PCBs in Fish Tissues at the Hudson River PCBs Superfund Site: *Special Study and Update on Monitoring Program*

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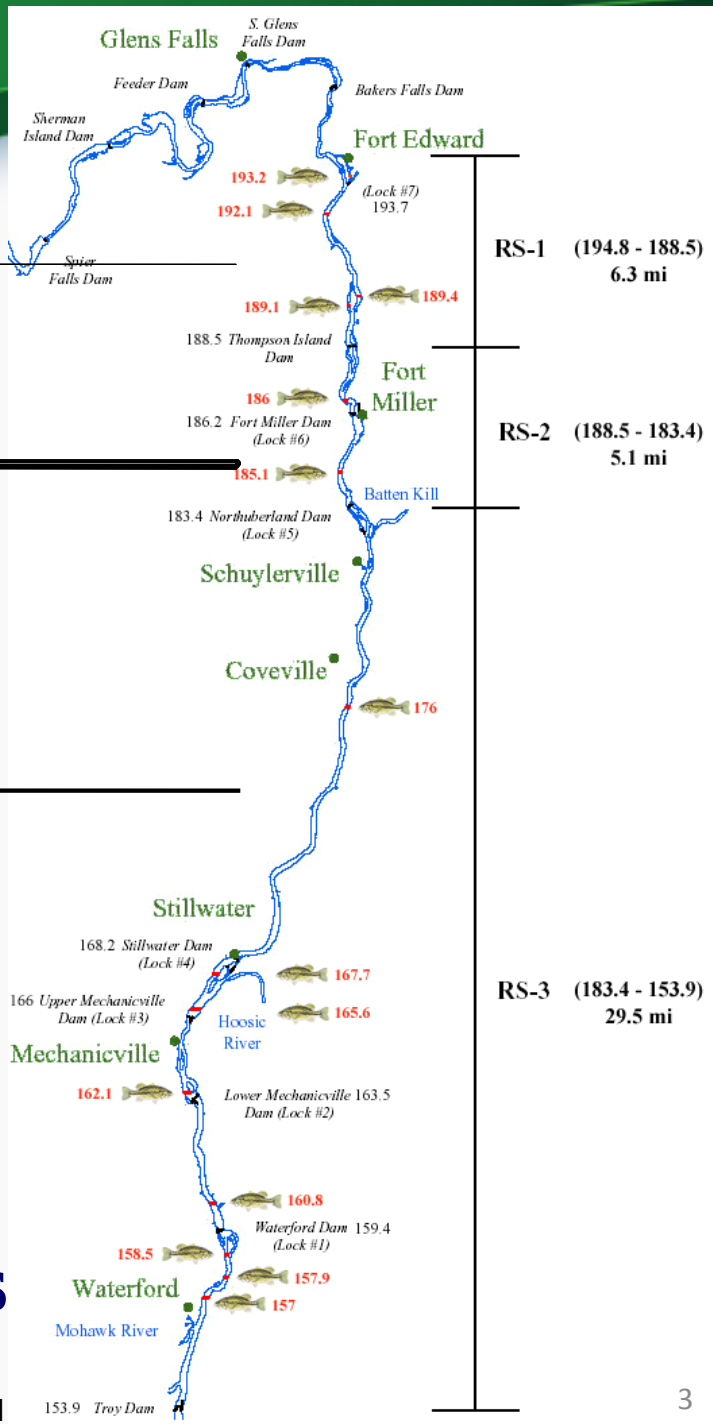
Background and Objectives

- Risk from fish consumption by humans and wildlife was the key driver for remediation
- Fish monitoring in the river since 1970s and will continue
- Since 2003: Baseline, remedial action, and post-remedy monitoring was designed to provide statistical power to address both short- and long-term needs
  - Allows evaluation of annual (short term) changes *and* establishment of long-term trends
  - Allows documentation of interim risk reduction following the remedial action

Baseline, Remedial Action & Long Term* Fish Monitoring Plans for UHR

River Area	No. Spp. Groups	No. Indiv/Spp Groups	Total Samples
Feeder Dam	4	20	80
RS-1	4	30	120
RS-2	4	25	100
RS-3	4	30	120
Albany/Troy	4	20	80



Four species/groups sampled ANNUALLY:

- Top-level pred: Blk Bass (LMB, SMB) SF
- Water col feeder: Perch (YP) SF
- Bottom-feeder: Bullhead (YB, BB) SF
- Yearling: Pumpkinseed WH

Annual composites of Forage Fish; n=10 per RS

* The LTMP may be modified after 3 years of OM&M

The 2014 Fillet Special Study
Background

- Prior to 2004: Fish were collected and processed by NYSDEC (used NYSDEC standard fillet including the ribs)
- 2004: GE begins sampling fish under the Baseline Monitoring Program
- 2009: Phase 1 Dredging and Remedial Action Monitoring Program begin
- 2012: EPA & NYSDEC identify that fillet procedure was rib-out
- 2013: EPA & NYSDEC discuss fish monitoring program including a special study of fillet methods
- 2014: GE agrees to conduct a special study to compare the two fillet methods (rib-in vs rib out)

The 2014 Fillet Special Study
Study Aims

- Focus was on black bass (largemouth and smallmouth bass)
- Sample size was designed to be adequate to detect a 20% difference in results between fillets prepared with and without the ribs
- Measurements included wet weight total PCBs, lipid-normalized PCBs and fraction lipids

The 2014 Fillet Special Study
Study Aims

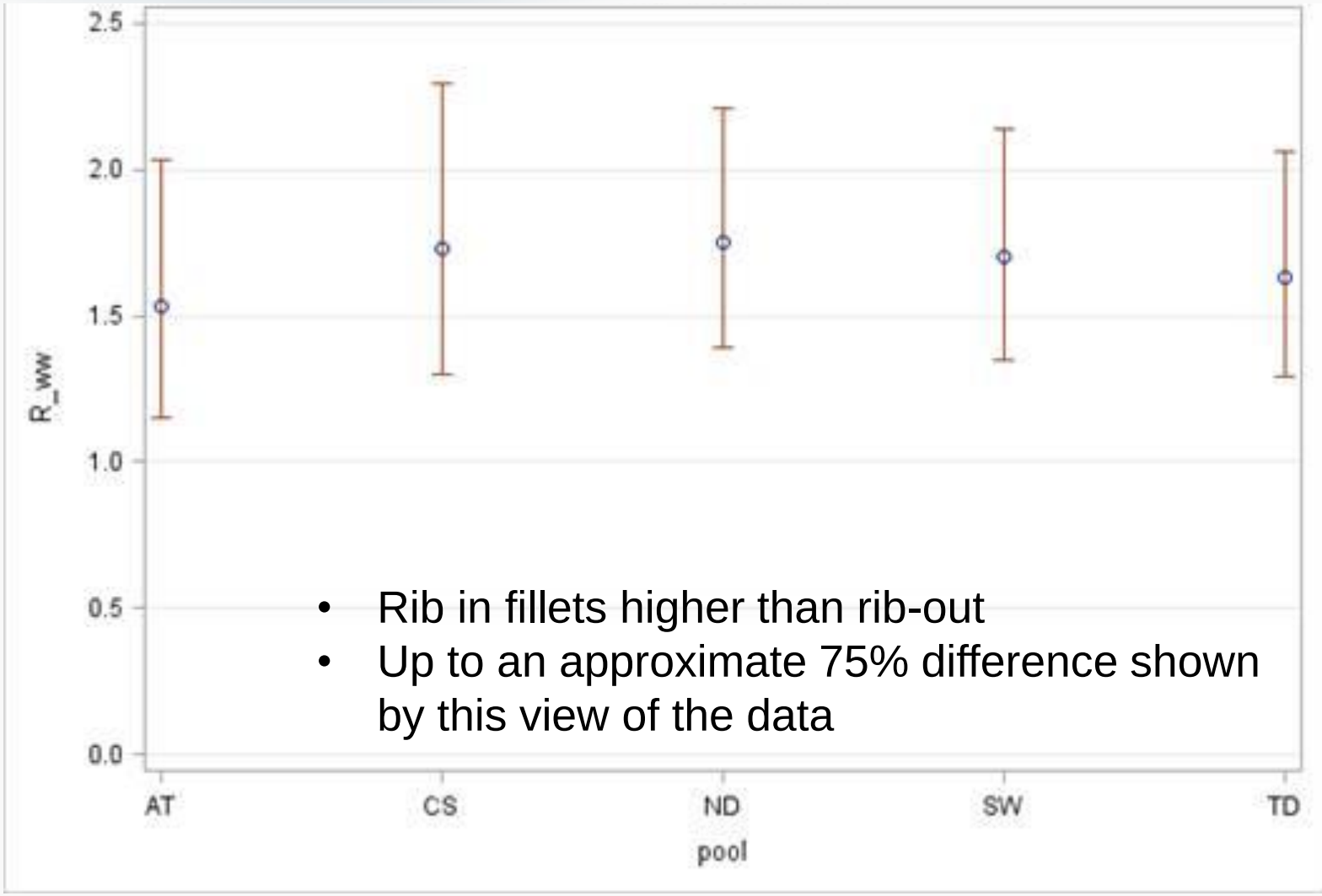
- Since 2004, EPA, in collaboration with the partner agencies, determined that the design of the fish monitoring program was predicated on the ability to see, with confidence, a minimum detectable difference of 20% for time point comparisons.

- Likewise, for the special study, the statistical test used is: If the margin of error between rib-on and rib-off measurements is less than 20% of the average of lipid normalized PCB concentrations with a 95% level of confidence, then the measurements are considered interchangeable.

The 2014 Fillet Special Study
Design

- Specifically, the NYSDEC standard fillet (rib-in) and GE lab fillet (rib-out) methods were compared
- Examined paired fillets from a single fish (one fillet included rib bones and the other did not)
    - Alternated left/right side for rib-in
- A total of 130 fish were sampled for this study
    - RS-1, -2, -3, Albany/Troy and Catskill

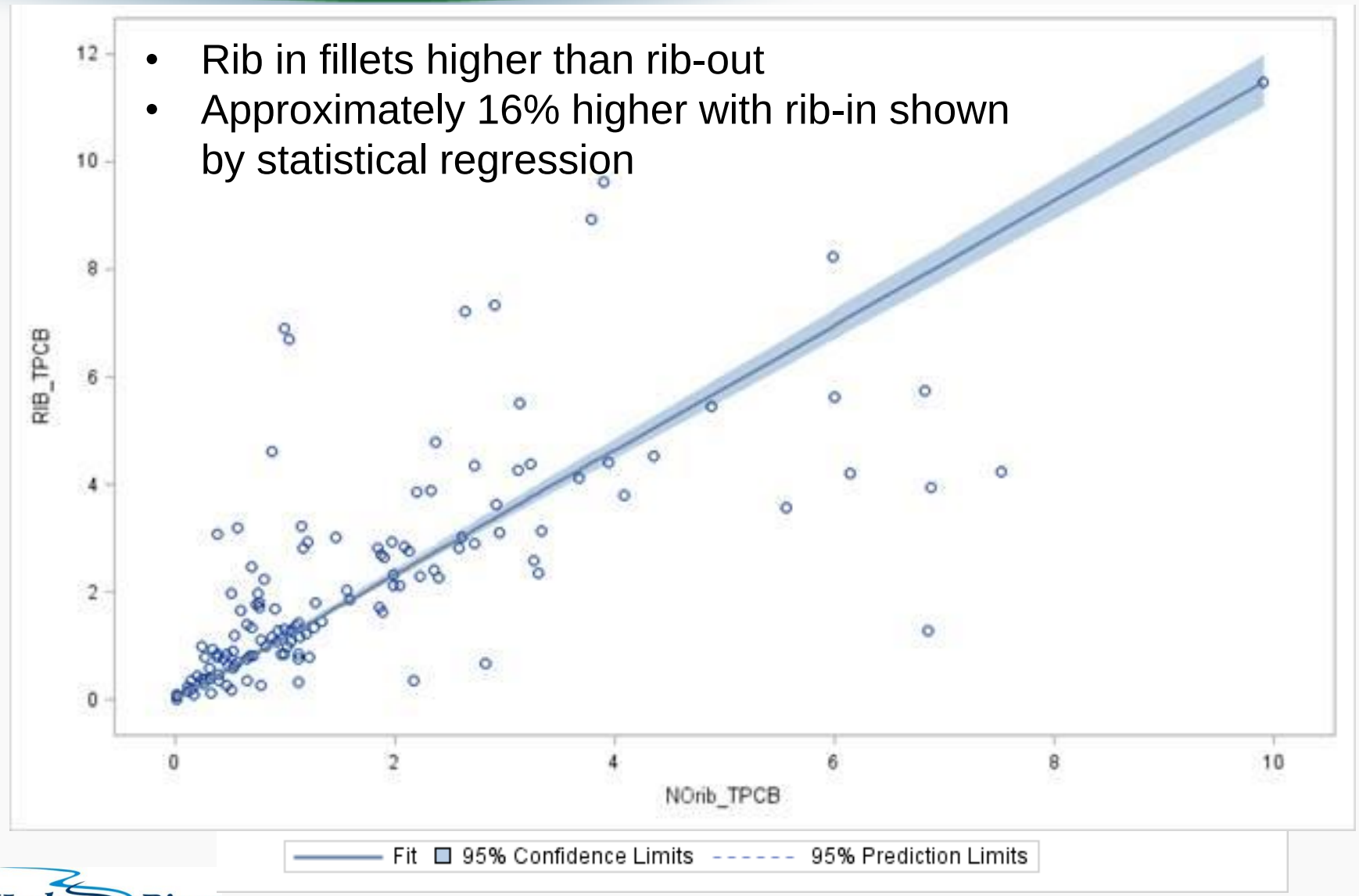
Ratio of Rib-In to Rib-Out Wet Weight PCB



- Rib in fillets higher than rib-out
- Up to an approximate 75% difference shown by this view of the data

Regression of Rib-In to Rib-Out Wet Weight PCBs

- Rib in fillets higher than rib-out
- Approximately 16% higher with rib-in shown by statistical regression



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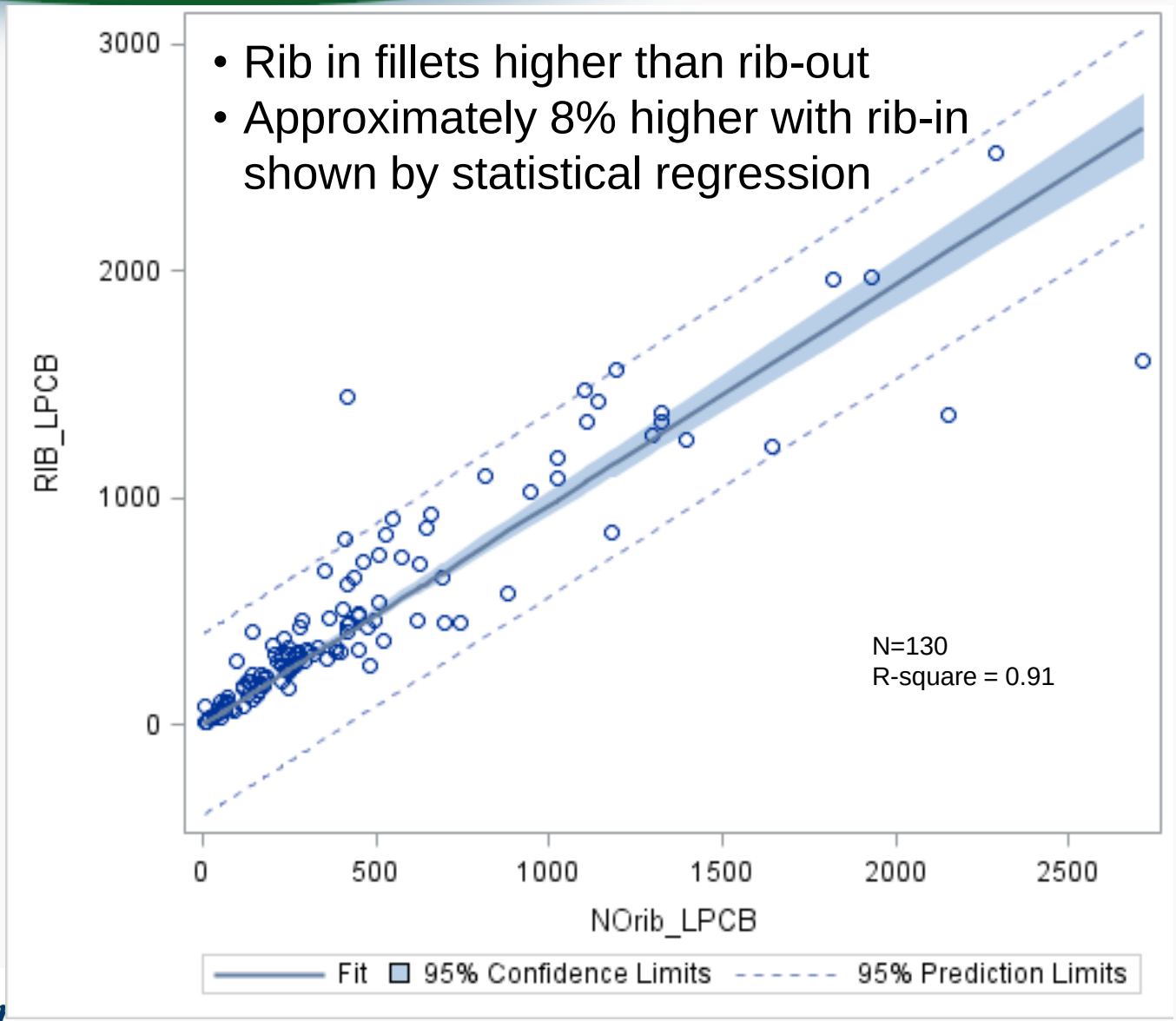
Preliminary Analysis

Regression of Rib-In to Rib-Out Lipid Normalized PCBs



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Preliminary Results

- Wet weight PCBs in rib-in fillets were higher
- The difference between lipid normalized PCB levels for rib-in vs rib-out fillets was 8%--less than the 20% difference previously discussed
- EPA will continue to coordinate with NYSDEC and GE to further understand the data and how it will be used

The 2014 Fillet Special Study
Next Steps

- GE to continue processing fish using the NYSDEC standard fillet (rib-in) procedure
- Continue evaluating fish program status with NYSDEC with an eye toward continuous improvement
    - Potential focus on steps in the fish collection, processing, and analysis procedures that might further limit variability
- All data generated by the program (2004-present and the special study) indicate that fish tissue PCB levels make it unsafe to eat fish taken from the Hudson River

Moving forward

- No element of EPA's decision-making about the choice of remedial alternative or the long-term success of the project has been or will be based on data from samples prepared using the "rib out" methodology.

- It is important that EPA, NYSDEC and GE carry on further discussions to identify and reduce variability (to the extent practicable) so that the project continues to produce high quality data for use in:
    - Evaluating trends in fish data
    - Comparison to remedial action objectives and
    - Eventual adjustments to fish advisories

- Fish monitoring (long term) will continue on the Hudson River

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