

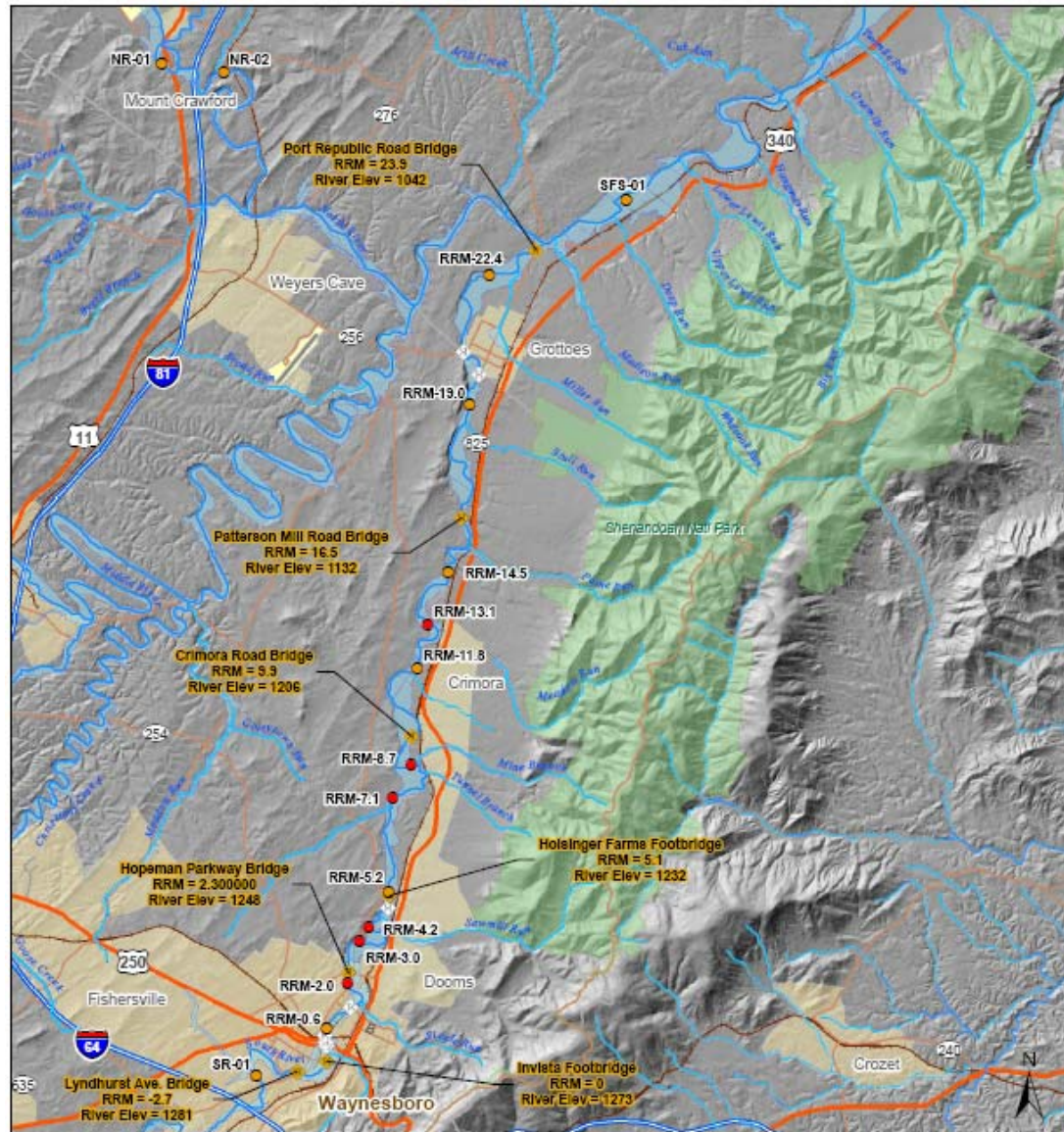
Baseline Water and Sediment Sampling: Ecological Study of the South River and a Segment of the South Fork Shenandoah River



Baseline Physical and Biological Characterization

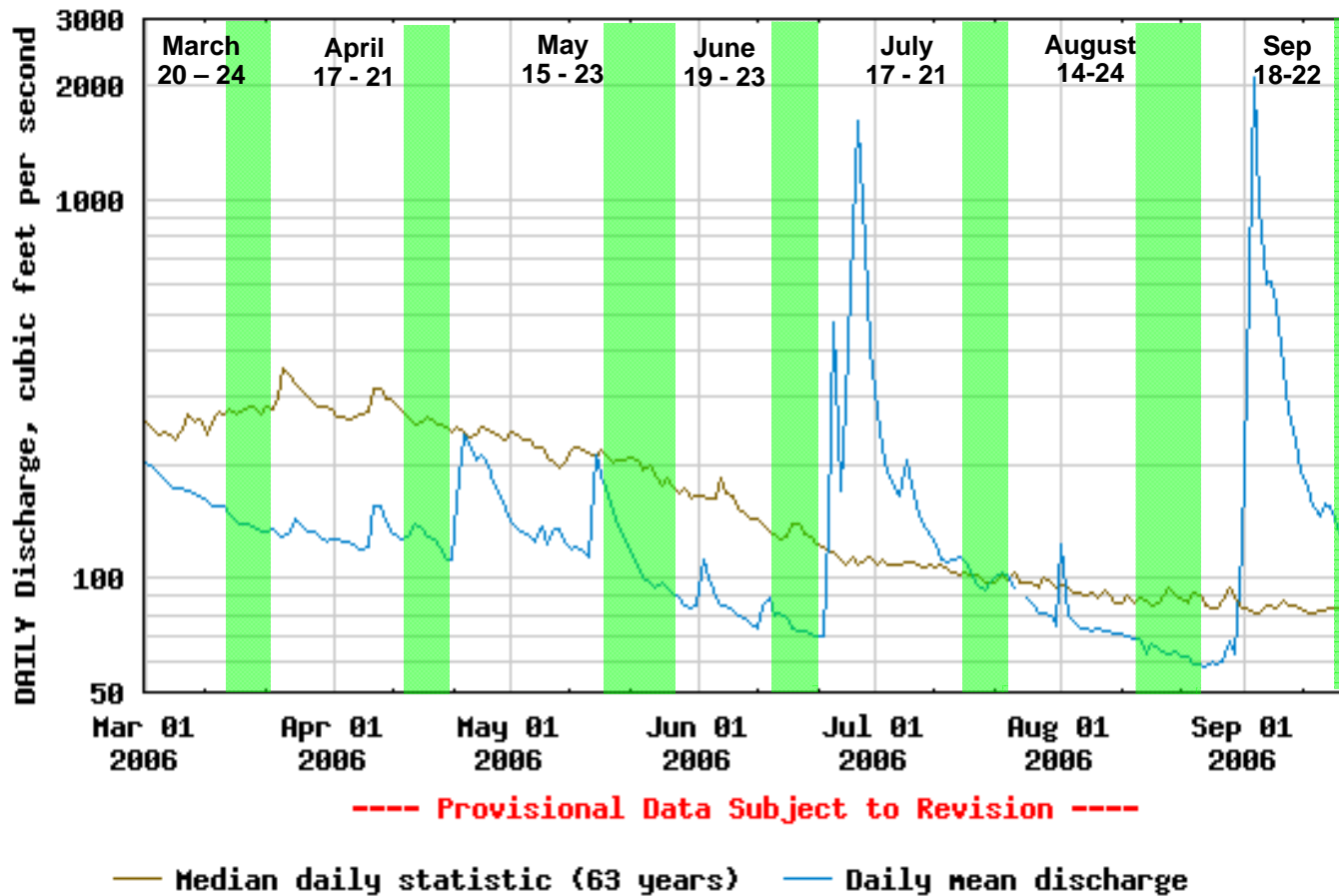
Sampling Goals:

- 13 baseline stations in study area; 3 reference stations
- Monthly collections of surface water and sediment



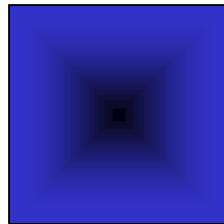
HYDROLOGICAL CONDITIONS DURING SAMPLING

South River Daily Mean Discharge During Sampling



Surface Water Mercury Data

March - July 2006



Surface Water Discussion of Results

Total Mercury:

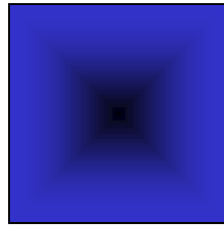
- Concentrations of particulate total mercury tend to rise rapidly to RRM- 3.0 and fluctuate thereafter reaching maximum concentrations at varying distances downriver in monthly samples
- Concentrations of particulate total mercury vary between months at stations with the highest concentrations recorded in May samples
- Concentrations of total mercury in filtered surface water rise with distance along the South River to ~RRM 19
- Concentrations of total mercury in filtered surface water were similar at stations between spring months and higher in summer months

Methylmercury:

- Methylmercury concentrations in filtered and particulate fractions of surface water samples increased between March and April at South River locations
- Generally, methylmercury concentrations in surface water samples trend higher through the spring and lower in the summer months at most locations
- The percent of total mercury as methylmercury in the particulate and filter passing fractions of surface water varied between months; percentages were lowest in March and highest in April
- At select locations between March and April, the percent of total mercury as methylmercury in the particulate phase rises from 1 to 3% and in the filter passing fraction rises from 5 to 23%

Sediment Mercury Data

March - July 2006



Sediment Discussion of Results

Total Mercury:

- Concentrations in sediment are similar between months at stations, with the exception of one high value (510 ug Hg/g Organic Carbon) at RRM-3.0 in July
- Concentrations in sediment tend to increase up to RRM-8.7 and tend to decrease thereafter
- Concentrations of total mercury are negatively correlated with river slope
- The percentage of KOH-extractable total mercury (bioavailable mercury) showed an increasing trend along the length of the South River (seasonally collected, May samples only)

Methylmercury:

- Concentrations in sediment were lowest in March and significantly higher in April, May and June than March at most South River locations.
- Maximum concentrations in sediment were generally seen at RRM-8.7 or 11.8 (sediments collected at the downstream end of two of the longest pools along the river)
 - No correlation between methylmercury concentrations in sediment and slope
- The percent of total mercury as methylmercury in sediment varied between months; percentages were lowest in March and highest in April