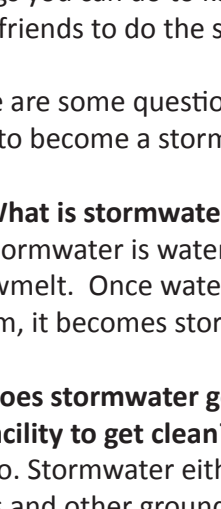


# Water Quality Fair Activity Guide



**SALT LAKE COUNTY STORMWATER COALITION**  
**WE ALL LIVE DOWNSTREAM**  
[www.stormwatercoalition.org](http://www.stormwatercoalition.org)

Hi, I'm Droplet!

It's my job to make sure that you know about stormwater and the many things you can do to keep our stormwater clean and to help your family and friends to do the same.

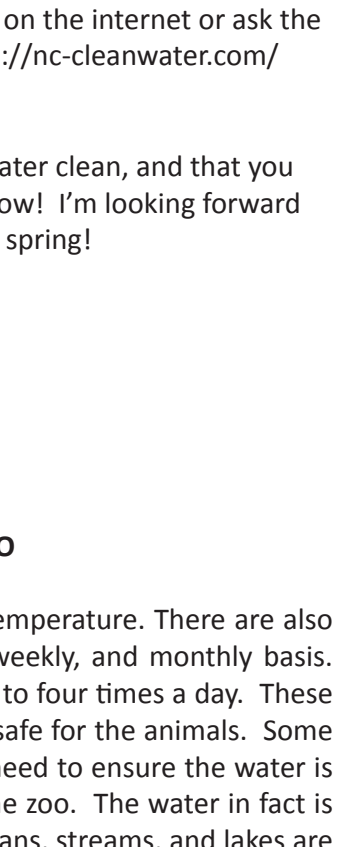
Here are some questions that you may have, and answers that may help you to become a stormwater champion.

**Q: What is stormwater?**

**A:** No. Stormwater is water from rain, hail, sleet and snowmelt. Once water hits the ground from a storm, it becomes stormwater.

**Q: Does stormwater go to the water treatment facility to get clean?**

**A:** No. Stormwater either sinks into the lawn, gardens and other ground surfaces that can absorb water. Other stormwater lands on streets, sidewalks, rooftops and other hard surfaces and runs off, picking up whatever it is in its path (leaves, cut grasses, fertilizers, garbage, oil, and other pollutants)—eventually flowing to the gutters and storm drains, and then, untreated, to our streams, rivers and lakes.



**Q: Is there anything I can do to help to keep our stormwater clean?**

**A:** Yes! There are many things that young people can do to help! Here is a short list, but you can think of others—and be sure to get your family and friends on board!

- Pick up any garbage you see on the ground
- Pick up pet waste and dispose in the garbage can
- Use reusable water bottles
- Recycle—everything!
- Ask about the hazardous waste items that the adults you know use and how they are disposed. These might include chemicals used as cleaners, fertilizers and pesticides. They also might include paint, used motor oil or antifreeze. Ask the adults to dispose of these properly, and if they aren't sure where, they can check on the internet or ask the Salt Lake County Health Department at: <https://nc-cleanwater.com/category/kids/> or call 385-468-4100.

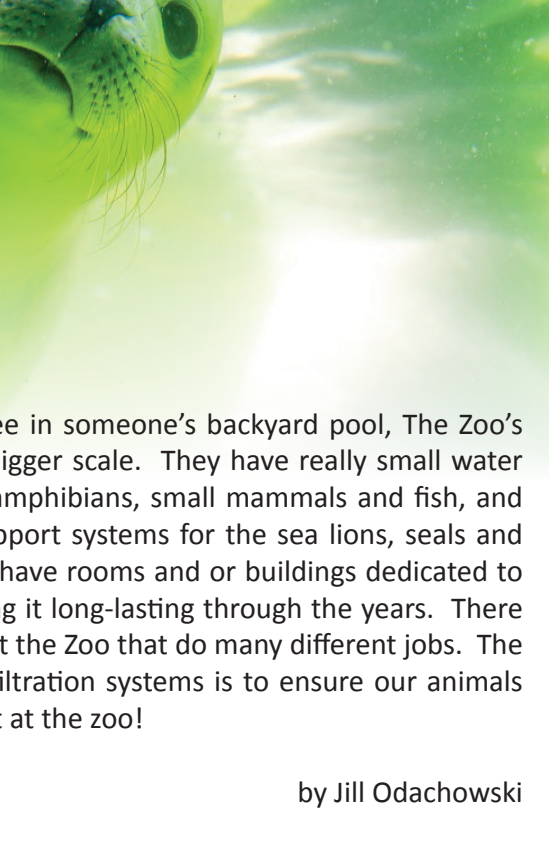
I hope you have a great time keeping the stormwater clean, and that you have a beautiful, clean planet to live on as you grow! I'm looking forward to seeing you in the streams, rivers and lakes this spring!

Your Friend, *Droplet*

## WATER, WATER EVERYWHERE! THE IMPORTANCE OF WATER QUALITY AT THE ZOO

Zoos use special equipment to measure pH and temperature. There are also many other test that are performed on a daily, weekly, and monthly basis. There are even some tests that must be run three to four times a day. These tests are run to make sure the water is clean and safe for the animals. Some animals are in pools all of the time, so zoo staffs need to ensure the water is healthy. At times, you may see cloudy water at the zoo. The water in fact is not dirty; it's natural and safe for the animals. Oceans, streams, and lakes are not intended to be "swimming pool clear". These bodies of water have algae and nutrient bio loads in them, too.

It's important to remember that when we humans go swimming in manmade pools and our eyes burn from chlorine after an hour, we don't want that to occur to the animals that are living in zoo pools much longer than just an hour.



Similar to filtration systems you see in someone's backyard pool, The Zoo's has filtration systems on a much bigger scale. They have really small water support systems for some of the amphibians, small mammals and fish, and then we have very large water support systems for the sea lions, seals and polar bears. These larger systems have rooms and or buildings dedicated to housing the equipment and keeping it long-lasting through the years. There are many different types of filters at the Zoo that do many different jobs. The most important job of the water filtration systems is to ensure our animals have the most natural environment at the zoo!

by Jill Odachowski

## Save our Water by Preventing Stormwater Pollution

**Where it Comes From**

**Where it Goes**  
When rain or water hit hard surfaces like pavement, it creates stormwater runoff.

**What You Can Do!**  
This pollution is not treated or removed from the water on its journey, so it is up to each of us to keep it clean and fresh from the start. Here are some things we can all do to prevent stormwater pollution and keep our communities looking and feeling great!

- ✓ Scoop poop!
- ✓ Follow the directions!
- ✓ Clean spills promptly!
- ✓ Dispose of properly!
- ✓ Mulch 'em!
- ✓ Pick up litter!

**If each of us makes some small changes, we can make sure our waters are clean and our environment is healthy for all of us!**

For More Information about Stormwater Pollution and What You Can Do to Help, Visit [nc-cleanwater.com](http://nc-cleanwater.com)

## Everyone in your family can help keep stormwater clean!

**Pet Waste**  
Bag and trash or flush it down the toilet.

**Lawn Care**  
Mulch grass clippings and leaves, leave on lawn, or compost.

**Debris**  
Sweep dirt into the lawn, pick-up debris and put in trash.

**Vehicle Maintenance**  
Pour waste oil into unbreakable container, seal, label, and recycle. Wash car on the lawn or at a commercial car wash.

**Household Chemicals**  
Target fertilizers and pesticides to the lawn & garden. Take excess chemicals to household hazardous waste facility.

## Can you commit to help with these stormwater solutions?

## Think Like a Scientist!

Today, while you are at the zoo, find a body of water (fountain, puddle, stream, pond). Describe the water body and its surroundings. What other observations can you make about the water body (smell, touch, nearby sounds, etc.).

Using your Water Quality Tool Kit, test the water for three parameters: pH, temperature, color.

**pH**  
What is the normal pH for water?  
What is the pH of the water you found?

**Color**  
What do you think is a normal apparent color for water?  
What is the apparent color of the water you found?

**Temperature**  
What do you think is a normal temperature for water this time of year?  
What is the temperature of the water you found?

**Rainfall turns from a natural resource to a vehicle for pollution when it hits the hard ground...**

**URBAN STORMWATER**  
It flows on top of paved surfaces to nearby rivers and streams picking up...

- Nutrients & Bacteria:** Lawn fertilizers and animal waste. Major cause of shellfish closures in Puget Sound.
- Copper:** Brake pad deposits on paved surfaces from vehicle wear and tear, pesticides. Toxic to fish at low levels.
- PAHs:** Polycyclic aromatic hydrocarbons from woodstove and fireplace combustion, vehicle combustion, creosote-treated wood. Toxic to humans as it enters the food chain.
- Stormwater drains concentrate large volumes of water and pollutants**
- Oil & Petroleum:** Drips, leaks, and emissions from vehicles.
- Other Heavy Metals:** Root material leaching, vehicle tire abrasion, aviation fuel combustion. Toxic to wildlife and people.

**How much stormwater?**  
For every inch of rainfall, one acre of paved surface can generate 27,150 gallons of runoff

Data Sources: The Department of Ecology, United States Geological Survey

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## Hogle Zoo Stormwater Scavenger Hunt

**Observe!**

Find and name 2 reptiles that live in water.

Find and name 2 amphibians that begin their lives in water.  
BONUS: Amphibian is Greek for \_\_\_\_\_.

Find and name 2 mammals that spend at least part of each day in the water (swimming)?

Find and name 2 fish that live at Hogle Zoo. How do fish breathe under water?

How does an elephant drink water?

Find and name 3 surfaces you have seen today where water would infiltrate (sink in) during a rainstorm.

Find and name 3 impervious surfaces you have seen today (hard surfaces that water cannot soak through).

Name 3 things that flow down storm drains that could harm water quality.  
Which of those things did you see today?

**BONUS:** What is the nearest waterbody where stormwater from Hogle Zoo would likely flow?



## HOW CAN FROGS TELL US ABOUT WATER QUALITY?

Nearly 4,000 different types of frogs exist, and frogs are found on every continent except Antarctica. They are important indicators of the health of their environments because they're extremely sensitive to changes in air and water quality, to moisture levels and to temperature. Frog populations have been declining markedly. Climate change, chemical pollution, acid rain, roads and loss of habitat are blamed for their disappearance.

**Pollution Absorption**  
Frogs have permeable skin that absorbs toxic materials. These poisons are concentrated and stored in the frogs' fat cells. Frogs spend part of their lives in water as tadpoles. Frogs' soft, jellylike eggs readily take up pollutants when they absorb moisture during development. Pesticides cause thyroid gland problems and physical mutations such as misshapen or extra limbs.

**Localized Populations**  
Frogs live part of their lives in water and part on land. Populations are localized to different habitats. If there are lots of frogs in an area, that indicates a healthy environment. A frog die-off indicates a problem with water, air or

soil in their habitat. Frogs in one ecosystem habitat might be thriving while frogs in a different habitat of the same ecosystem are disappearing. Laboratory and field studies let scientists study and compare the causes and effects of environmental changes in localized areas.

**Chemical Contamination**  
Frogs are extremely sensitive to chemical pollution. Tadpoles metabolize chemicals from the water and release them in their urine. The chemicals are then reabsorbed from the same water, much like a human fetus reabsorbs wastes. Scientists study environmental effects on frogs to understand how the environment affects humans. Chemical contamination causes mutations and cancers in frogs.

**What Frogs Can Tell Us**  
As frogs lose their habitats to development, weather changes and pollution, the entire ecosystem is affected. Studies of frogs can tell us when waters are polluted and warn us of how environmental changes affect cell development.

**A Sad Fact:**  
There are approximately 4,740 species of frogs around the entire world. There are about 90 species of frogs in the United States. Unfortunately, about 120 amphibian species, including frogs, toads and salamanders, have gone extinct since about 1980.

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