STREAMKEEPERS FROM SCRATCH

Building a Volunteer Monitoring Program

Watershed Congress

March 14th, 2015

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Alex Cooper, Community Watershed Specialist, TTF Watershed

Delaware River Watershed Initiative

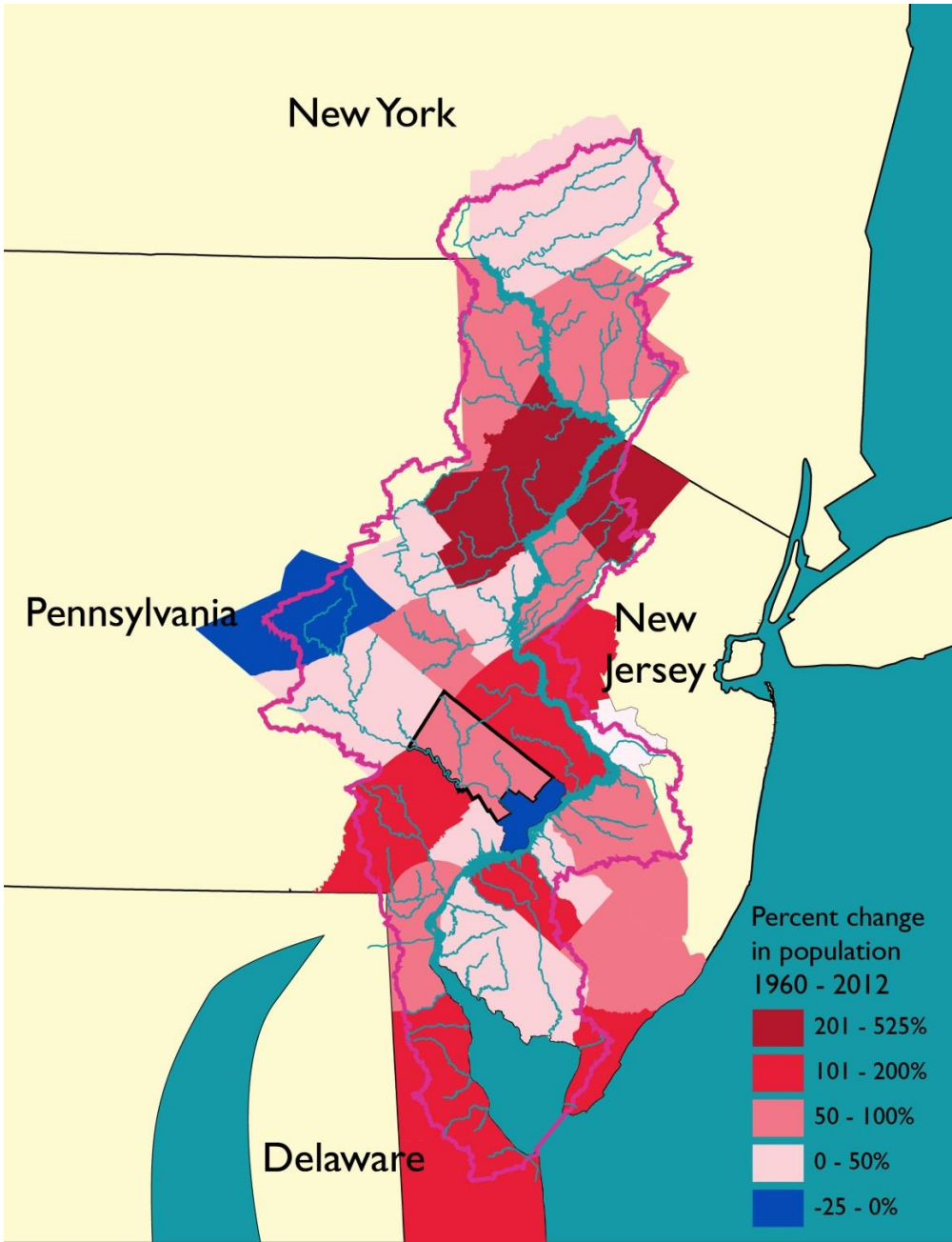
The Delaware River Watershed

Four states

23,700 streams miles

42 counties
838 municipalities

Varying growth rates & Development pressure



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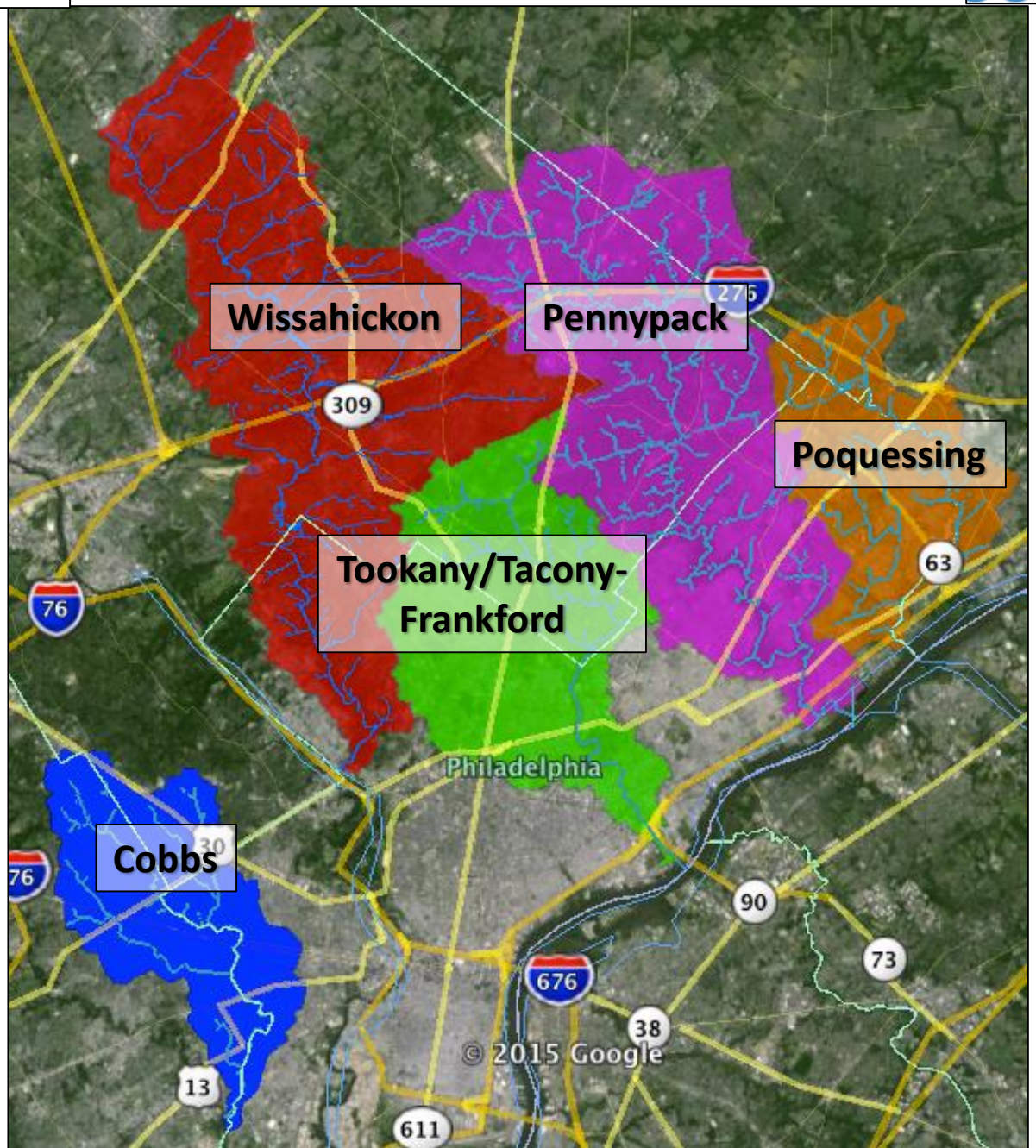
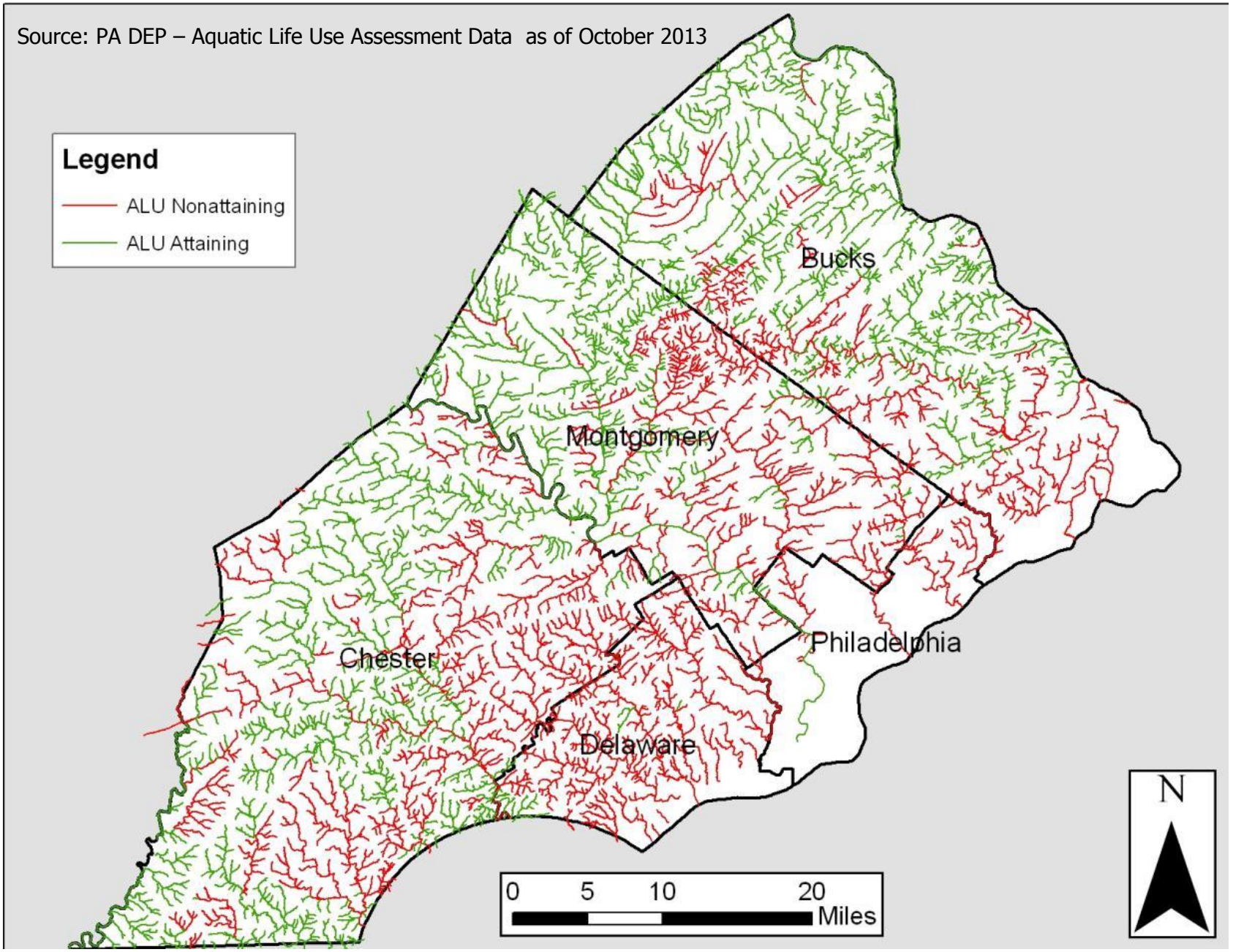



Source: PA DEP – Aquatic Life Use Assessment Data as of October 2013
Legend
ALU Nonattaining
ALU Attaining
Bucks
Montgomery
Chester
Philadelphia
Delaware
0 5 10 20
Miles
N

Restoration Targets and Goals

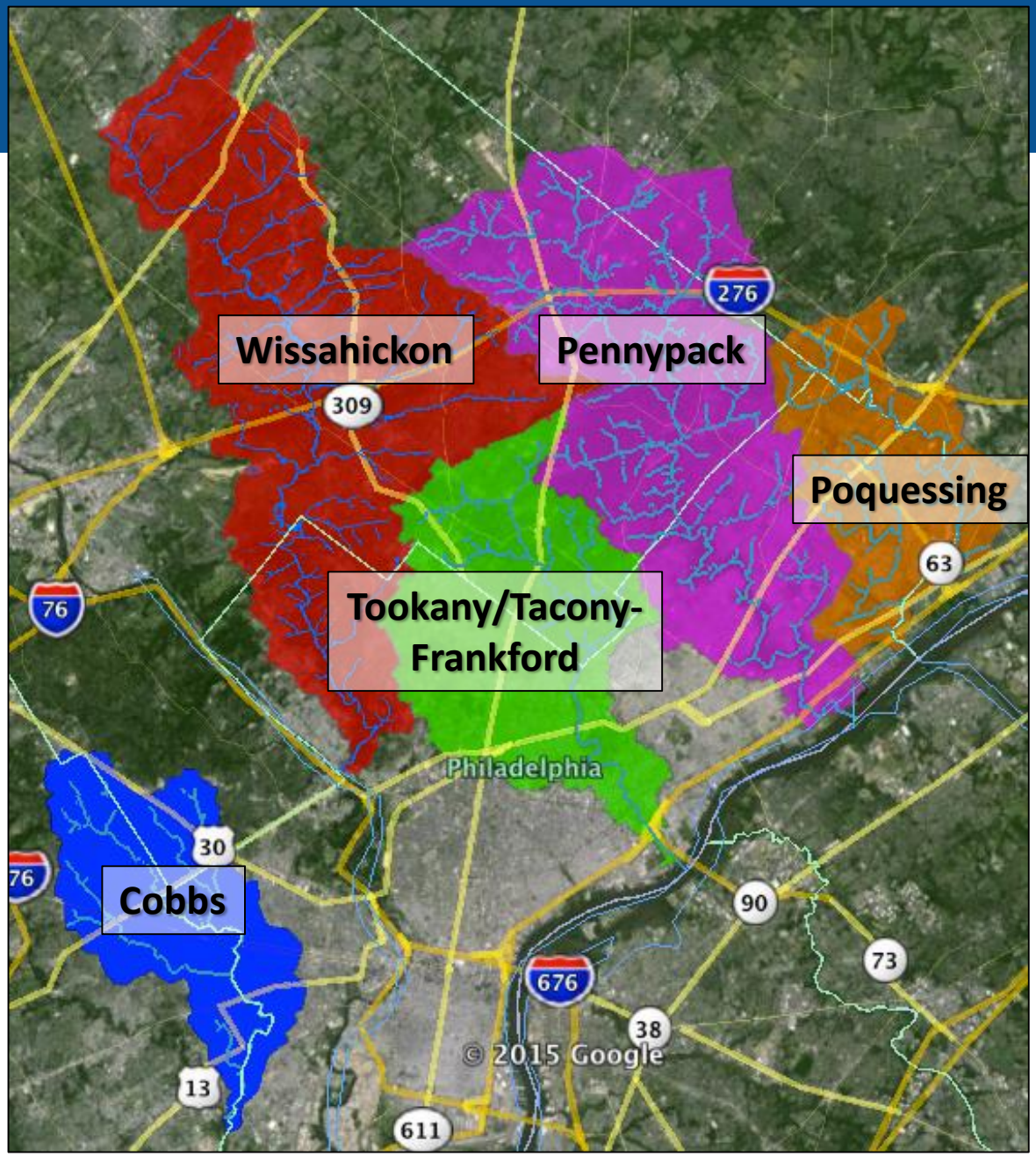
Improve the management of stormwater runoff

Improve the quality of riparian buffers

Improve the natural hydrologic conditions of streams and connectivity to associated floodplains and wetlands

Increase investment in WWTP and sewer systems

Upstream Suburban Philadelphia Cluster



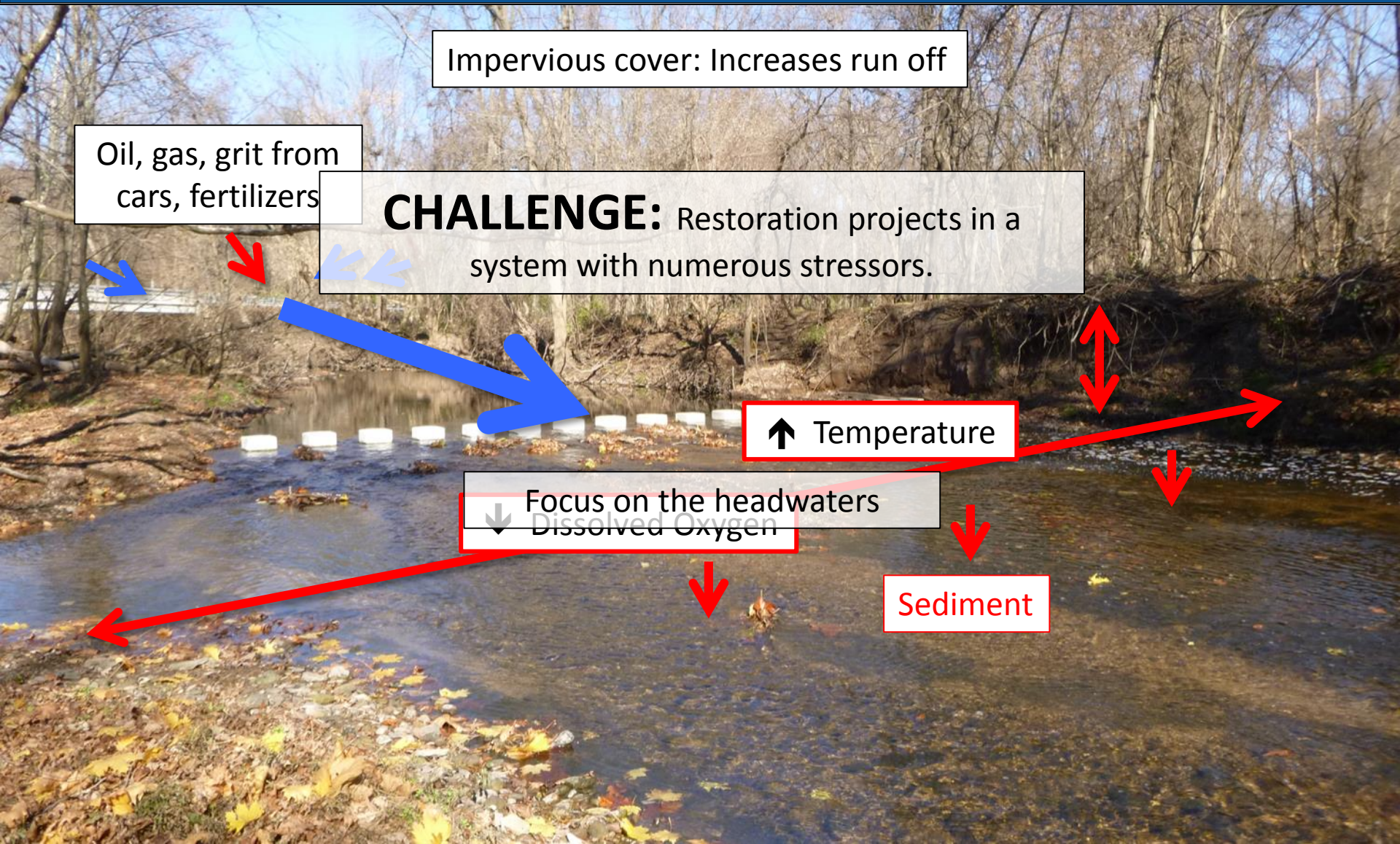
Challenges:

- Impervious cover, aging infrastructure

Tools:

- Restoration and green infrastructure
- Education and outreach
- Municipal collaboration

Urban/Suburban Impacts



Three Tiered Monitoring Approach

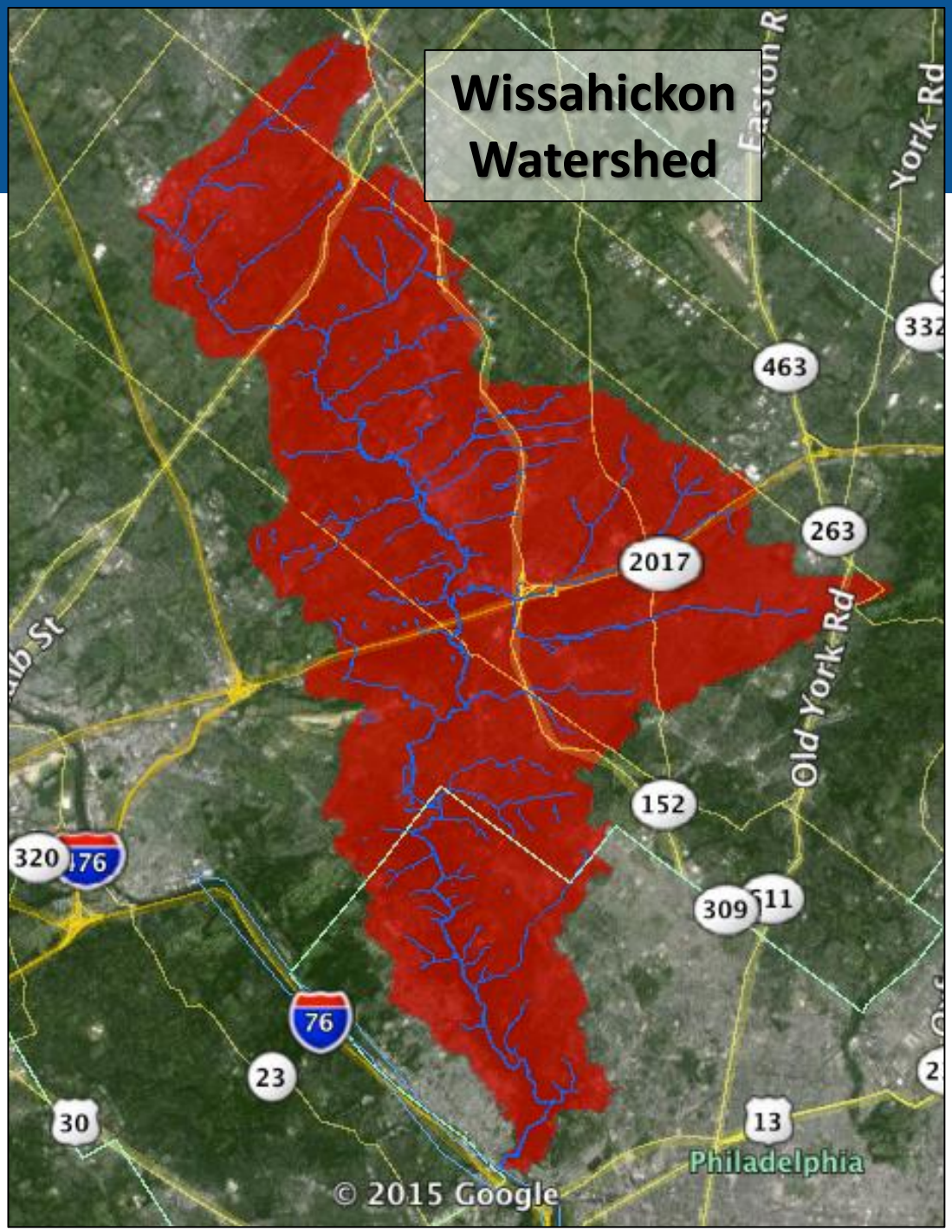
University	Watershed	Citizen
Temple and Villanova Universities	Watershed Associations	Citizen Scientists

- Collaborative
- Focused on project sites for improvements and effectiveness
- Watershed-wide
  - Understand the state of the watershed
  - Education and outreach

Set up

- Limitations (time, infrastructure, budget)

- Guidance
  - Academy of Natural Sciences
  - Past monitoring programs
  - NJDEP
  - Regulations



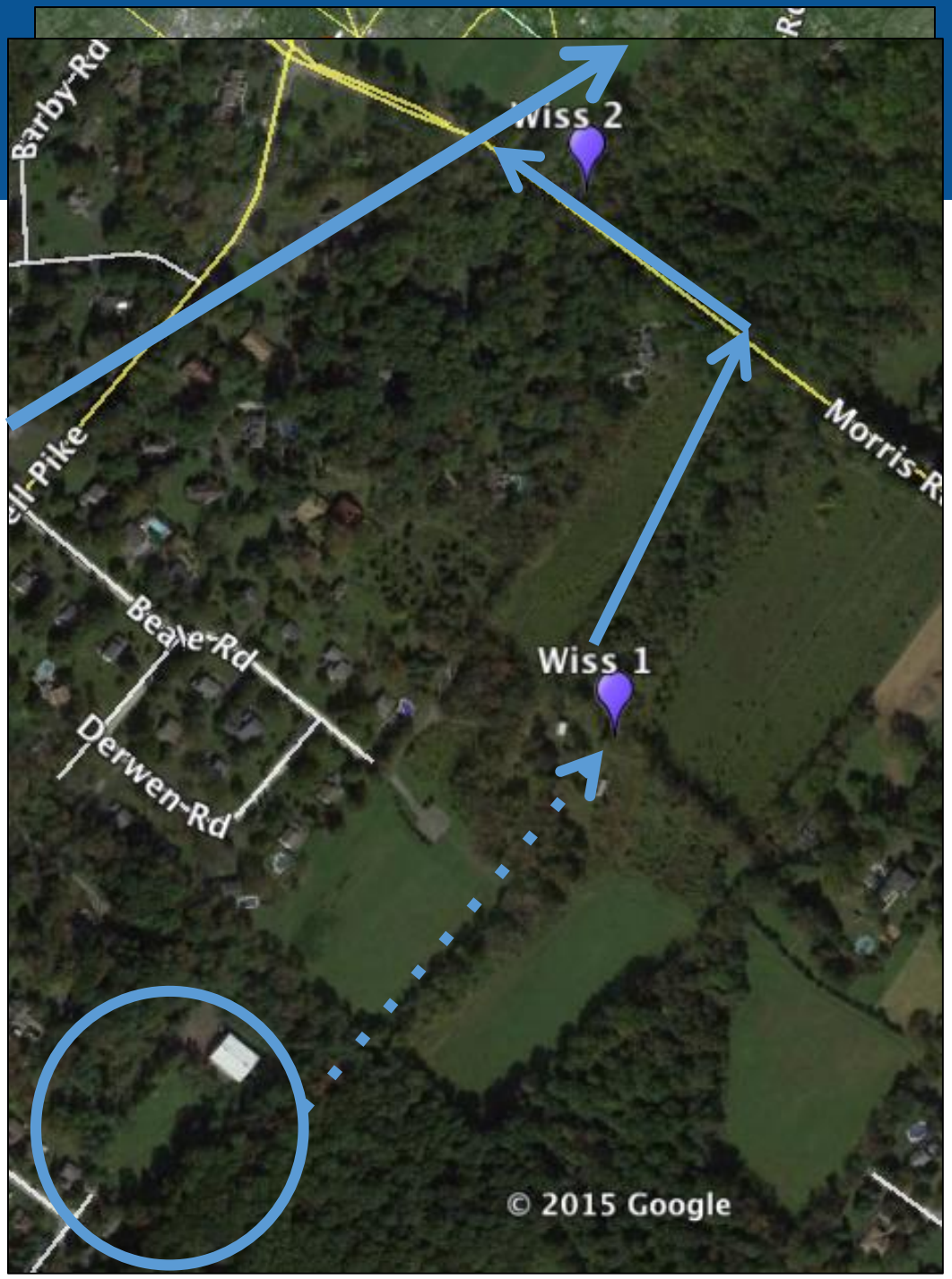
University Tier

Goals:

- Statistically quantify water quality improvements
- Collect baseline data
- Determine the distance that water quality improvements are detected

University Tier: Programs

- Sites (projects)
- Paired continuous loggers
  - Turbidity
  - Temperature
  - Water depth
  - Conductivity
  - Nitrate



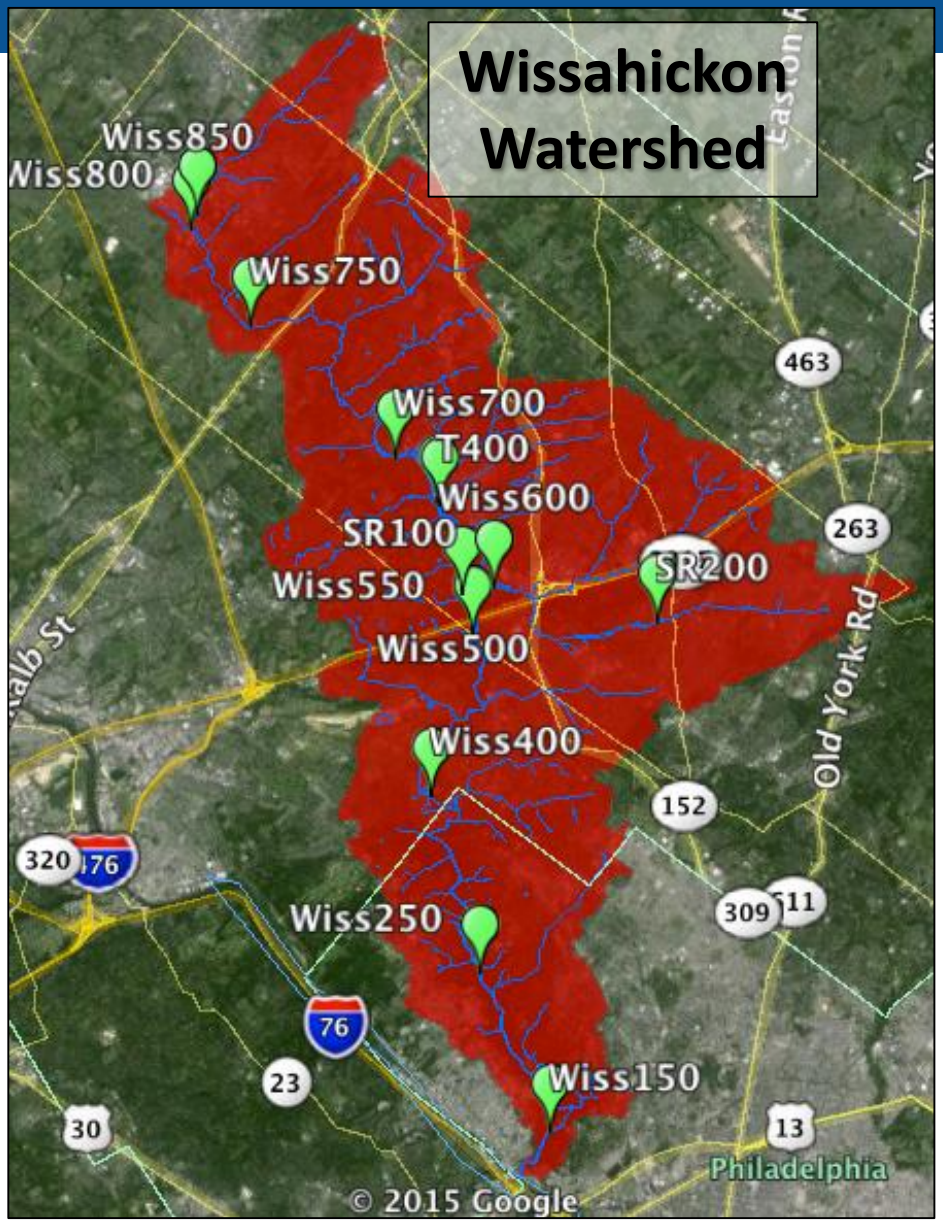
Watershed Tier

Goals:

- Valuable data for communication and research
- Determine the current conditions in headwaters
- Monitor for changes

Watershed Tier: Programs

- Sites (projects, main stem)
- Four times a year
  - Water chemistry (phosphorus, nitrogen, sediments, chlorides)
  - Stream side chemistry (Temp, dissolved oxygen, conductivity, pH)
  - Physical parameters (depth, width, flow, current conditions)
- Once a year
  - Macroinvertebrates
  - Habitat assessments



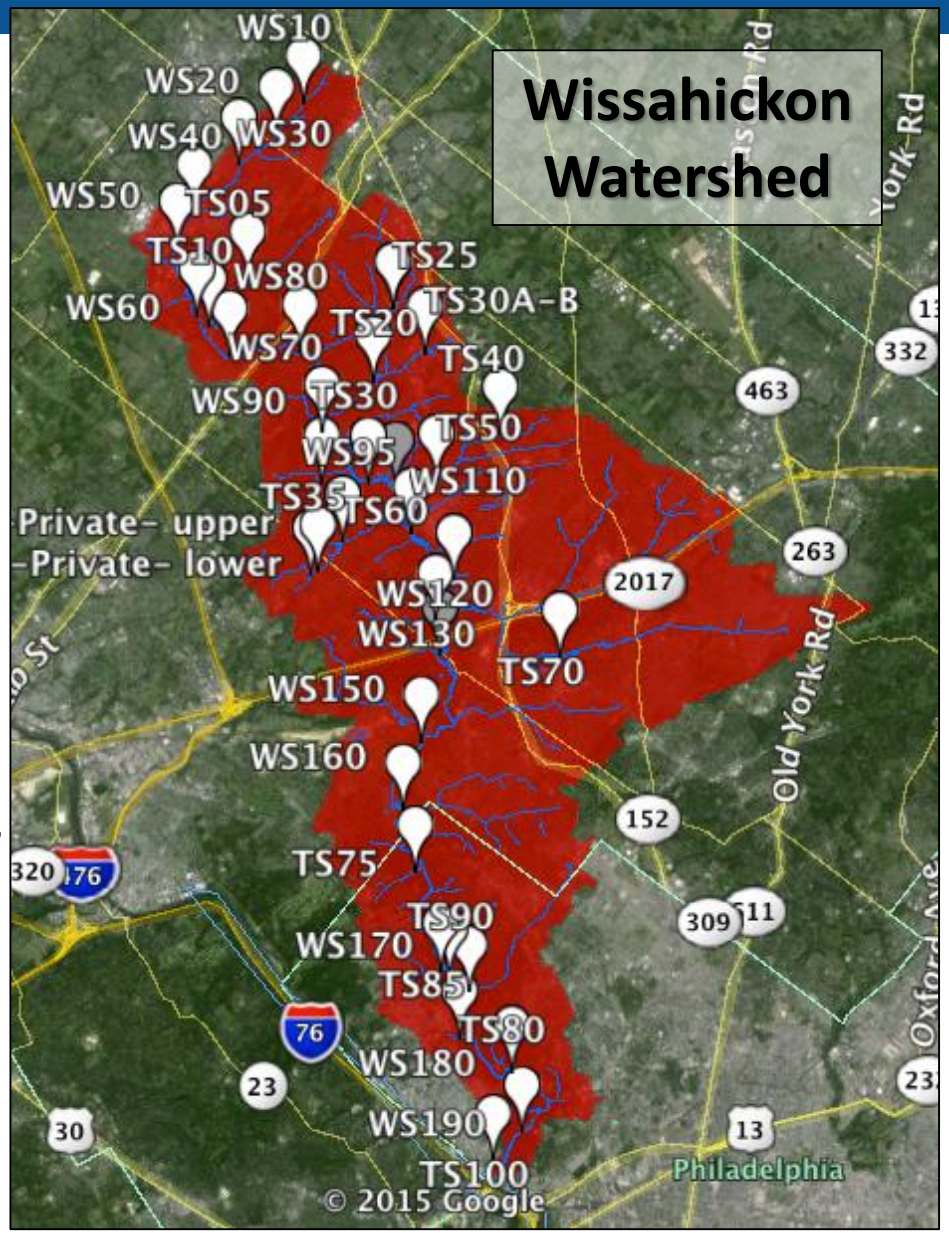
Citizen Tier

Goals:

- Approachable training
- Longevity
- Early detection of environmental concerns
- Community engagement, education and outreach

Citizens Tier: Program

- Started August 2014
  - ~100 citizen scientists over 5 watersheds
- Sites (public property, private homeowners)
- Once a month
  - Visual assessments (current conditions, absence/presence, changes in conditions)
  - Stream side chemistry (LaMotte kits, N and P)
- Additional training



So far…

- Baseline year for watersheds, valuable in communication
- Adjustments made to sites
- Citizens are a powerful, enthusiastic group that can identify concerns
- Community value: requests for monitors
- Future training: monitoring project sites

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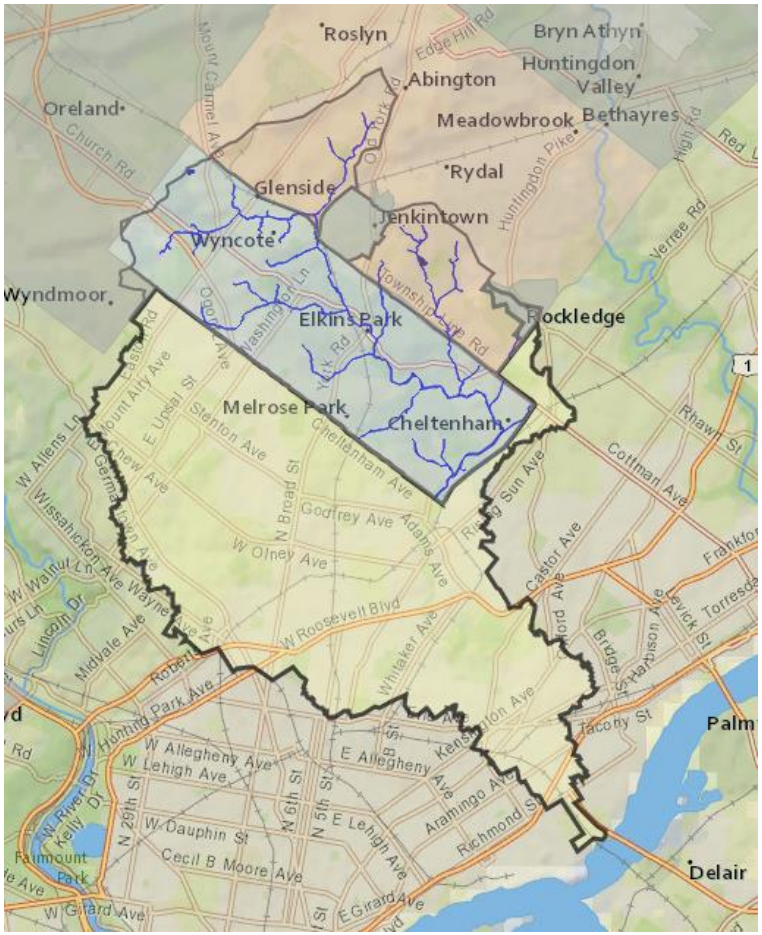
TTF Watershed: Projects, Education and Outreach



PENNYPACK ECOLOGICAL RESTORATION TRUST

Citizen Science

Growing in popularity

Improved Technology

Community Involvement in local environmental issues

Education Opportunity – Science Literacy

Regulators establishing more programs

TTF Citizens Monitor the Jenkintown Creek

Why Citizen Science for Stream Monitoring?

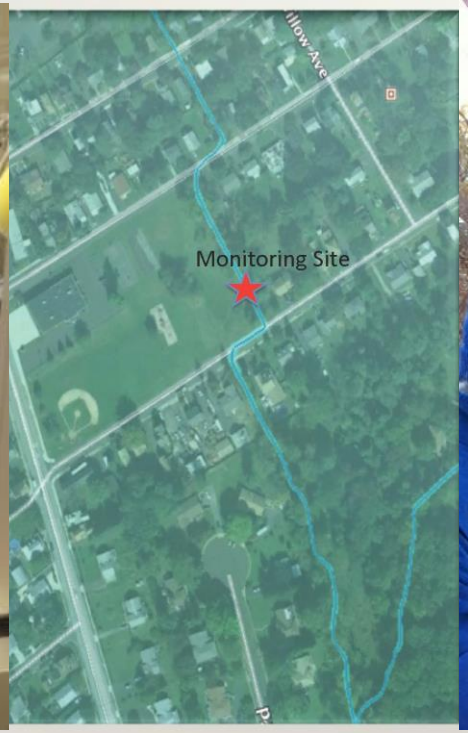
Planning, Identifying our goals and purpose for monitoring

- What are we monitoring?
- Purpose of Data
- Training & skills
- Equipment
- Location
- Coordination
- Submitting & Analyzing data

Call for Volunteers

- Generate Interest
- Survey Volunteers
- Scheduling
- Commitment

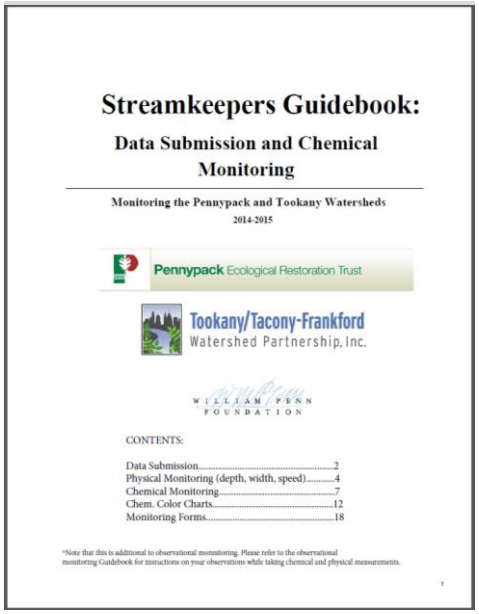
Training and Site Selection



What are we monitoring?

Monitoring Site Data					
Site photo file name (Section-ddMONTHyyyy-full name):					
Circle one choice					
Water clarity:	Clear	Slightly cloudy	Cloudy	Opaque/chocolate milk	
Surface coating:	None/clear	Bubbles	Scum	Oily	Other:
Odor:	Normal	Sewage	Rotten Eggs	Chemical	Petroleum	Other:
Stream bed color:	Orange/red	Yellow	Black	Brown	Green
% Shade:	<30%	30-50%	50-80%	>80%	
Algae cover:	Rare	Moderate	Abundant		
Flow:	Slow	Moderate	Swift	Combination	
Leaf packs:	None	Individual leaves	Small leaf packs (5-20 leaves)	Large leaf clumps (>20 leaves)	
Circle and describe all that apply					
Aquatic vegetation:	None	Floating	Rooted submerged	Rooted floating	Rooted emergent
Erosion:	No change	Continued bank erosion	New bank erosion	Increased sediment deposition/islands	Decreased sediment deposition/islands
Riparian vegetation:	No change	Decreased abundance	Increased abundance	Change in types	Fallen trees
Animal observations:	None	Fish (alive)	Fish (dead)	Birds	Insects	Mammals

Streamkeeper Equipment and Opportunities



Streamkeepers Guidebook:

Data Submission and Chemical Monitoring

Monitoring the Pennypack and Tookany Watersheds
2014-2015

Pennypack Ecological Restoration Trust

Tookany/Tacony-Frankford Watershed Partnership, Inc.

WILLIAM PENN FOUNDATION

CONTENTS:

Data Submission....2
Physical Monitoring (depth, width, speed)....4
Chemical Monitoring....7
Chem. Color Charts....12
Monitoring Forms....18

*Note that this is additional to observational monitoring. Please refer to the observational monitoring Guidebook for instructions on your observations while taking chemical and physical measurements.

Tookany/Tacony-Frankford Watershed Partnership, Inc.

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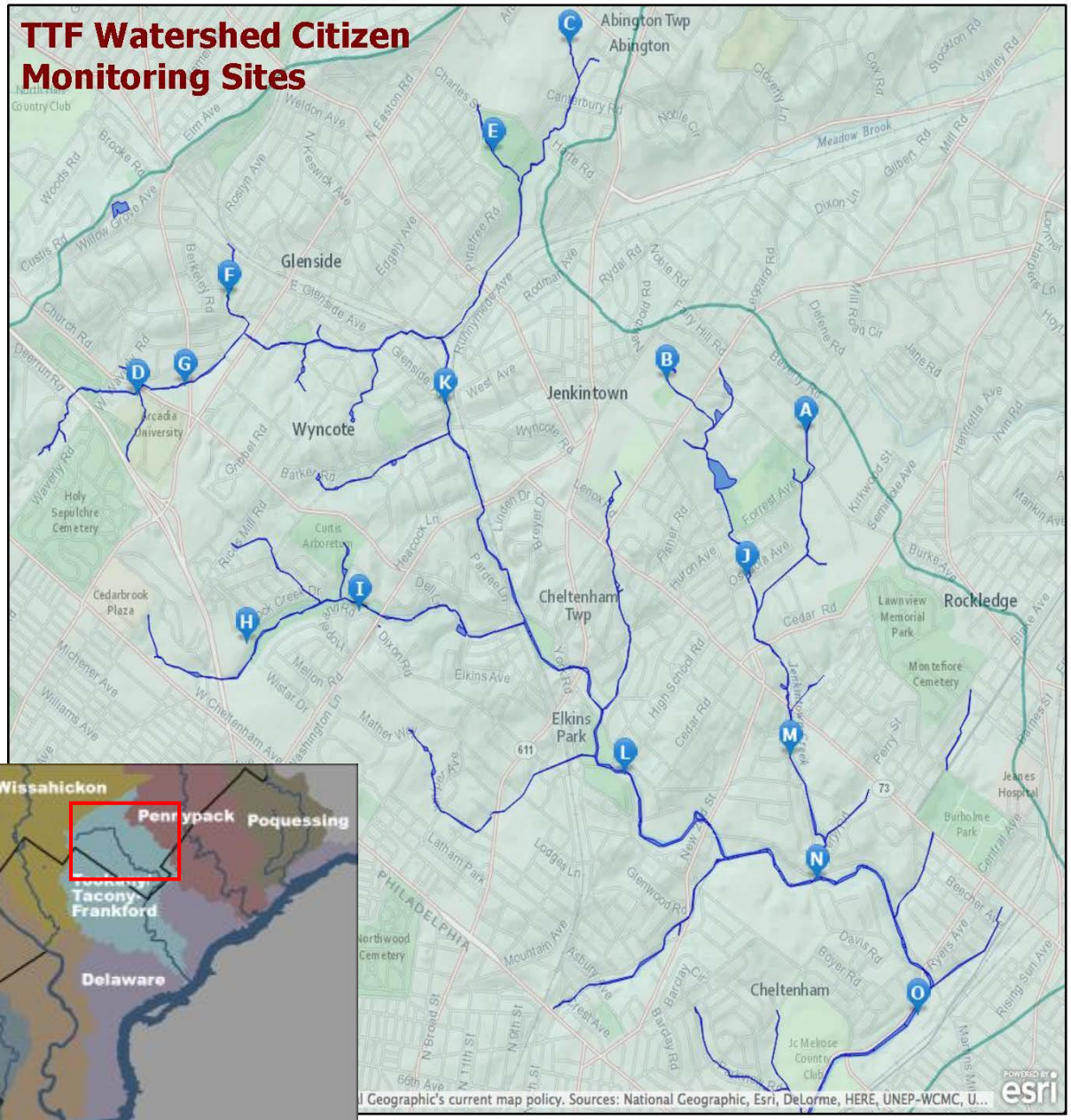
WISSAHICKON WATERSHED valley ASSOCIATION



Monitoring Sites

A: TTF 100*
Sisters of Saint Basil

B: TTF 200*
Abington Friends

C: TTF 300*
Abington JHS

D: TTF 350
Arcadia University

E: TTF 375
Baederwood Park

F: TTF 390
Grove Park

G: TTF 400*
Glenside Elementary

H: TTF 500*
Former Cedarbrook MS

I: TTF 550
Curtis Arboretum

J: TTF 575
Ethel Jordan Park

K: TTF 800
Ralph Morgan Park

L: TTF 900
High School Park

M: TTF 1000
Einstein Hospital

N: TTF 1050
Jenkintown Road Bridge

O: TTF 1100
Cheltenham Little League

*TTF Sampling Site

Tookany/Tacony-Frankford
Watershed Partnership, Inc.
YOUR WATERSHED...
YOUR FUTURE.
Report: Fall 2014
Stream
Keeper
Tookany/Tacony-Frankford Watershed

Compare Water Quality!

1T Tookany Creek 3R Rock Creek 2B Baeder Creek 5J Jenkintown Creek

Shade
A forested riparian area provides shade for the creek and the life it supports. Shade is an indicator of a healthy creek.

Leaf Packs
Leaves are a vital source of food in a stream. A healthy stream should have leaves in the creek all year.

Algae Cover
Algae is important to a healthy stream ecosystem, often used as an indicator of water quality. Streamkeepers track the amount growing at their sites.

Surface Coating
Bubbles, scum, and foam sometimes occur naturally, but detergents, oil, and other pollution can also be the source.

1T Tookany Creek

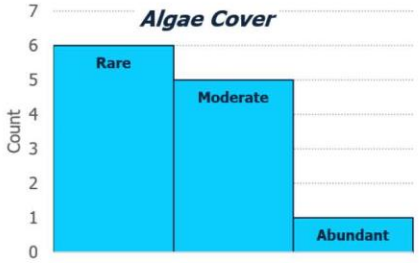
TTF 800—Ralph Morgan Park

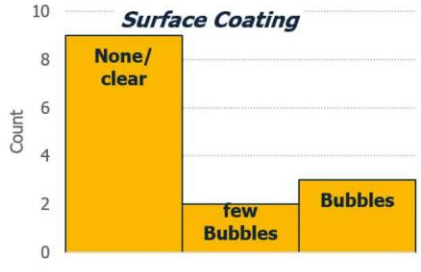
TTF 1050—Jenkintown Road Bridge

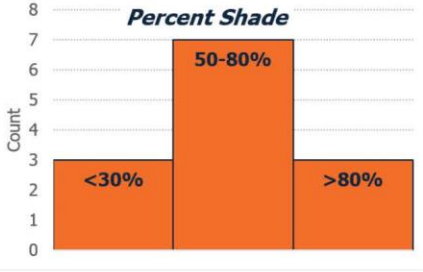
TTF 350-Arcadia University

TTF 390—Grove Park

*All **StreamKeepers** reported clear water clarity, normal odor, a brown stream bed, no aquatic vegetation, and an average PH of 7.29.*







The Streamkeepers of TTF & Pennypack

Additional Education through Water Monitoring

Summary

- 20 Committed, Trained Volunteers
- 15 Monitoring Sites
- Over 75 Individual Assessments
- Committed Watershed volunteers
- Voice for the Creek
- Growth
- Improved
- Pre-Post Project Monitoring
- Identifying opportunities for improvement

Looking Ahead & Lessons

- Data
- Access
- Gear
- Expenses
- Education/Events

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QUESTIONS?