US EPA ARCHIVE DOCUMENT

Proposed Total Phosphorus TMDL for the Wissahickon Creek Watershed

EPA Region 3 – Philadelphia, PA

Public Meeting

Temple University Ambler Campus

June 10, 2015

Overview

- General presentation
- Technical presentation on TMDL details and modelling
- Next steps

Clean Water Act Basics

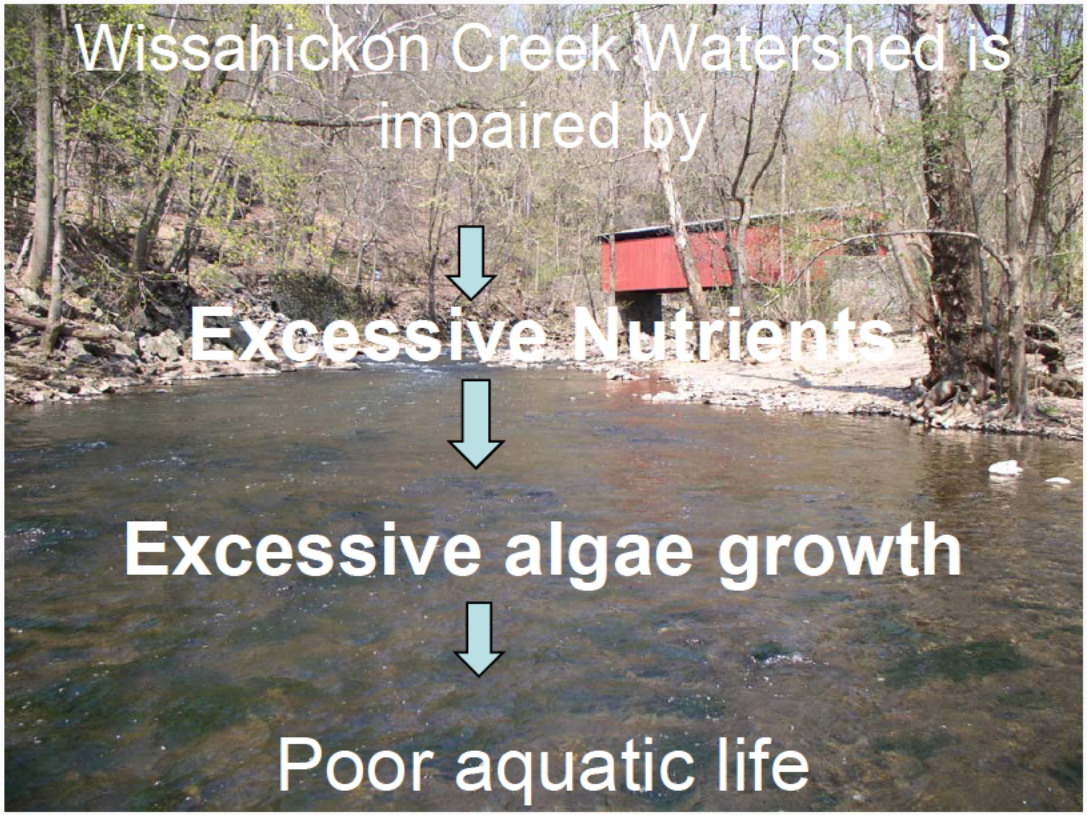
- "Fishable and swimmable" minimum goal
- States adopt water quality standards (WQS)
- Assess whether waters meet WQS
- Issue permits for discharge
- If water is impaired, look for causes
- Identify necessary reductions

What is a TMDL?

Total Maximum Daily Load (TMDL)

Pollution budget or expression for the maximum amount of a pollutant that a waterbody can receive and still allow for water quality standards or goals to be met.

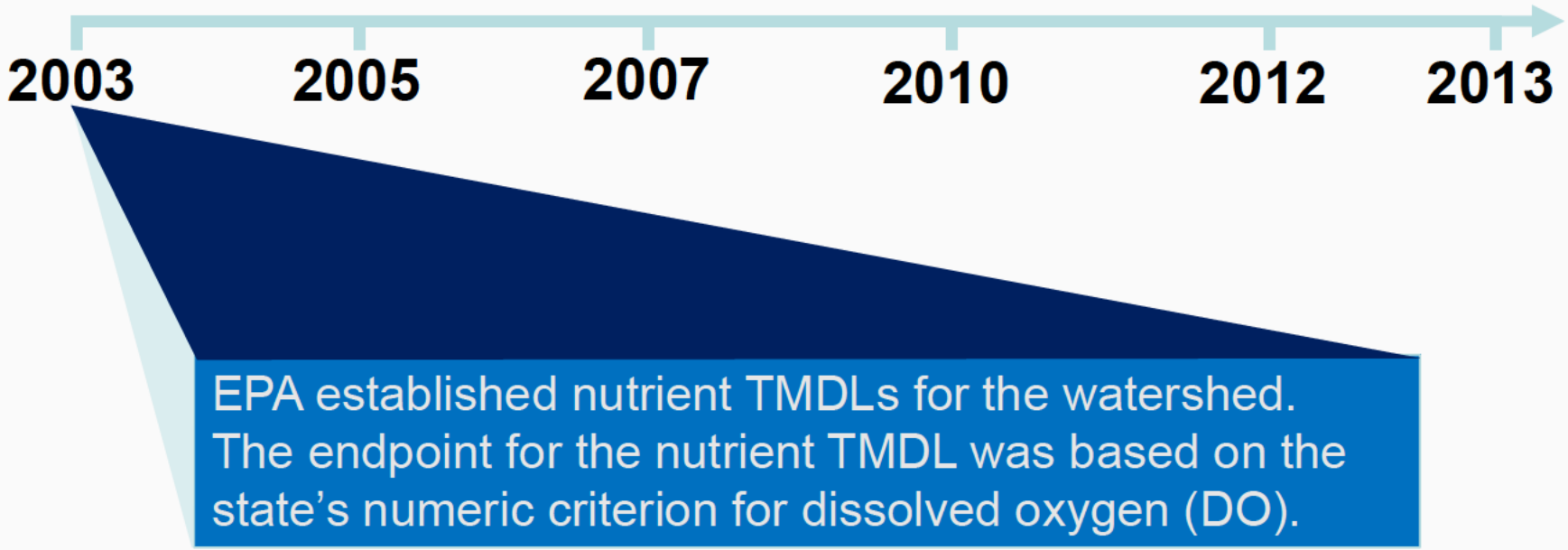
Why is a TMDL Needed?



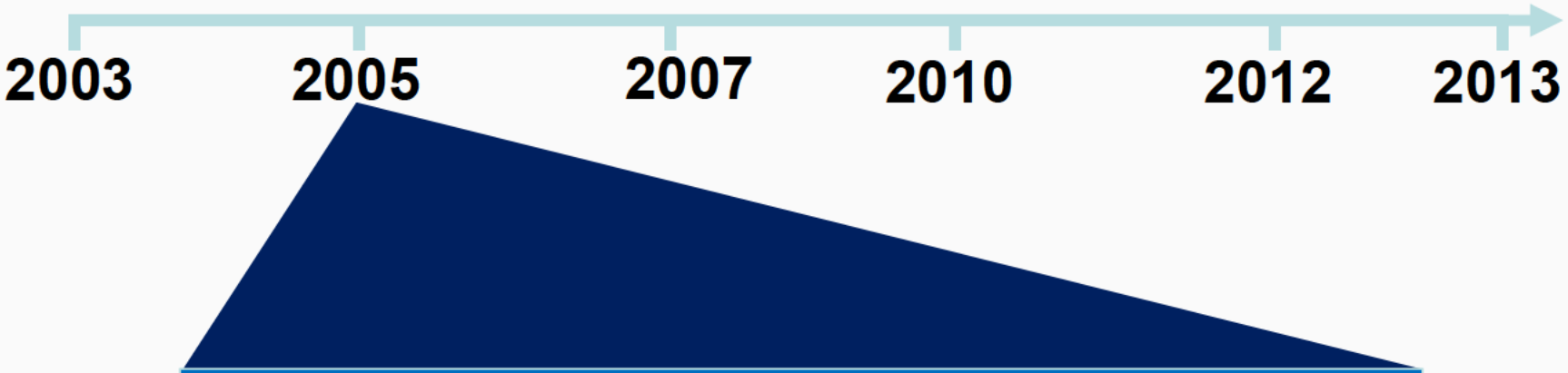
Impact of a TMDL

- Identifies existing loads from point and nonpoint sources
- Identifies critical conditions
- Flags reductions needed to meet WQS
- Permits issued after the TMDL must be "consistent"

A Brief History

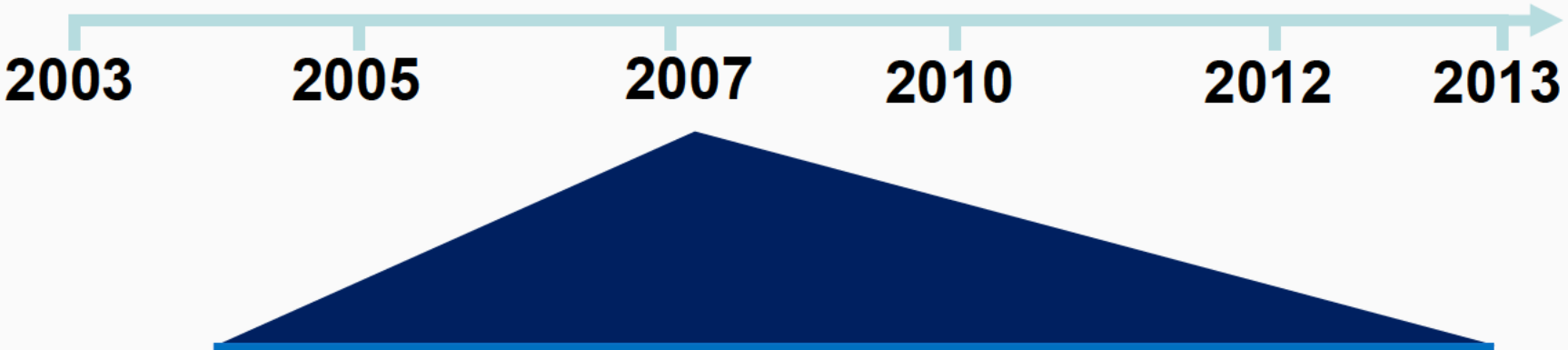


Improved TMDL Needed



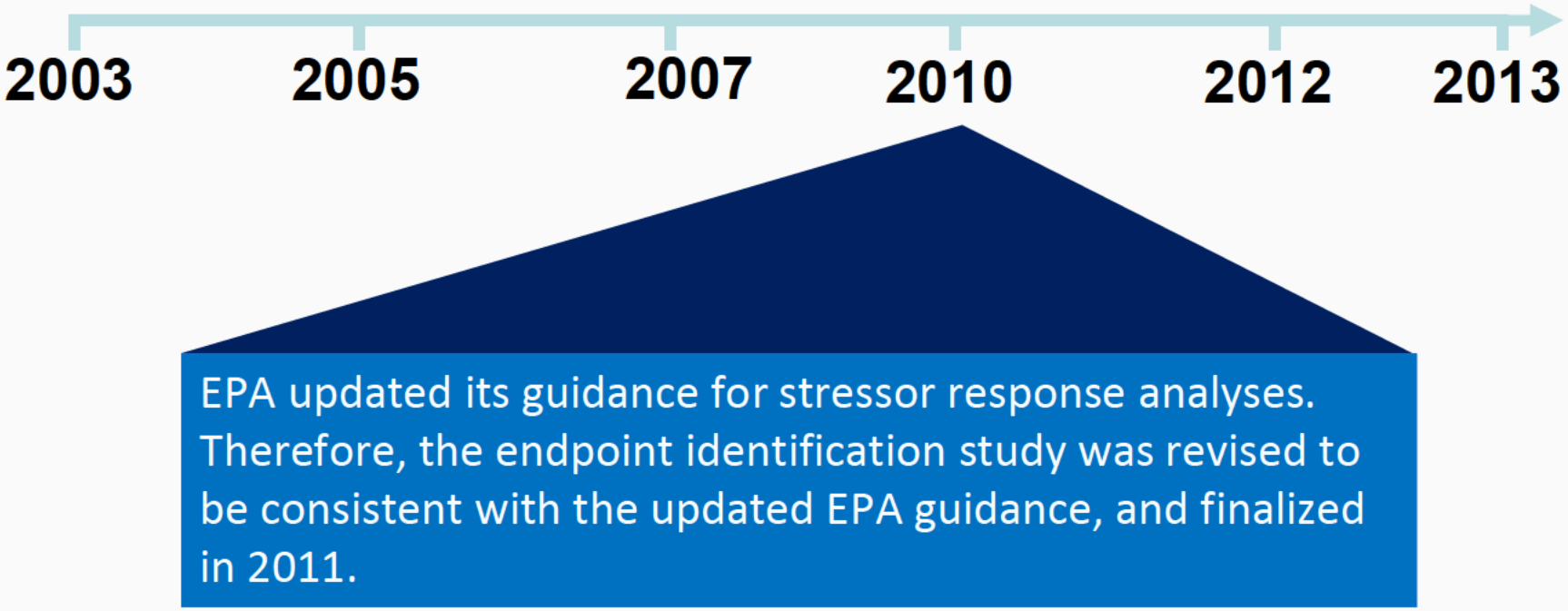
PADEP requested EPA develop a TMDL with a total phosphorus (TP) endpoint to protect the state's narrative water quality criteria by controlling algal growth. Rigorous monitoring begins to support effort.

Developing an endpoint

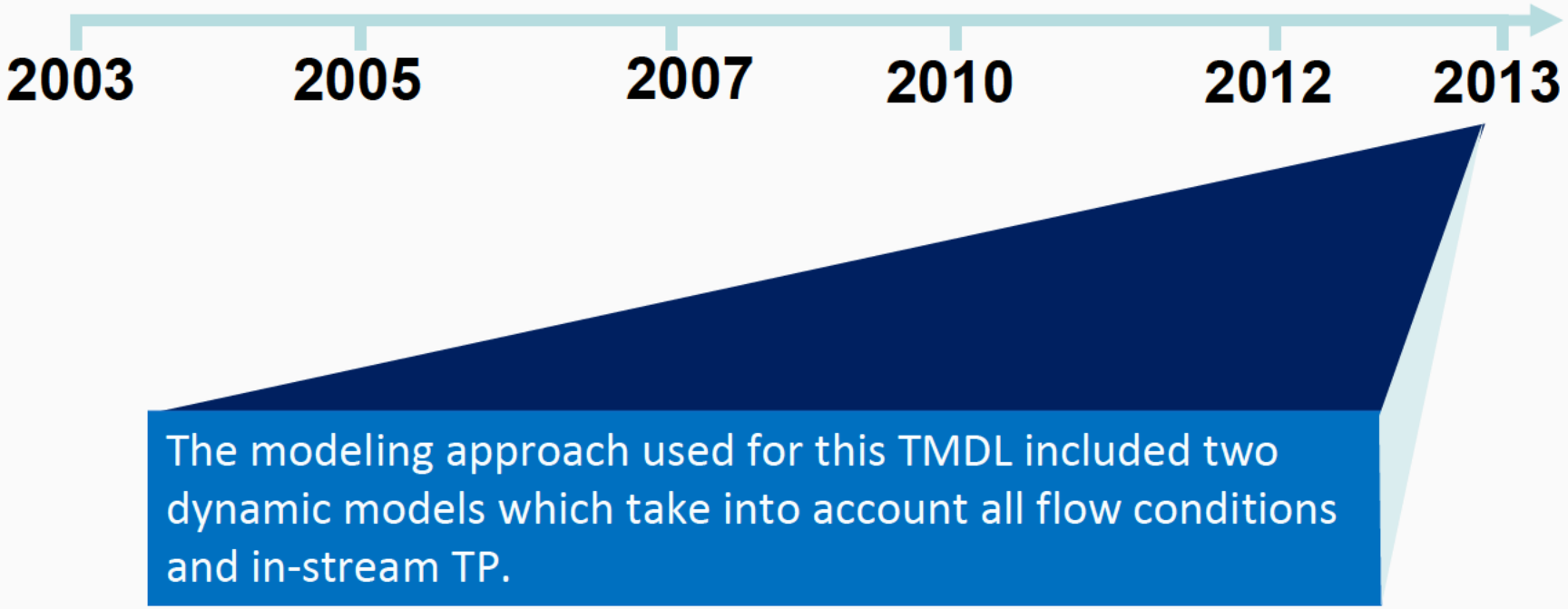


An EPA study conducted to establish scientifically defensible nutrient endpoints protective of aquatic life for streams in the Northern Piedmont Ecoregion of Pennsylvania. The TP endpoint of 0.04 mg/L was identified.

Endpoint review



More complex water quality modelling



Why a Phosphorus Endpoint?

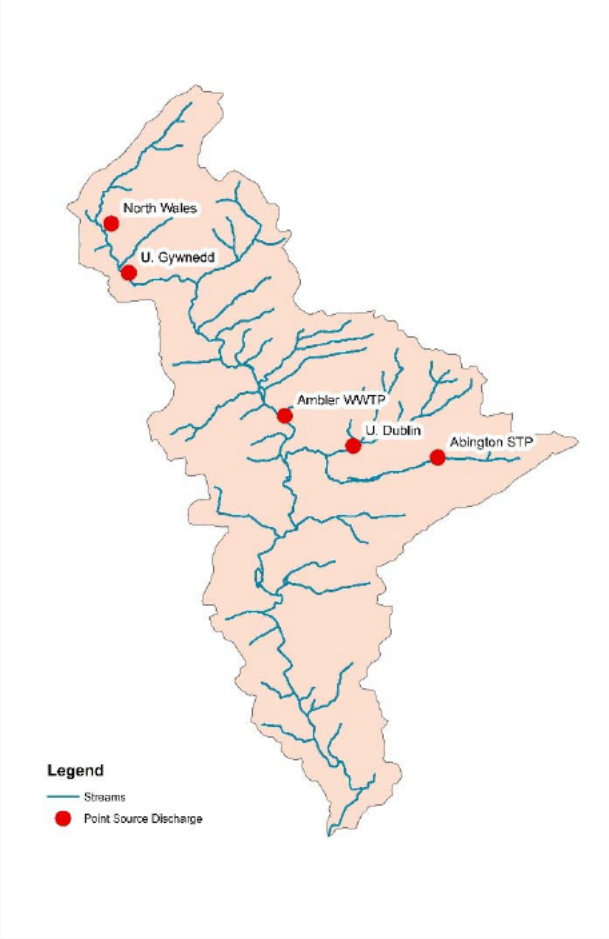
- PA has not yet adopted numeric criteria for nutrients.
- PA has “narrative criteria” in place which prohibit substances harmful to aquatic life.
- EPA’s selection of an endpoint was based on:
  - Statistical analysis
  - Multiple lines of evidence of what the phosphorus number could be
  - Concluded that 0.04 mg/l Total P would protect aquatic life

Point Sources of Nutrients Identified

Municipal Wastewater Treatment Plants

- Abington
- Ambler
- North Wales*
- Upper Dublin
- Upper Gwynedd

*No longer a discharger



Point Sources of Nutrients

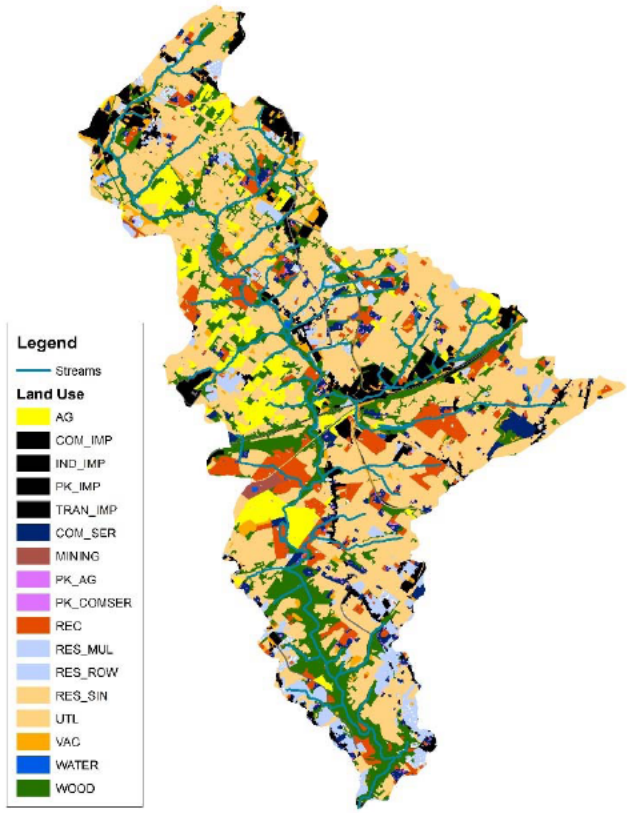
Municipal Separate Storm Sewer Systems (MS4s)

- Abington
- Ambler
- Cheltenham
- Horsham
- Lansdale
- Lower Gwynedd
- Montgomery
- North Wales
- Philadelphia
- Springfield
- Upper Dublin
- Upper Gwynedd
- Upper Moreland
- Whitemarsh
- Whitpain
- Worchester

Land uses determine nutrient loads

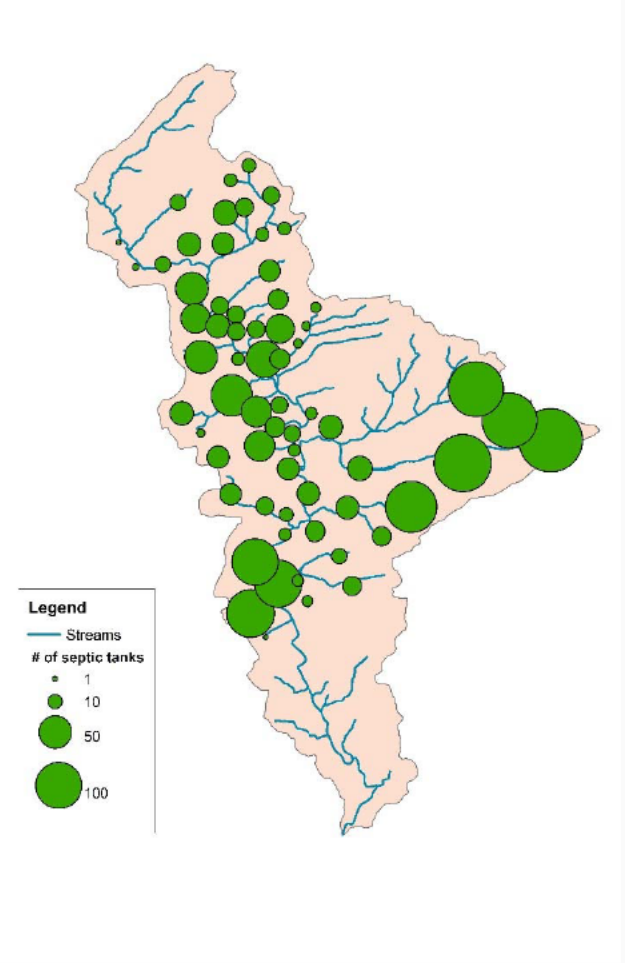
Land uses (by area) within the MS4s include:

Residential (51.2%)
Background (18.0%)
Pervious Developed (13.2%)
Impervious Developed (7.3%)
Agriculture (6.7%)
Golf (3.6%)

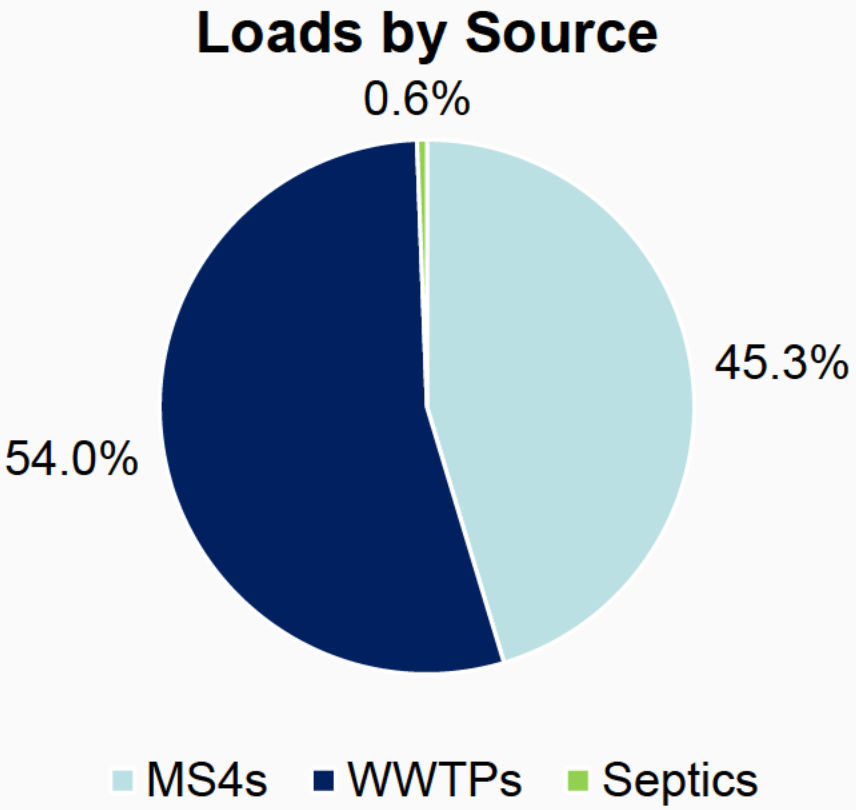


Nonpoint sources of Nutrients

- Limited to Septic Systems
- Other sources covered under Point Source Category
- Smaller contribution

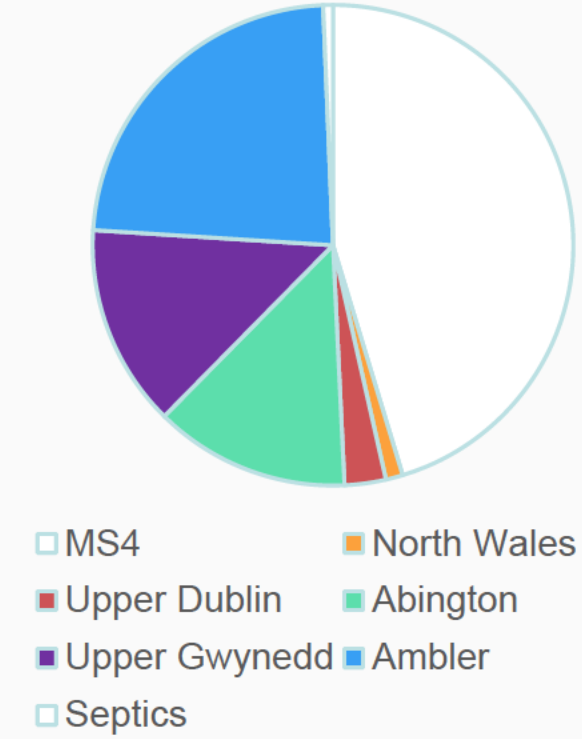


Loads by Sources

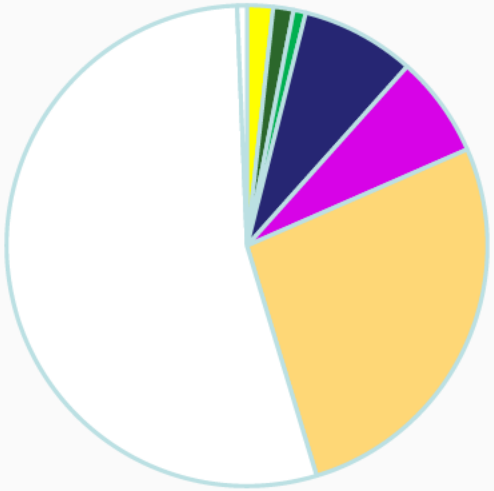


Loads by Sources

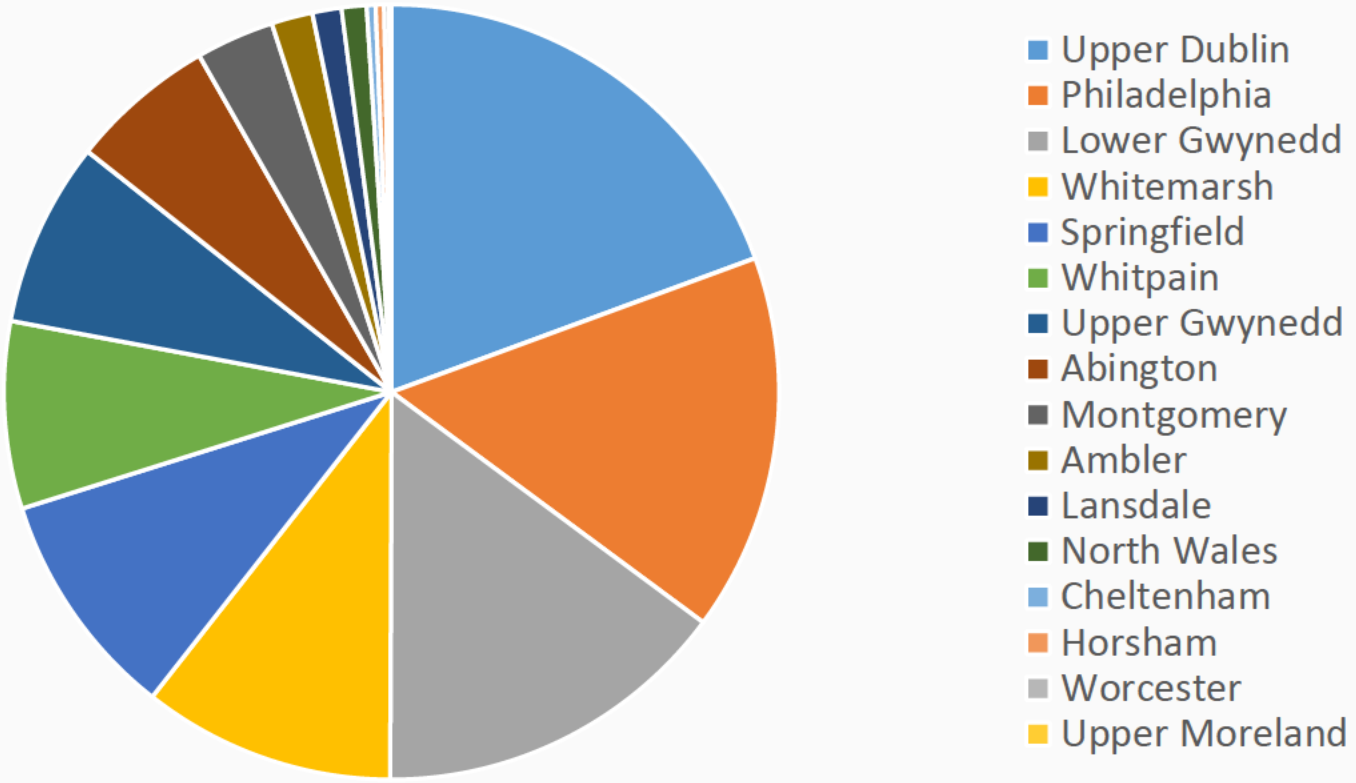
WWTP Contributions by Facility



MS4s Contributions by Land Use

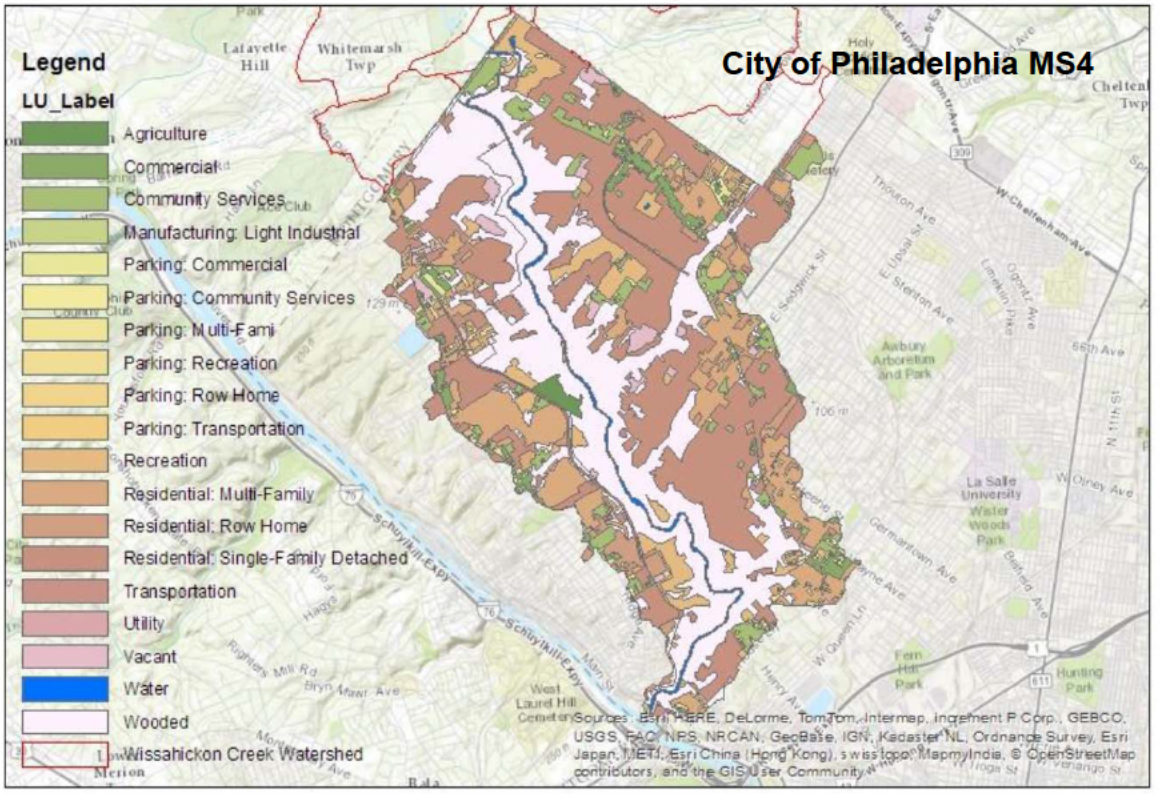


MS4 Loadings by Municipality



Modeling the Wissahickon

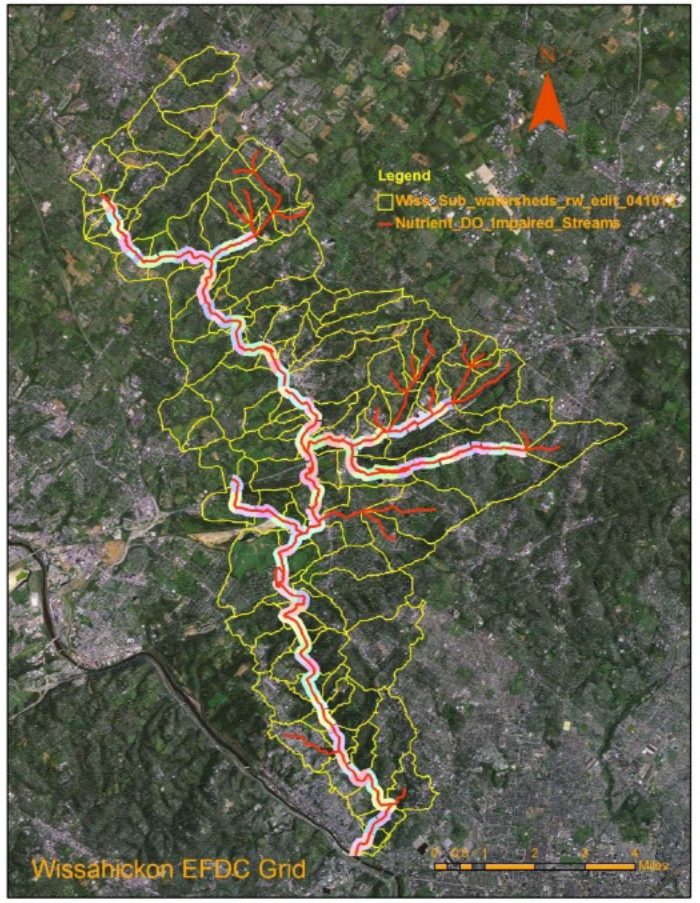
High-quality data was collected around the watershed to use in the models, including detailed land use data.



Modeling the Wissahickon

The models developed for the Wissahickon Creek TMDL were very detailed to ensure accurate representation of the watershed.

- The watershed was divided into 118 subwatersheds, with 118 stream segments
- Water quality modeling included loads delivered to the Creek as well those taking place within the Creek



Modeling the Wissahickon

DATA

High-quality data was collected around the watershed to use in the model. This data included:

- **Flow**
- **Stream cross sections**
- **Land Use**
- **Dam data**
- **Meteorological data**
- **Water quality data**

MODELS

Two dynamic models were developed for the Wissahickon Creek TMDL:

- **Loading Simulation Program in C++ (LSPC)**
- **Environmental Fluid Dynamics Code (EFDC)**

ALLOCATIONS

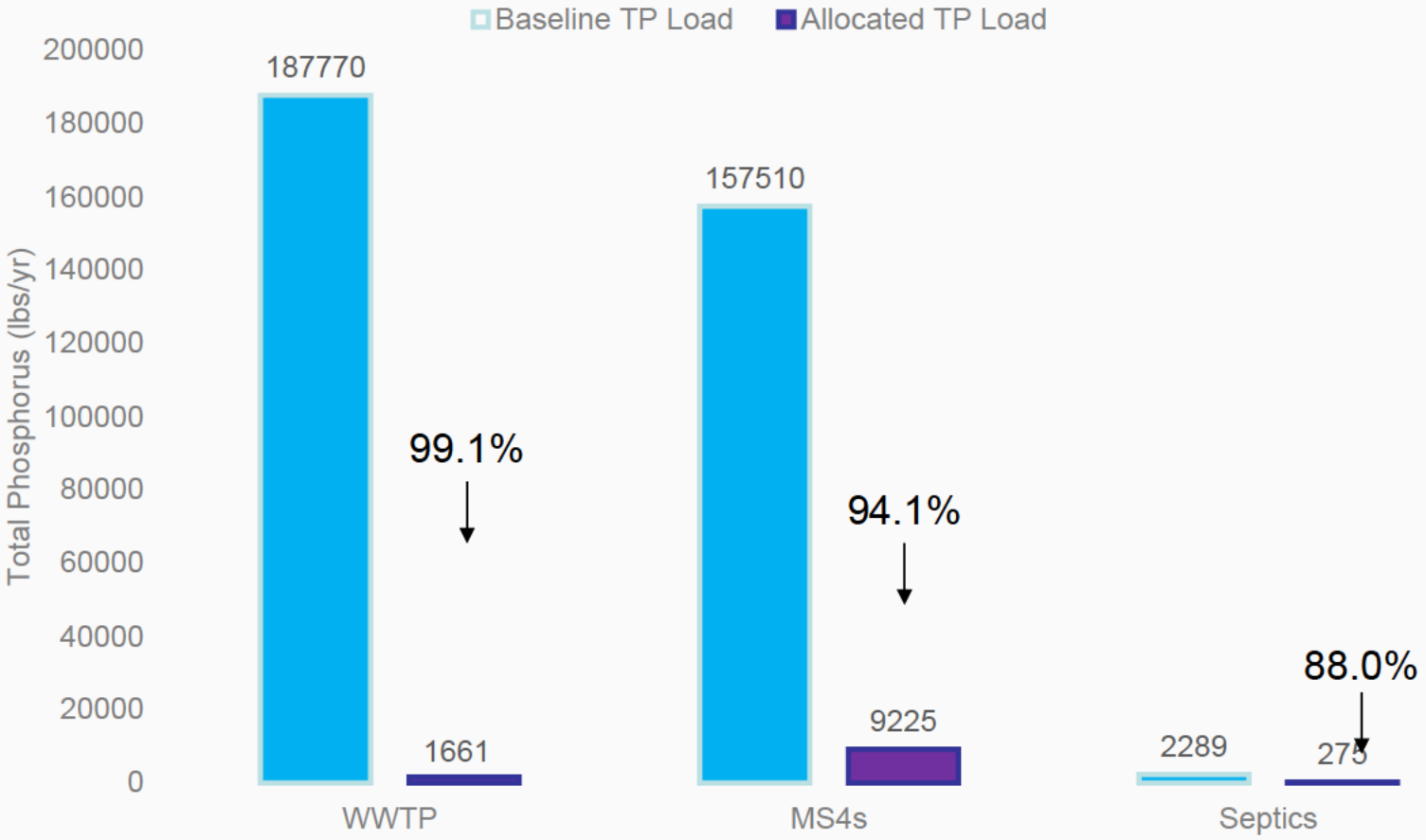
The models informed the allocations, ensuring the 0.04 mg/L total phosphorus endpoint was met throughout Wissahickon Creek and all of its tributaries.

The Pollution Budget

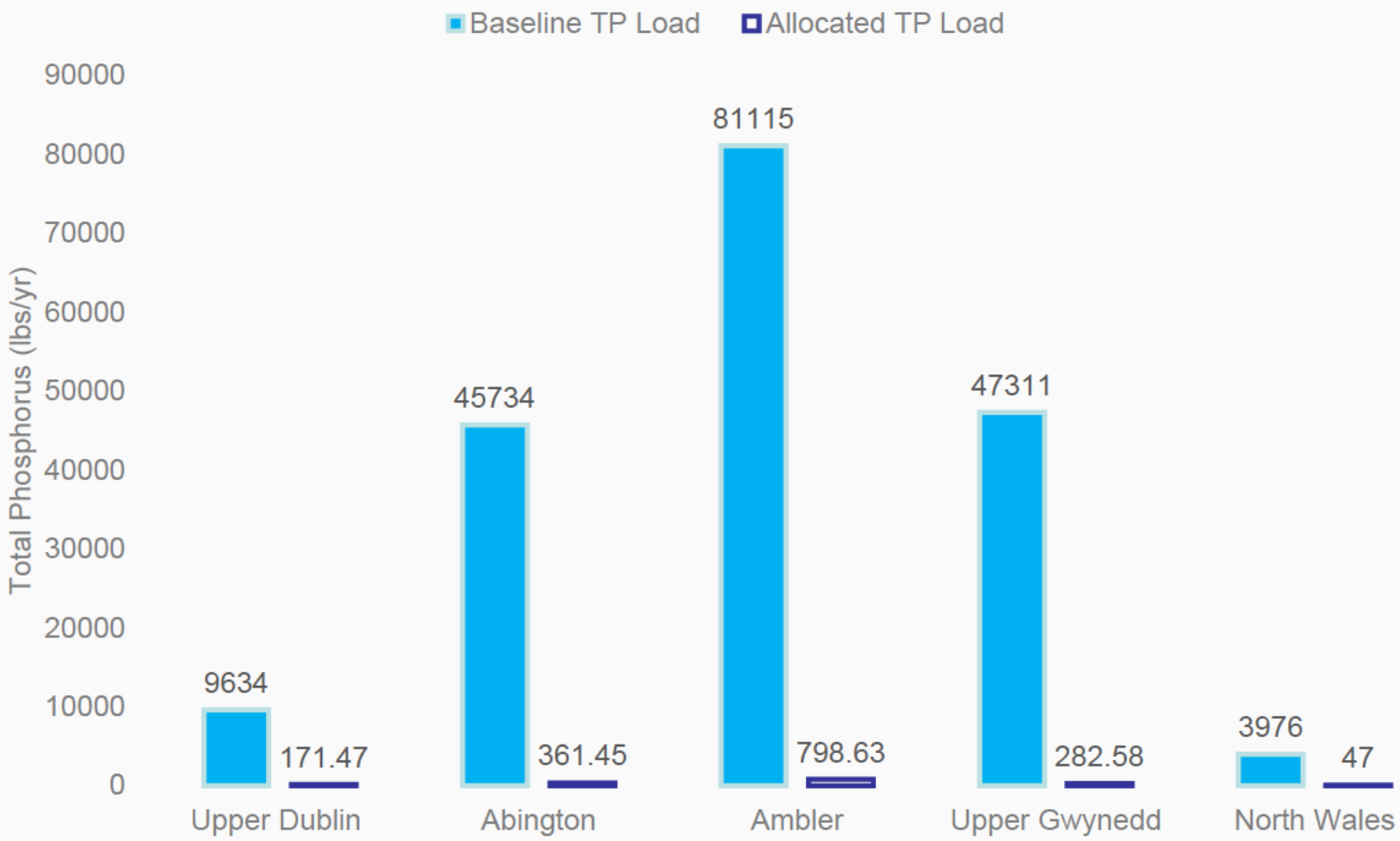
Wissahickon Total Phosphorus TMDL

$$(11{,}161\,\frac{lbs}{yr})_{TMDL} = (1661\,\frac{lbs}{yr})_{WWTPs} + (9225\,\frac{lbs}{yr})_{MS4s} + (275\,\frac{lbs}{yr})_{Septics}$$

Reductions Necessary to Meet Allocations



Reductions by WWTP



Public Process Schedule

- **May 20, 2015** – Published Notice
- **June 10, 2012** – Public Meeting
- **July 6, 2015** – Deadline for Comments

Next Steps

- Stakeholders considering whether they can commit to an alternative plan
- EPA will review and respond to comments
- Final TMDL will be developed based on responses

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http://www.epa.gov/reg3wapd/tmdl/index.htm