Data Sharing Activities of the Susquehanna River Basin Commission

ACWI--Streamflow Information Collaborative

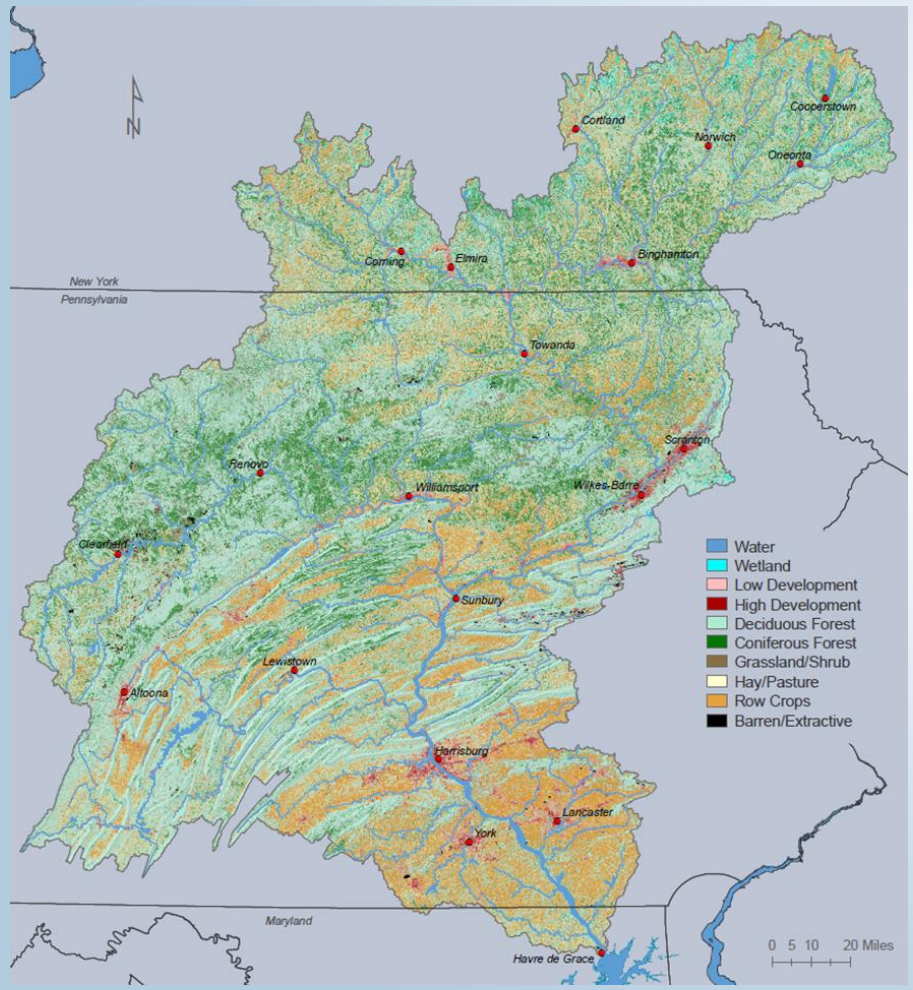
Tuesday, September 10, 2019

Susquehanna River Basin Commission (SRBC)

- SRBC is a federal-interstate compact commission established in 1971 by the federal government and the states of NY, PA, MD.

- SRBC is responsible for managing the basin's water resources and advancing public information on water resources.

Susquehanna River Basin



The Basin

- 27,510-square-mile watershed
- Comprises 43% of the Chesapeake Bay Watershed
- Diverse landscape; 60% forested
- 49,000+ miles of waterways
- Population of 4.2 million

The Susquehanna River

- 444 miles, largest tributary to the Chesapeake Bay
- Supplies 18 million gallons per minute to the bay
- Supports Public Water Supply, Industry and Ecosystem

SRBC Programs and Data Needs

- Regulation of water withdrawals and the consumptive use of water
  - quantity and location of water sources and usage; permit conditions
- Water quality monitoring, assessment and restoration
  - water chemistry, aquatic biology, sources and level of impairments
- Flood and drought monitoring and preparedness
  - hydrologic conditions
- Planning and watershed management
  - all of the above

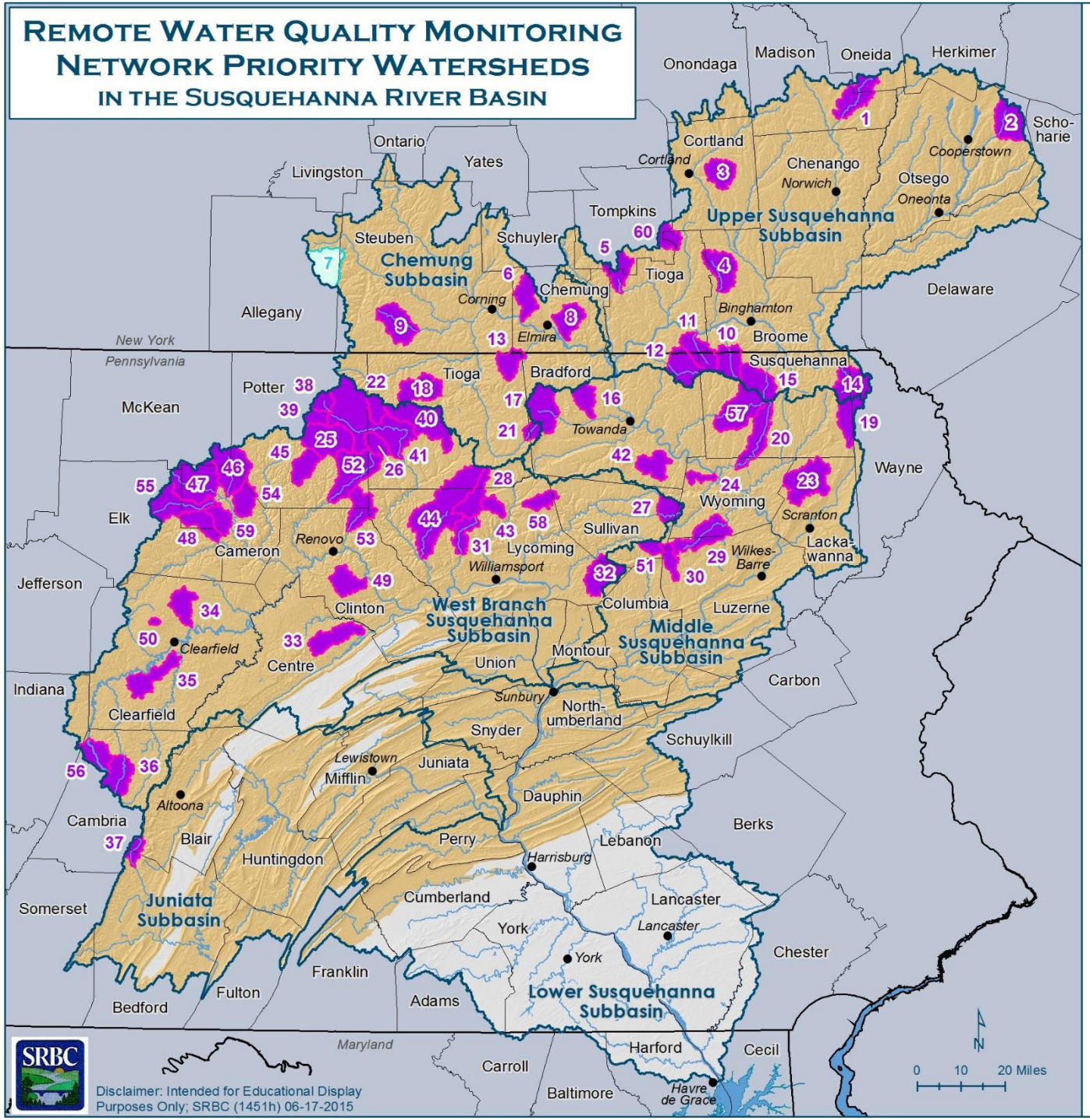
SRBC Data Collection, Management and Access

- Collect data directly
- Gather data from member agencies and partners
- Require permittees to collect and report data
- Database developer, database analyst on staff
- Software and training
- Access to records policy
- Public portals

Continuous Water Chemistry Monitoring Network

- Initiated in 2010
  - approximately 60 stations in northern PA and southern NY
- Initial purpose to track water quality and assess for impacts of increased natural gas extraction activity
  - Establish baseline water quality conditions;
  - Form collaborative partnerships to improve monitoring technology and provide educational opportunities;
  - Enhance protection for water supplies; and
  - Be responsive to public concerns.

Remote Water Quality Monitoring Network Priority Watersheds
in the Susquehanna River Basin



Area Containing Natural Gas Shales

Area with No Recoverable Natural Gas Formations

Recoverable Natural Gas Shales within the Susquehanna River Basin include the Marcellus, Burket, Utica/Antes, Geneseo, Mandata, Middlesex, Needmore, and Rhinestreet Formations.

PRIORITY WATERSHEDS

Station Installed

1. Sangerfield River
2. Cherry Valley Creek
3. Trout Brook
4. Nanticoke Creek
5. Catatonk Creek
6. Sing Sing Creek
8. Baldwin Creek
9. Tuscarora Creek
10. Choconut Creek
11. Apalachin Creek
12. Wappasening Creek
13. Hammond Creek
14. Starrucca Creek
15. Snake Creek
16. Tomjack Creek
17. Sugar Creek
18. Crooked Creek
19. Lackawanna River
20. Meshoppen Creek
21. Tioga River
22. Long Run
23. South Branch Tunkhannock Creek
24. Little Mehoopany Creek
25. West Branch Pine Creek
26. Elk Run
27. Loyalsock Creek
28. Blockhouse Creek
29. Bowman Creek
30. Kitchen Creek
31. Larrys Creek
32. Little Muncy Creek
33. Marsh Creek
34. Trout Run
35. Little Clearfield Creek
36. Chest Creek
37. Bobs Creek
38. Upper Pine Creek
39. Ninemile Run
40. Marsh Creek
41. Pine Creek
42. Sugar Run
43. Grays Run
44. Little Pine Creek
45. East Fork First Fork Sinnemahoning Creek
46. Portage Creek
47. Driftwood Branch
48. Hicks Run
49. Baker Run
50. Moose Creek
51. East Branch Fishing Creek
52. Kettle Creek
53. Young Womans Creek
54. Hunts Run
55. West Creek
56. West Branch Susquehanna River
57. East Branch Wyalusing Creek
58. Pleasant Stream
59. Sterling Run
60. West Branch Owego Creek

Historical Station

7. Canacadea Creek

Continuous Data

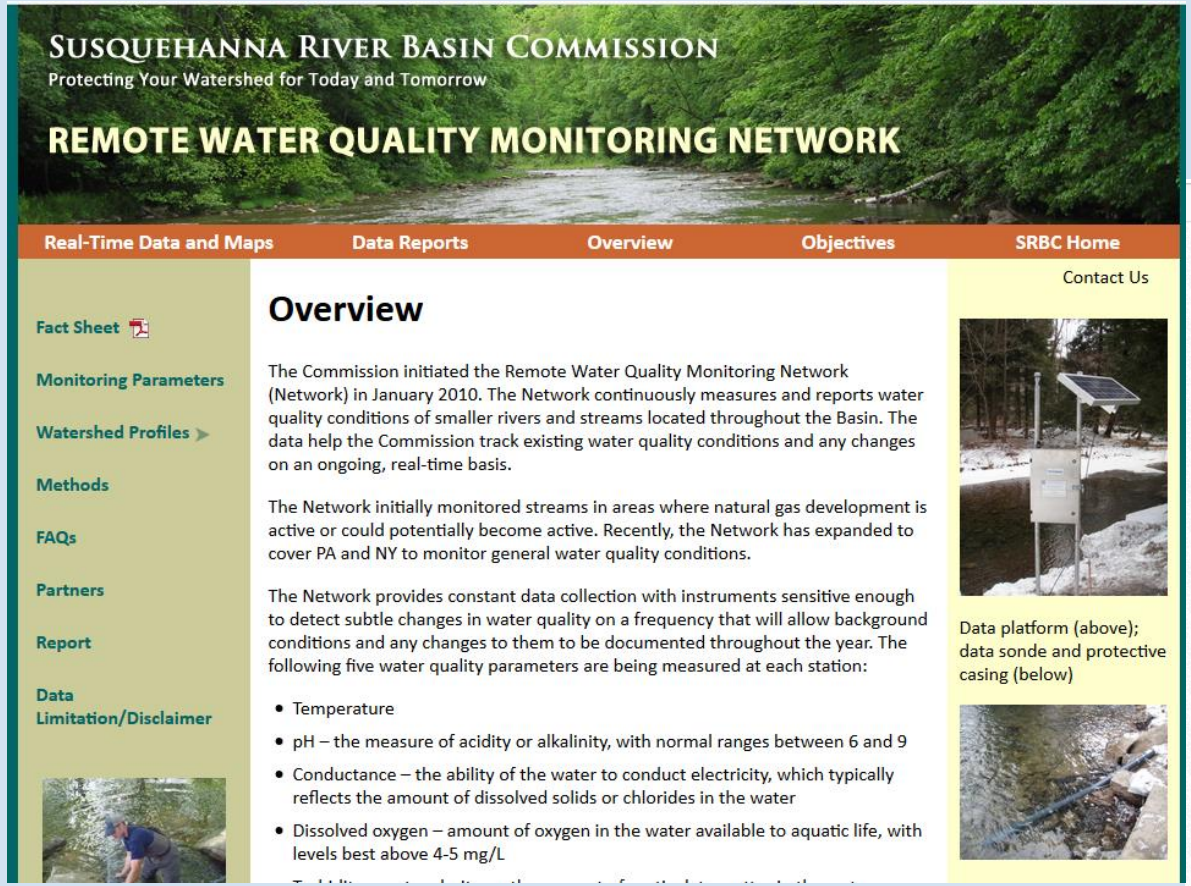
- Parameters monitored: pH, temperature, specific conductance, dissolved oxygen, and turbidity
- Collected at 15-minute intervals
- Transmitted to a public website at 4 hour interval
- Posted as provisional data

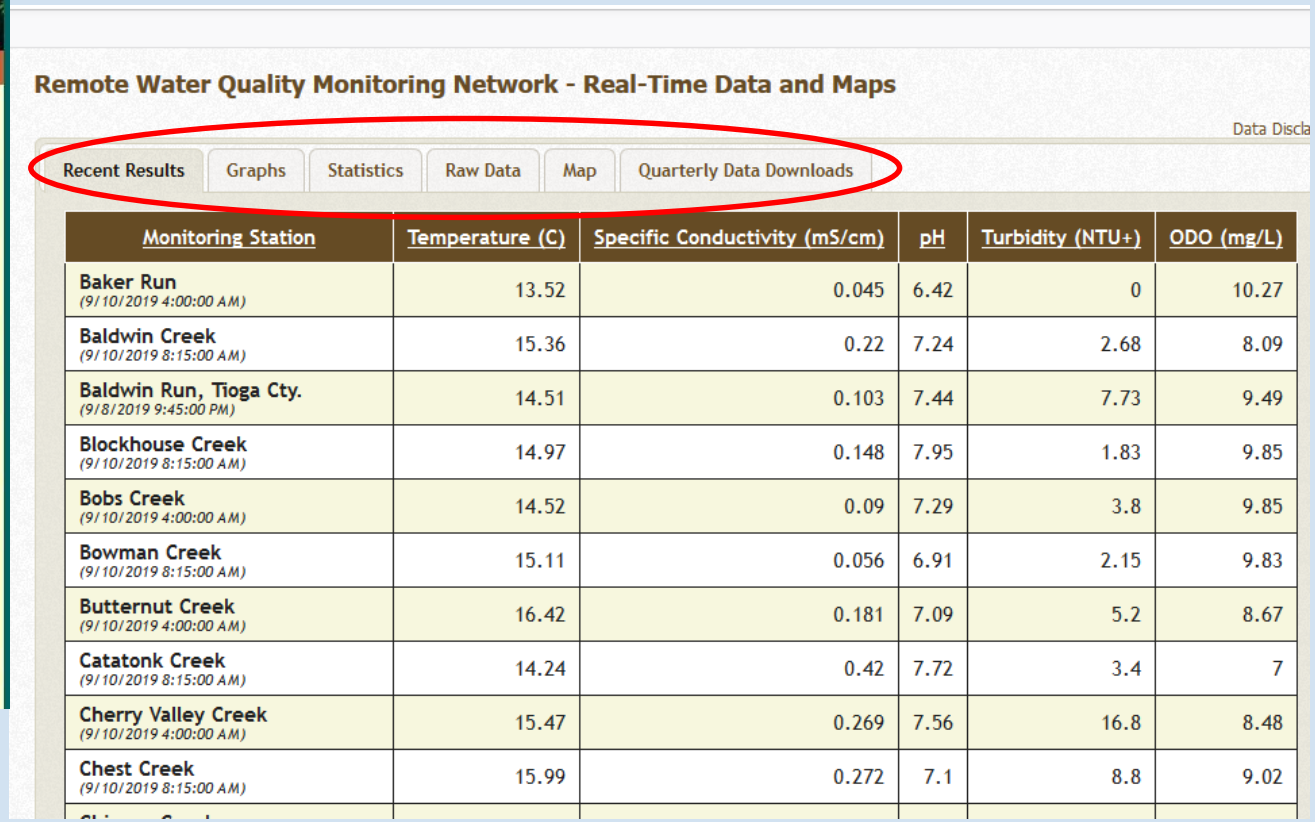
Monitoring Station	Temperature (C)	Specific Conductivity (mS/cm)	pH	Turbidity (NTU+)	ODO (mg/L)
Baker Run *(8/5/2019 8:00:00 AM)*	15.6	0.039	6.34	0.4	9.82
Baldwin Creek *(8/5/2019 12:00:00 PM)*	20.99	0.223	7.77	3.68	9.85
Baldwin Run, Tioga Cty. *(8/5/2019 11:00:00 AM)*	16.46	0.096	7.53	11	9.31
Blockhouse Creek *(8/5/2019 12:00:00 PM)*	20.35	0.136	8.34	3.96	9.59
Bobs Creek *(8/5/2019 8:00:00 AM)*	17.2	0.083	7.21	4.7	9.21
Bowman Creek *(8/5/2019 12:15:00 PM)*	19.8	0.045	7.02	2.35	9.58
Butternut Creek *(8/5/2019 8:00:00 AM)*	11.38	0	6.95	2.9	10.47

Other Monitoring

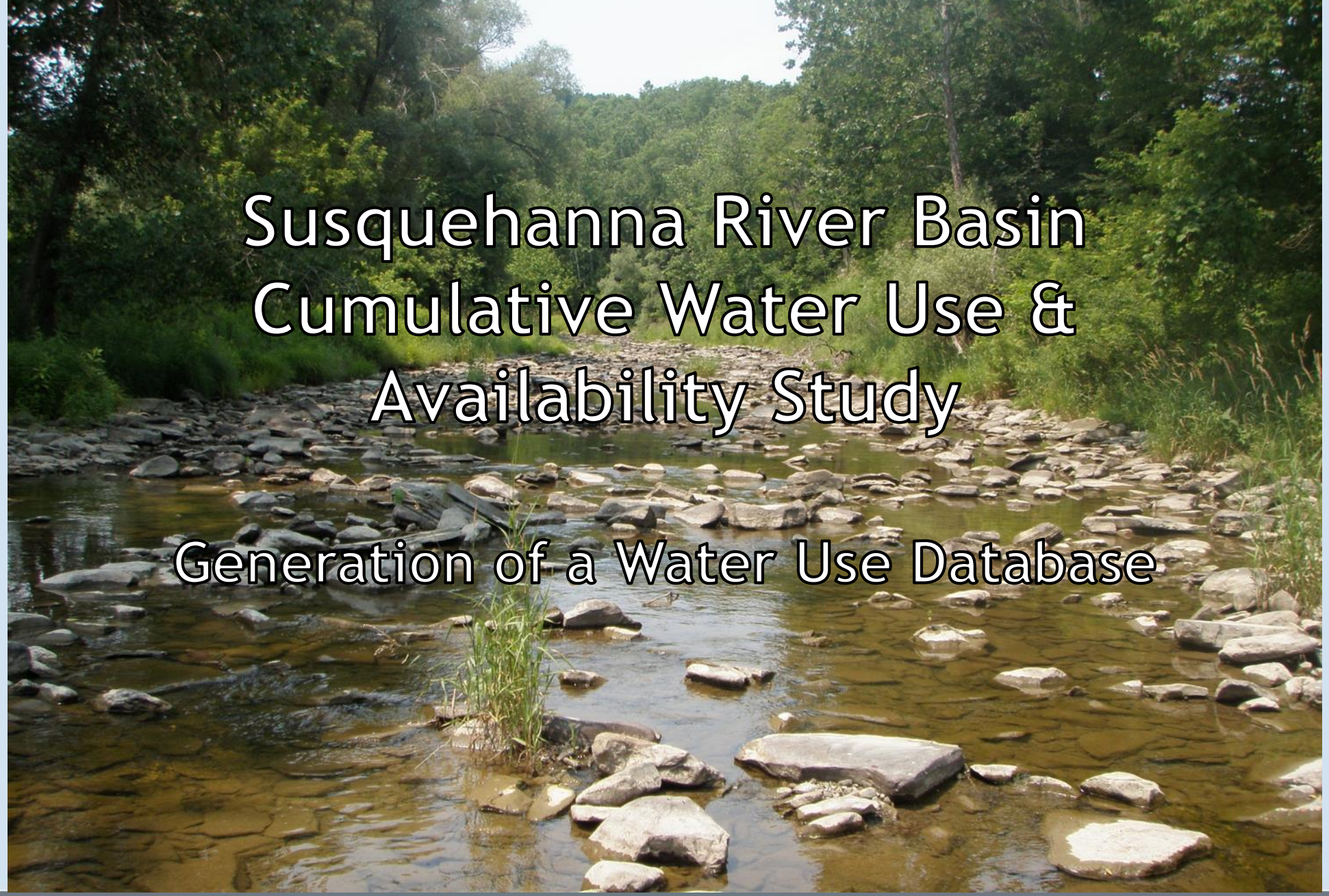
- Site visits – 10-12 weeks for O&M
  - More frequent if warranted
    - “Alarms” are sent via email to staff to alert them of potential problems or malfunctions
- Quarterly sampling for metals, nutrients, and ions
- Annual macroinvertebrate sampling
- Fish surveys

Continuous WQ Data Web Portal





Monitoring Station	Temperature (C)	Specific Conductivity (mS/cm)	pH	Turbidity (NTU+)	ODO (mg/L)
Baker Run (9/10/2019 4:00:00 AM)	13.52	0.045	6.42	0	10.27
Baldwin Creek (9/10/2019 8:15:00 AM)	15.36	0.22	7.24	2.68	8.09
Baldwin Run, Tioga Cty. (9/8/2019 9:45:00 PM)	14.51	0.103	7.44	7.73	9.49
Blockhouse Creek (9/10/2019 8:15:00 AM)	14.97	0.148	7.95	1.83	9.85
Bobs Creek (9/10/2019 4:00:00 AM)	14.52	0.09	7.29	3.8	9.85
Bowman Creek (9/10/2019 8:15:00 AM)	15.11	0.056	6.91	2.15	9.83
Butternut Creek (9/10/2019 4:00:00 AM)	16.42	0.181	7.09	5.2	8.67
Catatonk Creek (9/10/2019 8:15:00 AM)	14.24	0.42	7.72	3.4	7
Cherry Valley Creek (9/10/2019 4:00:00 AM)	15.47	0.269	7.56	16.8	8.48
Chest Creek (9/10/2019 8:15:00 AM)	15.99	0.272	7.1	8.8	9.02

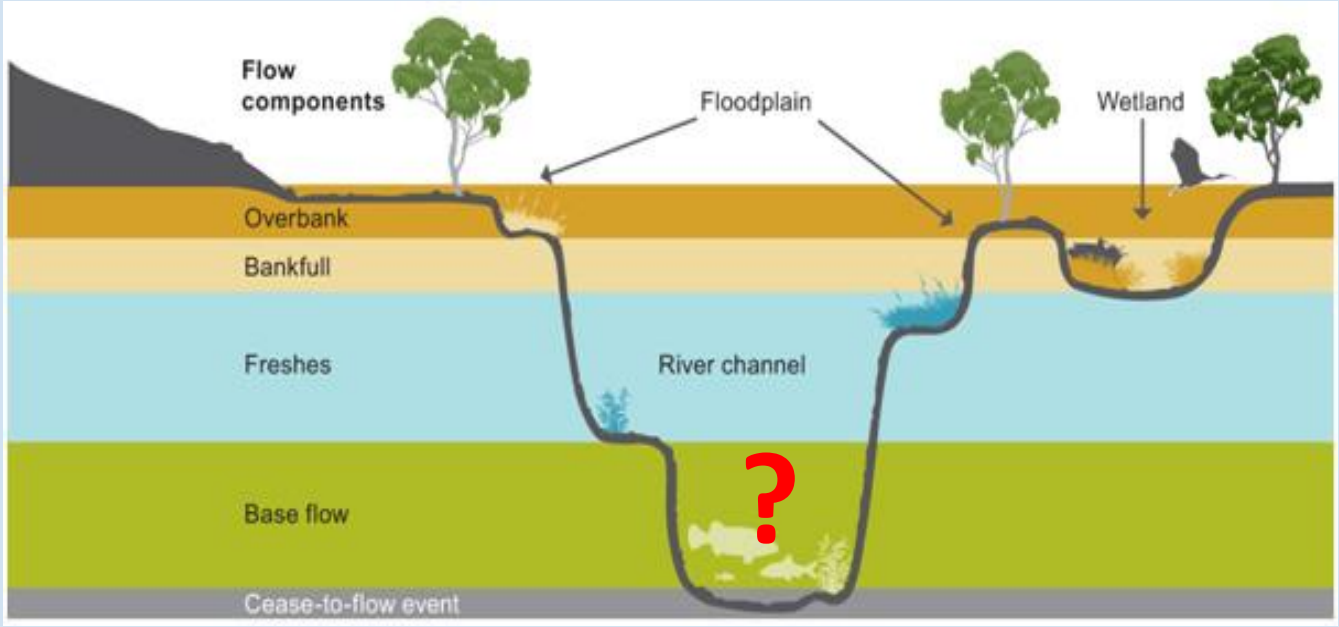


Susquehanna River Basin Cumulative Water Use & Availability Study

Generation of a Water Use Database

Purpose & Scope

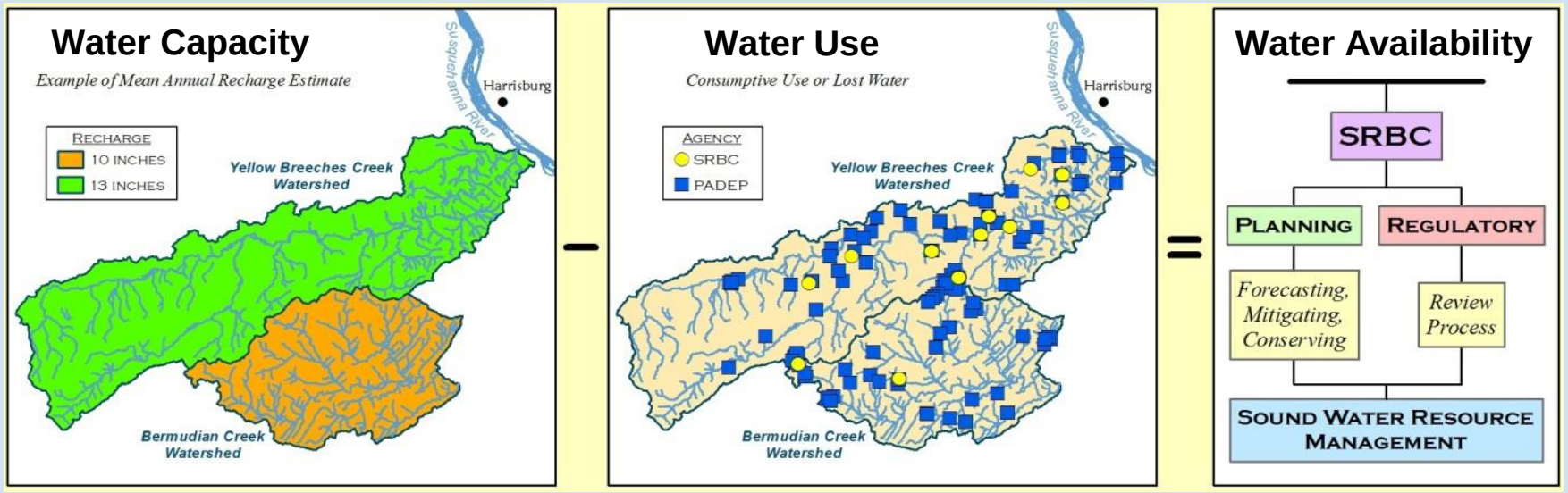
Comprehensively evaluate cumulative **water use**, determine **water capacity** sustainably available, and assess resultant **water availability** for Basin watersheds to inform planning and regulatory decision making

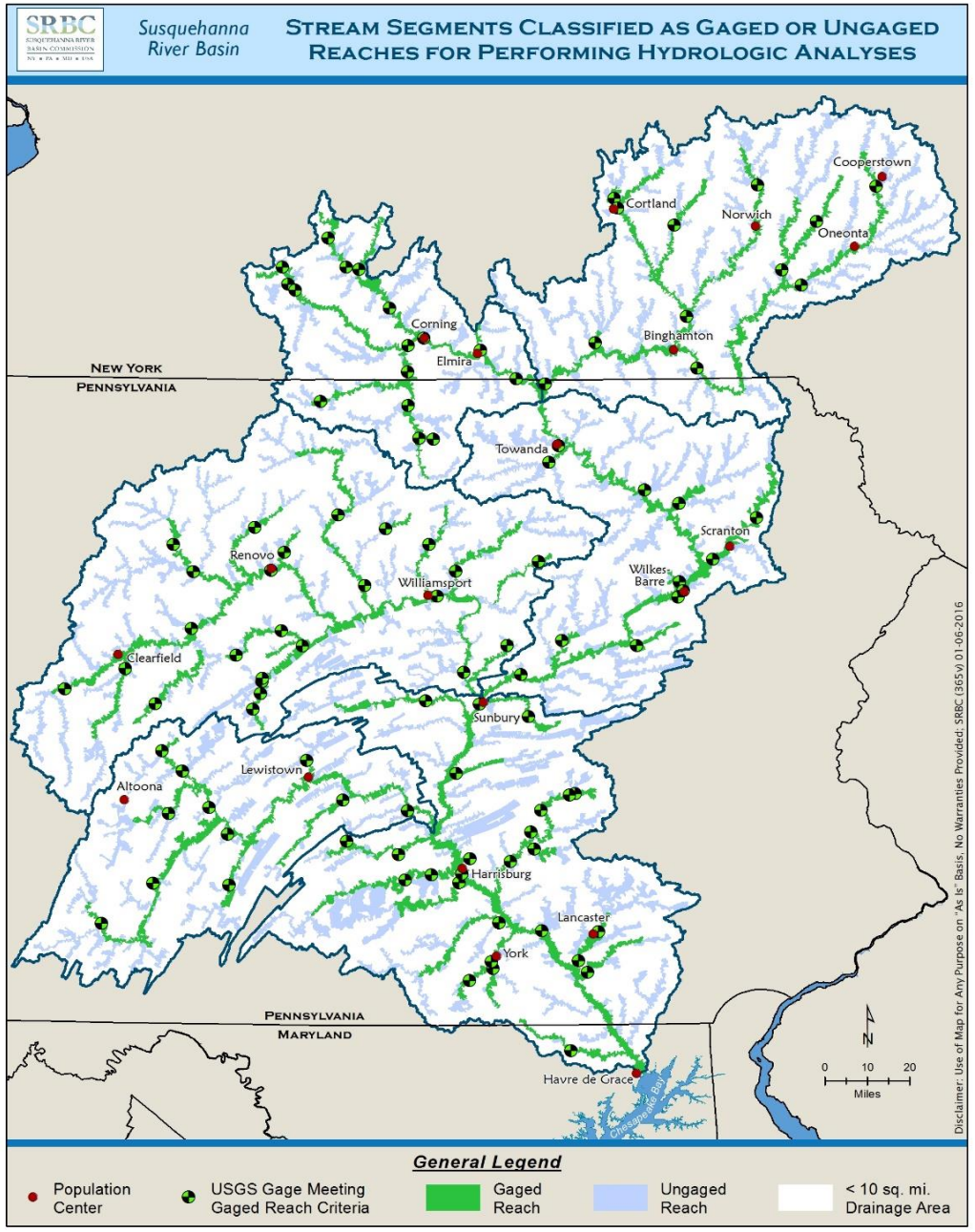


(Modified from Murray-Darling Basin Authority, 2011)

Defining Water Availability

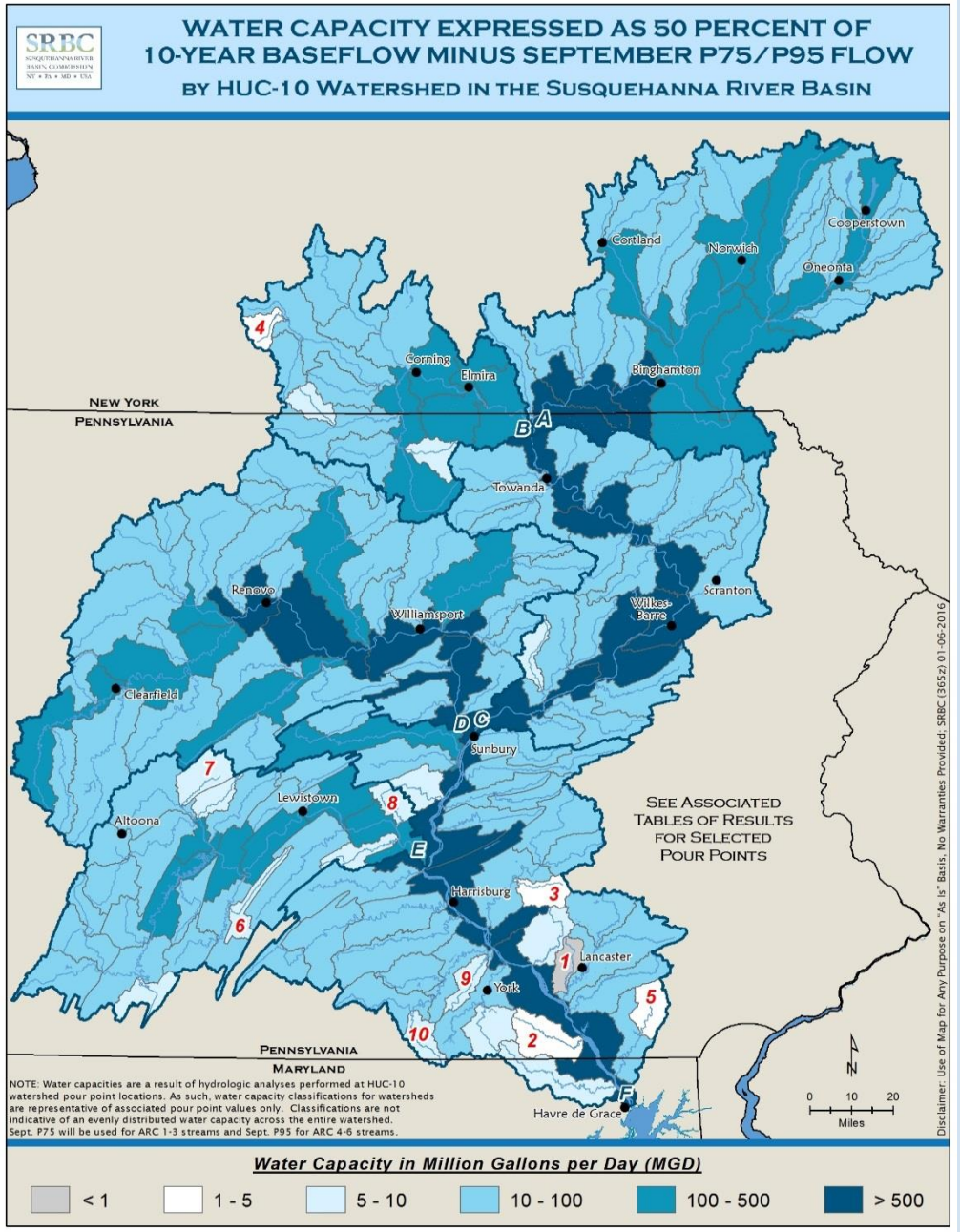
Water Capacity – Water Use (CU) = Water Availability





Water Capacity: Hydrologic Analysis

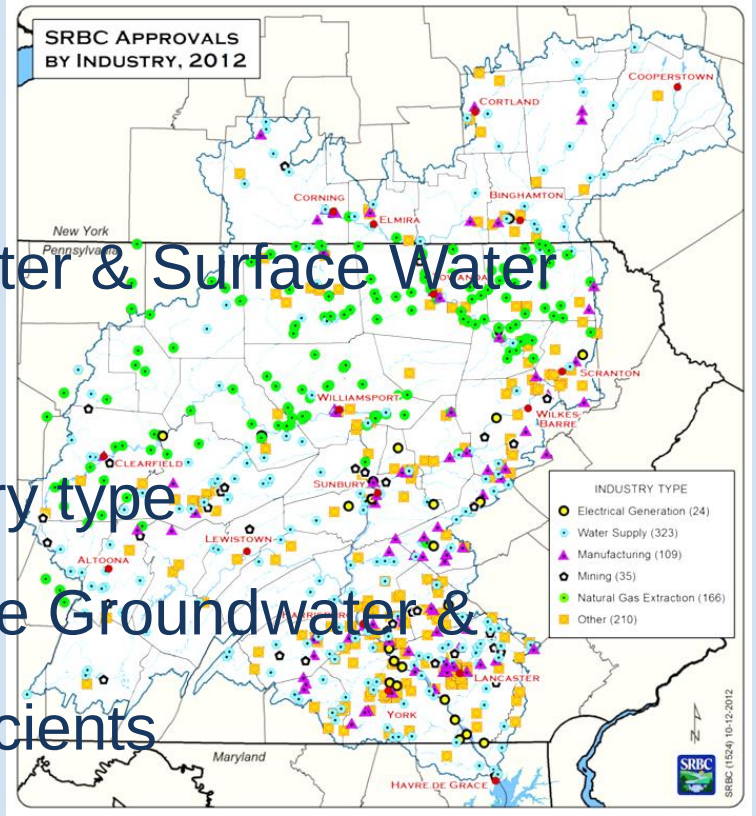
- Leverage gage network to extent reasonable
- Use regression equations for ungaged reaches
- Based on 10-year baseflow
- Analysis limited to watersheds >10 mi^2

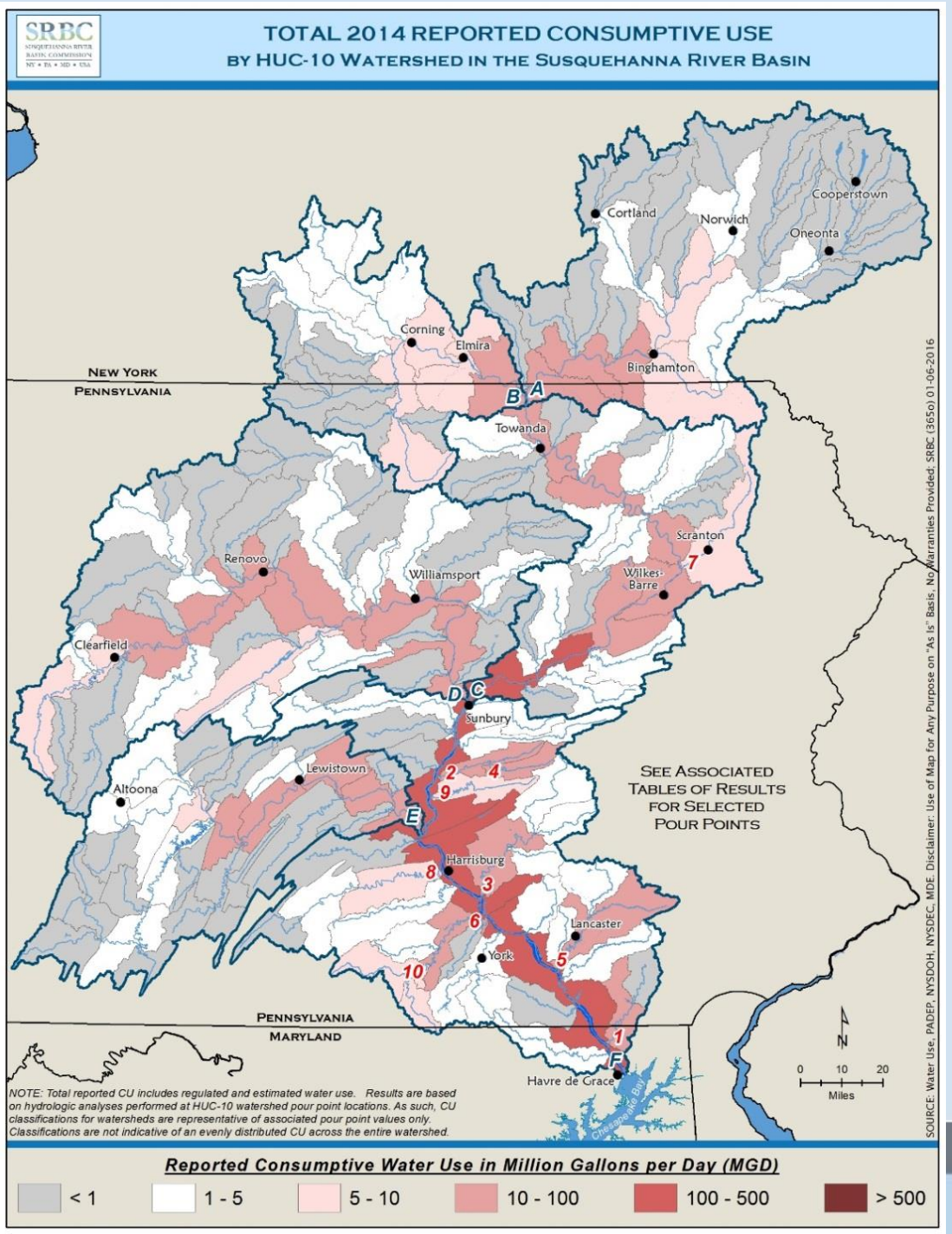

SRBC
SUSQUEHANNA RIVER BASIN COMMISSION
NY • PA • MD • USA
WATER CAPACITY EXPRESSED AS 50 PERCENT OF
10-YEAR BASEFLOW MINUS SEPTEMBER P75/P95 FLOW
BY HUC-10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN
Cortland
Norwich
Cooperstown
Oneonta
Corning
Elmira
Binghamton
NEW YORK
PENNSYLVANIA
Towanda
Renovo
Williamsport
Wilkes-Barre
Scranton
Clearfield
Sunbury
Lewistown
Altoona
Harrisburg
Lancaster
York
SEE ASSOCIATED TABLES OF RESULTS FOR SELECTED POUR POINTS
PENNSYLVANIA
MARYLAND
Havre de Grace
NOTE: Water capacities are a result of hydrologic analyses performed at HUC-10 watershed pour point locations. As such, water capacity classifications for watersheds are representative of associated pour point values only. Classifications are not indicative of an evenly distributed water capacity across the entire watershed. Sept. P75 will be used for ARC 1-3 streams and Sept. P95 for ARC 4-6 streams.
0 10 20
Miles
Disclaimer: Use of Map for Any Purpose on "As Is" Basis. No Warranties Provided. SRBC (365z) 01-06-2016
Water Capacity in Million Gallons per Day (MGD)
< 1
1 - 5
5 - 10
10 - 100
100 - 500
> 500

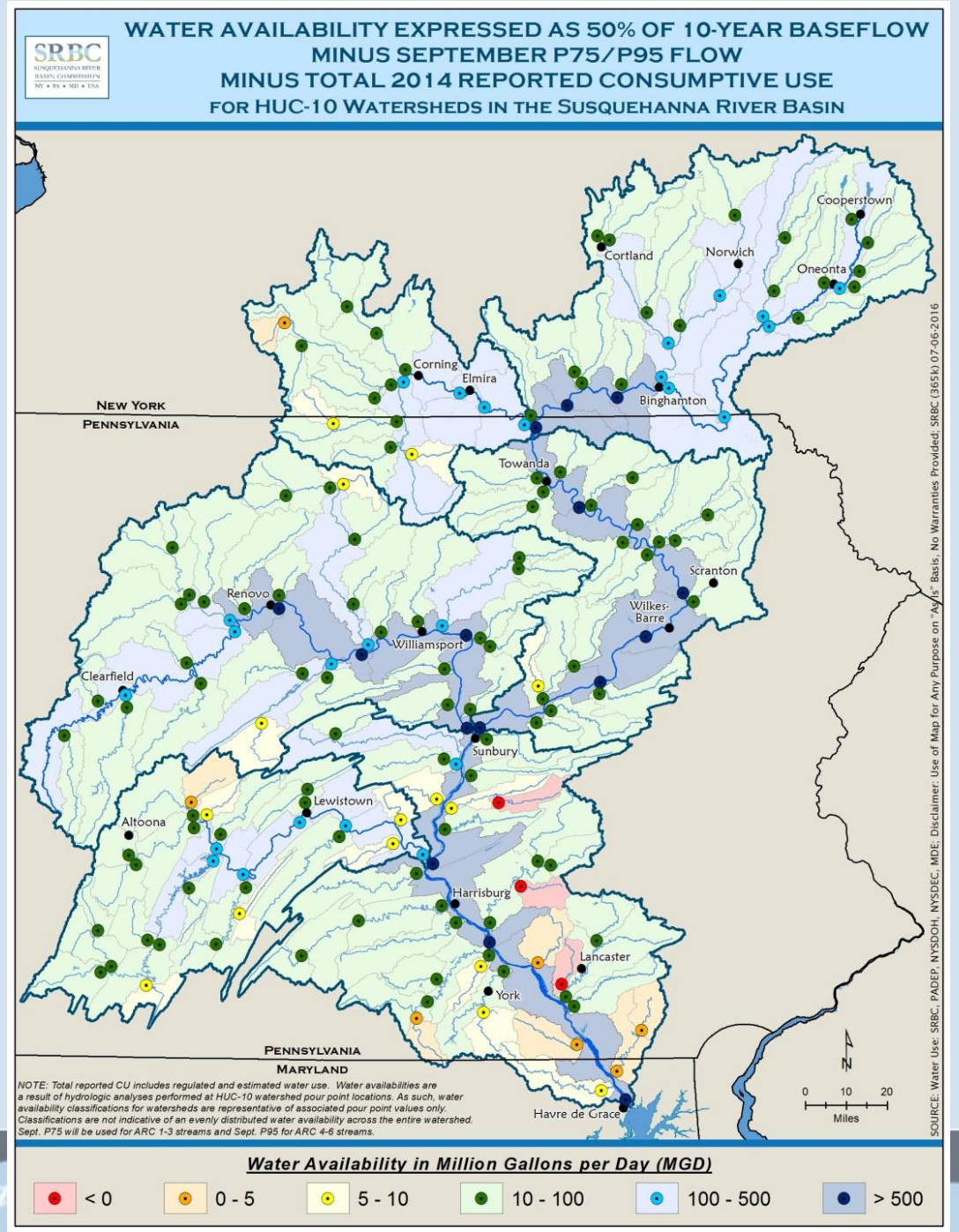
Water Use: Database Compilation

Consumptive Use Approach

- Based on SRBC CU approvals
- Supplemented by SRBC Groundwater & Surface Water approvals using CU coefficients
  - CU coefficients based on industry type
- Also supplemented by member state Groundwater & Surface Water data using CU coefficients
  - permitted and registered
- Estimated unregulated CU




SRBC
TOTAL 2014 REPORTED CONSUMPTIVE USE
BY HUC-10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN
NEW YORK
PENNSYLVANIA
PENNSYLVANIA
MARYLAND
Cortland
Norwich
Cooperstown
Oneonta
Corning
Elmira
Binghamton
Towanda
Renovo
Williamsport
Scranton
Wilkes-Barre
Clearfield
Sunbury
Lewistown
Altoona
Harrisburg
Lancaster
York
Havre de Grace
A
B
C
D
E
F
1
2
3
4
5
6
7
8
9
10
SEE ASSOCIATED TABLES OF RESULTS FOR SELECTED POUR POINTS
NOTE: Total reported CU includes regulated and estimated water use. Results are based on hydrologic analyses performed at HUC-10 watershed pour point locations. As such, CU classifications for watersheds are representative of associated pour point values only. Classifications are not indicative of an evenly distributed CU across the entire watershed.
0 10 20
Miles
SOURCE: Water Use, PADEP, NYSDOH, NYSDEC, MDE. Disclaimer: Use of Map for Any Purpose on "As Is" Basis. No Warranties Provided. SRBC (365o) 01-06-2016
Reported Consumptive Water Use in Million Gallons per Day (MGD)
< 1
1 - 5
5 - 10
10 - 100
100 - 500
> 500


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
SRBC
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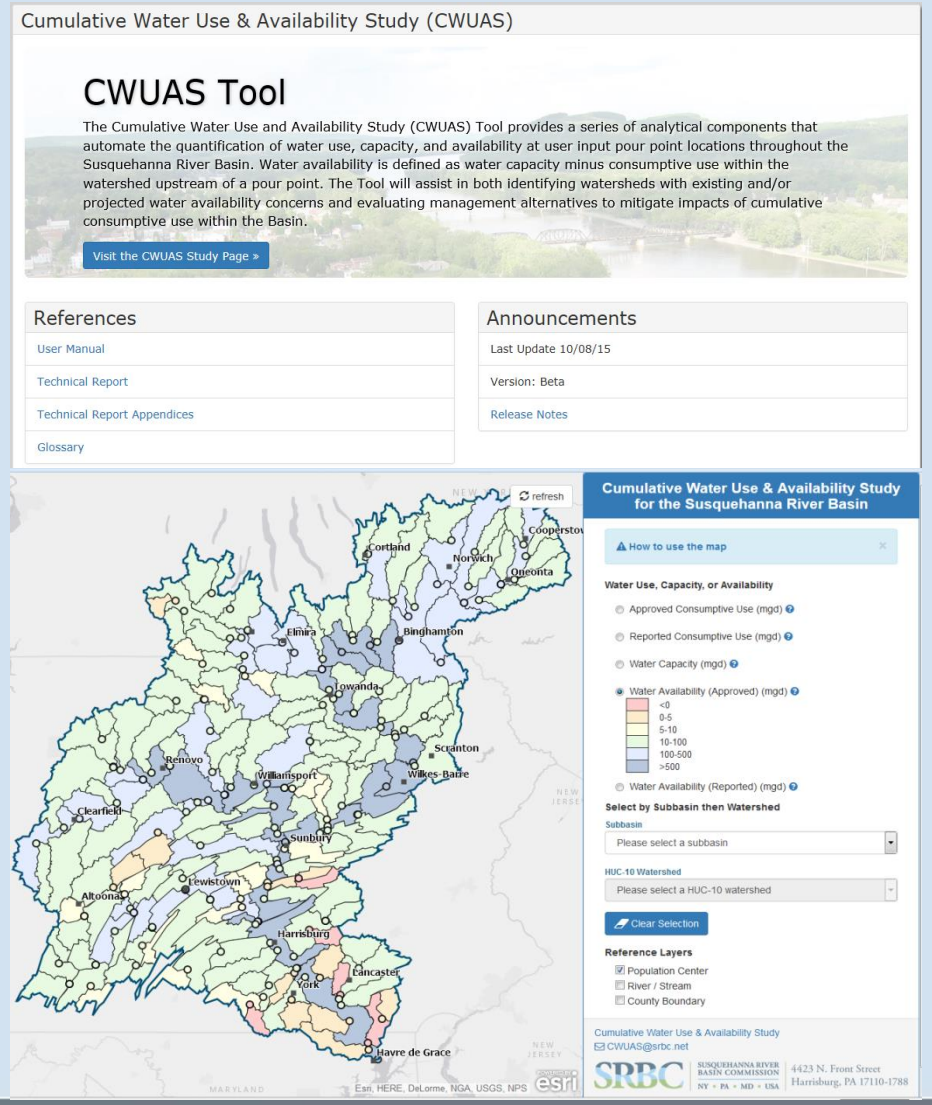
NOTE: Total reported CU includes regulated and estimated water use. Water availabilities are a result of hydrologic analyses performed at HUC-10 watershed pour point locations. As such, water availability classifications for watersheds are representative of associated pour point values only. Classifications 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.
N
0 10 20
Miles
SOURCE: Water Use: SRBC, PADEP, NYSDOH, NYSDEC, MDE; Disclaimer: Use of Map for Any Purpose on "As Is" Basis, No Warranties Provided; SRBC (365k) 07-06-2016
Water Availability in Million Gallons per Day (MGD)
< 0
0 - 5
5 - 10
10 - 100
100 - 500
> 500

Products

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

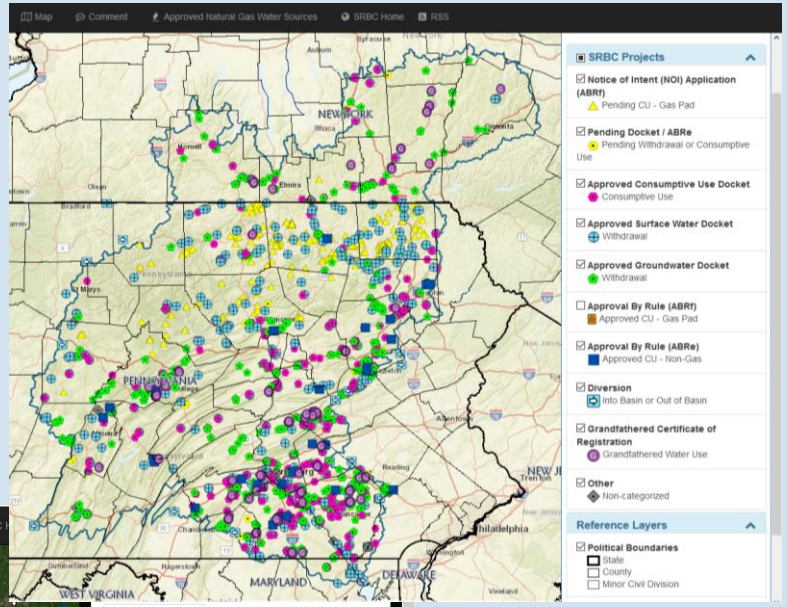


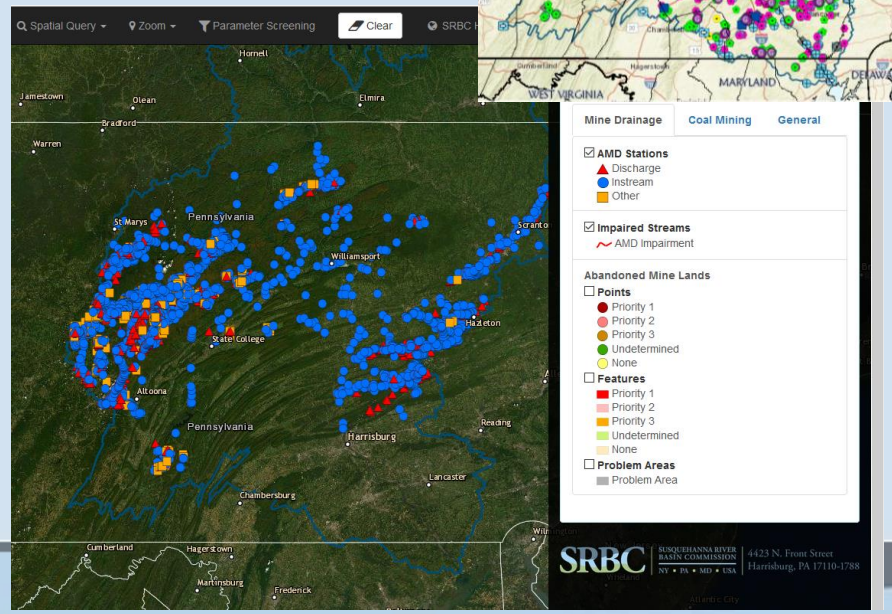
Challenges
Water Use Database Compilation

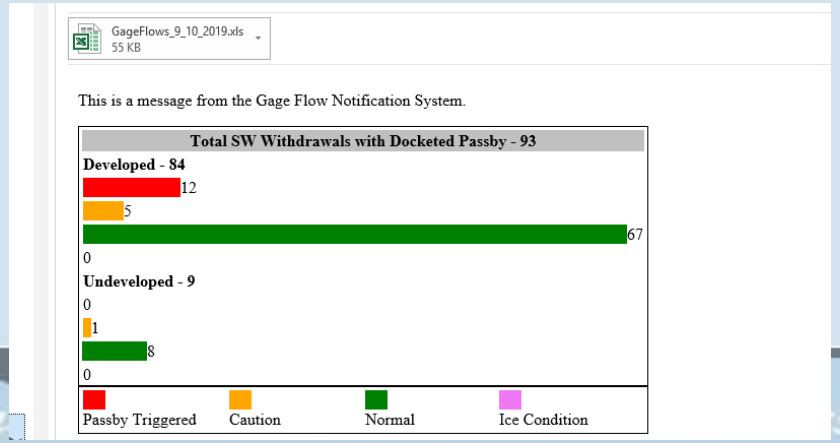
- Monthly reporting is available but not provided
- Return or discharge data was incomplete or not readily available from member states
- Varying thresholds for registration/permitting/reporting
- Monthly vs Annual; monthly vs 30-day
- IT and security hurdles
- Updates

Other Data Sharing Initiatives

- Water Application and Approval Viewer
- Mine Drainage Portal
- Agreements with member agencies
- Hydrologic conditions portal (under development)







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