

Sulfur Action Plan Update

SFWMD
Governing Board Meeting
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Sulfur Action Plan

Background & Objectives

- Concern has developed regarding sulfur impacts on the ecosystem over the last decade
- SFWMD has a role in facilitating and participating in sulfur research studies
- The Sulfur Action Plan is a multi-agency research initiative to provide information on the potential impacts of sulfur in south Florida
- Several agencies/institutions (FDEP, US Geological Survey, USEPA, U of Florida, Everglades Agricultural Area Environmental Protection District) are performing environmental sulfur research

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Background & Objectives

- Governing Board approved the plan in 2008; included in the 10-Year Strategic Plan
- Data gaps and management questions:
 1. If there is a sulfur problem, what can we do about it?
 2. What are the regional sources of sulfur?
 3. What other parameters come into play – e.g. Mercury and Phosphorus?
 4. Will there be repercussions for management of the system?

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Environmental Effects of Elevated Sulfur

Elevated sulfur concentrations in water and sediment can lead to:

- Enhanced mercury accumulation in fish
- Changes in plant species distribution
- Phosphorus mobilization

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Environmental Effects of Elevated Sulfur

Enhanced mercury accumulation in fish

- Sulfate reducing bacteria are the principle microorganisms that produce methyl-mercury
- There are optimum surface water sulfate concentrations for maximum methyl-mercury production

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Environmental Effects of Elevated Sulfur

Changes in plant species distribution

- Cattail has a greater ability produce a more extensive oxygenated root zone than sawgrass. In the root zone, oxygen reacts with sulfide to produce sulfate
- Research is being collected on sulfide effects to aquatic organisms

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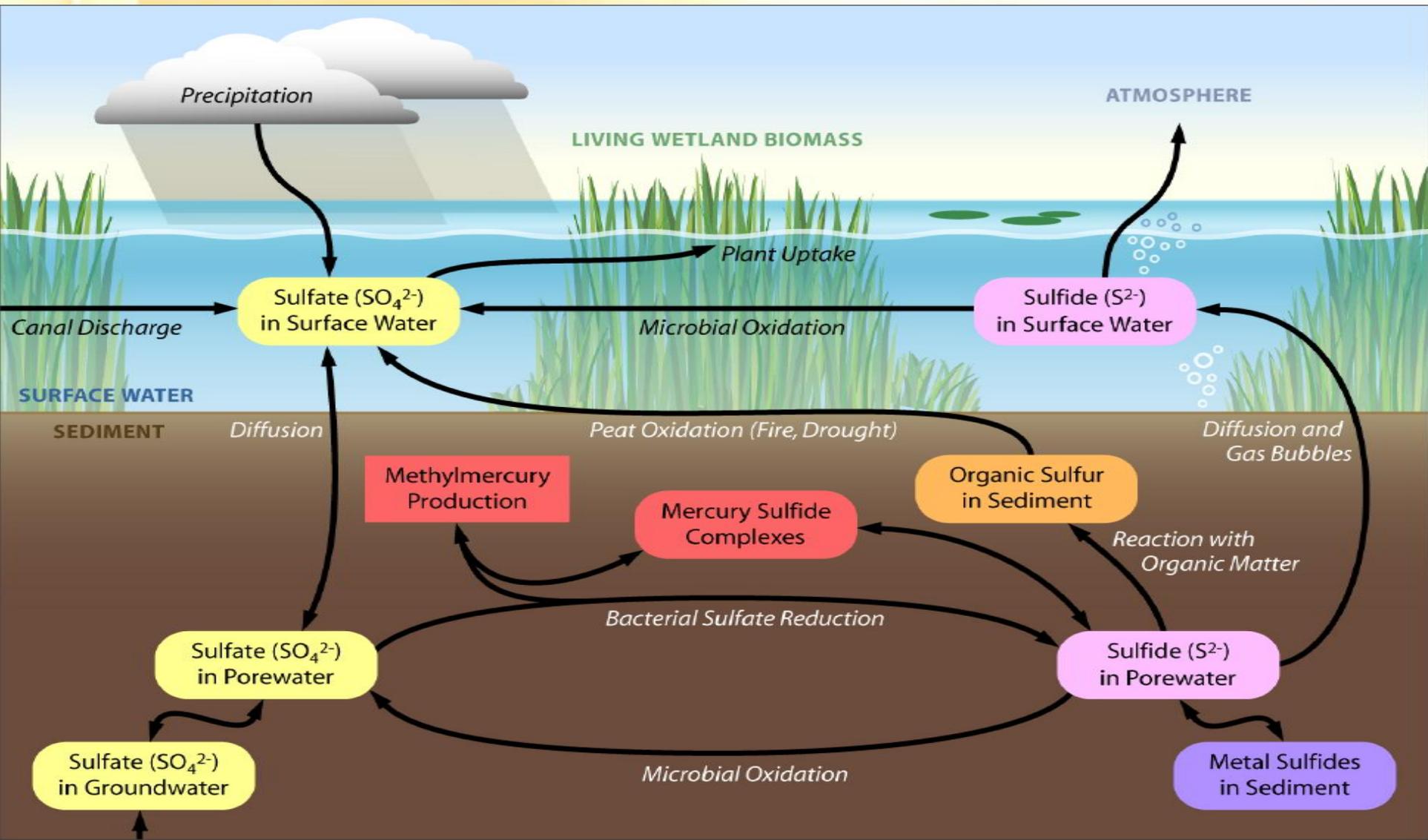
Environmental Effects of Elevated Sulfur

Phosphorus mobilization

- Phosphorous is released from the sediment to the water column when sulfate reducing bacteria digest organic material
- The formation of iron sulfides increases phosphorus mobilization

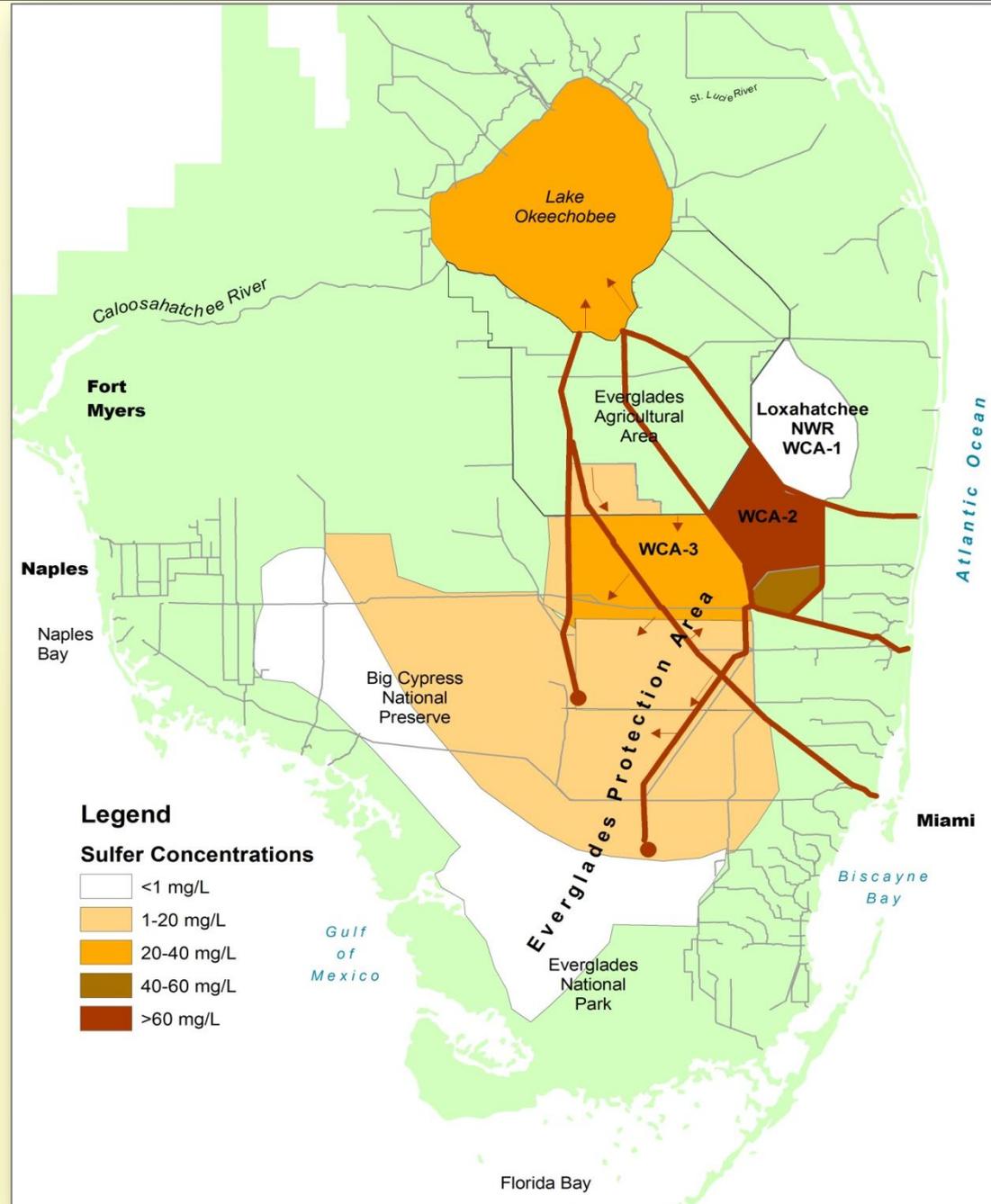
Wetland Sulfur Biogeochemical Cycle

- A complex cycle involving air, water and sediment



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Surface Water Sulfate Concentrations



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Sulfur Action Plan Project Timeline

Project	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	Total Project cost
STA/WCA Internal Eutrophication Study	\$100K EAA-EPD, \$125 K SFWMD	\$200K EAA-EPD, \$300K SFWMD	\$200K EAA-EPD, \$300 SFWMD	\$100K EAA-EPD, \$175K SFWMD			\$1.5M
Regional Sulfur Mass Balance Study							FTE time only
Mercury Hotspot Study			\$122K	\$122K	\$122K		\$366K
Small-Scale Sulfur Mass Balance Study				\$122K	\$122K	\$122K	\$366K
<i>SFWMD Totals</i>	\$125K	\$300K	\$422K	\$244K	\$244K	\$122K	

Annual workshops are held to discuss research results by all collaborating agencies

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How will project data support decision making?

- Results from these projects will be used to
 1. understand cycling and impacts of sulfur
 2. evaluate measures to limit sulfur impacts within the south Florida ecosystem
- Possible strategies to limit sulfur impacts could involve sulfur management practices or optimizing water management

Questions?

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