

IDDE Monitoring in Sligo Creek



Friends of Sligo Creek

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What is an Illicit Discharge?

- ▶ A discharge to an MS4 that is **not composed entirely of storm water** except permitted discharges and fire fighting related discharges
40 CFR 122.26(b)(2)
 - Unique frequency, composition & mode of entry
 - Interaction of the sewage disposal system & the storm drain system
 - Produced from “generating sites”



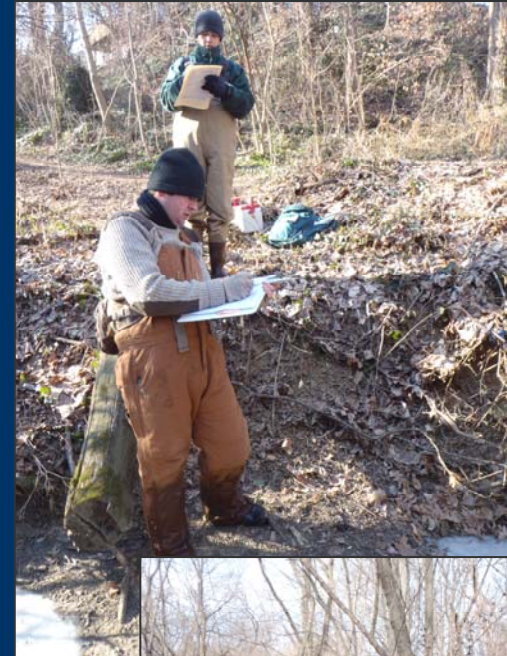
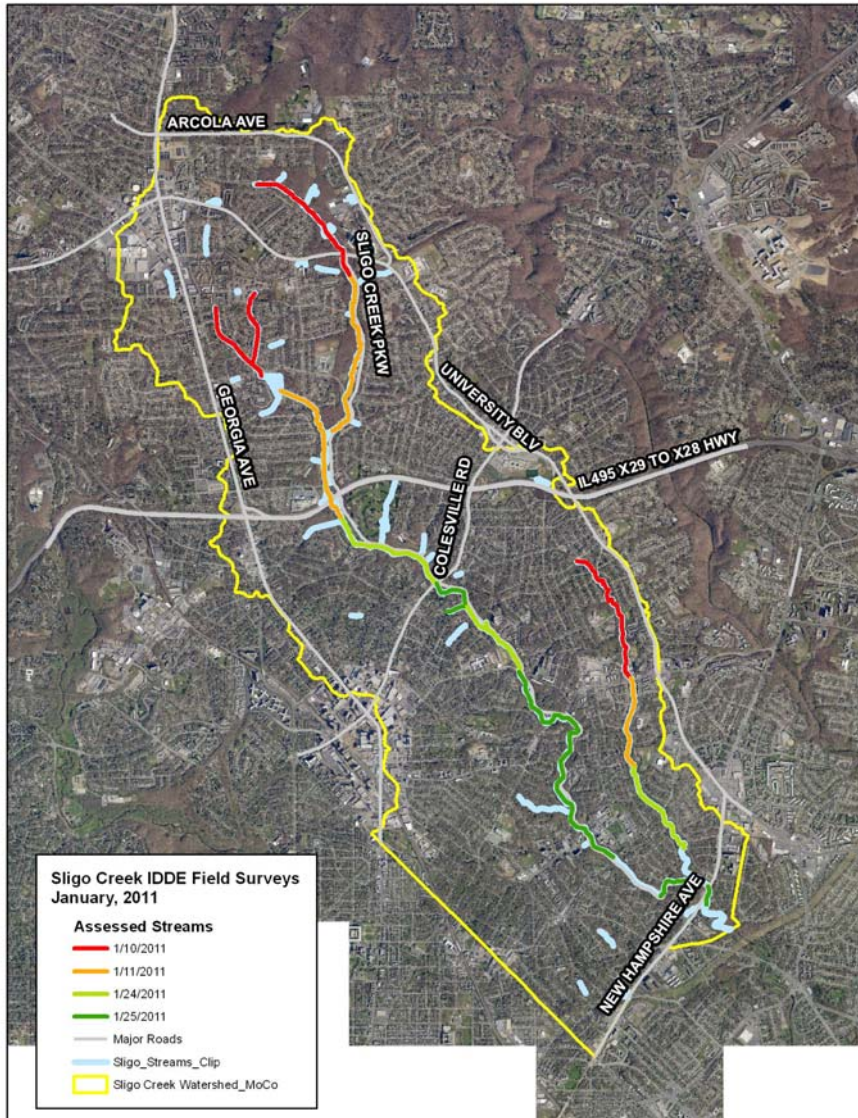
Regulatory Context

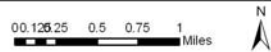
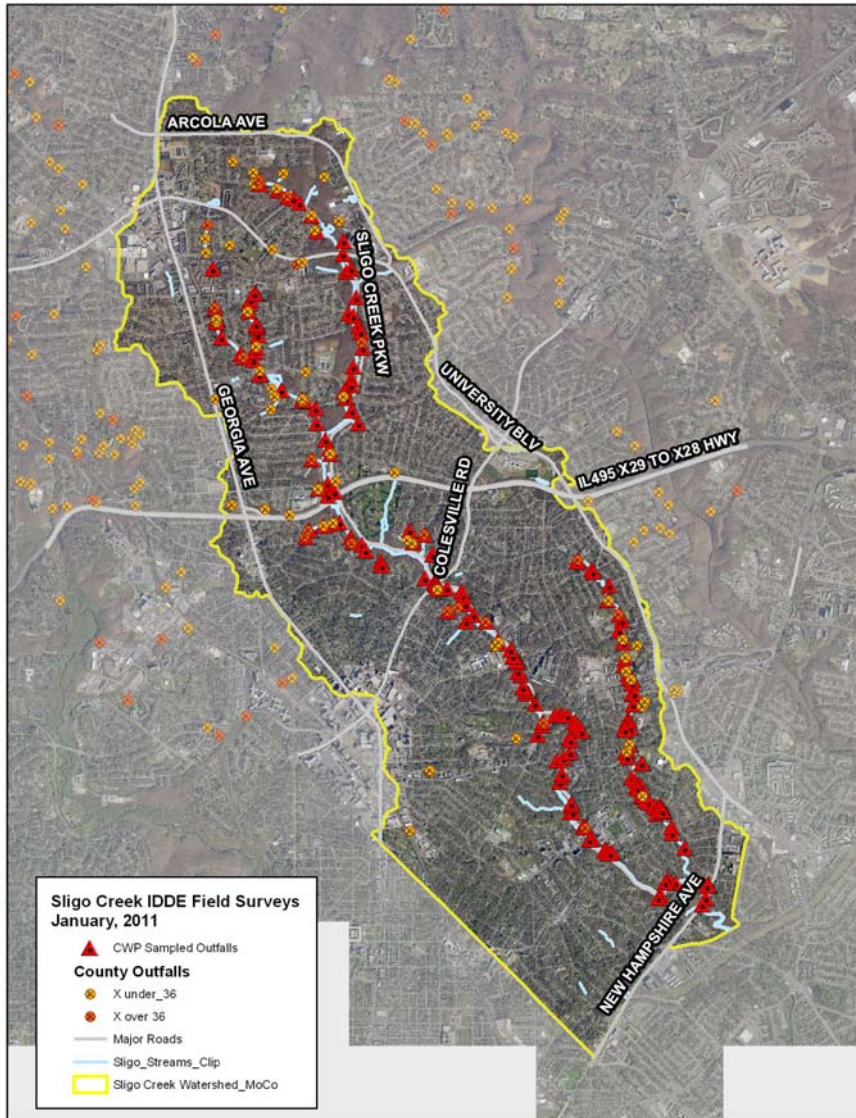
- ▶ Illicit discharges are regulated under Phase II MS4 permits as one of the six Minimum Measures
- ▶ Communities must develop a means for regulating illicit discharges, a plan to address them, education strategies and measurable goals



Discharge Frequency

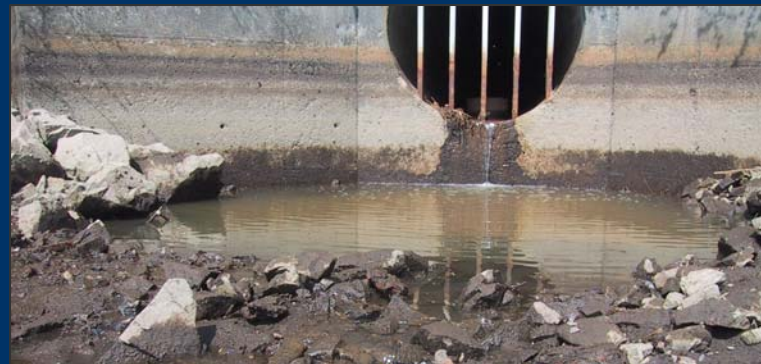
- ▶ **Continuous discharges**
 - Occur *most or all of the time*
- ▶ **Intermittent discharges**
 - Occur over a *shorter period of time* (e.g., a few hours per day or a few days per year)
- ▶ **Transitory discharges**
 - *Occur rarely*, usually in response to a singular event such as an industrial spill, ruptured tank, sewer break, transport accident or illegal dumping episode





Outfall Reconnaissance Inventory (ORI) Qualitative Assessment

- ▶ Outfall Damage
- ▶ Deposits/Stains
- ▶ Abnormal Vegetation
- ▶ Poor Pool Quality
- ▶ Pipe Benthic Growth



Outfall Reconnaissance Inventory (ORI) Quantitative Assessment

	Parameters Analyzed
In the field	Ammonia
Sample 1	Fluoride
	Anionic Surfactants
	Potassium
Sample 2	Total Nitrogen
	Total Phosphorus
Sample 3	E. coli and Total coliform



Field Work Summary

- ▶ Four days in the field throughout January, 2011
- ▶ 10 miles walked in Sligo Creek in Montgomery County
- ▶ 213 outfalls assessed
- ▶ 4 In-stream measurements
- ▶ 14 volunteers contributed 114 hours over field sampling period



Outfall Summary

- ▶ Flowing outfalls: 58/213 (27%)
- ▶ Mapped outfalls: 45/213 (21%)
- ▶ Overall hits for flowing outfalls: ~80%
- ▶ Field hits for ammonia (>0.1 mg/l): 35/58 (60%)
- ▶ Hits for fluoride (>0.25 mg/l): 17/58 (29%)
- ▶ Hits for detergents (>0.25 mg/l): 24/58 (41%)
- ▶ Storm drain investigations: 23

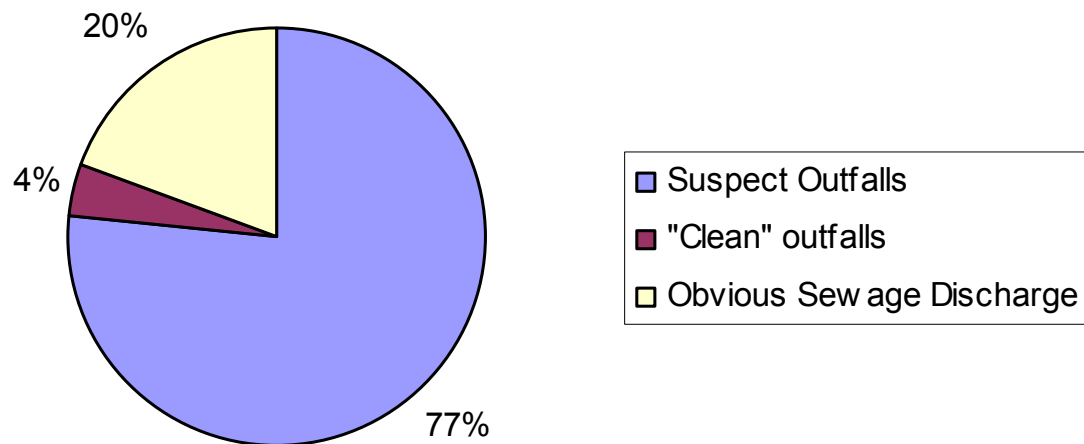


Bacteria – E. coli and Total Coliforms

- ▶ Outfalls with E. coli above EPA threshold for contact recreation (235 CFU/100ml): 14/58 (24%); range – up to 26,000 CFU/100ml
- ▶ Outfalls with total coliform >235 CFU/100ml: 38/58 (66%); range – up to 30,000 CFU/100ml

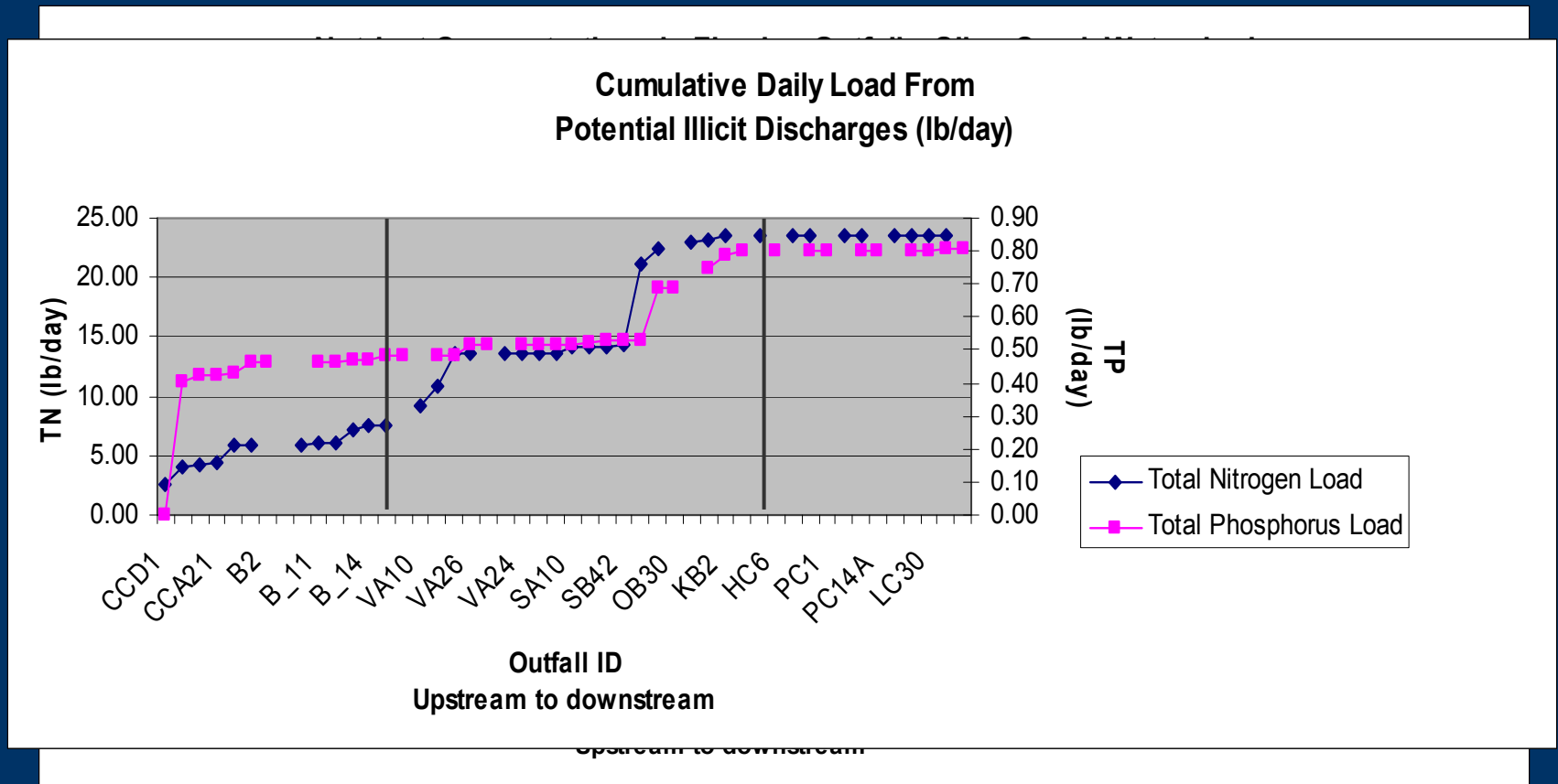


Percentage of Total E.coli in Sligo Creek Outfalls

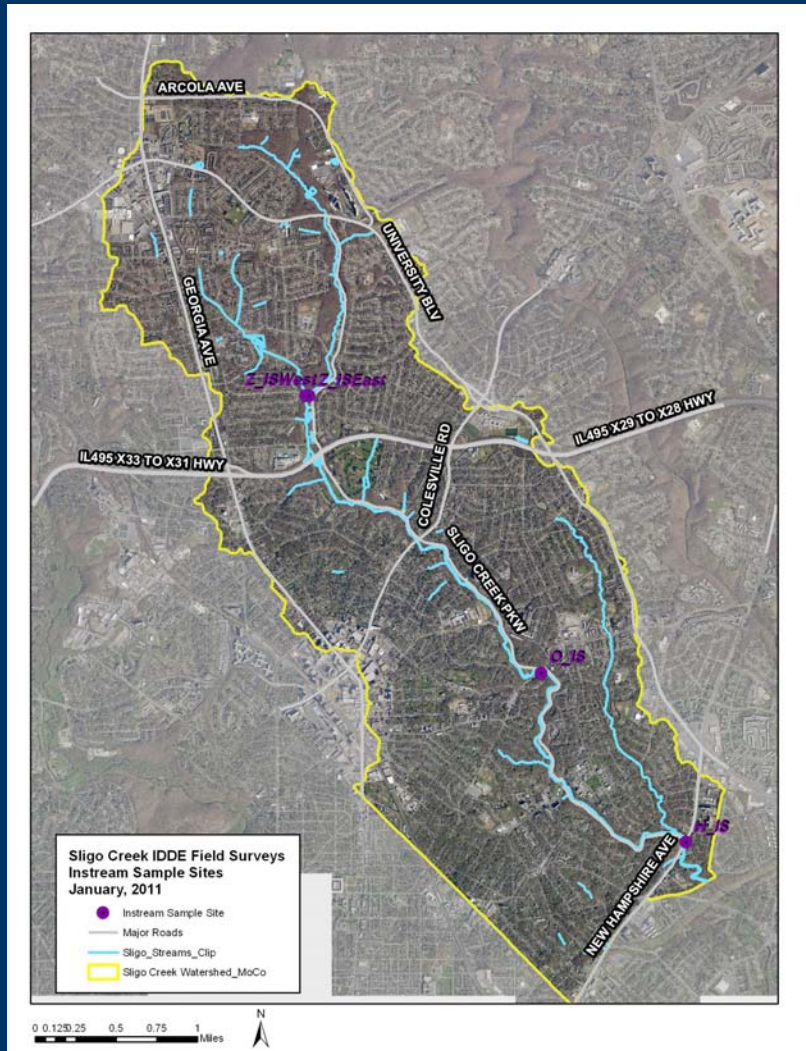


Nitrogen & Phosphorus

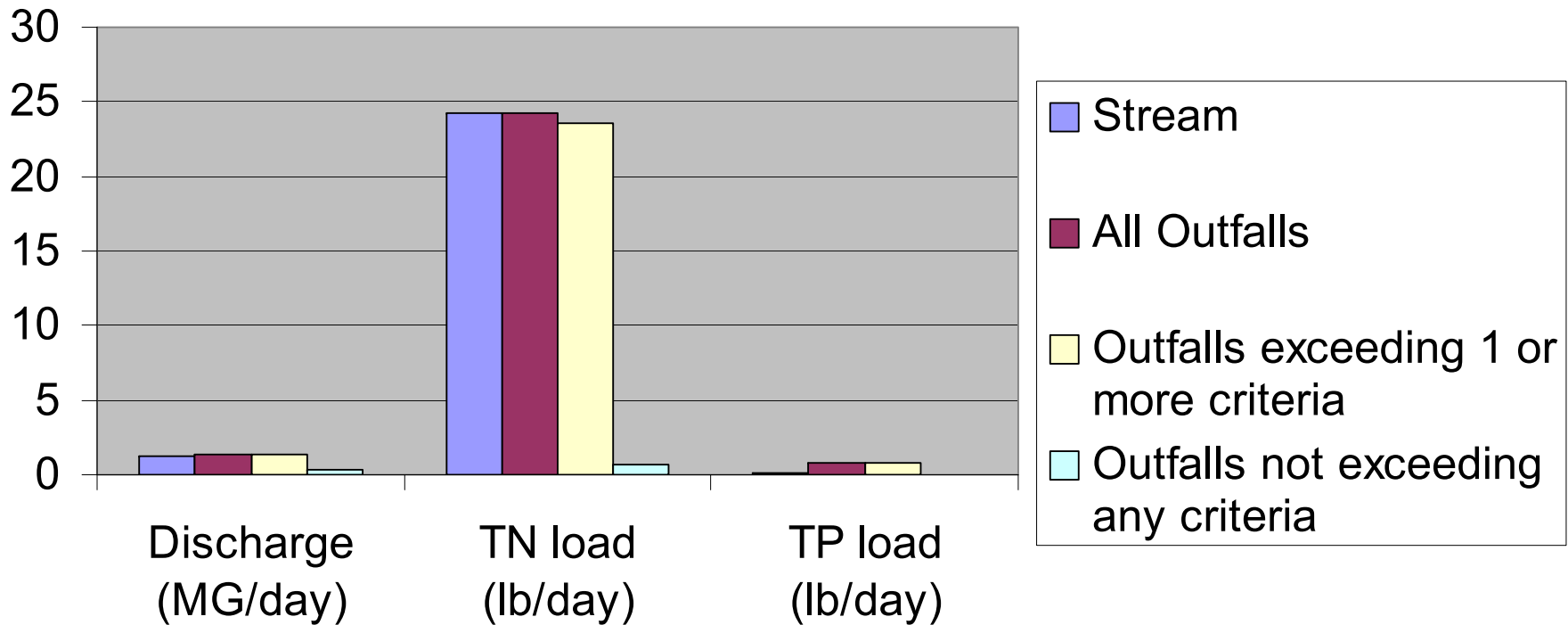
- ▶ Total nitrogen range: 0.645-9.744 mg/l
- ▶ Total phosphorus range: 0.001-0.899 mg/l



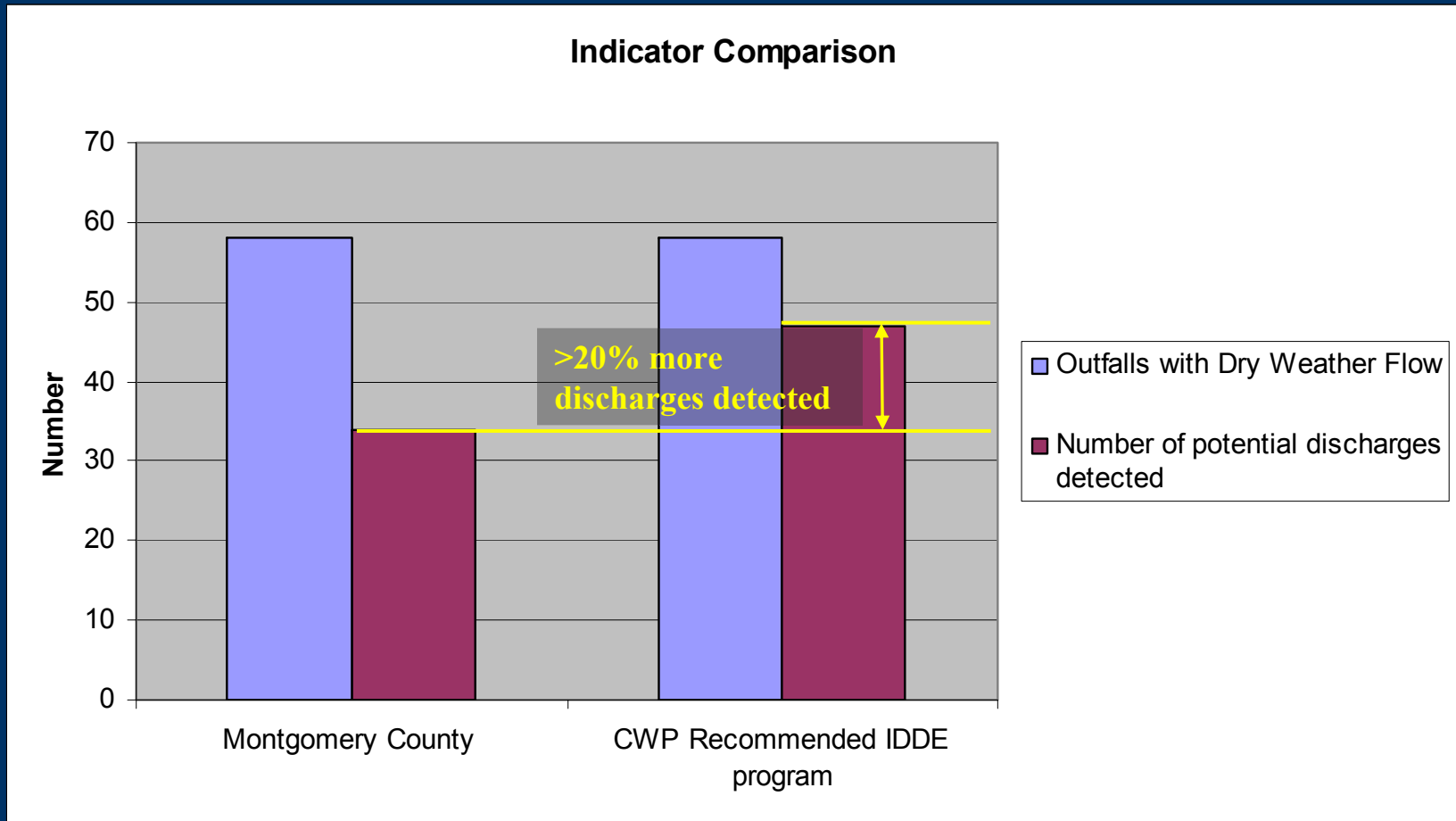
In-stream Sampling – 4 sites



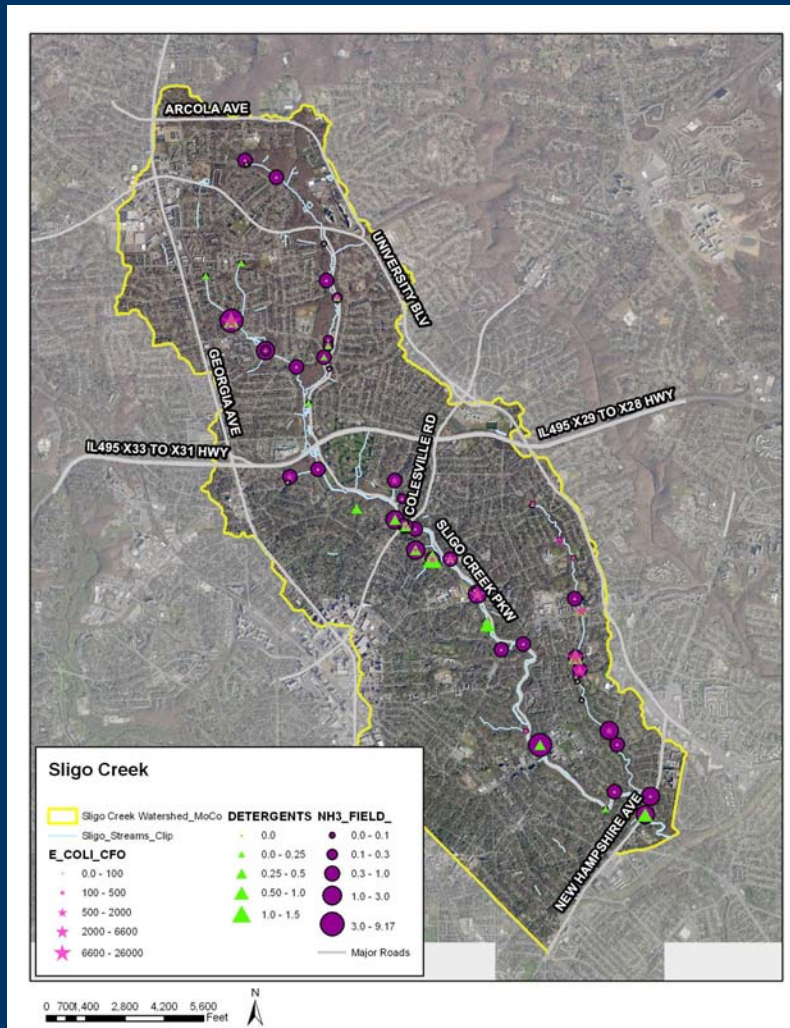
Sligo Creek Watershed Summary

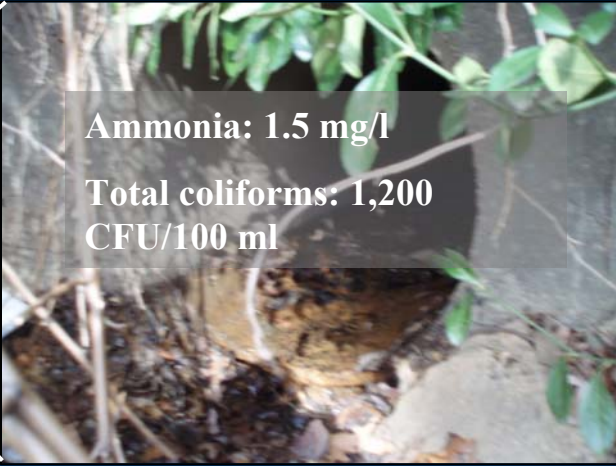
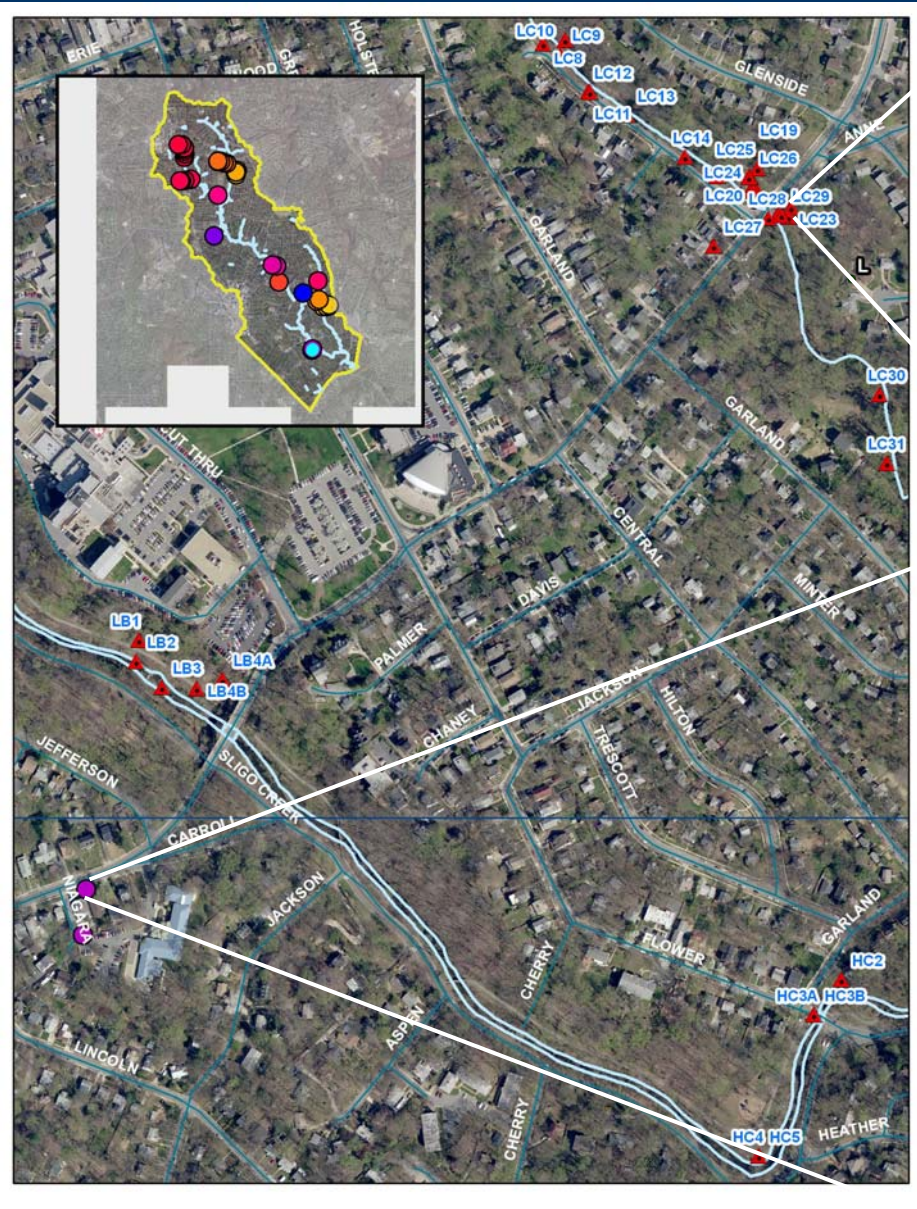


Illicit Discharge Indicators



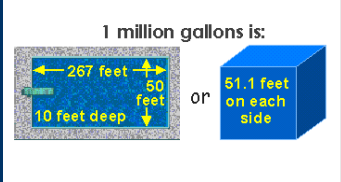
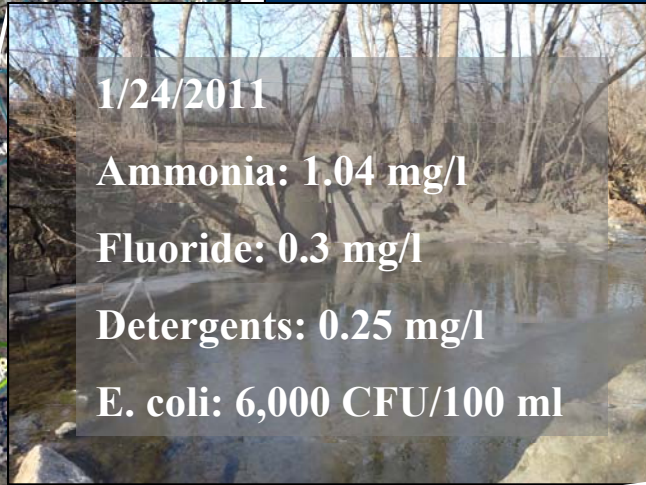
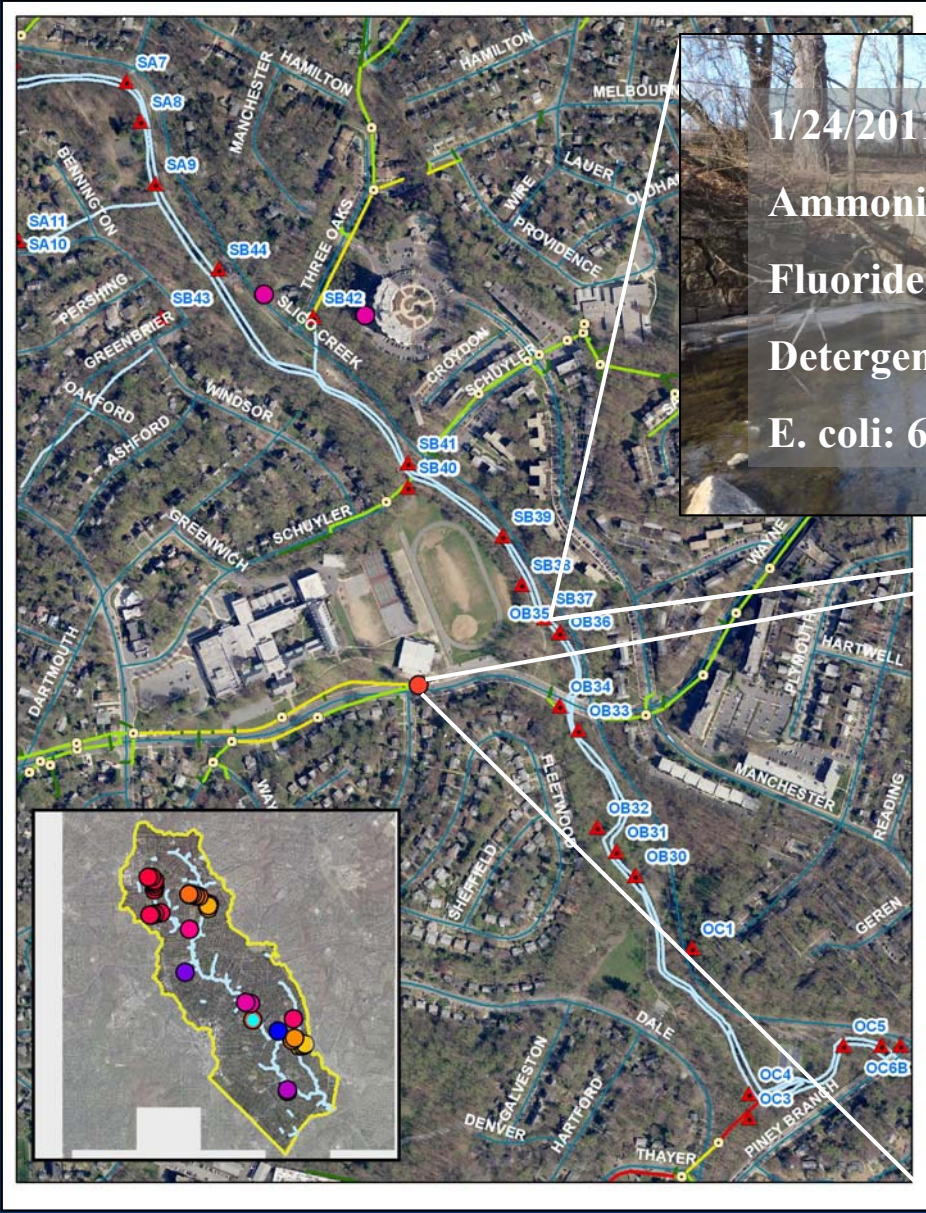
Storm Drain Investigations





Ammonia: 1.5 mg/l
 Total coliforms: 1,200
 CFU/100 ml

- Tracking team visited wrong site, however, they found two other illicit discharges
- Manhole investigation revealed a likely direct connection between a rehab center and the storm drain (ammonia: 0.87 mg/l; lab QC: OR)
- Detected additional flow from 7513 Carroll Ave; discharge traveled via the street and appeared to be from a sump pump although frequency was high for a sump pump
- Field ammonia: >1 mg/l and lab QC: OR



- Four site visits to this outfall
- Dye testing in school and video inspection revealed no connections
- Two sources of flow identified from Mansfield and between Mansfield and Dale on Wayne
- TN – 6.9 lb/day; TP – 0.16 lb/day
- Cumulative load as of 7/20/2011 = 1,000 lbs + ? TN & 23 + ? Lbs TP
- 38 million gallons + ?



1/10/2011
 Ammonia: 3.62 mg/l
 Potassium: 31 ppm
 Detergents: 0.75 mg/l
 E. coli: 13,000 CFU/100 ml
 Flow: 32,344 gallons/day

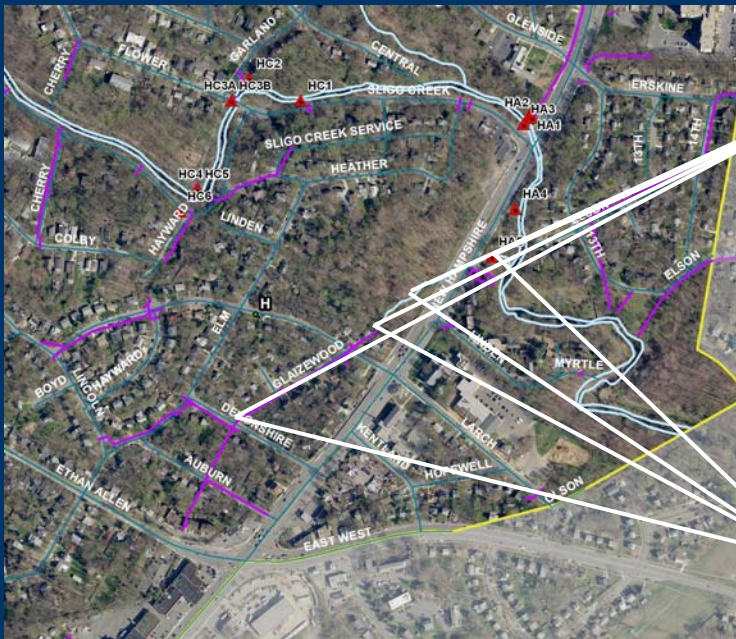
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Original total nitrogen load: 1.47 lb/day
 As of 7/20/2011 -
 ~4.8 million gallons + ?
 Total nitrogen load = 216 lbs + ?

Maple Ave. Outfalls



HA5

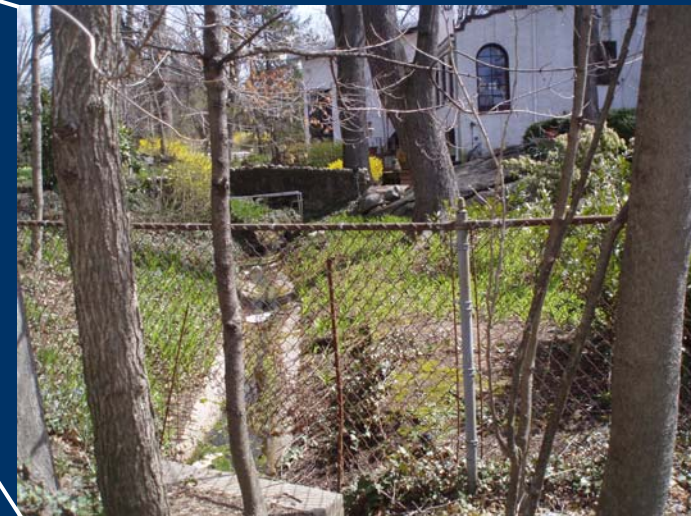
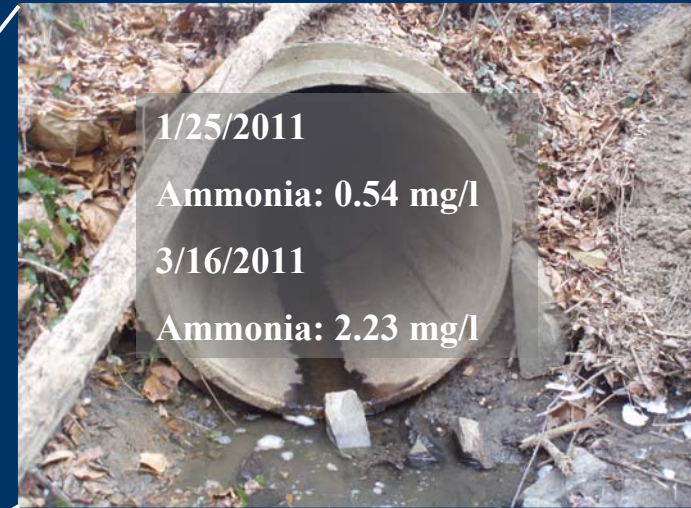
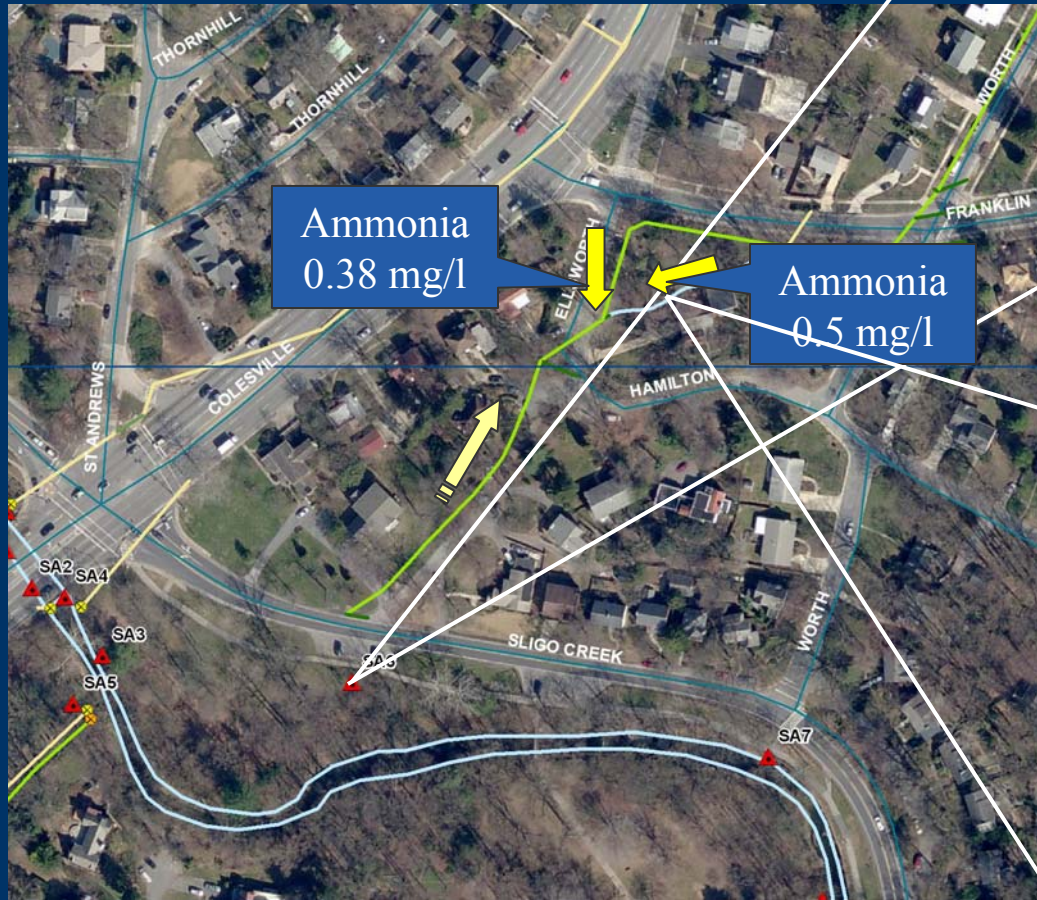


SB43

Ammonia – 0.32 mg/l
Potassium – 17 ppm
Detergents – 1.5 mg/l
E. Coli – 1,600 CFU/100 ml



SA6



Cost-effectiveness

	Total Nitrogen	Total Phosphorus
Sligo Creek Daily Load	24 lbs	0.8 lbs
Cost to repair (at a high estimate of 10K/repair)	\$300,000	
Annual stormwater runoff equivalent from impervious cover	560 acres	140 acres
Cost to retrofit equivalent impervious cover*	\$25,000,000	\$7,000,000

*See Watershed Treatment Model for assumptions

Recommendations to County

- ▶ Follow up on identified problems
- ▶ Dedicated IDDE staff
- ▶ Additional staff training for new parameters / isolating sources
- ▶ Education & outreach needs for transitory discharges
- ▶ Hotspot assessments needed?
- ▶ Complex drainage areas need attention

Recommendations to County

- ▶ Walk streams for outfall surveys
- ▶ Complete outfall & stormwater mapping for watersheds ~ unmapped outfalls contributed 37% of total phosphorus load & 63% of total nitrogen load
- ▶ Addition of (or replacement with) ammonia, potassium and bacteria to monitoring parameters
- ▶ Use of fluoride rather than chlorine
- ▶ Keep detergents, lower threshold
- ▶ Look into sump pumps

Recommendations to County

- ▶ Future monitoring:
 - Resurvey confirmed polluted outfalls four times per year until clean for 1 year;
 - Resurvey remaining suspect and potentially polluted outfalls at least one time per year;
 - Engage/encourage citizen water monitoring efforts to expand the County's capacity to address water pollution issues
 - Continue monitoring, or have citizens continue to monitor, for bacteria and assure that standards improve after elimination of the identified problems.

Role of FOSC

- ▶ Ensure follow-up on identified problems
- ▶ Education & outreach in hotspot areas
- ▶ Communicate the message that IDDE needs to be a priority for clean waterways
- ▶ Follow-up monitoring? Eyes and ears for dry weather flows

Next steps

- ▶ County may put more resources into IDDE – dedicated staff? Recognize that the program is beneficial for achieving water quality goals
- ▶ County programmatic changes: indicators and walking streams
- ▶ CWP – working to get IDDE listed as a BMP so that local jurisdictions can get “credit” for IDDE in the Bay TMDL; County is supportive
- ▶ CWP – Marpat Foundation proposal for additional work in Sligo Creek

Q/A

