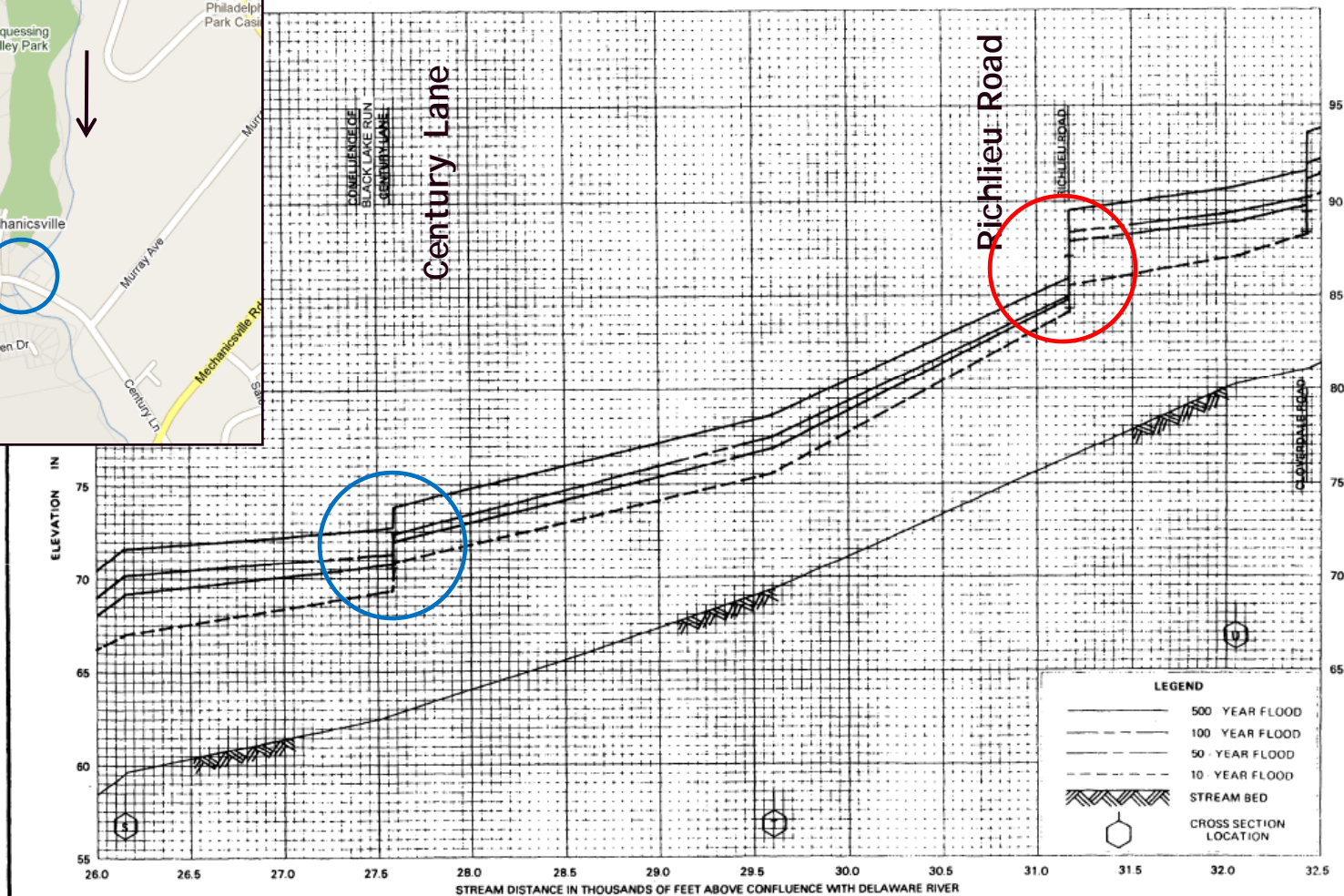
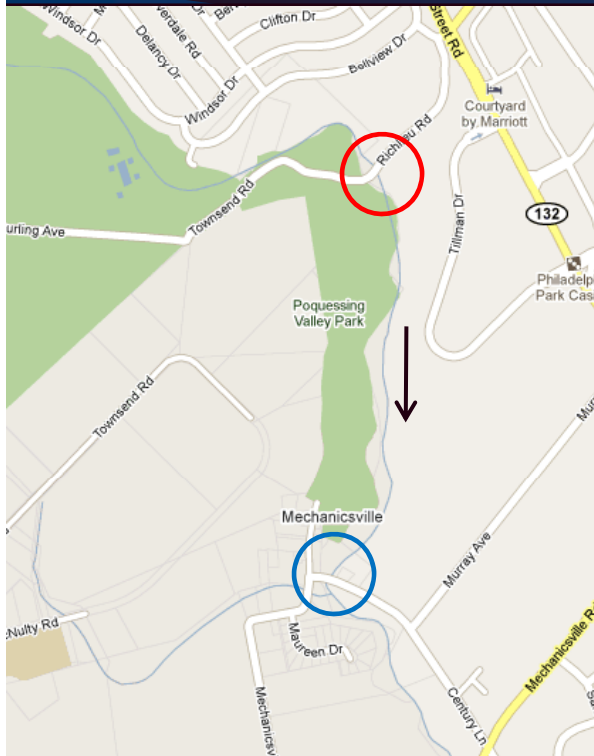


# FIS Profile

- Example of bridge with backwater
- Richlieu Road and Century Lane both show substantial backwater



FLOOD PROFILES

POQUESSING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
CITY OF PHILADELPHIA, PA  
(PHILADELPHIA CO.)

31P

# BEHI Photo

**URS**

## PHOTOGRAPHIC LOG

**Client Name:**

Philadelphia Water Department

**Site Location:** 3593 Teton Rd

Jefferies Property

**Project No.**

19998153.00001

**Photo No.**

1

**Date:**

4/7/09

**Direction Photo Taken:**

West

**Description:**

Upstream







## PHOTOGRAPHIC LOG

Client Name:  
Philadelphia Water Department

Site Location: 4611 Eden Street  
Accione Property

Project No.  
10008157.00001

Photo No.  
3

Date:  
3/23/09

Direction Photo Taken:  
Northeast

**Description:**

Downstream - Right bank  
(foreground) and Left bank  
(background)

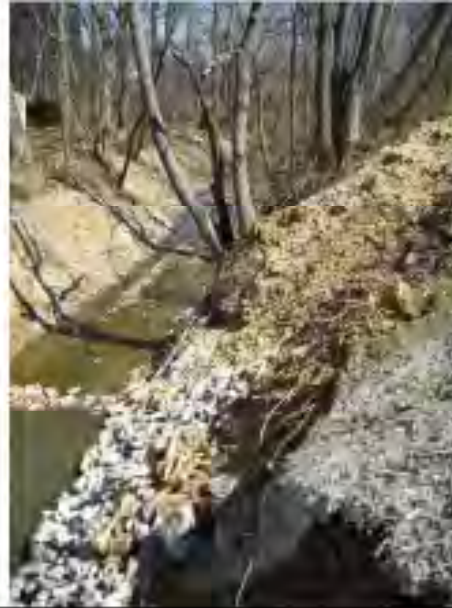


Photo No.  
4

Date:  
3/23/09

Direction Photo Taken:  
Northeast

**Description:**

Downstream - Right bank  
(foreground) and Left bank  
(background)



# Bank Erosion Hazard Index (BEHI)<sup>1</sup>

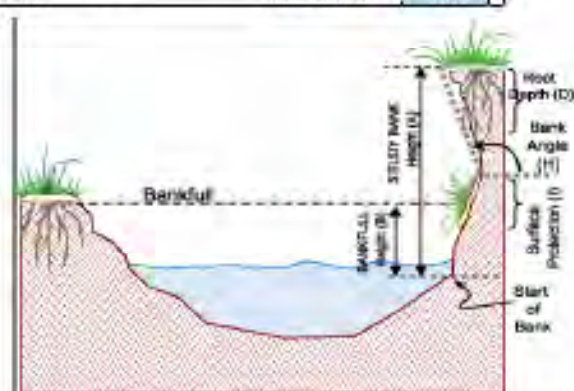
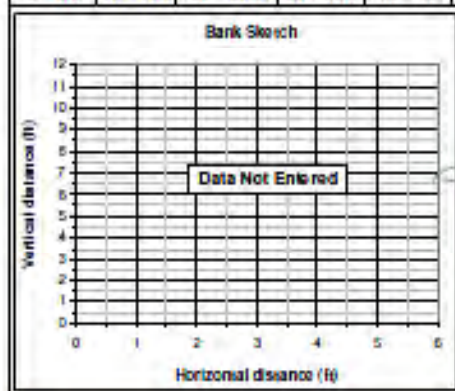
Stream: Trib to Poquessing Creek (DSRB) Location: 4611 Eden St. (Acclione)  
 Station: Observers: J. Gilmore, A. Federici  
 Date: 3/23/09 Stream Type: Valley Type:

Study Bank Height / Bankfull Height ( C ) (Fig. 5-19)						BEHI Score
Study Bank Height (ft) =	15 (A)	Bankfull Height (ft) =	1.7 (B)	( A ) / ( B ) =	8.82 ( C )	10
Root Depth / Study Bank Height ( E )						
Root Depth (ft) =	0 (D)	Study Bank Height (ft) =	15 (A)	( D ) / ( A ) =	0.00 ( E )	10
Weighted Root Density ( G )						
Root Density as % =	0% (F)	( F ) x ( E ) =	0.00 ( G )			10

Bank Angle ( H )		
Bank Angle as Degrees =	50	3.5
Surface Protection ( I )		
Surface Protection as % =	75%	2.5

Bank Material Adjustment:		Bank Material Adjustment
Bedrock (Overall Very Low BEHI)		
Boulders (Overall Low BEHI)		
Cobble (Subtract 10 points if uniform medium to large cobble)		
Gravel or Composite Matrix (Add 5-10 points depending on percentage of bank material that is composed of sand)		
Sand (Add 10 points)		
Silt/Clay (no adjustment)		
Sedimentation Adjustment:		
Add 5 - 10 points, depending on position of unstable layers in relation to bankfull stage.		0


Very Low	Low	Moderate	High	Very High	Extreme	Adjective Rating and Total Score
5 - 9.5	10 - 19.5	20 - 29.5	30 - 39.5	40 - 45	46 - 50	26




<sup>1</sup> Roegner, D., 2006. Watershed Assessment of River Stability and Sediment Supply (WARSSS). Worksheet 5-3.







ADDRESS	STREAM NAME	STUDY AREA	Physiographic Province	Near-Bank Stress (NBS) Method 5 Results	Bank Erosion Hazard Index (BEHI) Results
629 Poquessing Avenue, 19116	UNT Poquessing Creek	POQ Study Area-1	Piedmont	High - Very High	High
630 Maple Ave., 19116	UNT Poquessing Creek	POQ Study Area-1	Piedmont	High	Very High
13480 Trevoise Avenue, 19116	UNT Poquessing Creek	POQ Study Area-1	Piedmont	High	Very High
13488 Trevoise Avenue, 19116	UNT Poquessing Creek	POQ Study Area-1	Piedmont	High	Very High
13484 Trevoise Avenue, 19116	UNT Poquessing Creek	POQ Study Area-1	Piedmont	High	Very High
13475 Proctor Rd., 19116	UNT Poquessing Creek	POQ Study Area-1	Piedmont	NA	NA
3123 Mechanicsville Rd., 19154	Poquessing Creek	POQ Study Area-2	Atlantic Coastal Plain	High	Very High
3135 Mechanicsville Rd., 19154	Poquessing Creek	POQ Study Area-2	Atlantic Coastal Plain	Extreme	Very High
3303 Ancona Rd., 19154	UNT Poquessing Creek	POQ Study Area-3A	Atlantic Coastal Plain	Very High	Very High
3593 Teton Rd., 19154	UNT Poquessing Creek	POQ Study Area-3B	Atlantic Coastal Plain	Moderate	High
3650 Salina Rd., 19154	Byberry Creek (Trib. of Poquessing Creek)	POQ Study Area-4	Atlantic Coastal Plain	Extreme	High
3304 S. Keswick Plaza, 19114	UNT Byberry Creek (Trib. of Poquessing Creek)	POQ Study Area-5	Atlantic Coastal Plain	High	High - Very High







# Possible Solutions

- **BMP's**
  - **Non-Structural**
  - **Structural**

**Table II.1. Alternative Runoff Control Techniques per Pennsylvania Stormwater Best Management Practices Manual.**

Chapter 5. Non-Structural BMPs	Chapter 6. Structural BMPs
BMP 5.4.1 Protect Sensitive and Special Value Features	BMP 6.4.1 Pervious Pavement with Infiltration Bed
BMP 5.4.2 Protect/Conserve/Enhance Riparian Areas	BMP 6.4.2 Infiltration Basin
BMP 5.4.3 Protect/Utilize Natural Flow Pathways in Overall Stormwater Planning and Design	BMP 6.4.3 Subsurface Infiltration Bed
BMP 5.5.1 Cluster Uses at Each Site; Build on Smallest Area Possible	BMP 6.4.4 Infiltration Trench
BMP 5.5.2 Concentrate Uses Area-wide Through Smart Growth Practices	BMP 6.4.5 Rain Garden and Bioretention
BMP 5.6.1 Minimize Total Disturbed Area	BMP 6.4.6 Dry Well or Seepage Pit
BMP 5.6.2 Minimize Soil Compaction in Disturbed Areas	BMP 6.4.7 Constructed Filter
BMP 5.6.3 Re-vegetate and Re-forest Disturbed Areas Using Native Species	BMP 6.4.8 Vegetated Swale
BMP 5.7.1 Reduce Street Impervious Cover	BMP 6.4.9 Vegetated Filter Strip
BMP 5.7.2 Reduce Parking Impervious Cover	BMP 6.4.10 Infiltration Berm and Retentive Grading
BMP 5.8.1 Rooftop Disconnection	BMP 6.5.1 Vegetated Roof
BMP 5.8.2 Storm Sewer Disconnection	BMP 6.5.2 Runoff Capture and Reuse
BMP 5.9.1 Streetsweeping	BMP 6.6.1 Constructed Wetlands
	BMP 6.6.2 Wet Pond or Retention Basin
	BMP 6.6.3 Dry Extended Detention Basin
	BMP 6.6.4 Water Quality Filter
	BMP 6.7.1 Riparian Buffer Restoration
	BMP 6.7.2 Landscape Restoration
	BMP 6.7.3 Soil Amendment and Restoration
	BMP 6.7.4 Floodplain Restoration
	BMP 6.8.1 Level Spreader
	BMP 6.8.2 Special Detention Areas



## Problem Area Summary

- Source
  - Type
    - # of Problems
    - Solutions

Source	Types of Problems	# of Problems	Solutions
URS	BEHI Data	21	5.4.2, stream bank armoring, bioengineering, Reduce Run-off
PWD	Sedimentation Sites	8	Permanent stabilization, Correct Erosion, Reduce Run-off
	Erosion Sites	50	5.4.2, stream bank armoring, bioengineering, Reduce Run-off
PASDA	Flooding	In progress	All BMP's
FEMA	FIS Bridge Backwater Data	42	Reduce Run-off, Redesign

# Sample Problem Area Forms

- Will be used during field views to classify problems and determine potential solutions

POQUESSING WATERSHED		
Poquessing Watershed Act 167 Problem Area Inventory		
Problem Area - Map ID:		Comments
Municipality:		
Subwatershed:		
Stream name:		
Inspected By/Date:		
Checked By/Date:		
Type of Problem (highlighted):		
1	Flooding	
2	Deficient Bridge/Culvert	
3	Erosion	
4	Sedimentation	
5	Water/Groundwater Pollution	
6	Other	
INSERT PICTURE		Description
INSERT PICTURE		Description
Solution	XX.XXX.xxx	



# Sample Problem Area Form for Bridges

- Will be used to determine flow that passes under bridges within the watershed

POQUESSING WATERSHED			
Poquessing Watershed Act 167 Problem Area Inventory			
Problem Area ID:		Inspected By/Date:	
Municipality:		Checked By/Date:	
Subwatershed:			
Stream name:			
Drainage Area (mi <sup>2</sup> )			
Calculation Method			
C (Tc)			
Storm Frequency (Yrs)	Rainfall (in)	Peak Discharge (cfs)	Unit Discharge (cfs/Ac)
2			
5			
10			
50			
100			
500			
*Type of Problem (Highlight all that apply):		Description	
Flooding	Deficient Bridge/Culvert		
Erosion	Sedimentation		
Water/Groundwater Pollution	Other		
Potential Solutions			
Cost Estimates			
Option	A	B	C
Cost Range			

# Sample Problem Area Form for Bridges

## POQUESSING WATERSHED

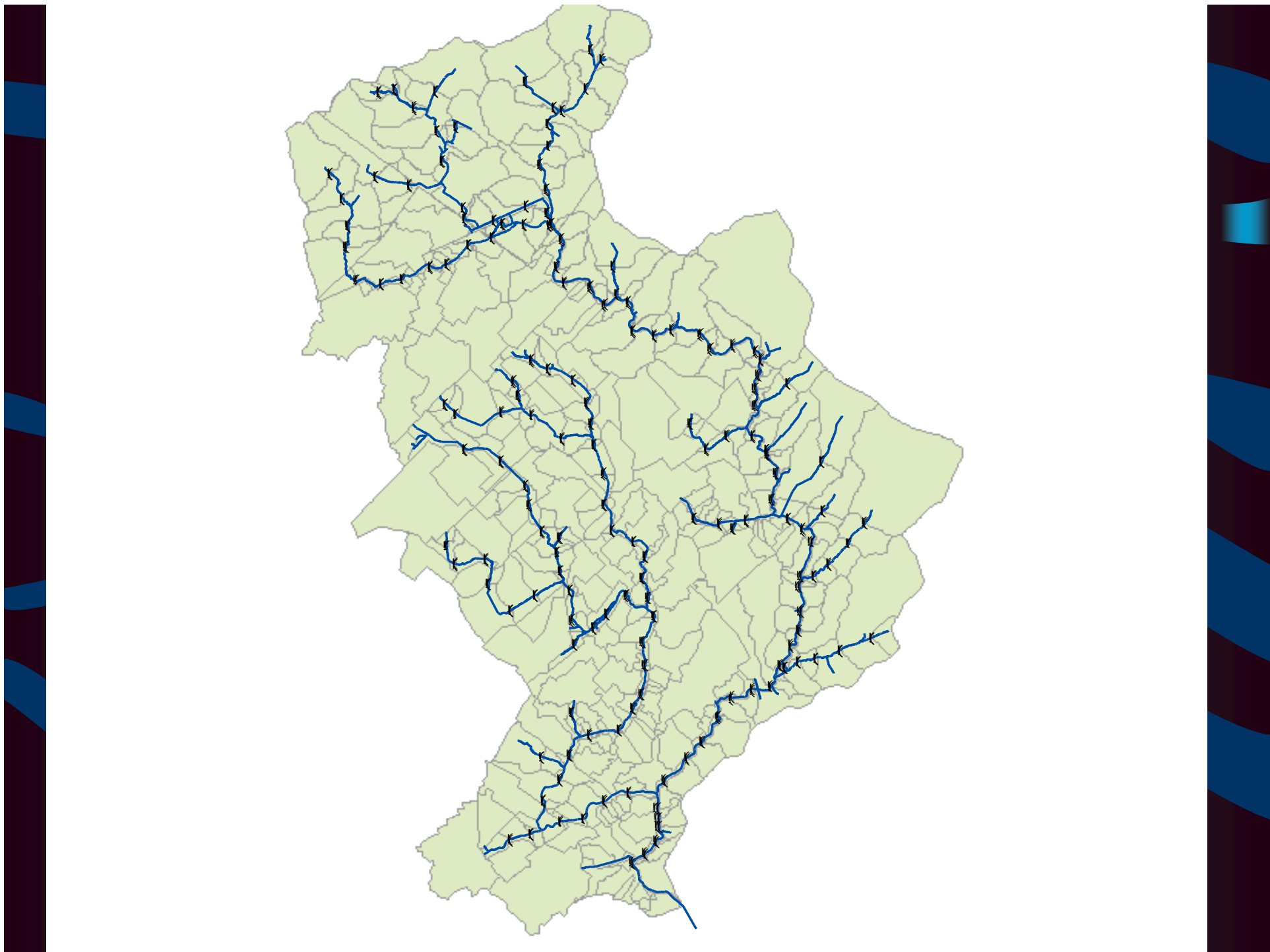


Problem Area	Municipality	Sub Watershed	Stream Name	Preferred Solution
Explanation:				
Note:				



# Modeling

(James Knighton, PWD)

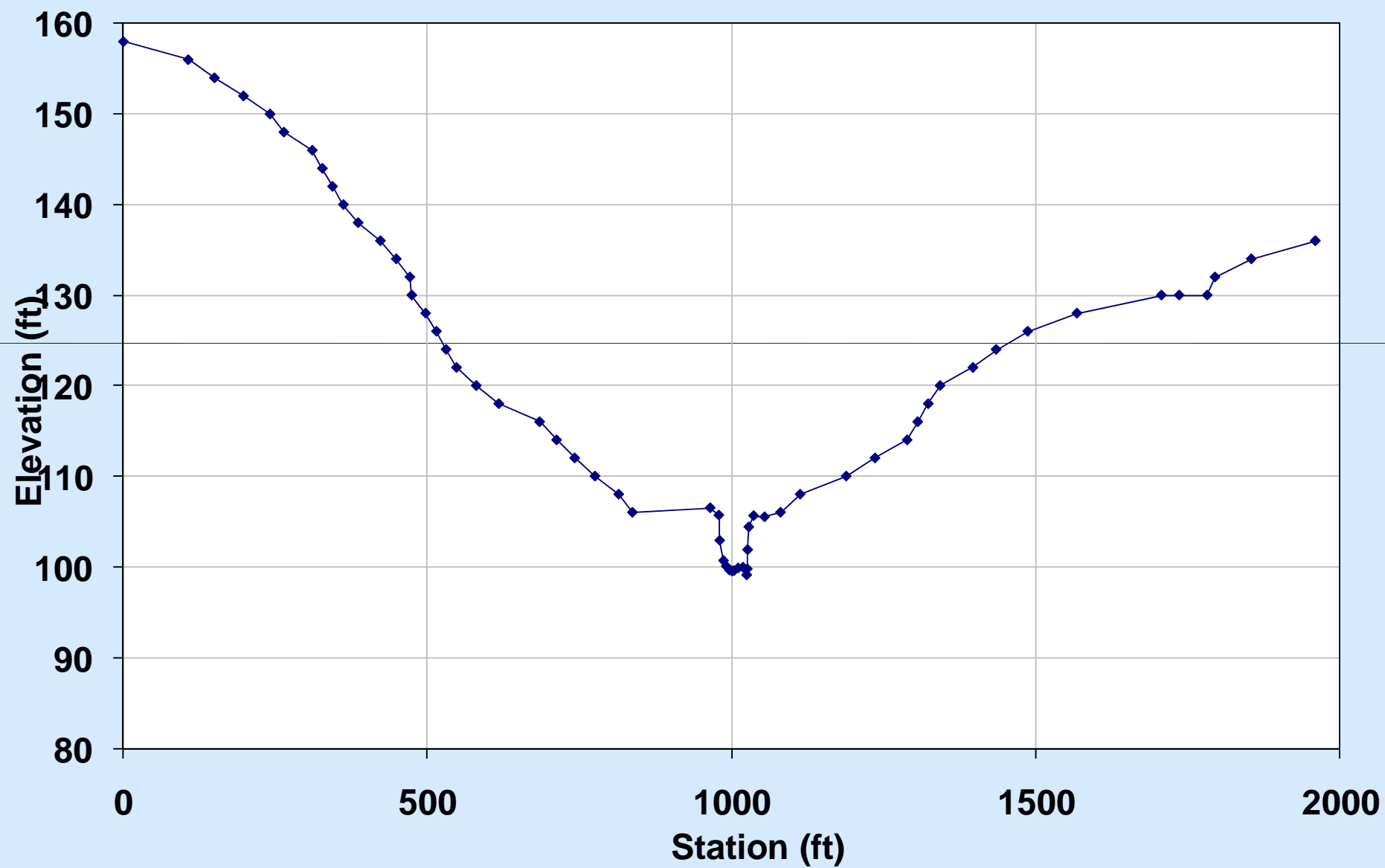








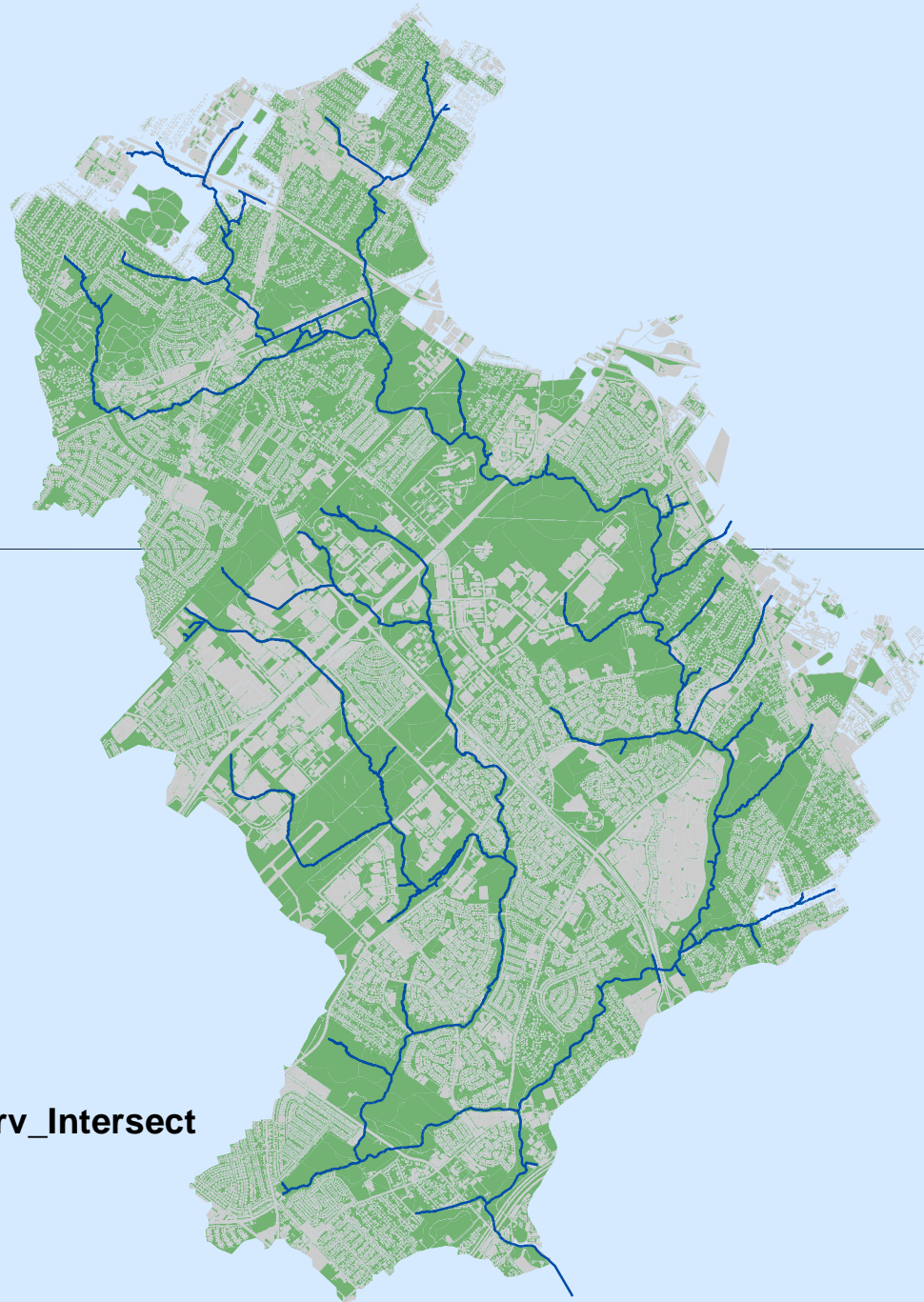
## POQ Main Stem Survey 28













## Poquessing Impervious Cover

## PoquessingSheds\_Imperv\_Intersect

 Impervious

## FCODE

 Pervious

**Poquessing Creek  
Hydrologic Soil Group**

**Poquessing\_Soils\_Project**

**HYDGRP**



A

A/D

B

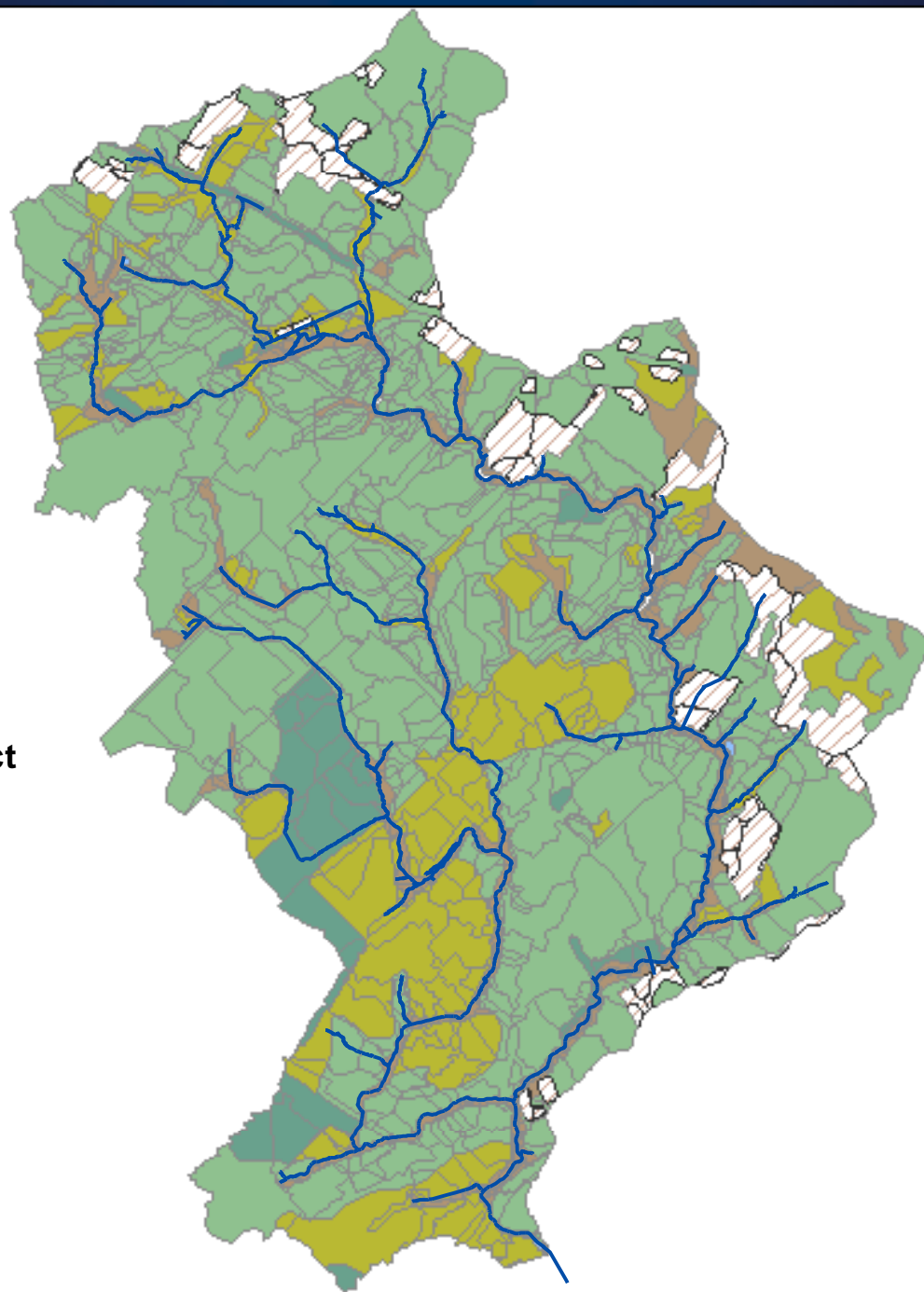
B/D

C

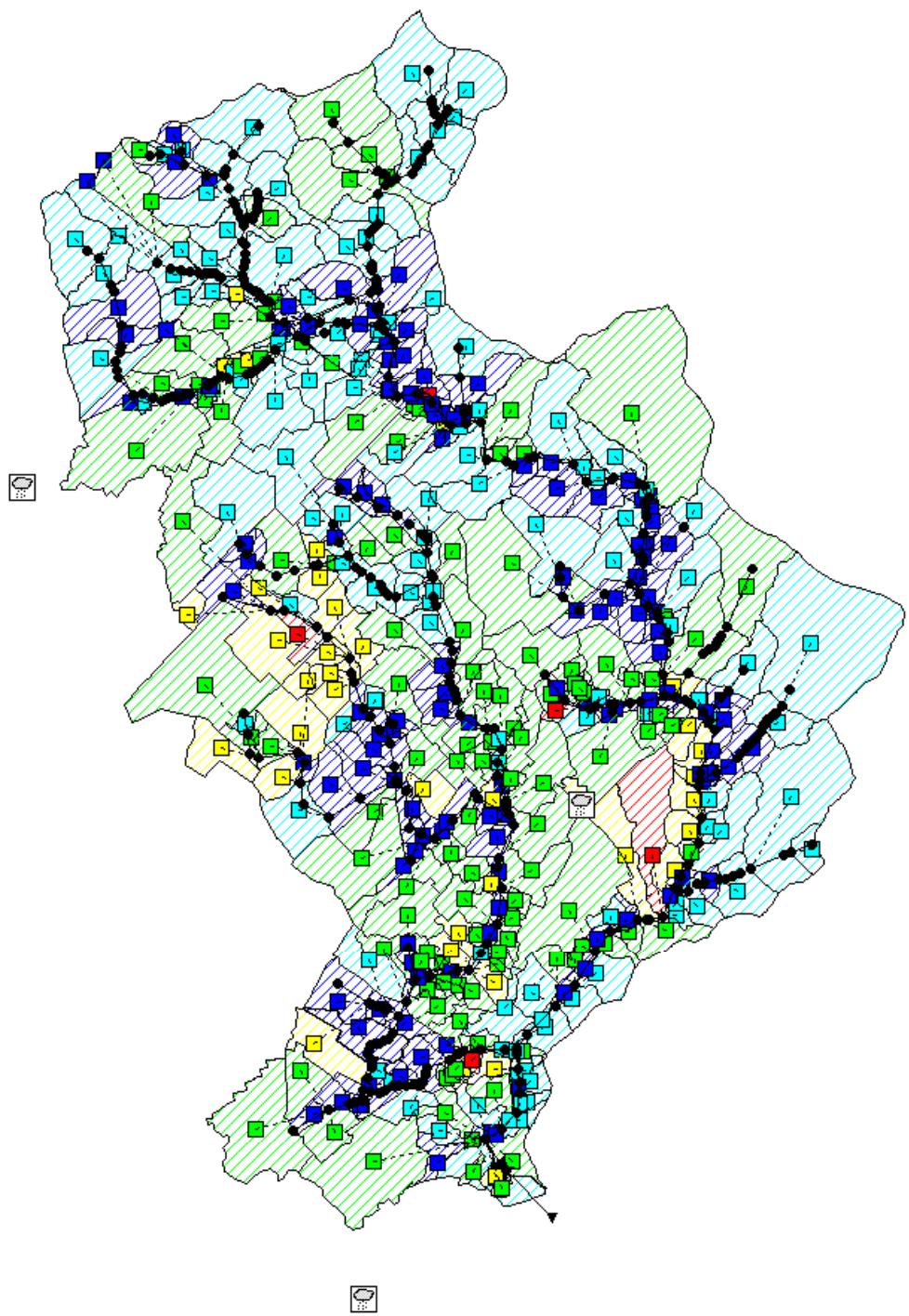
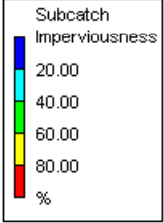
C/D

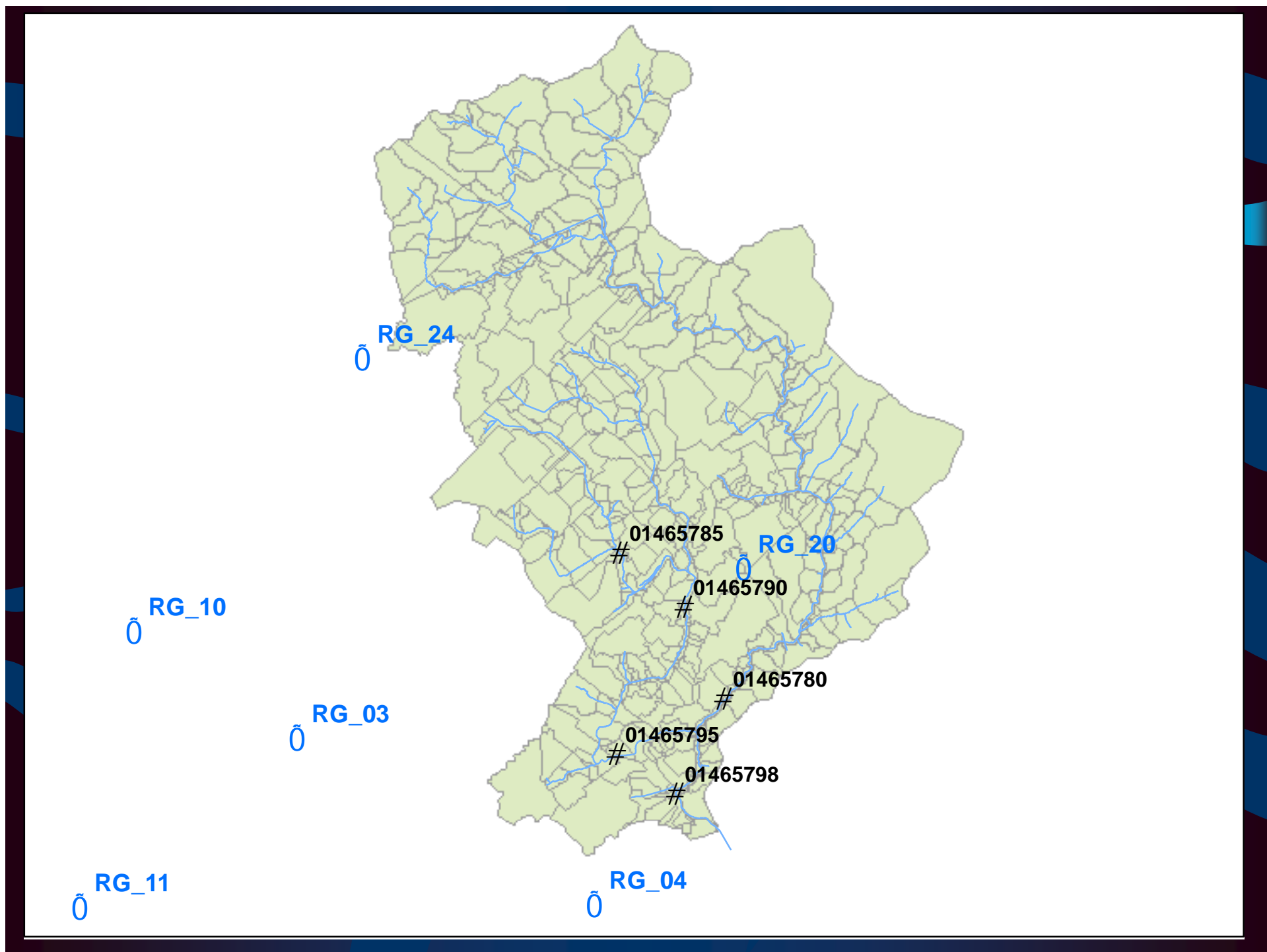
D

W





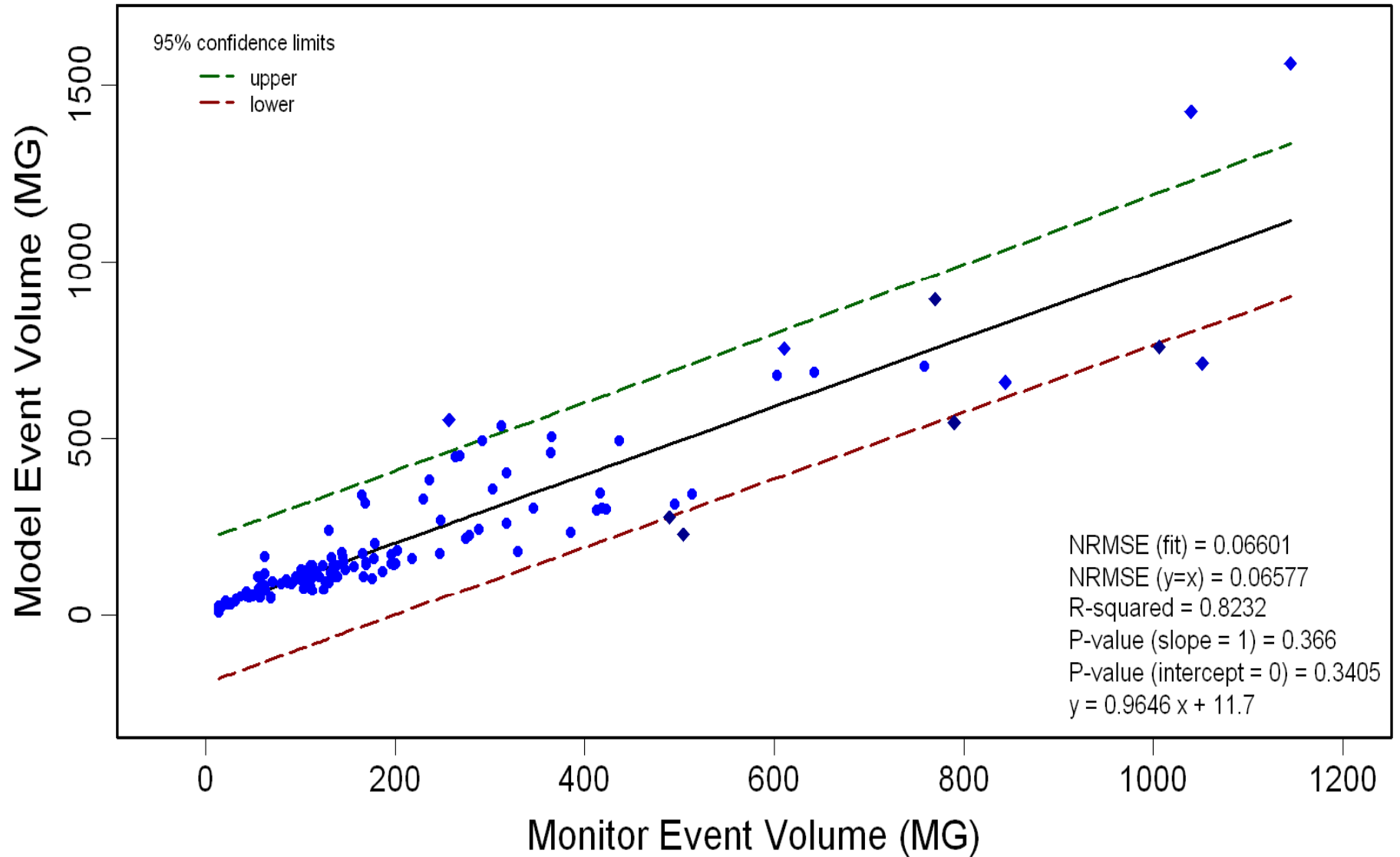




# Scatter Plot (with 95% Confidence Limits)

Model vs Monitored Event Volumes

Site: USGS-01465798 (Poquessing Creek) (133 Events with Non-Adjusted Rainfall)

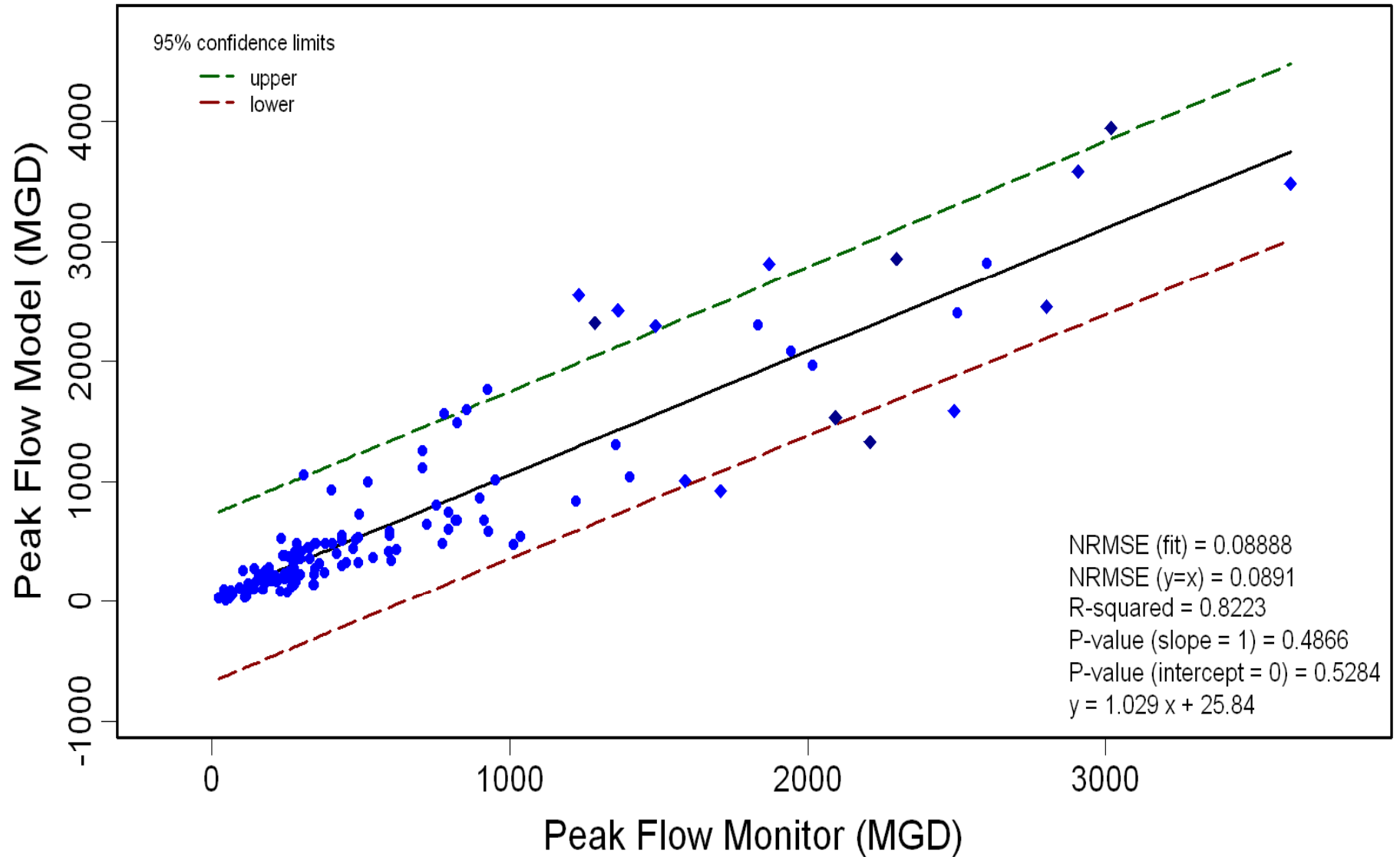




# Scatter Plot (with 95% Confidence Limits)

Model vs Monitored Events: Peak Flows

Site: USGS-01465798 (Poquessing Creek) (133 Events with Non-Adjusted Rainfall)

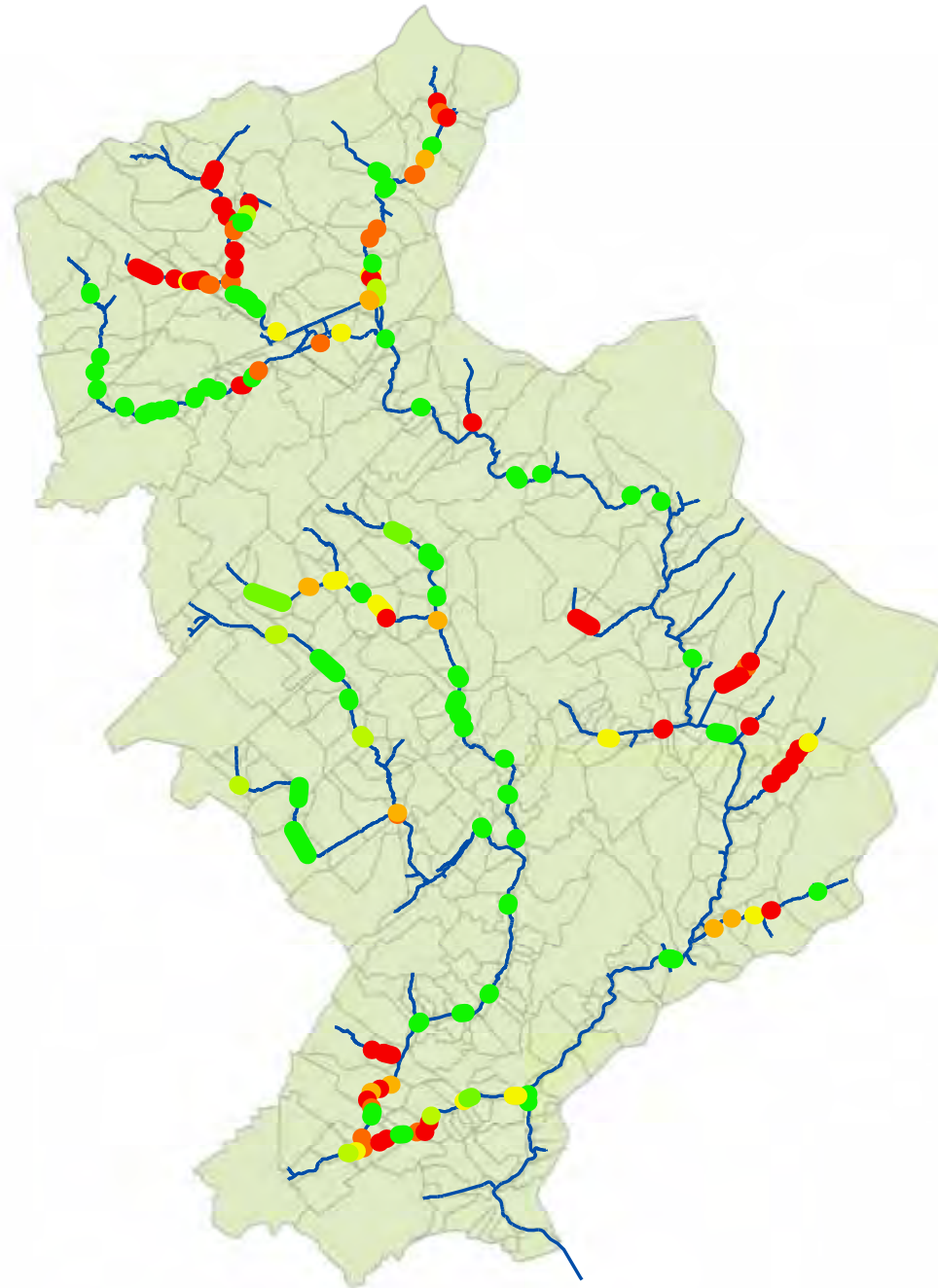


## Poquessing Creek Bridge Capacity Analysis

### Poq Constrictions

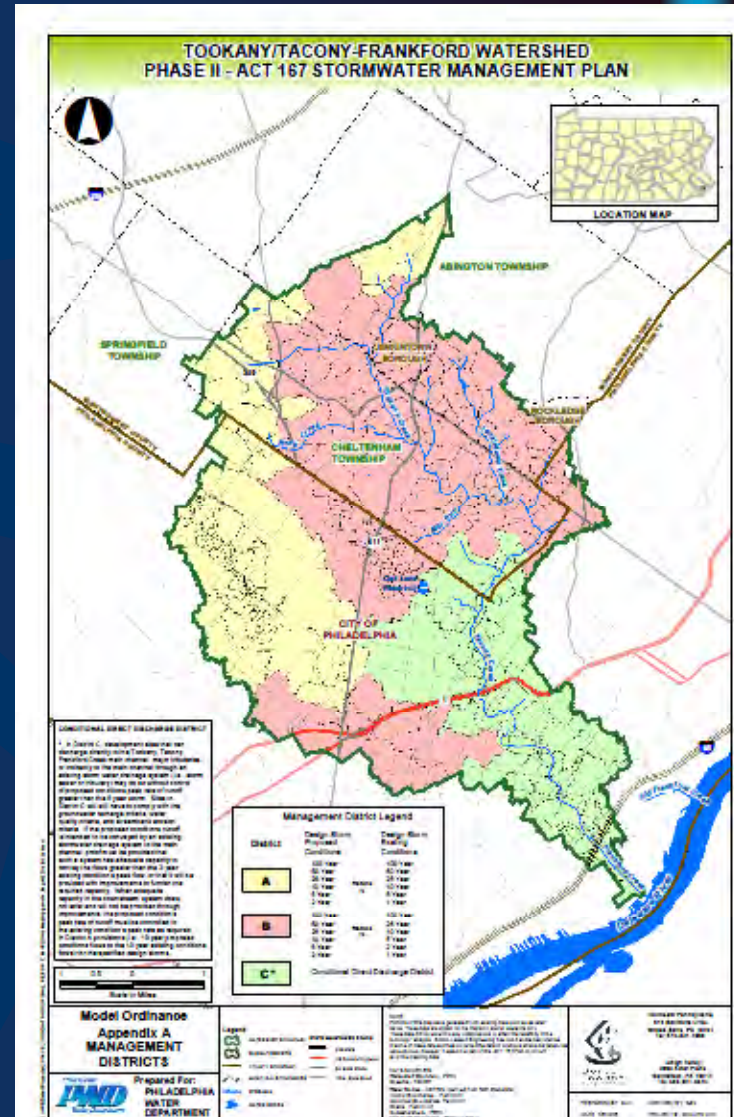
#### Event Passing

- < 1 year
- < 5 year
- < 10 year
- < 25 year
- < 50 year
- < 100 year
- > 100 year



## Final Products:

- Inventory of detention basins with proposed retrofits
- Inventory of problem areas with proposed solutions
- Final report
- Model Stormwater Mgmt Ordinance





# Coordination with the Pennypack Act 167 Plan

(Jeff Featherstone)