

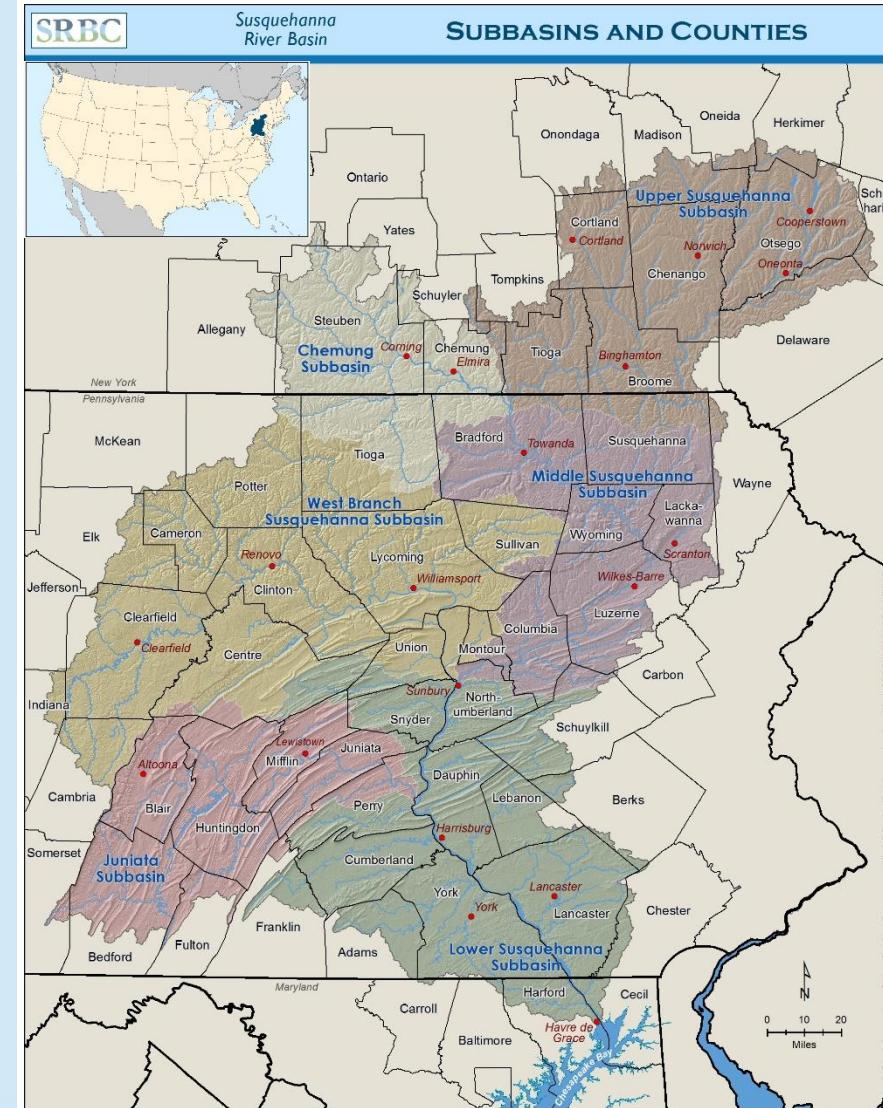
Cumulative Water Use & Availability Study



2022 National Water Use Data Workshop
Salt Lake City, UT
August 17, 2022

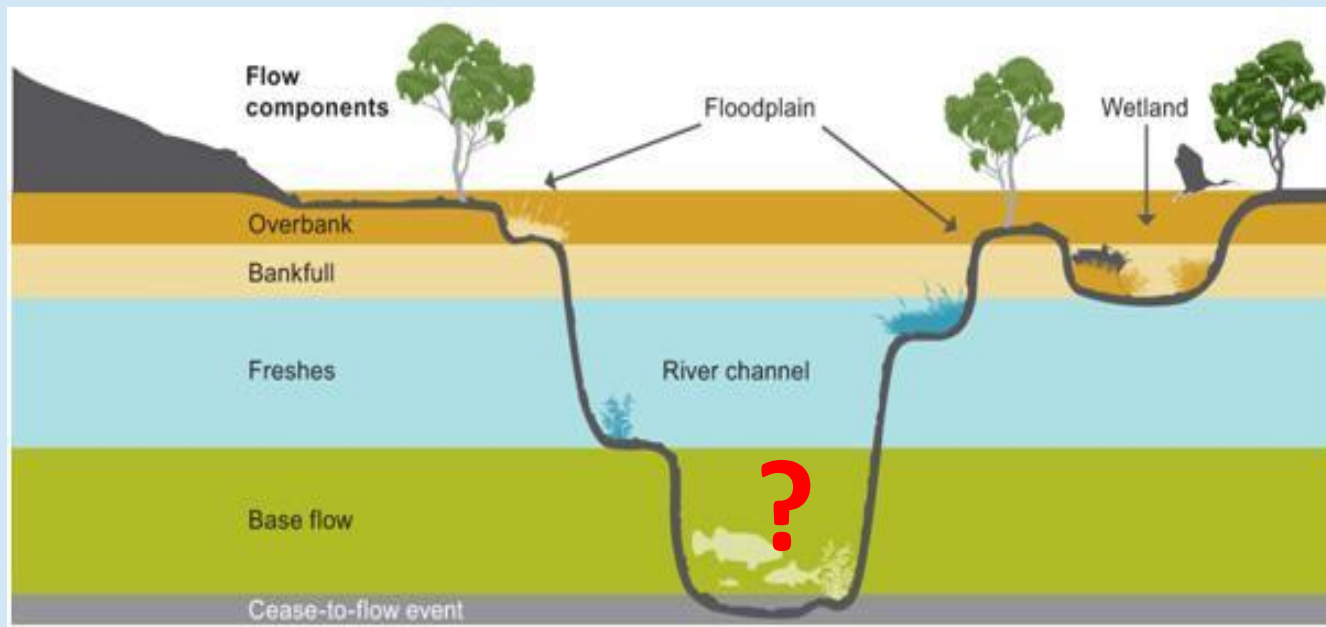
Susquehanna River Basin Commission

- Federal-interstate compact commission.
- New York, Pennsylvania, Maryland & United States.
- Mission: enhance public welfare through comprehensive planning, water supply allocation & management of water resources of basin.



Purpose & Scope

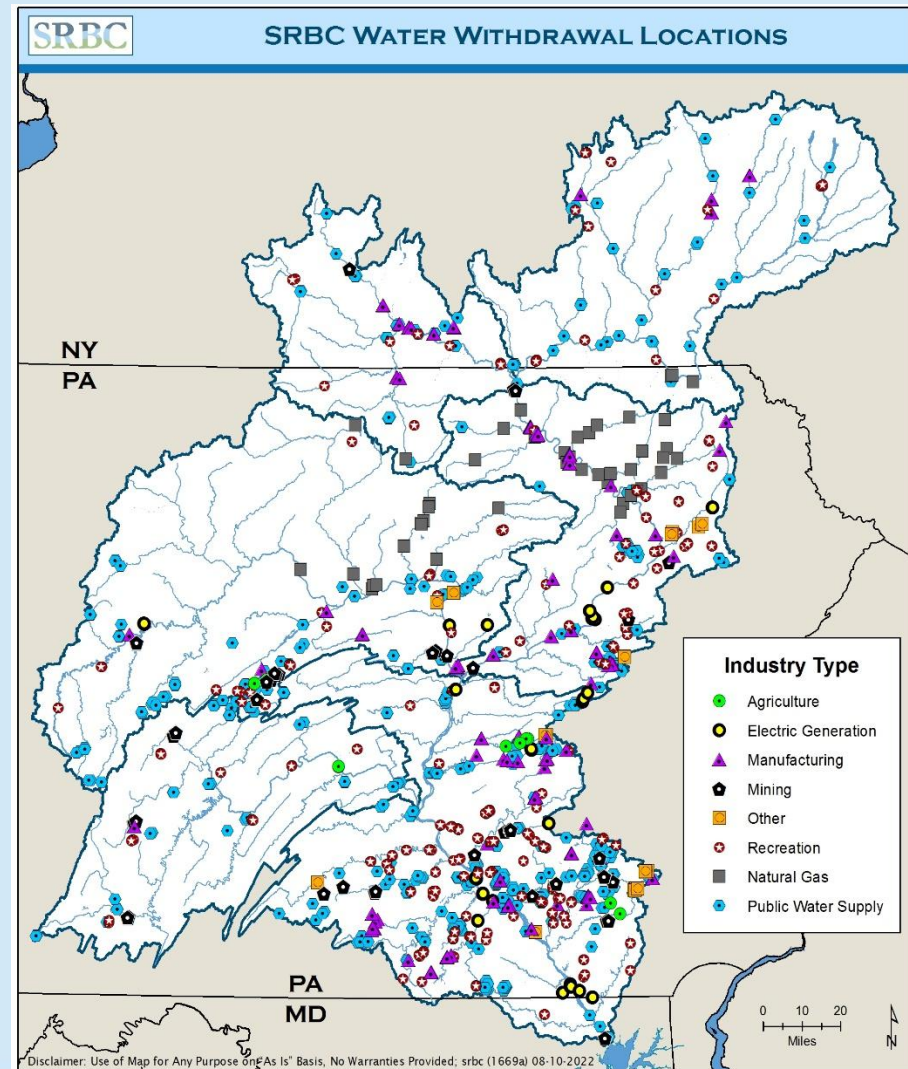
Comprehensively evaluate cumulative **water use**, determine **water capacity** sustainably available, and assess resultant **water availability** for Basin watersheds to inform planning and regulatory decision making.



(Modified from Murray-Darling Basin Authority, 2011)

SRBC Water Use Data

- Include approved (permitted) quantities & daily reported (actual) quantities.
 - Consumptive Uses:
 - $\geq 20,000$ gpd; facility-based.
 - Surface Water Withdrawals:
 - $\geq 100,000$ gpd; source-based.
 - Groundwater Withdrawals:
 - $\geq 100,000$ gpd; source-based.

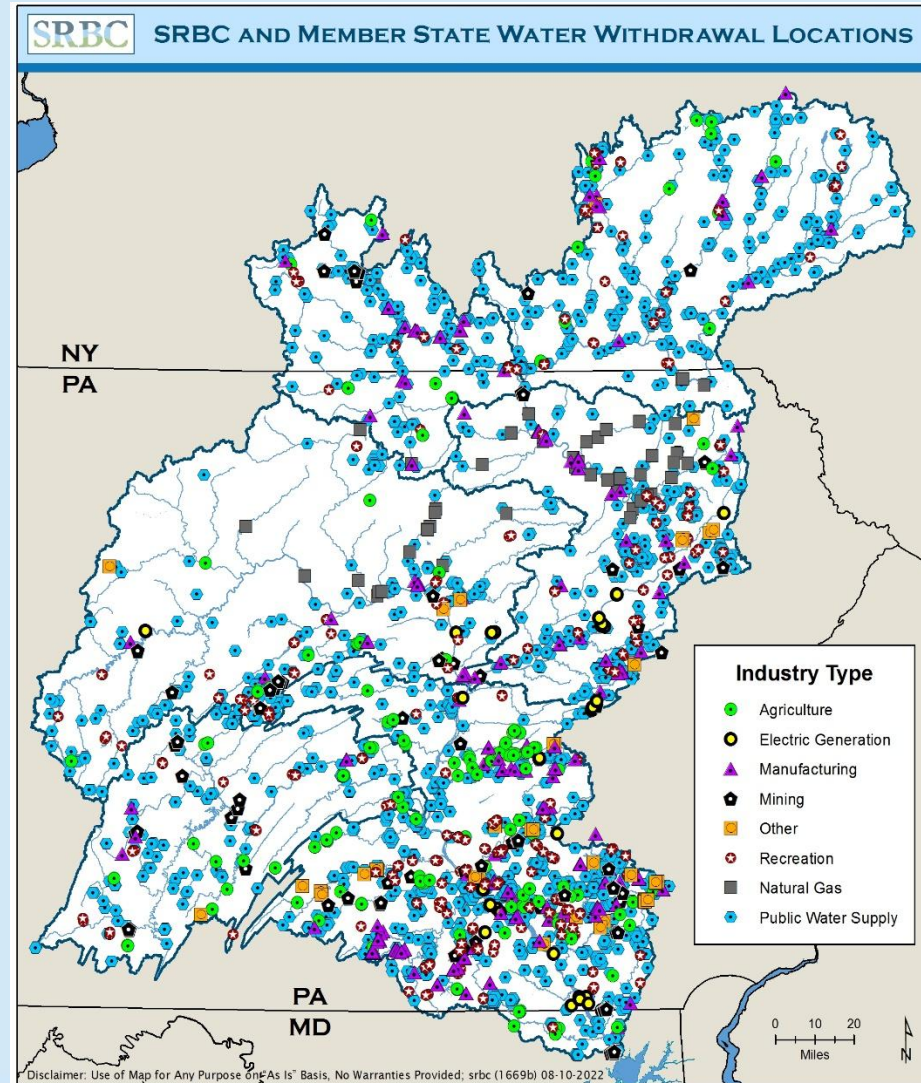


Member State Water Use Data

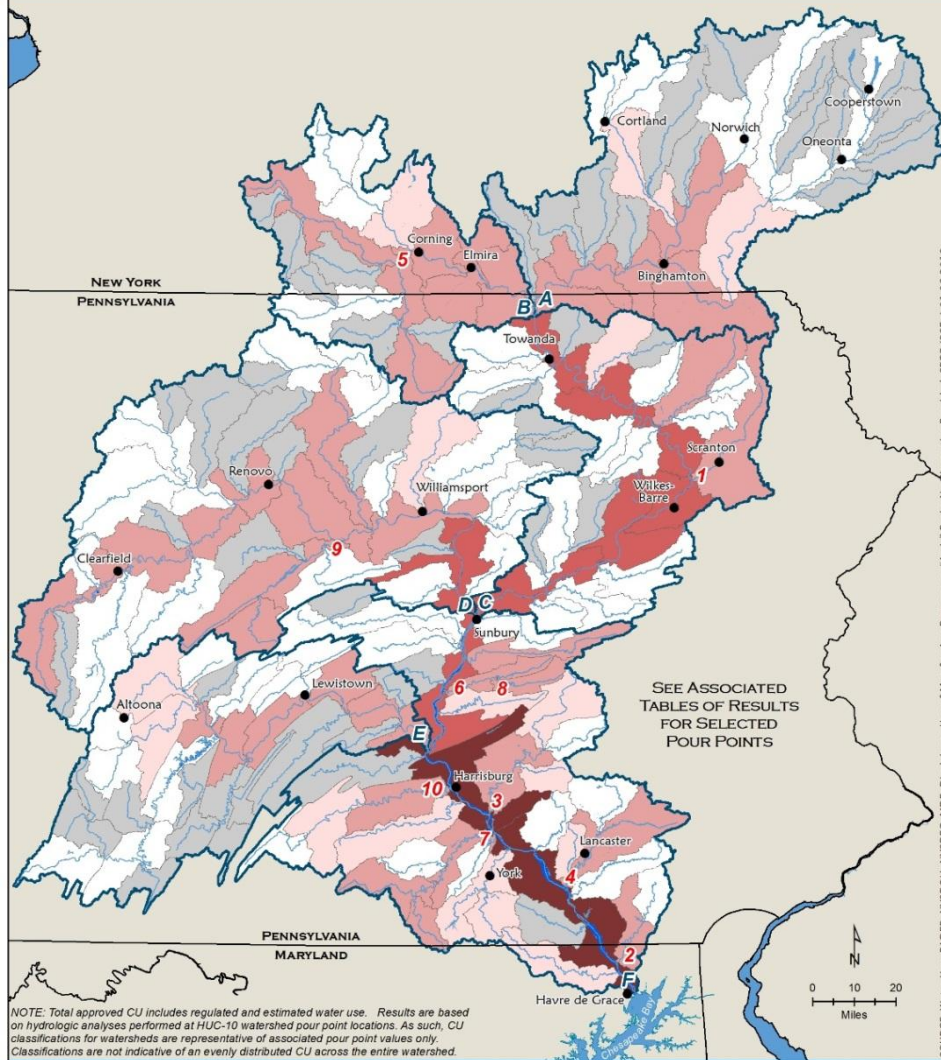
- New York - received annually.
 - NYSDEC withdrawal registrations: $\geq 100,000$ gpd; facility-based; approved quantities & annual reporting.
 - NYSDOH: public water supply withdrawals; all sources; annual reporting.
- Pennsylvania - received weekly.
 - Withdrawal registrations: $\geq 10,000$ gpd; source-based; monthly reporting.
 - System limits for PWS surface water withdrawals: facility-based; approved quantities & annual reporting.
- Maryland - received annually.
 - Withdrawal permits: $\geq 10,000$ gpd; source-based; monthly reporting.

Water Use Data Integration

- PA data received weekly; NY & MD data received annually.
- Reporting data is one year behind.
- Like records are identified to eliminate double-counting.
- Discharge data not readily available so withdrawal data is translated to consumptive use using published CU factors.
- Approved & reported quantities converted to annual average mgd.



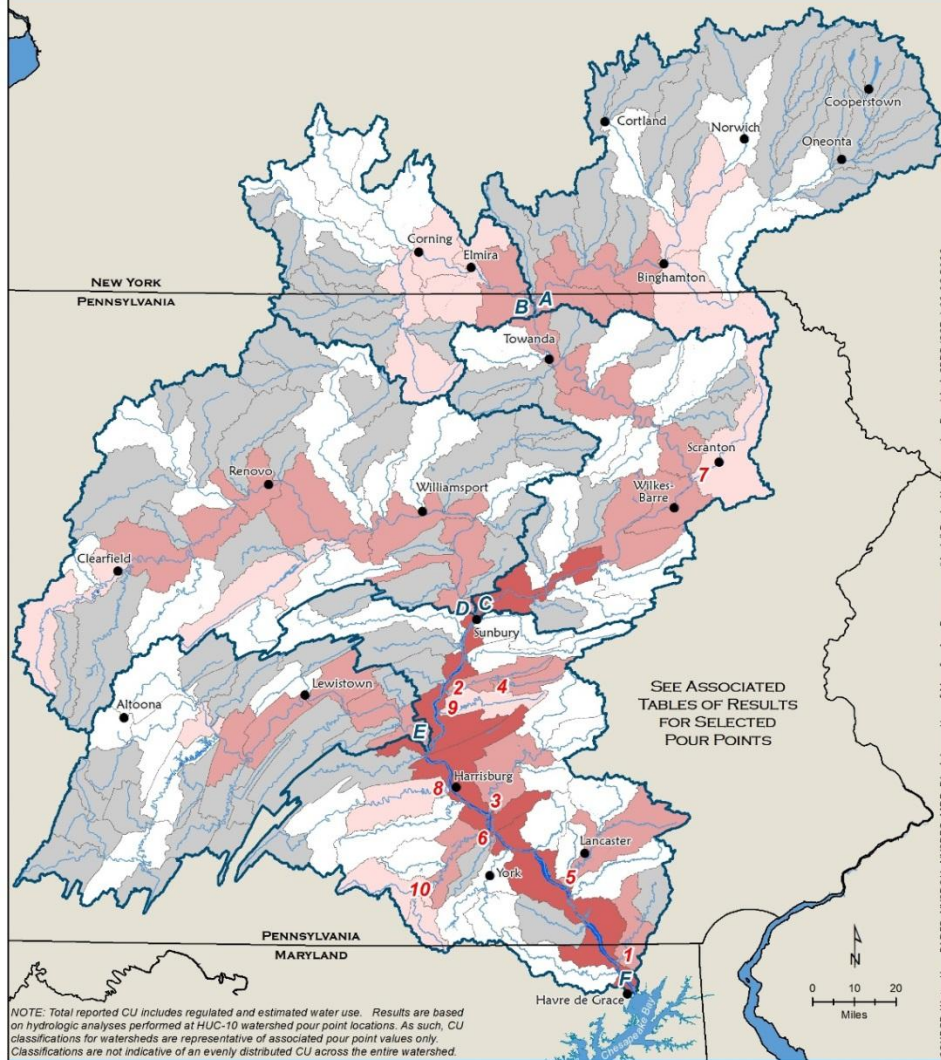
TOTAL 2014 APPROVED CONSUMPTIVE USE BY HUC-10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN



Approved Consumptive Water Use in Million Gallons per Day (MGD)

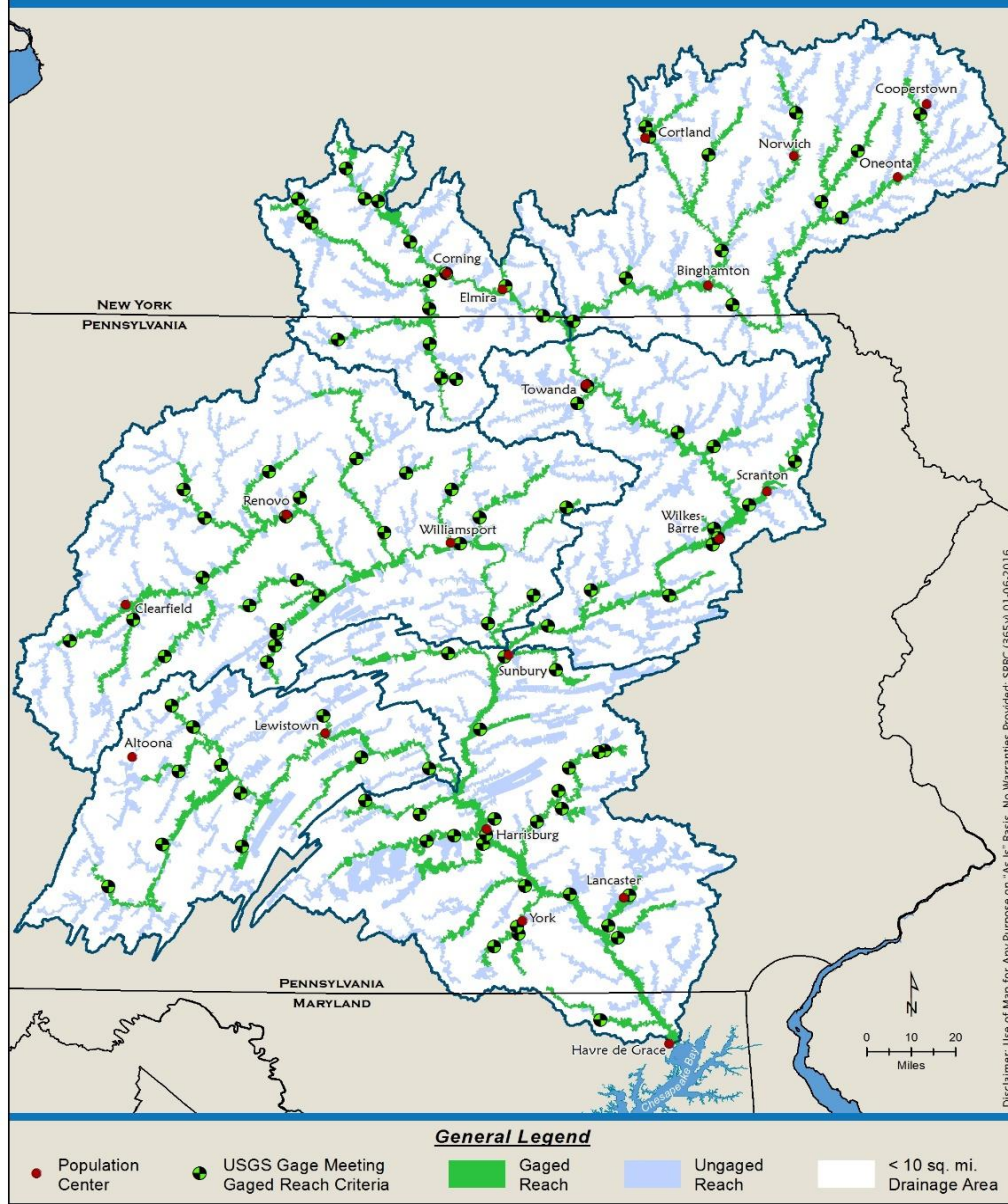


TOTAL 2014 REPORTED CONSUMPTIVE USE BY HUC-10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN



Reported Consumptive Water Use in Million Gallons per Day (MGD)

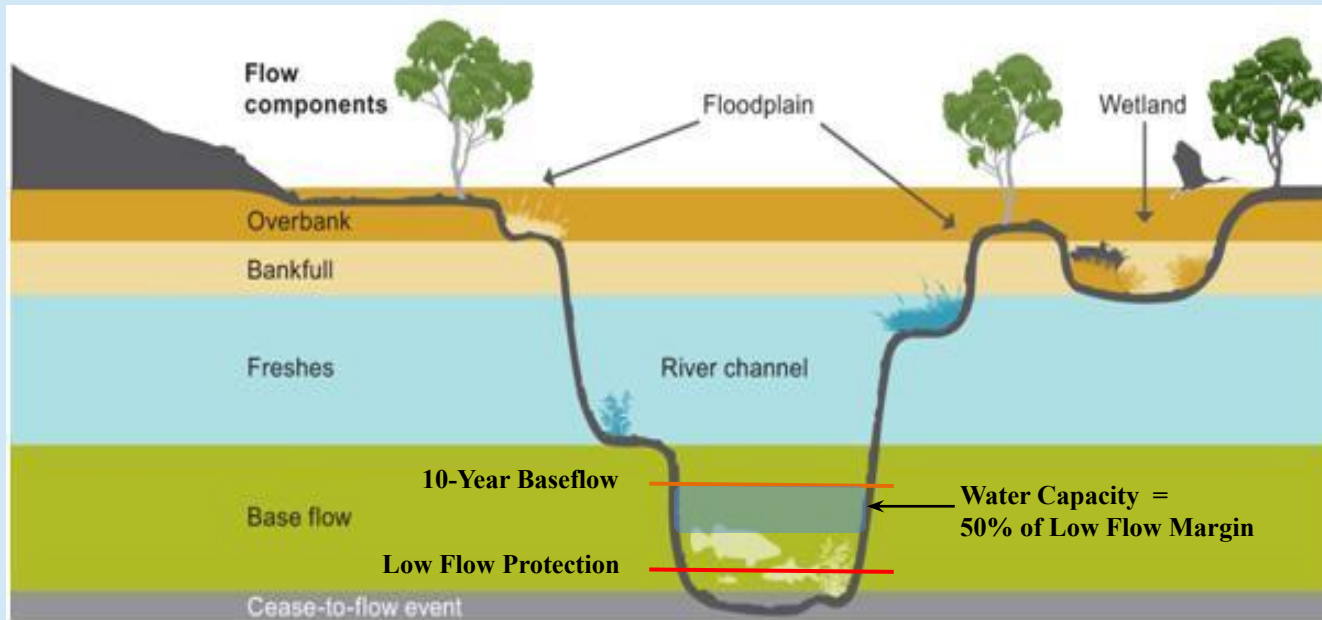




Hydrologic Analyses

- Leverage gage network to extent reasonable.
- Use regression equations for ungaged reaches.
- Analysis limited to watersheds $>10 \text{ mi}^2$.

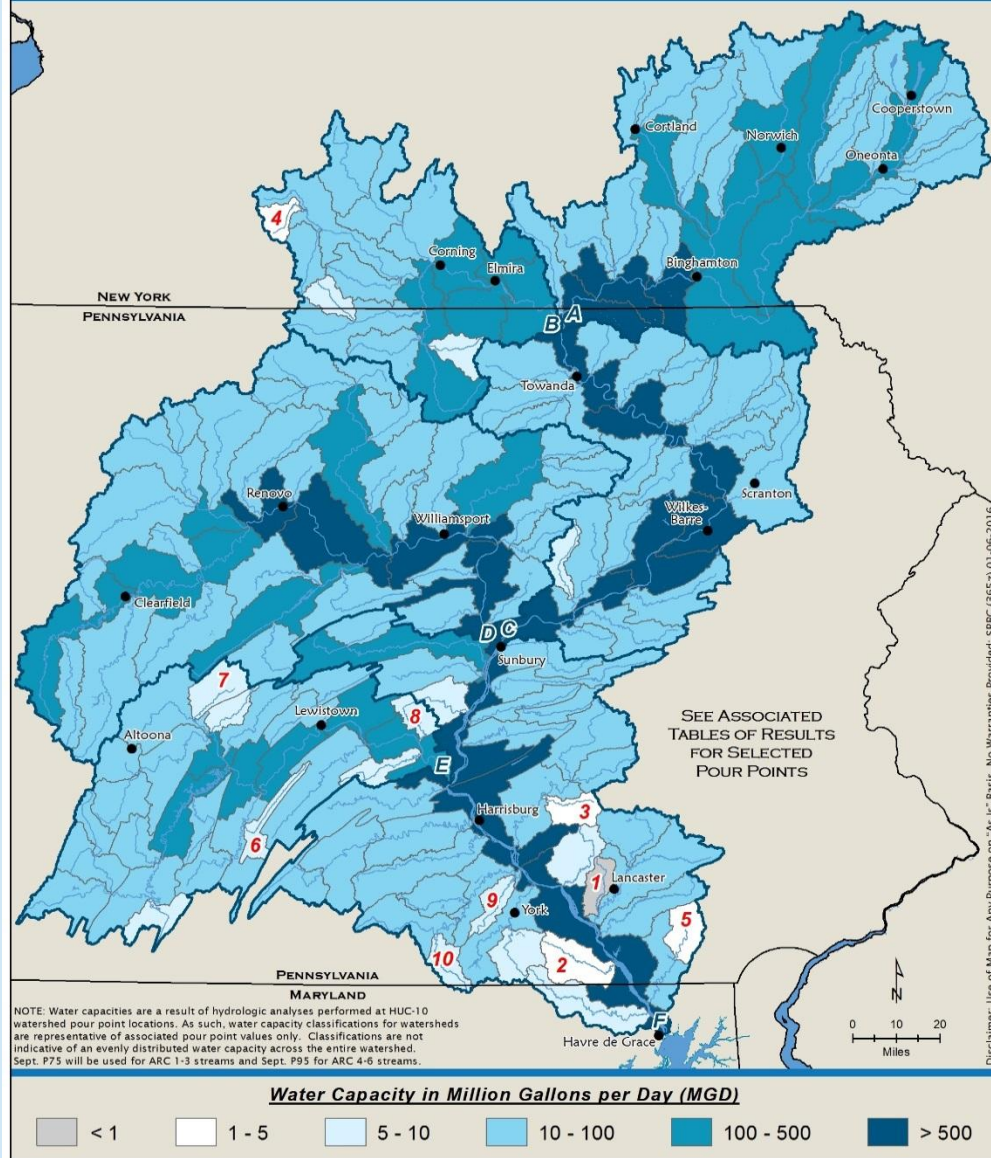
Defining Water Capacity



(Modified from Murray-Darling Basin Authority, 2011)

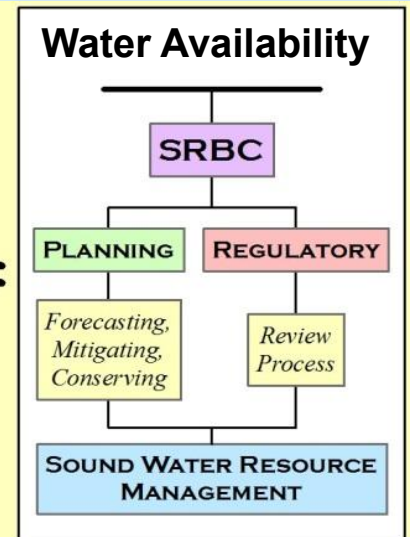
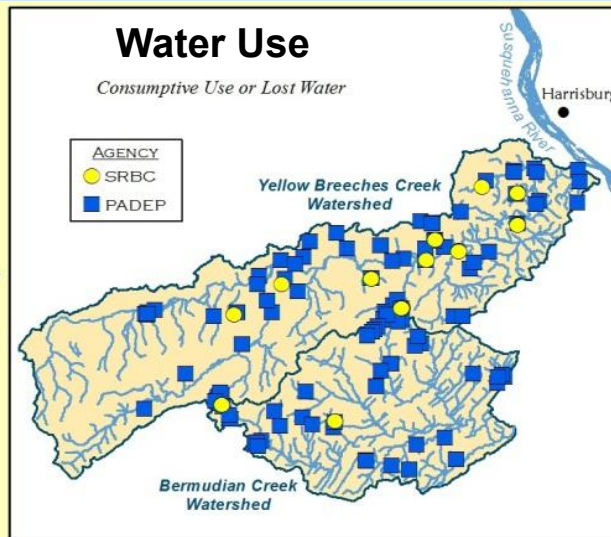
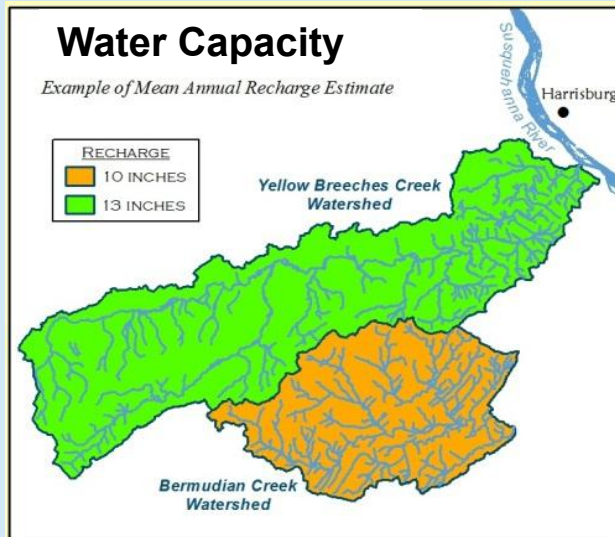
- Manage for sustainability during 1-in-10 year drought.
- Minimum flow set aside for ecosystem needs.
- Apply safety factor to account for uncertainty & emergencies.

WATER CAPACITY EXPRESSED AS 50 PERCENT OF 10-YEAR BASEFLOW MINUS SEPTEMBER P75/P95 FLOW BY HUC-10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN

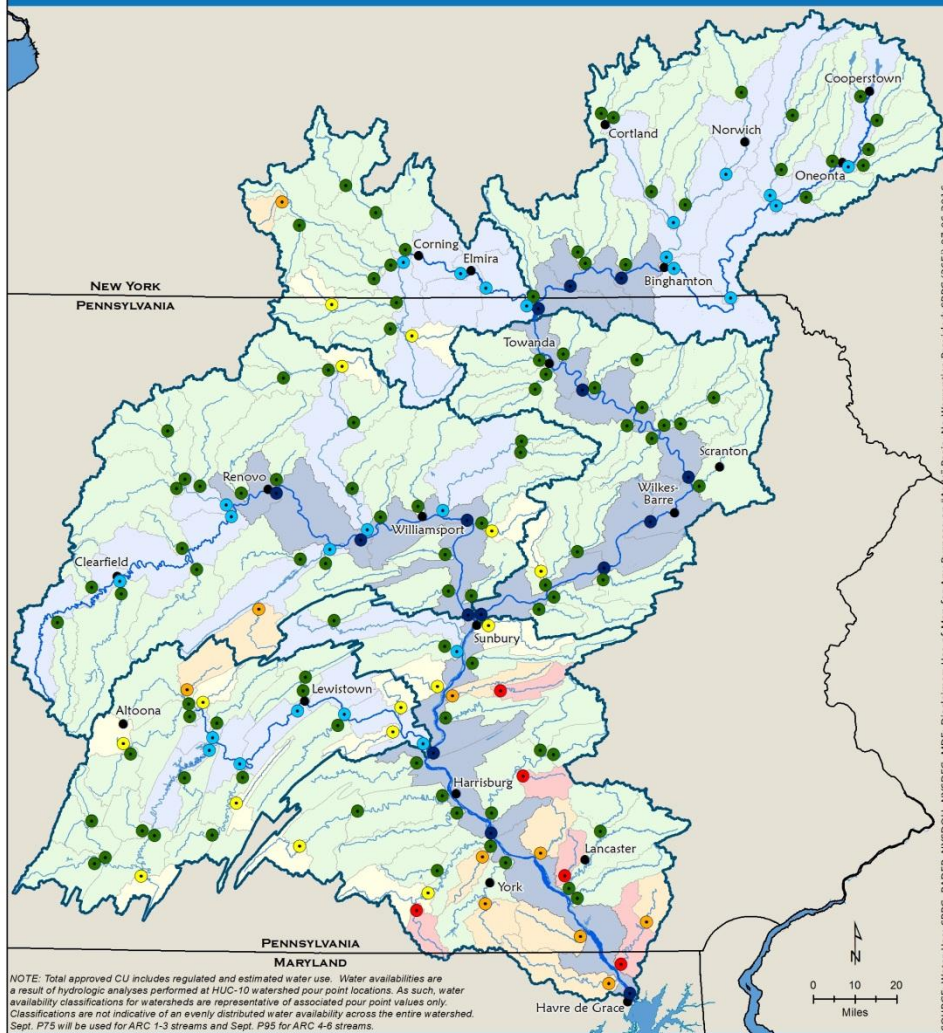


Defining Water Availability

$$\text{Water Capacity} - \text{Water Use (CU)} = \text{Water Availability}$$



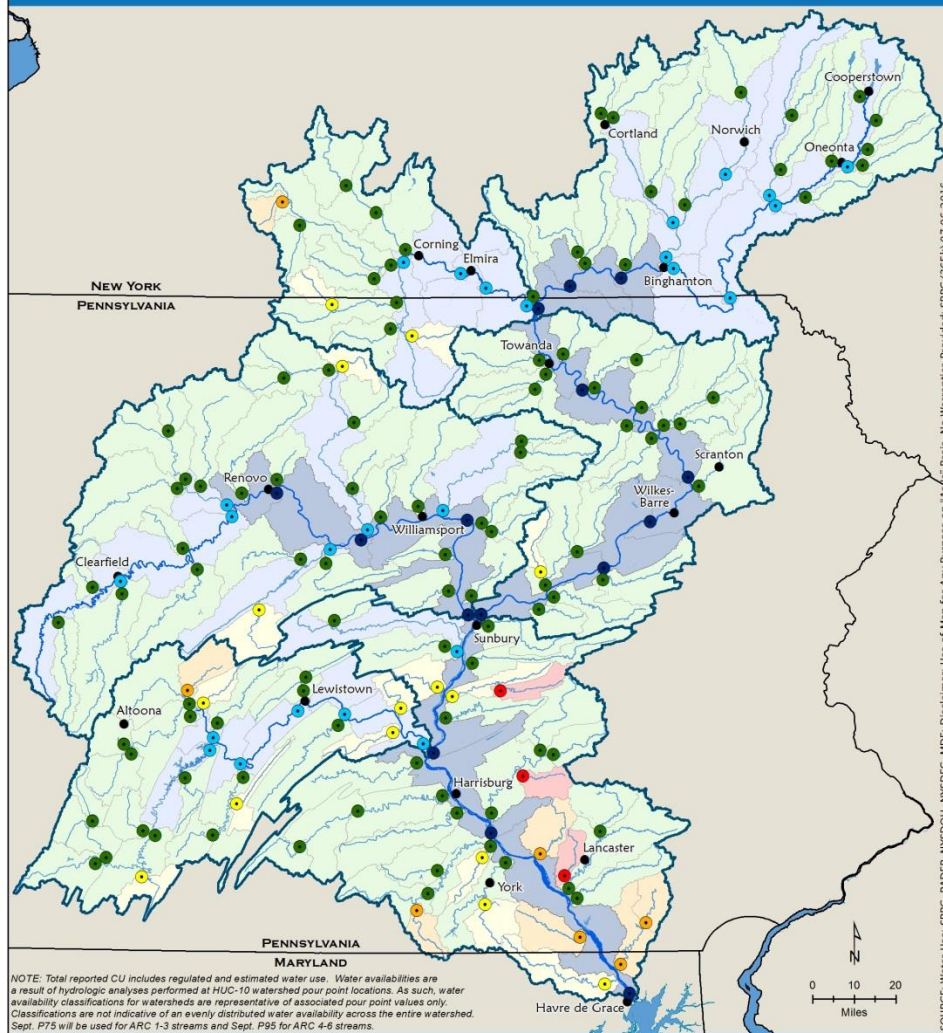
WATER AVAILABILITY EXPRESSED AS 50% OF 10-YEAR BASEFLOW MINUS SEPTEMBER P75/P95 FLOW MINUS TOTAL 2014 APPROVED CONSUMPTIVE USE FOR HUC-10 WATERSHEDS IN THE SUSQUEHANNA RIVER BASIN



Water Availability in Million Gallons per Day (MGD)

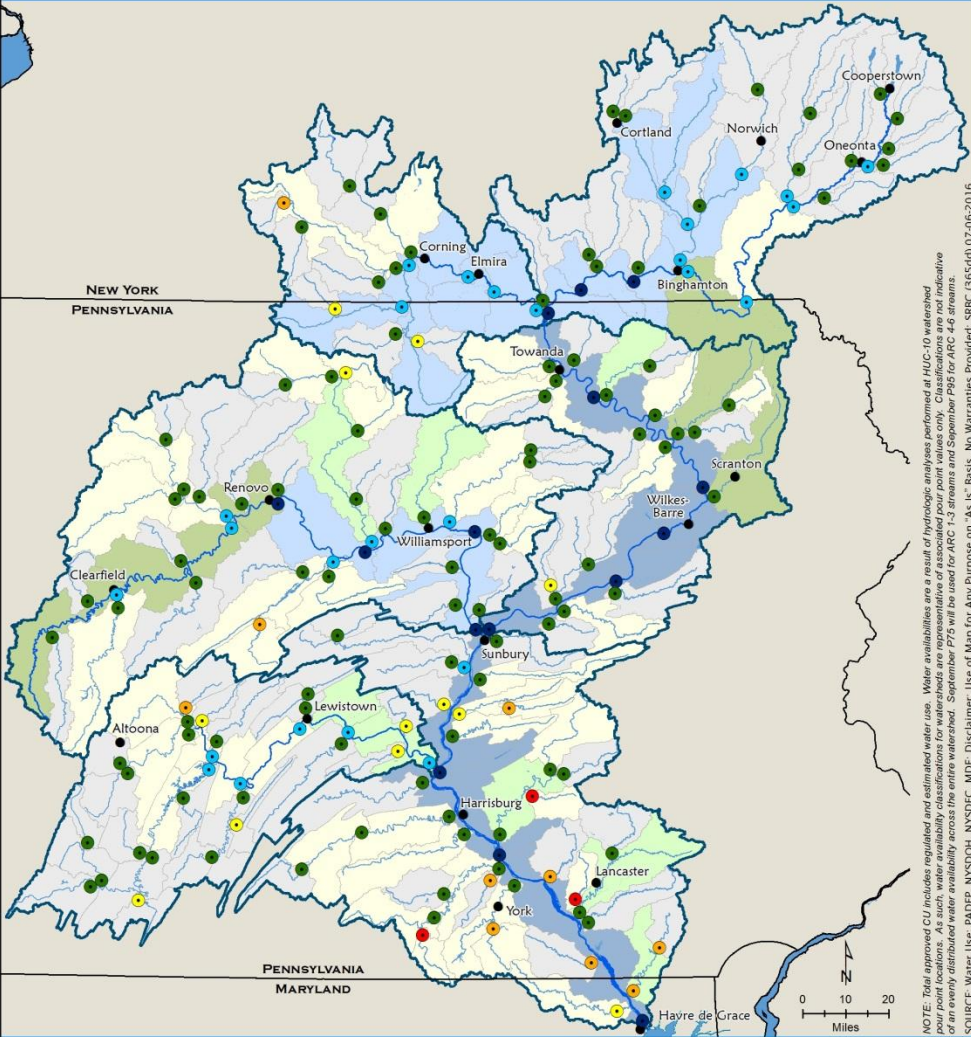


WATER AVAILABILITY EXPRESSED AS 50% OF 10-YEAR BASEFLOW MINUS SEPTEMBER P75/P95 FLOW MINUS TOTAL 2014 REPORTED CONSUMPTIVE USE FOR HUC-10 WATERSHEDS IN THE SUSQUEHANNA RIVER BASIN

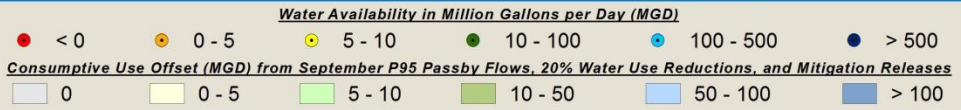


Water Availability in Million Gallons per Day (MGD)





NOTE: Total approved CU includes regulated and estimated water use. Water availabilities are a result of hydrologic analyses performed at HUC-10 watershed pour point locations. As such, water availability classifications for watersheds are representative of associated pour point values only. Classifications are not indicative of an evenly distributed water availability across the watershed. Supplemental P75 and Supplemental P95 for AEC-10 watersheds are not shown. SOURCE: Water Use: PADEP, NYSDOH, NYSDEC, MDE. Disclaimer: Use of Map for Any Purpose on 'As Is' Basis. No Warranties Provided. SRBC (3655dd) 07-05-2016



Management Measures

- Water use reductions.
- Passby flows.
- Conservation releases.
- CU mitigation releases.

Products

1. Technical report.
 - With executive summary.
2. Interactive GIS-based assessment tool.
 - For Commission staff & member jurisdictions.
3. Interactive web map.
 - For projects, consultants, NGOs, academia, & public.

Cumulative Water Use & Availability Study (CWUAS)

CWUAS Tool

The Cumulative Water Use and Availability Study (CWUAS) Tool provides a series of analytical components that automate the quantification of water use, capacity, and availability at user input pour point locations throughout the Susquehanna River Basin. Water availability is defined as water capacity minus consumptive use within the watershed upstream of a pour point. The Tool will assist in both identifying watersheds with existing and/or projected water availability concerns and evaluating management alternatives to mitigate impacts of cumulative consumptive use within the Basin.

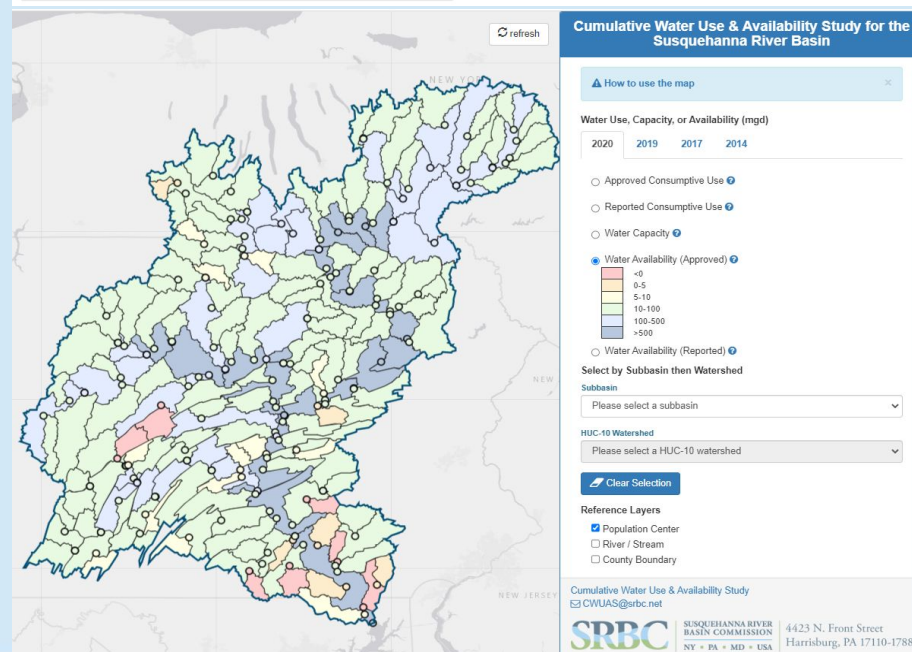
[Visit the CWUAS Study Page >](#)

References

- [Study Website](#)
- [Technical Report](#)
- [Technical Report Appendices](#)
- [Summary Report](#)

Announcements

Last Update 08/12/20
Version: 3.0
Last Database Update: 12/21/21



Questions

John W. Balay
Manager, Planning & Operations

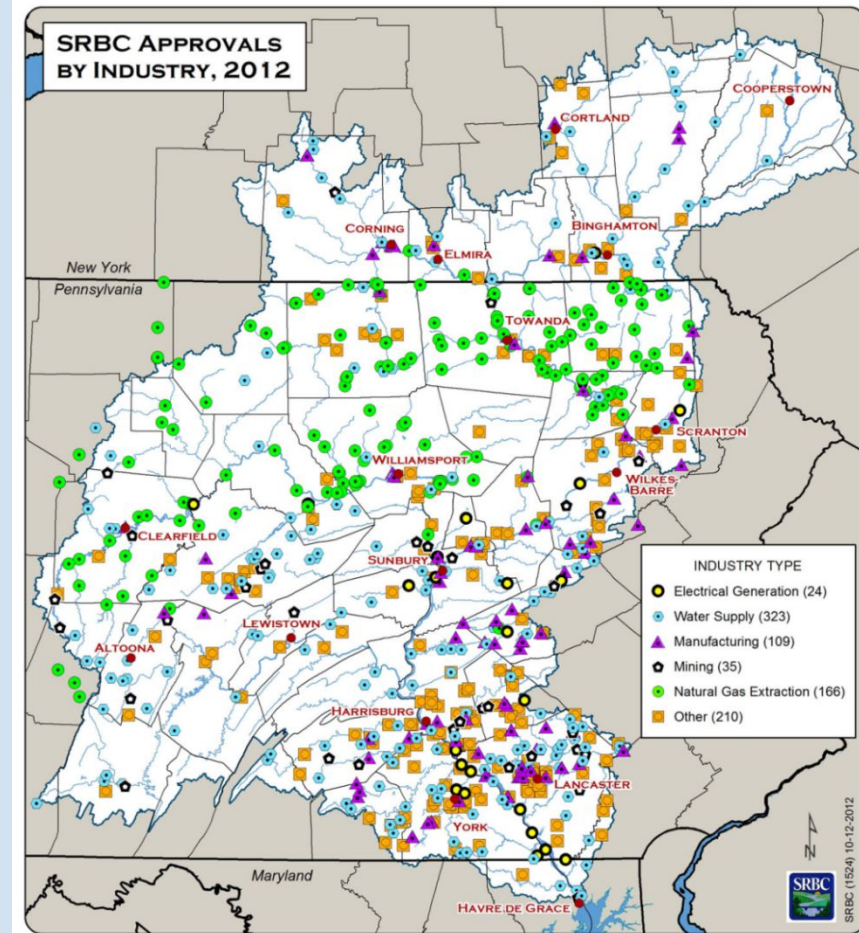
Susquehanna River Basin Commission

4423 North Front Street
Harrisburg, PA 17110-1788
717-238-0423
jbalay@srbc.net

Study Website: <http://www.srbc.net/planning/cwuas.htm>
Interactive Web Map: <http://mdw.srbc.net/cwuasmap/>

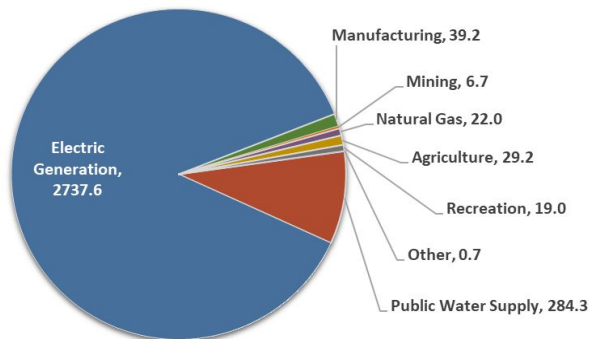
Water Use Assessment

- Commission & state records.
- CU & withdrawal x CU factor.
- Approved & reported CU.
- Estimated unregulated CU.
- Projected 2030 CU.

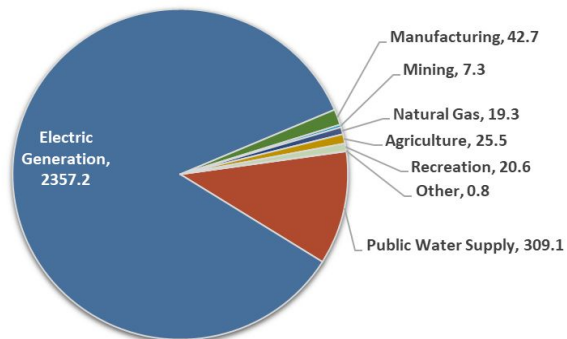


NOTE: CU = consumptive water use

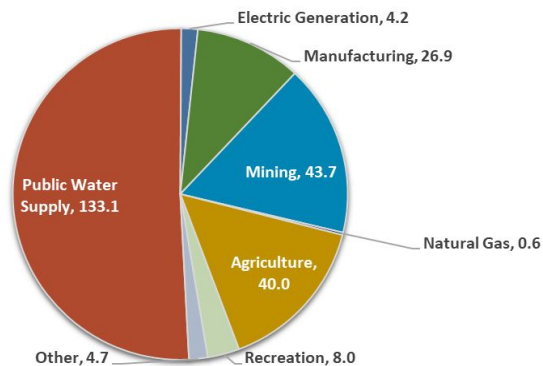
2017 Surface Water Withdrawals (mgd)



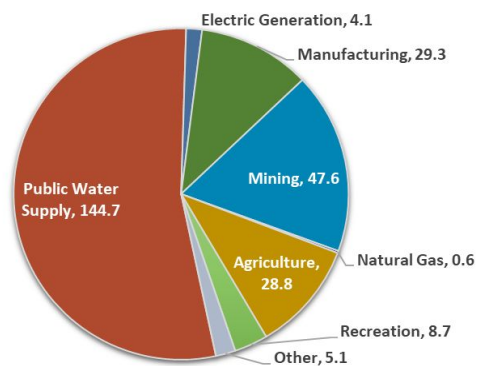
2040 Surface Water Withdrawals (mgd)



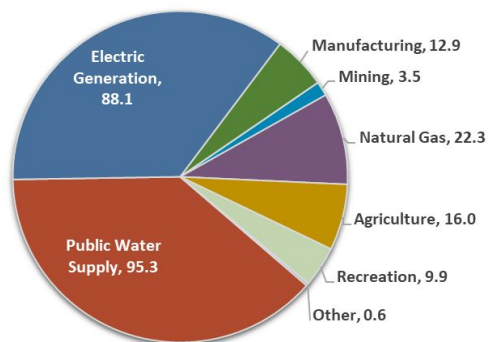
2017 Groundwater Withdrawals (mgd)



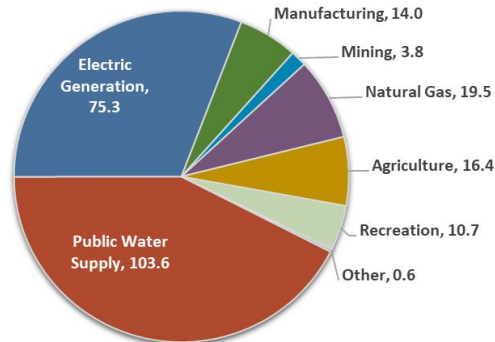
2040 Groundwater Withdrawals (mgd)



2017 Consumptive Use (mgd)



2040 Consumptive Use (mgd)



Water Use Findings

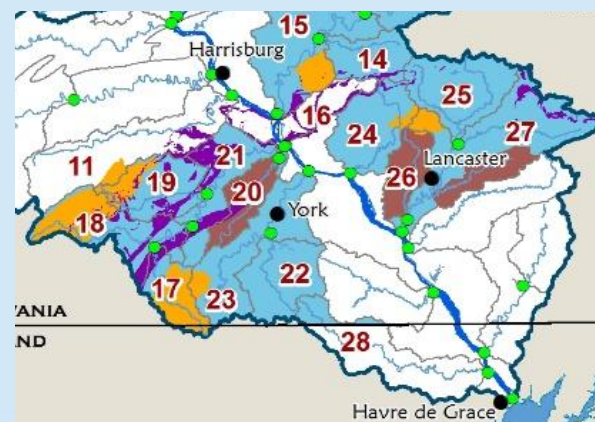
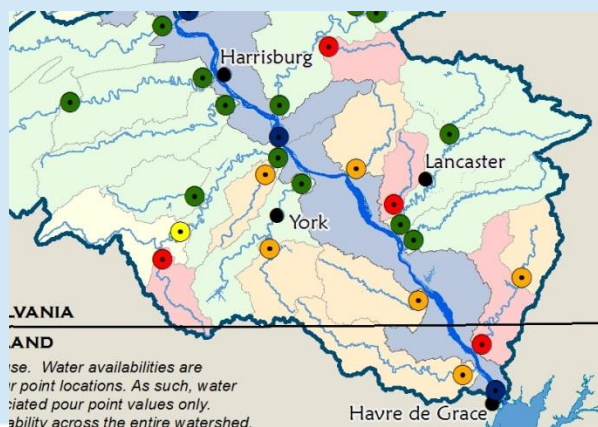
- Approved/reported CU dominated by public water supply (PWS) (47%/31%) & electric power generation (21%/30%).
 - Includes PWS diversions (e.g. Baltimore = 250 mgd).
- Approved & reported CU by natural gas industry estimated at 116 mgd (12%) and 27 mgd (9%), respectively.
- Reported CU significantly (~35%) less than approved CU.
 - Seasonal & intermittent uses (e.g. natural gas industry).
- For 126 of 170 (74%) watersheds approved CU was <10 mgd

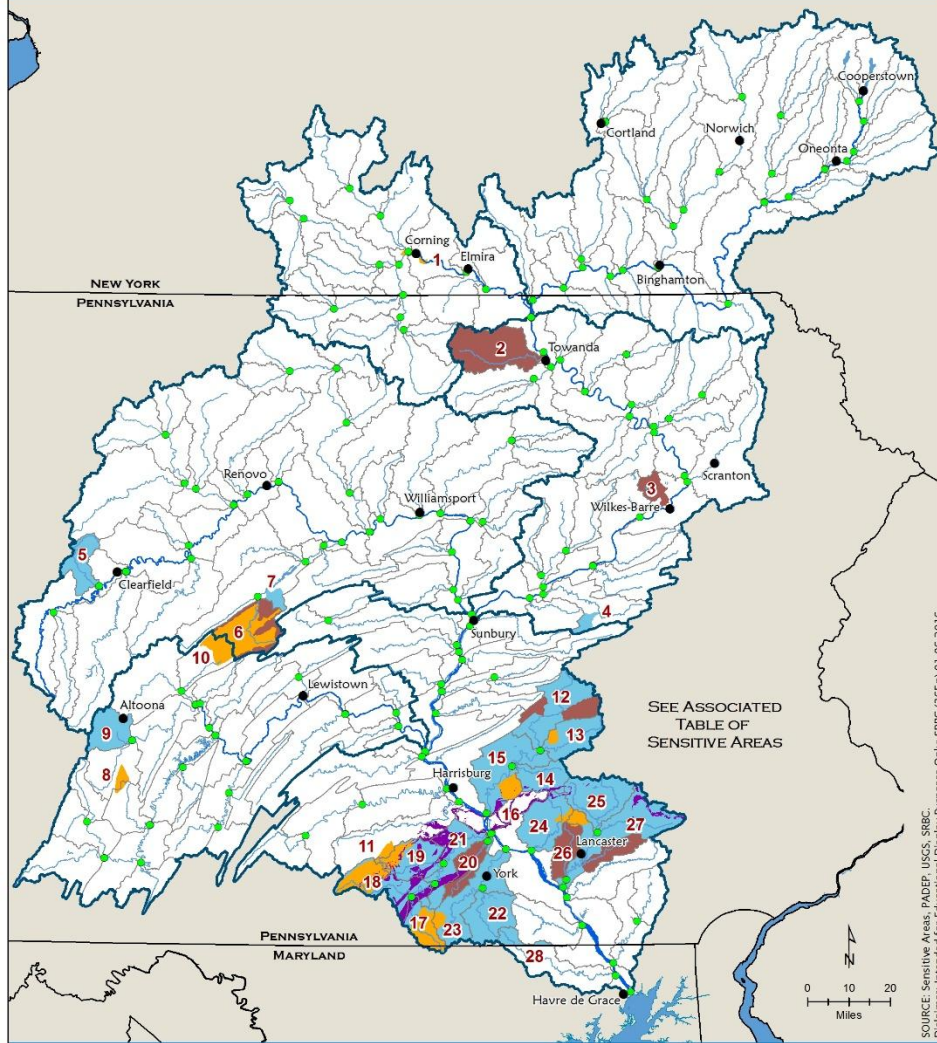
Water Capacity Findings

- Water capacity greatest for watersheds traversed by mainstem rivers & major tributaries.
- Water capacity >10 mgd for 150 of 170 (88%) watersheds.
 - 2014 Reported CU for TMI = 13.7 mgd.
- Lowest water capacities in smaller, headwater watersheds generally <100 mi².
- Majority of watersheds with lowest water capacity located in Lower Susquehanna subbasin.

Water Availability Findings

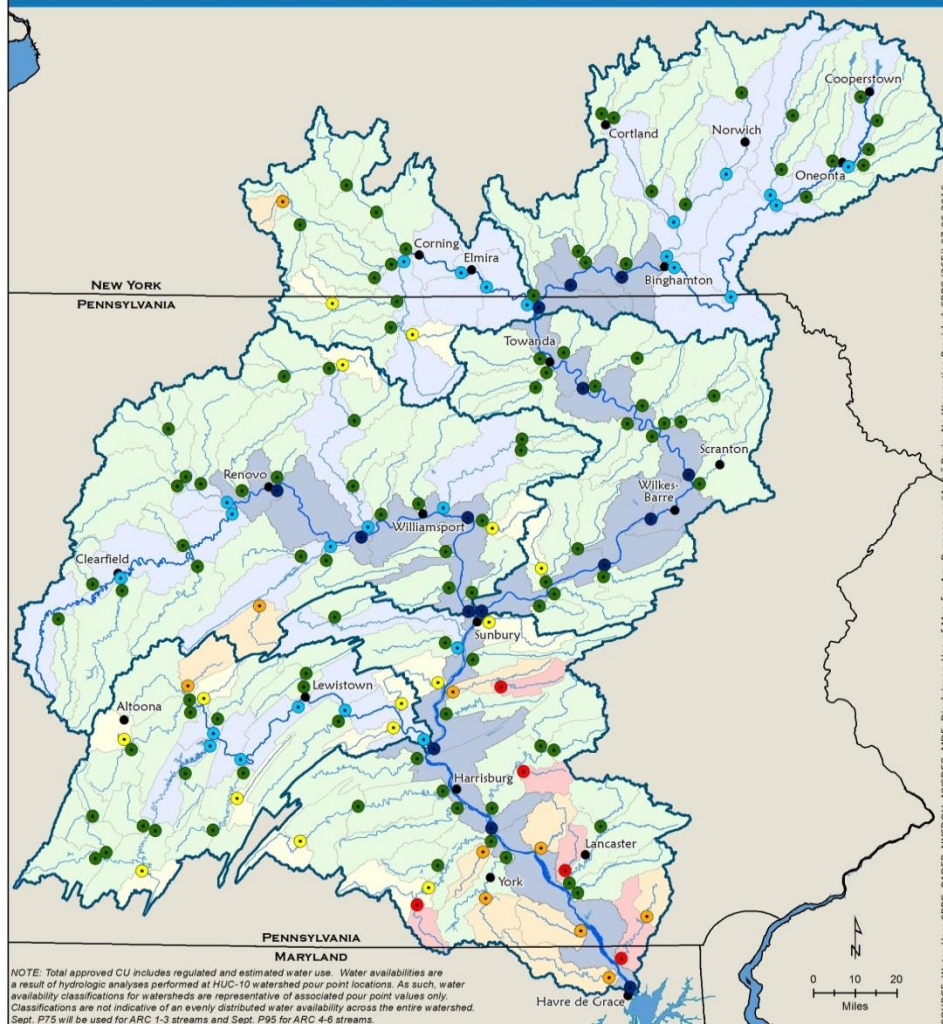
- Water capacity for most Basin watersheds adequate to satisfy existing/projected CU and avoid water availability conflicts.
- Water availability >10 mgd for 141 of 170 (83%) watersheds.
 - 2014 reported CU for TMI = 13.7 mgd.
- Majority of watersheds with lowest water availability located in Lower Susquehanna subbasin.





Sensitive Areas Identified by SRBC Groundwater Management Plan & PA State Water Plan

SOURCE: Sensitive Areas, PA DEP, USGS, SRBC.
Disclaimer: Intended for Educational Display Purposes Only, SRBC (3655) 01-06-2016



NOTE: Total approved CU includes regulated and estimated water use. Water availabilities are a result of hydrologic analyses performed at HUC-10 watershed pour point locations. As such, water availability classifications for watersheds are representative of associated pour point values only. Classifications are not indicative of an evenly distributed water availability across the entire watershed. Sept. P75 will be used for ARC 1-3 streams and Sept. P95 for ARC 4-6 streams.

Water Availability in Million Gallons per Day (MGD)



SOURCE: Water Use, SRBC, PA DEP, NYSDOH, NYSDRC, MDE. Disclaimer: Use of Map for Any Purpose on 7/15/2016. No Warranties Provided, SRBC (3655) 07-06-2016

Management Measures

- Water use reductions.
- Passby flows.
- Conservation releases.
- CU mitigation releases.

