NPS Monitoring on Glen Lake 2020

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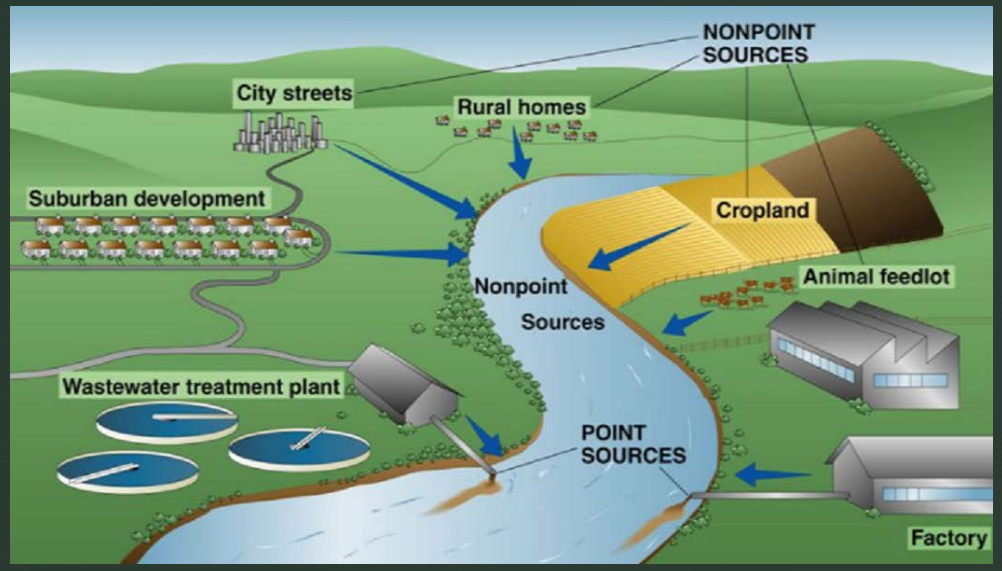
Point vs. Nonpoint Source Pollution

Point Source: "…any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture."



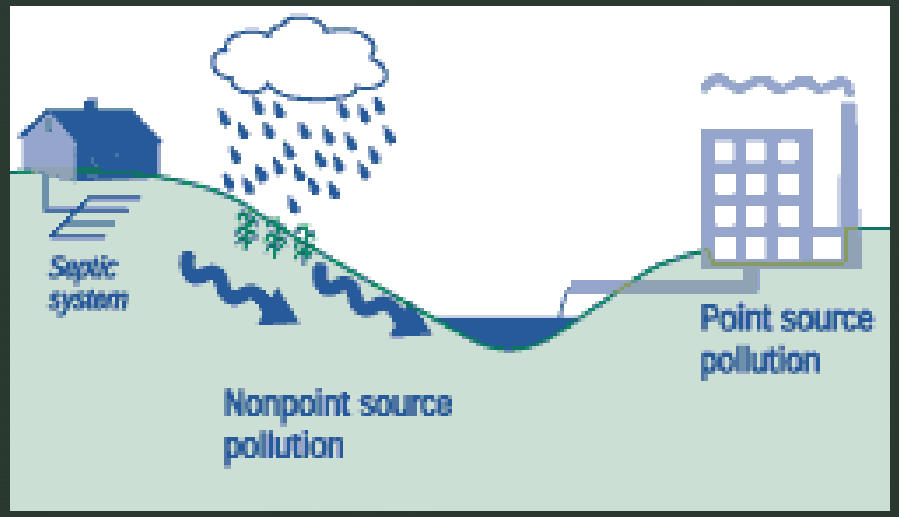
(https://www.epa.gov/nps)

Nonpoint Source Pollution (https://www.epa.gov/nps)

Nonpoint Source: "Any source of water pollution that does not meet the legal definition of "point source."

EPA: What causes nonpoint source water pollution?

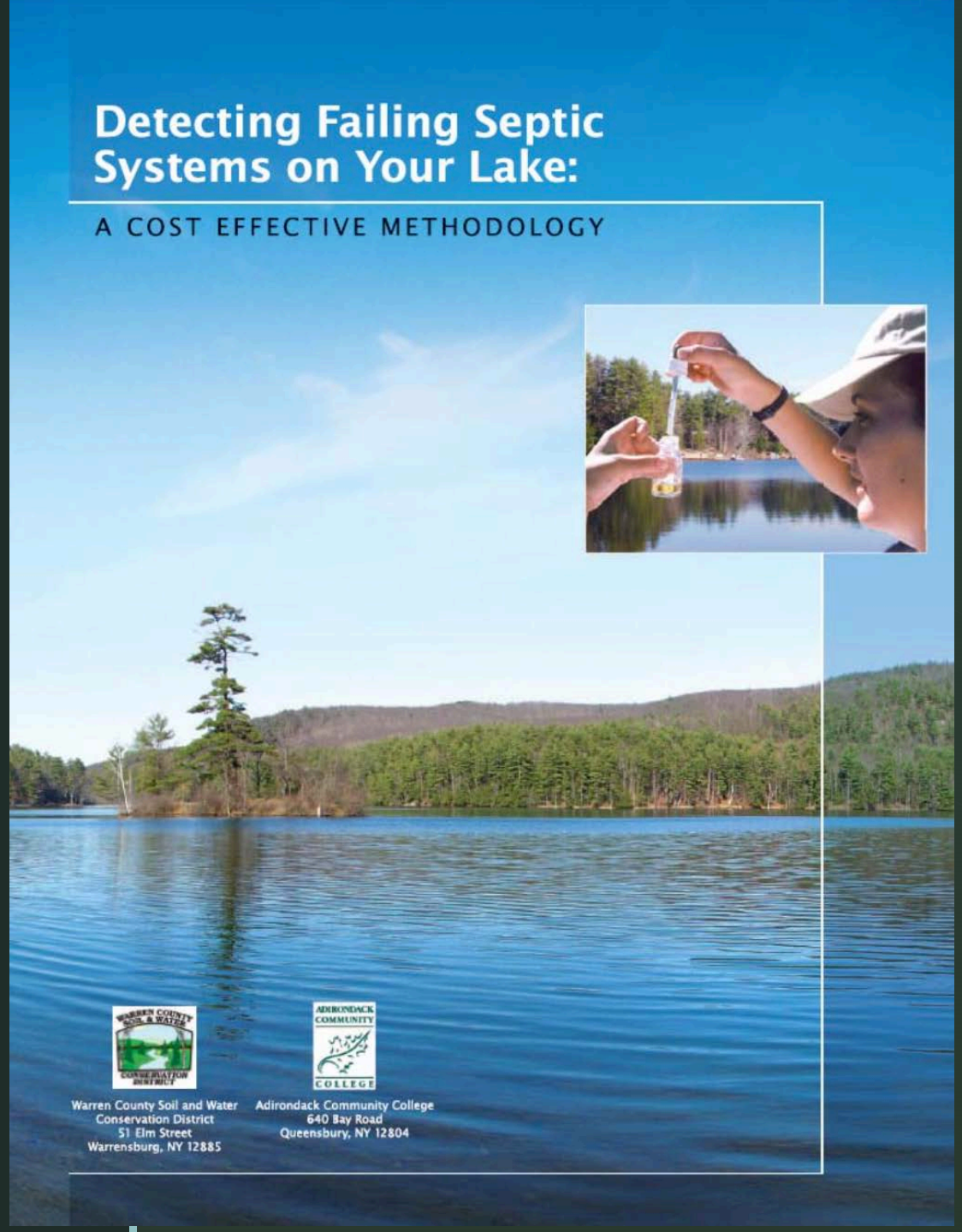
NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters.



Nonpoint source pollution can include: (https://www.epa.gov/nps)

- **Excess fertilizers, herbicides and insecticides** from agricultural lands and residential areas
- Oil, grease and toxic chemicals from urban runoff and energy production
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks
- **Salt from irrigation practices** and acid drainage from abandoned mines
- **Bacteria and nutrients from livestock, pet wastes and faulty septic systems**
- Atmospheric deposition and hydromodification

States report that nonpoint source pollution is the leading remaining cause of water quality problems. The effects of nonpoint source pollutants on specific waters vary and may not always be fully assessed. However, we know that these pollutants have harmful effects on drinking water supplies, recreation, fisheries and wildlife.

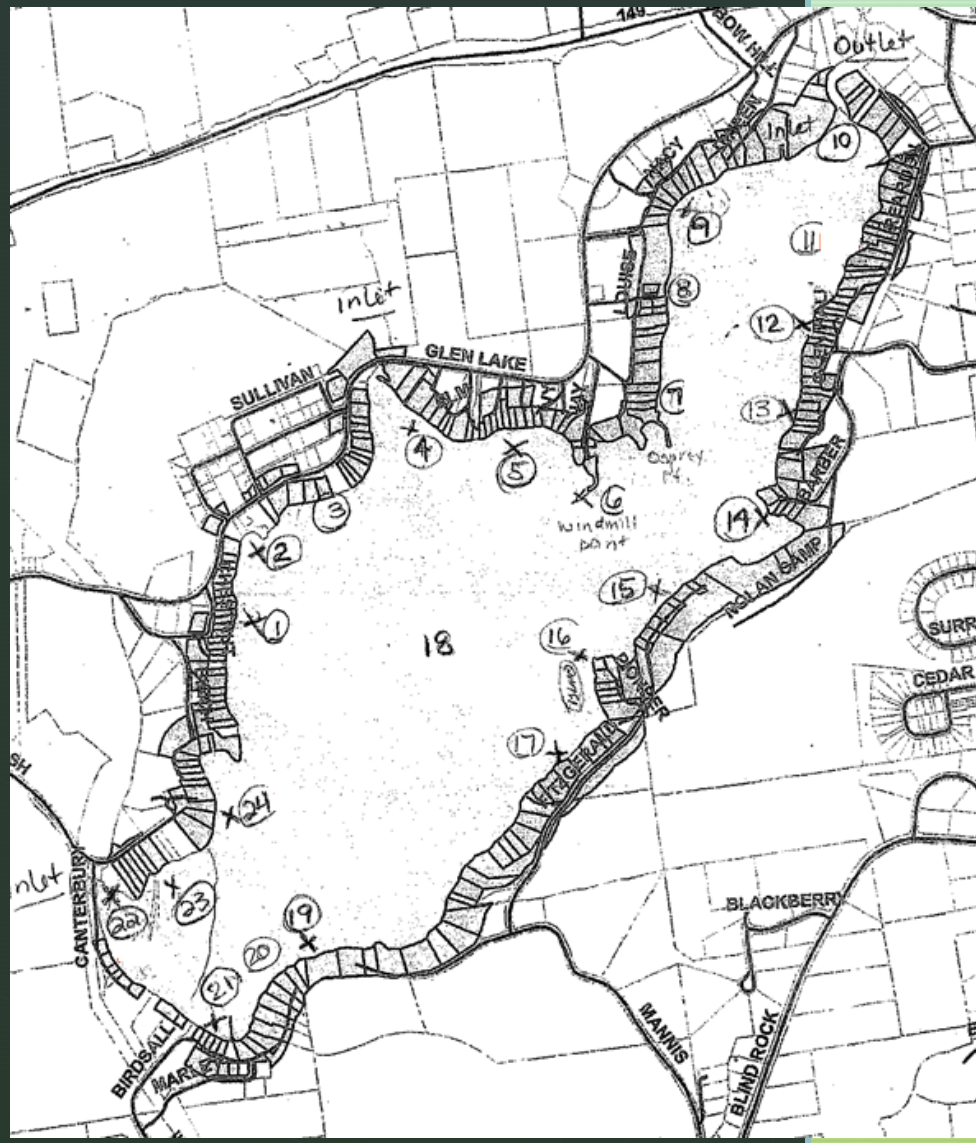


Monitoring Method for NPS

TWO indicators of septic system-derived NPS are measured; detection of BOTH indicates NPS:

1. E*scherichia coli (E. coli)*
   - Bacteria associated with human and animal fecal material
   - Some types of *E. coli* can reproduce in surface water

2. Free chlorine (hypochlorous acid or hypochlorite ion)
   - Form of chlorine found in bleach and household cleaners, municipal water supplies, and treated well water
   - No natural sources of HOCl


Outlet
Inlet
Inlet
GLEN LAKE
SULLIVAN
18
BLACKBERRY
CANTERBURY
BIRDSALL
MANNIS
BLIND ROCK
CEDAR

Cumulative Glen Lake NPS data 2018, 2019, 2020

	2017	2018			2019						2020						
	8/17/2017	18-Aug	18-Sep	18-Oct	16-May	10-Jun	8-Jul	12-Aug	10-Sep	8-Oct	13-May	10-Jun	6-Jul	18-Aug	14-Sep	12-Oct	Total
		LAKE					LAKE							LAKE			
1	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0	1	5
2	0	1	0	0	1	0	0	0	1	0	0	0	1	0	1	0	5
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
4	0	1	1	0	0	0	1	0	1	0	0	1	0	0	1	0	6
5	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	1	5
6	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	4
7	1	1	0	0	0	0	1	0	1	1	0	1	0	1	1	0	8
8	0	1	1	0	0	0	1	1	0	0	1	1	1	1	1	1	10
9	0	1	0	0	0	0	1	0	1	0	0	1	1	1	1	1	8
10	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	1	5
11	1	1	0	0	0	1	1	0	1	0	0	1	0	1	1	1	9
12	0	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	5
13	0	1	1	0	0	0	1	0	1	1	0	1	0	1	0	0	7
14	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	5
15	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	4
16	1	0	0	0	0	0	1	0	1	0	1	1	0	0	0	1	6
17	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	1	6
18	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
19	0	1	0	0	1	0	0	1	0	1	1	0	0	0	1	1	7
20	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	3
21	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
22	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	5
23	0	1	0	0	0	1	1	0	0	1	0	0	0	0	1	0	5
24	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	5
	6	18	4	1	2	5	15	4	11	7	5	10	6	8	12	15	
	25%	75%	17%	4%	8%	21%	63%	17%	46%	29%	21%	42%	25%	33%	50%	63%	

3 Year Summary – Take-aways

- Results support the validity of the SUNY Adk methodology to detect septic system-derived NPS pollution
  - Center of lake (negative control) was negative 15/16 testing dates.
- Detection of NPS indicators over 16 testing dates highlights an area with double the average number of NPS positive tests.
- There was little correlation between total NPS positive sites and rainfall totals.
- Better correlation between total NPS positive sites and lake usage patterns
- One month per year (but not the same month) showed more than 50% of the test sites were NPS positive.