

SRST Centralized Database

South River Monitoring Task Team
Meeting

May 13, 2015

Agenda

- Objective
- Current state of data
- EIM Demonstration
- Proposal
- Schedule

Central Database Objective

- Data repository for all project data
 - Analytical and field data from chemical, physical and biological sources, including metadata
 - Spatial data (floodplain outline, land use, etc.)
 - Documents
- Accessible to multiple stakeholders
- Flexible security (read only, read/write, etc.)

Current State of Data and Formats

- Chemical/Biological (tabular analytical data)
 - Majority of the data currently stored in Locus EIM and as flat-files with URS
 - Some data spread throughout stakeholders
- Spatial data resides among different stakeholders that work with GIS
 - URS maintains extensive spatial dataset
 - Will need to consider what spatial data is obsolete and what is worth maintaining
- Documents
 - SRST website (<http://southriverscienceteam.org/>) maintains and serves an extensive list of publications and project documents
 - Retrospective Data Quality Assessment (RDQA) completed - project “narratives”

Tabular Data Index

DRAFT MASTER DATA FILES CHECKLIST FOR WAYNESBORO OFFSITE

FILE NAME	MATRIX	LASTED SAVED	REVISIONS/UPDATES	NOTES
South River Sed Master_2012_10_24_BR	Bulk Sediment Interstitial Sediment Extract Sediment	2/13/2013	• Re-located three VADEQ samples • Removed data for location 1BSSF038.45 and 1BSSF086.12 dated 3/3/05. The wrong sample-ID was assigned to these data. 8/19/2009 • Removed duplicate data for location 1BSTH013.58 on 3/3/05. • Modified sample numbers in VADEQ studies to create unique sample numbers. 5/18/2009 • Updated result value field to report non detects as $\frac{1}{2}$ the detection limit. 6/11/2009 • Revised GPS coordinates for various VADEQ and SRST locations. 9/4/09 • Added point of contact information. 10/20/09 • Updated RRM and added study Phase II Clam Sed data 10/26/09 • Added U of D RRM 3.0 Sediment data 11/19/09 • Removed review and filtered columns, added notes column, fixed depth units, modified results modifier, updated glossary 12/22/09 • Added NRDC Eco Study 11/09 data 2/17/10 • Added RRM 11.8 Bank Soil-Sed 4/10 and RRM 0.1 Post Con Soil-Sed 3/10 6/22/10 • Added Sediment Triad 5/10 data and Yount Pond 1977 data & Revised Phase II sample ID for consistency. 7/29/2010 • Added depths for Phase II 2010 studies 8/3/10 • Added Resident Uptake Study 6/10 & JMUCISAT RRM 11.8 Mesocosm 8/25/2010	• Awaiting U of D sediment data 11/09

Tabular data example

	A	B	C	D	E	F	G	H	I	J	K	L	M
	PROJECT	SAMPLE_ID	SAMPLE_MAT	DATE_SAMPLED	SMPLT	SAMPLE_NO	TOP	BOTTOM	DEPTH_UNIT	CASNO	ANALYTE	RESULTVAL	UNITS
2	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R	Sediment	5/25/06 10:30 AM	FS	WSR-E-BP-R	0	0.17	Feet	EVS0507	DRY FRACTION	0.534	G/G
3	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R1	Sediment	5/25/06 11:00 AM	FS	WSR-E-BP-R1	0	0.17	Feet	EVS0507	DRY FRACTION	0.57	G/G
4	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R2	Sediment	5/25/06 10:50 AM	FS	WSR-E-BP-R2	0	0.17	Feet	EVS0507	DRY FRACTION	0.467	G/G
5	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R3	Sediment	5/25/06 10:40 AM	FS	WSR-E-BP-R3	0	0.17	Feet	EVS0507	DRY FRACTION	0.34	G/G
6	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R4	Sediment	5/25/06 10:20 AM	FS	WSR-E-BP-R4	0	0.17	Feet	EVS0507	DRY FRACTION	0.314	G/G
7	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R5	Sediment	5/25/06 10:15 AM	FS	WSR-E-BP-R5	0	0.17	Feet	EVS0507	DRY FRACTION	0.393	G/G
8	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R6	Sediment	5/25/06 10:10 AM	FS	WSR-E-BP-R6	0	0.17	Feet	EVS0507	DRY FRACTION	0.657	G/G
9	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R	Sediment	5/25/06 10:30 AM	FS	WSR-E-BP-R	0	0.17	Feet	7439976	MERCURY	28433	UG/KG
10	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R1	Sediment	5/25/06 11:00 AM	FS	WSR-E-BP-R1	0	0.17	Feet	7439976	MERCURY	5511	UG/KG
11	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R2	Sediment	5/25/06 10:50 AM	FS	WSR-E-BP-R2	0	0.17	Feet	7439976	MERCURY	6567	UG/KG
12	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R3	Sediment	5/25/06 10:40 AM	FS	WSR-E-BP-R3	0	0.17	Feet	7439976	MERCURY	81576	UG/KG
13	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R4	Sediment	5/25/06 10:20 AM	FS	WSR-E-BP-R4	0	0.17	Feet	7439976	MERCURY	16634	UG/KG
14	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R5	Sediment	5/25/06 10:15 AM	FS	WSR-E-BP-R5	0	0.17	Feet	7439976	MERCURY	10458	UG/KG
15	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R6	Sediment	5/25/06 10:10 AM	FS	WSR-E-BP-R6	0	0.17	Feet	7439976	MERCURY	4358	UG/KG
16	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R	Sediment	5/25/06 10:30 AM	FS	WSR-E-BP-R	0	0.17	Feet	22967926	METHYL MERCURY	106.8	UG/KG
17	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R3	Sediment	5/25/06 10:40 AM	FS	WSR-E-BP-R3	0	0.17	Feet	22967926	METHYL MERCURY	222.7	UG/KG
18	BANK FLUX SEDIMENT/SOILS 5/06	BPK-R4	Sediment	5/25/06 10:20 AM	FS	WSR-E-BP-R4	0	0.17	Feet	22967926	METHYL MERCURY	217.6	UG/KG
19	BANK STABILIZATION SED 8/08	DOWNSTREAM	Sediment	8/21/08 11:12 AM	FS	WSR-E-DOWNSTREAM	0	0.08	Feet	7439976	MERCURY	1280	UG/KG
20	BANK STABILIZATION SED 8/08	T1	Sediment	8/21/08 11:01 AM	FS	WSR-E-T1	0	0.08	Feet	7439976	MERCURY	53500	UG/KG
21	BANK STABILIZATION SED 8/08	T3_T5	Sediment	8/21/08 10:58 AM	FS	WSR-E-T3_T5	0	0.08	Feet	7439976	MERCURY	19000	UG/KG
22	BANK STABILIZATION SED 8/08	T6	Sediment	8/21/08 10:52 AM	FS	WSR-E-T6	0	0.08	Feet	7439976	MERCURY	1230	UG/KG
23	BANK STABILIZATION SED 8/08	UPSTREAM	Sediment	8/21/08 10:48 AM	FS	WSR-E-UPSTREAM	0	0.08	Feet	7439976	MERCURY	2580	UG/KG
24	BANK STABILIZATION SED 8/08	DOWNSTREAM	Sediment	8/21/08 11:12 AM	FS	WSR-E-DOWNSTREAM	0	0.08	Feet	22967926	METHYL MERCURY	11	UG/KG
25	BANK STABILIZATION SED 8/08	T1	Sediment	8/21/08 11:01 AM	FS	WSR-E-T1	0	0.08	Feet	22967926	METHYL MERCURY	95.6	UG/KG
26	BANK STABILIZATION SED 8/08	T3_T5	Sediment	8/21/08 10:58 AM	FS	WSR-E-T3_T5	0	0.08	Feet	22967926	METHYL MERCURY	31.5	UG/KG
27	BANK STABILIZATION SED 8/08	T6	Sediment	8/21/08 10:52 AM	FS	WSR-E-T6	0	0.08	Feet	22967926	METHYL MERCURY	18	UG/KG
28	BANK STABILIZATION SED 8/08	UPSTREAM	Sediment	8/21/08 10:48 AM	FS	WSR-E-UPSTREAM	0	0.08	Feet	22967926	METHYL MERCURY	5.79	UG/KG
29	BANK STABILIZATION SED 8/08	DOWNSTREAM	Sediment	8/21/08 11:12 AM	FS	WSR-E-DOWNSTREAM	0	0.08	Feet	C008	TOTAL SOLIDS	20.02	%
30	BANK STABILIZATION SED 8/08	T1	Sediment	8/21/08 11:01 AM	FS	WSR-E-T1	0	0.08	Feet	C008	TOTAL SOLIDS	25.24	%
31	BANK STABILIZATION SED 8/08	T3_T5	Sediment	8/21/08 10:58 AM	FS	WSR-E-T3_T5	0	0.08	Feet	C008	TOTAL SOLIDS	21.83	%
32	BANK STABILIZATION SED 8/08	T6	Sediment	8/21/08 10:52 AM	FS	WSR-E-T6	0	0.08	Feet	C008	TOTAL SOLIDS	17.01	%
33	BANK STABILIZATION SED 8/08	UPSTREAM	Sediment	8/21/08 10:48 AM	FS	WSR-E-UPSTREAM	0	0.08	Feet	C008	TOTAL SOLIDS	18.71	%
34	BANK STABILIZATION SED 8/08	DOWNSTREAM	Sediment	8/21/08 11:12 AM	FS	WSR-E-DOWNSTREAM	0	0.08	Feet	C001	TOTAL VOLATILE SOLIDS	16.22	%
35	BANK STABILIZATION SED 8/08	T1	Sediment	8/21/08 11:01 AM	FS	WSR-E-T1	0	0.08	Feet	C001	TOTAL VOLATILE SOLIDS	17.19	%
36	BANK STABILIZATION SED 8/08	T3_T5	Sediment	8/21/08 10:58 AM	FS	WSR-E-T3_T5	0	0.08	Feet	C001	TOTAL VOLATILE SOLIDS	14.47	%
37	BANK STABILIZATION SED 8/08	T6	Sediment	8/21/08 10:52 AM	FS	WSR-E-T6	0	0.08	Feet	C001	TOTAL VOLATILE SOLIDS	15.73	%
38	BANK STABILIZATION SED 8/08	UPSTREAM	Sediment	8/21/08 10:48 AM	FS	WSR-E-UPSTREAM	0	0.08	Feet	C001	TOTAL VOLATILE SOLIDS	14.94	%
39	CORE SAMPLING 9/05	HO-HSOL	Sediment	9/16/05 2:30 PM	FS	WSR-E-HO-HSOL	--	--	Feet	EVS0507	DRY FRACTION	0.481	G/G
40	CORE SAMPLING 9/05	KC-8-11	Sediment	9/16/05 2:45 PM	FS	WSR-E-KC-8-11	0.67	0.92	Feet	EVS0507	DRY FRACTION	0.525	G/G
41	CORE SAMPLING 9/05	OX-HSOL	Sediment	9/17/05 12:52 PM	FS	WSR-E-OX-HSOL	--	--	Feet	EVS0507	DRY FRACTION	0.48	G/G
42	CORE SAMPLING 9/05	HO-HSOL	Sediment	9/16/05 2:30 PM	FS	WSR-E-HO-HSOL	--	--	Feet	EVS0524	LOSS-ON-IGNITION	8.72	%
43	CORE SAMPLING 9/05	KC-8-11	Sediment	9/16/05 2:45 PM	FS	WSR-E-KC-8-11	0.67	0.92	Feet	EVS0524	LOSS-ON-IGNITION	7.41	%
44	CORE SAMPLING 9/05	OX-HSOL	Sediment	9/17/05 12:52 PM	FS	WSR-E-OX-HSOL	--	--	Feet	EVS0524	LOSS-ON-IGNITION	13.1	%
45	CORE SAMPLING 9/05	HO-HSOL	Sediment	9/16/05 2:30 PM	FS	WSR-E-HO-HSOL-F5	--	--	Feet	7439976	MERCURY	23261.954	UG/KG
46	CORE SAMPLING 9/05	HO-HSOL	Sediment	9/16/05 2:30 PM	FS	WSR-E-HO-HSOL-F1	--	--	Feet	7439976	MERCURY	39.501	UG/KG
47	CORE SAMPLING 9/05	HO-HSOL	Sediment	9/16/05 2:30 PM	FS	WSR-E-HO-HSOL-F3	--	--	Feet	7439976	MERCURY	1908.524	UG/KG
48	CORE SAMPLING 9/05	HO-HSOL	Sediment	9/16/05 2:30 PM	FS	WSR-E-HO-HSOL-F4	--	--	Feet	7439976	MERCURY	5185.0311	UG/KG

Example RDQA

This narrative provides a summary describing the AOC 4 2008 Floodplain Soil Investigation. The overall purpose of the effort was to characterize surface soils within the floodplain as a basis for future decision making. Samples were collected throughout the South River 62-year floodplain from Waynesboro, VA to Port Republic VA. The following text provides additional details on the specific components of the program, demonstrating its suitability for use in ecological risk decision-making.

Project Name	2008 Floodplain Soil Investigation, Floodplain INV.2008-MOTOCROSS, YR II ECO WETLAND SAMPLING4/08, Floodplain INVEST 2008 ADD-ON
Relevance to Ecological Risk Assessment	THg concentrations within the 0-2, 2-5, and 5-62 year floodplains from each assessment reach were used for screening level evaluation and to calculate exposure point concentrations for terrestrial ecological receptors.
Sampling Program Objectives	1) Develop an understanding of the spatial distribution of mercury in floodplain soils, banks, historic accretions and tributary banks. 2) Determine to what extent the mercury concentration in floodplain soils changes spatially under similar and differing land-use conditions. 3) Further develop understanding of relationship between soil mercury concentrations and soil depth. 4) Further develop current understanding of relationship between mercury concentrations and particle size or associations with various size particles, including soil colloids. 5) Provide input to future risk and remedial decision making.
Sampling Design	Stratified random sampling approach. Sampling design included 90 sample stations randomly selected within each of six reaches of the South River divided by bridge crossings. Of those 90 locations, 10 sample stations were located in each of the 3 inundation areas (0-2 year, 2-5 year, and 5-62 year) and from each of the three primary land uses identified in each reach-floodplain combination. 618 sampling locations were sampled, including re-analysis of 20 samples to test effectiveness of compositing methods. Two intervals were analyzed; 0-6 inches and 6-30 inches. Sampling design rationale is detailed in DuPont CRG, 2008a.
Sampling Date	2/2008 - 4/2008
No. of Locations	638
No. of Samples¹	1232
Spatial Extent of Sampling (in Relative River Miles)	0.3 to 23.8

Synchronizing Databases

- AECOM data not currently included in EIM

Projects Not Included in the EIM Database

Soil	Sediment	Water	Biota
Forestry Center Soils	VADEQ_FishKill_Sediment-2007	2008 TMDL IP Monitoring	BRI Bat Study 2006
US EPA Shifflet Farm Sampling	VADEQ_ProbabMonit_20032006	Ambient Water Quality Monitoring QAPP and SOP	BRI Bat Study 2007
	VADEQ_Sediment_2007	Autosampler SW Samples 4/12	BRI Bat Study 2008
	State of Virginia WCB - Yount Pond	BSA GW Sampling 6/09	BRI Mallard Study
	VADEQ Sediment 04/27/10	South River South Fork of the Shenandoah River 100 Year Mercury Study	BRI Mallard Study - UCONN
	VADEQ Sediment 10/04/11	South River/South Fork Shenandoah Bacteria TMDL	BRI Mammal Study
	VADEQ SEDIMENT 10/13/10	South, SF Shenandoah and Shenandoah River Mercury Study	Cristol Birdy Study
		US EPA Shifflett Farm Sampling	State Of Virginia WCB - Yount Pond
		VADEQ Surface Water 01/08/02	VATECH Amphibian Study
		VADEQ Surface Water 01/10/05	VATECH Snapping Turtle Study
		VADEQ Surface Water 01/11/05	VATECH Turtle Isotope Study
		VADEQ Surface Water 01/29/04	VIMS Sed and Periphyton Study 2008
		VADEQ Surface Water 02/19/03	
		VADEQ Surface Water 02/26/03	
		VADEQ Surface Water 02/27/01	

Outside Researcher Data

- Inventory and assessment

Researcher	Affiliation	DuPont Contact	Date	Data Type	Analytes	Matrices	Tissue Type	Data in AECOM Datafiles
Carol Ptacek	Univ. of Waterloo	Rich Landis	2009 - present	Laboratory	Hg, MeHg	Soil/Sediment	--	No
Reed Harris		Jim Dyer					--	No
Dick Jensen	Unique Environmental		2003 - 2008	Field	Hg, MeHg, Metals, Nutrients	Soil, Sediment, Surface Water	--	Yes
Ralph Turner	RTGeosciences		2005 - 2006	Field	Hg, MeHg	Soil, Sediment, Surface Water	--	Yes
Tom Benzing	James Madison University	Mike Liberati	2002 - 2004	Field	Hg, MeHg	Clams	whole body	Yes
Dean Cocking	James Madison University	Mike Liberati	2006 - 2007	Field	Hg, MeHg	Earthworms	whole body	Yes
Danny Reible	Texas Tech	Rich Landis		Field	Hg	Pore Water (DGT)	--	No
Gary Gill	Battelle	Rich Landis		Laboratory				No
Cindy Gilmour	Smithsonian	Nancy Grosso		Laboratory		Sediment (sedimite)	--	No
Dan Cristol	College of William and Mary	Mike Liberati	2005 - 2010	Field Laboratory	Hg	Birds	blood, egg, feather, wing	Yes
Dave Yates	BRI	Mike Liberati	2006 - 2008	Field	Hg	Bats	blood, fur	Yes
			2008			Mammals	blood, fur, muscle	
Lucas Savoy			2007 - 2008		Hg, Isotopes	Mallard	blood, egg, feather	

eGIS in Locus EIM

Identify results for all dates

Location ID: MN-FP-065 Location Type: Soil Latitude: 38.08513 Longitude: -78.87582

☐ Analytical ☐ Exceedance ☐ Groundwater Levels ☐ Field Measurements

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Field Sample ID	Date Sampled	Parameter	Result	Units	Lab Qualifier	Validation
20981796	02/14/2008	Clay	7.00000	%		
20990230	02/14/2008	Clay	7.00000	%		
19448208	02/14/2008	Loss-On-Ignition	2.80000	%		
19448206	02/14/2008	Loss-On-Ignition	4.80000	%		
19448206	02/14/2008	Mercury	29.20000	MG/KG		
19448208	02/14/2008	Mercury	52.60000	MG/KG		
19448206	02/14/2008	Percent Moisture	21.60000	%		
19448208	02/14/2008	Percent Moisture	14.60000	%		
19448206	02/14/2008	Residue - fixed	73.50000	%		
19448208	02/14/2008	Residue - fixed	82.60000	%		
20981796	02/14/2008	Retained on Us#10 Sieve	8.57000	%		
20990230	02/14/2008	Retained on Us#10 Sieve	8.57000	%		
20990230	02/14/2008	Sand	68.00000	%		
20981796	02/14/2008	Sand	68.00000	%		
20990230	02/14/2008	Silt	25.00000	%		
20981796	02/14/2008	Silt	25.00000	%		
19448206	02/14/2008	Total Residue	78.40000	%		
19448208	02/14/2008	Total Residue	85.40000	%		

Waynesboro South River

Layers MAP TOOLS

Map Types: Latitude: 38.08514 Longitude: -78.87583

Satellite Roadmap Terrain Hybrid Post Data

Groundwater Sediment Soil Surface Water

South River

MN-FP-065

Can add spatial layers (flood plain outline, etc.)

Proposal for SRST Database

- Maintain three distinct databases
 - Chemical/Biological
 - Locus EIM
 - Migrate current flat-files to EIM
 - Link data to documents (i.e., metadata in SharePoint/RDQAs)
 - Spatial
 - Use EIM for point data display and key spatial layers (static)
 - Document
 - DuPont SharePoint system

Proposal for SRST Database (cont.)

- Link all three database through a common portal hosted on SRST website
- Incorporate stakeholder needs by conducting a testing period
- Three general stakeholders
 - Agencies
 - DuPont
 - Study teams (e.g., consultants)

EIM Schedule

Steps to Proceed with EIM	Proposed Schedule
Locus SM to make minor modifications to EIM schema modification to fully accommodate biological data	2 nd Quarter 2015
Setup database administrators within DuPont and/or URS to manage and administer SRST data	2 nd Quarter 2015
Establish common user-interface web site – co-opt existing SRST website? DuPont website?	3 rd Quarter 2015
Migrate remaining SRST data to EIM	3 rd Quarter 2015
Test the efficacy of the data migration	3 rd Quarter 2015
Determine user security for the new SRST EIM database (e.g., SRST scientists receive access to all data, general public has limited access) - <i>will need to work with EIM</i>	3 rd Quarter 2015
SRST EIM database staging period before official release - testing data access and security - <i>on-call maintenance</i>	3 rd Quarter 2015
SRST EIM database training	3 rd Quarter 2015
Post spatial data and metadata to common website	3 rd Quarter 2015
Official release of SRST EIM database	4 th Quarter 2015

At same time, setup DuPont SharePoint system for document management