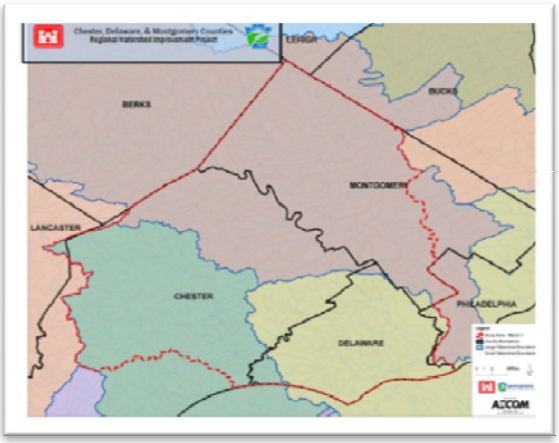
Chester, Delaware & Montgomery Counties
Regional Watershed Improvement Project



Stakeholder Outreach Summary Report

April 18, 2011

Prepared by:
AECOM Technical Services, Inc.
1700 Market Street
Philadelphia, PA 19103

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Appendices

Acknowledgements

Authors: Ross Gordon – AECOM Technical Services, Inc.
Karen Appell – AECOM Technical Services, Inc.
Andy Wohlsperger – AECOM Technical Services Inc.
Erik Rourke – U.S. Army Corps of Engineers, Philadelphia District
Tricia Aspinwall - U.S. Army Corps of Engineers, Philadelphia District
Jay Braund – Pennsylvania Department of Environmental Protection
David Burke - Pennsylvania Department of Environmental Protection

Executive Summary

The Chester, Delaware and Montgomery Counties Regional Watershed Improvement Project is a collaborative partnership of the U.S. Army Corps of Engineers, Philadelphia District (USACE) and the Pennsylvania Department of Environmental Protection (PA DEP). On March 29, 30 and 31, 2011 workshops were held in each of the three counties that make up the project area to solicit stakeholder input.

Participants at the workshop were united in their desire to develop integrated regional solutions to watershed issues. Participants included municipal officials, County officials, consulting engineers, conservation groups, and employees from State and federal agencies.

Delaware County participants identified flooding as the foremost watershed degradation issue, with a focus on the associated erosion and sediment loading. For the most part, Delaware County stakeholders connect this issue to existing conditions and future development. In Montgomery County, participants identified water quality as the principal issue, also focusing on the associated erosion and sediment loading. Montgomery County stakeholders associate their watershed issues primarily with existing conditions, but believe there are also problems related to future development and future regulations. In Chester County, chief concerns span across water quality, restoration, and flooding issues. Chester County stakeholders link their watershed issues equally to existing conditions and future regulations. Stakeholders from all three counties identify sediment loading and erosion related to new development, increased volume, reduction in natural buffers, and in-stream bank erosion, as issues of concern.

Participants from all three counties reported insufficient funding to address water quality and restoration needs. They also reported the existence of defined plans and/or projects that address water quality needs and restoration opportunities that could immediately move forward should funding become available. While restoration was consistently identified as a preferred method of addressing both water quality and flooding issues, stakeholders agreed on the need to implement fundamental solutions such as on-site stormwater management and volume control.

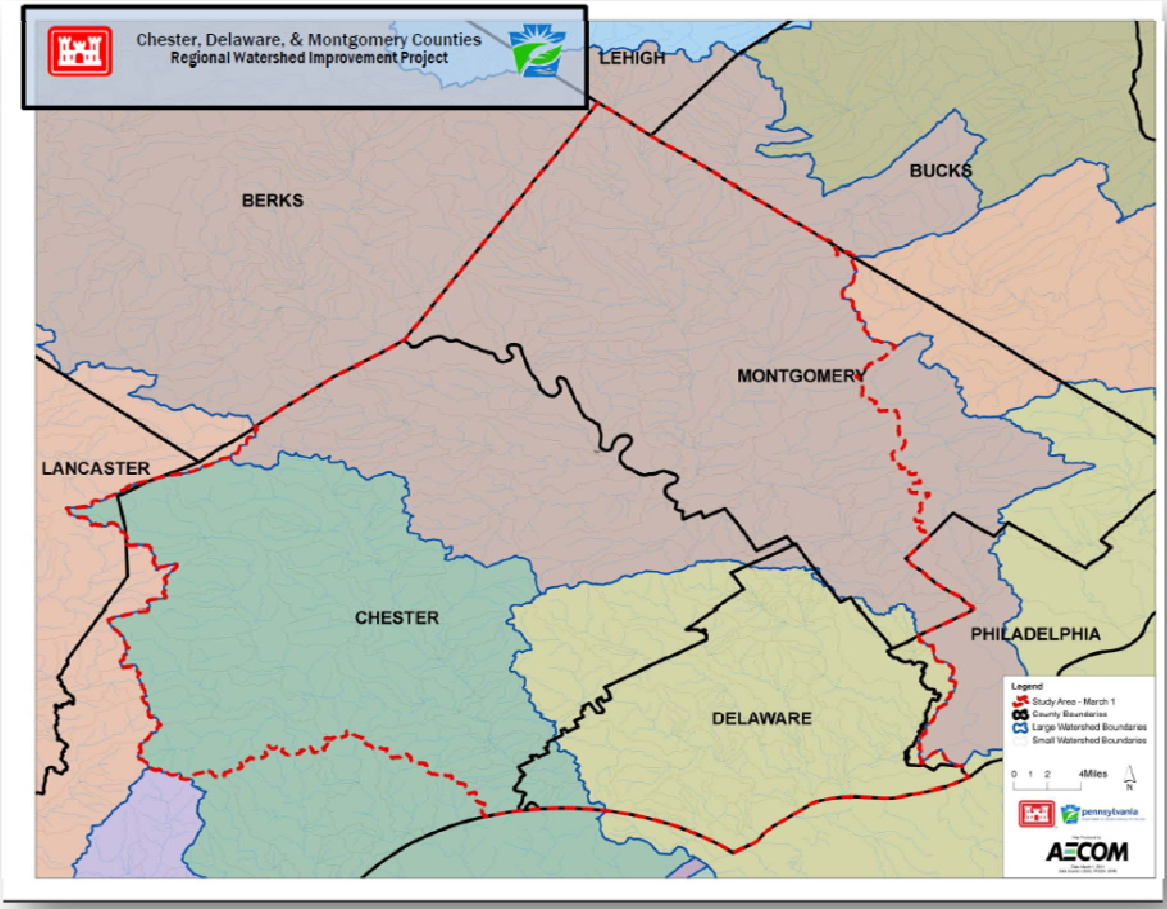
Many stakeholders were frustrated with the lack of regional coordination to address flooding and water quality issues, as well as restoration opportunities. Stakeholders recognize that solutions for one municipality often necessitate improvements in another municipality, but the general population does not usually support these types of projects. Stakeholders agree that these issues, combined with the significant uncertainly surrounding the impact of new Municipal Separate Storm Sewer System (MS4) and Total Maximum Daily Load (TMDL) regulations, are preventing government, community, and agency leaders from addressing watershed issues using a regional, integrated approach.

All counties expressed strong interest in working with the USACE and PA DEP on this project and were supportive of the development of a Decision Support Tool for watershed improvements. Upon completion of the stakeholder workshops, it was evident that the problems facing each watershed area and the priorities established by each watershed area vary greatly. The USACE and PA DEP emphasized that as the development of the Decision Support Tool moves forward, it should allow for customization of assessment criteria and weighting factors to accommodate the different issues facing the region.

Project Overview

The Chester, Delaware and Montgomery Counties Regional Watershed Improvement Project is a collaboration of the U.S. Army Corps of Engineers (USACE) Philadelphia District and its local sponsor, the Pennsylvania Department of Environmental Protection (PA DEP). The goal of the project is to improve and protect surface water resources and environmental infrastructure in portions of Chester, Delaware and Montgomery Counties through regional coordination and collaboration. This goal will be met through the prioritization and implementation of regional watershed projects inside the three-county project area. The project area, outlined in red in Figure 1 below, includes the portions of the Brandywine Creek, Direct to Delaware River tributaries, and the Schuylkill River watersheds that fall within Delaware, Chester and Montgomery Counties.

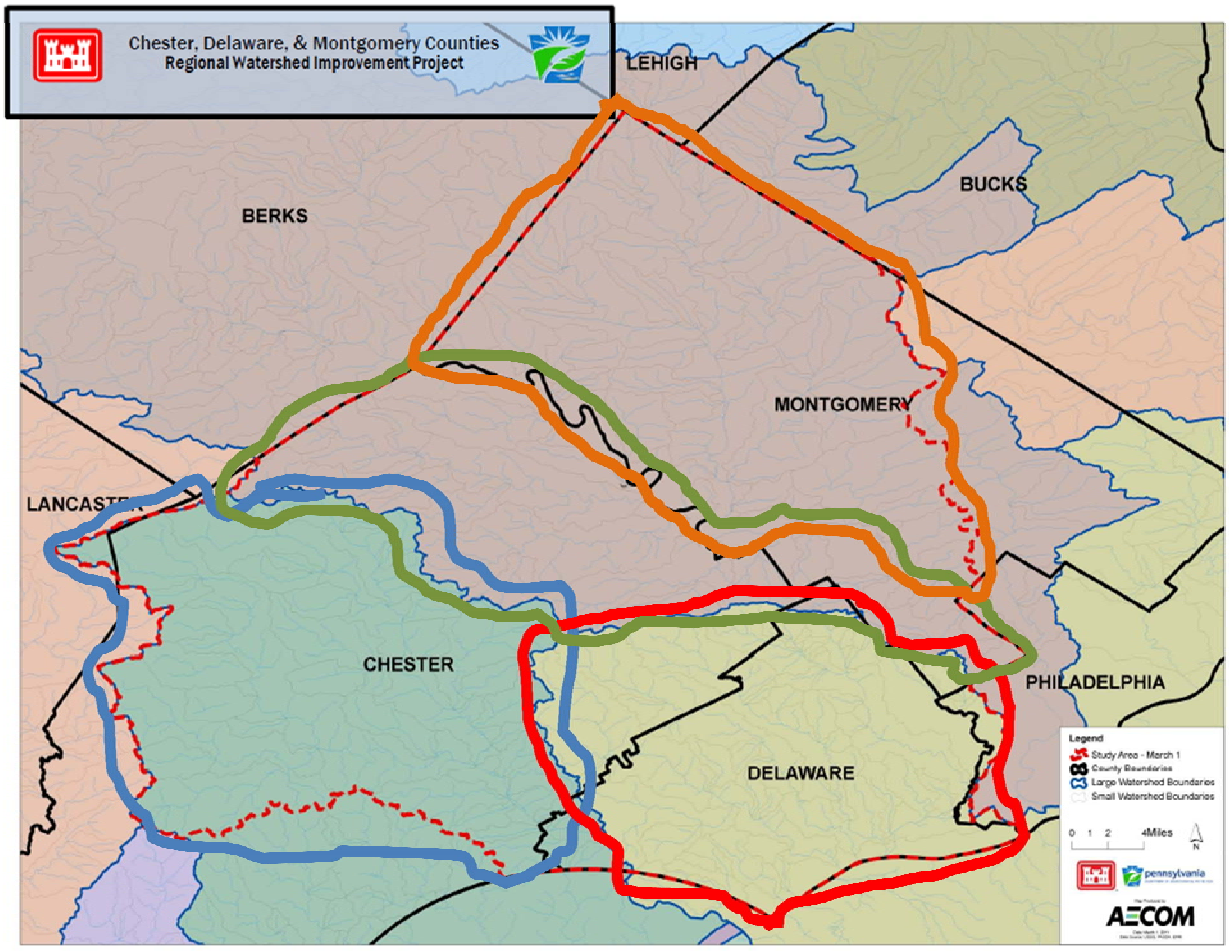
Figure 1: Project Area



The project approach will follow the Integrated Water Resources Management process to ensure designs address system-wide problems and issues, resulting in a comprehensive, watershed-based solution. This will involve evaluation of a wide-range of parameters including, but not limited to, sedimentation, erosion, aquatic habitat,, and point and non-point source pollution. Project types are

expected to include flood risk management, water quality improvement, ecosystem restoration (wetland, stream, & riparian corridor), and habitat enhancement. The final product will include a GIS-based Decision Support Tool and prioritized preliminary designs (30% design level), including project costs. Within Chester, Delaware and Montgomery Counties, four separate subareas will be independently prioritized for watershed improvements: the Brandywine Creek, Direct to Delaware River Tributaries, the South Shore of the Schuylkill River, and the North Shore of the Schuylkill River (shown in Figure 2 below).

Figure 2: USACE Prioritization Areas



Section 566 Program Authority:

Through Section 566 of the Water Resources Development Act of 1996 (WRDA), the USACE has design-build authority to develop, design, and construct watershed improvement projects in the project area related to flooding, water quality, and restoration. The Southeastern Pennsylvania Environmental Improvement Program, authorized by Section 566 of WRDA 1996, as amended, provides design and construction assistance to non-Federal interests for carrying out water-related environmental infrastructure, resource protection, and development projects in southeastern Pennsylvania, including

projects for wastewater treatment and related facilities, water supply and related facilities, and surface water resource protection and development. Projects are cost-shared with a non-Federal sponsor providing 25% of the total project costs. Funding for this Authority is at the sole discretion of Congress through Congressionally Directed Spending and is not part of the USACE annual budget.

Prior to initiation of the project development and design process, an integrated, region-wide, assessment of need and coordination of proposed solutions will be employed. The initial phases require assessment of existing conditions and identification and prioritization of areas in need of watershed improvements. Future phases of this project will include project alternatives development, preliminary design, final design, and construction of watershed improvement projects in the areas in need as prioritized by the Decision Support Tool.

Project Phases:

This project has been divided into five phases, of which the first three are currently in progress and constitute the planning efforts required to initiate the later phases of the project.

PROJECT PHASES	
Phase 1	**Public Coordination & Involvement**
Phase 2	**Data Collection, Organization & Analysis**
Phase 3	**Decision Support Tool Development** Assessment of existing conditions & identification/prioritization of areas in need of watershed improvements.
Phase 4 (FUTURE)	**Project Alternatives Development** Develop project alternatives to address watershed issues in areas in need identified/prioritized in previous phase.
Phase 5 (FUTURE)	**Preliminary Project Design** Preliminary project design, cost & schedule estimates, funding coordination, NEPA / environmental studies.

The ultimate product of Phases 1, 2 and 3 is a GIS-based Decision Support Tool that will comprehensively assess existing conditions and identify and prioritize areas in need of watershed improvements. The Decision Support Tool will allow for an objective assessment of issues facing the project area and provide consistency in regional coordination efforts. Those areas in need that have local support will move into Phases 4 and 5, which consist of the project alternatives development process and the completion of preliminary project design and associated environmental coordination and planning.

Phases 1, 2, and 3 Project Schedule:

It is anticipated that Phases 1, 2, and 3 of this project will require approximately one-year to complete. Initial tasks include the completion of stakeholder workshops across the project area, collection of data, and development of the Decision Support Tool. A Public Forum is anticipated for January, 2012, to debut the draft Decision Support Tool and obtain additional stakeholder comments. Upon revision of the Decision Support Tool, a second Public Forum is anticipated for March, 2012, to present the final Decision Support Tool and associated prioritization of watershed improvement areas. This forum will also include training on the use of the Decision Support Tool to facilitate additional use of the tool at the local, watershed and county levels. The project's Stakeholder Steering Committee will also be consulted on a regular basis throughout Phases 1, 2, and 3 to ensure local needs and considerations are being addressed and incorporated into the Decision Support Tool.

PHASES 1, 2, & 3 SCHEDULE		
2011	March	Stakeholder Workshops
	April	Stakeholder Meeting Summary Posted on Website for Review & Comment
	April to December	Data Collection & Decision Support Tool Development
2012	January	Public Forum to Debut Decision Support Tool & Receive Stakeholder Comments
	February	Revision of Decision Support Tool & Development of Draft USACE Prioritization Rankings
	March	Public Forum on Prioritization Rankings & Tutorial on Application and Use of Decision Support Tool

Stakeholder Outreach Process

At the initiation of the project, three stakeholder workshops were held to solicit stakeholder input. Separate stakeholder workshops were held at each of the three counties in the project area. Informed stakeholders, such as federal, State, County, and municipal officials, leaders of environmental and conservation groups, and local consultant engineers were invited to participate in the workshops. A list of participants at each workshop is included in Appendix E. The workshops were facilitated by staff from the USACE, and PA DEP, and AECOM.

The workshops were structured to include both large groups sessions, accompanied by real-time polling of participants using the Turning Point Audience Response System, and small group sessions to promote in-depth discussion of key issues. The information for each workshop, including the presentations with graphical polling results and written summaries of small group discussions, are included in Appendices A, B, & C. The tabular summary of polling for each workshop is included in Appendix D.

Dates and Locations:

Delaware County:

- March 29, 2011 - 9:00am to 1:00pm
- Springfield Township Building, 50 Powell Road, Springfield, PA

Montgomery County:

- March 30, 2011 – 8:30am to 12:30pm
- Montgomery County Fire Academy, 1175 Conshohocken Road, Conshohocken, PA

Chester County:

- March 31, 2011 – 8:30am to 12:30pm
- Chester County Government Services Center, 601 Westtown Road, West Chester, PA

Facilitators:

- Tricia Aspinwall, USACEDavid Burke, PA DEP (Flooding)
- Andy Wohlsperger, AECOM (Flooding)
- Jay Braund, PA DEP (Water Quality)
- Ross Gordon, AECOM (Water Quality)
- Erik Rourke, USACE (Restoration)
- Karen Appell, AECOM (Restoration)

Stakeholder Workshop Schedule:

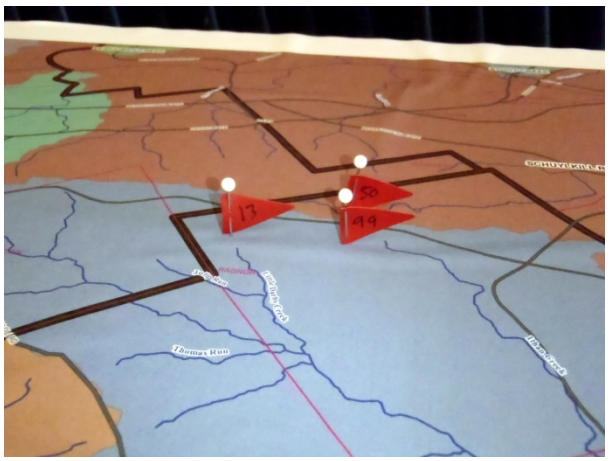
Stakeholder Workshop Schedule	
Hour 1	Project Introduction & General Discussion (with Turning Point questions)
Hour 2 & 3	Small Group Sessions (Flooding – Water Quality – Restoration)
Hour 4	Additional Input, Recap, & Review of Next Steps (with Turning Point questions)

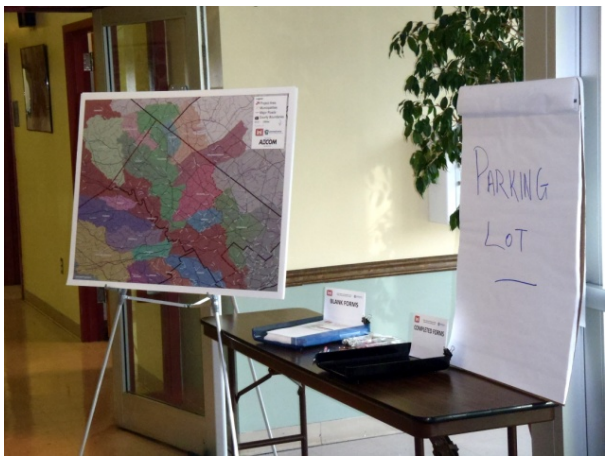
Turning Point Audience Response System:

The Turning Point Audience Response System, an education and outreach tool by Turning Technologies, was used to solicit input from participants through real-time polling during workshop presentations. This technology allows for the rapid, anonymous collection of information, opinions, and preferences. The system facilitates the equitable collection of information and opinions from all participants and enables on-the-fly synthesis and discussion of key issues. More information on Turning Point can be found at http://www.turningtechnologies.com/. Polling results, in graphical form, can be found throughout the presentations included in Appendices A, B, & C. Polling results, in tabular form, can be found in Appendix D.

Parking Lot:

To catalog proposed or preferred projects and particular issues of concern for consideration in later phases of this project, a 'Parking Lot' station was set up at each of the workshops. The station included numbered, color-coded pins for participants to locate specific problems or projects relating to flooding, water quality, and restoration on project area maps, along with forms for participants to provide details and contact information. Information collected at the Parking Lot will be used during the project alternative development phase.





Delaware County Stakeholder Workshop Recap

A total of thirty-nine stakeholders attended the Delaware County Stakeholder Workshop on March 29, 2011. The majority of attendees were municipal officials, but County officials, consulting engineers and conservation group leaders were also in attendance. Participants were interested in developing integrated regional solutions to watershed issues and by the possibility of leveraging federal funding opportunities.

Participants were most concerned about existing problems and future development, with only minimal concern regarding future regulations. Participants identified flooding as the primary issue of concern. Particular issues related to flooding included minimizing the population impacted by flooding, reducing flood damages, and controlling erosion. Water quality issues were associated with increased sediment loading and erosion due to increased volumes and rates of stormwater runoff. To date, the majority of restoration efforts have centered on stream stabilization and riparian buffers.

Small group sessions revealed the spatial distribution of issues across the County. Newer development in the upstream areas has lead to increased impervious cover, reduction in natural buffers, and increased stormwater volume and erosion. Downstream areas are older with more traditional development that suffers from aging infrastructure and the impacts of industrial activity. Storm sewer overflows (SSOs) and combined sewer overflows (CSOs) are common and issues regarding increased volume and inflow and infiltration are important. Flooding issues are dominated by properties in the floodplain or adjacent to the floodplain that flood on a regular basis. A consequence of increased flood flows is increased erosion, which is prevalent throughout the entire County.

Delaware County participants identified several obstacles to successful restoration, including invasive species, lack of maintenance, and trash and debris. These could be mitigated through invasive management plans, accountability for and/or enforcement of maintenance, cleanup programs, and public education. The Delaware County participants believe that restoration efforts should focus on perpetual “issue” locations such as eroding streambanks, exposed utilities, and low areas of recurring flooding.

Delaware County also focused on education of private property owners as the key to successful restoration in their area. Restoration projects should be promoted as opportunities for protection of property, reduction in flooding, and positive impacts on property value. Residents need to be “sold” on the economical and aesthetic benefits of non-tradition methods such as bioengineering.

Prioritization of restoration projects should consider public safety; cost-benefit; vulnerability/reduction of flood damage or pollution; location in headwaters areas, protection of water supply; project visibility; projects that could have matching funds; and ability to maintain post-construction. Politics can also play a key role in project selection and funding. Restoration opportunities on public lands such as schools, parks, and libraries should be explored.

The most impactful restoration project types will likely be retrofitting traditional sedimentation basins; stabilization of stream banks and channels; enhancing riparian buffers; planting of native vegetation; and implementation of Low Impact Development (LID)/Water Sensitive Urban Design (WSUD) techniques in more urban areas. While flood reduction and water quality improvement are the foremost reasons for implementing restoration projects in Delaware County, due to the lack of public open space, there is increasing support for ecorestoration that promotes recreation and wildlife enhancement.

Polling results are included within the presentation slides in Appendices A, B, & C (graphical) and in Appendix D (Tabular).

Montgomery County Stakeholder Workshop Recap

A total of eighteen stakeholders attended the Montgomery County Stakeholder Workshop on March 30, 2011. Similar to Delaware County, most of the attendees were municipal officials with some County officials, consulting engineers and conservation group leaders. Participants were most interested in developing integrated regional solutions to watershed issues.

Participants were most concerned about existing problems, but placed secondary importance equally on issues related future development and future regulation. Participants identified water quality as the primary issue of concern. The predominant issues related to water quality were erosion and sediment loading due to increased volumes and rates of stormwater runoff. To date, the majority of restoration efforts have been related to stream stabilization and riparian buffers. Future compliance issues are a major driver for watershed improvement projects.

Small group sessions revealed uncertainty related to new Total Maximum Daily Load (TMDL) and water quality regulations. Municipalities are struggling to decide how to meet pollutant reduction goals and how to develop a framework to encourage regional collaboration to deal with those issues that cannot be addressed solely by the municipalities. There is particular interest related to legacy sediment and trying to identify effective methods to control sedimentation, both in-stream and in upland areas. There are concerns regarding bacterial issues due to contributions from SSOs, on-site septic systems, and agriculture.

For Montgomery County, the participants agreed that the restoration opportunities and stormwater issues varied; there are heavy nutrient loads in the West and more urbanization and stormwater issues in lower portion of the watershed. Tributaries that enter Schuylkill River all have big opportunities for stream restoration. However, lack of funding for implementation of restoration and LID/WSUD projects is a big constraint. It can be tough to achieve buy-in from homeowners and farmers for projects seen as impacting their properties. An opportunity does exist in that many County and regional groups see restoration as a usable tool for flood abatement.

Much like Delaware County, Montgomery County focused on education as key to successful restoration, but their approach differed in that they placed the importance on focusing on elected officials and community boards. They agreed that politics can be a big constraint to restoration and by focusing on those people that are representing the residents and making decisions as to what projects will be funded, there could be more of a ‘top-down’ impact.

The stakeholders firmly believed that the “band-aid approach” is not going to work and are looking for ways to create a regional plan. They thought the Decision Support Tool could help government officials by providing supporting information to show that regional solutions, especially those located “out-of-town”, could greatly improve conditions within the municipality.

Restoration projects should preference property loss and public safety; need and/or funding for long-term maintenance; protection of water supply; project longevity; contiguous areas; emphasis on headwater streams/critical areas; cost-benefit; and projects with quantifiable objectives.

Efforts should be centered on long-term open space restoration – e.g. lawn to meadow; farm to forest; abandoned golf courses; easements with large office buildings. Revision of ordinances to promote buffer enhancement on private property could also be quite impactful. In general, restoration plans that include multiple fixes for multiple problems and/or multiple communities, for example open space/trails integrated with wildlife/recreational/aesthetics/flood reduction/water quality should be prioritized.

Polling results are included within the presentation slides in Appendices A, B, & C (graphical) and in Appendix D (Tabular).

Chester County Stakeholder Workshop Recap

A total of thirty-eight stakeholders attended the Chester County Stakeholder Workshop on March 31, 2011. The majority of attendees were municipal officials and conservation group leaders, with a small mix of County officials, consulting engineers, and State or federal agency representatives. Participants were principally interested in funding support, but also placed significance on developing integrated regional solutions to watershed issues.

Participants were equally concerned with existing problems and impacts of future regulation. They did not identify any particular issue of primary concern, but were instead focused equally on issues related to restoration, water quality, and flood control. Specific issues included flood risk management, improving safety, agricultural considerations, and erosion and sediment control. Water quality issues were primarily related to increased sediment loading and erosion issues due to increased volumes and rates of stormwater runoff. To date, the majority of restoration efforts have been associated with stream stabilization and riparian buffers.

Small group sessions revealed the variety of issues facing the region. While there are no CSOs, SSOs and other on-site sewage systems contribute to water quality issues. Existing TMDLs and other regulations have helped to control point source pollution. Erosion is of significant concern, and is primarily related to changes in hydrology due to new development and removal of natural stormwater control features such as riparian buffers. The primary concern related to flooding is major stream erosion and loss of property due to erosion. Participants from the Brandywine and the South Shore of the Schuylkill River watersheds reported preferences for improvements related to flood control and water quality, with restoration seen as a feasible alternative to address both issues. Participants from the Direct to Delaware River Tributaries placed a higher premium on flood mitigation, compared to water quality and restoration.

Chester County is the fastest growing county in Pennsylvania. The stakeholders agreed on the importance of protecting areas prone to future development. They cited Big Woods, White Clay, and the Brandywine as potential growth areas that need to be protected. Participants described multiple examples of past and current restoration projects. Type of restoration have included planting native vegetation in buffers and adjacent areas; bank stabilization; livestock fencing; removing legacy sediment; re-grading slopes; dam removal; raingarden and infiltration projects; and constructed wetlands. Challenges they have faced have included constraints due to existing infrastructure and hydrologic conditions; lack of funding/resources for site management; management of projects on private property; duration to obtain permits; and cost for sediment/excavated material removal offsite.

Chester County stakeholders recognize that they have a huge advantage in that they have a regional Water Resources Authority, as well as active, passionate water resources groups, providing the ability to link townships along different lengths of watershed. These existing regional organizations and partnerships, such as “Red Streams Blue” and Valley Creek Restoration Partnership, are great resources, both for their experience with restoration and stomrwater management, as well as with integrating

education and outreach to residents. Another huge resource is the work that these groups and the County have already put in to identifying priority projects for the watershed.

There was agreement in the need to look at restoration opportunities from watershed/stream corridor perspective, focusing on action in the upstream headwaters areas to solve downstream conditions. While it can often be a "tough sell" for one municipality to contribute funding to a project outside of their immediate boundaries and there is a need for education to promote this approach, residents and community leaders are starting to recognize potential benefits. Water companies are also recognizing the benefits of spending funds upstream.

Regional solutions could include regulations, such as a stormwater utility fee based on impervious surfaces or other contributions to stormwater system. Focus should be on landscapes that are linked to water with the restoration/enhancement of adjacent areas, as well as reforestation of residential developments and office parks. Redevelopment ordinances that promote buffer establishment and infiltration at street level would be helpful. Monitoring is imperative for future success - need to set quantifiable objectives before the start of the project.

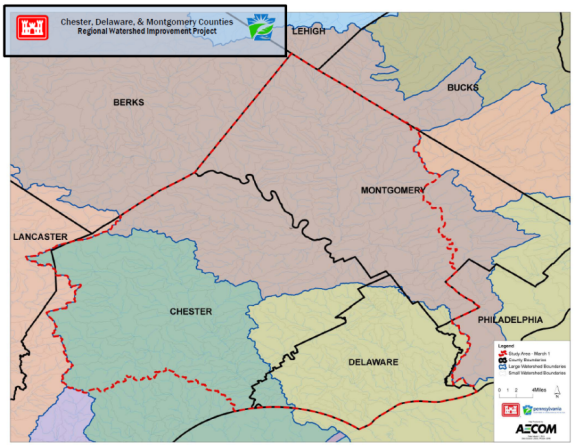
Restoration projects should have a holistic approach, mimic natural flow regimes, and maintenance plans need to consider existing conditions. Prioritization criteria should include potential for property damage/public safety; political pressure; available funding; headwaters projects; cost-benefit; compliance with National Pollutant Discharge Elimination System (NPDES) permit/water quality; restoring ecological function; viewsheds/aesthetics; and sustainability/ability to manage. The overall regional contribution, including incorporation with open space/natural areas and the ability to address multiple issues, should also be a key factor in choosing projects. Linkage of restoration projects to stormwater management, flood risk management, and water quality improvement projects is important.

Polling results are included within the presentation slides in Appendices A, B, & C (graphical) and in Appendix D (Tabular).

Appendix A – Delaware County: Workshop Presentation & Small Group Session Summary

Presentation

Chester, Delaware & Montgomery Counties
Regional Watershed Improvement Project



STAKEHOLDER WORKSHOP

Delaware County

March 29, 2011

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Introductions

U.S. Army Corps of Engineers – Philadelphia District
- Erik Rourke
- Tricia Aspinwall

Pennsylvania Department of Environmental Protection
- Jay Braund
- David Burke

AECOM
- Ross Gordon
- Karen Appell
- Andy Wohlsperger

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Meeting Schedule

Hour 1	**Project Introduction & General Discussion** (with Turning Point questions)
Hour 2 and 3	**Small Group Workshops** Flooding – Water Quality – Restoration
Hour 4	**Addtl. Input, Recap and Review of Next Steps** (with Turning Point questions)

****** Interactive and collaborative process ******

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Project Overview

Chester, Delaware & Montgomery Counties Regional Watershed Improvement Project

- Authorized and funded through efforts of Congressional Representatives
- Collaboration of the U.S. Army Corp of Engineers (USACE) and the PA Department of Environmental Protection

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Project Focus

- Improving and protecting surface water resources and environmental infrastructure in the three County region
  - Flood risk management
  - Water quality improvement
  - Ecological restoration
- Mandates an integrated, region-wide, assessment of need and coordination of proposed solutions

"We cannot fix regional flooding and watershed problems, such as need for ecological restoration and erosion control, solely with band-aid solutions that each only deals with concerns of a small community."

Former Congressman Sestak

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Integrated Solutions

Integrated solutions traditionally provide:

- Better benefit/cost ratio
- More focused solutions addressing core issues

Enhance cost and benefit of project:

- Avoid duplication of efforts
- Leverage funding
- Pool and share limited resources
- Promote data sharing

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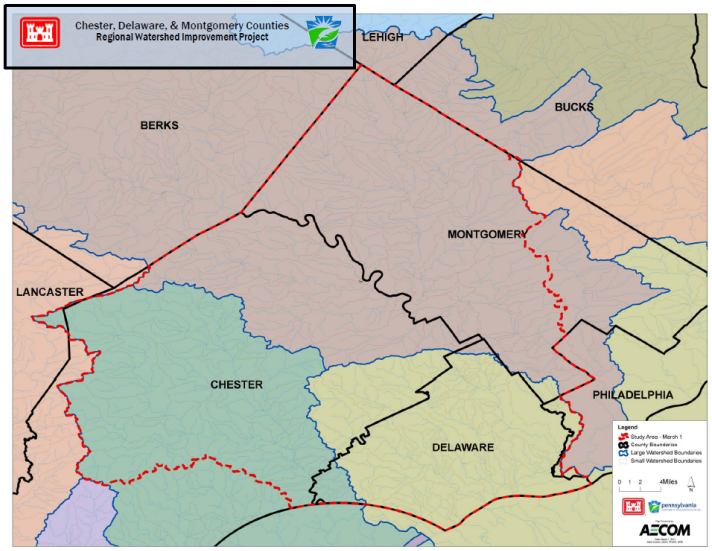
Project Area



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Project Phases

Phase 1	**Public Coordination & Involvement**
Phase 2	**Data Collection, Organization & Analysis**
Phase 3	**Develop a Decision Support Tool** Assessment of Existing Conditions & Identification of Priority Areas for Watershed Improvements
Phase 4	**Project Alternatives Development** Develop project alternatives to address watershed issues in priority areas identified in previous phase
Phase 5	**Preliminary Project Design** Preliminary project design, cost & schedule estimates, funding coordination, NEPA / environmental studies

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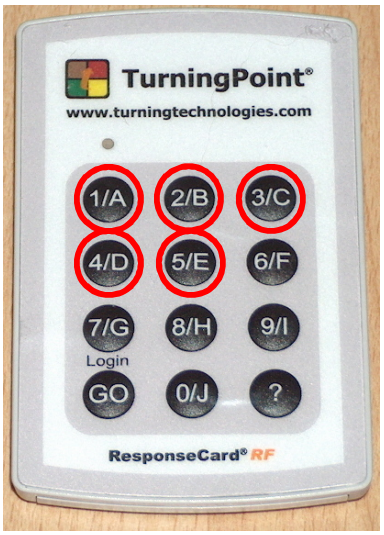
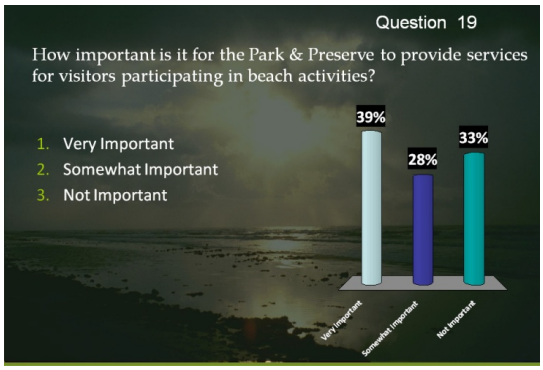
Turning Point Introduction





Please return your Turning Point Clicker on exiting

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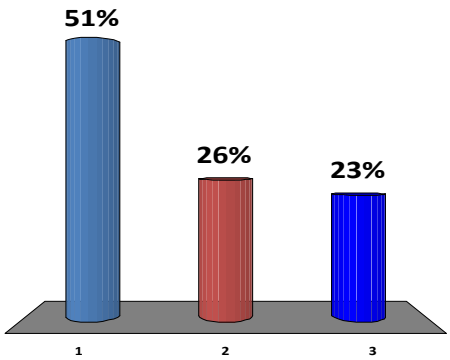
Sample Question 1

Will the Phillies win the World Series?

1. Yes, of course!
2. Maybe, we'll see…
3. Not a chance!



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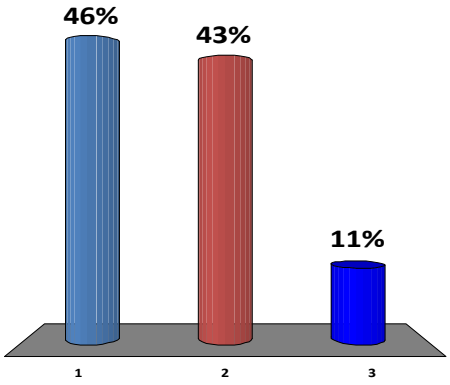
Overview Question 1

What brought you here today?

1. Desire to develop regional solutions
2. Opportunity for funding support
3. Just part of the job…



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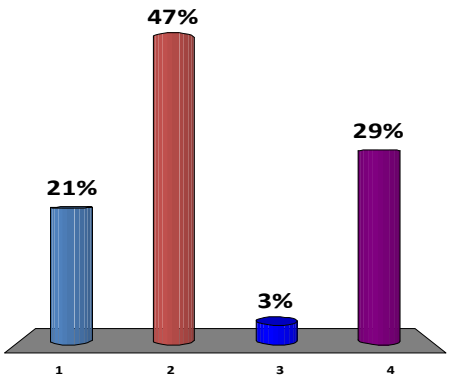
Overview Question 2

What intrigues you most about this project?

1. Addressing problems collaboratively
2. Developing integrated, regional solutions
3. Opportunity for larger projects
4. Funding support



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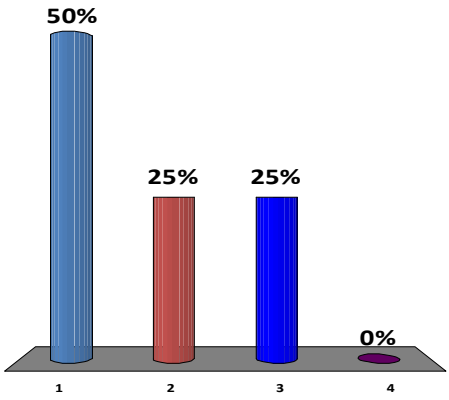
Overview Question 3

Which issue matters most to you?

1. Flooding
2. Water quality
3. Restoration
4. Other



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Project Goal #1

Assist local entities in regional watershed planning

- Identify areas in greatest need of watershed improvements
- Prioritize and develop integrated regional solutions to watershed management problems

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Project Goal #2

Identify and prioritize areas where the USACE could assist in design and construction of priority regional watershed improvement projects

- Funding Distribution: 75% Federal / 25% Local
- Design Build Authority under Section 566 of WRDA 1996

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Deliverable

GIS-based Decision Support Tool

- Centralized watershed data for three county region
- Provide objective assessment of existing conditions and issues facing the project area
- Provide consistent decision-making approach for the region
- Facilitate discussion of watershed issues and solutions
- Assist in regional coordination, fundraising and project definition efforts
- To be made available to stakeholders to allow others to continue to use, update, or enhance

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Deliverable

1st step in leveraging USACE resources for regional watershed improvement projects

Decision Support Tool will:

- Provide objective assessment of existing conditions and issues facing the project area
- Identify priority areas/problems for USACE involvement
- Produce ranked list of priority areas for each major watershed area
  - Brandywine
  - Direct to the Delaware Tributaries
  - South Shore – Schuylkill
  - North Shore – Schuylkill

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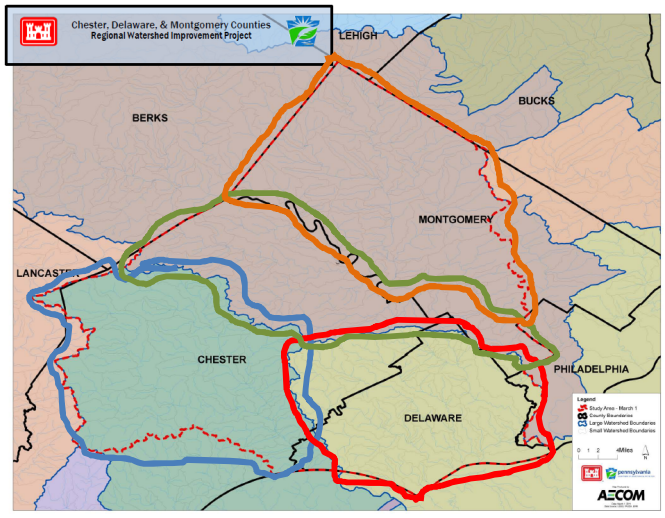
Prioritization Areas



21

Future Phases of Project

- Priority areas identified by Decision Support Tool which have local support will move into:
  - Phase 4 - Project Alternatives Development
  - Phase 5 - Preliminary Design
- Area/problem must be identified as a priority through Decision Support Tool and coordination with local partners
- Funding Distribution: 75% Federal / 25% Local
- Funding must be approved and appropriated by Congress
- Design Build Authority under Section 566 of WRDA 1996

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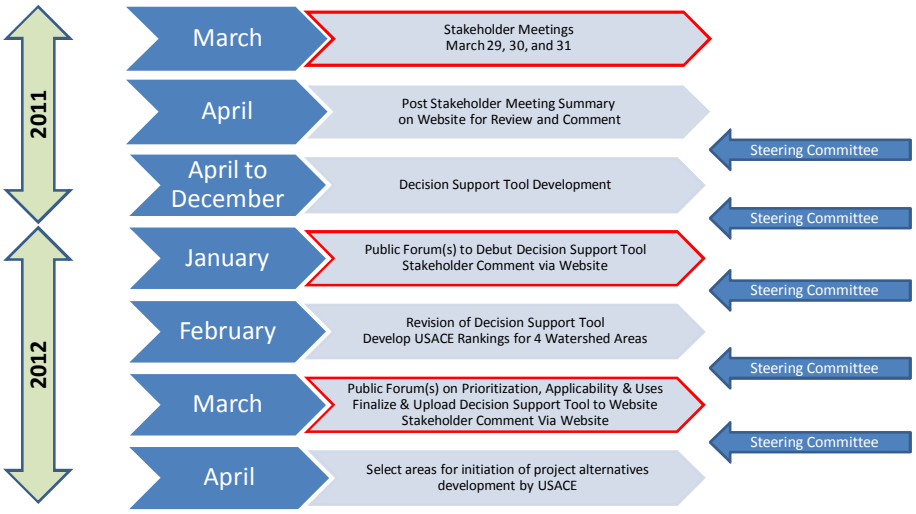
Future Involvement/Schedule



23

Project/Problem 'Parking Lot'

- Proposed, preferred, or ongoing projects will not be discussed at this meeting
  - Focus is on problem/need identification
- "Parking lot" station will catalog proposed or preferred projects and issues of personal concern for consideration in later phases
  - Map of Project Area
  - Color coded pins by theme (with number identifier)
  - Place pins at areas of personal concern or proposed/preferred projects
  - Detailed form to be filled out (with number identifier)
- Can also send-in additional forms via email/mail at a later time

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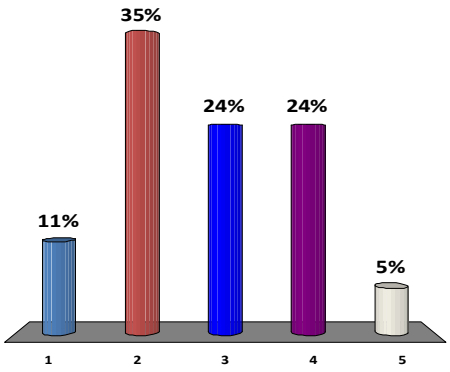
Overview Question 4

What is your affiliation?

1. County official/employee
2. Municipal official/employee
3. Consulting engineer
4. Environmental or Conservation group
5. Other

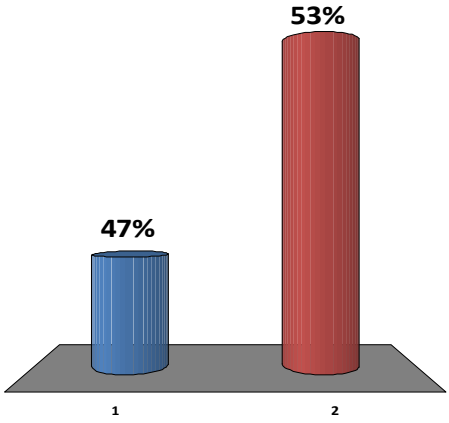


25

Overview Question 5

Have you worked with the USACE before?

1. Yes
2. No



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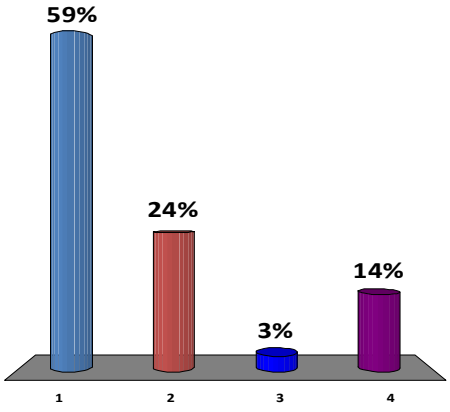
Overview Question 6

What concerns you most?

1. Existing problems
2. Future/developing problems
3. Compliance with current regulation
4. Compliance with future regulation



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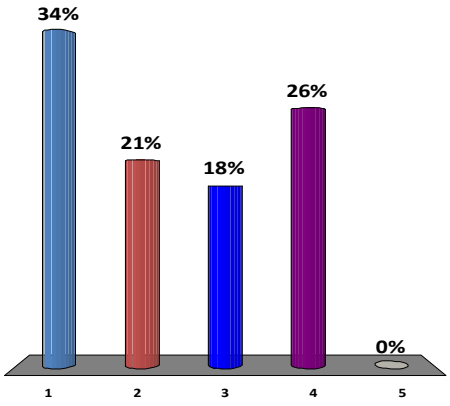
Overview Question 7

Which issue do you need the most help in addressing?

1. Flooding
2. Water Quality
3. Stormwater
4. Ecosystem/stream restoration
5. Other



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Decision Support Tool Goal

Objective Assessment of Need for Improvements

- Build on previously completed work
- Based on readily available geo-referenced information
  - Minimal new data will be collected
- Planning tool for projects of regional significance
  - Includes both structural and non-structural solutions
  - Considers distributed management projects
- Need oriented versus project oriented
  - Projects to be developed later based on assessment and coordination of need across region
- Identify opportunities for regional solutions to multiple problems/needs
- Obtain community input on priorities and preferences

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Decision Support Examples

City of Houston, Texas
Storm Water Enhanced Evaluation Tool (SWEET)

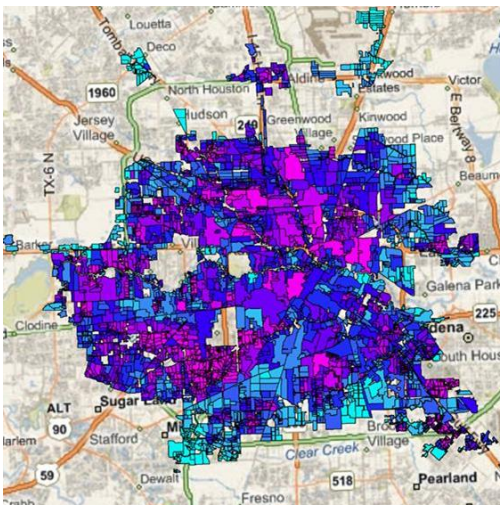
- GIS based analysis tool for prioritizing storm water improvements
- Analysis unit = storm sewer outfall areas
- Produces prioritized list of areas with greatest need for storm water improvements
- Combination of modeling & reporting
- Customizable – can alter inputs and update weightings and prioritization factors

30

Decision Support Examples

Tool considers:

- Drainage Effectiveness
  - 2 year pipe capacity
  - Resident flooding complaints
  - Ponding areas
- Damages from structural flooding
  - Resident flooding complaints
  - FEMA insured losses
- Mobility impacts
  - Street impassable reports
  - Flooded underpass reports
- Emergency Response
  - First responder reports



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Decision Support Examples

Hawaii

Watershed Prioritization Process

- GIS based analysis tool for prioritizing watershed protection and restoration improvements
- Analysis unit = subwatersheds
- Produces prioritized list of watersheds with greatest need for improvements
- Consideration of land cover, agricultural impacts, nutrient loading, erosion potential, watershed discharge, sensitive natural resources, impaired streams, and several other factors

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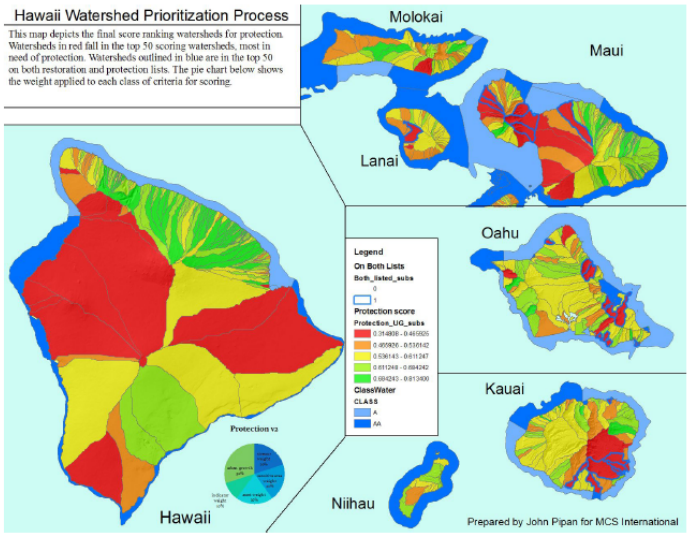
Decision Support Examples



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Tool Limitations

Not looking to:

- Create new datasets
- Perform new modeling

Limited by:

- Scale and resolution
- Spatial/causal connectivity

Will tell you where projects are needed to address major watershed issues

Will not tell you what project to build

- Phase 4 and Phase 5

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How DST Can Help You

- Quantifies need for watershed improvements
- Consistent decision support tool for region
- Facilitates discussion of causal relationships and identification of connected issues
- Assist in development of concepts to address multiple issues
- Watershed-wide prioritization:
  - Planning purposes
  - Support of fundraising efforts
  - Meets grant requirements

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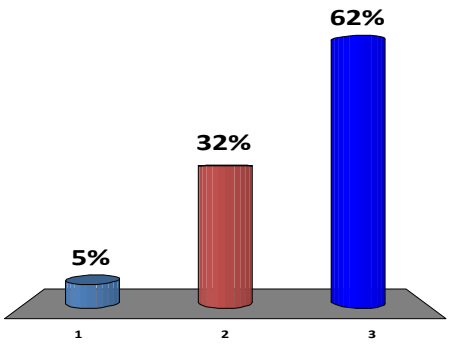
DST Question 1

How helpful would such a tool be in your watershed planning efforts?

1. Not very helpful
2. Moderately helpful
3. Very helpful



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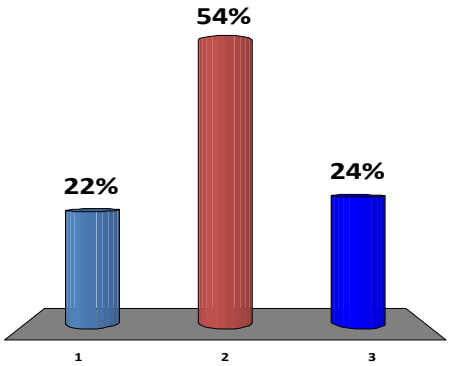
DST Question 2

Are problems facing the region similar in all watersheds?

1. Yes
2. Yes, in some areas
3. No



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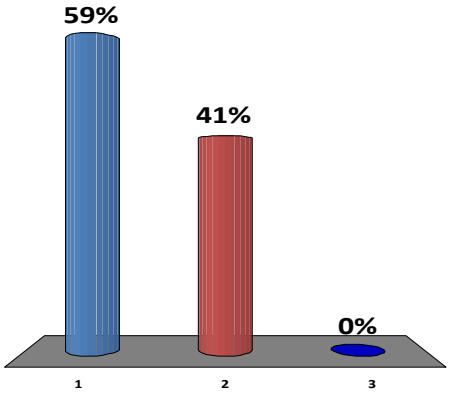
DST Question 3

Are past problems a good indicator of need for improvements?

1. Yes
2. Yes, in some areas
3. No



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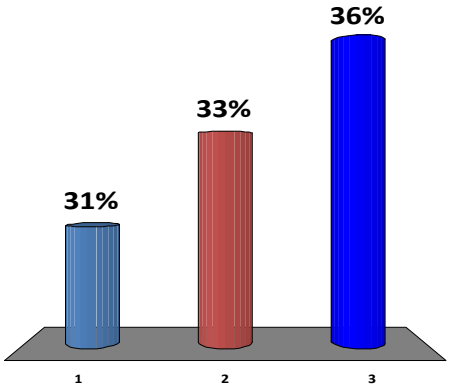
DST Question 4

Are future compliance issues a major driver for improvement projects?

1. Yes
2. No
3. Unsure



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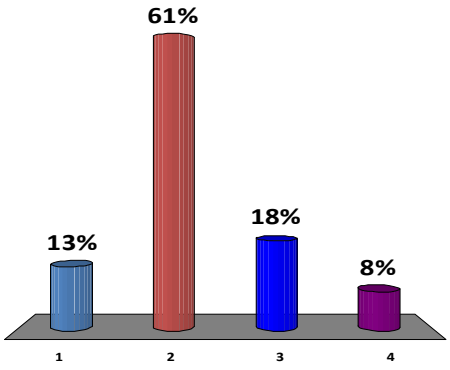
DST Question 5

What might you use such a tool for?

1. Regional planning assistance
2. Project identification and development
3. Fundraising support
4. Political support



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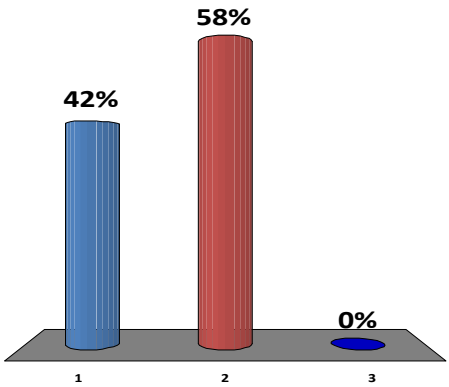
DST Question 6

What would be your preferred method of using the DST?

1. Desktop version (on flash drive or CD)
2. Web-based GIS Server
3. Other



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Focus Areas

Looking for integrated solutions to address major issues in:

- Flooding
- Water quality
- Ecosystem/stream restoration

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Flooding

Considerations:

- Flood damage/risk reduction
- Floodplain size
- Population affected
- Safety and mobility
- Riverine vs. urban
- Stormwater

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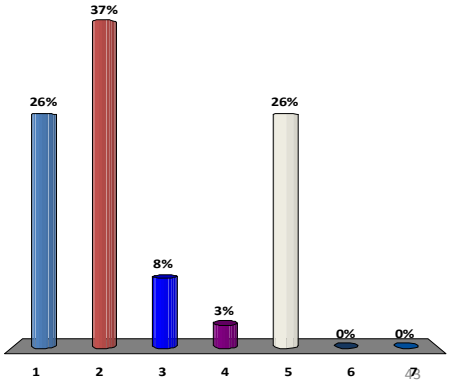
Flooding Question 1

What is your priority?

1. Property damage ($) reduction
2. Minimize population impacted
3. Improve safety
4. Improve mobility
5. Erosion control
6. Economic development considerations
7. Agricultural considerations



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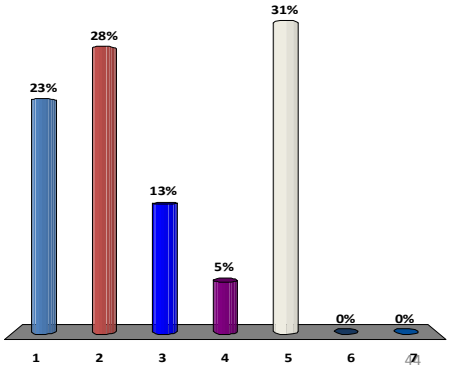
Flooding Question 2

What is your second priority?

1. Property damage ($) reduction
2. Minimize population impacted
3. Improve safety
4. Improve mobility
5. Erosion control
6. Economic development considerations
7. Agricultural considerations



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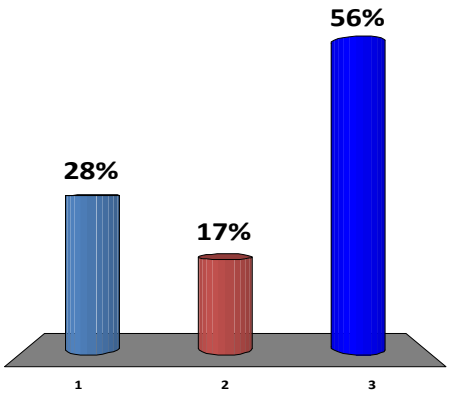
Flooding Question 3

What do you attribute flooding in your area to?

1. Deficiencies in local conveyance (storm sewers, ditches)
2. Deficiencies in major conveyance (streams, rivers)
3. Mix of both



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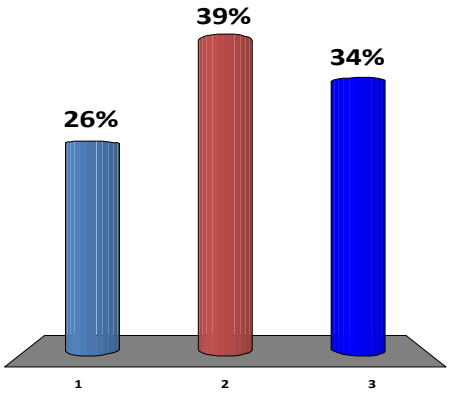
Flooding Question 4

How would you describe your flooding?

1. In houses and businesses
2. In streets and driveways
3. Along the banks of streams and rivers



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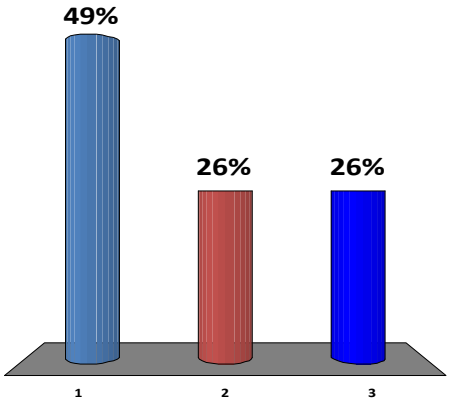
Flooding Question 5

Is your stormwater ordinance enforced?

1. Yes
2. No
3. Unsure



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Water Quality

Considerations:

- TMDL, NPDES, NSMP
  - Sediment
  - Nutrients (Nitrogen, Phosphorous)
  - Bacteria
- Environmental flows (low and high)
- Stormwater

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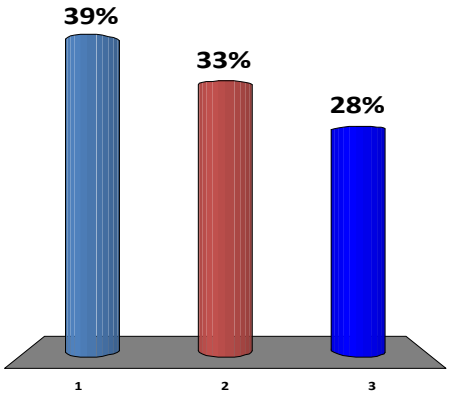
Water Quality Question 1

Are you facing TMDL/NPDES compliance issues which will require major structural or non structural controls?

1. Yes
2. No
3. Unsure



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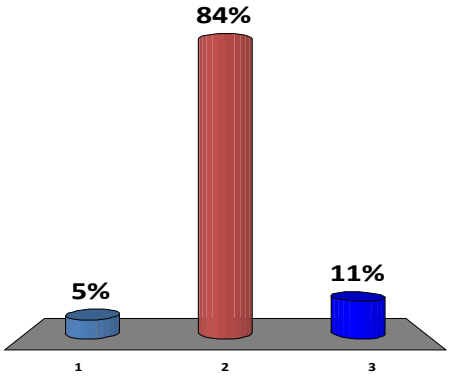
Water Quality Question 2

Do you have identified financial resources to address water quality issues?

1. Yes
2. No
3. Unsure



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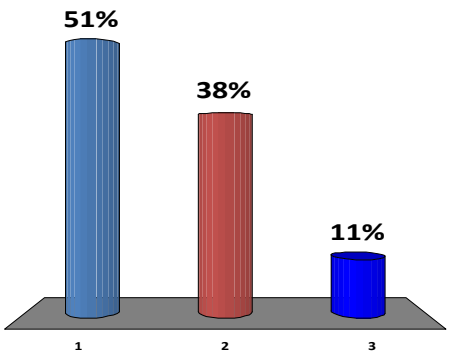
Water Quality Question 3

Do you have identified plans or projects to address water quality issues?

1. Yes
2. No
3. Unsure



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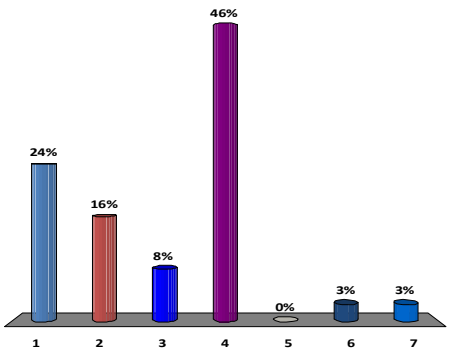
Water Quality Question 4

Which is your most important issue?

1. Sediment
2. Nutrients
3. Bacteria
4. Erosion (high flows)
5. Base flow (low flows)
6. Other
7. No major issues



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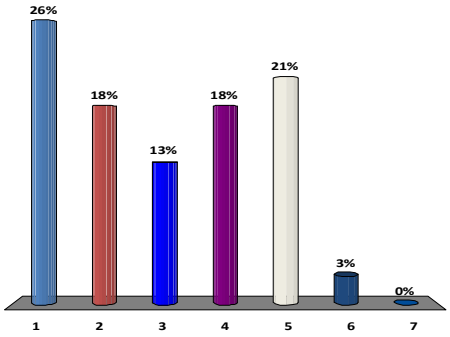
Water Quality Question 5

Which is your second most important issue?

1. Sediment
2. Nutrients
3. Bacteria
4. Erosion (high flows)
5. Base flow (low flows)
6. Other
7. No major issues



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Restoration

Considerations:

- Wetland and stream restoration
  - Erosion control /stabilization
  - Restore natural features
  - Floodplain connectivity
  - Riparian/aquatic habitat
  - Buffers

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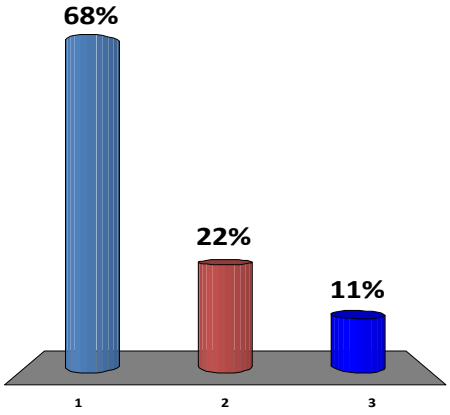
Restoration Question 1

Have you incorporated stream or wetland restoration as a part of previous projects?

1. Yes
2. No
3. Unsure



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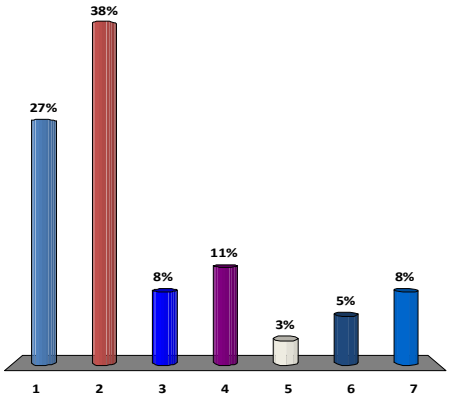
Restoration Question 2

What type of restoration have you completed?

1. Stream stabilization
2. Buffer creation
3. Restore natural features
4. Wetland creation/restoration
5. Aquatic habitat
6. Other
7. No experience



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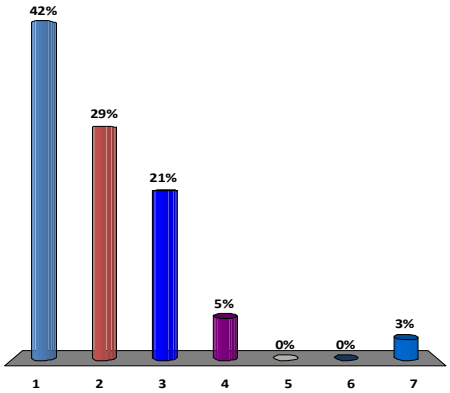
Restoration Question 3

What type of restoration would most benefit your area of interest?

1. Stream stabilization
2. Buffer creation
3. Restore natural features
4. Wetland creation/restoration
5. Aquatic habitat
6. Other
7. Unsure



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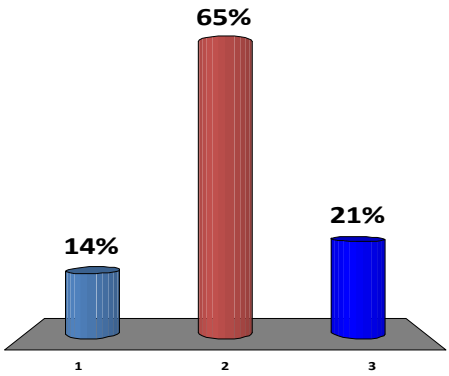
Restoration Question 4

Is there funding available for restoration in your area of interest?

1. Yes
2. No
3. Unsure



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Introduction of Small Groups

Themed by issue

- Flooding, water quality, restoration

Small groups will rotate through each of the three themes

- 30 min, 30 min, 30 min

Goals:

- Identify types of problems and hotspots
- Discuss reasons/causes of problems
- Review need assessment factors/metrics
- Discuss applicable previous work or available datasets

Conclusion:

- Summarize particular issues facing the County and ways to determine areas with the greatest need for improvements

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Breaking into Groups

- Group number identified on your Agenda
- 10 minute break for refreshments
- Form into your small groups
  - Group 1 – Back left
  - Group 2 – Front left
  - Group 3 – Middle Right
- Group rotation will be clock-wise

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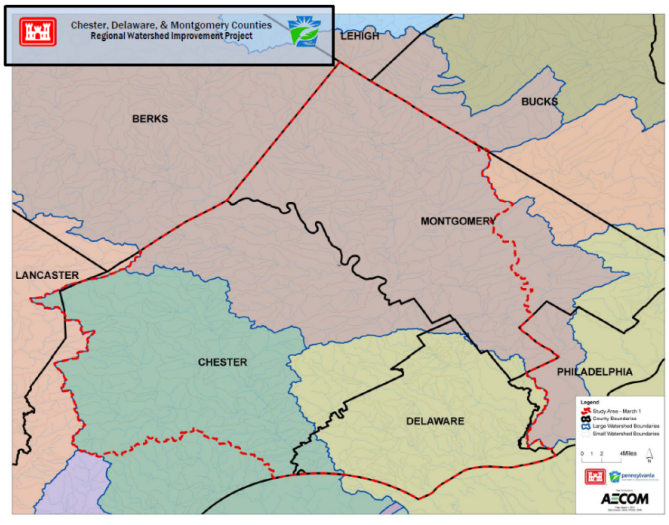
Small Group Sessions



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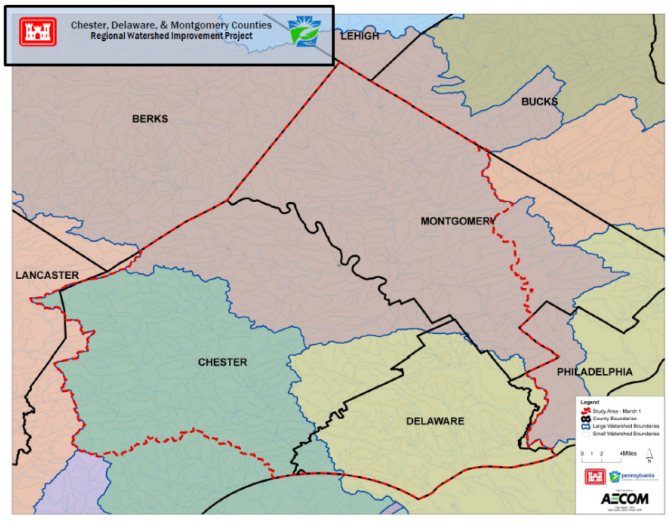
Recap - Flooding



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Recap - Flooding

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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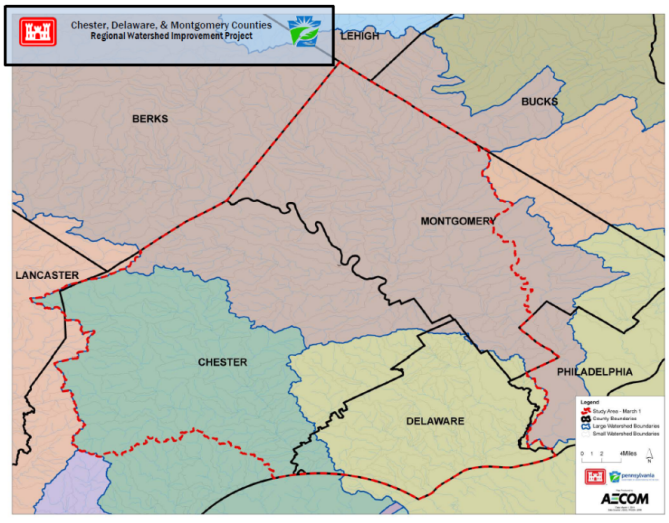
Recap – Water Quality



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Recap – Water Quality

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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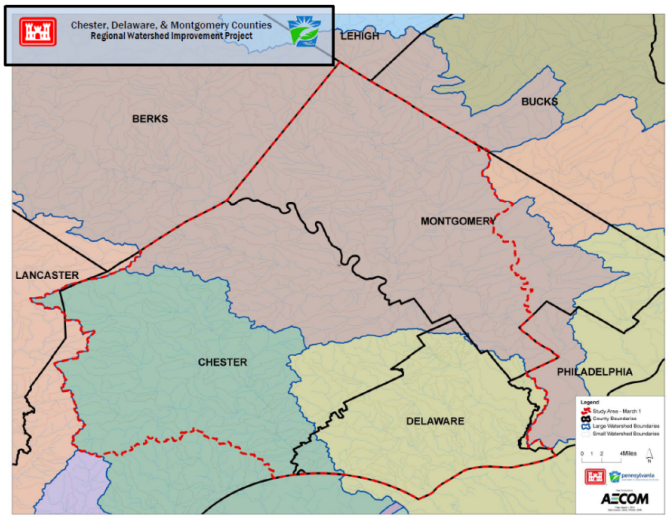
Recap - Restoration



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Recap - Restoration

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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Additional Comment?

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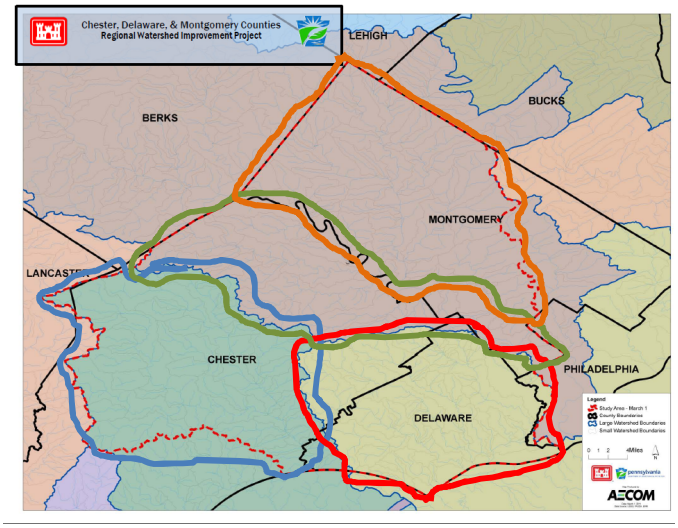
Prioritization Areas



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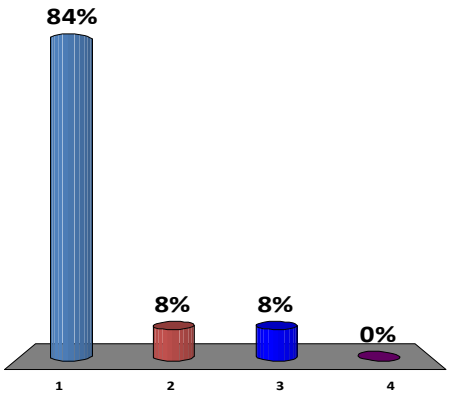
Direct to Delaware – Question 1

What is the most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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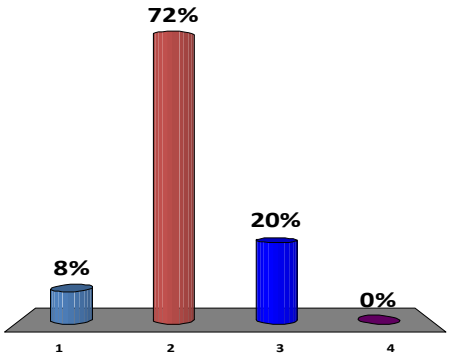
Direct to Delaware – Question 2

What is the second most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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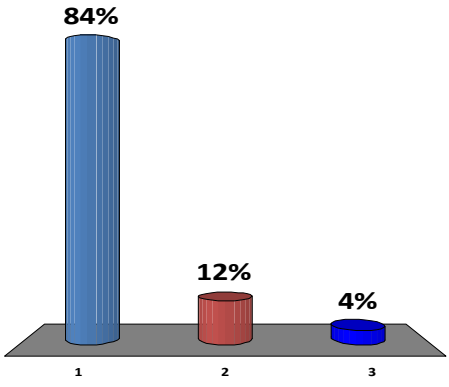
Direct to Delaware – Question 3

How would you describe your watershed issues?

1. Legacy problems
2. Growing problems caused by new development
3. Difficulty in complying with future regulation



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Project Phases

Phase 1	**Public Coordination & Involvement**
Phase 2	**Data Collection, Organization & Analysis**
Phase 3	**Develop a Decision Support Tool** Assessment of Existing Conditions & Identification of Priority Areas for Watershed Improvements
Phase 4	**Project Alternatives Development** Develop project alternatives to address watershed issues in priority areas identified in previous phase
Phase 5	**Preliminary Project Design** Preliminary project design, cost & schedule estimates, funding coordination, NEPA / environmental studies

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Future Involvement/Schedule

2011	March	Stakeholder Meetings March 29, 30, and 31
	April	Post Stakeholder Meeting Summary on Website for Review and Comment
	April to December	Decision Support Tool Development
2012	January	Public Forum(s) to Debut Decision Support Tool Stakeholder Comment via Website
	February	Revision of Decision Support Tool Develop USACE Rankings for 4 Watershed Areas
	March	Public Forum(s) on Prioritization, Applicability & Uses Finalize & Upload Decision Support Tool to Website Stakeholder Comment Via Website
	April	Select areas for initiation of project alternatives development by USACE

Steering Committee

Steering Committee

Steering Committee

Steering Committee

Steering Committee

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Future Communications

- Project website (under construction)
  - http://www.nap.usace.army.mil/Projects/spe/
- Regular email updates every 6 weeks
- Regular Steering Committee meetings
- Future Public Meetings
  - January 2012
  - March 2012

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Data Collection

- Provide contact information and description of Data to Facilitator staff
- We will follow up with you to collect your applicable data

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Key Take Away Points

- Excited to work with you to:
  - Develop centralized watershed data
  - Develop GIS-Based Decision Support Tool
- Support regional watershed planning efforts
  - Decision Support Tool to be publicly available & customizable
- Provide means to leverage USACE resources in the design and construction of priority watershed improvement projects

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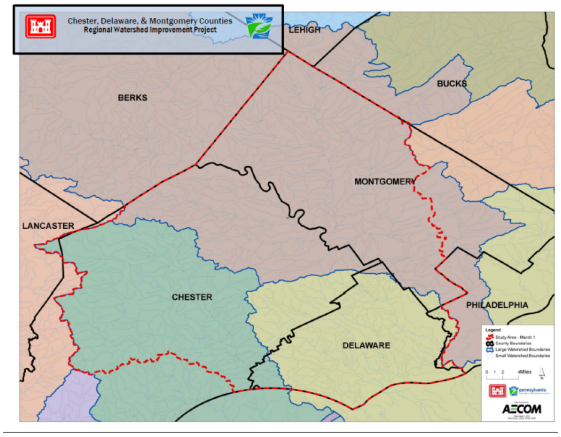
THANK YOU!



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Small Group Session Summary

Delaware County Flooding Breakout Session 03/29/2011				
Index	Issue Category	Watershed	Location	Description
1	Residential	Darby	Chester Creek Rd; Darby Borough, Yeadon Borough, and Colwyn Borough	Repetitive loss properties in the flood plain. Low income housing often without flood insurance; no money to make repairs.
2	Residential	Crum; Darby	Main stem of Darby and Tributaries to Crum	Repetitive loss properties in the floodplain
3	Erosion	Ridley	Map 1	Small streams flood several times a year causing erosion issues
4	Drainage/ Stormwater	Darby	Route 420 in Prospect Park Borough; two locations: Amtrak crossing and Chester Pike crossing.	Amtrak ROW and Chester Pike are both built across the valley, with culverts to allow flow to go under. 1-2" rain event causes severe flooding of 3-4 block business area; Penn Dot says it's Amtrak issues not theirs and vice versa
5		All	Site specific	Residential behavior on properties causing flooding
6		Darby	Darby Borough	Flooding issues due to developed floodplain (same as index #1)
7	Drainage/ Stormwater	Delaware River	Ridley TWP along HWY 291, between Darby Creek bridge and Crum Creek bridge.	Flooding due to backed up stormwater system draining roadway.
8	Dike/tidal effect on local drainage	Darby	Tinicum TWP; Floods 291 just west of the airport	Tinicum is essentially an island. The south side dike is at elev 10 to contain Delaware River; the north side dike on the Darby Creek side is at elev 6. During high tide the stormwater systems cannot drain to River, causing flooding.
9	Tidal effect on local drainage	Delaware River	Marcus Hook	Delaware Tidal issues; back flow flaps prevent backflow from the Delaware but it also doesn't allow for drainage of storm events during high tides.
10	Drainage/ Stormwater	Darby	Marple TWP; Darby Creek and Lawrence Rd (also near Westchester Pike	Flooding at mainstem Darby Creek; increased development in the watershed causes issues and flood Apartment Complex. Stabilization project was done but doesn't fix the flooding issues.

			and Blue Route)	
11	Drainage/ Stormwater	Crum	Upper Providence Twp; Providence Rd and Dam View Rd across from the middle school	Undersized pipes floods roads and affects traffic. Two private homes are also affected. PADOT-maintained roadway.
12	Residential		Marple Twp. / Tenicum / Millbourne Boro	Lots of LOMA's that show structures out off the floodplain but the issues persist
13	Residential	Ridley	Ridley Creek Rd / Upper Providence TWP	development built in the floodplain; at least one structure is repetitive loss (location is close to index #19)
14	Drainage	Darby	Nailors Run Creek; Two locations: Lansdowne Ave and State Rd; and Sherbrook Blvd and Beverly Blvd	Undersized stream enclosures, flooding of commercial and residential areas happens repeatedly. USACE did a feasibility study on building a second enclosure to increase capacity, and it would cost $20MM; land is available to build it.
15	Drainage Stormwater	Darby	Darby Borough/ Darby Creek/ Cobbs Creek	USACE did a study after Floyd (1999) Economic and residential impacts
16	Residential	Chester	Chester TWP/ Toby Farms Development	150 units in the floodplain and some are repetitive loss
17	Residential		Map 2	Acquisition of properties
18	Erosion and deposition	Chester	Downstream of Toby Farms Development/ Kerlin St at Bridge	Sediment issues. Bridge openings reduced by deposition.
19	Drainage/ Stormwater	Ridley	Ridley Creek and Dismal Run / Barren Rd at Bridge/ Middletown TWP	1" event causes flooding issues of road (location is close to index #13)
20	Bridge	Chester	Chester Creek Rd and Brookhaven Rd	Bridge washed out; transportation issues
21	Residential	Darby	Wynnefield Dr near Eagle Rd., Cobbs Creek	Cobbs Creek is in concrete channel with 90-degree bends. In large storms the creek goes over bank impacting residences; USACE Study exists.
22	Bridge	Darby	Darby Creek bridge; Route 1 (at State Rd, near	Severe flooding issues even with new bridge

			Rolling Rd) Upper Darby/Springfield border Map 3	
23	Residential	Chester	Map 5 / Dutton Mill Rd and Bridgewater Rd (Brookhaven Twp and Chester Twp, near Aston Twp)	14 houses get flooded regularly and are in the floodplain of mainstem Chester Creek
24	Drainage	Darby	Darby Creek Rd to Timber Trail Lane	USACE Channel Study, mainstem Darby Creek
25	Drainage/ Stormwater	Darby	Map 6 / Glenolden Borough at Chester pike and South Ave	Undersized Culvert under Chester Pike. Traffic and commerce issues
26	Drainage/ Stormwater	Chester	Chester Creek Rd	Flooding and downstream system can't absorb the flooding

Other mentioned data:
Hazard Mitigation Plans – Alexis Melusky (Baker)
Stormwater Surveys for Delaware County (Zach)
Daily Times Records

Notes For Delaware County (3/29/2011)
Water Quality Breakout Session
Facilitators: Jay Braund (PA DEP) and Ross Gordon (AECOM)

Water Quality – Delaware County

- Primary issue is sediment. Mud from upstream is flowing into downstream towns. Stream bank erosion is large issue as well as habitat damage due to sediment accumulation.
- Riparian buffers in upstream areas are severely degraded, significantly increasing upstream erosion and removing an important water quality feature.
- Several industrial outfalls in Cobbs Creek,
- Muckinapates has same issues as others, primarily stream bank erosion.
- Sediment issues in all watersheds in Delaware County.
- Belief that there is an over-reliance on detention versus infiltration.
- Crum Creek – lower half has deteriorated badly. Significant sediment coming from upstream areas and industrial discharges in downstream areas.
- Ridley Creek is a gem compared to the other watersheds, however lower portions still have significant sediment issues.
- Chester Creek goes over its banks frequently. Known as the muddiest creek in the US. High impervious cover in headwater areas contributes to issues. Also issues with SSOs and multiple waste water treatment plant discharges to the creek. Chester has 32 wastewater discharges, and significant issues in CBOD in waters. In low flow situations, effluent is a major portion of base flows.
- Localized flooding in the headwaters of Marcus Hook Creek.
- Flooding in the lower reaches of Stone Creek combined with industrial discharges.
- Primary drivers for water quality impairment include growth in western or headwaters areas combined with development in the floodplain.
- Temperature is also an issue related to aquatic health. Have real-time monitoring of temperature in Ridley Creek. Too warm to support aquatic life. Issues due to lack of shading and increase in impervious cover.
- Very little agriculture in the County.
- Incentives for groups to work together would benefit the area.
- Creation or re-establishment of buffers in upstream areas would be a major help with sediment issues on all creeks. Stream restoration or wetland creation on available land would be a viable and beneficial solution.
- There is also resistance to enforce local buffer and sewage codes. Local entities are reluctant to get into private vs. public property issues and do not want to discourage development or growth. There are lots of exceptions given for economic reasons and the cumulative impact of small, exempted, redevelopment is causing major problems. Most towns enforce stormwater requirements on new development, but struggle to control redevelopment. Need for public education and outreach to educate people on the impacts of small actions taken on private property.
- Monthly data available in Ridley and Chester on oxygen, nitrogen, phosphorous, and temperature. Have annual invertebrate assessment on Crum Creek.
- Recommend a mandatory buffer law to set aside and enforce buffer controls.

- Other recommendations include end-of-pipe treatment in the more urbanized, old, developments in the lower portions of each watershed.
- Issues characterized by new development in the upstream areas increasing sediment load and stormwater volume and deteriorating infrastructure in downstream areas leading to CSOs and SSOs and other infrastructure related issues.
- Difficult to address as the source of issues does not always match the impact of issues. Also, have flashy streams, with minimal open space, dense development, and very few opportunities for volume control.
- Local entities do not have money for implementation of required solutions. In addition, there is great variation in the wealth of towns in the inner vs. outer areas. Older towns are impacted most by water quality issues but have least money to address issues. Need inter-municipal capacity building and collaboration to address issues equitably. Need to develop coalitions and build partnerships to work together to address regional issues.
- Solutions could include better enforcement in upstream areas and treatment on downstream outfalls.
- CSO problems in City of Chester and in Cobbs Creek.
- Dams have played major role in accelerating bank erosion. There have been several dams removed in Darby, two in lower Ridley, and one in Upper Ridley. American Rivers has data on dam removal.
- Creation of a stormwater utility could be a good idea to raise money for stormwater and to mandate coordinated and integrated solutions.
- Water quality inserts in inlets could be an affordable solution.
- Education and promotion of grass conversion to meadow would be very beneficial. PECO has had a successful meadow conversion program.
- Ridley Park Lake loses oxygen over the summer. Have installed mechanical aerators, but this has increased temperature.
- Zoning at times prevents development which maintains riparian buffers. Changing zoning to allow cluster development or establishments of dedicated buffer areas.

Restoration 1 – Delaware County

- Some have done some stream restoration work before
- Would a buffer work? Yes if there was a better definition of the buffer – or if regulated buffer were better defined – scientific/functional definition too – determine zoning criteria that would follow – local municipalities/groups had more information to work from
- Counties have stormwater management guidelines (Act 167) that have recommendations for minimum – usually about 50 ft on either side with 100ft being preferred if possible. There are opportunities to reduce depending on zoning. Ordinance does discuss appropriate plantings
- One good solution would be in urbanized or built up areas – how do restore buffer or at least mimic buffer functions.
- Lack of existing buffers creates issues with flooding and water quality
- Existing conditions are very urbanized/developed
- Delaware county is ripe with old school retaining basins – find opportunities to retrofit existing "problem areas" to control flooding – good upstream solution – also good because not taking land from anywhere
- Other utilities impacting stream qualities – erosion due to hard structures – exposed infrastructure
- Sell erosion control program for homeowners – keep what they have because if stream moves, it becomes public domain
- Dollar value important for public support
- LID/WSUD could also be a big assistance to impact problems in urban areas
- Philly green city clean waters program is good example
- City is about 1/3 to ¼ heavily developed and this is increasing in western part of county
- In general, redevelopment and future development have guidelines to address – issues are more with existing problems
- LID/WSUD should help with changes in climate to keep stormwater in county
- Storm blowouts – perpetual locations – banks, in channel, floodplains all an issue – soil conservation distractions and municipalities – flashy streams
- More frequent storms and more development – past 60 to 10 years development is big issues plus issues outside of county
- Pavement is a big contributor
- Upper Darby township severe flooding issue – have requested several times to USACE to dredge to solve issue – Preference to call it "enhancement" instead of "dredge"
- What would be better – small projects or larger area? – look at specific issue area and then consider upstream/downstream solutions
- Dam removal – USACE or American Rivers let silt go downstream – can we stop this?
- Buffers are low hanging fruit, education programs, utilizing public spaces wherever possible, and basin retrofits

- Flood and water quality are foremost reasons for restoration; wildlife and recreation and aesthetics are secondary, except for areas with large open space areas
- Lack of available land for public open space is making people looking for more opportunities for recreation and wildlife enhancement in limited space
- Important that it combines water quality and flooding – municipalities worried about spending money on these issues if they don't exactly meeting MS4 requirements – sediment is biggest issue but municipalities don't realize that upstream may be issue – UNFUNDED MANDATE and not enough understanding of how to implement and meet requirements – and so nothing is getting done and therefore stream erosion is getting worse
- National wildlife is adjacent and not supposed to eat fish – only coastal zone in PA

Restoration 2 – Delaware County

- Probably better opportunities for buffer restoration/enhancement where open space existing where municipalities control space as opposed to private property
- PRD did dedicated open space along stream corridors
- Aesthetic problem with restoration that concentrates on buffer as they are long and skinny – deer and invasives necessitate the need for management/maintenance – need to establish premier successful restoration site as demonstration project
- Erosion issues and trash and debris (manmade and vegetation) on lower section of all the streams is a huge problem. they are so narrow – need enforcement but people can't pay – large debris dumps that have blown out vegetation
- Trash and debris is a big issue – need education for kids – fine the adults
- Need a program that starts at the headwaters and then goes to tributaries – cleanup program that is consistent and then restoration of banks – and no issue if it's a long-term (20-25yr) program – and then town's must be responsible for enforcement
- There are opportunities in open space areas along the creeks where BMPs could be retrofitted
- Buy out for reservoirs or detention basins – political issue
- Dam removal has helped, but since water level has decreased, banks that were exposed and eroded – need enhancement or restoration of stream channels when dams are removed and need to go back and fix these areas
- There really aren't any invasive species management plans – county/municipality staff don't care or don't understand
- Lower Marion Twnshp has 3-person crew that focus on invasive mgmt/maintenance – maybe use as an example?
- Messing up ecosystem because biomass is not being eaten or decay and shallow roots of invasives are causing further erosion
- Buffer with native vegetation – need immediate start
- Utilities/infrastructure is "in the stream" as opposed on the side now
- Focus needs to be on more frequent smaller storm events to start

- Homeowner impacts is primary metric; upstream of the McDade bridge USACE has been studying the area (dumpsters and old dam are still there) it for 12 years – in 12 years there has been 3 high impact events with home and business losses – need action based on economic impact and physical damages
- Restoration means restore an ecosystem – water quality will be better increased by restoration in upper areas; lower area restoration will help flood
- Identify problem and then figure out watershed/stream/regional solution
- Public safety is big priority – flooding on roadways is important
- Pollution issues near water intakes where it can get into drinking water – both Chester Creek (Middletown route 452) and Ridley creek (borough of media at Baltimore pike) – Aqua PA is water company - major intakes for potable water – IMPORTANT!
- USACE is studying water quality issues – need to be familiar with all the streams
- Prioritize cost-benefit first over multiple cheaper projects
- Vulnerability is a metric; flooding prone areas overlaid with most people or the most damage that could take place
- Ability to maintain is an important metric
- Ecological significance/habitat is important but is secondary

Restoration 3 – Delaware County

- Buffer restoration/enhancement will help greatly – and even a small buffer makes a big difference (5 -15 feet even) – no mow! Easy to ask but need education for private properties
- East Goshen is special in that they own a lot of buffer publically
- Approach private owners on a neighborhood basis – peer pressure – and aesthetics are important and also group mentality – not impact property value – educate about erosion and less loss of property and less flooding
- Decrease clearing and plant more street trees
- Upper providence as tree ordinance – take one down you have to replace similar in size – more impacts/regulations on developers
- Large scale restoration – generally speaking, as you get downstream of the watersheds you have more constraints – floodplain restoration more opportunities upstream; downstream may be at individual homeowner implementation – no mow zones, WSUD
- Definition of eco restoration vs. channel stabilization – because a lot of people think hard structure stabilization when they hear restoration in urban areas – be clear and introduce bioengineering techniques and softer solutions where possible
- Look at public lands such as schools, parks, libraries
- Educate homeowners on opportunities for protection
- Ground infiltration is important
- Townships should encourage WSUD/LID
- Regional funding of projects to help multiple communities very hard – NIMBYism is a big issue – if the science and financial benefits supports out-of-area restoration benefits then you could get

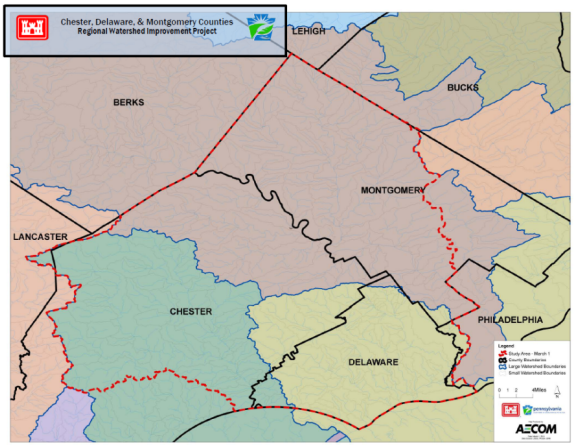
contributions from multiple townships – need education – Delaware is not going to be as open Chester – sell it as a flood control project that has restoration component

- Education is a big need to sell bioengineering or softer solutions vs traditional methods (hardscape) – past-performance is an issue
- Need to connect protection of stream = protection of property
- visibility, financial beneficial, results in decreasing flood damage or pollution – metrics to determine
- Maintenance is big constraint – especially on private property – once the municipality touches it, the perception is they own it
- Politics is big prioritization metric
- Headwaters projects should be priority cause they help everyone
- Protecting of water supply and potable water projects should be important because Aqua PA could help fund
- Economy is issue – competing against other public services
- Need to promote connections between upstream and downstream
- Maintenance agreements are needed
- Need to promote that eco solutions can be cheaper or more cost-effective
- Projects that could have matching funds from other organizations – example soil district could be obligated to help funding – watershed groups work with municipalities to find funding

Appendix B – Montgomery County: Workshop Presentation & Small Group Session Summary

Presentation

Chester, Delaware & Montgomery Counties
Regional Watershed Improvement Project



STAKEHOLDER WORKSHOP

Montgomery County

March 30, 2011

4

Introductions

U.S. Army Corps of Engineers – Philadelphia District
- Erik Rourke
- Tricia Aspinwall

Pennsylvania Department of Environmental Protection
- Jay Braund
- David Burke

AECOM
- Ross Gordon
- Karen Appell
- Andy Wohlsperger

5

Meeting Schedule

Hour 1	**Project Introduction & General Discussion** (with Turning Point questions)
Hour 2 and 3	**Small Group Workshops** Flooding – Water Quality – Restoration
Hour 4	**Addtl. Input, Recap and Review of Next Steps** (with Turning Point questions)

****** Interactive and collaborative process ******

6

Project Overview

Chester, Delaware & Montgomery Counties Regional Watershed Improvement Project

- Authorized and funded through efforts of Congressional Representatives
- Collaboration of the U.S. Army Corp of Engineers (USACE) and the PA Department of Environmental Protection

7

Project Focus

- Improving and protecting surface water resources and environmental infrastructure in the three County region
  - Flood risk management
  - Water quality improvement
  - Ecological restoration
- Mandates an integrated, region-wide, assessment of need and coordination of proposed solutions

"We cannot fix regional flooding and watershed problems, such as need for ecological restoration and erosion control, solely with band-aid solutions that each only deals with concerns of a small community."

Former Congressman Sestak

8

Integrated Solutions

Integrated solutions traditionally provide:

- Better benefit/cost ratio
- More focused solutions addressing core issues

Enhance cost and benefit of project:

- Avoid duplication of efforts
- Leverage funding
- Pool and share limited resources
- Promote data sharing

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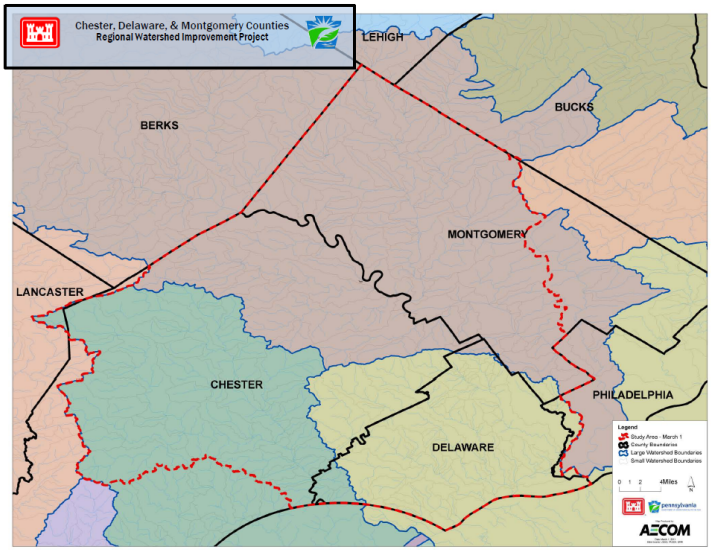
Project Area



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Project Phases

Phase 1 — **Public Coordination & Involvement**

Phase 2 — **Data Collection, Organization & Analysis**

Phase 3 — **Develop a Decision Support Tool**
Assessment of Existing Conditions & Identification of Priority Areas for Watershed Improvements

Phase 4 — **Project Alternatives Development**
Develop project alternatives to address watershed issues in priority areas identified in previous phase

Phase 5 — **Preliminary Project Design**
Preliminary project design, cost & schedule estimates, funding coordination, NEPA / environmental studies

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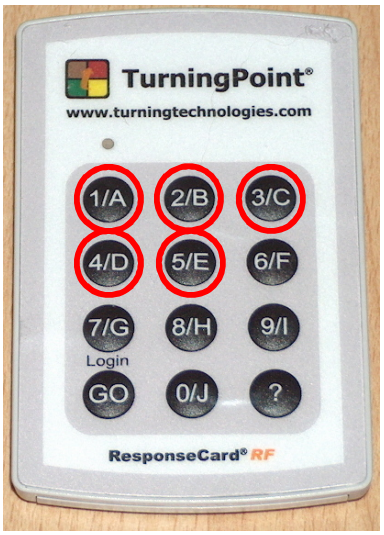
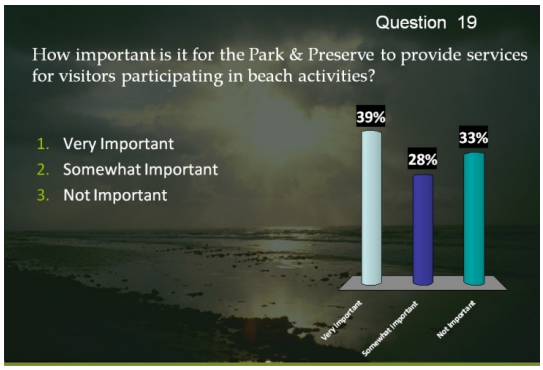
Turning Point Introduction





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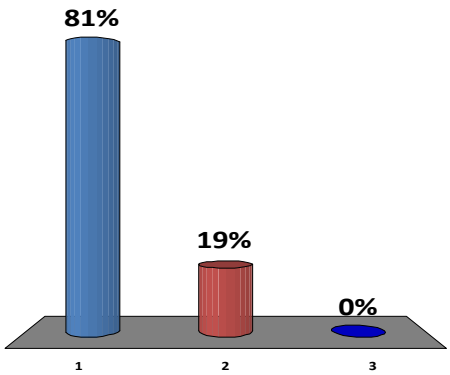
Sample Question 1

Will the Phillies win the World Series?

1. Yes, of course!
2. Maybe, we'll see…
3. Not a chance!



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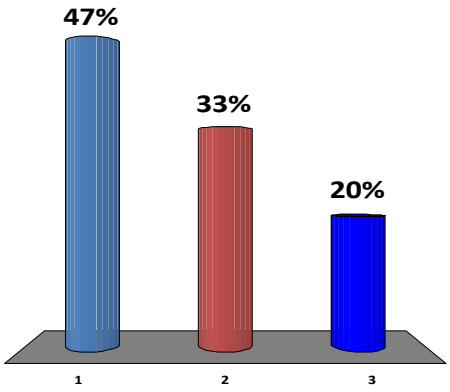
Overview Question 1

What brought you here today?

1. Desire to develop regional solutions
2. Opportunity for funding support
3. Just part of the job…



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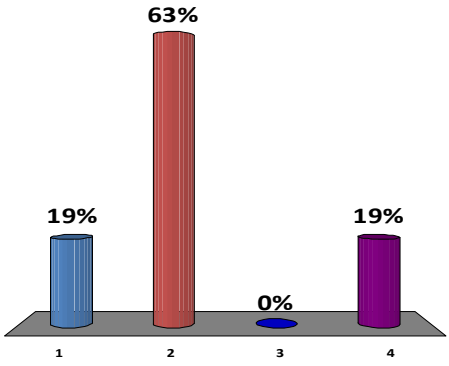
Overview Question 2

What intrigues you most about this project?

1. Addressing problems collaboratively
2. Developing integrated, regional solutions
3. Opportunity for larger projects
4. Funding support



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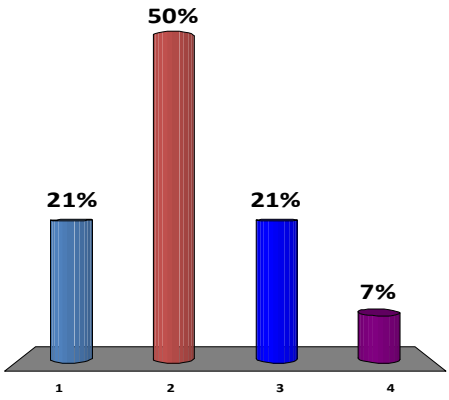
Overview Question 3

Which issue matters most to you?

1. Flooding
2. Water quality
3. Restoration
4. Other



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Project Goal #1

Assist local entities in regional watershed planning

- Identify areas in greatest need of watershed improvements
- Prioritize and develop integrated regional solutions to watershed management problems

17

Project Goal #2

Identify and prioritize areas where the USACE could assist in design and construction of priority regional watershed improvement projects

- Funding Distribution: 75% Federal / 25% Local
- Design Build Authority under Section 566 of WRDA 1996

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Deliverable

GIS-based Decision Support Tool

- Centralized watershed data for three county region
- Provide objective assessment of existing conditions and issues facing the project area
- Provide consistent decision-making approach for the region
- Facilitate discussion of watershed issues and solutions
- Assist in regional coordination, fundraising and project definition efforts
- To be made available to stakeholders to allow others to continue to use, update, or enhance

19

Deliverable

1st step in leveraging USACE resources for regional watershed improvement projects

Decision Support Tool will:

- Provide objective assessment of existing conditions and issues facing the project area
- Identify priority areas/problems for USACE involvement
- Produce ranked list of priority areas for each major watershed area
  - Brandywine
  - Direct to the Delaware Tributaries
  - South Shore – Schuylkill
  - North Shore – Schuylkill

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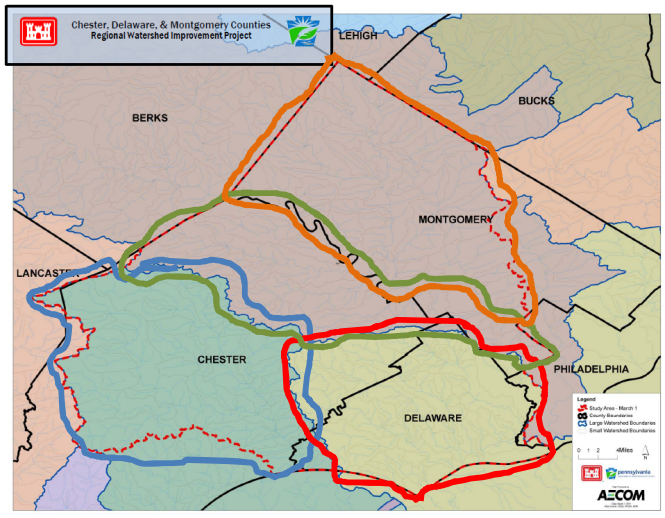
Prioritization Areas



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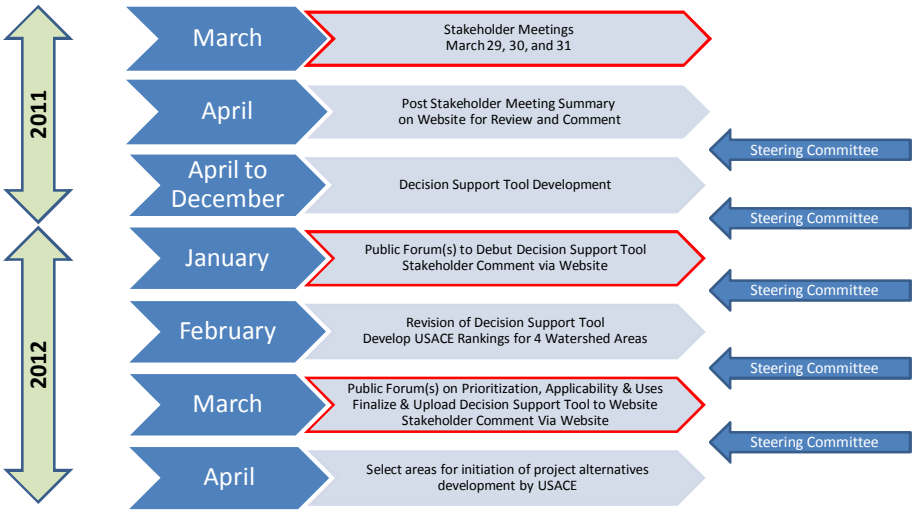
Future Phases of Project

- Priority areas identified by Decision Support Tool which have local support will move into:
  - Phase 4 - Project Alternatives Development
  - Phase 5 - Preliminary Design
- Area/problem must be identified as a priority through Decision Support Tool and coordination with local partners
- Funding Distribution: 75% Federal / 25% Local
- Funding must be approved and appropriated by Congress
- Design Build Authority under Section 566 of WRDA 1996

22

Future Involvement/Schedule



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Project/Problem 'Parking Lot'

- Proposed, preferred, or ongoing projects will not be discussed at this meeting
  - Focus is on problem/need identification
- "Parking lot" station will catalog proposed or preferred projects and issues of personal concern for consideration in later phases
  - Map of Project Area
  - Color coded pins by theme (with number identifier)
  - Place pins at areas of personal concern or proposed/preferred projects
  - Detailed form to be filled out (with number identifier)
- Can also send-in additional forms via email/mail at a later time

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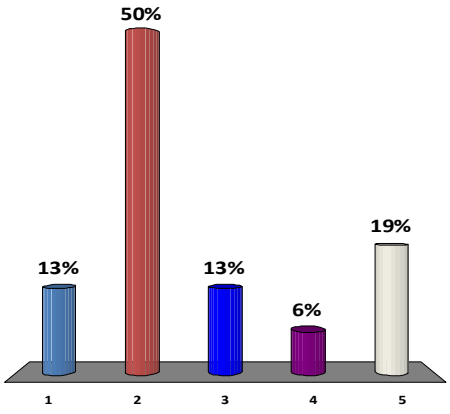
Overview Question 4

What is your affiliation?

1. County official/employee
2. Municipal official/employee
3. Consulting engineer
4. Environmental or Conservation group
5. Other



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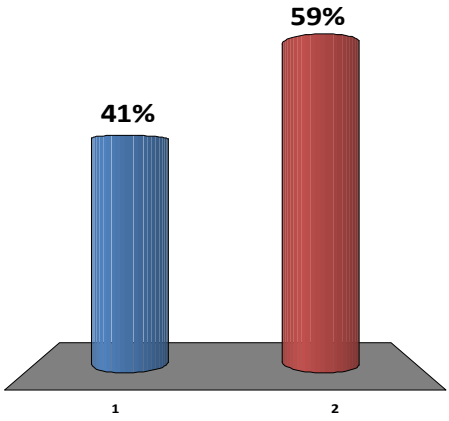
Overview Question 5

Have you worked with the USACE before?

1. Yes
2. No



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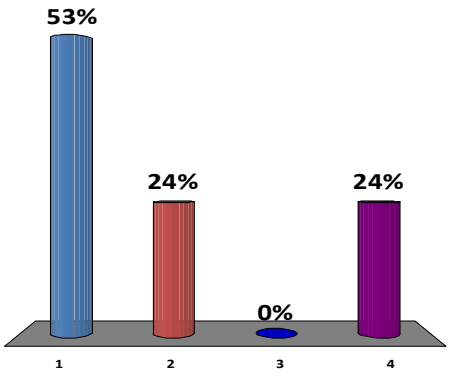
Overview Question 6

What concerns you most?

1. Existing problems
2. Future/developing problems
3. Compliance with current regulation
4. Compliance with future regulation



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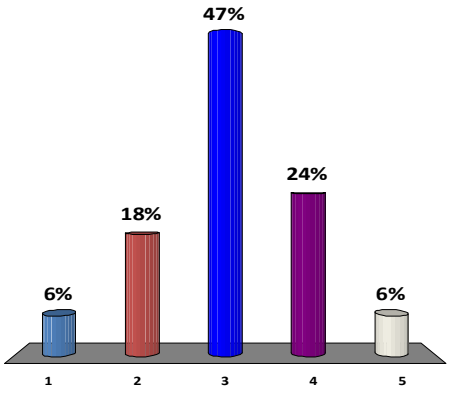
Overview Question 7

Which issue could you use the most help in addressing?

1. Flooding
2. Water Quality
3. Stormwater
4. Ecosystem/stream restoration
5. Other



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Decision Support Tool Goal

Objective Assessment of Need for Improvements

- Build on previously completed work
- Based on readily available geo-referenced information
  - Minimal new data will be collected
- Planning tool for projects of regional significance
  - Includes both structural and non-structural solutions
  - Considers distributed management projects
- Need oriented versus project oriented
  - Projects to be developed later based on assessment and coordination of need across region
- Identify opportunities for regional solutions to multiple problems/needs
- Obtain community input on priorities and preferences

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Decision Support Examples

City of Houston, Texas
Storm Water Enhanced Evaluation Tool (SWEET)

- GIS based analysis tool for prioritizing storm water improvements
- Analysis unit = storm sewer outfall areas
- Produces prioritized list of areas with greatest need for storm water improvements
- Combination of modeling & reporting
- Customizable – can alter inputs and update weightings and prioritization factors

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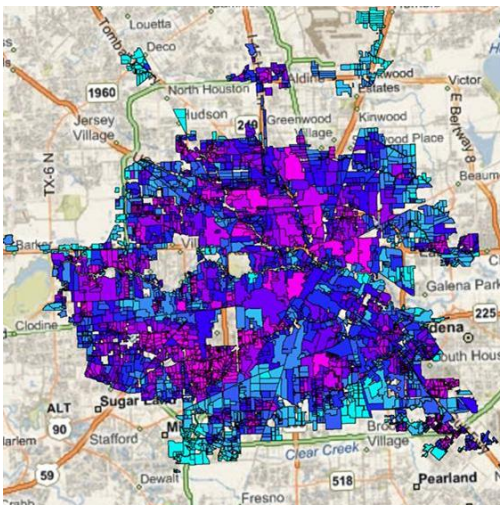
Decision Support Examples

Tool considers:

- Drainage Effectiveness
  - 2 year pipe capacity
  - Resident flooding complaints
  - Ponding areas
- Damages from structural flooding
  - Resident flooding complaints
  - FEMA insured losses
- Mobility impacts
  - Street impassable reports
  - Flooded underpass reports
- Emergency Response
  - First responder reports



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Decision Support Examples

Hawaii

Watershed Prioritization Process

- GIS based analysis tool for prioritizing watershed protection and restoration improvements
- Analysis unit = subwatersheds
- Produces prioritized list of watersheds with greatest need for improvements
- Consideration of land cover, agricultural impacts, nutrient loading, erosion potential, watershed discharge, sensitive natural resources, impaired streams, and several other factors

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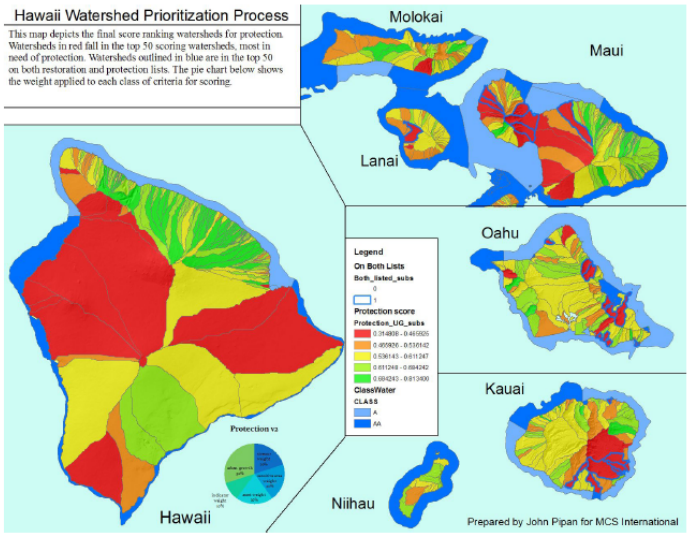
Decision Support Examples



33

Tool Limitations

Not looking to:

- Create new datasets
- Perform new modeling

Limited by:

- Scale and resolution
- Spatial/causal connectivity

Will tell you where projects are needed to address major watershed issues

Will not tell you what project to build

- Phase 4 and Phase 5

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How DST Can Help You

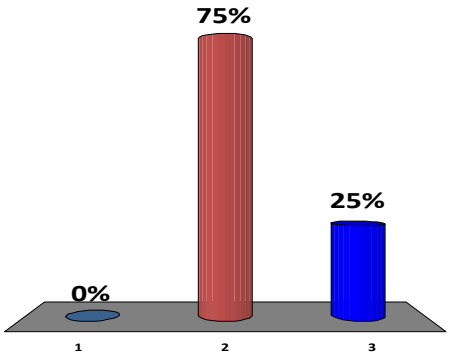
- Quantifies need for watershed improvements
- Consistent decision support tool for region
- Facilitates discussion of causal relationships and identification of connected issues
- Assist in development of concepts to address multiple issues
- Watershed-wide prioritization:
  - Planning purposes
  - Support of fundraising efforts
  - Meets grant requirements

35

DST Question 1

How helpful would such a tool be in your watershed planning efforts?

1. Not very helpful
2. Moderately helpful
3. Very helpful



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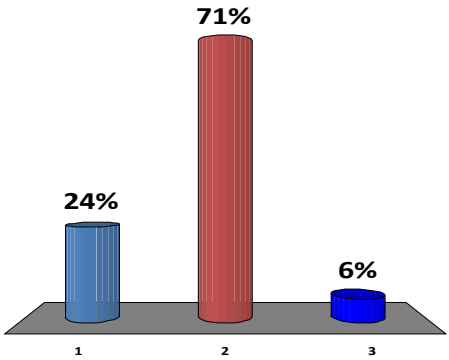
DST Question 2

Are problems facing the region similar in all watersheds?

1. Yes
2. Yes, in some areas
3. No



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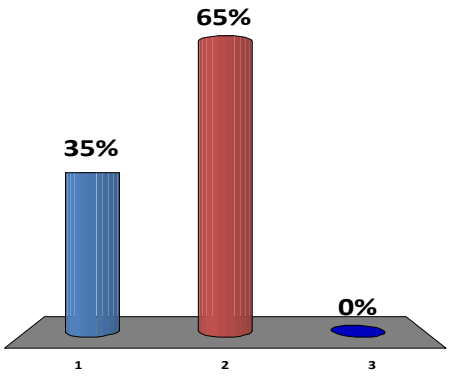
DST Question 3

Are past problems a good indicator of need for improvements?

1. Yes
2. Yes, in some areas
3. No



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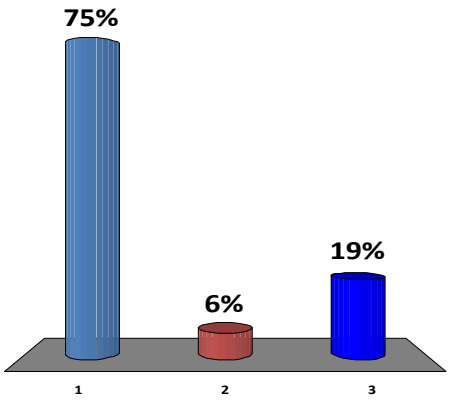
DST Question 4

Are future compliance issues a major driver for improvement projects?

1. Yes
2. No
3. Unsure



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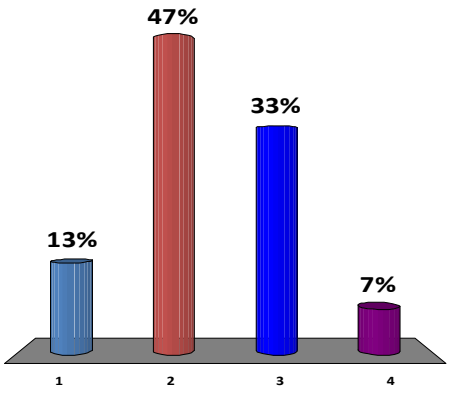
DST Question 5

What might you use such a tool for?

1. Regional planning assistance
2. Project identification and development
3. Fundraising support
4. Political support



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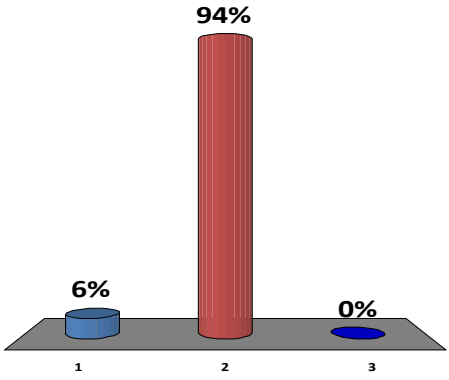
DST Question 6

What would be your preferred method of using the DST?

1. Desktop version (on flash drive or CD)
2. Web-based GIS Server
3. Other



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Focus Areas

Looking for integrated solutions to address major issues in:

- Flooding
- Water quality
- Ecosystem/stream restoration

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Flooding

Considerations:

- Flood damage/risk reduction
- Floodplain size
- Population affected
- Safety and mobility
- Riverine vs. urban
- Stormwater

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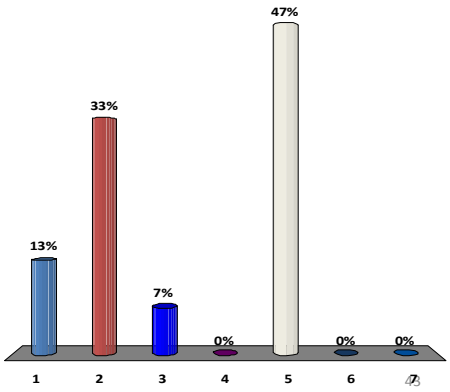
Flooding Question 1

What is your priority?

1. Property damage ($) reduction
2. Minimize population impacted
3. Improve safety
4. Improve mobility
5. Erosion control
6. Economic development considerations
7. Agricultural considerations



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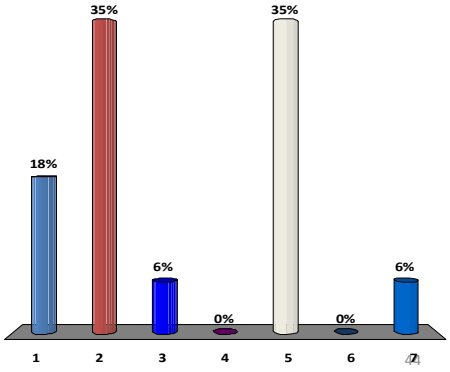
Flooding Question 2

What is your second priority?

1. Property damage ($) reduction
2. Minimize population impacted
3. Improve safety
4. Improve mobility
5. Erosion control
6. Economic development considerations
7. Agricultural considerations



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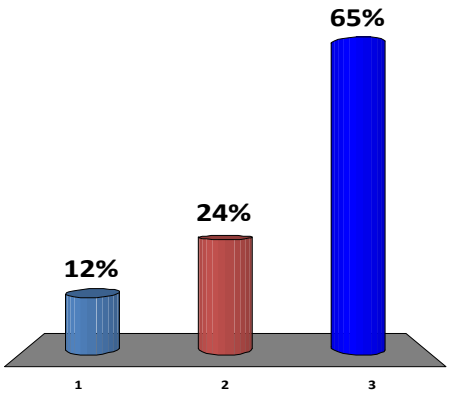
Flooding Question 3

What do you attribute flooding in your area to?

1. Deficiencies in local conveyance (storm sewers, ditches)
2. Deficiencies in major conveyance (streams, rivers)
3. Mix of both



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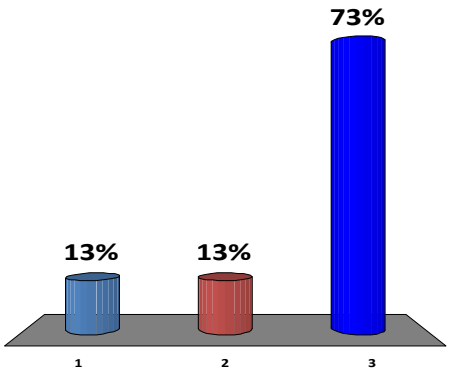
Flooding Question 4

How would you describe your flooding?

1. In houses and businesses
2. In streets and driveways
3. Along the banks of streams and rivers



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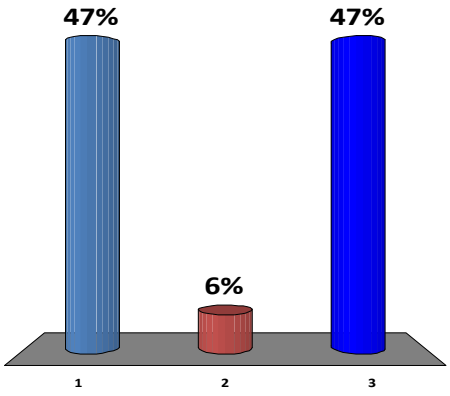
Flooding Question 5

Is your stormwater ordinance enforced?

1. Yes
2. No
3. Unsure



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Water Quality

Considerations:

- TMDL, NPDES, NSMP
  - Sediment
  - Nutrients (Nitrogen, Phosphorous)
  - Bacteria
- Environmental flows (low and high)
- Stormwater

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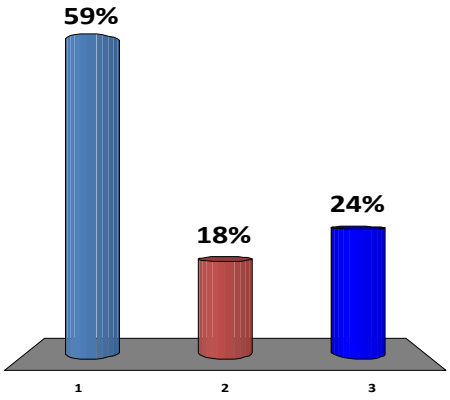
Water Quality Question 1

Are you facing TMDL/NPDES compliance issues which will require major structural or non structural controls?

1. Yes
2. No
3. Unsure



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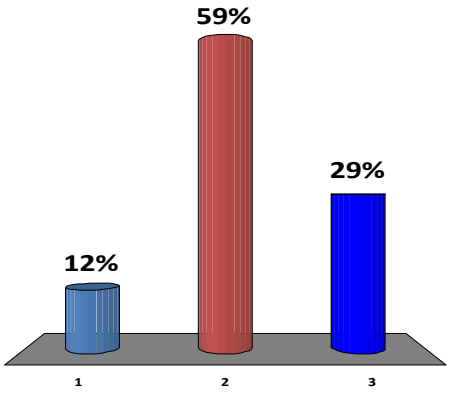
Water Quality Question 2

Do you have identified financial resources to address water quality issues?

1. Yes
2. No
3. Unsure



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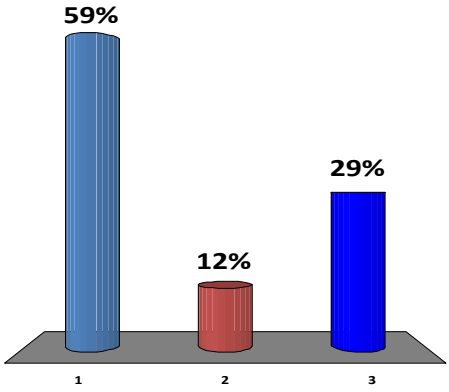
Water Quality Question 3

Do you have identified plans or projects to address water quality issues?

1. Yes
2. No
3. Unsure



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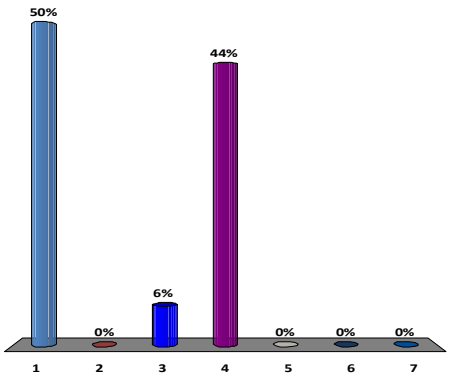
Water Quality Question 4

Which is your most important issue?

1. Sediment
2. Nutrients
3. Bacteria
4. Erosion (high flows)
5. Base flow (low flows)
6. Other
7. No major issues



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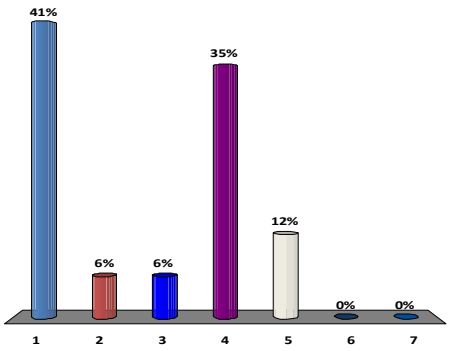
Water Quality Question 5

Which is your second most important issue?

1. Sediment
2. Nutrients
3. Bacteria
4. Erosion (high flows)
5. Base flow (low flows)
6. Other
7. No major issues



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Restoration

Considerations:

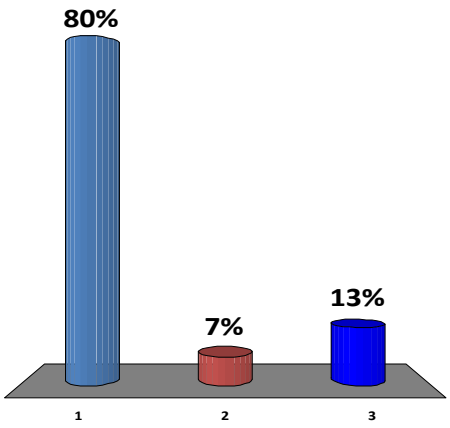
- Wetland and stream restoration
  - Erosion control /stabilization
  - Restore natural features
  - Floodplain connectivity
  - Riparian/aquatic habitat
  - Buffers

55

Restoration Question 1

Have you incorporated stream or wetland restoration as a part of previous projects?

1. Yes
2. No
3. Unsure



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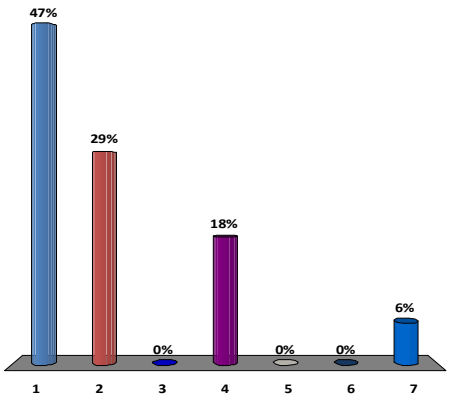
Restoration Question 2

What type of restoration have you completed?

1. Stream stabilization
2. Buffer creation
3. Restore natural features
4. Wetland creation/restoration
5. Aquatic habitat
6. Other
7. No experience



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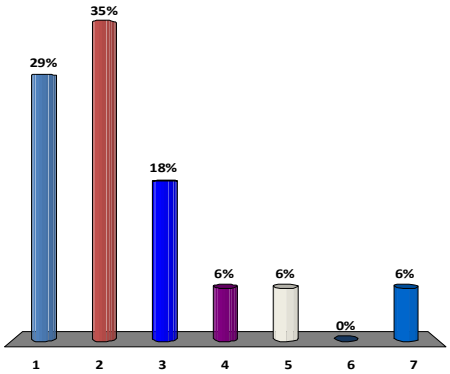
Restoration Question 3

What type of restoration would most benefit your area of interest?

1. Stream stabilization
2. Buffer creation
3. Restore natural features
4. Wetland creation/restoration
5. Aquatic habitat
6. Other
7. Unsure



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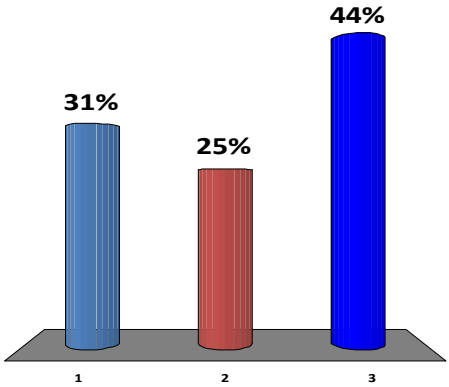
Restoration Question 4

Is there funding available for restoration in your area of interest?

1. Yes
2. No
3. Unsure



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Introduction of Small Groups

Themed by issue

- Flooding, water quality, restoration

Small groups will rotate through each of the three themes

- 30 min, 30 min, 30 min

Goals:

- Identify types of problems and hotspots
- Discuss reasons/causes of problems
- Review need assessment factors/metrics
- Discuss applicable previous work or available datasets

Conclusion:

- Summarize particular issues facing the County and ways to determine areas with the greatest need for improvements

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Breaking into Groups

- Group number identified on your Agenda
- 10 minute break for refreshments
- Form into your small groups
  - Group 1 (Flooding) – Conf. Room
  - Group 2 (Water Quality) – Stage Right
  - Group 3 (Restoration) – Stage Left
- Group rotation will be clock-wise

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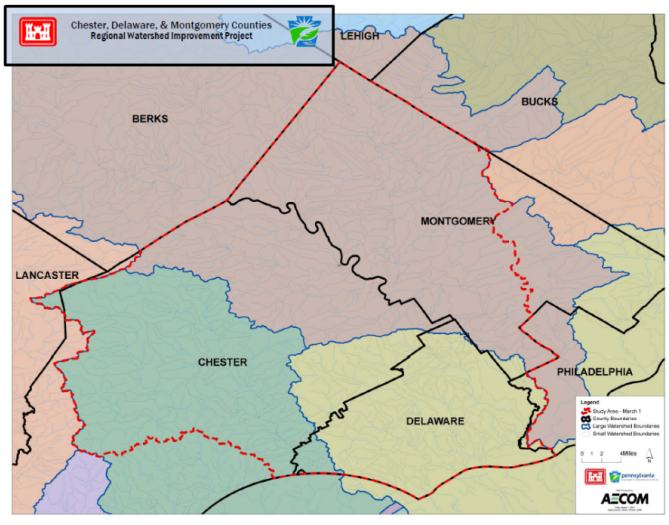
Small Group Sessions



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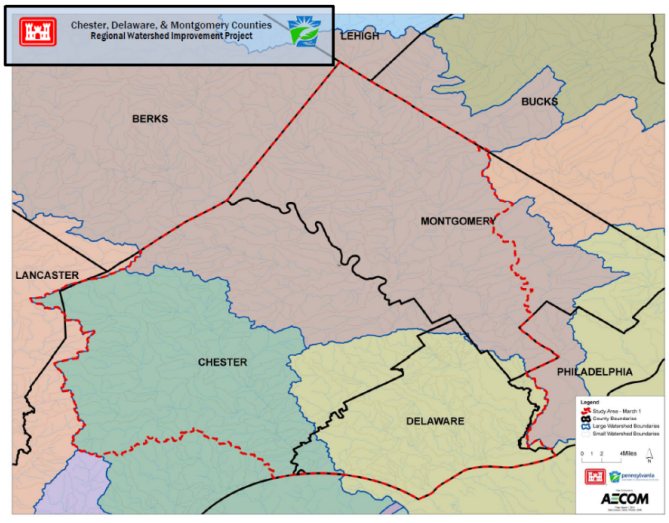
Recap - Flooding



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Recap - Flooding

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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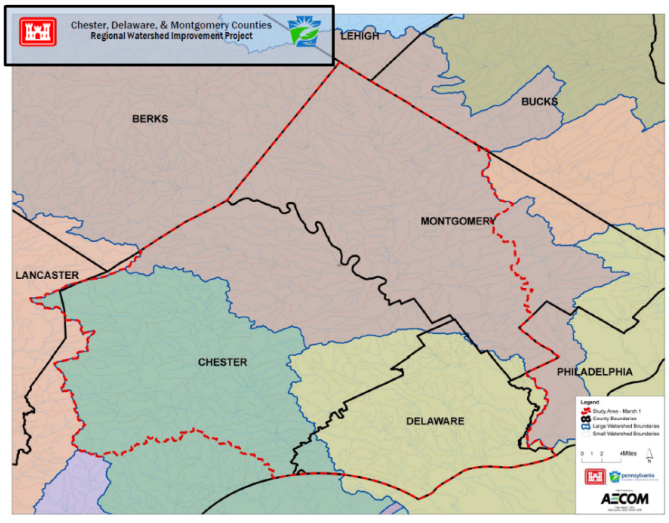
Recap – Water Quality



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Recap – Water Quality

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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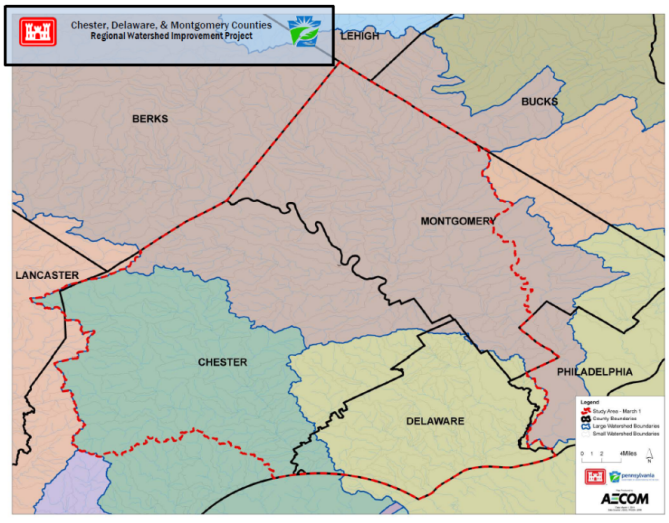
Recap - Restoration



69

Recap - Restoration

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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Additional Comment?

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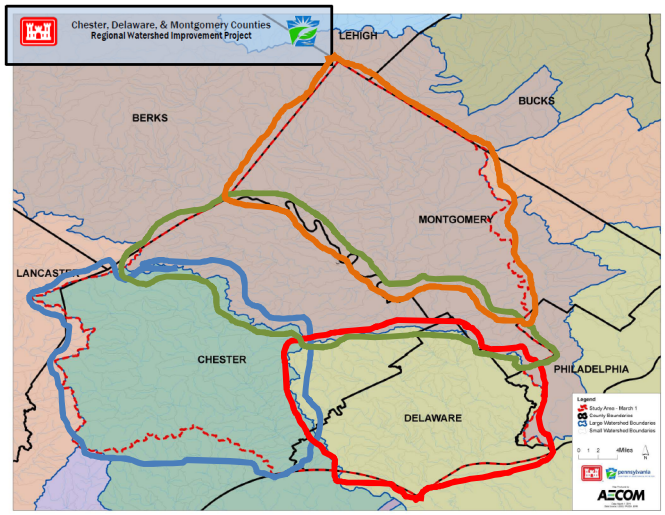
Prioritization Areas



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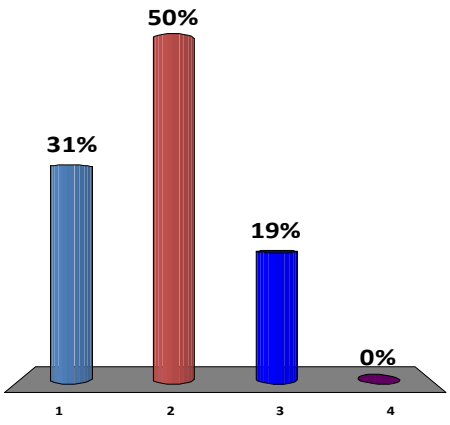
NS Schuylkill – Question 1

What is the most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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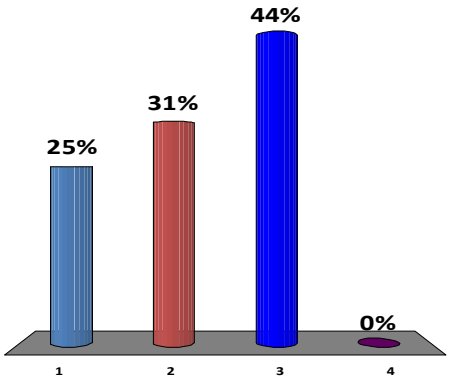
NS Schuylkill – Question 2

What is the second most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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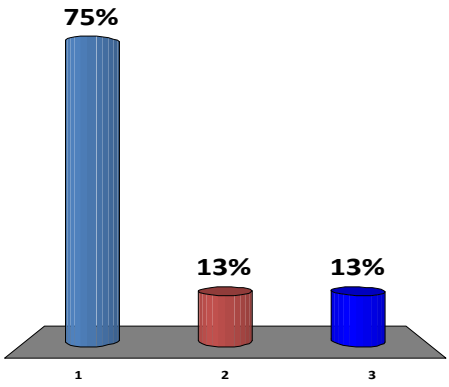
NS Schuylkill – Question 3

How would you describe your watershed issues?

1. Legacy problems
2. Growing problems caused by new development
3. Difficulty in complying with future regulation



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Project Phases

Phase 1	**Public Coordination & Involvement**
Phase 2	**Data Collection, Organization & Analysis**
Phase 3	**Develop a Decision Support Tool** Assessment of Existing Conditions & Identification of Priority Areas for Watershed Improvements
Phase 4	**Project Alternatives Development** Develop project alternatives to address watershed issues in priority areas identified in previous phase
Phase 5	**Preliminary Project Design** Preliminary project design, cost & schedule estimates, funding coordination, NEPA / environmental studies

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Future Involvement/Schedule

2011	March	Stakeholder Meetings March 29, 30, and 31
	April	Post Stakeholder Meeting Summary on Website for Review and Comment
	April to December	Decision Support Tool Development
2012	January	Public Forum(s) to Debut Decision Support Tool Stakeholder Comment via Website
	February	Revision of Decision Support Tool Develop USACE Rankings for 4 Watershed Areas
	March	Public Forum(s) on Prioritization, Applicability & Uses Finalize & Upload Decision Support Tool to Website Stakeholder Comment Via Website
	April	Select areas for initiation of project alternatives development by USACE

Steering Committee

Steering Committee

Steering Committee

Steering Committee

Steering Committee

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Future Communications

- Project website (under construction)
  - http://www.nap.usace.army.mil/Projects/spe/
- Regular email updates every 6 weeks
- Regular Steering Committee meetings
- Future Public Meetings
  - January 2012
  - March 2012

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Data Collection

- Provide contact information and description of Data to Facilitator staff
- We will follow up with you to collect your applicable data

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Key Take Away Points

- Excited to work with you to:
  - Develop centralized watershed data
  - Develop GIS-Based Decision Support Tool
- Support regional watershed planning efforts
  - Decision Support Tool to be publicly available & customizable
- Provide means to leverage USACE resources in the design and construction of priority watershed improvement projects

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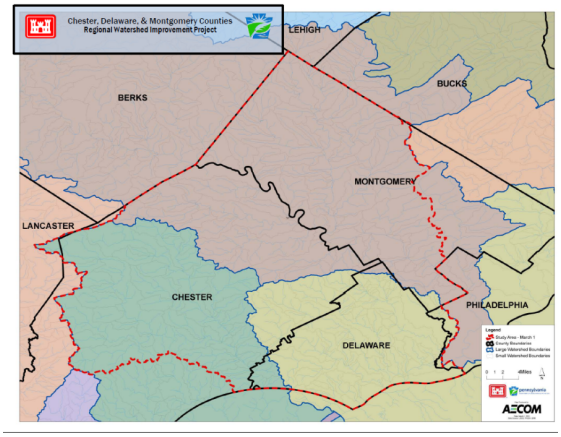
THANK YOU!



Please return your Turning Point clicker on exiting

Small Group Session Summary

Notes For Montgomery County (3/30/2011)
Flooding Breakout Session
Facilitators: David Burke (PADEP) and Andy Wohlsperger (AECOM)

	Montgomery County Flooding Breakout Session 03/30/2011			
Index	Issue Category	Watershed	Location	Description
1	Stormwater, property damage	Schuylkill	Map 1 Lower Merion TWP; Mill Creek and other small streams	Twp-sponsored stormwater study was conducted and several items from the prioritized list have been addressed. There are several items that still require funding and haven't been started. Flood damages occurred on residential property, roads and other property.
2	Stormwater; residential	Schuylkill	Map 2 Whitemarsh TWP (small streams)	Twp-sponsored stormwater study identified and prioritized stormwater improvement projects. Some of those were designed at $11MM total cost. 3 projects have been completed. On Baron Hill Rd sewers to redirect run off have been installed or fixed to help with conveyance. Catch Basin got fixed) There is some residential flooding as well, community currently working with FEMA on buyout options. Some roads are impassable in the community as well during storm events.
3	Other	Skippack/ Perkiomen confluence	Map 3 / Lower Providence TWP	Several naturalization projects have been completed by the TWP to restore basins to their more natural state to help flooding issues within the watershed and recharge the water table.
4	Data	County-wide		USGS noted existence of gages, information and various datasets.
5	Other	Wissahickon (Outside project study area)	Map 4 Springfield Twp	Needs data to quantify issues in order to justify funding for improvement projects outside their own jurisdiction. (Doug Hetter)
6	Stormwater	Perkiomen	Collegeville Boro	Route 29 gets blocked and some houses flood during storm events 1-2 times per year.

7	Stromwater	Perkiomen	Map 5 Schwenksville	Plank Rd and Park get impassable during events along the route 29 corridor
8	Residential	Schuylkill	Map 6 Mingo Creek Royersford Boro	Flooding overtops the banks and floods community. Residential damage. ("Riverwalk" new development that floods to some extent)
9	Residential	Schuylkill	Map 7 Port Indian (West Norriton Twp)	Flooding occurs at the marked location
10	Commercial/Transportation	Wissahickon (Outside project study area)	Map 8 Upper Dublin TWP	Fort Washington Business Park and Fort Washington Interchange of PA Turnpike; located in the floodplain and experiences flooding regularly
11	Drainage	Perkiomen	Map 9 Schwenksville Borough	Spring Mountain Rd; Bridge overtops
12	Drainage	Valley Creek and other small creeks.	Upper Merion TWP	The mall floods. Limestone rock; complex hydrology. Large impervious area.

Other mentioned data:
Updated 167 plans are available for Swamp Creek and East Branch

Notes For Montgomery County (3/30/2011)
Water Quality Breakout Session
Facilitators: Jay Braund (PA DEP) and Ross Gordon (AECOM)

Water Quality - Montgomery County

- Municipalities are financially stressed. With new MS4 and TMDL regulations, municipalities are looking for ways to pay for all of this.
- Major issues are peak flows, erosion and sediment. Bacteria is still an issue. CSO issues in places like Pottstown and Norristown. Treatment plants usually OK, but septic systems and sewer overflows cause problems. Causes of sediment include new construction, erosive stream conditions, and lack of volume control. Eastern areas have high velocities and lack of volume control, western areas are still developing or are agricultural and have sediment loading issues and nutrient issues.
- Interest in TMDL credits for extending public sewer system to on-site sewerage areas.
- TMDL requires unrealistic reductions.
- Sediment issues due to deforestation, development, impervious cover.
- Emphasis should be on preserving open space in large lot residential, industrial, and commercial areas. Conversion from grass to meadow or woodlands is very beneficial.
- Farming Preservation Program may work against efforts to encourage the re-establishment of buffers along agricultural lands.
- Much uncertainty over where sediment is coming from. Is it land-based or in-stream erosion? Don't know where to put the project. Also need to figure out how volume reduction coverts to sediment reductions. USGS suggests sediment fingerprinting to help locate sources. "Uncertain science leads to an uncertain fix".
- Should emphasis or prioritize the re-establishment of hydrologic conditions. Need to reduce volume and support baseflow.
- Work in Valley creek is good example of progress on sediment and erosion.
- Need more long term projects to measure water quality problems and solutions. Concern over 'objectiveless' projects which may not address key issues.
- County does have some records on historic dams. DEP orphan dam program could also help to identify potential sources of legacy sediment.
- Heritage Conservancy has also just completed a Riparian Buffer Assessment and has received funding for an update.
- PWD has lots of water quality data on the main stem of the Schuylkill. Stroud Water Research Center also has 15 years of water quality data for the Schuylkill.
- Pennsylvania Environment Council on Sediment Trading.
- Confusion over who owns which waterways and who is responsible for restoration or maintenance.
- USGS has continuous water quality monitoring on the Brandywine.
- Lower Marion Conservancy has annual report for Mill Creek Basin.
- Issues with structurally deficient bridges. PennDOT wants to replace, but does not have authority to go beyond the ROW. Therefore bridge retrofit or replacement projects often do not significantly improve erosion/sediment issues.

- Could tie back sewer overflows to potable water quality. There are many water quality intakes which are impacted by overflows.
- Need science to get political support necessary for regional solutions. Need to convince tax payers why doing a project upstream will help them. Need to be certain that this project will have the expected outcome. Biggest concern is spending money and seeing no benefit. Need to be able to quantify load reductions from regional projects to allocate back to municipalities for meeting the TMDL reduction requirements.
- Aqua PA has inventory of dams on the Perkiomen.
- DEP has a database of buffer projects. Revitalization projects are required to register on database.
- Tool should help to identify sources, rather than impacts. Because addressing the sources is most often the most cost effective solution.
- Most municipalities do not have GIS software, therefore a web-based server would be preferable.
- Every two years the DEP and Conservation Disrtricts submit Annual Reports.

Restoration 1 – Montgomery County

- Heritage Conservatory worked on ID'ing impaired streams for entire county
- Property owner complaint driven
- Property loss and safety are two biggest reasons for stream restoration
- Counties and regional groups see it more as a tool for flood abatement but not necessarily restoration for aesthetics or recreation or wildlife
- Elected official – politics is big constraint – two issues – 1) will or the people and needs – ecological issues are important and 2) funding – there is a will by the people to restore nature for "right" reasons
- People want the ecological work done but as elected official you have to find the funding under some other name like flood control – hard to find funding for sake of wildlife or recreation or aesthetics
- Restoration = gradual slopes, addressing stormwater outfalls, energy dissipaters, vegetation, getting municipalities/developers to do riparian corridors,
- Educate people to see opportunities
- Elected official failed to pass an ordinance that could enforce riparian buffer protection/no development zone because they could not define which properties are on "real" streams due to ephemeral vs intermittent – passed to environment commission (EIC) who are now trying to define those properties that are on streams and need riparian buffers
- Elected official said actually have ordinance forbidding riparian buffers – tall grass buffer – trying to pass ordinance now to make them permittable
- Looking for local solutions BUT also how to work regionally to help regional area – realize that bandaid approach is not going to work
- DST could help local gov't show that regional solutions that could be up or downstream and not necessarily in the municipality – need scientific/engineering evidence – but if had that could get buy-in for taxpayers to fund "out-of-town" projects if they helped their issues
- Maintenance is an agenda item but working – if you have volunteers to work with staff it works – environmental groups funded by municipalities but composed of volunteers as well and "friends of" organizations and university service days provide volunteers to do maintenance
- Prioritization factor is long-term maintenance – need to get commitment from whomever
- Site specific maintenance/O&M plans are getting done
- Studies out there on specific streams in SE PA on conditions of streams/impairments/types of impairments, where riparian buffers are or are not
- Skewed to projects that will improve water quality for a potable water source; upstream of water source intake is priority
- Montgomery co as a whole – opportunities/issues varies – have heavy nutrient loads in western part but more urbanization and stormwater issues in lower part; universities have heavy loads from athletic fields
- Issue is not necessarily in ID'ing problem area, but getting landowner to buy-in to project – NIMBYism & issue with farmers losing land use are problems

- Natural areas inventory by Morris Arboretum in conj with Montgomery Co – available online on county website
- Longevity of project is metric; ability to have continuous areas/corridors – i.e. multiple residents buy-in
- Within municipality boundaries for elected officials
- Open space/trail opportunities integrated with wildlife/recreational/aesthetics & flood & water quality – multiple fixes for multiple problems and/or multiple communities – look at county trail map on website
- Use 2010 FEMA flood maps – every municipality is supposed to let residents know if they have had a change in status – so there is a parcel by parcel list of changes – note that changes are due more to accurate mapping and not necessarily change in conditions – shows who is most effected and who has to pay insurance
- Bad planning in past is exacerbating problems – it was never good; past development is issue
- Guidelines in place for new development but this will not solve the problems – future is not the problem

Restoration 2 – Montgomery County

- County Planner - restoration has occurred in two ways:

  1) Restoration projects that the county has been involved in

  – township park, bend of the east branch eroding township road – is there a "responsible" way of fixing that with dumping riprap
  – private property wants to fence stream to keep cattle out and restore buffer
  – have done work on Schuylkill river

  Erosion reduction and other ecological benefits – see immediate results

  2) Overall goal of writing zoning and land development ordinance that try to restore or preserve pre-development conditions as much as possible

- Restoring hydrology is big benefit and also water quality but takes years for results to really be apparent
- Education will help - try to convince people that you don't have to mow all open space/public property – converting large areas to meadow – needs education, necessitates changing the philosophy that people are used to – came about by influx of people that changed natural areas to more densely populated areas with a lot of impervious surfaces – we need to go back and change what we have been doing because we are impairing our environment and dropping the water table and drying up wells – but you can't change development back to forest
- Would like to see before and after evidence at valley forge where they mow less
- Some municipalities have tried to naturalize detention basins, but that's a small number

- WSUD/LID solutions are popular among environmental groups – lack of knowledge of how useful they can be; lack of incentives – short term cost is more – in Philly there is a financial incentive; upper watersheds there may be regulatory incentive but financial incentives are not as apparent, especially in this economy
- Community college parking lots – big opportunities for retrofits but just redid parking lots so can't spend money – county is working with them to naturalize sediment basins
- Money is big issue – no money to do anything new – just trying to maintain existing infrastructure
- Local gov't is getting regulations pushed on them – unfunded mandates – and no money to implement
- County should be able to coordinate with local municipalities and their own departments to incorporate WSUD/LIS/restoration for new projects – can we regulate/mandate/guideline this – need to look at this comprehensively
- Directing emphasis to headwater streams/critical areas will be priority
- Looking for solutions in areas of heavy development and impervious surfaces – to increase infiltration
- Cost-benefit analysis should be priority
- Projects with visible, immediate benefits to sell public & politicians – aesthetics are important to tax payers
- Right now, priorities are - Property owner wants it – erosion issue or farmer needs help restoring stream bank; Environmental organization knows some way to make it "go easier"; Permitting or lack of need for permitting it easier
- Maintenance is issue for bigger water quality/TMDL methods – look at in-lieu fee or other ways to meet permit requirements in a "smarter way"
- Reduced mowing can be lauded as reduced maintenance – savings can fund other projects
- Implement projects with less maintenance which imparts lower future costs
- Look at long-term open space restoration – lawn to forest; farm to forest; abandoned golf courses; easements with large office buildings – people need to see benefit of municipalities have open space acquisition
- Assessing water quality improvements is priority – benefit to restoration method on water quality improvement

Restoration 3 – Montgomery County

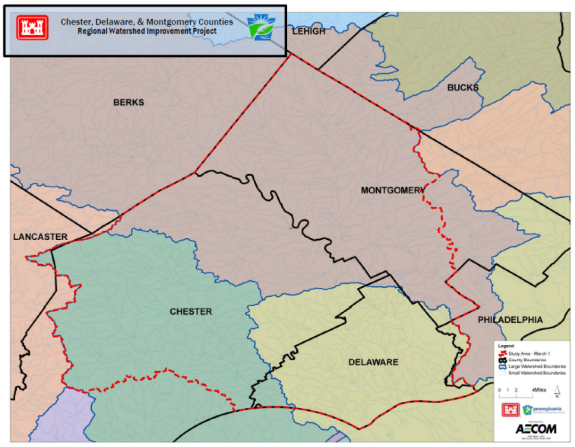
- Restoration = Naturalize sediment basins – rip out low flow channels and vegetate with aesthetically pleasing flowering plants and planting trees in upper zones
- Restoration = remove concrete lined stream banks to naturalize – did it both for "stream health" and sediment load and erosion issues – heard this from residents
- Restoration = plantings and shaping – has helped flooding – heard this from residents
- Grant money helps; growing greener; municipality money allocated; sed basins from DEP money; grants

- Stream stabilization issues = erosion/property loss complaints from property owners; then also sediment loading complaints
- Tributaries that enter Schuylkill River all have big opportunities for stream restoration – public focus is erosion and sediment loading; environmental groups do recognize/want to improve ecological health
- Over 15 years projects funded through Growing Greener with no quantifiable objectives – they just say fix erosion or get sediment out of stream – priority should be projects with quantifiable objectives
- Also, lack of maintenance plans or implementation – structures put in and then people move on with monitoring or maintenance – lack of follow-up
- Funding out of township to solve problem would be hard sell – but technical/monetary/tangible evidence could help
- Problem in bringing people who have problem to the table to educate them
- Cost-benefit is priority
- Elaborate 3-D modeling – visual could really help buy-in – even before they see the cost-benefit
- Elected officials & board all have primary jobs so the education needs to be at night – these are the people you need to convince
- Go to EAB meetings and board meetings at night – traveling show that's 15 min agenda item
- Presentation on local TV channel; library video – different target audiences
- Public benefit priority over private benefit, unless its not cost effective
- Projects that "fix the problem" instead of "Fix a symptom"
- Start at the top of watershed – may have to say no to bottom of watershed
- Pick projects that have likelihood of success – lower hanging fruit from the standpoint of function success
- Continuous stretch of restored area is priority
- Within entire county townships have differing problems and differing level of problems – so there will be differing levels of buy-in
- White marsh – top 3 issues – addressing stormwater for many residents is bigger issue than trash pickup

Appendix C – Chester County: Workshop Presentation & Small Group Session Summary

Presentation

Chester, Delaware & Montgomery Counties
Regional Watershed Improvement Project



STAKEHOLDER WORKSHOP

Chester County
March 31, 2011

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Introductions

U.S. Army Corps of Engineers – Philadelphia District
- Erik Rourke
- Tricia Aspinwall

Pennsylvania Department of Environmental Protection
- Jay Braund
- David Burke

AECOM
- Ross Gordon
- Karen Appell
- Andy Wohlsperger

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Meeting Schedule

Hour 1	**Project Introduction & General Discussion** (with Turning Point questions)
Hour 2 and 3	**Small Group Workshops** Flooding – Water Quality – Restoration
Hour 4	**Addtl. Input, Recap and Review of Next Steps** (with Turning Point questions)

****** Interactive and collaborative process ******

6

Project Overview

Chester, Delaware & Montgomery Counties Regional Watershed Improvement Project

- Authorized and funded through efforts of Congressional Representatives
- Collaboration of the U.S. Army Corp of Engineers (USACE) and the PA Department of Environmental Protection

7

Project Focus

- Improving and protecting surface water resources and environmental infrastructure in the three County region
  - Flood risk management
  - Water quality improvement
  - Ecological restoration
- Mandates an integrated, region-wide, assessment of need and coordination of proposed solutions

"We cannot fix regional flooding and watershed problems, such as need for ecological restoration and erosion control, solely with band-aid solutions that each only deals with concerns of a small community."

Former Congressman Sestak

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Integrated Solutions

Integrated solutions traditionally provide:

- Better benefit/cost ratio
- More focused solutions addressing core issues

Enhance cost and benefit of project:

- Avoid duplication of efforts
- Leverage funding
- Pool and share limited resources
- Promote data sharing

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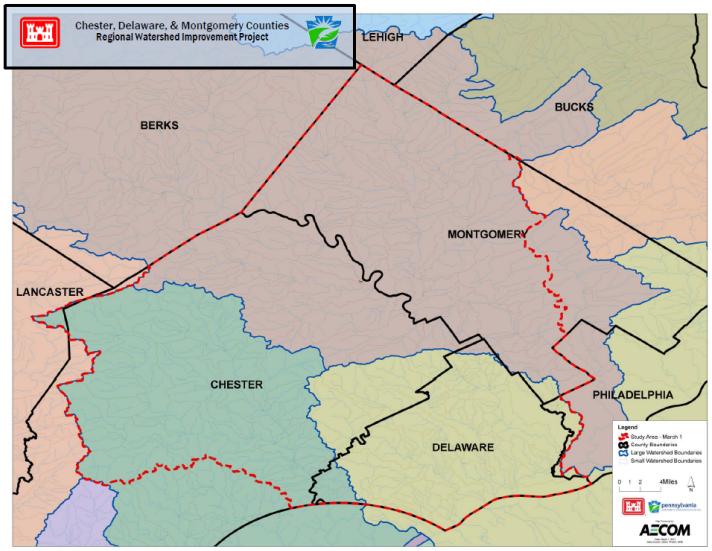
Project Area



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Project Phases

Phase 1	**Public Coordination & Involvement**
Phase 2	**Data Collection, Organization & Analysis**
Phase 3	**Develop a Decision Support Tool** Assessment of Existing Conditions & Identification of Priority Areas for Watershed Improvements
Phase 4	**Project Alternatives Development** Develop project alternatives to address watershed issues in priority areas identified in previous phase
Phase 5	**Preliminary Project Design** Preliminary project design, cost & schedule estimates, funding coordination, NEPA / environmental studies

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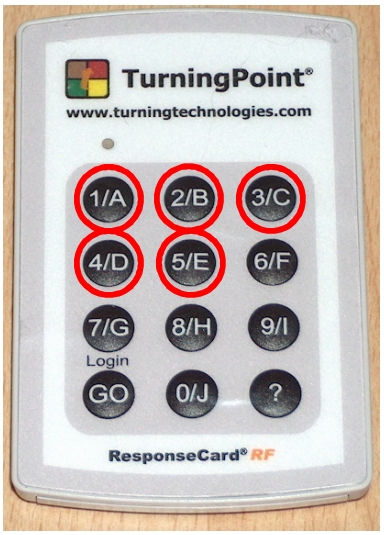
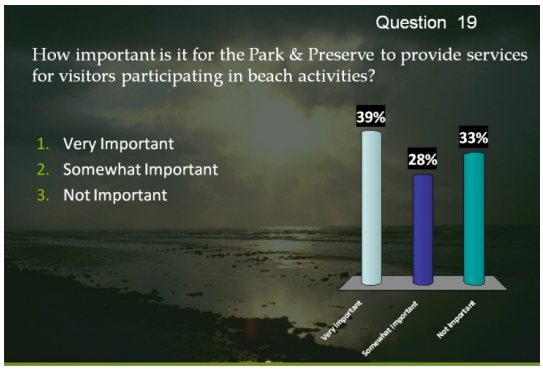
Turning Point Introduction





Please return your Turning Point Clicker on exiting

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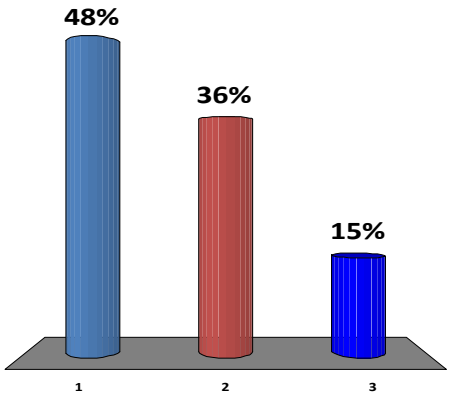
Sample Question 1

Will the Phillies win the World Series?

1. Yes, of course!
2. Maybe, we'll see…
3. Not a chance!



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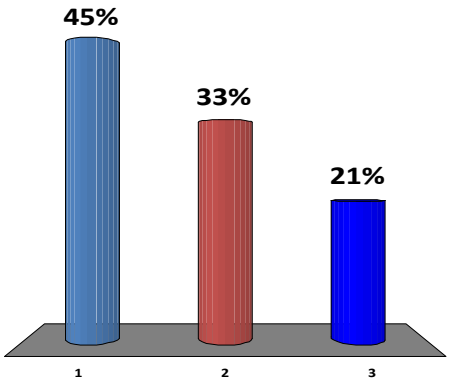
Overview Question 1

What brought you here today?

1. Desire to develop regional solutions
2. Opportunity for funding support
3. Just part of the job…



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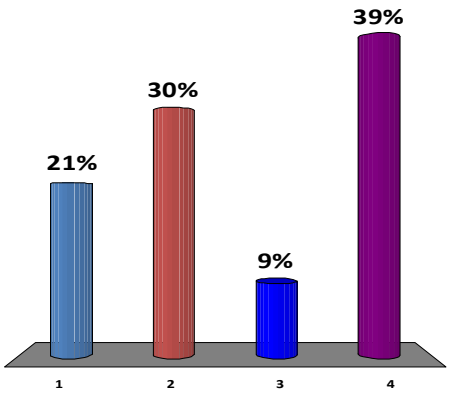
Overview Question 2

What intrigues you most about this project?

1. Addressing problems collaboratively
2. Developing integrated, regional solutions
3. Opportunity for larger projects
4. Funding support



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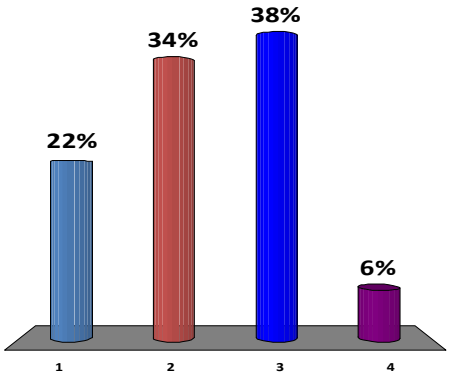
Overview Question 3

Which issue matters most to you?

1. Flooding
2. Water quality
3. Restoration
4. Other



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Project Goal #1

Assist local entities in regional watershed planning

- Identify areas in greatest need of watershed improvements
- Prioritize and develop integrated regional solutions to watershed management problems

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Project Goal #2

Identify and prioritize areas where the USACE could assist in design and construction of priority regional watershed improvement projects

- Funding Distribution: 75% Federal / 25% Local
- Design Build Authority under Section 566 of WRDA 1996

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Deliverable

GIS-based Decision Support Tool

- Centralized watershed data for three county region
- Provide objective assessment of existing conditions and issues facing the project area
- Provide consistent decision-making approach for the region
- Facilitate discussion of watershed issues and solutions
- Assist in regional coordination, fundraising and project definition efforts
- To be made available to stakeholders to allow others to continue to use, update, or enhance

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Deliverable

1st step in leveraging USACE resources for regional watershed improvement projects

Decision Support Tool will:

- Provide objective assessment of existing conditions and issues facing the project area
- Identify priority areas/problems for USACE involvement
- Produce ranked list of priority areas for each major watershed area
  - Brandywine
  - Direct to the Delaware Tributaries
  - South Shore – Schuylkill
  - North Shore – Schuylkill

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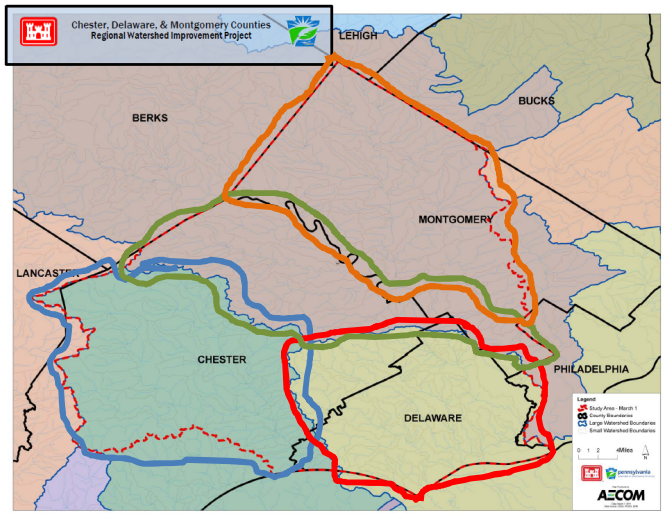
Prioritization Areas



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Future Phases of Project

- Priority areas identified by Decision Support Tool which have local support will move into:
  - Phase 4 - Project Alternatives Development
  - Phase 5 - Preliminary Design
- Area/problem must be identified as a priority through Decision Support Tool and coordination with local partners
- Funding Distribution: 75% Federal / 25% Local
- Funding must be approved and appropriated by Congress
- Design Build Authority under Section 566 of WRDA 1996

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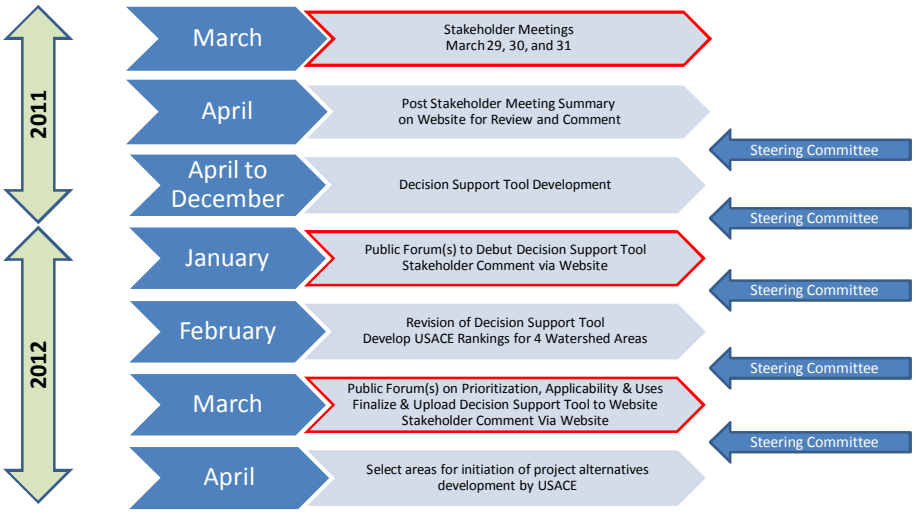
Future Involvement/Schedule



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Project/Problem 'Parking Lot'

- Proposed, preferred, or ongoing projects will not be discussed at this meeting
  - Focus is on problem/need identification
- "Parking lot" station will catalog proposed or preferred projects and issues of personal concern for consideration in later phases
  - Map of Project Area
  - Color coded pins by theme (with number identifier)
  - Place pins at areas of personal concern or proposed/preferred projects
  - Detailed form to be filled out (with number identifier)
- Can also send-in additional forms via email/mail at a later time

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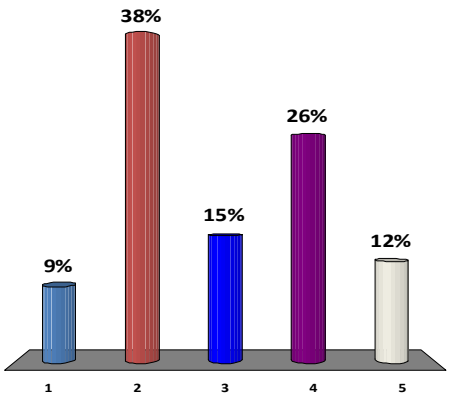
Overview Question 4

What is your affiliation?

1. County official/employee
2. Municipal official/employee
3. Consulting engineer
4. Environmental or Conservation group
5. Other



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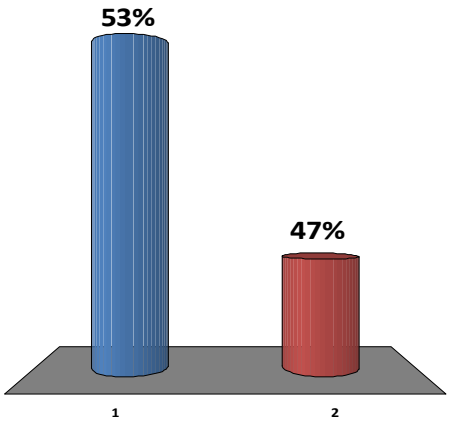
Overview Question 5

Have you worked with the USACE before?

1. Yes
2. No



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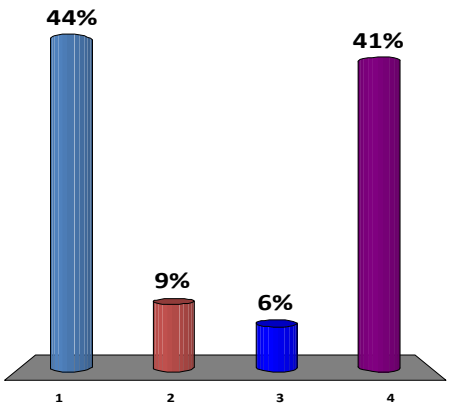
Overview Question 6

What concerns you most?

1. Existing problems
2. Future/developing problems
3. Compliance with current regulation
4. Compliance with future regulation



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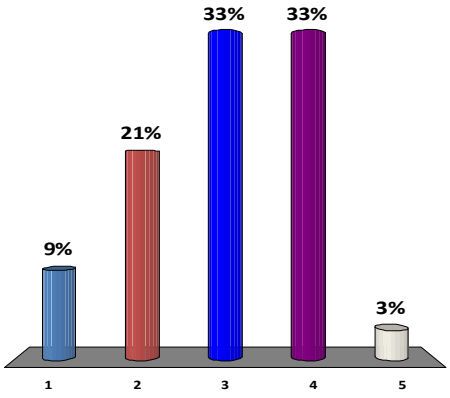
Overview Question 7

Which issue do you need the most help in addressing?

1. Flooding
2. Water Quality
3. Stormwater
4. Ecosystem/stream restoration
5. Other



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Decision Support Tool Goal

Objective Assessment of Need for Improvements

- Build on previously completed work
- Based on readily available geo-referenced information
  - Minimal new data will be collected
- Planning tool for projects of regional significance
  - Includes both structural and non-structural solutions
  - Considers distributed management projects
- Need oriented versus project oriented
  - Projects to be developed later based on assessment and coordination of need across region
- Identify opportunities for regional solutions to multiple problems/needs
- Obtain community input on priorities and preferences

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Decision Support Examples

City of Houston, Texas
Storm Water Enhanced Evaluation Tool (SWEET)

- GIS based analysis tool for prioritizing storm water improvements
- Analysis unit = storm sewer outfall areas
- Produces prioritized list of areas with greatest need for storm water improvements
- Combination of modeling & reporting
- Customizable – can alter inputs and update weightings and prioritization factors

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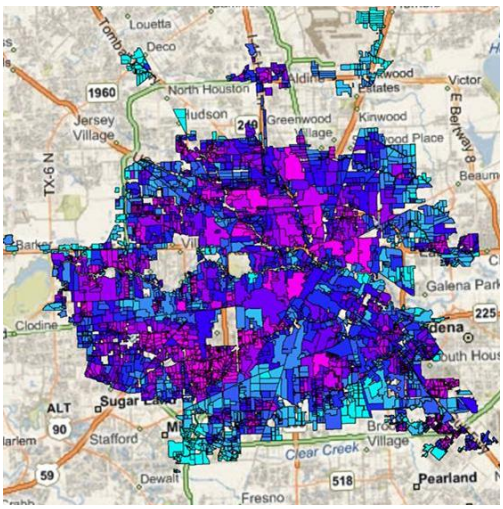
Decision Support Examples

Tool considers:

- Drainage Effectiveness
  - 2 year pipe capacity
  - Resident flooding complaints
  - Ponding areas
- Damages from structural flooding
  - Resident flooding complaints
  - FEMA insured losses
- Mobility impacts
  - Street impassable reports
  - Flooded underpass reports
- Emergency Response
  - First responder reports



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Decision Support Examples

Hawaii

Watershed Prioritization Process

- GIS based analysis tool for prioritizing watershed protection and restoration improvements
- Analysis unit = subwatersheds
- Produces prioritized list of watersheds with greatest need for improvements
- Consideration of land cover, agricultural impacts, nutrient loading, erosion potential, watershed discharge, sensitive natural resources, impaired streams, and several other factors

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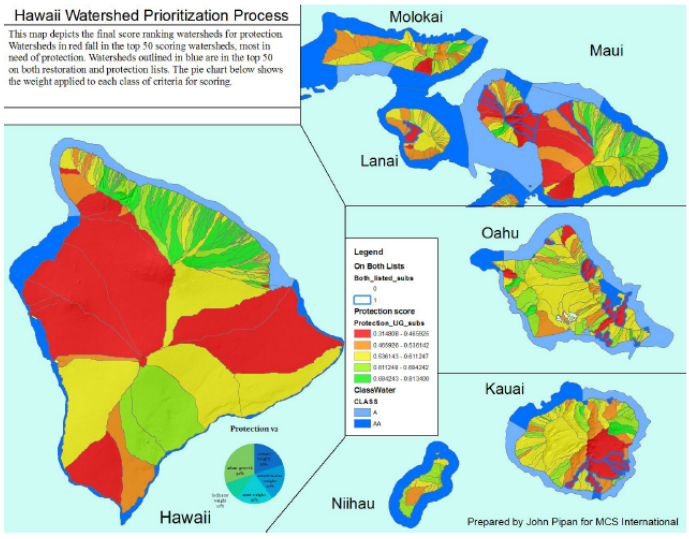
Decision Support Examples



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Tool Limitations

Not looking to:

- Create new datasets
- Perform new modeling

Limited by:

- Scale and resolution
- Spatial/causal connectivity

Will tell you where projects are needed to address major watershed issues

Will not tell you what project to build

- Phase 4 and Phase 5

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How DST Can Help You

- Quantifies need for watershed improvements
- Consistent decision support tool for region
- Facilitates discussion of causal relationships and identification of connected issues
- Assist in development of concepts to address multiple issues
- Watershed-wide prioritization:
  - Planning purposes
  - Support of fundraising efforts
  - Meets grant requirements

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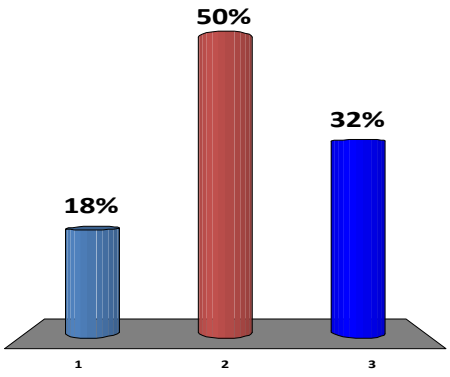
DST Question 1

How helpful would such a tool be in your watershed planning efforts?

1. Not very helpful
2. Moderately helpful
3. Very helpful



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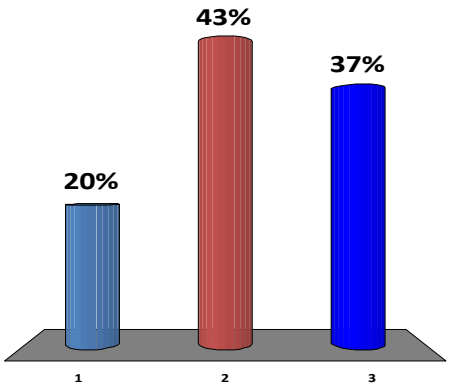
DST Question 2

Are problems facing the region similar in all watersheds?

1. Yes
2. Yes, in some areas
3. No



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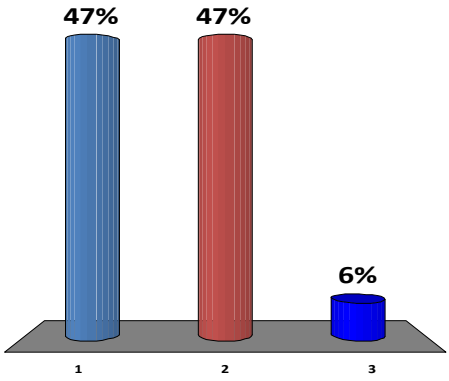
DST Question 3

Are past problems a good indicator of need for improvements?

1. Yes
2. Yes, in some areas
3. No



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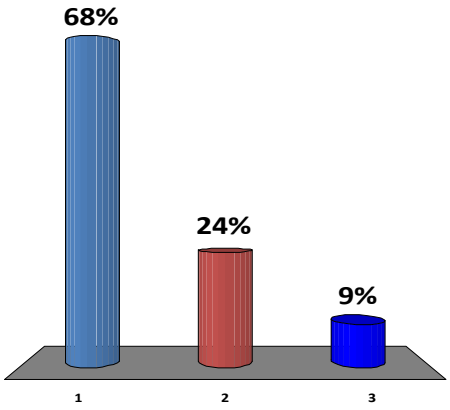
DST Question 4

Are future compliance issues a major driver for improvement projects?

1. Yes
2. No
3. Unsure



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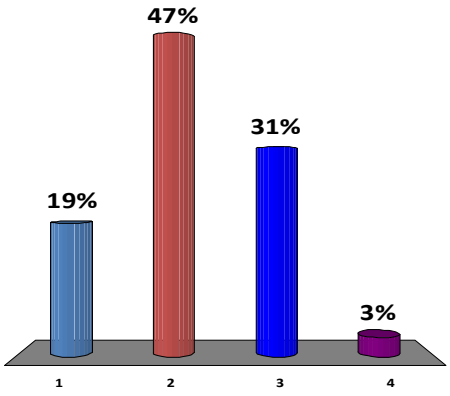
DST Question 5

What might you use such a tool for?

1. Regional planning assistance
2. Project identification and development
3. Fundraising support
4. Political support



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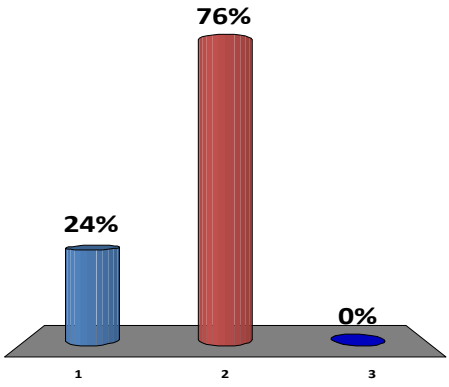
DST Question 6

What would be your preferred method of using the DST?

1. Desktop version (on flash drive or CD)
2. Web-based GIS Server
3. Other



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Focus Areas

Looking for integrated solutions to address major issues in:

- Flooding
- Water quality
- Ecosystem/stream restoration

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Flooding

Considerations:

- Flood damage/risk reduction
- Floodplain size
- Population affected
- Safety and mobility
- Riverine vs. urban
- Stormwater

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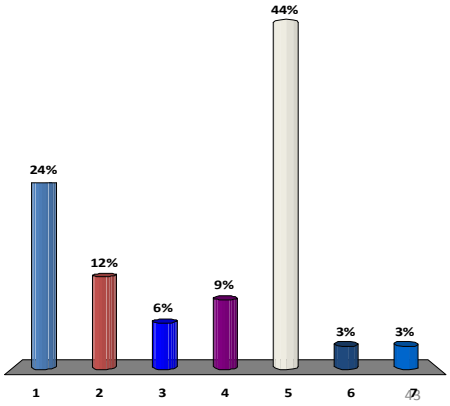
Flooding Question 1

What is your priority?

1. Property damage ($) reduction
2. Minimize population impacted
3. Improve safety
4. Improve mobility
5. Erosion control
6. Economic development considerations
7. Agricultural considerations



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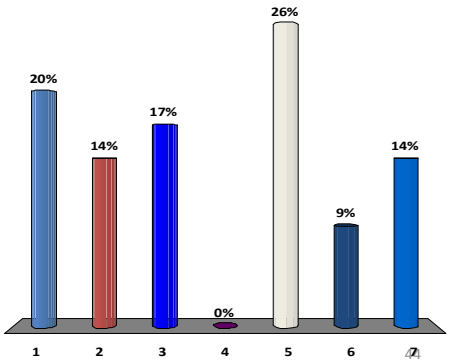
Flooding Question 2

What is your second priority?

1. Property damage ($) reduction
2. Minimize population impacted
3. Improve safety
4. Improve mobility
5. Erosion control
6. Economic development considerations
7. Agricultural considerations



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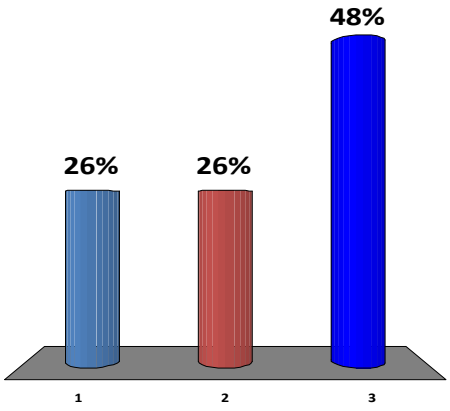
Flooding Question 3

What do you attribute flooding in your area to?

1. Deficiencies in local conveyance (storm sewers, ditches)
2. Deficiencies in major conveyance (streams, rivers)
3. Mix of both



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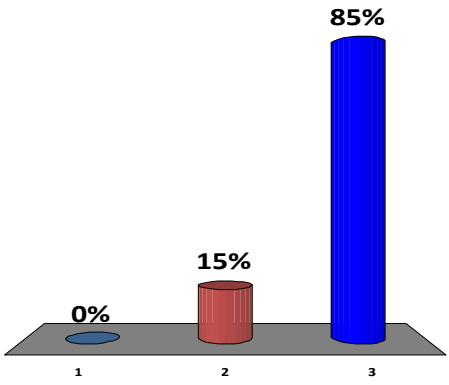
Flooding Question 4

How would you describe your flooding?

1. In houses and businesses
2. In streets and driveways
3. Along the banks of streams and rivers



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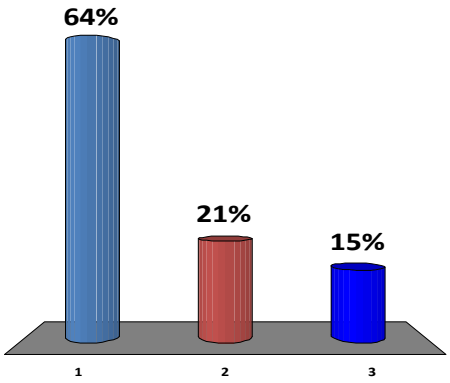
Flooding Question 5

Is your stormwater ordinance enforced?

1. Yes
2. No
3. Unsure



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Water Quality

Considerations:

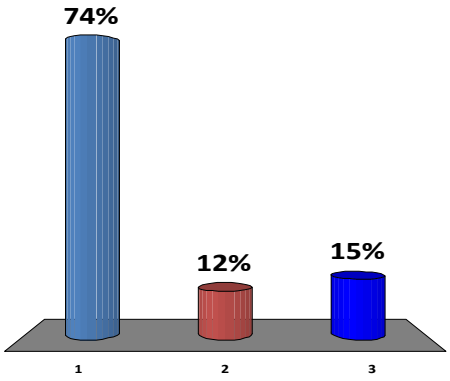
- TMDL, NPDES, NSMP
  - Sediment
  - Nutrients (Nitrogen, Phosphorous)
  - Bacteria
- Environmental flows (low and high)
- Stormwater

49

Water Quality Question 1

Are you facing TMDL/NPDES compliance issues which will require major structural or non structural controls?

1. Yes
2. No
3. Unsure



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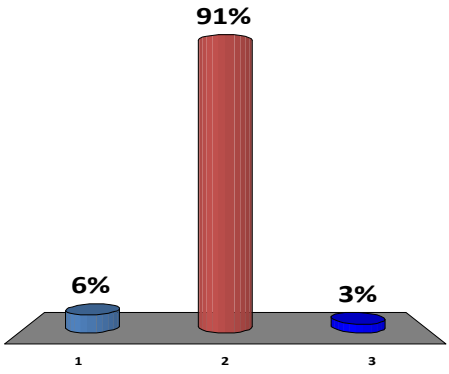
Water Quality Question 2

Do you have identified financial resources to address water quality issues?

1. Yes
2. No
3. Unsure



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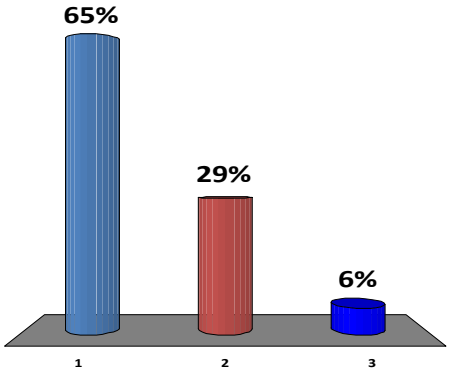
Water Quality Question 3

Do you have identified plans or projects to address water quality issues?

1. Yes
2. No
3. Unsure



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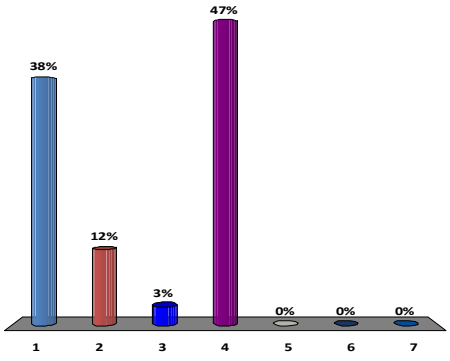
Water Quality Question 4

Which is your most important issue?

1. Sediment
2. Nutrients
3. Bacteria
4. Erosion (high flows)
5. Base flow (low flows)
6. Other
7. No major issues



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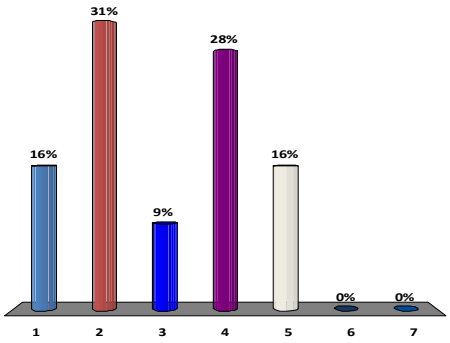
Water Quality Question 5

Which is your second most important issue?

1. Sediment
2. Nutrients
3. Bacteria
4. Erosion (high flows)
5. Base flow (low flows)
6. Other
7. No major issues



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Restoration

Considerations:

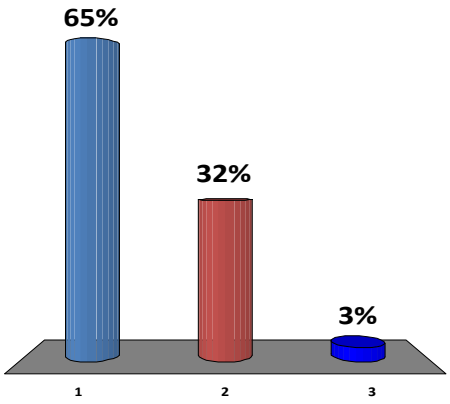
- Wetland and stream restoration
  - Erosion control /stabilization
  - Restore natural features
  - Floodplain connectivity
  - Riparian/aquatic habitat
  - Buffers

55

Restoration Question 1

Have you incorporated stream or wetland restoration as a part of previous projects?

1. Yes
2. No
3. Unsure



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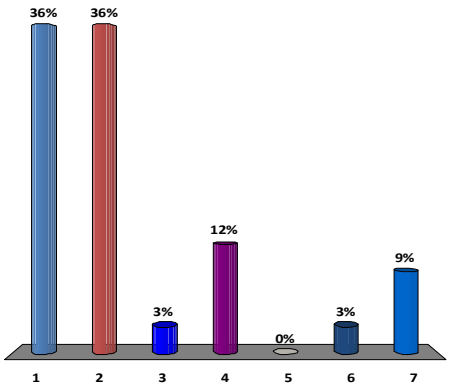
Restoration Question 2

What type of restoration have you completed?

1. Stream stabilization
2. Buffer creation
3. Restore natural features
4. Wetland creation/restoration
5. Aquatic habitat
6. Other
7. No experience



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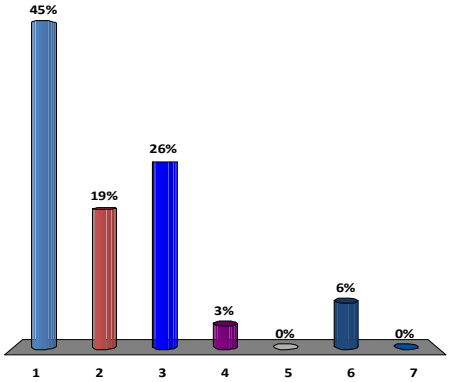
Restoration Question 3

What type of restoration would most benefit your area of interest?

1. Stream stabilization
2. Buffer creation
3. Restore natural features
4. Wetland creation/restoration
5. Aquatic habitat
6. Other
7. Unsure



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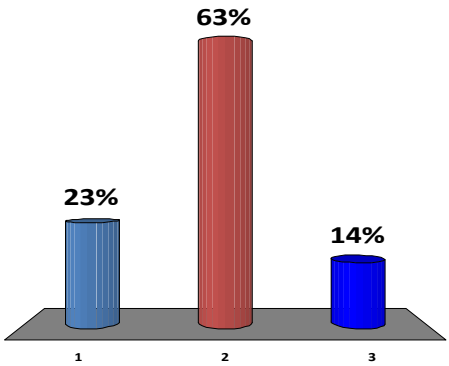
Restoration Question 4

Is there funding available for restoration in your area of interest?

1. Yes
2. No
3. Unsure



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Introduction of Small Groups

Themed by issue

- Flooding, water quality, restoration

Small groups will rotate through each of the three themes

- 30 min, 30 min, 30 min

Goals:

- Identify types of problems and hotspots
- Discuss reasons/causes of problems
- Review need assessment factors/metrics
- Discuss applicable previous work or available datasets

Conclusion:

- Summarize particular issues facing the County and ways to determine areas with the greatest need for improvements

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Breaking into Groups

- Group number identified on your Agenda
- 10 minute break for refreshments
- Form into your small groups
  - Group 1 (Flooding) - Front
  - Group 2 (Water Quality) – Room 270, up one floor.
  - Group 3 (Restoration) – Back
- Group rotation will be clock-wise

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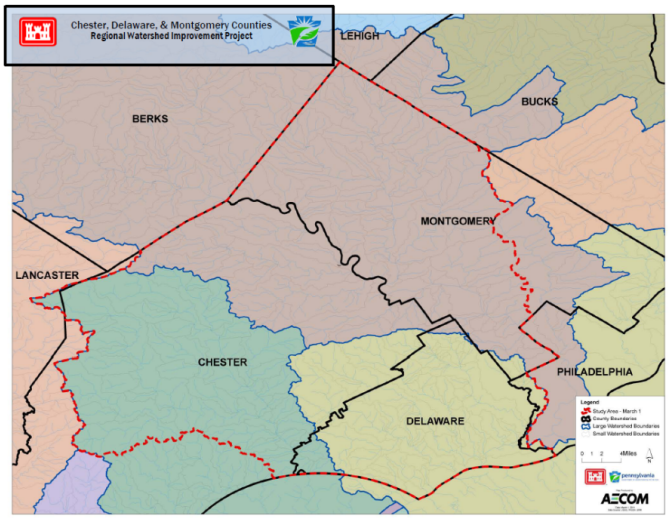
Small Group Sessions



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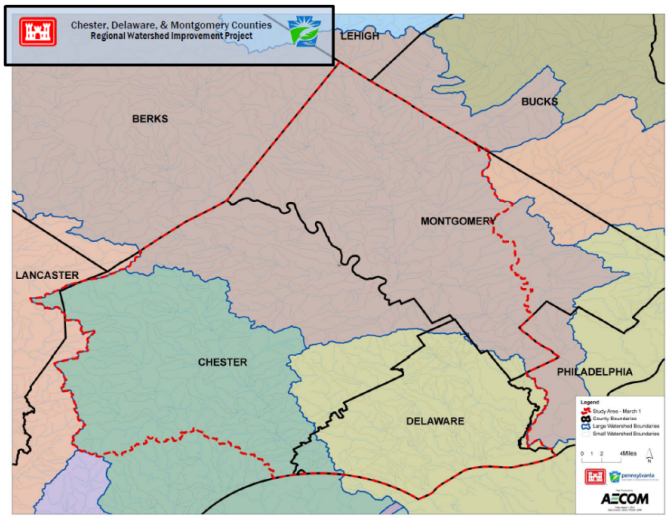
Recap - Flooding



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Recap - Flooding

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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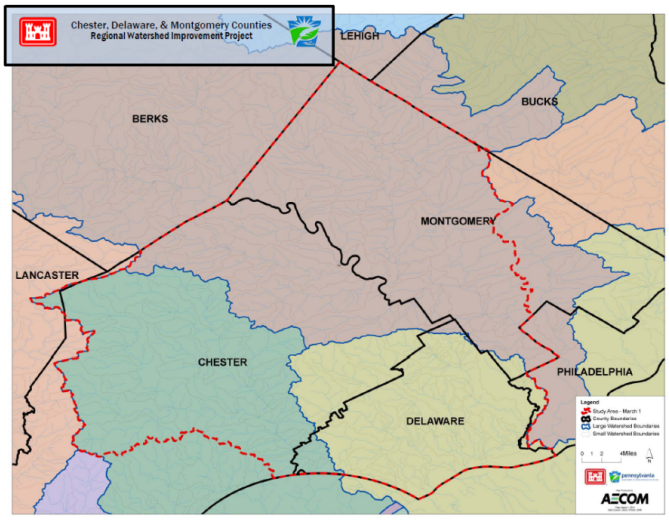
Recap – Water Quality



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Recap – Water Quality

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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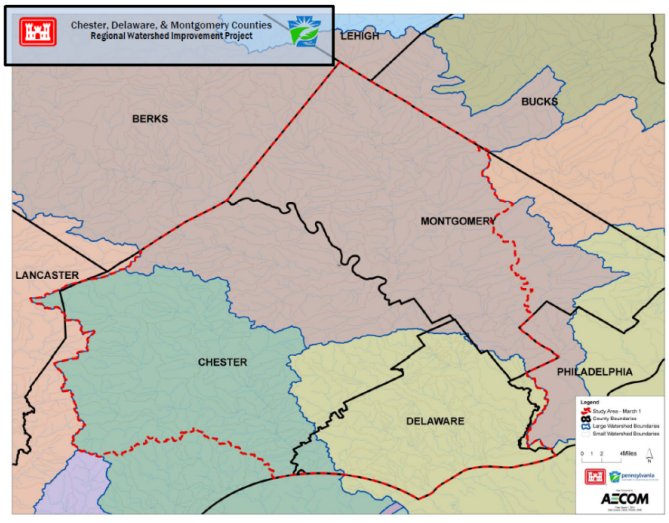
Recap - Restoration



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Recap - Restoration

- Description of type of problems facing the area
- Description of location of problems facing the area
- Description of reasons/causes of problems
- Discussion of factors/metrics to assess need

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Additional Comment?

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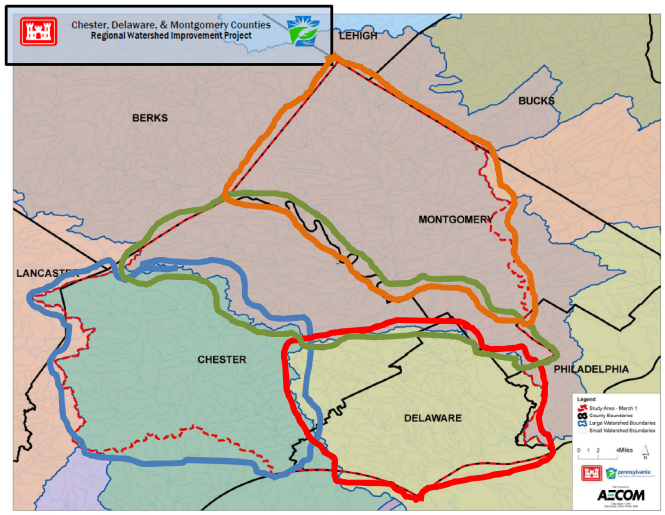
Prioritization Areas



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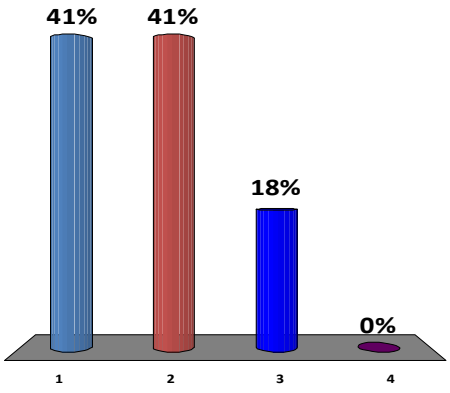
Brandywine – Question 1

What is the most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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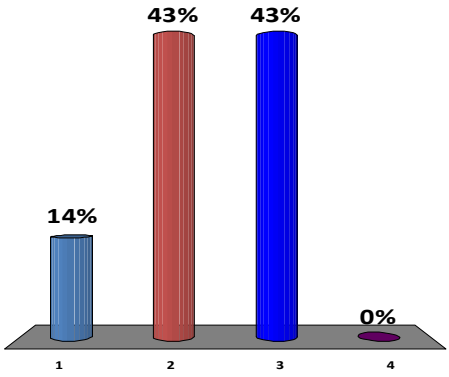
Brandywine – Question 2

What is the second most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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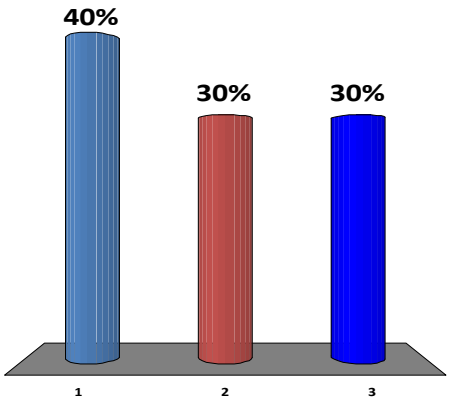
Brandywine – Question 3

How would you describe your watershed issues?

1. Legacy problems
2. Growing problems caused by new development
3. Difficulty in complying with future regulation



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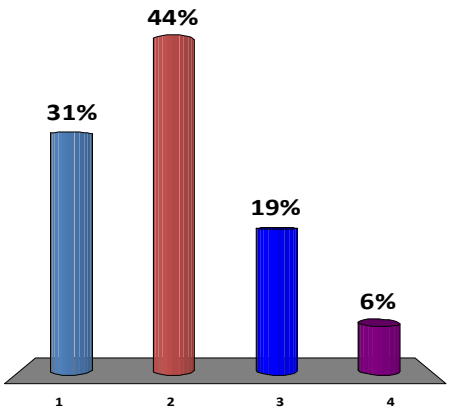
SS Schuylkill – Question 1

What is the most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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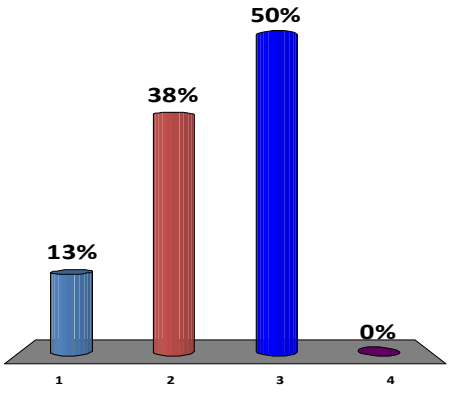
SS Schuylkill – Question 2

What is the second most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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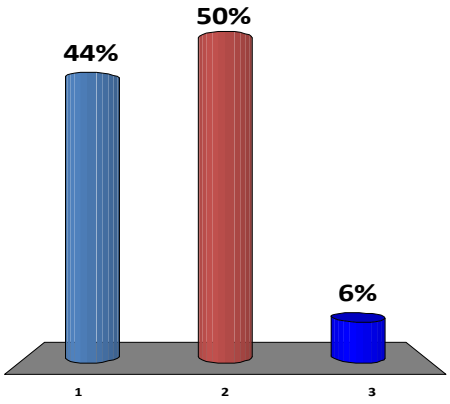
SS Schuylkill – Question 3

How would you describe your watershed issues?

1. Legacy problems
2. Growing problems caused by new development
3. Difficulty in complying with future regulation



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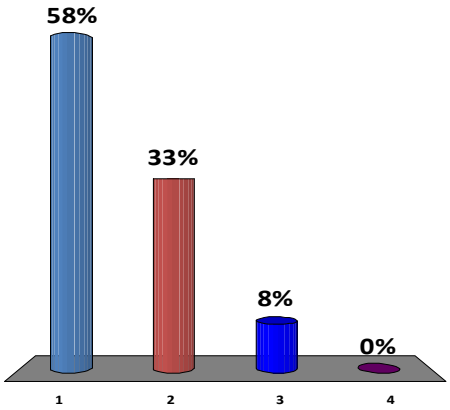
Direct to Delaware – Question 1

What is the most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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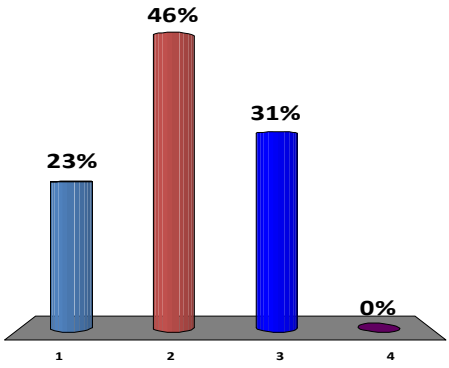
Direct to Delaware – Question 2

What is the second most important issue?

1. Flooding
2. Water Quality
3. Restoration
4. Other



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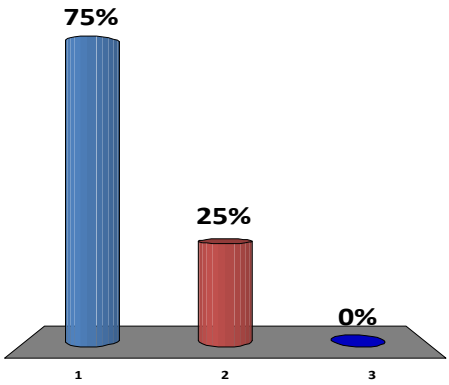
Direct to Delaware – Question 3

How would you describe your watershed issues?

1. Legacy problems
2. Growing problems caused by new development
3. Difficulty in complying with future regulation



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Project Phases

Phase 1	**Public Coordination & Involvement**
Phase 2	**Data Collection, Organization & Analysis**
Phase 3	**Develop a Decision Support Tool** Assessment of Existing Conditions & Identification of Priority Areas for Watershed Improvements
Phase 4	**Project Alternatives Development** Develop project alternatives to address watershed issues in priority areas identified in previous phase
Phase 5	**Preliminary Project Design** Preliminary project design, cost & schedule estimates, funding coordination, NEPA / environmental studies

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Future Involvement/Schedule

2011	March	Stakeholder Meetings March 29, 30, and 31
	April	Post Stakeholder Meeting Summary on Website for Review and Comment
	April to December	Decision Support Tool Development
2012	January	Public Forum(s) to Debut Decision Support Tool Stakeholder Comment via Website
	February	Revision of Decision Support Tool Develop USACE Rankings for 4 Watershed Areas
	March	Public Forum(s) on Prioritization, Applicability & Uses Finalize & Upload Decision Support Tool to Website Stakeholder Comment Via Website
	April	Select areas for initiation of project alternatives development by USACE

Steering Committee

Steering Committee

Steering Committee

Steering Committee

Steering Committee

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Future Communications

- Project website (under construction)
  - http://www.nap.usace.army.mil/Projects/spe/
- Regular email updates every 6 weeks
- Regular Steering Committee meetings
- Future Public Meetings
  - January 2012
  - March 2012

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Data Collection

- Provide contact information and description of Data to Facilitator staff
- We will follow up with you to collect your applicable data

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Key Take Away Points

- Excited to work with you to:
  - Develop centralized watershed data
  - Develop GIS-Based Decision Support Tool
- Support regional watershed planning efforts
  - Decision Support Tool to be publicly available & customizable
- Provide means to leverage USACE resources in the design and construction of priority watershed improvement projects

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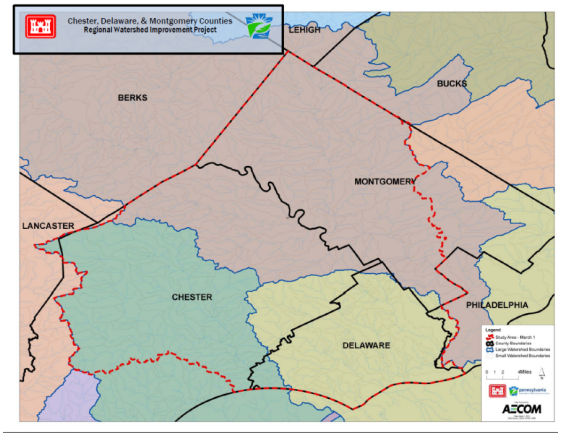
THANK YOU!



Please return your Turning Point clicker on exiting

Small Group Session Summary

	Chester County Flooding Breakout Session 03/31/2011			
Index	Issue Category	Watershed	Location	Description
1	Drainage/ Stormwater	East Branch Brandywine Creek	Map 1 Downingtown Boro, Smaller tribs are issues but the main issues is the East Branch Brandywine	Recent development has increased run off and stormwater system gets overwhelmed. There isn't much effective stormwater management. Suggestion was to covert some detention basins.
2	Residential and commercial	Chester	Map 2 West Chester TWP; Goose Creek	Boxed in stream that run underneath a business (Rubenstein Office Products) floods regularly and causes residential flooding in the floodplain. Drainage has been improved but flooding cause remains.
3	Bridge	Chester	Map 3 Westtown TWP; Oakboard Rd	Bridge was washed out and not replaced
4	Drainage	Valley Creek	Map 4 Tredyffrin TWP	Streambanks are getting close to sewer pipes due to erosion issues caused by high flow
5	Drainage	Valley Creek and other nearby small streams	Map 5 Tredyffrin TWP; Trout Creek	Sediment loads are huge issues; TWP has some modeling. USGS has a monitoring station at the site.
6	Bridge	Brandywine	Map 6 Birmingham Twp / Pocopson Twp border; Where route 926 crosses Brandywine	Regular road closures due to flooding of the bridge approaches on either side. Bridge stays dry. Penn DOT had initial design to raise approach and then revised the plan to maintain the floodplain as is. (this areas was mentioned by all 3 groups)
7	Bridge / stream channel erosion	West Branch Brandywine	Map 7 / Newlin TWP	Harveys Bridges Rd stays dry but the bridge approach gets flooded frequently. Erosion problems in the channel of the Brandywine West Branch
8	Residential / property damage	East Branch Brandywine	Map 8 Uwchlan TWP; Shamona Creek	Residential flooding complaints along the lower section.
9	Drainage/ Stormwater	East Branch Brandywine	Map 9; East Caln TWP; 113	Property damage due to run off from road. Mainly erosion. The Woodmont Development

			corridor above the 30 bypass	gets flooded often, Penn DOT says it's out of their jurisdiction and a municipal problem
10	Residential	East Branch Brandywine	Map 10 West Whiteland; Pottstown Pike and Lincoln HWY	Residential flooding every 10 yrs or so. Repetitive loss properties
11	Dam	Ridley	Map 11 East Goshen; Greenhill and Hershey Mill Rd; Ridley Creek	Road is subject to flooding. Historic Dam causes concern. The township is currently trying to decide whether to repair or remove the dam.
12	Drainage/ Stormwater	Ridley	Map 12; East Goshen; Ridley Creek	Small stream flooding, headwaters of the Ridley Creek; stormwater issues due to debris at times. Too much runoff
13	Drainage	West Branch Brandywine	Map 13 Honeybrook TWP; Burdell Rd	Road get flooded and closes. USGS maintains gage right there and has the TOR elevation on hydrograph / Could easily be quantified.
14	Drainage/ Stormwater	Brandywine	Map 14 Brandywine Creek and Route 1	Stormwater runoff issues
15	Drainage	West Branch Brandywine	Map 15 Valley TWP; Sucker Run	Severe channel erosion and channel meander causes concern and damage to property. Sewer is exposed. Infrastructure problem. Restoration opportunity
16	Drainage/ Stromwater	Ridley	East Goshen	Rt. 202 was repaved and the median was modified by Penn DOT. Drainage efficiency improved, causing increased run off to downstream areas, and private property damage.
17	Drainage/ Stormwater		Map 16 Devon (Easttown TWP) Route 30 (aka Lancaster Ave)	Rt. 30 floods frequently. Undersized drainage system;
18	Erosion	Brandywine		Anecdotal reports indicate West Branch Brandywine tends to carry more suspended sediment than the east branch. East Branch is ore wooded while the West Branch is characterized by farms and cities.
19	Stormwater	Brandywine		District has observed that conservation tillage, designed to reduce nutrient loading, also

				reduces the wet weather runoff volume from cropland.
20	Stormwater			Age of development has typically been indicative of the type of stormwater management and degree of issues. Before 1975 there was no stormwater management. Between 1975 and 1990 there was only peak rate control. After 1990 volume control was mandated.

Other items mentioned:
Mapshed – Watershed planning tool developed by Penn State
DREAM – Tool developed by Jerry Mead at the Patrick Center

Water Quality – Chester County

- Primary issues is sediment due to new construction, upland/agricultural erosion, and in-stream bank erosion. Bank erosion is an in-stream process caused by increased stormwater flows. Problems are equal on small streams and large creeks. General concern is volume, velocity, and increase in impervious cover.
- Dealing with significant legacy sediment issues. Legacy sediment causes very erodible banks. Makes it very hard to pin down where best to stabilize. In addition, newly deposited sediment is harming habitat.
- Need to address change in hydrology. Reports are out-of-bank flows are 20 to 30 times more frequent than in the past.
- Chester County has agriculturally impaired streams. Streams have underlying nutrient problems as well as point discharges.
- Delaware (Wilmington) is asking for cleaner water coming downstream. Are requesting changes to farming practices to ensure water quality.
- Significant issues with sanitary sewer contributions.
- Monitoring has shown several streams which have significant bacteria increases after very small rainstorms. Many sanitary sewers run along streams. Sewer and potable water lines run parallel to streams which have major erosion problems Each township should have GIS layers of sewer systems, but these may not be as-builts.
- In upstream areas, bacteria contributions due to manure on farm lands.
- Watersheds described as agriculture in the upper areas and highly maintained suburban development in lower reaches.
- There are lots of septic systems in the County, which could be a contributor of nutrients.
- No CSO's in the county.
- No major issues with treatment plan discharges. TMDLs went into effect 5 years ago and more restrictive permitting has improved plant performance. Phosphorous may still be an issue.
- Valley Forge Sewer Authority has recorded increased loads and significant inflow and infiltration issues.
- Package plants across the county are a major concern. Treatment performance is variable, and regulations are more difficult to enforce. DEP has datasets for all permitted plants.
- Could use the 303d list to assess need for improvements. Determine how many different impacts each stream has. Also, there are many annual reports which summarize water quality trends.
- Most problems are non-point-source in nature, but there is still some influences of point sources. Non-point-source should be the priority.
- In agricultural areas, nutrient problems go back to legacy farming practices.
- Need monitoring, truly do not know what is working and what is not.
- Red streams blue project does baseline monitoring, but does not have money for follow-up monitoring.

- Chester has very high nitrate levels in groundwater, according to studies done by USGS. However, not the worst in the area – Lancaster County has levels four to five times higher.
- Should work from outside in, addressing issues on first order streams first.
- Concern over impact of improvements. Belief is we are spending money, but the issues are not getting better.
- Need to consider future impacts. Must try to preserve areas from development. There is renewed interest in new development in sensitive areas. Stakeholders want to try and preserve these areas. Question of restoration versus preservation. Where should the emphasis be? The area has many exceptional value streams. Should emphasis be on preserving these? Or should emphasis be on restoring more impaired streams?
- Interested in the possibility of collaborating or sharing resources with the EPA and Department of Agriculture, as they are already working aggressively on agricultural issues in project area.
- Doing better recently on sediment issues related to new development, but do not know how to deal with the legacy, easily erodible, sediment located in the streams.
- Towns lack access to areas where problems are. Erosion is often on private land. Also, it is very difficult to take taxpayers money and spend it on a project not located in the municipality. But often the causes are not located in the impacted municipality.
- Need ways to encourage property owners to solve problems themselves. Used to be a program to encourage planting of trees along streams.
- Related to farming – plain sect farmers do not trust the establishment and are hesitant to change traditional practices. Takes a long time to implement new regulations in farming areas.
- Erosion is a symptom of collective or cumulative impact, which is very hard to address in a single project.
- Controlling access to waterways for horses and cows would help to improve water quality.
- Lots of issues with SSOs. Inflow and infiltration issues cause overflows and discharges into streams.
- Lots of uncertainty related to TMDLs. What is the correct number? Unrealistic reduction goals which are not possible for municipalities to meet. Municipalities want to be told what to do so they can start to do it. But do not want to move forward without any guarantees.
- Priority is to control volume in suburban areas, improve aging infrastructure in older developed areas, and focus on agricultural issues.
- Have had some success getting HOAs to convert grassed areas into meadows. Efforts have shown reduction in flooding and improvement in water quality.
- Locals have done stream restoration, meadow conversions, buffer creation, basin retrofits, and LID site features like rain gardens, rain barrels, etc. Also completed several infiltration projects associated with making towns more walkable and encouraging green roofs.
- Redevelopment allows for volume increase and cumulatively across a large area is major factor in increases in volume and erosion. Starting to ratchet down on exemptions for redevelopment.
- Hard to distinguish between out of balance systems vs. natural erosion and stream migration. Streams are supposed to carry a normal sediment load.

- County Act 167 plan has survey on ordinances. All have volume control requirements in ordinances, but it has been hard to see marked improvements. Traditional peak flow control did not work, no consensus yet on whether volume controls are working.
- Need to better understand the solutions. Which BMPs work best? Can we quantify reductions? Do we have monitoring in place to confirm performance? USGS has sediment stations in Chester.

Restoration 1 – Chester County

- Restoration = riparian buffer improvement/restoration/creation/stream bank restoration/improvement; relocating stream back to natural footprint
- Restoration subject to constraints that you have – existing infrastructure
- Restoration = native vegetation restoration for habitat and water quality – focus on landscape outside of buffer
- You have to consider that you can't go back to "native" – you have to address the changes/conditions that created the problem
- Constraint – get the project in the ground and then there are no resources for management piece – maybe water resources are changed but establishing vegetation takes 5, 10, 15, 20 years
- Management may be better term than maintenance – maintenance is component of management – holistic approach
- What types of restoration projects have you completed - Stream buffer plantings; livestock fencing; removing legacy sediment to re-grading slopes to dam removal
- Sediment removal expensive when you have to remove sediment off site
- Rain garden and infiltration projects; constructed wetlands for stormwater treatment;
- Have found that infiltration is consideration/successfully implemented for new development but doesn't seem to tie into legacy/existing problems with stream restoration – they can manage water on site and not add to issues
- Need to look at it from watershed/stream corridor perspective – fix at top or upstream to solve downstream conditions
- Tough sell for one municipality to pay for project outside of another municipality, but starting to recognize potential benefit – starting to look at regional approach benefits
- Water companies will recognize the benefits of spending funds upstream
- Need education to promote regional/upstream approach for municipalities to buy in – education of regional groups and elected officials
- Huge advantage in Chester County in that they have a water resources authority and active, passionate water resources groups – ability to link townships along different lengths of watershed
- If a project needs to occur on private property, it's a constraint because it can be difficult to manage after its completed – this could be remedied by education of homeowner's associations
- Saturate with education – tie into kids who are hearing these terms in school
- Regulations could also help– stormwater utility fee – pay for impervious surfaces or other contributions to stormwater system – interesting to municipalities to promote this
- Acknowledge the work of watershed resources authority as a resource – county has put a lot of energy into prioritization – look at what is already prioritized
- Safety is priority; likelihood of success is priority; sustainability and ability to manage
- Reward management staff/groups
- Extent of success – addressing multiple stormwater issues

- Fixing cause over fixing symptom – quantifiable objectives
- Viewsheds are important; Restoration for habitat improvements is occurring and is important and community sees this as having value
- Altruistic reasons bring more value to community; open space/natural areas are popular – leverage this to sell costs to maintain
- Permitting is scary for municipalities from cost perspective for naturalization and/or stream restoration
- Prioritize where public lands are available
- Retrofit school properties and have kids sell to parents
- Avoid private land owner with no exterior control
- Problem areas - Valley creek has 24% impervious surface – eastern part of Chester County, empties into Valley Forge National Park and effects that area
- Chester County is the fastest growing county in PA – concerns to protect areas with future development – Big Woods, White Clay, Brandywine areas have potential for growth and need to be protected
- Conversion is happening from Mennonite and Ag lands to exurban sprawl in far western portion
- Planning Commission in Chester County has good predictions of where the area is headed
- People are going to the beautiful natural areas to rejuvenate
- Take care of issues on private property now before they get worse – stormwater fee could help
- Potential to have greater flood problems and need to actually move people from homes and gov't buy the land – seeing more issues now with people moving into floodplains and along streams which is exacerbate

Restoration 2 – Chester County

- Restoration = whole gamut of things – know the site – what needs to be done in a smaller subwatershed – what can we get done and what can we pay for sometimes installation riparian zones, sometimes relocating stream, redirect the stream to save a building, rain gardens
- Need buy in for private landowners – spend time talking to landowners
- Restoration = restoring the stream to its ecological/natural function to improve water quality, prevent flooding, lessen erosion IN TODAY'S SETTING – land use setting we have on ground now
- Restoration = landscape is linked to water – focus on restoration adjacent lands to – this has lead to impacts on groundwater and stream flow
- Hydrologic & hydraulic are both important factors
- Restoration = obtaining stable condition that gets as many of the other factors as possible – sometimes add wetlands or replant vegetation
- Never going to get back to valley creek running through virgin forest – need to deal with reality by focusing on stability to improve aquatic habitat
- Restoration = Mimic natural flow regimes – allow for floods and drought levels
- Needs to be maintainable with existing conditions
- Need to plan for holistic approach

- Ignoring maintenance can make a project fail in as short as a year – sometimes maintenance can be small thing with big impact
- Metrics – cross-section changing, erosion, sediment moving, have invertebrates come back or increased – monitoring helps to determine what the most effective maintenance measures would be
- Frustrating when permit conditions require funding but grants don't provide for the money to monitor
- Monitoring needs to have set metrics – what are you measuring – need quantifiable objectives BEFORE the start of the project
- Permitting can be big constraint to getting to the end of restoration projects – Contentious
- Existing projects – "Red Streams Blue" bank stabilization, reconnection of floodplain by removing legacy sediments, replanting riparian buffers – typically projects are downstream from urban area – do this on small watershed basis – integrate education and outreach to residents in urban setting to try to get private residents to modify their behaviors before the water goes into the old infrastructure – also focus on redevelopment ordinances
- Valley Creek Restoration Partnership – small feeder subwatersheds within larger watershed – grant money for infiltration at street level and athletic field levels – trying to show demonstration of system of rain gardens to make larger contribution; also grant to do stream stabilization in area where it was undercutting storm sewer line
- Focusing on reforestation plan – residential developments and office parks
- Priorities:
    - Restoring ecological function
    - Location of watershed
    - Cost-benefit
    - Water quality improvements
    - Applicability to regional contributions/issues – replicability

Restoration 3 – Chester County

- Restoration = stabilization, stop the erosion – remove legacy sediments
- Remove development or vertical wall
- Restoration – what are you restoring to? Maybe stabilization or naturalization
- Restoration tough to accomplish since the changes we have made are not reversible
- Considering H&H factors/flow in existing conditions is important
- Legacy sediment is principal problem – headwaters community – from improper stormwater stabilization with legacy development (post-WWII) & Ag land runoff & historic mills caused a lot of sediment – current regs are good – grades are very flat – sediment is not moving so turbidity is issue
- Restoration = retrofitting existing practices that were previously put in place – i.e. revegetating sediment basins

- Streambank naturalization – planting and erosion control – on private lands re-vegetation or planting in buffers can be constraint as it takes away viewsheds
- Restoration on small stream in Valley Creek Watershed – studied as pilot project – but during study found exposed sewer pipe which became priority – historic location of the stream found – had to remove massive amounts of fill and sediment that were used to refill channel that moved – been tough process but learned a lot
- Homeowner's associated motivated to repair/re-vegetation sediment basin because they had blowout
- Stream is incised on golf course and they want to re-grade banks/embankment to create low flow channels to react to current flows
- Power company came in and cut vegetation within stream buffer
- Prioritization criteria:
    - Potential for property damage
    - Political pressure – who's the loudest or has someone's ear
    - Funding availability/opportunity
    - Headwaters
    - Cost-benefit
    - Comply with MPDS permit – water quality
- Maintenance – is this a priority? - Yes, who's performing it? money is tight so it is focus; projects are "no-go'd" because of maintenance needs
- Developer based projects – asked for maintenance funds to be provided to conservancy group upfront
- Basin retrofit and other naturalization methods can reduce maintenance cost for municipality
- Plum Run – already on counties on Red Streams Blue prioritization list – need comprehensive map
- Holland Run in Marple Twp – exceptional value stream that has upstream development demands

Appendix D – Tabular Summary of Polling Data

Tablular Summary of Turning Point Results by Question

	Delaware County	Montomery County	Chester County
1.) Will the Phillies win the World Series?			
	Responses	**Responses**	**Responses**
Yes, of course!	51%	81%	48%
Maybe, we'll see…	26%	19%	36%
Not a chance!	23%	0%	15%
2.) What brought you here today?			
	Responses	**Responses**	**Responses**
Desire to develop regional solutions	46%	47%	45%
Opportunity for funding support	43%	33%	33%
Just part of the job…	11%	20%	21%
3.) What intrigues you most about this project?			
	Responses	**Responses**	**Responses**
Addressing problems collaboratively	21%	19%	21%
Developing integrated, regional solutions	47%	63%	30%
Opportunity for larger projects	3%	0%	9%
Funding support	29%	19%	39%
4.) Which issue matters most to you?			
	Responses	**Responses**	**Responses**
Flooding	50%	21%	22%
Water quality	25%	50%	34%
Restoration	25%	21%	38%
Other	0%	7%	6%
5.) What is your affiliation?			
	Responses	**Responses**	**Responses**
County official/employee	11%	13%	9%
Municipal official/employee	35%	50%	38%
Consulting engineer	24%	13%	15%
Environmental or Conservation group	24%	6%	26%
Other	5%	19%	12%
6.) Have you worked with the USACE before?			
	Responses	**Responses**	**Responses**
Yes	47%	41%	53%
No	53%	59%	47%
7.) What concerns you most?			
	Responses	**Responses**	**Responses**
Existing problems	59%	53%	44%
Future/developing problems	24%	24%	9%
Compliance with current regulation	3%	0%	6%
Compliance with future regulation	14%	24%	41%

Tablular Summary of Turning Point Results by Question

	Delaware County	Montomery County	Chester County
8.) Which issue do you need the most help in addressing?			
	Responses	**Responses**	**Responses**
Flooding	34%	6%	9%
Water Quality	21%	18%	21%
Stormwater	18%	47%	33%
Ecosystem/stream restoration	26%	24%	33%
Other	0%	6%	3%
9.) How helpful would such a decision support tool (DST) be in your watershed planning efforts?			
	Responses	**Responses**	**Responses**
Not very helpful	5%	0%	18%
Moderately helpful	32%	75%	50%
Very helpful	62%	25%	32%
10.) Are problems facing the region similar in all watersheds?			
	Responses	**Responses**	**Responses**
Yes	22%	24%	20%
Yes, in some areas	54%	71%	43%
No	24%	6%	37%
11.) Are past problems a good indicator of need for improvements?			
	Responses	**Responses**	**Responses**
Yes	59%	35%	47%
Yes, in some areas	41%	65%	47%
No	0%	0%	6%
12.) Are future compliance issues a major driver for improvement projects?			
	Responses	**Responses**	**Responses**
Yes	31%	75%	68%
No	33%	6%	24%
Unsure	36%	19%	9%
13.) What might you use such a decision support tool (DST) for?			
	Responses	**Responses**	**Responses**
Regional planning assistance	13%	13%	19%
Project identification and development	61%	47%	47%
Fundraising support	18%	33%	31%
Political support	8%	7%	3%
14.) What would be your preferred method of using the DST?			
	Responses	**Responses**	**Responses**
Desktop version (on flash drive or CD)	42%	6%	24%
Web-based GIS Server	58%	94%	76%
Other	0%	0%	0%

Tablular Summary of Turning Point Results by Question

	Delaware County	Montomery County	Chester County
15.) Flooding - What is your priority?			
	Responses	**Responses**	**Responses**
Property damage ($) reduction	26%	13%	24%
Minimize population impacted	37%	33%	12%
Improve safety	8%	7%	6%
Improve mobility	3%	0%	9%
Erosion control	26%	47%	44%
Economic development considerations	0%	0%	3%
Agricultural considerations	0%	0%	3%
16.) Flooding - What is your second priority?			
	Responses	**Responses**	**Responses**
Property damage ($) reduction	23%	18%	20%
Minimize population impacted	28%	35%	14%
Improve safety	13%	6%	17%
Improve mobility	5%	0%	0%
Erosion control	31%	35%	26%
Economic development considerations	0%	0%	9%
Agricultural considerations	0%	6%	14%
17.) Flooding - What do you attribute flooding in your area to?			
	Responses	**Responses**	**Responses**
Deficiencies in local conveyance (storm sewers, ditches)	28%	12%	26%
Deficiencies in major conveyance (streams, rivers)	17%	24%	26%
Mix of both	56%	65%	48%
18.) Flooding - How would you describe your flooding?			
	Responses	**Responses**	**Responses**
In houses and businesses	26%	13%	0%
In streets and driveways	39%	13%	15%
Along the banks of streams and rivers	34%	73%	85%
19.) Flooding - Is your stormwater ordinance enforced?			
	Responses	**Responses**	**Responses**
Yes	49%	47%	64%
No	26%	6%	21%
Unsure	26%	47%	15%
20.) Water Quality - Are you facing TMDL/NPDES compliance issues which will require major structural or non structural controls?			
	Responses	**Responses**	**Responses**
Yes	39%	59%	74%
No	33%	18%	12%
Unsure	28%	24%	15%

Tablular Summary of Turning Point Results by Question

21.) Water Quality - Do you have identified financial resources to address water quality issues?

	Delaware County	Montomery County	Chester County
	Responses	Responses	Responses
Yes	5%	12%	6%
No	84%	59%	91%
Unsure	11%	29%	3%

22.) Water Quality - Do you have identified plans or projects to address water quality issues?

	Responses	Responses	Responses
Yes	51%	59%	65%
No	38%	12%	29%
Unsure	11%	29%	6%

23.) Water Quality - Which is your most important issue?

	Responses	Responses	Responses
Sediment	24%	50%	38%
Nutrients	16%	0%	12%
Bacteria	8%	6%	3%
Erosion (high flows)	46%	44%	47%
Base flow (low flows)	0%	0%	0%
Other	3%	0%	0%
No major issues	3%	0%	0%

24.) Water Quality - Which is your second most important issue?

	Responses	Responses	Responses
Sediment	26%	41%	16%
Nutrients	18%	6%	31%
Bacteria	13%	6%	9%
Erosion (high flows)	18%	35%	28%
Base flow (low flows)	21%	12%	16%
Other	3%	0%	0%
No major issues	0%	0%	0%

25.) Restoration - Have you incorporated stream or wetland restoration as a part of previous projects?

	Responses	Responses	Responses
Yes	68%	80%	65%
No	22%	7%	32%
Unsure	11%	13%	3%

26.) Restoration - What type of restoration have you completed?

	Responses	Responses	Responses
Stream stabilization	27%	47%	36%
Buffer creation	38%	29%	36%
Restore natural features	8%	0%	3%
Wetland creation/restoration	11%	18%	12%
Aquatic habitat	3%	0%	0%
Other	5%	0%	3%
No experience	8%	6%	9%

Tablular Summary of Turning Point Results by Question

	Delaware County	Montomery County	Chester County
27.) Restoration - What type of restoration would most benefit your area of interest?			
	Responses	**Responses**	**Responses**
Stream stabilization	42%	29%	45%
Buffer creation	29%	35%	19%
Restore natural features	21%	18%	26%
Wetland creation/restoration	5%	6%	3%
Aquatic habitat	0%	6%	0%
Other	0%	0%	6%
Unsure	3%	6%	0%
28.) Restoration - Is there funding available for restoration in your area of interest?			
	Responses	**Responses**	**Responses**
Yes	14%	31%	23%
No	65%	25%	63%
Unsure	21%	44%	14%
29.) North Shore Schuylkill - What is the most important issue?			
	Responses	**Responses**	**Responses**
Flooding		31%	
Water Quality		50%	
Restoration		19%	
Other		0%	
30.) North Shore Schuylkill - What is the second most important issue?			
	Responses	**Responses**	**Responses**
Flooding		25%	
Water Quality		31%	
Restoration		44%	
Other		0%	
31.) North Shore Schuylkill - How would you describe your watershed issues?			
	Responses	**Responses**	**Responses**
Legacy problems		75%	
Growing problems caused by new development		13%	
Difficulty in complying with future regulation		13%	
32.) Brandywine - What is the most important issue?			
	Responses	**Responses**	**Responses**
Flooding			41%
Water Quality			41%
Restoration			18%
Other			0%
33.) Brandywine - What is the second most important issue?			
	Responses	**Responses**	**Responses**
Flooding			14%
Water Quality			43%
Restoration			43%
Other			0%

Tablular Summary of Turning Point Results by Question

	Delaware County	Montomery County	Chester County
34.) Brandywine - How would you describe your watershed issues?			
	Responses	**Responses**	**Responses**
Legacy problems			40%
Growing problems caused by new development			30%
Difficulty in complying with future regulation			30%
35.) South Shore Schuylkill - What is the most important issue?			
	Responses	**Responses**	**Responses**
Flooding			31%
Water Quality			44%
Restoration			19%
Other			6%
36.) South Shore Schuylkill - What is the second most important issue?			
	Responses	**Responses**	**Responses**
Flooding			13%
Water Quality			38%
Restoration			50%
Other			0%
37.) South Shore Schuylkill - How would you describe your watershed issues?			
	Responses	**Responses**	**Responses**
Legacy problems			44%
Growing problems caused by new development			50%
Difficulty in complying with future regulation			6%
38.) Direct to Delaware Tributaries - What is the most important issue?			
	Responses	**Responses**	**Responses**
Flooding	84%		58%
Water Quality	8%		33%
Restoration	8%		8%
Other	0%		0%
39.) Direct to Delaware Tributaries - What is the second most important issue?			
	Responses	**Responses**	**Responses**
Flooding	8%		23%
Water Quality	72%		46%
Restoration	20%		31%
Other	0%		0%
40.) Direct to Delaware Tributaries - How would you describe your watershed issues?			
	Responses	**Responses**	**Responses**
Legacy problems	84%		75%
Growing problems caused by new development	12%		25%
Difficulty in complying with future regulation	4%		0%

Appendix E – Stakeholder Participant List

Stakeholder Participant List

	Delaware County Workshop	Montgomery County Workshop	Chester County Workshop
1	Alexis Melusky Environmental Planner Michael Baker Corporation	Andrea Campisi Building and Planning Department Lower Merion Township	Amanda Shaner South Coventry Township
2	Allison A. Lee, P.E. Upper Darby Township Department of Public Works	Barry Wert, P.E., P.L.S. Metz Engineers Franconia & Lower Salford Township	Ann Hutchinson, AICP Natural Lands Trust Senior Director Municipal Conservation Services
3	Amy Miller Environmental Planner Delaware Valley Regional Planning Commission	Daniel A. Coghlan, PE Civil Engineer SSM Group, Inc.	Barbara D'Angelo Township Supervisor Wallace Township
4	Ann Jackson Darby Creek Valley Association	David H. Shaffer Jr. Director of Public Works Lower Providence Township	Bob Struble Red Clay Valley Association
5	Anne Murphy Executive Director Chester-Ridley-Crum Watersheds Association Ridley Creek State Park	Doug Heller Springfield	Charlotte "Chotty" Sprenkle Watershed Coordinator Chester County Conservation District
6	Anthony T. Hamaday Township Manager Marple Township, PA	Drew Shaw, AICP Chief, Environmental Planning Montgomery County Planning Commission	Chris Lehenky Valley Township Supervisor
7	Bill Payne, City Planner Chester City	Geoffrey D. Thompson Manager, Borough of Collegeville	Christian E. Strohmaier Manager Chester County Conservation District
8	Brian J. Vadino Watershed Specialist Delaware County Conservation District	Jennifer Kehler Water Program Specialist DEP Rachel Carson State Office	Daniel H. Daley, P.E. Edward B. Walsh & Associates, Inc Uwchlan Township, East Caln Township, West Bradford Township
9	Bruce A Dorbian Marcus Hook Borough	Jon Lesher Environmental Planner Montgomery County Planning Commission	Dani-Ella Betz Chester County Water Resources Authority
10	Charles J. Catania, Jr., P.E. Catania Engineering Associates, Inc. Ridley Township	Joseph P. Hebelka, P.G. Hydrogeologist PA DEP Bureau of Watershed Management Source Water Protection Section	Drew Reif USGS Pennsylvania Water Science Center
11	Dan Meier, P.E. Duffield Associates Radnor Township Environmental Advisory Council	Karl Lukens Director of Parks Lower Providence Township	Ed Rasiul Pennoni Associates Valley Township Engineer
12	Daniel E. Malloy, P.E. Township Engineer Radnor Township	Kevin Bowers Pennoni Associates, Inc. Lower Merion Township	Erin McPherson, EIT, CPESC Tredyffrin Township Engineering Assistant
13	Dee Ross, Watershed Coordinator Partnership for the Delaware Estuary	Kirk White USGS Supervisory Hydrologist	James W. Hatfield, P.E. VanDemark & Lynch, Inc. Birmingham Township, Pocopson Township, and East Marlborough Township
14	Dennis F. O'Neill, P.E. Consulting Engineers and Surveyors, Inc. Marple Township, Millbourne Borough and Tinicum Township	Leslie Richards Whitemarsh Township Supervisor	Jan Bowers, P.G. Executive Director Chester County Water Resources Authority
15	Desiree Henning Dudley Assessment and Planning Chief Watershed Management Program PA DEP Southeast Regional Office	Scott Greenly Associate Planner Upper Merion Township	Jane Fava Red Streams Blue Program Brandywine Valley Association Red Clay Valley Association
16	Edward Cashman Township Manager Upper Providence Township	Susan Harris Montgomery County Conservation District	Janie Baird Chairman of Newlin Township Board of Supervisors

Stakeholder Participant List

	Delaware County Workshop	Montgomery County Workshop	Chester County Workshop
17	Eileen M. Nelson, PE Senior Principal Stantec	Tom Davidock SAN Coordinator Partnership for the Delaware Estuary	Jeffrey W. McClintock, PE, CFM Township Engineer Caln Township
18	Eileen W. Mulvena, P.E. Walton, Mulvena & Associates	Juan Vicenty-Gonzalez SERO DEP	John R. Weller, AICP Director of Planning & Zoning West Whiteland Township
19	Elizabeth A. Catania, PE, F.NSPE Vice President Catania Engineering Associates, Inc. Parkside, Prospect Park and Folcroft Boroughs	Erik Rourke Strategic Planner U.S. Army Corps of Engineers	Kate Goddard Department of Biology Ursinus College
20	F. Clark Walton, P.E. Walton, Mulvena & Associates	Tricia L. Aspinwall Project Manager U.S. Army Corps of Engineers	Kathy Bergmann Brandywine Valley Association(BVA) Red Streams Blue Coordinator
21	Gary Cummings Township Manager Nether providence Township	Jay Braund Special Projects Coordinator Department of Environmental Protection	Kevin B. Munley Watershed Manager Department of Environmental Protection Southeast Regional Office
22	George Windsor Code Enforcement Dept. Marcus Hook Borough	David Burke Watershed Manager Department of Environmental Protection	Kirk White USGS Supervisory Hydrologist
23	Ginnie Newlin East Goshen Twp EAC and CRC Watershed Association	Ross Gordon AECOM	Kristina Heister Natural Resource Manager Valley Forge National Historical Park
24	Greg Lebold Zoning and Code Enforcement Officer Upper Providence Township	Karen Appell AECOM	Margot Taylor Green Valleys Association
25	John Devlin Springfield Township Plumbing/Mechanical Inspector	Andy Wohlsperger AECOM	Matthew VanLew Roadmaster East Brandywine Township
26	Joseph Mastronardo, PE Pennoni Associates Inc. Springfield, Haverford, Concord, Chadds Ford, Newtown, Lower Merion, Douglass, and New Garden Township		Ms. Marlou Gregory Chair, Schuylkill Township Environmental Advisory Council
27	Karen L. Holm Manager, Environmental Planning Section Delaware County Planning Dept.		Pete Goodman, President, Valley Forge Trout Unlimited
28	L. Fernando Baldivieso Upper Darby Township Department of Public Works		Randy Patry, P.E. Senior Staff Professional II Advanced GeoServices
29	Peter Williamson Vice President of Conservation Services www.natlands.org		Richard D. Bauer Valley Creek Restoration Partnership
30	Shaun Bollig Environmental Planning Section Delaware County Planning Dept.		Rick Craig Township Engineer West Goshen Twp
31	Steve Kosiak CRC Watershed Association		Rick Smith Township Manager East Goshen Township
32	Susan Warner Asst Twp Manager of Springfield Township		Robert Johnston Londonderry Township

Stakeholder Participant List

	Delaware County Workshop	Montgomery County Workshop	Chester County Workshop
33	Tim Devaney Darby Creek Valley Association [DCVA]		Robert Layman Westtown Township
34	William J. Cervino Director of Code Enforcement Springfield Township		Robert Wilpizeski Director of Public Works Borough of West Chester
35	Zach Barner Environmental Planning Section Delaware County Planning Dept.		Scott Piersol Township Manager East Brandywine Township
36	Matthew Houtmann, PE G.D. Houtmann and Son Bethel Township, PA		Terry Woodman Manager, East Whiteland Township
37	Dan Shinskie Borough of Lansdale		Victoria Laubach Green Valleys Association
38	Annew Crowley Penn Future		Wesley Horner Brandywine Conservancy
39	Judy Serratore Folcroft Borough		Erik Rourke Strategic Planner U.S. Army Corps of Engineers
40	Erik Rourke Strategic Planner U.S. Army Corps of Engineers		Tricia L. Aspinwall Project Manager U.S. Army Corps of Engineers
41	Tricia L. Aspinwall Project Manager U.S. Army Corps of Engineers		Jay Braund Special Projects Coordinator Department of Environmental Protection
42	Jay Braund Special Projects Coordinator Department of Environmental Protection		David Burke Watershed Manager Department of Environmental Protection
43	David Burke Watershed Manager Department of Environmental Protection		Ross Gordon AECOM
44	Ross Gordon AECOM		Karen Appell AECOM
45	Karen Appell AECOM		Andy Wohlsperger AECOM
46	Andy Wohlsperger AECOM		