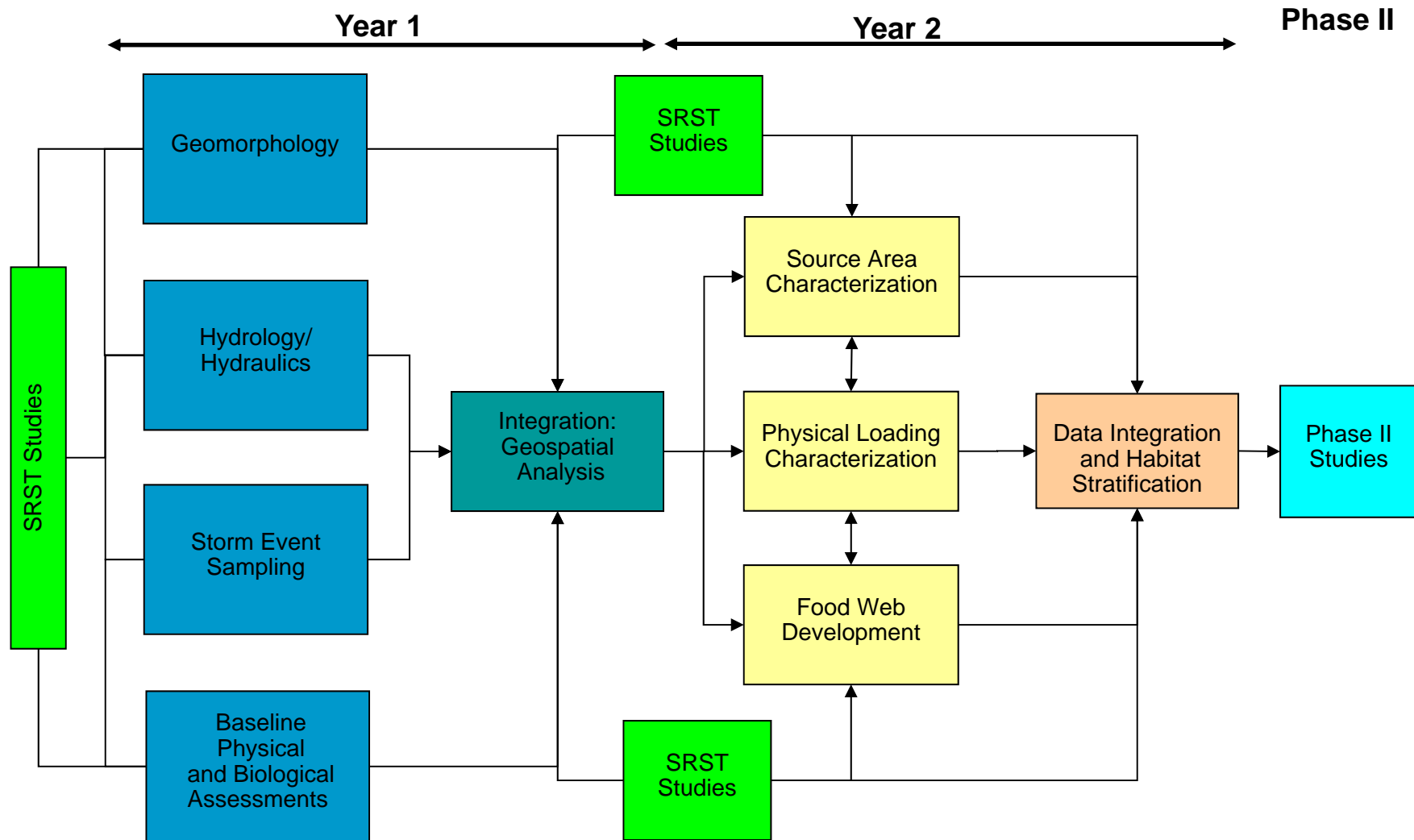


Phase I System Characterization: Expert Panel Review



Overview: Phase I Ecological Study



General Overview of South River Study Reach

RRM 0-12

Higher floodplain and channel storage capacity

- Lower gradient
- Greater FGS volume
- Greater floodplain area

Higher percentage of eroding channel banks

Predominant landuse in 5-yr floodplain includes agriculture and pasture

Closer proximity to source; highest THg and MeHg soil and sediment data sets

Highest baseline loading rates for MeHg and THg; generally positive loads during year of sampling

RRM 12-24

Greater number of island side channels (roughly 4X upper segment)

Two “standout” RRM features

- Deep pool near RRM 12.7 with substantial FGS
- floodplain area and river gradient change near confluence at RRM 22-23

Predominant landuse in 5-yr floodplain includes undeveloped forest types

Receives Hg loads from upper reach; biota tissue Hg levels generally equivalent to or higher than upper reach

Goals and Objectives for Ecological Study: Transitioning from Phase I into Phase II

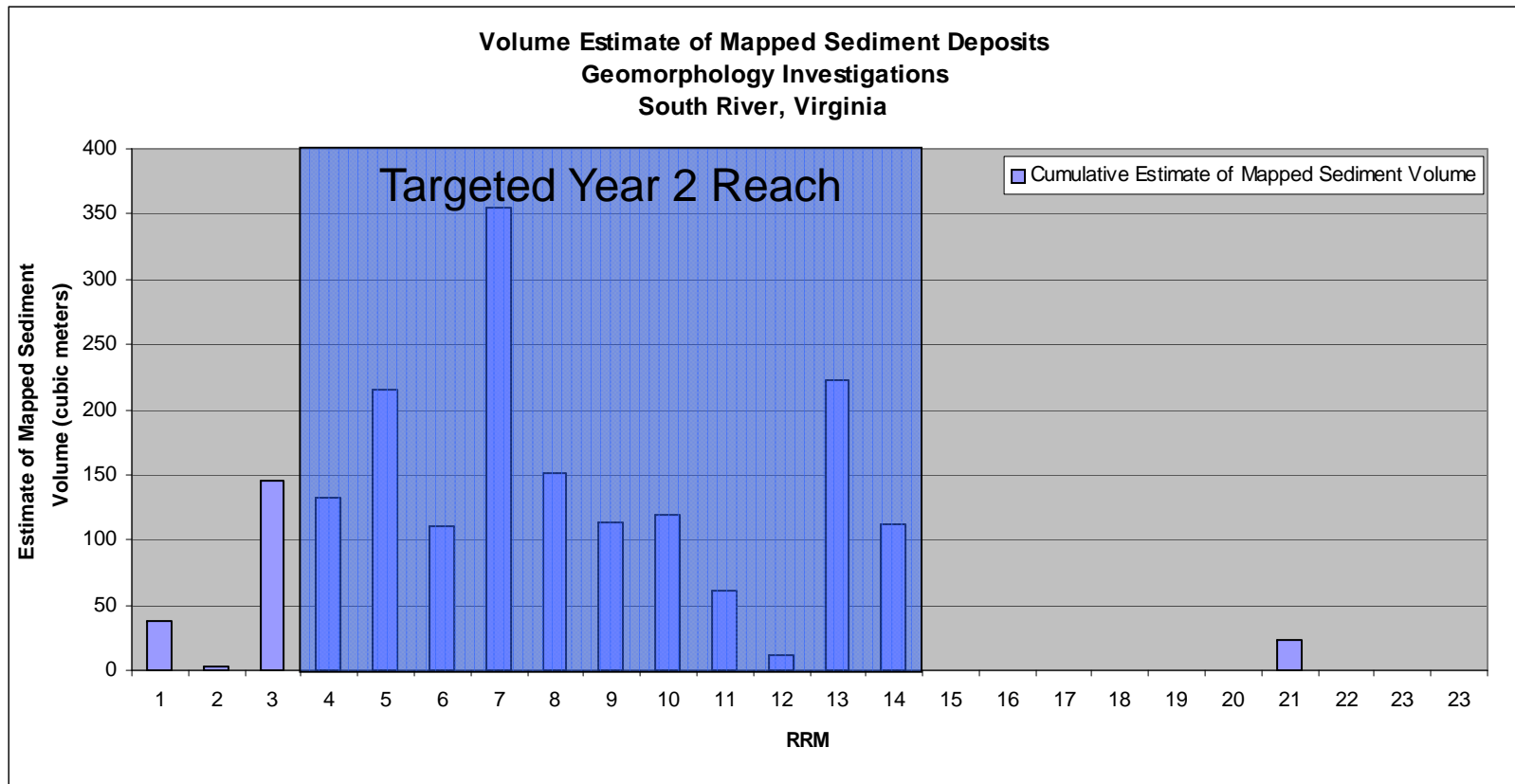
Collect and integrate data from numerous SRST activities to:

1. Characterize potential sources (i.e. physical media) of Hg to the South River System
2. Determine loading rates and the relative importance of various major potential sources of Hg to the South River system
3. Describe and rank various river and floodplain habitats (substrate types) with favorable overall conditions for methylation

Year 2 Study Plans

- Evaluating potential sources of Hg to the South River
 - Targeted sediment deposits
 - Participate in VADEQ floodplain study
- Targeted tributary and floodplain loading study between RRM 0 to 10
- Revised baseline monitoring
- Develop an integrated Phase II MeHg study for various river environments

Characterization of Depositional Features



Targeted Loading Study



- Evaluate THg and TSS loading during storm events along the South River between RRM 0 to RRM 10
 - Major trib. inputs within and above the 100-yr floodplain
 - Direct floodplain runoff features
 - Mainstem river
- Evaluate mainstem and direct floodplain runoff post-storm for THg and MeHg

Targeted Loading Study



Study Methods:

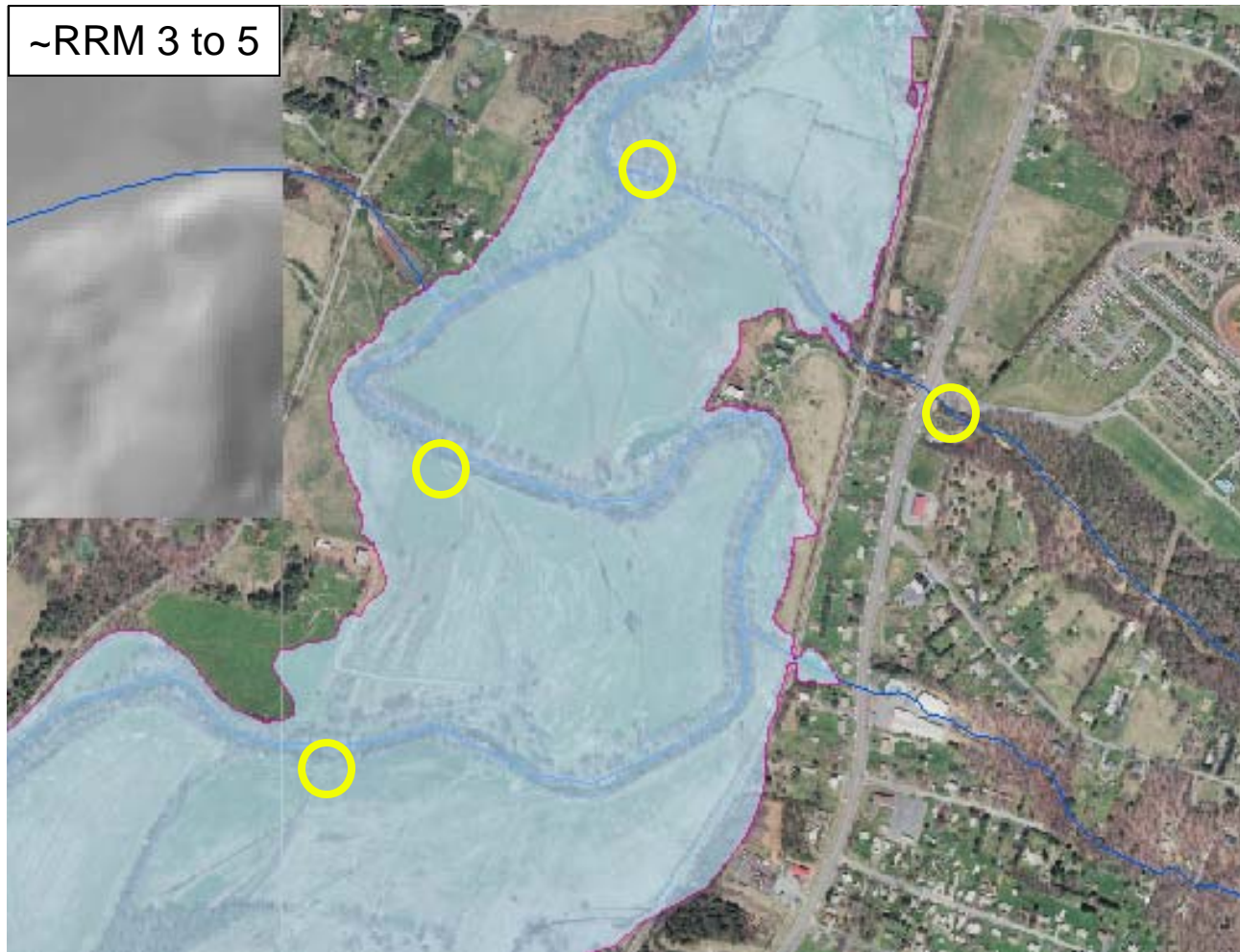
- Goal of 2 storm events
- Direct samples from bridges on South River over hydrograph
- Passive storm water samplers in place to collect rising limb samples:
 - floodplain direct drainages
 - evaluate contributions from tributaries above the floodplain and at the confluence
- Acoustic Doppler Profiler (ADP) technology to evaluate trib. discharges
- Water level recorders paired with passive samplers
- Direct grab samples post storm at safely accessible drainages on the floodplain

Major Tributaries between RRM 0 and 10

Shaded tributaries to be evaluated in loading study

RRM Confluence	Common Name	Total Drainage Area (KM ²)	Tributary Drainage Area in Flood Plain (KM ²)			
			100-yr	5-yr	2-yr	0.3-yr
0.1 to 0.2	Rockfish Run	14.5	0.148	0.057	0.003	0.0014
1.5 to 1.6	Steele Run	12.7	0.199	0.115	0.021	0.0021
2.5 to 2.6		7.6	0.063	0.034	0.017	0.0048
3.7 to 3.8		1.7	0.006	0.002	0.0007	0.0004
4.5 to 4.6		2.5	0.002	0.001	0.0007	0.0004
4.7 to 4.8	Sawmill Run	26.1	0.067	0.011	0.002	0.0004
5.6 to 5.7		4.7	0.129	0.039	0.026	0.014
6.0 to 6.1		4.1	0.057	0.004	0.0008	0.0003
6.7 to 6.8		4.6	0.164	0.106	0.029	0.011
7.2 to 7.3	Porterfield Run	15.0	0.178	0.079	0.015	0.0093
7.9 to 8.0		0.9	0.009	0.007	0.005	0.0028
8.1 to 8.2		0.5	0.004	0.001	0.0006	0.0004
8.4 to 8.5		4.1	0.006	0.001	0.0004	0.0001
8.6 to 8.7	Mine Branch	10.8	0.009	0.0005	0.0002	0.0001

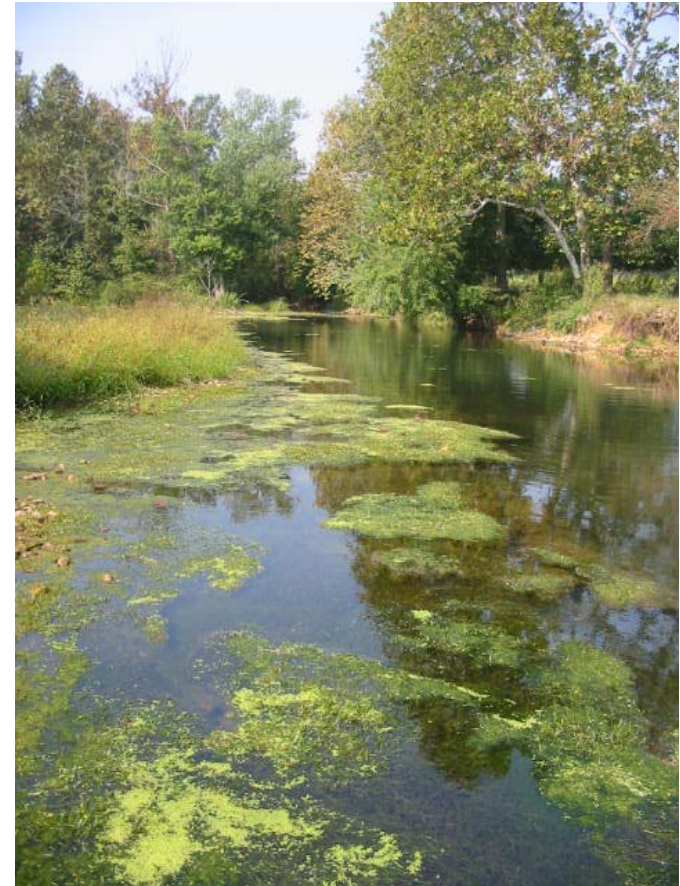
Targeted Stations for Loading Study



Baseline Monitoring Program Revisions

Program focused along South River:

- Surface water stations moved to bridges on South River (8 stations)
- Sediment sampling revised to MeHg in five riverine/wetland environments on South River (10 stations)
- Additional SW and SED characterization for Middle River station



MeHg Studies



Integrated data collections to characterize five river environments:

- Open substrate within the main channel pools
- Embedded substrates within the main channel pools
- Fine grained deposits along the edges of the main channel
- Fine grained deposits along side channels or mill race pools
- Wetland features on the 0.3-yr floodplain

Phase II MeHg Studies

- Benthic flux chambers
 - Measure MeHg flux
- Mercury bioavailability and methylation potentials study (with Rutgers University)
 - Identify which source materials have the most bioavailable mercury
 - Sequential extraction, methylation assays
 - Identify which substrate types have highest ability to methylate mercury
 - ^{203}Hg potentials
 - Characterization of microbial community
- Additional characterization
 - *In situ* data logging for near bottom surface water conditions in environments
 - Sediment MeHg baseline monitoring



Summary of Study Plans for 2007 into 2008

THg:

- Compile data to characterize and spatially describe potential sources of THg to the South River
- Evaluate loading rates and relative contributions for various sources along the river (floodplain soils, tribs., eroding river banks)
- Revise the soil and sediment budget for the river

MeHg:

- Evaluate changes in MeHg concentrations in sediments in various environments over time
- Characterize environments with favorable overall conditions for methylation
- Spatially describe these environments along the river

Scheduled Activities for 2007 into 2008

- Complete Year 2 studies
- Year 1 Report and ongoing data evaluations
- Meet with NRDC in December 2007
- Currently planning for Phase II studies to begin by Spring 2008