

A River Runs Through Us

An interactive touch-screen display at Swaner EcoCenter helps explore the East Canyon Creek watershed, water quality, and aquatic ecology



A River Runs Through Us is an interactive touchscreen display at Swaner EcoCenter.

- Users can look quickly through main sections or “drill down” into specific subject areas.
- The display has over 180 separate screens, 20 videos, 9 slide shows and hundreds of photos.
- The display is designed for easy modification, so it will remain current and relevant over time.

Current Conditions

USU Extension and the Utah Division of Water Quality monitors the water in East Canyon Creek near the Swaner EcoCenter.



To learn more about what we have found, click on the "Typical Data" and the "Measured Data" links.

These data were collected at this station within the past six hours.

Wednesday, July 31, 2013	Value	Unit
Stream Flow	6.8	cfs
Water Temperature	15.4	°C
Dissolved Oxygen	10.6	mg/L
pH	8	
Specific Conductance	349	µS/cm
Turbidity	1	NTU

To learn more click on the individual parameter names in the table.

See Typical Data

See Measured Data From 2012 and 2013

Unit Definitions

cfs stands for cubic feet per second. 1 cfs equals about 7.5 gallons per second.

°C stands for degrees Celsius, which is the metric system's unit for temperature. 0°C is the freezing point of water, and 100°C is the boiling point.

mg/l means "milligrams per liter". In the metric system, one liter of water weighs 1,000,000 mg, so this measurement is the same as saying "parts per million".

µS/cm means "micro siemens per centimeter". A "siemen" is a measure of electrical conductivity, so the unit indicates how well the water conducts electricity through a centimeter of water.

NTU stands for "nephelometric turbidity unit" and is a measure of how cloudy, or turbid, the water is. The lower the number the clearer the water.

Data from East Canyon Creek are updated every 6 hours.
Users can "drill down" to more information about each measurement.

Current Conditions

Turbidity

The water's turbidity tells us how much material is suspended in the water, and therefore how much light can pass through the water. Common types of suspended solids include small pieces of soil, plant material, industrial waste, and microorganisms.

The natural level of turbidity varies in streams because of differences in their watersheds (eg. soils, amount of plant cover). High stream flows can carry more particulate matter, so turbidity often increases when flows go up.

Turbidity is measured using a [Digital Turbidity Sensor](#).

[Why do we care about turbidity?](#)

Turbidity Data

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NTU stands for "nephelometric turbidity unit" and is a measure of how cloudy, or turbid, the water is. The lower the number the clearer the water.

Why do we care about turbidity?

High turbidity in a stream can prevent sunlight from reaching aquatic plants that grow on the stream bottom. These plants provide important food and shelter for aquatic animals AND produce oxygen which the animals need.

If suspended soil causes the turbidity, this material may settle out, covering up important spawning beds or filling the space between rocks where tiny aquatic animals live.

Some fish naturally prefer turbid water but fish who have to see their prey may have problems getting enough food in very turbid water.

How do human activities affect turbidity in East Canyon Creek?

Any activity that increases erosion near a stream (such as road building, development, over grading riparian areas or sanding roads) can increase turbidity in the stream. Disturbance WITHIN a stream, such as off-road vehicles, large animals or construction, can also increase stream turbidity.

Turbidity is sometimes caused by microscopic plants, rather than by suspended sediments. In these cases, activities that introduce nutrients (plant food) to a stream will increase turbidity.

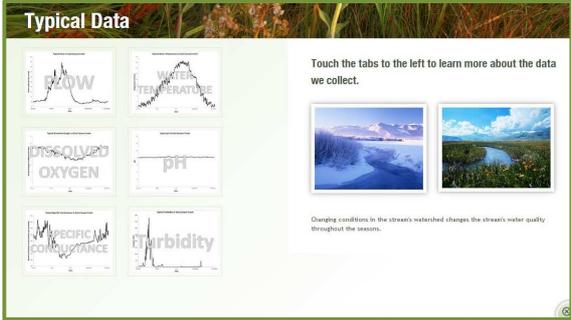
We can protect streams from excess turbidity by protecting and replanting stream banks and reducing how plant nutrients that can run off into streams.



This creek has very high turbidity. It drains a watershed with poor land management.

Users can "drill down" to more information about each measurement.

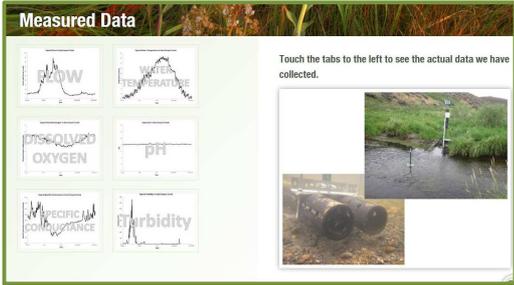
Typical Data



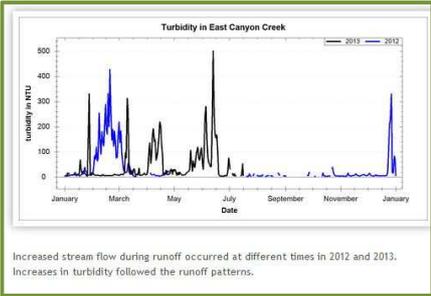
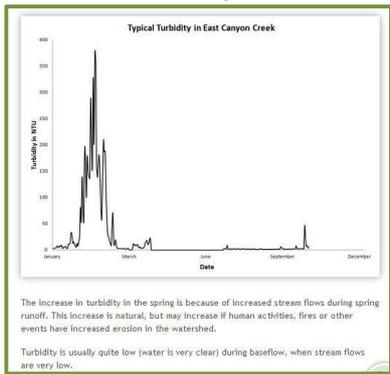
Typical data graphs help explain general patterns based on “average” conditions for streams like East Canyon Creek.

Measured data graphs are updated daily.

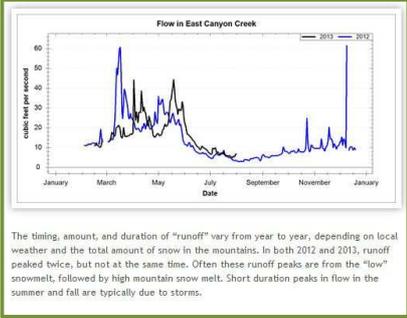
Measured Data



The user can compare typical data with measured data



Or compare different parameters measured at the same time



Users can learn about typical annual patterns

Touch a magnifying glass for a closer look at seasonal patterns.

Typical Dissolved Oxygen in East Canyon Creek

Dissolved oxygen is often higher in the winter than the summer because less oxygen can dissolve in warm water than in cold water.

Touch a magnifying glass for a closer look at seasonal patterns.

Typical pH in East Canyon Creek

Plants living in streams get the carbon dioxide they need for photosynthesis from the water. This can raise the pH of a stream when plants are actively growing before the sun is out. Click the magnifying glass to see how pH changes as the sun rises and sets.

As well as daily variability

Typical Dissolved Oxygen in East Canyon Creek

Dissolved oxygen can vary considerably between night and day. During the day, photosynthesis by plants creates oxygen. At night there is no photosynthesis because it's dark. Oxygen is still getting used, however. Because of this, dissolved oxygen can be low during the day but may dip to dangerous levels at night.

East Canyon Creek near the Swamer EcoCenter

Plants use dissolved carbon dioxide (a weak acid) during photosynthesis. This can make the pH increase during the day and decrease at night.

Real Time Monitoring

The East Canyon Creek monitoring station has 5 underwater sensors that measure water depth, turbidity (cloudiness), temperature, specific conductance (dissolved salts), pH and dissolved oxygen.

A datalogger "prompts" the probes to take a measurement every 30 minutes. The data are transmitted back to the Swamer EcoCenter where they are stored in a computer for analysis and display.

UMW Volunteer Monitors check the station regularly. They help with calibrating and maintaining the probes, and also take independent water measurements that we use to make sure that the probes are working correctly.

Multi-probe Sensor

Plastic pipe is used to house the sensors at the monitoring site. Access to the sensors is critical as routine calibration is necessary to maintain data reliability.

Our probe sends a beam of light into the water and measures the amount of light reflected back. Anything that prevents light from getting through the sensor face to the sensor will interfere with this measurement. Therefore this probe has a special "windshield wiper" that sweeps across the sensor just before a new reading is taken.

View Current Conditions

An "exploded view" of the monitoring station offers more details on can how samples are collected.

Volunteer Monitoring

Do you like visiting lakes or streams? Want to be a scientist?

Utah Water Watch is a free program that allows for the public to help monitor water quality in Utah's lakes and streams. Volunteers monitor a lake or stream at least once a month for seven months a year and report the data online. This information is shared with water managers to help protect and manage our watersheds. Utah State University Water Quality Extension provides the training, support, and equipment to empower volunteers to be stewards of their local water bodies.

Join Utah Water Watch

If you are interested in volunteering with Utah Water Watch call (435)797-2580 or email the program coordinator: brian.greene@usu.edu. You can also ask at the front desk of Swaner for more information.

Introduction video to Utah Water Watch.



Map of East Canyon Creek Watershed.



Utah Water Watch photos.



Utah Water Watch volunteers play an important role in keeping the station running. They also collect data at other sites throughout the watershed.

The display provides information about the local watershed, including a series of maps at different scales.

About The Watershed

What Makes Up The East Canyon Creek Watershed?

How Do People Impact East Canyon Creek?

What Are The Issues In East Canyon Creek Watershed?

What Can We Do To Help?

View The Watershed Map

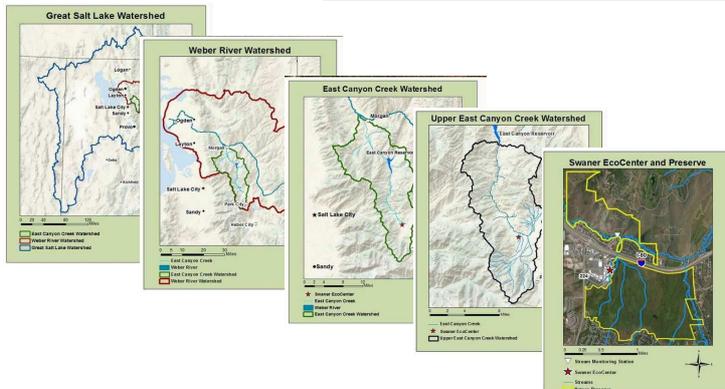


A watershed is the area that drains to a particular water body or point in a river. Small watershed areas are "nested" within larger watersheds. (See the **Watershed** **Map** to see the different watersheds that you are currently in.)

The upper East Canyon watershed includes all the land draining into East Canyon Creek from its headwaters to the north end of East Canyon Reservoir.

Facts about the upper East Canyon Watershed:

- The watershed is not very big (about 148 square miles). The Great Salt Lake is 25 times larger.
- It is located entirely on the eastern slope of the Wasatch Mountains.
- The highest point is Capitol Hill (9718 feet) at the top of Iron Canyon and its lowest point is just above East Canyon Reservoir (5200 feet).
- 50% of the area is forest or shrub - mostly timber.
- About 25% of the watershed is used for agriculture (mostly grazing).
- 50% of the land is privately owned.
- Precipitation varies with elevation, averaging 44 inches/year at the highest elevations and 23 inches/year near the reservoir.



Taking Action

Do I impact the water?

What we do on land influences water quality. Even if your home or school is not near a lake or stream, it is still connected by the watershed.

What can I do to improve water quality?

You can take simple steps to help protect water quality. View the photos for everyday tips and volunteer opportunities that help make water safer for the environment.

Want to make a difference?

You can volunteer with groups like Swater EcoCenter or Utah Water Watch. Or organize a clean-up with your school or neighborhood. There are lots of easy fun things that you can do to help improve the environment.

How can communities work together?

The East Canyon Creek Watershed Committee works with the Utah Division of Water Quality and the local community to improve the creek's water quality and to protect downstream waters, such as East Canyon Reservoir.

Snyderville Basin Waste water treatment plant removes phosphorus from its waste, which has helped restore East Canyon Reservoir.

Local agricultural producers are actively protecting our water by managing their animal waste, planting cover crops, reducing erosion and much more.






Slide shows provide more details on how people can work alone or as a community to protect their water



IF YOU THINK PICKING UP DOG POOP IS UNPLEASANT, TRY DRINKING IT.

One messy pollutes local lakes and streams. Pick up and dispose of properly.



Proper use of fertilizer reduces nutrients in water bodies.

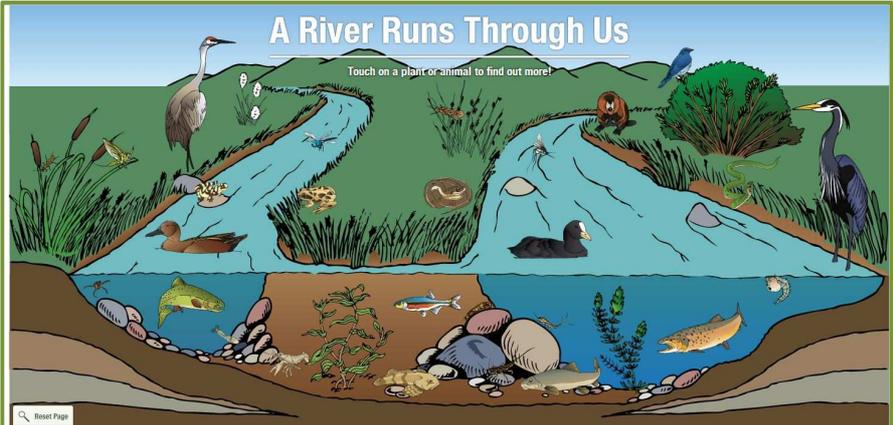


SMART DISPOSAL
A Prescription for a Healthy Planet

Never flush prescription drugs down the toilet. Take to a drop-off location.

A River Runs Through Us

Touch on a plant or animal to find out more!



Reset Page

Kids Links:

“The River” shows the plants and animals that inhabit East Canyon Creek.

Protecting Water in Your Neighborhood

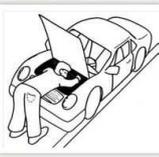


The people in this town want to protect their stream from pollution, but they are making some mistakes. Point to the mistakes to find out more.



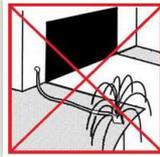
Oops!

Oil that drips from cars can wash straight into our lakes and streams.



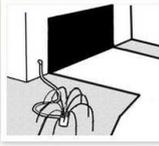
Fix those leaks!

Oil and antifreeze make our cars run well, but leaks can be very dangerous to fish, birds and even cats and dogs!



Oops!

Don't water the driveway or the sidewalk. We live in a dry state and need to conserve water.



This Looks Better!

The water that lands on a driveway or sidewalk doesn't help your lawn, and ALSO washes pollutants into storm drains.

Journey Through A Bug's World



These kids are exploring the stream bottom and have found lots of insects!

Did you know that **KIDS RULE** underwater? Many insects spend most of their life in the water as kids (larvae). Touch the icons to the right to learn how conditions change when living underwater.

 Oxygen

 Light

 Temperature

 What would you need to be an aquatic insect?

How can you get involved?

Journey through a Bug's World helps kids imagine what life is like under the water

The Right Temperature

Fish and many other aquatic animals have the same body temperature as their surroundings.
All fish have a range of temperatures that work best for them. Some do well in warmer water, while others need cool water.
If the water gets too warm, fish can get sick or even die.

- What keeps a stream cool?
- What can fish do if the water gets too warm?
- Can a stream get too cold for a fish?

As long as the water is liquid (not ice) and has enough oxygen, fish are usually just fine in really cold water.



That's why they survive all winter in a stream. However, as the water gets colder, the fish move a LOT slower.

Some of Utah's native fish require very warm water. This is why you don't find them in cold streams.



The willow is then trimmed to the right height.



The tip of the newly planted willow is painted to help protect it from insects and disease.



As the willow grows, it will begin to provide shade to help keep the stream cool.

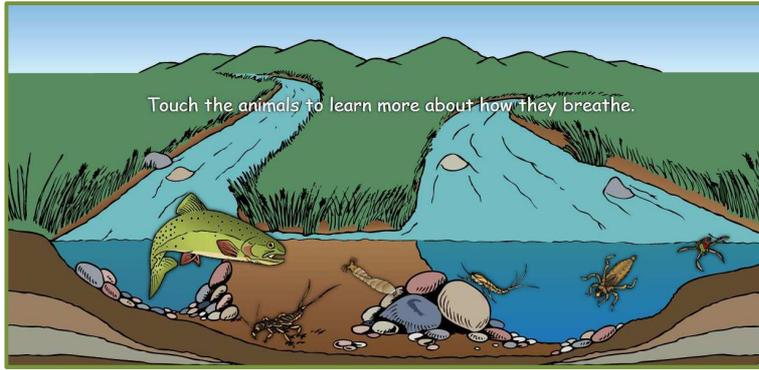
This fish is in water that is too warm.
Tap on the fish so you can move it to cooler water.

There are no shade trees along this stream, so the sun has heated the water. It is too warm for the fish.

Oops! Fish can't live on land.

Yes! The shade from the trees along the stream keeps the water cool.

Don't be silly. Fish can't fly!



Stonefly

The gills of stoneflies look like hairs. Some stoneflies have gills where their legs attach to their bodies (where your armpits are), next to their tails, under their bodies, or just below their heads.




Stoneflies sometimes do push-ups to move water past their gills. Watch the stonefly in this video do push-ups.



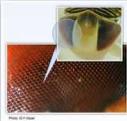
Build A Bug

How many eyes would it be an insect? Make a hat, or a fish, or a water bug. Let's find out what you would need to be a water bug.




Compound eyes!

Insects have compound eyes that help them see all around them.

He needs gills!

Insects use gills to breath oxygen from the water. Some, like this stonefly, have feathery gills in their armpits.




Would you like to see him in his native habitat?

