PERKIOMEN WATERSHED MAPPING & FLOOD STUDY

REP CAPPELLETTI AND REP. WEBSTER WEBINAR

APRIL 1, 2025

Engineering | Planning | Infrastructure Solutions

PROJECT BACKGROUND

- Flooding devastation after Hurricane Ida, September 1, 2021
- State Rep. Joe Webster secured funding from State for Perkiomen Watershed.
- Flooding consequences…
  - Recurring financial loss to residents and businesses
  - Loss of life
  - Risk to first responders
  - Loss of property
  - Water pollution

PERKIOMEN WATERSHED

- 362 Square Miles
- 55 Municipalities
- 4 Counties
- ~38 miles long

PERKIOMEN SUBWATERSHEDS

- East Branch Perkiomen Creek
- Perkiomen Creek
- Skippack Creek
- Swamp Creek
- Unami/Ridge Valley Creek

CONCURRENT STUDIES

- Montgomery County Stormwater Management Plan
- Bucks County Act 167 Plan
- Lehigh County Act 167 Plan

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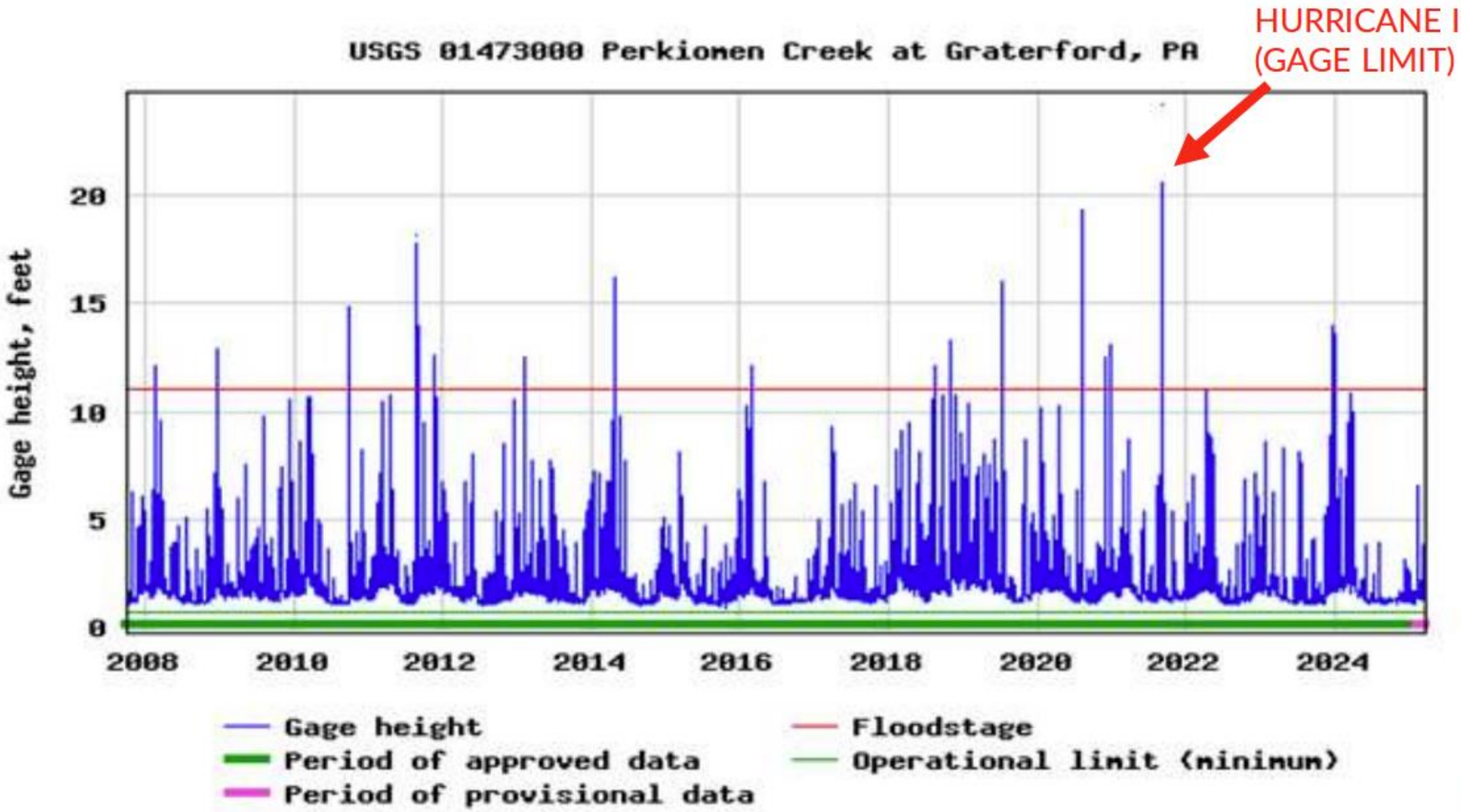
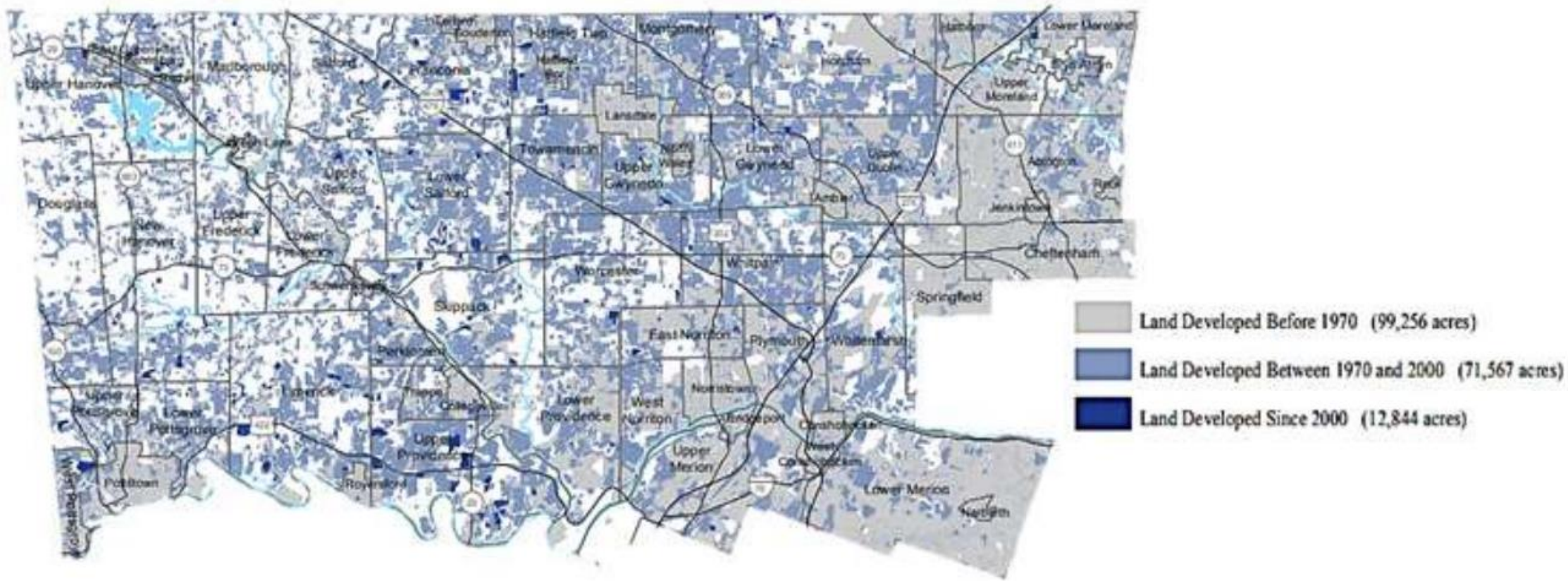
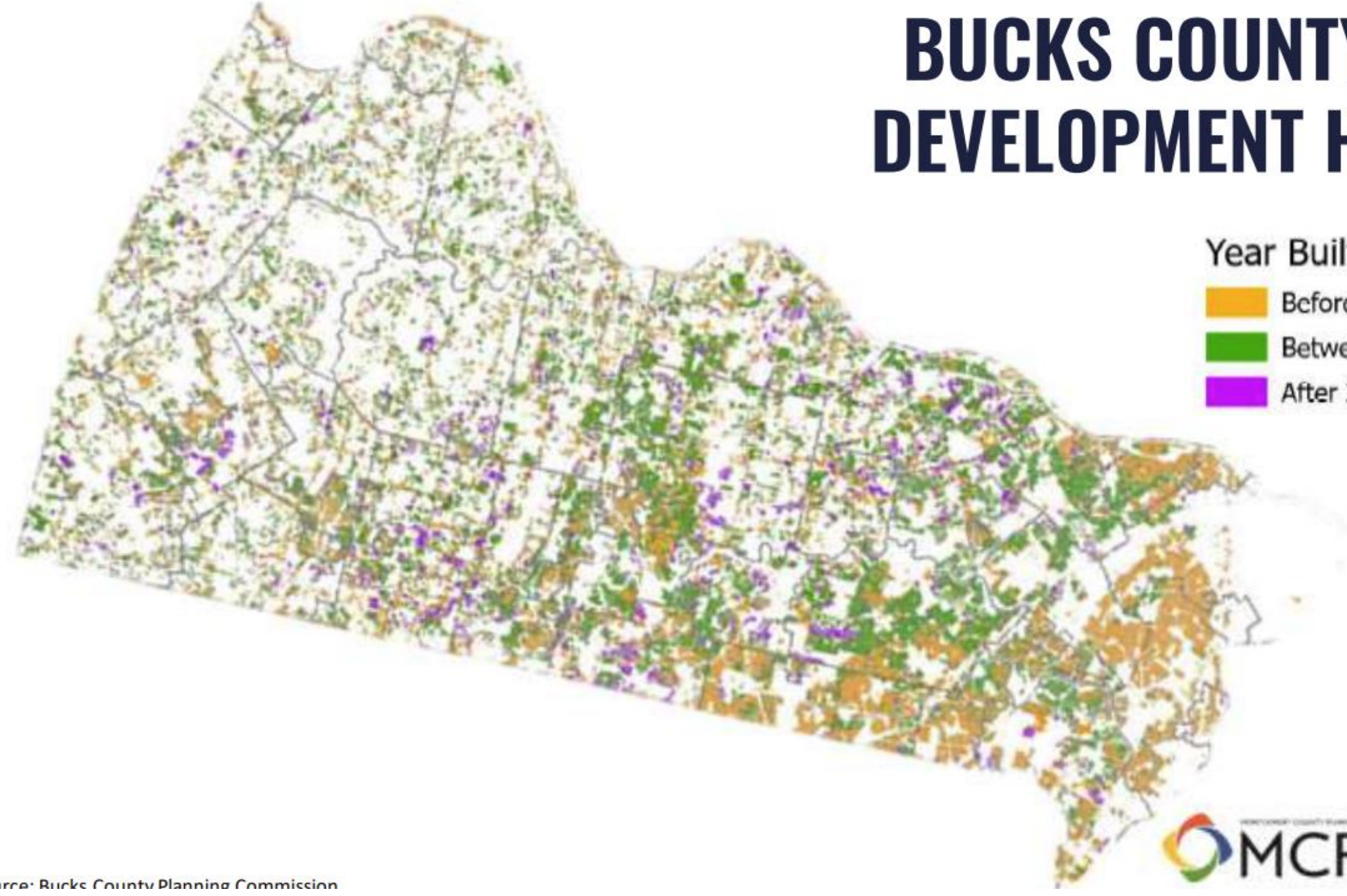
PERKIOMEN DISCHARGE AT GRATERFORD



MONTGOMERY COUNTY LAND DEVELOPMENT HISTORY



BUCKS COUNTY LAND DEVELOPMENT HISTORY



Source: Bucks County Planning Commission

GETTING TO THE STARTING BLOCKS!

September 2021 – Hurricane IDA Hits the Perkiomen Valley

FY 2022 – 25 State Budget Negotiations - $1 million for a Perkiomen Flood Study, per Representative Joe Webster's advocacy.

February 2023 – Webster hires staff to move the project forward.

Remainder of 2023 – Convince Montgomery County to revise their annual work program to include the Perkiomen Flood Study & $1 million grant.

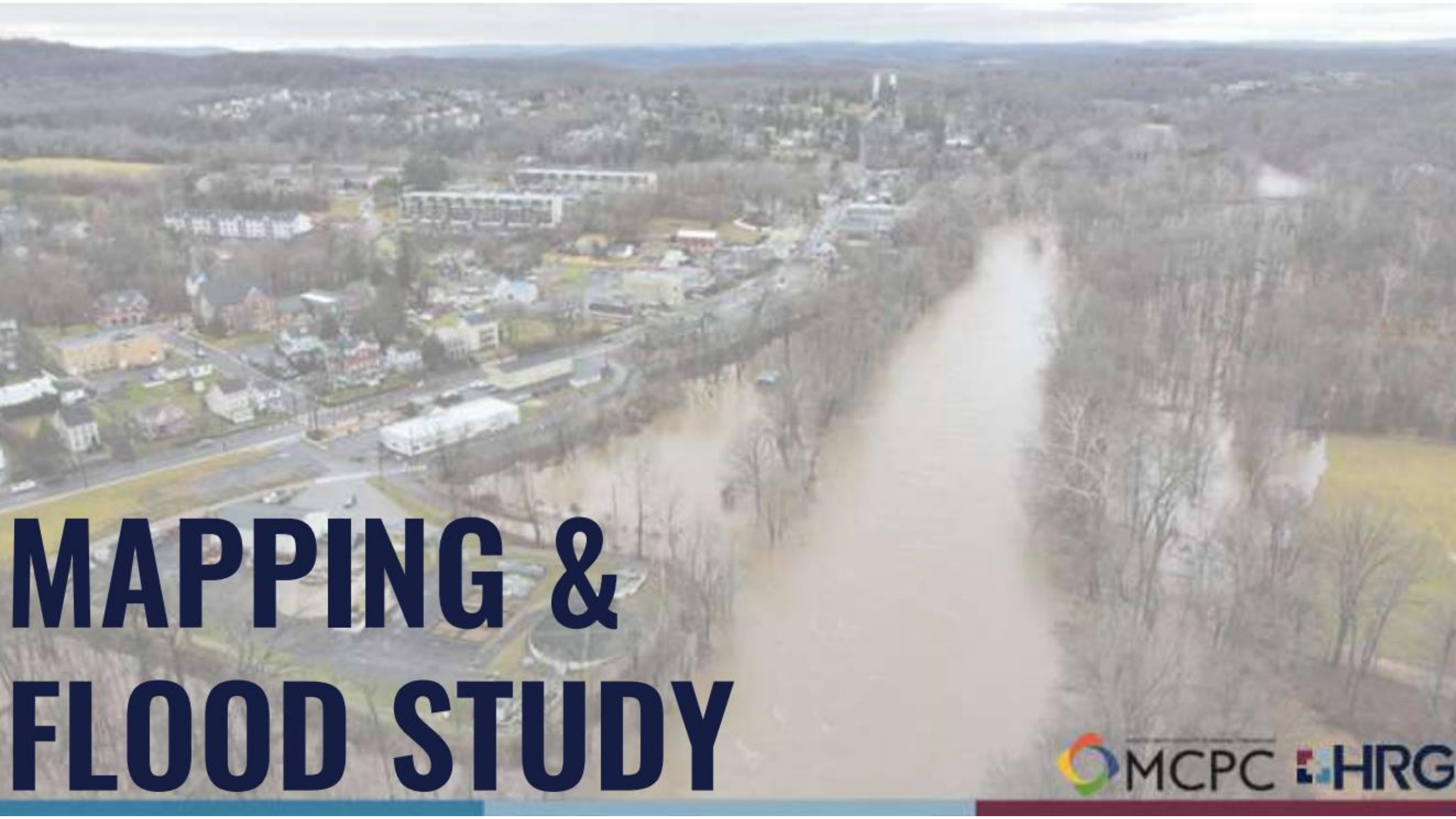
Also – work with PaDEP to locate the funds in the budget (somewhere under general funds!) and determine how the grant would be managed at DEP.

Late 2023/Early 2024 – Coordinate with MontCo regarding overall draft budget and scope of work, create a Request for Proposals, and understand how MontCo would announce and finalize the consultant selection.

By June 2024 – RFP posted, three teams applied, and consultant selection was completed by June.

July 2024 – HRG, JMT, and Center for Watershed Protection team under contract, minor revisions to budget and scope of work prepared and submitted to PaDEP.

July 2024 – Project team can begin. Requested to do 18 months of work in 12!



MAPPING & FLOOD STUDY

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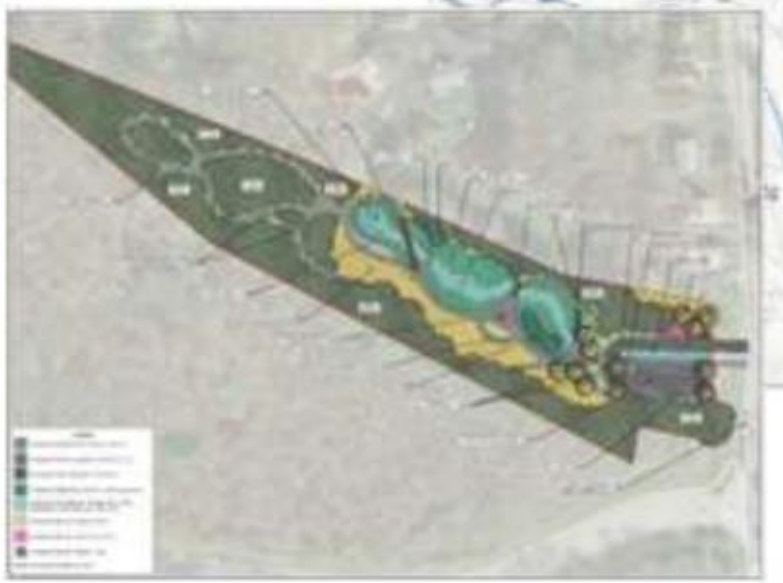
PROJECT OBJECTIVES

- Watershed-wide flood study
  - Evaluate overall flood conditions in the Perkiomen Watershed
  - Identify the locations most in jeopardy of severe flooding
    - Document known flooding areas
    - Focus on priority flooding areas
  - Provide planning-level mitigation solutions & recommendations for green & gray infrastructure
- Coordinate with Municipalities and other Stakeholders
- Public Outreach
- Demonstration Projects



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MAPPING & FLOOD STUDY

DESIRED OUTCOME

- Identify, document, and prioritize flooding issues
- Develop planning-level solutions for 20 Phase 1 flooding areas
- Develop an implementation strategy
- Planning demonstration projects
- **Achieve Stakeholder support**
- **Achieve Public support & awareness**

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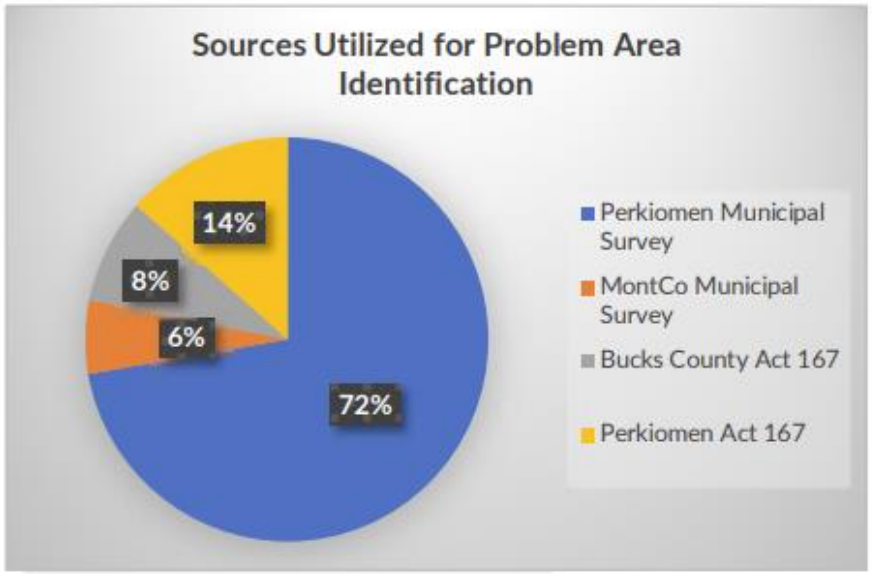
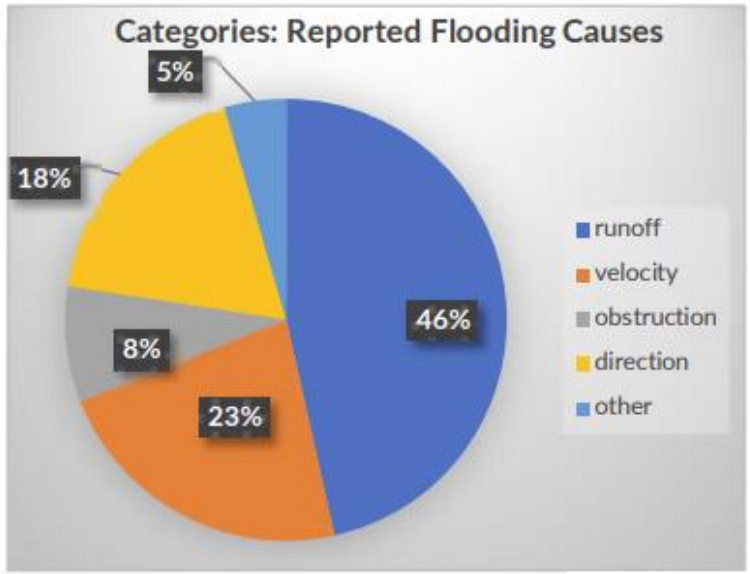
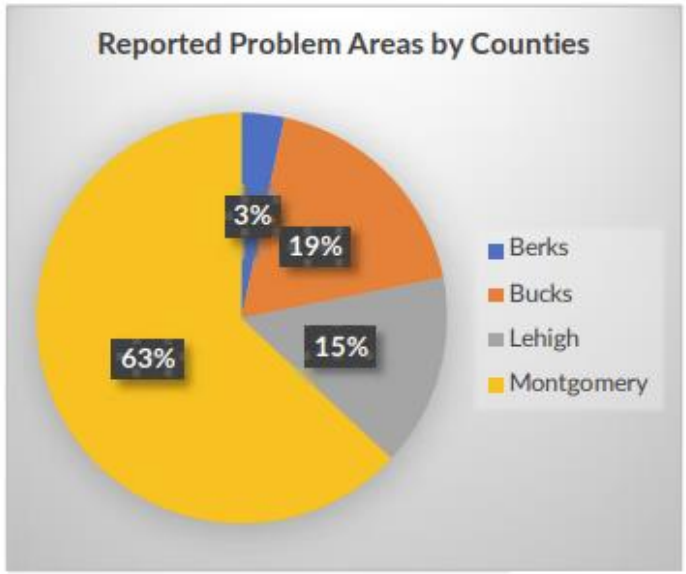
MAPPING & FLOOD STUDY

SURVEY RESULTS

- Stormwater concerns and locations collected via Perkiomen Flood Study Survey







MAPPING & FLOOD STUDY

IDENTIFICATION OF PHASE 1 PRIORITY FLOODING PROBLEMS

- Data collection/Existing Studies
  - GIS
  - Available H&H Models (PCSWMM)
- Utilize feedback from the Perkiomen Flood Study Survey

  *Still accepting survey responses!

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MAPPING & FLOOD STUDY

FLOOD HAZARD CRITERIA

Floodplains

Higher risk of flooding for areas in floodplains

Height Above Nearest Drainage

Higher risk of flooding for areas at lower heights above stream channel

Distance to Streams

Higher risk of flooding for areas located at closer horizontal distance to stream channel

Curve Number (Land Cover)

Higher curve numbers (more impervious area) generate more stormwater runoff and increase flood risk

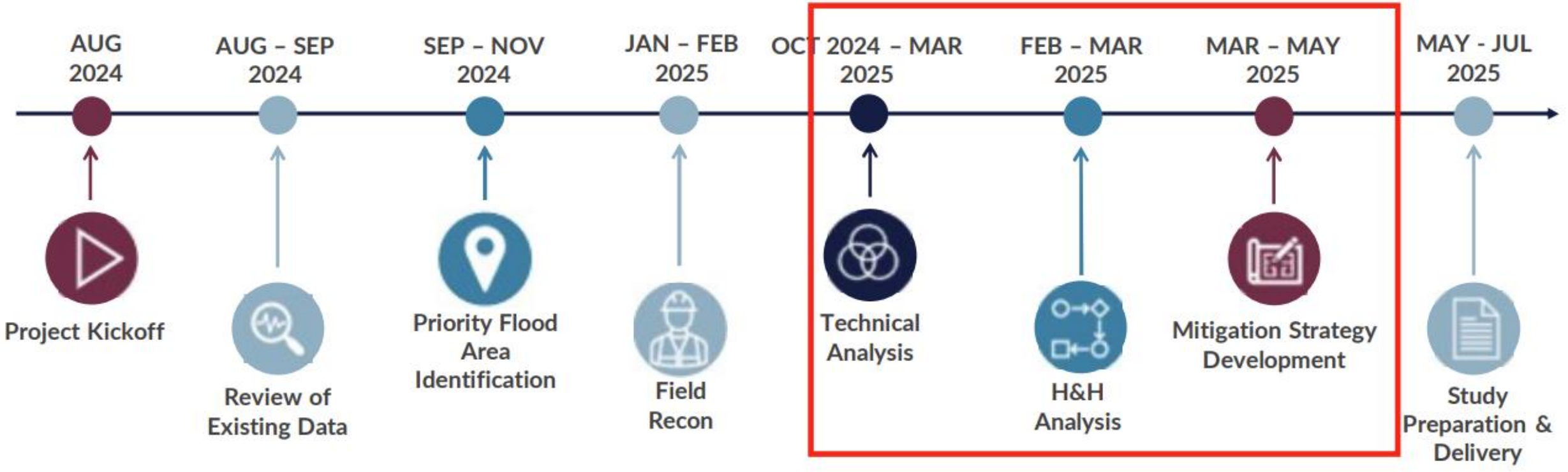
Slopes

Steeper slopes generate more stormwater runoff and increase flood risk

Population

Higher risk of flood damage in areas with higher population density

PROJECT TIMELINE



PUBLIC OUTREACH

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PUBLIC OUTREACH

INCREASE AWARENESS

KEEP THE COMMUNITY INFORMED about ongoing efforts and project progress.

IDENTIFY LOCALIZED FLOOD AREAS

ENSURE ACCURACY & relevance of mapping and data collection by sharing the local experience.

BUILD RESILIENCE

BUILD SUPPORT for large scale projects proposed in the final report to achieve flood resilience.

ENCOURAGE ACTION

START SMALL with stormwater management projects on your property & join participation events.

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PUBLIC OUTREACH

SHARE OUTREACH MATERIAL

- Perkiomen Watershed Conservancy (PWC) Newsletters
- Website
  - Study Updates
  - Upload Flooding Photos
  - Public Survey
  - Educational Flyers
  - Media Package

https://www.perkiomenwatershed.org/perkiomen-flood-study

SHARE PUBLIC MEETING INFO

- *Past meetings ~ November 2024*
- Future meetings ~ Summer 2025

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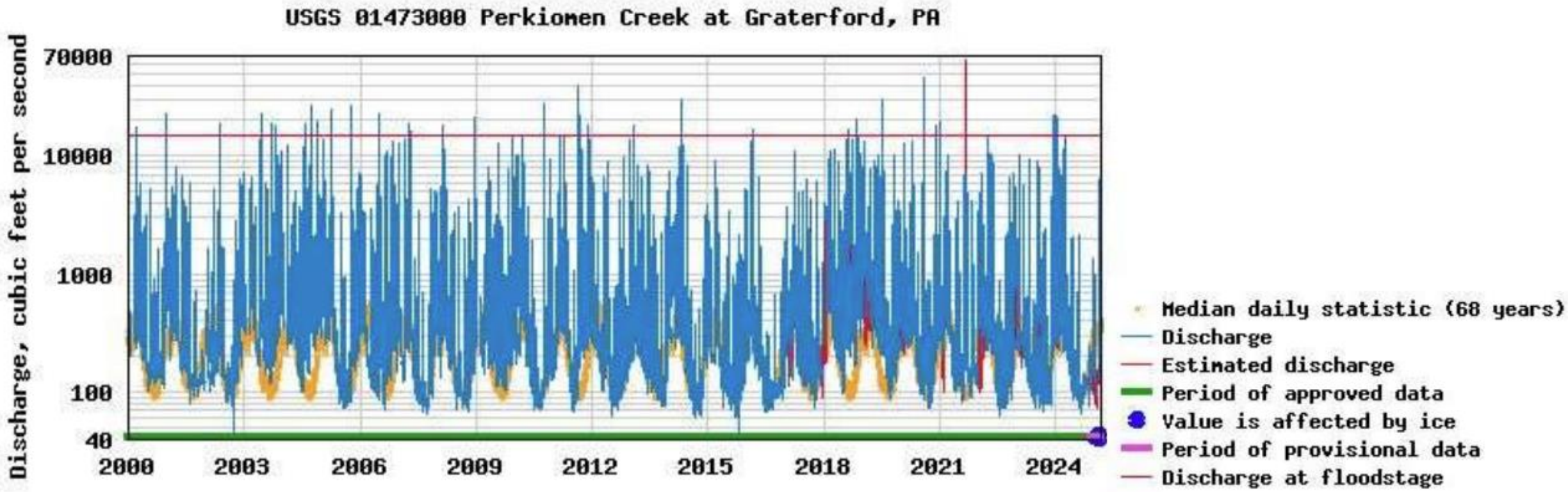
THANK YOU!
Questions?

PERKIOMEN DISCHARGE AT GRATERFORD (cfs)

Most recent instantaneous value: 116 03-05-2025 12:00 EST



AGENDA

- Introductions
- Project Purpose & Objectives
- Mapping & Flood Study
- Project Timeline
- Next Steps
- Why Your Participation Matters
- Public Outreach

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PROJECT TEAM, PARTNERS & STEERING COMMITTEE

PROJECT TEAM

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Drew Shaw, AICP
Project Manager

JOE WEBSTER

Crystal Gilchrist, AICP
Rep. Joe Webster Project Manager

PERKIOMEN

Ryan Beltz
Public Outreach

HRG

Juni Alam, PE
Project Manager | Senior Water Resources

HRG

Matt Vanaskie, PE
Senior Water Resources

HRG

Jonathan Robinson, PE
Water Resources

CENTER FOR WATERSHED PROTECTION

Beth Uhler
Public Outreach

JMT

Tyler Charles, PE
Senior Water Resources

PROJECT PARTNERS

JOE WEBSTER

MCPC

LVPC Lehigh Valley Planning Commission

BCPC Berks County Planning Commission

PERKIOMEN Watershed Conservancy

pennsylvania Department of Environmental Protection

BCPC Bucks County Planning Commission

PROJECT STAKEHOLDERS

MCPC

JOE WEBSTER

BCPC Bucks County Planning Commission

BCPC Berks County Planning Commission

LVPC Lehigh Valley Planning Commission

Montgomery County Conservation District

Bucks County Conservation District

PERKIOMEN Watershed Conservancy

Dr. Robert Traver (Villanova University)

Robert Pace (Ret. U.S. Army Corp)

PURPOSE & OBJECTIVES

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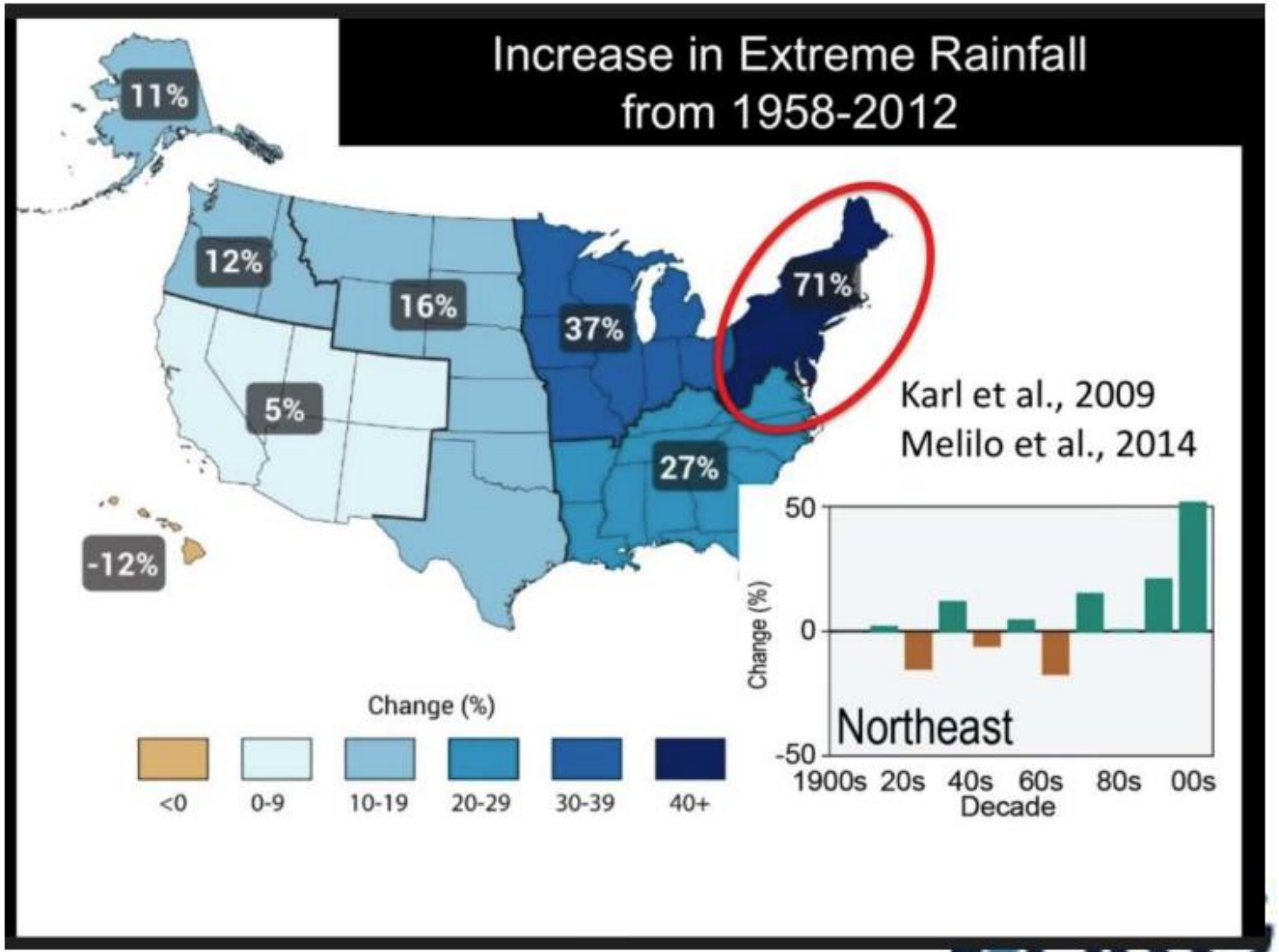
THE PROBLEM: TOO MUCH OF A GOOD THING

A changing climate results in:

- Increased Storm Activity And Severity
- Lives Lost
- Recurring Damage To Property
- Loss Of Property Value
- Risks To EMS Personnel
- Loss Of Value In Affected Communities



MANAGING EXPECTATIONS

Flooding issues have developed over decades
We're not going to solve this problem in a few years

Flooding in Montgomery County, 1960

Flooding in Montgomery County, 2014

MAPPING & FLOOD STUDY

Data Collection/Review

+

Priority Flood Area Identification

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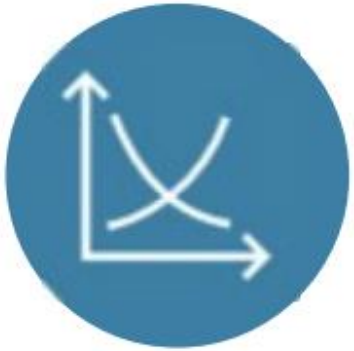

Analysis of Flood Conditions & Mitigation Strategies

Summary of Findings

+

Recommendations

+

Implementation

=

Perkiomen Watershed Mapping & Flood Study

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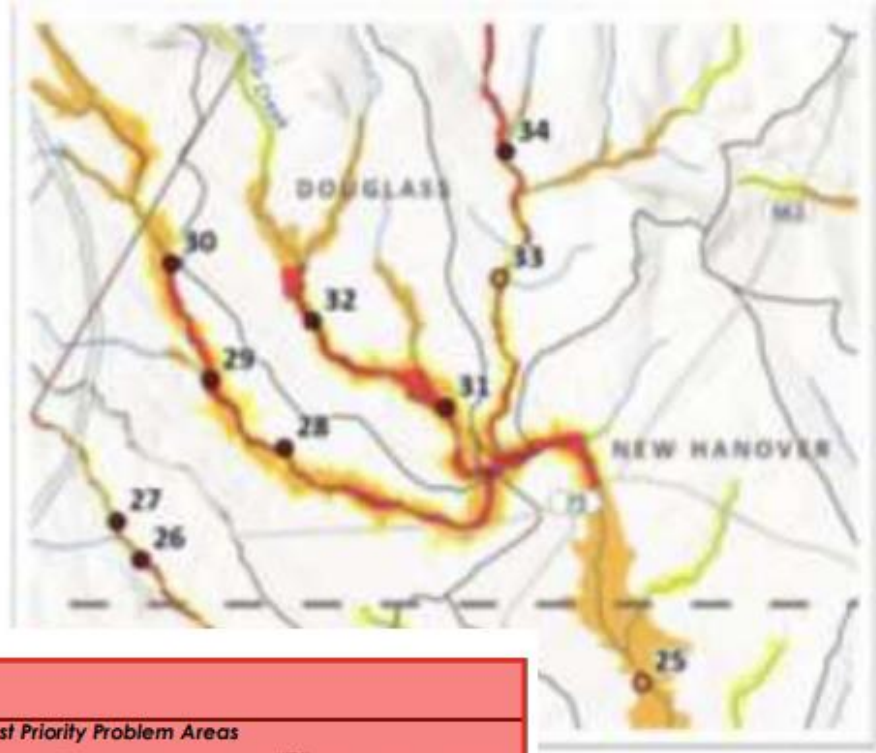
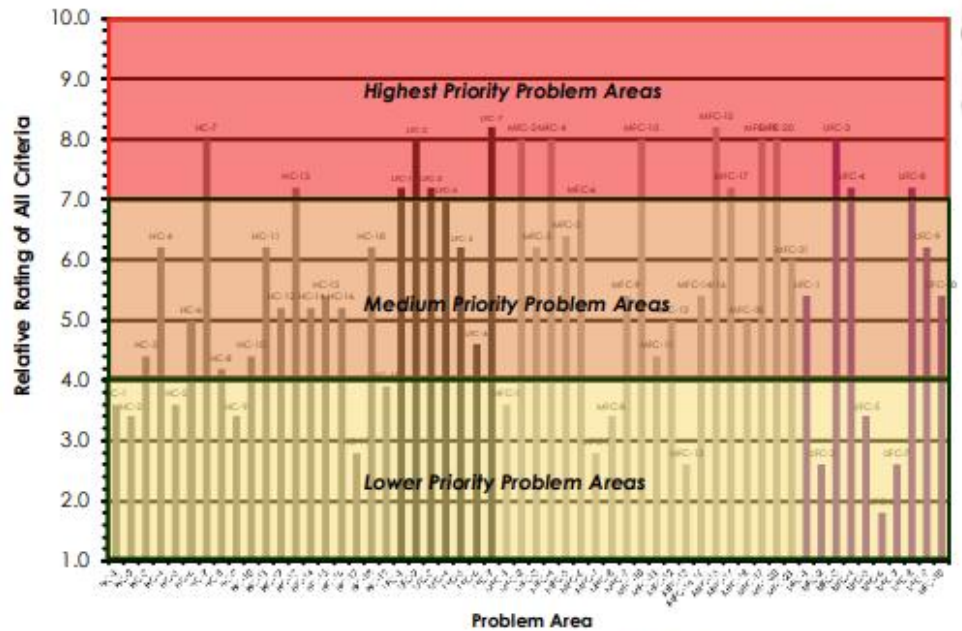
MAPPING & FLOOD STUDY

IDENTIFICATION OF PRIORITY FLOODING PROBLEMS

- All flooding areas will be preserved in a database for future planning purposes
- **Flood Hazard Evaluation**
- **Risk Assessment**
- **Prioritization Criteria**
- **Develop Flood Models**
- Study scope is limited to detailed analysis of the top 20 flooding areas
- Criteria has been developed to prioritize the 20 flooding areas





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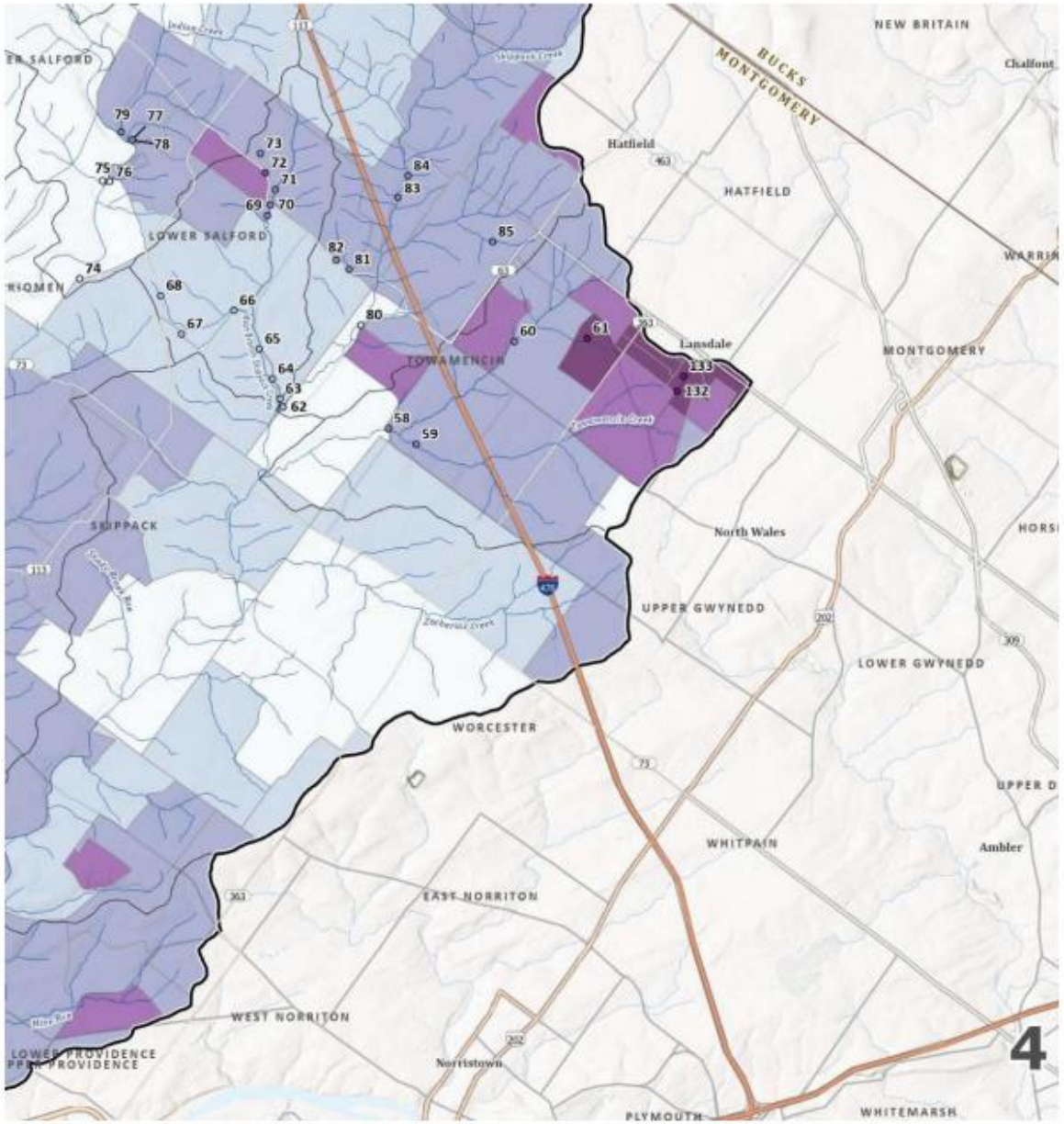
MAPPING & FLOOD STUDY

FLOOD HAZARD MAPPING

- Ongoing collaboration with Steering Committee on selection of flood hazard criteria and risk assessment
- Identified and mapped 6 flood hazard criteria
- Analyzing 135 flooding problem areas to determine flood risk score and prioritize
- Focus on current/known flooding problems



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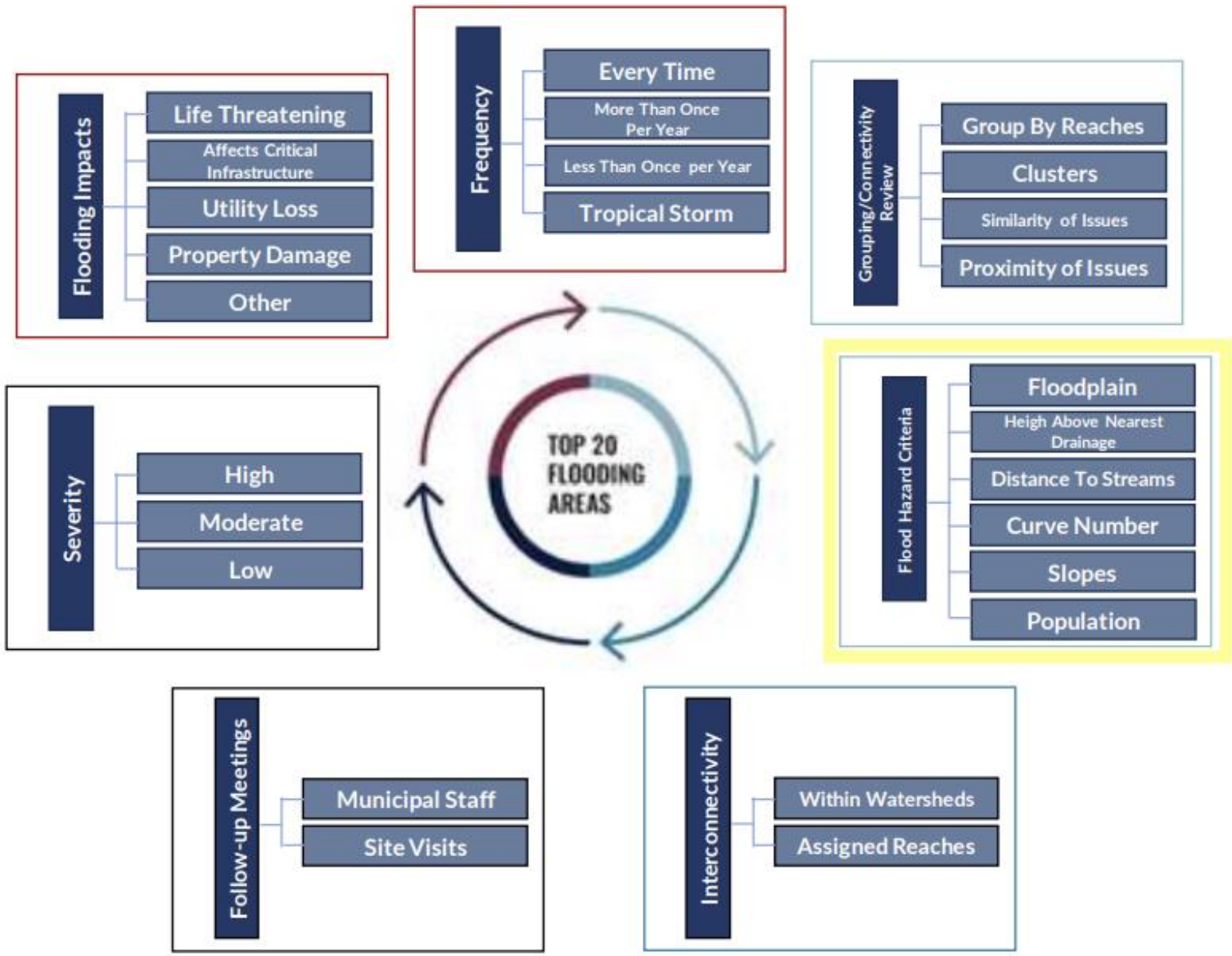
MAPPING & FLOOD STUDY – PRIORITIZATION CRITERIA

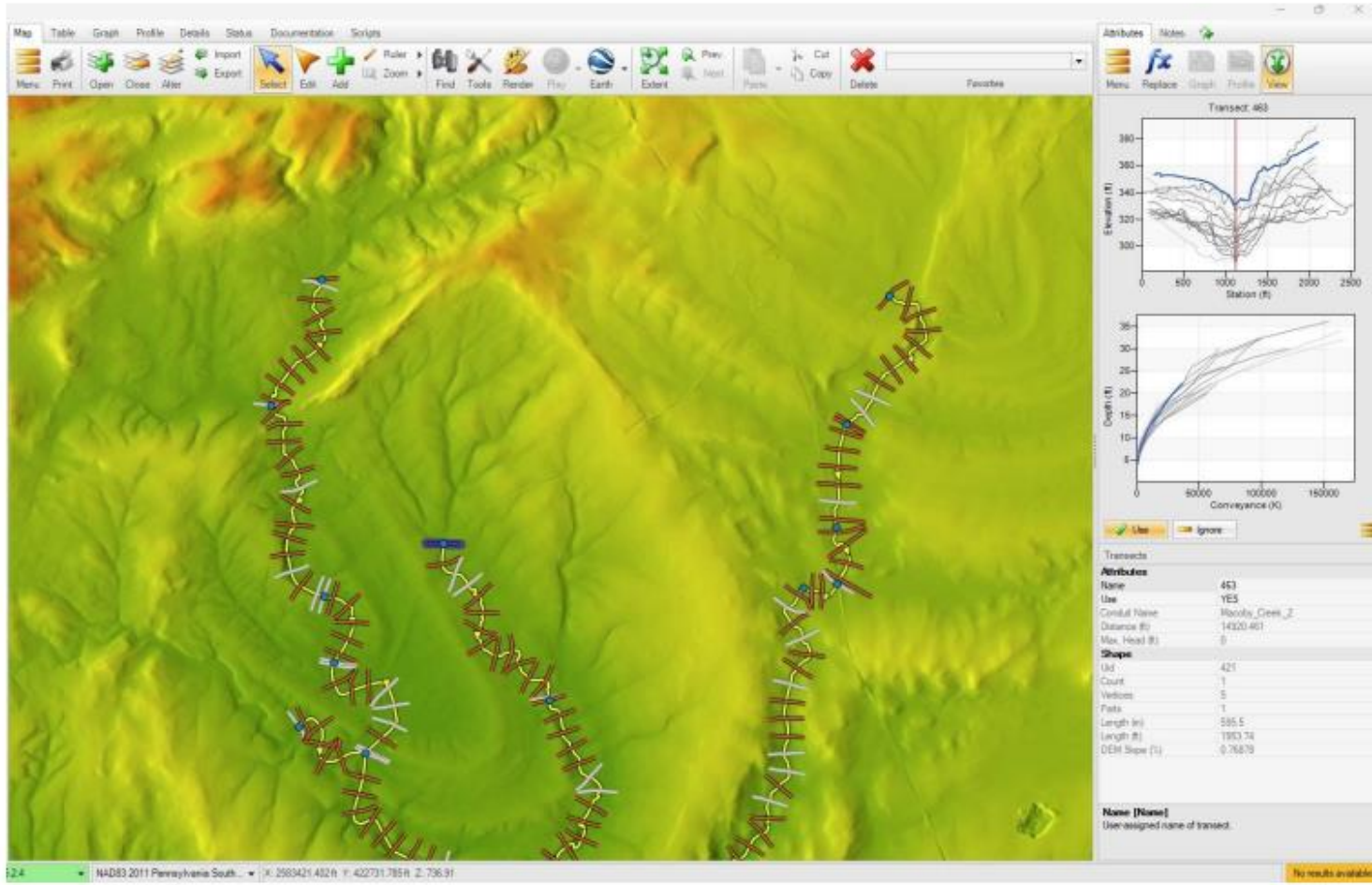
Iterative Process



MAPPING & FLOOD STUDY

BASE MODEL DEVELOPMENT

- Watershed-wide hydrologic and hydraulic model using PCSWMM software
- Calibrated using USGS stream gauges and available rain gauges
- Used to validate findings of the flood risk assessment
- Capable of future updates to evaluate impacts for specific rain events



MAPPING & FLOOD STUDY

DEVELOP PLANNING-LEVEL MITIGATION SOLUTIONS

- **Phase 1** flooding areas
- **H&H Analysis** of first 20 flooding areas
- **Field investigations** at all 20 sites

  *Project team to follow-up with municipalities for field investigations
- **Planning-level solutions** will consider:
  - Strategies
  - Projects
  - Cost

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PROJECT TIMELINE – GETTING TO THE STARTING BLOCKS!

Final Perkiomen Mapping and Flood Mitigation Plan - Total Budget $1,000,000							
Phase/Deliverable	Salaries/ Benefits	Travel	Equip & Supplies	Admin	Contractual	Construction	Other
1. Support Advisory & Steering Committees	$31,500	$3,640	$2,000	$1,500	$11,000		
2. Data Collection & Model Creation	$18,000			$250	$30,500		
3. Determine High Hazard Flood Areas	$20,500			$250	$27,000		
4. Develop Mitigation Strategy & TestModel	$8,000			$250	$93,970		
5. Public Outreach	$7,500		$5,000	$250	$45,250		
6.Create Final Plan & Garner Approvals	$17,750		$5,000	$250	$32,750		
7. Demonstration Project(s)	$9,000	$1,400	$1,050	$100	$76,500	$346,500	$203,340
Project Management							
TOTAL	$112,250	$5,040	$13,050	$2,850	$316,970	$346,500	$203,340

WHY YOU'RE IMPORTANT TO THE PROCESS

Identification of **Flood Areas**

Outreach, Garner Support – Helps Funding Strategies

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