



My Water Address, Take Action!

During a natural disaster, knowing your water address and having an action plan could be a lifesaver.

■ Grade Level

Upper Elementary, Middle School, High School

■ Subject Areas

Earth Science, Environmental Science, Health, Government

■ Duration

Preparation time: Part I: 10 minutes; Part II: 10 minutes

Activity time: Part I: 50 minutes; Part II: 50 minutes

■ Setting

Classroom

■ Skills

Gathering information (collecting); Organizing; Applying (planning, problem solving, developing and implementing investigations and action plans)

■ Charting the Course

“The Life Box” introduces students to the four essential factors—one of them water—that allow life to exist. “Blue River,” “High Water History,” “Nature Rules!” and “Snow and Tell” help students understand that every water address has unique hydrologic characteristics, and some have long-standing challenges such as floods. “Rainy Day Hike” could be used to establish your school’s water address, while “8-4-1, One for All” can be used to discuss how communities manage water challenges and disasters through adaptive and integrated management.

■ Vocabulary

water address, flash flood, riverine flood, coastal flood, urban flood, Action Pack, Family Action Plan, tsunami, topography, geology, hydrology, precipitation, potable, monsoon, typhoon

▼ Summary

Students determine their water address and identify unique characteristics (e.g., spring floods along rivers, thunderstorms with hail common during the summer), assess their risk and create an Action (Emergency) Pack and Family Action Plan to be prepared in case of a flood or other natural disaster.

Objectives

Students will:

- identify their water address to determine the area’s water risks (e.g., flooding).
- identify and gather items to build an Action (Emergency) Pack for their home in case of a natural disaster.
- develop a Family Action Plan.

Materials

Warm Up

- Paper and pencils/pens

Part I

- Catalogs, magazines or newspapers that can be cut up
- Paper
- Scissors
- Glue
- Poster board or paper for collage
- Computer and printer (students can draw elements of Action Pack if they do not have computer access or collage materials)

Part II

- Copies of *Family Action Plan & Action Pack Contents* ©

Making Connections

It is important for students to know their water address to prepare for and stay safe during disasters such as floods, forest and grass fires, drought, tsunamis, tornados and hurricanes. Water plays a role in many disasters, either directly in the case of floods, tsunamis and hurricanes or indirectly in the case of water contamination after a tornado, water shortages in a drought, etc. Students will be familiar with such events through news reports, and some students will have lived through some kind of natural disaster and will therefore understand the value of being prepared.

Background

A “water address” includes the natural features of a specific location, such as topography/ landscape, geology, hydrology (atmospheric, surface and ground water), soils and vegetation, weather and climate and the human environment, including structures and utilities (e.g., roads, buildings, power lines, dams, dikes, levees). The features of a specific water address may change over time due to population growth, development and/or changes in the environment.

Your water address is defined by the interconnectedness of your location’s natural features and human environment. This activity addresses how these concepts come together to make your water address unique and special.

My Water Address



Some water addresses are dry. Sandy soil, hot temperatures and extremely low precipitation and humidity will dictate the area's natural vegetation, native wildlife and potential for agricultural crops. In the United States, for example, residents of the Southwest know that their water address is "dry." To be able to live and prosper in this unique water environment, residents of the area—past and present—have been fixated on securing water and have gone to great lengths to bring water from outside sources. In the case of Phoenix, Arizona, that meant accessing water from the distant Colorado River through the Central Arizona Project. Even with the new water brought in for use in the community, Phoenix's old water address remains, and it is an ever-present reminder of the realities of living in a dry place. Indeed, the city's prospects for the future are linked directly to external sources of water and creative water

conservation measures and programs.

On the opposite side of the spectrum, some water addresses are extremely wet. The Everglades in southern Florida have been called a "river of grass" because water flows slowly through the vast stretches of wetland grass toward oceans, bays and keys. Hot and humid, the Everglades receive significant—sometimes even extraordinary, especially in the case of hurricanes—amounts of precipitation. However, the excess water that once moved slowly through the Everglades in seasonal ebbs now moves much more quickly due to the construction of drainage canals, water diversions and inland waterways that move water out of the area much faster than the original flow. These water controls allow for continued development and production while also fueling considerable debate and effecting change in the area as a whole.

Whether wet or dry, every water address has its challenges because water—whether too much, not enough or not potable—plays a role in most natural disasters. Flooding is the single most common natural disaster in the United States, occurring in every region of the country. Moreover, other natural disasters—hurricanes and tsunamis in particular—can lead to flooding, making flood preparation and safety of particular importance to every individual and family.

No matter whether individuals are at home or school, on the hiking trail or at a camping site or vacation destination, they should determine their water address to assess the likelihood of their location becoming inundated during a flood. Perhaps a home is not in danger during a flood disaster, but what if a school located in a low area is vulnerable to flooding? What about a road outside of town that crosses a river? Your water address

depends on your location, and if floodwaters approach, it is important to be prepared.

Beyond floods, knowing your water address is important for dealing with the aftermath of most other natural disasters as well. In the wake of an earthquake, for example, one of the most common problems is contaminated water and lack of easily available potable water. If the water normally available in your water address is not usable, what will you do? Preparation for such situations is vital for safety and health, since everyone requires water to survive.

Knowing the potential effects of natural disasters is key in preparing for them. One of the most important things you can do for yourself, your family and your school is to be prepared.

Procedure

▼ Warm Up

- Tell students that whether they are at home, school or on vacation, their water address is made up of the natural features (topography, landscape, geology, hydrology, soils and vegetation, weather and climate) and the human environment (buildings and utilities) of a specific location.
- Given that introduction, ask students if they can describe their water address. Ask them to think about where they live and write a short explanation of their water address (e.g., “Jacob’s Water Address is…” or “Emma’s Water Address is…”). Like the author did in the sidebar, students should describe general characteristics of their location and explain how water helped shape the

people, economy and culture. Make sure students identify and include a brief discussion of the area’s water-related natural disasters.

- Ask students how they could be affected by a disaster in their water address. Is there a river, stream, dry wash or creek bed near their home? Is their home or school located at a lower elevation in the community? Is their home or school in a floodplain? (This can be determined by obtaining local or federal flood maps, online or through government agencies.) Do they live in a coastal area prone to hurricanes, typhoons, monsoons or tsunamis?
- Have students answer the questions below. These help determine if their water address is at risk from floods. Have students record their answers and discuss.
 - ◆ How far is your home from a dry wash or creek bed, stream or river?
 - ◆ Has it ever flooded where you live?
 - ◆ Have long-time residents ever recounted floods?
 - ◆ Has land use in your community changed to affect where surface water flows?
 - ◆ If you live in hilly or mountainous country, are the hillsides stable or have trees and ground cover been removed?
 - ◆ If you live near a stream, is it free-flowing or clogged with refuse?
 - ◆ How does weather affect where you live?
 - ◆ Do you experience hurricanes, monsoons, typhoons or spring thaws?
 - ◆ What seasonal changes affect your water supplies?
 - ◆ Do you camp or hike along rivers or in narrow canyons?



A flooded playground.

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My Water Address: One Expert Responds

Tom Cech is a water manager, author and educator in Fort Collins, Colorado, and has been involved in the world of water resources management for more than 30 years. The Project WET Foundation asked him some questions about his personal water address, as well as some questions about what the concept means to him.

Project WET Foundation (PWF): What river basin do you live in?

Tom Cech (TC): I live in the Cache la Poudre River basin. There are no large rivers or natural lakes in the area.

PWF: What are the weather and climate like there?

TC: We get an average of 14 inches of annual precipitation and often experience both summer thunderstorms and months with little or no rain. We get heavy snow, especially in the mountains, and below-zero temperatures in the winter sometimes. In the summertime, however, it's not unusual to see temperatures in the high 90s.

PWF: At what elevation does the area sit?

TC: Fort Collins is just under a mile high at about 5,000 feet above sea level. That means we get lots of sun and have high evaporation rates.

PWF: What's the vegetation like?

TC: We see a lot of sagebrush, prickly pear cactus and short-grass terrain. There aren't a lot of trees unless you're in an irrigated area or the mountains.

PWF: How are water resources developed?

TC: Water is moved around in canals, ditches and water pipelines, and ground water is used for irrigation.

PWF: How is the water quality?

TC: The water quality is very good in the mountains but declines somewhat in terms of nutrients below the cities.

PWF: When you know your water address, what can this knowledge do for you?

TC: I believe knowing our water address can help us to understand the type of water environment we live in—whether that's wet, dry, humid, with big rivers, lacking groundwater, etc. Knowing the components of my water address will also help me better understand limits (or restrictions) on our environment from a water perspective and can help me understand why water conflicts or controversies may exist in our area.

- ◆ Ask students if they are at risk from flooding. If their water address is safe from flooding, do they ever travel to locations that are at risk?
- ◆ What could they do to be safer from floods or other natural disasters at new or temporary water addresses? (Listen for weather warnings, pay attention to news reports from the area, etc.)
- ◆ If they are hiking in a narrow canyon and they hear thunder, should they quickly leave? What other locations or situations could put them at risk from floods?
- ◆ Should anyone ever drive through a flooded street? Should they play in rapidly flowing streams or drainage pipes?
- Remind students that water plays a role in many kinds of disasters, not just in floods. Ask them how they would get the water they need for drinking, washing and cooking if the water supply within their water address was contaminated or otherwise unavailable.

▼ The Activity

Part I

- 1. Inform students they are going to prepare an Action (Emergency) Pack in case a flood or other natural disaster affects their community.**
- 2. Tell students they have one minute to write all the items they would gather from their home if they needed to evacuate quickly or shelter in their home because of a natural disaster.** Stop all writing after one minute.
- 3. Have students break into groups to compare their lists.** After a few minutes, ask groups to tell the class the common and different items listed by each person in the group (e.g., everyone listed their pets, but only one person listed rain gear).

4. Ask students how complete their lists were when they were given only one minute. Ask them to imagine being under pressure and making such difficult and important choices during a stressful situation such as a flood or other natural disaster. Is it better to be prepared and plan ahead?
5. Explain that preparing an Action Pack in advance is much better than making difficult choices during a natural disaster. Being prepared is smart!
6. Divide students into groups and give each group appropriate magazines, catalogues or access to computers and printers to locate pictures of common items in a home. Have students cut out appropriate items they would gather from their home in preparation for a flood. This creates the student's Action Pack.
7. If students focus on personal effects, ask if there are supplies they should have in addition to those important items. Have them brainstorm in groups to come up with ideas for things that would be useful in a natural disaster (e.g., flashlight, bottled water, matches, etc.). Supply students with the list on *Family Action Plan & Action Pack Contents* if needed. Allow students time to collect other images if necessary.
8. Direct students to create a collage by cutting out pictures and gluing them on a poster board or sheet of paper.
9. If materials are not available, students can draw items.
10. Direct students to discuss their Action Pack with their family that evening. Ask students to report to the class the following day the results of the family Action Pack discussion. Did any students work with their families to assemble an Action Pack for emergencies? Do they feel more prepared in the case of a natural disaster?



A flooded street.

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Part II

1. Inform students that creating a Family Action Plan is another important step in preparing for a natural disaster. Tell them that they are going to prepare a Family Action Plan in small groups.
2. Ask students what tasks should be included in a Family Action Plan. After 15 minutes, ask each group to report and record their suggestions on the board.
3. Provide each student with a copy of the Student Copy Page *Family Action Plan & Action Pack Contents*.
4. Compare the class list with the student copy page. Add student items to the bottom of the student copy page.
5. Discuss the Family Action Plan. Ask students to begin completing it.
6. Instruct them to take the list home to finish with their families.

7. On the following day, discuss their lists and have them work in teams to complete them.
8. Ask students why it is important to prepare the Family Action Plan well before a natural disaster.

▼ Wrap Up

- Have students discuss how their families reacted to the *Action Pack* and *Family Action Plan*. Ask students if they think the *Action Pack* and *Family Action Plan* will make them better prepared for a flood or other natural disaster.
- Inquire why it is important to be prepared in advance of an emergency. Discuss the idea that an emergency situation may invoke fear and panic unless they are organized and have a plan. Ask students if there are other things they could do to be prepared.

- So that they are not overly concerned, remind students that there are many agencies that collect and assess data, monitor weather and climate patterns and recommend structural (e.g., levees, flood-proofing homes) and nonstructural (e.g., early warning systems) solutions to help protect people from floods.

ActionEducation™

- Hold an emergency-preparedness evening for the class or school. Invite representatives from local Disaster and Emergency Services and/or the local chapter of the Red Cross to address the group. Prepare **Family Action Plans** with attendees. Participants can be given a list of potential materials in advance, or local businesses could be asked to donate basic supplies. Publicize the event to spread the word about the importance of disaster preparation. Results of the seminar can be reported to the local media or to the Project WET Foundation at actioneducation@projectwet.org.

▼ Project WET Reading Corner

Lauber, Patricia. 2001. *Hurricanes: Earth's Mightiest Storms*. Boston, MA. Houghton Mifflin.*

Accounts of hurricane disasters and the human tragedies that accompany them are highlighted in this pre-Katrina book.

Markle, Sandra. 2006. *Rescues!* Minneapolis, MN: Lerner Publications.

With full-color photographs, this book dramatizes amazing real-life rescues of people, including those trapped by the aftermath of Hurricane Katrina.

Project WET Foundation. 2009. *Discover Floods*. Bozeman, MT: Project WET Foundation.

Colorful illustrations discuss how floods form and the damage they can cause.

Spilsbury, Louise and Richard Spilsbury. 2010. *Sweeping Tsunamis*. Chicago, IL: Heinemann Library.

This book educates students on the science of tsunamis and how technology is attempting to increase warning time.

*National Governors Association Center for Best Practices and Council of Chief State School Officers, "Texts Illustrating the Complexity, Quality, and Range of Student Reading K-5." And "Texts Illustrating the Complexity, Quality, and Range of Student Reading 6-12." *Common Core State Standards Initiative*. www.corestandards.org (June, 2009)

Assessment

Have students:

- describe their water address (**Warm Up**).
- identify the nearest river, stream, dry wash or creek bed and assess the possibility of flooding at their water address (**Warm Up**).
- list five items to be included in their Action Pack (**Part I**, step 7).
- create a **Family Action Plan (Part II)**, steps 1-8).

Extensions

Have students observe the landscape around their home or school. Is there a stream nearby? If so, is it choked with garbage or other debris? Have students talk to families, school or other community officials to organize a clean-up effort to reduce or even prevent a flood. Have students discuss what other efforts could reduce or mitigate flood impacts in their community or at another water address. This could include alerting community officials of plugged neighborhood storm drains.

Have students develop an Action Pack and Action Plan for a flood at school.

Have students research their community's natural disaster relief organizations and invite representatives to the classroom to discuss emergency preparedness.

Teacher Resources

Books

Project WET Foundation. 2009. *Discover Floods Educators Guide*. Bozeman, MT: Project WET Foundation.

Journals

Freudenburg, William R., Robert Gramling, Shirley Laska and Kai T. Erikson. 2008. "Organizing Hazards, Engineering Disasters? Improving the Recognition of Political-Economic Factors in the Creation of Disasters." *Social Forces*, 87 (2), 1015-1038.

Mjelde, James W., et al. 2007. "Fires, Floods, and Hurricanes: Is ENSO to Blame?" *Science Scope*, 30 (7), 38-42.

Websites

Federal Emergency Management Agency. Ready: Prepare. Plan. Stay Informed. This website discusses how families can prepare for disasters by having a disaster kit and plan. www.ready.gov. Accessed June 17, 2011.

National Oceanic and Atmospheric Administration. National Weather Service. This site has information on current weather conditions and climate data. www.weather.gov. Accessed March 22, 2011.

National Oceanic and Atmospheric Administration. River Conditions. This website offers real-time data on river conditions in the United States, including flooding. www.noaawatch.gov/floods.php. Accessed June 14, 2011.



Be sure each family member has one copy of the Family Action Plan and post it in a prominent place in the home. Review the plan every six months with family members.

1. Record your physical home address: _____

2. Record addresses, land and cell telephone numbers for each family member and a responsible family friend or relative: _____

3. Record emergency numbers and discuss when it is appropriate to call these numbers:
Fire _____
Police _____
Doctor _____
Hospital _____

4. Draw or describe community evacuation routes from your home to a known safe place. Practice driving or walking it once a year with family members. _____

5. If family members become separated and they are not sheltering in their home, their meeting place will be: _____

6. List local radio and television channels to receive emergency information: _____





7. List location of community safe shelters: _____

8. Record location of nearest hospital: _____

9. Keep your Action Pack ready to go!*

- Flashlight with plenty of extra batteries
- Battery-powered radio with extra batteries or wind-up radio
- First aid kit
- Prescription medications in their original bottle, plus copies of the prescriptions
- Eyeglasses (with a copy of the prescription)
- Water (at least one gallon [3.8 l] per person is recommended; more is better)
- Foods that do not require refrigeration or cooking
- Items that infants and elderly household members may require
- Sanitation and personal hygiene supplies (e.g., hand sanitizer, toilet paper)
- Matches in a waterproof container
- Can opener
- Paper plates and eating utensils
- Small tool box (e.g., hammer, screw driver, small saw)
- Medical equipment and devices, such as dentures, crutches, prostheses, etc.
- Change of clothes for each household member
- Waterproof clothing, such as raincoats and especially rubber boots for each family member
- Sleeping bag or bedroll and pillow for each household member
- Checkbook, cash and credit cards
- Passports, birth certificates, insurance documents—place all important documents in a waterproof container
- Map of the area

10. Develop a plan for taking care of family members, such as grandparents who live nearby or elderly neighbors.

11. Write an Action Plan to care for your pets or livestock.

12. Make it a rule to keep your vehicles fueled or other modes of transportation always in working order.

**From Family Disaster Plan developed by the Federal Emergency Management Agency and the American Red Cross, in addition to other sources.*

