Review of MPCA Proposed Changes to the Wild Rice Sulfate Standard and its Poteintial Impacts

By Tyler Untied, Jake Callaghan, and Adam Frankiewicz

Introduction

The Minnesota Pollution Control Agency (MPCA)

- Proposal to changes the water quality sulfate standard in MN
- Believe new changes can better protect wild rice and is more flexible

Concerns from all side → Fear and Frustration.

- But are the concerns valid?

Ignore the emotion, instead look at the issue from all angles.

Outline

- MPCA's standard
- Chemistry of sulfur in wetlands
- Affected parties:
  - Researchers
  - Municipalities
  - Industry
  - Tribes
- Conclusions

Origins of the Standard

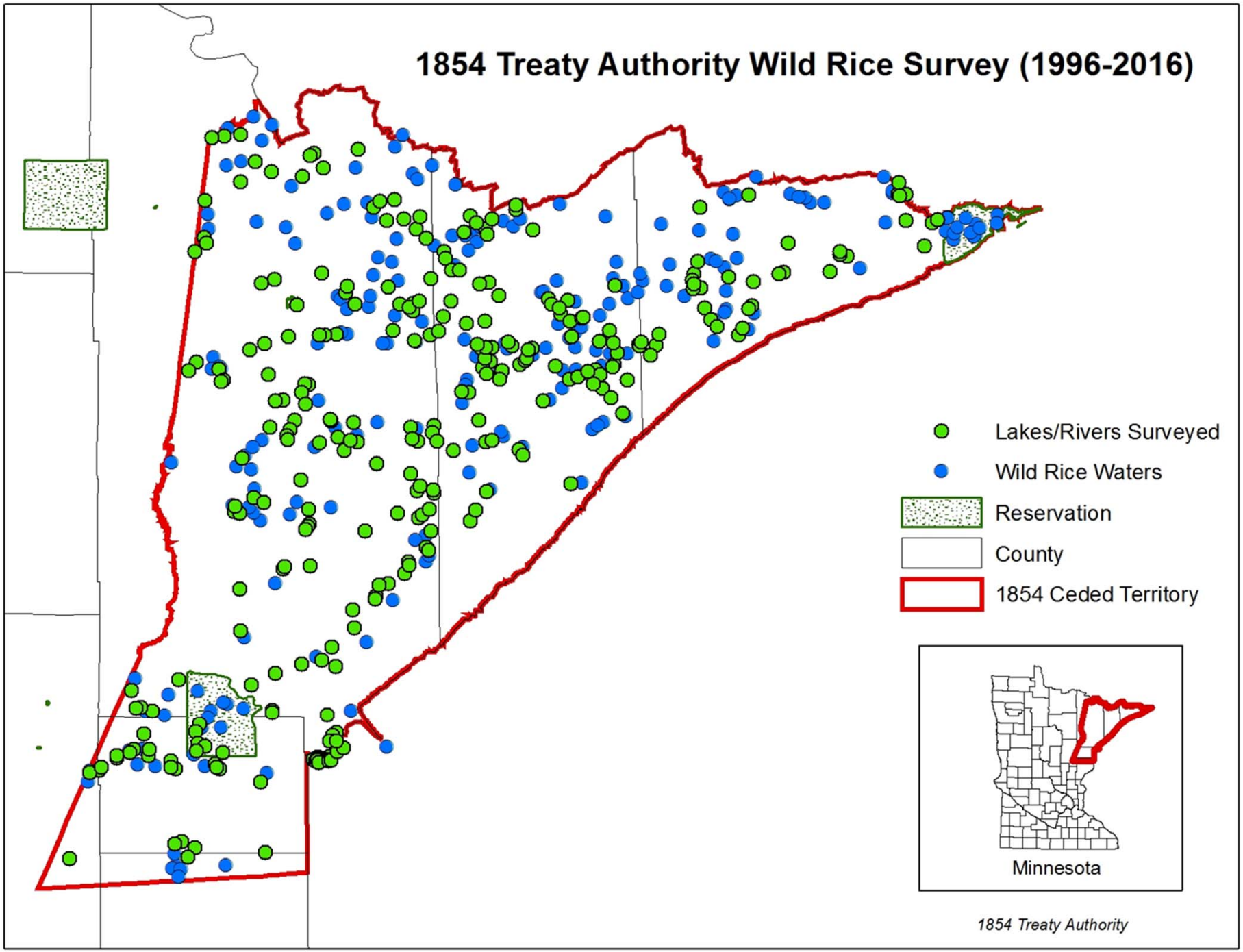
- Moyle Research in the 30's
  - –Observational
  - –50 ppm -> decline
  - –100 ppm -> removal

circa 1925 // Photo by Kenneth Melvin Wright, courtesy of Minnesota Historical Society

The Current Standard

- What the standard is:
  - 10 ppm in wild rice water bodies
  - Adopted in 1973

- "Wild rice water bodies"
  - List started Nov 28th, 1975
  - Based on DNR/MPCA observations


1854 Treaty Authority Wild Rice Survey (1996-2016)
Lakes/Rivers Surveyed
Wild Rice Waters
Reservation
County
1854 Ceded Territory
Minnesota
1854 Treaty Authority

Why is the MPCA Changing the Standard now?

- Needs to be viable for:
  - –Industry
  - –Municipalities
  - –Regulators
- Concerns about wild rice decline
  - –Tribal/public outcry
  - –**Polymet proposed mines**

Proposed Changes

- New rule will be a dynamic regulation based on a set algorithm
  - –Different from waterbody to waterbody
  - –Algorithm based on:
    - •Iron content of soil
    - •Organic content of soil
    - •Sulfate flux to waterbody
    - •Presence of wild rice (2 stem/m^2)

Northern wild rice (*Zizania palustris)*

- Manoomin (Ojibwe)

Ecological Importance

- Sediment stabilization
- Act as a nutrient sink
- Provide shelter and nesting habitats
- Nutritious food sources for humans and wildlife

https://www.mprnews.org/story/2016/09/21/wild-rice-comeback-effort-st-louis-river
http://www.ihcun.org/wildrice/en-us/index.php

Sulfur transformations in wetland sediments (from Mitsch and Gosselink 1993).

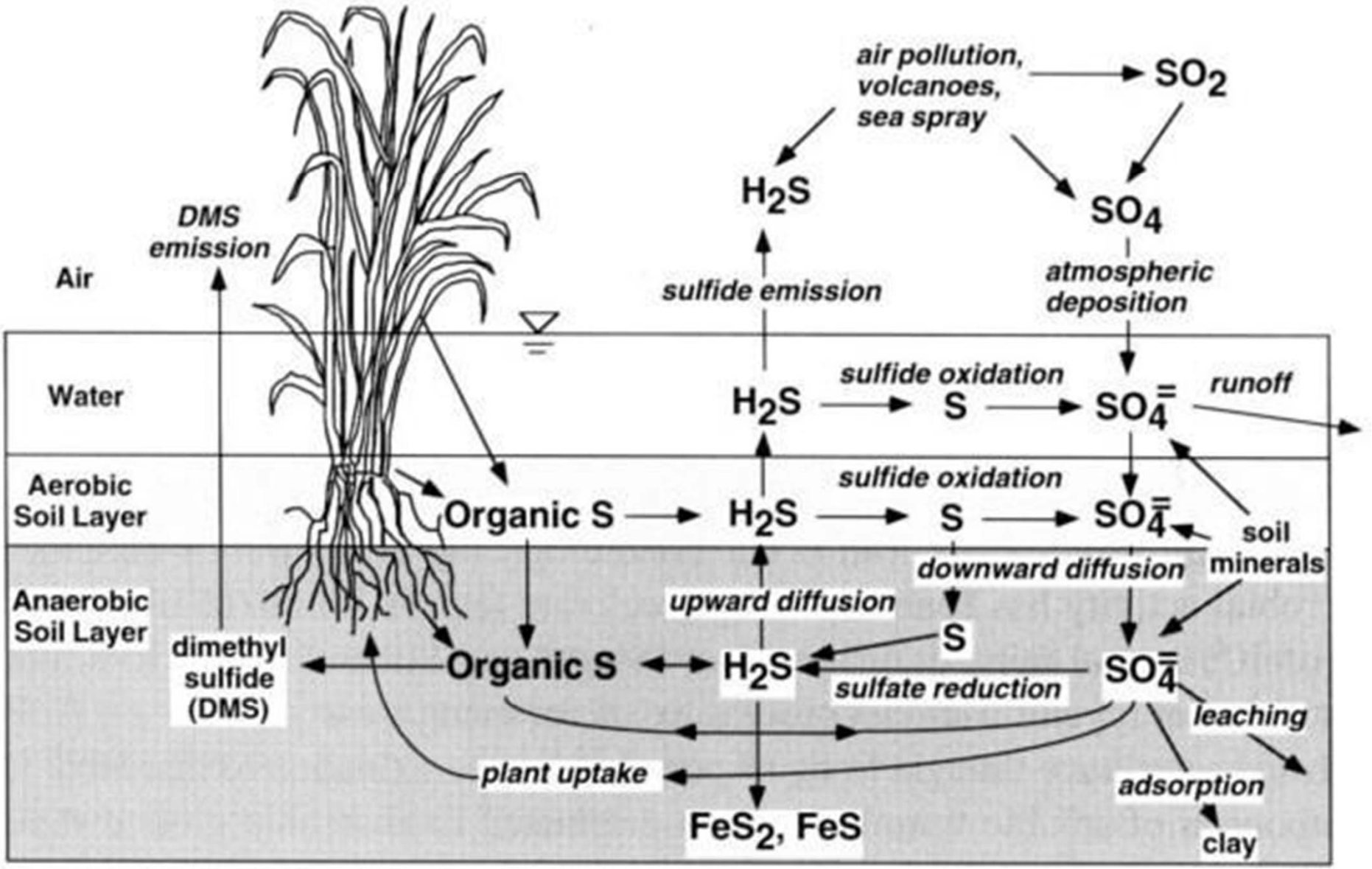


Figure 5-9 p 132 In WETLANDS pp. 114-147 by W. Mitsch and J. Gosselink. Copyright © 1993 by John Wiley & Sons, Inc. This material is used by permission from John Wiley & Sons, Inc.

Wild Rice Life Cycle

- Senescence (Step 6): Seed production
  - Photosynthesis declines which decreases size of oxygenated zone in rhizosphere
  - Increased nutrient uptake and flux to seeds

Shea, K., & Townsend, M. (2011, August 05). Infographic: Wild Rice is Keystone Species for Upper Great Lakes Region [Digital image]. Retrieved November 24, 2017, from http://www.circleofblue.org/2011/world/infographic-wild-rice-is-keystone-species-for-upper-great-lakes-region/

Fond du Lac Band

Nancy Schuldt,

- Oppose new regulation, want current enforced
- Treaty of 1854 obligations
- Cultural and economical significance

Eamon Coyne for MPR News https://www.mprnews.org/story/2017/05/25/water-event-fond-du-lac#gallery

Iron Mining Association

Kelsey Johnson, President of IMA

- Oppose current regulation and proposed
- MPCA and mines relationship
- Economic factors of mining

http://minnesotabrown.com/2016/03/recent-legislative-candidate-named-iron-mining-rep.html

Western Lake Superior Sanitation District

Joe Mayasich and Al Parella

- “This industry doesn’t stop”
- Want to see pilot study
- Information gap about fate/transport

http://wlssd.com/newsroom/image-gallery/

MN Power

Kurt Anderson

- No clear evidence sulfate is to blame
- Groundwater is important
- Better uses of $$ to protect wild rice

minnesota power

AN ALLETE COMPANY

University of Minnesota-Duluth

John Pastor, University of Minnesota

- Supports current standard, opposes new
- New standard overlooks iron flux
- Wild rice is susceptible at different life stages
- Politics are impacting regulation

Research Criticisms

- Concerns with J. Pastor research
  - Controlled conditions
  - High mortality rate in controls
- Concerns with Douglas Forts research
  - Short duration
  - Low concentrations tested (12 mg/L)
- Both research state these concerns

Concerns with the New Proposal

- Will the changes actually protect wild rice?
  - **No it will not**
- Is MPCA reasoning scientifically justified or are there factor they overlooked?
  - **Picked and choose data → Incorrect assumption**.
- We all take a financial hit for a result that is far from guaranteed

Conclusions

- Not clear consensus in science
- Other factors could be to blame for wild rice decline
- Treating for both standard is unreasonable with current available data
- MPCA is swamped
- **Cooperation and further research needed**

Questions?