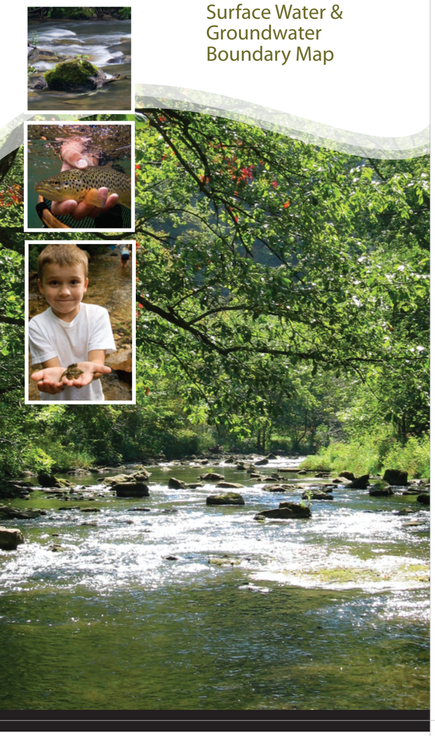
Spring Creek WATERSHED

Surface Water & Groundwater Boundary Map



protect
Spring Creek WATERSHED

Project Partners

Spring Creek Watershed Commission
http://scwatershed.com

SPRING CREEK WATERSHED ASSOCIATION
A grassroots stakeholder initiative
http://www.springcreekwatershed.org

ClearWater Conservancy
http://www.clearwaterconservancy.org

Additional funding provided by:

Penn State University Office of Physical Plant
http://www.opp.psu.edu

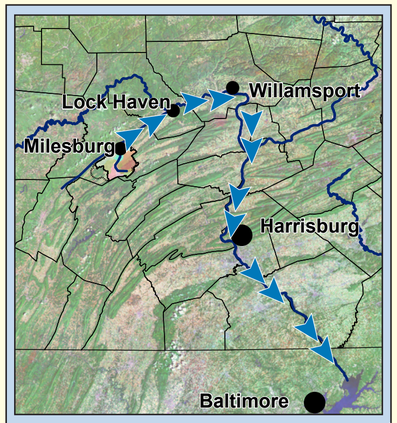
MS4 (Municipal Separate Storm Sewer System) Partners
State College Borough, College Township, Patton Township, Ferguson Township, Harris Township, and Penn State University

The Spring Creek Watershed

Encompassing a broad limestone valley and framed by forested mountain ridges, the Spring Creek watershed is home to abundant wildlife, fertile farms, historic towns, a large university, and bustling urban centers. Every year many visitors come to enjoy the region's natural beauty, recreation, and vibrant quality of life.

The community of State College is located near the headwaters of the Spring Creek watershed, making it one of only a few growing metropolitan areas not situated near a large river or along the coastline. A number of distinct natural features characterize the Spring Creek watershed. Spring Creek itself is a legendary trout stream and one of the most productive trout fisheries in Pennsylvania. Emerging from the hemlock and rhododendron forests of Tussey Mountain and fed by the valley's limestone springs, the creek draws people who come to wade, kayak, and fish in its cool waters. At the western edge of the watershed lies the Scotia Barrens, a pitch pine/scrub oak ecosystem. Groundwater in the Scotia Barrens area flows underground to Big Spring, which is located 15 miles away near the mouth of Spring Creek. The second largest spring in Pennsylvania, Big Spring discharges 14.5 million gallons of water per day into Spring Creek and provides drinking water for the residents of Bellefonte.

Conservation of the abundant natural resources of the Spring Creek watershed presents pressing challenges. The region is experiencing some of the most rapid growth in Pennsylvania. Rural areas surrounding State College, including the area near the Scotia Barrens, are experiencing intense development pressure. Without careful planning and management, growth and development threaten to severely impact the resources of the watershed.



What is a watershed?

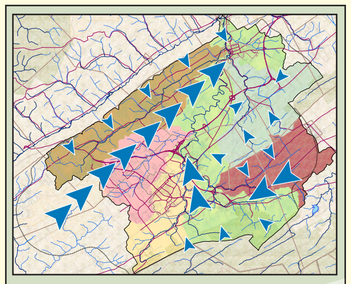
A watershed is an area of land that drains into a particular body of water. Small watersheds are part of the larger watersheds that drain to rivers, lakes, and oceans. Spring Creek flows into Bald Eagle Creek at Milesburg. Bald Eagle Creek flows into the West Branch of the Susquehanna River, which ultimately flows to the Chesapeake Bay. This means that pollutants entering streams in the Spring Creek watershed will eventually end up in the Bay over 200 miles away.

The Karst Landscape

Many terrain features in the Spring Creek watershed have their origin in the limestone beneath the soils on the valley floor. The limestone bedrock, deposited in a primeval sea that once covered the area, has been dissolved by rainwater seeping into the ground. Over eons, this infiltrating water has dissolved much of the limestone to form what's known as a karst landscape, characterized by sinkholes, losing streams, springs, and caves.

A sinkhole forms when rainfall percolates along joints and fractures in the limestone, dissolving the rock and creating small openings. Over millennia, some of these openings become large caverns. When a cavern roof cannot support the overlying rock and soil, it collapses and a sinkhole is formed in the ground surface. Once formed, a sinkhole may become a place where surface water is channeled directly into the subsurface to become groundwater.

Losing streams, another feature of karst areas, are surface streams that lose water through the streambed into the subsurface as they flow downstream. The surface water from the losing streams recharges the groundwater. Springs are places where groundwater seeps or flows out of the ground to become surface water.

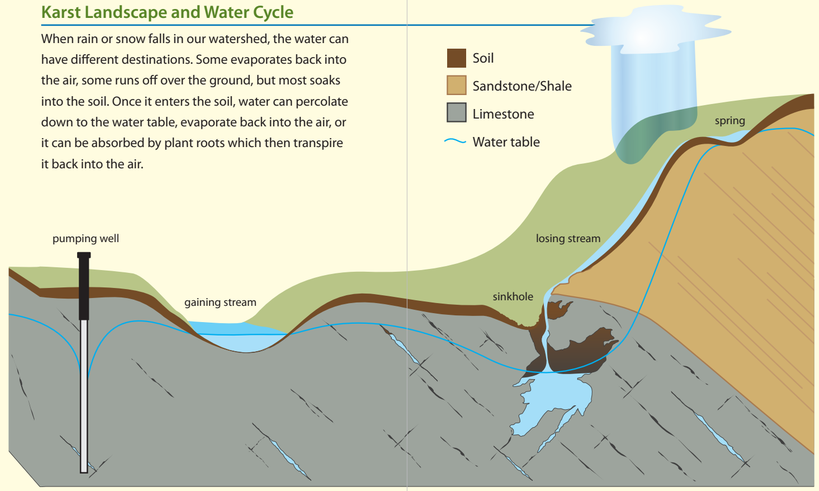


How Groundwater Flows

In the Scotia Barrens area of the Spring Creek watershed, the surface streams above and the groundwater below flow in opposite directions. The Scotia Barrens area is located outside of the surface water watershed boundary of the Spring Creek watershed. Surface water from the Barrens area flows southwest into Spruce Creek, while the groundwater under this Barrens area flows northeast to Big Spring. In a karst region, solution openings and caverns in the limestone act as underground conduits, conveying groundwater over long distances. That is how groundwater from beneath the Scotia Barrens area discharges at Big Spring in Bellefonte, some 15 miles away.

Karst Landscape and Water Cycle

When rain or snow falls in our watershed, the water can have different destinations. Some evaporates back into the air, some runs off over the ground, but most soaks into the soil. Once it enters the soil, water can percolate down to the water table, evaporate back into the air, or it can be absorbed by plant roots which then transpire it back into the air.



Protecting Water Resources

Groundwater is a precious natural resource, particularly in the Spring Creek watershed where groundwater is the source of 99% of the region's drinking water. Groundwater discharging from springs and seeping up through streambeds supplies most of the flow of Spring Creek and its tributaries, giving them the cold water temperatures necessary to sustain trout and other aquatic life.

Although surface water and groundwater quality are generally good today, the conservation of the high quality of these resources presents some major challenges for our growing region. This issue is of concern to anyone who lives, works, or plays in the Spring Creek watershed. The quality of our drinking water and the health of our streams depend on how we use the land and how well we protect the groundwater.

The growing amount of paved surfaces in the watershed creates one set of problems for our water resources. Roads, parking lots, driveways, and buildings have increasingly replaced undeveloped land that once allowed rainfall and snowmelt to infiltrate the soil and recharge the groundwater. Rain and melting snow run off from these impervious areas into storm sewers, which channel the water directly to streams. Streams flood, stream banks erode, and the water clouds with sediment.

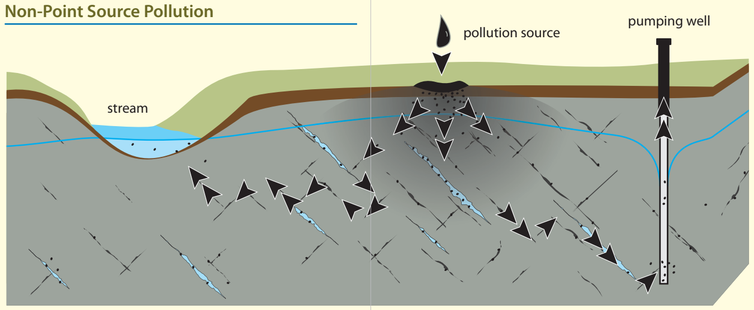
Stormwater runoff also causes thermal pollution. In the summer, heated runoff water from streets and parking lots enters cool streams, increasing the temperature of their waters. Thermal pollution is of particular concern because trout and other native aquatic life require cold waters to survive.

Non-point source pollution is a serious concern. By definition, this pollution comes not just from one point, but from a large number of sources, both urban and rural. Common non-point source pollutants include chemicals sprayed on lawns and gardens, motor oil spilled on roads and driveways, salt from roadway de-icing agents, and manure produced by livestock grazing next to streams. A big source is excess fertilizers, both natural and synthetic, spread on farm fields. These non-point source pollutants wash into streams and seep into the soil where they can find their way into the groundwater.

Pollution in groundwater can move quickly in a karst region. Public water supply wells have large source-water areas and contaminants entering the groundwater can end up in wells located miles away from the pollution source.

The challenges to our watershed are serious, but the good news is that most of the problems have solutions. Careful management of growth and development can limit the degradation of our water resources. Watershed management begins with individuals taking action. An aware public, knowledgeable about the impacts of their day-to-day activities, can help protect the groundwater upon which everyone in the Spring Creek watershed depends.

Non-Point Source Pollution



Controlling pollution is essential for protecting water quality. Non-point source pollution, which accumulates from widespread sources, can seep into the ground. Once pollution enters the groundwater, it can travel for miles, reappearing in a stream or well.

Actions for a Healthy Watershed

You can help protect the water resources of the Spring Creek watershed. Here's how:

- **Conserve water.** The less groundwater we use, the more that is available to feed streams and natural areas. Repair leaks around your home. Take shorter showers. Water gardens and flower beds in the morning or evening to limit evaporation. Install water-saving shower heads, toilets, and appliances.
- **Protect and restore riparian zones.** These natural areas along streams help keep stream temperatures low, protecting stream life. Plant roots along stream borders filter nutrients from runoff. If you own property bordering a stream, you can improve the riparian area by planting native trees and shrubs and removing non-native species. On farms install streambank fencing to prevent livestock from destroying vegetation and polluting the water.
- **Protect sinkholes.** Never put garbage, fuel, household chemicals, or fertilizers in a sinkhole. If you wouldn't drink it, don't dump it. You can report illegal dumping by calling the Centre County Solid Waste Authority at 1-800-605-6649.
- **Control non-point source pollution.** Use low phosphorous detergents to reduce nutrient flow into water. Use lawn and garden chemicals and road salt sparingly or not at all. Clean up after your pet. Dispose of motor oil, anti-freeze, and other toxic chemicals in a safe manner, and always clean up spills.
- **Install a rain barrel.** Rain and snowmelt collected from rooftops can be used to water lawns and gardens. Rain barrels reduce runoff and lessen the drain on groundwater.
- **Plant a rain garden.** A rain garden is a slightly sunken garden planted with native plants. It absorbs rainwater and prevents excess runoff from homes, driveways, and other impervious surfaces.
- **Speak up.** Become knowledgeable about land use and development decisions that affect water resources. Promote good stormwater, forestry, and agriculture practices that reduce non-point source pollution. Remember that the voices of informed citizens help protect water resources for everyone.
- **Get Involved.** Join the ClearWater Conservancy, attend the meetings of the Spring Creek Watershed Association, or volunteer to help with their Water Resources Monitoring Project.

The Water Resources Monitoring Project (WRMP)

The Spring Creek Watershed Association initiated the WRMP in 1998 to gather data about the quantity and quality of our surface water and groundwater resources. The WRMP is managed by ClearWater Conservancy's Water Resources Coordinator and overseen by an advisory group of water resources professionals. Local municipalities, water authorities, non-profits, and the Pennsylvania State University provide funding for the project.

WRMP and U. S. Geological Survey (USGS) instruments continuously measure stream stage and temperature at 11 sites throughout the watershed. Four times per year, the project manager evaluates water quality at 14 stream sites and seven springs. The WRMP also operates four groundwater level monitoring wells in addition to the watershed's two USGS wells. By tracking long-term changes in the quantity and quality of our surface water and groundwater, we can learn how natural phenomena and human activities are affecting them. The WRMP provides local planners with information needed to protect Spring Creek watershed's precious water resources for years to come.

THE SPRING CREEK WATERSHED

Map Legend

- Perennial Stream (year-round flow)
- Intermittent Stream (seasonal flow)
- Surface Water Divide
- Groundwater Divide
- Recreation Areas
- WRMP/USGS Groundwater Monitoring Station
- WRMP/USGS Stream Gage
- Large Volume Springs
- Municipal Boundaries
- State Forest
- State Game Lands

Spring Creek and its Tributaries

Many regions of the watershed drain first into small streams, which in turn feed Spring Creek. The colored areas show these smaller watersheds that correspond to Spring Creek and its tributaries.

- **Buffalo Run**
- **Spring Creek (main stem)**
- **Big Hollow**
- **Slab Cabin Run**
- **Cedar Run**
- **Logan Branch**

SNOW SHOE
MILESBURG
BOGGS
MARION
WALKER
Zion
GREGG
McCoy Access Point
Kayak Access Point
Spring Creek
Wallace Run
Bush Hollow Run
Bald Eagle Creek
Dewitt Run
UNION
UNIONVILLE
BELLEFONTE
Talleyrand Park
Big Spring
Cerro Spring
Dix Run
BALD EAGLE MOUNTAIN
Buffalo Run
SPRING
Axemann Spring
Little Fishing Creek
Fishermans Paradise
Paradise Spring
BENNER
Continental Courts Spring
HUSTON
Laurel Run
Julian
Spring Creek
Blue /Shutgart Spring
Pleasant Gap
Gap Run
Logan Branch
Benner Spring
CENTRE HALL
Old Fort
Black Hawk Gap Run
WORTH
PATTON
Spring Creek Park
COLLEGE
Bathgate Springs
Millbrook Marsh Nature Center
NITTANY MOUNTAIN
POTTER
Lemont
Thompson Spring
Linden Hall
Linden Hall Spring
Mackeys Run
Stormstown
HALFMOON
STATE COLLEGE
Oak Hall
Cedar Run
Sinking Creek
Boal Gap Run
Halfmoon Creek
SCOTIA BARRENS
Spring Creek
Blue Spring
Boalsburg
Colyer Lake
Galbraith Gap Run
Shingletown
FERGUSON
HARRIS
Slab Cabin Run
Windy Hill Farms Spring
Roaring Run
Mussor Gap Run
Pine Grove Mills
TUSSEY MOUNTAIN
JACKSON
Beaver Branch
FRANKLIN
BARREE

Spring Creek Watershed

1:60,000

0 1,500 3,000 6,000 9,000 12,000 Feet

1 inch equals 5,000 feet

Map Projection:
Pennsylvania Stateplane North Zone Datum NAD83, feet

Data Sources: PADCNR, PADEP, Centre County GIS, PAMAP, USGS, PennDOT and ClearWater Conservancy.
Map Produced by: GeoDecisions/ Gannett Fleming - 10/2009