

Good things in the Spring Creek Watershed

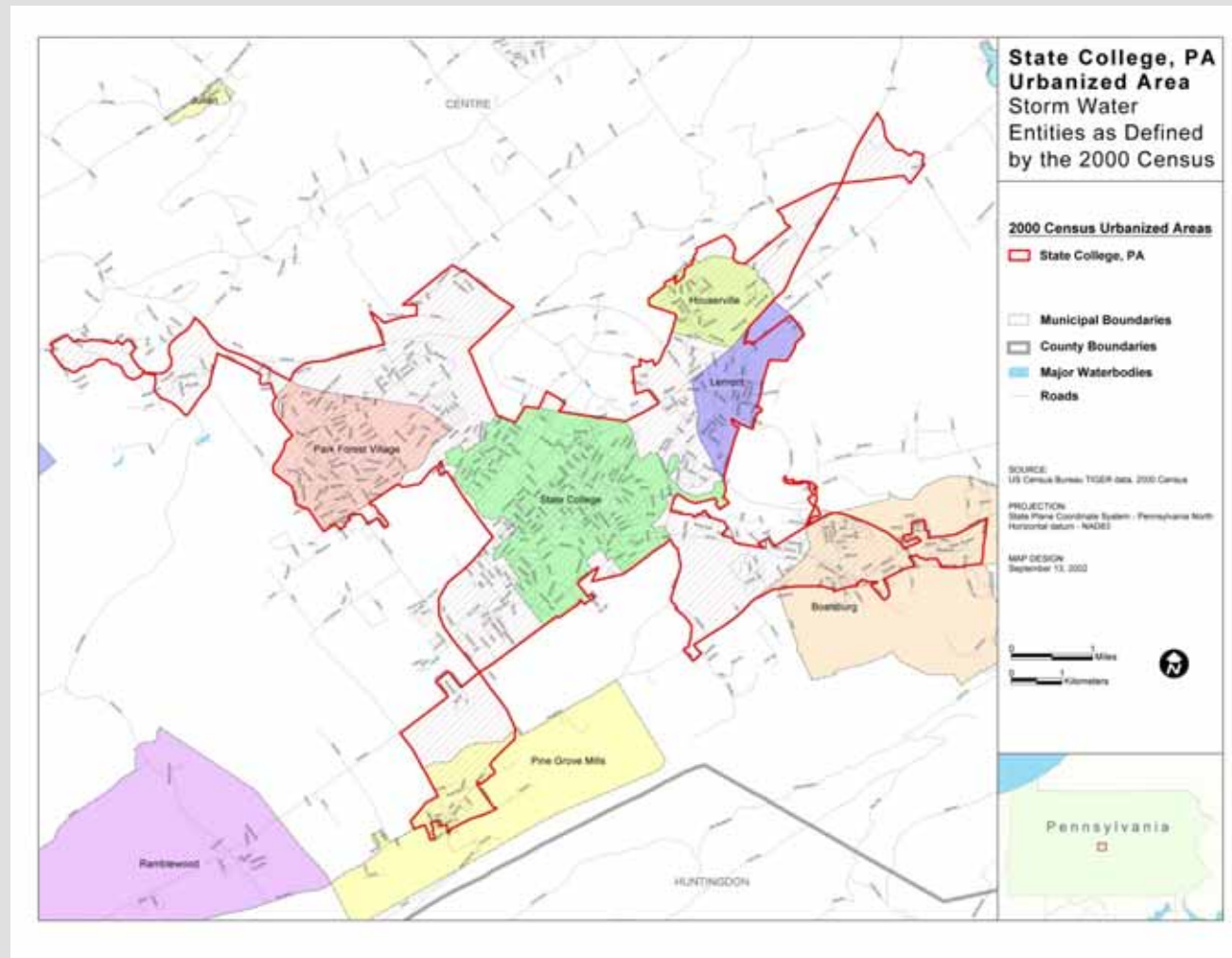


Courtesy Bob Baumbach

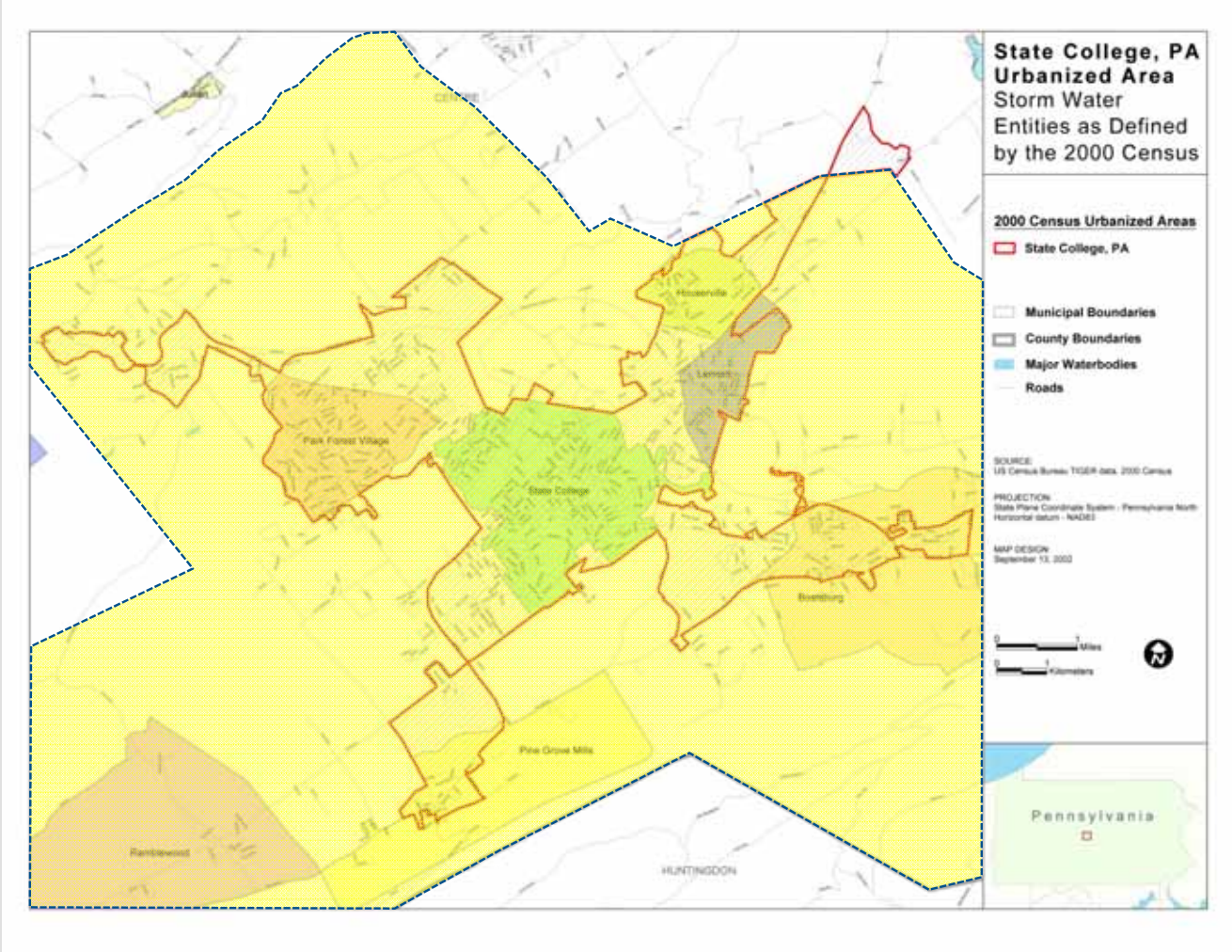
The six local MS4 (stormwater) permit holders work together on permit minimum control measures (MCMs).



The EPA Urban Area Boundary officially defines the MS4 permit boundaries, which include parts of State College Borough; Benner, College, Ferguson, Harris, and Patton Townships; and Penn State.



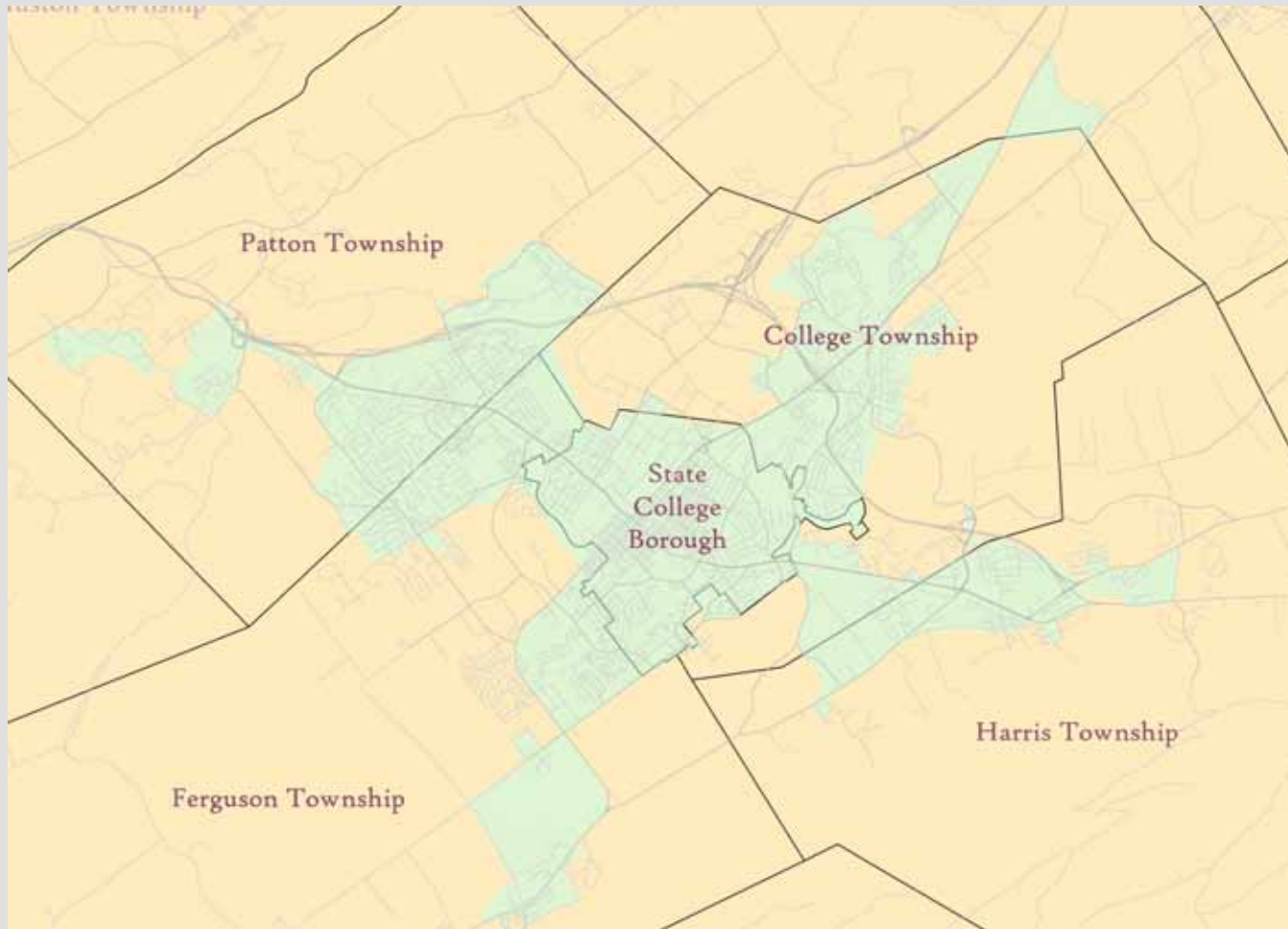
However, the MS4 partners administer the MS4 requirements and standards across their entire municipalities with the resulting effective coverage shown below in yellow hatch (Benner Twp has a MS4 Permit waiver).



The University and the Borough of State College have detailed mapping of all of their lands and stormwater features. The University frequently updates the imperviousness it owns.



The other COG municipalities have comprehensive GIS data from both COG and the County that they use to track and maintain their stormwater systems.



Spring Creek MS4 Partners – State College Borough; College, Ferguson, Harris, and Patton Townships; and Penn State

The MS4 municipalities are required by the MS4 permit to inspect private stormwater systems and have programs to stop any illicit discharges into the waterways.



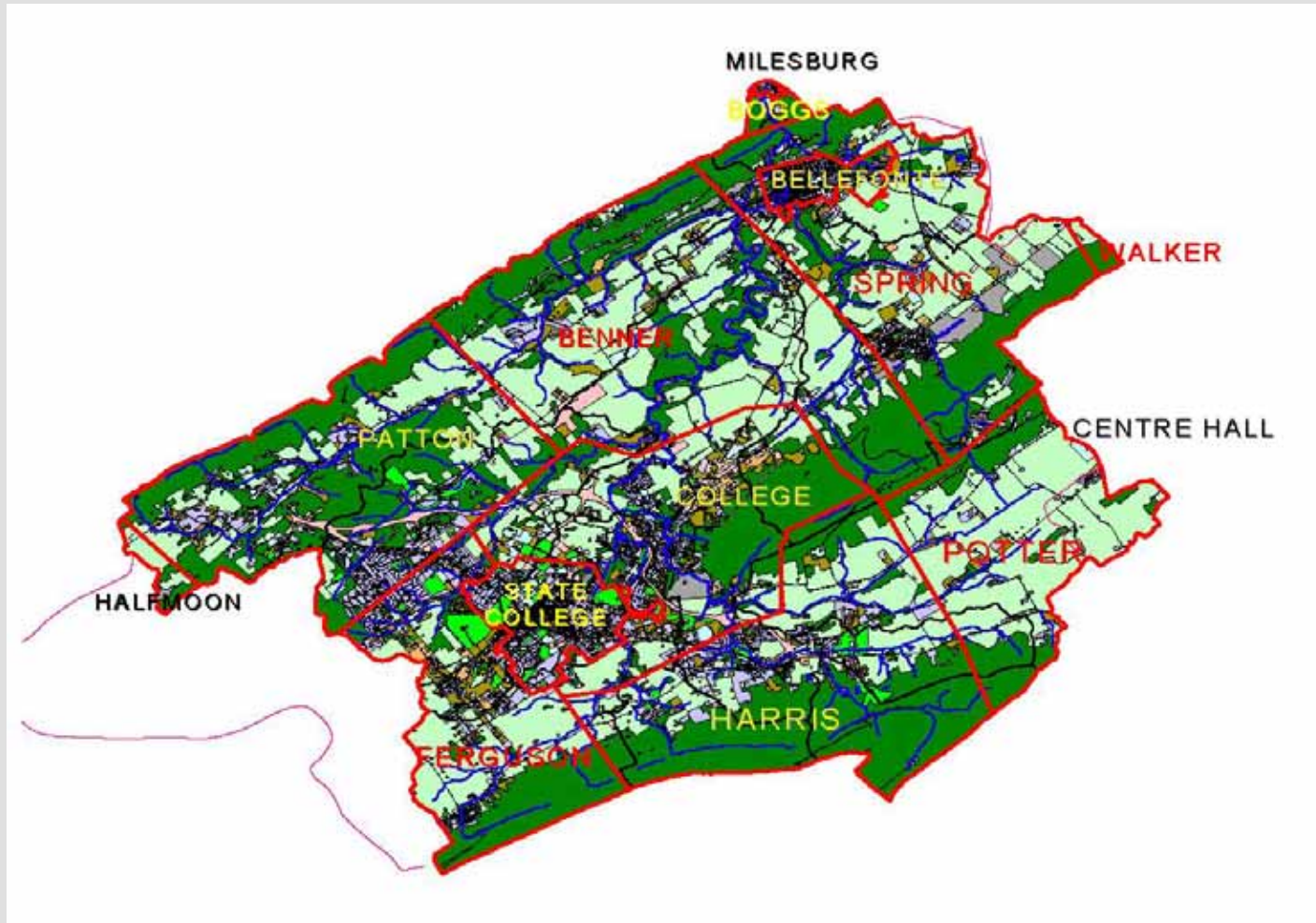
Courtesy Sh ruthi Baskaran

The MS4 municipalities and the University conduct regular street sweeping based on needs.



Spring Creek MS4 Partners – State College Borough; College, Ferguson, Harris, and Patton Townships; and Penn State

The Spring Creek Act 167 Plan adopted in 2003 has proven to be a very effective stormwater management tool and with some minor edits that have been approved by PaDEP will meet the latest regulations set by PaDEP.

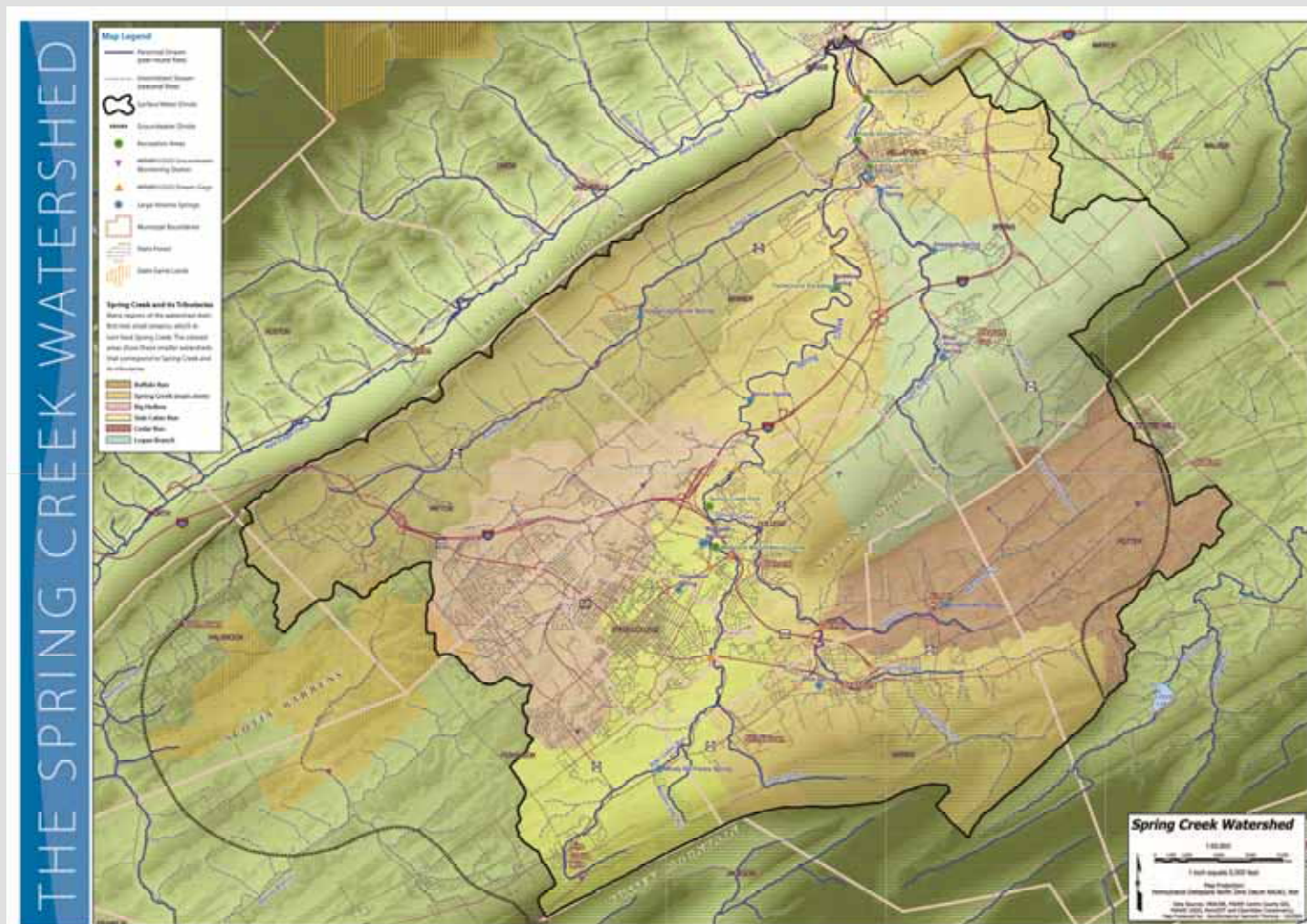


The Watershed Commission is comprised of 12 municipalities within the watershed that formed the Commission with an inter-municipal agreement to establish a long-range vision for the watershed.

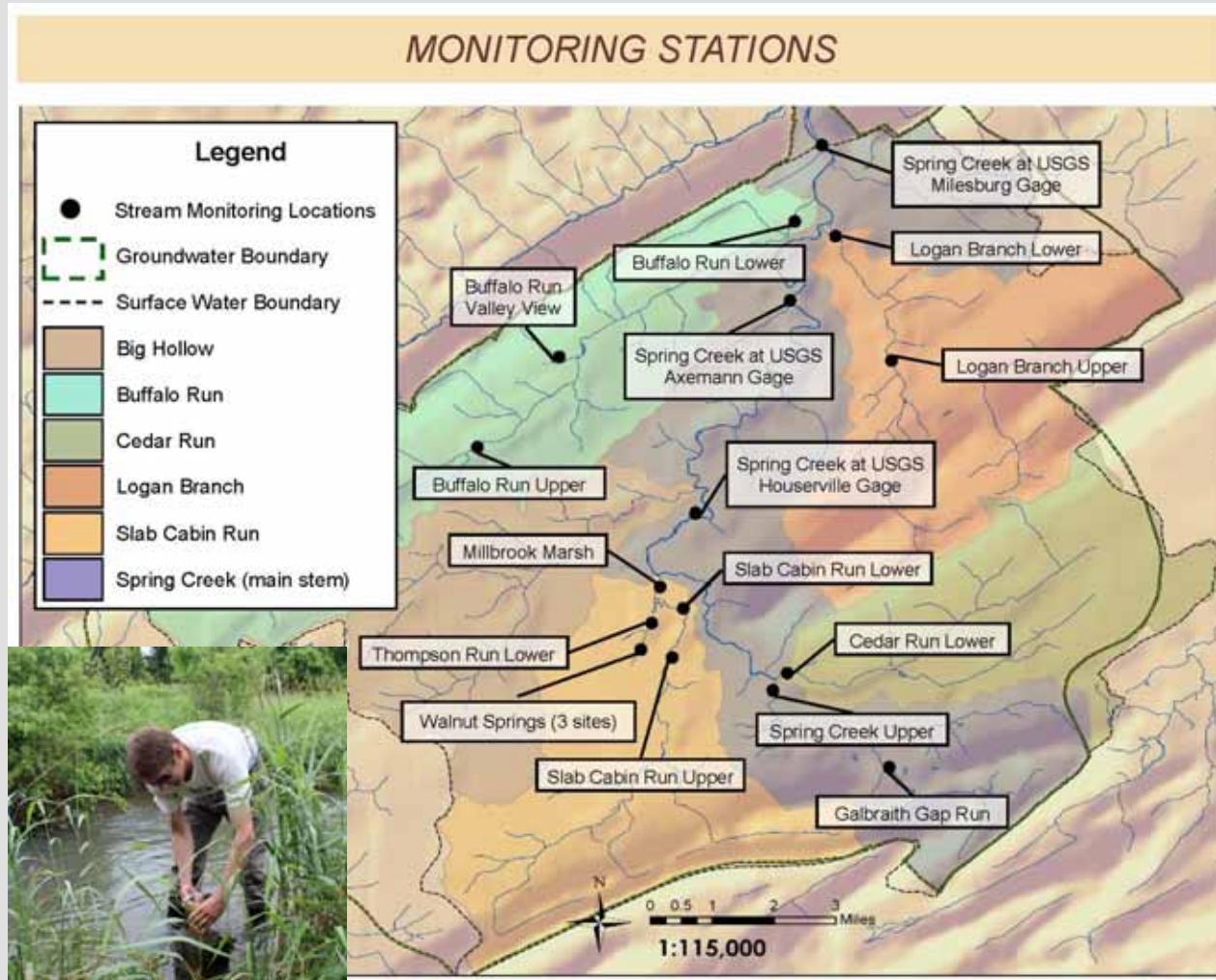


Courtesy Jake Powell

The Spring Creek Watershed Association promotes actions that protect and enhance the quality of life, environment, and the economy throughout the watershed while maintaining and improving the high quality of Spring Creek.



The Water Resources Monitoring Project (WRMP) is locally funded and was initiated in 1997. Its goal is to gather baseline information about the quantity and quality of the water resources in the Spring Creek.





ClearWater Conservancy is the foremost land trust and natural resource conservation organization in central Pennsylvania. Since 1980, ClearWater has worked to improve central Pennsylvania for all.



Spring Creek MS4 Partners – State College Borough; College, Ferguson, Harris, and Patton Townships; and Penn State



ClearWater Conservancy's Riparian Conservation Program began in 2004 and has installed 73 acres riparian buffers along 69,890 feet of Centre County streams as well as 35,988 feet of stream bank fencing.





Since 2007 ClearWater Conservancy has purchased 647 acres of land on Tussey Mountain and transferred them to the state Department of Conservation and Natural Resources Bureau of Forestry's Rothrock State Forest.



Courtesy Matt Dallos



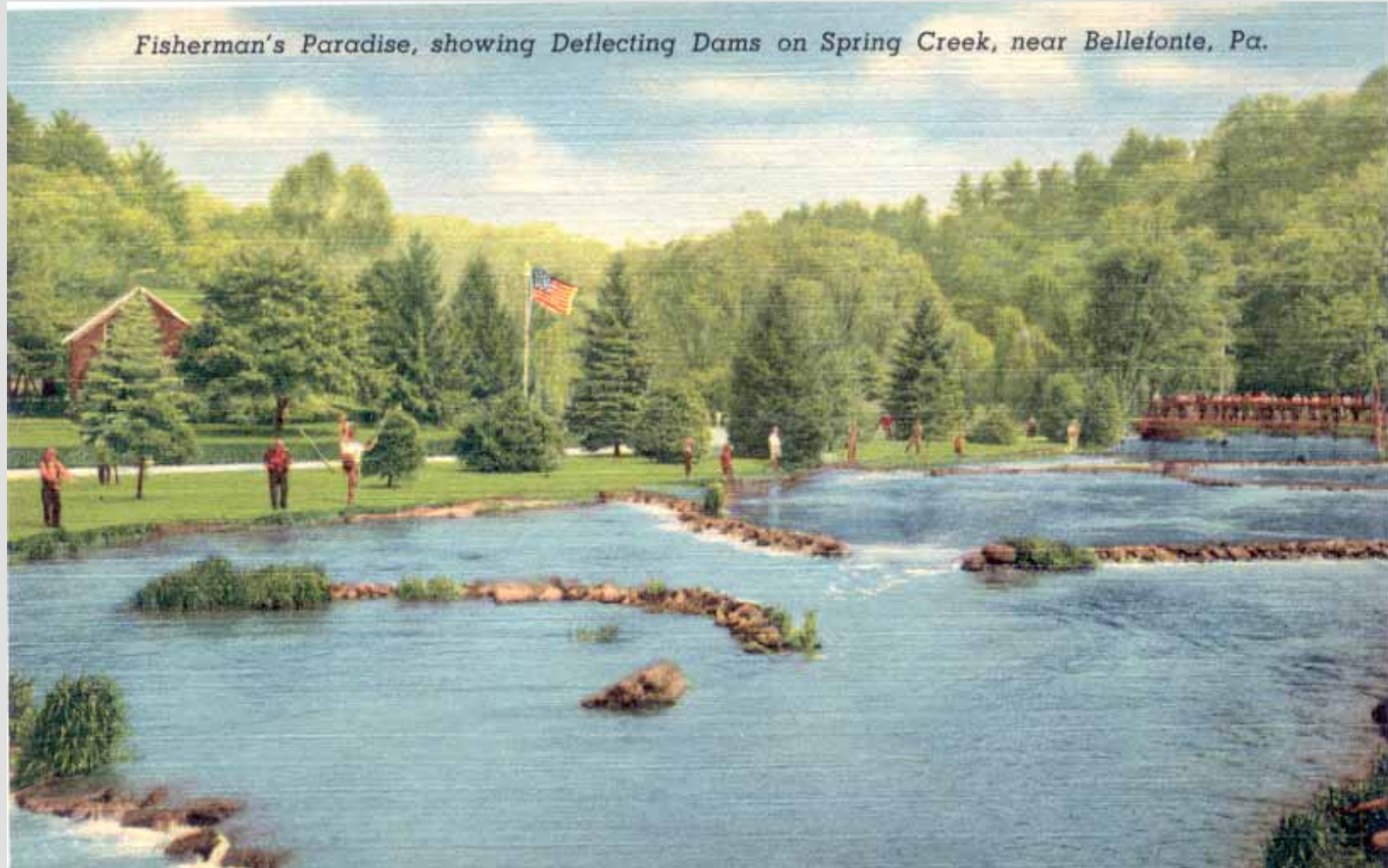
The Spring Creek Chapter of Trout Unlimited, founded in 1973, works to protect, conserve and restore Spring Creek and its attendant watershed through outreach, cooperation, and projects.



The Spring Creek Chapter of TU's Watershed Watch Program designates community volunteers as observers of the Spring Creek Watershed to protect, conserve, and enhance water quality and aquatic life throughout the watershed.



Because of the efforts of the community, dedicated individuals, and local organizations such as TU and ClearWater Conservancy, Spring Creek remains a world class fishery.



The six Centre Region municipalities adopted riparian buffering requirements to protect ground and surface waters from contamination caused by runoff. Riparian buffers can filter contaminants, reduce flooding, prevent erosion, and support aquatic life and biodiversity.



No buffer



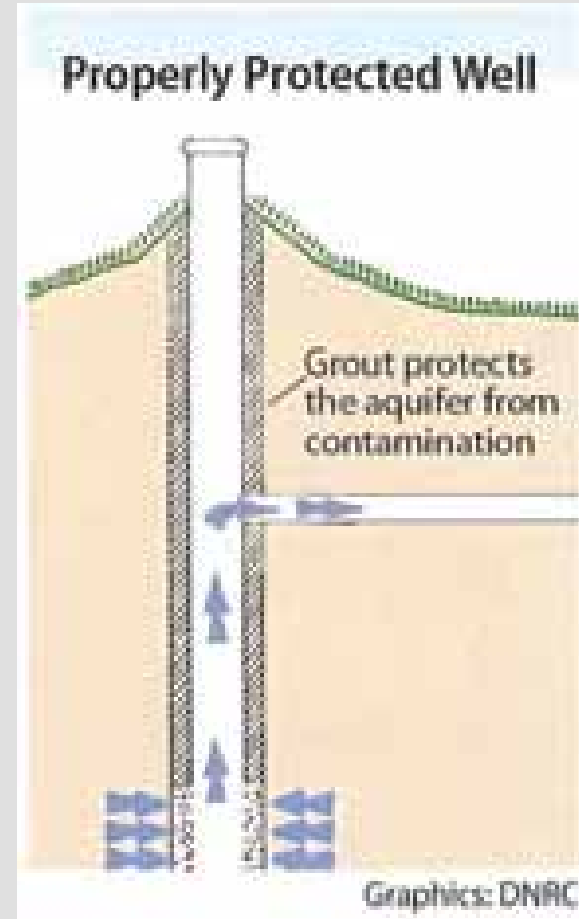
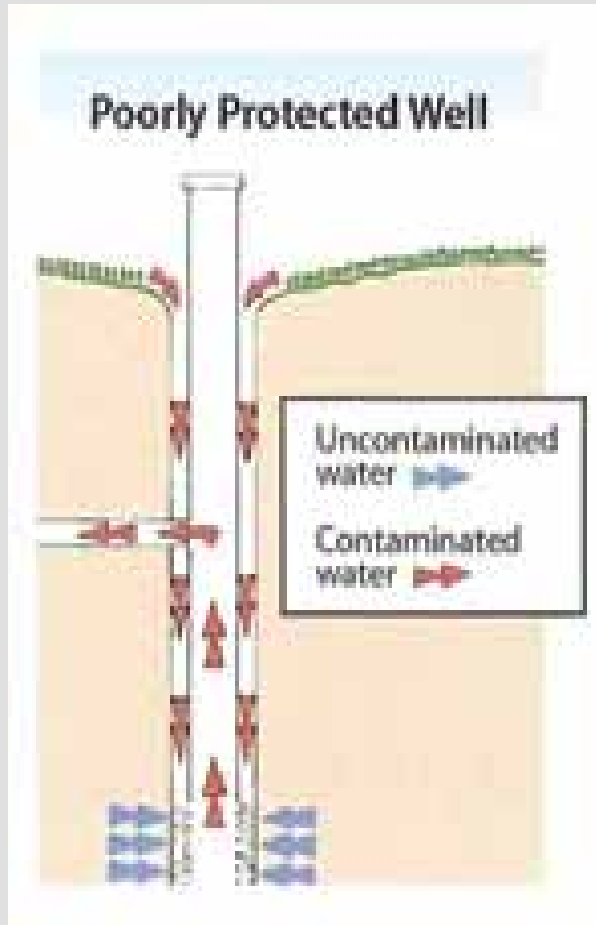
35 foot buffer



100 foot buffer



In 2010, all 12 municipalities in the SCWC adopted regulations to assure the proper construction of wells and boreholes. The regulations were the first of their kind in the Commonwealth and are a model of regional implementation.



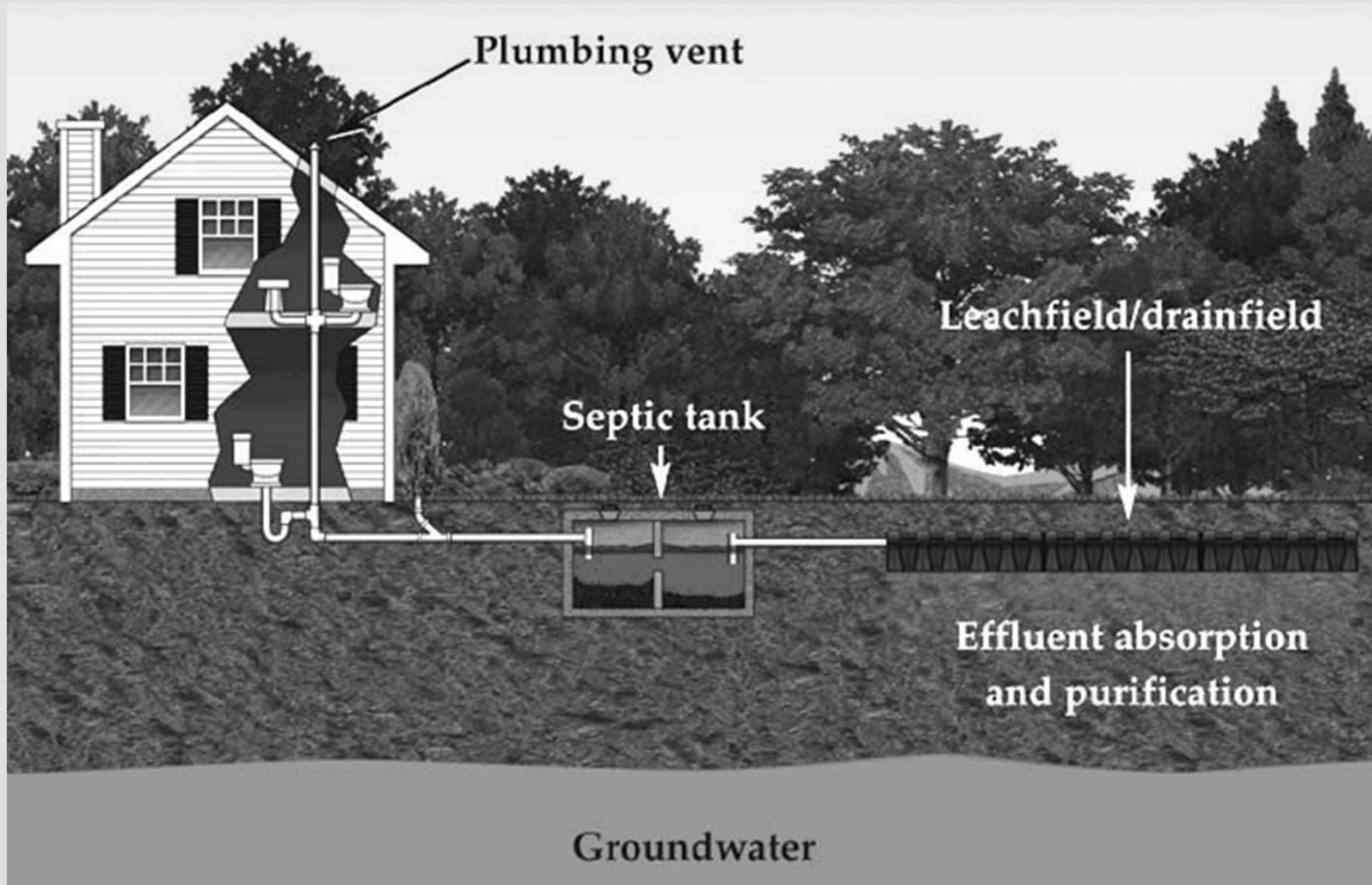
Diagrams courtesy of Montana Department of Natural Resources and Conservation

Ferguson, Harris and Patton Townships adopted ridge protection ordinances to protect wooded ridges and upland slopes from development that would adversely affect water resources. Property owners are required to determine the best location for development.



Photograph Courtesy COG

In 2006, the Centre Region municipalities adopted regulations that require inspections of on-lot septic systems every six years and pumping every three years.



In the Centre Region, municipal ordinances require conservation subdivisions in rural areas. Conservation subdivision designs cluster smaller house lots together to preserve open space, reduce imperviousness and conserve environmental features.



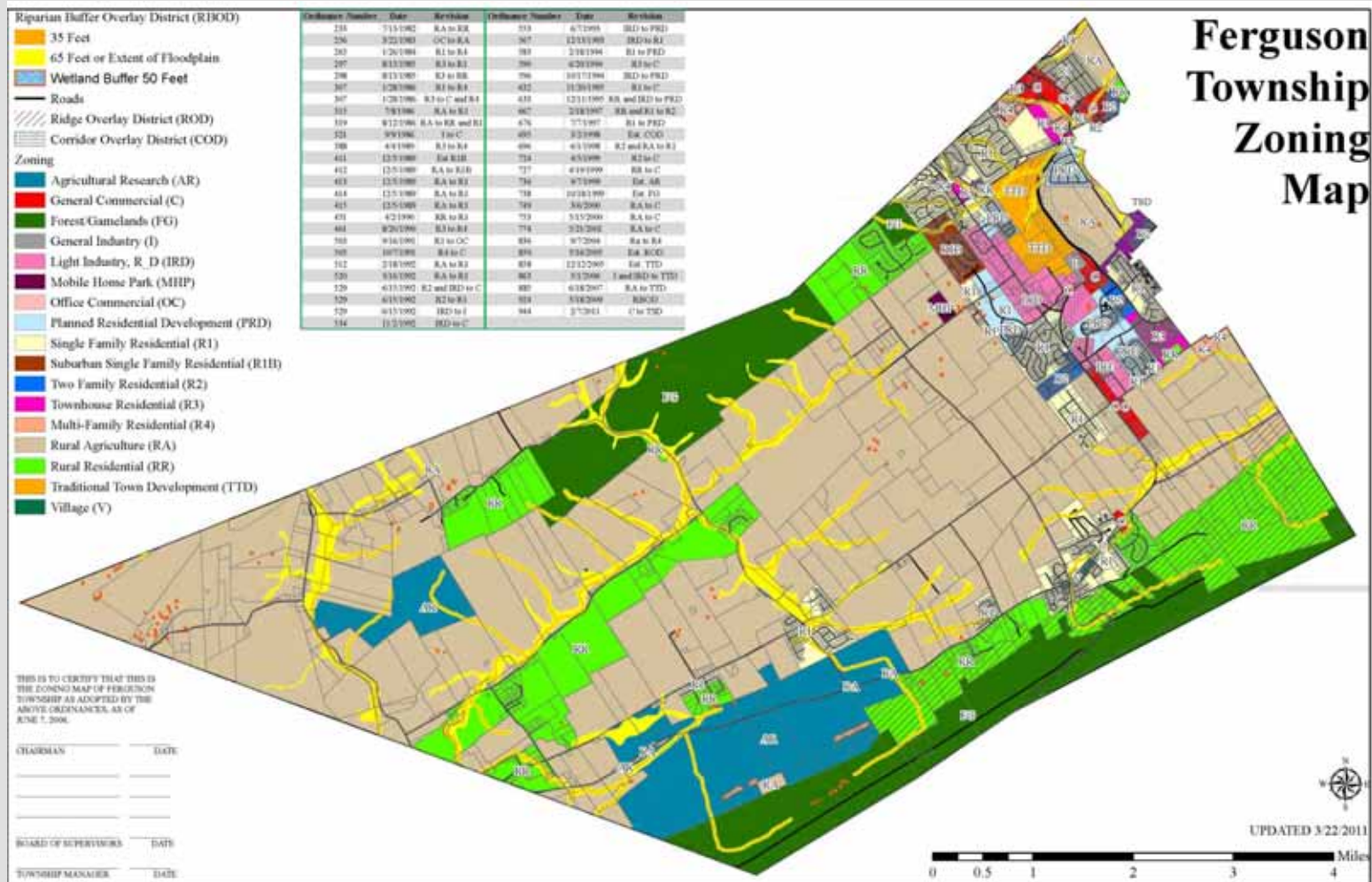
Conventional Subdivision



Conservation Subdivision

** Illustrations courtesy of Randall Arendt, Conservation Design for Subdivisions*

In Ferguson Township, Rural agricultural areas are limited to 1 dwelling unit per 50 acres, which significantly contributes to the protection of water resources.





Watershed Cleanup Day volunteers have collected more than 2,857 tons of trash since 1997 through a partnership with CCRRA, CRPR, the MS4 partners, and the generosity of local businesses, and municipalities.



The Centre County Recycling & Refuse Authority (CCRRA) offers an annual household hazardous waste collection event, which helps prevent these wastes from ending up in our surface or groundwater.



The Drug Enforcement Administration offers a National Prescription Drug Take-Back Day twice a year and the CCRRA, the University, and several local municipalities work with these issues.

Common Hazardous Chemicals:

- Furniture and metal polishes
- Paint, varnish and paint thinner
- Deck cleaners and rust remover
- Garden chemicals such as fertilizers, pesticides and herbicides/weed killers
- Motor oil, antifreeze and most all vehicle-related fluids



Medications/Prescription drugs:

- Birth control pills
- Estrogen replacement therapy, etc.
- Antidepressants
- Antibiotics
- Veterinary/pet medicines
- Aspirin
- Ibuprofen
- Prescription narcotic painkillers
- Cold and flu remedies
- Germ-killing liquids

The local University Area Joint (Sewer) Authority (UAJA) developed the beneficial reuse system and hopes to reuse more of the high quality water it treats instead of being discharged directly back into Spring Creek.



The local State College Borough Water Authority (SCBWA) considers water a precious natural resource and works continuously to protect and improve its system, and educate its customers.



The Borough of State College retrofits older stormwater facilities to improve water quality and hydraulic performance when possible such as the Orchard Road Pond and the Westerly Parkway flood control structure shown here.



The Borough of State College installed a green roof on part of its municipal building to lead by example.



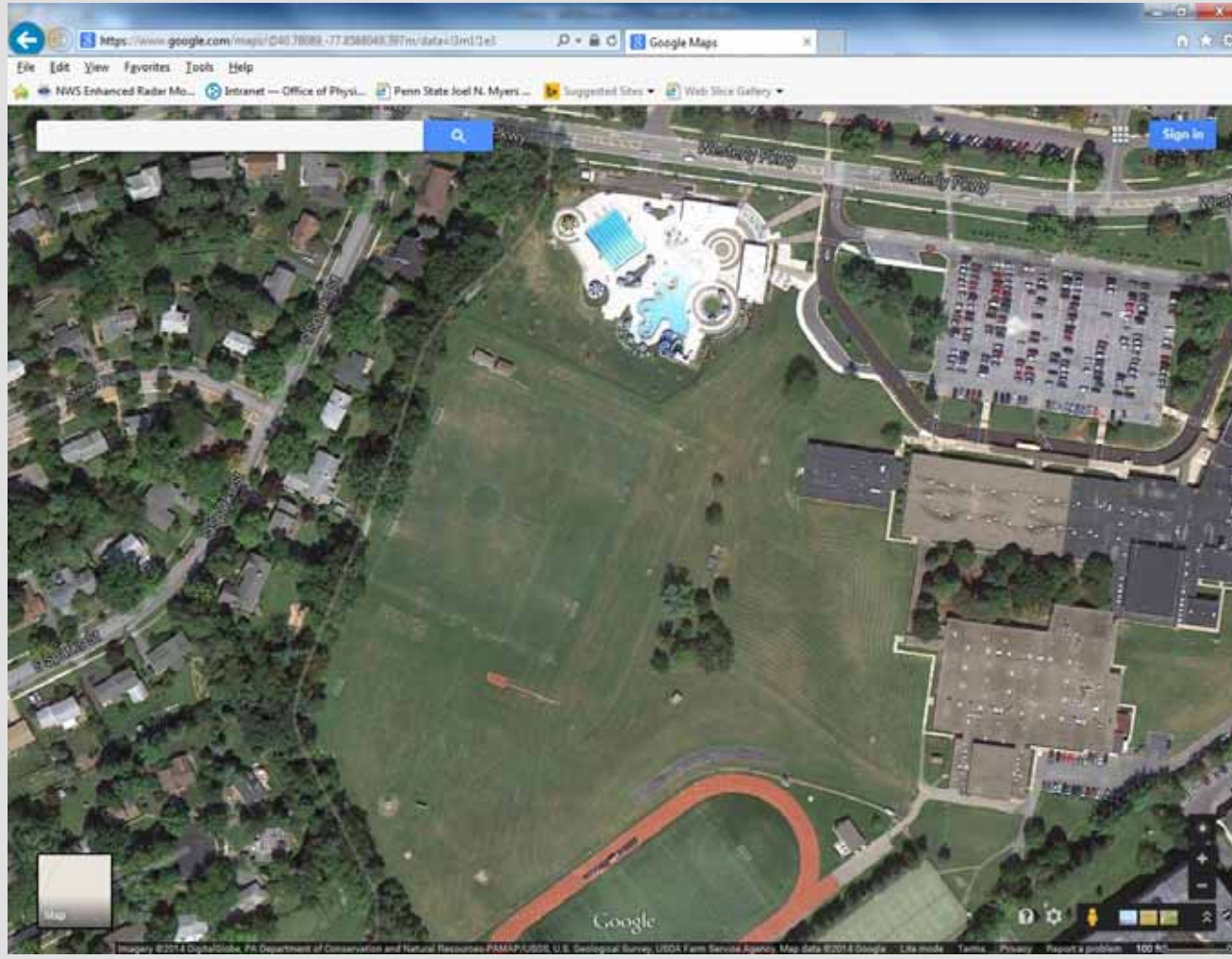
The Borough of State College evaluates the use of rain gardens for roadway improvement projects when possible.



The Borough of State College has constructed custom trash racks in the drainage network to remove trash and debris from reaching Spring Creek.



The Borough of State College worked cooperatively with the State College Area School District to reduce downstream flooding impacts.

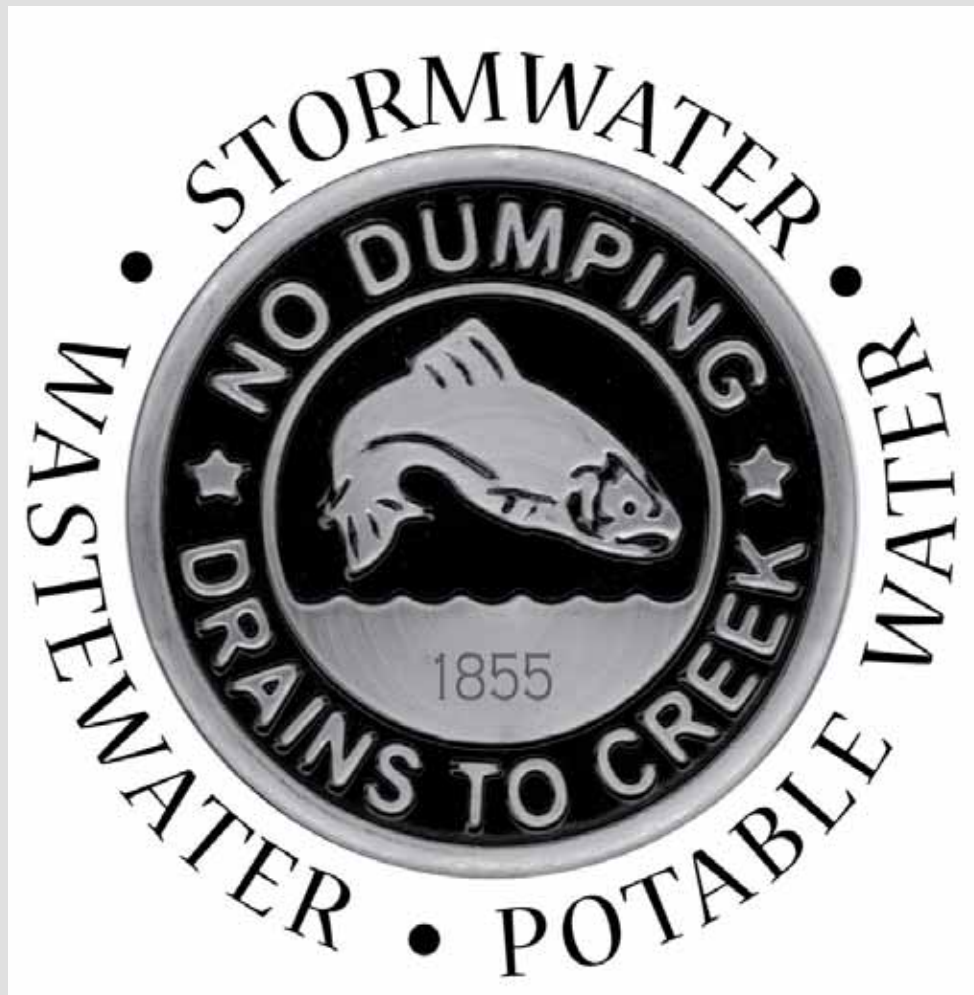


Spring Creek MS4 Partners – State College Borough; College, Ferguson, Harris, and Patton Townships; and Penn State

The Borough of State College built the Thompson Run Preserve Wetlands to help improve downstream water quality.



The University has a holistic approach to stormwater and wastewater management, as well as potable source water protection. The University wisely manages billions of gallons of water a year.

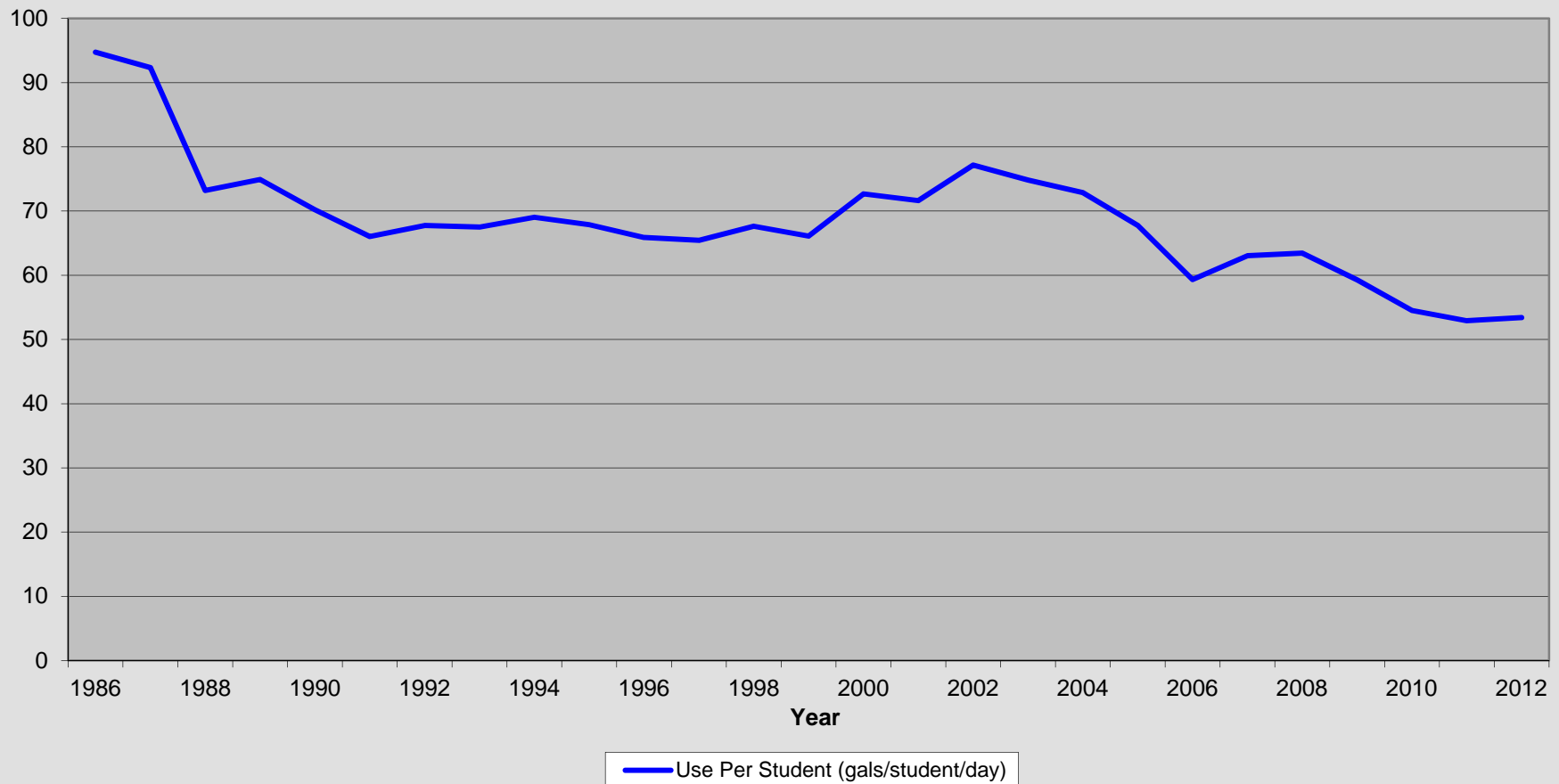


The University's wastewater treatment system includes a land treatment area (606 acres), which has discharged no effluent to surface waters since 1983, instead recharging the treated effluent in the Big Hollow.



Through conservation efforts, education and replacement of old waterlines, potable water consumption at the University has fallen over the last several decades.

University Park
gals/student/day



The University Park stormwater collection system includes over 73 miles of storm drains ranging in size from 6” to 72” in diameter, more than all the local municipalities.



However, at the University not all imperviousness creates surface runoff. For example, Old Main, and several other buildings have never drained to surface waters or the storm system.

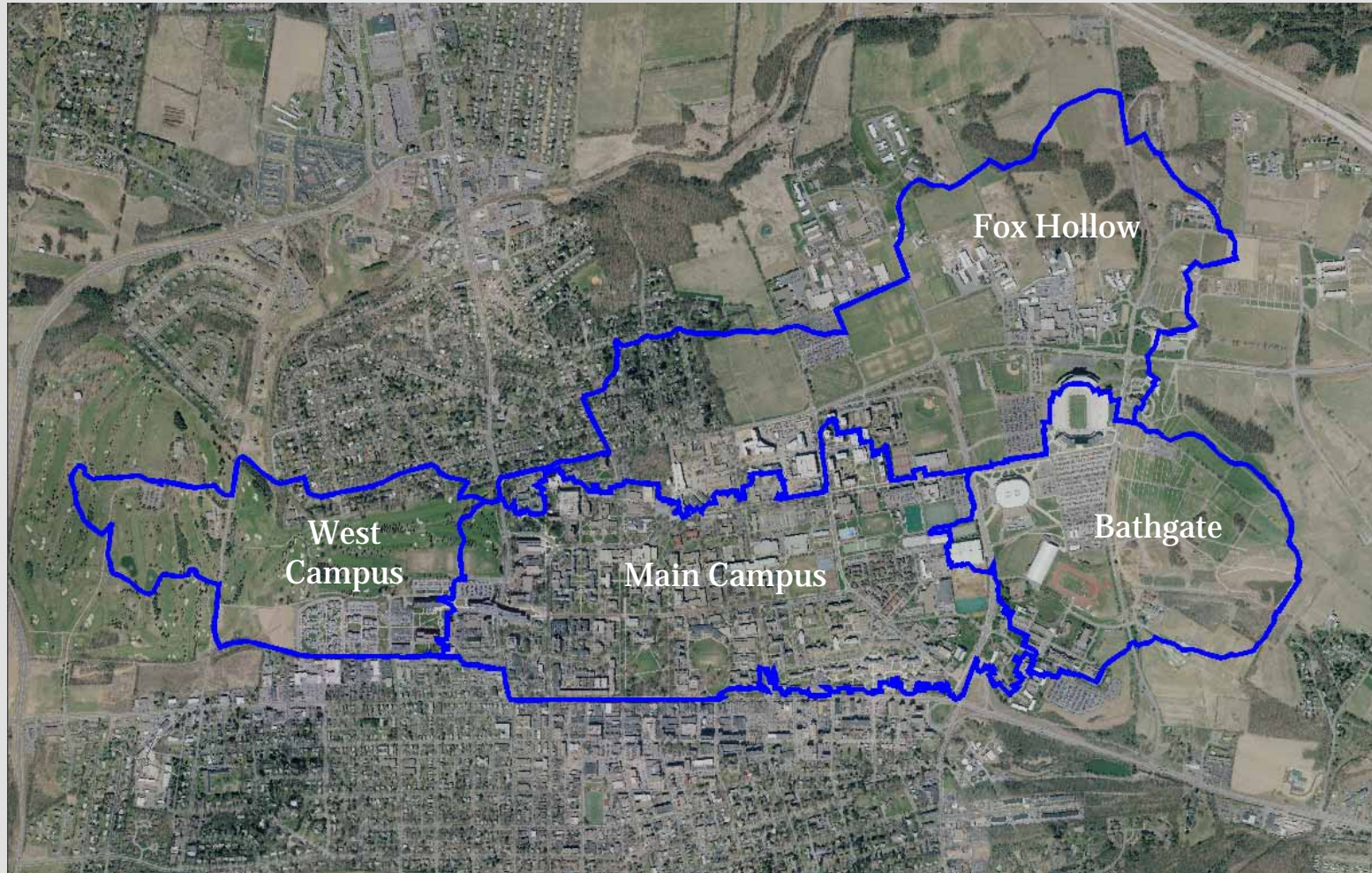


Old Main and Old Main Bell

The University has established a Water Resources Preservation land use classification (blue shaded areas below) for approximately 455 acres of its land at University Park.



Most of the University's developed land areas are within four major drainage basins, which are managed differently based on the local soils, geology, and stream classification.



These four watersheds have a combined area of 1,265 acres, of which approximately 871 acres (69%) are controlled by a stormwater management facility.



Fox Hollow Filtration Area

Recharge areas are aggressively protected. The Mitchell Tract recharge area, now located within the Arboretum, fully infiltrates a 100-year runoff event and consists of two closed depressions, one natural and one artificial.



Mitchell Tract Closed Depressions seen from roof of the Katz Law School Building

Nearly one billion gallons annually of surface runoff from the surrounding community's impervious areas drain into the University's protected area of the Big Hollow where it's recharged.



The University owns four regulatory dams in Centre County, one of which is the “duck Pond”.



Bathgate Dam

The University currently has 24 surface stormwater management ponds that actually have other positive effects such as acting like infiltration ponds even though they weren't specifically designed as such.



Parking Lot 43 Pond

The University owns 32 subsurface detention facilities to reduce peak runoff rates and filter trash. The largest subsurface detention facility has a storage capacity of 3.2 ac-ft and was built in conjunction with the Pegula Ice Rink.



Bigler Field Subsurface Facility

The University has numerous facilities (structural and nonstructural) to protect surface water quality such as this 15,000 gallon oil/water separator.



Fleet O/W Separator

The University has numerous bioswales throughout campus, some are lined like this one, which was built inside the foundation of an old building basement.



Grad Circle Bioswale B

The University has several major regional stormwater control facilities, but still uses small site control facilities with each new project.



Fox Hollow Filtration Area

Numerous recharge facilities are being designed on the low head weir concept, a method pioneered at the University, which mimics natural closed depression functions.



Orchard Road/Park Ave Low Head Weir

The University has approximately three (3) acres of green roofs on its buildings. One of the more interesting (and sloped) roofs can be seen on the Katz Building.



Katz Law School Building Roof

The University has several rainwater harvesting systems, two of which are used to flush toilets.



Millennium Science Complex Building

The University owns the Millbrook Marsh Nature Center, operated by Centre Region Parks & Recreation. The 50-acre wetland area also hosts a Conservation Easement with ClearWater Conservancy of Central PA.



Courtesy Jen Shuey

The University fosters an environment where demonstration type projects can prove their worth, such as the Slab Cabin cross vane project that enhanced the stream to floodplain connection.



Millbrook Marsh cross vane

The University installed a floating trash rack above the Duck Pond to take floating debris out of the stream, which the University and the Borough maintain together.



Duck Pond inflow channel trash rack

The University outreach efforts related to water resources are extensive and creates a significant brain trust in the community.



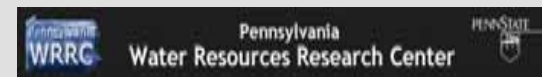
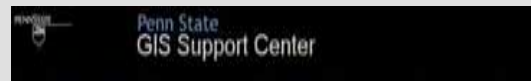
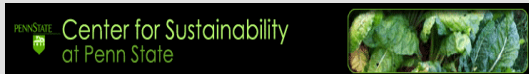
The Pennsylvania Housing Research/Resource Center



College of Agricultural Sciences



- Water Resources Extension
- Agricultural and Biological Engineering Extension
- School of Forest Resources, Natural Resources Extension



**"It is likely that water quality in Spring Creek
is better now than it has been since 1900."**

R.F. Carline et al., 2011



Spring Creek MS4 Partners – State College Borough; College, Ferguson, Harris, and Patton Townships; and Penn State

“Yet, despite these improvements, there are still signs of impairment to biological communities. The challenge ahead is finding cost effective ways to reduce nonpoint source pollution originating from agricultural and urban stormwater.”

R.F. Carline et al., 2011



We all need to do our part

