



WOW: WATERSHEDS

POST-ACTION AUDIT, GRADES 3-5

Did the team/class work with any resource experts and/or volunteers? () Yes () No

Please list if applicable: _____

Using the same sample group as your baseline survey, conduct the survey again post-action. Insert the average student response. On a scale from 1-10, 10 being the most important and 1 being the least important,

- How important is a healthy watershed to wildlife? _____
- How important is a healthy watershed to the local community? _____

TABLE 1. GEOGRAPHIC INFORMATION

1. What are the GPS coordinates for your study site? Use your smartphone's GPS or go to: https://www.whatsmygps.com to find the coordinates.	Latitude N _____ Longitude W _____
---	---------------------------------------



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



TABLE 2. WATERSHED CHARACTERISTICS AND BENEFITS

<p>1. What percentage of students can identify elements of a watershed? The list is not exhaustive. These are the elements most important to grasp at this age.</p> <ul style="list-style-type: none"> • Geography • Water quality • Vegetation • Soils 	<p>A. ____ 0 elements</p> <p>B. ____ 1 element</p> <p>C. ____ 2-3 elements</p> <p>D. ____ 4 elements</p>
<p>2. A watershed is a system. What percentage of students can identify one or more system benefits associated with a healthy watershed?</p> <ul style="list-style-type: none"> • Healthy plants and animals • Tourism and recreation • Spiritual celebrations, Relaxation, physical fitness or other health benefits 	<p>____ %</p>

Think about the following question as you summarize the data in Table 2.

1. How has student understanding changed from the baseline audit to the post audit or between audit years?



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



TABLE 3. TEMPERATURE AND PRECIPITATION

<p>1. For today's date, collect the weather data listed to the right. Use your local weather website, application or use the following:</p> <ul style="list-style-type: none"> • http://www.weatherbase.com/weather/state.php3?c=US • www.weather.com 	<p>____ ____ Temperature in degrees Fahrenheit and Celsius</p> <p>____ ____ Precipitation in inches and centimeters</p>																																							
<p>2. Change Over Time and Patterns</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">January</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">February</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">March</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">April</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">May</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">June</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">July</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">August</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">September</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">October</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">November</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">December</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> <tr> <td style="text-align: center;">Yearly Average</td> <td style="text-align: center;">____ °F ____ °C</td> <td style="text-align: center;">____ inches ____ millimeters</td> </tr> </table>		January	____ °F ____ °C	____ inches ____ millimeters	February	____ °F ____ °C	____ inches ____ millimeters	March	____ °F ____ °C	____ inches ____ millimeters	April	____ °F ____ °C	____ inches ____ millimeters	May	____ °F ____ °C	____ inches ____ millimeters	June	____ °F ____ °C	____ inches ____ millimeters	July	____ °F ____ °C	____ inches ____ millimeters	August	____ °F ____ °C	____ inches ____ millimeters	September	____ °F ____ °C	____ inches ____ millimeters	October	____ °F ____ °C	____ inches ____ millimeters	November	____ °F ____ °C	____ inches ____ millimeters	December	____ °F ____ °C	____ inches ____ millimeters	Yearly Average	____ °F ____ °C	____ inches ____ millimeters
January	____ °F ____ °C	____ inches ____ millimeters																																						
February	____ °F ____ °C	____ inches ____ millimeters																																						
March	____ °F ____ °C	____ inches ____ millimeters																																						
April	____ °F ____ °C	____ inches ____ millimeters																																						
May	____ °F ____ °C	____ inches ____ millimeters																																						
June	____ °F ____ °C	____ inches ____ millimeters																																						
July	____ °F ____ °C	____ inches ____ millimeters																																						
August	____ °F ____ °C	____ inches ____ millimeters																																						
September	____ °F ____ °C	____ inches ____ millimeters																																						
October	____ °F ____ °C	____ inches ____ millimeters																																						
November	____ °F ____ °C	____ inches ____ millimeters																																						
December	____ °F ____ °C	____ inches ____ millimeters																																						
Yearly Average	____ °F ____ °C	____ inches ____ millimeters																																						



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



Think about the following questions as you summarize the data in Table 3.

1. How has temperature and precipitation changed over the course of the year?
2. Can weather impact wildlife in a watershed? Explain.
3. Can weather impact wildlife at the study site? Did the team/class see evidence of this?
4. If applicable, describe one action the team/class took to help wildlife deal with weather impacts, such as extreme weather events, development and/or pollution?



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



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 second panoramic or set of images of the study area and insert them in the summary for Table 4. Be prepared to explain how the study site has changed from the first set(s) of photos to the post-action set of photos.

If you are unable to be at your study site, use Google Earth or Google Maps, locating the study site using the GPS coordinates from Table 1. As a reminder, take screen shots of the features listed below.

In the photo you want to see the following features.

- Banks of the waterbody
- Waterbody
- Surrounding terrain

2. From your study site what types of land do you see?

	Forested-private land		Forested-public land		Open green space
	Open space-rocky or little vegetation		Housing or businesses		Farm/ranch (crops or animals)

Continued on the next page.



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



Insert photos here. Compare and contrast photos from the baseline to the photos you have now (if this site has been studied over multiple years, review all images).

Think about the following questions as you summarize the information in Table 4.

1. Why is it important to understand what the area looks like and how the land is used at the study site?



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



TABLE 5. SOIL QUALITY

<p>1. Soil Temperature</p> <p>Test 1 _____ °F _____ °C</p> <p>Test 2 _____ °F _____ °C</p> <p>Test 3 _____ °F _____ °C</p>	<p>2. Soil pH</p> <p>Test 1 _____ pH level</p> <p>Test 2 _____ pH level</p> <p>Test 3 _____ pH level</p> <p>() Acidic () Neutral () Basic</p>	
<p>3. Nitrogen (optional)</p> <p>Test 1 () low () medium () high</p> <p>Test 2 () low () medium () high</p> <p>Test 3 () low () medium () high</p>	<p>3. Phosphorus (optional)</p> <p>Test 1 () low () medium () high</p> <p>Test 2 () low () medium () high</p> <p>Test 3 () low () medium () high</p>	<p>4. Potassium (optional)</p> <p>Test 1 () low () medium () high</p> <p>Test 2 () low () medium () high</p> <p>Test 3 () low () medium () high</p>

TABLE 6. WATER QUALITY

<p>1. Water Temperature</p> <p>Test 1 _____ °F _____ °C</p> <p>Test 2 _____ °F _____ °C</p> <p>Test 3 _____ °F _____ °C</p>	<p>2. Water pH</p> <p>Test 1 _____ pH level</p> <p>Test 2 _____ pH level</p> <p>Test 3 _____ pH level</p> <p>() Acidic () Neutral () Basic</p>	
<p>3. Dissolved Oxygen (optional)</p> <p>Test 1 _____ ppm (parts/million)</p> <p>Test 2 _____ ppm (parts/million)</p> <p>Test 3 _____ ppm (parts/million)</p>	<p>4. Nitrates (optional)</p> <p>Test 1 _____ ppm (NO₃ parts/million)</p> <p>Test 2 _____ ppm (NO₃ parts/million)</p> <p>Test 3 _____ ppm (NO₃ parts/million)</p>	

Continued on the next page.



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



TABLE 6. WATER QUALITY - CONTINUED

5. Transparency	
Test 1 _____ cm Test 2 _____ cm Test 3 _____ cm () greater than depth of transparency tube	
6. Is it raining or has it rained in the last 24 hours? Stormwater runoff from surrounding areas can impact watershed quality and appearance, including temperature and pH.	() Yes () No
7. Is there evidence of pollution?	() Yes () No
8. List potential sources of pollution.	

Think about the following questions as you summarize the data in Tables 5 and 6.

1. Review why it is important to observe and test soil and water at the study site.
2. Review the impacts water upstream can have on water downstream?
3. Describe one action the team/class took to be better watershed stewards?



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



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 7. WILDLIFE

<p>1. Collectively, how many different plants and animals are observed on this day?</p>	<p>_____ amphibians _____ birds</p> <p>_____ fish _____ insects</p> <p>_____ mammals _____ reptiles</p> <p>_____ aquatic plants _____ terrestrial plants</p>
--	--

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.

Continued on the next page.



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



2. MACROINVERTEBRATE TYPE	OBSERVED AND CUMULATIVE INDEX VALUE (CIV)
Pollution Tolerant	_____ total # _____ points toward CIV
In Between	_____ total # _____ points toward CIV
Pollution Intolerant	_____ total # _____ points toward CIV
Total # macroinvertebrates identified	_____ total # _____ points toward CIV
Stream Assessment (check one) () Excellent () Good () Fair () Poor	

Insert photos here.



WOW: Watersheds

POST-ACTION AUDIT, GRADES 3-5



Think about the following questions as you summarize the data in Table 7.

1. Can wildlife be one indicator of a healthy watershed? Explain.
2. Describe one action the team/class took to support current watershed programs/initiatives?

Review of All Data

1. Based on what is known and has been learned, does the team/class think there is evidence to support the claim that this site is healthy? If this site is healthy or unhealthy does this mean the entire watershed is too?
2. Did students find patterns in the data? Explain.
3. Did students identify relationships between,
 - Wildlife and temperature?
 - Wildlife and precipitation?
 - Temperature and macroinvertebrates?
 - Precipitation and soil or water quality?