

The Influence of Canal Water Releases on the Methylmercury Production in Everglades National Park: Implications for Ecosystem Restoration

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WARNING

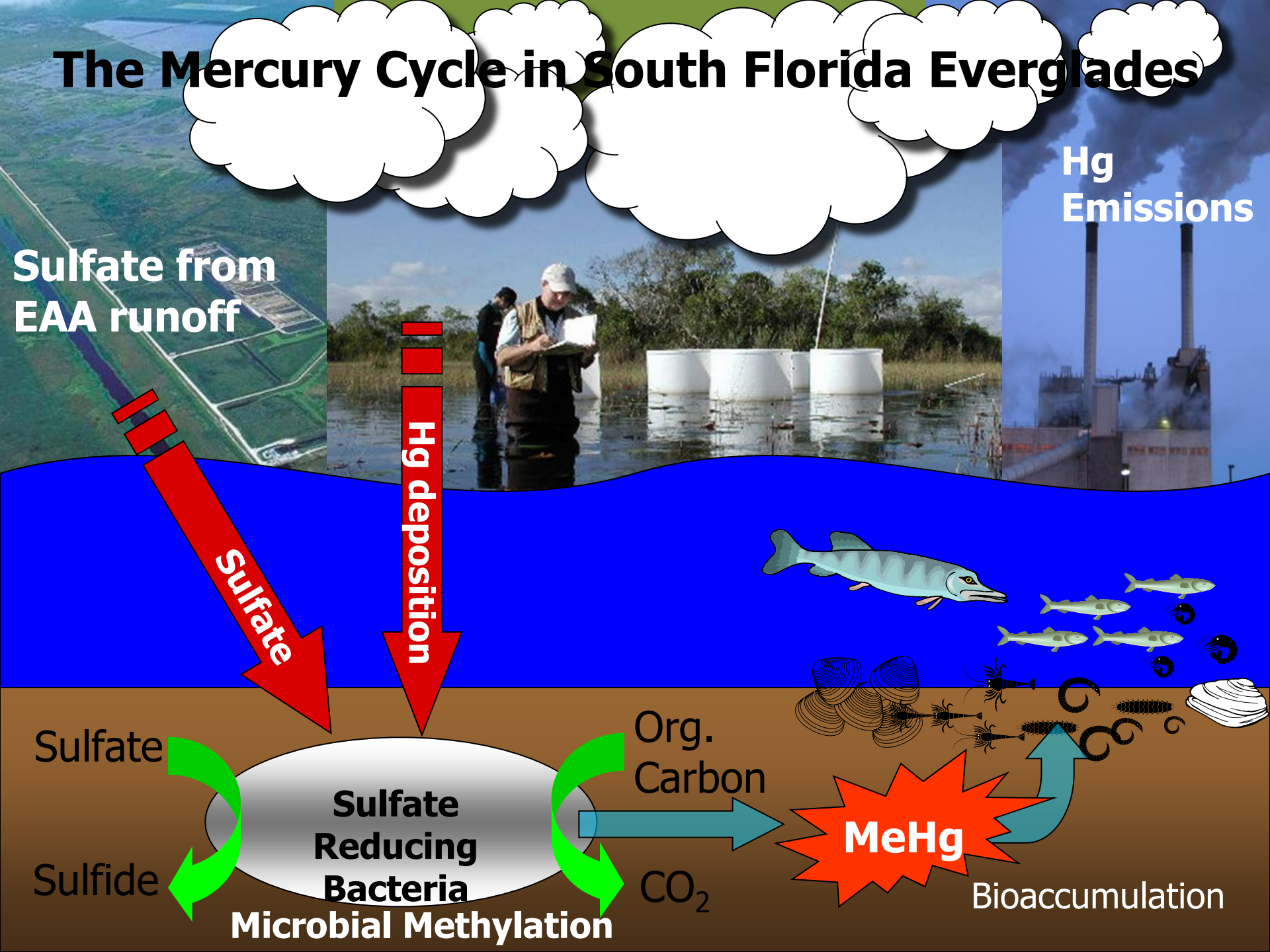
The Florida Department of Health and Rehabilitative Services has issued a health advisory urging limited consumption of largemouth bass and warmouth caught in certain portions of the Everglades due to excessive accumulation of the element mercury.

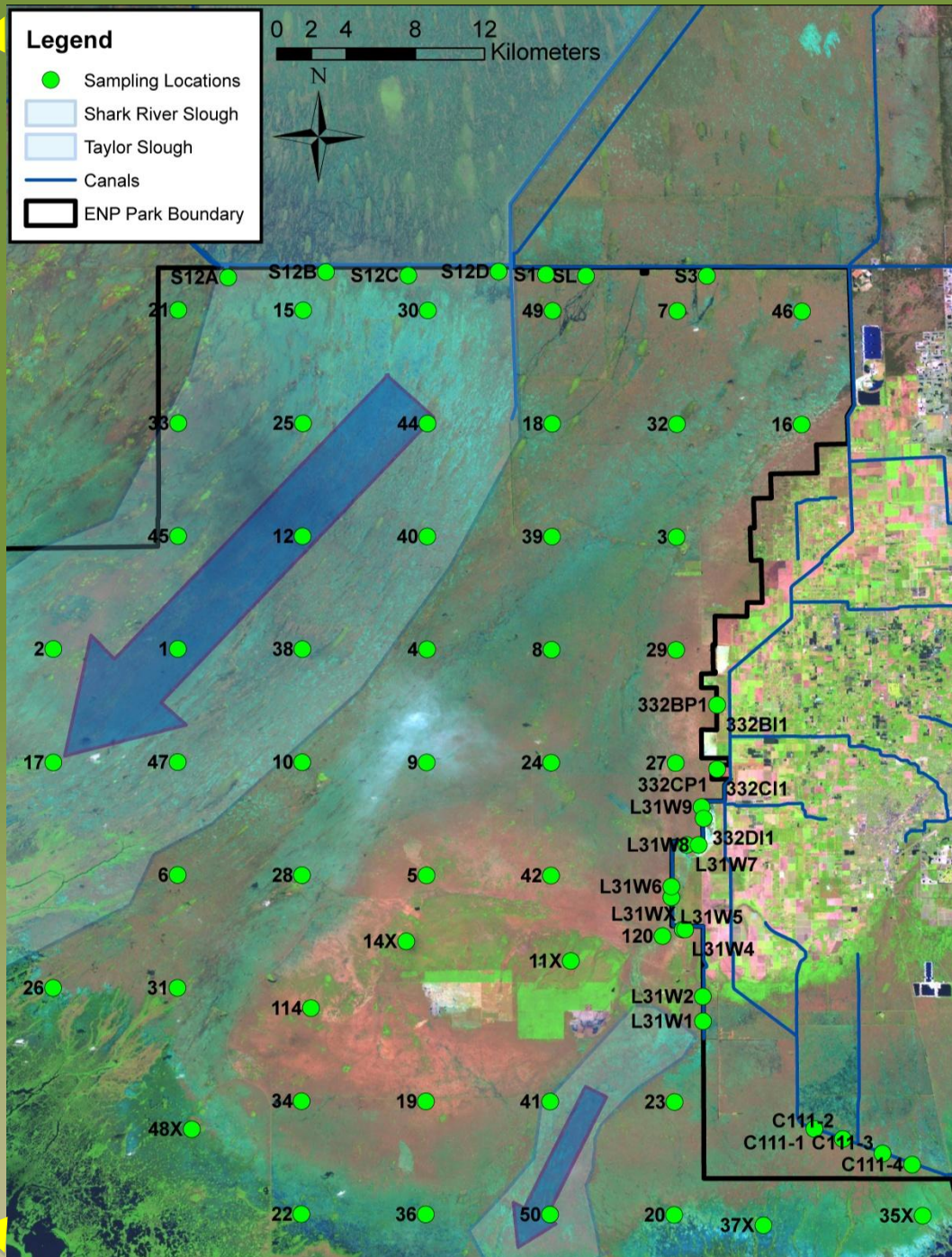
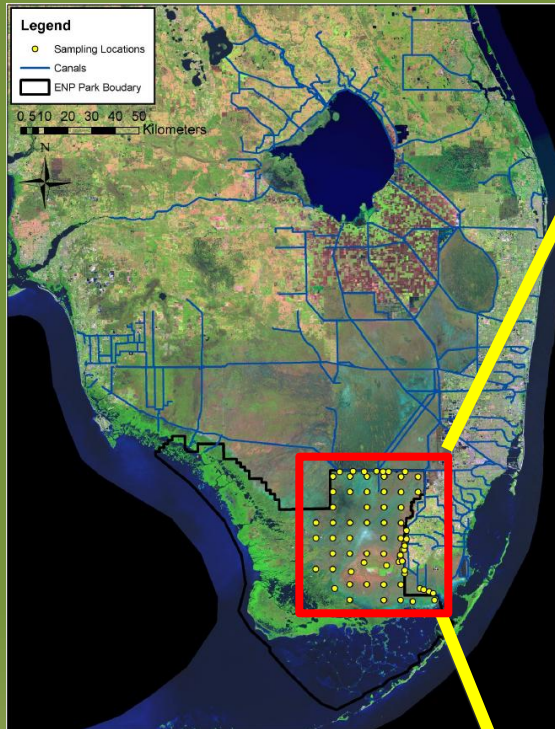
- Fish caught in Arthur R. Marshall Loxahatchee National Wildlife Refuge (Water Conservation Area 1) should not be eaten more than once per week by adults and not more than once per month by children under 15 and pregnant women.
- Fish caught in Water Conservation Areas 2a and 3 should not be eaten at all.

For additional information, contact the Florida Department of Health and Rehabilitative Services at (405) 355-3018.



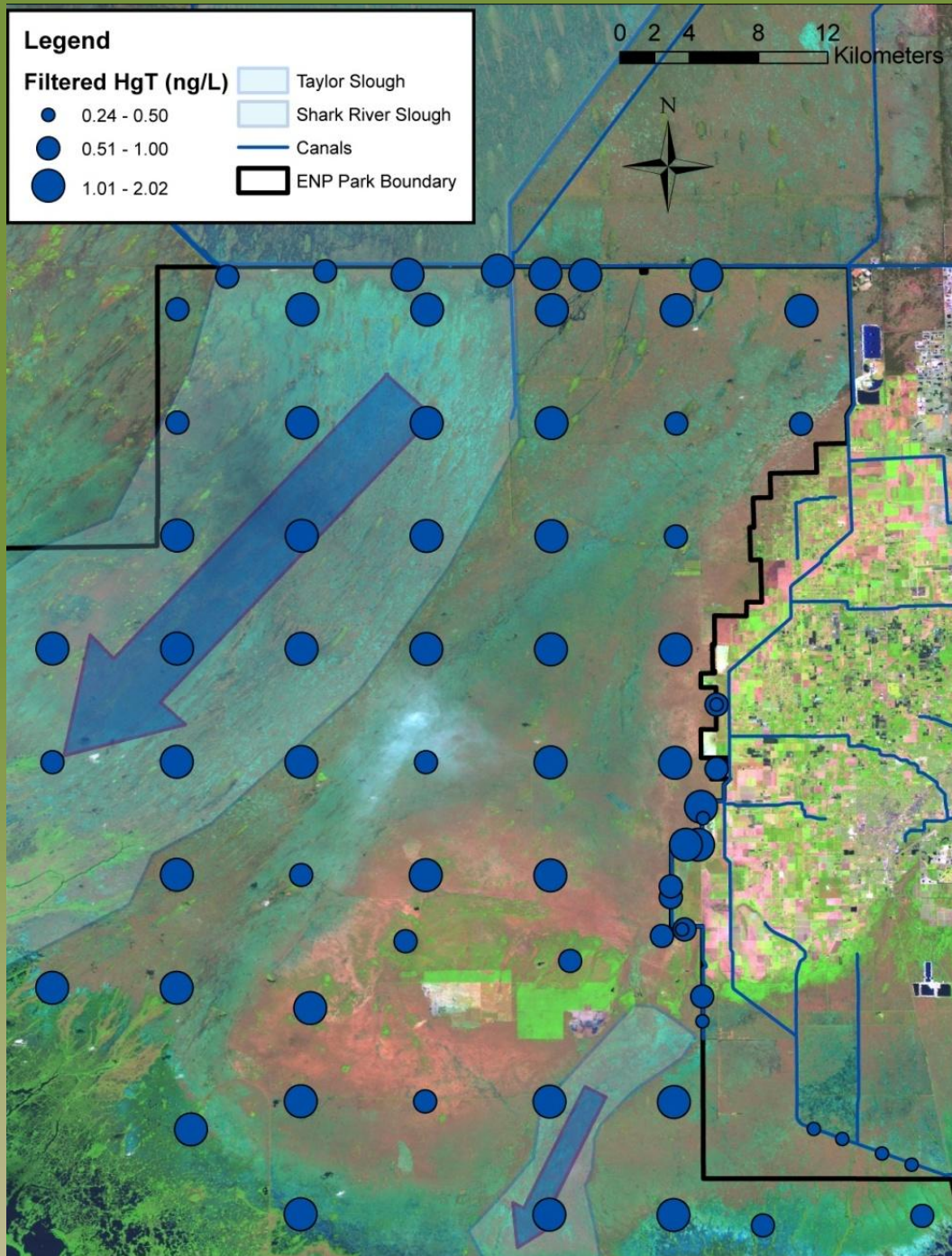
The Mercury Cycle in South Florida Everglades





Sampling network:

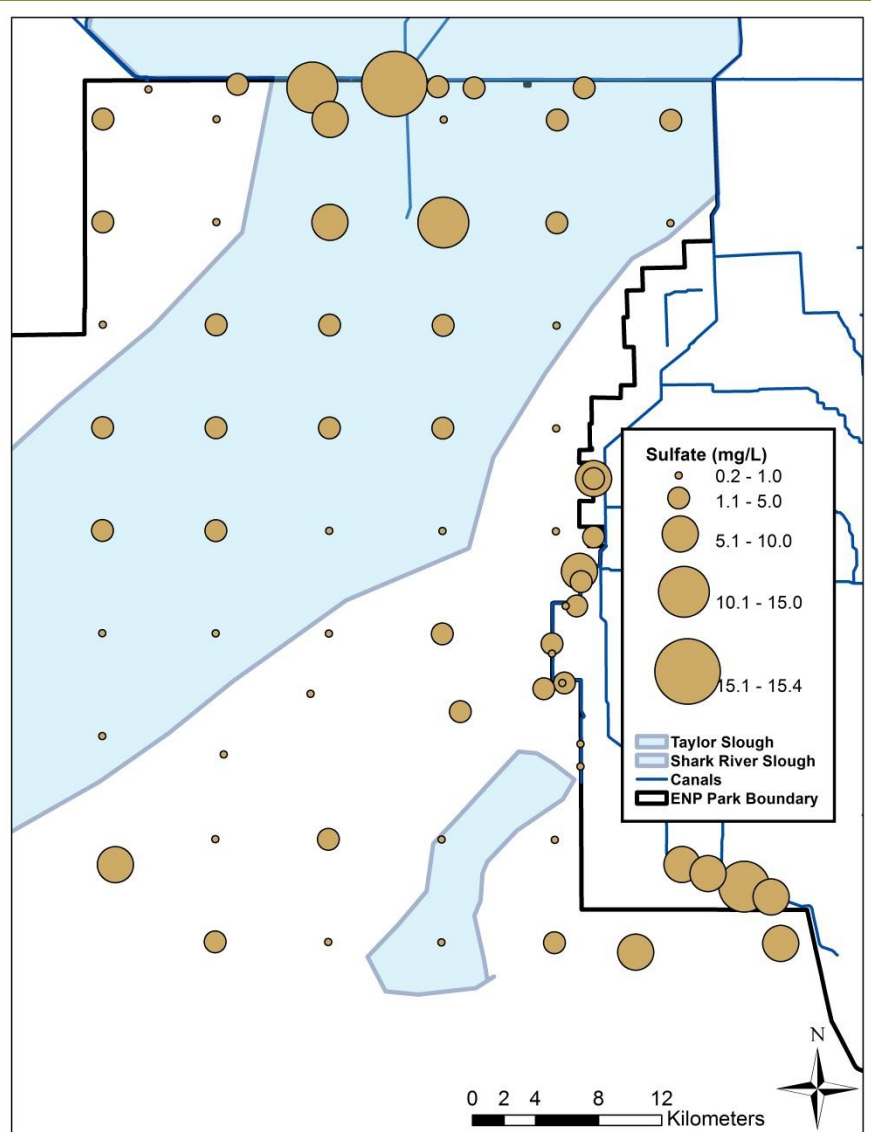
- 76 sites covering marsh and canals
- Sampled in Fall of 2008 & 2009
- Surface water and small fish
- Analyzed for QW, Hg and MeHg



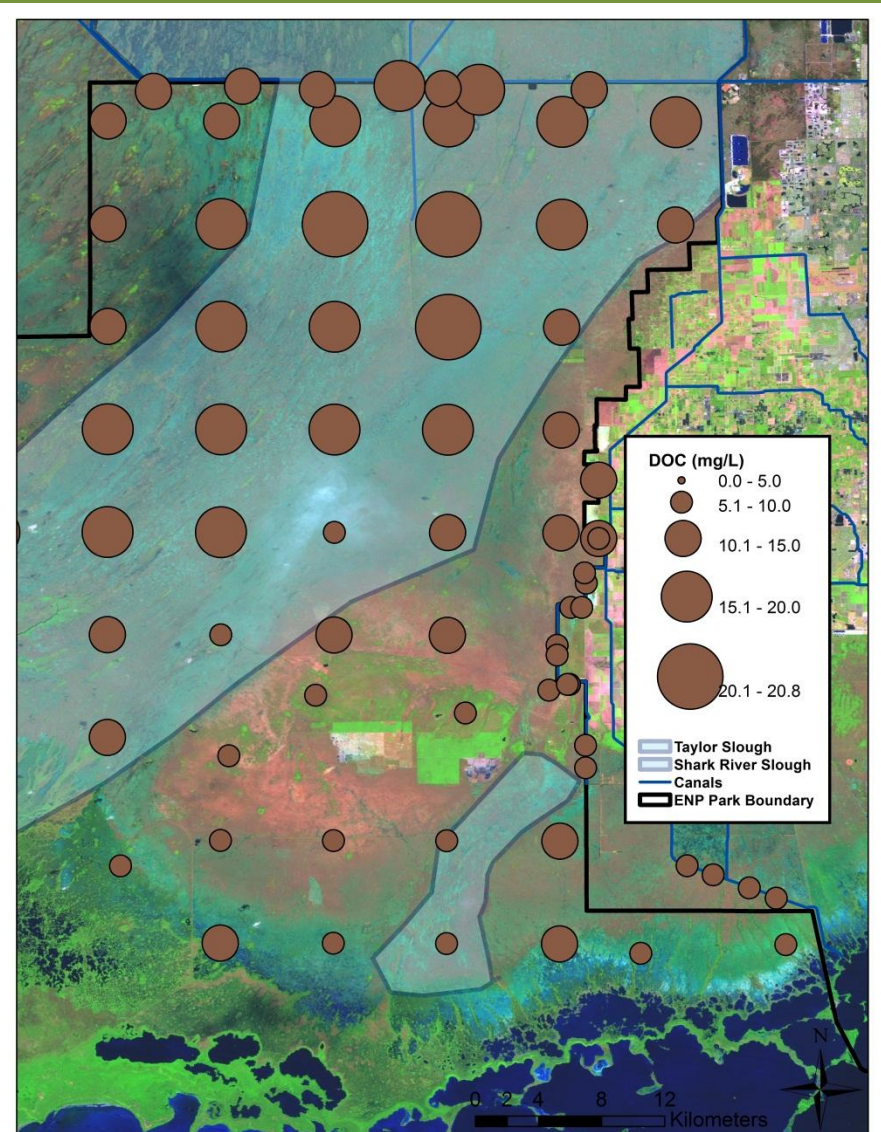
Four Year Mean Filtered Total Mercury Concentration in Surface Water

Sulfate and DOC – 4 Year Means

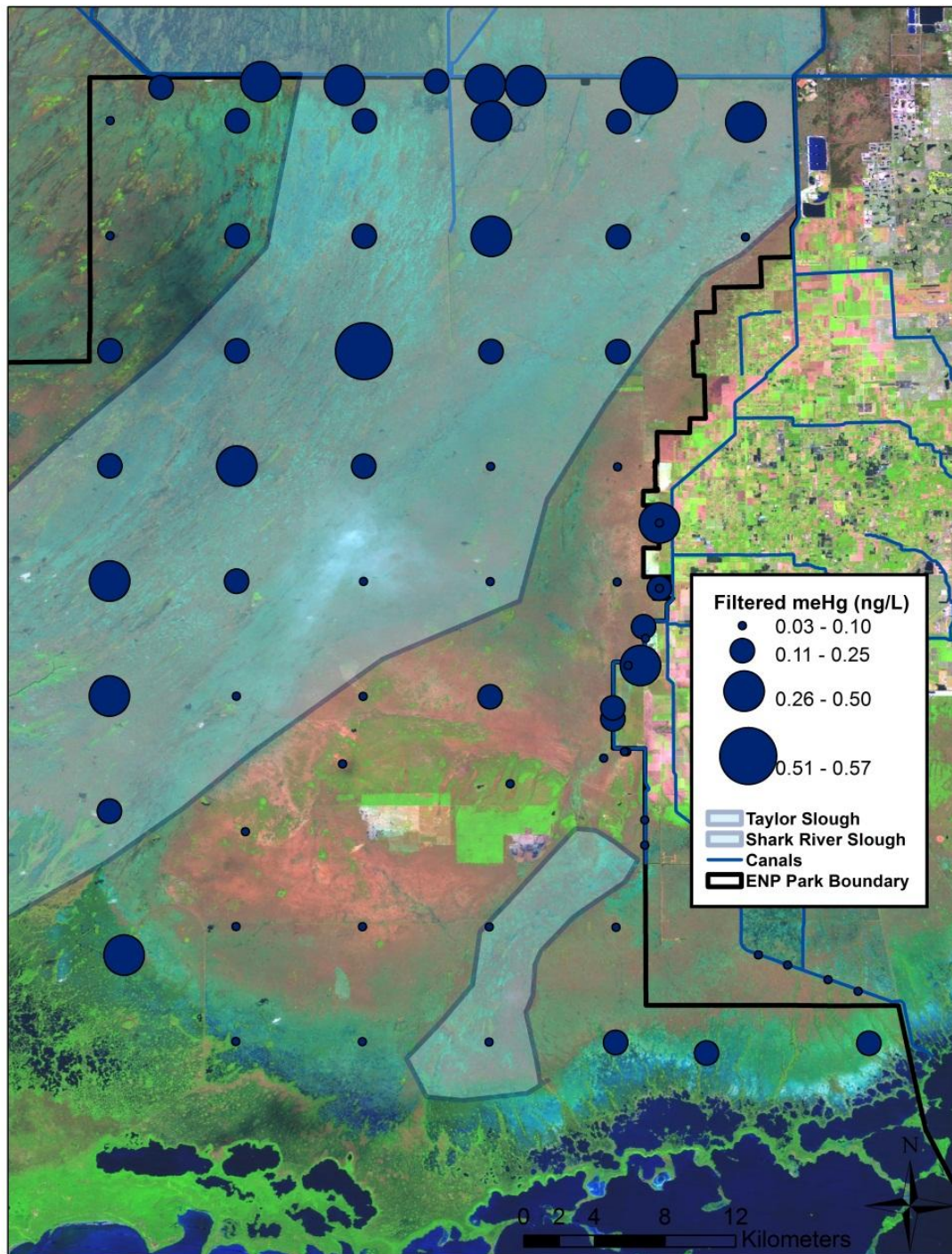
Sulfate



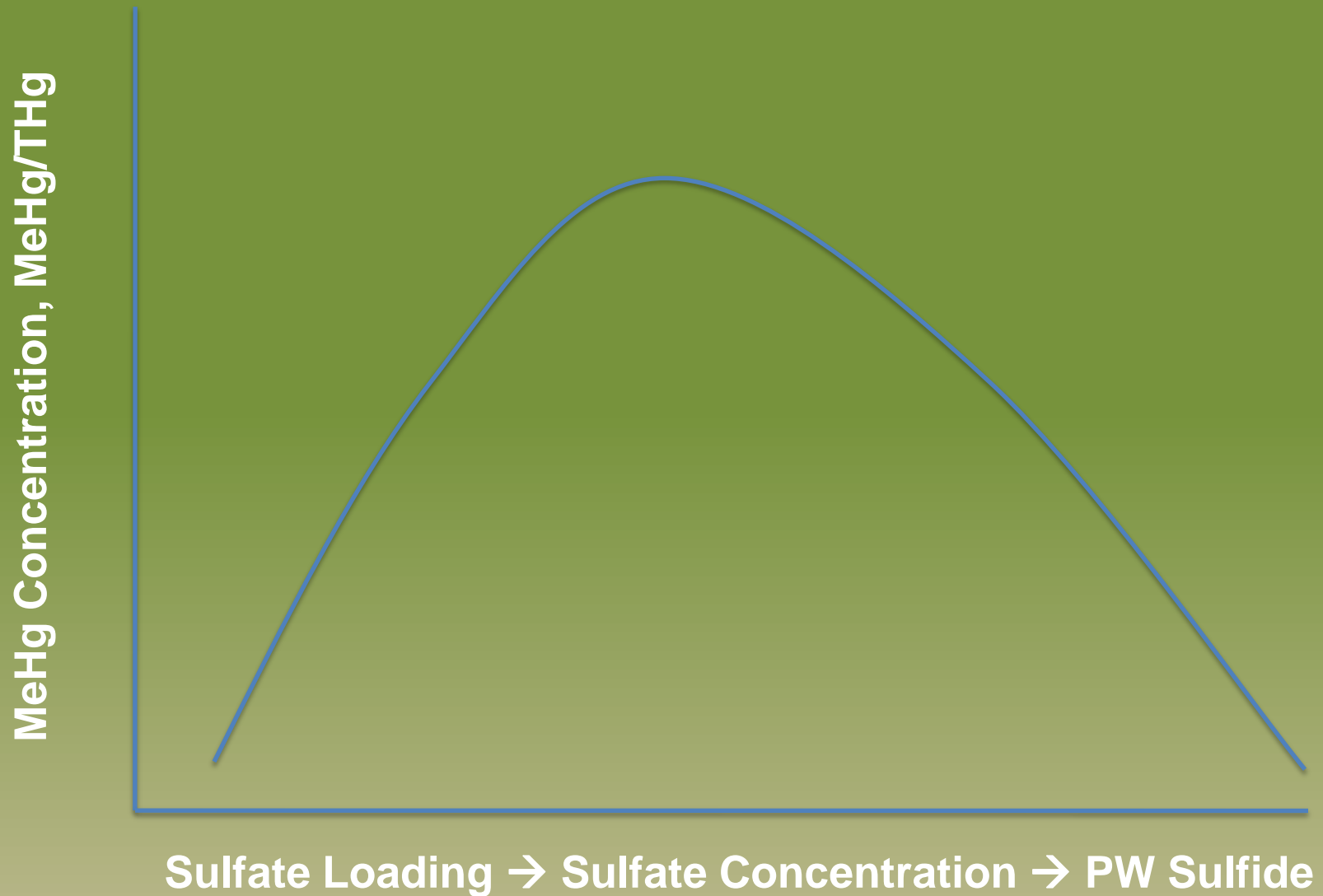
DOC



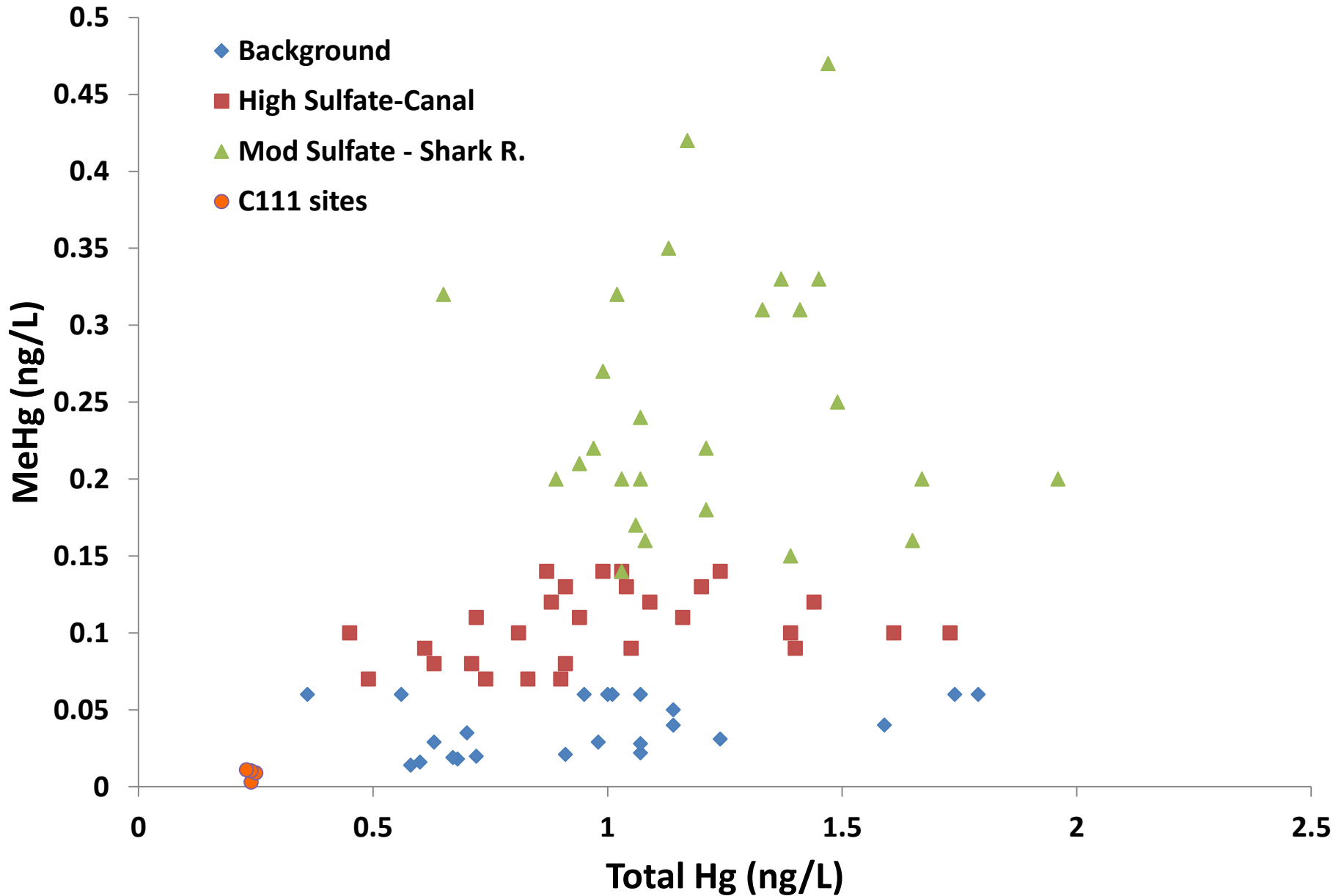
Four Year Mean Filtered Methylmercury Concentration in Surface Water



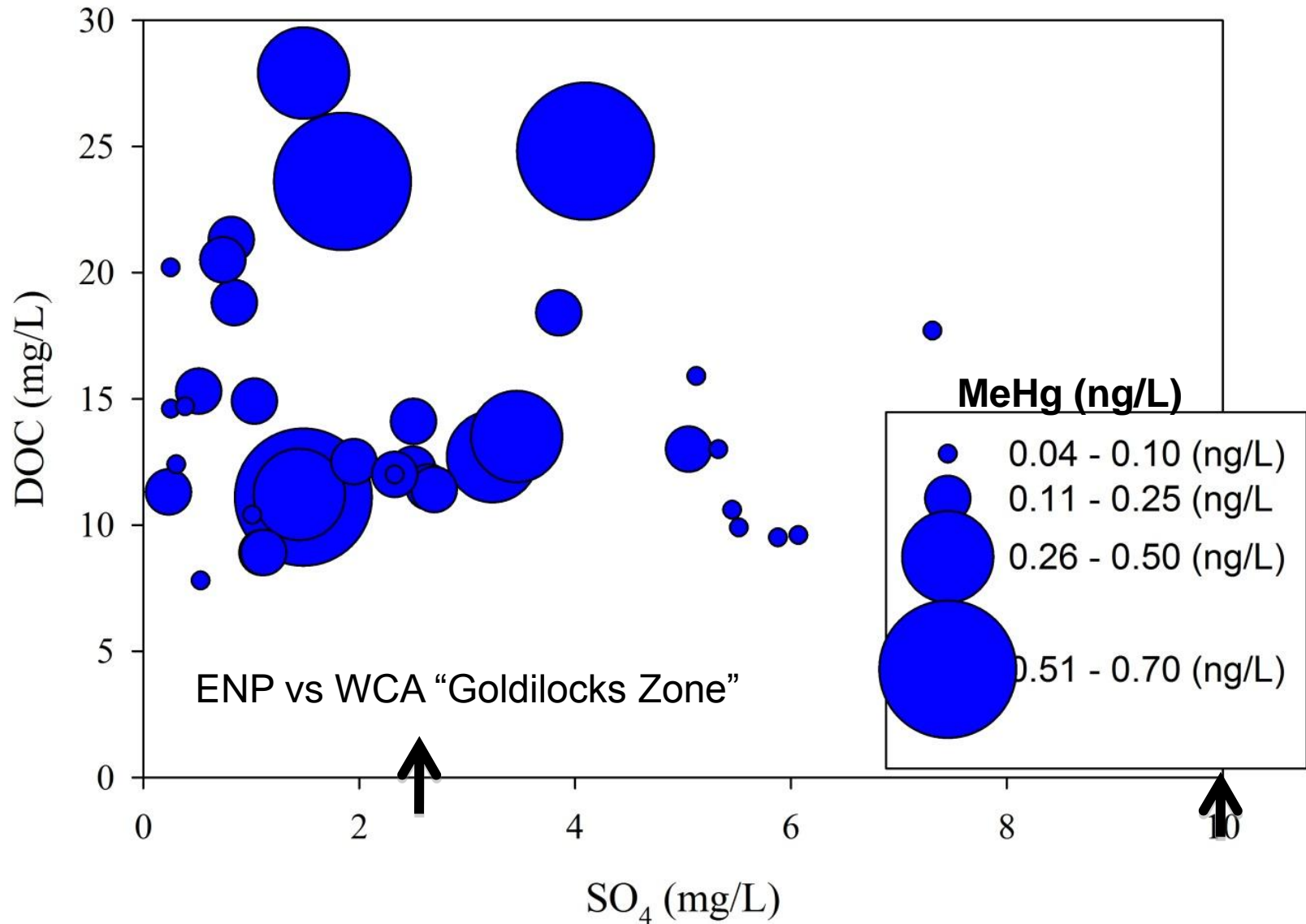
The Original – Goldilocks MeHg Hypothesis?



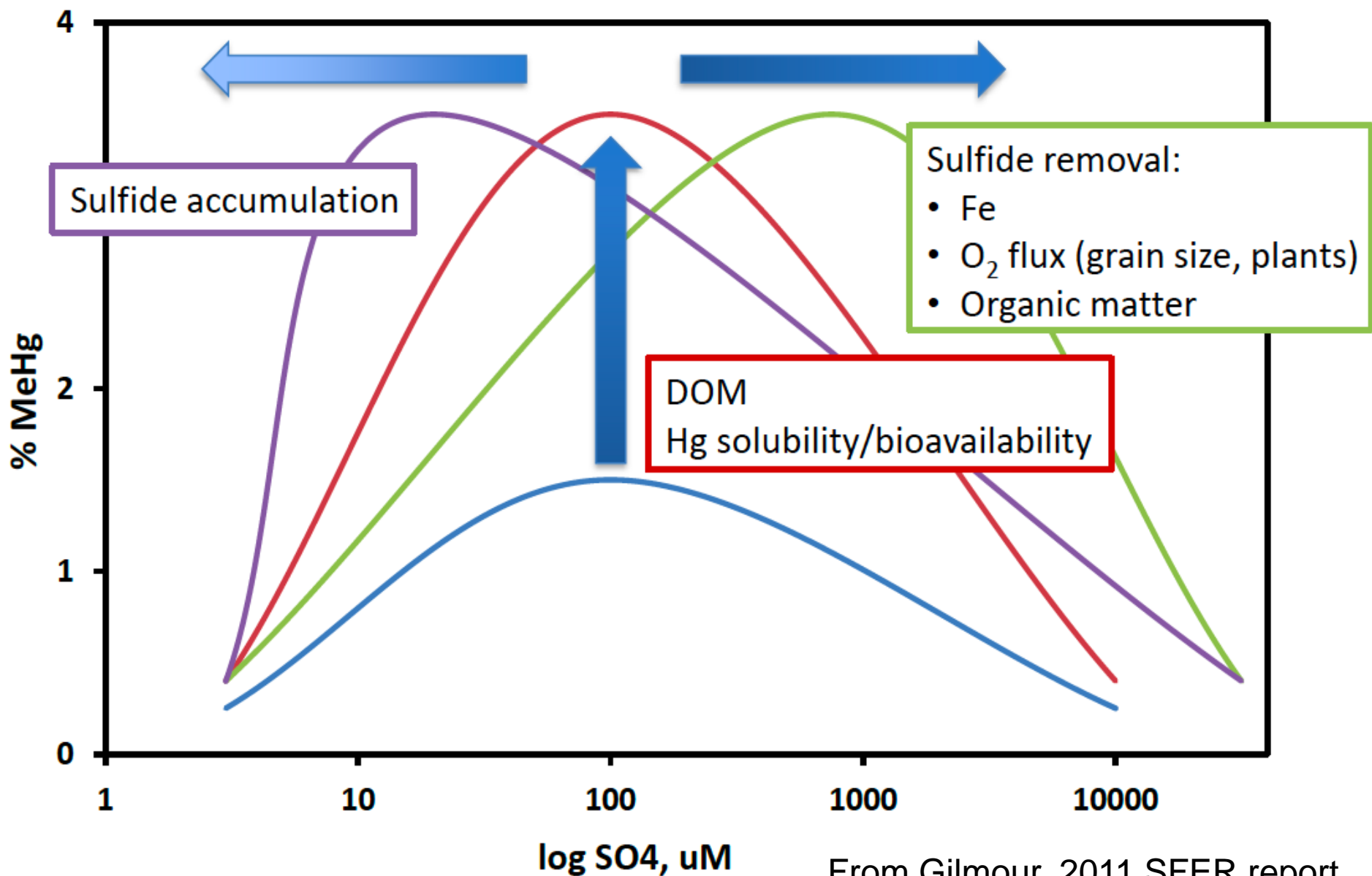
MeHg vs Total Hg Distribution Among Canal Water Affected Types



MeHg Distribution in Sulfate-DOC Space

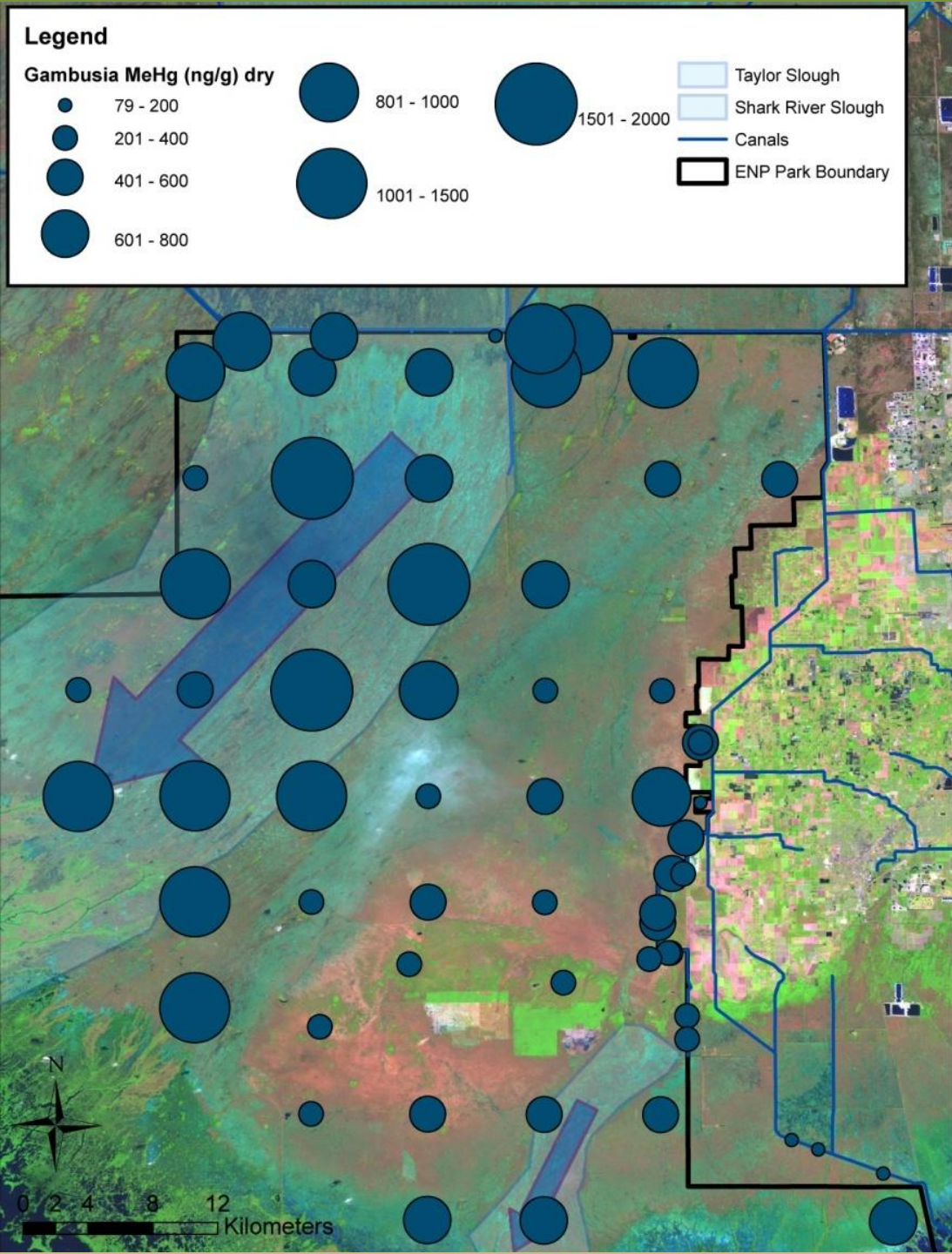
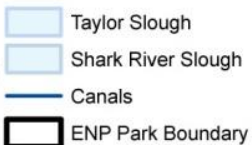
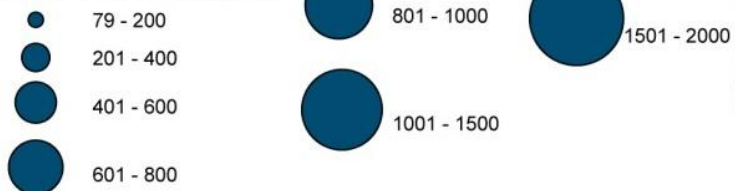


Redefining the Goldilocks Distribution



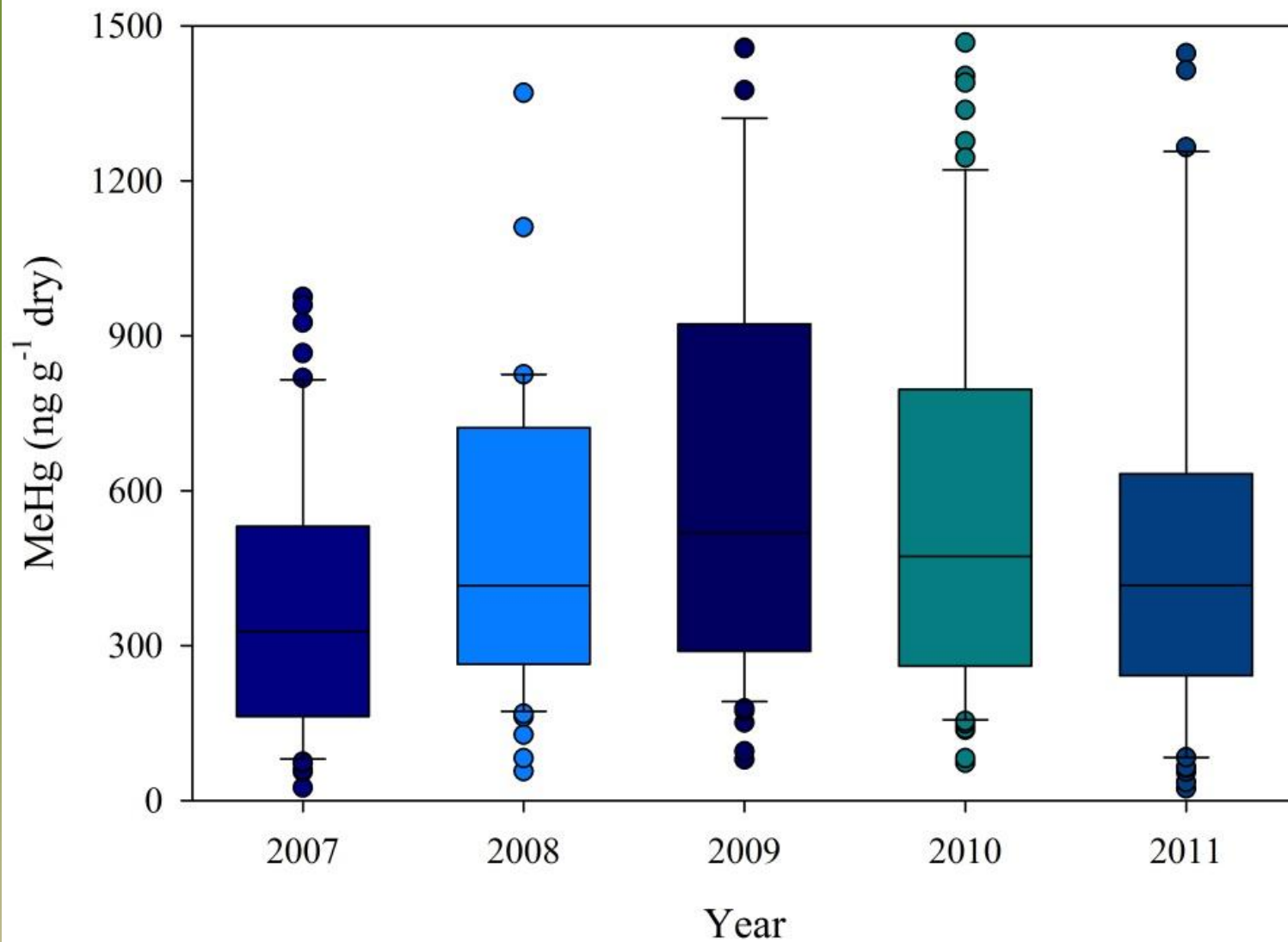
Legend

Gambusia MeHg (ng/g) dry

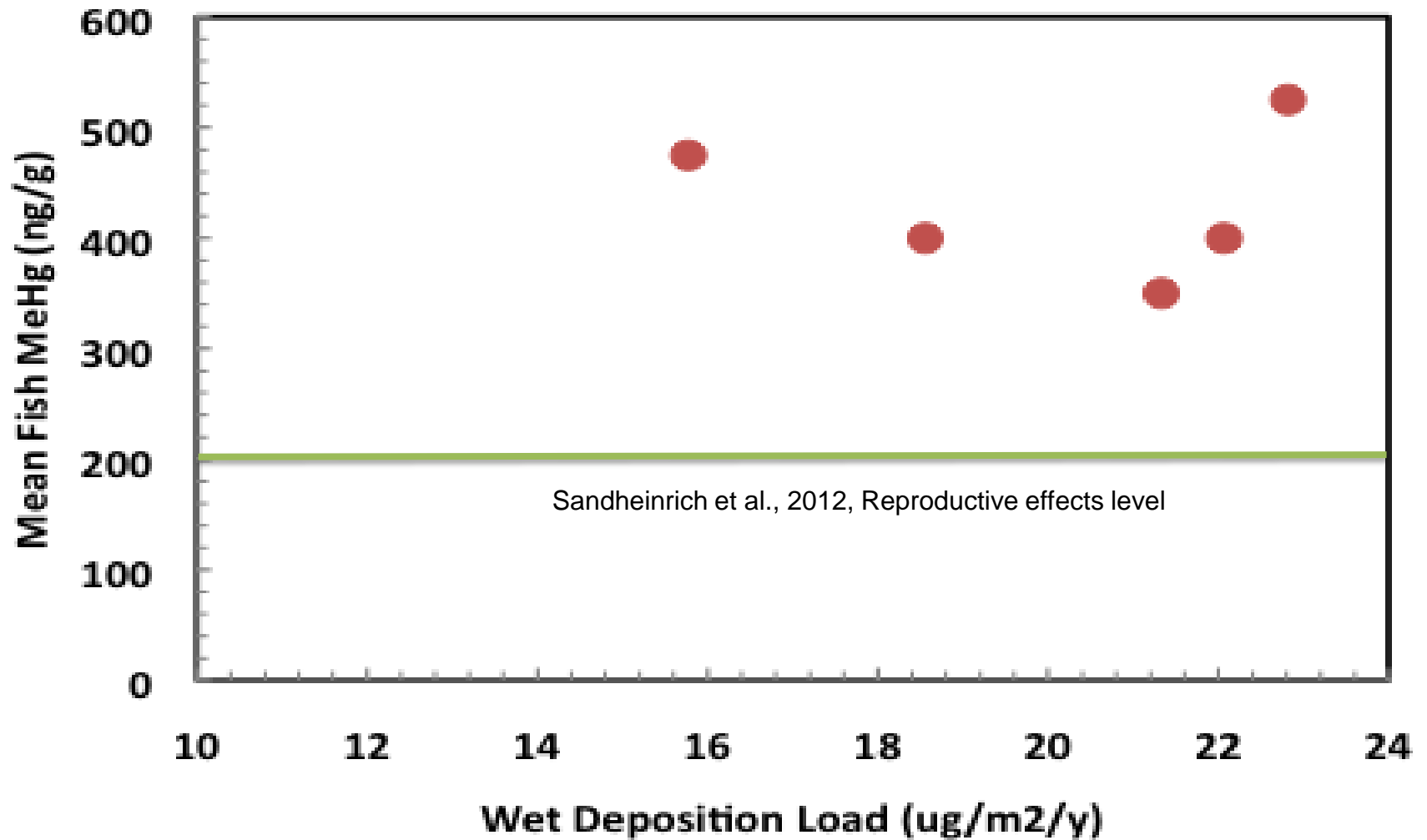


Four Year Mean Gambusia Methylmercury Concentration

MeHg in Gambusia 2007 - 2011

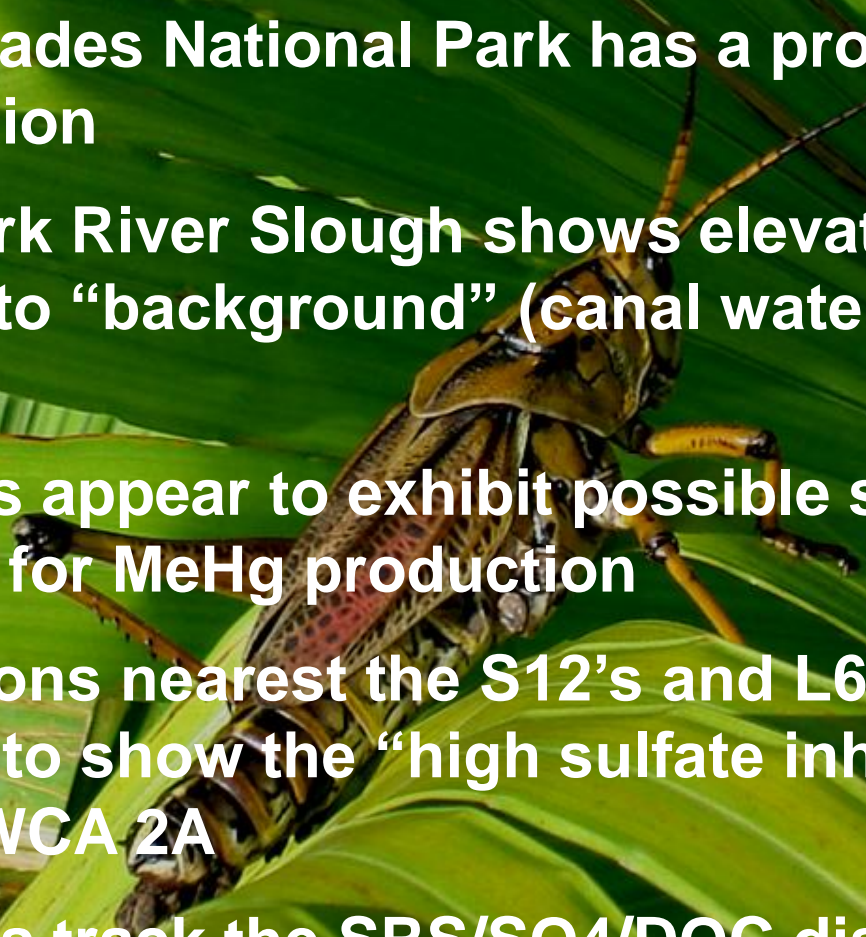


Gambusia MeHg vs Wet Deposition 2007-2011



What Drives Gambusia MeHg Levels?

Summary:

- The delivery of sulfate and DOC from canal water to regions of Everglades National Park has a profound affect on MeHg production
 - Most of the Shark River Slough shows elevated levels of MeHg compared to “background” (canal water unaffected areas)
 - Some ENP areas appear to exhibit possible sulfate and/or carbon limitation for MeHg production
 - Sampling locations nearest the S12’s and L67’s discharge locations appear to show the “high sulfate inhibition effect” first revealed in WCA 2A
 - Fish MeHg levels track the SRS/SO₄/DOC distribution closely, with less obvious ties to depositions
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- A close-up photograph of a grasshopper resting on a large, vibrant green leaf. The grasshopper is positioned diagonally across the frame, facing towards the upper right. Its body is a mix of brown and green, with distinct patterns on its back and legs. The leaf it sits on is broad and has prominent parallel veins. The background is filled with other similar green leaves, creating a dense, natural setting.