

The Great South River Floodplain Sampling Event of 2008

Calvin Jordan - DEQ

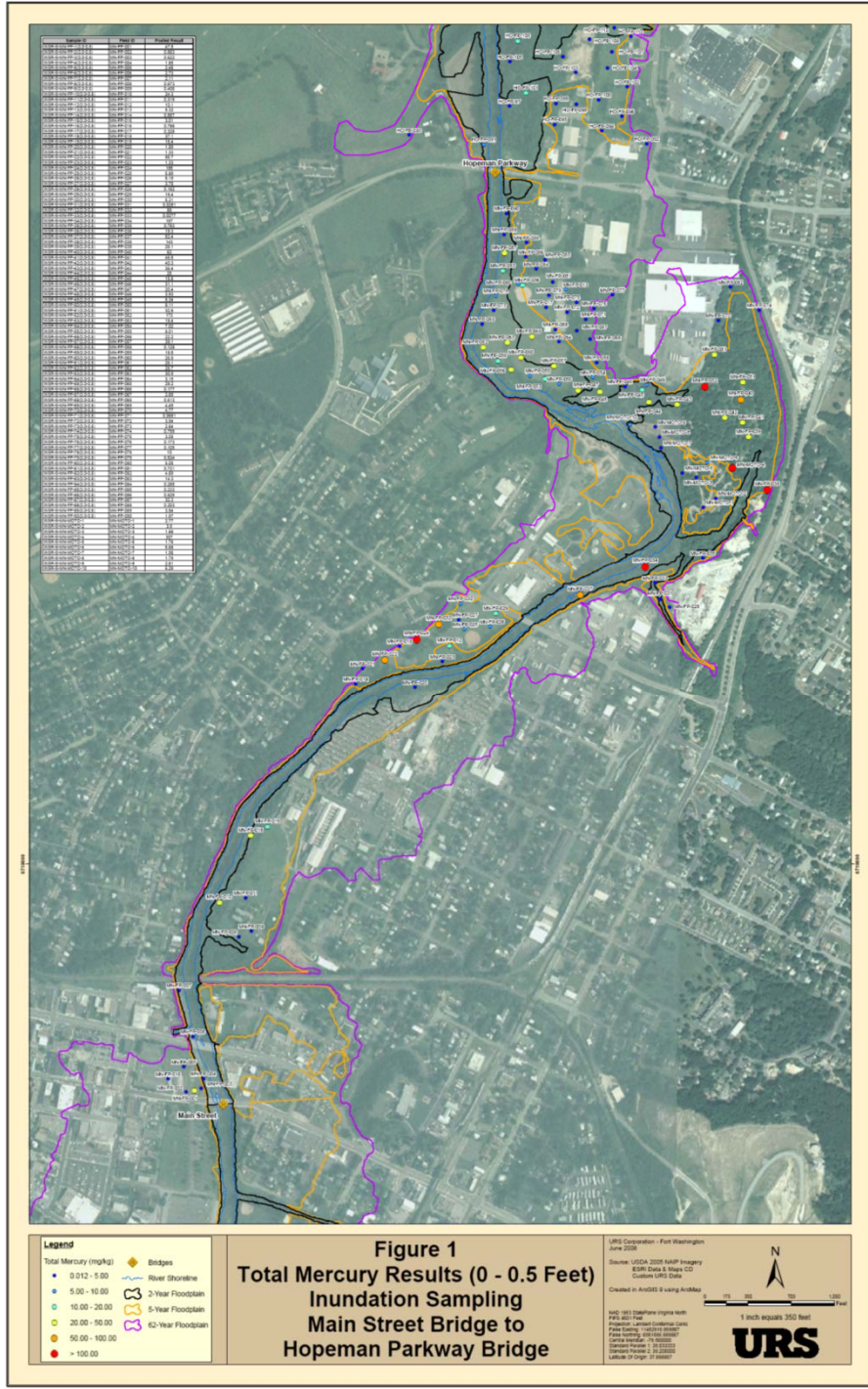


The Facts

- Started 2/12/2008 and Finished 4/17/2008
- Planned to do 600 sites
 - 540 upland
 - 60 wetland
- Completed 618 sites
 - 8 extra sites sampled in second reach due to late permissions
 - 10 sites added at motocross track (first reach)
- 167 sites relocated
 - All 60 wetland sites relocated
- A total of **2700** man hours spent on this project

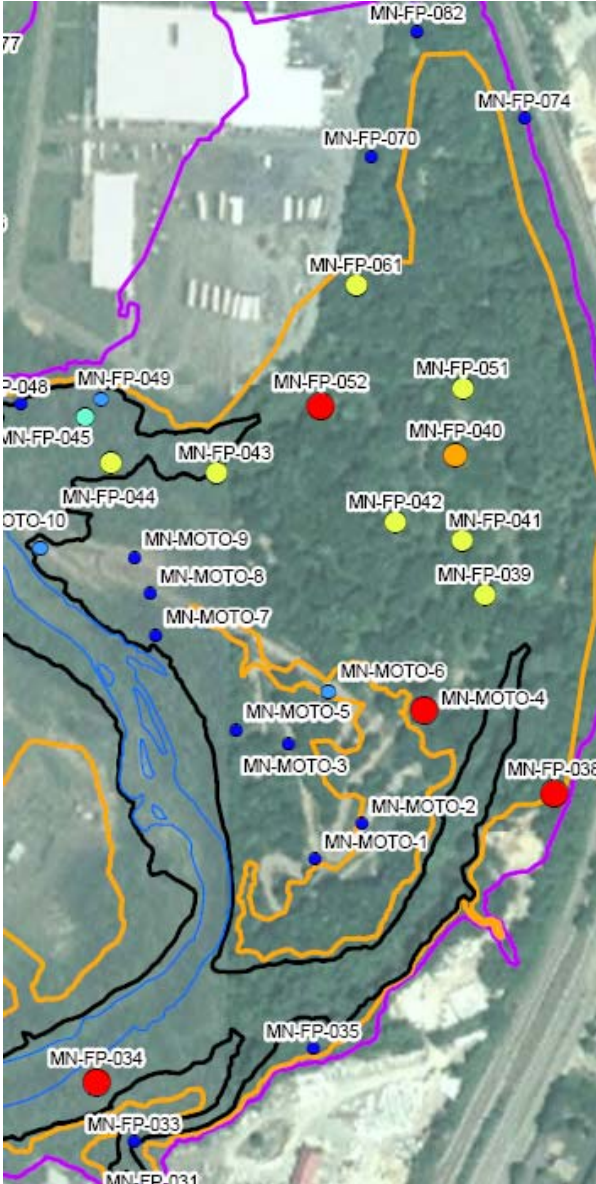
Results



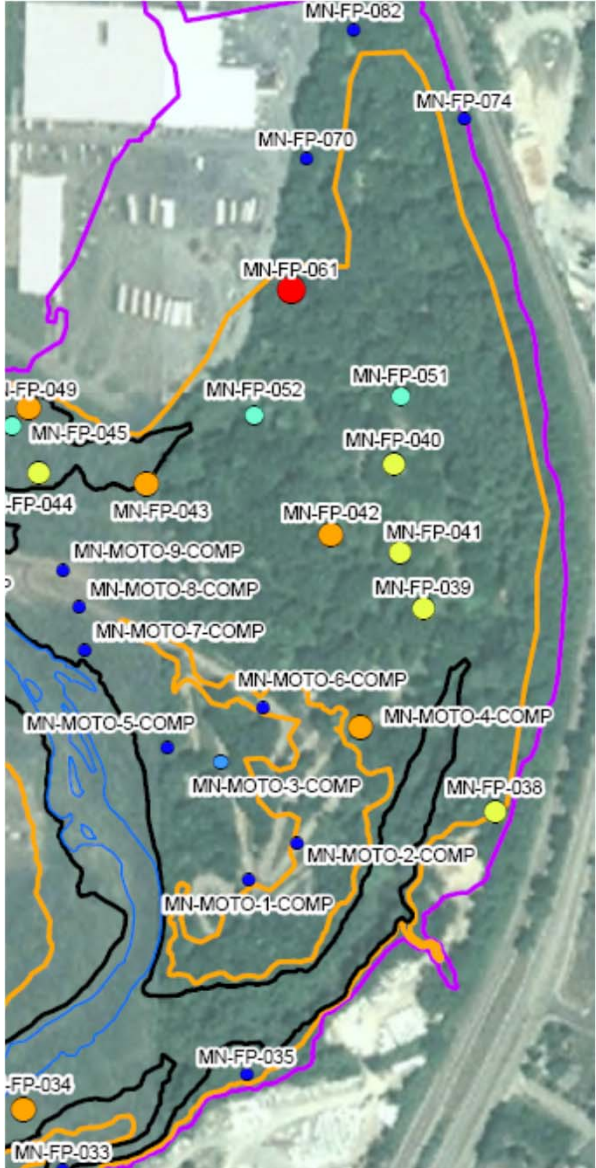


The Old Oxbow is Hot!

Surface Interval

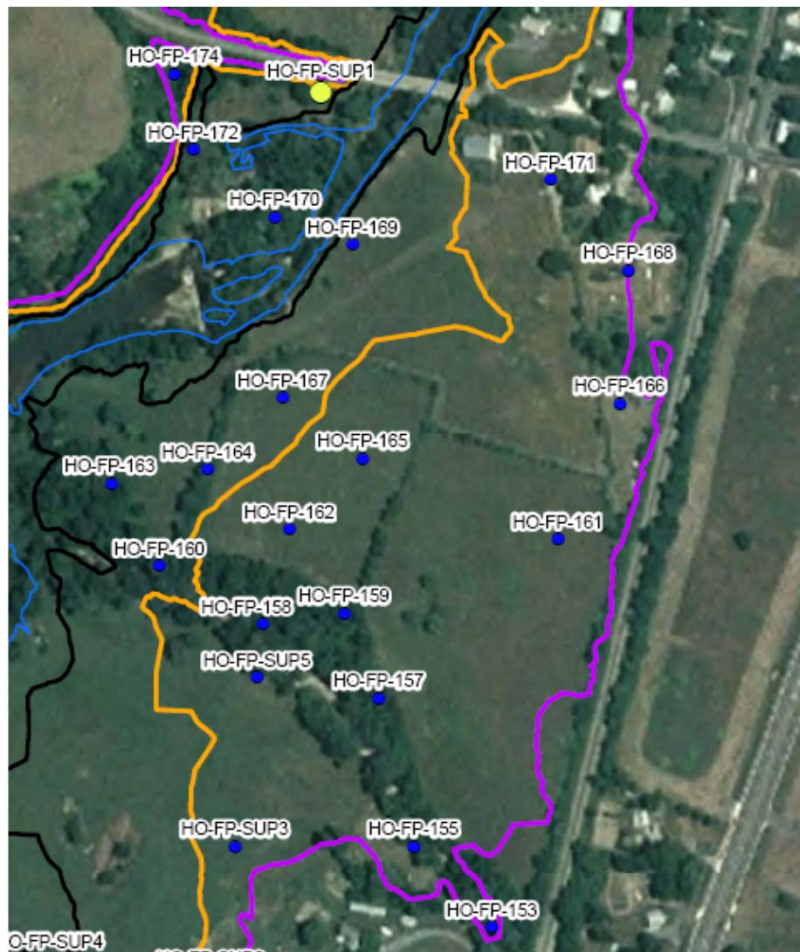


Composite Sample

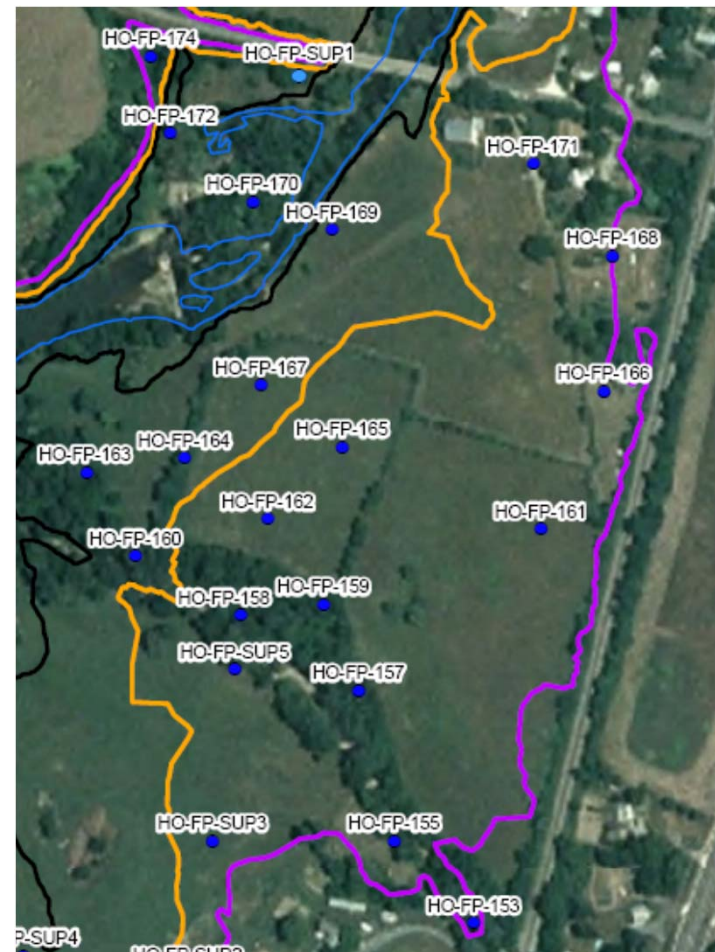


Dooms Isn't Hot?

Surface Interval



Composite Interval

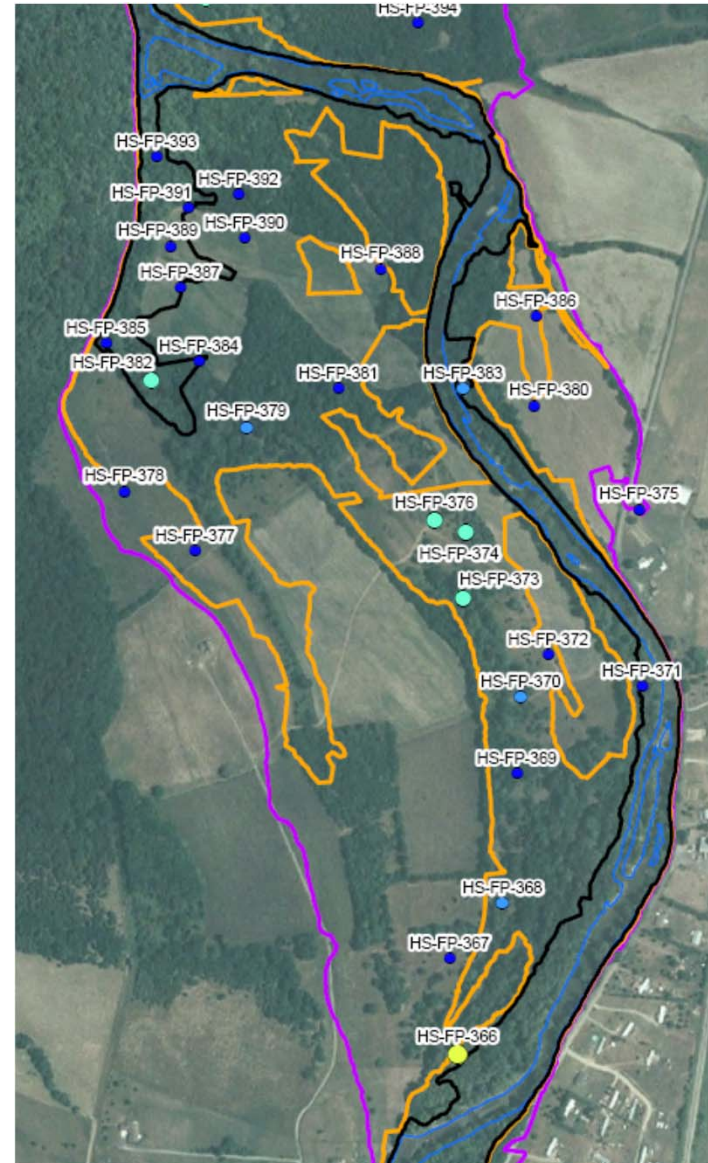


A Story of Old Millraces and Side Channels

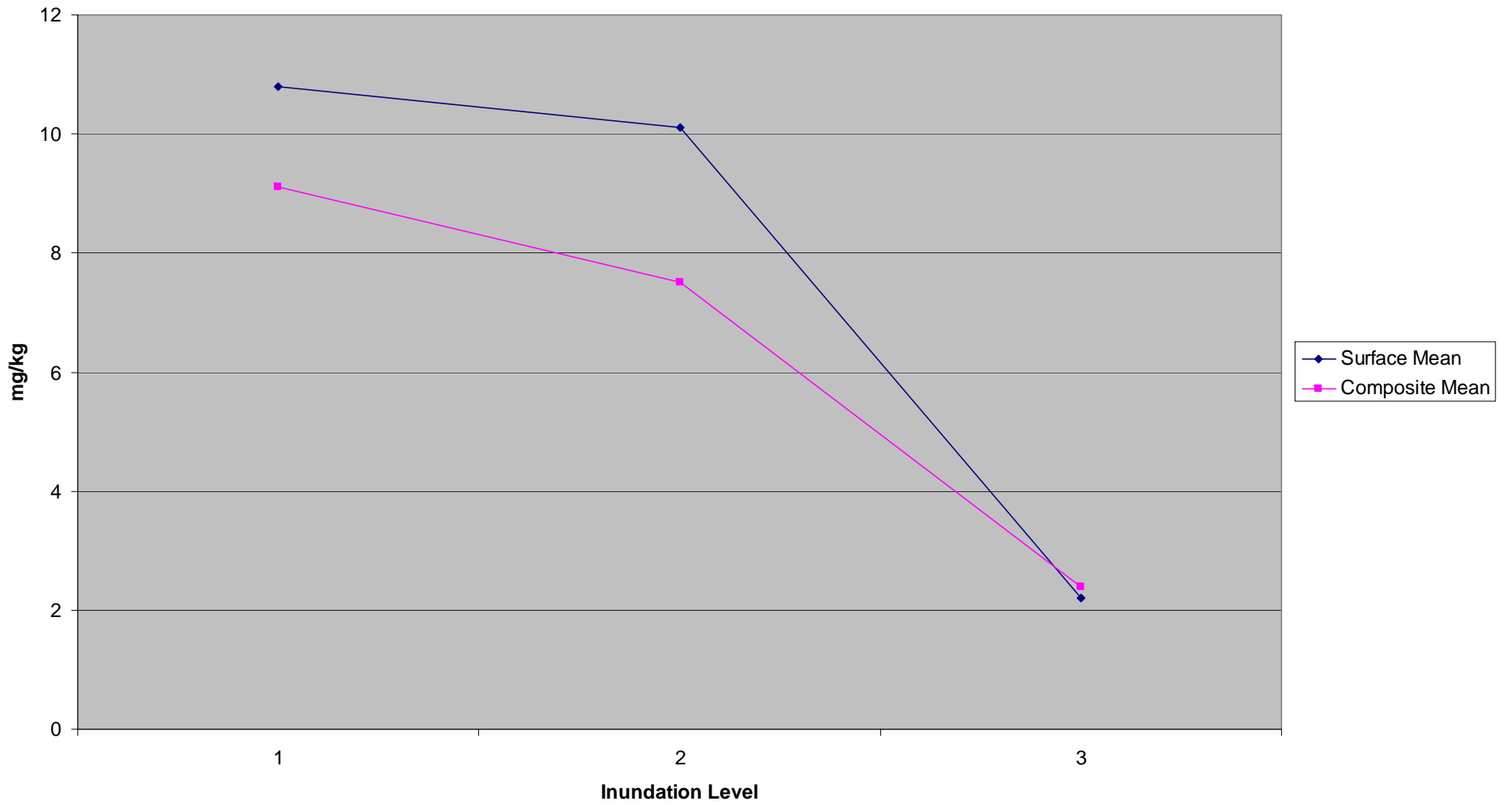
Old Millrace at North Park



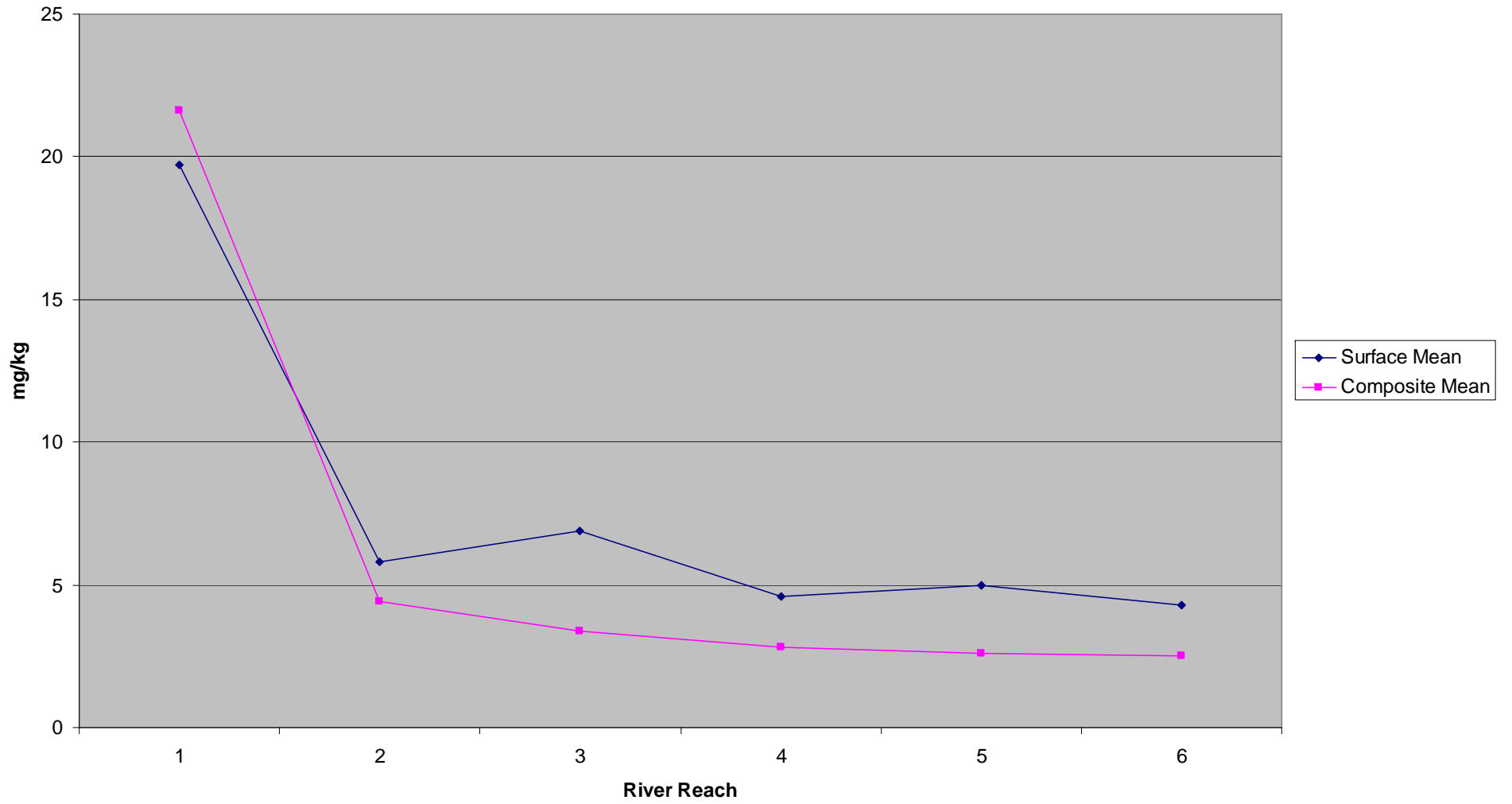
Side Channel Below Harriston



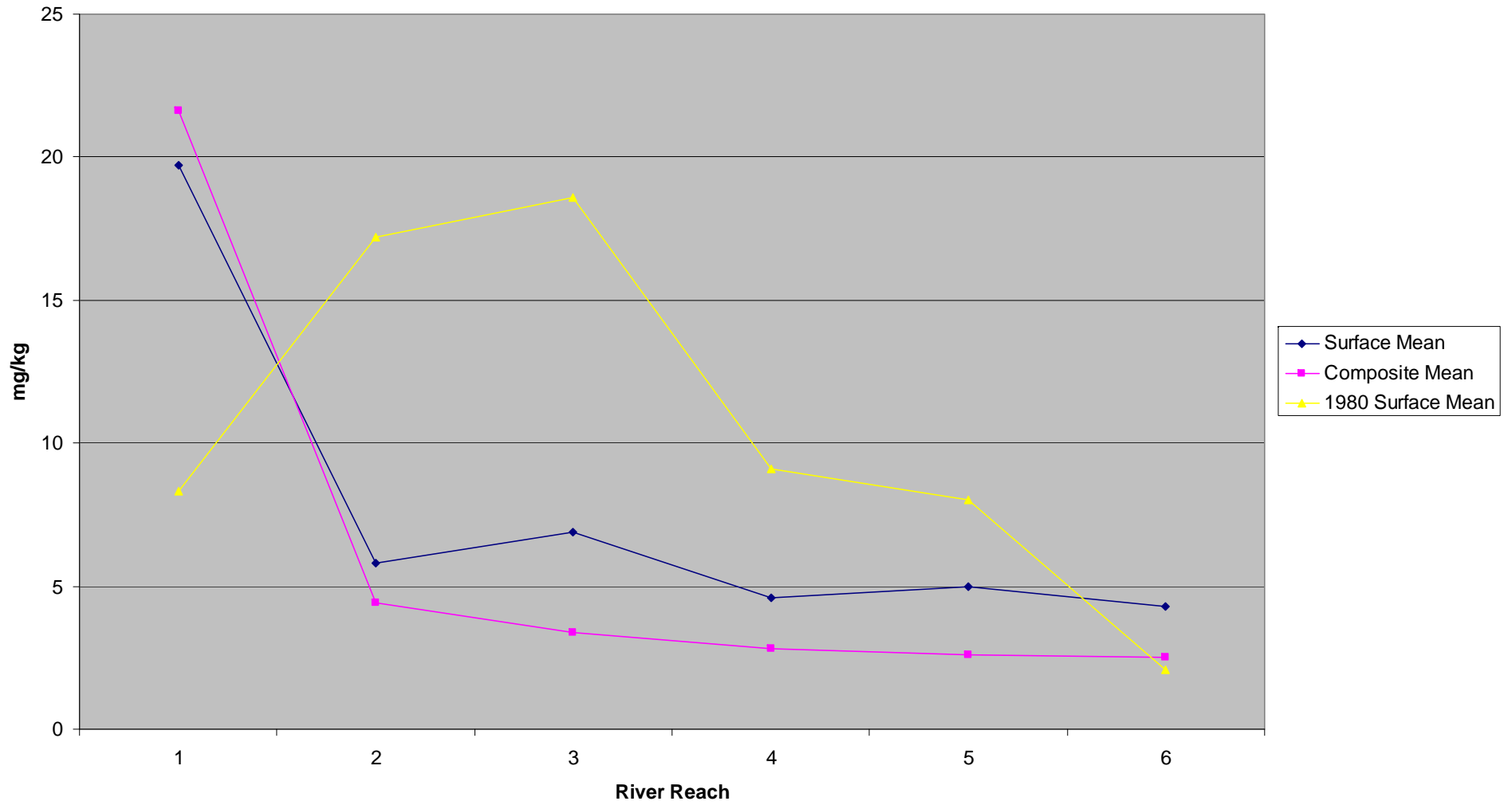
Average Mercury Concentrations Per Inundation Level



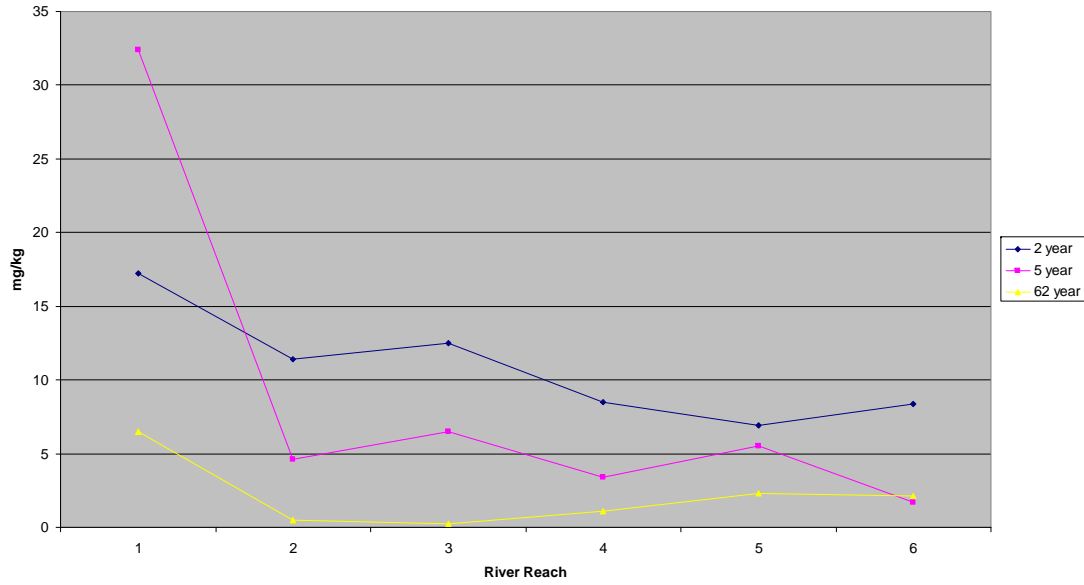
Average Mercury Concentrations Per Reach



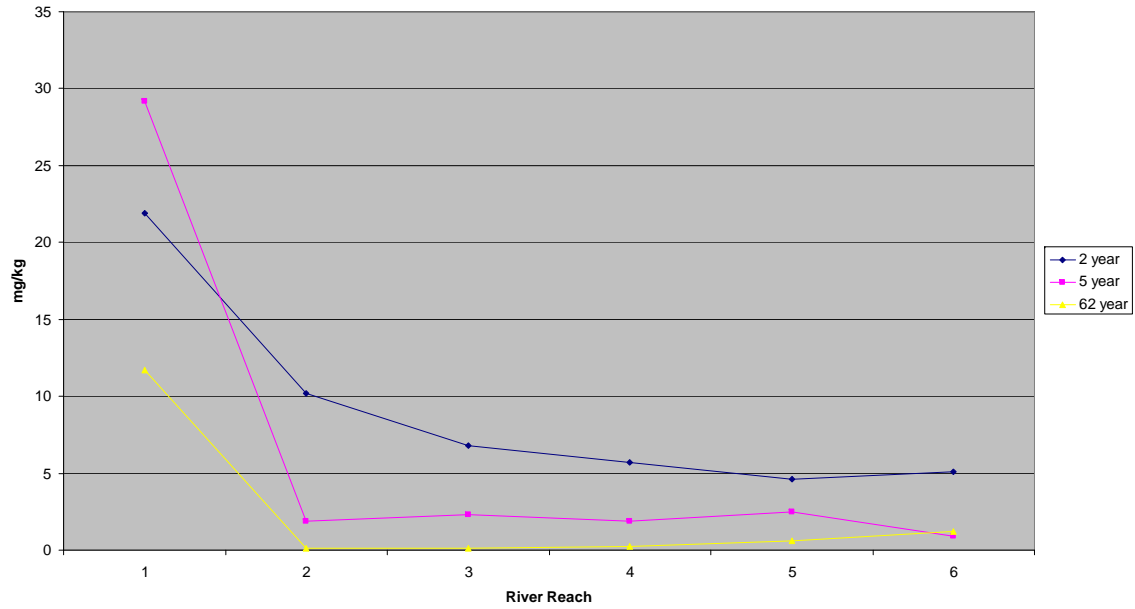
Average Mercury Concentrations Per Reach



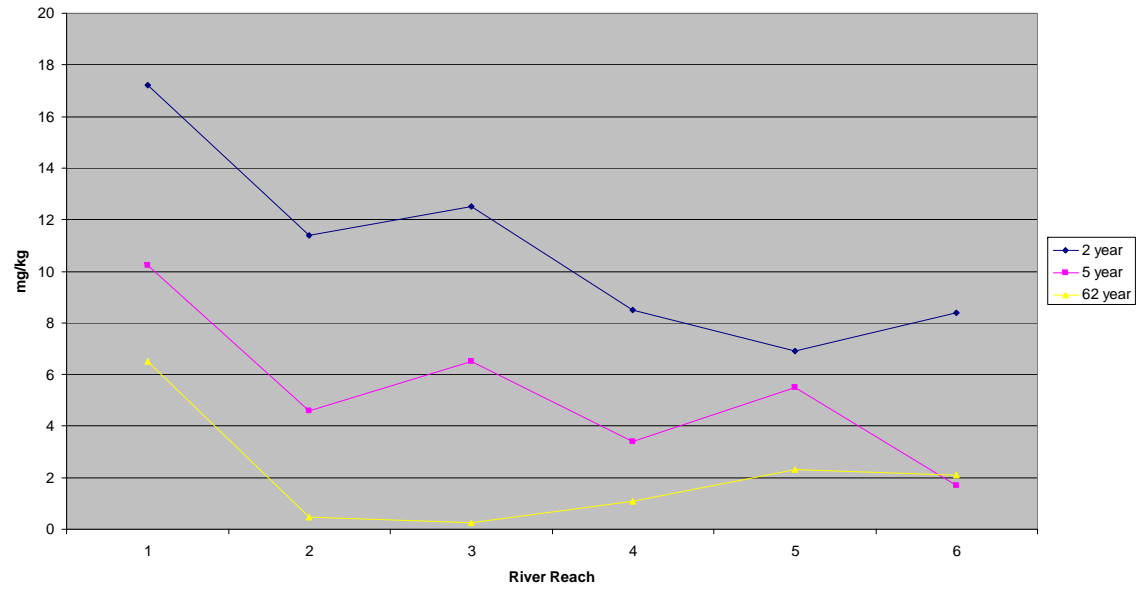
Average Surface Mercury Concentrations Per Reach and Inundation Level



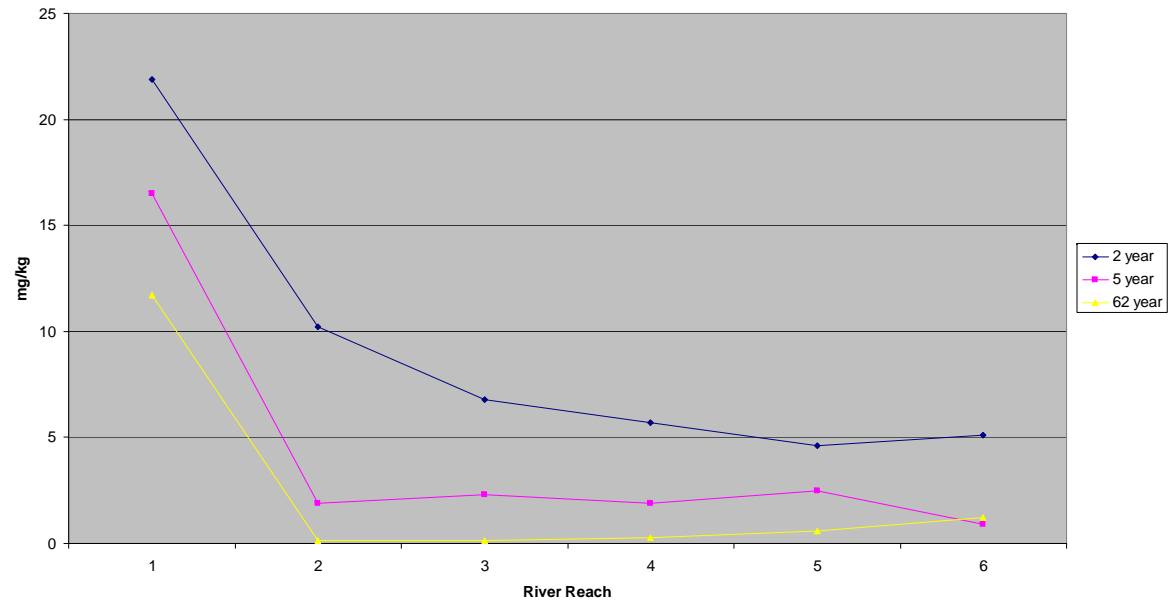
Average Composite Mercury Concentrations Per Reach and Inundation Level



Average Surface Mercury Concentrations Per Reach and Inundation Level
W/O Site MOTO-4 Surface Interval 307 mg/kg



Average Composite Mercury Concentrations Per Reach and Inundation Level
W/O MN-FP-061 Comp Interval 535 mg/kg



More Fun Facts

- Background Hg levels in the state of Virginia range from 0.06 – 0.15 ppm according to a Virginia Tech study on biosolid application.
www.ext.vt.edu/pubs/compost/452-304/452-304.html
- EPA screening levels for Hg in soil are 23 ppm for residential and 310 for industrial.
www.epa.gov/reg3wcmd/ca/ca_resources.htm#risk
- The following spreadsheet breaks down the number of samples into percentages based upon whether they were above residential screening levels (> 23 ppm), elevated (> 0.15 ppm but < 23 ppm), and background (0 – 0.15 ppm). Percentages are approximate. Only one sample was above the industrial screening level. That sample was a composite sample that measured 535 ppm and was located on the Allied Concrete property in Waynesboro. There was also a surface sample that measured 307 ppm on the same property on the motocross track.

Entire Floodplain

Soil Interval	Above 23 ppm	Elevated	Background
Surface	7%	82%	11%
Composite	7%	64%	29%

0 - 2 Year Inundation Level

Soil Interval	Above 23 ppm	Elevated	Background
Surface	11%	87%	2%
Composite	11%	83%	6%

2 – 5 Year Inundation Level

Soil Interval	Above 23 ppm	Elevated	Background
Surface	8%	83%	9%
Composite	6%	68%	26%

5 – 62 Year Inundation Level

Soil Interval	Above 23 ppm	Elevated	Background
Surface	1%	62%	37%
Composite	1%	38%	60%

Surface Interval Percentages per Reach

Reach	Above 23 ppm	Elevated	Background
1	23%	72%	4%
2	6%	81%	13%
3	7%	67%	26%
4	2%	85%	13%
5	0%	89%	11%
6	2%	78%	23%

Composite Interval Percentages per Reach

Reach	Above 23 ppm	Elevated	Background
1	25%	63%	13%
2	37%	61%	36%
3	4%	58%	38%
4	3%	64%	33%
5	1%	72%	26%
6	2%	67%	31%

Conclusion

- The highest concentrations of Hg are found in the 0 – 5 year floodplain.
- The highest concentrations of Hg are found in the First Reach between Main Street and Hopeman Pkwy.
- There is contamination to at least 2.5 ft in some areas.
- 2008 study not comparable (yet) with 1980 study.
- Only 7% of the samples were > 23 ppm, but 80% were > background levels.
- Hot spots close to river and in old river channels and millraces.
- Didn't find peak in concentrations between Dooms and Crimora as we see with fish and other samples.
- Hopefully, Jim Pizzuto's work will fill in the gaps for riverside concentrations. (Dooms Farm 720 ppm ~ 40 ft from river, upriver dam).

Questions?

