

# Wetland Restoration: Contemporary Issues & Lessons Learned

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Support provided by: U.S. EPA Wetlands Division



# Presentation Outline

- Overview of Project(s)
- 9 Overall Challenges & Recommendations
- Next Steps
- Available Resources





# ASWM Wetland Restoration Project

- ❑ **2 U.S. EPA Wetlands Division Grants**
  - ❑ Identifying Best Management Practices for Restoration (2013-2014)
  - ❑ Raising the Bar on Wetland Restoration Success (2015-2016)
- ❑ **Interdisciplinary work group**
- ❑ **Monthly webinar series**
- ❑ **White paper based on webinars and participant feedback**
- ❑ **Pursued strategies that:**
  - ❑ Maximize outcomes for watershed management
  - ❑ Include ecosystem benefits
  - ❑ Consider climate change
  - ❑ Improve permit applications and review





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# Overall Challenges

- 1) Subjective Evaluation Of Wetland Restoration Outcomes & Vague Project Goals
- 2) Insufficient Monitoring Horizons
- 3) Narrowly Focused Regulations & Permit Conditions
- 4) Altered Landscapes & Changing Land Uses
- 5) Separation of Wetland & Stream Restoration
- 6) Underestimation of Restoration Costs
- 7) Lack of an Adaptive Management Framework
- 8) Lack of Accountability
- 9) Limited Access to Expertise, Training  
& Knowledge Sharing





# #1: Subjective Evaluation Of Wetland Restoration Outcomes & Vague Project Goals

“I restored it, so it’s a success.”

“It’s green, so it’s a success.”

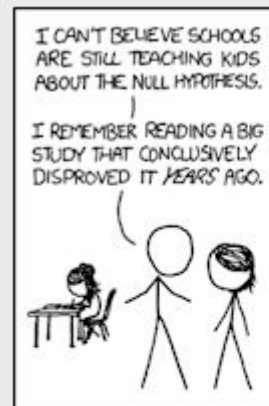
“We spent a million bucks, so it’s a  
\$ucce\$\$.”



“I saw a marsh bird,  
so it’s a success.”

“I took a course in restoration, so it’s  
a success.”

“Mom likes it, so it’s a success.”



Why it's time to publish research  
“failures”

Publishing bias favors positive results; now there's a movement to change that.

Source: Elsevier.com

If NOTHING is right,  
It's still “on its way to success.”



# Recommendation: Develop Clear Project Goals & Use Appropriate and Quantifiable Performance Standards to Measure Progress





## #2: Insufficient Monitoring & Performance Criteria

- 3-5 years time window
- Hydrology, soils, plants
- Reference wetlands





# **Recommendation: Develop Achievable Performance Criteria for Short Term Evaluation and Establish a Long-term Management Plan**





## #3: Narrowly Focused Regulations & Permit Conditions

- Wetland types & regions are ecologically diverse
- Voluntary vs compensatory
- Different goals and strategies, e.g., restoration, creation, enhancement





# Recommendation: Establish Appropriate Performance Criteria Based on Restoration Goals & Project Type





## #4: Altered Landscapes & Changing Land Uses

- Lack of consideration of the historical, current and projected future context of the proposed restoration site constrains restoration
- Drainage
- Soil condition
- Modified streams  
rivers
- Future LULC





# Recommendation: Research the Site's Land Use History & Model Potential Future Stressors Using Historical Trend Data





## #5: Separation of Wetland and Stream Restoration

- Wetland and stream restoration are still largely addressed separately
- Wetland projects determined to be a “success” by all wetland scientists can have serious negative impacts on stream and floodplain function - the same occurs for stream restoration projects





# Recommendation: Use a Watershed Approach





## #6: Underestimation of Restoration Costs

- Restoration costs, particularly pre and post construction costs, are frequently underestimated
- Pressure to further reduce anticipated costs
- Very little information available to compare restoration costs
- Restoration benefits often undervalued because they are public goods

**2 + 2 = 3...?**



# Recommendation: Include Pre and Post Construction Costs in Estimates





## #7: Lack of an Adaptive Management Framework

**“The unexpected is to be expected.”  
(Cottam, 1987)**

- Layers of historical drainage
- Contamination
- Invasive species
- Wildfire
- Drought
- Changing climate
- Politics
- Funding





# Recommendation: Use an Adaptive Management Approach Throughout the Life of the Project





## #8: Lack of Accountability

- No wetland restoration certification program
  - *However, SER has an ecological restoration certification program now*
- Monitoring and assessment reports rarely result in revisions and changes
- Monitoring reports are usually provided by the permit applicant
- There is no penalty for a restored wetland that doesn't meet performance criteria





# Recommendation: Require Documentation of Credentials, Provide Incentives & Enforce Accountability



## Society of Wetland Scientists Professional Certification Program

"The PWS program is very special, in the fact that it upholds strong support for the hard working wetland professionals."  
Key McMurtry, Owner, Key Environmental Solutions



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## Certified Ecological Restoration Practitioner Program

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More in this Section...

SER's ecological restoration practitioner certification program encourages a high professional standard for those who are designing, implementing, overseeing, and monitoring restoration projects throughout the world.

SER is currently accepting CERP and CERPIT applications! This application period will be open from July 17 through September 15, 2017 (midnight eastern standard time).



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**Experience:** A minimum of five (5) years of experience having significant responsibility and experience in the field of hydrology, or four (4) years after the award of a Master's degree, or three (3) years after the award of a Bachelor's degree.

**Examination:** The applicant must pass both examination Part I (Hydrology Fundamentals) and Part II (Hydrology Applications) with a minimum score of 70%.

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## #9: Limited Access to Expertise, Training & Knowledge Sharing

- Prohibitive costs to academic journals
- Insufficient time to review literature
- Few undergraduate and graduate studies
- Limited training opportunities for practicing professionals
- Lack of access to information about performance of wetlands previously restored
- Professional silos





## **Recommendation: Improve Access to Knowledge & Training and Engage Interdisciplinary Teams**





# Other Challenges

- Climate change
- Invasive species
- Water rights



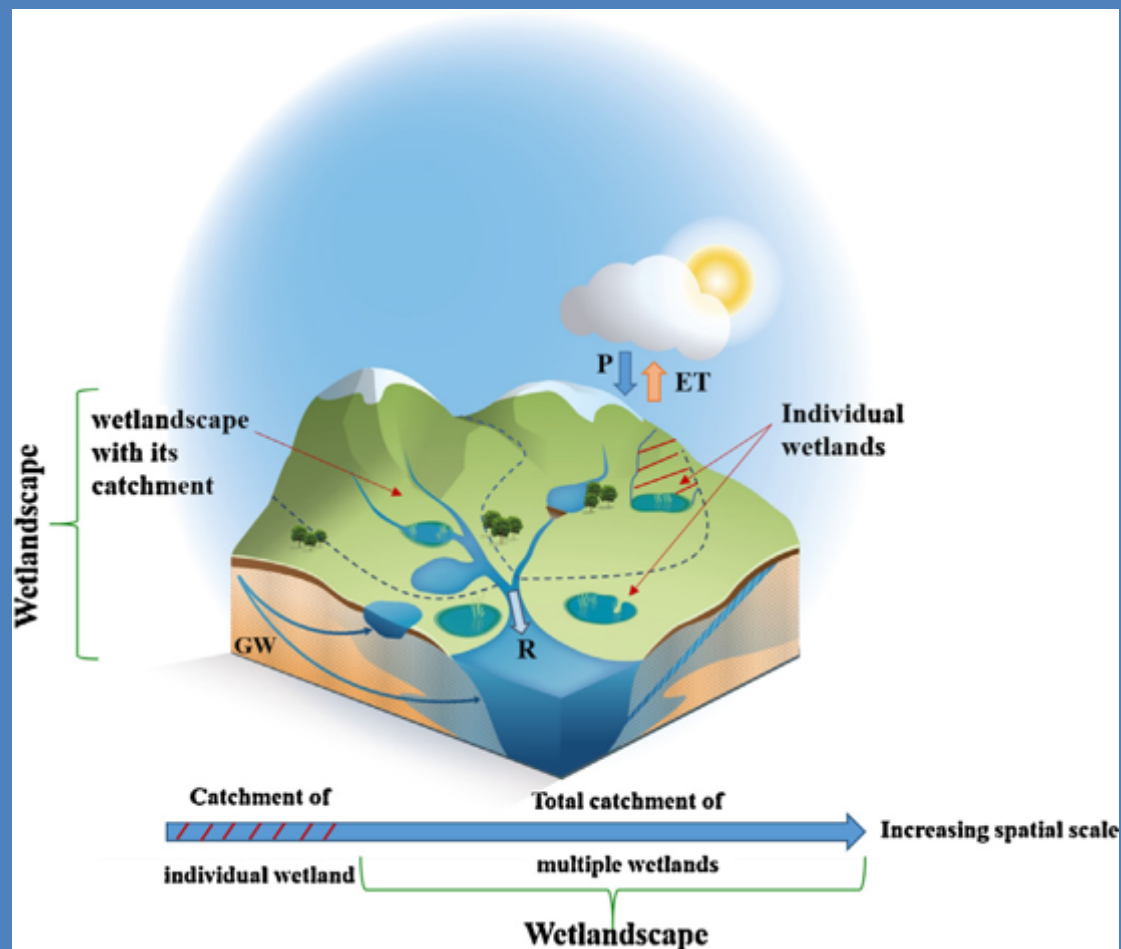


# An Action Plan to Implement ASWM's Recommendations





# Most Commonly Cited Problem: Inability to correctly assess the site and surrounding landscape in planning for restoration



Thorslund, J., et al., Wetlands as large-scale nature-based solutions: Status and challenges for research, engineering and management. Ecol. Eng. (2017),  
<http://dx.doi.org/10.1016/j.ecoleng.2017.07.012>

# Resources



- ASWM Wetland Restoration Bibliography  
[http://www.aswm.org/pdf lib/restoration webinar/wetland restoration bibliography\\_0415.pdf](http://www.aswm.org/pdf_lib/restoration_webinar/wetland_restoration_bibliography_0415.pdf)
- Wetland Restoration: Contemporary Issues & Lessons Learned (draft white paper)  
[http://www.aswm.org/pdf lib/wetland restoration whitepaper 041415.pdf](http://www.aswm.org/pdf lib/wetland_restoration_whitepaper_041415.pdf)
- Ecosystem Service Valuation for Wetland Restoration: What It Is, How To Do It, and Best Practice Recommendations  
[http://www.aswm.org/state meeting/2014/ecosystem service valuation for wetland restoration.pdf](http://www.aswm.org/state_meeting/2014/ecosystem_service_valuation_for_wetland_restoration.pdf)
- A Comparative Analysis of Ecosystem Service Valuation Decision Support Tools for Wetland Restoration  
[http://www.aswm.org/pdf lib/ecosystem service valuation 032116.pdf](http://www.aswm.org/pdf lib/ecosystem_service_valuation_032116.pdf)
- Permits for Voluntary Wetland Restoration: A Handbook  
[http://www.aswm.org/pdf lib/permits for voluntary wetland restoration handbook.pdf](http://www.aswm.org/pdf lib/permits_for_voluntary_wetland_restoration_handbook.pdf)
- Voluntary Restoration of Wetlands: Complex Issues in the Regulation of Restoration Projects [http://www.aswm.org/pdf lib/voluntary restoration of wetlands.pdf](http://www.aswm.org/pdf lib/voluntary_restoration_of_wetlands.pdf)
- ASWM Restoration Webpages <http://www.aswm.org/wetland-science/wetland-restoration>
- ASWM Restoration Webinar Series Recordings <https://www.aswm.org/aswm/6925-past-webinars-improving-wetland-restoration-success-project>

# *Questions?*

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