


Stream Monitoring in Loudoun County

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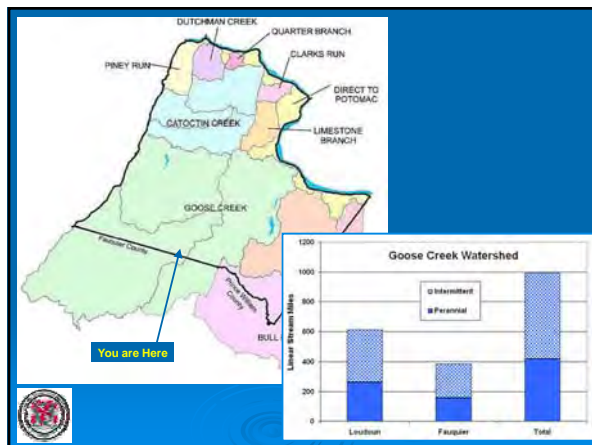


Department of Building and Development,
Water Resources Team
Loudoun County, Virginia

**For Goose Creek Association
"State of the Creek"
Middleburg, VA
March 12, 2009**


Purpose

- Summarize water resources programs and hydrologic monitoring
- Highlight stream monitoring (citizens, government agencies such as Loudoun County, and Loudoun Soil and Water Conservation District)
- Stream impairments ("Listing" by VA Dept Environmental Quality)

Water Resources Programs



- Water Resources Monitoring Program (2001-2009)
- Strategic Watershed Management Solutions (2005-2006)
- Comprehensive Watershed Management Program (2006-2008)
- Wetlands Modeling (2006-2008)
- **Stream Assessment (2009)**



Water Resources Monitoring Program (WRMP)

TYPES OF DATA COLLECTED OR INCORPORATED:

- ◆ Precipitation/Rainfall
- ◆ Stream Water Quality
- ◆ Groundwater Quality
- ◆ **Stream Monitoring**
- ◆ Stream Stage & Discharge
- ◆ Groundwater Level
- ◆ **Stream Assessment**

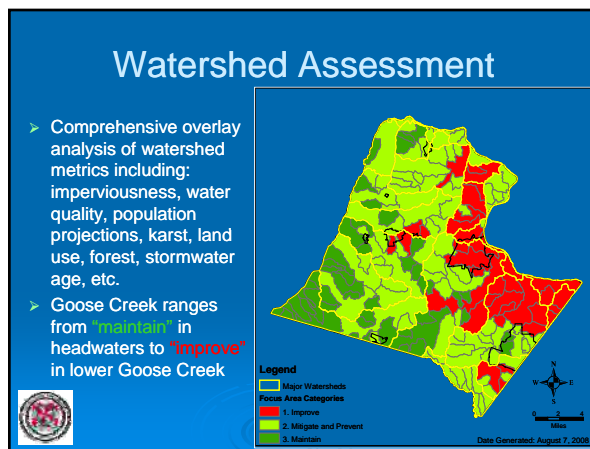
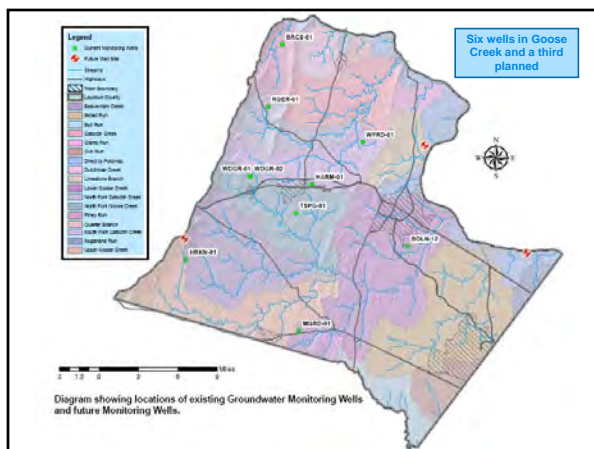
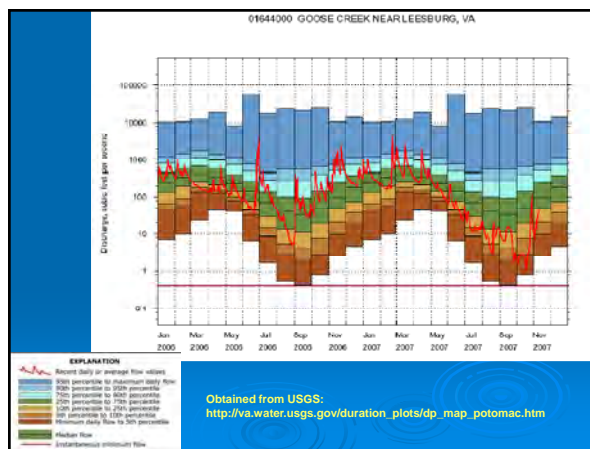
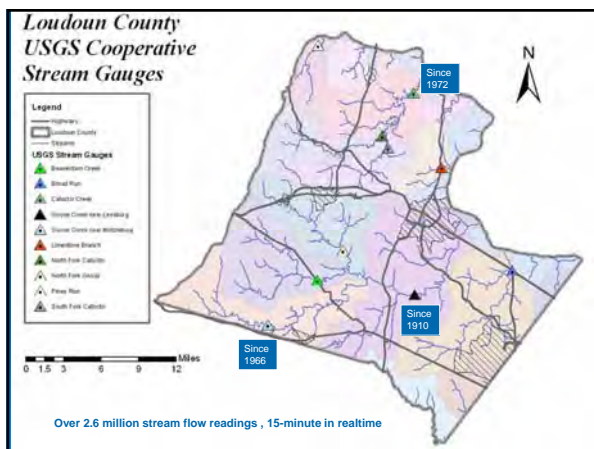
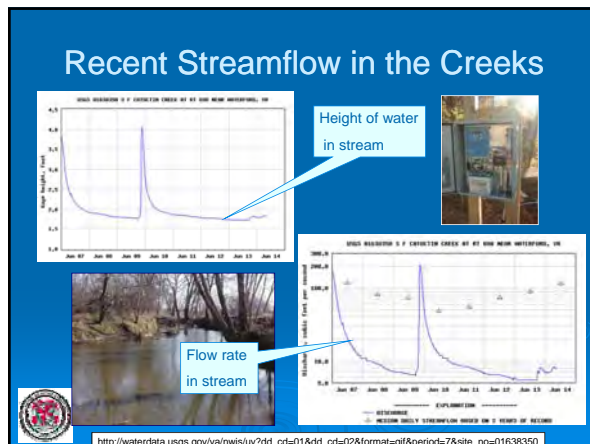
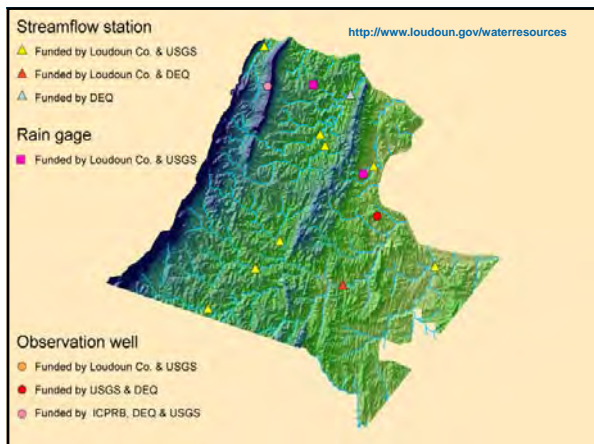



Water Resources Monitoring Program (WRMP)

DATA SOURCES:

- ◆ National Weather Service
- ◆ U. S. Geological Survey
- ◆ Dept. of Building & Development
- ◆ Environmental Health permitting
- ◆ Hydrogeologic studies for subdivision
- ◆ VA DEQ
- ◆ Metro Wash. Council of Governments
- ◆ **Volunteer groups**



Volunteer Stream Monitoring

- Began in late 1990's with Loudoun Soil and Water Conservation District, Loudoun Wildlife Conservancy, Audubon Naturalist and others.
- In 2000 Stream Monitoring Project memorandum of understanding that was rebranded to Loudoun Watershed Watch.
- Loudoun Watershed Watch partners monitored 249 times 1997-2007 using ANS protocol.
- Goose Creek Association monitored 272 times 2003-2009 using VA SOS protocol.
- In 2008 Loudoun Wildlife Conservancy changed to VA SOS protocol.

<http://www.loudounwatershed.org>

Water Quality Assessment and TMDLs

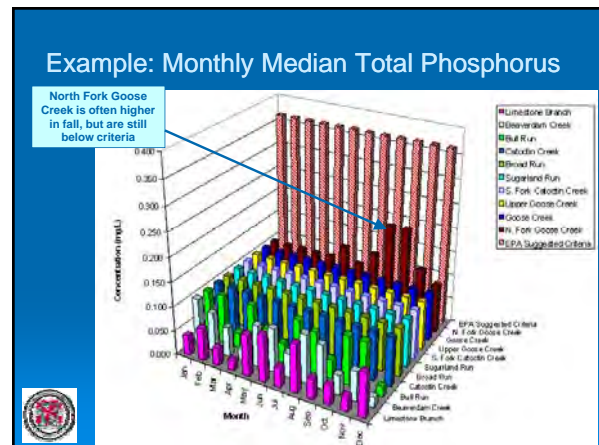
- Every two years VA DEQ conducts Water Quality Assessment
- Based on monitoring reaches of creek are assessed for criteria and if levels are exceeded, the reach is "listed" as being impaired
- Once "listed", DEQ is required to find out the source of the pollution and write a TMDL (Total Maximum Daily Load) report
- After the source determination, DEQ may figure what can be done to correct in TMDL Implementation Plan
- The Plan establishes the corrective action and funding
- Based on the plan government (Dept Health and/or Dept Conservation & Recreation) oversee conducting the plan, often through Soil Water & Conservation District

<http://www.loudounwatershed.org>

VA DEQ Surface Water Quality

- Ambient and trend stations for Chemical (N, P, Zn, Cu, pH, etc) and biological (E. Coli)
- Over 44,000 measurements since early 70's in Goose Creek watershed at 56 stations

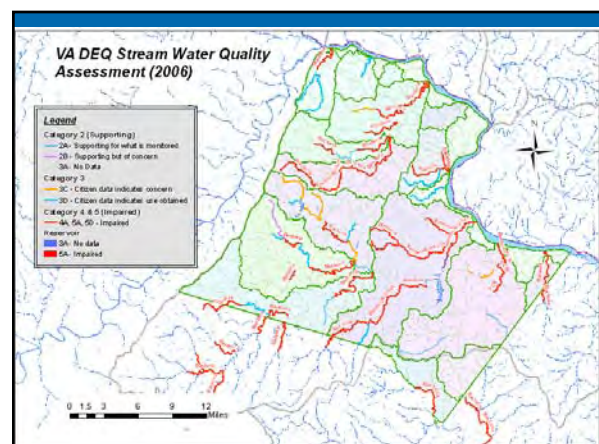
http://gisweb.deq.virginia.gov/monapp/mon_query_form.cfm



VA DEQ Benthic Monitoring

- Benthic monitoring (Code name "ProbMon EDAS")
- More involved than VA SOS
- Over 50 measurements in Goose Creek since 1994 at 14 stations and over 5,000 statewide

<http://www.deq.virginia.gov/probmon/products/>



Subcategory 3 - Insufficient Data

- Virginia 3A - No Data Available
- Virginia 3B - Data Available But Insufficient Quantity
- Virginia 3C - Citizen Monitoring Indicates Problem
 - Waters Evaluated And Prioritized For Follow-Up Monitoring
- Virginia 3D - Citizen Monitoring Indicates No Problems

Goose Creek Data in 2008

Reference letter February 15, 2008 to Hazel Edens. 22 stations with 132 sample events

Based on review of protocols and methods, dissolved oxygen, pH, temperature, and E. coli data are acceptable for VA Category 3C and 3D purposes.

Dissolved oxygen was not accepted due to malfunctioning equipment.

http://www.deq.virginia.gov/wqa/pdf/2008ir/appendices/ir08_AppendixD_Data_Sets_Considered.pdf

New in 2008 – You can select which type of impairment:

1. Aquatic life (benthic-sediment)
2. Fish consumption
3. Public water supplies
4. Shellfish consumption
5. Recreation or swimming (bacteria)
6. Wildlife

<http://gisweb.deq.virginia.gov/adbrms/viewer.htm>

Aquatic Life - Benthic

Red → Impaired

Green → Supporting (OK)

Blue → No data

2008 Impaired Waters

Category 4 & 5 by 2008 Impaired Area ID*

Potomac and Shenandoah River Basins

Cause Group Code: A08R-02-BEN - Little River

Location: Begins at the confluence with Hungry Run, approximately 1.5 rivermiles upstream from Route 50 near Aldie, and continues downstream until the confluence with Goose Creek.

City/County: Loudoun Co.

Use(s): Aquatic Life

Cause(s) / VA Category: Benthic-Macroinvertebrate Bioassessments / 4A

While the benthic community integrity showed an improvement from the 1998 303(d) list, this was not sufficient to warrant removing this segment from the impaired waters list. Therefore, the stream segment remains impaired for the benthic macroinvertebrate community.

Assessment list	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TREL Schedule	Size
VAN-A08R_LIV1500	Little River	Segment begins at the confluence with Hungry Run, approximately 1.5 rivermiles upstream from Route 50 near Aldie, and continues downstream until the confluence with Goose Creek.	4A	Benthic Macroinvertebrate Bioassessments	1998	2004	8.11

Little River

Impaired Area ID: VAN-A08R-02	Benthic-Macroinvertebrate Bioassessments / 4A	Estuary (sq. miles)	Reservoir (acres)	River (miles)
	Total impaired size by water type:			8.11

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