Chapter 3

Water and Pollution

PreK – 12th grade

Chapter Objective

Students will learn about the many sources of water pollution and what they can do to help.

Supported Standards

Supported Standards: Wisconsin Department of Public Instruction / Standards for Science / 2017

Science: Disciplinary Core Ideas (DCI) — Earth and Space Science 3 (ESS3) — Earth and Human Activity

Standard SCI.ESS3: Students use science and engineering practices, crosscutting concepts, and an understanding of earth and human activity to make sense of phenomena and solve problems.

Connect Strand: ELS.C1: Students develop and connect with their sense of place and well-being through observation, exploration, and questioning.

Wisconsin Department of Public Instruction / Standards for Art and Design / 2019

Art and Design (AA)

Standard AA 1: CREATE—Students will generate, develop, and refine artistic work.

Standard AA 3: RESPOND—Students will critically interpret intent and meaning in order to evaluate artistic work. (1. Describe; 2. Analyze; 3. Interpret; 4. Inquire; or 5. Evaluate)

When you think of sources of water pollution, what comes to mind? You may be surprised to know that today the biggest source of pollution is us—you and me. Known as "nonpoint source pollution," this type of pollution can't be traced to any one source. Because we are the source, it is important for us to learn how to prevent such pollution. Rivers are constantly threatened by pollution from chemicals and fertilizers that are washed through the soil by rain and end up in the rivers. In the developing world, 90% of all wastewater still goes untreated into local rivers and streams, making them natural sewers.

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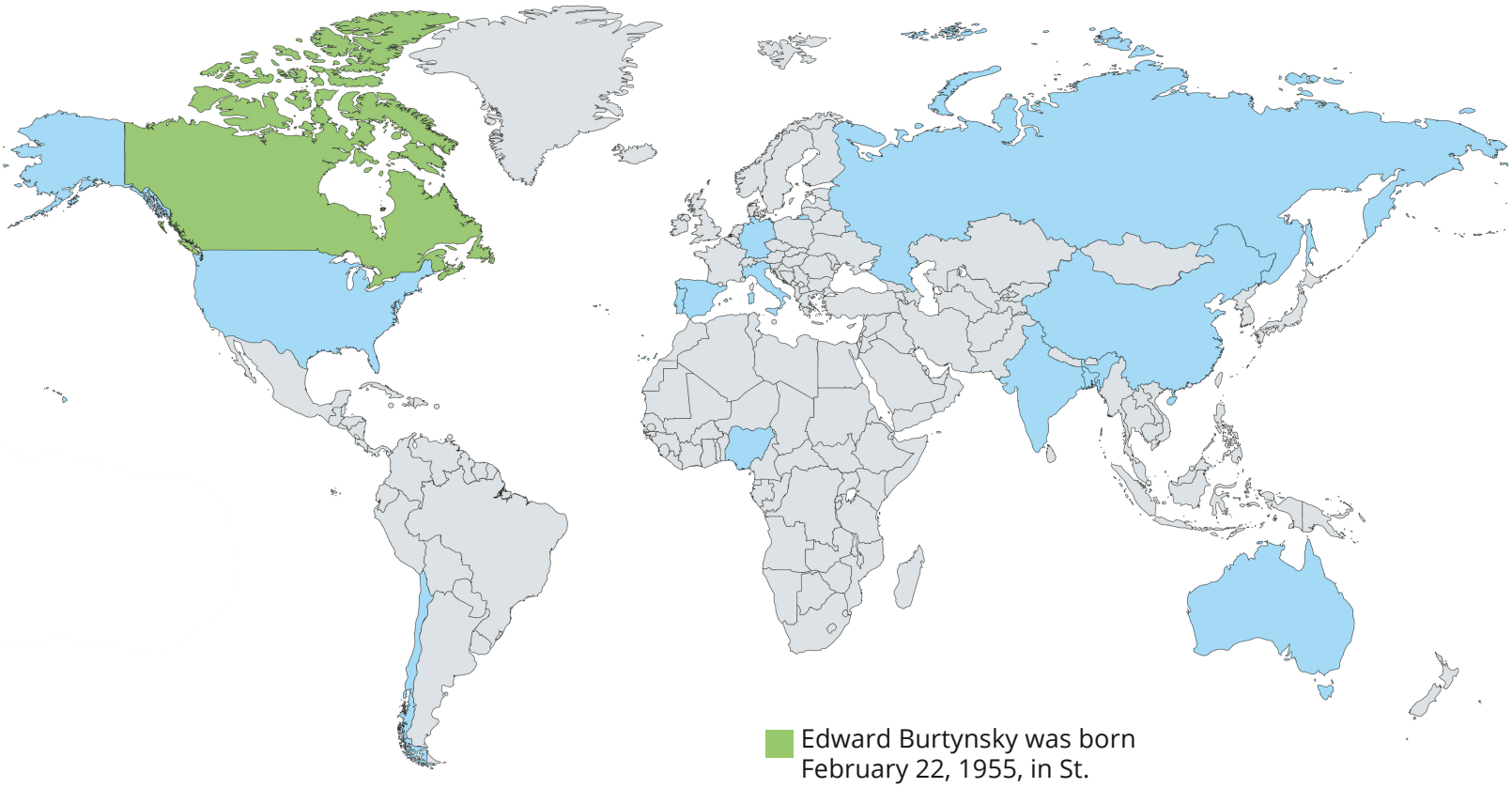
Edward Burtynsky (Canadian, b. 1955), *SOCAR Oil Field #1 a*, Baku Azerbaijan, 2006. Digital chromogenic color print, 40 x 120 in (101.6 x 304.8 cm). Museum purchase with funds from Mrs. Martha W. Smith by exchange, Collection of the Haggerty Museum of Art, Marquette University, 2009.31.

Edward Burtynsky (Canadian, b. 1955), *SOCAR Oil Field #1 b*, Baku Azerbaijan, 2006. Digital chromogenic color print, 40 x 120 in (101.6 x 304.8 cm). Museum purchase with funds from Mrs. Martha W. Smith by exchange, Collection of the Haggerty Museum of Art, Marquette University, 2009.31.

Art in Context

Use this map with your students to explore Edward Burtynsky's life and work.



Edward Burtynsky was born February 22, 1955, in St. Catherines, Ontario, Canada.

Where in the world did Burtynsky photograph?

Fun Fact

When Burtynsky was 11, in 1966, his father purchased a darkroom with cameras and an instruction manual, and both learned how to make black-and-white prints. Then, Burtynsky established with his older sister a small business taking portraits at their local Ukrainian Center in Canada. His earliest photographic series was from 1983 to 1985, *Breaking Ground: Mines, Railcuts and Homesteads*. (Source)

Visit Burtynsky's website to explore his photographic series *Water*.

John Pfahl (American, b. 1939), *Occidental #26, Niagara Falls, NY*, 1989. Chromogenic color print, 24 x 20 in (60.96 x 50.8 cm). Museum purchase from the Heller Art Acquisition Fund, Collection of the Haggerty Museum of Art, Marquette University, 2011.5.2.

Art in Context

Use this timeline with your students to explore John Pfahl's life and work.

Estelle Jussim wrote, "it is almost impossible for a single photograph to state both the problem and the solution." (Source)

John Pfahl was born February 17, 1939, in New York City, New York, U.S.A., and was raised in Wanaque, New Jersey.

Fun Fact: Sharp Wisconsin cheese cost 23¢ per POUND in 1939.

1939

1968

Pfahl recieved a BFA from Syracuse University in the School of Art in 1961, and his MA from Syracuse University in the School of Communications in 1968.

1968–1984

Pfahl taught at the Rochester Institute of Technology, Rochester, New York, from 1968–1983. He was also a visiting professor at the University of New Mexico, Albuquerque between 1983–1984.

1985

In 1985, Pfahl resigned as full professor from the School of Photographic Arts and Sciences, Rochester Institute of Technology, to pursue a photographic career.

1986

Although Pfahl resigned from his role at the Rochester Institute of Technology, he has worked as an adjunct professor at the University of Buffalo, Buffalo, NY, since 1986.

2014

In 2014 alone, Pfahl's artwork was featured in three solo exhibitions:

Joseph Bellows Gallery, La Jolla, CA, *Picture Windows*

Nina Freudenheim Gallery, Buffalo, NY, *Beauty, Humor, Nature, Knowledge*

Janet Borden Gallery, New York, NY, *Found Pfahls*

As well as four group exhibitions:

Albright-Knox Art Gallery, Buffalo, NY, *Anselm Kiefer, Beyond Landscape*

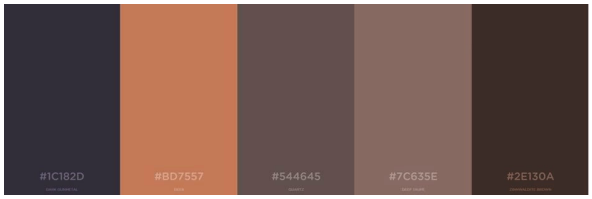
Musée de Beaux Arts; Bordeaux, France, *Photography of the American West*

Orange County Museum of Art, Newport Beach, CA, *California Landscape into Abstraction*

Southwest School of Art, San Antonio, TX, *Altering Space*

* *Occidental #26, Niagara Falls, NY*, 1989 is part of Pfahl's series titled *Smoke*. See the other works in this series here. The smoke in each photograph is a different color.

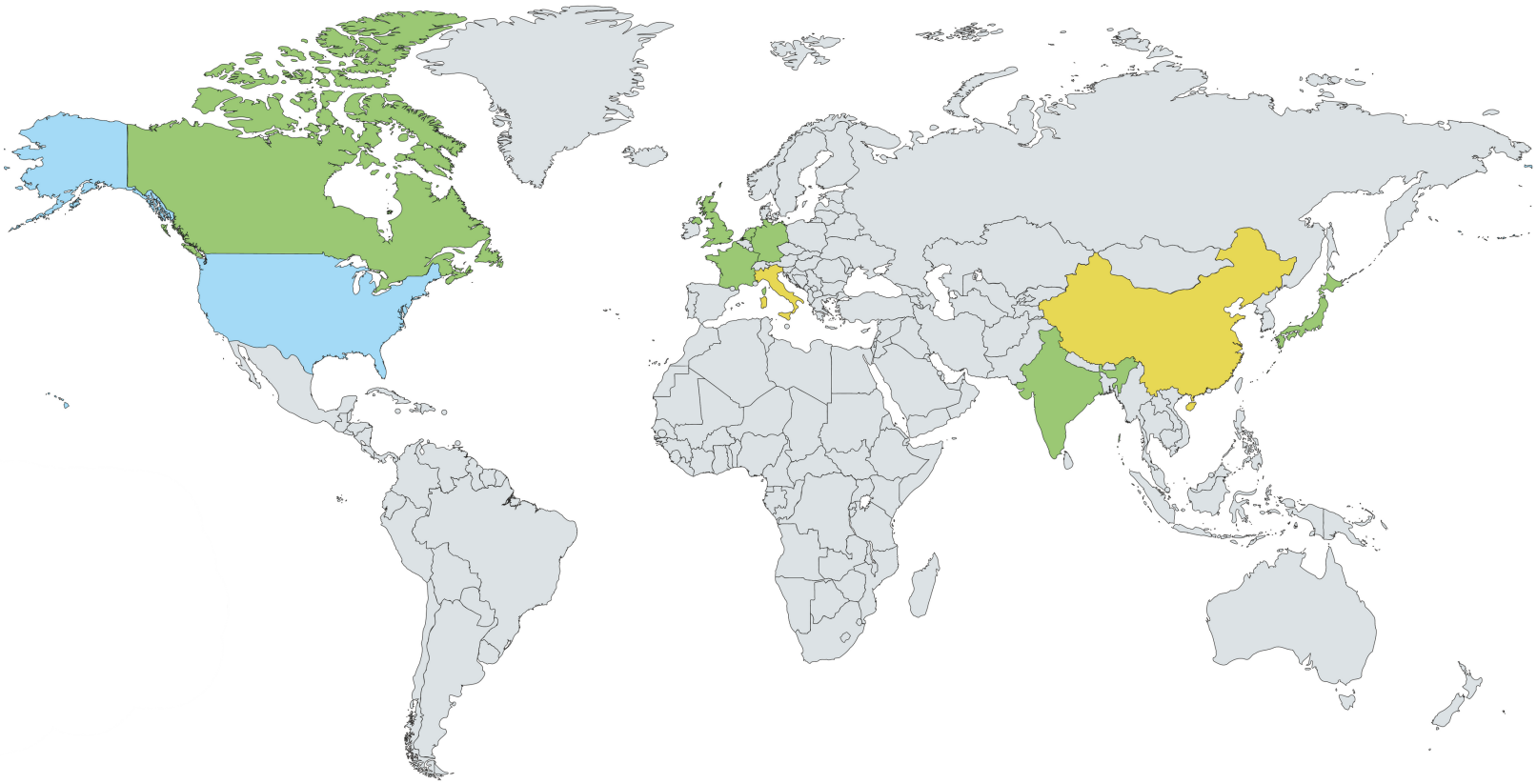
Visit https://coolors.co to create a color palette of the other photographs in the series. Here is the color palette we made for *Occidental #26, Niagara Falls, NY*, 1989. Create a physical version of your palette using colored pencil or paint.



Pat Steir (American, b. 1938), *Blue*, 2004. Pace Editions, Inc. (Publisher), Color silkscreen, 56 1/2 x 43 in (143.51 x 109.22 cm). Museum purchase, partial gift of Mary and Michael J. Tatalovich, Collection of the Haggerty Museum of Art, Marquette University, 2014.7.5.

Art in Context

Use this map with your students to explore Pat Steir's life and work.



Pat Steir was born in Newark, New Jersey, U.S.A.

Steir draws inspiration from Renaissance Painting (Italy) and Chinese paintings from the Tang and Song Dynasty.

Steir and her work have traveled all over the world.

* *Blue* was inspired by a waterfall. Can you figure out which waterfall inspired Steir? Explore a map of American waterfalls! Visit the website World of Waterfalls here.

Ralph Steiner (American, 1899 – 1986), *Tug and New York Skyline*, 1921 - 1922 / 1981. Gelatin silver print, 1 7/8 x 3 3/4 in (4.8 x 9.5 cm). Gift of Therese and Murray Weiss, Collection of the Haggerty Museum of Art, Marquette University, 90.15.2.

Art in Context

Use this timeline with your students to explore Ralph Steiner's life and work.

Ralph Steiner was born February 8, 1899, in Cleveland, Ohio, U.S.A.

American Event: Just two days after Steiner was born, Ohio experienced its lowest recorded temperature: -39°F (-39.4°C), in Milligan, Ohio (the record still stands!).

1899

1921

Steiner graduated with a chemical engineering degree in 1921 from Dartmouth College in Hanover, New Hampshire. He then studied at the Clarence White School of photography in New York City, New York, from 1921 to 1922.

Fun fact: According to Dean Keith Simonton, author of *Creativity in Science: Chance, Logic, Genius, and Zeitgeist*, photography is a common hobby among "creative scientists."

1923

In 1923, Steiner became a freelance photographer in New York City for advertisements and magazines.

1929

Steiner made moving-image films and photographs during his life. Watch his film *Ode to Water*, 1929, here.

American Event: The Wall Street Crash of 1929, also known as the Stock Market Crash of 1929 or the Great Crash, was a major stock market crash that occurred in late October 1929.

1933

In 1933, Franklin D. Roosevelt was elected president and introduced the New Deal. This was a series of programs, public works projects, financial reforms, and regulations that focused on the "3 Rs": relief for the unemployed and poor; recovery of the economy back to normal levels, and reform of the financial system to prevent a repeat stock market crash resulting in an economic depression.

1943

From 1943 to 1947, Steiner worked on films in Hollywood, California. What famous actors and actresses might Steiner have met while working in Hollywood?

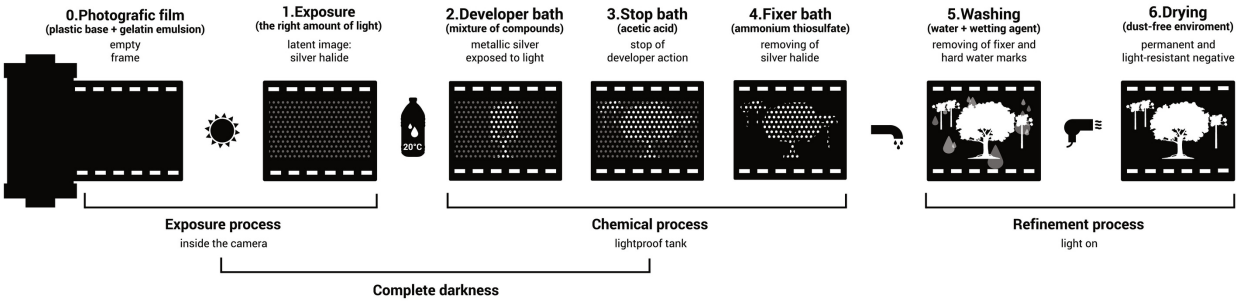
1970

In 1970, Steiner moved to Thetford, Vermont, U.S.A.

1986

Ralph Steiner died on July 13, 1986.

The photographic process is a science! Creating a photographic print requires special paper, chemicals, and light. Learn more here with this photographic process image:

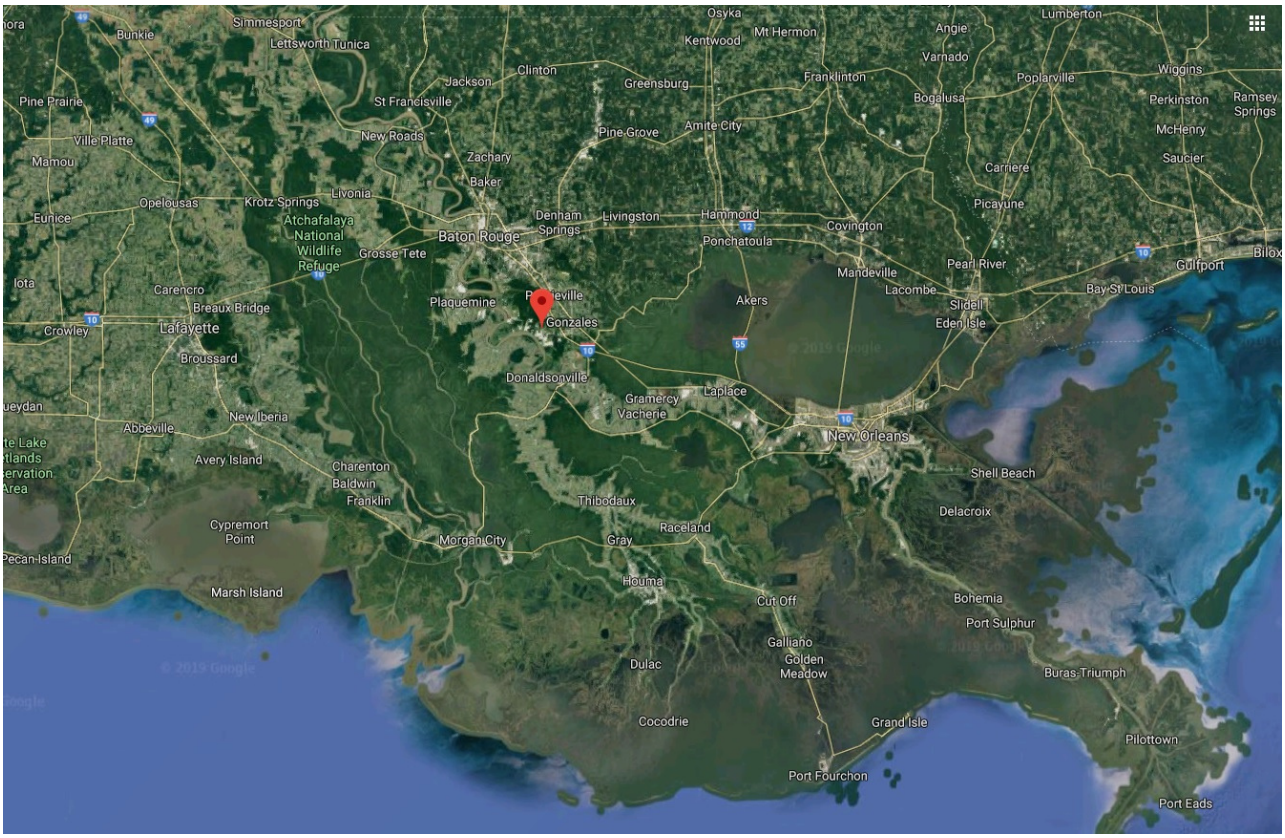


Richard Misrach (American, b. 1949), *Swamp and Pipeline, Giesmart, Louisiana*, 1998. Chromogenic color print, 27 5/8 x 35 in (70.17 x 88.9 cm). Museum purchase with funds from Miss Marion C. Wagner, Mrs. Jane W. Kranick, Mr. F. E. Wagner, and Mr. Robert Wagner (by exchange), Collection of the Haggerty Museum of Art, Marquette University, 2011.20.

Art in Context

What is a swamp?

Swamps are forested wetlands, characterized by specific types of trees and soil types. Swamps and lowland forests are very similar and often considered interchangeable. However , swamps are usually wetter for a longer period throughout the year and have deeper standing water than lowland forests. (Source) Misrach's photograph was taken in Giesmart, Louisiana. See the red pin below for the exact location.



The Atchafalaya Swamp, Louisiana, is the largest swamp in the United States. It is near the lower section of the Mississippi River. Can you find where the Mississippi River starts and ends using Google Earth? How many states touch the Mississippi River?

Fun Fact

71% of the Earth's surface is water-covered but only a small percent of that water is freshwater. (Source)

Experience and Explore

Imagine Collage Activity

Nonpoint pollution that ends up in our waterways includes used oil poured into storm drains, soil washed from construction sites, grease from restaurants, fertilizer and pesticides washed off farm fields and city lawns, and cars cleaned in the driveway using non-biodegradable soap. Industrial waste is often dumped into our rivers.

What kind of nonpoint water pollution do you create? Where will it go?

Have students cut out images from magazines that depict items they use that might end up causing pollution if not disposed of correctly. Next print out copies of *Swamp and Pipeline, Giesmart, Louisiana*, 1998, for each student to create a collage. Students will glue their magazine images on top of *Swamp and Pipeline, Giesmart, Louisiana*, 1998, to create a pollution collage.

Make It Personal

What? Why? Activity

Water that is safe to drink is called potable water, in contrast to safe water, which can be used for bathing or cleaning. Potable and irrigation water are both scarce.

Nonpotable forms of wastewater generated by humans may be referred to as gray water, which means the water is treatable and can easily be made potable again. 50 to 80 percent of household wastewater is gray water. Blackwater generally contains sewage and other forms of waste which require more treatment to be made reusable. Toilets generate blackwater.

Why do we need to think about safe water here in Milwaukee? Use the image of the Great Lakes Basin to investigate how water pollution travels around the Great Lakes. The area of land that drains to a body of water is called a watershed. Milwaukee's three rivers are the Milwaukee, the Menomonee, and the Kinnickinnic. Each has its own watershed.

Learn more about our local Milwaukee watershed here.

Engage and Take Action

Make a Plan: Stronger Together

Imagine a world with no water pollution.

In the United States, the Environmental Protection Agency sets maximum levels for the 90 most commonly occurring water contaminants. If something happens to your water supply, your supplier has to contact you to let you know what precautions you should take. Filtration or distillation can make water potable.

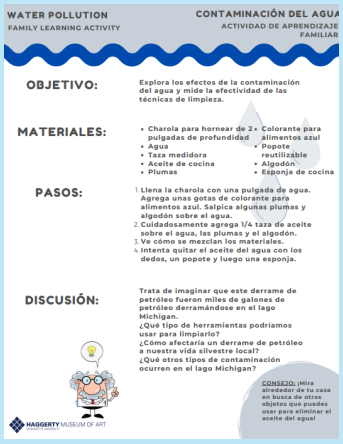
What can you do to help? Create a list of actionable items with your students to help decrease their contribution to water pollution. Find examples here.

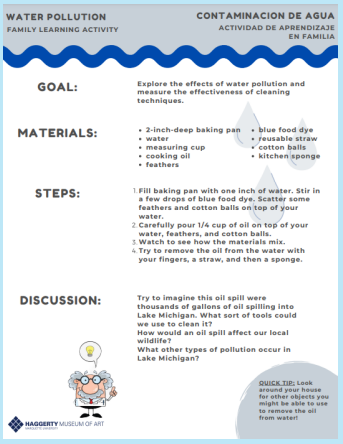
Make sure to post the list somewhere in your classroom, or track one item from your list each week. Make charts or graphs and CELEBRATE everyone's efforts, you can also join the EcoLiteracy challenge with your students or school here.

Deep Dives

Family Learning Activity

(Available in both Spanish and English)





Check Out: World's Largest Lesson Clean Water for All

Watch the Liquid Gold music video from True Skool here.

Explore the Plastic Education Toolkit from PLASTIC FREE MKE

Additional Resources

Milwaukee Community Map and MCM Teachers Guide

"What is the impact of beach litter?" lesson plan (6–8 and 9–12)

Organize a cleanup event with your students! Keep Greater Milwaukee Beautiful will supply bags and loan tools to groups hosting cleanups. Register to host a cleanup and reserve your supplies online.

Learn more about Milwaukee's Project Clean & Green.

HAGGERTY MUSEUM OF ART
MARQUETTE UNIVERSITY

Ride the Wave

Lessons can be scaffolded to meet the needs of any grade level.

Choose to do one lesson, or all three! Visit the Haggerty Museum of Art's Educators webpage to get started.

Essential Questions:

- How does photography inform our relationship to the environment?
- How does art inspire action?

PreK–5

Lesson 1: Students will look at *Swamp and Pipeline, Giesmart, Louisiana* by Richard Misrach and discuss potential pollutants in the image. Students will learn about different kinds of water pollution and what kind of substances can dissolve in water. Art as activism will also be discussed, and the concept of artists who create artwork as statements about environmental pollution will be discussed. Printmaking/stamping with "one-use plastics" such as forks from the school cafeteria will be used to emphasize the waste and pollution created with these objects.

Lesson 2: Students will look at *Socar Oil Field # 1 a & b* by Edward Burtynsky and discuss how the artist depicts a sense of water without realistic rendering. Students will begin thinking about how they might create a bas-relief artwork that speaks out against pollution or "one-use plastics".

Lesson 3: Students will look at *Blue* by Pat Steir and discuss what kinds of substances pollute our water. Students will articulate the purpose for their artwork through a verbal and written artist statement for their bas-relief sculptures.

Ride the Wave

Lessons can be scaffolded to meet the needs of any grade level.

Choose to do one lesson, or all three! Visit the Haggerty Museum of Art's Educators webpage to get started.

Essential Questions:

- How does photography inform our relationship to the environment?
- How does art inspire action?

6–8

Lesson 1: Students will be introduced to the concepts of water pollution, "one use plastics" and the effects of plastic pollution on Lake Michigan. The concept of Art as Activism will be explored as students view the image of *Swamp and Pipeline, Giesmart, Louisiana* by Richard Misrach and connect the work of an activist in the Visual Arts. Students will create either a "one use plastics" sculptural form or a collage incorporating their thoughts and "voice" about water and pollution.

Lesson 2: Students continue to explore the theme of water and pollution as they investigate *Socar Oil Field # 1 a&b* by Edward Burtynsky, and watercolor images from the Dirty Watercolor Project in Manila, Philippines. Students then will create an artist statement and reflect on the sculpture or collage that they are creating and how it represents their thoughts and feelings about water and pollution.

Lesson 3: The investigation of Art as Activism continues as students are introduced to "Word Artist" Prince Ea and His Epic Message. Students will be introduced to *Blue* by Pat Steir and discuss what kinds of substances pollute our water. Students also will finalize their sculpture or collage artwork written artist statement.

Ride the Wave

Lessons can be scaffolded to meet the needs of any grade level.

Choose to do one lesson, or all three! Visit the Haggerty Museum of Art's Educators webpage to get started.

Essential Questions:

- How does photography inform our relationship to the environment?
- How does art inspire action?

9–12

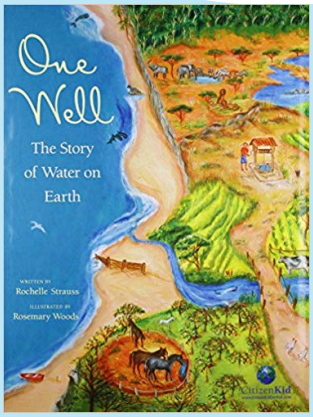
Lesson 1: Students will focus on *SOCAR Oil Field a & b* by Edward Burtynsky and *Blue* by Pat Steir to discuss how water is used as subject matter. Students will consider the artist's perception, intent, and methods selected for presentation of the subject matter. The artist's role as an activist will also be explored and incorporated into the realm of discussion as students begin developing ideas for a water and pollution themed collage.

Lesson 2: Students will be introduced to *Occidental # 26, Niagara Falls, NY* by John Pfahl and *Tug and New York Skyline* by Ralph Steiner as they continue to develop concepts for a collage focusing on the theme of water and pollution. The concepts of realistic and abstract representation will be explored by students as they select printed images, words, and graphics for their collage compositions. Students continue to reflect on the water and pollution message they wish to communicate with their collage.

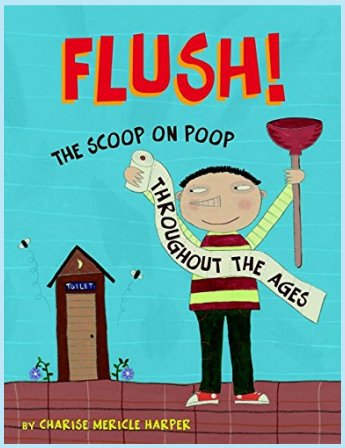
Lesson 3: The concept of Art as Activism continues as students are introduced to "Word Artist" Prince Ea and His Epic Message. *Swamp and Pipeline, Giesmart, Louisiana*, by Richard Misrach is discussed with students to add context to their collage theme. Students complete their collage, as well as their written artist's statement.

Book Recommendations

Find them at a library near you! Or click on each book title to follow along with a virtual reading.

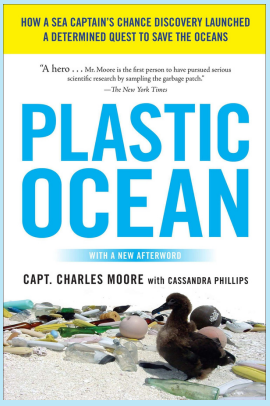


One Well: The Story of Water on Earth
Author: Rochelle Strauss
Illustrator: Rosemary Woods

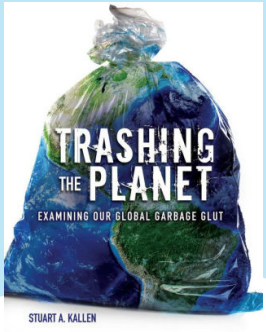


Flush!: The Scoop on Poop Throughout the Ages
Author: Charise Mericle Harper

What a Waste: Trash, Recycling, and Protecting our Planet
Author: Jess French



Plastic Ocean: How a Sea Captain's Chance Discovery Launched a Determined Quest to Save the Oceans
Authors: Charles Moore and Cassandra Phillips



Trashing the Planet: Examining Our Global Garbage Glut
Author: Stuart A. Kallen