

Connecting The Dots - Developing Stormwater Networks For 18 MS4s



Jim Hall

Thursday October 19, 2017

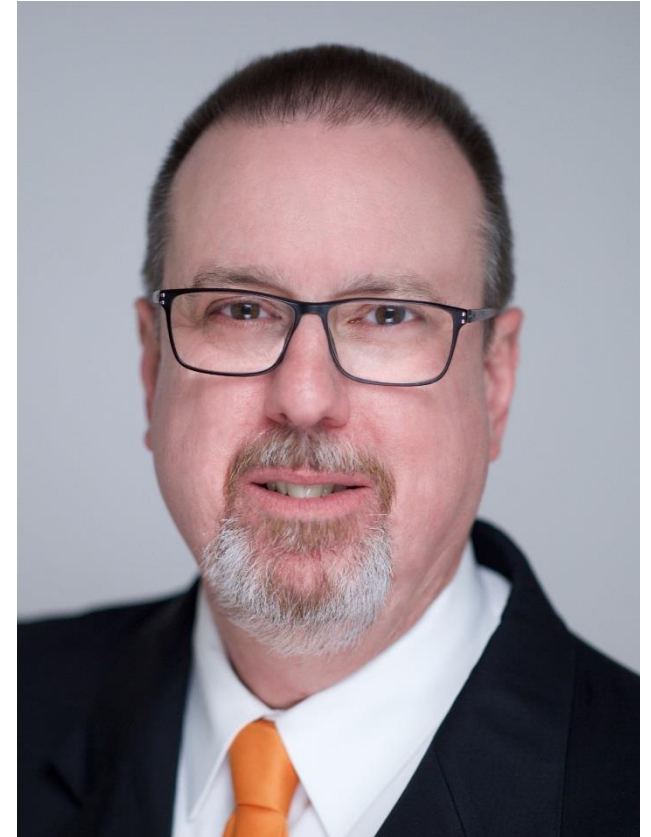


Agenda

- About me
- Overview of stormwater management regulations
- Why is mapping required?
- Problems, and a solution
- Case study – Sleepy Hollow Mapping Consortium
- Lessons learned

About Me

- Jim Hall, GISP, PMP, CSM, PCP
- Vice President Strategic Accounts
- Bowne Management Systems, Inc.
- Based in the New York City area
- Focused on delivering technology solutions that improve operations, planning and strategic decision making



Stormwater Management

- Amendments to the 1987 Clean Water Act created EPA regulations
- That address stormwater issues that impact water quality
- Applicable to every “municipal separate storm sewer system” (MS4)

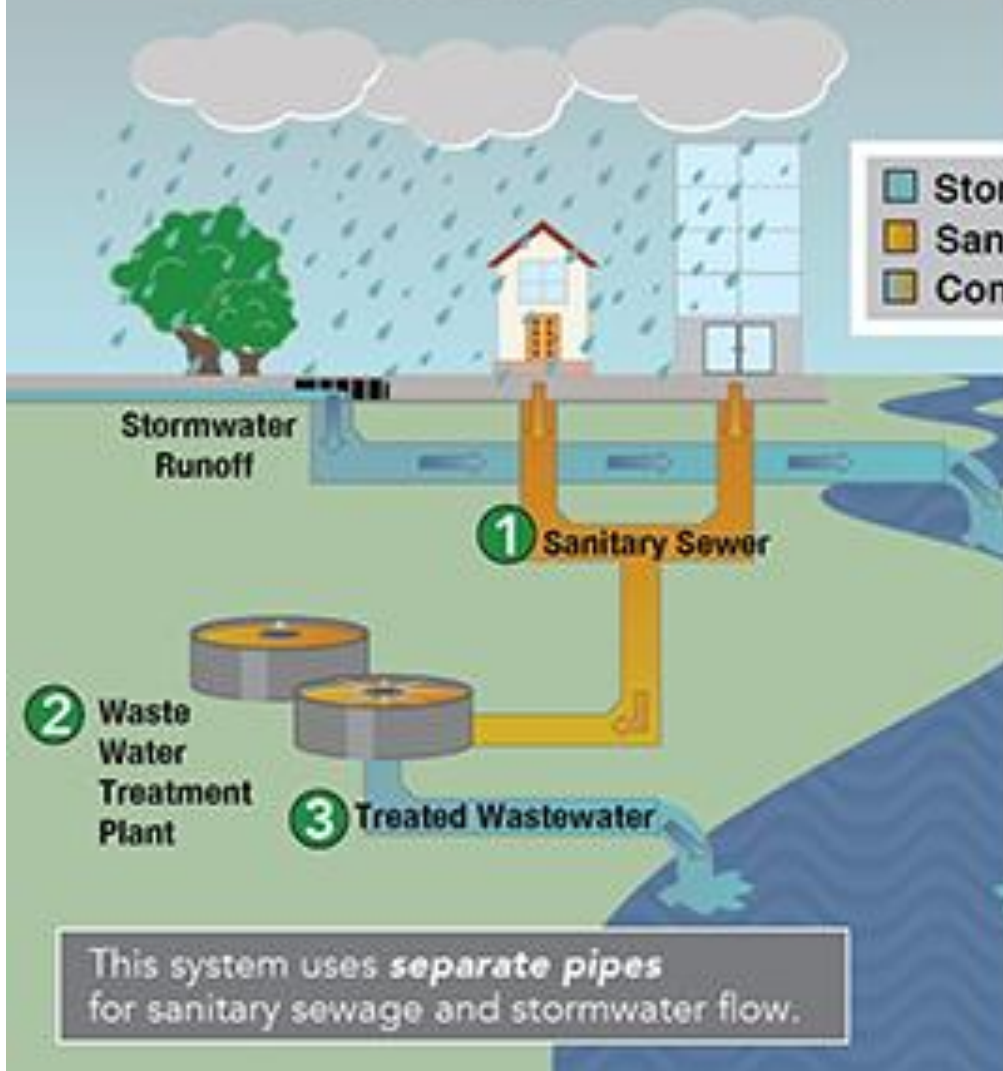




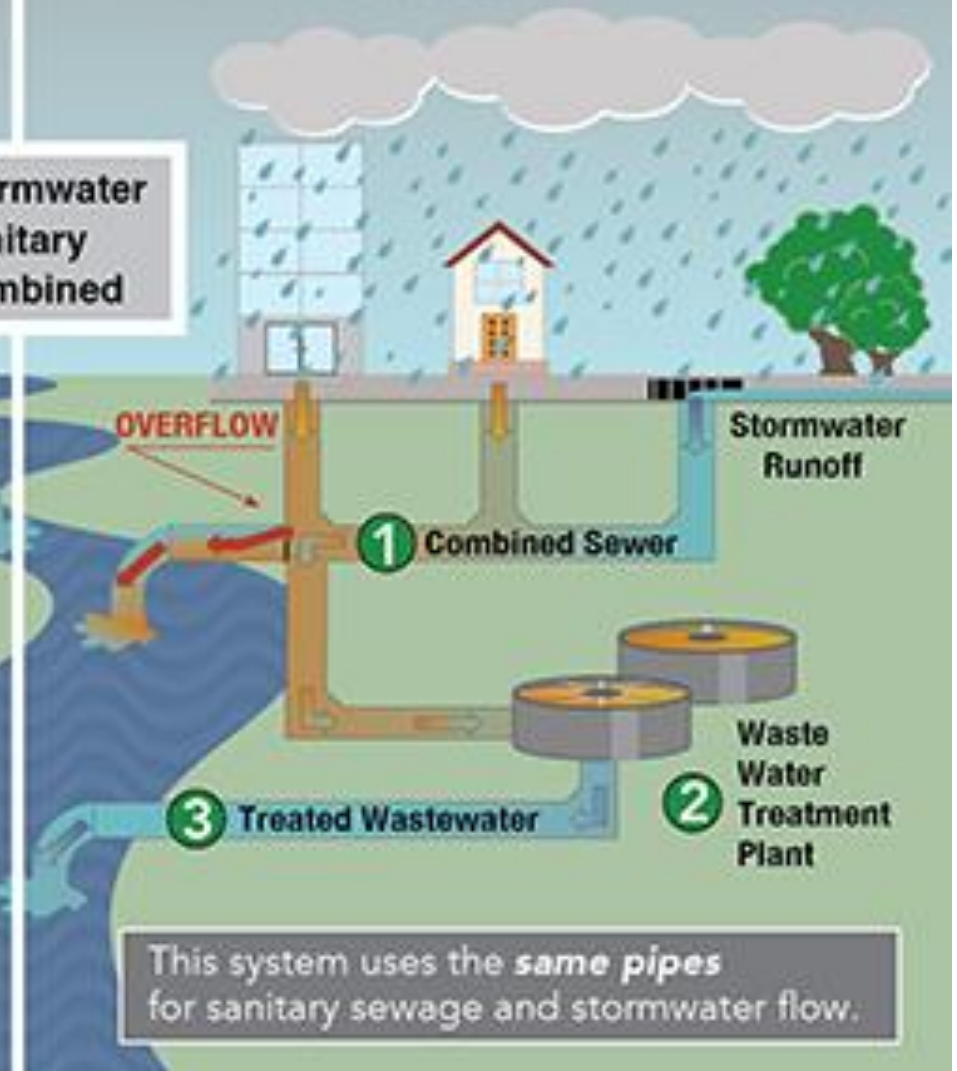
A MS4 Is:

- A system of conveyances (incl. catch basins, pipes, ditches)
- Owned by a public entity (e.g. town) that discharges to waters of the United States
- Not part of a Publicly Owned Treatment Works (sewage treatment plant)
- Not a combined sewer system (CSO)

MS4 MUNICIPAL SEPARATE STORM SEWER SYSTEM

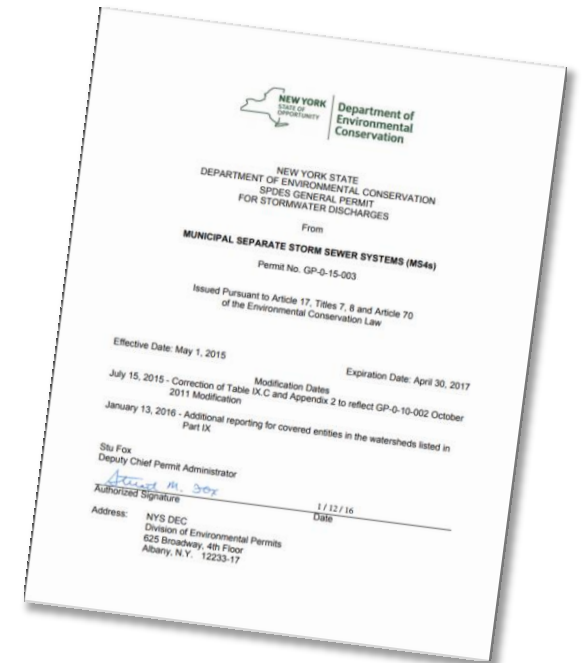


CSS COMBINED SEWER SYSTEM



MS4 Regulation in New York

- The DEC is the EPA's agent
- Discharges must be authorized in accordance with a permit
- The DEC has issued the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges for all NY MS4s
- Each MS4 must develop a stormwater management program, which has six components, that are the minimum control measures (MCMs)



The Six Minimum Control Measures

1. Public education and outreach
2. Public participation/involvement
3. Illicit discharge detection and elimination (IDDE)
4. Construction site runoff control
5. Post-construction runoff control
6. Pollution prevention/good housekeeping

Why Is Mapping Required?

1. Public education and outreach
2. Public participation/involvement
3. Illicit discharge detection and elimination (IDDE)
4. Construction site runoff control
5. Post-construction runoff control
6. Pollution prevention/good housekeeping

Needed: IDDE Track Down

- The third MCM requires the MS4 to develop, implement and enforce a plan to detect and eliminate illicit discharges



- This requires mapping the system

DEC's Mapping Expectations

1. Outfalls
 2. Catch basins and manholes
 3. Pipes with flow direction
- Impaired waters
- Stormsheds
- Outfall photo(s), type, size, material
- BMPs, incl. description
- Municipal facilities
- Land use



Challenges for MS4s

- Fiscal constraints
- Limited staff
- Existing staff may not know the system well
- May lack relevant knowledge and/or technology
- Want to avoid potential fines



The Path of Least Resistant

- Team with others
- Use NYS DEC grant funding
- Bring in experts
- Get it done
- For free.



Case Study: Sleepy Hollow Mapping Consortium

- 18 MS4s teamed to chase three rounds of DEC grant funding
- All three applications were approved and three projects completed
- Village of Sleepy Hollow has been lead for all three phases
- All participating MS4s are in Westchester County, New York

The Phase 2 Project (1 of 4)

- Started in 2012
- Teams of one contractor with one municipal employee
- All features accurate to +/- one foot horizontal
- Common data model



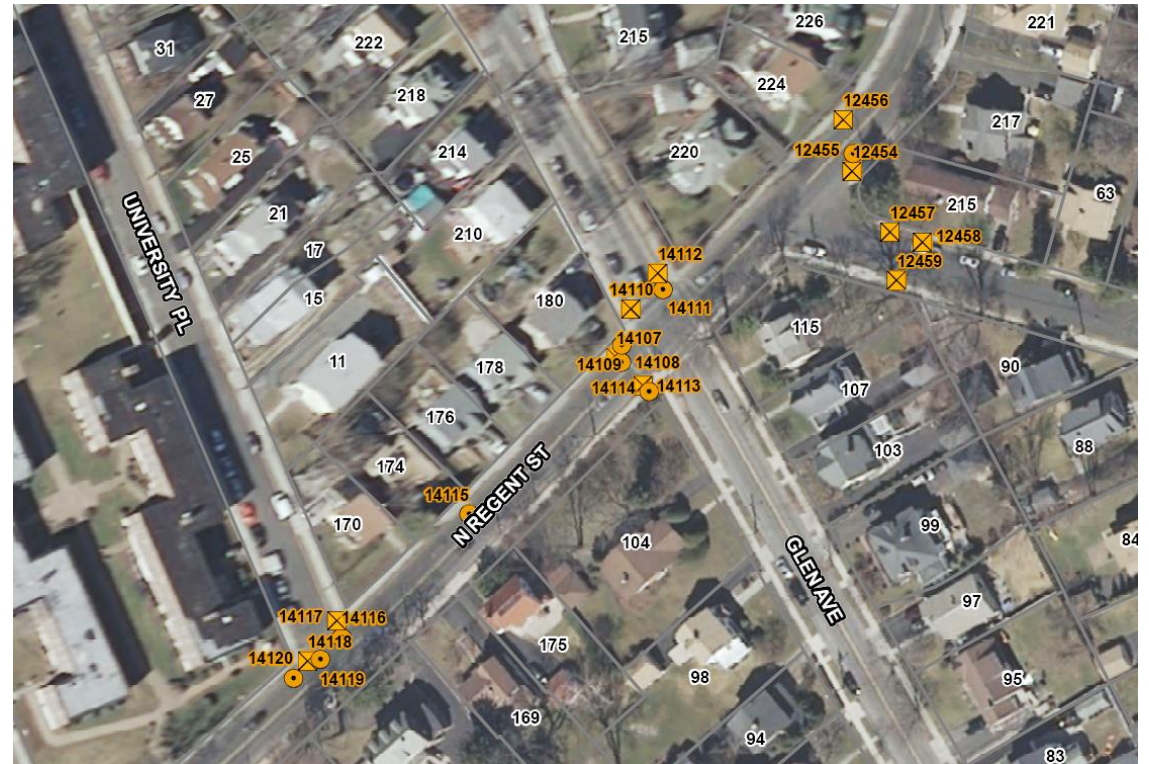
The Phase 2 Project (2 of 4)

- 21,000 features captured
- Single integrated ID scheme
- Took 18 months to complete
- Completed in 2013



The Phase 2 Project (3 of 4)

- Products included:
 - Hardcopy maps
 - PDF maps
 - File geodatabase, shapefile, DWG
- Data hosted on Web by County GIS Program





Sleepy Hollow Mapping Consortium
New York State
Department of Environmental Conservation
Contract No. 304394

VILLAGE
OF
PORT CHESTER

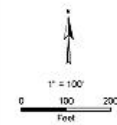


The organizations that worked together with the municipality to complete this project include:

 Westchester County New York	 Geographic Information System
 Merritt GIS Ltd 360 West 104th Pleasanton, CA 94566 914-709-3302	 Boone Management Systems, Inc. 2112 Lee Avenue Simms, NY 11521 800-540-3096

Legend

- Contour lines
- Drainage mainline
- Other structure
- Existing outfalls
- Railroad
- Parcels
- Municipal boundary
- Natural drainage polygon
- Natural drainage line



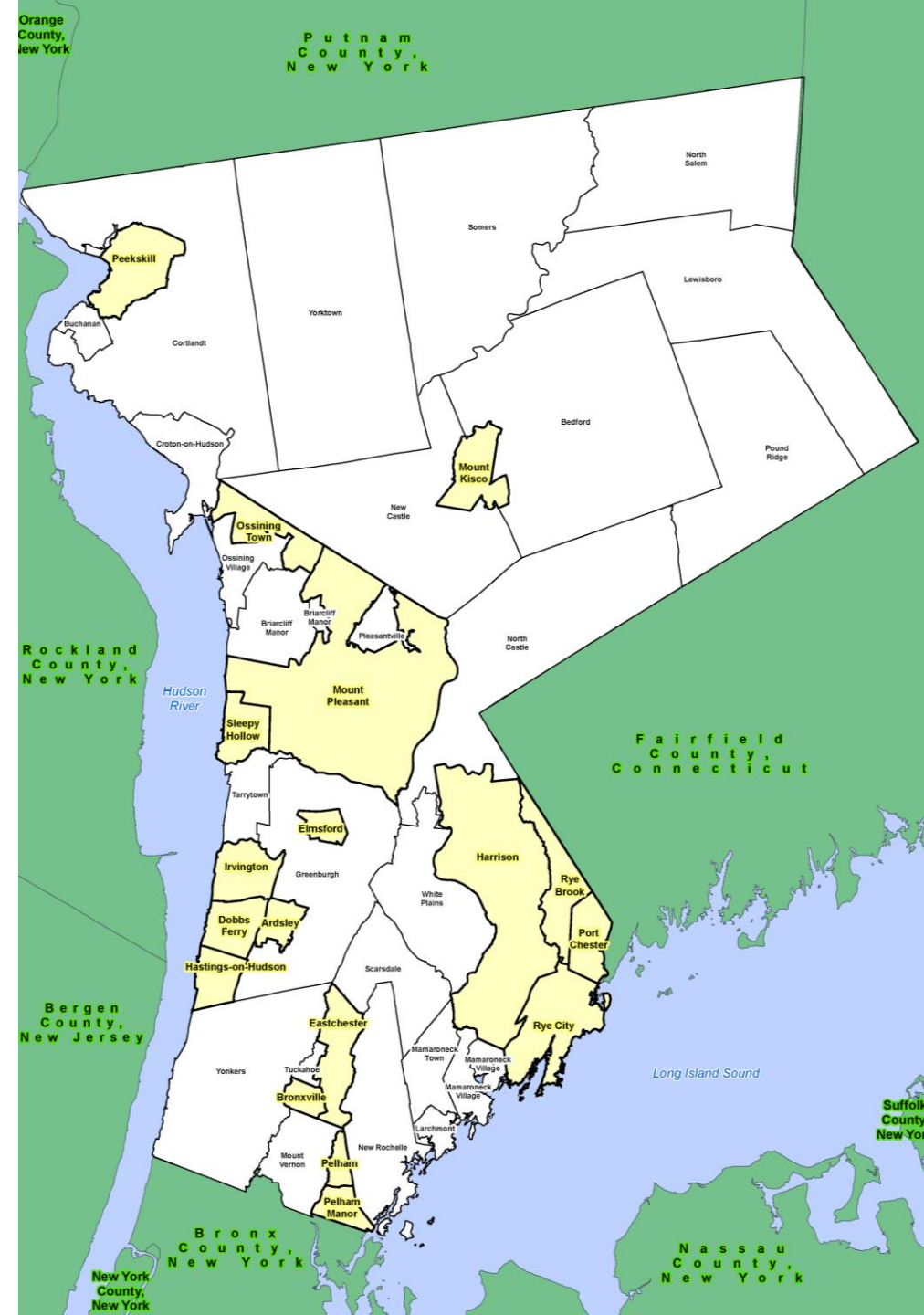
BN25

18
 Print date
 April 25, 2013

Base map data provided by Westchester County GIS, Orthorectography spring 2009

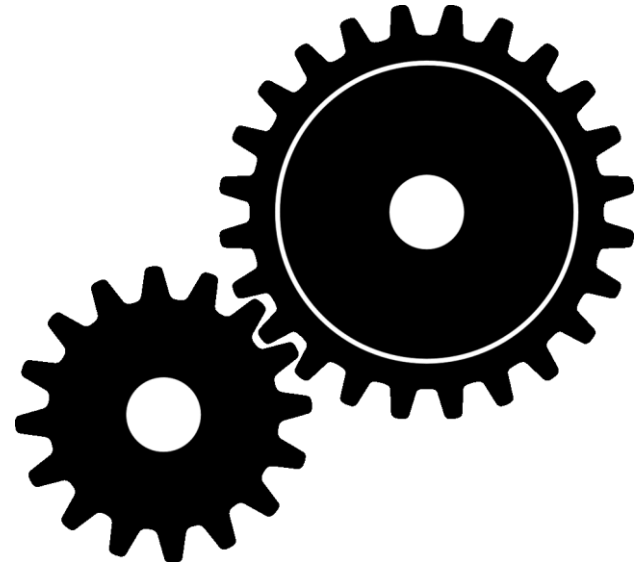
The Phase 3 Project

- Started in 2017
- Underway now
- More data, more complex
- No single solution or workflow
- We integrate all data



Work Involved

- Records research and analysis
- Hardcopy markup
- Scanning and georeferencing
- Digitizing/data entry
- Data conversion
- Field completion



Key Data Issues



Achieve complete and accurate connectivity

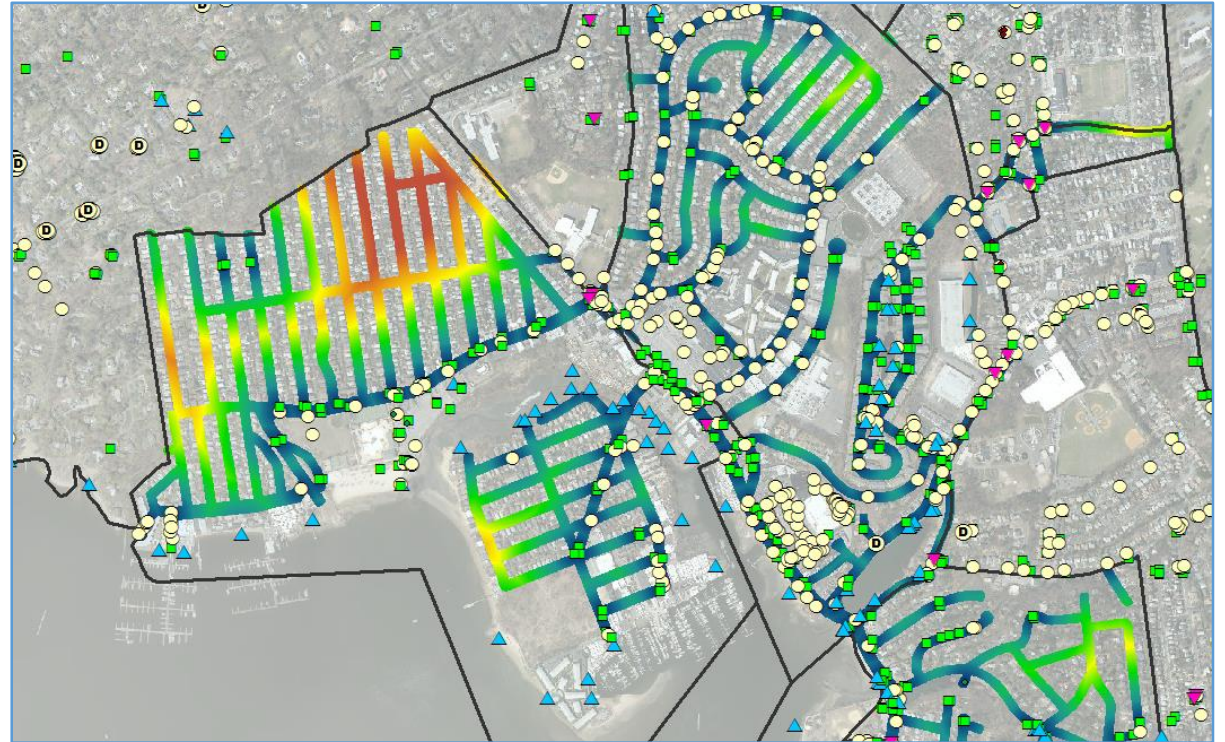
Key Data Issues (cont.)



Determine accurate flow direction

Other Data Issues

- Need to determine most definitive source
- Figure out the “real world” maintenance responsibilities
- Map all the interconnects
- Minimize field work

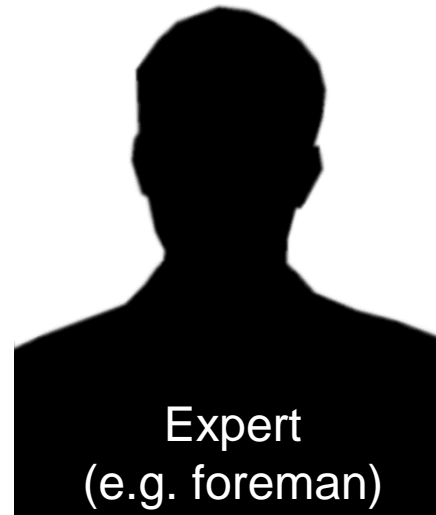
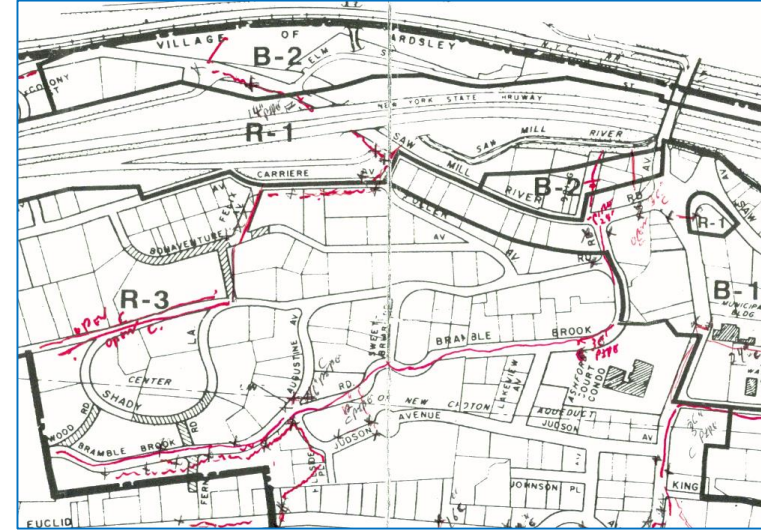
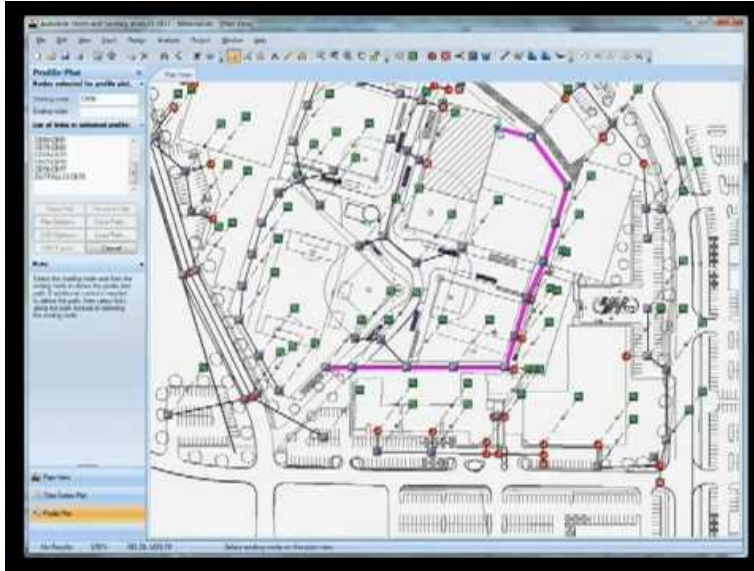


No Two MS4s Are The Same

- Each has different resources and capabilities
- We hold meeting upfront with each to identify challenges and opportunities
- Use a custom approach for each



Wide Variety of Data Sources



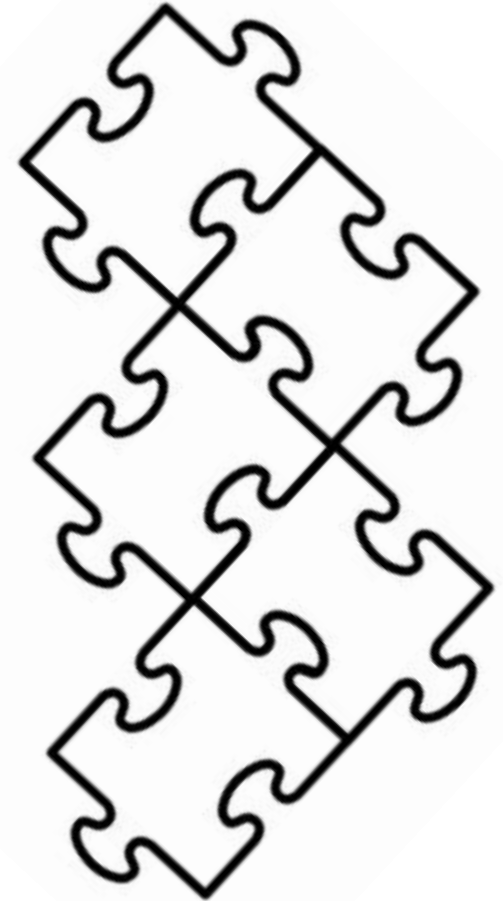
In-kind Services

- MS4s are expected to provide
- Can be:
 - Staff time (salary and benefits)
 - Vehicle usage and mileage
- Can include administrative and management time
- All must be documented appropriately



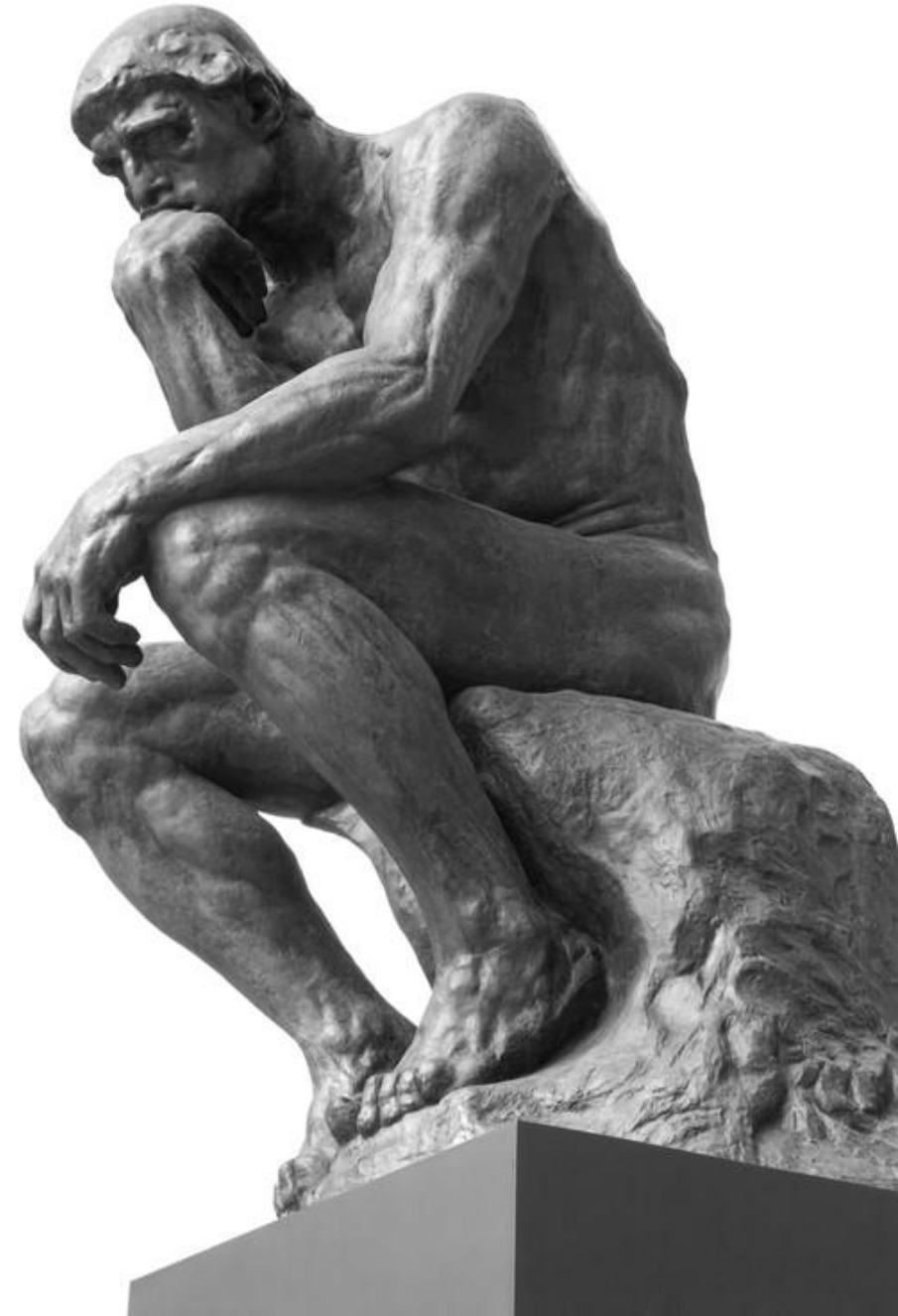
Teamwork Drives Success

- The Consortium members
- Dolph Rotfeld Engineering, P.C.
- Westchester County GIS Program
- Stellar Services, Inc.
- Bowne Management Systems, Inc.



Lessons Learned

- The DEC wants you to succeed
- Seek partners and collaborate
- Build on the work of others
- Expect that data development will take time
- Use technology to your advantage
- Be flexible and adaptive



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THANK YOU.



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