

Indian Creek Watershed Sediment Allocations Stakeholder Webinar

Jennifer Sincock and Jillian Adair
U.S. Environmental Protection Agency
March 22, 2018

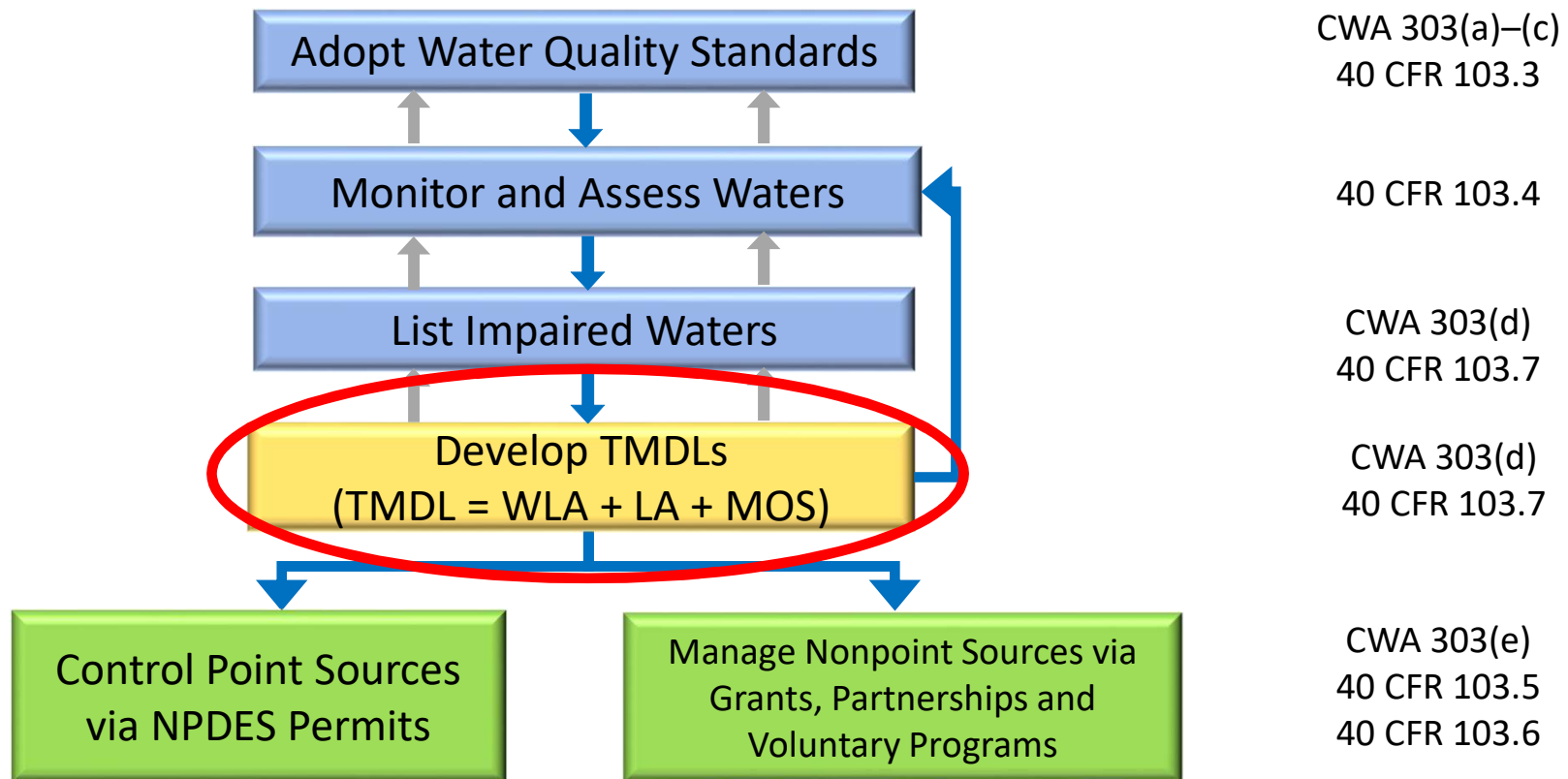


Overview

- Welcome
- Sediment TMDL Overview
- Existing Loads
- Sediment Allocations
- Feedback and Questions?



Steps in the Water Quality-based Approach of the Clean Water Act



A TMDL is defined as...

The greatest amount of loading of a particular pollutant that a waterbody can receive without violating water quality standards.

$$\text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS}$$

WLA = wasteload allocation (*point source loads*)

LA = load allocation (*nonpoint source and background loads*)

MOS = margin of safety (explicit or implicit)

TMDL = total maximum daily load

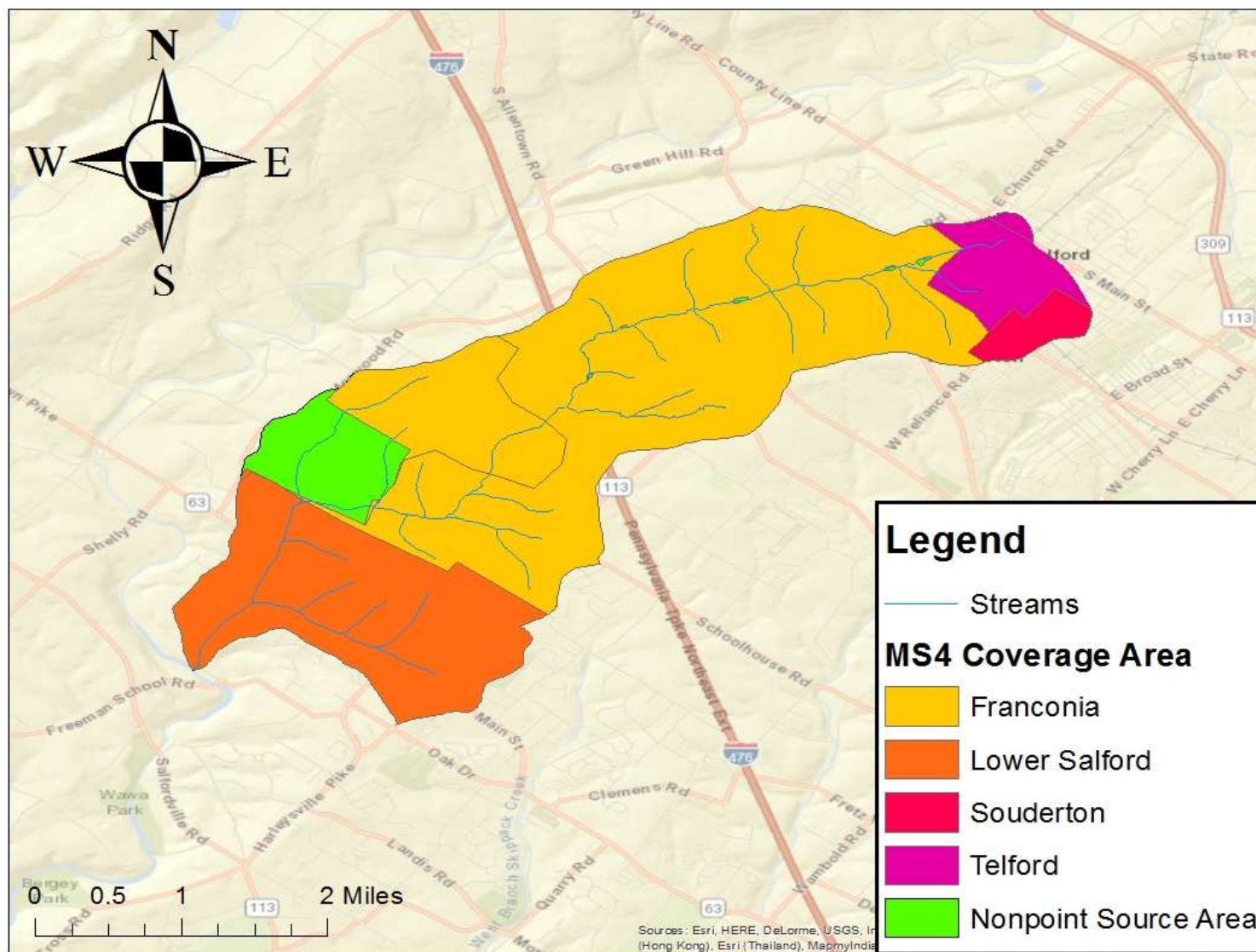
A TMDL is important because...

- Critical for achieving water quality standards
- Analytic underpinning for watershed decisions
- Can integrate solutions
- Opportunity for innovations

Indian Creek Sediment TMDL

- June 30, 2008 – EPA established Indian Creek TMDL for nutrients and sediment
- March 21, 2014 – EPA reconsideration decision regarding the Indian Creek Sediment TMDL
 - Confirmed concerns that the reference watershed approach and sediment loading rates should be revisited.
- April 3, 2014 – Voluntary remand granted for Indian Creek Sediment TMDL
- Sediment TMDL Revision
 - Stakeholder group formed
 - Data calls held in 2014 and 2016
 - Existing Sediment Loads Stakeholder Meeting in August 2017

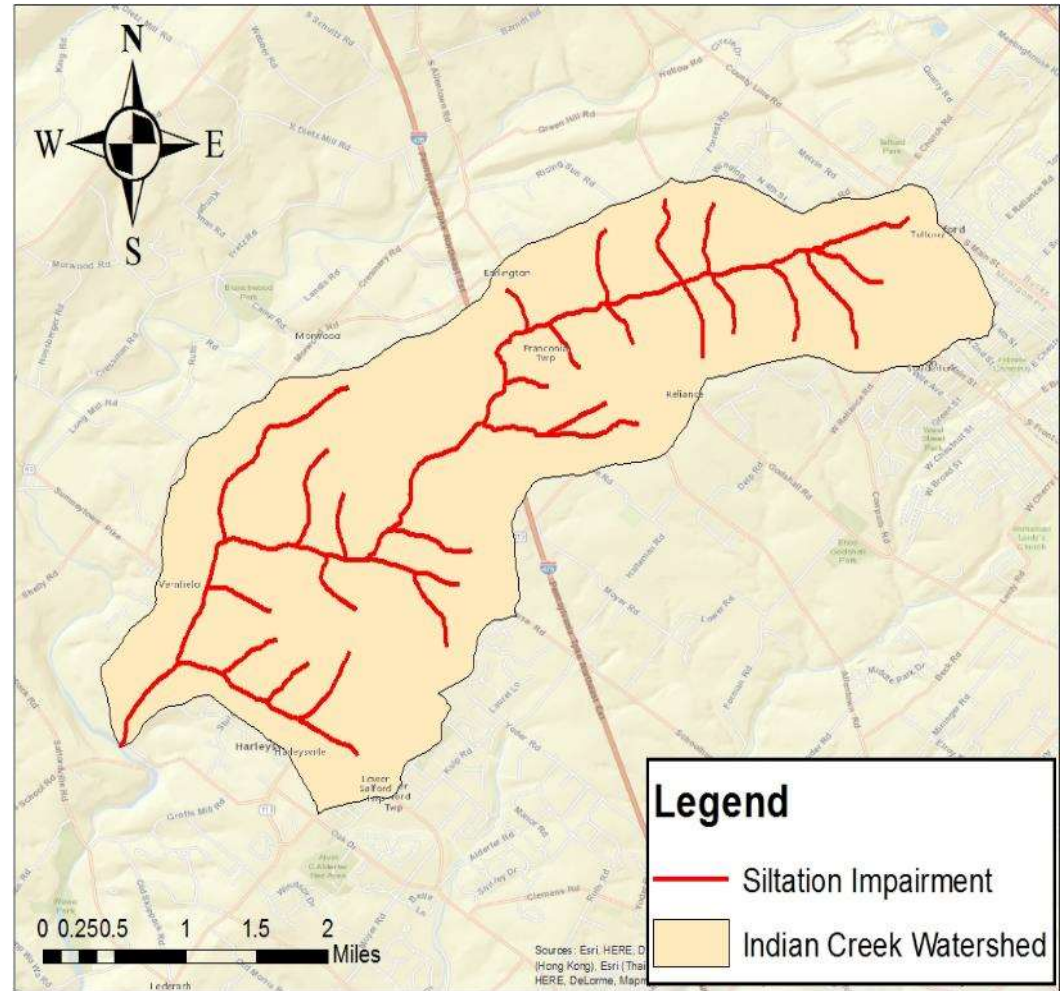
Indian Creek Watershed



Indian Creek is Impaired for Sediment

Sources:

- Agriculture
- Urban Runoff/Storm Sewers
- Small Residential Runoff



Sediment TMDL Development Plan

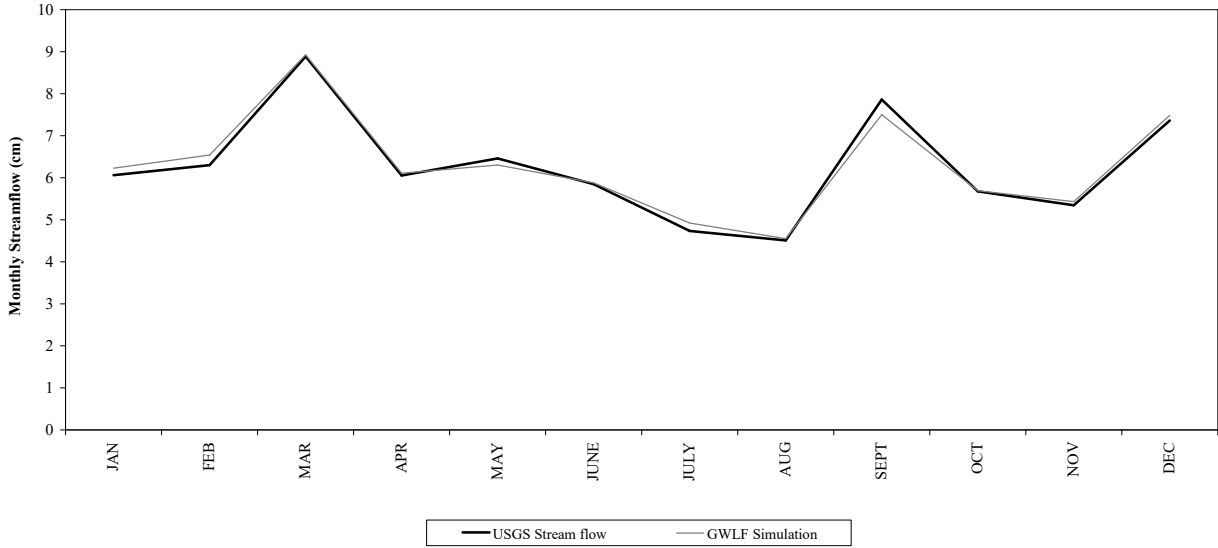
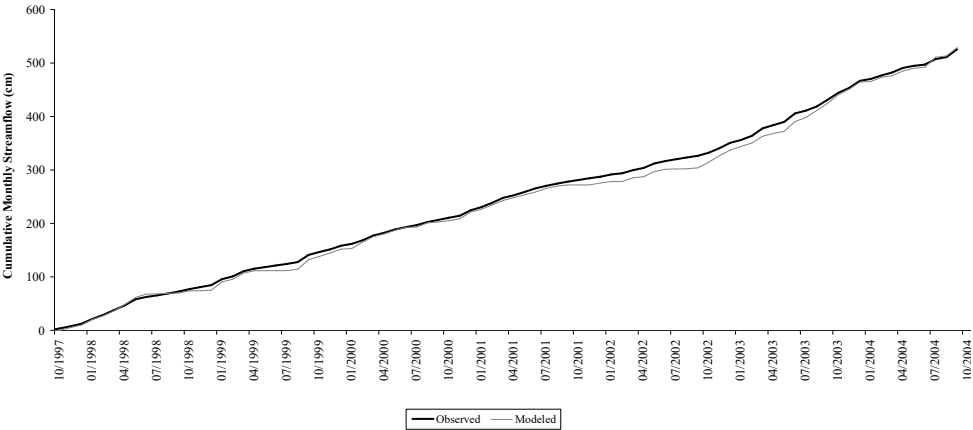
- Generalized Watershed Loading Function (GWLF) model
- Reference watershed approach
- Use local data (as available)
- Account for streambank erosion
- Refine MS4 allocations
- Seek feedback on approach/assumptions with stakeholders

The GWLF Model

- Widely accepted model for sediment loads in streams
- Capable of modeling streambank erosion
- Continuous-simulation
- Spatially-lumped
- Daily time step for water balance
 - Calibrated to monitored data
- Monthly time step for pollutant loading
- Consistency in modeling the target and reference watersheds is vitally important
- Inputs
 - Rainfall, Hydrologic Parameters, Sediment Model Parameters

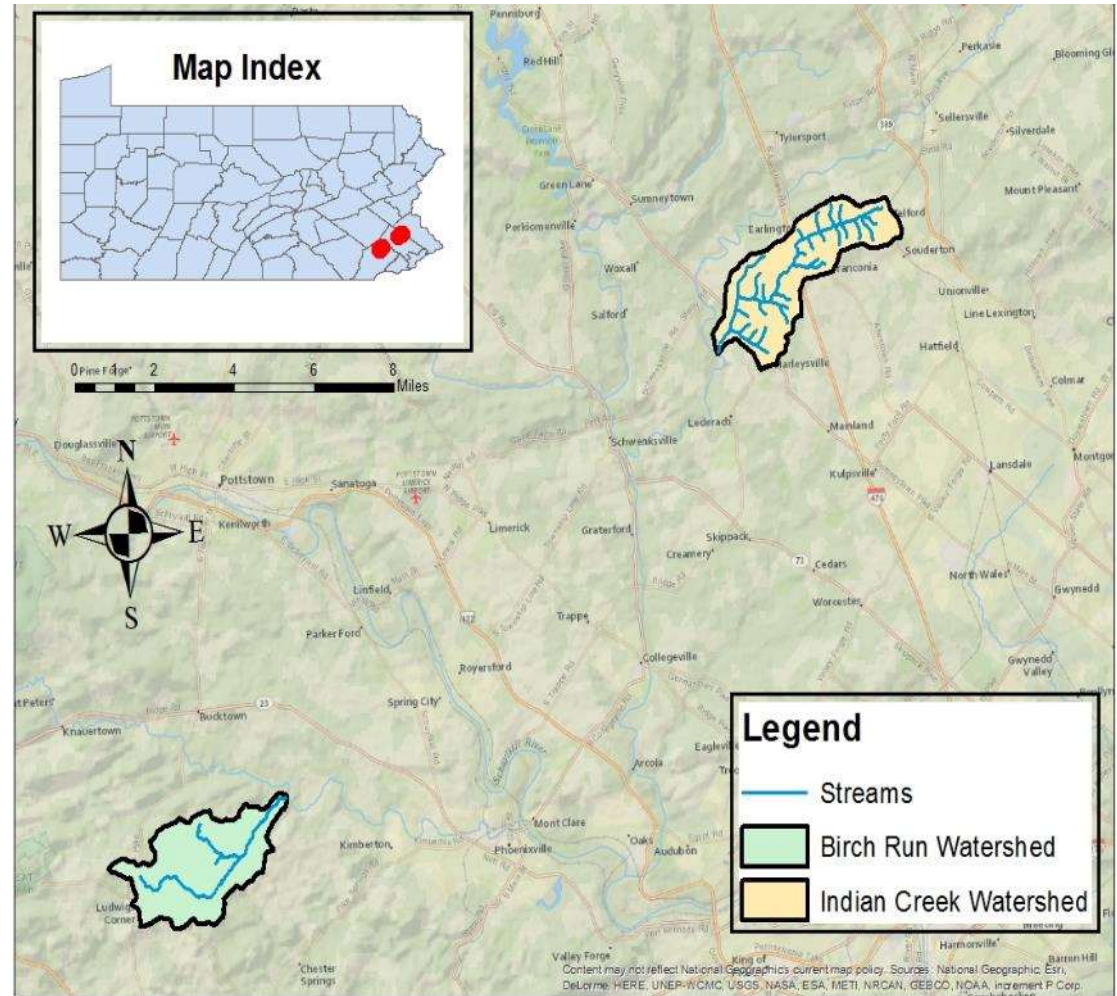
Hydrologic Model Calibration

- Successful Hydrologic Calibration in both watersheds



Reference Watershed Approach

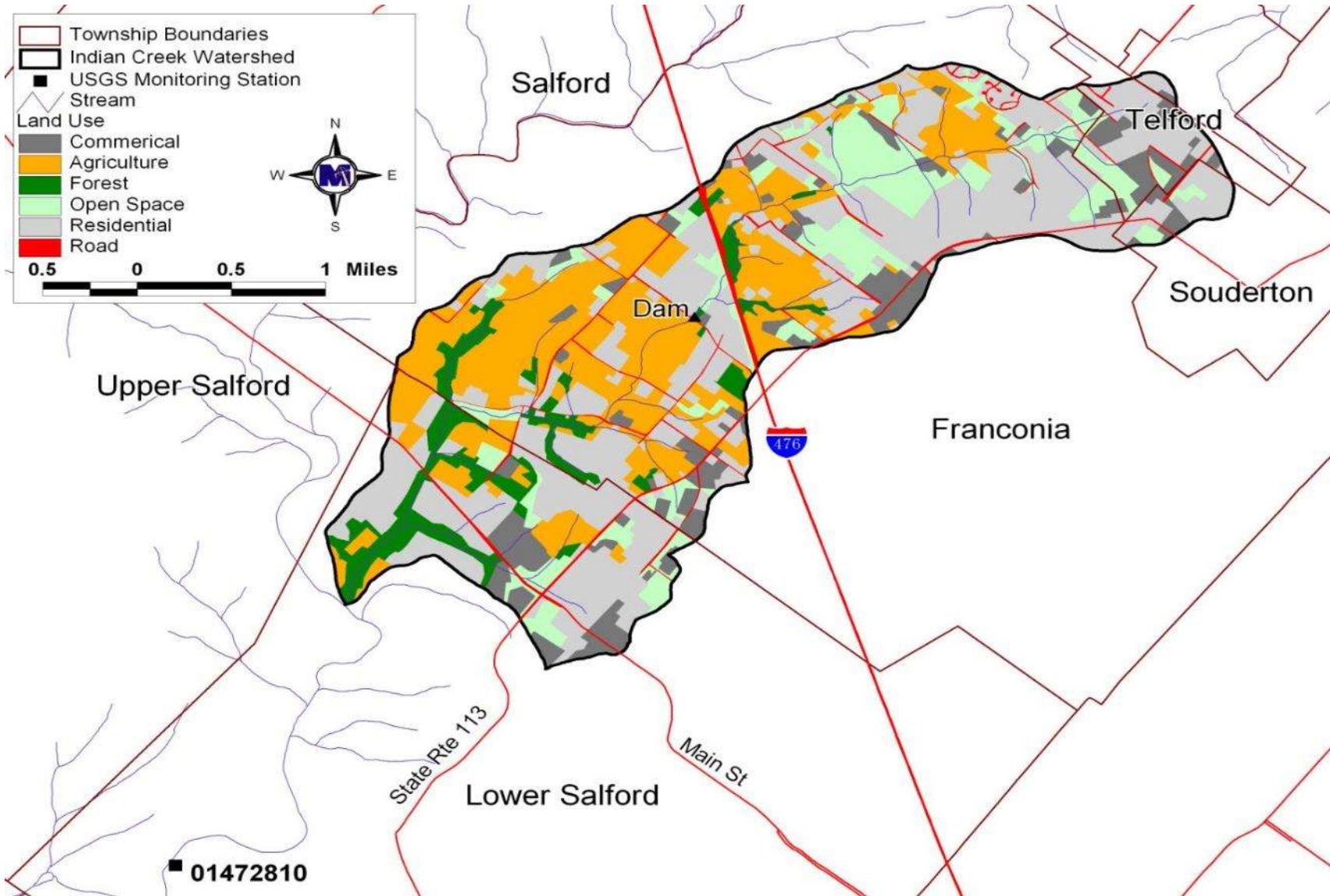
- Develop a Sediment TMDL endpoint based on the existing sediment loads in an unimpaired watershed.
- Birch Run (Chester County) represents an unimpaired and suitable reference watershed for Indian Creek.



Indian Creek & Birch Run Watershed Characteristics

Watershed Properties	Indian Creek	Birch Run
County	Montgomery	Chester
HUC (8-digit)	02040203	02040203
Discharges to Watershed	East Branch Perkiomen	French Creek
Square Miles	7	6.5
Benthic IBI Score	30.3	74.6
IBI Date	9/6/2013	4/26/2012
Designated Uses	TSF, MF	EV-TSF, MF
Watershed Characteristics		
Stream Order	3	3
Slope (percent)	5.93	5.58
Aspect (degrees)	200.69	192.6
Soil Characteristics		
Hydrologic Group (avg)	2.75591	2.177083
Erodibility Kf factor	0.30033	0.426898
Available Water Capacity	0.116595	0.131346
Level 3 EcoRegion		
Northern Piedmont	100%	100%
Level 4 EcoRegion		
Triassic Lowlands	100%	1%
Piedmont Lowlands		99%

Indian Creek Land-Use



Sources of Sediment

- MS4s
- WWTPs
- General Stormwater Permits
- Illicit Discharges
- Surface Runoff
- Channel and Streambank Erosion
- Natural Background



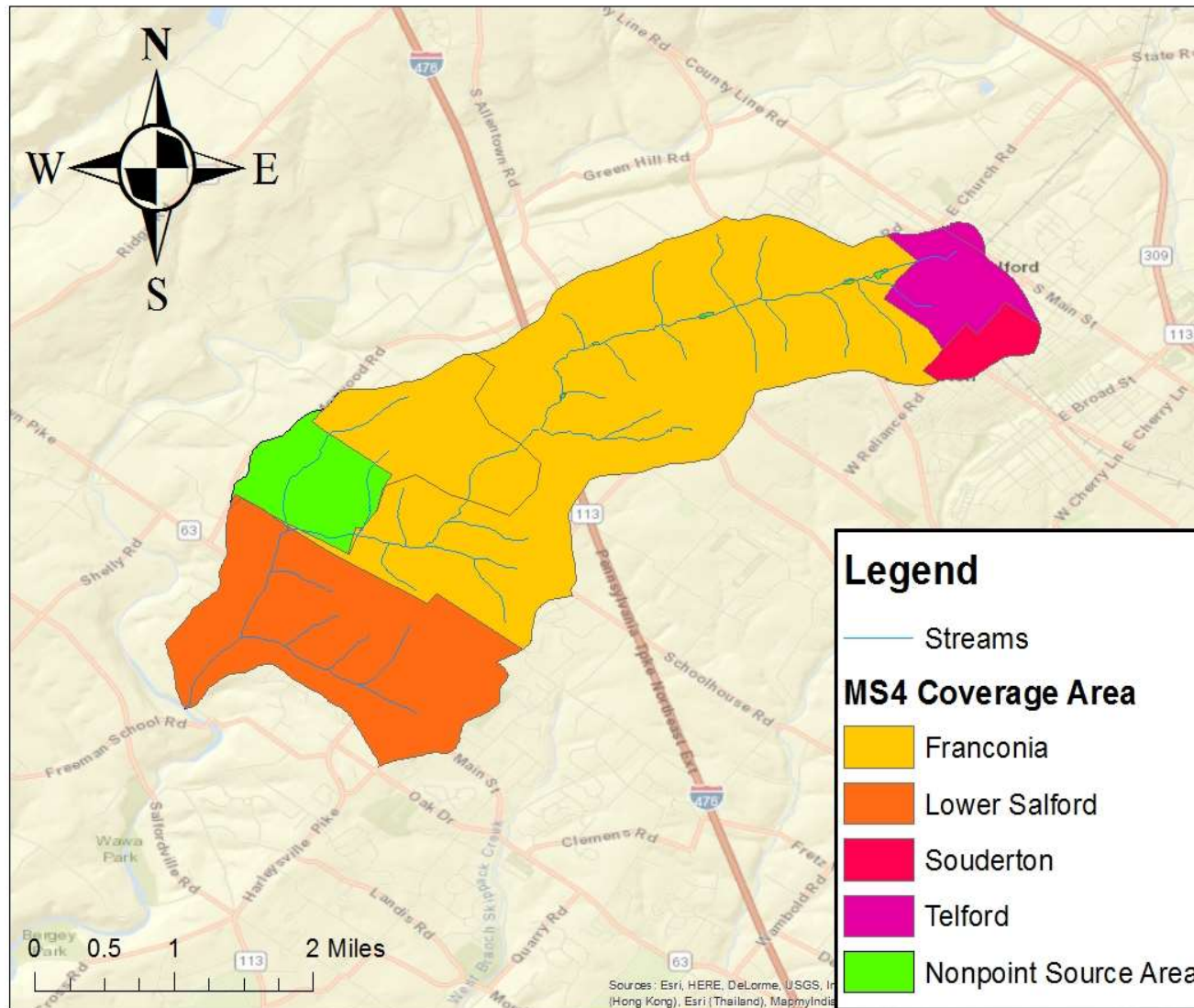
Insignificant dischargers and/or
technology based effluent limits =
NO REDUCTIONS

Permittees

Permit Number	Permit Name	Design Flow (MGD)	Permitted Area (ac)	TSS Limit (mg/L)
General/Stormwater				
General Permits	Aggregate Loads	NA	NA	NA
Individual				
PA0024422	Harleysville Sewage Treatment Plant	0.7	NA	30
PA0036978	Telford Borough Authority WWTP	1.1	NA	30
PA0054950	Pilgrim's Pride Facility (Franconia)	0.3	NA	10
MS4				
PAG130147	Franconia MS4	NA	2,752	NA
PAG130133	Telford MS4	NA	246	NA
PAG130132	Souderton MS4	NA	109	NA
PAG130131	Lower Salford MS4	NA	1,079	NA
PAI-1315-00-06-0001	Pennsylvania Turnpike Commission	NA	TBD	NA
PAI-1315-00-05-0001	Pennsylvania Department of Transportation	NA	TBD	NA

Significant dischargers =
REDUCTIONS NEEDED

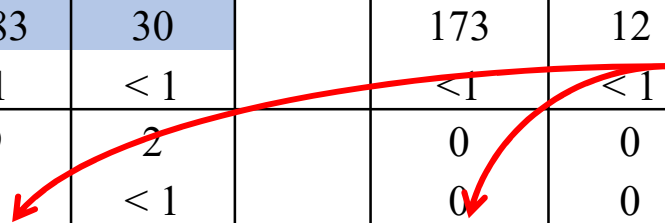
MS4 Coverage: Based on Urban Areas (2010 Census)



Existing Watershed Sediment Loads

Sediment Source		Indian Creek			Reference Watershed Area-Adjusted Birch Run		
		t/yr	% of Total	t/ha/yr	t/yr	% of Total	t/ha/yr
Pervious:	Forest	5	< 1	0.04	71	5	0.10
	Open	176	4	0.73	101	7	1.30
	Residential	105	2	0.21	184	13	0.52
	Crop	2,394	56	5.84	380	26	4.69
	Commercial	19	< 1	0.26	< 1	< 1	0.24
	Road	7	< 1	0.61	4	< 1	< 1
	Pasture	45	1	1.27	325	23	3.24
	Hay	8	< 1	0.18	167	12	0.42
Impervious:	Residential	81	2	0.45	28	2	0.45
	Commercial	50	1	0.45	1	< 1	0.45
	Road	20	< 1	0.45	4	< 1	0.45
Direct:	Streambank Erosion	1,283	30		173	12	
	Straight Pipes	< 1	< 1		< 1	< 1	
Permitted:	Individual Permits	79	2		0	0	
	General Stormwater Permits	2	< 1		0	0	
Watershed Total		4,275	100	2.35	1,439	100	0.79

-66%



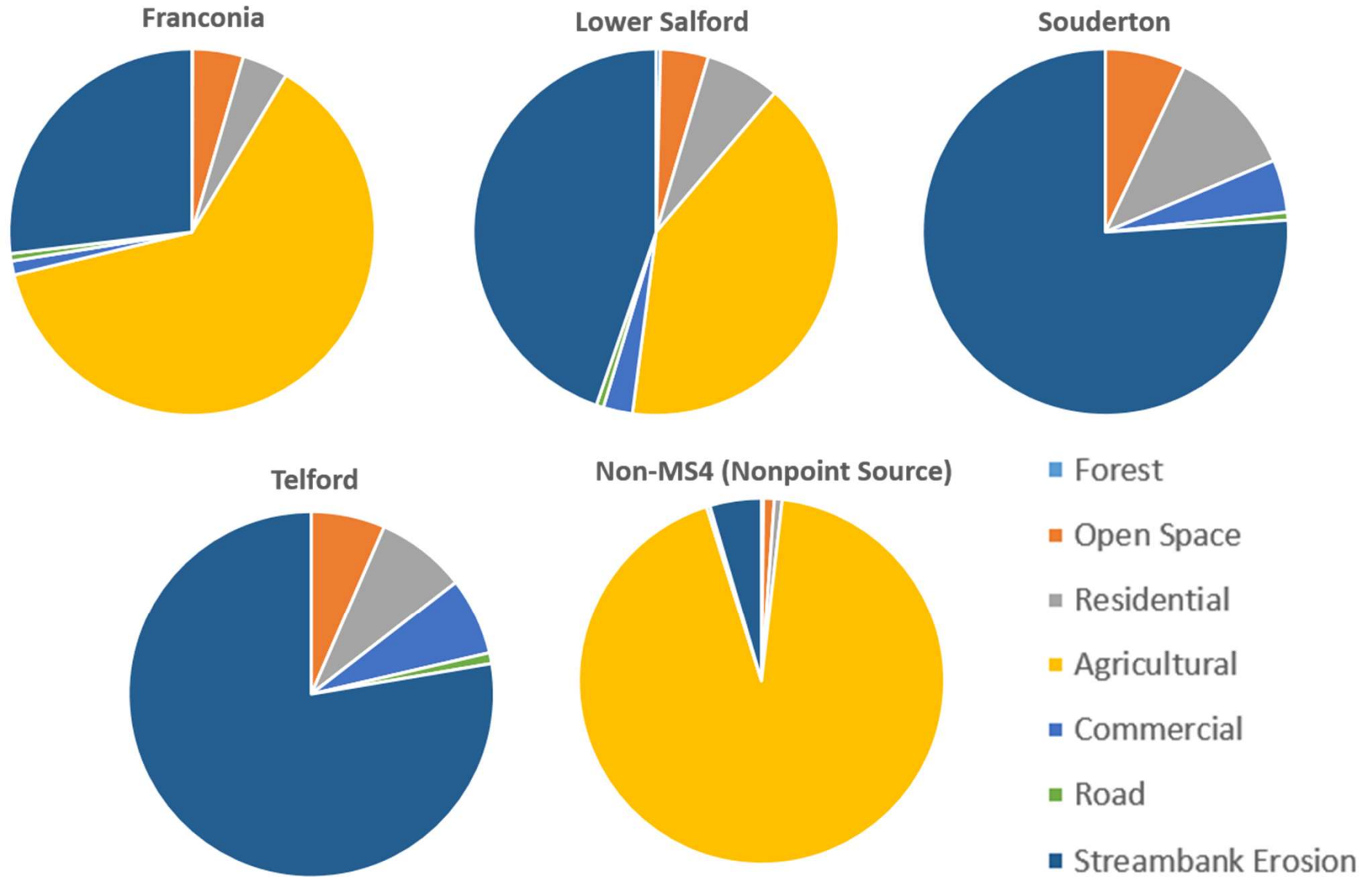
Existing Sediment Load by Jurisdiction

Jurisdiction	Forest	Open Space	Residential	Agricultural	Commercial	Road	Streambank Erosion	Total
Franconia	1.69	123.66	111.94	1726.25	33.91	18.10	740.85	2756.40
Lower Salford	2.98	32.64	51.04	314.65	20.00	4.90	344.49	770.70
Souderton	0.00	4.60	7.47	0.00	3.01	0.46	49.31	64.85
Telford	0.00	10.83	13.22	0.00	11.40	1.58	128.81	165.84
Non-MS4 (Nonpoint Source)	0.76	4.13	3.02	406.11	0.01	1.33	19.79	435.15

Units are in metric tons

1 metric ton = 1.10231 US ton = 2204.62 pounds

Existing Sediment Load by Jurisdiction



Allocation Strategies

- Permittees with insignificant dischargers and/or technology-based limits continue to discharge at current permit limits
- Margin of Safety: 5% vs. Implicit
- Future Growth: 5% vs. None
- Focus on Problem Sources of Sediment***
 - Agriculture and Stream Bank Erosion Sources (i.e. Nonpoint Sources & MS4s)
- Equal Reduction Across All Land Sources: ~71%
- Aggregate township MS4s with PennDOT and PA Turnpike MS4s

Scenario 1: Focus on Agriculture and Streambank Erosion

Scenario 2: Equal Reductions across all Land-based Sources

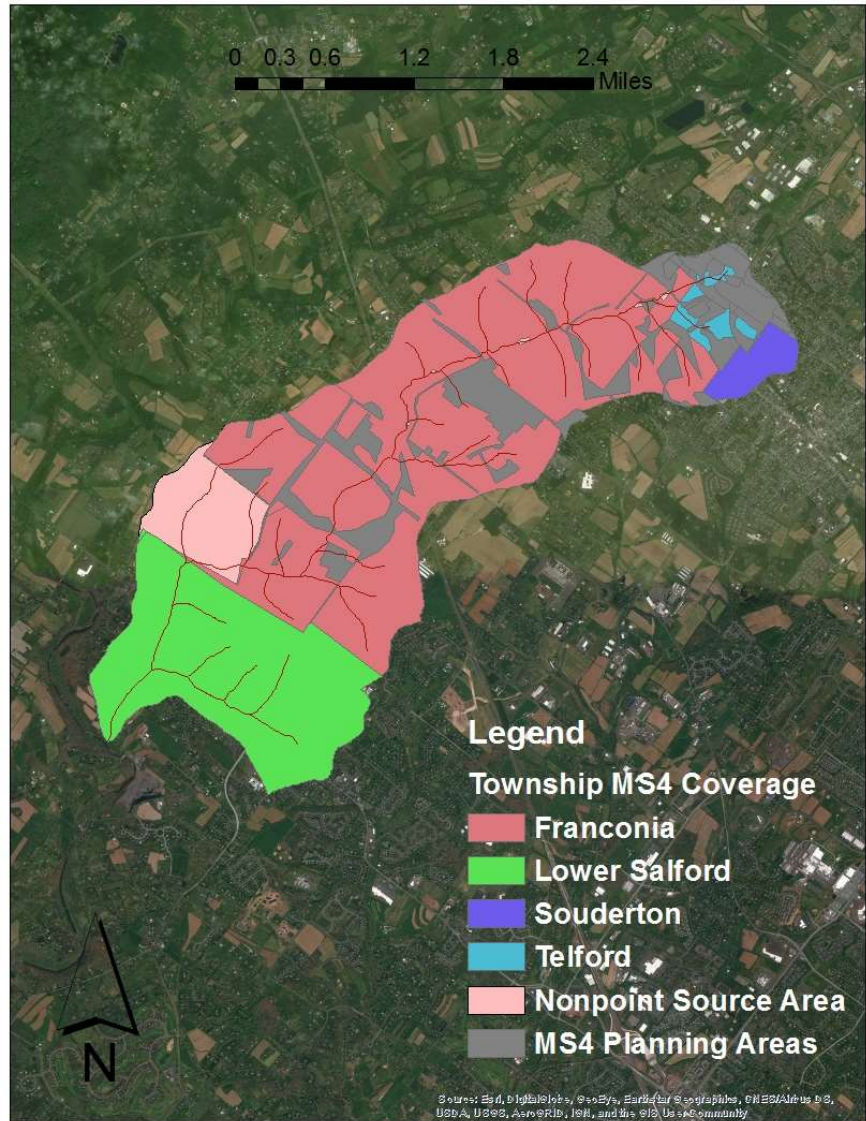
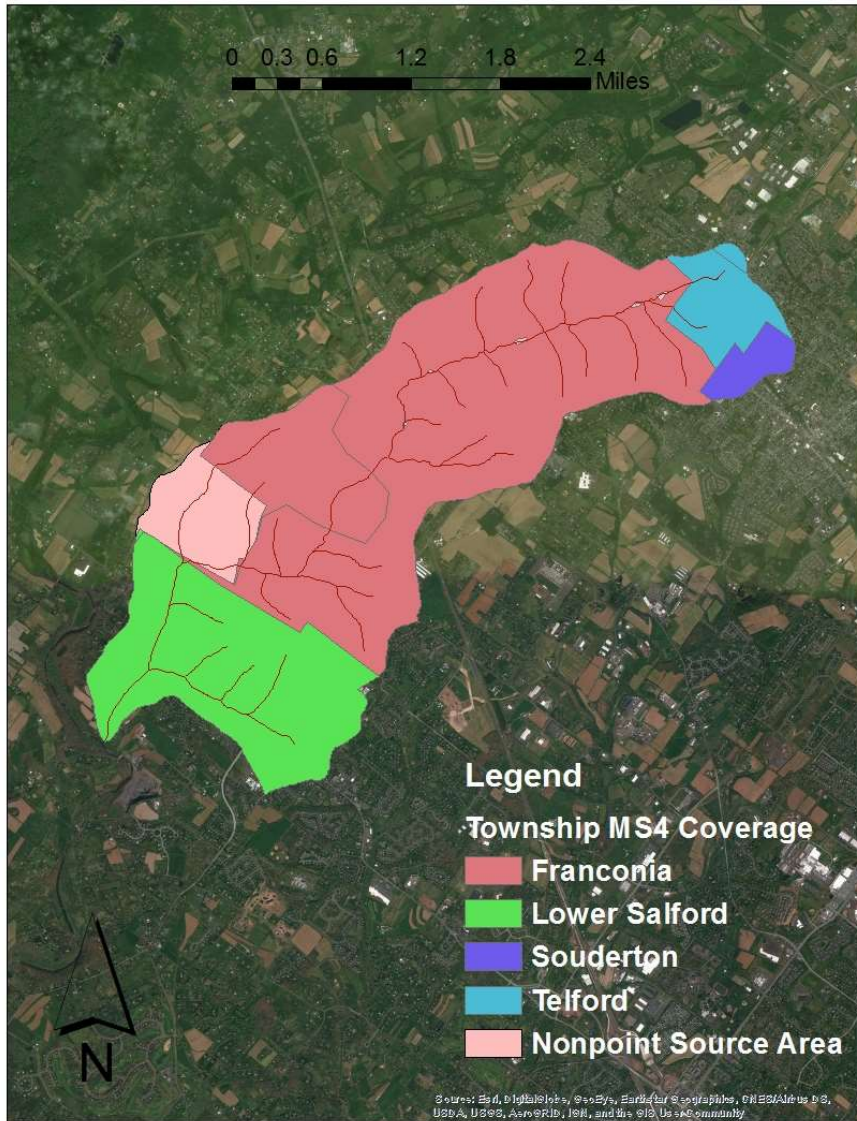
Jurisdiction	Scenario 1 Reductions (% or t/yr)	Scenario 2 Reductions (% or t/yr)
Franconia, PennDOT & PA Turnpike	72% or 1,976.15	71% or 1,967.48
Lower Salford & PennDOT	69% or 530.54	71% or 548.31
Souderton & PennDOT	62% or 40.10	71% or 46.32
Telford & PennDOT	63% or 104.76	71% or 118.44
Non-MS4 (Franconia)	78% or 339.25	71% or 310.25

See Draft Sediment Allocations
in Separate Document

EPA's Preferred Approach

- Focus on Agriculture and Streambank Erosion
- Enables Stakeholders to use a variety of BMPs to target the most pervasive sources of sediment in the watershed
- Aggregate Loads between each township MS4 and their respective transportation MS4
- Build flexibility for MS4s to implement BMPs elsewhere in the watershed to achieve greater sediment reductions overall in a cost-effective manner

Other Considerations: MS4 Planning Areas



MS4 Planning Areas

- Received Planning Areas from Franconia, Telford, and PennDOT
- Preliminary Review suggests that these may not be inclusive of all land under MS4 jurisdiction
- Because the Plans have not been approved by PADEP, EPA cannot use them in the TMDL
- EPA plans to include flexible language in the TMDL Report to allow for the refinement of allocations if additional information becomes available
- The TMDL should be used as a resource during Pollution Reduction Plan development so as to inform BMPs

Questions for Stakeholders

- Stakeholder's thoughts on:
 - Draft Sediment Allocations
 - Future Growth
 - Margin of Safety
- Reasonable Assurance (RA)
 - Are there grants, partnerships, community program policies, etc. that would assist in providing RA?
- Suggestions on Meeting Locations for the Draft TMDL Public Comment Period
- Other feedback?

Next Steps

- Request Comments on Draft Indian Creek Sediment Allocations by **4/23/2018**
- Revise Sediment TMDL report to include sediment allocations
- Release Draft Sediment TMDL for Public Comment by Summer 2018
- Public Meeting in Fall 2018
- Establish TMDLs after responding to comments



Questions/Comments?



Contact Information

EPA Region III

- Jennifer Sincock Sincock.Jennifer@epa.gov
215-814-5766
- Jillian Adair adair.jillian@epa.gov
215-814-5713

Michael Baker International:

- Sabu Paul spaul@mbakerintl.com

Map Tech:

- James Kern jkern@maptech-inc.com