

AOC 4 Monitoring Program Update

Former DuPont Waynesboro Site, Virginia

May 13, 2015



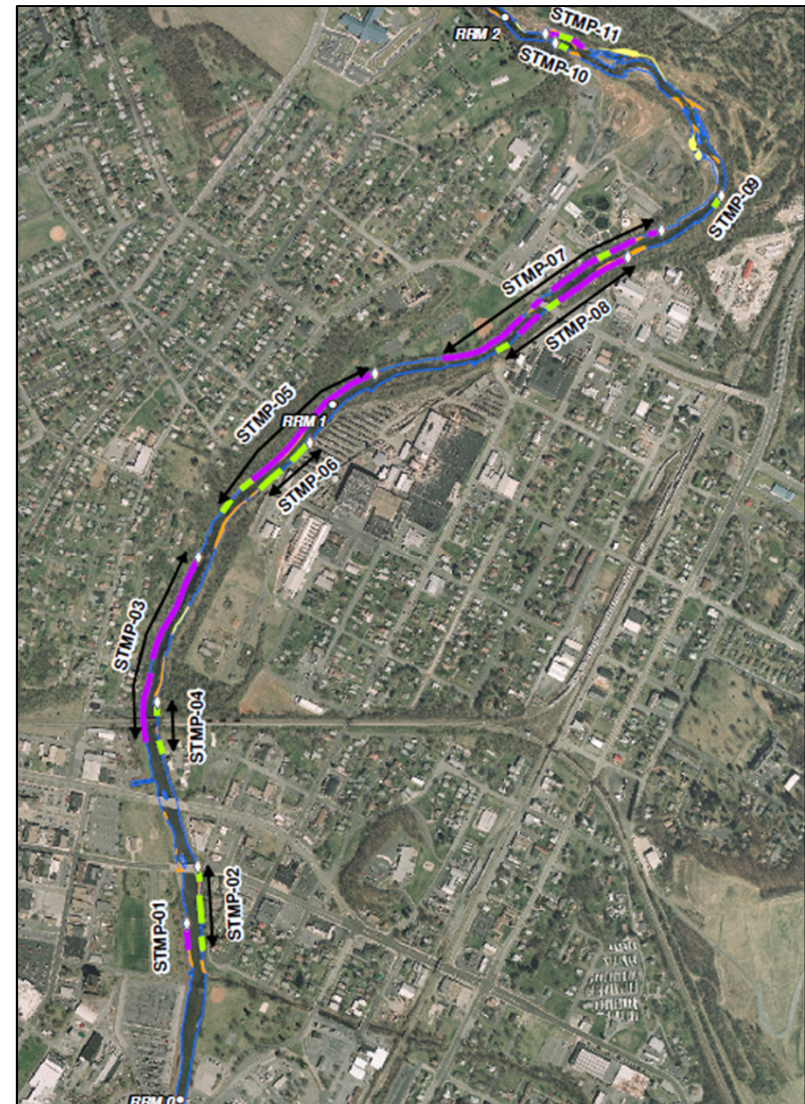
Agenda

- Review
 - Short-Term Monitoring (STM)
 - Long-Term Monitoring (LTM)
- STM Kick-off
- Fall 2014 LTM Status
- Spring/Summer 2015 LTM Activities
- Discussion



Short-Term Monitoring Elements

- 11 STM locations; RRM 0-2
- Abiotic Exposure Media
 - Near-bank Sediment
 - Pore Water
- Biological Exposure Media
 - Periphyton (near bank/mid-channel)
 - Transplanted Asiatic Clams
 - Near bank (Seeded/Caged)
 - Mid-channel (Caged)
- Vegetation/Habitat Monitoring



Human Exposure Monitoring

- 13 Monitoring Locations:
 - South River (4)
 - South Fork Shenandoah (7)
 - Shenandoah (2)
- Fall 2014 Media:
 - Adult Smallmouth and Largemouth Bass
 - Mallard Ducks

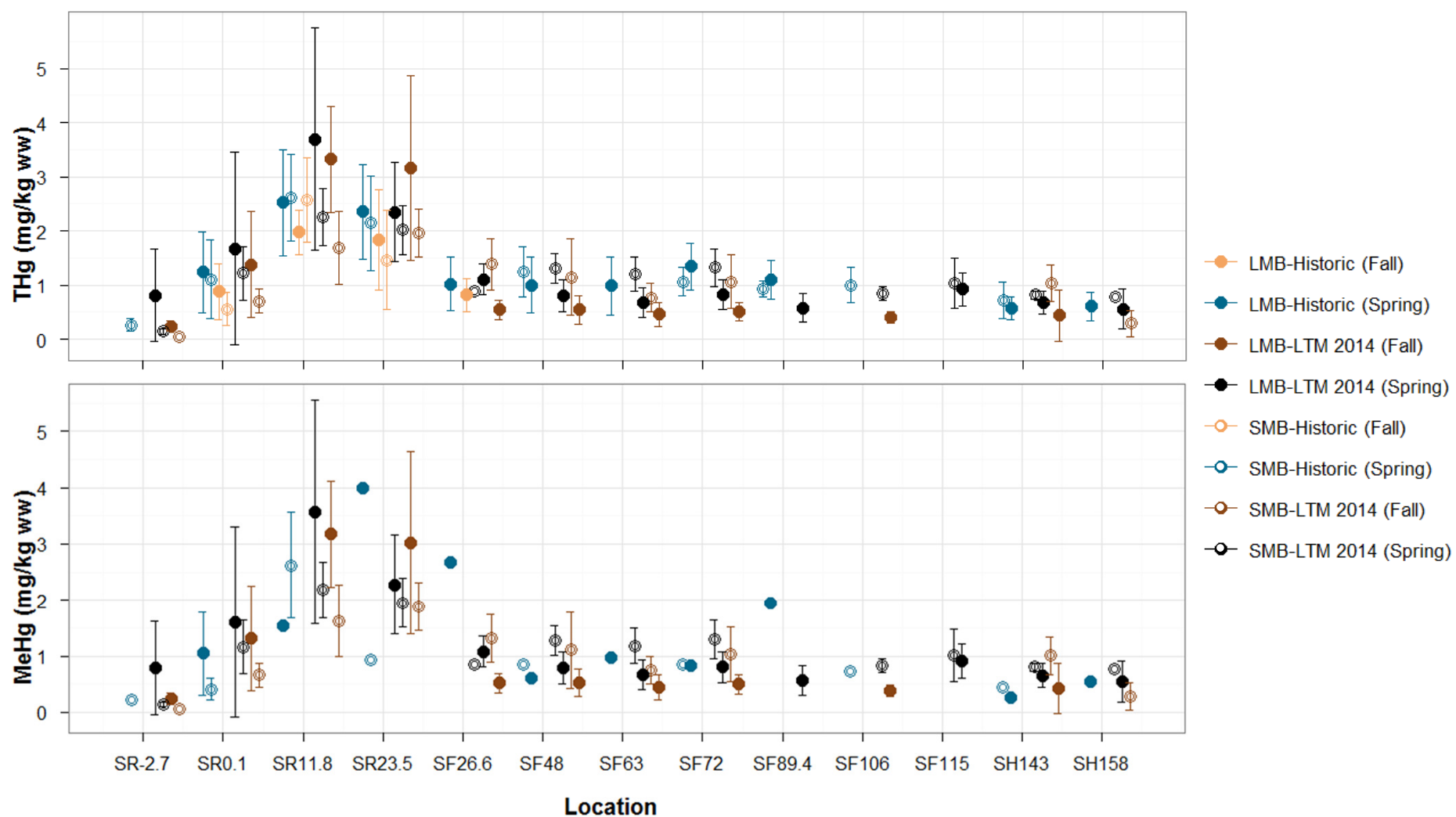


Fall 2014 Adult Bass Monitoring Summary

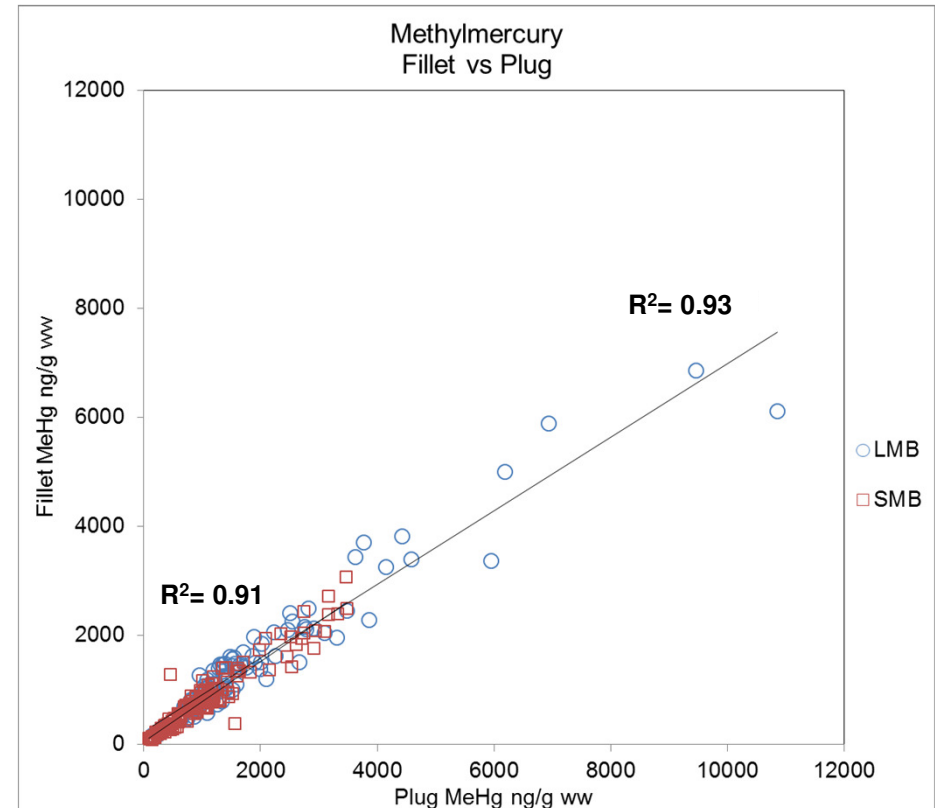
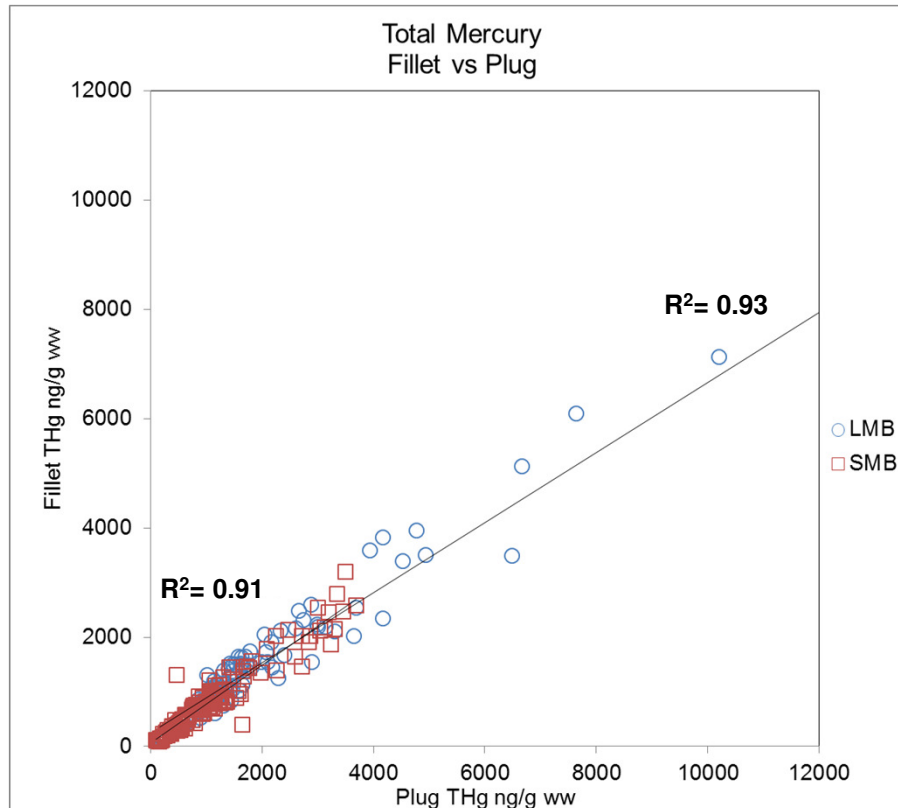
- September 2014
- Biopsy plugs and fillets collected for THg and MeHg analysis



Summary of Bass Tissue Results



Summary of Bass Tissue Results – Fillet vs Plug



- Strong correlation between fillet and plug data
- Consider non-lethal techniques only for future sampling

2014/2015 Waterfowl Monitoring Activities

- 2014 hunter outreach (regional DU chapter)
 - Limited number of hunters identified based on leg band returns
 - No mallard ducks harvested
- Sampling approaches are being re-evaluated for 2015/2016



Aquatic Ecological Exposure Monitoring

- Eight Monitoring Locations:
 - South River (5)
 - South Fork Shenandoah (2)
 - Middle River (1)
- Fall 2014 Media:
 - Asiatic Clams (mid-channel; caged)
 - Mayflies
 - Periphyton
 - Benthic Community Assessment (*analyses pending*)
 - Young-of-Year Smallmouth Bass



Asiatic Clam Monitoring Activities

- Transplanted caged clams deployed mid-channel
- 5-week deployments (spring and fall)
- Three replicates per location
- 24-hr depuration
- THg and MeHg analysis
- Influence of river conditions on sampling



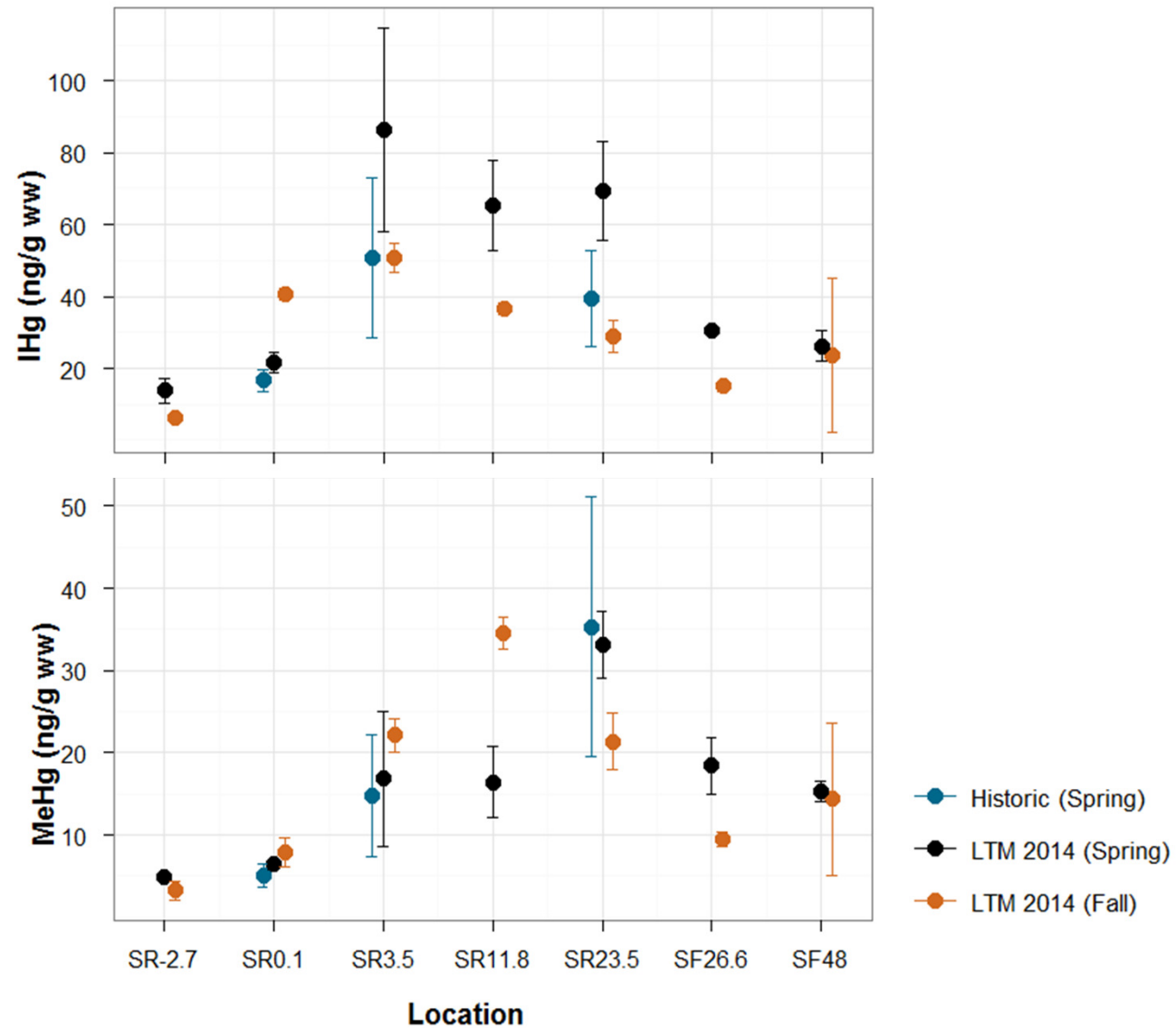
Same location

← Spring

Fall →



Summary of Asiatic Clam Results

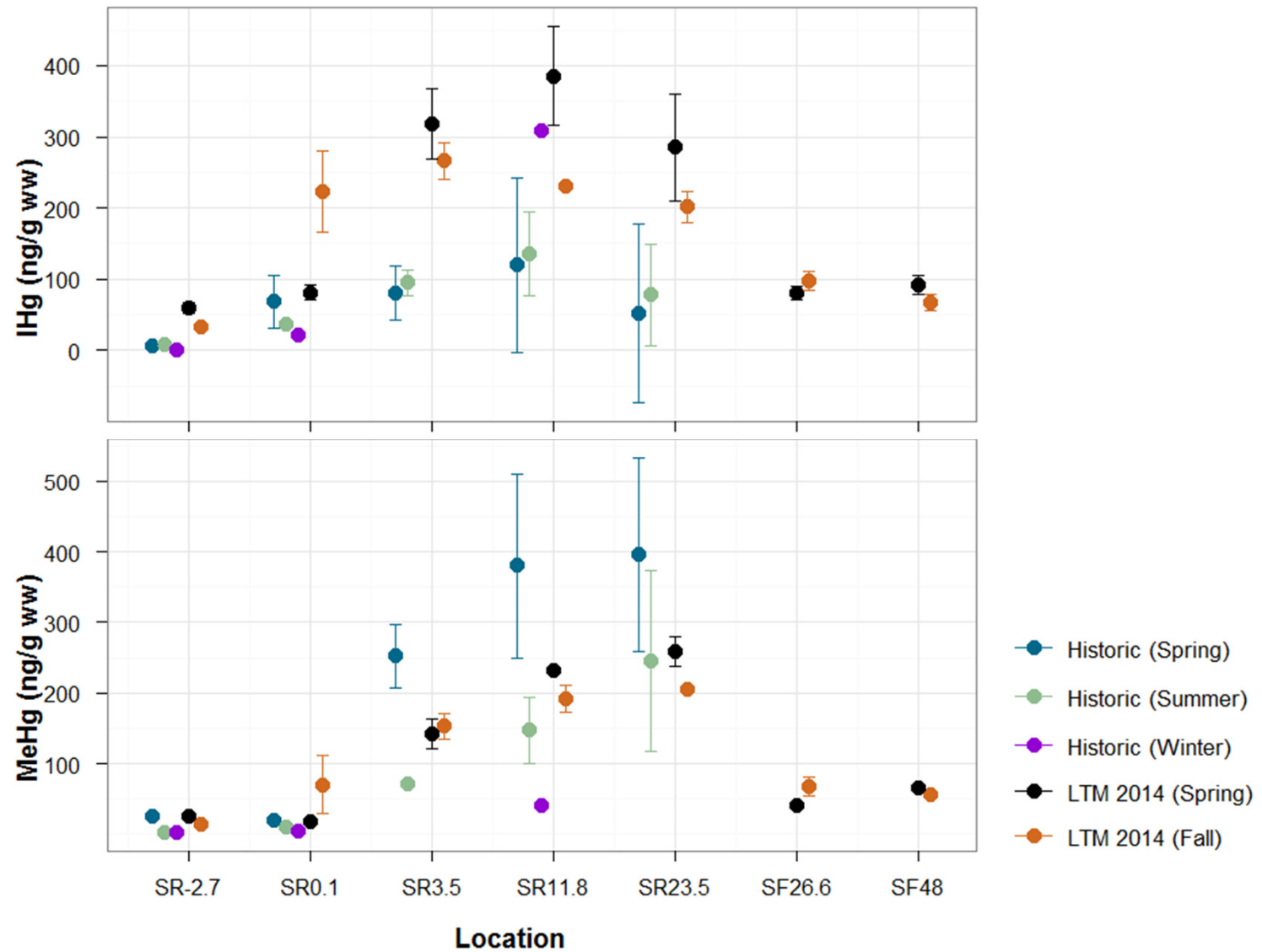


Mayfly Monitoring Activities

- *Heptagenid* mayflies collected in spring and fall of 2014
- Three replicates per location
- 10 individuals per composite
- THg and MeHg analysis



Summary of Mayfly Results

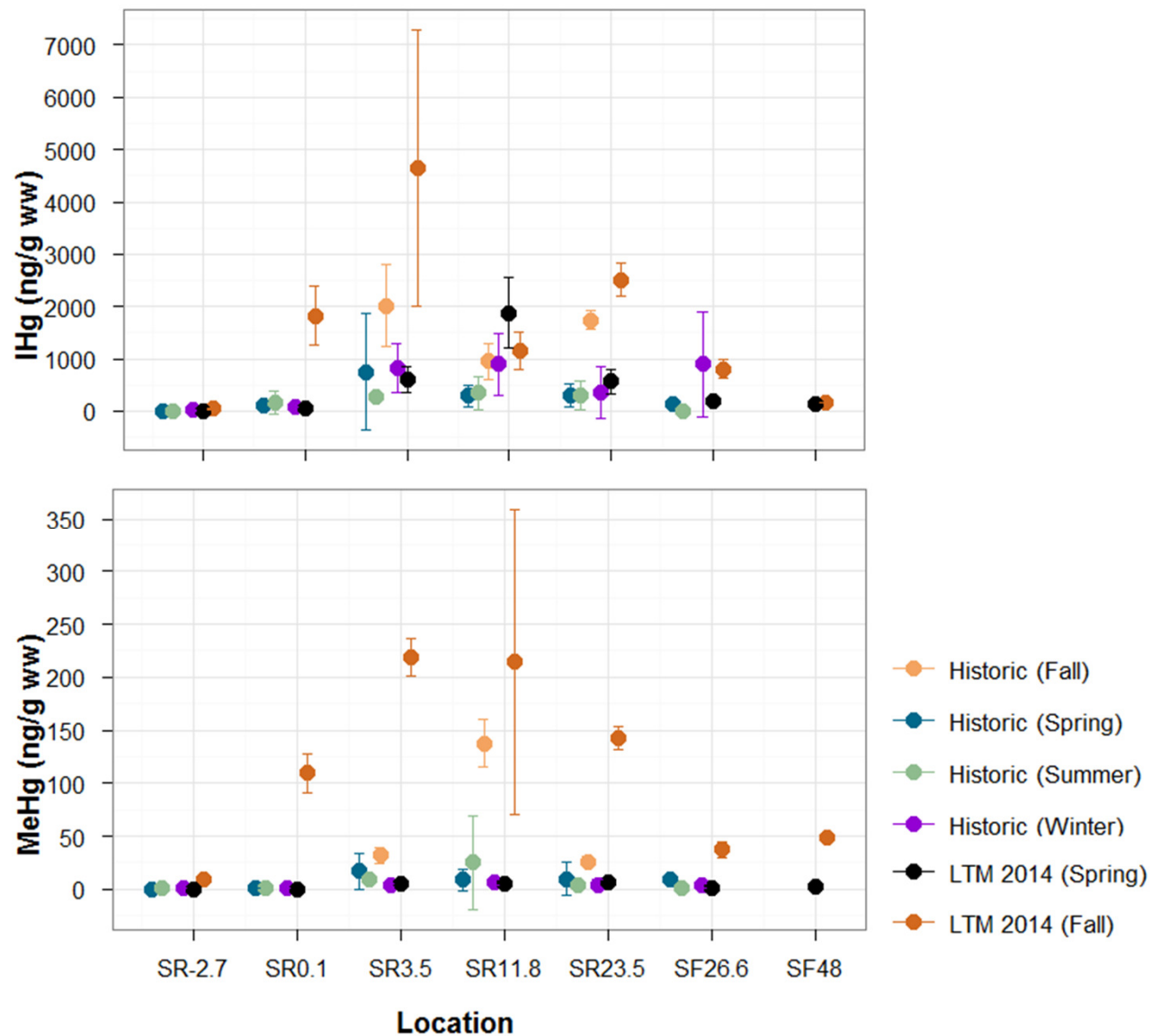


Periphyton Monitoring Activities

- Native periphyton sampled from cobbles
- Three replicates per location collected in the spring and fall of 2014
- THg and MeHg analysis

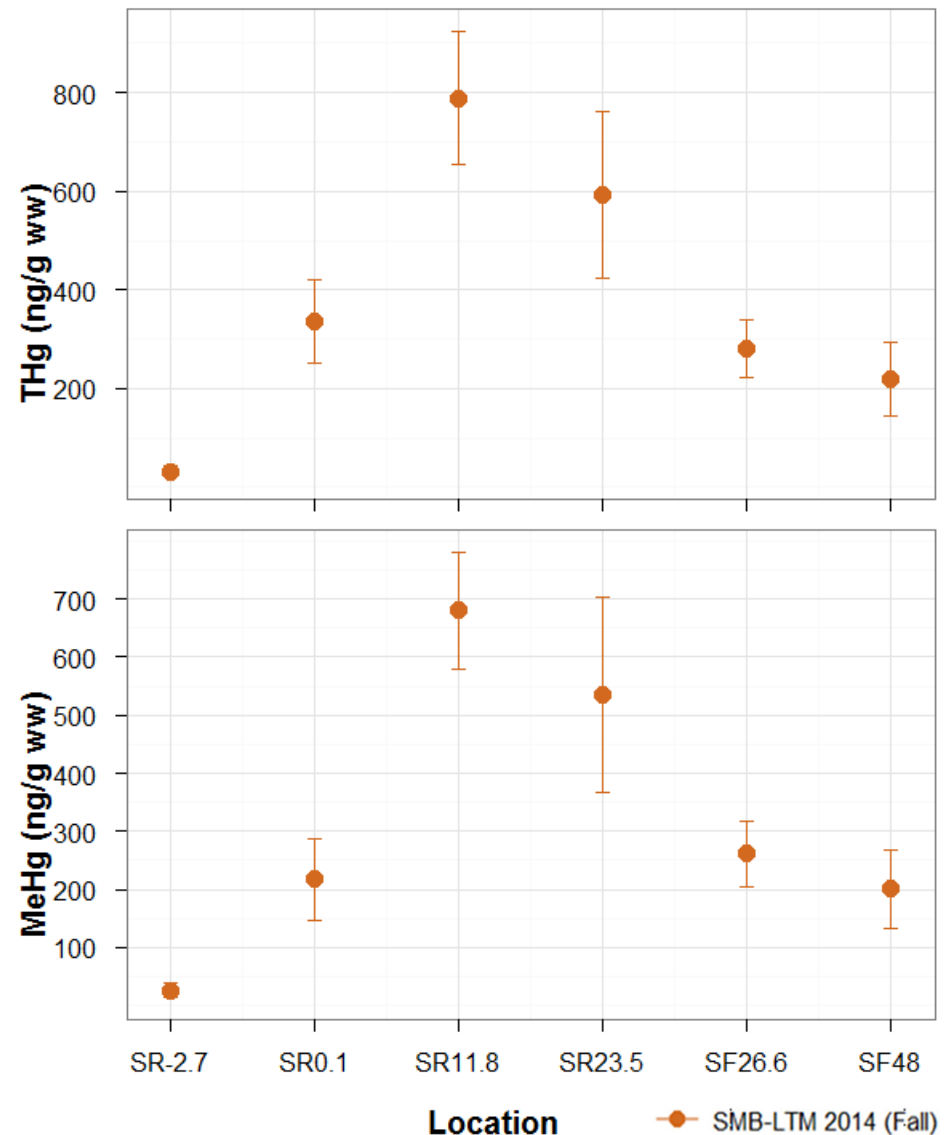


Summary of Periphyton Results



Summary of Young of Year Smallmouth Bass Results

- 10 SMB collected per location during fall 2014 adult fish tissue sampling
- Analyzed individually for THg and MeHg
- Consistent with trends in adult bass tissue data
- Continued sampling will increase dataset



2014 Long-term Monitoring Conclusions

- 2014 fish tissue data consistent with historical data
- Plug to fillet relationship is very promising – consider transitioning to non-lethal techniques moving forward?
- Continued monitoring will improve understanding of relationship to historical trends in biotic media



Upcoming 2015 Spring / Summer Collections

May

- Fish sampling currently underway
 - Collaborating with VDGIF fish health assessment efforts

June

- Terrestrial Exposure (Carolina wren, earthworms, wolf spiders, soil)
- Aquatic Exposure (sediment, clams, periphyton, mayflies, benthic community)

July

- Snapping turtles





Questions ?

A scenic photograph of a wide river flowing through a lush green valley. The river's surface is covered in gentle ripples, reflecting the bright sky. The far bank is a steep, densely forested hillside with vibrant green trees. The sky above is a clear, pale blue with a few wispy white clouds. The overall atmosphere is peaceful and natural.

Supplemental Slides

Human Exposure Monitoring

- Media Evaluated:
 - Adult Smallmouth and Largemouth Bass
 - Snapping Turtles
 - Mallard Ducks
- 13 Monitoring Locations
 - South River (4)
 - South Fork Shenandoah (7)
 - Shenandoah (2)

Reach Code	Description
SR-2.7	Existing SR-01 located at Lyndhurst Ave. to Ridgeview Park
SR0.1	Constitution Park/Waynesboro Reach
SR11.8	Dooms to Crimora Reach
SR23.5	Hariston to Port Republic Reach
SF26.6	SFS @ Lynwood
SF48	SFS @ Shenandoah (above dam)
SF63	Newport Landing
SF72	Hamburg, VA near Rt. 211 Bridge
SF89.4	Foster's Landing, near Rt. 694 Bridge
SF106	Bentonville Landing, near Rt. 613 Bridge
SF115	Karo Landing
SH143	Rt. 17/50 Bridge
SH158	Berryville, VA near Rt. 7 bridge

Notes:

SR = South River

SF = South Fork Shenandoah River

SH = Shenandoah River

Aquatic Ecological Exposure Monitoring

- Five potential exposure media are being evaluated:
 - Asiatic Clams (mid-channel; caged)
 - Mayflies
 - Periphyton
 - Sediment
 - Young-of-Year Smallmouth Bass
- Benthic Community Assessment
- Eight Monitoring Locations
 - South River (5)
 - South Fork Shenandoah (2)
 - Middle River (1)

Reach Code	Description	Aquatic Ecological Exposure (Sediment, Benthic Inverts, Periphyton, Asiatic Clam, YOY Fish, Benthic Community)
SR-2.7	Existing SR-01 located at Lyndhurst Ave. to Ridgeview Park	●
SR0.1	Constitution Park/Waynesboro Reach	●
SR3.5	RRM 3.5	●
SR11.8	Dooms to Crimora Reach	●
SR23.5	Hariston to Port Republic Reach	●
SF26.6	SFS @ Lynwood	●
SF48	SFS @ Shenandoah	●
MR01	Middle River Reference	●

Notes:

SR = South River

SF = South Fork Shenandoah River

NA = Not applicable

● No YOY fish

● No Benthic community

● Benthic community only