Rock Creek TMDL Update

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Project Background

- In September 2002, LTI was contracted through EPA Region 3 to assist in the development of TMDLs for Upper and Lower Rock Creek

  – Includes Metals & Organics

  – Bacteria TMDL and tributary TMDLs have been or are being developed by DC DOH

Project Timeline

- **Phase 1: 9/2002 to 12/2002**

    - Review of the available data
    - Recommended options for each TMDL

- **Phase 2: 1/2003 to 12/2003**

    - Collect sampling data

    - Assist in the development of TMDLs

- **Phase 3: Early 2004**

    - Respond to comments, modify TMDL as needed

Step 1: Review of Available Data

- **Physical Data**
  - Hydrography
    - USGS Gage at Sherrill Drive in Washington, DC
    - GPS Derived Stream Channel from the ICPRB
  - Topography (USGS)
    - 20ft elevation contours
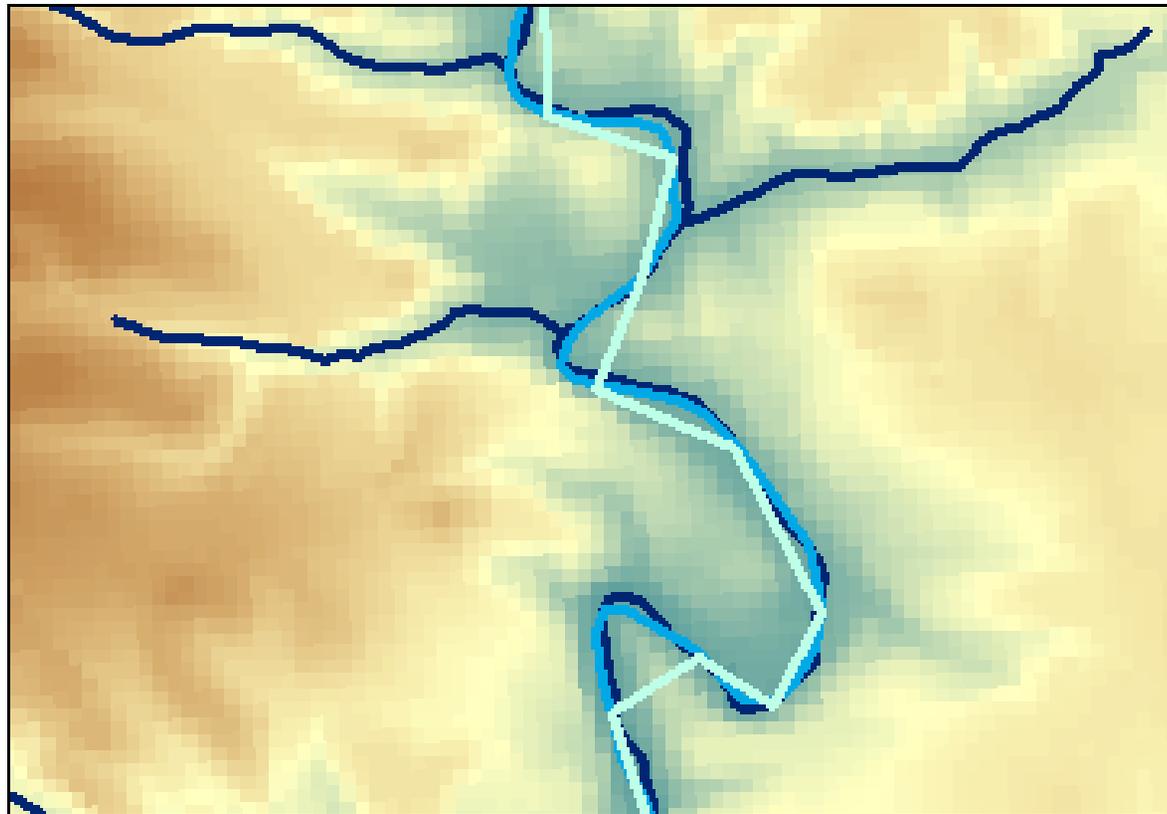   - 1:24,000 Digital Elevation Model
  - Soils
    - State Soil Geographic Database (STATSGO)

Review of Available Data (con't)

- Hydrography & Digital Elevation Model

Review of Available Data (con't)

- STATSGO

Soil Type

- BELTSVILLE-CROOM-SASSAFRAS (MD001)
- MANOR-GLENELG-CHESTER (MD011)
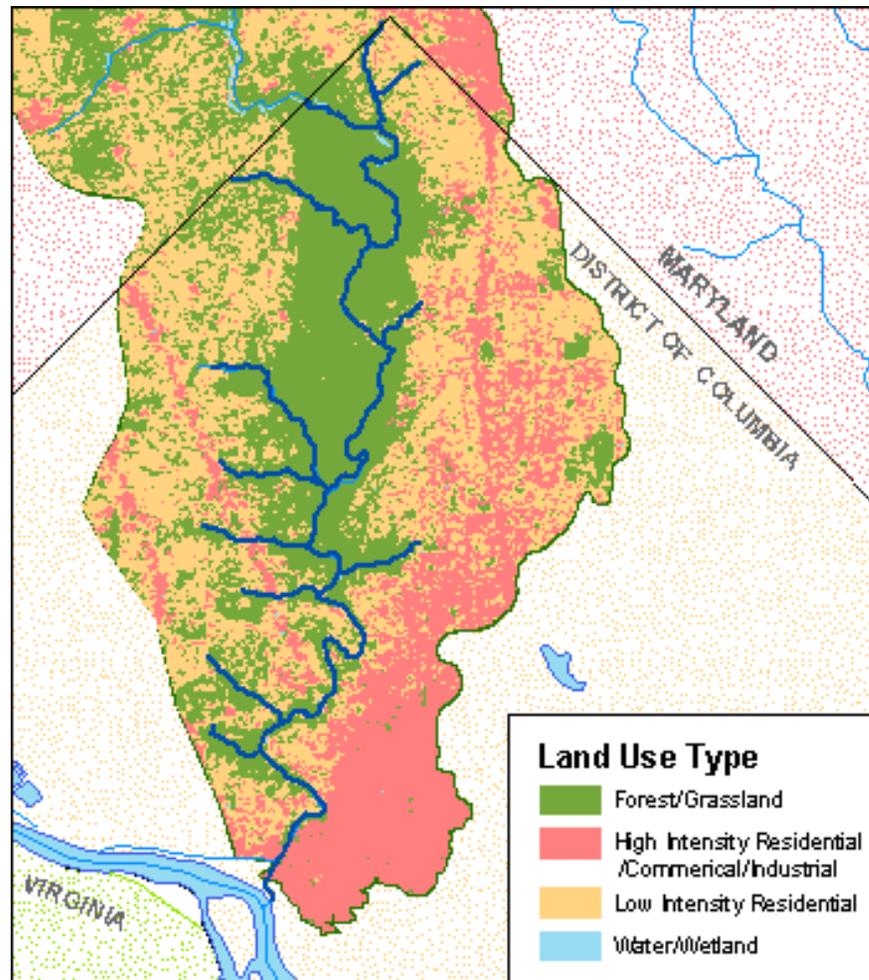
Review of Available Data (con't)

- **Anthropogenic Data**
  - Political boundaries & roads
  - Nat'l Land Cover Dataset (mid-1990's)
  - DC WASA Collection System
    - Combined, Sanitary, & stormwater systems
  - Point Sources
    - INDUS53 and BASINS

Review of Available Data (con't)

- Nat'l Land Cover Dataset

Water Quality Data Investigation

- **Data Sources**
  - DC WASA Long-Term Control Plan
  - Draft Phase II Stormwater Permit
  - LTI Sediment Study (1989)
  - USGS WQ Baseline Study (1999)
  - Bioassessment Studies (1992-93, 1997-98)
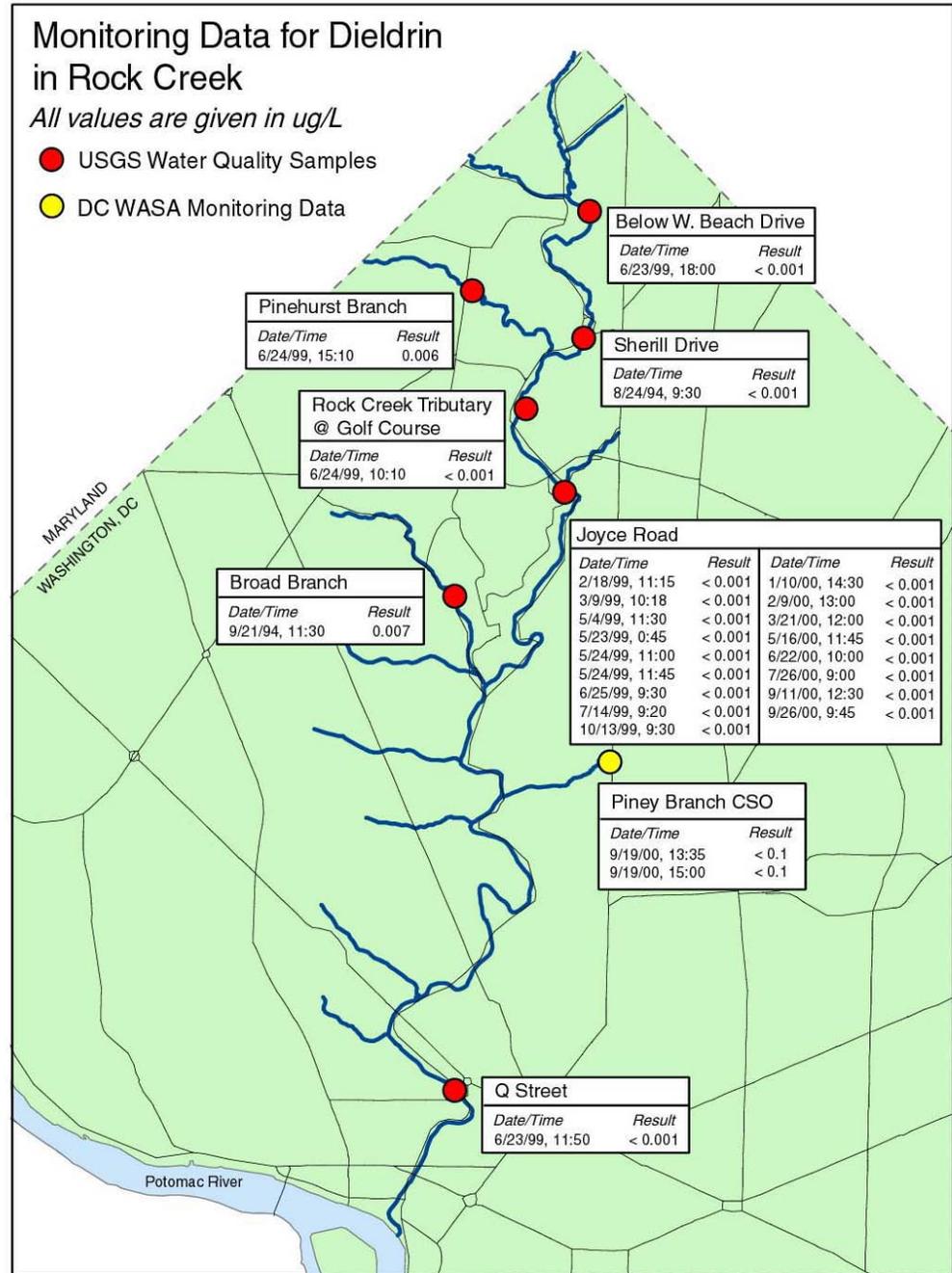 - DC DOH Routine Monitoring (STORET)

Data Map

Monitoring Data for Dieldrin in Rock Creek. All values are given in ug/L.

Data Gaps

- ## Water Column
  - Very little data on organics
  - Detection limits for some metals (copper, cadmium) are above WQ standards

- ## Point Sources
  - Data is limited to one CSO, 3 SW outfalls

- ## Sediments
  - Limited knowledge of sediment characteristics

- ## Biology
  - No fish tissue data, bioassessments used different protocols

Monitoring Possibilities

- **Water Column**
  - Collect additional cadmium and copper samples at upstream & downstream boundaries

- **Sediments**
  - Collect TSS upstream/downstream for sediment balance
  - Sediment characterization study

- **Biology**
  - Future bioassessment studies

Potential TMDL Approaches

- Four Options were considered

  - Delisting

  - Section 4.b – 2002 Integrated WQ Montoring & Assessment Report Guidance

    - "Other Pollution Control requirements are reasonably expected to result in attainment of the WQ Standard in the near future"

    - http://www.epa.gov/owow/tmdl/2002wqma.pdf

  - Simple Modeling (SMPTOX), TMDL

    - Steady-state, sediment/water column model

  - Complex Modeling (WASP), TMDL

Approaches for each constituent

Delisting	Section 4.b	Simple Modeling
Arsenic	Chlordane	Cadmium
Chromium	DDT	Copper
Nickel	Endosulfan	Lead
Selenium	Heptachlor Epoxide	Mercury
Dieldrin	HCB	Zinc
Endrin	Total PAHs	
Gamma-BHC	Total PCBs	
Mirex		

Lindane: A case for delisting

- **Water Quality Data**
  - All water column data (21 points) is less than 0.004 ug/L
  - All CSO data is less than 0.05 ug/L
  - Sediment data is less than 1 ug/kg

- **Water Quality Standards**
  - Chronic Numeric Criteria = 0.08 ug/L
  - Acute Numeric Criteria = 2.0 ug/L
  - Class D Standard = 0.063 ug/L

DDT: A section 4.b example

- ■ **Water Quality Data**
  - – Water column data for DDE is less than the detection limit of 0.006 ug/L for all samples
  - – All CSO data collected was less than the detection limit of 0.1 ug/L
  - – Sediment data of up to 8 ug/kg was found

- ■ **Water Quality Standards**
  - – Chronic Numeric Criteria = 0.001 ug/L
  - – Acute Numeric Criteria = 1.1 ug/L
  - – Class D Standard = 0.00059 ug/L

Copper: A case for SMPTOX

- **Water Quality Data**

  - Water column data is less than the detection limit of 25 ug/L for all samples

  - CSO data collected ranged from 18 to 37 ug/L

  - SW data collected ranged from 12 to 201 ug/L

  - Sediment data of up to 170 ug/g was found

- **Water Quality Standards**

  - Chronic Numeric Criteria = 3.6 to 23.6 ug/L *

  - Acute Numeric Criteria = 4.8 to 38 ug/L *

  * - dependent on hardness

Next Steps

- Sample for Cadmium and Copper in Rock Creek

- Integrate Efforts with those of the tributary TMDLs

- Decide on an approach for the Mercury TMDL