

# Great Lakes Literacy: Bridging the Connection between Land and Water

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**Inland Seas**  
EDUCATION ASSOCIATION







## Ventura River Watershed

The majority of water quality problems involve eutrophication (excessive nutrients and effects), especially in the estuary/lagoon. A large storm drain

### Permitted discharges:

- Six NPDES discharges: one major (POTW)
- 31 dischargers covered under the industrial storm water permit
- 16 dischargers covered under the construction storm water permit
- One municipal stormwater permit

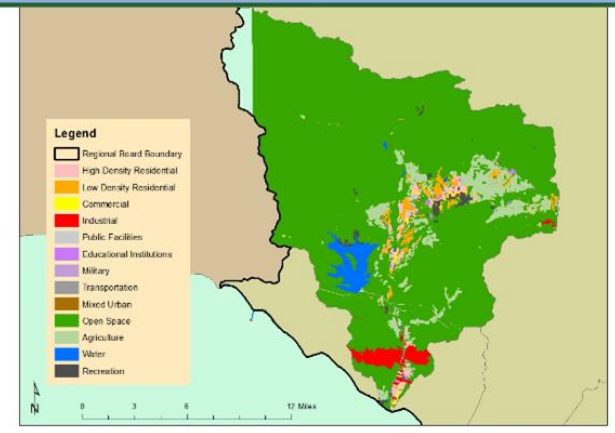
enters the river near the estuary and homeless persons live in and frequent the river bed.

Sediment in the estuary, however, appears relatively uncontaminated. In some subwatersheds, high TDS concentrations impair the use of water for agriculture. The watershed's water quality problems are, for the most part, nonpoint source-related. There have also been incidents of releases of toxic materials into storm drains entering the lower river.

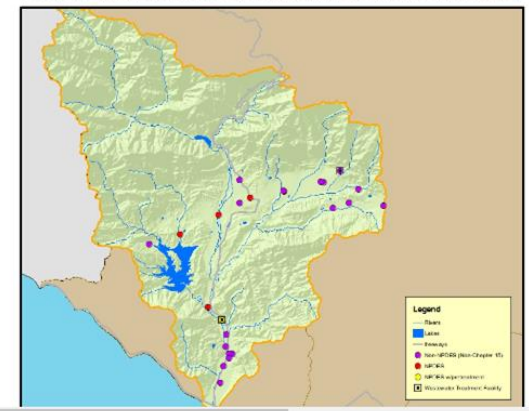
There is only one major discharger, a small POTW discharging to the lower river. For much of the year, the facility's effluent can make up two-thirds of the total river flow in that stretch.

The locations of facilities with discharges to surface water or to the ground (other than those covered by general industrial or construction stormwater permits) are shown in the figure above.

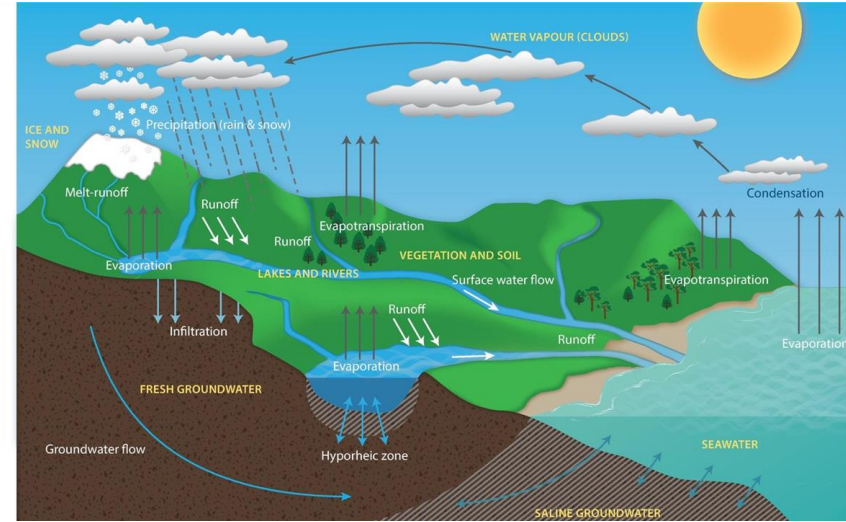
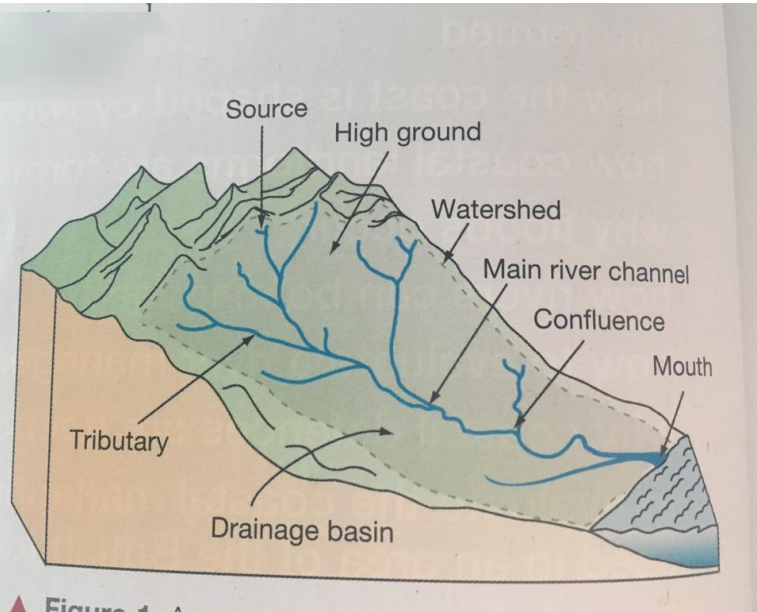
Of the 31 dischargers enrolled under the general industrial storm water permit in the watershed, the majority are in the city of Ventura. Wholesale trade-durable goods, trucking and warehousing, and



Locations of Non-Stormwater Discharges in the Ventura River Watershed



# Where do people 'see' a watershed?



# Lack of Watershed Knowledge and Understanding

- The Michigan Office of the Great Lakes State of the Great Lakes 2016 Report says that in some Michigan counties, up to 60% of respondents do not realize they live in a watershed.
- Great Lakes water quality and pollution only comes from human recreation and activity on the lakes or the coastline.



# So What Can We Do?

ISEA is addressing watershed stewardship in three ways:

- Modifying shipboard programs to connect participants' watersheds to the Great Lakes in a plastics pollution station
- Hosting intensive Great Lakes Watershed Field Courses for educators
  - 4 days, immersive field experiences, and community partner connections
- Expanding shoreside programs into Watershed Exploration Programs to connect what happens on land to what happens in the basin





# Microplastics Pollution Station - 'before'

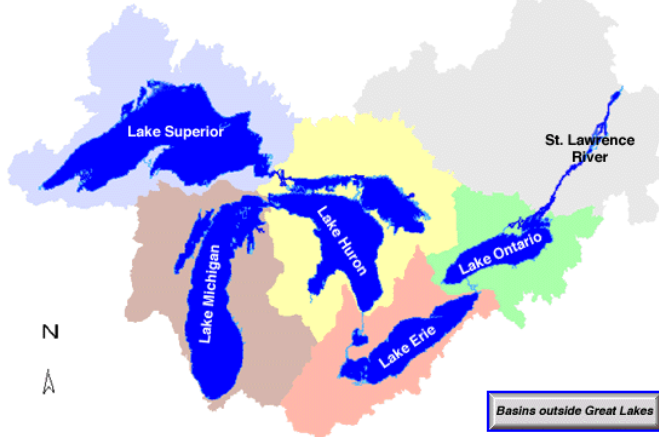
- Types of microplastics, how did they get here?
- Bioaccumulation
- Collect a microplastics sample





# Plastics Pollution - Program Modifications

- How did this get here?
  - Pull misconception right away, show watershed map
- Bioaccumulation, why it matters
- Single use plastics mad lib



**Plastics Pollution: The story of \_\_\_\_\_ the Straw.**

I'm a single use plastic, that means I only get used once and then thrown away in a trash can or recycled. I started my journey in \_\_\_\_\_ and traveled for 130 years to get to the Atlantic. I was sitting in a glass of \_\_\_\_\_ when a gust of wind carried me into the street, bouncing me off \_\_\_\_\_ until I landed in a ditch. The ditch water floated me to a nearby river. It was a \_\_\_\_\_ ride on the river, but I slowed down once I hit Lake Michigan. Did you know \_\_\_\_\_ all water in Michigan \_\_\_\_\_ into a Great Lake? I floated past a giant sailboat with \_\_\_\_\_ sails and students waving at me. I was rudely pecked by a couple of \_\_\_\_\_ who broke me into \_\_\_\_\_ pieces. I saw the Mackinac Bridge and got sunburned, which made me even smaller. It took almost \_\_\_\_\_



# Great Lakes Watershed Field Course





# Watershed Exploration Programs

ISEA has added programs that connect what happens on land to what happens in the Great Lakes basin

## About Watershed Exploration Programs

Expand your group's Great Lakes knowledge and experience by participating in our land-based watershed programs throughout the entire year. Choose from a half-day, full-day, or overnight experience.

A 40-bed onsite dormitory space is available for

## Who is Inland Seas Education Association?

Since 1989 Inland Seas Education Association (ISEA) has connected students to the Great Lakes through hands-on STEM experiences aboard traditionally-rigged tall ship schooners, along the shores of the Great Lakes, and in local rivers,



## Program Opportunities



### Watershed Watchers

Identify the boundary of land use in a local watershed and the stream that flows through it, then assess its health by conducting water chemistry and macroinvertebrate investigations.

### Study the Stream

Explore how choices on land impact the Great Lakes. Investigate the impact of physical properties of streams and their banks by measuring riparian zone characteristics and building a stream profile.

### Dissect the Watershed

Collect and dissect native and invasive plants and animals (e.g. native cattail, native and invasive mussels, native and invasive crayfish, invasive round goby), and learn about the advantageous adaptations that allow invasives to outcompete native species.

### ROV Engineer and Explore

Collaborate in teams to design and build an ROV to complete specific missions. Engage with engineering practices, learn how technology helps us observe and protect the Great Lakes, and gain exposure to marine technology and freshwater protection careers. \*Advanced programming with professional-grade ROVs are available for small groups, robotics clubs, etc. Reach out if you'd like more information.

### Navigate the Great Lakes

Learn how to use tools and charts necessary to navigate on the Great Lakes. Use bathymetric maps and charts, chart a path through the Great Lakes, and navigate a shipwreck course with a compass.

### Boatyard Challenge

Learn how ships have been designed and engineered to meet challenges faced by scientists and sailors in Great Lakes history. Then, design a battery or solar-powered boat by upcycling single-use plastic objects in the style of 'Junkyard Wars' to navigate a series of challenges in a water trackway in our outdoor classroom.

### Groundwater: The 6th Great Lake

Explore the role groundwater plays in our Great Lakes watershed. Define and identify the water table, experiment with infiltration of water through various ground covers near the coastline, and explore the role of soil in groundwater systems (not available in winter months).

### ISEA-Facilitated Extra Evening Programs

#### Watershed Summit (1-1.5 hrs)

Take on the role of a farmer, landowner, municipal official, or other neighbors as you work to clean up a watershed and prevent future pollution. Great for any age group.

#### Climate Summit (1.5-2 hrs)

Learn the various factors impacting climate change, then act as UN countries to come to agreements and limit global carbon emissions. Best for HS groups or those with higher background knowledge in climate change.

#### Invention Convention (1-1.5 hrs)

Participate in a series of team activities to create, communicate, design, and engineer solutions to communication, critical thinking, and engineering challenges provided by facilitators.



### Self-Led Experiences

- \* Cycling the Leelanau Trail
- \* Campfire by the bay

For more info on these experiences visit [Watershed Exploration Programs](#) from the [School Programs](#) tab of the ISEA homepage



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Bay, MI 49682  
[blship.org](#)

## Watershed Exploration Programs



Inspiring a lifetime of Great Lakes curiosity, stewardship, and passion in people of all ages

*S/V Inland Seas* sailing the Detroit River

Thanks for your attention!

