

Storm Event Sampling

Sampling Update:

- Target one storm event each season; sample at 8 bridge locations during
 - baseline conditions
 - 3-hr intervals during rising discharge
 - 1, 3, 5, and 7-days during falling discharge
- Three storms:

| Date | Peak Flow at Harriston (CFS) | Storm Return Interval (yrs) |
|-----------|------------------------------|-----------------------------|
| 28-Jun-06 | 2,640 | 0.2 |
| 31-Aug-06 | 3,010 | 0.31 |
| 16-Nov-06 | 3,690 | 0.44 |

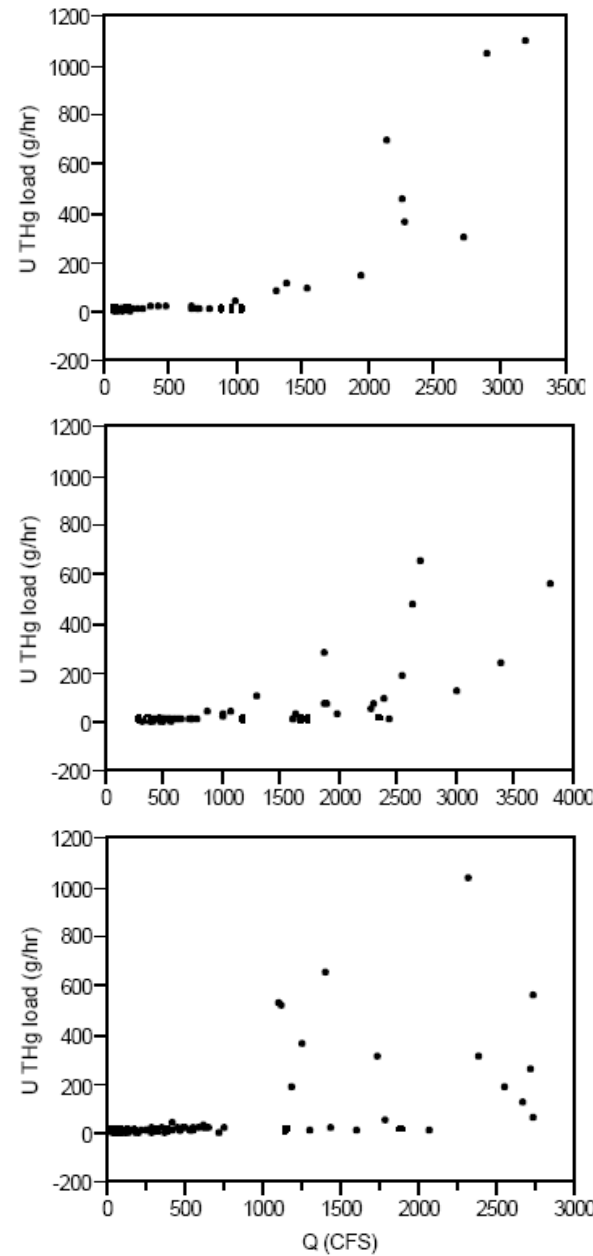
- Fourth storm sampled in late February 2007; data not yet available



Particulate THg Loading at Peak Flows

Results:

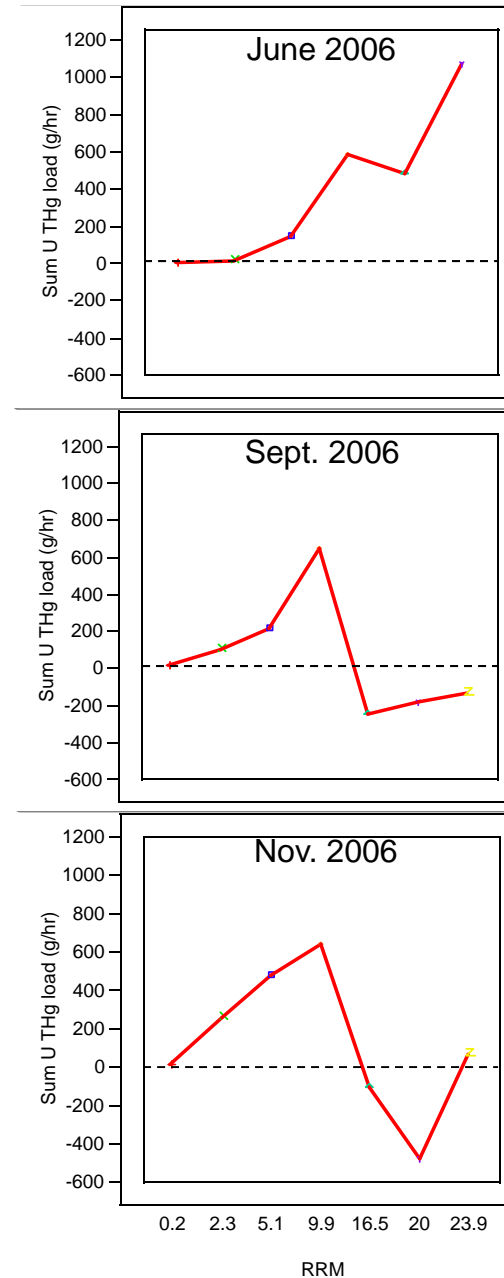
- Highest loading rates occurred in June and generally decreased over the course of 2006
- Load increases above 1000 CFS
 - Shear stress
 - Water surface elevation



Sum of Unfiltered Loads

Results:

- Sum of unfiltered loads was positive over length of SR during June 2006 storm event
- After June, sum of load were negative below Crimora, suggesting that primary sources are upstream
- Magnitude of loads decreases over course of 2006
- Results of 4th quarter storm will test idea that freeze thaw cycles provide added material for loads

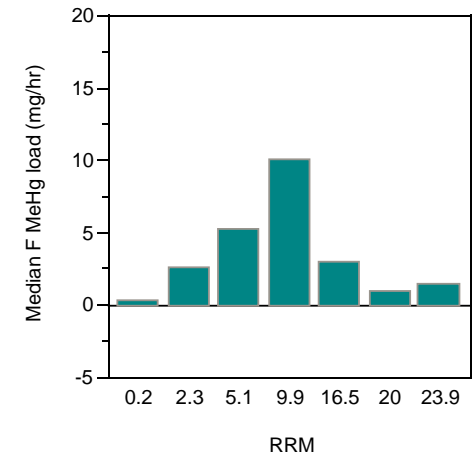
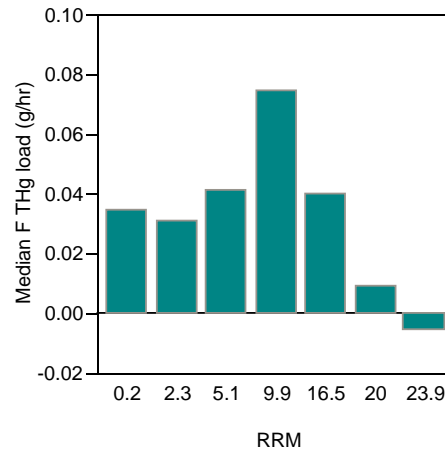
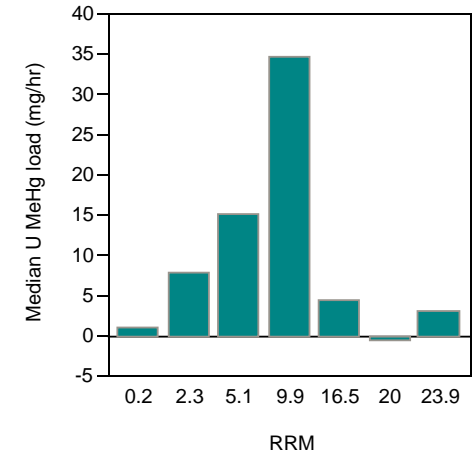
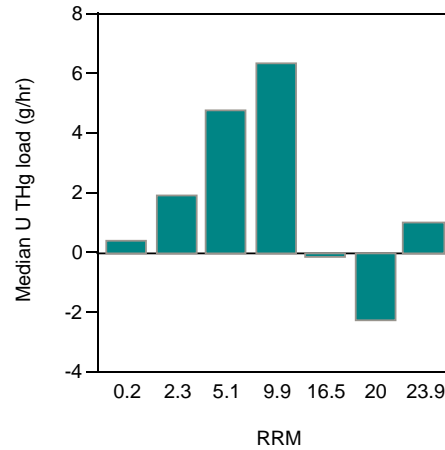


Median THg and MeHg Loadings

Median Loading for June, September and November Storm Events Combined

Results:

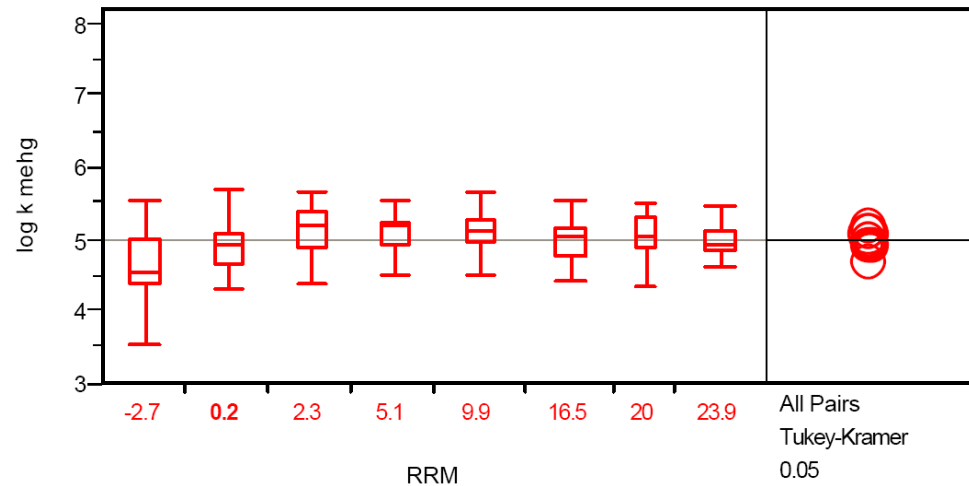
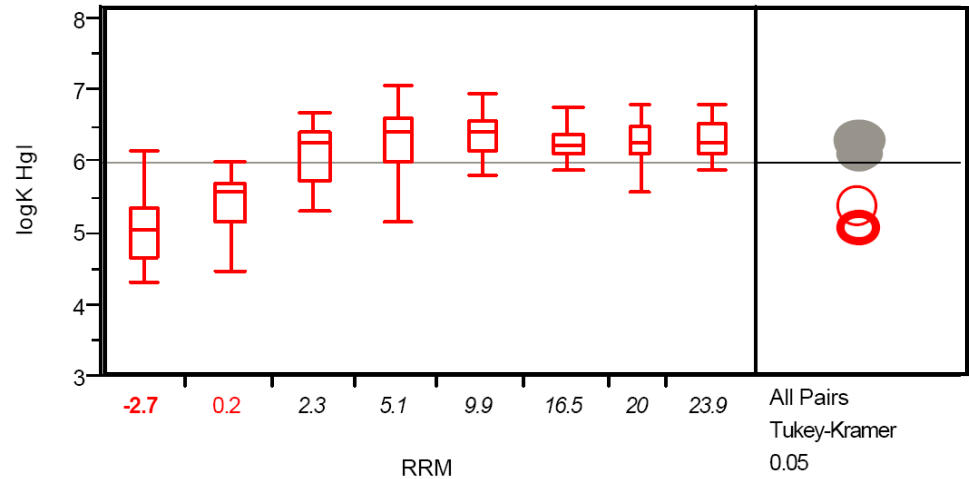
- Evidence that sources are primarily upstream of Crimora (RRM-9.9)
- Larger differences between filtered and unfiltered THg loading as compared to MeHg
- Pattern between filtered and unfiltered MeHg loading due to partitioning behavior of MeHg in South River



Mercury Behavior During Storm Events

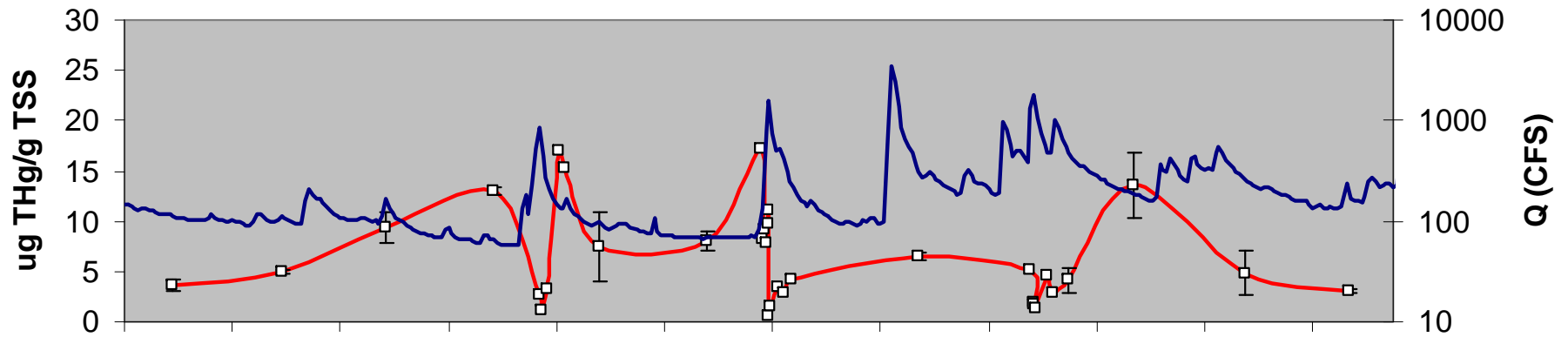
Results:

- Log K for inorganic mercury (THg – MeHg) is ~6 for all South River locations under storm flows; similar to baseline
- Inorganic mercury up to Main St. is associated with filter-passing fraction of surface water; lower than under baseline conditions
- As expected for MeHg, log K is lower than for inorganic mercury; similar to baseline overall

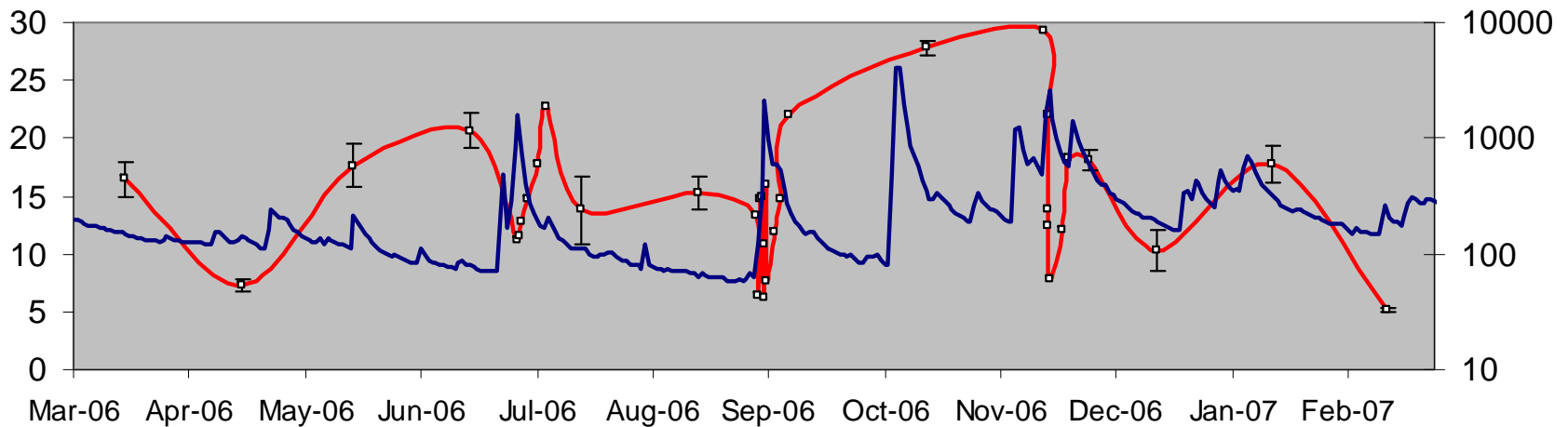


Influence of Storms on Concentrations of THg on Particles

Hopeman Parkway/RRM-2.0

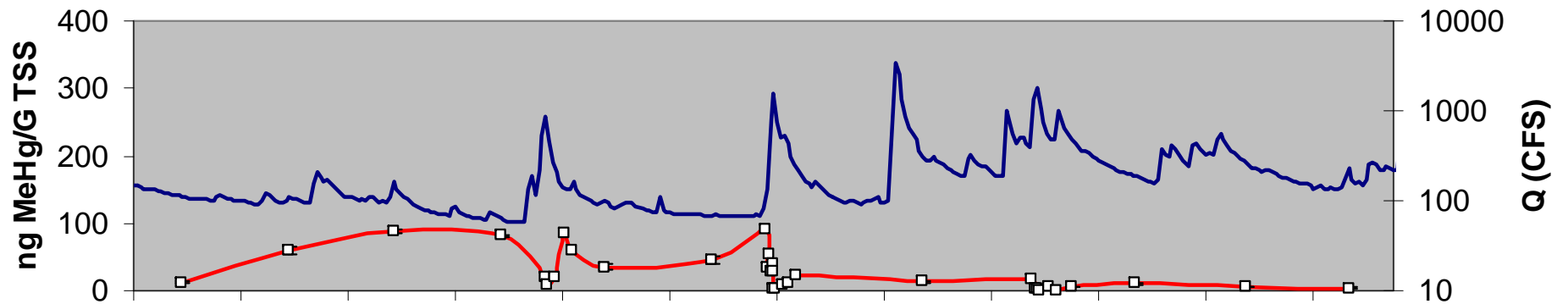


Patterson Mill Rd/RRM-14.6

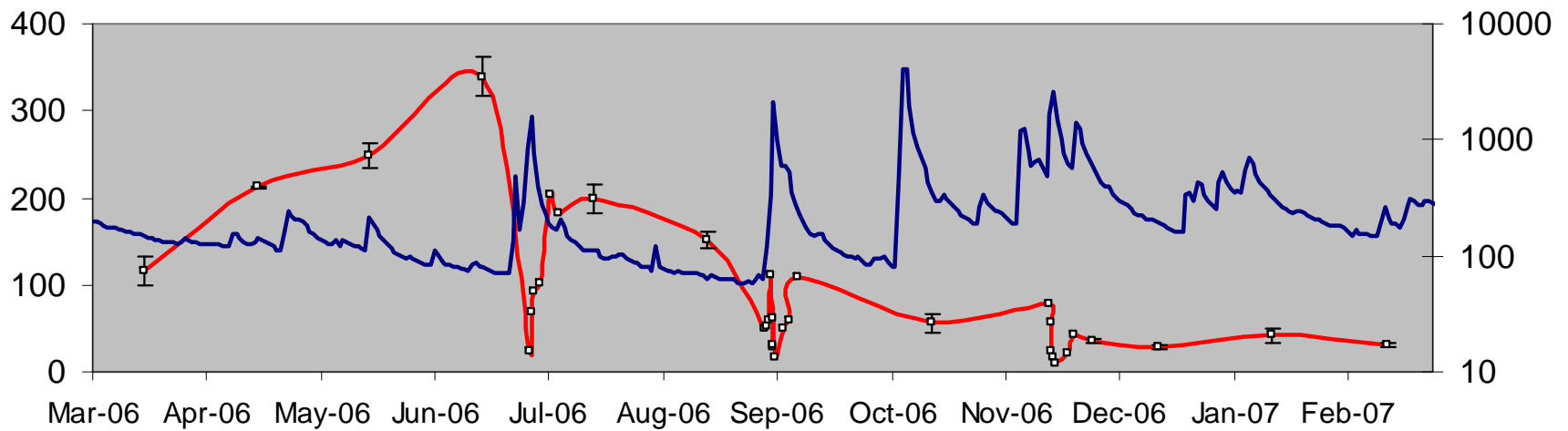


Influence of Storms on Concentrations of MeHg on Particles

Hopeman Parkway/RRM-2.0



Patterson Mill Rd/RRM-14.6



Storm Event Sampling

Conclusions:

- Storm peak flows show highest loading rates
- Data collected during rising discharge reveals areas contributing THg and MeHg to the system
 - Hopeman Parkway to Crimora for particulate and filtered loads
- Storms lower concentrations of THg and MeHg on particles by mixing downstream solids with clean, upstream solids
- Concentrations on particles return to baseline levels over the course of the falling discharge

