

Real-time Continuous Monitoring in the Susquehanna River Basin

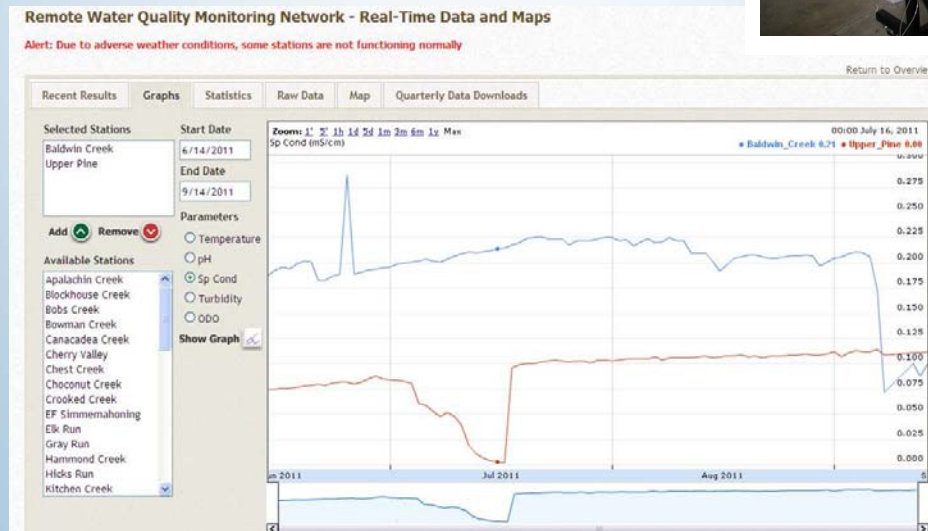


Andrew Gavin – Deputy Executive Director

ACWA Annual Meeting – August 2016

Real-Time Continuous Monitoring

- Conductance
- Temperature
- pH
- Dissolved oxygen
- Turbidity
- Depth
- UVAS
- TOC



CONTINUOUS WATER QUALITY MONITORING NETWORK IN THE SUSQUEHANNA RIVER BASIN

 Drinking Water Early Warning System Station

 Area Containing Natural Gas Shales

 Area with No Recoverable Natural Gas Formations

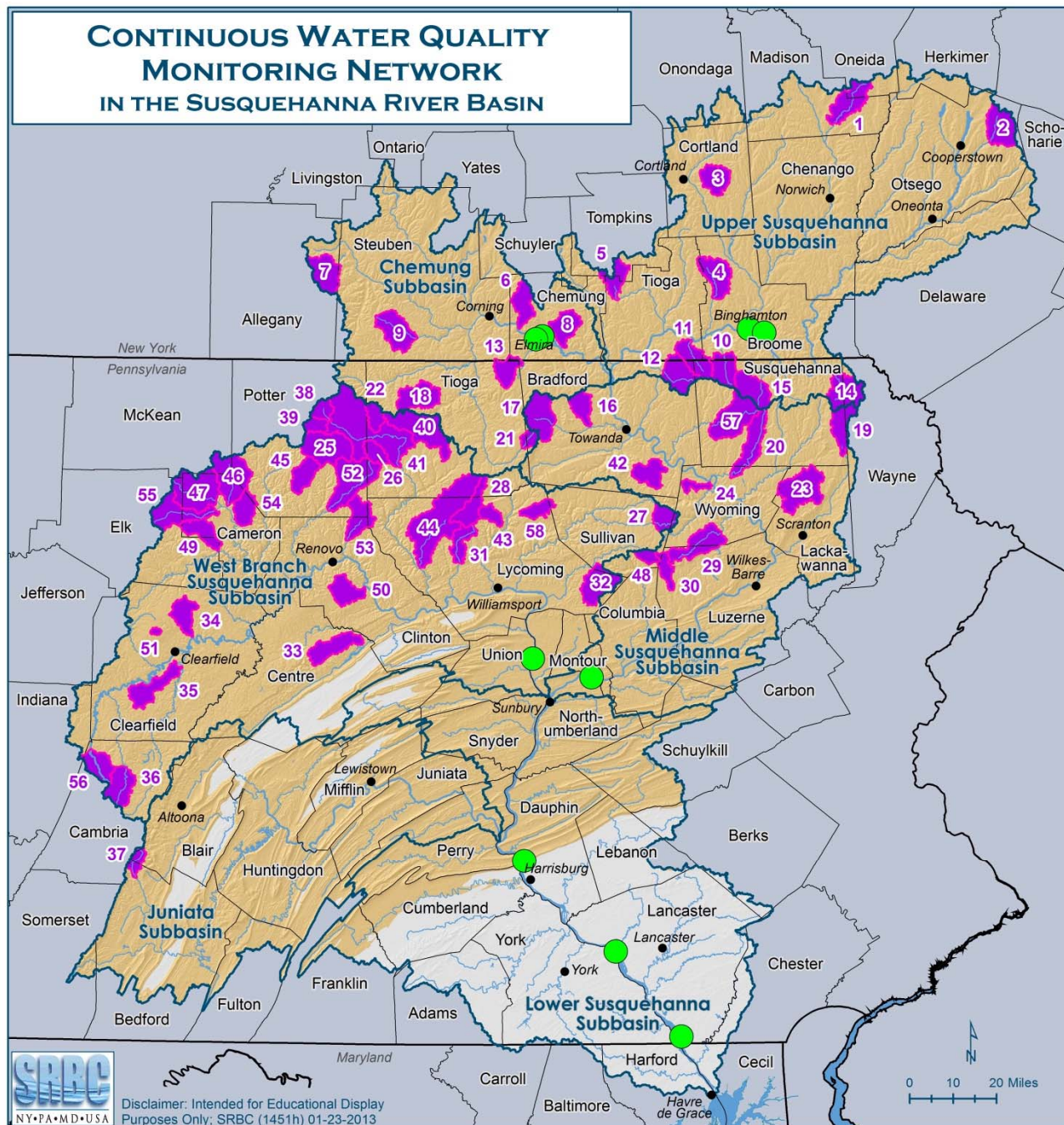
WATERSHEDS WITH MONITORING STATIONS IN THE NATURAL GAS REGION

 Station Installed

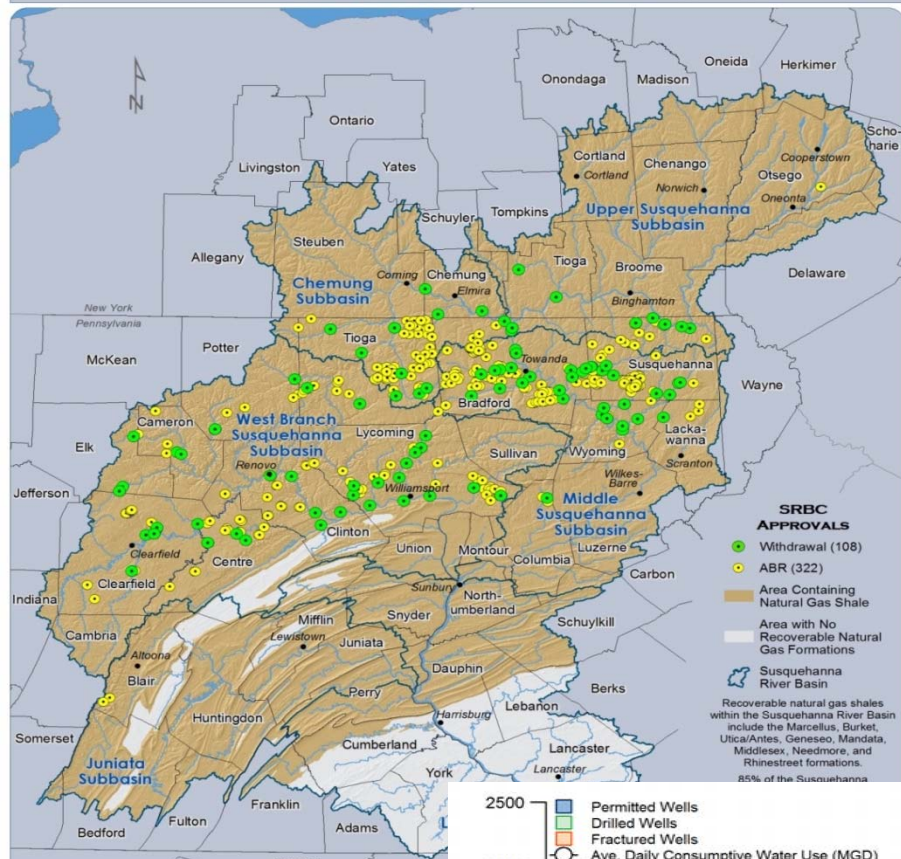
- | | |
|------------------------------------|--|
| 1. Sangerfield River | 31. Larrys Creek |
| 2. Cherry Valley Creek | 32. Little Muncy Creek |
| 3. Trout Brook | 33. Marsh Creek |
| 4. Nanticoke Creek | 34. Trout Run |
| 5. Catatunk Creek | 35. Little Clearfield Creek |
| 6. Sing Sing Creek | 36. Chest Creek |
| 7. Canacadea Creek | 37. Bobs Creek |
| 8. Baldwin Creek | 38. Upper Pine Creek |
| 9. Tuscarora Creek | 39. Ninemile Run |
| 10. Choconut Creek | 40. Marsh Creek |
| 11. Apalachin Creek | 41. Pine Creek |
| 12. Wappasening Creek | 42. Sugar Run |
| 13. Hammond Creek | 43. Grays Run |
| 14. Starrucca Creek | 44. Little Pine Creek |
| 15. Snake Creek | 45. East Fork First Fork Sinnemahoning Creek |
| 16. Tomjack Creek | 46. Portage Creek |
| 17. Sugar Creek | 47. Driftwood Branch |
| 18. Crooked Creek | 48. East Branch Fishing Creek |
| 19. Lackawanna River | 49. Hicks Run |
| 20. Meshoppen Creek | 50. Baker Run |
| 21. Tioga River | 51. Moose Creek |
| 22. Long Run | 52. Kettle Creek |
| 23. South Branch Tunkhannock Creek | 53. Young Womans Creek |
| 24. Little Mehoopany Creek | 54. Hunts Run |
| 25. West Branch Pine Creek | 55. West Creek |
| 26. Elk Run | 56. West Branch Susquehanna River |
| 27. Loyalsock Creek | 57. East Branch Wyalusing Creek |
| 28. Blockhouse Creek | 58. Pleasant Stream |
| 29. Bowman Creek | |
| 30. Kitchen Creek | |



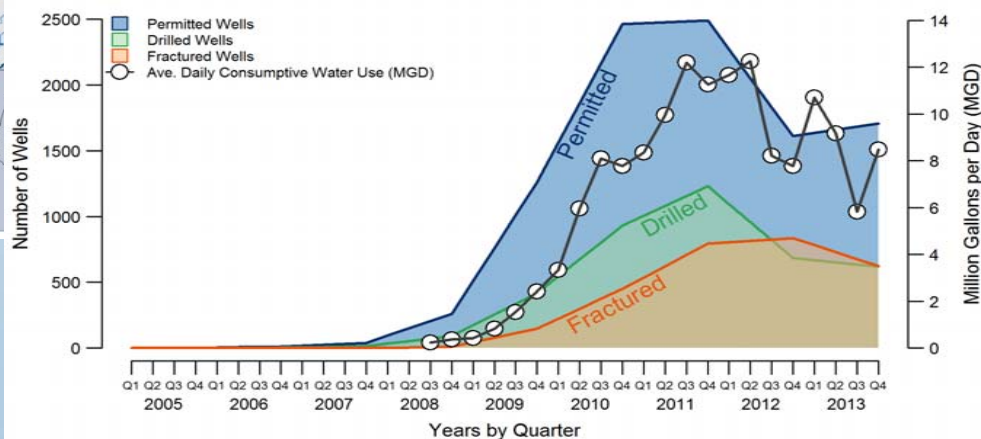
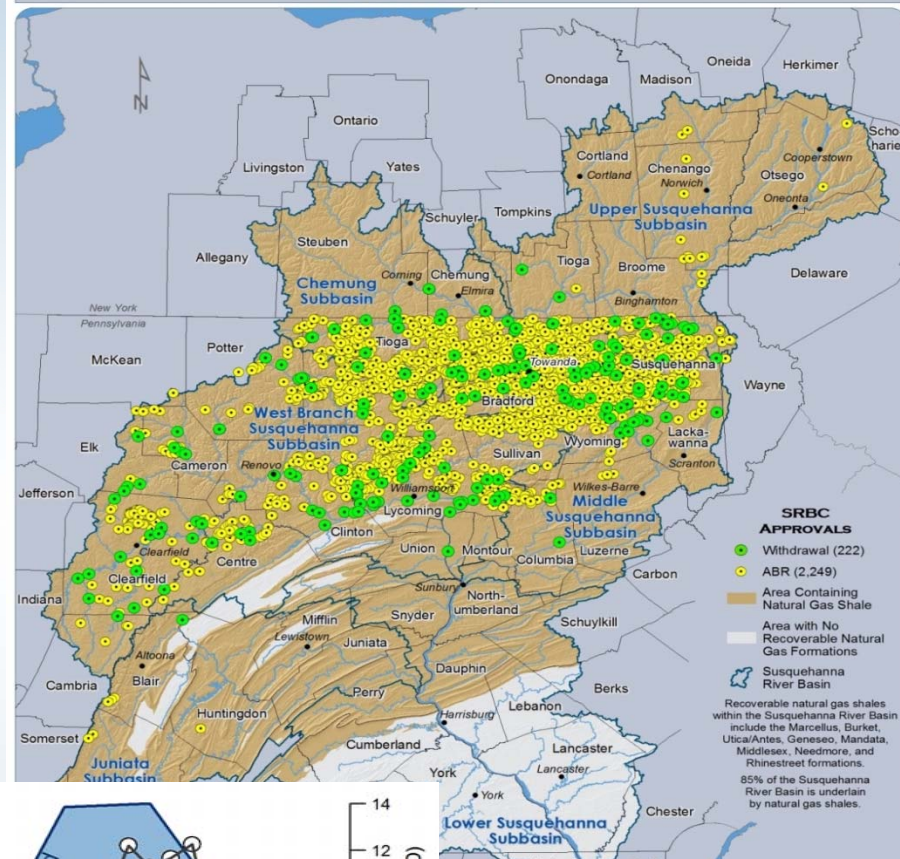
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Purposes Only; SRBC (1451h) 01-23-2013



NATURAL GAS RELATED WATER WITHDRAWALS AND ABR APPROVALS in the Susquehanna River Basin, 2008-2009



NATURAL GAS RELATED WATER WITHDRAWALS AND ABR APPROVALS in the Susquehanna River Basin, 2008-2013



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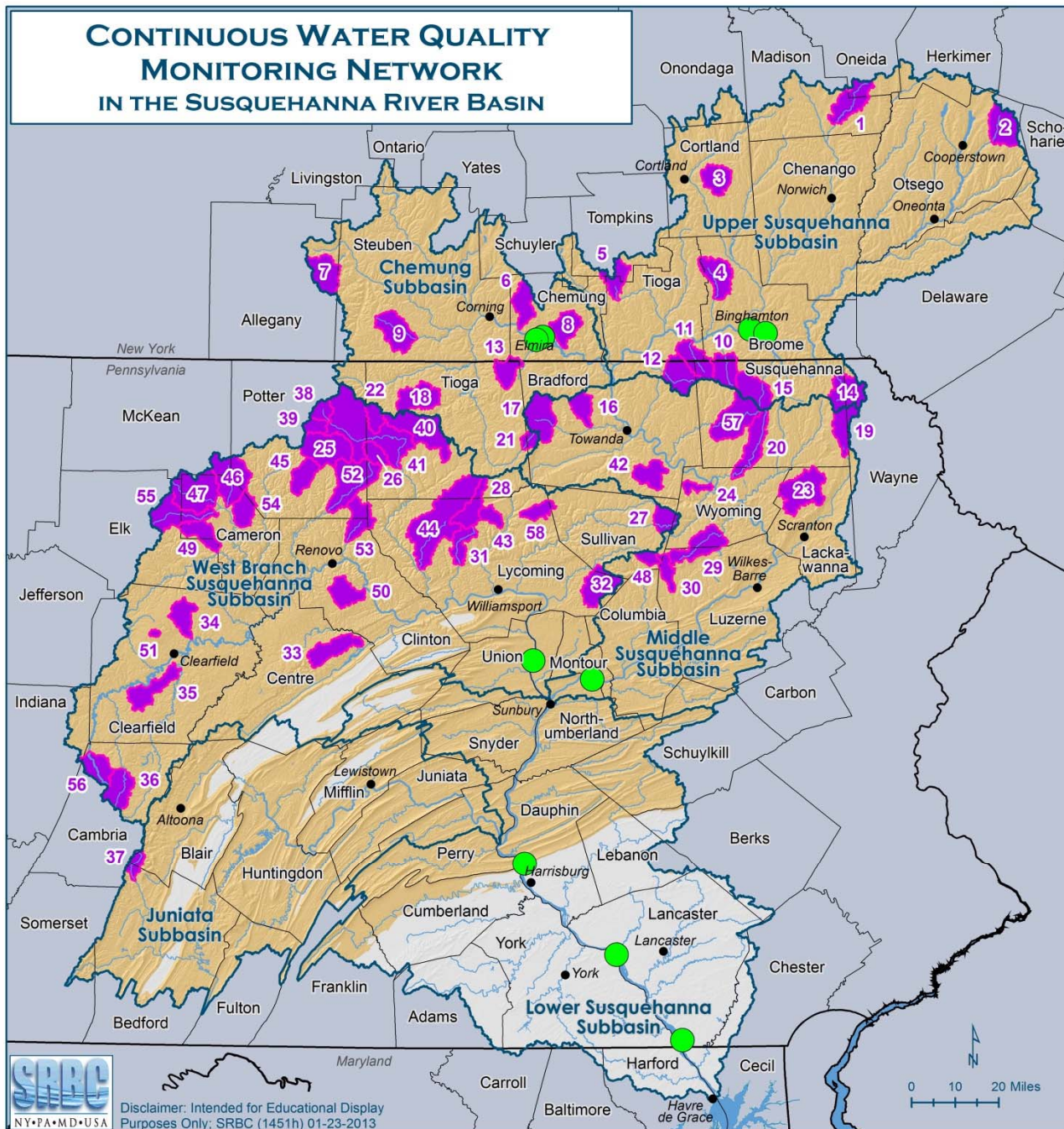
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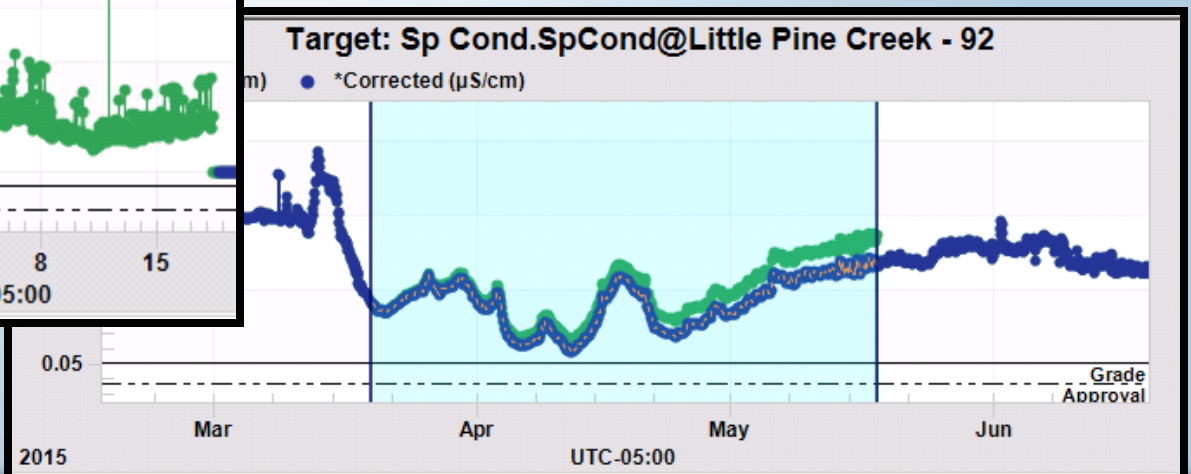
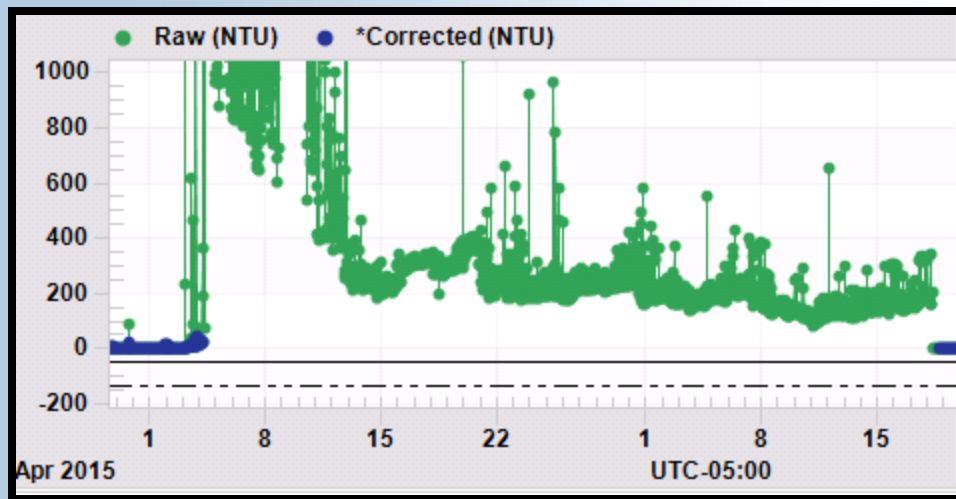


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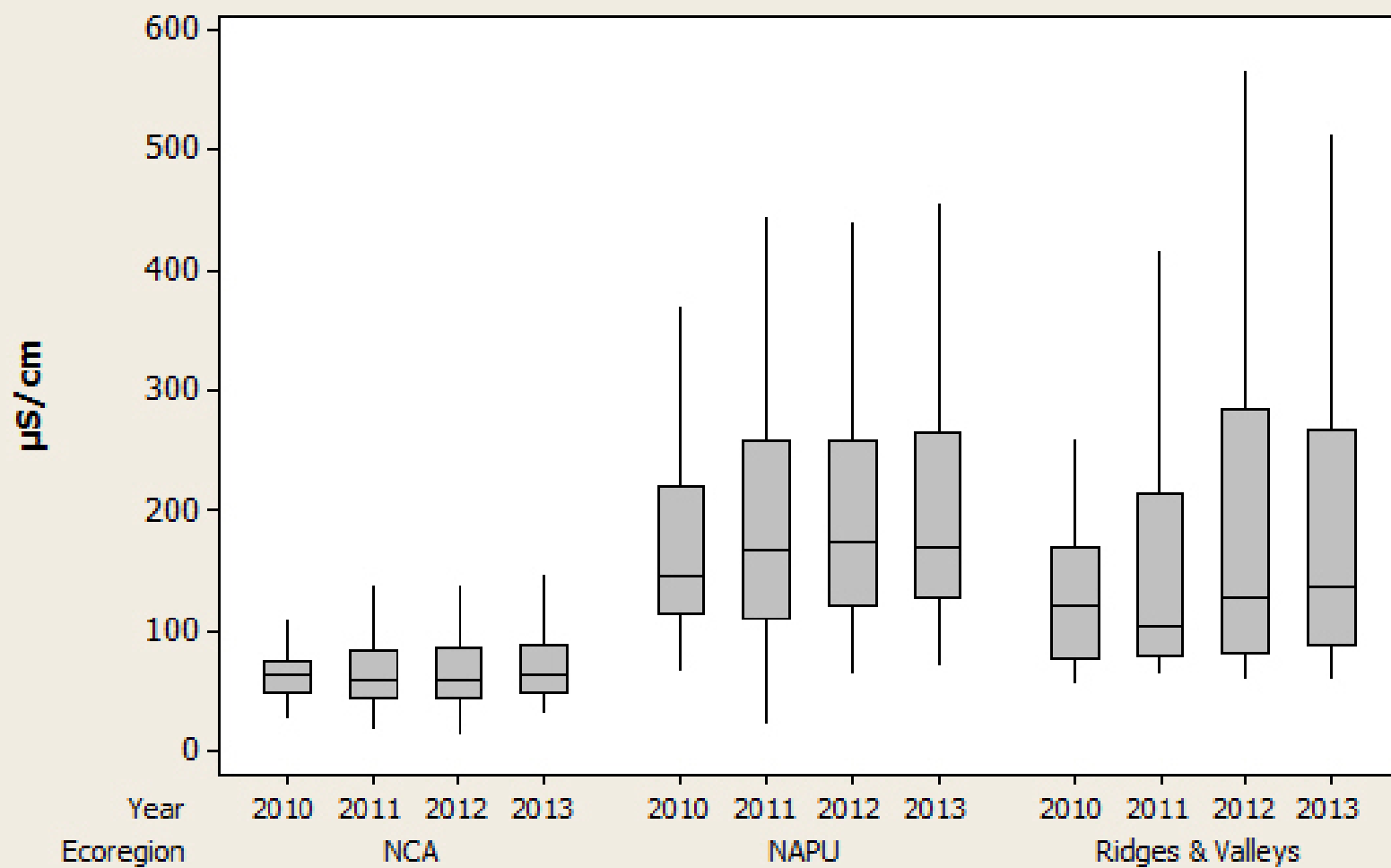


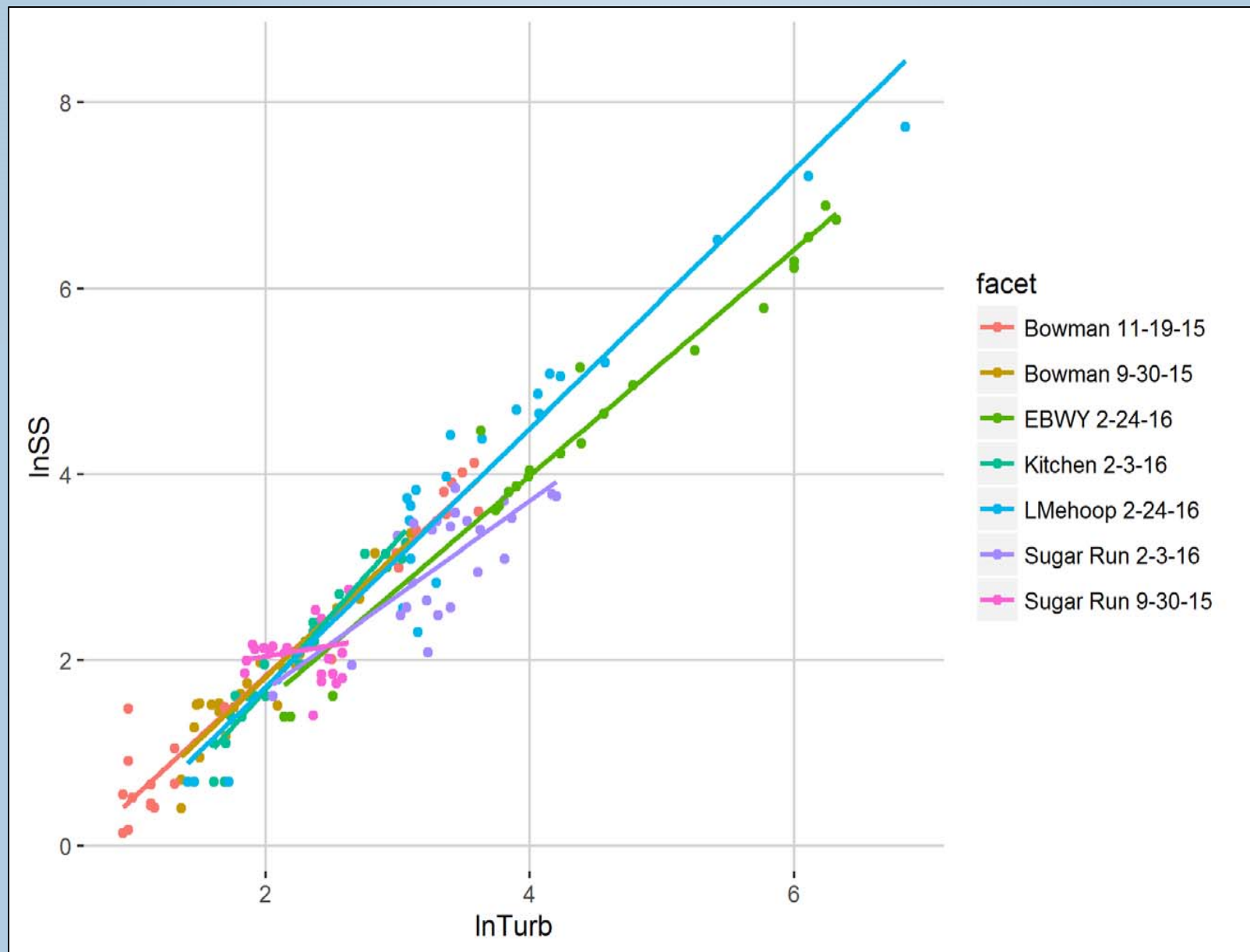
Data Challenges

- Data volume
- Suspect data
- Correcting for equipment fouling and drift



Specific Conductance by Ecoregion and Year





Supplemental Sampling

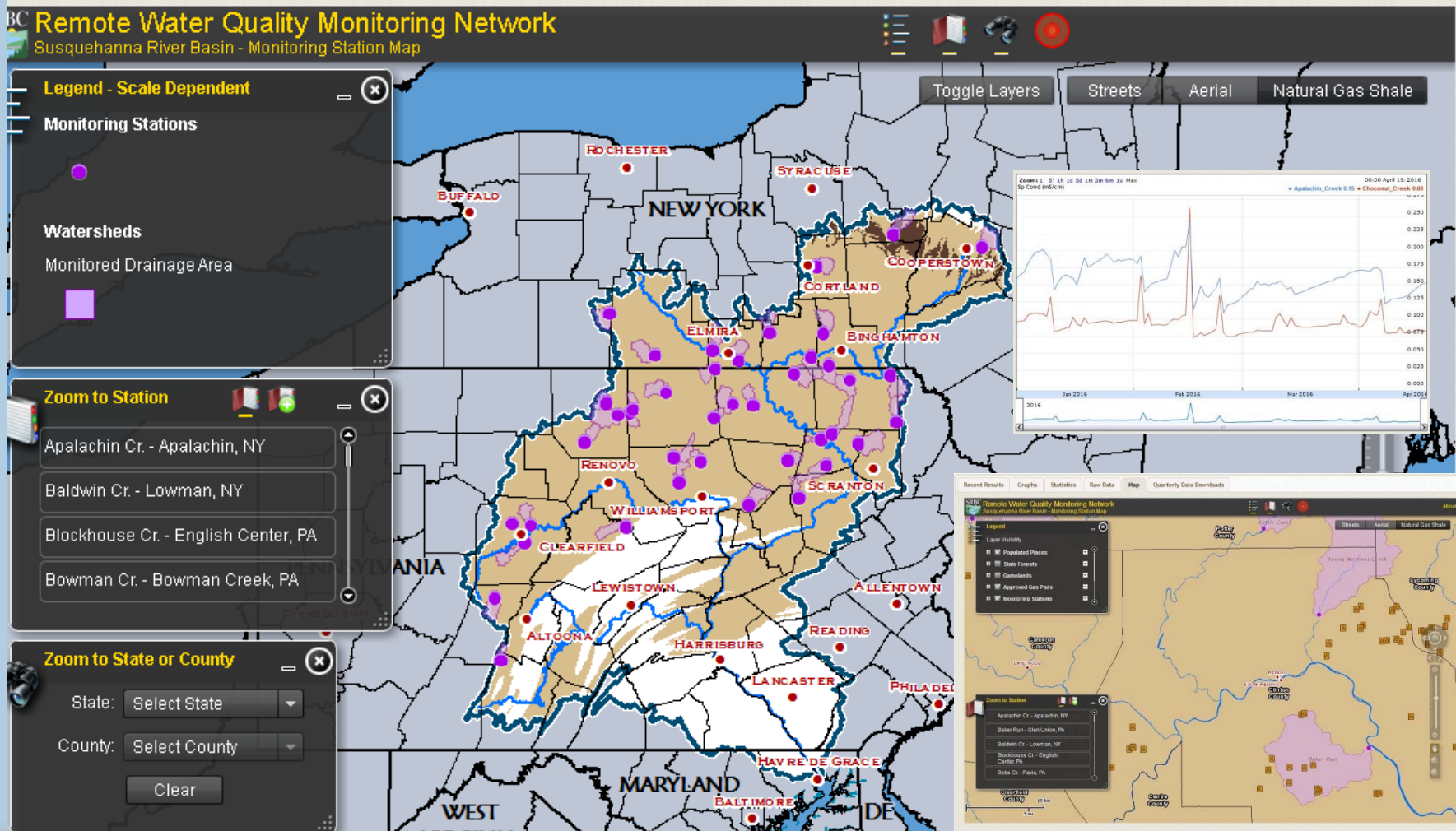
- Stream flows/levels
- Lab water chemistry
- Aquatic Insects
- Habitat
- Fish



Acidity	Chloride
Alkalinity	Bromide
Carbonate Alkalinity	Carbon Dioxide
Bicarbonate Alkalinity	Total Dissolved Solids
Barium	Total Organic Carbon
Aluminum	Sulfate
Calcium	pH
Magnesium	Specific Conductance
Sodium	Nitrate
Potassium	Phosphorus
Strontium	Gross Alpha
Lithium	Gross Beta

Real-Time Data Access on the Web

www.srbc.net/programs/remotenetwork.htm



Susquehanna River Basin Commission

www.srbc.net

Data Use/Applications

- Drinking Water Protection
- Water Quality Tracking
- Sustainable Water Use
- Climate Change
- Habitat Alteration
- Better Science and Partnerships
- Public Outreach and Education

