

2013 Basin Study

Genesee River Project

Genesee River Project

SUNY Brockport

-SUNY Brockport water quality lab

-USDA funded

-August 2010-2013

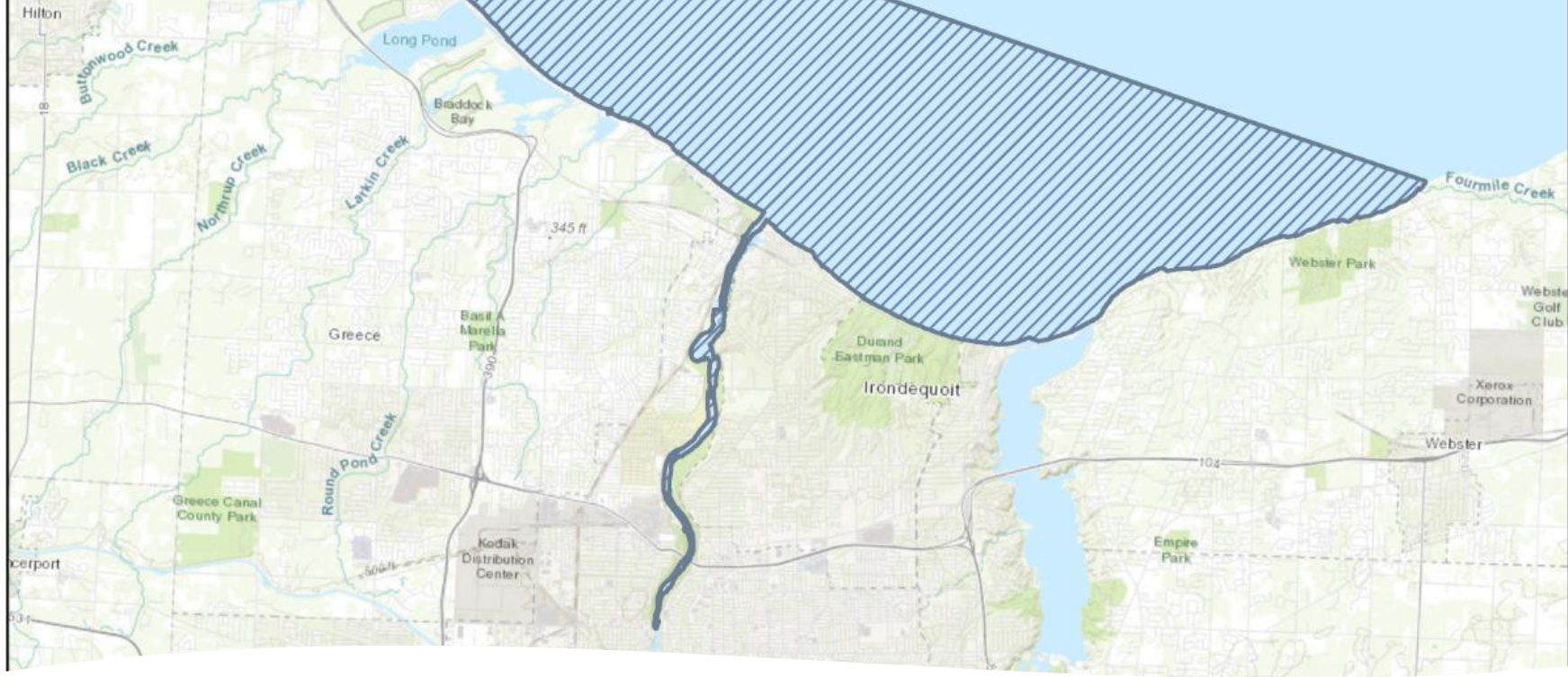
-Weekly water sampling and analysis

-Nutrient loading trends

-Nutrient sources

-Management practice effectiveness - SWAT

TSS, TP, SRP, TN, NO₃₋, bacteria



Genesee River – 2nd largest source of P to Lake Ontario [412,505 kg P/yr]

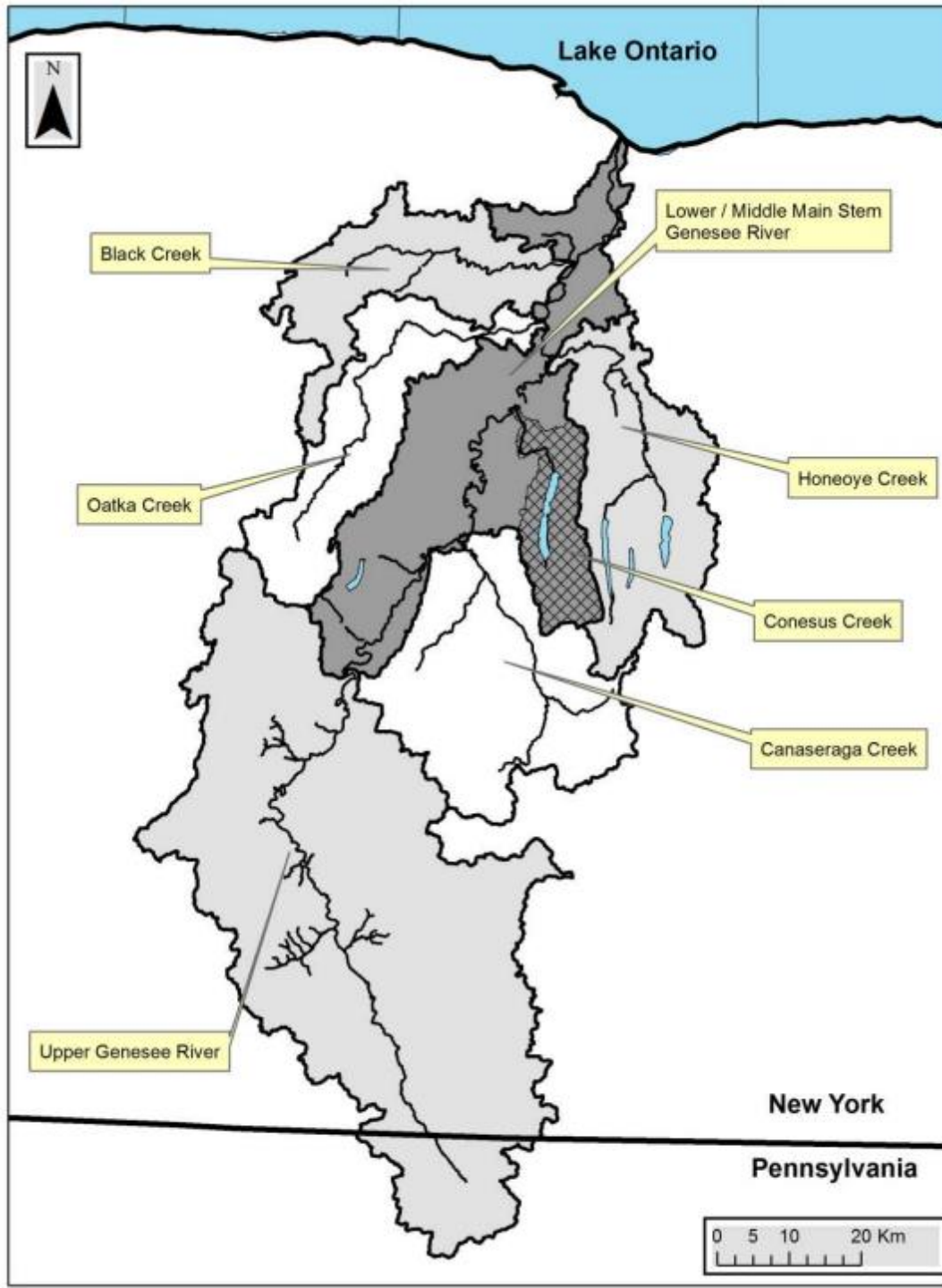
Background

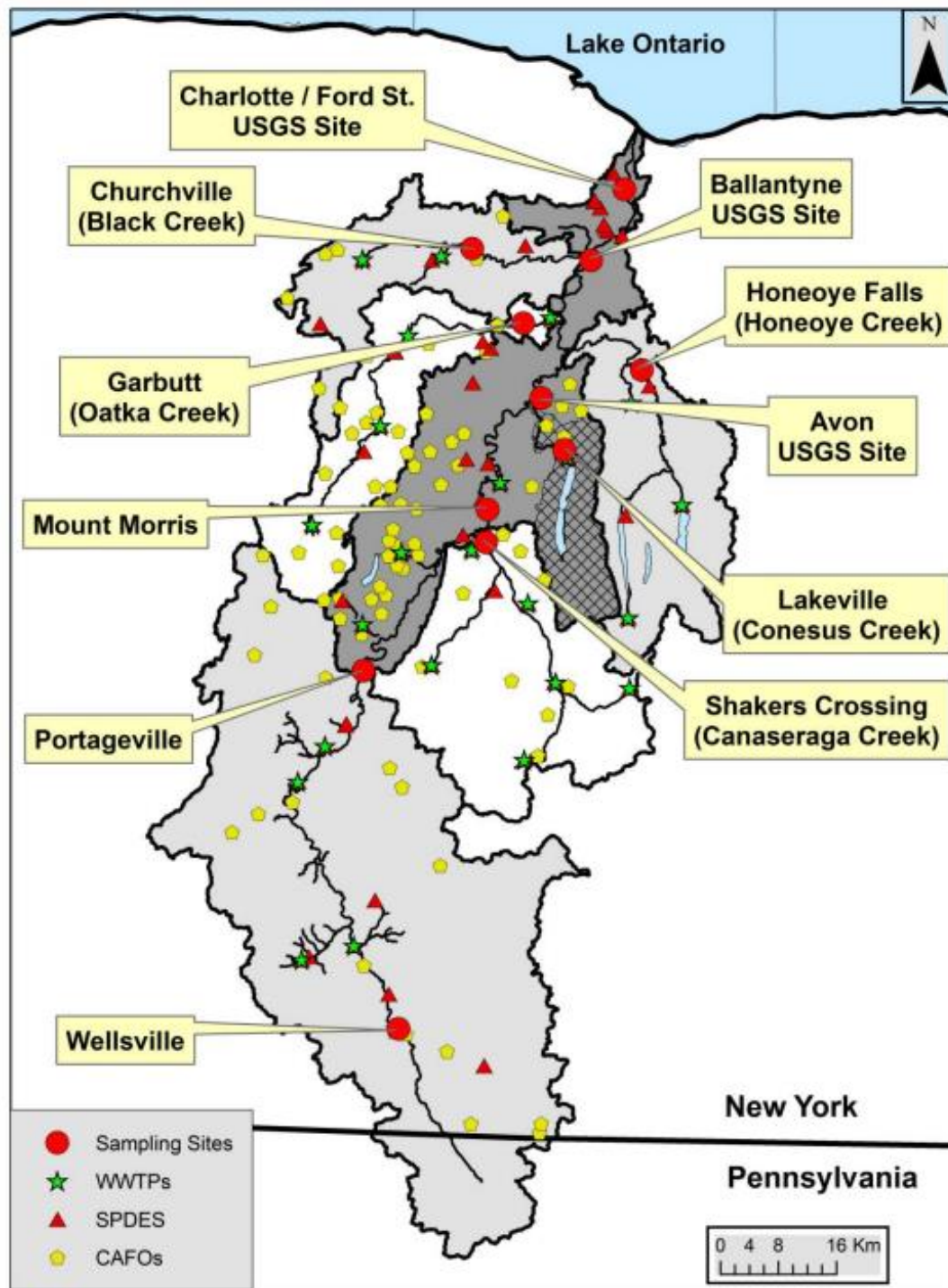
Rochester Embayment Impacts
Benthic blooms
Beach closings
Diminished value

Rochester Embayment – EPA AOC

Background







Purpose

Base for current understanding of sediment and nutrient loading

Information drives project focus

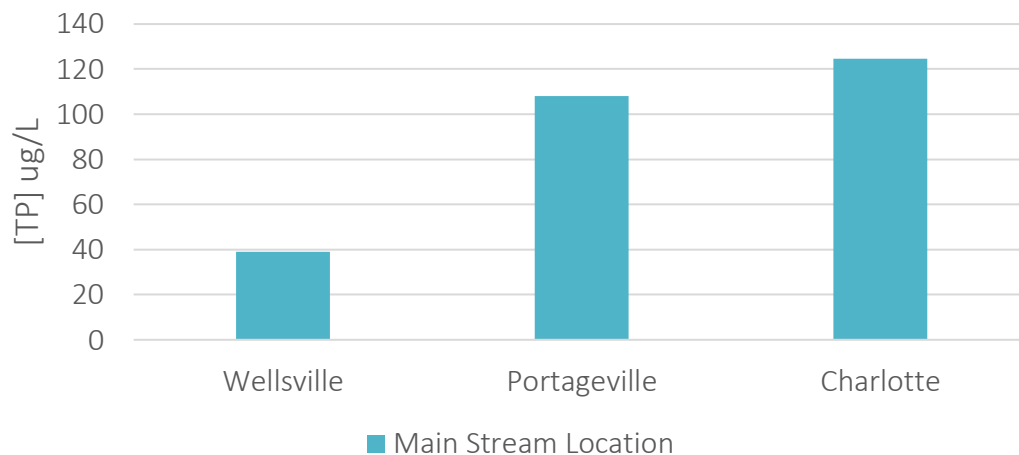
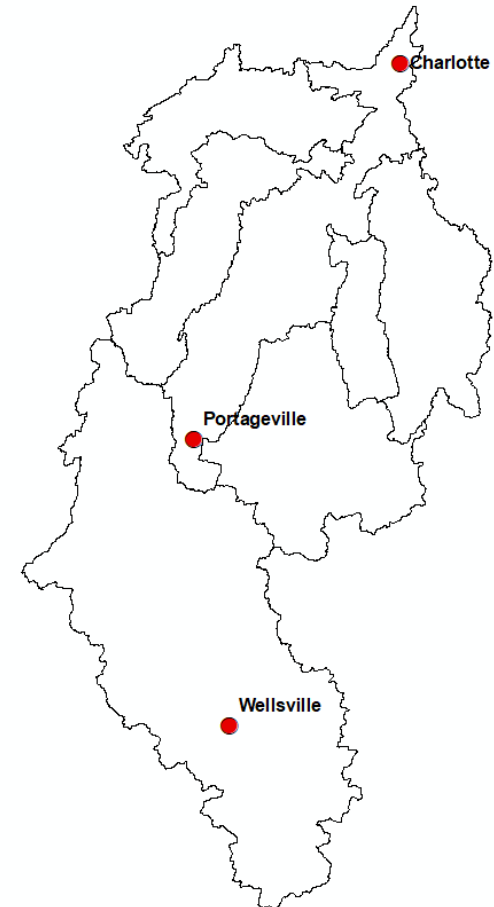
~10 years old – Time for an update?

TP Trends – Main Stem

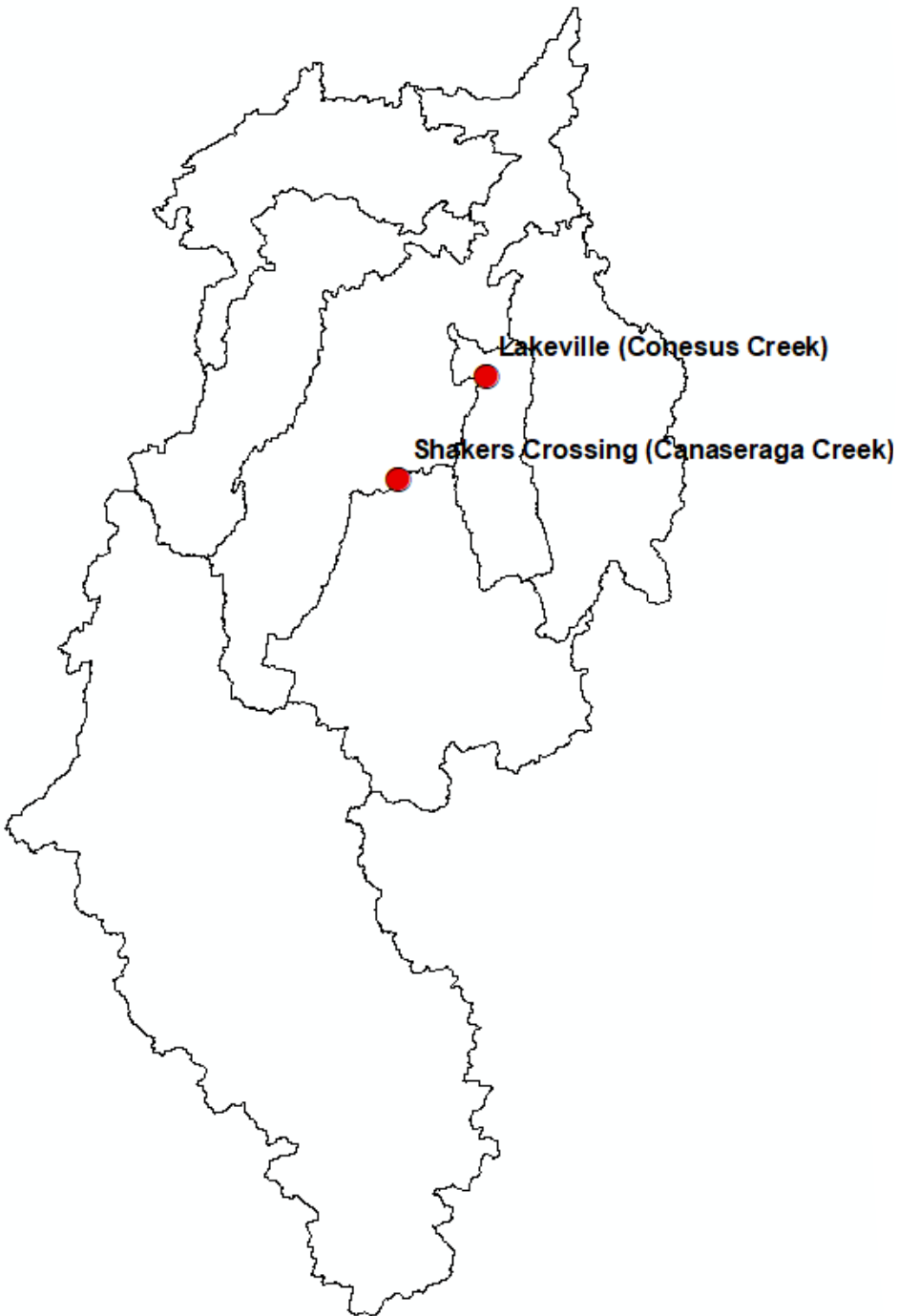
Wellsville ($39.0 \pm 9.1 \mu\text{g P/L}$)

Portageville ($108 \mu\text{g P/L}$)

Charlotte ($124.5 \pm 17.3 \mu\text{g P/L}$)



TP Trends - Tributaries



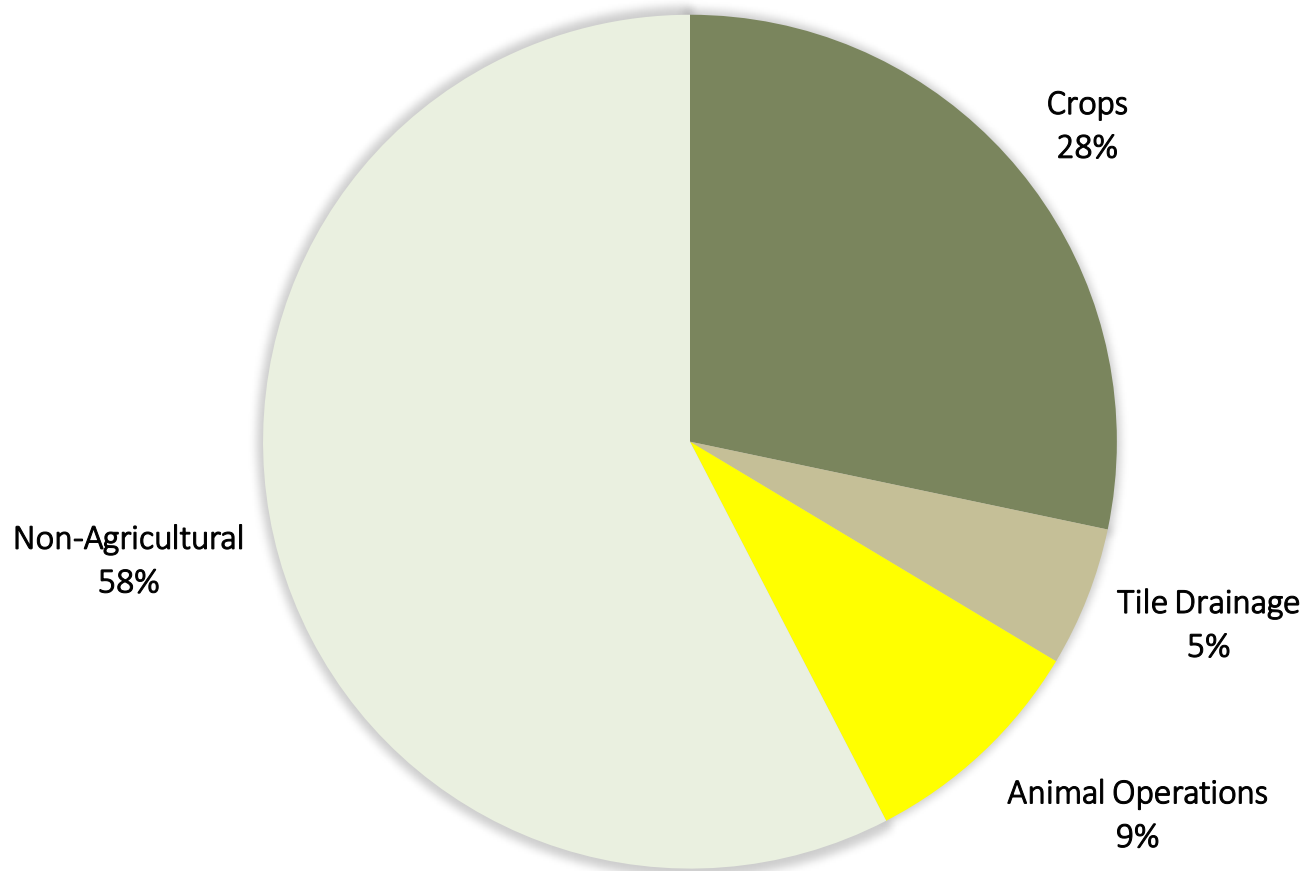
Conesus Creek ($177.1 \pm 25.3 \mu\text{g P/L}$)

Canaseraga Creek ($118.7 \pm 23.1 \mu\text{g P/L}$)

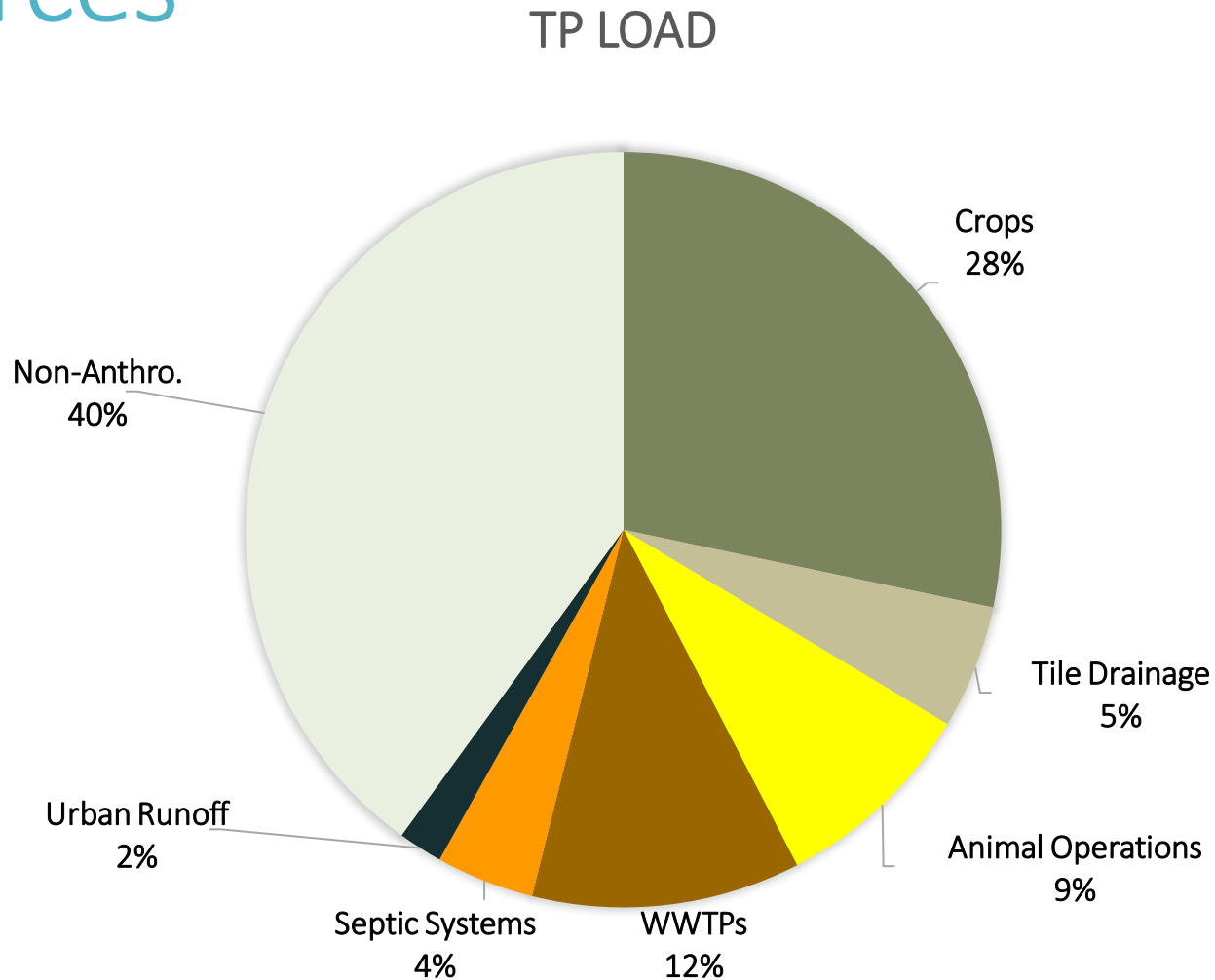
Upstream WWTPs within
1 km

TP Trends – Ag. Sources

TP LOAD



TP Trends – Anthropogenic Sources



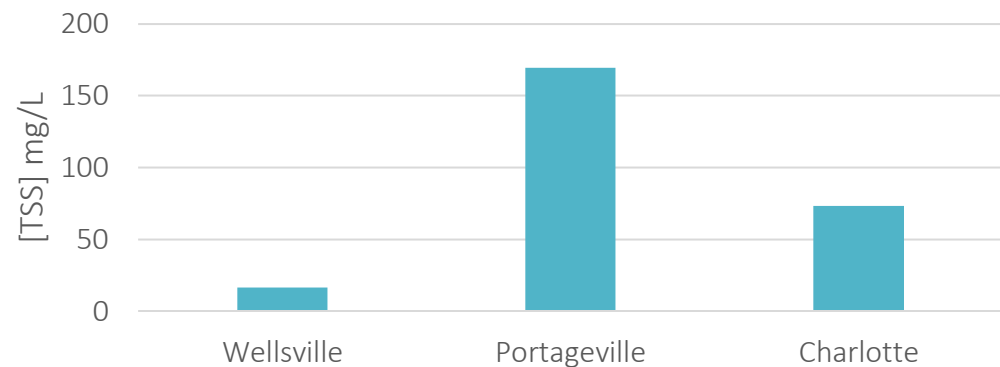
TSS Trends – Main Stem

Average annual 383,182 Mt/yr

Wellsville (16.4 ± 5.9 mg/L)

Portageville (169.4 ± 65.6 mg/L)

Charlotte (73.2 ± 13.5 mg/L)



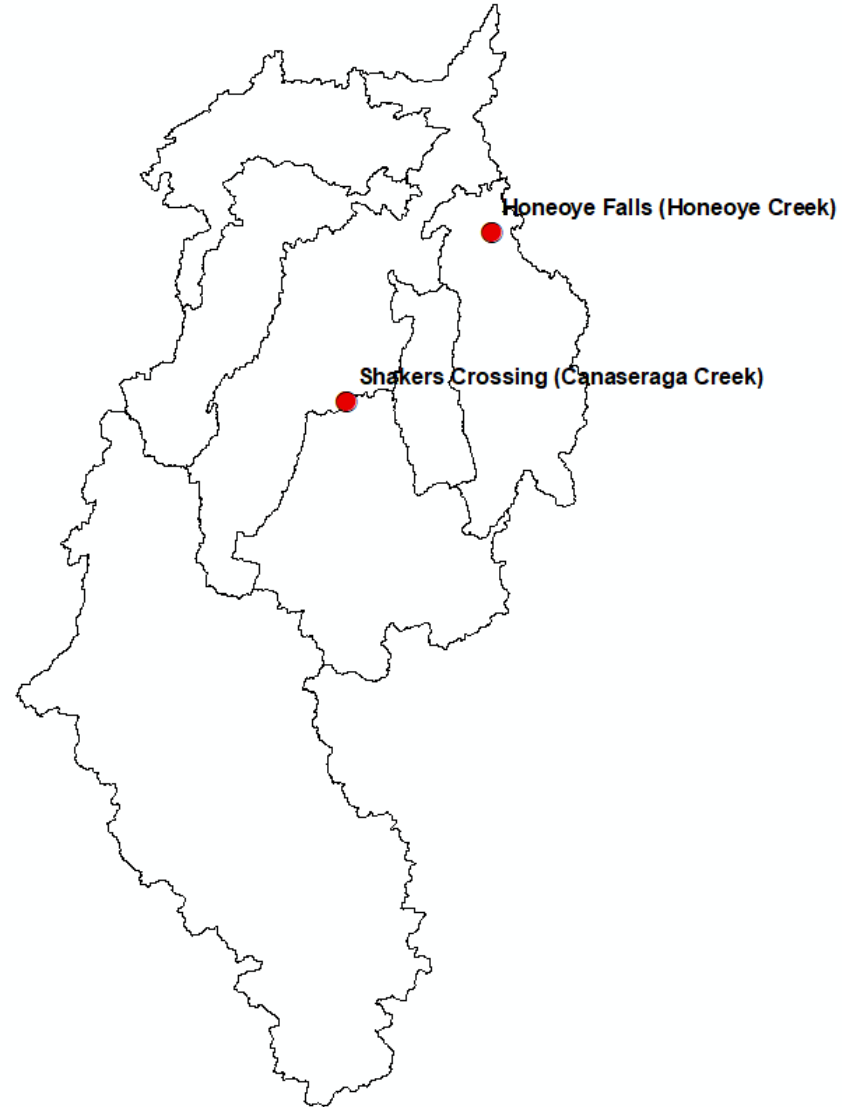
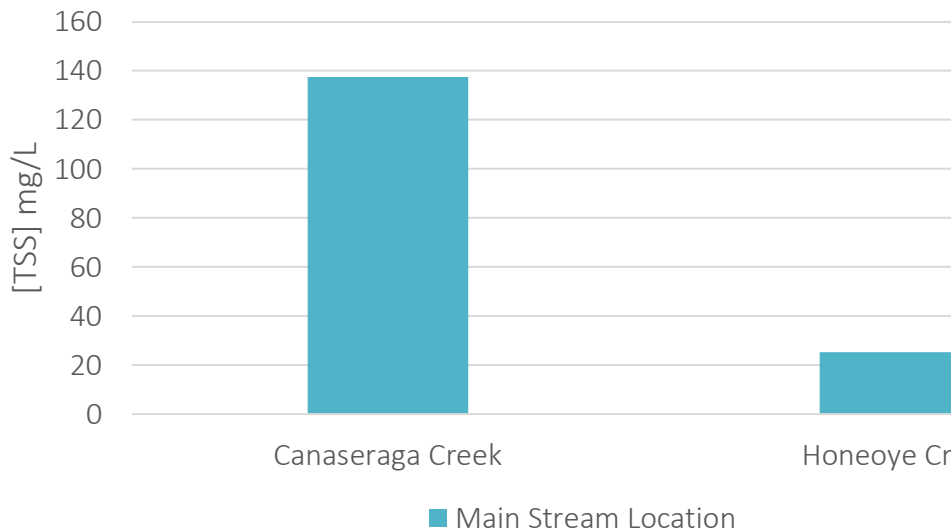
■ Main Stream Location



TSS Trends - Tributaries

Canaseraga Creek
(137.4 ± 53.4 mg/L)

Honeoye Creek
(25.3 ± 4.7 mg/L)



Trends – TSS | TP

Strong correlation between TSS and TP loads

Charlotte $r^2=0.76$

Wellsville $r^2=1.00$

All stems $r^2=0.82$

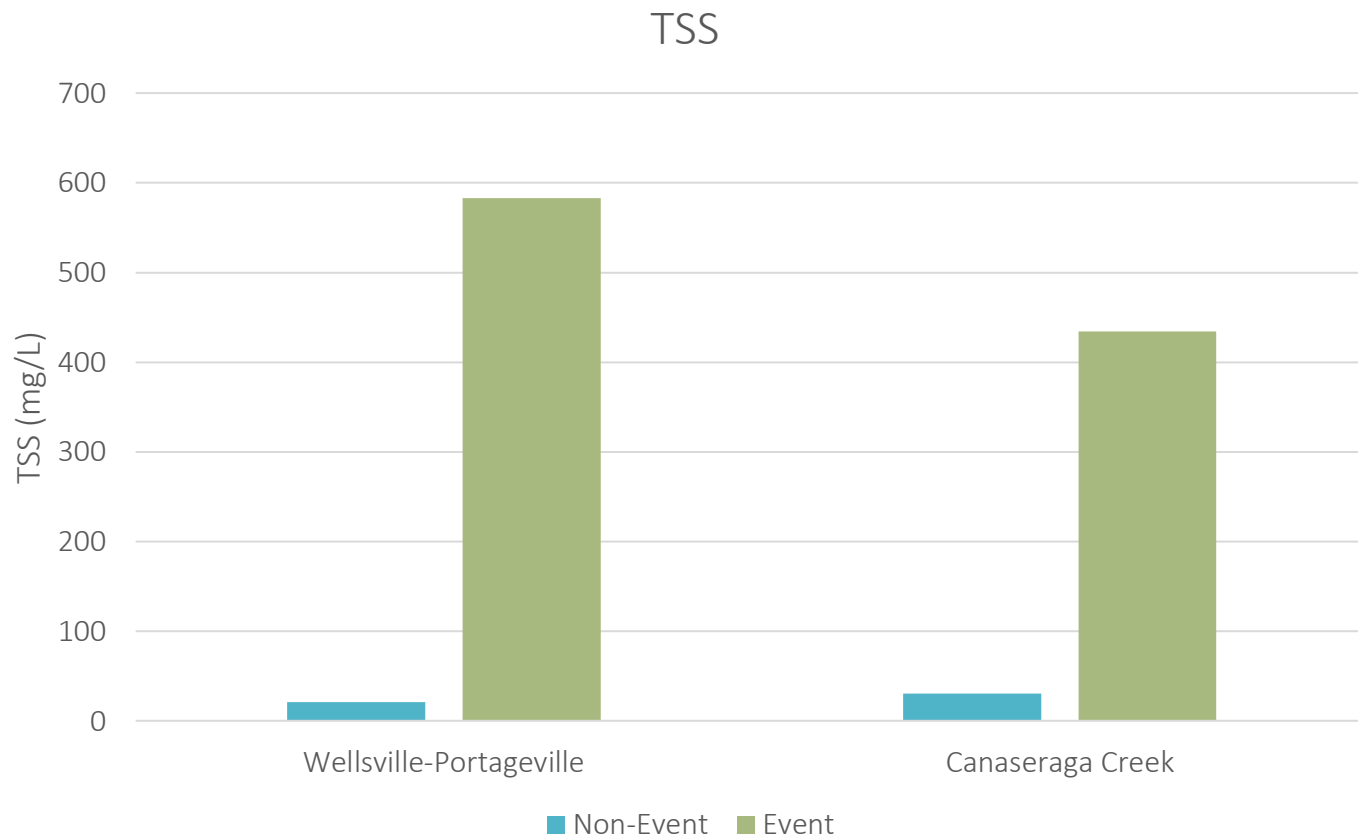
Trends – Storm Events

Wellsville → Portageville

TSS: 2,690%

Canaseraga Creek

TSS: 1,333%



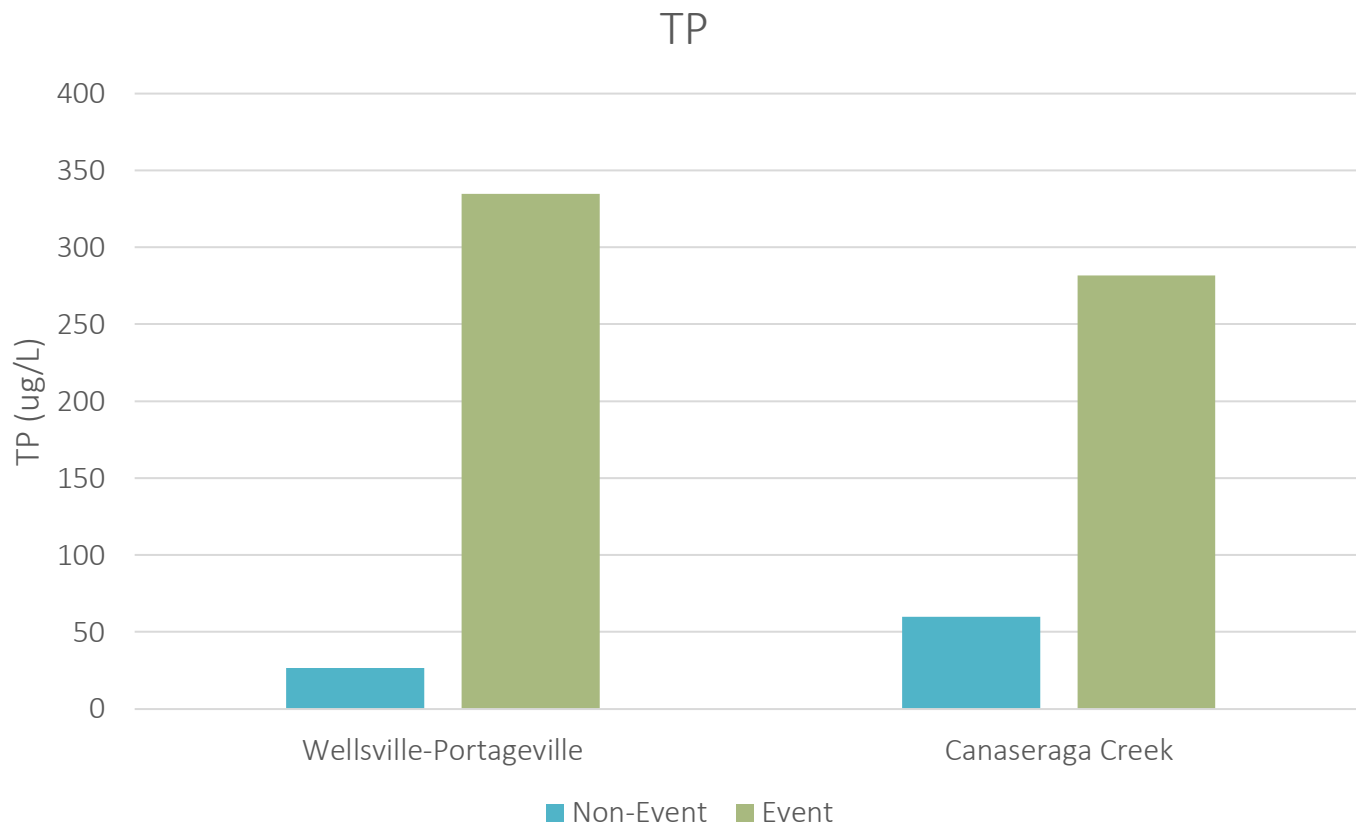
Trends – Storm Events

Wellsville → Portageville

TP: 1,159%

Canaseraga Creek

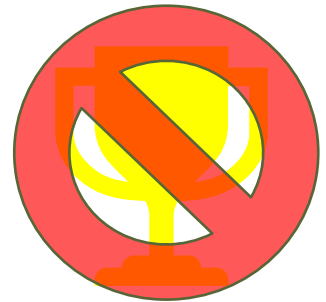
TP: 371%



Greatest Contributor

Canaseraga Creek

4x the load of the Genesee River (412,505 kg P/yr)



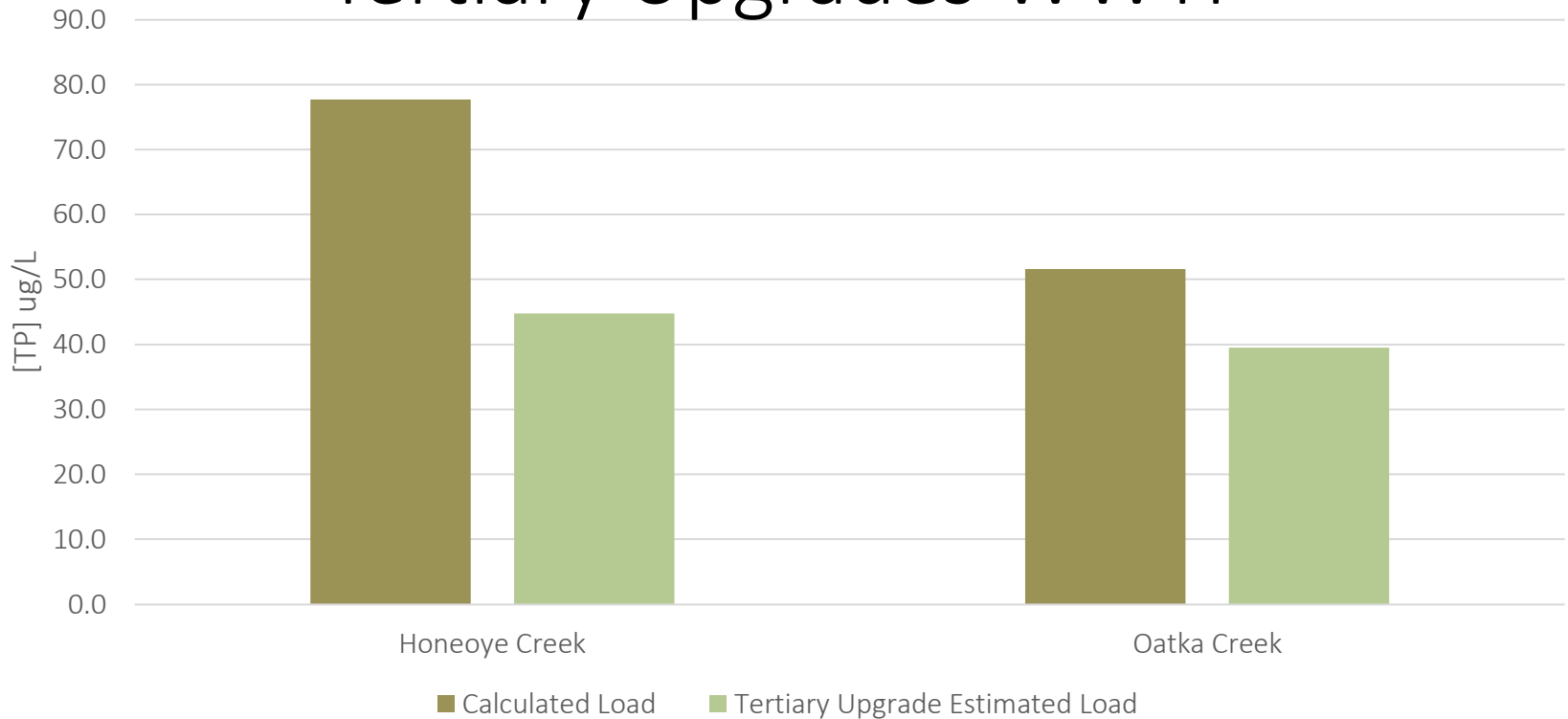
Least Contributions

Conseus Creek

– 6,428 kg TP/yr

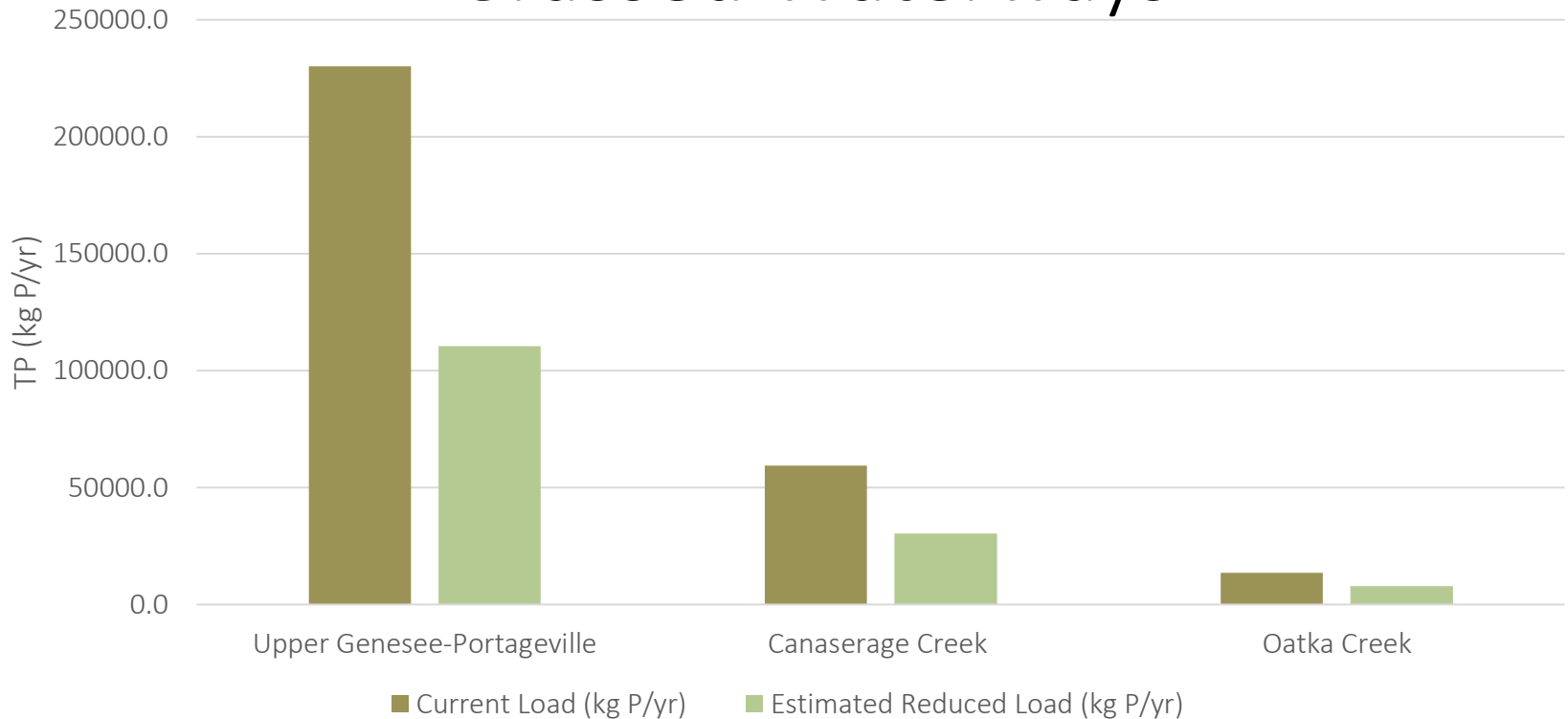
GRSWAT - TP Reductions

Tertiary Upgrades WWTP



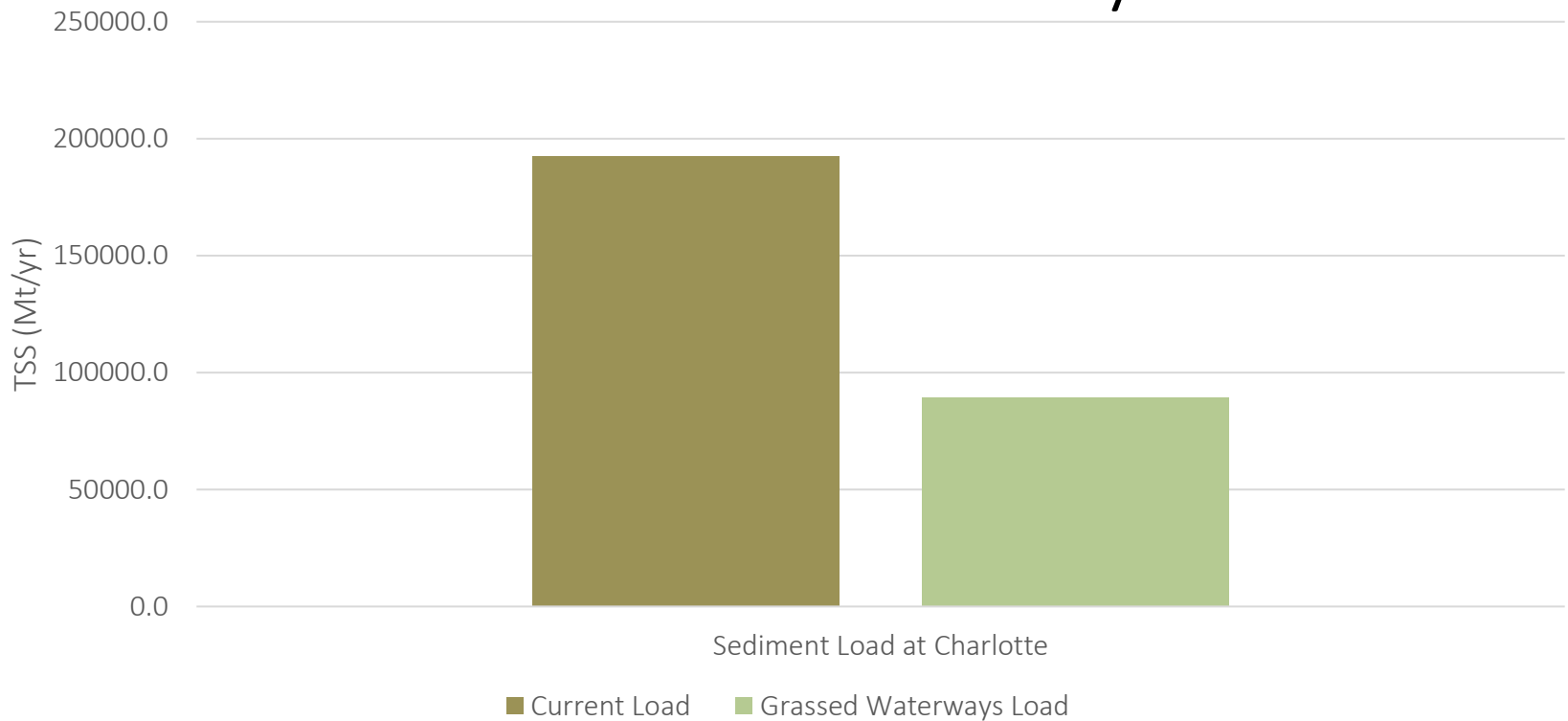
GRSWAT - TP Reductions

Grassed Waterways

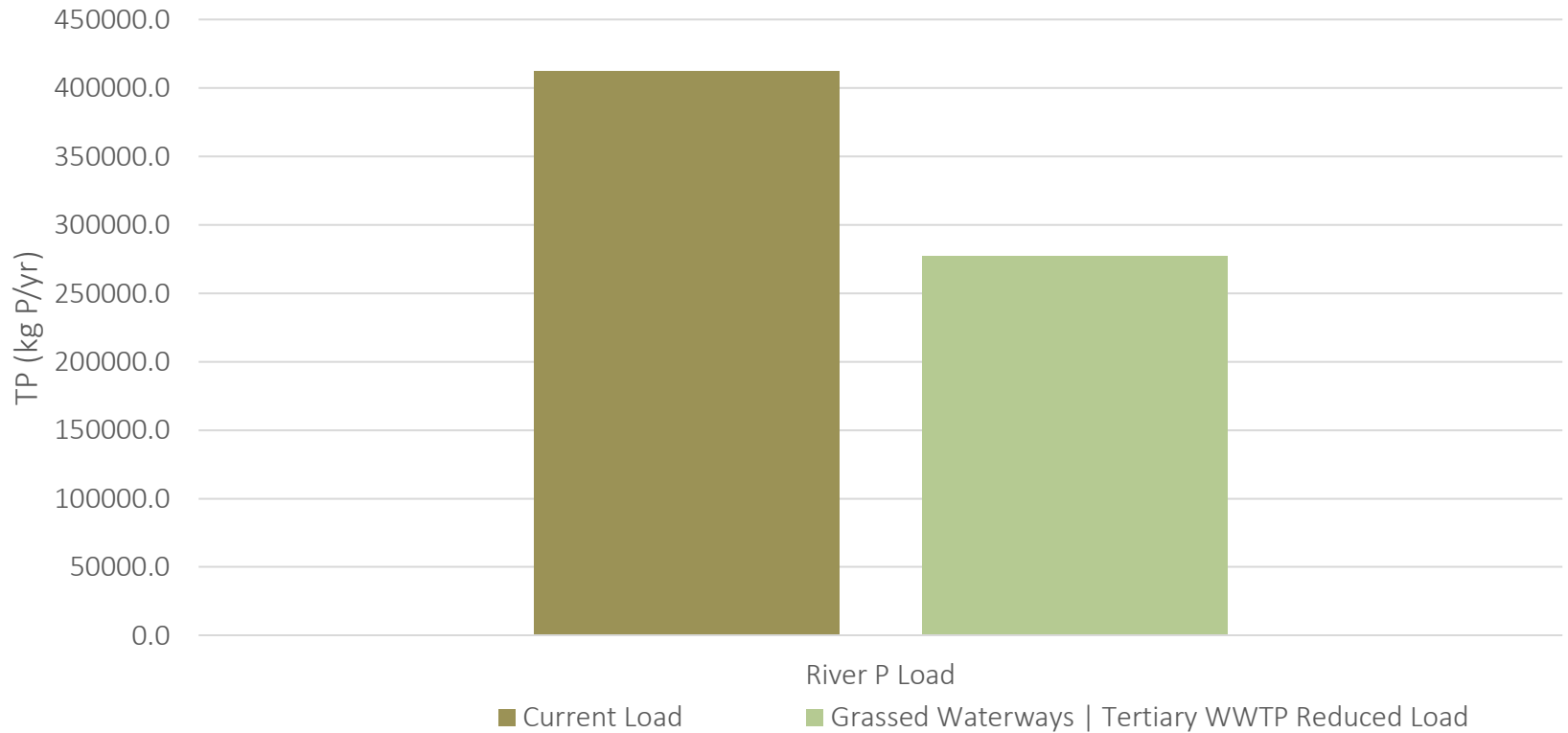


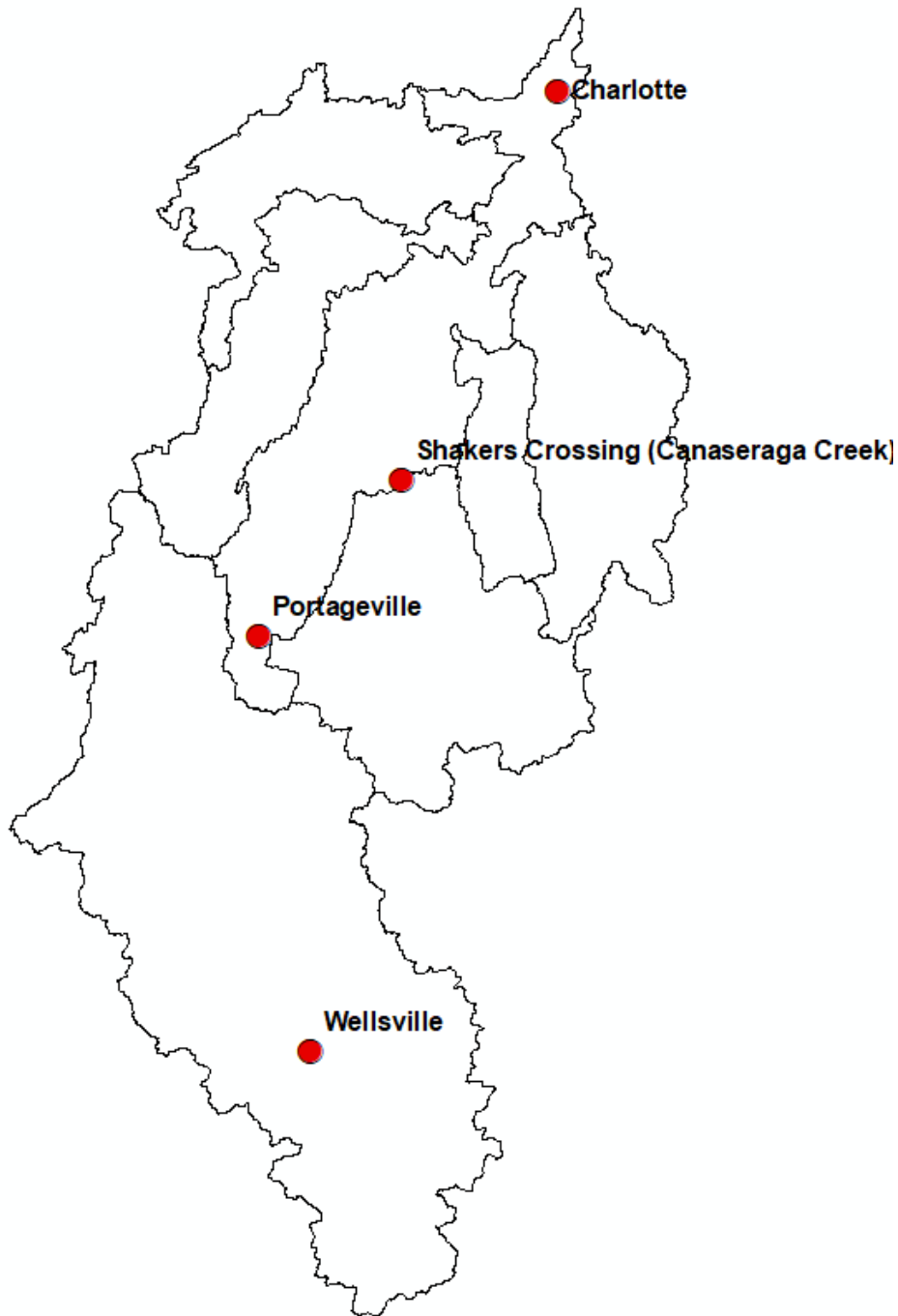
GRSWAT - TSS Reductions

Grassed Waterways

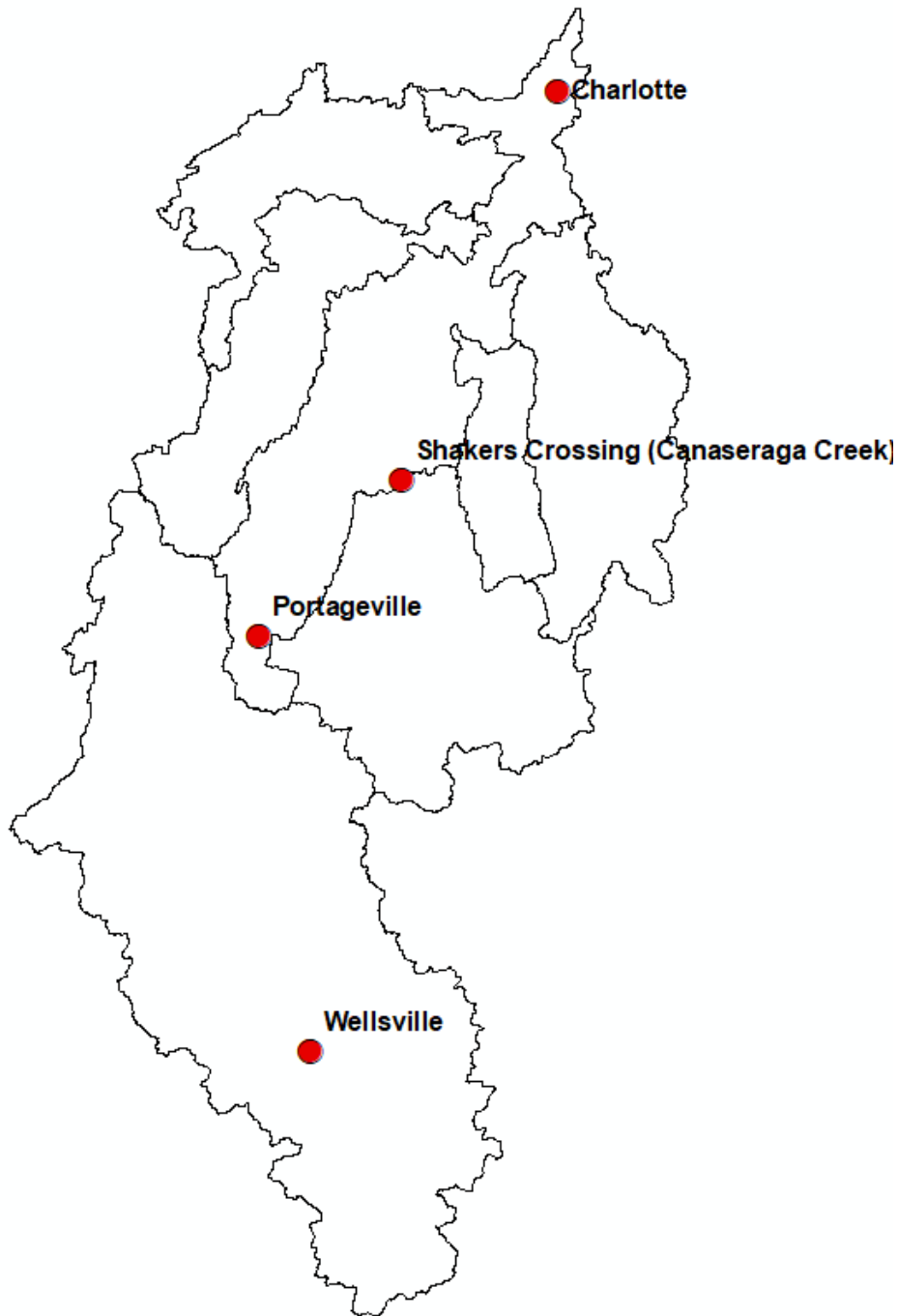


GRSWAT – Management Recommendation





Conclusions



Conclusions

References

Makarewicz, J. C., Lewis, T.W., Snyder, B., Winslow, M., Pettenski, D., Rea, E., Dressel, L., Smith, W.B. 2013. Genesee River Watershed Project. Volume 1. Water Quality Analysis of the Genesee River Watershed: Nutrient Concentration and Loading, Identification of Point and Nonpoint Sources of Pollution, Total Maximum Daily Load, and an Assessment of Management Practices using the Soil Water

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USEPA Rochester Embayment AOC <https://www.epa.gov/great-lakes-aocs/rochester-embayment-aoc> Accessed May 7, 2023

All photos of the Genesee River basin taken by Mike Haugh