River Exploration with Minnesota Sea Grant

2025 St. Louis River Quest Lesson Plan

Goal

Through this station, students will learn about the ecological and economic importance of the St. Louis River and western Lake Superior.

Objectives

After completing this learning station, sixth-grade students will be able to:

1. Describe the geography of the St. Louis River from the Fond du Lac Dam to the Duluth and Superior entries.
2. Understand the factors that led to degradation of the St. Louis River ecosystem.
3. Identify the significant ecological improvements that have occurred in the St. Louis River as a result of pollution controls, remediation, and restoration.
4. Describe the recreational and economic opportunities on the St. Louis River and western Lake Superior.
5. Explain how the river has been and is currently used for boat-based transportation and trade.

Vocabulary

- **Contaminant:** Any physical, chemical, biological, or radiological substance or matter in water.
- **Environmental Degradation:** A process through which the natural environment is compromised, reducing biological diversity and the general health of the environment. This process can be entirely natural in origin, or it can be accelerated or caused by human activities.
- **Estuary:** A partially closed coastal body of water where two different water qualities mix.
- **Remediation**: Reversing or eliminating environmental damage to an ecosystem.
- **Restoration**: The act or process of returning an ecosystem to its earlier good condition.

Implementation

Explore the St. Louis River and western Lake Superior, while learning about historical contamination that led to environmental degradation and celebrating the significant ecological improvements that have occurred as a result of pollution controls, remediation, or restoration. Students will work together to complete a puzzle of the St. Louis River and western Lake Superior that will tell the story of wild rice, Lake Sturgeon, recreational opportunities, and Great Lakes shipping in the Port of Duluth-Superior.

Methods

1. Set up: This learning station is approximately 12 minutes long, and can be completed with groups of 10 - 25 students. This learning station does not require chairs, and is best

completed with students standing, gathered around the map that will be placed on the floor. Approximate timing of each portion of the station is in parentheses.

2. (*2 minutes*) Ask students to gather around a 4′ x 6′ vinyl map of the St. Louis River and western Lake Superior (Figure 1). Invite students to share what they know about the mapped area and/or what they notice about the map (e.g., change in elevation in Duluth).
3. (*2 minutes*) Introduce students to this portion of the St. Louis River, the St. Louis River Estuary, which extends from the Fond du Lac dam to western Lake Superior. Explain that the river has a very rich history. It has been home to Indigenous peoples for centuries. It was and still is an important transportation corridor for people and goods. Explain that the river became polluted and important habitat was lost in the 1800s and early 1900s. Today, we are celebrating the history of the St. Louis River Estuary and the hard work of many people to clean it up and bring back species that were nearly wiped out. Explain that we will be working together to complete a puzzle exploring and celebrating the St. Louis River.

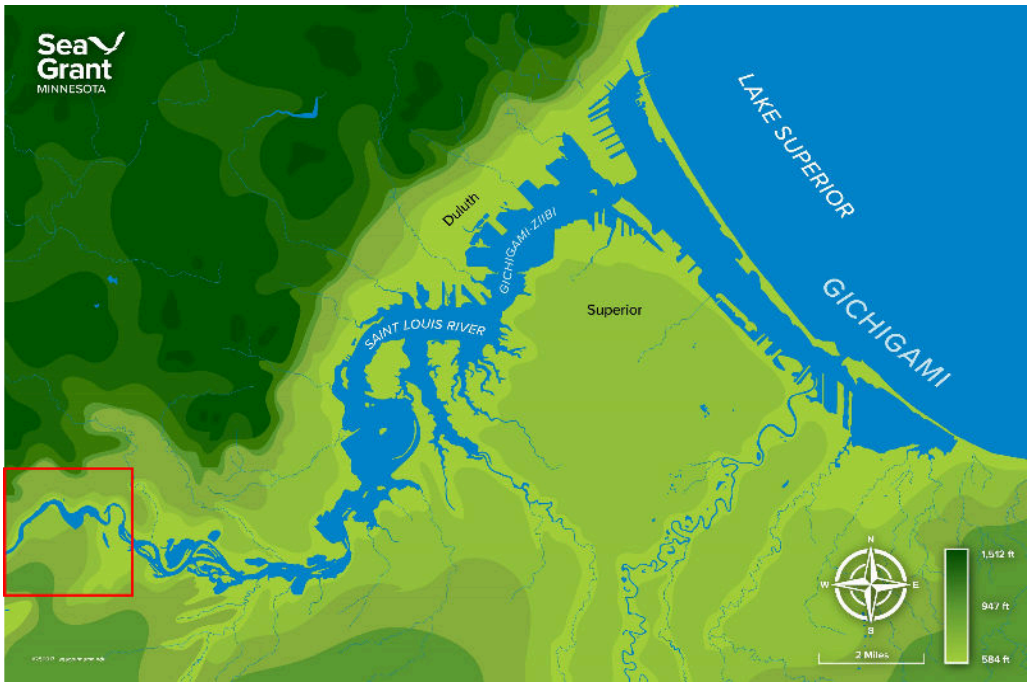
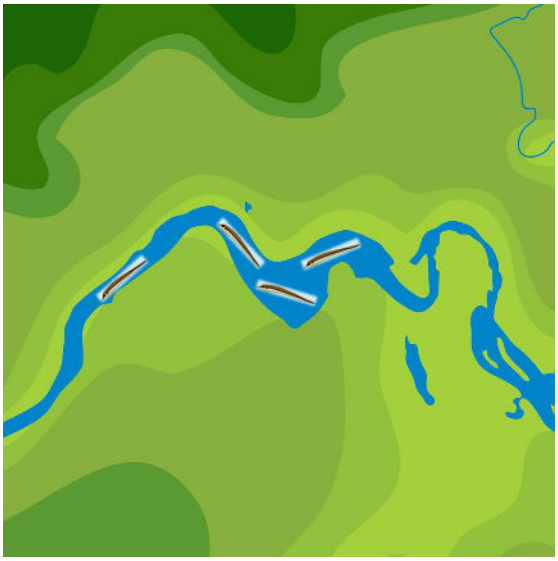


Figure 1. 4′ x 6′ vinyl map of the St. Louis River and western Lake Superior. The red square shows the location of the "Story of the Lake Sturgeon" puzzle piece (pictured below).

4. (*2 minutes*) Pass around 12 puzzle pieces. Students will work in small groups to share the information on their puzzle piece and then find the correct place on the map where the puzzle piece fits.
5. (*3 minutes*) Each puzzle piece will highlight important river-based activities or will ask students to answer a river-focused trivia question. Each small group will read their puzzle piece out loud so that the entire class can learn about each topic. The trivia question cards will be asked by the small group, and the rest of the students will work together to determine the correct answer.
6. (*3 minutes*) After the group reads their puzzle piece, they can start working on finding where on the map it goes until the puzzle has been completed.

7. The 12 puzzle pieces and the station learning objectives they address are below. The "References" section has online resources where educators and students can go to learn more about each of these topics.:
    a. **Story of the Lake Sturgeon (Figure 2; Learning Objective 1, 2, 3)**
        i. In the early 1900s, overfishing, habitat destruction, and pollution almost wiped out Lake Sturgeon in the St. Louis River. In 1983, a program started to bring back young sturgeon to the river. In 2009, new habitats were created below the Fond du Lac dam to help Lake Sturgeon and other fish spawn. In 2011, baby sturgeon from natural reproduction were found in the river. Since then, most years have seen successful sturgeon reproduction.



Story of the Lake Sturgeon

By the early 1900s, the Lake Sturgeon population in the St. Louis River was nearly extinct due to overfishing, habitat destruction, and pollution. Efforts to reestablish Lake Sturgeon in the river began in 1983 with a stocking program that introduced young sturgeon to the river. In 2009, rock riffles were created below the Fond du Lac dam to create spawning pools for Lake Sturgeon and other fish species. It took many years, but the stocking and habitat restoration efforts paid off. In 2011, the first documented naturally reproduced larval Lake Sturgeon were sampled below the Fond du Lac dam. Since 2011, all but two sampling years have shown evidence of reproductive success in the river.

Figure 2. Front and back of the "Story of the Lake Sturgeon" puzzle piece.

    b. **Wild Rice Restoration (Learning Objective 1, 2, 3)**
        i. Manoomin means wild rice in Ojibwe. Manoomin has been important to Indigenous peoples for centuries. It also provides food for animals plus the

plant creates habitat for wildlife. The St. Louis River Estuary once had up to 3,000 acres of wild rice. Industrial development, pollution, and logging nearly wiped it out. Since 2014, many groups have worked together to plant wide rice seeds each year. The seeds restore this important plant to the river.

c. Common Tern Migration and Nesting (Learning Objective 1, 2, 3)

i. The Common Tern migrates up to 6,000 miles from South America to the northern United States and Canada. They once nested in the Duluth-Superior area, but human activities displaced them. In 1989, wildlife managers encouraged nesting on Interstate Island in the St. Louis River. From 2020 to 2022, the island was restored to prevent flooding and enhance tern habitat. Now, about half of Lake Superior's Common Tern nests there.

d. St. Louis River Estuary National Water Trail (Learning Objective 1, 4)

i. In 2020, the St. Louis Estuary National Water Trail joined the National Parks Trail System. The St. Louis River Alliance and partners manage it. There are 11 loop trails for paddlers and boaters of all skill levels. This summer, explore the St. Louis Estuary National Water Trail. Trails range from 1 to 12 miles long!

e. Paddling Opportunities and Paddle Safe Twin Ports (Learning Objective 1, 4)

i. Paddle Safe Twin Ports is a safety campaign started in 2020. It was created by Minnesota Sea Grant and partners to promote safe paddling. The campaign focuses on the St. Louis River Estuary and western Lake Superior. It includes signs at 13 launch sites and provides online resources. Paddle Safe Twin Ports advises paddlers to wear life jackets, keep away from large ships, check the weather, and dress for cold water.

f. Swimming and Park Point Beach (Learning Objective 1, 4)

i. Minnesota Point is a seven-mile sandbar. It shields Duluth Harbor and Superior Bay from Lake Superior. The area features sandy beaches, swimming spots, and paddle launch sites. You can also enjoy the Park Point Nature Trail, which winds through an old-growth pine forest.

g. Fond du Lac and the Fur Trade (Learning Objective 1, 5)

i. Fond du Lac, now a neighborhood in Duluth, was home to the American Fur Company's trading post from about 1817 to 1847. Located along the St. Louis River, it was an early canoe route. The post had a warehouse, stores, a cabin, living quarters, and a large canoe and boat yard.

h. Wreck of the *M.C. Neff* (Learning Objective 1, 5)

i. The *M.C. Neff* was a wooden steamboat built in 1888 to load and unload lumber. On September 19, 1909, she delivered bridge pilings for a two-story rail and auto bridge over the St. Louis River. This bridge connects Wisconsin and Minnesota and is now called the Oliver Bridge. The next morning, a fire started, and the ship sank. Today, part of the ship rests in about twelve feet of water.

i. Largest Port by Tonnage on the Great Lakes (Learning Objective 1, 5)

i. The Port of Duluth-Superior is the largest port by tonnage on the Great Lakes. Each year, about 35 million short tons of cargo move through the port. It sees around 800 vessel visits. The cargo includes iron ore, coal, limestone,

grain, cement, salt, and wind turbine parts. The port supports 7,136 jobs and generates $1.6 billion dollars in economic activity.

j. **River Trivia #1** - Q: How long do female Lake Sturgeon typically live?
    i. A: Up to 150 years. Males live to around 55 years old.
k. **River Trivia #2** - Q: What bird species, known for its impressive fishing skills and large wingspan, can often be seen hunting along the St. Louis River?
    i. A: The Bald Eagle.
l. **River Trivia #3** - Q: Which state park, located along the St. Louis River, offers hiking trails, waterfalls, a swinging bridge, and scenic views of the river?
    i. A: Jay Cooke State Park.

Evaluation and Assessment

Students will be asked to write down two things in their River Quest Passport Books:

1. One thing that they learned about the St. Louis River from this station.
2. One place on the St. Louis River or Minnesota Point that they want to explore this summer.

If there is additional time, students may share what they wrote down in their passport books with their class.

References

Lake Sturgeon

Anselmo, T. (2020). Lake Sturgeon (Namé) in the St. Louis River: Cultural Significance, History and Current Status. ArcGIS StoryMap. https://storymaps.arcgis.com/stories/dcd40f05074142b88d04cc1918fc8c1d.

Wild Rice

Wisconsin Department of Natural Resources. (2024). St. Louis River Estuary Manoomin Restoration and Stewardship Plan. Wisconsin Department of Natural Resources, Office of Great Waters. Superior, WI. https://dnr.wisconsin.gov/sites/default/files/topic/GreatLakes/St.LouisRiverEstuaryManoominRestorationStewardshipPlan.pdf

Common Tern

Minnesota Land Trust. Restoring Habitat for a Threatened Species on Interstate Island. https://mnland.org/2022/04/18/interstate-island/

Recreation and Water Safety

City of Duluth. Park Point Beach Weather and Beach Conditions. https://parkpointbeach.org/

Minnesota Department of Natural Resources. (2002). Minnesota Point Pine Forest SNA. https://www.dnr.state.mn.us/snas/detail.html?id=sna02000

Minnesota Sea Grant. (2020). Paddle Safe Twin Ports. https://www.paddlesafetwinports.org/

St. Louis River Alliance. St. Louis River Estuary National Water Trail Map. https://www.stlouisriver.org/national-water-trail-map

Shipping

Duluth Seaway Port Authority. Port Statistics. https://duluthport.com/about-us/port-statistics/

Minnesota Historical Society. (2022). Fort St. Louis (Fond du Lac). https://www.mnopedia.org/place/fort-st-louis-fond-du-lac

Wisconsin Sea Grant and Wisconsin Historical Society. Wisconsin Shipwrecks: M.C. Neff (1888). https://www.wisconsinshipwrecks.org/Vessel/Details/821

Learning Targets

Minnesota State Standards

6E.3.2.1.3 (Earth and Human Activity) - Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Wisconsin State Standards

SCI.CC2.m (Cause and Effect) - Students use science and engineering practices, disciplinary core ideas, and cause and effect relationships to make sense of phenomena and solve problems.
SCI.SEP8.m (Science and Engineering Practices) - Students obtain, evaluate, and communicate information, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.
SCI.ESS3.C.m (Earth and Human Activity) - Students use science and engineering practices, crosscutting concepts, and an understanding of earth and human activity to make sense of phenomena and solve problems.
SCI.ETS2.B.m (Links Among Engineering, Technology, Science, and Society) - Students use science and engineering practices, crosscutting concepts, and an understanding of links among engineering, technology, science, and society to make sense of phenomena and solve problems.

Next Generation Science Standards

MS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
Grade: Middle School (6-8)

MS-ESS3-3 Earth and Human Activity

Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
Grade: Middle School (6-8)