

Local Watershed Context: The Susquehanna River Basin



Citizens Advisory Committee – December 1st, 2021

Your River --Our Mission

SRBC's 50th Anniversary Celebration: 1971-2021

Scroll through the Commission's history, landmark achievements, and meet the people who have helped make SRBC history.

Susquehanna River Basin Commission | January 5, 2021



The Susquehanna Workhorse

- The Susquehanna's resources and waterways helped build the nation after colonization and through the Industrial Revolution
 - timber, coal and oil
 - canals and mills
- The Susquehanna still provides critical energy and power resources
 - power generation
 - natural gas

Timber

- 1800s to early 1900s
- Largely in the West Branch Susq



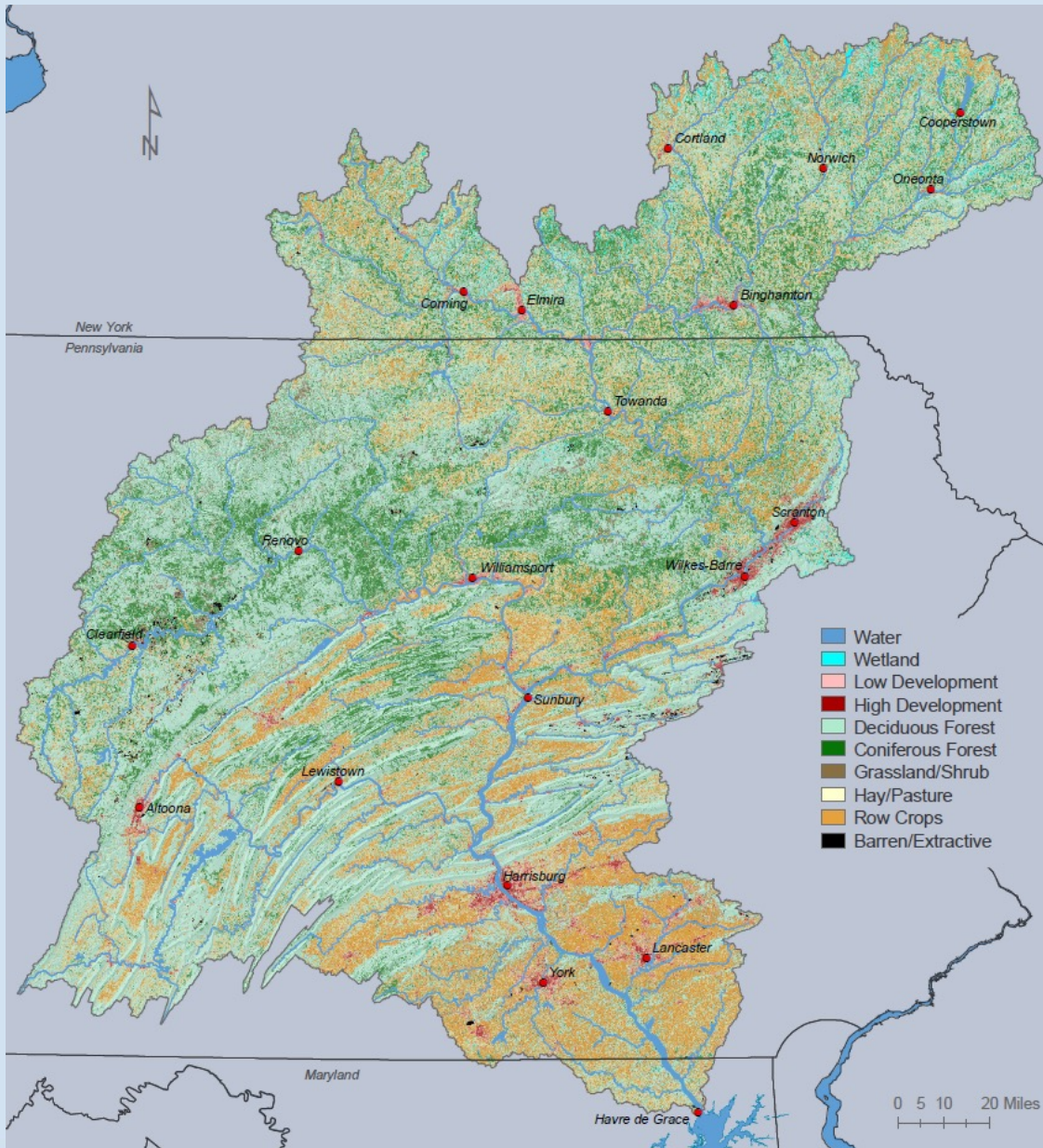
LOG RAFTS IN THE SUSQUEHANNA RIVER AT LOCK HAVEN, PA.

Deforestation

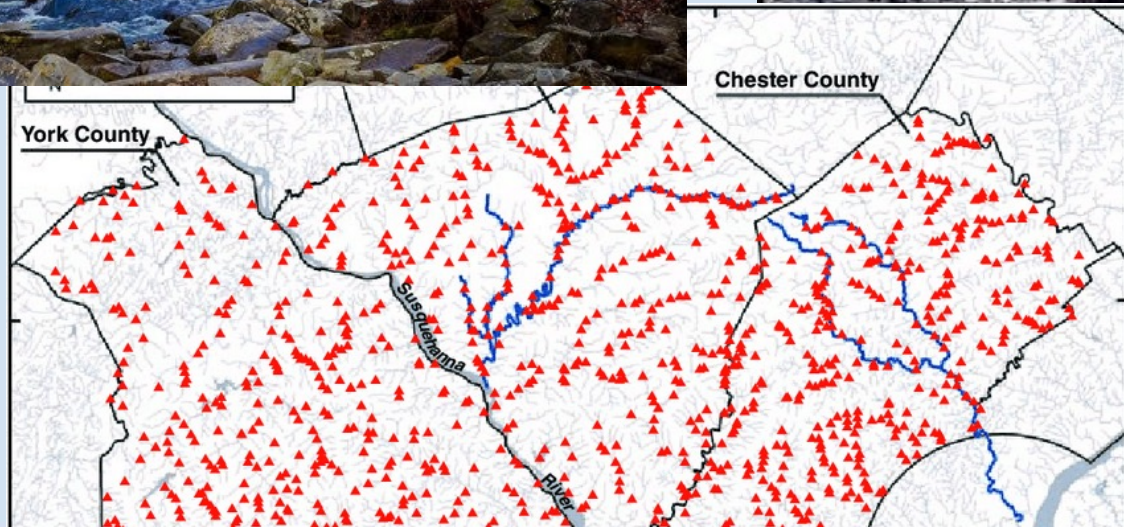


Susquehanna River Basin Land Cover

- 60% forested



Mill Dams



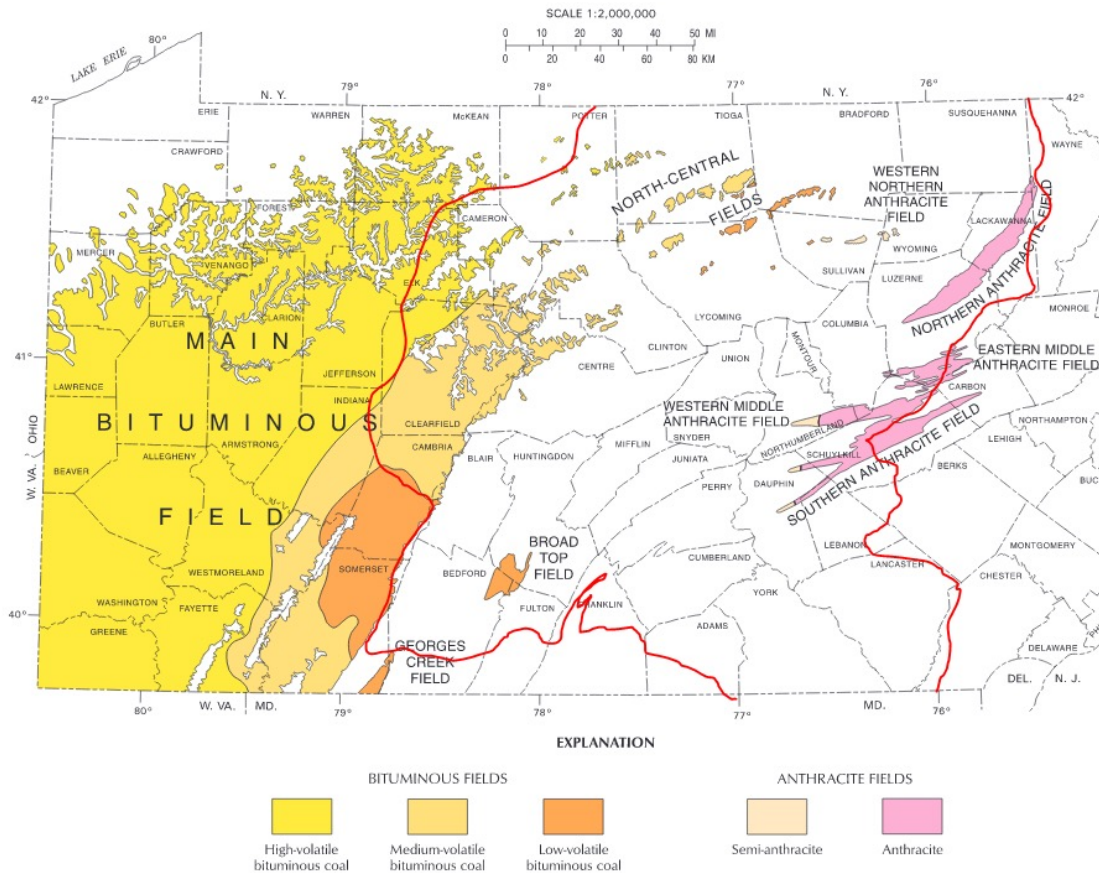
Legacy Sediments





Coal

DISTRIBUTION OF PENNSYLVANIA COALS

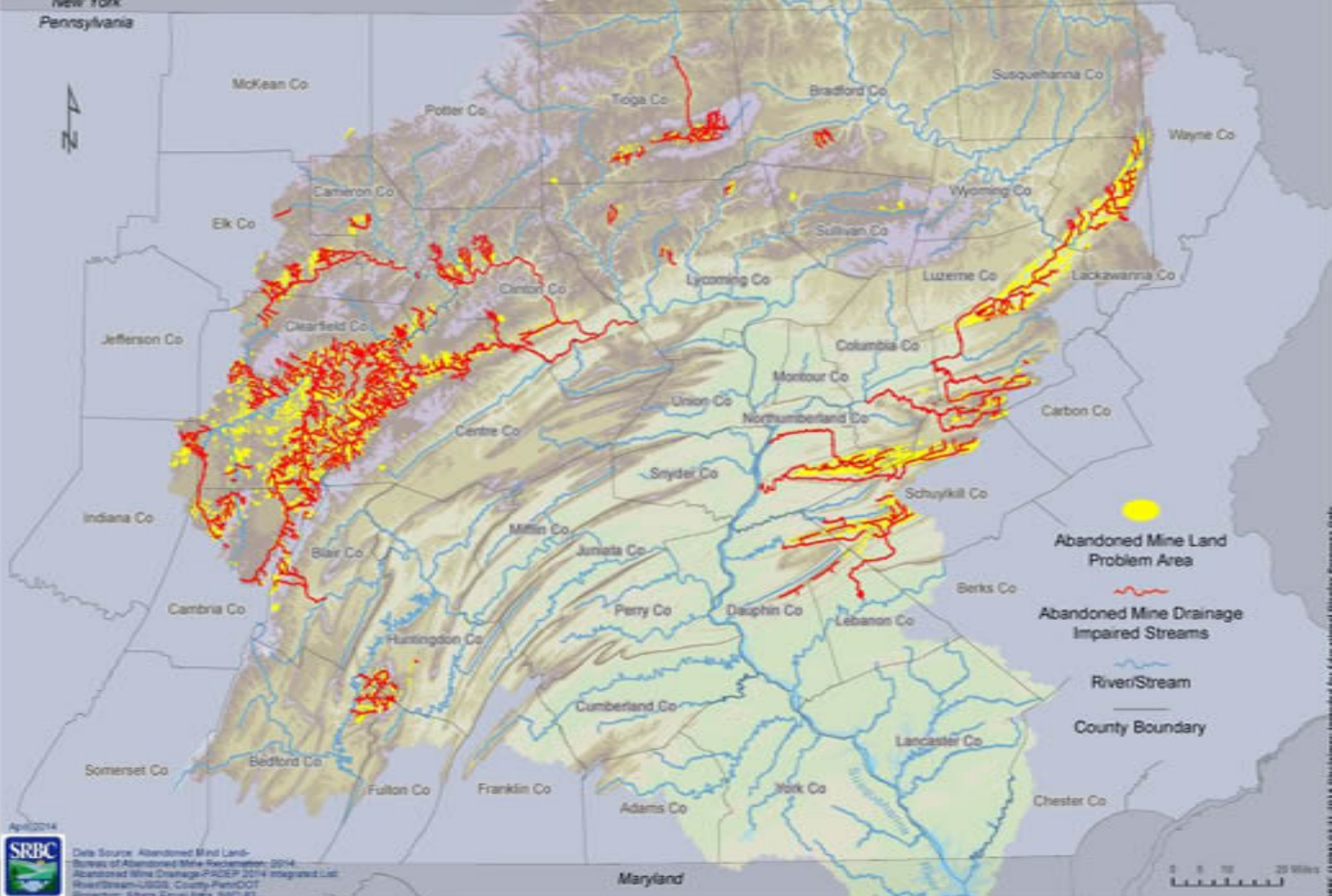


Coal Legacy



MINE DRAINAGE IMPAIRED STREAMS and MINE LAND PROBLEM AREAS in the SUSQUEHANNA RIVER BASIN

New York
Pennsylvania



April 2014



Data Source: Abandoned Mine Land
Survey of Abandoned Mine Reclamation: 2014
Abandoned Mine Drainage-PADEP 2014 Integrated List
River/Stream-USGS, County-PA/MDOT
Projection: Albers Equal Area, NAD 83

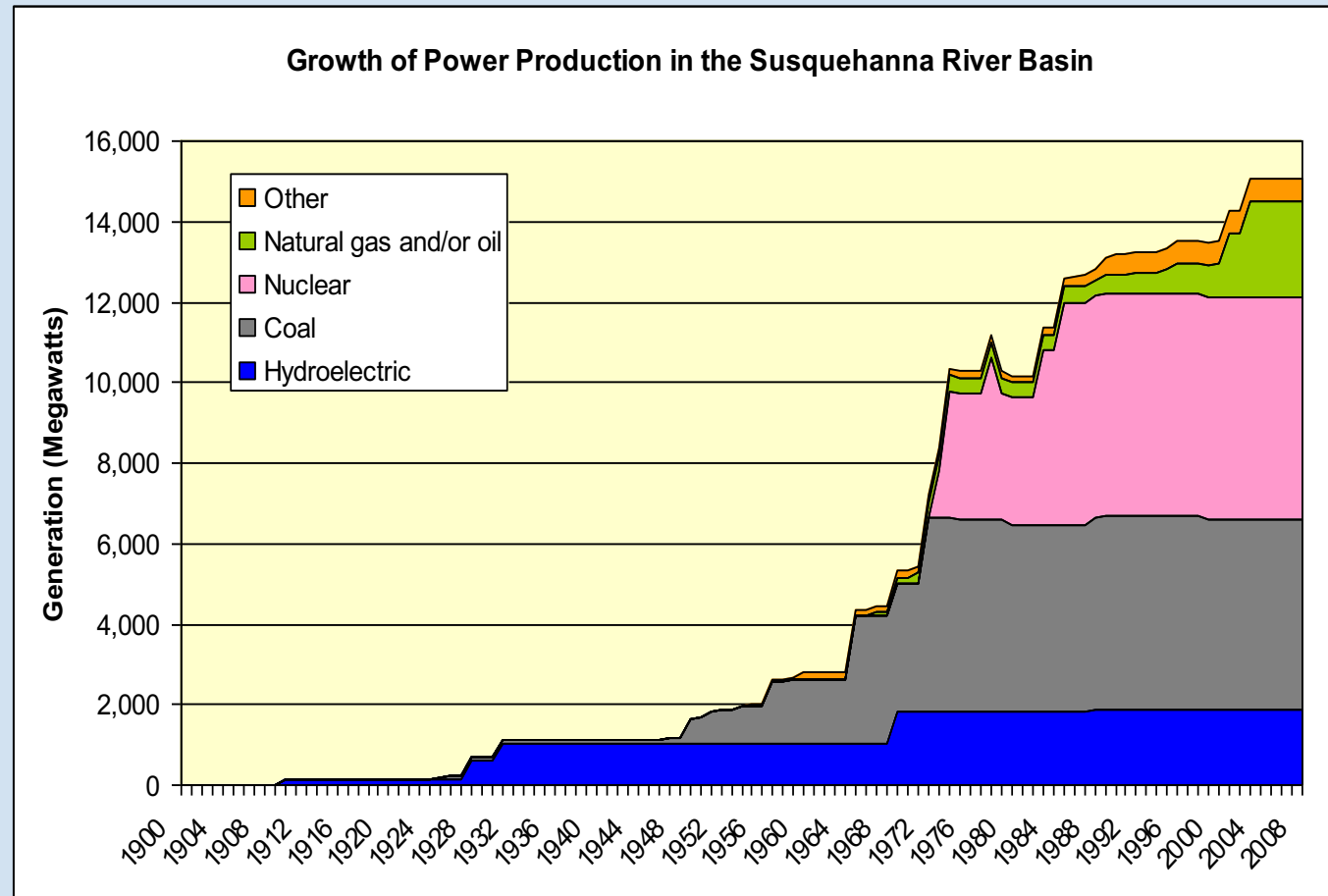
Maryland

0 5 10 20 Miles

SRBC (1088) 03.11.2018 (Disclaimer: Intended for Educational Display Purposes Only)

Energy Generation in the Susquehanna

- Began with Hydroelectric in 1900s
- Energy Production Quadrupled in 40 Yrs



Citizens Saw the Need



In the late 1960s, a broad group of concerned citizens saw the need for a coordinating agency to lead the conservation, development, and administration of the Basin's resources that would preserve and enhance its value as a scenic and recreational asset for the people who live in the Basin

Federal & State Governments



On Christmas Eve 1970, President Richard M. Nixon signed into law the Susquehanna River Basin Compact (Public Law 91-575) joining the federal government and New York, Pennsylvania and Maryland as equal partners for a period of 100 years. The compact formed the SRBC to protect and wisely manage the water resources of the Susquehanna River basin.

The Basin

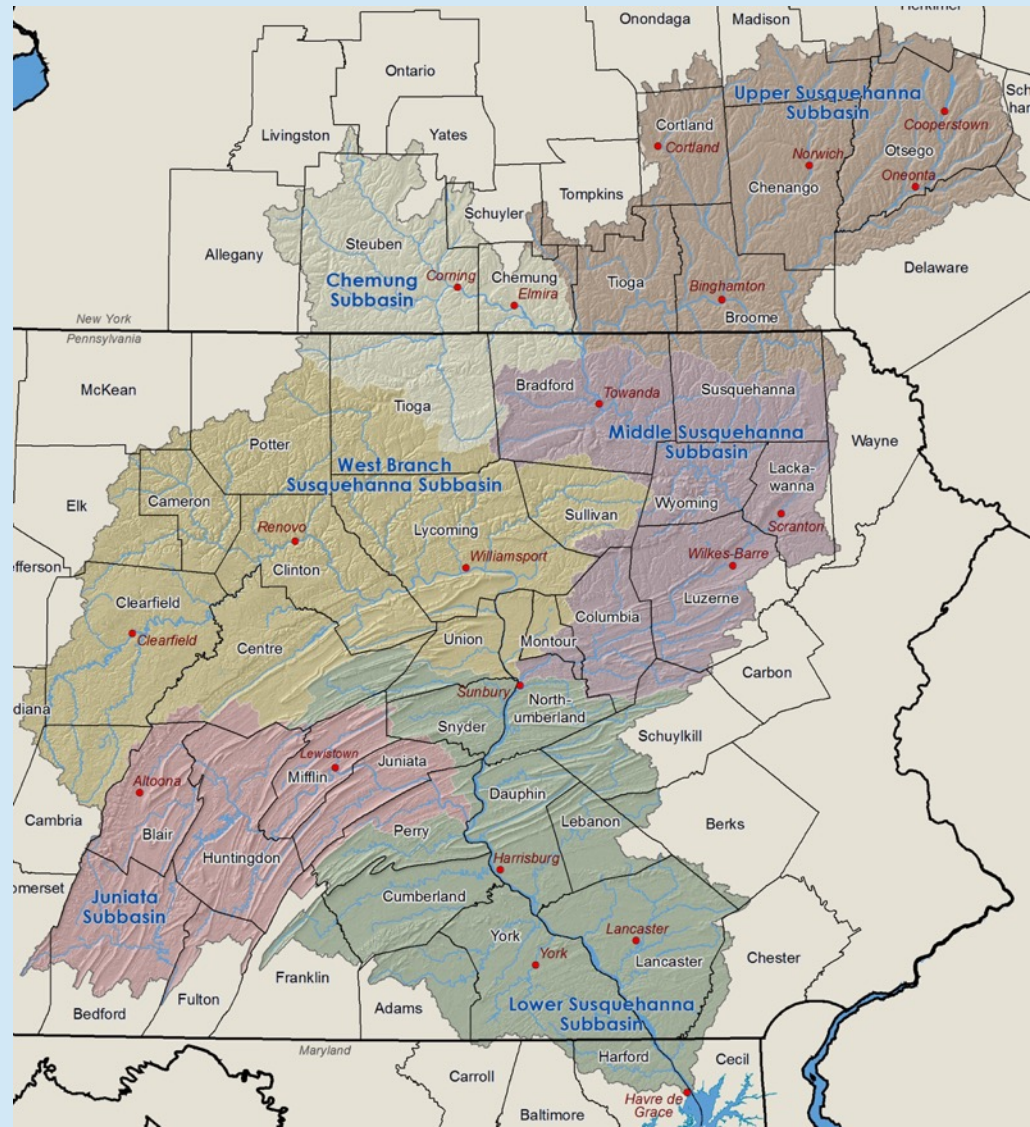
- 27,510 square-mile watershed
- Comprises 43% of the Chesapeake Bay watershed
- 49,000+ miles of waterways
- 4.1 million population
- 60% forested

The Susquehanna River

- 444 miles, largest tributary to the Chesapeake Bay
- Supplies 18 million gallons a minute to the bay (about 50% of the freshwater inflow)
- Largest river lying entirely in the US that flows into the Atlantic

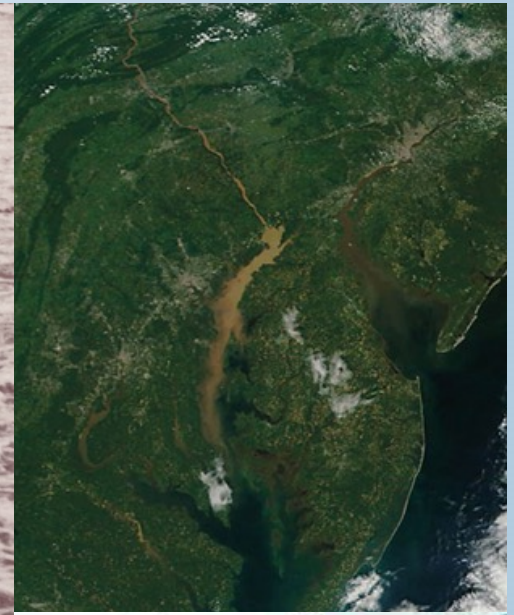
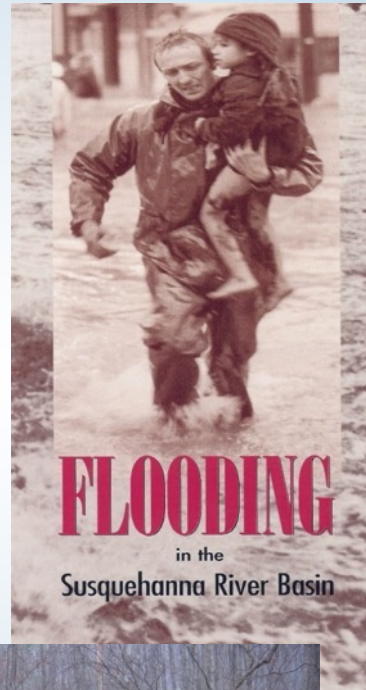
SRBC Mission

- Enhance public welfare through comprehensive planning, water supply allocation, and management of the water resources of the Basin.
 - Regulatory authority over water withdrawals and consumptive use

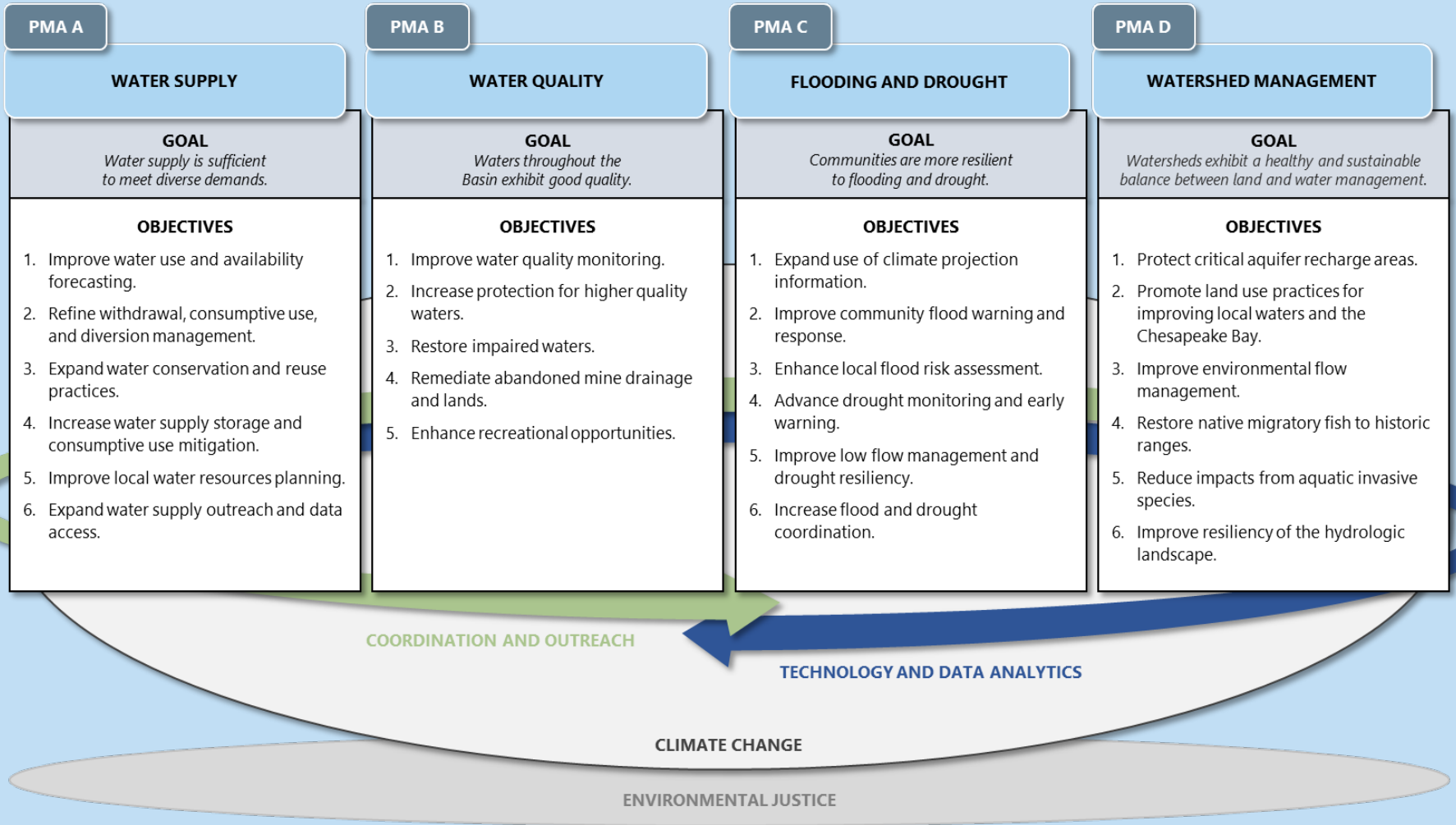


Issues facing the Susquehanna

- Water Quantity
 - Water Use
 - Flooding
 - Droughts
- Water Quality
 - Landuse Impacts
 - Chesapeake Bay
 - Emerging threats



Comp Plan Framework



Water Is Needed All the Time



What Does SRBC Regulate?

- Surface, Groundwater (100K+)
- Consumptive (20K+)
- Natural Gas Industry (“gallon one”)
- Basin Diversions (both in/out)



Consumptive Use Mitigation

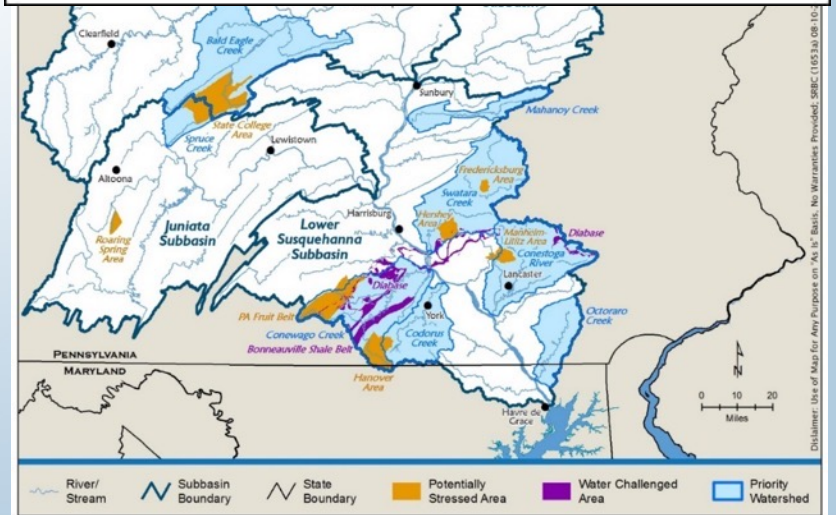
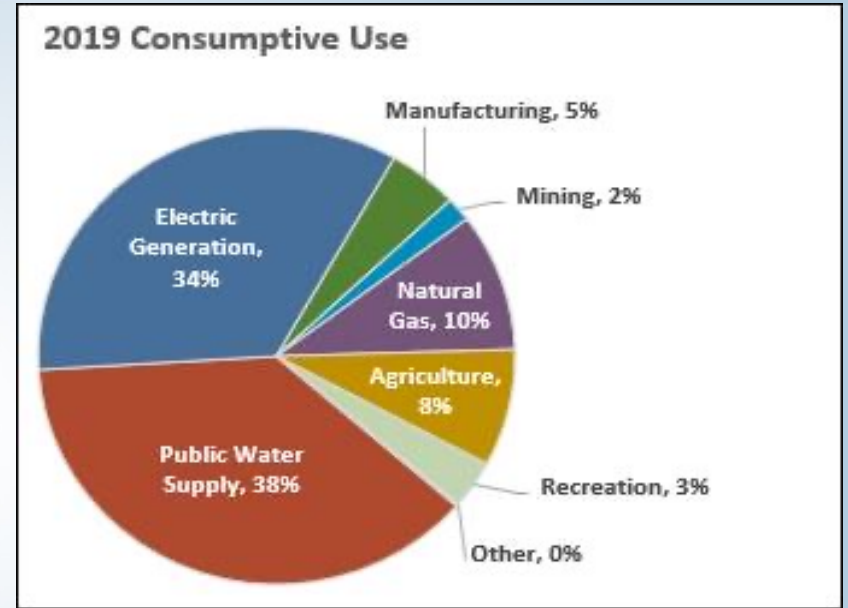
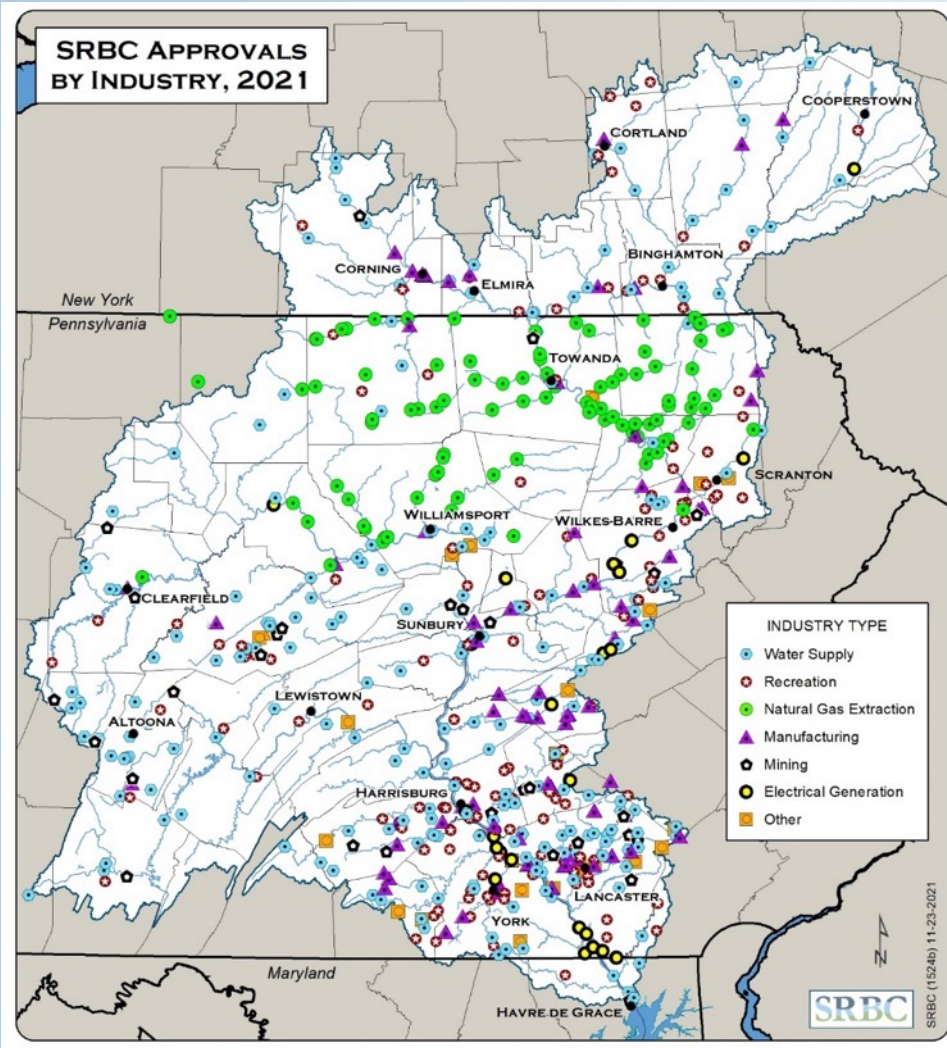
- Consumptive use:
 - Water removed from, but not returned, to basin undiminished in quantity
- Mitigation objectives:
 - Eliminate or reduce manmade impacts caused by CU during drought periods
 - Ensure water availability for downstream uses including ecosystem flow needs



Water Uses In the Basin

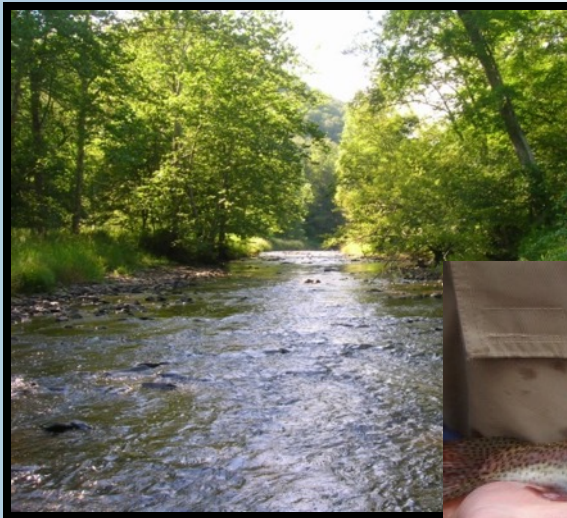


Sustainable Water Use



Sustainable Water Use

Ecosystems flow
protection for aquatic life



Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration



EPA Report 822-R-16-007

USGS Scientific Investigations Report 2016-5164

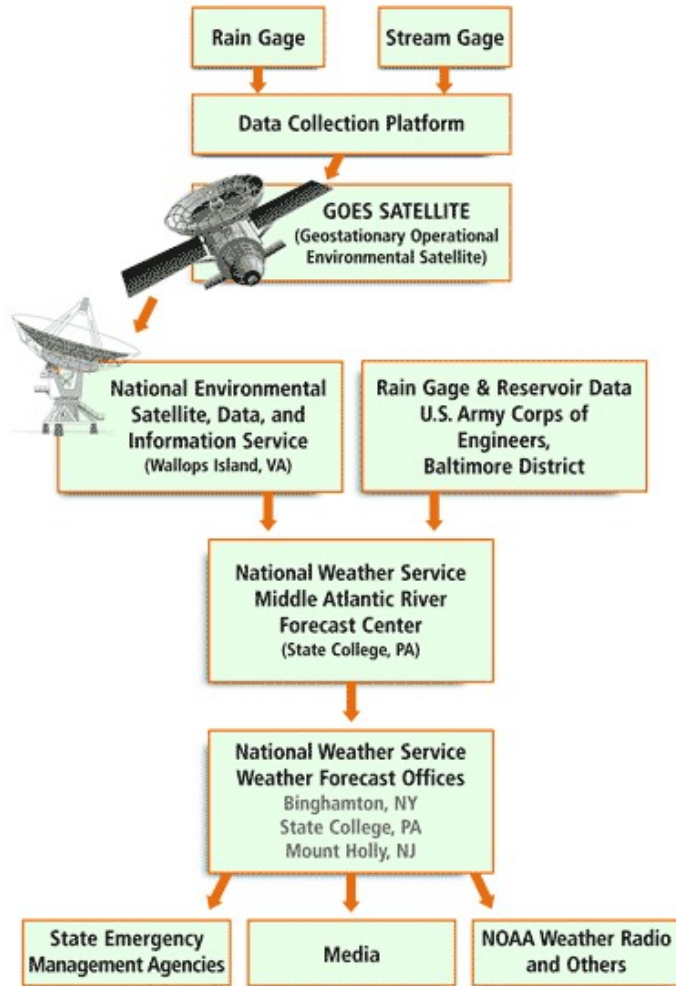
Tropical Storm Agnes (1972)

- Record-setting flooding
- 72 lives lost
- \$2.8 billion in damages
- Set SRBC's course and agenda for many years



Susquehanna Flood Forecast and Warning System

U.S. Geological Survey – NY, PA, and MD Water Science Centers



Saving lives and property through:

- Enhanced forecasts
- More timely delivery



Flood inundation mapping



Floods

More than 80% of the basin's communities have flood prone areas.

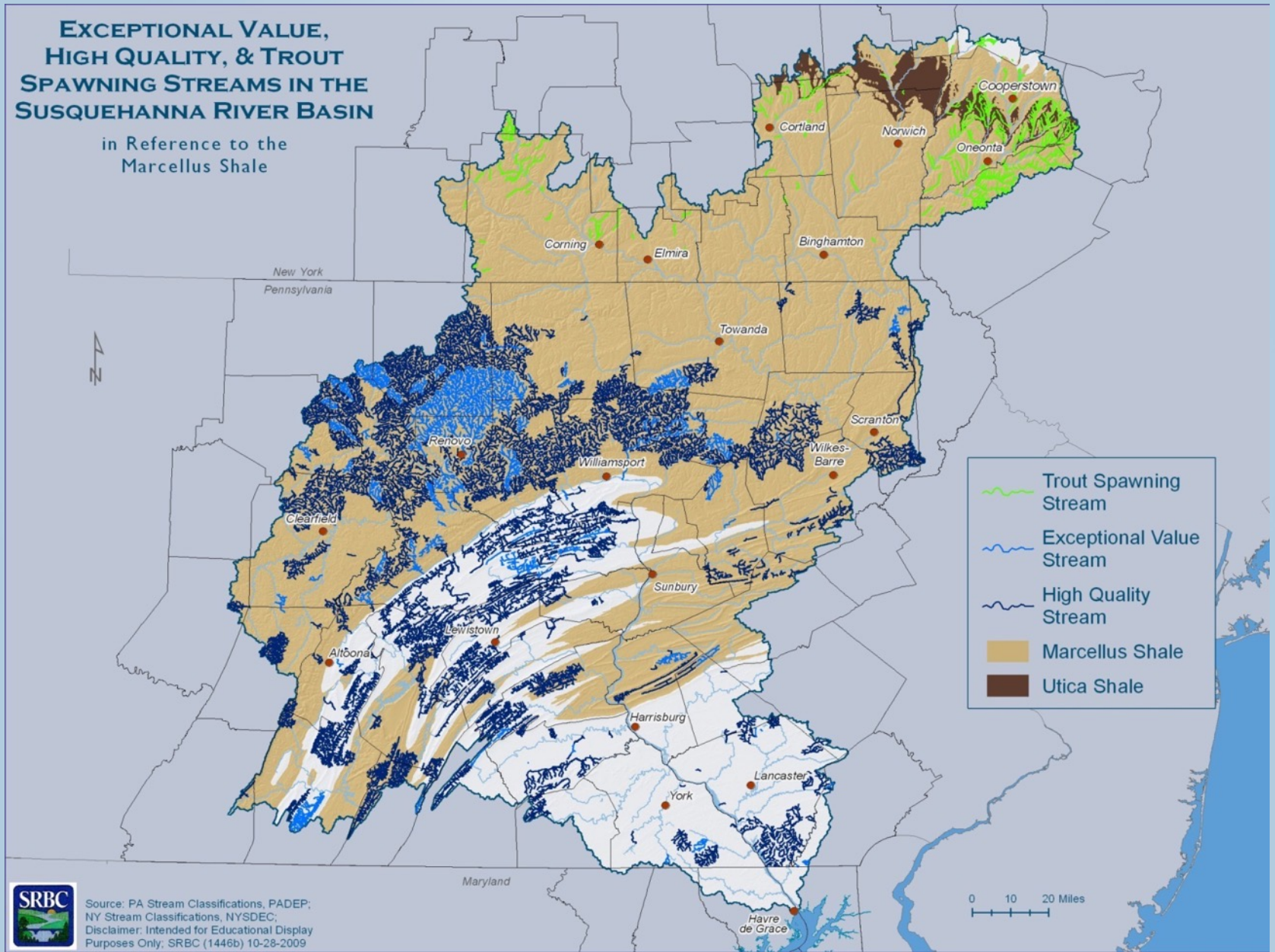


Droughts

Since 1990, emergency drought status was declared over 20 times for various counties in the basin

EXCEPTIONAL VALUE, HIGH QUALITY, & TROUT SPAWNING STREAMS IN THE SUSQUEHANNA RIVER BASIN

in Reference to the
Marcellus Shale

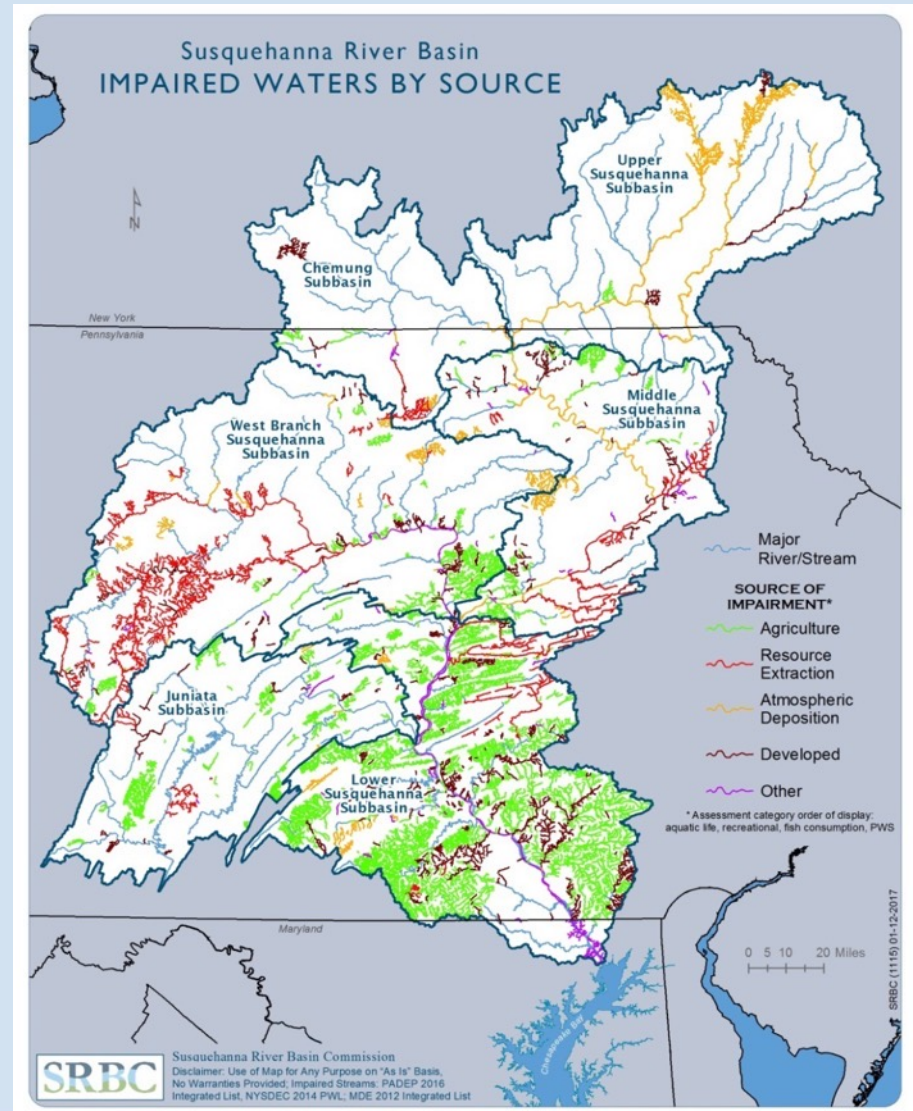


Source: PA Stream Classifications, PADEP;
NY Stream Classifications, NYSDEC;
Disclaimer: Intended for Educational Display
Purposes Only; SRBC (1446b) 10-28-2009

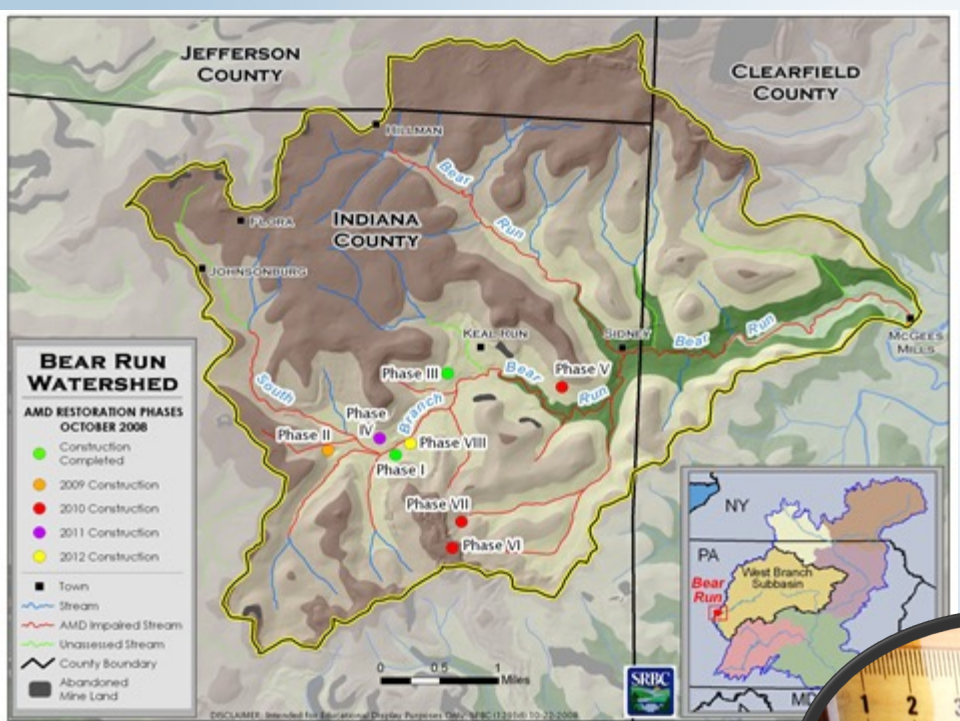
Water Quality Challenges

Profile for the Susquehanna River Basin

- Stream impairment at ~15-20%
- Leading sources of impairment
 - Agriculture and Mine Drainage
- Urban/suburban influence growing
- Slower pace of restoration
- Need for protection
- New issues of concern from the last 10 years
 - Shale gas development
 - Multiple ecosystem stressors
 - Emerging contaminants



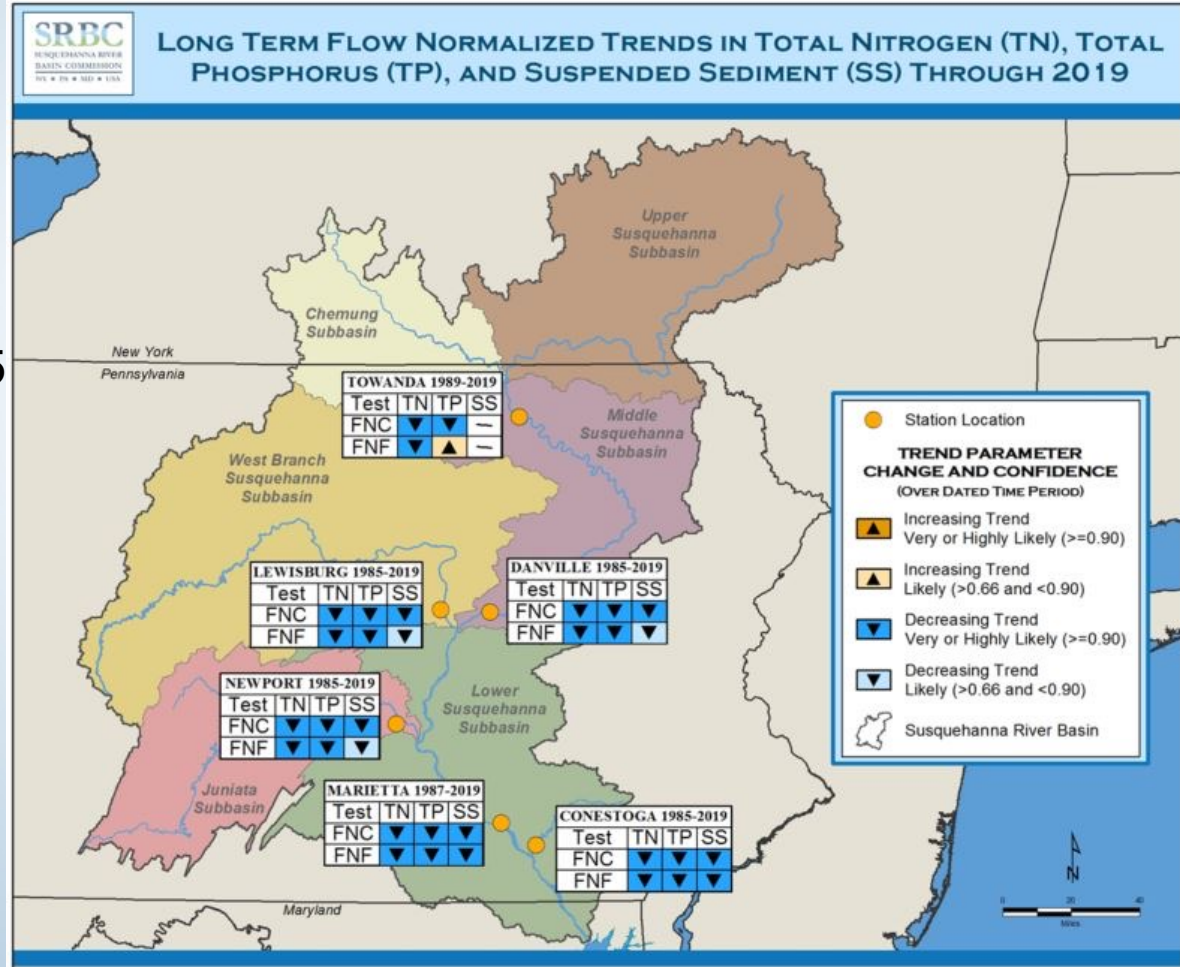
Acid Mine Drainage and Abandoned Mine Land restoration



Chesapeake Bay Restoration

Nutrients and Sediment in the Basin

- Pollution control strategies need to be in place by 2025
- Long term trends show improvement
- Need more progress



Conowingo Watershed Implementation Plan (CWIP)

Nutrients and Sediment in the Basin

- 2010 TMDL assumed Conowingo Reservoir would act as a “trap” thru 2025
- In 2017, the reservoir determined to be effectively full - additional N/P reductions needed
- CWIP needed to address additional loads in a innovative, cost-effective, collaborative manner



Conowingo Watershed Implementation Plan

- Final CWIP – July 2021
- Letter of Understanding for moving forward
 - NY, PA, MD, VA, WV, SRBC
 - Establishes SRBC as the financing authority
 - Facilitates movement of \$\$ and contracts to implement CWIP BMPs
 - Bay partnership guidance
 - Coordination with state/county WIPs
- Fall 2022 implementation schedule



Challenges/Opportunities in the Basin Looking Forward

- **Climate Change**
 - Predicted shifts in precipitation patterns and storm/drought intensity
 - Stepped up monitoring and resiliency/contingency planning
- **Sustainable Water Use**
 - Competing demands between users
 - Increasing conservation and reuse measures
- **Water Quality Degradation**
 - Overlap of multiple stressors/contaminants
 - Increased collaboration and public interest/support
- **Habitat Alteration**
 - Expanding development
 - Accelerating restoration and expanding use of green infrastructure
- **Supporting Science and Infrastructure (for all of the above)**
 - Leveraging resources (\$\$\$), increasing collaborative partnerships (public/private), enhanced outreach to underserved communities

A Shared Namesake



After the Susquehannocks' first European contact in 1608, Captain John Smith reportedly found noteworthy the Susquehannocks' size, deep voice and variety of weapons.

Susquehanna – the name that graces the longest river on the East Coast – is derived from the name Sasquesahanough, which was given to explorer Captain John Smith by his American Indian interpreter.

When Captain Smith first encountered an Iroquoian-speaking tribe in 1608, its people

became known to the English as the Susquehannock, an Algonquian name meaning "people of the Muddy River."

The Suquehannocks were a small but powerful tribe; however, they eventually struggled to survive amidst wars with Iroquois nations, smallpox epidemics, and hostilities with European settlers.

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More Information

More information about the history of the Susquehannock can be found at:

(NOTE: When selecting link, be sure to click on end of URL address.)

Susquehanna Natural Heritage Area

<https://www.susquehannaheritage.org/discover-river-history/susquehannock-native-landscape/>

PA DCNR - History of the Susquehannock State Park

<https://www.dcnr.pa.gov/StateParks/FindAPark/SusquehannockStatePark/Pages/History.aspx>

Elizabethtown University

<https://hist20901spring2017.wordpress.com/2017/03/22/susquehannocks-placeholder-cory-price/>

<http://users.etown.edu/m/mooren/media/History.htm>

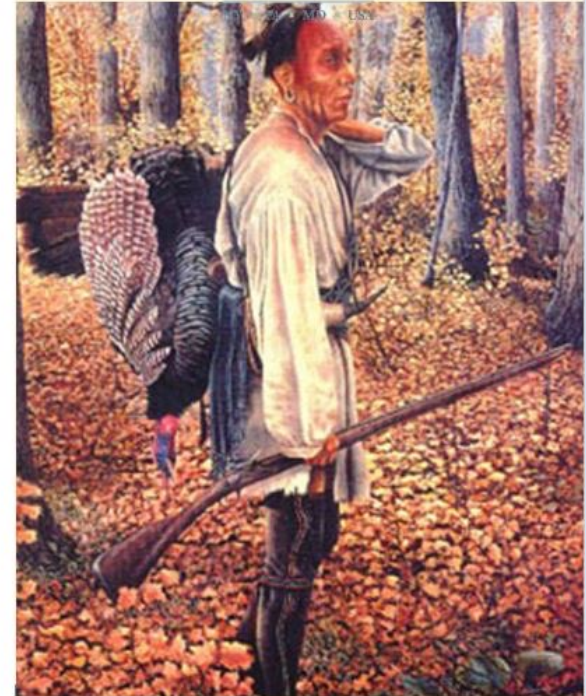
Susquehannock History

<http://www.dickshovel.com/susque.html>

<http://www.phmc.state.pa.us/portal/communities/archaeology/native-american/contact-period.html>

NOTES

COVER: Taken from the cover of Annals of the Susquehannocks And Other Indian Tribes of Pennsylvania: 1500-1763 by Frank Eshleman

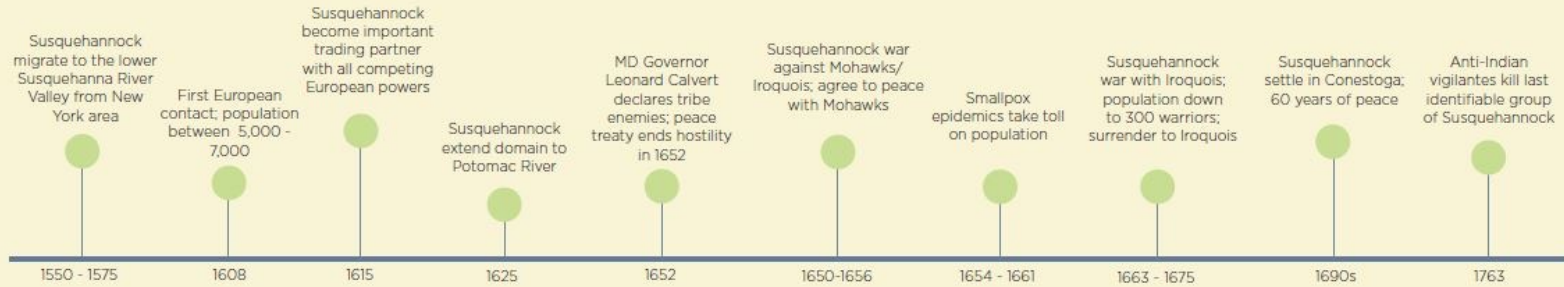


The Susquehannock

Susquehanna River
Basin Commission

www.srbc.net

THE SUSQUEHANNOCK: WARRIORS, FUR TRADE LEADERS, ALLY or ENEMY



The Susquehannock first migrated to the Susquehanna River valley nearly 500 years ago. Historical accounts suggest they were pushed south by the Iroquois' and/or moved south to better control the fur trade.

They lived in one or two fortified towns at a time along the Susquehanna River in New York, Pennsylvania and Maryland, moving frequently as farmers and following the fur trade along the river and Chesapeake Bay. These skilled hunters and warriors made home to many of the islands in the Chesapeake.

Their trading partnership with all of the European powers was unmatched by any other tribe. They quickly over-trapped the Susquehanna valley and became a "middle-man" for furs from native groups in New York, Ohio, and Canada. Tensions between these tribes over the fur trade were fierce throughout the 17th century.

The Susquehannock were one of the most formidable tribes of the Mid-Atlantic region. Europeans seldom visited their villages, and the Susquehannock overwhelmed the Algonquian tribes along the shores of the Chesapeake. Long-standing enemies included the Iroquoian Seneca and Mohawk nations; allies included the French and Huron and, for a time, Maryland.

¹ The term "Iroquois" was a French word that was used to describe the Five Nations including the Mohawk and Seneca; Haudenosaunee is the accurate, native term now used to refer to this confederacy of nations.

DUGOUT CANOES



For travel up or down the river, the Susquehannock used an extensive system of walking paths and dugout canoes. Made from hollowed-out logs, dugouts were more suited to the swift and rocky Susquehanna River, compared to the more fragile birchbark canoes that were commonly used by many northern American Indians.

Though too heavy and slow for long distance travel, dugouts were ideal for fishing and carrying cargo and people across the river.

Most dugouts were less than 20 feet long, but some were reported to be 50 feet or larger. There is evidence to suggest that they may have been sunk with rocks when not being used to keep them from drying out and cracking, and perhaps to hide them from potential thieves.

THE LAST TOWN

During the Beaver Wars, the Susquehannock successfully fought the larger Iroquois Confederacy with help from Maryland to acquire rifles. However, they were defeated by the Iroquois in 1675. They moved south near present-day Washington D.C., but problems on the frontier led to conflicts with local militias and the murder of five Susquehannock chiefs. They moved back to New York for the next 20 years but returned to the lower Susquehanna River valley.

In the 1690s, the Susquehannock built a village called Conestoga and became known locally as the Conestoga Indians. For many years, treaties kept the peace. However, in 1763, a group of anti-Indian vigilantes known as the Paxton Boys slaughtered six Susquehannock at Conestoga. Survivors were given protection at the jail in Lancaster city, yet the Paxton Boys returned and slaughtered the remaining 14 Indians.

A husband and wife known only as Michael and Mary were the only Susquehannock known to have escaped the massacres. They lived on the farm of Christian Hershey near Lititz, Pa. Their burial on the farm marked the end of the once powerful Susquehannock Indians.



SRBC Public Information Pamphlets



<https://www.srbc.net/our-work/pamphlets/index.html>