Tookany Creek Feasibility Study

Hydrologic Modeling Presentation

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January 30, 2013

US Army Corps of Engineers

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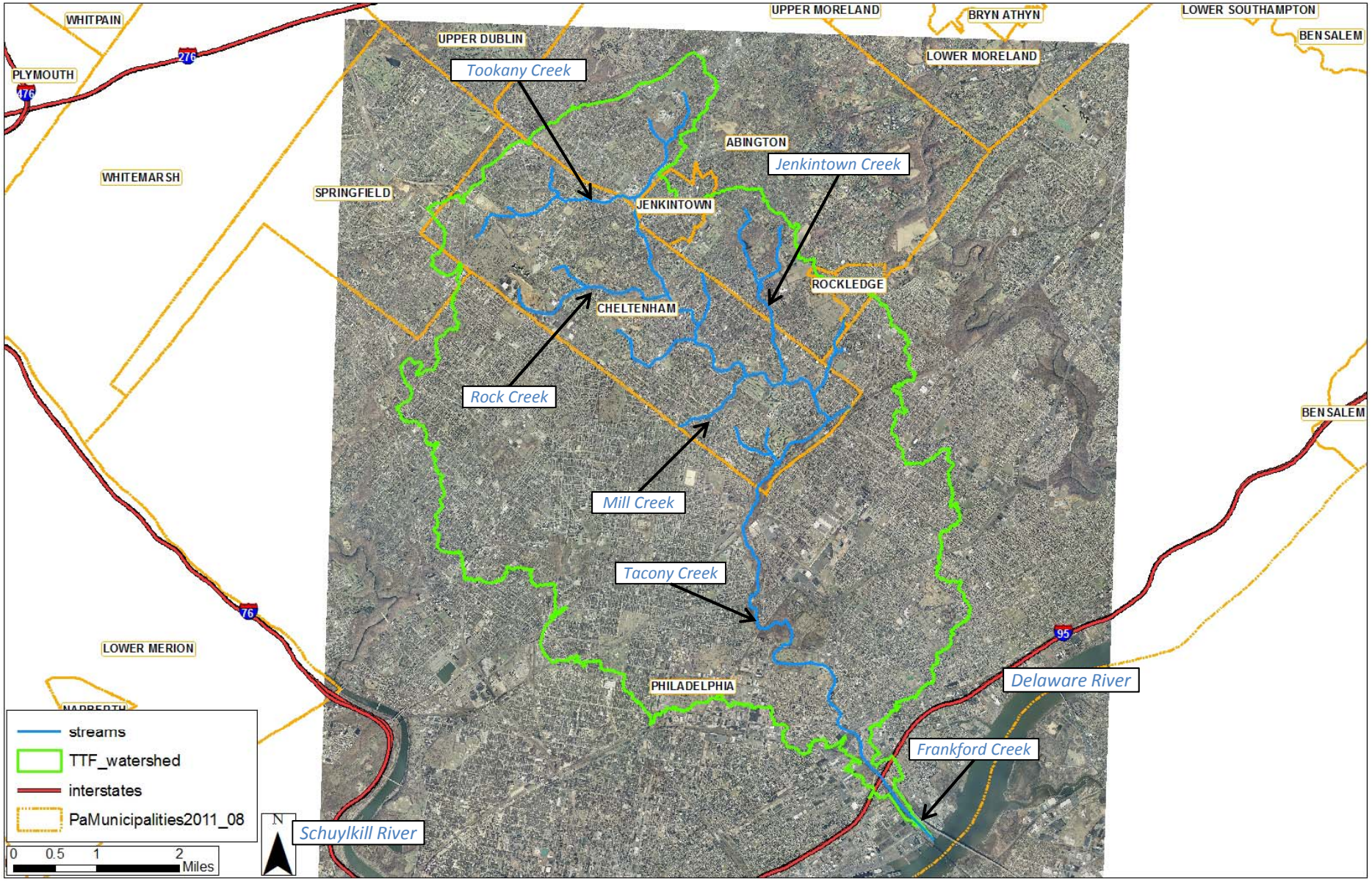
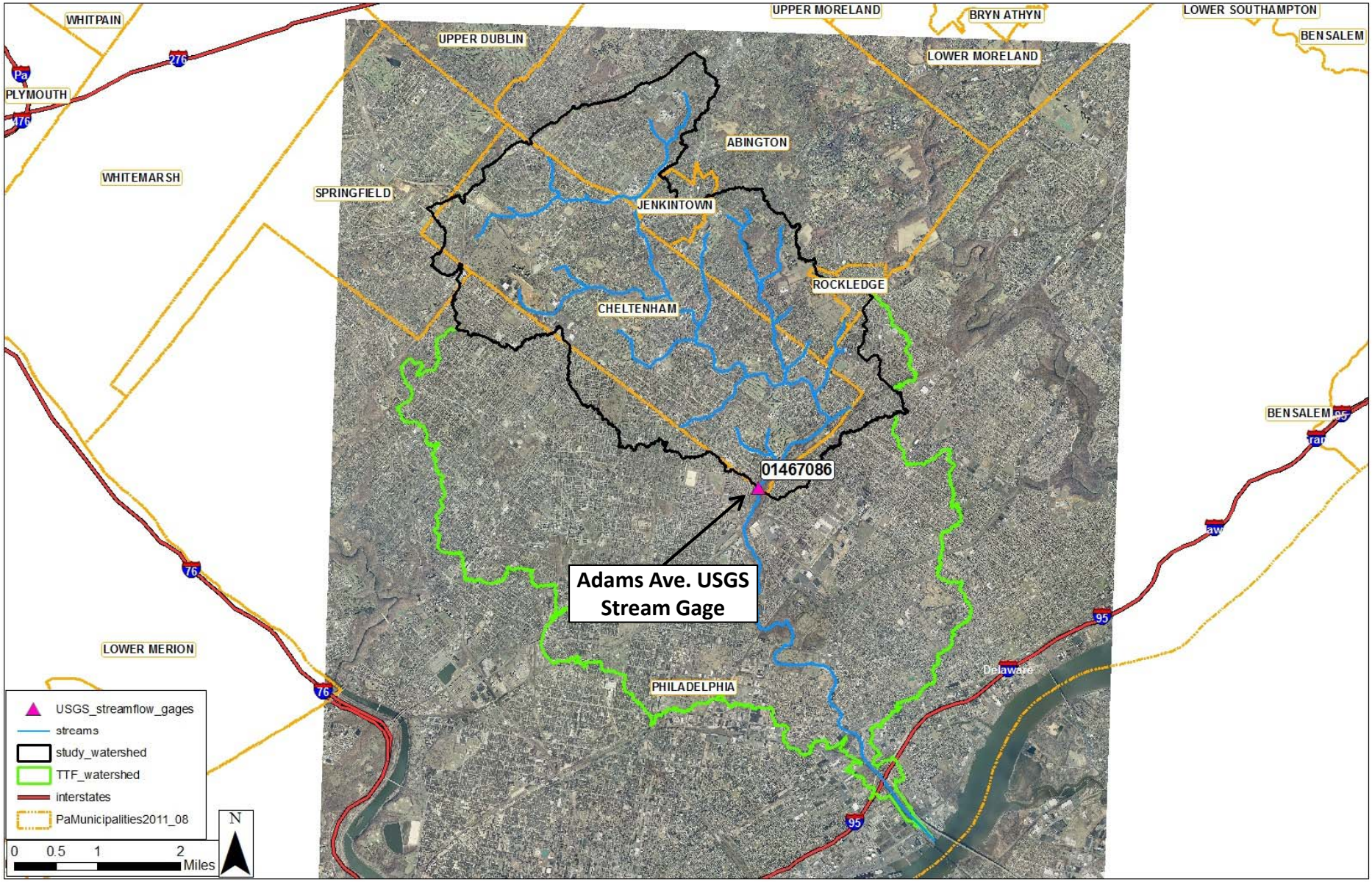
Overview

- Study Area and Purpose
- Hydrologic Model Formulation
  - Code
  - Sample Input and Output
  - Calibration
  - Flood Questionnaires
- Next Steps
  - Without vs. With Project Conditions



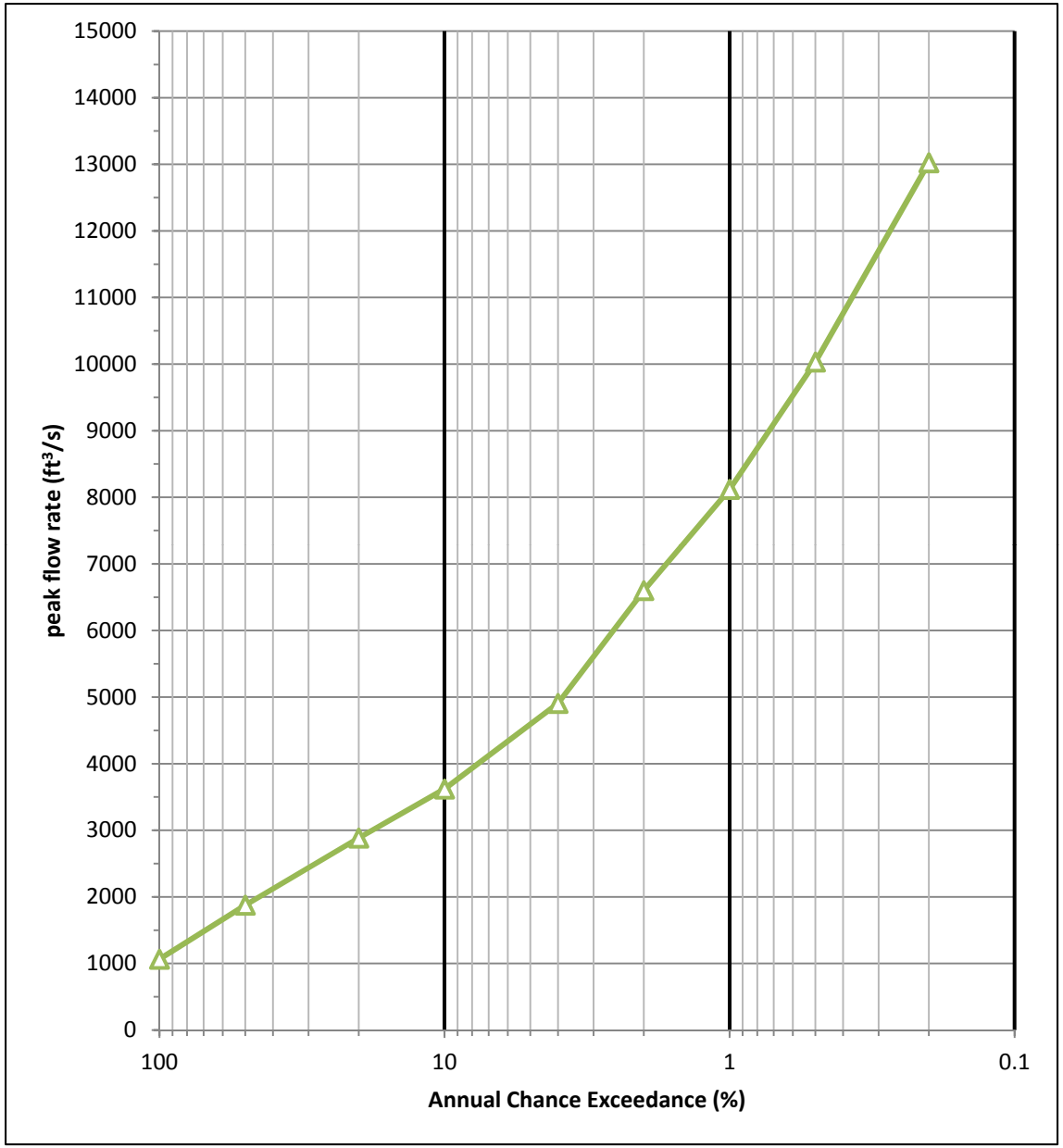
	Tookany / Tacony / Frankford Creek Watershed *DCNR / PAMAP Orthophotograph*	Figure 3 JANUARY 2013



	Study Watershed *DCNR / PAMAP Orthophotograph*	Figure 4 JANUARY 2013

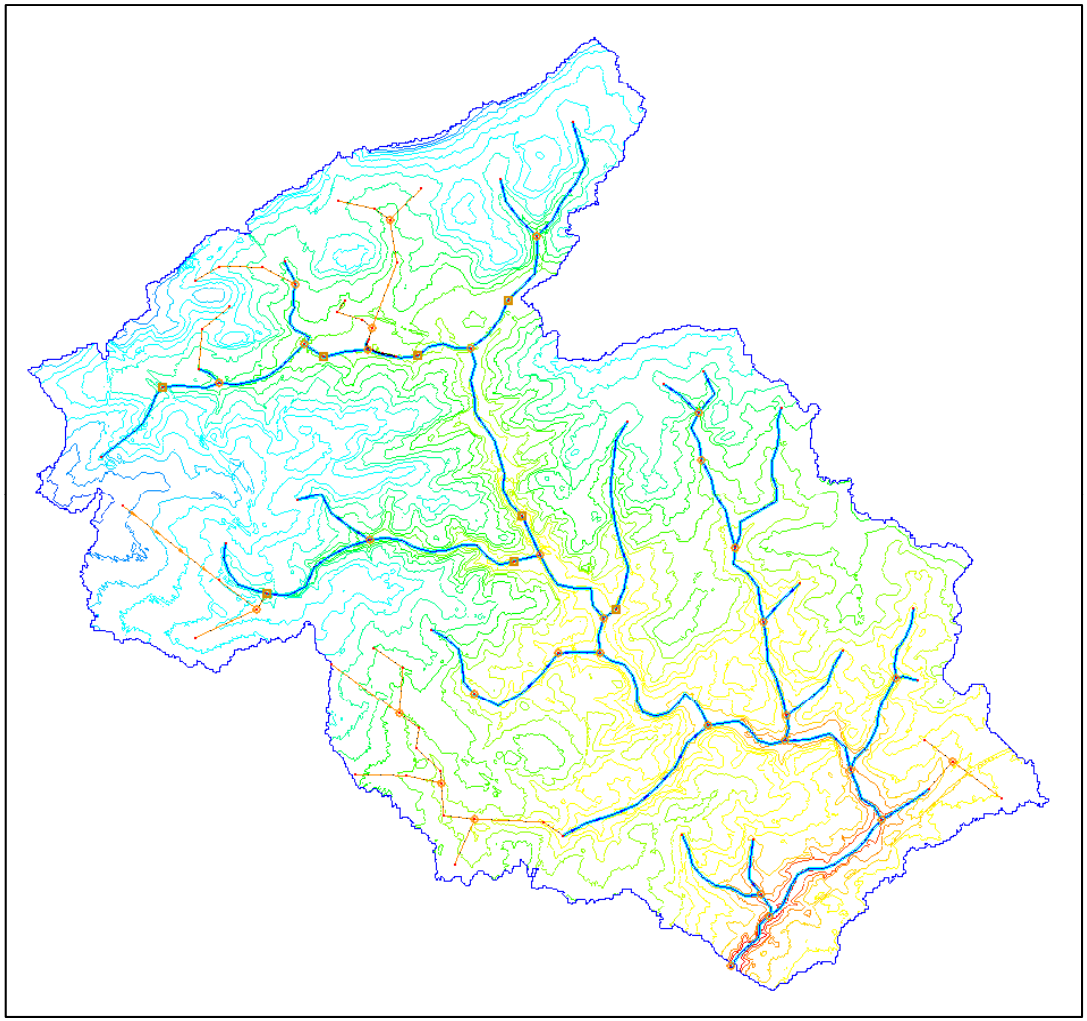
USACE Requirements

- Benefits / Costs
  - "BCR" > 1
- "100 year" vs. 1% Annual Chance Exceedance
- Statistics vs. Modeling

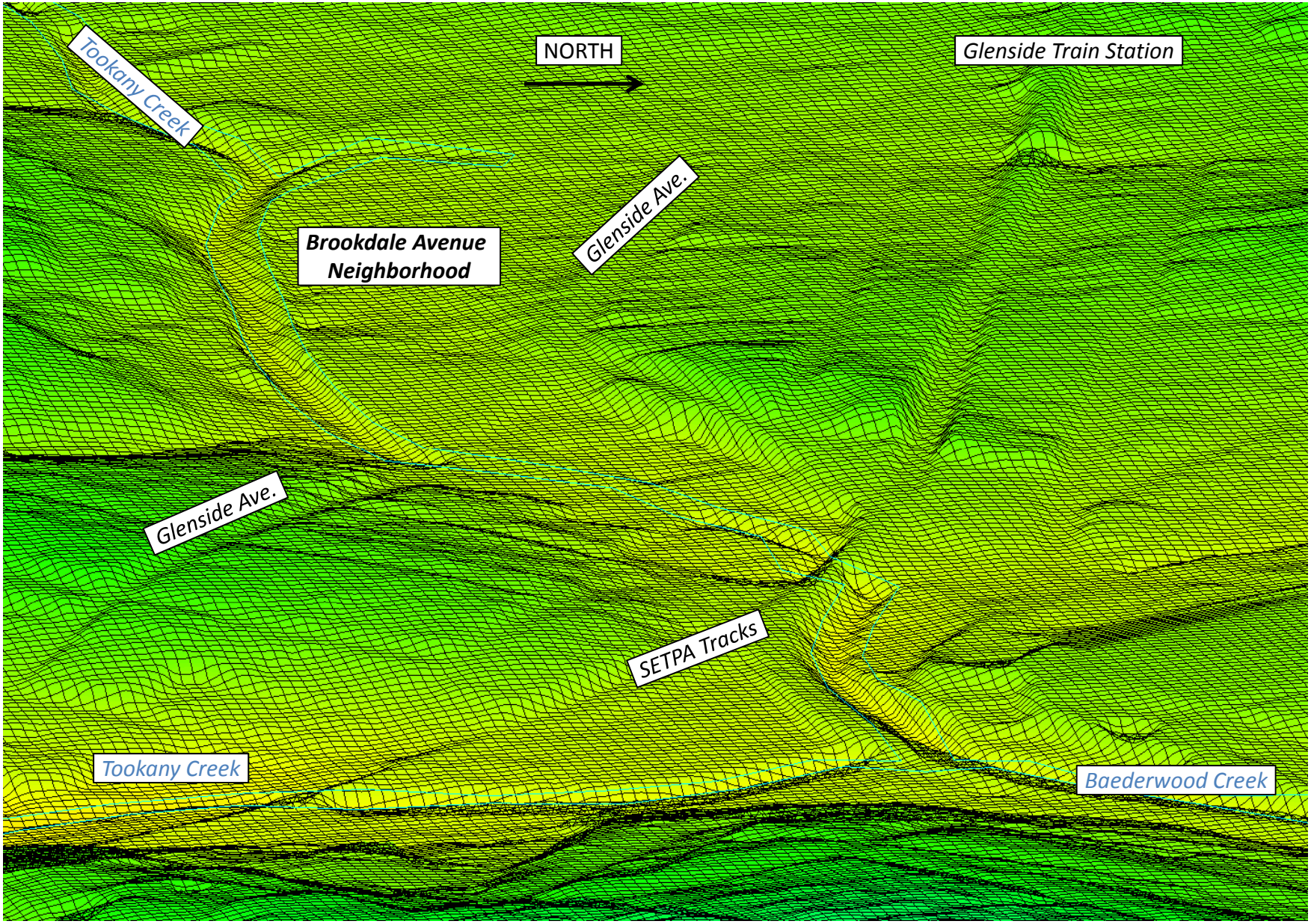


GSSHA MODEL OVERVIEW

- 15.6 mi^2 watershed
- 15 m x 15 m gridded network
  - 179,000+ active cells
  - each grid cell is 225 m^2 = 2420 ft^2 = 0.06 acres (typical house footprint)
- 22+ miles of streams
- 7+ miles of storm sewers



	Base GSSHA Model	Figure 6
		JANUARY 2013



GSSHA Overland Grid

DCNR / PAMAP LIDAR

Figure 7

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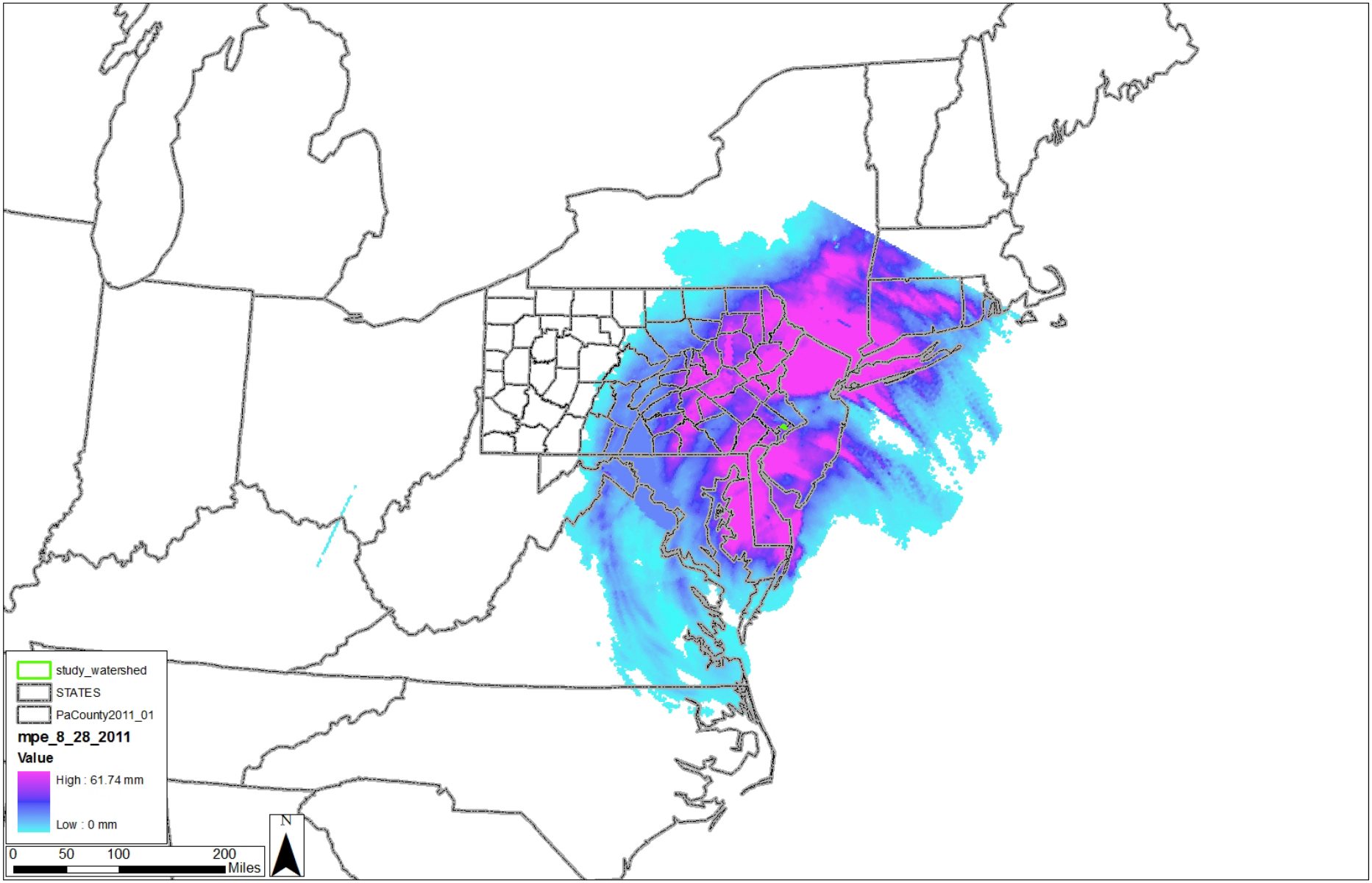

MPE

Hurricane Irene – 8-28-2011 1:00 AM – 2:00 AM

Figure 8

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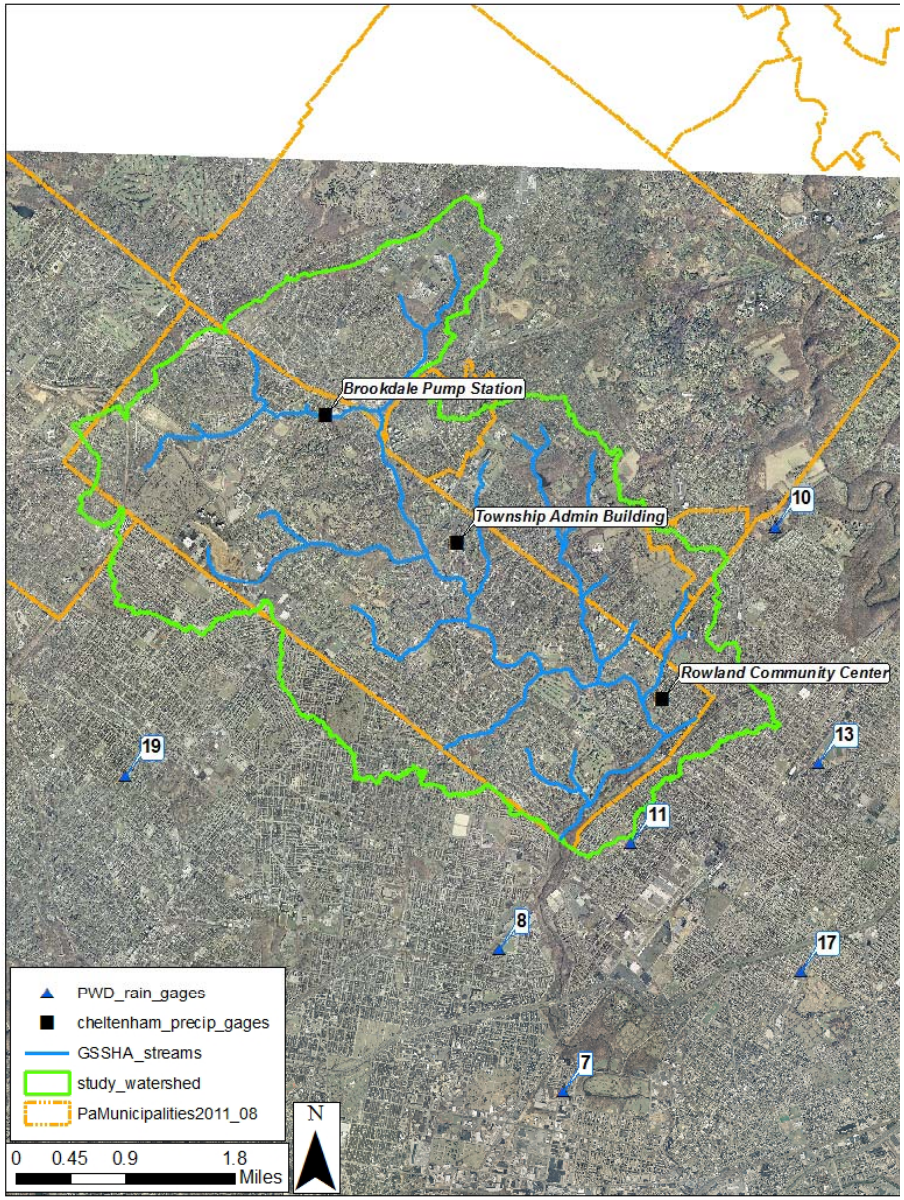

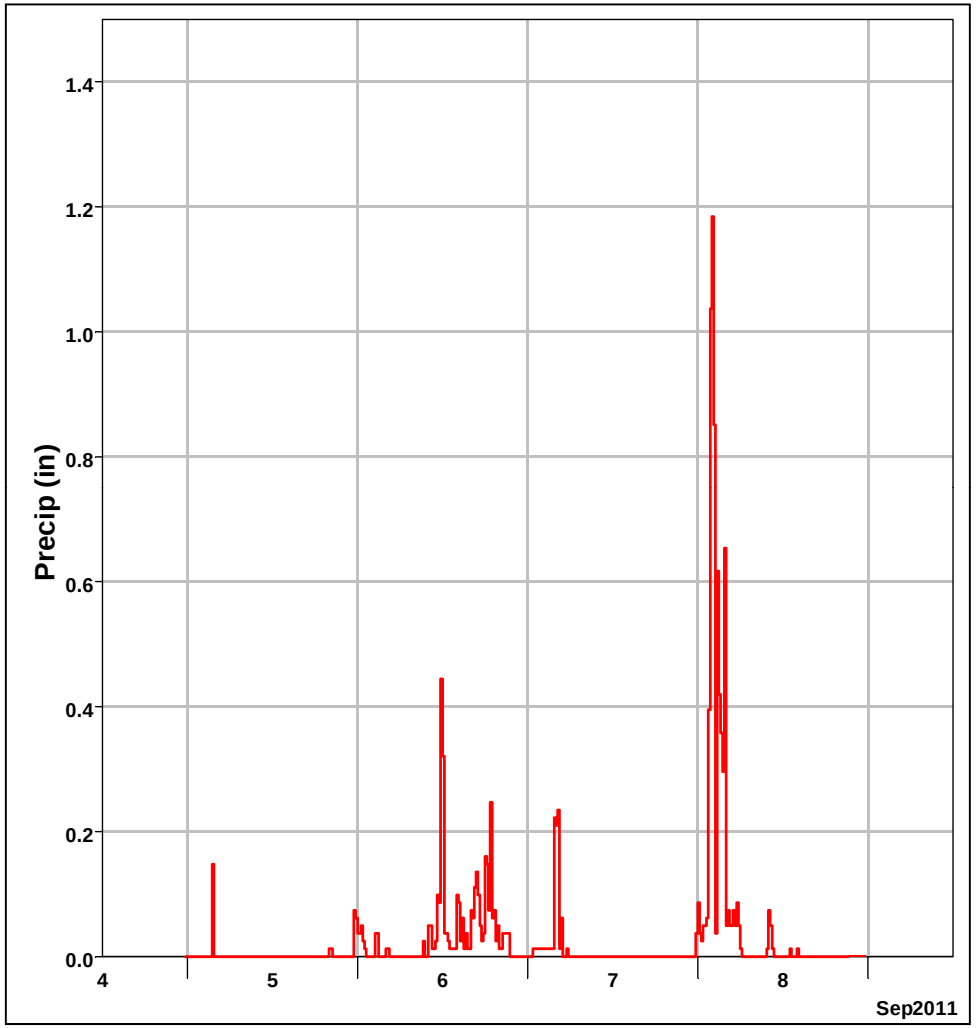

TS Lee Hyetograph at Brookdale Pump Station

Cheltenham & PWD Precip Gages

DCNR PAMAP Orthophotograph

Figure 9

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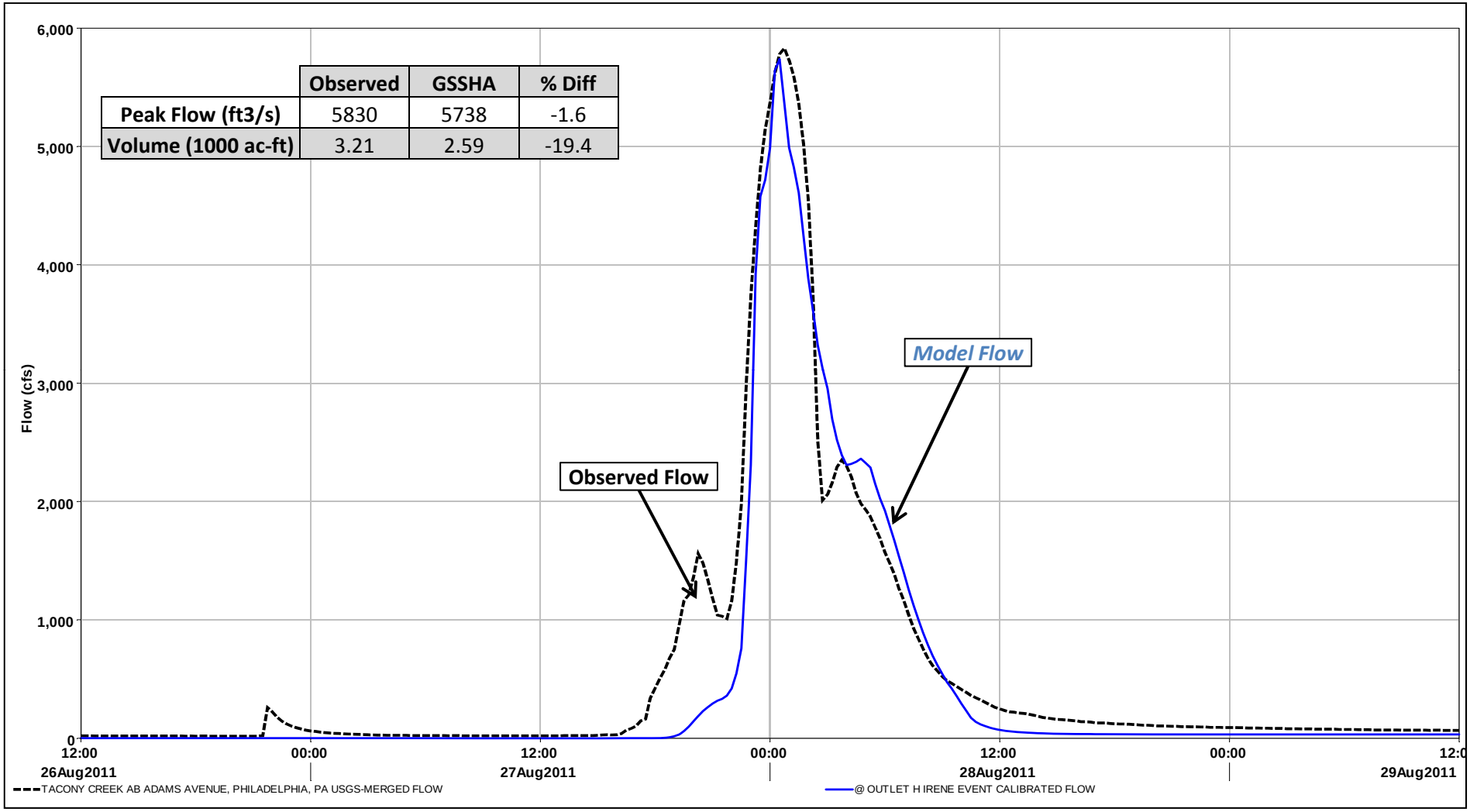

H. Irene Event

Model Calibration Results

Figure 10

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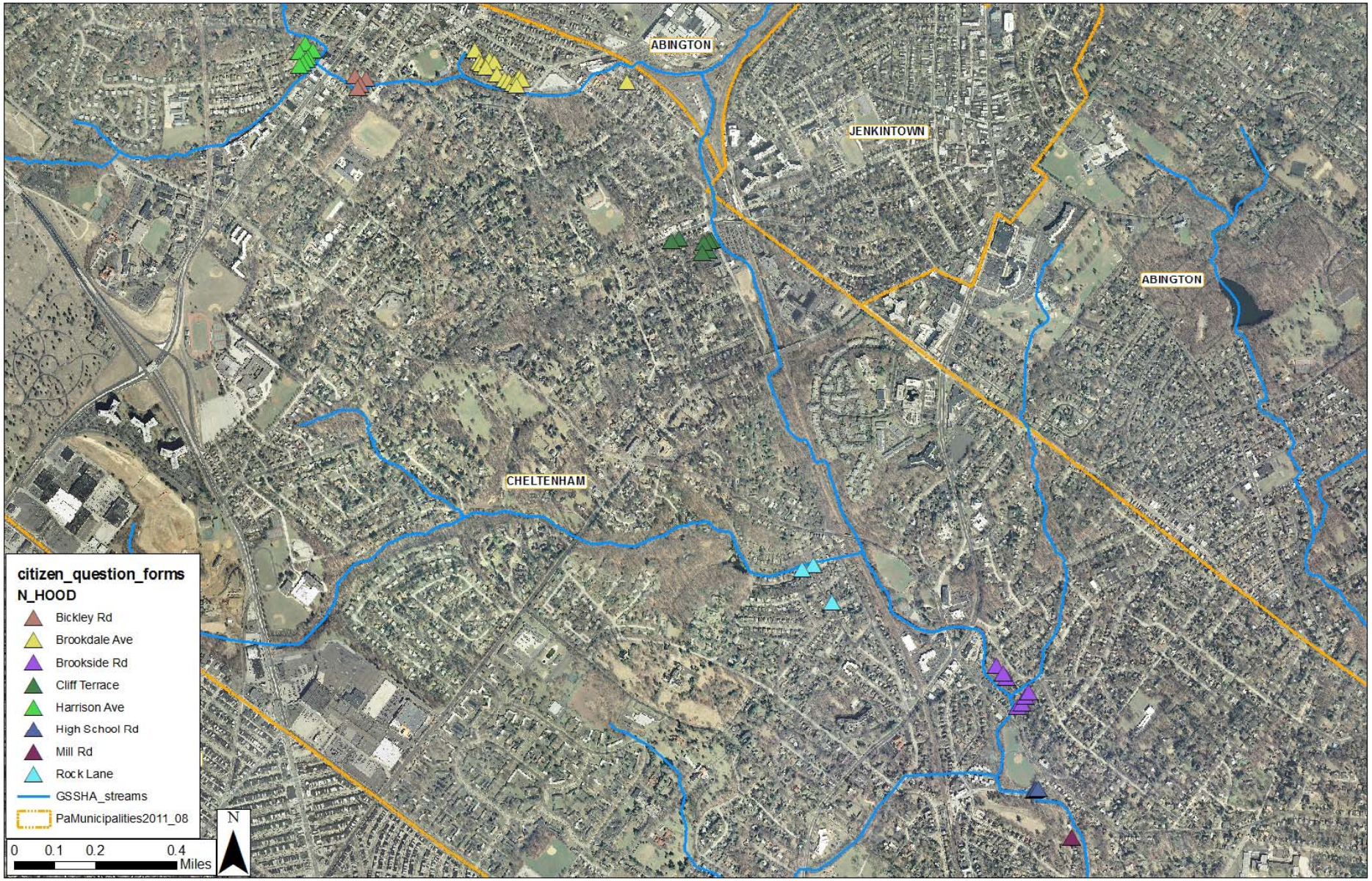

Citizen Questionnaire Forms Returned

DCNR / PAMAP Orthophotograph

Figure 11

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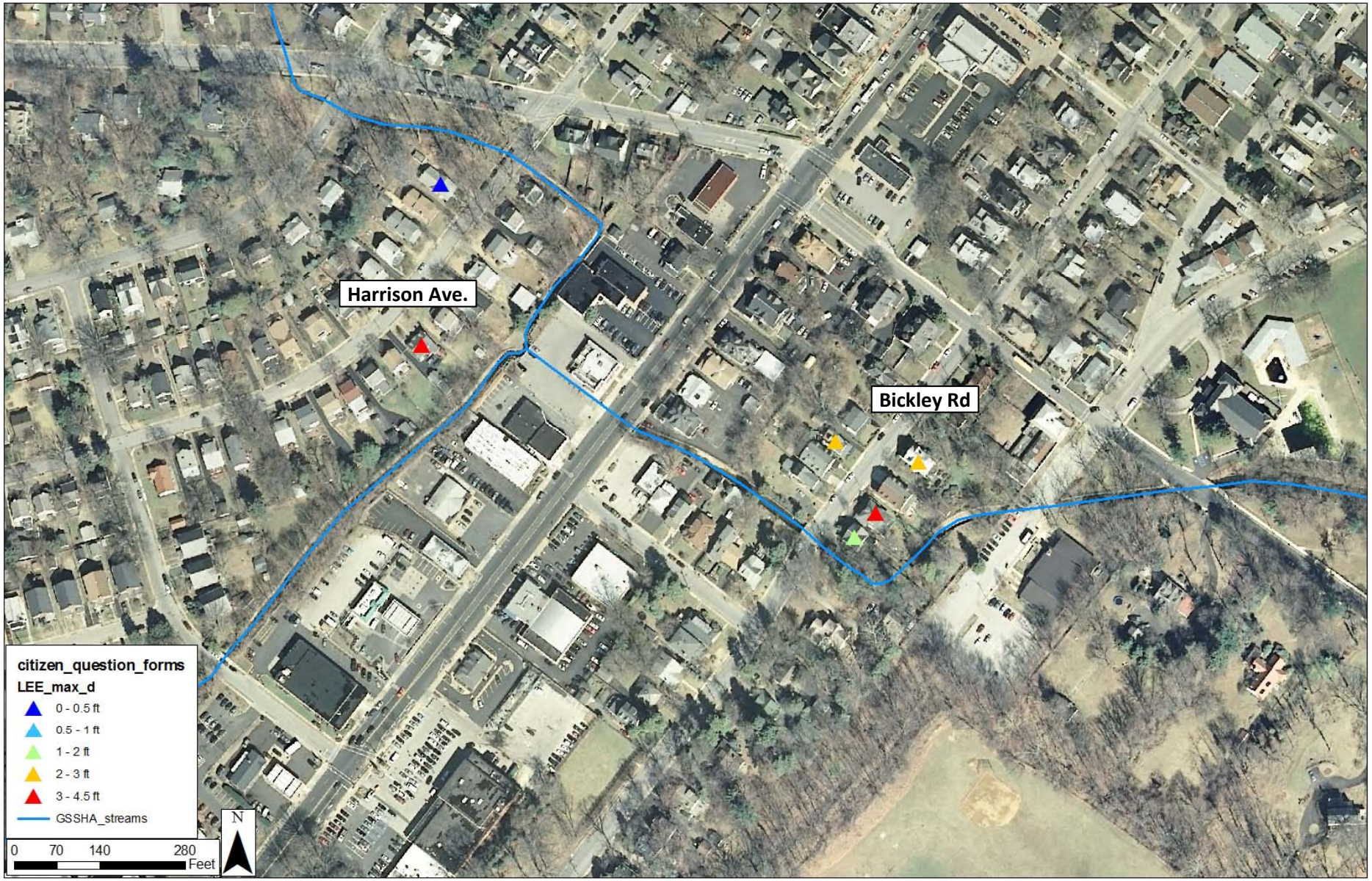

Questionnaire Forms w/ Depths – TS Lee Event

DCNR / PAMAP Orthophotograph

Figure 12

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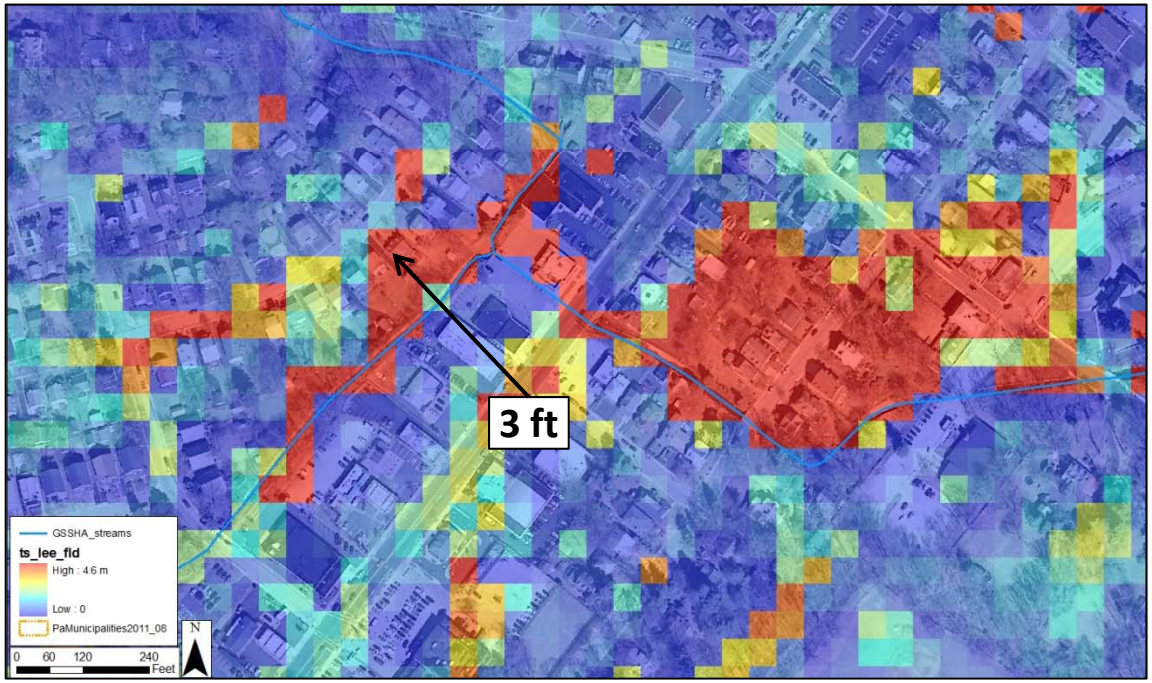
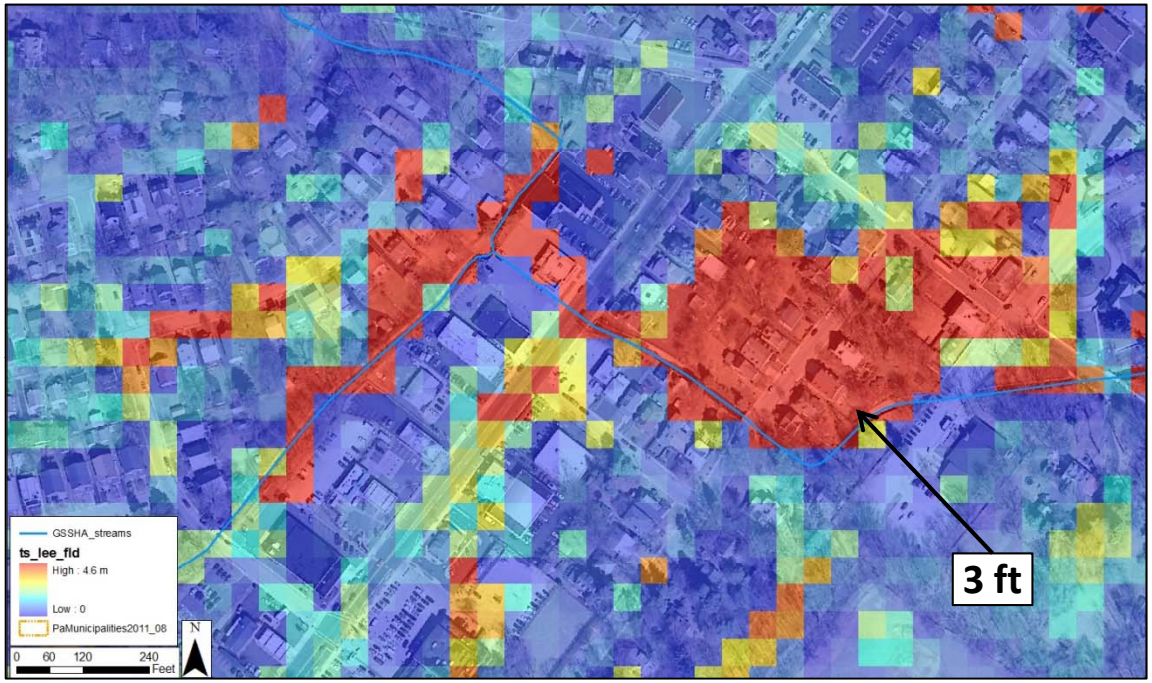
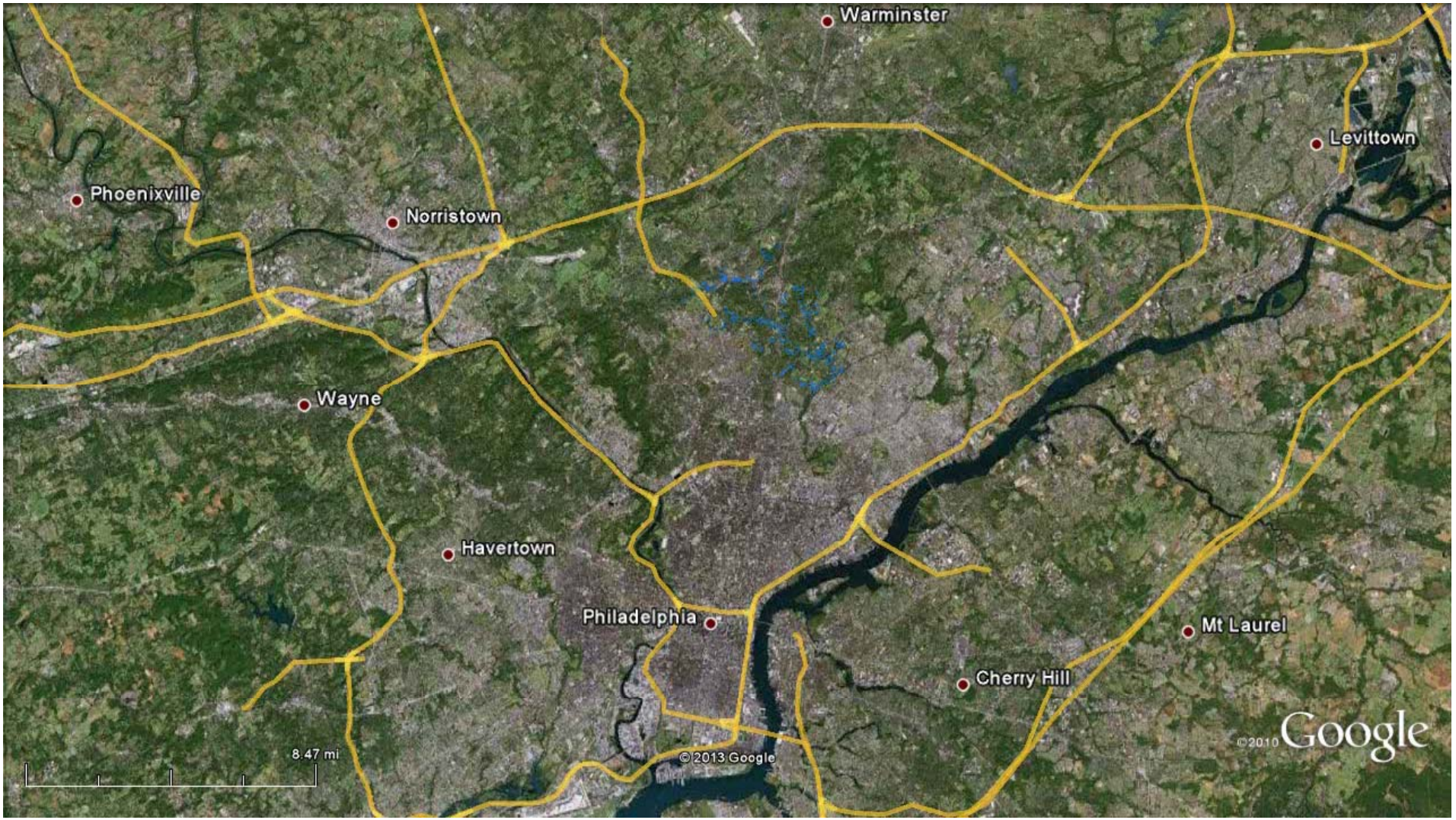


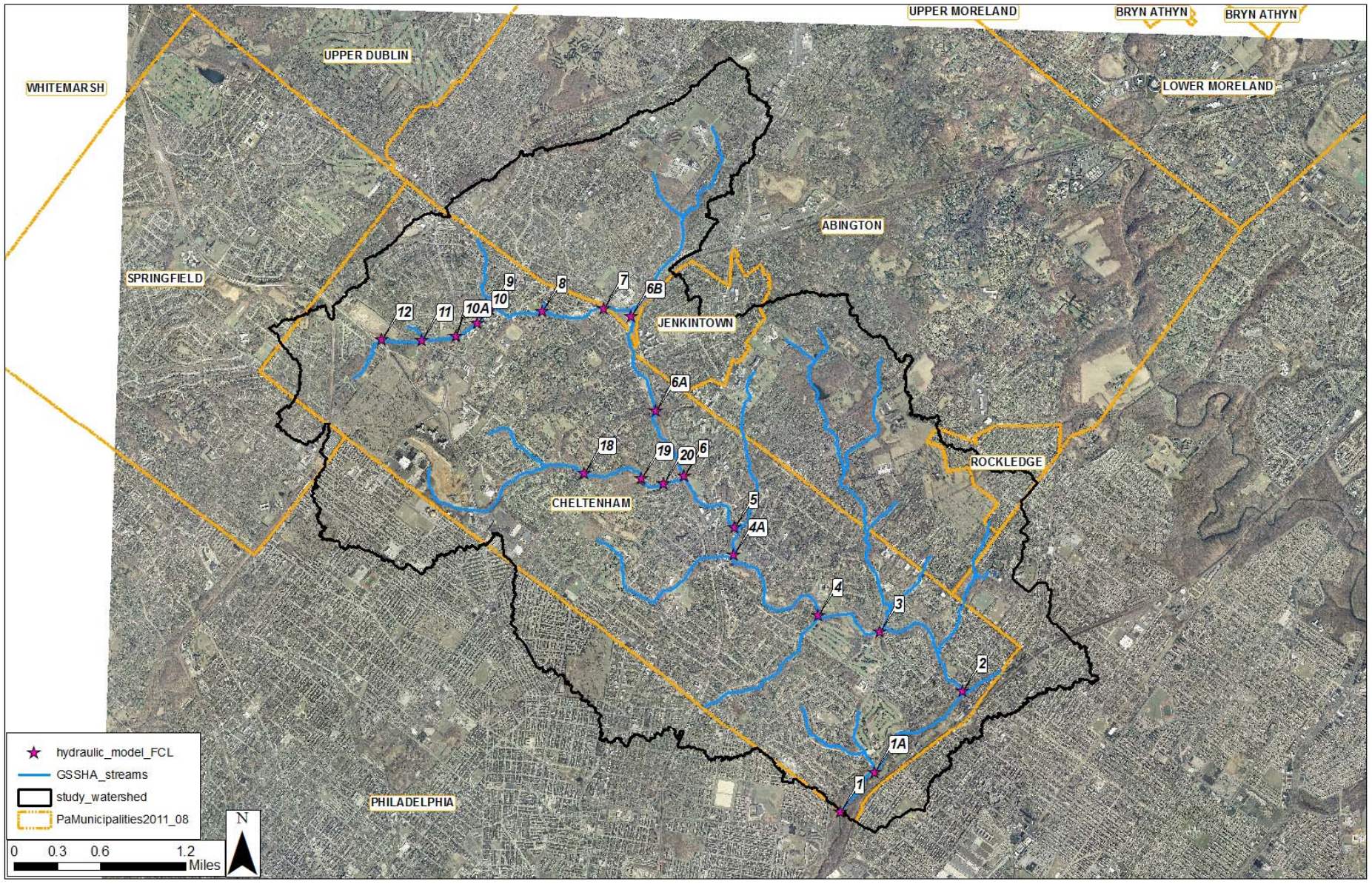
	Observed vs. Calibrated Results *Harrison Ave. Neighborhood - TS Lee*	Figure 13 JANUARY 2013



	Observed vs. Calibrated Results *Bickley Rd Neighborhood - TS Lee*	Figure 14 JANUARY 2013



	Google Earth Movie *TS Lee Event*	Figure 15 JANUARY 2013



Hydraulic Model Flow Change Locations

DCNR / PAMAP Orthophotograph

Figure 16

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EVENT	peak flow (ft^3/s) at location:																			
	1	1A	2	3	4	4A	5	6	6A	6B	7	8	9	10	10A	11	12	18	19	20
H_Irene	5738	5722	5691	4767	4213	3935	3547	2666	2025	1992	1199	872	885	1015	816	582	402	1101	1106	1076
TS_Lee	6191	6181	6237	5613	5229	4787	4442	3387	2720	2676	1766	1258	1713	1320	1077	768	498	1264	1277	1201
Jun_06	2648	2641	2638	2280	2042	1938	1792	1369	1136	1109	688	494	421	432	350	254	167	532	477	517

name	location
1	Adams Ave. Gage
1A	U/S of Trib near Melrose Creek
2	U/S of Central Ave
3	Just U/S of Jenkintown Creek
4	Just U/S of Mill Creek
4A	Just U/S of Trib near High School
5	Just U/S of Trib along Brookside Ave
6	Just U/S of Rock Creek
6A	Just U/S of Green St. Culvert
6B	Just D/S of Baederwood Creek
7	Just U/S RR (just U/S of Baederwood Creek)
8	Just U/S of Keswick Culvert
9	U/S of Easton Road
10	Just U/S of Springhouse Road
10A	Just D/S of Rt 152 (just U/S of trib on ROB)
11	Just U/S of Rt 73
12	Just D/S of Rt 309
18	Rock Creek - Washington Lane crossing
19	U/S end Off-Channel pond along Rock Creek
20	Rock Creek culvert inlet

Peak Flow Rates and Locations

H. Irene, TS Lee, and June 2006 Events

Figure 17

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Conclusion

- Existing Conditions Completed
- Without vs. With Project Conditions
- Next Steps -> Investigate Possible Solutions

Tookany Creek along Oak Road

Figure 18

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