WOW: WETLANDS

POST-ACTION AUDIT, GRADES 6-8

Did the class/team work with resource experts and/or volunteers? ☐ Yes ☐ No nearest wetland.
Please list if applicable.

_____

Compare these average survey responses to the baseline audit responses. On a scale from 1-10, 10 being the most important and 1 being the lease important,

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

Metrics Required for Dashboard

1. How many actions did students take in an effort to improve or support current wetland programs or initiatives? _____

TABLE 1. GEOGRAPHIC INFORMATION-CONTINUED

1. Confirm your GPS coordinates for your forest study site, by comparing them to your coordinates in your baseline audit? Use your smart phone's GPS or go to: http://www.whatsmygps.com/ to find your coordinates.	Latitude N _____ Longitude W _____

TABLE 2. WETLAND CHARACTERISTICS AND BENEFITS

1. What percentage of students can identify three characteristics that define a wetland? • The hydro period (how long a wetland stays wet) • Soil characteristics • Biodiversity of vegetation	A. _____ 0 characteristics B. _____ 1 characteristic C. _____ 2 characteristics D. _____ All 3 characteristics
2. A wetland is a system and is part of a larger watershed system. What percentage of students can identify one or more system benefits associated with a healthy wetland? • Wildlife habitat • Erosion control • Water filtration • Flood protection Note, there are several benefits under each main benefit. https://www.epa.gov/wetlands/why-are-wetlands-important	_____ %

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-action audit or between audit years? Use the survey data to help support response.
2. Are students/team members better able to communicate wetlands information to authentic audiences?

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: • http://www.weatherbase.com/weather/state.php3?c=US • www.weather.com	_____ | _____ Temperature in degrees Fahrenheit and Celsius _____ | _____ Precipitation in inches and millimeters

2. Change Over Time and Patterns

You have been collecting temperature and precipitation data throughout the school year or over an extended period of time. Insert the data below and calculate the averages for temperature and precipitation. For months where students are not in school, collect the historical data from one of the two sites listed.

- http://www.weatherbase.com/weather/state.php3?c=US
- www.weather.com

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

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

1. Looking at historical weather data, 30-50 years or more ago, how has temperature and precipitation averages changed at this location? If changes have occurred, what might that mean for wildlife and the health of the wetland in general?
2. Have there been any major weather events since the baseline audit or between audit years?
3. If applicable, describe one action the class/team took to help wildlife deal with weather impacts, such as extreme weather events, urban sprawl/development and pollution.

TABLES 4, 5 and 6. Consider contacting a local college or university, or wetland 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 a wetland, 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. Wetlands are controlled by your state's EPA. In addition, connect with the U.S. Fish and Wildlife Service's *National Wetlands Inventory* for contacts.

Whether or not you are physically able to go to your nearest wetland area, students can still collect water and soil data from nearby study sites or from samples you bring to the classroom.

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.

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TABLE 4. SOIL QUALITY

1. Soil Temperature Test 1 _____ °F _____ °C Test 2 _____ °F _____ °C Test 3 _____ °F _____ °C	2. Soil pH Test 1_____ pH level Test 2 _____ pH level Test 3 _____ pH level ☐ Acidic ☐ Neutral ☐ Basic	3. Iron Test 1 _____ Fe ppm (parts/million) Test 2 _____ Fe ppm (parts/million) Test 3 _____ Fe ppm (parts/million)
4. Nitrogen Test 1 ◯ low ◯ medium ◯ high Test 2 ◯ low ◯ medium ◯ high Test 3 ◯ low ◯ medium ◯ high	5. Phosphorus Test 1 ◯ low ◯ medium ◯ high Test 2 ◯ low ◯ medium ◯ high Test 3 ◯ low ◯ medium ◯ high	6. Potassium Test 1 ◯ low ◯ medium ◯ high Test 2 ◯ low ◯ medium ◯ high Test 3 ◯ low ◯ medium ◯ high

TABLE 5. WATER QUALITY

1. Water Temperature Test 1 _____ °F _____ °C Test 2 _____ °F _____ °C Test 3 _____ °F _____ °C	2. Water pH Test 1_____ pH level Test 2 _____ pH level Test 3 _____ pH level ◯ Acidic ◯ Neutral ◯ Basic	3. Salinity Test 1 _____ ppt (parts/thousand) Test 2 _____ ppt (parts/thousand) Test 3 _____ ppt (parts/thousand)
4. Dissolved Oxygen Test 1 _____ ppm (parts/million) Test 2 _____ ppm (parts/million) Test 3 _____ ppm (parts/million)	5. Nitrates Test 1 _____ ppm (NO3 parts/million Test 2 _____ ppm (NO3 parts/million Test 3 _____ ppm (NO3 parts/million	
6. Ammonia Nitrogen (optional) Test 1 _____ NH3-N parts per million (ppm) Test 2 _____ NH3-N parts per million (ppm) Test 3 _____ NH3-N parts per million (ppm)		

Continued on the next page.

7. Transparency – Pick A or B to collect the transparency data.

A1. Secchi disk – distance from observer to:

Test 1 _____ m water surface | _____ m where disk disappears | _____ m where disk reappears

Test 2 _____ m water surface | _____ m where disk disappears | _____ m where disk reappears

Test 3 _____ m water surface | _____ m where disk disappears | _____ m where disk reappears

A2. Secchi disk reaches the bottom and does not disappear – distance from observer to:

Test 1 _____ m to water surface | _____ m depth to the bottom of the water site

Test 2 _____ m to water surface | _____ m depth to the bottom of the water site

Test 3 _____ m to water surface | _____ m depth to the bottom of the water site

B. Transparency Tube

Tube test 1 _____ cm or _____ greater than depth of transparency tube.

Tube test 2 _____ cm or _____ greater than depth of transparency tube.

Tube test 3 _____ cm or _____ greater than depth of transparency tube.

8. Is it raining or has it rained in the last 24 hours? Stormwater runoff from surrounding areas can impact water quality and appearance, including temperature, pH and transparency.	☐ Yes ☐ No

Think about the following questions as you summarize the data in Tables 4 and 5.

1. Review why it is important to observe and test soil and water throughout a wetland?
2. What conclusions can you draw about your wetland's health based on this data?
3. If applicable, describe one action the class/team took to be better wetland stewards.

TABLE 6. WILDLIFE

1. Collectively, how many different plants and animals are observed on this day? If students know the name of a specific animal and/or the species, it's good practice to make notes in the section below. Also encourage students to draw what they observe. **Never remove animals from a study site.**	_____ amphibians _____ birds _____ fish _____ insects _____ mammals _____ reptiles _____ aquatic plants _____ terrestrial plants
2. Wetlands provide habitat for wildlife. What percentage of students can provide the four required habitat elements? • Shelter • Places to have and/or raise young • As a source of food • As a source of clean water	_____ %
3. Calculate the biodiversity index. the number of species in the area (numerator) _____ = biodiversity index the total number of individuals in the area (denominator) For example, a 4 X 4 meter square area in a carrot patch has 300 carrot plants, all the same species. It has a very low biodiversity index of 1/300, or 0.003. A 4 X 4 meter square area in the forest has 1 pine tree, 1 fern, 1 conifer tree, 1 moss, and 1 lichen, for a total of 5 different species and 5 individuals. The biodiversity index here is high, 5/5 = 1.	

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Think about the following questions as you summarize the data in Table 6.

1. Have students/team members skills observing and/or identifying local wetland plants and animals improved?
2. Has the biodiversity index improved? Explain.
3. Is this one variable, numbers and diversity of wildlife enough evidence to conclude the wetland is or is not healthy?
4. If applicable, describe one action taken to improve or support current wetland programs/initiatives?
5. Optional: Attach photos of your wetland study site and make comparisons to the photos taken for the baseline audit or from previous audit years. What similarities and differences are observed? How do photographs support field investigation?

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 wetland is healthy? Has this one location improved or become unhealthy since last visiting? Explain.
2. What patterns have the class/team noticed? How have these patterns helped students/teams draw conclusions?
3. Has the class/team been able to identify relationships between wildlife and wetland characteristics, such as water or soil quality? Explain.

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