

WE KEEP WATER FLOWING

Patch Program

October 2020

girl scouts
of black diamond


WEST VIRGINIA
AMERICAN WATER
WE KEEP LIFE FLOWING™





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“The We Keep Water Flowing patch encourages these future leaders to make the connection between their actions and the impact they could have on drinking water resources.”

Erica Pauken
Source Water Protection
Program Manager,
West Virginia American Water



A photograph of three young girls standing in a shallow pond or stream. The girl on the left is wearing an orange vest over a purple long-sleeved shirt. The girl in the middle is wearing a black vest over a pink long-sleeved shirt and blue jeans. The girl on the right is wearing a pink hoodie and black pants, and is crouching down. The water is calm, reflecting the surrounding autumn foliage. A green banner with the word 'INTRODUCTION' is overlaid on the top left of the image.

INTRODUCTION

West Virginia American Water (WVAW) and Girl Scouts of Black Diamond partnered to develop the We Keep Water Flowing patch program. It will inspire Girl Scouts to learn more about water sources in their community, strive to protect them and explore careers in the water industry.

The patch program aligns with the Girl Scout Leadership Experience to achieve the following goals:

- **Discover:** Seek opportunities to learn about the wide world of water.
- **Connect:** Collaborate with others to expand water knowledge.
- **Take Action:** Do something to help protect water sources.

This patch program manual is for both the Girl Scout and the facilitator. It serves as a guide through the activities to complete the **We Keep Water Flowing** patch. It is a three-step process. All Girl Scouts will complete the step one activities. Step two and step three activities are age appropriate.

Safety should always be the top priority in this patch program. Adults should review the Safety Activity Checkpoints manual to follow Girl Scout safety standards and guidelines. The intent is to provide a safe and positive experience for the girls.

ACRONYMS

- **USEPA** United States Environmental Protection Agency
- **USGS** United States Geological Survey
- **WVAW** West Virginia American Water
- **WVBPH** West Virginia Bureau of Public Health
- **WVDEP** West Virginia Department of Environmental Protection



BACKGROUND

Who is West Virginia American Water?

West Virginia American Water is a drinking water utility that has been serving customers in West Virginia since 1886. We provide drinking water and wastewater services to approximately 550,000 people in 19 counties and 362 communities in West Virginia. That represents about one third of the state's population. We operate 8 water treatment facilities, 2 wastewater facilities, 4300 miles of water pipes and 10,400 fire hydrants! Our drinking water comes from the following sources of water supply.

- Bluefield Area- Kee, Horton and Ada Reservoir
- Bluestone Area- New River (Bluestone Lake)
- Fayetteville Area- New River
- Gassaway, Kanawha Valley, and Webster Springs Areas- Elk River
- Huntington Area- Ohio River
- Weston Area- West Fork River

Our priority is to provide clean and reliable drinking water to the communities we serve. This starts at the source! Protecting our sources of supply supports the overall treatment process and benefits the community as a whole.

We are stewards of water resources and the environment. We work with partners upstream in our watersheds on challenges that could impact sources of supply now or in the future. Water is an integral part of life, and we take great pride in taking care of it.

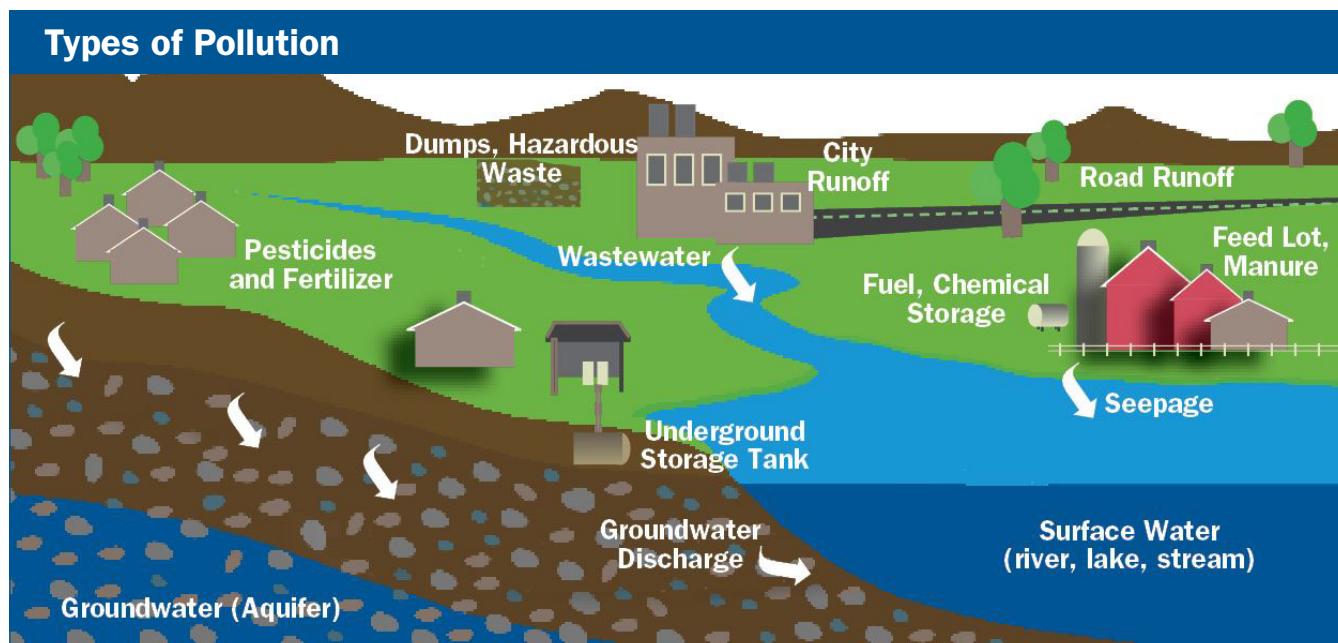
What is a Watershed?

We all live in a watershed. Watersheds are areas of land where runoff from rain and snow drains into a lake, stream, river or wetland. Water constantly travels over the land's surfaces that include farmland, lawns and city streets, on its course to a waterway. When it rains, water runs over the surface picking up any pollutants across the land. Small amounts of motor oil, pet waste, pesticides or litter are collected along the journey and released into the nearest waterway.

These watersheds are full of life. They provide homes for fish, birds and wildlife. They are also a source of drinking water for homes and businesses. No matter where you live, work or play, you are always in a watershed.

What we all do to the land makes a difference in the quality of water in our rivers and streams. Because of this, we spend a lot of our time and efforts protecting our water resources.





Types of Pollution

Various sources of pollution can exist within watersheds. They come from natural sources such as minerals that leach out of soil and rock, and man-made sources such as factory-made chemicals or waste. Pollution can enter water supplies by land runoff, other streams, and/or by soaking into the ground.

Pollution sources are often grouped into one of two categories: point sources and non-point sources. Point source pollution occurs at a specific location, such as a pipe or a leaking storage tank above or below the ground. Non-point source pollution occurs across a larger area that is not tied to a specific point or location. Examples of non-point source pollution include excess fertilizers and pesticides from farming or neighborhoods, waste or chemicals from city rainwater runoff, and sediment from erosion.

Each watershed is unique and can contain different types of pollution sources depending on land use. Drinking water utilities develop Source Water Protection Plans to reduce the risk to their drinking water supply from pollution.

Protecting Drinking Water Supplies

Source water is water used as a supply for drinking. It can take the form of surface water, which flows on top of the land surface within a watershed, or groundwater, which is stored in underground aquifers in the pore spaces of soil and rock.

What is Source Water Protection?

- Proactive approach to safeguard, maintain or improve the quality of drinking water sources.
- Involves identifying upstream land uses and addressing potential impacts those activities may have on water supplies.
- Provides value to our customers, employees, and operations – clean water is easier and less expensive to treat.

How We Protect Drinking Water Supplies

- Identify potential sources of pollution located upstream of our surface water intakes
- Monitor for changes in water quality
- Establish emergency plans to prepare and respond in case of potential contamination
- Engage community through outreach & education
- Partner with the community, agencies, and non-government organizations on watershed efforts





PATCH REQUIREMENTS

ALL GRADE LEVELS

Step 1

To complete the We Keep Water Flowing patch program, complete **all** the step 1 activities, regardless of grade level:

Research and follow the safety measures you need to take prior to your activity. Remember to follow the Girl Scouts Safety Activity Checkpoints.

- **Take a tour of your local water treatment plant.**
If you are unable to visit the facility, contact your local water system's community outreach team to set up a meeting, interview, or virtual tour. Find out what the source of your drinking water supply is, how they treat the water, and how it gets to your house.
- **Identify one or two women who work in the water utility business and invite them to speak to your troop about their career.**
Before they come to speak, have the troop develop a list of questions they want to ask. Another idea is to ask the girls if they have any water careers they would like to hear about and then try and find speakers from those fields (laboratory, water treatment, education, engineering, environmental protection, etc.) *
- **Find out the following information about your local water utility:**
To what areas does your local water utility provide drinking water service? How many customers do they serve? How many miles of pipeline do they have? How many fire hydrants do they maintain? How much water do they pump a day? *

- **Pick one of the lessons from the American Water Educational Toolkit.**

(DOES NOT APPLY TO DAISY/BROWNIE)

The toolkit contains 12 lessons that teach young people about the importance of water in their lives. Select at least one lesson that is age appropriate and meaningful to you. To view the lessons, visit [American Water Educational Toolkit](https://www.amwater.com/wvaw/water-information/Water-Learning-Center/water-curriculum-kids-activities) (<https://www.amwater.com/wvaw/water-information/Water-Learning-Center/water-curriculum-kids-activities>).

*Can be combined with the water treatment plant tour.



DAISY/BROWNIE (K-3)

Step 2

To complete the We Keep Water Flowing patch program, **pick two** of the step 2 activities:

- **Draw, color, or paint a picture of The Water Cycle and label the four main stages.**
- **Learn the different types of water bodies.**
Pick the body of water that is most important to you. Create a picture collage to share with your troop and tell them why it's important to you.
- **Explore watersheds.** Define the word "Watershed." Discover what watershed YOU live in. Make a list or draw a picture of plants and animals that you have observed in your watershed. Use the United States Environmental Protection Agency's (USEPA) [How's My Waterway website](https://www.epa.gov/waterdata/how-s-my-waterway) (<https://www.epa.gov/waterdata/how-s-my-waterway>) to locate your watershed.
- **Discover source water protection.** Define "source water protection." List two ways YOU can protect your drinking water source and share it with your troop and family.
- **List all the ways you used water this week.**
- **Learn what it means to conserve water.** List two ways you can conserve water at home or school.
- **Take the water pledge (See Resources).**



Step 3

To complete the We Keep Water Flowing patch program, **pick one** of the step 3 activities:

Research and follow the safety measures you need to take prior to your activity. Remember to follow the Girl Scouts Safety Activity Checkpoints.

- **Go on a hike with your troop or family beside a river or stream.** What animals, insects, birds, plants, etc. do you notice? What else do you see? Is the water clear or muddy? Are there any strange smells? How is the land around the water used? Are there houses, roads, businesses, farms? Are there any pipes flowing into the water? Are there boats or people in the water? Discuss your observations with your troop.
- **Reach out to a local watershed protection group. Learn what they do and volunteer for one of their activities.** To find a watershed group in your area use the [West Virginia Department of Environmental Protection's \(WVDEP\) Watershed Group Map](https://dep.wv.gov/WWE/getinvolved/sos/Pages/WVWGs.aspx) (<https://dep.wv.gov/WWE/getinvolved/sos/Pages/WVWGs.aspx>). Or reach out to your state environmental protection agency for help finding a local watershed group or a watershed protection activity.
- **Take part in a litter clean-up around a body of water to protect that water source and the wildlife who live there.** Watershed groups or your state environmental protection agency are familiar with upcoming events.

JUNIOR/CADETTE (4-8)

Step 2

To complete the We Keep Water Flowing patch program, **pick three** of the step 2 activities:

- **Draw, color, or paint a picture of The Water Cycle and describe how the stages work.**
- **List the different types of water bodies.**
Pick the body of water that is most important to you. Create a collage to share with your troop and tell them why it's important to you.
- **Explore watersheds.** Define the word "Watershed." Discover what watershed YOU live in. Gather information about your watershed that you find interesting and share it with your troop and family. Use USEPA's [How's My Waterway website](https://www.epa.gov/waterdata/how-s-my-waterway) (<https://www.epa.gov/waterdata/how-s-my-waterway>) to locate your watershed.

- **Discover source water protection.** Define “source water protection.” List two ways YOU can protect your drinking water source and share it with your troop and family.
- **Research your water system’s water quality report.** What substances are they monitoring for? Are they achieving compliance with regulations?
- **Take the water pledge (See Resources).**
- **Understand water conservation.** If you pay attention to how much water your family uses, you can find opportunities to conserve water in your own home.

HOW MUCH WATER DOES IT TAKE TO?	
Activity	Gallons Used
Flush the toilet	3 gallons
Take a shower	25-50 gallons (3 gal per minute)
Take a bath	36 gallons
Wash clothes	33 gallons
Run dishwasher	10 gallons
Brush teeth	1 gallon
Wash hands	1 gallon
Outdoor watering	15 gallons per minute

1. Record the amount of water used at your home over a one-week period. Read your water bill to find that information. You may need take the total monthly gallons and divide by four for a weekly total.
2. Record the number of toilet flushes, showers (including length), washing machine loads, dishwasher cycles, etc.
3. Make a pie-chart graph showing the percentage of your total water use in each activity.
4. Research and list ways that your family could use less water. Share your findings with your troop and family.

Step 3

To complete the We Keep Water Flowing patch program, **pick one** of the step 3 activities:

Research and follow the safety measures you need to take prior to your activity. Remember to follow the Girl Scouts Safety Activity Checkpoints.

- **Go on a hike with your troop or family beside a river or stream.** Where does the stream drain?
- Do other streams contribute to this stream? What happens when it rains? How does the stream change as you walk? What insects, birds, plants or aquatic life do you observe? How is the land around the water used? Are there houses, roads, businesses, farms? Are there any pipes flowing into the water? Use United States Geological Survey’s (USGS) [Current Water Data website](https://waterdata.usgs.gov/nwis/rt) <https://waterdata.usgs.gov/nwis/rt> for stream gauge information to learn more about the stream. Record the data, from one gauge, that is available for the stream on the day of your hike (e.g. gauge height, discharge, temperature, etc.) Define any words you are unfamiliar with. Discuss your observations with your troop.
- **Organize a water bracelet activity for a younger Girl Scout troop in your Service Unit.** Explain the water cycle phases as you make the bracelet (See Resources).
 - **Explore green infrastructure.** Define the term “green infrastructure.” Reach out to an organization in your community who utilizes green infrastructure. Interview them or tour the project to learn how it is improving water quality. Your local Stormwater Utility Board, state environmental protection agency or Environmental Dept. at a University can help identify a green infrastructure project in your community.
 - **Organize a showing for Girl Scouts of After the Storm,** a free video co-produced by USEPA and The Weather Channel. After showing the video discuss with the group how you can do your part to protect your watershed (See Resources).
 - **Create an attractive wall mural or bulletin board for your school or community with messages about clean water.** Some ideas for themes might be “We All Live Downstream,” “What is a Watershed?” “Where Does My Drinking Water Come From?” or “The Wonders of Wetlands.” Display your mural where others in your community can see it!
 - **Take part in or organize a litter clean-up around a body of water to protect that water source and the wildlife who live there.** Watershed groups or your state environmental protection agency are familiar with upcoming events. The [WVDEP’s WV Make It Shine program](https://dep.wv.gov/environmental-advocate/reap/wvmis/Pages/default.aspx) (<https://dep.wv.gov/environmental-advocate/reap/wvmis/Pages/default.aspx>) may be able to assist with organizing an event or contact your state environmental protection agency.

SENIOR/AMBASSADORS (9-12)

Step 2

To complete the We Keep Water Flowing patch program, **pick three** of the step 2 activities:

Research and follow the safety measures you need to take prior to your activity. Remember to follow the Girl Scouts Safety Activity Checkpoints.

- **Explore watersheds.** Define the word “Watershed.” Discover what watershed YOU live in. Gather information about your watershed that is interesting to you and share it with your troop and family. Use USEPA’s [How’s My Waterway website](https://www.epa.gov/waterdata/how-my-waterway) (<https://www.epa.gov/waterdata/how-my-waterway>) to locate your watershed.
- **Locate two industrial facilities upstream from your drinking water intake or on a major river near your home.** Use the [USEPA’s Enforcement and Compliance History Online \(ECHO\) database](https://echo.epa.gov) (<https://echo.epa.gov>) to research the facilities. Make a report of the facility including the location, what USEPA region it is located in, what type of Clean Water Act (CWA) permits it has and any details about the permits you can find. Include in your report if the facility has had any violations of noncompliance. If so, list when the violations/noncompliance was and what they were for. In the conclusion of the report, research and describe why this information is important for protecting drinking water sources and what industrial facilities can do to protect drinking water source.
- **Do a display or presentation on source water and explain how pollutants threaten its quality.** Show where your drinking water comes from. Show maps or data from one of the following websites. [USEPA’s Drinking Water Mapping Application to Protect Source Waters](https://geopub.epa.gov/DWWidgetApp) (<https://geopub.epa.gov/DWWidgetApp>) or West Virginia Bureau of Public Health’s (WVBPH) [West Virginia Source Water Protection Map Viewer](https://oehsportal.wvdhhr.org/wvswap/index.html) (<https://oehsportal.wvdhhr.org/wvswap/index.html>).
- **Organize a showing for Girl Scouts of After the Storm**, a free video co-produced by USEPA and The Weather Channel. After showing the video discuss with the group how you can do your part to protect your watershed (See Resources).
- **Organize a water bracelet activity for a younger Girl Scout troop.** Explain to them the water cycle phases as you make the bracelet (See Resources).

- **Explore green infrastructure.** Define the term “green infrastructure.” Reach out to an organization in your community who utilizes green infrastructure. Interview them or tour the project to learn how it is improving water quality. Your local Stormwater Utility Board, state environmental protection agency or Environmental Dept. at a University can help identify a green infrastructure project in your community.

Step 3

To complete the We Keep Water Flowing patch program, **pick one** of the step 3 activities:

Research and follow the safety measures you need to take prior to your activity. Remember to follow the Girl Scouts Safety Activity Checkpoints.

- Work with other Girl Scouts **to organize or participate in a [World Water Monitoring Day event](http://www.worldwatermonitoringday.org)** (<http://www.worldwatermonitoringday.org>), **[WVDEP Save Our Streams Workshop](https://dep.wv.gov/WWE/getinvolved/SOS/Pages/default.aspx)** (<https://dep.wv.gov/WWE/getinvolved/SOS/Pages/default.aspx>) **or comparable water monitoring program.**
- **Organize a litter clean-up around a body of water to protect that water source and the wildlife who live there.** The [WVDEP’s WV Make It Shine program](https://dep.wv.gov/environmental-advocate/reap/wvmis/Pages/default.aspx) (<https://dep.wv.gov/environmental-advocate/reap/wvmis/Pages/default.aspx>) may be able to assist with organizing an event or contact your state environmental protection agency.
- **Create an attractive wall mural or bulletin board for your school or community with messages about clean water.** Some ideas for themes might be “We all live downstream,” “What is a watershed?” “Where does my drinking water come from?” or “The Wonders of Wetlands.” Display your mural where others in your community can see it! Reach out to a local watershed protection group. Learn what they do and volunteer for one of their activities. To find a watershed group in your area use the [WVDEP’s Watershed Group Map](https://dep.wv.gov/WWE/getinvolved/sos/Pages/WVWGs.aspx) (<https://dep.wv.gov/WWE/getinvolved/sos/Pages/WVWGs.aspx>). Or reach out to your state environmental protection agency for help finding a local watershed group or a watershed protection activity.

A photograph of three children in a forest. A girl in the foreground is looking at a blueberry on a branch. Behind her, another girl with yellow sunglasses on her head is looking down. To the left, a boy is also looking at the blueberries. They are surrounded by green foliage and trees.

RESOURCES

ONLINE RESOURCES

- **West Virginia American Water** <https://www.amwater.com/wvaw/>
- **American Water Educational Toolkit** <https://www.amwater.com/wvaw/water-information/Water-Learning-Center/water-curriculum-kids-activities>
- **USEPA's How's My Waterway** <https://www.epa.gov/waterdata/how-s-my-waterway>
- **WVDEP Watershed Group Map** <https://dep.wv.gov/WWE/getinvolved/sos/Pages/WVWGs.aspx>
- **United States Geological Survey (USGS)** <https://waterdata.usgs.gov/nwis/rt>
- **USEPA "After The Storm" Video** <https://www.youtube.com/watch?v=OfIXhs6DzIE>
- **WV Make It Shine** <https://dep.wv.gov/environmental-advocate/reap/wvmis/Pages/default.aspx>
- **Drinking Water Mapping Application to Protect Source Waters** <https://geopub.epa.gov/DWWidgetApp/>
- **West Virginia Source Water Protection Map Viewer** <https://oehsportal.wvdhhr.org/wvswap/index.html>
- **USEPA Enforcement and Compliance History Online (ECHO)** <https://echo.epa.gov/>
- **World Water Monitoring Day** <http://www.worldwatermonitoringday.org/>
- **WVDEP Save Our Streams Workshop** <https://dep.wv.gov/WWE/getinvolved/SOS/Pages/default.aspx>

WATER CYCLE BRACELET

What You Need:

- White, blue, brown, green, yellow, and clear beads (can have one of each color, or repeat the pattern to fill up the bracelet)
- Pipe cleaner

What To Do:

- Place the beads on your pipe cleaner/string in a pattern that represents the water cycle.
- The sun (yellow bead) heats up water in and on the earth (green bead). Water evaporates (clear bead), cools and condenses into clouds (white bead).
- Then it rains, sleets, snows or hails (blue bead) and that water (called runoff) soaks into the earth creating mud (brown bead) where the sun again heats it, making it evaporate once again and continuing the cycle.
- After you place all your beads onto your bracelet have an adult tie it around your wrist.

REFERENCES

- <https://water.usgs.gov/edu/activity-percapita.php>
- https://www.gscm.org/content/dam/girlscouts-gscm/documents/Volunteer%20Resources/Program%20Resources/WaterDropPatchProjectManual_March2009.pdf
- <https://www.gscnc.org/content/dam/girlscouts-gscnc/documents/Kits%20and%20Patches/Water%20Drop%20Cadette%20Leader%20Guide.pdf>

WATER CONSERVATION PLEDGE



I pledge to the planet and everything on it to try my best not to waste water.

I'll turn the faucet off when brushing my teeth, washing my face, and later when I shave.

I'll try to keep my showers short, and only run the dishwasher or washing machine when they're full.

If I see a leak, I'll report it to my parents.

Finally, I'll share my knowledge of water conservation with others so that we can all be better stewards of the environment and leave plenty of water for future generations!

Signed Name and Date

