



WOW: WETLANDS

BASELINE AUDIT, GRADES 3-5



Contact a wetland outreach coordinator (city water department), college or university, or local wetland non-profit. Their involvement is a great way to connect to the community, inspire students, demonstrate career possibilities, and share resource expertise. This is also a fantastic opportunity to engage parents in their child's education.

If you cannot conduct a study at a nearby wetland 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 wetland. Contact the U.S. Fish and Wildlife Service's *National Wetlands Inventory* for contacts.

Before starting the wetland audit or going further, survey your students. On a scale from 1-10, 10 being the most important and 1 being the least important,

- How important is a healthy wetland to wildlife, the plants and animals? _____
- How important is a wetland to a local community? _____

TABLE 1. GEOGRAPHIC INFORMATION

<p>1. What is the name of your watershed? https://cfpub.epa.gov/surf/locate/index.cfm</p>	
<p>2. What is the wetland's name and/or classification? https://www.fws.gov/wetlands/data/Mapper.html Most wetlands around the U.S. do not have formal names. For example, the nearest wetland to my location is PEM1A. Hit "decode" to learn what the letters and/or numbers in your wetland name mean. This will be good information to include in the summary.</p>	



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TABLE 1. GEOGRAPHIC INFORMATION-CONTINUED

<p>3. What type of wetland are you auditing? https://www.fws.gov/wetlands/data/Mapper.html For example, freshwater pond, freshwater forested/shrub wetland or estuarine and marine wetland. There are many different types.</p>	
<p>4. What are the GPS coordinates for your wetland study site? Use your smart phone's GPS or go to: http://www.whatsmygps.com to find your coordinates.</p>	<p>Latitude N _____ Longitude W _____</p>



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TABLE 2. WETLAND CHARACTERISTICS AND BENEFITS

<p>1. What percentage of students can identify three characteristics that define a wetland?</p> <ul style="list-style-type: none"> • The hydro period (how long a wetland stays wet) • Soil characteristics • Biodiversity of vegetation 	<p>A. _____ 0 characteristics</p> <p>B. _____ 1 characteristic</p> <p>C. _____ 2 characteristics</p> <p>D. _____ All 3 characteristics</p>
<p>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?</p> <ul style="list-style-type: none"> • Wildlife habitat • Erosion control • Water filtration • Flood protection <p>Note, there are several benefits under each main benefit. https://www.epa.gov/wetlands/why-are-wetlands-important</p>	<p style="text-align: center;">_____ %</p>

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

1. Why is being able to identify wetland characteristics important when learning how to support a healthy wetland?



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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 millimeters</p>
<p>2. Change Over Time and Patterns</p> <p>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.</p> <p>We encourage your team to keep the data posted, so students are more easily able to look for patterns and see how weather changes throughout the school year. Use LEGOs or unifix cubes to create visual models that represent the data. Optional: Attach photos or student work to the audit as evidence.</p>	

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

- Over the course of your study or schoolyear, be on the lookout for patterns and relationships between temperature and precipitation, and any of the following variables –
 - soil quality
 - water quality
 - wildlife numbers
 - wildlife diversity
- How can weather impact wetland wildlife?
- What actions can the class/team take to help wildlife deal with weather impacts, such as extreme weather events such as floods and drought, development and pollution?



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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.

TABLE 4. 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</p> <p>Test 1 () low () medium () high</p> <p>Test 2 () low () medium () high</p> <p>Test 3 () low () medium () high</p>	<p>4. Phosphorus</p> <p>Test 1 () low () medium () high</p> <p>Test 2 () low () medium () high</p> <p>Test 3 () low () medium () high</p>	<p>5. Potassium</p> <p>Test 1 () low () medium () high</p> <p>Test 2 () low () medium () high</p> <p>Test 3 () low () medium () high</p>



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TABLE 5. 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. Salinity</p> <p>Test 1 _____ ppt (parts/thousand)</p> <p>Test 2 _____ ppt (parts/thousand)</p> <p>Test 3 _____ ppt (parts/thousand)</p>
<p>4. Dissolved Oxygen</p> <p>Test 1 _____ ppm (parts/million)</p> <p>Test 2 _____ ppm (parts/million)</p> <p>Test 3 _____ ppm (parts/million)</p>	<p>5. Nitrates</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>	

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6. 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.

7. 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. Why is it important to observe and test soil and water throughout a wetland?
2. Is water and soil data enough to conclude the wetland is healthy?
3. What actions can the class/team take to be better wetland stewards? Use this information to inform the Eco-Action plan.



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TABLE 6. WILDLIFE

<p>1. Collectively, how many different plants and animals are observed on this day?</p> <p>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.</p>	<p>_____ amphibians _____ birds</p> <p>_____ fish _____ insects</p> <p>_____ mammals _____ reptiles</p> <p>_____ aquatic plants _____ terrestrial plants</p>
<p>2. Wetlands provide habitat for wildlife. What percentage of students can provide the four required habitat elements?</p> <ul style="list-style-type: none"> • Shelter • Places to have and/or raise young • As a source of food • As a source of clean water 	<p>_____ %</p>

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

1. Reflecting on the types and numbers of wildlife observed at the study site, is this data enough to suggest the wetland is healthy or not healthy? Explain.
2. What are some of the actions that can be taken to improve or support current wetland programs/initiatives? Use these actions to support your Eco-Action Plan.
3. Optional: Attach photos of your wetland study site to use as a comparison against the post-action audit.

Review of All Data

1. Be prepared in the post-audit to explain **patterns** students have identified through their investigations.
2. Be prepared in the post-audit to explain any **relationships** students identified between wildlife and the health of the soil and water.