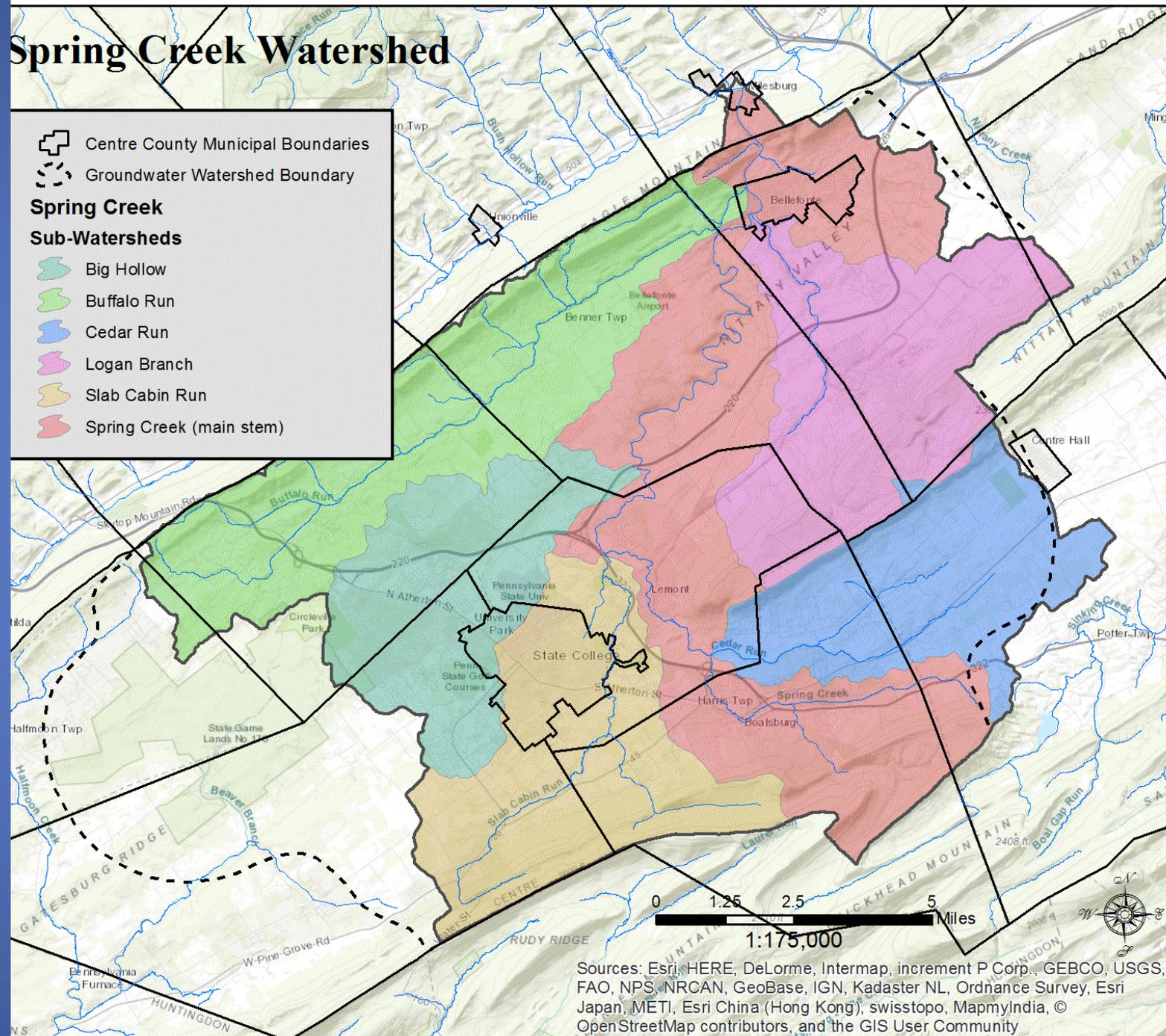


Spring Creek Watershed Phase 2

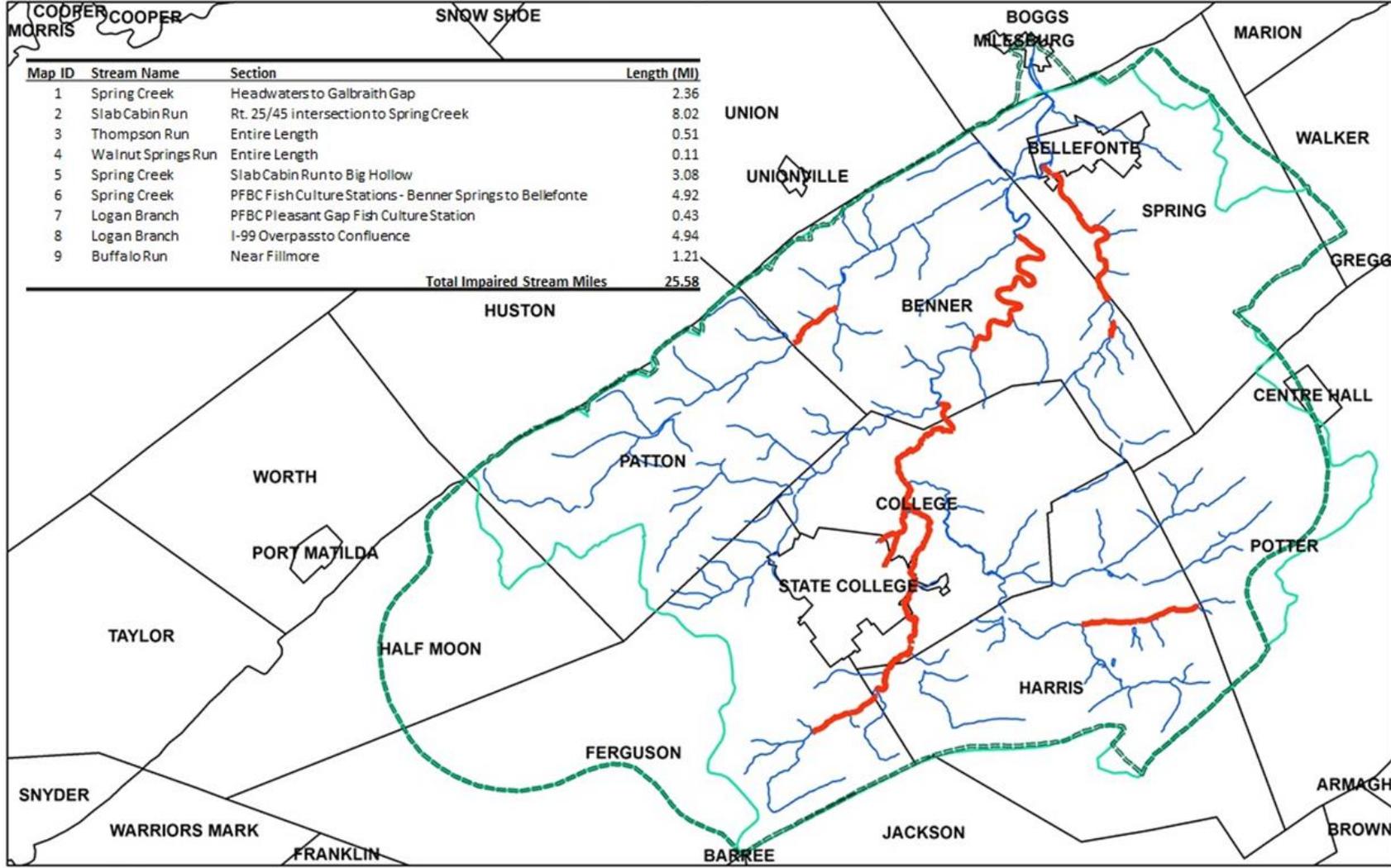
Our One Water Plan for Integrated Watershed Leadership

Spring Creek Watershed Overview

- 146 Sq Miles
- 93,440 acres
- Landuse
 - 28% Agriculture
 - 45% forested
 - 27% urban
- Municipalities: Bellefonte Borough, Benner Township, Centre Hall Borough, College Township, Ferguson Township, Halfmoon Township, Harris Township, Milesburg Borough, Patton Township, Potter Township, Spring Township, State College Borough, Walker Township
- Tributary to Bald Eagle Creek, which drains into the West Branch Susquehanna River



Impaired Streams in the Spring Creek Watershed



| Map ID | Stream Name | Section | Length (MI) |
|------------------------------------|--------------------|---|--------------|
| 1 | Spring Creek | Headwaters to Galbraith Gap | 2.36 |
| 2 | Slab Cabin Run | Rt. 25/45 intersection to Spring Creek | 8.02 |
| 3 | Thompson Run | Entire Length | 0.51 |
| 4 | Walnut Springs Run | Entire Length | 0.11 |
| 5 | Spring Creek | Slab Cabin Run to Big Hollow | 3.08 |
| 6 | Spring Creek | PFBC Fish Culture Stations - Benner Springs to Bellefonte | 4.92 |
| 7 | Logan Branch | PFBC Pleasant Gap Fish Culture Station | 0.43 |
| 8 | Logan Branch | I-99 Overpass to Confluence | 4.94 |
| 9 | Buffalo Run | Near Fillmore | 1.21 |
| Total Impaired Stream Miles | | | 25.58 |

Ground Water Boundary
 Surface Water Boundary
 Impaired Streams
 Streams
 Municipalities

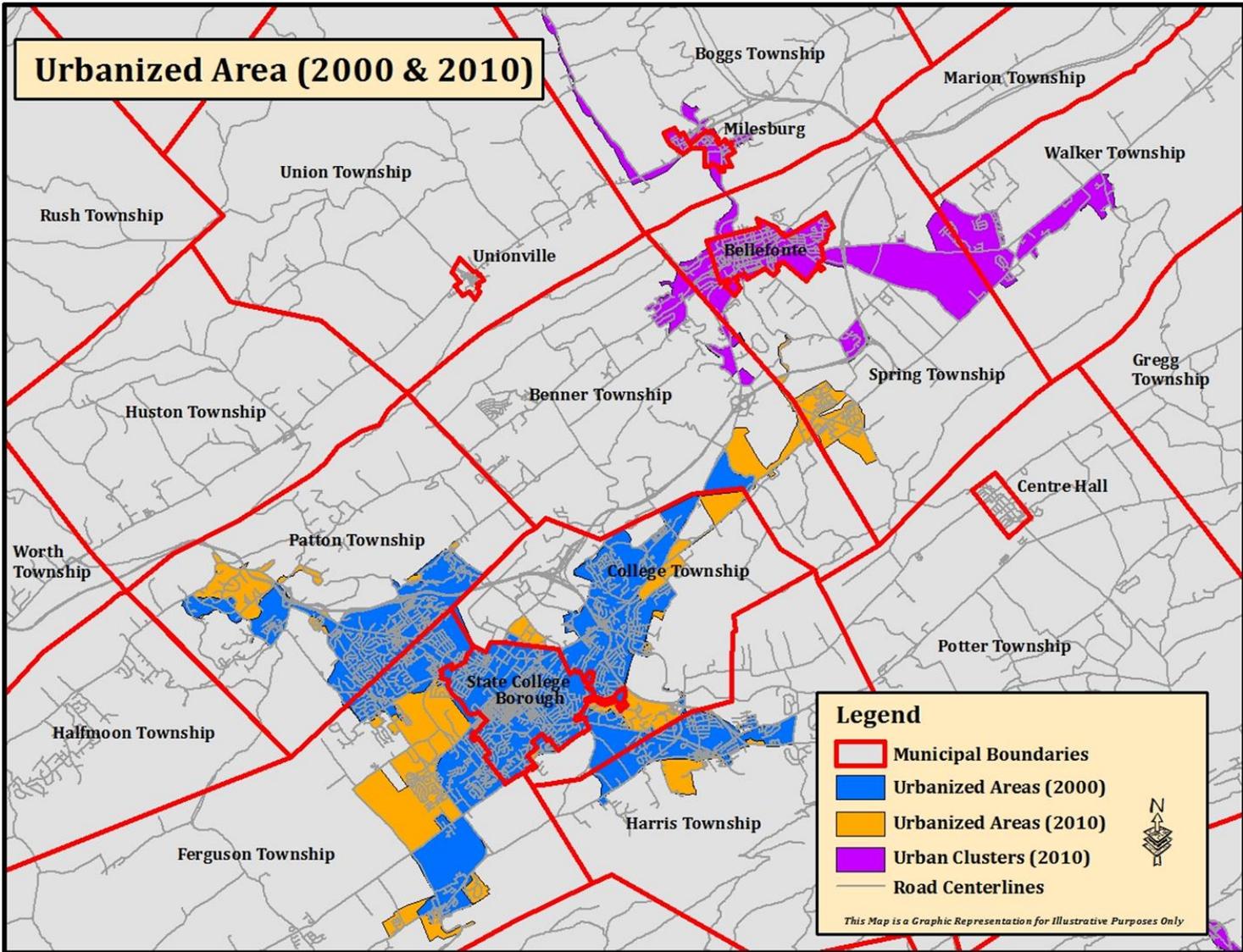


Created by ClearWater Conservancy, 2015
 Data Sources: Centre County Planning and
 Community Development Office, PA DEP

Population Change

| Municipality | 2017 | 2000 | % change 2010-17 |
|-----------------------|----------------|----------------|------------------|
| Bellefonte Borough | 6,308 | 6,424 | 2% |
| Benner Township | 9,309 | 5,219 | 50.7% |
| Centre Hall Borough | 1,251 | 1076 | -1.1% |
| College Township | 10,245 | 8,522 | 7.6% |
| Ferguson Township | 19,316 | 14,100 | 9.2% |
| Halfmoon Township | 2,793 | 2,359 | 4.7% |
| Harris Township | 5,803 | 4,655 | 19.1% |
| Milesburg Borough | 1,088 | 1,156 | -3.1% |
| Patten Township | 16,038 | 11,301 | 4.7% |
| Potter Township | 3,593 | 3,333 | 2.2% |
| Spring Township | 7,853 | 6,233 | 5.1% |
| State College Borough | 42,430 | 38,434 | .09% |
| Walker Township | 4,721 | 3,194 | 6.5% |
| Total | 130,748 | 106,006 | |

Urbanized Area (2000 & 2010)



Challenge: New Ways of Coordinating Across Local and Regional Entities

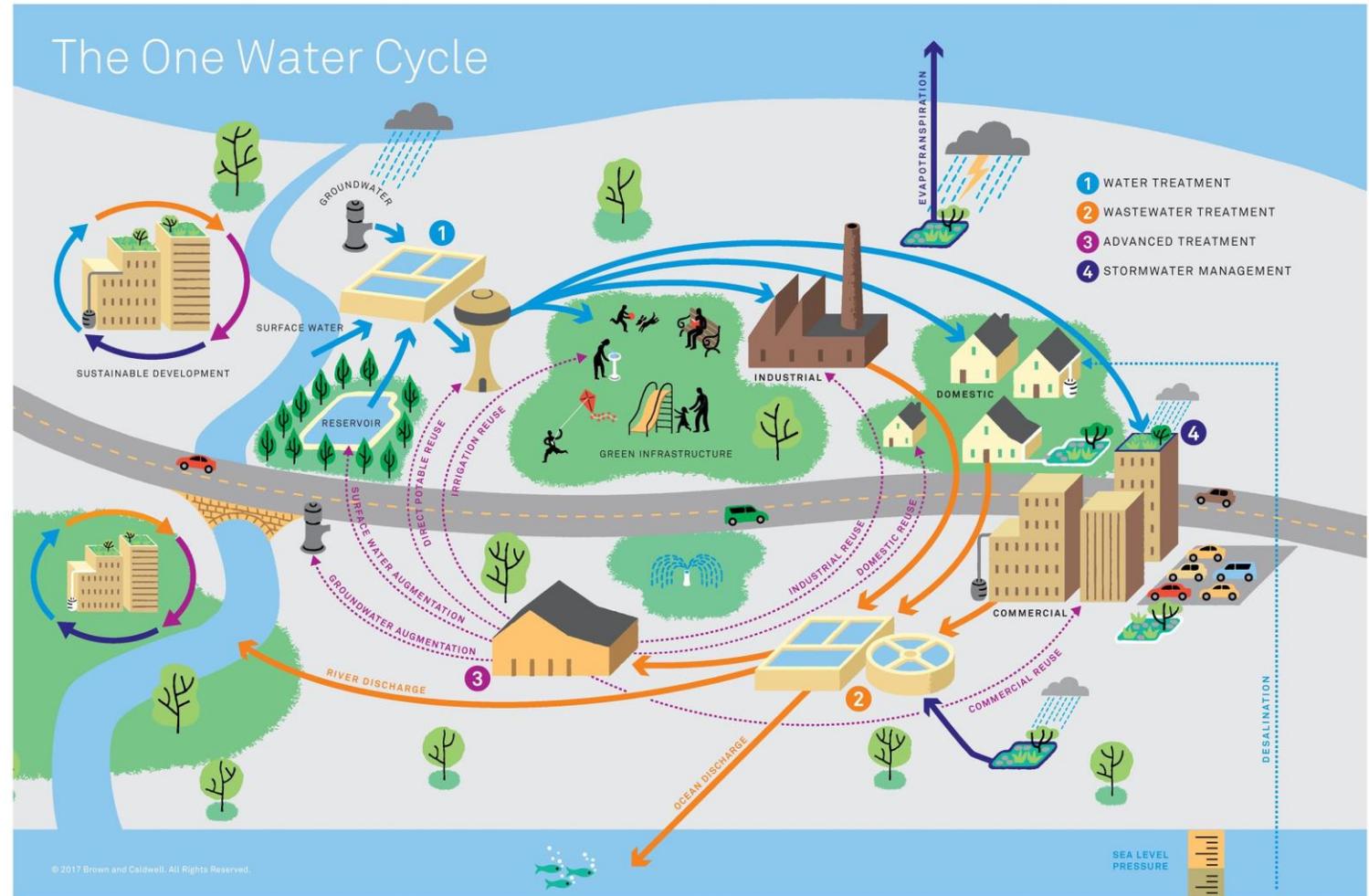
| Water Suppliers | Wastewater |
|--|--|
| State College Borough Water Authority | University Area Joint Authority |
| Bellefonte Borough Water and Sewer Authority | Spring Benner Walker Joint Authority |
| College Township Water Authority | Centre Potter Sewer Authority |
| Benner Township Water Authority | Regional Planning |
| PSU (Water and Sewer) | Centre Region Planning |
| Walker Township Water Association | Nittany Valley Joint Planning Commission |
| Milesburg Borough Water Authority | Lower Bald Eagle Planning |
| Centre Hall Borough Water Authority | Penns Valley Region Planning |

Challenge: PA Water Law

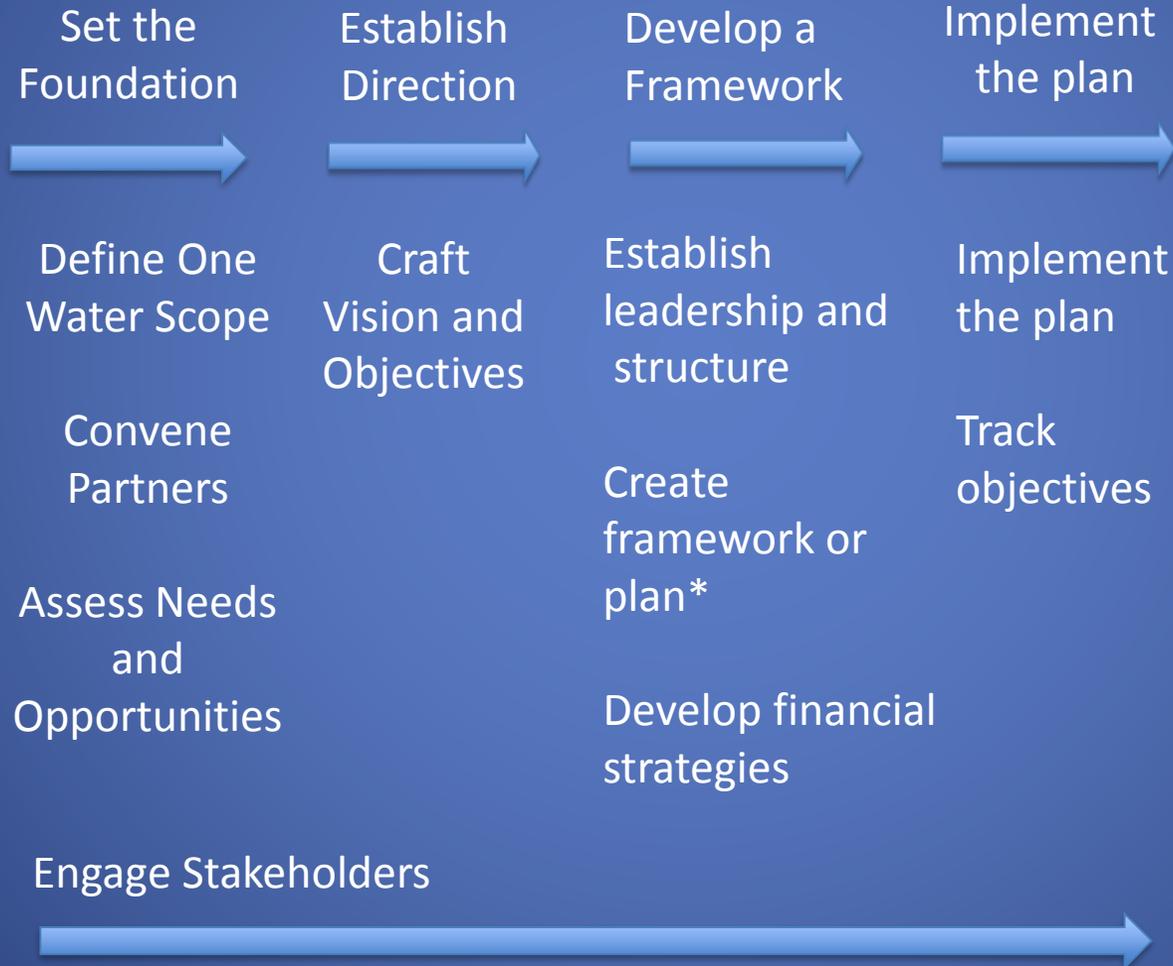
- Various pieces of law interwoven together to manage water.
- Not well designed for future demands and emergency situations.
- Sources of PA water law include common law, interstate compacts regulating some parts of the Commonwealth, and statutes targeting specific water topics.
- Both surface and groundwater are legally managed separately under riparian law. Act 220 tries to address this issue.

<https://www.springcreekwatershedatlas.org/single-post/2018/01/16/An-Overview-of-Pennsylvania-Water-Law>

Managing Water Resources and Water Services



One Water Planning Process



Forum Major Themes

- OVERALL WATERSHED CONSIDERATIONS – 17 ISSUES
- GROWTH, DEVELOPMENT, EXISTING & NEW IMPACTS
- INFRASTRUCTURE
- TOURISM AND RECREATION
- AGRICULTURE
- DRINKING WATER
- WASTEWATER
- MINING
- TRANSPORTATION
- PENN STATE UNIVERSITY

Vison and Mission

One Water Plan Vison Statement

The vision for the Spring Creek Watershed is an integrated management of water resources in an environmentally, economically, and socially beneficial manner. This will foster a vibrant, prosperous watershed where natural and human communities thrive, and citizens embrace the value of our assets and sustain our resources now and for future generations. This vison, developed collaboratively with stakeholders, is accomplished through the mission of the Spring Creek Watershed Commission.

SCWC Mission Statement

- To implement the long-range vision for the watershed that represents a consensus of thoughts and ideals that are commonly shared by the people of the Spring Creek Watershed.
- To establish a leadership role within the watershed to advance and coordinate projects and programs that are consistent with the long-range vision of the Spring Creek Watershed, including conservation and enhancement of the exceptional wild trout resources it supports.
- To develop a long-range comprehensive Integrated Watershed Management Plan that relies on quality scientific data and a program of meaningful associated projects to conserve and enhance the quality of life within the Spring Creek Watershed.

Value Statements

1. Recognizes that the Spring Creek Watershed is worthy of conservation and careful stewardship.
2. Conserve Spring Creek's cold water ecosystem including its exceptional wild trout fishery.
3. Provides a clear visual image of the watershed community that reflects the highest standards of design quality for public and private commercial, residential, institutional and industrial development in Spring Creek resulting in the conservation of water and the conservation and enhancement of its natural beauty, natural features and cultural heritage.
4. Promote buildings and public infrastructure development that are practical, sustainable, and in harmony with the environment and surrounding landscape.
5. Fosters a feeling of community spirit, community identity, and promotes a sense of full citizen participation, guaranteeing an opportunity for everyone to share in the duties and responsibilities that benefit the Spring Creek Watershed.
6. Provides cultural, recreational, and educational opportunities for the residents and visitors to the Spring Creek Watershed.

Guiding Principles For Decision Making

- Is not an effort to change local governance but to integrate management and leadership.
- Strives for a systematic, watershed-wide, science-based approach to watershed management; driven by the participating local governments, state and federal governments, water utilities, planning commissions, Penn State University, citizens, businesses and industry.
- Planning and implementation efforts will recognize local commitment and contribution.
- Will embrace the concept of multiple benefits based on measures of social, economic and environmental outcomes in the development and prioritization of implementation strategies and actions.

Framework for Spring Creek One Water Plan

- Goals are statements that describe the fundamental endpoints or outcomes we are aiming to achieve through activities across all sectors of management. Goal statements are expressed in broad aspirational terms.
- Objectives are statements about desired outcomes and support the high-level goals.
- Metrics can be considered performance indicators. They can be considered benchmarks that can be measured to track how well we are achieving our desired outcomes. For example, “tons of sediment eliminated”.
- Outcomes are specific changes we are trying to achieve. They should be measurable and realistic but challenging. If outcomes are unrealistic and too difficult to achieve, they may discourage people rather than motivate them. On the other hand, outcomes that are too easy to achieve can lead to complacency.

Goals 1: Protect, Enhance and Sustain Healthy and Resilient Coldwater Stream Ecosystems

| Objective | Description | Suggested Metric (s) | Outcome(s) |
|--|---|--|--|
| Objective 1A: Protect Ecosystem Flows | Rivers, streams, wetlands and springs need certain amounts of water to support healthy aquatic ecosystems. Improve water quality and quantity for resiliency to ensure the capacity of the ecosystem to respond to a disturbance by resisting damage and recover quickly. This is especially critical given the unique and coldwater ecosystem supported by the Spring Creek Watershed and highlighted by the exceptional wild trout populations and fishery, which require cold, clean water to flourish. Management must consider the impacts of point and nonpoint discharges, development, stormwater, and water withdrawals. | <ul style="list-style-type: none"> • The Nature Conservancy Ecosystem Flow Recommendations • Acres of impervious surface • Lbs of nitrogen, phosphorus and sediment reduced • Number of miles of riparian buffers installed • Miles of stream improved that meet criteria to be delisted from impairment • Development of a proactive TMDL to determine maximum amount of pollutants allowed to occur in spring creek and tributaries in the future. | <p>Restore High, Seasonal and Low Stream Flows</p> <p>Maintain and improve existing hydrology</p> <p>Impaired stream sections improved to meet criteria for removal from impairment designation on 303D list</p> <p>Voluntary Total maximum Daily Loads Met.</p> |

Goals 1: Protect, Enhance and Sustain Healthy and Resilient Coldwater Stream Ecosystems

| | | | |
|---|--|---|---|
| <p>Objective 1B: Create Resilient Habitats</p> | <p>Stream habitat is one of the important factors that affect aquatic communities. This includes physical habitat and water quality. Based on the macroinvertebrate diversity and sensitivity to pollution, and wild trout population dynamics and densities, we gain an understanding of our streams' health. Degraded in-stream habitat often results from uncontrolled storm water runoff and uncontrolled runoff from cultivated agricultural land. Other reasons for poor stream habitat include altered stream flows, excess sediment, and a loss of surrounding trees and shrubs that help slow the erosion of the stream banks and provide shade to help maintain cool water temperatures during critical summer months. Chemicals and pollutants also negatively impact stream habitat/water quality.</p> | <ul style="list-style-type: none"> • Index of Biological Integrity Scores • DO, water temperature, sediment loads, stream channel surveys (fluvial geomorphology) • Number of trout, biomass, sizes and redds • Acres of Impervious surface reduced • Miles of riparian buffers installed • % of impervious surface | <p>Diversity of macroinvertebrates.</p> <p>Improved water quality and thermal regime</p> <p>Wild trout populations at or above current levels.</p> <p>Maintain and improve existing water quality, including water temperature and D.O.</p> <p>Acres and/or # of Green Infrastructure</p> |
|---|--|---|---|

Goal 2: Maintain and improve water quality and quantity to sustainably meet the needs of the human community.

| | | | |
|--|--|---|--|
| <p>Objective2A: Maintain a reliable water supply for residents, agriculture, and industry</p> | <p>Protecting, maintaining, improving and developing new water supply sources and recharge/storage areas ensures a supply for future uses. Water management must consider the multiple uses of groundwater to ensure reliability. Recycled water can offer a reliable source that can displace a portion of the need for additional surface or groundwater withdrawals</p> | <p>% loss from water systems, #gallons of drinking water from new sources, % stormwater volume directed to recharge areas; % reduction in treatment costs</p> | <p>% water use served by recycled water, # new large-scale storage areas developed</p> |
| <p>Objective 2B: Implement a water demand strategy</p> | <p>Water demand management involves the adoption of policies and investments by water utilities to achieve efficient water use by all members of the watershed community. This strategy requires a major paradigm shift from conventional supply management to the management of demand. The aim is to promote the use of the right quantity of water on the farm, industry, household, and by the watershed community as a whole.</p> | <p># of tributaries with water budgets, # of critical supply areas identified, % critical contribution areas with practices/policies in place to support sustainable yield/withdrawal scenarios, # of effective ordinances/policies Gallons of water from natural systems, withdrawals per capita</p> | <p>No exceedance of sustainable withdrawal rates. Number of new sources to mitigate impact. % public water supply loss reduced. Drinking water needs met Maintain low flows at or above long-term monthly median flows at each of the Three USGS gages on Spring Creek and on tributaries while meeting daily drinking water needs</p> |

Goal 2: Maintain and improve water quality and quantity to sustainably meet the needs of the human community.

| | | | |
|--|--|--|---|
| <p>Objective 2C: Sustain and protect groundwater</p> | <p>Groundwater accounts for 88% water supply in the Spring Creek Watershed. Aquifers provide critical storage to meet needs during droughts. The amount of groundwater in storage in each basin is dependent on the precipitation, recharge and the total extraction of all the wells. A groundwater management plan that is designed for the political, institutional, legal and technical specifics of the basin can help maintain the quality and quantity of the groundwater supply.</p> | <p># of BMP's to minimize recharge loss, # of source water plans updated,</p> <p># of emergency water supply plans developed,</p> <p>% change in well levels;</p> <p>% flow in and out of the watershed</p> <p>% deviation from historic baseflows</p> | <p>sustained well yields, ground water management plan</p> <p>% attainment on meeting historic base flows</p> |
|--|--|--|---|

Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life

| | | | |
|--|--|---|---|
| <p>Objective3A: Implement an Integrated Water Management Network/Governance Model</p> | <p>This network would promote the coordinated development and management of water, land and related resources, to maximize environmental, economic and social results in an equitable manner without compromising the sustainability of the watershed. Participation would involve applying knowledge from various disciplines as well as the insights from diverse stakeholders to devise and implement efficient, equitable and sustainable solutions to water and development problems. Network members could include the Spring Creek Watershed Commission, municipal governments, water utilities, Penn State, state and federal agencies, industry, and planning organizations. Political will and commitment will help unite all stakeholders and move the process forward.</p> | <p>Build capacity of Spring Creek Watershed Commission to administer the network</p> <p>Utilize Penn State to evaluate existing networks in other states or other governance options</p> <p>Include MS4 Partnership and Central PA Source Water Protection Partnership</p> | <p>Cross agency and cross scale interaction and communication</p> <p>Administrative process implemented</p> <p>Network charter in place</p> |
|--|--|---|---|

Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life

| | | | |
|--|---|--|---|
| <p>Objective 3B: Implement network subcommittee for technical support, data driven science, education and information exchange.</p> | <p>Diversity of membership includes utility personnel, academia, government employees (federal, state, local), non-governmental organizations, industry representatives and consultants. Review, evaluate, and disseminate information on best practices on integrated watershed management. Encourage adoption of new advances and applications for watershed management, develop workshops and organize/moderate technical discussion and educational events.</p> | <p>#of members representing diverse capabilities</p> <p>#of educational events</p> <p>Data driven science metrics</p> <p>% economic growth</p> <p>% biological growth</p> <p>Centralized data sets</p> | <p>Science based collaboration</p> <p>Land Use plans coordinated</p> <p>Online searchable data base</p> |
|--|---|--|---|

Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life

| | | | |
|--|---|---|--------------------|
| <p>Objective 3C: Promote the value of the watershed's recreation, aesthetic and cultural assets</p> | <p>Ecosystems provide recreational opportunities and cultural and aesthetic value. Communities rely on clean air, water, green space, and other natural amenities for economic sustainability and quality of life, yet their benefits are not always fully understood or considered in local decisions. Recreation and tourism associated with outdoor environments can play a huge role in local economies. Many citizens place high value on historically or culturally important landscapes because of their significance. However, human activities can stress natural areas where people recreate or visit cultural sites.</p> | <p>#of clean up events # of recreational users # cultural sites # of groups involved % value of ecosystem services</p> <p>Reenergize "Spring Creek Day"</p> <p>Recreational growth and economic value</p> | <p>Stewardship</p> |
|--|---|---|--------------------|

Phase 3 Short Term Actions

Continue to convene technical workgroup to begin capturing ideas for phase 3 milestones and actions

Engage PSU to begin evaluating informal networks through literature review of other watersheds with fragmented management structures and how they resolved coordination of overlapping authorities.

Implement a speaker series based on the 10 substantive law forum issues.

SCWC to continue to improve their website to serve as a centralized data base and document storage.

Develop a funding plan and raise funds to hire professional team to draft final integrated water management plan - \$250,000/yr for 2 years estimated.

SCWC to hire staff for coordination, website and grant applications to raise funds for professional support – estimated cost \$30,000.

Internship to compile historic data over time.