WOW: OCEANS

POST-ACTION AUDIT, GRADES 3-5

It is understood that not all schools will be able to conduct coastal and marine studies. However, all waters inland flow downstream and eventually lead to an ocean. Therefore, if you are not able to conduct your studies along the coast, coastal plain or bar-built estuary, or offshore, then it is expected you will conduct your studies at a waterway within your watershed. Your reflections and summarizations will allow you to make connections between what you find and their potential impacts along the coast and into the ocean.

Consider contacting local, regional or state non-profits, NOAA office, or U.S. Fish and Wildlife Service Center for assistance conducting your audit. 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 the coast and/or offshore, please determine the best way to gather the data, using technology such as Google Earth, phone calls, emails, SKYPE or Google Hangouts with resources specialists are both beneficial ways to collect information from a distance.

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 projects. This experience is a great way to build community.

Did the class/team work with any resource experts/specialist or volunteers? (   ) Yes   (   ) No
If yes, please list.

_____

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

- How important is a healthy ocean to wildlife? _____

- How important is it to address climate change in order to improve ocean health? _____

- How important are a school's actions to ocean conservation and stewardship? _____

METRIC REQUIRED FOR DASHBOARD
- How many actions did students take in an effort to improve or support current watershed programs or initiatives?

TABLE 1. GEOGRAPHIC INFORMATION

1. Confirm your GPS coordinates for your ocean 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 _____
2. Again make observations or use Google Earth (for those students who are inland), and describe the ocean study site. **Optional, but encouraged.** If pictures were taken during the baseline audit, make comparisons to your current view. Note any observed changes to right. Make note if there was a land altering event causing significant change to your study site, such as flooding, hurricane, tornado, fire, drought, etc. _____ _____	____ sandy coastline ____ tide pools ____ rocky coastline ____ dunes ____ white sands ____ coastal grasses/shrubs/plants ____ brown sands ____ mangroves or forests ____ black sands ____ cliffs

Insert photos here.

TABLE 2. OCEAN CHARACTERISTICS AND BENEFITS

1. What percentage of students can identify the following characteristics that help define an ocean? • Salinity • Temperature • Currents (how the oceans move) • Topography (the features of the ocean floor) • Biodiversity (plants and animals)	A. _____ 0 elements B. _____ 1-2 elements C. _____ 3-4 elements D. _____ 5 elements
2. An ocean is a system. What percentage of students can identify one or more system benefits oceans provide? • Ecosystem benefits and services: biodiversity of plant and animal species • Economic benefits, including tourism, sport/commercial fishing • Physical and mental health benefits	_____ %

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?
2. What have students learned about different cultures and their local community's connections to the ocean?

TABLE 3. WATER QUALITY

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1. pH

_____ **pH Level**

_____ Acidic _____ Neutral _____ Basic

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2. Salinity

Time of High Tide _____ | Time of Low Tide _____

Method used: ( ) hydrometer ( ) titration ( ) probe

Test 1 | Time of day before test _____ | _____ ppt (parts/thousand)

Test 2 | Time of day before test _____ | _____ ppt (parts/thousand)

Test 3 | Time of day before test _____ | _____ ppt (parts/thousand)

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3. Temperature

Test 1 _____F° | _____ C°

Test 2 _____F° | _____ C°

Test 3 _____F° | _____ C°

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4. Dissolved Oxygen

Test 1 _____ mg/L

Test 2 _____ mg/L

Test 3 _____ mg/L

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5. Transparency – Choose method A or B.

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.

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Think about the following questions as you summarize the data in Table 3.
1. What changes to water quality, if any, have been observed?
2. If changes have occurred, why?

TABLES 4 and 5. Consider contacting a coastal/ocean outreach coordinator (local non-profits) college or university. 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 along the coast/shore/beach 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 the nearest water quality monitoring station. Contact your regional EPA, NOAA and/or state-based fish and wildlife office for resource specialist contacts, resources or recommendations.

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. LITTER

1. Percentage of students who know the oceans are polluted.	_____ %
2. Percentage of students who a basic understanding of what an ocean gyres are.	_____ %
3. Percentage of students who know 90% of the contents within the ocean's garbage patches are plastic.	_____ %

4. Conduct a litter audit using the items most commonly found in and around coastal and marine ecosystems. First weigh the collection of litter. Next sort the collection by type and insert the total number of each item found. Safety is of utmost importance. Please ensure teams have access and use/wear proper safety gear, including, but not limited to gloves, litter grabbers/pinchers and appropriate recycling and trash receptacles.

Total weight to the nearest pound and kilogram, diverted from coastal and marine ecosystems. _____ pounds | _____ kilograms

_____ cigarette butts	_____ fishing line/nets	_____ can tabs	_____ tires
_____ bottle caps	_____ balloons	_____ lighters	_____ straws
_____ 6-pack rings	_____ cans	_____ plastic bottles	_____ Styrofoam
_____ sandwich bags	_____ plastic ware	_____ plastic lids	_____ grocery sacks
_____ micro-plastics	_____ _____	_____ _____	_____ _____

Think about the following questions as you summarize the information in Table 4.
1. What impacts on wildlife, if any, have been observed during clean-ups?
2. Have sources of litter been identified? If so, explain.
3. Describe one action teams/classes took to improve or support coastal and/or ocean cleanup programs/initiatives.

TABLE 5. WILDLIFE

1. Collectively, how many different plants and animals are observed on this day?	_____ amphibians _____ birds _____ fish _____ insects _____ mammals _____ reptiles _____ marine or brackish plants _____ coastal plants
2. Percentage of students who can identify **more than one local** plant and animal who rely on healthy coastal and/or marine ecosystems.	_____
3. MIGRATORY BIRDS As a part of the baseline audit you were asked to research migratory bird species in your community, paying close attention to their migration paths, especially those that flew over the ocean or in and around coastal areas. Below, the answers will be specific to the migratory bird(s) teams/classes researched and investigated. **Be sure to include an image of each species studied below this table**.	
4. List the common and scientific names of the migratory specie(s) studied.	Common Name(s) _____ _____ Scientific Name(s) _____ _____
5. List the reason(s) the species is considered a priority migratory species?	
6. Describe the species' habitat requirements.	
7. Where do the migratory birds spend winter and summer?	Winter _____ Summer _____

Continued on the next page.

TABLE 5. WILDLIFE, CONTINUED

8. What ocean, estuary, and/or bay do the migratory birds fly over?	
9. Survey teams/classes again. What percentage of student can identify all four habitat elements: food, water, shelter and a place to raise young?	_____
10. Did teams/classes participate in a migratory bird citizen science project?	_____ Yes _____ No
11. Did your school construct a new or expand an existing NWF Certified Schoolyard Habitats® as a part of this audit?	_____ Yes _____ No
12. Take a student survey. **Record the average score.** On a scale from 1-10 where 10 is very important/critical and 1 is not important/critical, how important/critical are coastal and marine ecosystems to migratory bird species?	_____

Think about the following questions as you summarize the data in Table 5.
1. Do students have a better understanding of the role this specific species plays in a food chain or web?
2. What connections did students make between tourism and migratory birds?
3. Describe one of the actions teams/students took to improve or support migratory bird habitat and/or migratory bird programs?

Review of All Data
1. Based on what is known and has been learned, and after implementing an action plan, what claims can be made based on the data and other evidence?
2. What patterns have teams/students identified? How have these patterns helped students develop a deeper understanding or to draw conclusions?
3. Have teams/students been able to identify relationships between-
   - Wildlife and water quality? Explain.
   - Wildlife and litter? Explain.