# WOW: WATERSHEDS

**BASELINE AUDIT, GRADES K-2**

Before starting the watershed audit or going further, survey your students. Insert the total number of students who respond *Yes* and *No*.

- I know what a watershed is. _____ Yes     _____ No

## TABLE 1. GEOGRAPHIC INFORMATION

| | |
|---|---|
| 1. What is the name of your watershed? https://cfpub.epa.gov/surf/locate/index.cfm | |
| 2. What are the GPS coordinates for your study site? Use you smartphone's GPS or go to: https://www.whatsmygps.com to find the coordinates. | Latitude N<br>_____<br><br>Longitude W<br>_____ |
| 3. Eventually water running over your watershed empties into an ocean. Identify the ocean. | _____ Atlantic (east coast)<br><br>_____ Atlantic (Gulf of Mexico)<br><br>_____ Pacific<br><br>_____ Other |

## TABLE 2. WATERSHED CHARACTERISTICS AND BENEFITS

| | |
|---|---|
| 1. What percentage of students understand that a watershed is not just about water, but movement of water over an area of land? | _____ % |
| 2. There are several characteristics that are used to "define" a watershed. The list below is not exhaustive, but are elements students at this age should identify. What percentage of students can identify one or more elements related to a watershed? <br> • Land features (basic) <br> • Water quality <br> • Plants <br> • Soils | A. _____ 0 elements <br><br> B. _____ 1 element <br><br> C. _____ 2-3 elements <br><br> D. _____ 4 elements |
| 3. A watershed is a system. What percentage of students can identify one or more system benefits associated with a healthy watershed? <br> • Healthy plants and animals <br> • Tourism and recreation <br> • Spiritual celebrations, relaxation, physical fitness or other health benefits | _____ % |

**Think about the following question as you summarize the data in Table 2.**
1. How might knowing watershed characteristics and benefits help students become better watershed stewards?

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## TABLE 3. TEMPERATURE AND PRECIPITATION

| | |
|---|---|
| 1. For today's date, collect the weather data listed to the right. Use your local weather website, application or use the following:<br>• http://www.weatherbase.com/weather/state.php3?c=US<br>• www.weather.com | _____ Temperature in degrees Fahrenheit<br><br>_____ Precipitation in inches |
| 2. Change Over Time and Patterns<br>How does temperature and precipitation change over the course of the school year? Use your school's weather station, local weather application or one of the sites listed in #1 to collect temperature and precipitation data, a minimum of once a month, throughout the schoolyear. The post audit will ask for your monthly averages and totals.<br><br>We encourage the team/class to keep the data posted, so students are more easily able to look for patterns and see how weather changes throughout the school year. Encourage students to compare weather data at a variety of different points throughout the entire watershed. Use the discussion questions each time students collect data and/or add to the team/class chart or graph. As always, attach photos or student work to the audit as evidence. | |

**Think about the following questions as you summarize the data in Table 3.**
1. Can weather impact a watershed? Explain.
2. Can weather impact wildlife in a watershed? Explain.
3. What actions can the team/class take to help wildlife deal with weather impacts, such as floods, drought, development or pollution?

**TABLES 4, 5 and 6**. Consider contacting a watershed outreach coordinator (city water department) college or university, or local watershed non-profit. Their involvement is a great way to connect to the community, inspire students, demonstrate career possibilities and share resource expertise. If you cannot conduct a study within your watershed please determine the best way to gather the data, i.e. a phone call, an email or ideally a SKYPE, Zoom or Google Hangout with someone who works as a biologist, ecologist, volunteer, etc. at your nearest water quality or soil quality monitoring station. Contact your city's water department for resources specialists or recommendations.

Remember the water within the watershed is a network of connected systems. Water quality and/or pollutants upstream impact water quality downstream. Whether or not you are physically able to go to a nearby creek, stream, river, lake, etc., students can still collect water and soil data from samples you bring to the classroom for investigation.

Invite parents and community members to participate in the auditing process. Students can take on the role of educator by working with volunteers on citizen science. This experience is a great way to build community.

## TABLE 4. LANDSCAPE

| | |
|---|---|
| 1. Take a panoramic picture or multiple images of the study area and insert them in the summary for Table 4. If you are unable to be at your study site, use Google Earth or Google Maps, locating your study site using the GPS coordinates from Table 1. Take screen shots of the features listed below.<br><br>In the photo you want to see the following features.<br>• Banks of the waterbody<br>• Waterbody<br>• Surrounding land features | |

| 2. From your study site what types of land do you see? | | | | | |
|---|---|---|---|---|---|
| | Forested-private land | | Forested-public land | | Open green space (such as a park) |
| | Open space-rocky or little vegetation | | Housing or businesses | | Farm/ranch (crops or animals) |

**Continued on the next page.**

**Insert photos here.**

**Think about the following questions as you summarize the information in Table 4.**
1. How does the land near the water impact the waterbody?
2. What observations were made based on the photographs?
3. How are the photographs of the study site different from being on site or looking at Google Earth?

## TABLE 5. SOIL AND WATER QUALTIY

| 1. Soil Temperature | 2. Soil pH |
|---|---|
| Test 1 _____ °F<br><br>Test 2 _____ °F<br><br>Test 3 _____ °F | Test 1 _____ pH level<br><br>Test 2 _____ pH level<br><br>Test 3 _____ pH level<br><br>( ) Acidic ( ) Neutral ( ) Basic |
| 3. Is there trash on the ground that you can see from the study site? | ( ) Yes  ( ) No |
| 4. Describe how the soil looks, feels and smells. Come to a consensus with the class/team on 5-10 soil descriptors. | |
| 5. Water Temperature | 6. Water pH |
| Test 1 _____ °F<br><br>Test 2 _____ °F<br><br>Test 3 _____ °F | Test 1 _____ pH level<br><br>Test 2 _____ pH level<br><br>Test 3 _____ pH level<br><br>( ) Acidic ( ) Neutral ( ) Basic |
| 7. Transparency<br><br>Test 1 _____ cm    Test 2 _____ cm    Test 3 _____ cm    ( ) greater than depth of transparency tube | |
| 8. Is there trash in the waterbody that you can see from the banks (sides of waterbody)? | ( ) Yes  ( ) No |
| 9. **Is it raining now or has it rained in the last 24 hours?** Stormwater runoff from surrounding areas can impact watershed quality and appearance, including temperatures and pH. If possible, monitor and track temperature and pH throughout the schoolyear. Help students identify patterns, see how data changes as seasons change and problem solve big changes in data (What could be happening/why are our numbers so different than before?) | ( ) Yes  ( ) No |

**Think about the following questions as you summarize the data in Tables 5.**

1. Why is it important to observe and test soil and water at the study site?
2. What impacts can trash on the land or in the water have on,
   - Water quality?
   - Soil quality?
   - Wildlife?
3. What actions can the team/class take to be better watershed stewards? Use this information to inform the Eco-Action Plan.

Consider contacting a watershed outreach coordinator (city water department) college or university, or local watershed non-profit. Their involvement is a great way to connect to the community, inspire students, demonstrate career possibilities and share resource expertise. If you cannot conduct a study at your watershed please determine the best way to gather the data, i.e. a phone call, an email or ideally a SKYPE or Google Hangout with someone who works as a biologist, ecologist, volunteer, etc. at your nearest watershed monitoring station. Contact your city's water department for resources specialists or recommendations.

Remember the water in your watershed has a direct connection upstream and downstream to your location. Whether or not you are physically able to go to a nearby creek, stream, river, lake, etc., students can still collect water and soil data from samples you bring to the classroom for investigation.

Involve parents in their child's learning. Invite parents to participate in the auditing process, especially the macroinvertebrate studies. Animal counts are a fun family experience and a great way to connect families to nature.

## TABLE 6. WILDLIFE

| | |
|---|---|
| 1. Count how many **different** plants and animals are observed on this day? | _____ amphibians  _____ birds<br><br>_____ fish  _____ insects<br><br>_____ mammals  _____ reptiles<br><br>_____ aquatic plants  _____ terrestrial plants<br><br>_____ total plants and animals observed |

**Volunteers needed for macroinvertebrate studies**. Consider speaking to a resource expert before completing this section. They may have materials that you can borrow or they may be able to come assist you.

There are several macroinvertebrate resources, such as Stroud or GLOBE. Please use a resource that works best for your team.

    Stroud - http://www.stroudcenter.org/macros/           GLOBE - https://goo.gl/p6niFW

**To help you with identification** and assessment please refer to the handout on the WOW-Audits page, titled Macroinvertebrate Studies Guide.

**Reminder:** Please attach photos or student work to the audit as evidence.

| | |
|---|---|
| 2. How many macroinvertebrates were collected total? | _____ |
| 3. How many different types were collected? | _____ |

**Insert photos here.**

**Think about the following questions as you summarize the data in Table 6.**
1. How are wildlife important to a watershed? Explain.
2. Can wildlife be one indicator of a healthy watershed? Explain.
3. What are some of the actions that can be taken to support current watershed programs/initiatives? Use these actions to support your Eco-Action Plan.

**Review of All Data**
1. Based on what is known and has been learned, does the class/team think there is evidence to support the claim that the watershed is healthy?
2. Be prepared in the post-audit to explain **patterns** students have identified through their investigations.
3. Be prepared in the post-audit to explain any **relationships** students identified between wildlife and the health of the soil and water.