

MONITORING PERSISTENT CONTAMINANTS IN BALD EAGLES

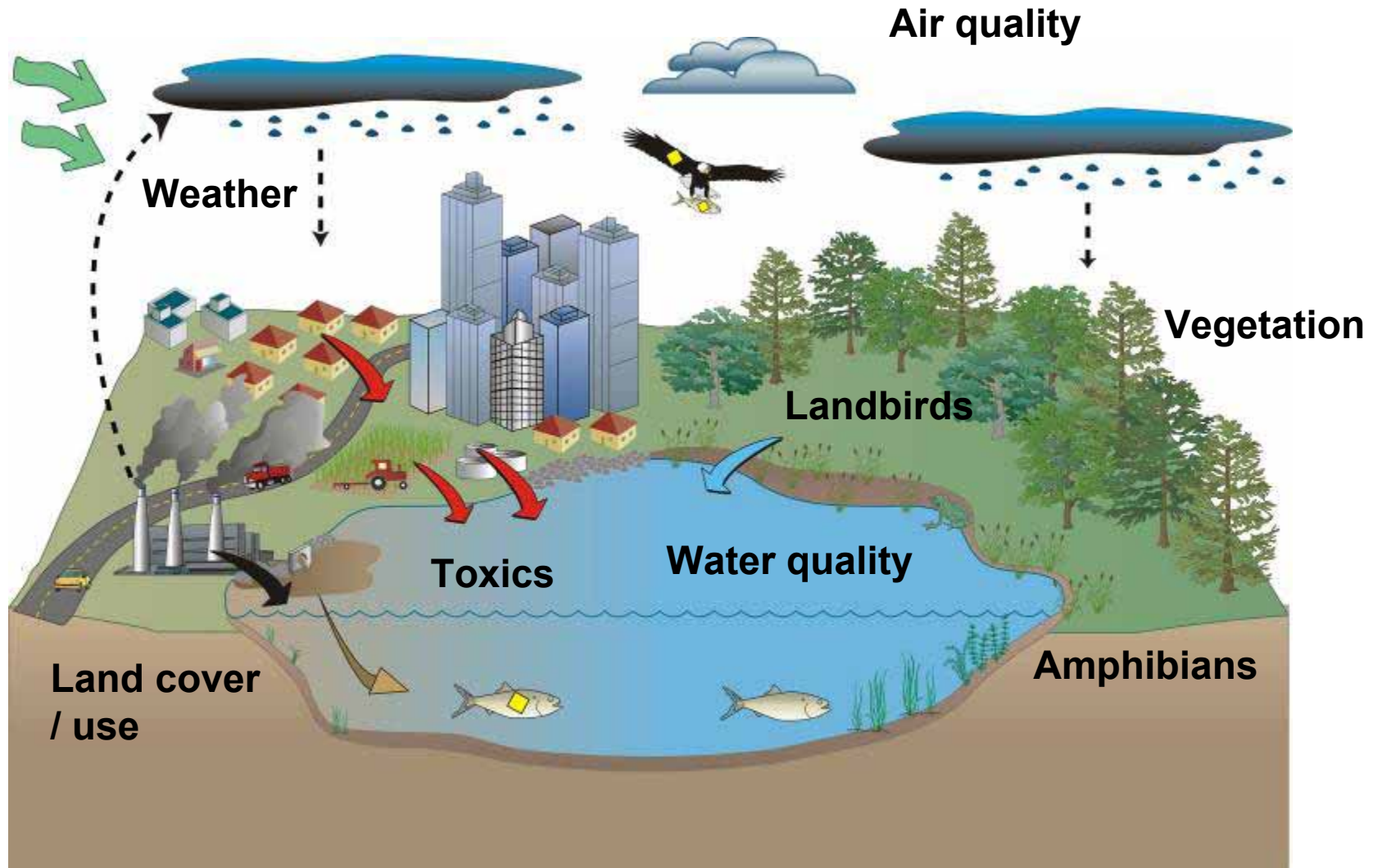
Bill Route, National Park Service, Great Lakes Network

Mike Meyer, Wisconsin Department of Natural Resources

Mark Martell, Audubon Minnesota



NPS - Ecosystem approach



Contaminants Sampled at 3 parks 2006, 2007, 2008

Heavy Metals

- Mercury (Hg)
- Lead (Pb)

Banned

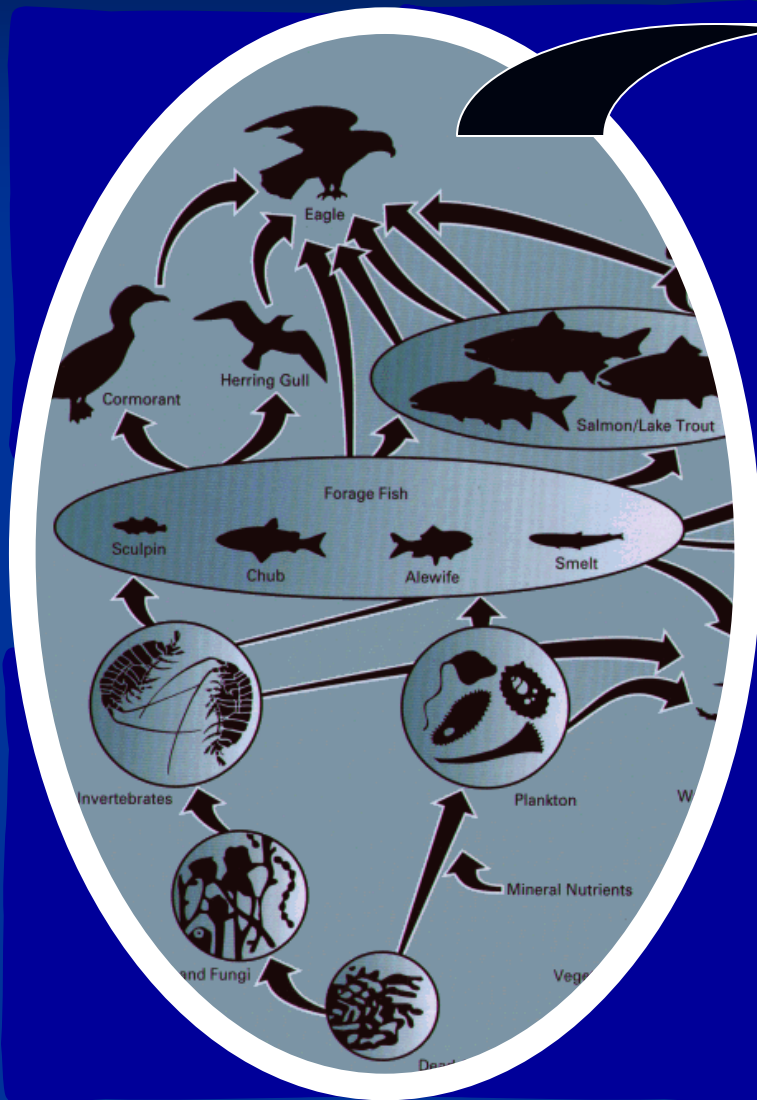
- PCBs (75 congeners)
- DDT (DDE & DDD)

New & Emerging

- Brominated flame retardants PBDEs (9)
- Fluorinated compounds (16)
 - PFOS (ex. Scotchgard)
 - PFOA (ex. Teflon)



Bald Eagle Nestlings as Sentinels









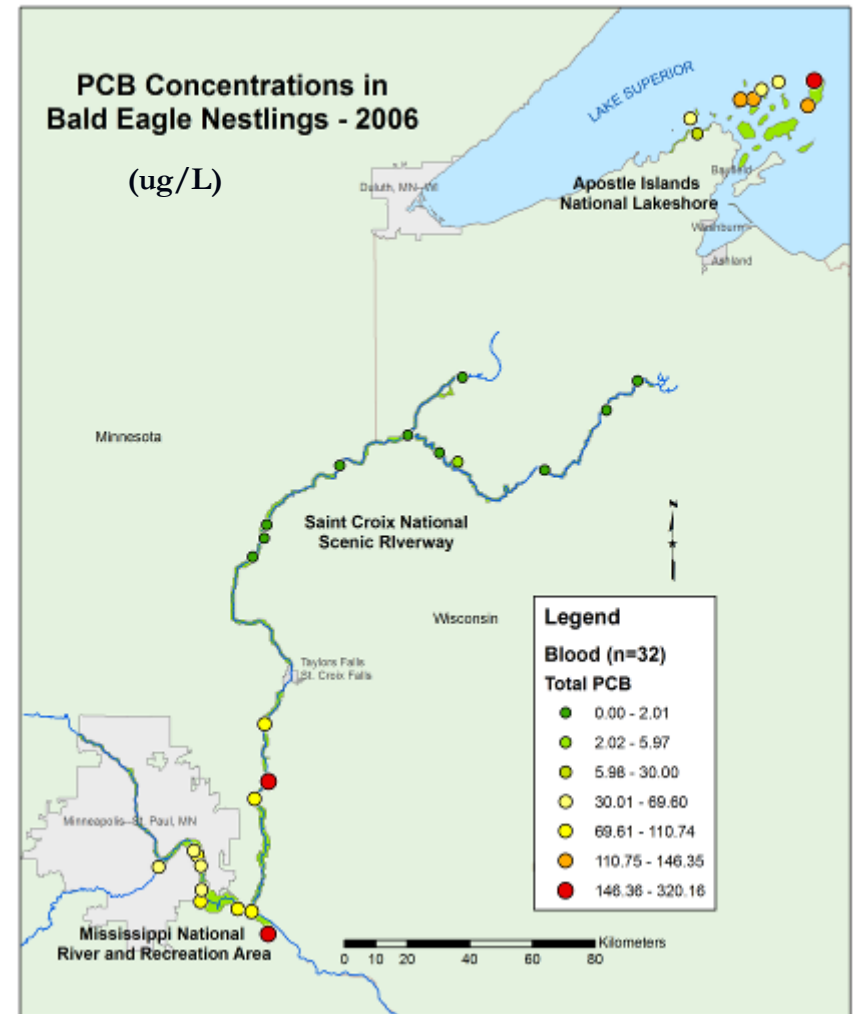
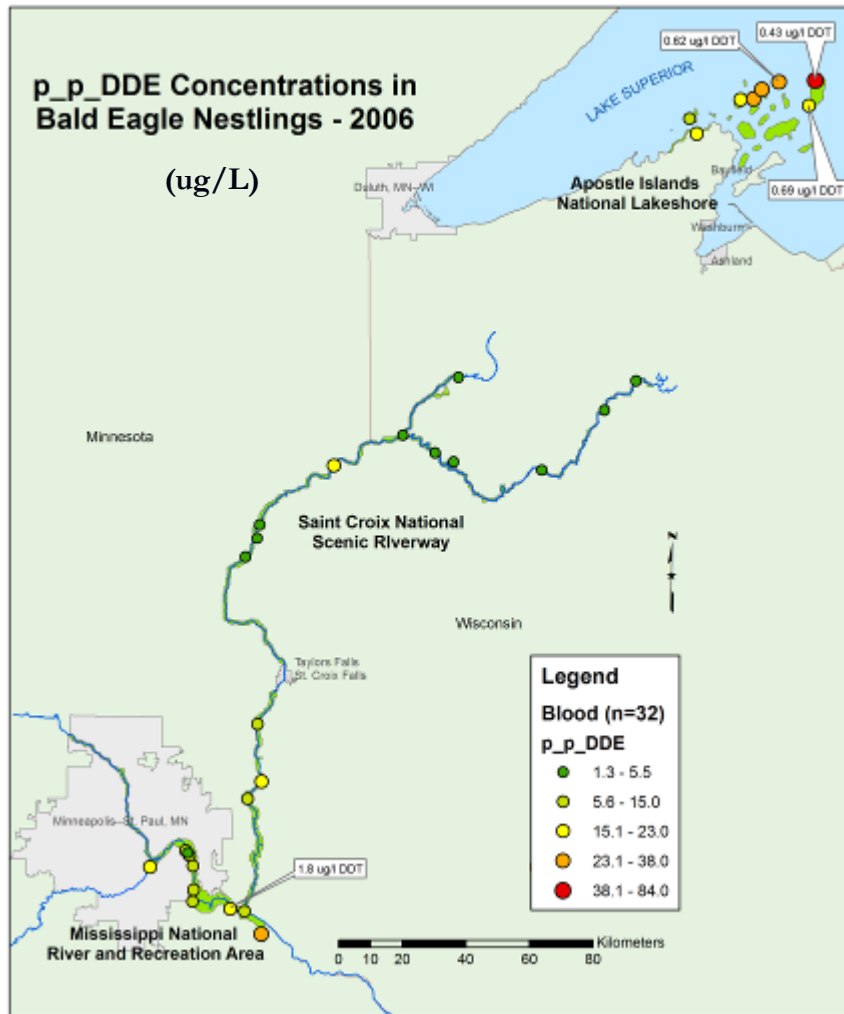
Then back in the nest



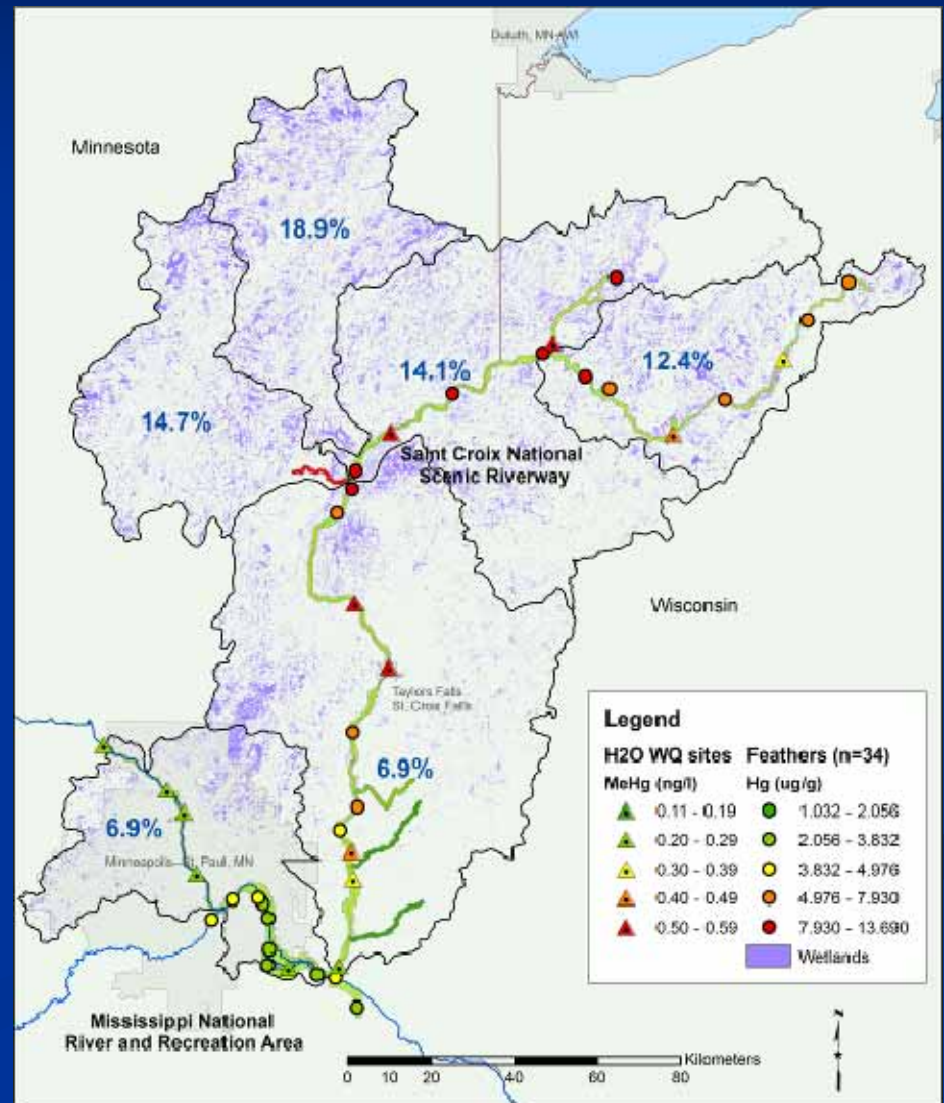
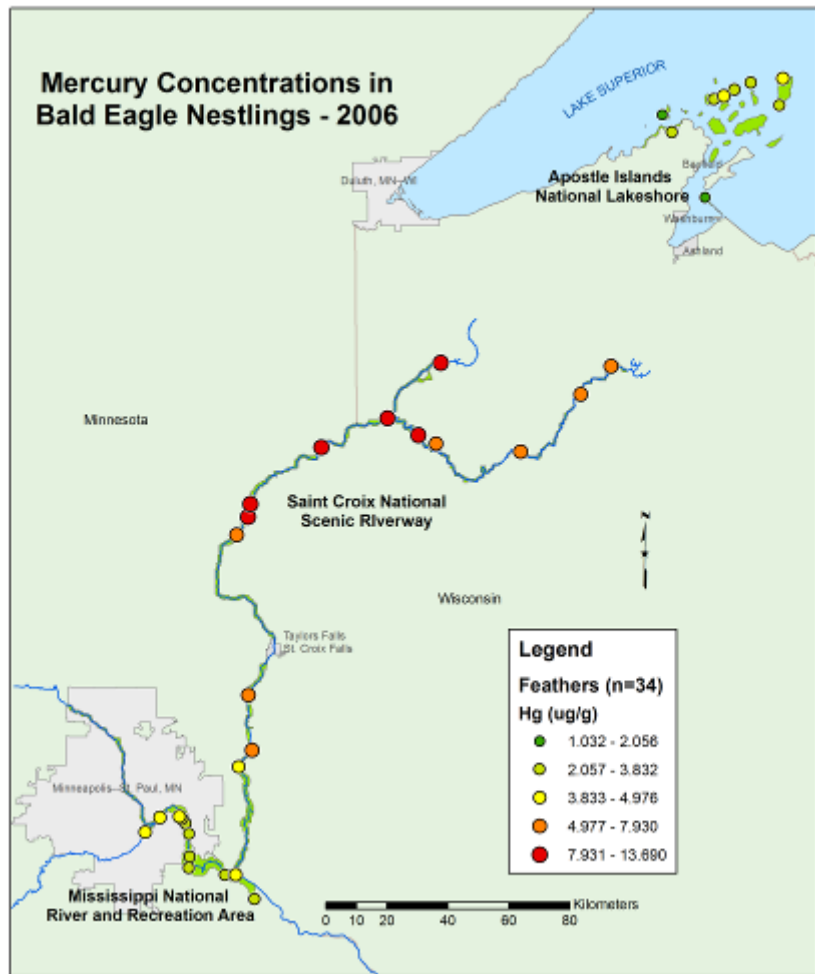




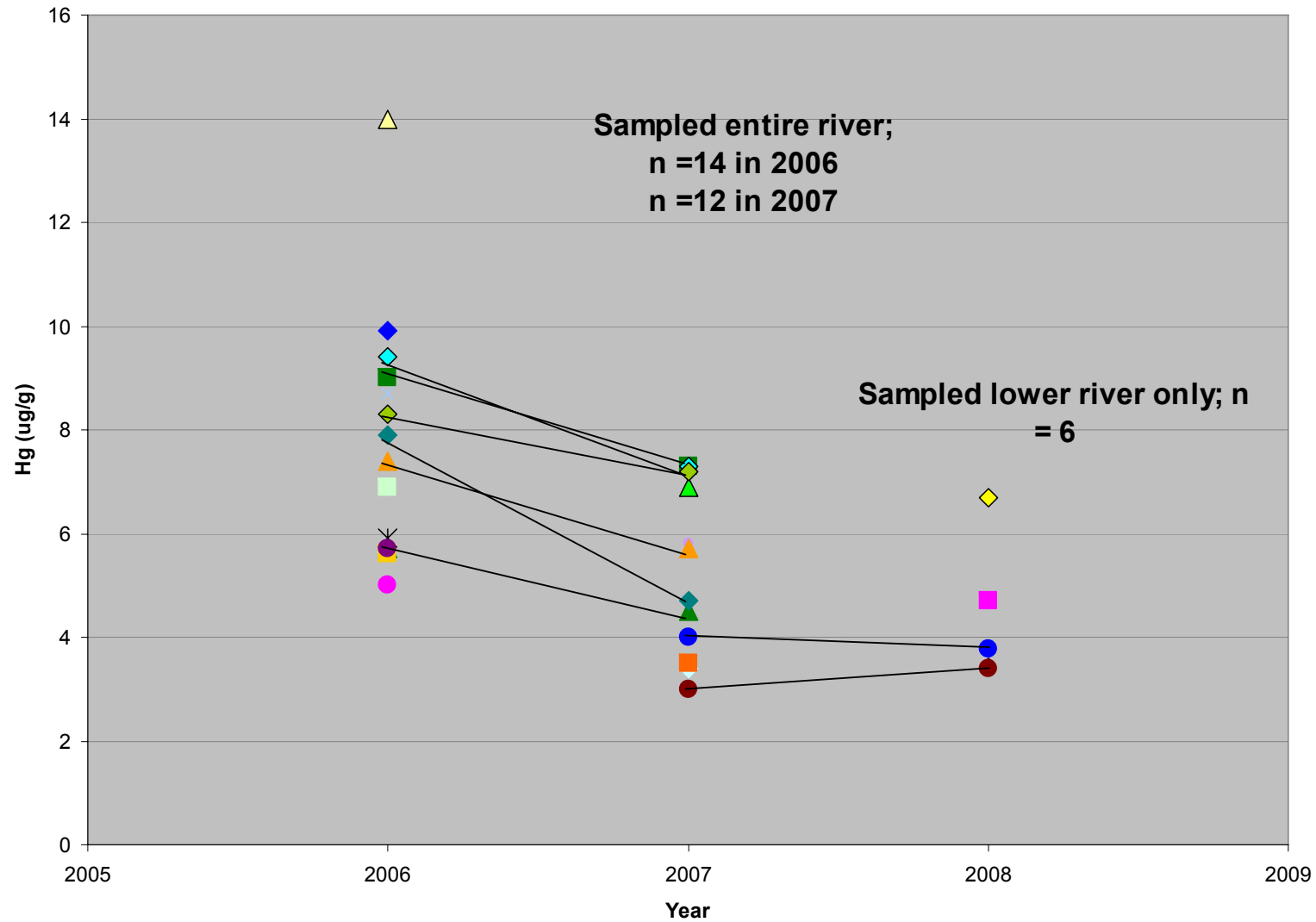
Distribution & Relative Concentrations of PCBs & DDT

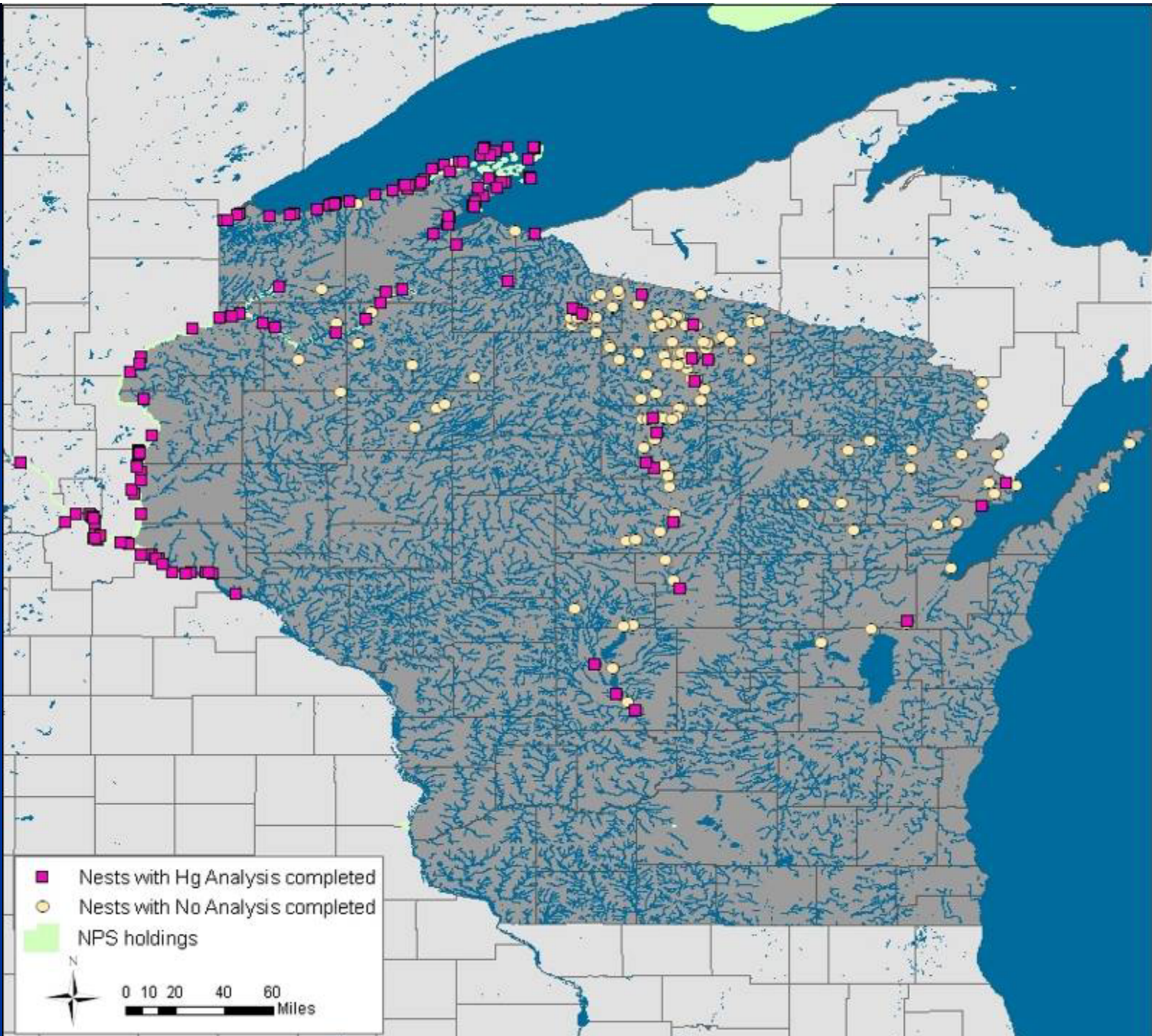


Distribution and Relative Concentrations of Mercury

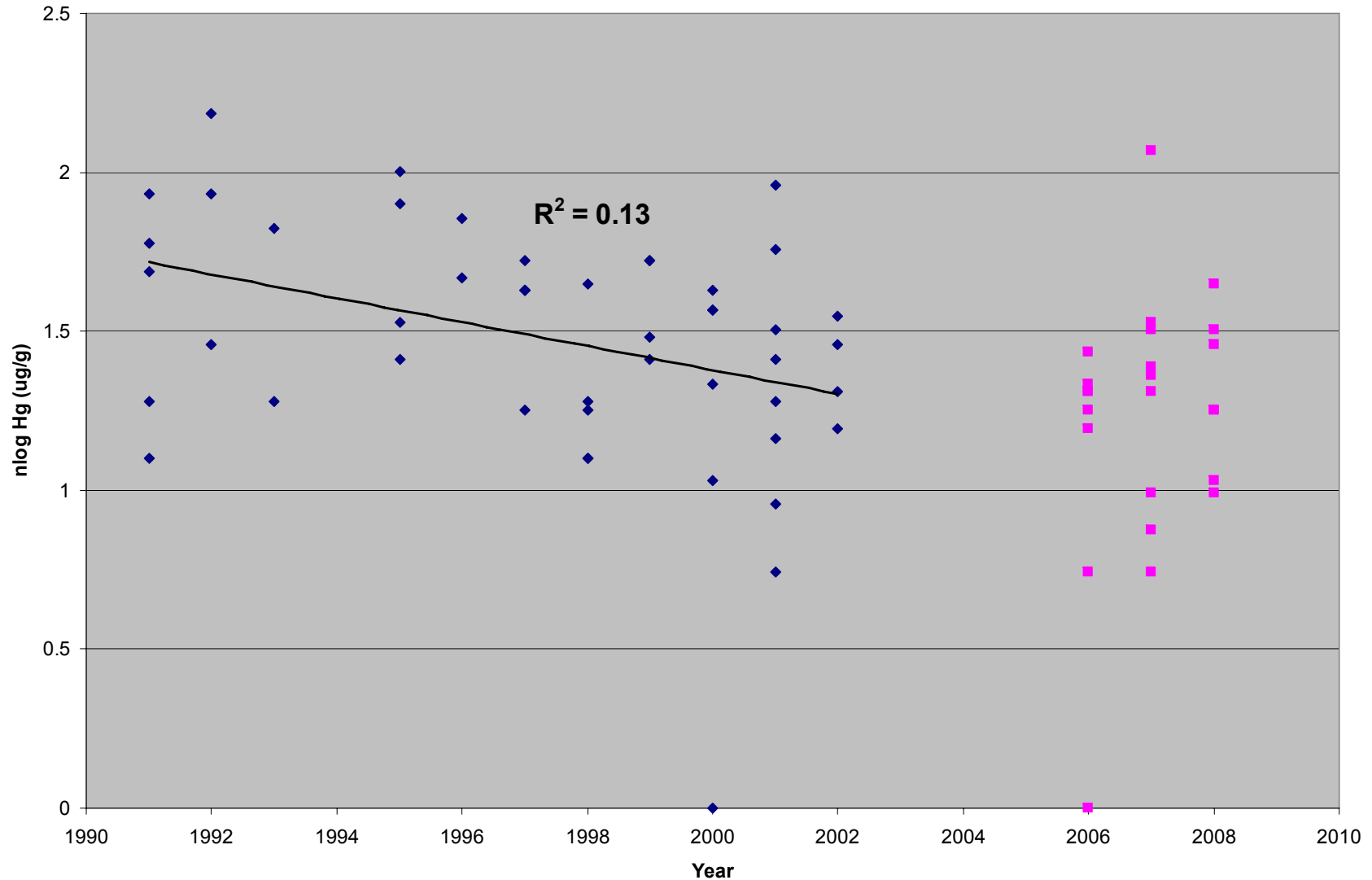


Hg levels by nest (2006,2007,2008)

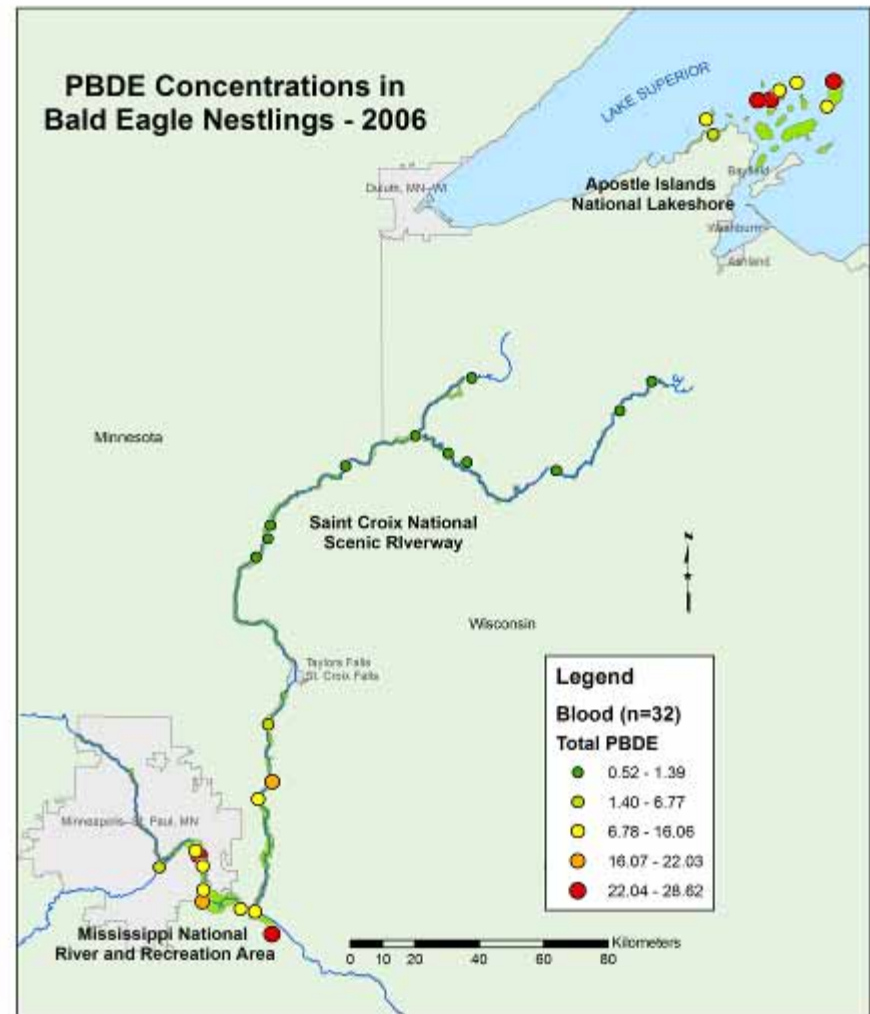
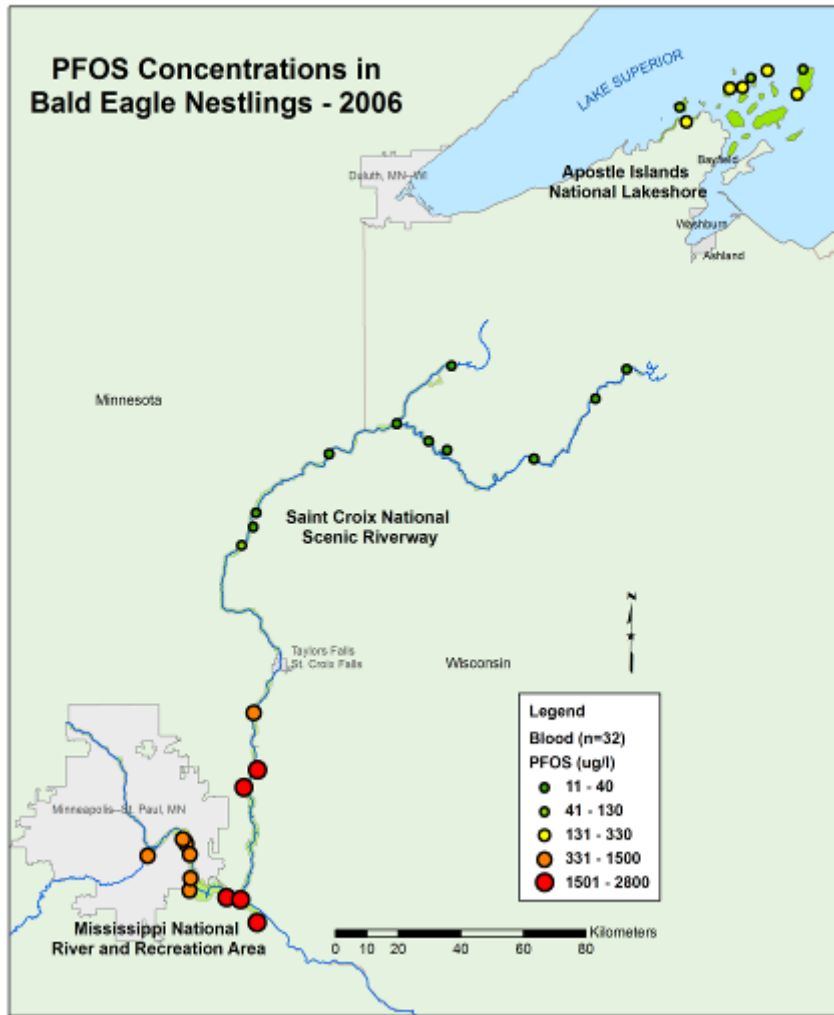




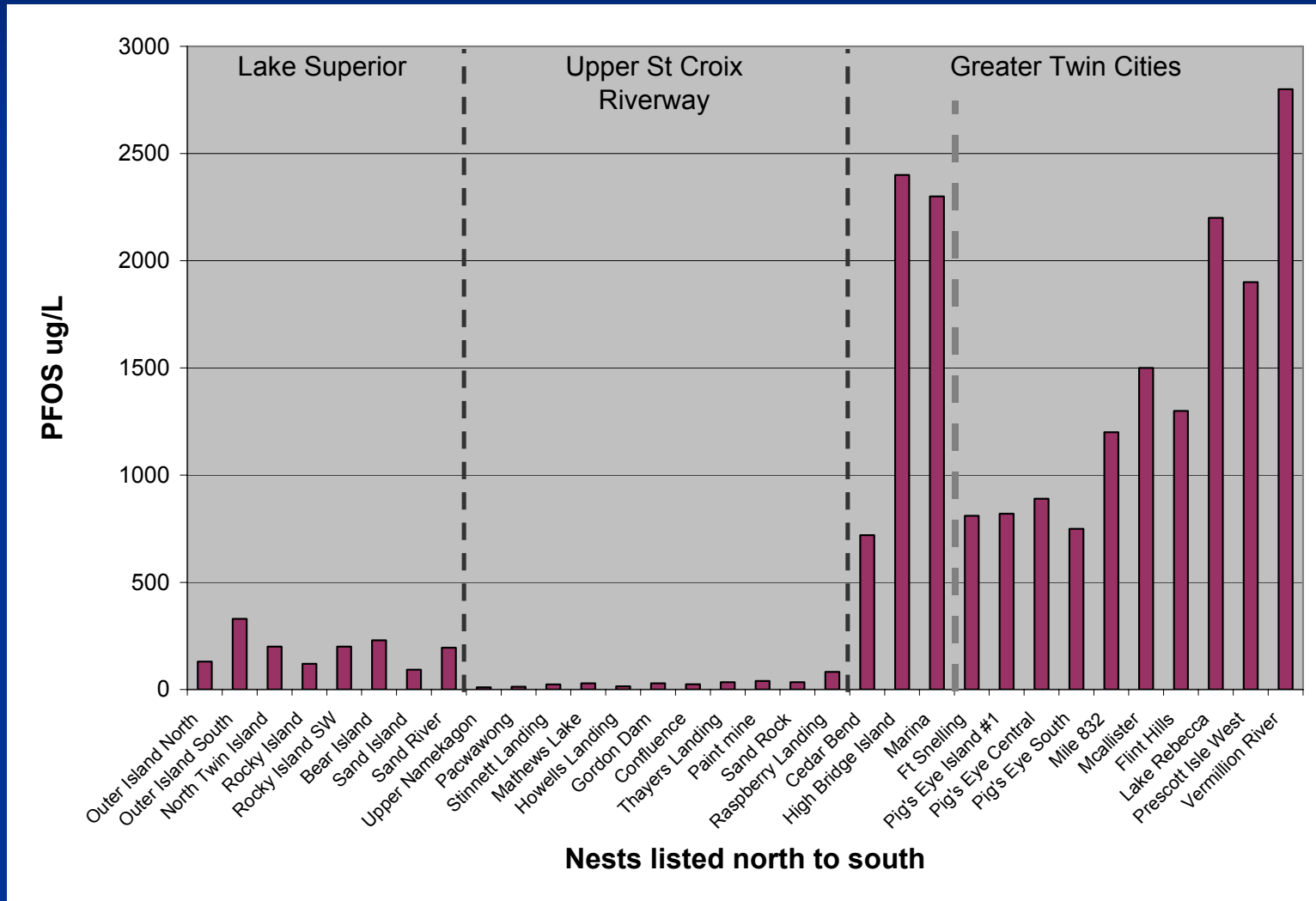
Hg Concentrations for nestlings on the South Shore of Lake Superior



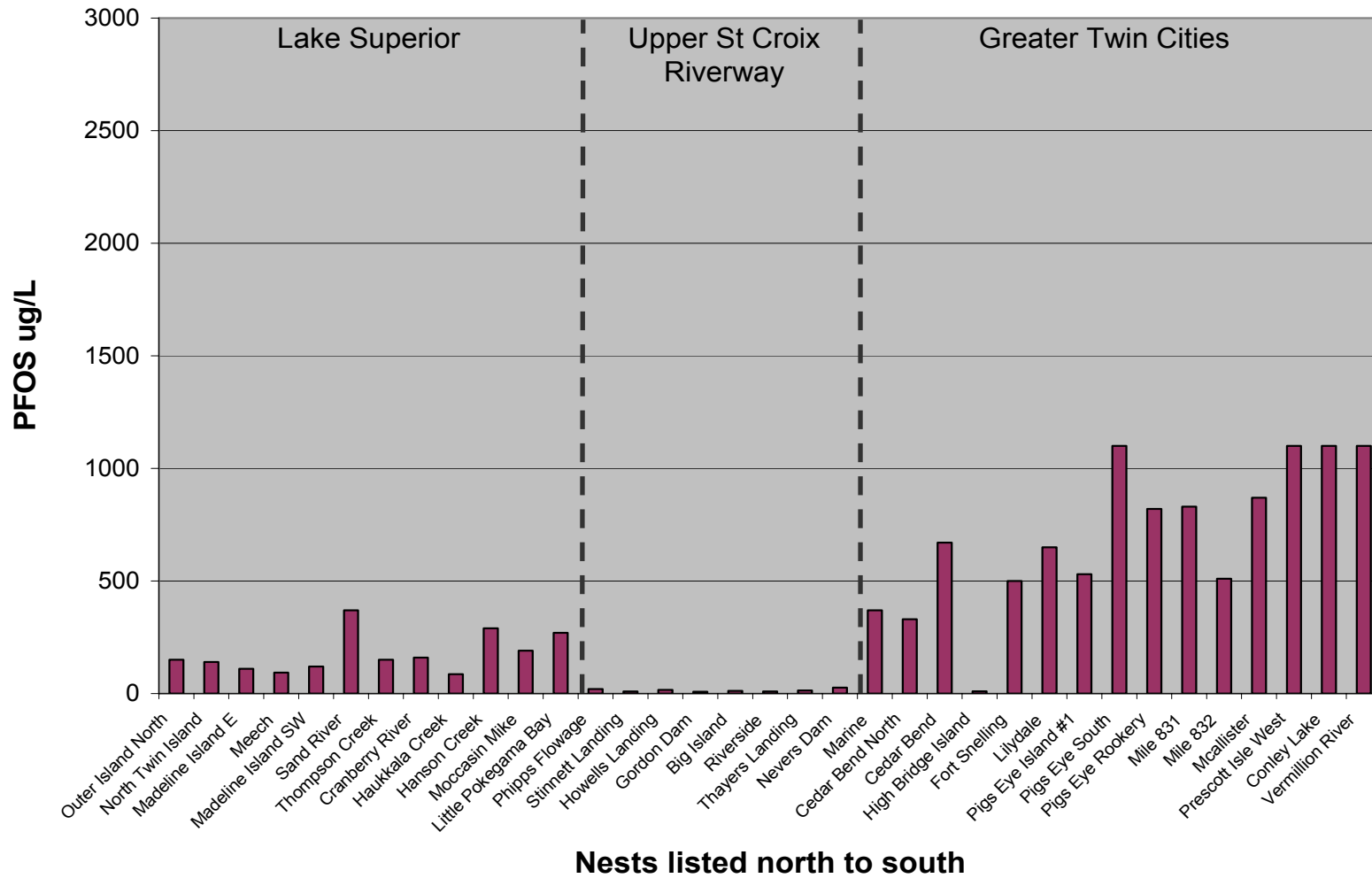
Distribution & Relative Concentrations of PFOS & PBDEs



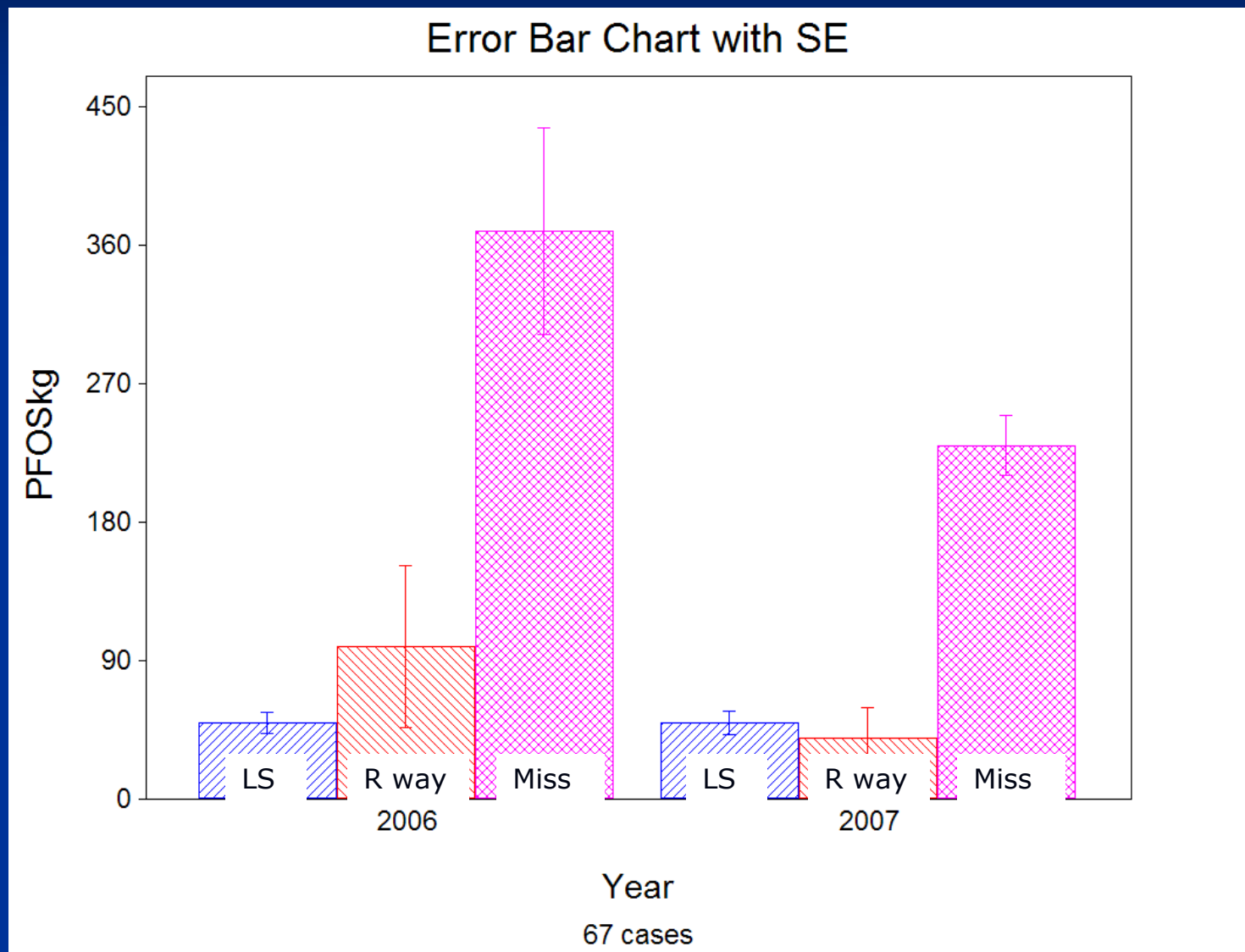
2006 PFOS Distribution



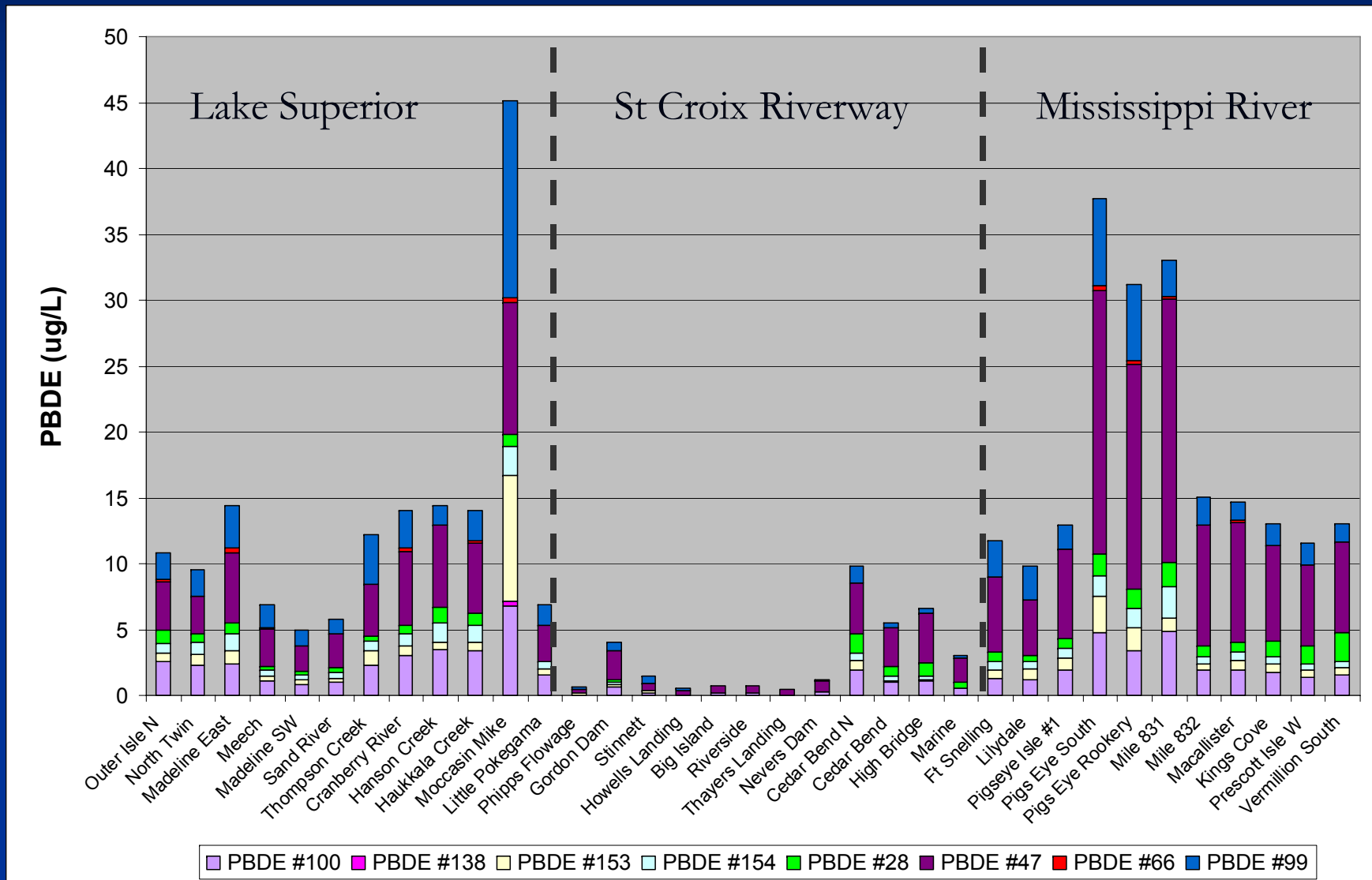
2007 PFOS Distribution



Evidence of PFOS decline



PBDE Congener Distribution (2007)



Conclusions

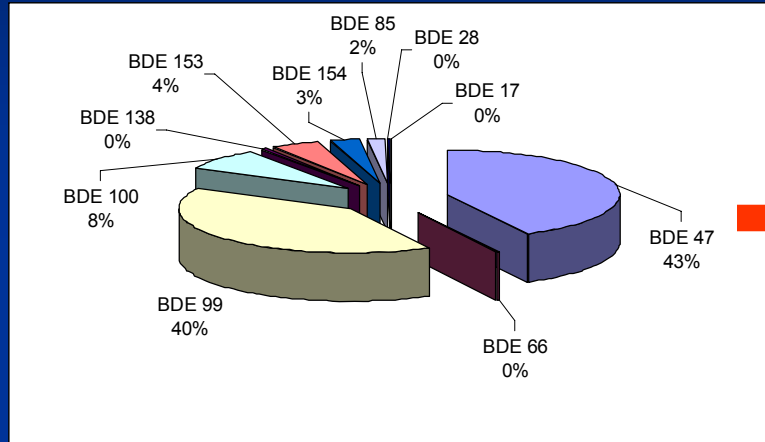
- PCBs and DDE are low across the Riverway
- Hg is high in the upper Riverway, likely from air deposition and methylation in wetlands
- Hg up-take in BE has been decreasing
- PFOS levels are high in lower Riverway
- Overall decline in PFOS in both the Riverway and the Miss from 2006 to 2007
- PFOS did not decline in Lake Superior
- PBDEs high in the lower river with similar patterns as PCBs and PFOS – suggesting point sources

Acknowledgments

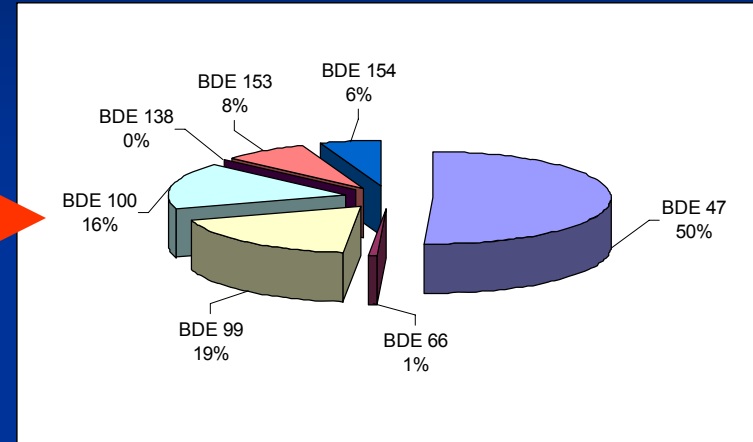
- National Park Service I&M Program
- Wisconsin Department of Natural Resources
- Audubon Minnesota
- Minnesota Pollution Control Agency
- Weesner Foundation
- St. Croix National Scenic Riverway
- Mississippi National River & Recreation Area
- Apostle Islands National Lakeshore

PBDEs

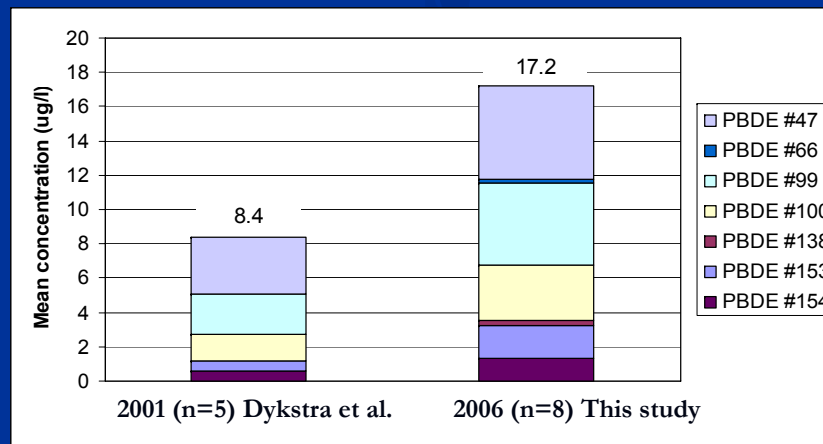
Persistent & Cumulative



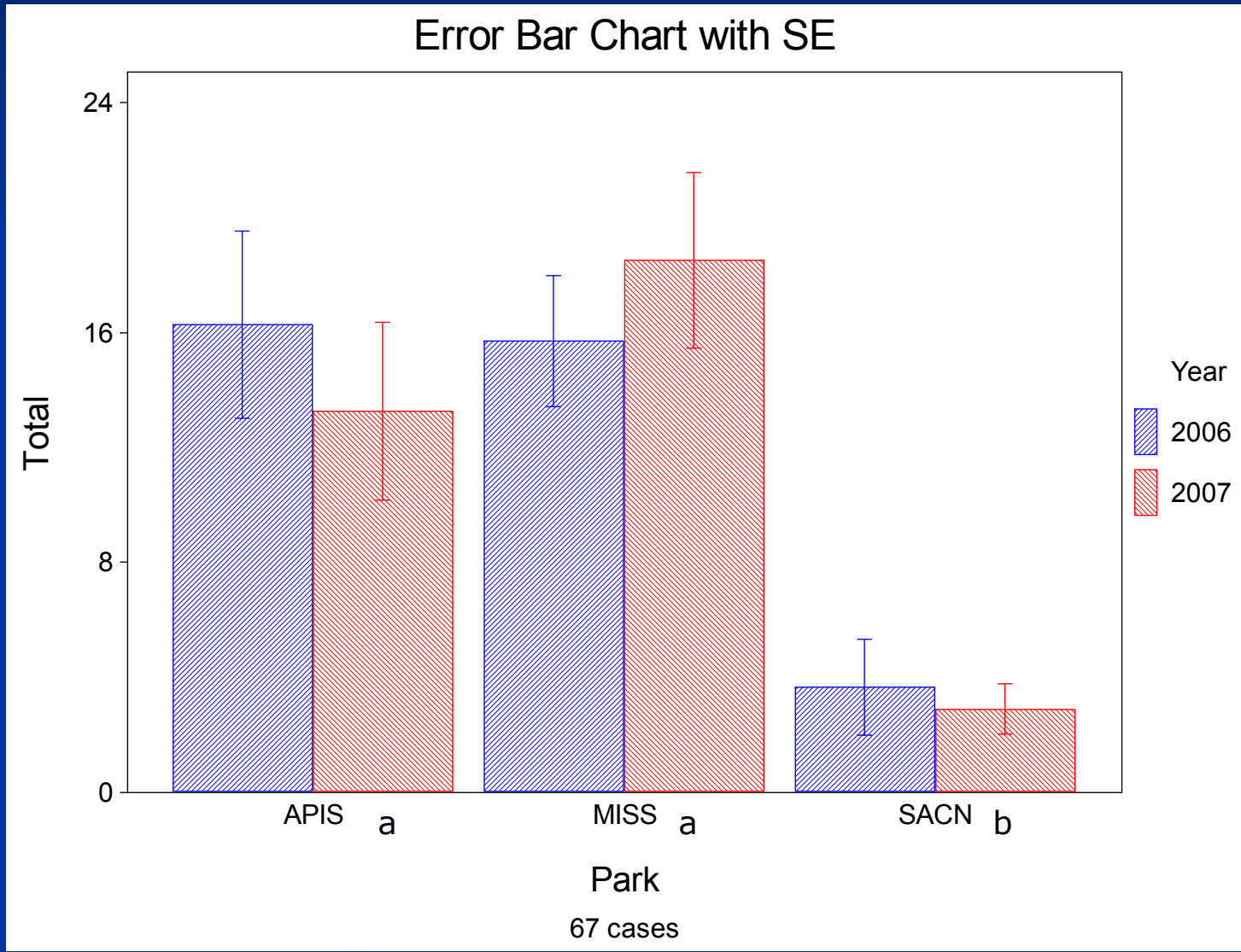
Common Flame Retardant



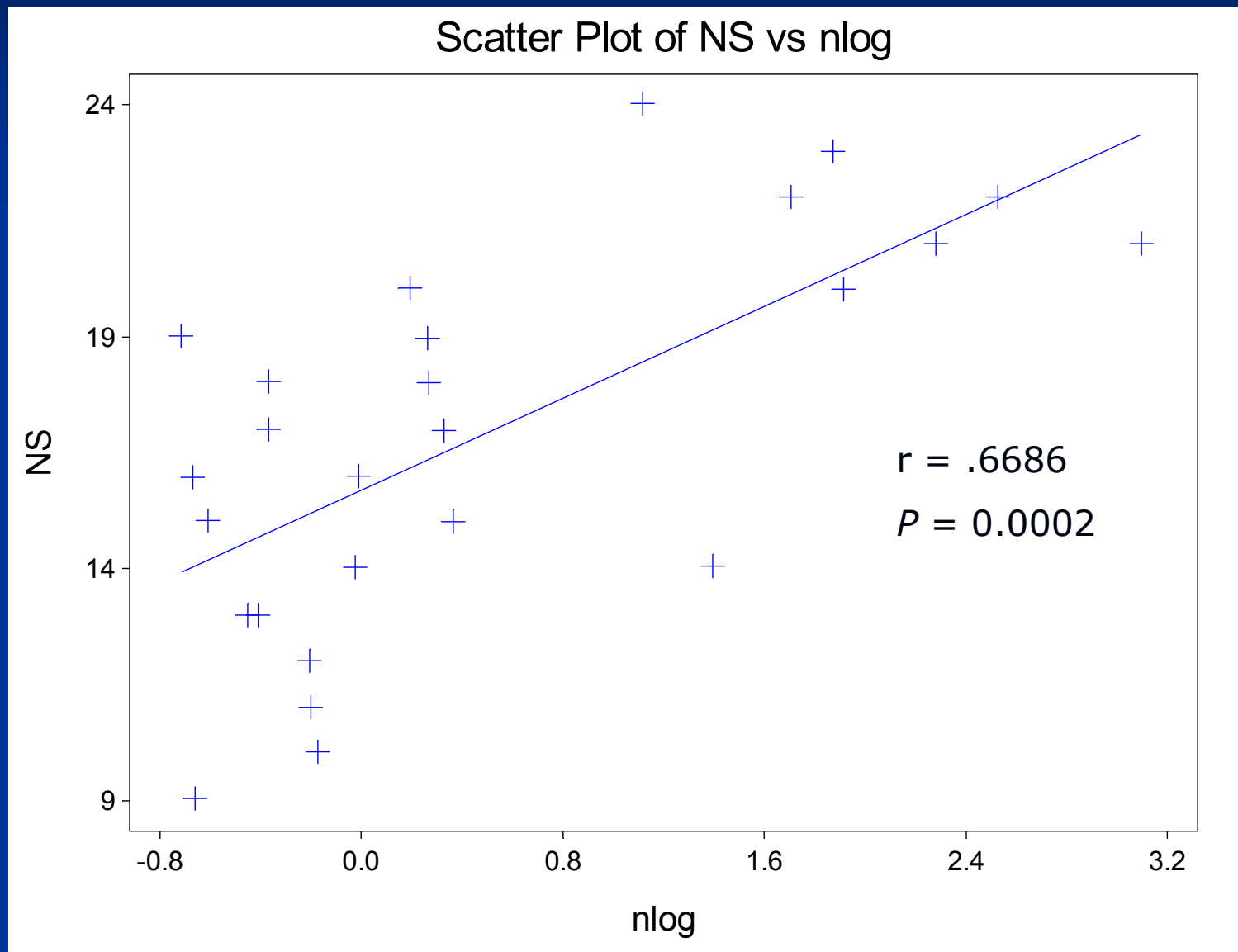
Bald Eagle Blood Samples



Total PBDE 2006 & 2007



SACN PBDE increases N to S (2006 & 2007)



PBDE Congener Distribution (2006)

