Follow the Water Lab: NYSSLS Alignment

Teacher guide for the student worksheet at mrsajdak.com/watershed (two pages, 18 questions; a low-write version has the same numbering). Environmental Science, Chapter 6, Lesson 6.4: What Are the Major Types of Freshwater Systems? (SE pp. 186-189). The answer key is a separate file, kept off the public site.

Performance expectations

> **HS-ESS2-5**
> Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. *"Water's movement shapes the land: students read how a real creek's slope changes from source to floodplain, and where it drops its load."*

> **HS-ESS2-7**
> Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. *"Living systems and water change each other: wetlands hold back a flood, and nutrients from the land change what lives in a lake."*

Practices and concepts, where students do them

Practice or concept	Questions	What students do
SEP 3 Planning and Carrying Out Investigations	8	Plan check: what changed, what was measured and what stayed about the same in a comparison of real creeks.
SEP 2 Developing and Using Models	12	Model check: the lab compares real creeks, not a controlled test. Name what else differs.
SEP 4 Analyzing and Interpreting Data	1, 3, 7, 13, 14	Read heights, flows and years; find the pattern and the year that does not fit it.
SEP 5 Using Mathematics and Computational Thinking	2, 9	Drop per mile; flow per square mile; a ratio.
SEP 7 Engaging in Argument from Evidence	17, 18	Answer "more nutrients make a lake healthier" with data; argue about a mall on a wetland.
CCC Patterns	3, 4	Land gets flatter and water wider from source to floodplain.
CCC Structure and Function	10, 11	A wetland's mud and plants hold water, so the flood comes later and lower.
CCC Cause and Effect	14, 15	Phosphorus, then algae, then lost oxygen.
CCC Stability and Change	18	What changes downstream when a wetland is gone.

Opening: pick a phenomenon

The slideshow's first slides offer three openers. Pick one per class.

Opener	What happens	Notes
Video: Lake Erie Goes Green	WTOL 11 Toledo news clip, 1:46, on the bloom growing across Maumee Bay. Backup: How the Buffalo River Got Clean, Buffalo Niagara Waterkeeper, 1:26.	Mute it if the anchors explain too much. Ask what turned the water green, and leave it open for Part 3.
Activity: Sponge or Plate?	4 minutes. Pour water over a tilted plate, then over a tilted wet sponge on the same plate. Count how long water keeps dripping.	Needs a plate, a kitchen sponge, a cup of water and a tray. Do not explain it.
Photos: Same Lake, Two Colors	Lake Erie from space: brown with storm mud, then green with algae.	Ask where the color came from. The answer is the land.

Part by part

Part 1, Follow the creek (Tab 1). Explore: Q1 to Q3. Learn It on the river's three zones sits between Q3 and Q4. Apply: Q4 to Q6.

Part 2, One storm, three creeks (Tab 2). Explore: Q7 to Q9. Learn It on inland wetlands and their seven services sits between Q9 and Q10. Apply: Q10 to Q12. The Model check is Q12.

Part 3, Lake Erie's green summers (Tab 3). Explore: Q13 and Q14. Learn It on lake zones, eutrophication and the four human impacts sits between Q14 and Q15. Apply: Q15 to Q17. Q18 closes the lab.

The district section

BPS Environmental Science Unit 2, Lesson 6.4. This lab serves the section's three core ideas (a river's three zones; the seven services of inland wetlands; human activities that degrade fresh water) and its vocabulary (surface water, freshwater life zone, runoff, watershed, eutrophication, delta, inland wetland). From the district list it uses On the Map: Rivers (trace a local river and find its zones), Interpret Visuals: Lake Zones, and the Thinking Ahead four impacts. **Additions, beyond the district list:** the stream gauge comparison and the Lake Erie data set. The Lab Manual's Modeling a Watershed question (how would wetlands change the flow?) is the root of Tab 2.

Sources. USGS Water Data for the Nation, daily mean discharge, gauges 04215500, 04217000, 04220045, July 16 to August 3, 2021. USGS NLDI and NHDPlus flowlines and basin outlines. USGS 3DEP via the Elevation Point Query Service. USGS The National Map, Topo and Imagery. MRLC National Land Cover Database 2021. NOAA NCCOS, Western Lake Erie HAB Seasonal Assessment, Bulletin 08, 2025; Lake Erie Historical Time Series: 2025 Update; phosphorus data collated by Heidelberg University NCWQR and NOAA NCCOS. NOAA rain gauges via ACIS, July 17 and 18, 2021. Environmental Science (National Geographic Learning / Cengage), Lesson 6.4. Images are listed on the lab page.