



State Water Plan Update Lower Susquehanna Regional Committee Meeting

October 17, 2024

9:00 a.m. – 11:00 a.m.

Virtual Microsoft Teams Meeting

Committee Members in Attendance:

Felicia Dell	Joe McNally, P.G.
Tyler Erb	George Pomeroy, Ph.D.
Lincoln Kaufman	Mark Snyder
Andy Gavin	Justin Spangler, P.E.
Sean Kenny	Warren Weaver
Mike Kyle	Jenni Woodworth, P.E.

Others in Attendance:

James Horton – DEP	Bob Whitmore - Strategic Consulting Partners
Dave Jostenski – DEP	Jenny Gallagher Blom – Strategic Consulting Partners

Visitors:

John Seitz – York County Planning Commission
Graham Markowitz – SRBC

Welcome

James Horton, DEP, welcomed everyone to the meeting, explained the meeting was being recorded, and provided helpful hints on the use of technology. Chair McNally asked each member of the committee to introduce themselves.

Meeting Summary

The summary of the April 10, 2024, meeting was reviewed by the committee members. The meeting summary was approved as presented on a Mike Kyle / Andy Gavin motion.

Public Comment

Chair Joe McNally opened the meeting for public comment. An opportunity to express comments verbally or in the chat box was offered. There was no public comment.

Bylaws

James (DEP staff) reviewed Article XII of the Lower Susquehanna Committee Bylaws. The current bylaws state the following about amending the bylaws: “the By-Laws may be amended at any meeting of the Regional Committee by two-thirds vote of the full Regional Committee membership (15 voting members).” James said internal review of the bylaws by legal counsel is asking this article to be corrected to state:

“The By-Laws may be amended at any meeting of the Regional Committee by a simple majority vote of the full Regional Committee membership provided that written notice of such change has been sent via certified mail with a return receipt to each member at least two weeks prior to the meeting.”

This change will align the bylaws with Act 220. The legal opinion is this is a change to comply with the Act and does not need to be voted on by the committee as a bylaw change.

A Warren Weaver / George Pomeroy motion was offered to accept the correction of the by-laws that were sent to all members prior to this meeting.

DEP Update

James Horton, DEP, provided an overview presentation of the state water planning process and the direction forward.

DEP Team

- Sue Weaver, P.E. – Environmental Program Manager, Interstate Water Resources Management
- James Horton – Environmental Group Manager, Water Use and Planning Section
- David Jostenski – Water Program Specialist

Regional Committee Objectives

2025 – Draft regional content
2026 Q1 – Combined Public Hearing and Meeting
2026 Q3 – Send to Statewide Committee for Approval
2027 – Next update to the State Water Plan

Five-Year Plan

2023 – Outreach/Recruitment/Review
2024 – Implementation and Analysis
2025 – Workgroups and drafting content
2026 – Editing/Compiling public content

Outreach

Upcoming tools:

Clearing house webpage with key plan details, partner links, and example projects.

Analysis

- Integrated Water Resource Management (IWRM) work group planning.

Critical Area Resource Plans (CARPS)

- Back Creek, Ohio Region – In review phase with DEP
- Laurel Hill Creek CARP, Ohio Region – In review phase with DEP
- Marsh and Rock Creeks CARP, Potomac Region – In review phase with DEP

Committee Health

Proposed committee members are currently in the review and approval process and applications have been sent to the Governor's office. A new committee member has been appointed by the Governor for the Lower Susquehanna Regional Committee – Jennifer Engle, Associate Director of Lancaster County Conservation District.

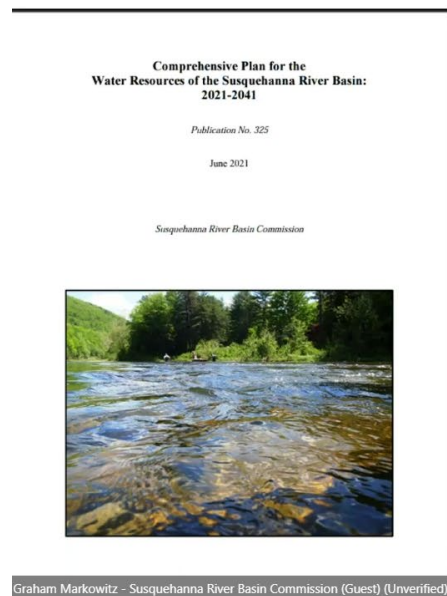
Roles to Fill in Lower Susquehanna Regional Committee

- CCD Director
- County Planner
- Horticulture
- Agriculture
- Industrial, Commercial, Energy X 2
- Local Government X 2

Recruiting New Members Process

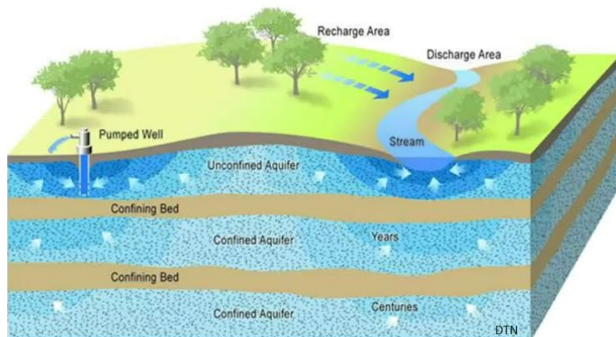


PLANNING CONTEXT



- **COMPREHENSIVE PLAN OBJECTIVE D-1**
 - **PROTECT CRITICAL AQUIFER RECHARGE AREAS**
 - IDENTIFY AND PROMOTE OPEN SPACE AND OTHER LAND USES THAT PROVIDE FOR INCREASED GROUNDWATER RECHARGE TO ENHANCE THE RESILIENCY OF WATER SUPPLY, STREAM BASEFLOW, AND WATER TEMPERATURES.

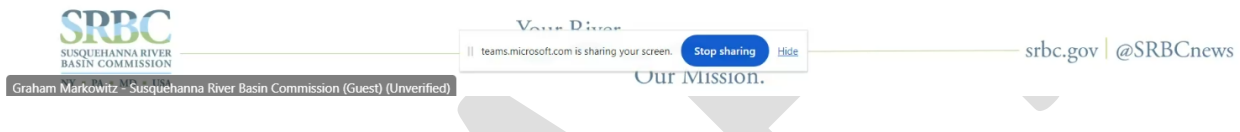
DEFINITIONS



- **RECHARGE:** THE ADDITION OF WATER FROM THE LAND SURFACE TO UNDERGROUND WATER-BEARING ZONES
 - TYPICALLY FROM PRECIPITATION BUT COULD ALSO BE ARTIFICIAL
- **BASEFLOW:** NON-RUNOFF PORTION OF STREAMFLOW SUSTAINED BY GROUNDWATER
 - OFTEN USED AS AN APPROXIMATION OF RECHARGE
 - CAN BE MEASURED / ESTIMATED USING HYDROGRAPH SEPARATION TECHNIQUES

WHY IS PRESERVING RECHARGE/BASEFLOW IMPORTANT?

- INCREASED RECHARGE = INCREASED BASEFLOW
 - WATER QUALITY BENEFITS
 - MORE INFILTRATION/FILTERING AND LESS RUNOFF, EROSION, SEDIMENT (PHOSPHORUS)
- INCREASED BASEFLOW = INCREASED COLD-WATER CONTRIBUTIONS FROM GROUNDWATER/SPRINGS
 - PROVIDES THERMAL REFUGE AND SUSTAINED HABITAT (WETTED AREA & DEPTH) FOR COLD-WATER SPECIES DURING HOT/DRY PERIODS
- INCREASED DROUGHT RESILIENCY
 - ENSURES WATER IS AVAILABLE IN AQUIFERS AND STREAMS FOR WATER SUPPLY



WHAT INFLUENCES GROUNDWATER RECHARGE?

- EXCLUDING PRECIPITATION AND EVAPOTRANSPIRATION, RECHARGE IS GOVERNED PRIMARILY BY LAND COVER, SOIL CHARACTERISTICS, AND SUBSURFACE GEOLOGIC FEATURES
- DIVERSE GEOLOGY, TOPOGRAPHY, AND LAND USES IN THE SUSQUEHANNA BASIN
 - CONTRIBUTES TO CONSIDERABLE VARIATIONS IN LOCAL RECHARGE RATES
 - 25.6 TO 2.5 IN/YR (30 YEAR AVERAGE)
- INCREASED IMPERVIOUS COVER AND REMOVAL OF FOREST COVER DISRUPTS THE NATURAL INFILTRATION CAPACITY



STUDY GOAL(S)

- DEVELOP A GEOGRAPHIC INFORMATION SYSTEMS (GIS) FRAMEWORK TO IDENTIFY AREAS OF GREATER AND LESSER RECHARGE POTENTIAL THROUGHOUT THE BASIN
- USE THE FRAMEWORK TO DELINEATE **CRITICAL AQUIFER RECHARGE AREAS**
 - I.E. LAND SURFACE AREAS THAT ARE RESPONSIBLE FOR A LARGE FRACTION OF RECHARGE
 - BY VIRTUE OF HIGH AQUIFER PERMEABILITY, SOIL CHARACTERISTICS, VEGETATIVE COVER, AND LOCATION WITH RESPECT TO DISCHARGE AREAS AND/OR WITHDRAWALS, TOPOGRAPHIC SETTING, OR A COMBINATION OF THESE



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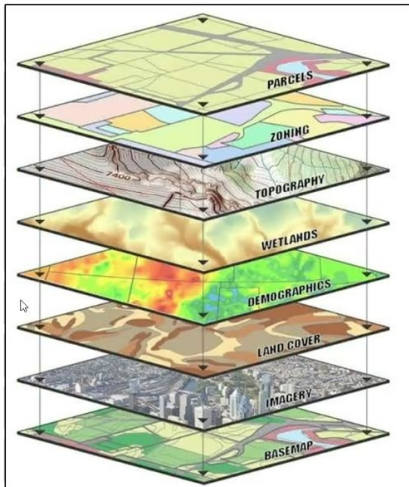
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Graham Markowitz - Susquehanna River Basin Commission (Guest) (Unverified)

Our Mission.

GIS FRAMEWORK: MULTI-CRITERIA DECISION ANALYSIS

- DATA SOURCES CAN BE COMBINED THROUGH STANDARDIZATION AND WEIGHTING-ASSIGNMENTS TO PRODUCE A MEANINGFUL INDEX
- EACH RASTER'S CELL/PIXEL VALUE IS MULTIPLIED BY THE WEIGHT OR "PERCENT INFLUENCE"
- VALUES ARE SUMMED FOR EACH OVERLAPPING CELL/PIXEL FOR A COMPOSITE OUTPUT/INDEX
 - I.E. "RECHARGE POTENTIAL"



Multi-Criteria Decision Analysis Representation (Ryan and Nimick, 2019)



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VARIABLES USED IN ASSESSING RECHARGE POTENTIAL

INFORMED BY PHYSICAL BASIN CHARACTERISTICS USED IN REGIONAL REGRESSION EQUATIONS TO PREDICT BASEFLOW (RECHARGE) IN UNGAGED LOCATIONS

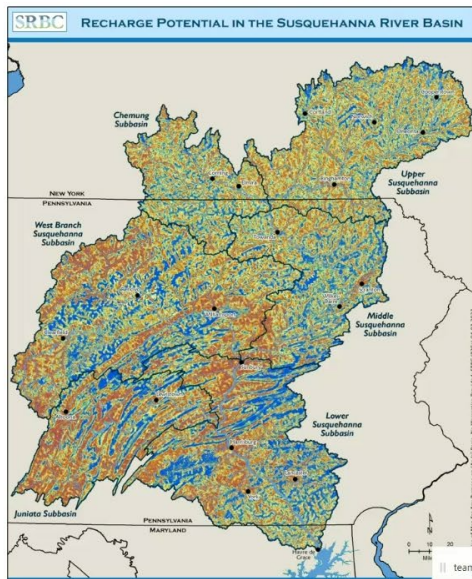
REQUIREMENTS:

- GEOSPATIAL COVERAGE FOR THE ENTIRE BASIN
- DATA ACCESSIBLE WITHOUT SITE VISIT, OR PROPRIETARY INFORMATION
- CONSISTENT SPATIAL SCALE (30x30 METERS) FINE ENOUGH TO IDENTIFY DISCRETE AREAS

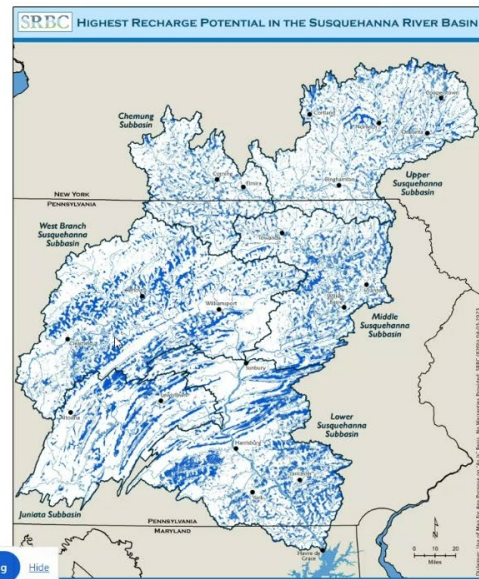


First-Level Factors	Weight	Second-Level Factors	Weight	Data Source
Land Cover / Terrain	40	Impervious Area	25	USGS (2019) National Land Cover Dataset
		Land Surface Slope	15	USDA NRCS SSURGO Database
Shallow-Subsurface Geology	20	Percent Sand	15	USDA NRCS SSURGO Database
		Percent Clay	2.5	USDA NRCS SSURGO Database
		Depth to Bedrock	2.5	USDA NRCS SSURGO Database
Structural / Bedrock Geology	40	Drainage Density	25	SRBC calculated from USGS (2019) National Hydrology Dataset (NHD)
		Karst Density	10	DCNR-PGS (2003) Density of Mapped Karst Features
			5	Isachsen and McKendree (1977); Berg and others (1980)

- EACH PIXEL HAS A RECHARGE POTENTIAL INDEX VALUE RANGING FROM 100 (LOW) TO 500 (HIGH)

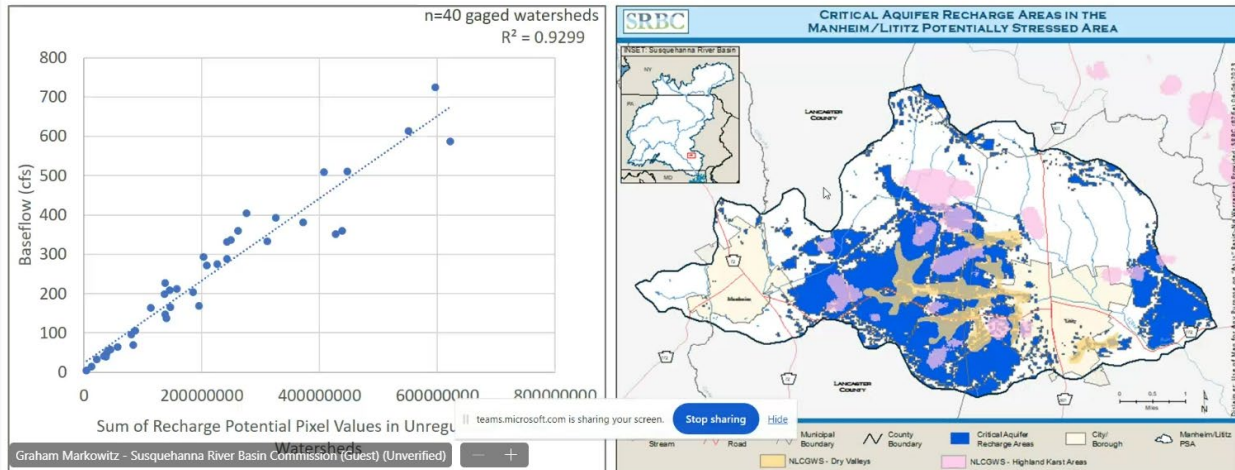


- HIGHEST RECHARGE POTENTIAL DESCRIBED BY UPPER 20% OF PIXEL VALUES.



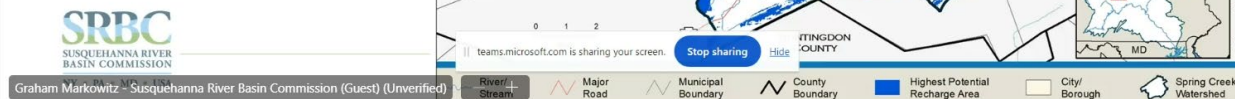
DESKTOP VERIFICATION

- THE SUM OF ALL “RECHARGE POTENTIAL” PIXELS WITHIN A WATERSHED CAN PREDICT AVERAGE ANNUAL BASEFLOW (RECHARGE) WITHIN 19.7% (AVERAGE STANDARD ERROR)
- COMPARISON OF HIGH RECHARGE POTENTIAL AREAS AND CRITICAL AQUIFER RECHARGE AREAS IDENTIFIED IN NORTHERN LANCASTER GROUNDWATER STUDY (EDWARDS AND PODY, 2005)



LOCAL APPLICATIONS: CRITICAL AQUIFER RECHARGE AREA (CARA) DELINEATION

- RESAMPLING IN SMALLER USER-DEFINED AREAS WHERE WATER SUPPLY HAS BECOME MORE-LIMITED AMID DEVELOPMENT AND INCREASING IMPERVIOUS COVER
- RESULTS ARE RELATIVE TO ALL AREAS/CHARACTERISTICS WITHIN BOUNDARY
- IDENTIFY HIGHEST RECHARGE POTENTIAL IN AREAS WITH OTHERWISE LIMITED, OR INCREASED RECHARGE POTENTIAL



LOCAL APPLICATIONS: ROCK LITITZ, LANCASTER COUNTY

- LEVERAGING/ENHANCING DRY STREAM VALLEYS FOR STORMWATER INFILTRATION
 - ALTERNATIVE BMP FOR NPDES PERMITTING - STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION



Graham Markowitz - Susquehanna River Basin Commission (Guest) (Unverified)

POTENTIAL APPLICATIONS/INTENDED USES

- AGRICULTURAL AND FORESTED LAND PRESERVATION ACTIVITIES
- AQUIFER/STORMWATER RECHARGE ENHANCEMENT PROJECTS
- IDENTIFYING SUSTAINABLE GROUNDWATER SOURCES AND/OR AVOIDING POTENTIALLY OVER-UTILIZED AREAS WITH LIMITED WATER AVAILABILITY
- EVALUATION CRITERIA FOR SRBC'S CONSUMPTIVE USE MITIGATION GRANT PROGRAM



Graham Markowitz - Susquehanna River Basin Commission (Guest) (Unverified)

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PRODUCT AVAILABILITY

- DATASETS AVAILABLE FOR DOWNLOAD AT THE [PENNSYLVANIA SPATIAL DATA ACCESS \(PASDA\) GEOSPATIAL DATA PORTAL](#)
 - GROUNDWATER RECHARGE POTENTIAL
 - HIGHEST GROUNDWATER RECHARGE POTENTIAL AREAS
- ADDITIONAL INFORMATION AVAILABLE ON THE [COMMISSION'S WEBSITE](#)
 - PREVIEW LAYERS ON THE [SUSQUEHANNA ATLAS](#)
- IF A LOCAL ASSESSMENT OF RECHARGE POTENTIAL IN ANY REGION, COUNTY, WATERSHED, OR OTHER SCALE IS DESIRED, A REQUEST CAN BE MADE THROUGH THE [COMMISSION'S WEBSITE](#)



IWRM Workgroup Discussion

- A workgroup to discuss IWRM was created from volunteers of the regional committees and the statewide committee.
- The workgroup held three meetings –
 - May – What are issues to be addressed with IWRM?
 - June – Who is already implementing IWRM?
 - July – What roles do different stakeholders play in IWRM?
- The workgroup decided that IWRM is a collection of principles.
- The IWRM definition used by the workgroup was:

IWRM Definition

"[IWRM is] an approach to managing water that looks holistically at the planning and management of water supply, wastewater, and stormwater systems. IWRM focuses on the water cycle as a single connected system and promotes coordinated development and management of water, land, and related resources to maximize the economic and social benefits while minimizing impacts on the environment."

American Planning Association

<https://www.planning.org/knowledgebase/watermanagement/>



Findings

- A holistic approach is best to achieve results.
- Collaboration between stakeholders is important.
- Framework for IWRM work – IWRM Principles and IWRM Outcomes:
 - Implementors – people working on the ground and implementing ideas.
 - Resources – to provide background information and data for decision making.
 - Decision makers – planning and coordination.

Suggested Actions

- Pre-application meetings
- Connect local stakeholders with resources and tools.
- Catalogue existing efforts and compile a body of knowledge that others can replicate (Clearinghouse of information and links on a webpage).

Discussion

- Like the framework, it is simple and easy to understand.
- How do we get people to make initial changes in thinking to consider IWRM?
- DEP communication specialists can be used to support messaging of IWRM use.
- PSATs should be an important stakeholder for communicating IWRM resources.
- The Water Atlas is also a great resource.

Items in the chat

None

Next Steps

Next meeting – The next Lower Susquehanna Regional Committee meeting will be held in October 2025. DEP is open to hold an in-person meeting at DEP Rachael Carson building or another site if a member is interested in hosting.

The meeting was adjourned at 10:55 a.m. on a Justin Spangler / George Pomeroy motion.