

Stream Monitoring in Central NJ: Water Quality of Matawan Creek and South River



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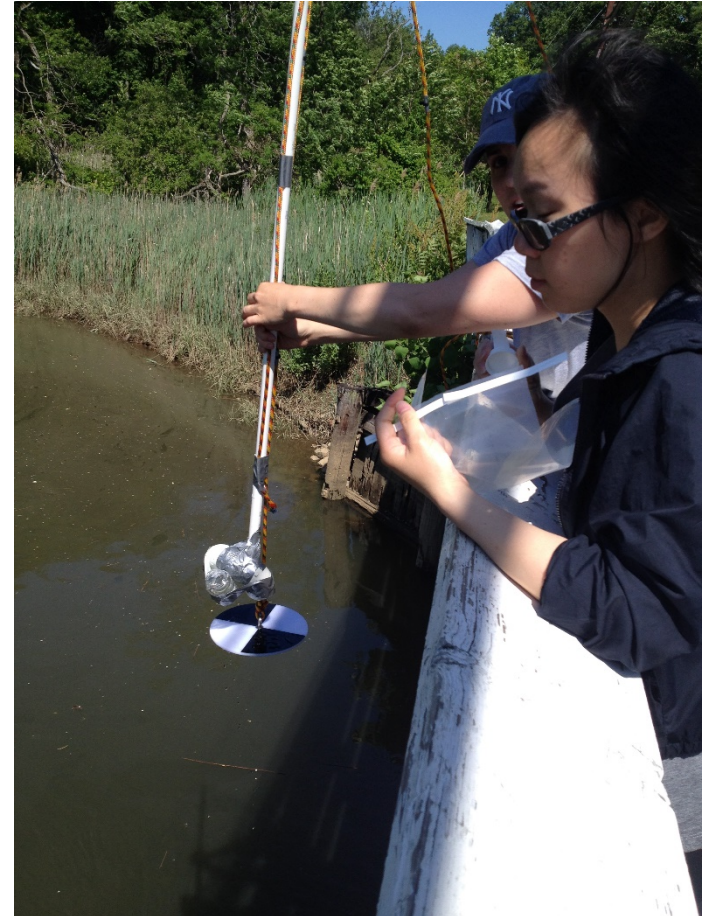


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- Baykeeper has been acting as the citizen guardian for the Hudson-Raritan Estuary since 1989.
 - Protect, Preserve, Restore
 - Engaging and empowering citizen scientists

Why bother?

- ▶ Provide useful data to USEPA/NJDEP/others on water quality in our watershed
- ▶ Pathogen indicators to analyze anthropogenic inputs to watershed
- ▶ Train citizen scientists on how to analyze stream health

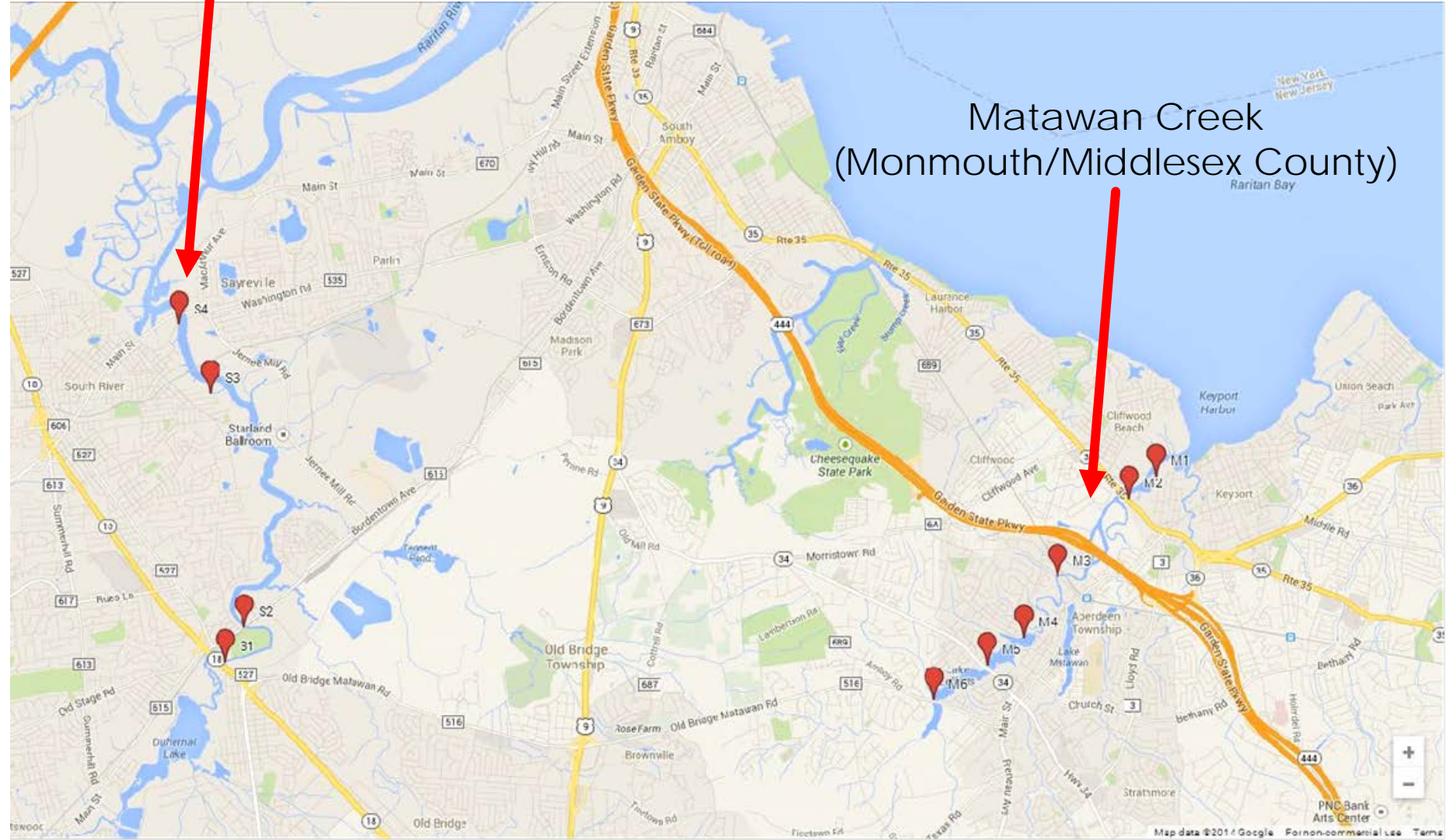


Why Matawan Creek and South River?

- ▶ NEIWPCC designated certain watershed as high priority, including South River and Matawan Creek
 - ▶ NJDEP and EPA needed data on these sites to properly assess and implement pollution controls
- ▶ Add to the growing database of Baykeeper water quality data and citizen science data
- ▶ Obtain data to educate our members about local water quality conditions



South River (Middlesex County)



Matawan Creek (Monmouth/Middlesex County)

Sampling Regime

- ▶ 5x/month
- ▶ At least one date after a rain event
- ▶ At each site:
 - ▶ YSI for physiochemical data
 - ▶ Garmin for GPS location
 - ▶ Sample of water for Enterococcus levels
 - ▶ Secchi disk for depth/visibility
 - ▶ Observations on weather, point-source pollution, usage




DATA
ANALYSIS:
What did we
learn?



WOW, we
have a LOT
of data!!!

28 parameters
entered PER SITE,
PER DATE

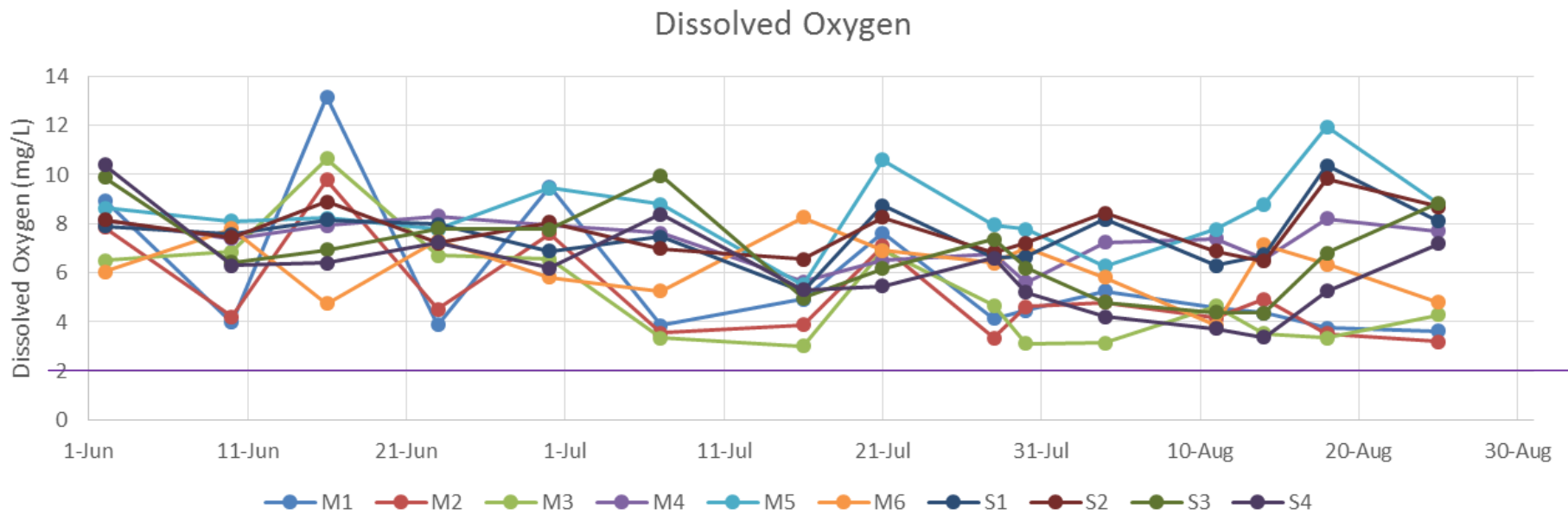


4173	Photos taken (Y/N)
4174	Temperature, water
4175	pH
4176	Dissolved oxygen (DO)
4177	Conductivity
4178	Enterococ
4179	Cloud cov
4180	Precipitation during activity (YES/NO)
4181	Precipitation 24hr prior to monitoring event (YES/NO)
4182	Precipitation 48hr prior to monitoring event (YES/NO)
4183	Tide stage (choice list)
4184	Discoloration (Y/N) (choice list)
4185	Color, apparent, unfiltered sample
4186	Odor (adverse or offensive) (Y/N) (choice list)
4187	Floating foam/suds (Y/N) (choice list)
4188	Oil and Grease surface slick/sheen (Y/N) (choice list)
4189	Floating debris (Y/N) (choice list)
4190	Floating sewage (Y/N) (choice list)
4191	NPS Pollution - Wildlife Present (Y/N)
4192	NPS Pollution - Livestock Present (Y/N)
4193	NPS Pollution - Domestic Pets Present (Y/N)
4194	NPS Pollution - Other (Y/N)
4195	PS Pollution - Outfall Pipe Present (Y/N)
4196	PS Pollution - Outfall Pipe Discharging (Y/N)
4197	Observed Recreational Use - Swimming (Y/N)
4198	Observed Recreational Use - Boating (Y/N)
4199	Observed Recreational Use - Fishing (Y/N)

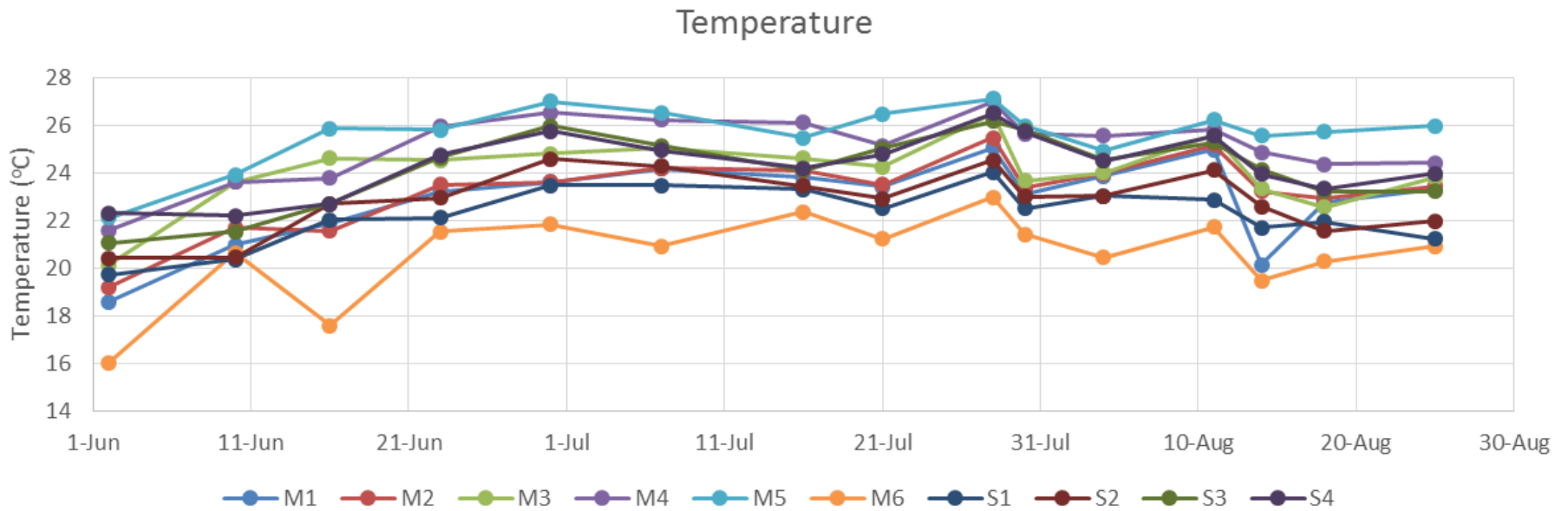
Ecological impact of measured parameters

- ▶ Need a reason to analyze parameter
 - ▶ Relate it to the health of the ecosystem, health of the watershed
- ▶ Temp, salinity, DO → all effect organisms in water
- ▶ *Enterococcus* → affects humans in water
- ▶ Weather → can affect temp, salinity, DO, *Enterococcus*
- ▶ Point-source pollution → can affect *Enterococcus*, DO

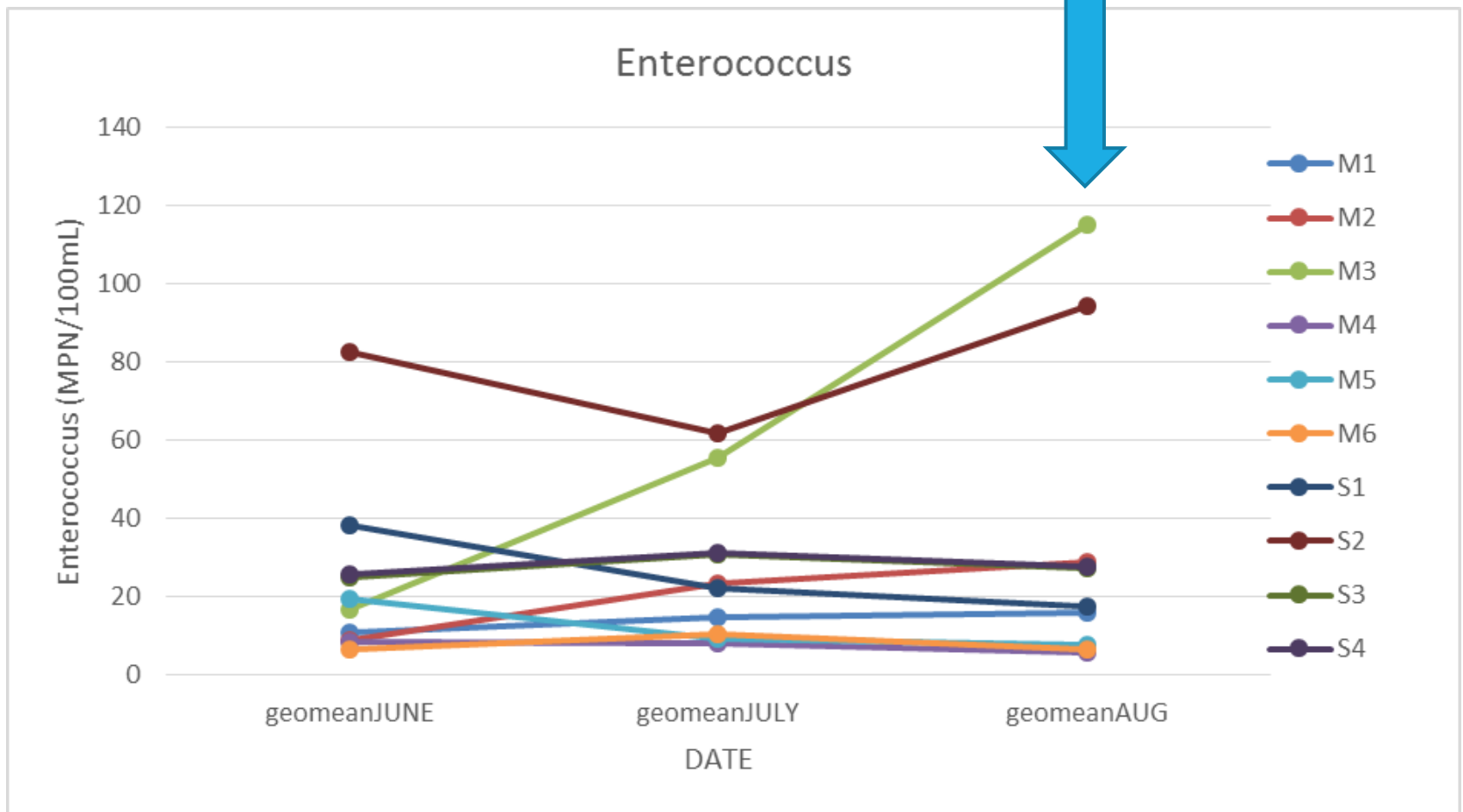
DO was average at sites, not dipping below hypoxia threshold; no pattern seen between salt/freshwater sites

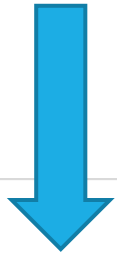


Temperature rose as the summer increased, with little variation except for M6 (furthest end of Matawan Creek)

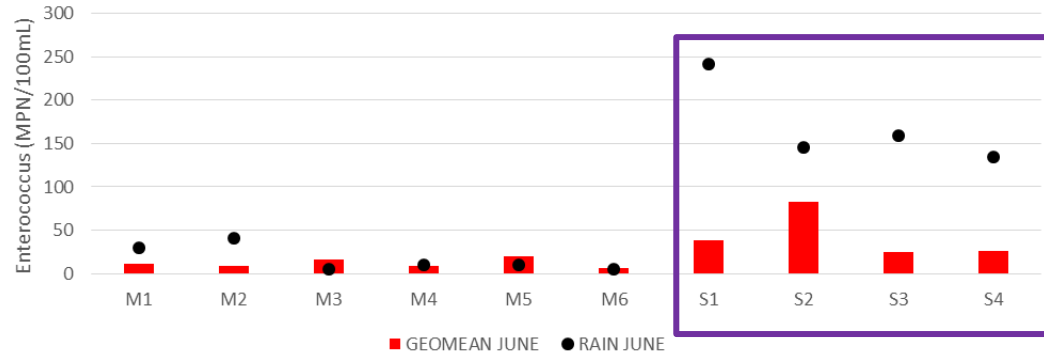


Geomean for each month shows consistently higher *Enterococcus* levels in South River

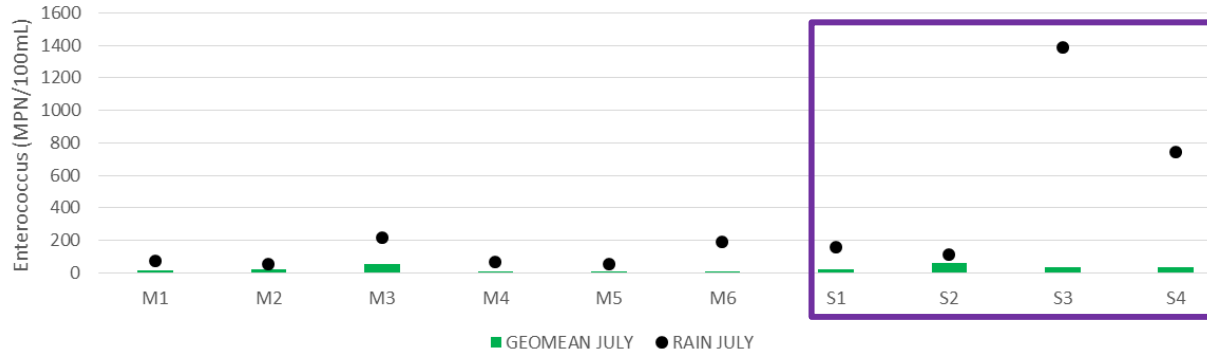




Enterococcus and Precipitation June 2014

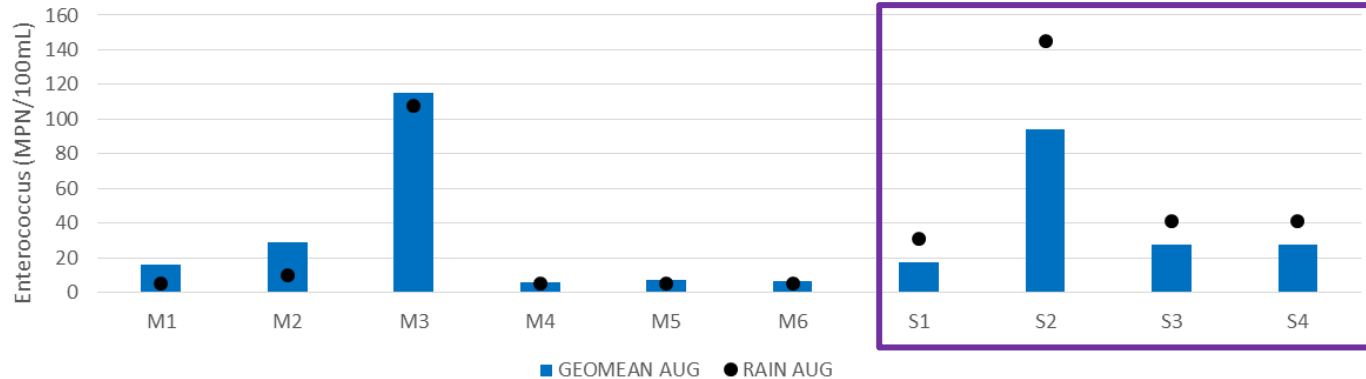


Enterococcus and Precipitation July 2014



Average Rainfall:
June- 3.93"
July- 7.15"
August- 1.88"

Enterococcus and Precipitation August 2014



Future directions- what do we want to do with data?

- ▶ Data can influence policy decisions around our watershed, including requirements under the Clean Water Act
- ▶ Add to growing database of citizen science
- ▶ More citizen science monitoring projects, training sessions
- ▶ Educate members and build constituency engagement

Successes and failures

- ▶ What would we repeat?
 - ▶ Using GPS to take site location
 - ▶ Using handheld YSI for physiochemical parameters
 - ▶ College internship program
- ▶ What would we fix?
 - ▶ Site access– original plan had to be amended after visiting sites
 - ▶ Do Enterococcus and E.coli bacterial levels, especially when in freshwater



Thank you!

Questions?

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