblogsscientificamericancomsymbiartic201107125-reasons-your-camera-wone28099t-steal-my-job/) gives us several examples of how scientific illustration is used today. They are used for creating cutaways in scientific publishing; for images of things that no longer exist; for items that cannot be photographed; and for creating diagrams that show scientific process. In certain instances writers and editors of scientific books and texts choose scientific illustration for artistic effect. Institutes and organizations that use scientific illustration today include museums, publishers, the movie industry, game developers, government agencies, and parks and nature centers.

What do libraries have to do with it?
There are many examples of libraries leveraging their collections in an artistic fashion to further their mission, especially with digital materials. One champion is the Biodiversity Heritage Library (BHL), a consortium of natural history and botanical libraries that cooperate to digitize the legacy literature of biodiversity held in their collections and to make that literature available for open access and responsible use as a part of a global “biodiversity commons.” Their web
presence is a great example of the science and art intersect.


In Wisconsin, the Ebling Health Sciences Library at the University of Wisconsin-Madison has been involved in the science and art intersect for many years, with an on-staff curator creating exhibits on anatomical and scientific illustrations. The library hosted a recent exhibit in support of the common book read (Go Big Read) on the UW-Madison campus. Go Big Read chose the graphic novel Radioactive in 2013 and this exhibit highlighted the use of radioactivity in medicine over the years.

Figure 12. Fallout: The Mixed Blessing of Radiation & the Public Health [Announcement] (n.d.).
Using Art and Science Together To Inform the World about Wicked Problems

For the Wisconsin Water Library at UW-Madison, interest in bringing these disciplines together has been a result of the library’s outreach and education mission and its work with children. The library resides within the Aquatic Sciences Center, the administrative home of the Wisconsin Sea Grant Institute. The mission of Wisconsin Sea Grant (WSG) is to promote the sustainable use of Great Lakes resources through research, education and outreach. As an outreach function, the Wisconsin Water Library participates in education and outreach to Wisconsin residents of all ages to heighten awareness of the Great Lakes and Wisconsin’s water resources. The library does this in a variety of ways and in the 2018-2022 WSG Strategic Plan the library includes a specific objective related to the art and science intersect: to use the arts and humanities to achieve a science-inspired society.

The genesis of the library’s work with art and science was born out of the library’s ongoing work with children ages three through nine. The library has offered library story times to children three through nine with a strong emphasis on science. There the library has observed how children approach scientific concepts with an open mind, an interdisciplinary nature and an artistic flair. Some examples from recent programs follow.

![Figure 13. Photo by Anne Moser](image)
This objective to bring art and science together will provide the library an interdisciplinary platform to discuss Great Lakes issues with a goal to reach a more diverse audience and to work with more diverse collaborators. The library believes both disciplines approach society’s wicked problems in distinct but complementary ways. And with these collaborations, both disciplines stand to benefit from each other: a scientist has the potential to bring scientific legitimacy and accuracy to an artist’s environmentally-focused body of work and an artist has a unique potential to give a scientist a new way to communicate their findings.

The library sees at least four opportunities to intersect art and science through her work as an outreach librarian. 1. Creating visual arts (painting, sculpture etc) programming that communicates scientific concepts and research findings; 2. Seeking out and supporting education projects funded by WSG that bring art into the WSG portfolio of projects; 3. Combining science with literature to communicate scientific concepts and research findings; and 4. Creating opportunities in the performing arts arena, in formats including film.

Current and future projects
To date, the Wisconsin Water Library has had several successful art and science projects, two of which are highlighted here. The first, the Poly Pledge, was a collaboration with two Master in Fine Arts (MFA) students participating in a public art seminar that included an interactive art piece and a public discussion. The second project, Title/Tidal, was an artists’ book exhibit which included a public talk about the meaning of water as inspiration. The library is also currently planning a 2018-2019 art exhibit on the lake sturgeon which will be discussed briefly.

The Poly Pledge
In early 2016, the Wisconsin Water Library collaborated with two UW-Madison Masters in Fine Arts (MFA) students on their project, the Poly Pledge. The Poly Pledge was born out of conversations with one of the students interested in the effect of plastics in area waters. During the following semester, she enrolled in a public art seminar and was inspired to create an art piece around the topic. The artist, Leigh Garcia, partnered with another student in the class, Pete Bouchard, to create a vending machine that was installed around the UW campus with the intent to create conversation around plastics in water. Visitors to the piece made a pledge to reduce their use of plastic over the next month and in return received a reusable shopping tote as a gift for making the pledge. While interacting with the piece, the artists had a chance to converse with the person about the environmental challenges relating to marine debris. After its install, the library hosted an event and invited Leigh and Pete to talk about the project with Tim Hoellhein, a researcher from Loyola University in Chicago, speaking on his work on investigating plastics in Lake Michigan.

The project was successful because the artists and the librarian were able to meet and talk with
several hundred students from the university about the science of plastic in area waters. It raised visibility for the topic to an audience that may not hear the message. One of the biggest challenges was helping the artists understand the scope and limits of the research on the issue and convince them to include some nuance to their message. Collaborators on the project included the University of Wisconsin Department of Art, Loyola University in Chicago and several supermarkets in the Madison area. Images from the project follow.

Figure 15. Photo of the machine in action, UW-Madison, West Campus Mall. Photo by Anne Moser

Figure 16. The machine with the artists, Pete Bouchard (left) and Leigh Garcia (right) Photo by Anne Moser
Title/Tidal
In late 2016, in collaboration with the Kohler Art Library at UW-Madison, the Wisconsin Water Library curated 30 pieces of artists’ books from Kohler’s permanent collection for an exhibit in the library’s space. Lyn Korenic, librarian at Kohler, Water Library student assistant Sigrid Peterson and Anne Moser curated pieces around the theme of water. The works, by artists from
around the world, focused on a wide range of themes and addressed several wicked environmental problems. The exhibit ran for almost three months and concluded with a public talk by a world-renowned limnology scholar and an artist on the faculty of the UW’s Art Dept. The primary purpose of the collaboration was to highlight the art pieces in the art library’s collection. In addition, the curators hoped a new audience was created for both water science and water art. Partners included the UW-Madison Department of Art, the Center for Limnology, Kohler Art Library and the UW-Madison Libraries’ Friends of the Libraries that generously supported the public event.

Figure 19. “Red Tide” gouache on paper, 5.5” x 7” © Karen Hackenberg 2009
Source: [http://karenhackenberg.com/](http://karenhackenberg.com/)

Figure 20. The exhibit in the Kohler Art Library at the UW-Madison.
Photo by Anne Moser

This first collection of pieces from the exhibit is included to show the beauty of the books and the artists’ gorgeous interpretation of water. Their subject matter cover the action of water flowing, one of its most endearing inhabitants, the fun of going to the beach, and the beauty found in and around a freshwater lake.
And the water gathered more and more in that place until it was a little clear crystal pool deep enough for a small green frog to jump into and live there under the water.


**Figure 22.**
But not all the works would be considered aesthetically pleasing in a traditional sense. Some seemed to be created to evoke an emotional response or to communicate about environmental concerns or both. For example, Julie Chen’s *Panorama* addresses the artist’s concern about climate change.
Colin Finlay’s work juxtaposes his photographs of melting icebergs (presumably due to climate change) with his photographs of starvation in Darfur, making a visual link between the two issues.
To highlight the exhibit and to continue the conversation, a public talk was held at the end of the exhibit, with Steven Carpenter, a limnologist and Sarah FitzSimmons, an artist, invited to talk about water as a creative force in their work. The project was a success if measured in the conversations and networking that was a result of seeing the exhibit and hearing from the two renowned scholars. The exhibit reached a new audience of scientists, artists, librarians and the public.
Living Memory: Portraits of The Lake Sturgeon
For 2018 and 2019, the library is collaborating with two University of Minnesota-Duluth faculty artists on an exhibit they curated on the lake sturgeon. The collection of black and white art pieces will be presented at the Thelma Sadoff Center for the Arts in Fond du Lac, Wisconsin and at gallery space at UW-Madison. Both exhibits will include science and art presentations, and program planning is under way. Due to copyright restrictions, the images are unable to be included in this paper.