

DWSPP Quarterly Meeting



Photo by J. Palmer, ICPRB

Critical Area Resource Planning
Marsh and Rock Creek Watersheds

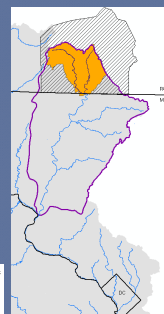
February 16, 2012

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Background

- Marsh and Rock Creeks (143 sq. mi.)
- Adams County, PA
- Headwaters of the Monocacy River
- PA Act 220 of 2002 CWPA
- Demand > supply
- ∴ development of a Critical Area Resource Plan (CARP)
- Funded by PADEP and ICPRB

Marsh and Rock Creek Watersheds
Adams County
Monocacy Watershed
Potomac Basin



2/16/2012

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Project Purpose

Identify and quantify, where possible, water resources issues that affect water availability and develop practical, implementable solutions

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Project Outline

- Participation
- Data collection
- Technical analyses
- Identify water resources issues
 - E.g. In combination, 13 PWS only have 2.3 days of average use in storage
- Identify management alternatives
- Evaluate/prioritize alternatives
- Develop CARP



"We don't have a water problem,
we have a water management problem."
CAAC mtg

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Participation

- Legislated participation required from range of water sectors
- Existing county WRAC committee formed basis
- Advisory committee with 59 diverse members



Advisory committee mtg

Organizations
Farm Bureau
Fruit growers association
Mason Dixon Farm
Bream Orchards
PA Groundwater Assoc
Watershed Alliance of Adams county
4 concerned citizens
3 county departments
3 county commissioners
Mason Dixon Country Club
4 university/college
5 school districts
Gettysburg National Military Park
GettOn
Ski Liberty
Knouse Foods
13 municipalities and COG
PA Rural Water Association
2 public water suppliers
3 state representatives
Adams County Economic Development

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Participation

www.marshrockwaterplan.blogspot.com



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One Piece of the Puzzle Water Quality

According to Act 220, a CARP must assess water quality issues that have a direct and substantial impact on water resource availability.

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Water Quality Introduction

- ◉ Identify existing or potential impacts to water resource availability
- ◉ Identify designated uses and impaired waterways
- ◉ Compare existing water quality data to water quality standards

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Designated Uses

- ◉ Designated by Pa DEP under US Clean Water Act
- ◉ Rock Creek and its tributaries plus Willoughby Run in Marsh Creek watershed are warm water fisheries
- ◉ Marsh Creek and its other tributaries are cold water fisheries
- ◉ Three waterways in Marsh Creek watershed are trout approved waterways
- ◉ Two stretches upstream of the approved trout waters are wild trout waters

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Designated Uses



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Impairments

- ◉ Marsh and Rock creek watersheds have impairments for sediment and nutrients
 - Impairments also include flow and runoff related conditions
 - Rock Creek Mainstem segments have been identified as impaired for DO, TN and TP

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Impairments



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Water Data

- ◉ Water quality data was collected from multiple sources
 - USGS compiled electronically available ground water quality data collected in Pa from 1979 to 2006
 - Adams County Conservation District has a program started in 1990 to analyze homeowner collected drinking water samples
 - Local watershed and environmental groups have collected surface water samples from 2000 to 2011

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USGS Ground Water Quality Data

- ◉ Compiled electronic databases for PA
- ◉ Samples collected by:
 - Pa DEP Fixed Station Network (FSN)
 - Pennsylvania Department of Agriculture (PennAg)
 - US Environmental Protection Agency (USEPA)
 - US Geological Survey (USGS)
- ◉ Contains analyses for:
 - Major Ions, Minor Ions, Nutrients, Insecticides, Herbicides, Fungicides, Radiochemicals, Microorganisms, and Field Parameters

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Major Ions

- ◉ Total of 332 samples:
 - USGS – 22 wells
 - FSN – 14 wells
 - US EPA – 11 wells



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Minor Ions

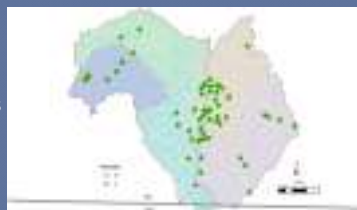
- ◉ Total of 34 samples:
 - USGS – 11 wells
 - FSN – 14 wells
 - US EPA – 4 wells



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Nutrients

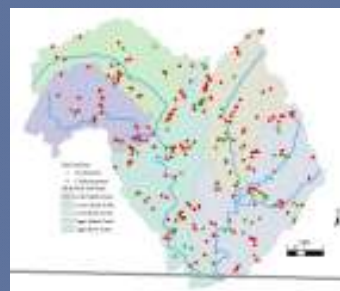
- ◉ Total of 176 samples:
 - USGS – 88 wells
 - FSN – 15 wells
 - US EPA – 55 wells
 - PennAg – 5 wells



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Microorganisms

- ◉ Total of 367 samples collected by analyzed by ACCD
 - Total Coliform bacteria



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Microorganisms

- Total of 367 samples collected by analyzed by ACCD
 - E. Coli bacteria



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Ground Water Data Summary

- A large number of samples have been collected for different purposes and analyzed for a range of constituents.
- Does not appear to be widespread or localized ground water contamination.
- The exception is bacteria. Total coliform and E.Coli have been detected in well water in all parts of the watersheds. This may be an indicator that proper treatment system installation and maintenance of private wells watersheds needs to be improved.

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Surface Water

- Environmental Alliance for Senior Involvement (EASI)
 - Collected surface water samples from streams in the watersheds from 2000-2011
 - Currently 351 sample results from 12 sites in the watersheds; number of sample exceeding MCLs/SMCLs -

Sample Location Name	Number exceedences/number of samples						
	pH	TDS*	Nitrate	Phosphat	Sulfate	Alkalinity	D.O.
Marsh Creek 1	4/14	0/14	0/14	4/9	0/12	2/16	0/15
Marsh Creek-Sachs Bridge #5b	2/9	0/7	0/5	3/3	0/9	0/9	1/9
Rock Creek 2a	11/43	4/43	5/40	13/36	0/45	1/45	5/41
Little Marsh Creek 1	0/4	0/3	0/5	2/2	0/5	0/6	1/4
Rock Creek #1	4/29	0/29	3/21	5/19	0/29	1/27	3/28
Rock Creek #3	0/1	0/1	0/1	0/1	0/1	0/1	0/1
Mumfordsburg Run #2	2/33	0/33	4/29	4/29	0/20	0/33	1/34
Mumfordsburg Run #1	0/7	0/7	0/4	1/3	0/6	0/7	0/6
Marsh Creek #7	26/70	1/68	0/60	4/55	0/32	0/68	2/65
Wilburdsburg Run 2	3/18	1/18	2/17	0/13	0/16	0/17	0/17
Rock Creek 11	20/58	1/56	10/61	0/52	0/48	0/59	0/58
Little Marsh Creek 3	2/38	0/0	2/43	1/28	0/11	0/44	0/46

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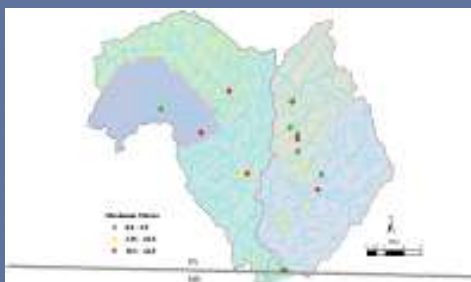
Surface Water

- Watershed Alliance of Adams County (WAAC)
 - Conducted an assessment of Rock Creek from Feb through Jul 2005
 - Monthly samples at 11 sites on Rock Creek or tributaries

	Temperature °C	Turbidity cm	Dissolved Oxygen mg/L	Nitrate mg/L	Phosphate mg/L	Sulfate mg/L
Number of samples	54	57	59	59	60	53
Minimum value	1.25	60	3	0	0	0
Maximum value	34	5.5	30.5	20	3.33	100
Number exceeding target			4	1	1	0

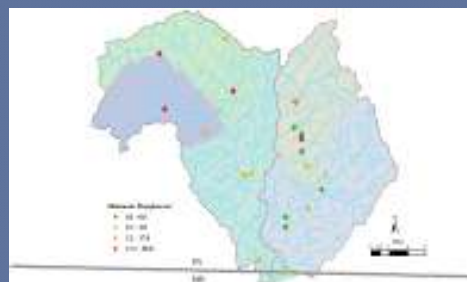
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Surface Nitrate Samples



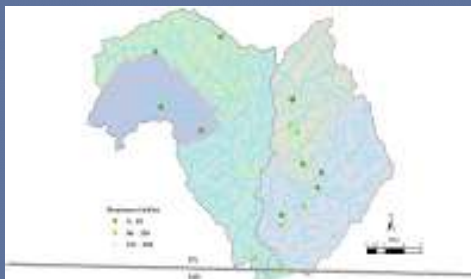
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Surface Phosphorous Samples



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Surface Sulfate Samples



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Surface Minimum DO Samples



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Surface Water Summary

- ◉ Fewer surface water sampling locations and samples than for ground water
- ◉ Primarily sampled for nutrients and physical parameters
- ◉ Exceeding samples appear intermittent runoff related
- ◉ Not a rigorous sampling program, not designed to identify sources

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Conclusions

- ◉ There doesn't appear major water quality problems in Marsh and Rock Creek watersheds impacting drinking water supplies
- ◉ The few samples exceeding limits are spatially and temporally dispersed
- ◉ Surface water exceedances probably storm runoff related
- ◉ However, the high flow, stormwater dominated events are frequent

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Marsh and Rock Impaired Streams



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Water Quality Mgmt Alternatives

- ◉ Establishment of groundwater protection ordinances (e.g. well construction, geothermal wells)
- ◉ Adoption of a wellhead protection ordinance
- ◉ Develop TMDLs for impaired waterways
- ◉ Encourage installation and maintenance of riparian buffers
- ◉ Public suppliers should prepare and get approval for Source Water Protection Plans
- ◉ Additional water quality monitoring

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Thank You!

Questions?

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