Follow the Water Lab

Name _____

Date _____

Period _____

mrsajdak.com/watershed · © Ryan Sajdak · CC BY-NC-SA 4.0 · Low-write



Do Now This is the Buffalo River, near the old grain elevators. The water here started as rain on hills about 40 miles south of the city. 2 minutes, before you open the lab

A. Predict: from the hills to Lake Erie, what happens to the creek?

☐ It gets narrower and faster ☐ It gets wider and slower ☐ It stays the same

B. Name one thing rainwater could pick up on its way to the lake.

_____

☐ I can use real data to find a river's three zones.

☐ I can explain what an inland wetland does to a flood, and name the services it gives.

☐ I can use Lake Erie data to explain eutrophication.

Part 1. Follow the creek (Tab 1)

SEP 4 Analyzing and Interpreting Data · SEP 5 Mathematics · CCC Patterns

Tap all six stops, **A** to **F**. Copy each one from **Your stop log**.

1. Your stop log: Cazenovia Creek and the Buffalo River.

Stop	A	B	C	D	E	F
Miles from the top						
Height (ft)						

Example. A road drops 300 ft in 5 miles. 300 ÷ 5 = 60 ft per mile. These are not your numbers.

2. A to B: _____ ft ÷ _____ miles = _____ ft per mile. E to F: _____ ft ÷ _____ miles = _____ ft per mile.

3. As the water goes from A to F, the land gets ☐ steeper ☐ flatter and the water you can see gets ☐ narrower ☐ wider

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 4 to 6.

CLUE. Source zone: steep and narrow. Transition zone: wider and lower. Floodplain zone: flat and slow.

4. Which zone is each stop in? Tick one box in each row.

Stop	Zone
D: a gravel creek, about 25 m wide	☐ source zone ☐ transition zone ☐ floodplain zone
F: the Buffalo River at lake level	☐ source zone ☐ transition zone ☐ floodplain zone
B: a small stream under the trees, in steep hills	☐ source zone ☐ transition zone ☐ floodplain zone

WORD BANK. watershed · runoff · delta · aquifer

5. All the land that drains into one body of water is its _____. Rain that flows over the land into a stream is _____.

6. The Buffalo River drops sand and mud near Lake Erie because the land is ☐ flat ☐ steep so the water is ☐ slow ☐ fast

Part 2. One storm, three creeks (Tab 2)

SEP 3 Investigations · SEP 5 Mathematics · CCC Structure and Function

Pick each creek. Copy it from **Your creek log**. Press **Play the storm** and watch the bars and the graph.

7. Your creek log. Rain fell on Day 0 and Day 1.

Creek	Land drained (sq mi)	Wetland (%)	Highest flow (cfs)	Highest on Day	Flow on Day 7 (cfs)
Cazenovia					
Tonawanda					
Oak Orchard					

8. Plan check. This is a comparison of real creeks. What job does each one have? Tick one box in each row.

In this comparison	Job
How much land each creek drains	☐ changed ☐ measured ☐ kept about the same
The share of wetland in each watershed	☐ changed ☐ measured ☐ kept about the same
The highest flow in the creek	☐ changed ☐ measured ☐ kept about the same

Example. A creek drains 100 sq mi and its highest flow is 900 cfs. 900 ÷ 100 = 9 cfs per sq mi. These are not your numbers.

9. Cazenovia: _____ cfs per sq mi. Oak Orchard: _____ cfs per sq mi. Cazenovia's is about ☐ 2 times ☐ 5 times ☐ 50 times as high.

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 10 to 12.

WORD BANK. hold · slowly · lower · later · faster · drain

10. An inland wetland's mud and plants _____ storm water, then let it out _____. So the highest flow is _____ and it comes _____.

11. Tick every service inland wetlands give people.

☐ filter pollution ☐ make floods bigger ☐ recharge groundwater ☐ homes for many species ☐ speed up runoff ☐ keep streams flowing in dry times

12. Model check. Besides wetlands, Cazenovia Creek and Oak Orchard Creek were also different in ☐ how steep the land is ☐ the color of the water ☐ the name of the creek

This could change the result because _____

Part 3. Lake Erie's green summers (Tab 3)

SEP 4 Analyzing Data · CCC Cause and Effect

Tap all 11 years. Copy these six from **Your year log**. Watch the dots on the graph.

13. Each spring and the summer after it.

Year	2016	2023	2014	2019	2011	2015
Phosphorus (t)						
Severity						

14. More phosphorus in spring usually means ☐ a worse bloom ☐ a milder bloom ☐ no change

Find the dot far from the line. It is ☐ 2012 ☐ 2015 ☐ 2023

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 15 to 17.

15. Number the steps of **eutrophication** , 1 to 4. _____ algae grow fast _____ fertilizer washes in with runoff _____ bacteria use up the oxygen _____ algae die and sink

16. Plankton make food in the sunlit top water, the ☐ littoral ☐ limnetic ☐ benthic zone. Mud and bloodworms are in the ☐ littoral ☐ limnetic ☐ benthic zone.

17. "More nutrients make a lake healthier." ☐ true ☐ false The data show that more phosphorus brings _____

Wrap it up

SEP 7 Engaging in Argument from Evidence · CCC Stability and Change

18. A town plans to drain a wetland upstream and build a shopping mall. I ☐ agree ☐ disagree because a wetland peak came on Day _____ and a creek with little wetland peaked on Day _____. The town would also lose this service: _____

NYSSLS: building toward HS-ESS2-5 and HS-ESS2-7 (DCI ESS2.C, ESS2.E). Environmental Science, Chapter 6, Lesson 6.4: What Are the Major Types of Freshwater Systems? (pp. 186-189). SEP = Science and Engineering Practice, CCC = Crosscutting Concept. Data: USGS (elevation, stream gauges), MRLC NLCD 2021, NOAA NCCOS and Heidelberg University NCWQR (Lake Erie).