8987 Yellow Brick Road
Baltimore, Maryland 21237

Mattawoman Creek Discreet and Continuous Water-Quality Monitoring Program Progress Report
U.S. Geological Survey

Reporting Period: Water-Year 2004: October 1, 2003 through September 30, 2004

Cooperating Agencies: Charles County Maryland Government
U.S. Geological Survey (USGS)

Project Personnel: Brenda Feit Majedi, Project Chief, USGS
David Brower, Hydrologic Technician, USGS

Project Objectives:

1. Continue the collection of stage data at Mattawoman Creek near Pomonkey, MD according to standard USGS protocols; refine the rating curve for continuous discharge determination; determine and report discharge data in the annual data report, as well as on-line through the real-time web page.

2. Continue to collect and analyze monthly base-flow as well as stormflow samples at Mattawoman Creek near Pomonkey, MD, for nutrients (N and P) and suspended-sediment concentration.

3. Expand data collection at Mattawoman Creek near Pomonkey, MD to include real-time reporting of additional water-quality parameters (water temperature, pH, specific conductance, and turbidity).

4. Plan, coordinate, and oversee sample collection at Mattawoman Creek near Pomonkey, MD, including the quality-assurance data-collection effort.

5. Manage all data collected for the project and publish annually in the USGS MD-DE-DC District Annual Data Report.

Deliverables:

1. Water-quality and discharge data, to be published in the USGS MD-DE-DC District Water-Year 2004 Annual Data Report.

2. Real-time reporting of continuous water-quality data for water temperature, pH, specific conductance, and turbidity.

Progress During Reporting Period:

1. A total of 43 water-quality samples were collected at Mattawoman Creek near Pomonkey, MD (01658000) during water year 2004, and include those listed below. All samples for nutrient concentrations were analyzed at the USGS National Water Quality Laboratory (NWQL); all samples for suspended sediment were analyzed at the USGS Sediment Laboratory in Kentucky.
   a. Eleven base-flow samples were collected, one during each month of the year, except for August 2004, in which no samples were collected due to budgetary constraints.
   b. Twenty-seven stormflow samples were collected over six separate storm events that occurred in October, April, June, July, and September.
   c. Four quality-control samples were collected, including two blanks (one field blank and one Isco automatic-sampler blank), and two replicate samples. Note that the automatic-sampler blank had no detections of analytes above the analytical detection limits.
   d. Continuous monitoring of water temperature, pH, specific conductance, and turbidity continued to be displayed on the real-time web page (http://waterdata.usgs.gov/md/nwis/uv?01658000). USGS personnel serviced and maintained the instrumentation in a timely manner when possible in order to minimize equipment down time.

2. Continuous dissolved oxygen data continues to be problematic and was not displayed on the real-time page during 2004 nor will it be published in the annual data report, as agreed by USGS and Charles County. Continuous dissolved oxygen data is being collected, but the data are of a questionable quality. Also note that instantaneous dissolved oxygen data are being measured when water-quality samples are collected.

   In order to have a good dissolved oxygen record, more frequent maintenance (weekly or biweekly) of the sensor would be needed. A possible alternative is deploying a different type of sensor that is more resistant to biofouling; current project budget cannot support this, however.

3. The project web page continues to be updated. The web page can be accessed at: http://md.water.usgs.gov/watershed/9B211/index.html. The site contains graphs showing relations of precipitation, discharge, and nitrogen, phosphorus, and suspended-sediment concentrations for each quarter for water years 2001, 2002, 2003, and 2004. The precipitation data appear on a separate graph, and the nitrogen, phosphorus, and suspended-sediment concentrations are shown with discharge. Data are considered final, except for water-year 2004 data, which are provisional.

4. Agreement for fiscal year 2005 signed 23 August 2004.

Plans for Water Year 2005:

1. Continue to collect and analyze monthly and stormflow discreet water-quality samples for nutrients and suspended sediment.

2. Perform monthly site and instrument maintenance.

3. Display continuous measurements of water temperature, pH, specific conductance, and turbidity on the real-time web page.

4. Continue to post plots of precipitation, concentration, and discharge data on the project web page, on a quarterly basis.

5. Begin data analysis and looking at relations between continuously measured water temperature, pH, specific conductance, and turbidity, and nitrogen and phosphorus species and suspended sediment.

6. Finalize water-year 2004 discharge and water-quality concentration data.

7. Collect cross-section comparison samples from the bridge as flow warrants, pending SHA's availability to close traffic lane.

8. Determine Charles County's need for reliable continuous dissolved oxygen data.

9. Schedule a meeting/site visit with Charles County representatives.