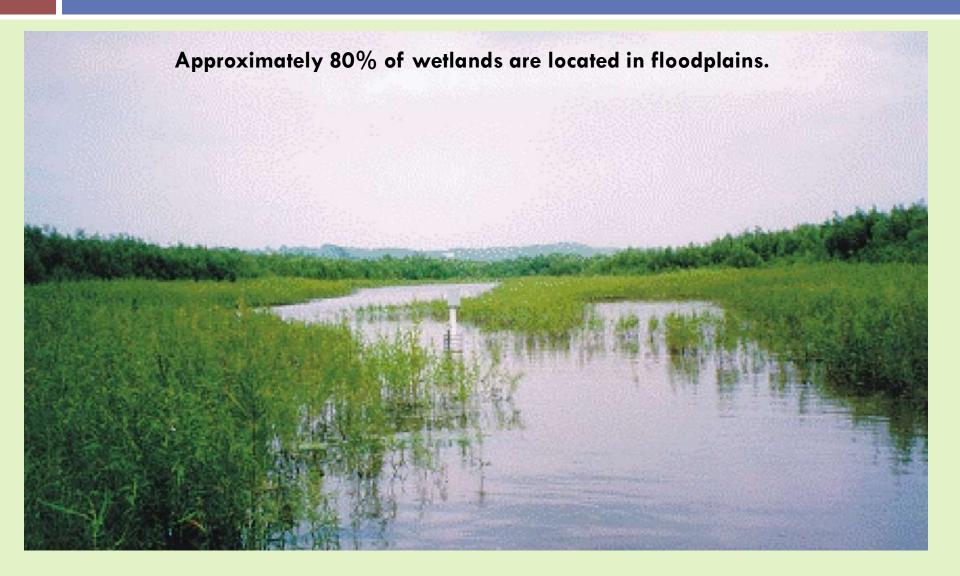
Association of State Floodplain Managers Annual Conference June 19-24, 2016

Challenges and Solutions for Restoring Floodplain Wetlands

Marla J. Stelk, Policy Analyst Association of State Wetland Managers



Wetlands & Floodplains



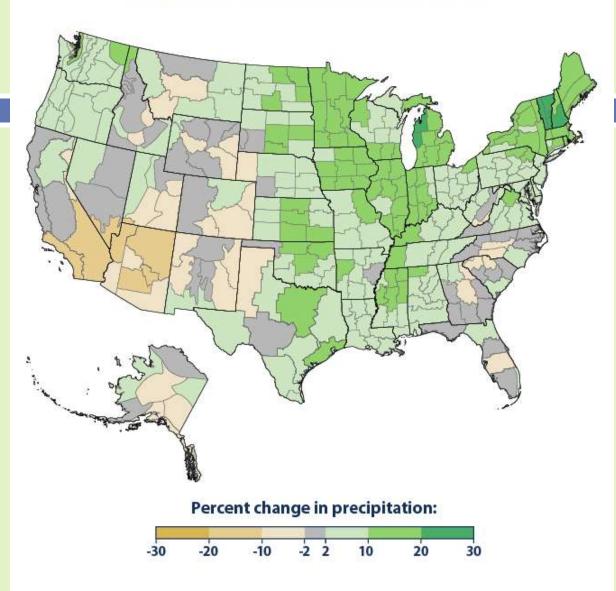
The Wetland-Floodplain Connection

"The bottomland hardwood – riparian wetlands along the Mississippi River once stored at least 60 days of flood water. Now they store only 12 days because most have been filled or drained." (Environmental Protection Agency http://www.epa.gov/owow/wetlands/vital/people.html, Flood Protection, p.2)

Wetlands & Climate Change



Change in Precipitation in the United States, 1901–2014



*Alaska data start in 1925.

Data source: NOAA (National Oceanic and Atmospheric Administration). 2015. National Centers for Environmental Information. Accessed April 2015. www.ncei.noaa.gov.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climatechange/indicators.



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
- Pursuing strategies that:
 - Maximize outcomes for watershed management
 - Include ecosystem benefits
 - Consider climate change
 - Improve permit applications and review

Develop a national strategy for improving wetland restoration outcomes

Implementation: identity current actions & key future actions & players

White Paper Available to Review

http://www.aswm.org/pdf lib/wetland restoration whitepaper 041415.pdf

This white paper is currently in draft form only. The final version is expected to be completed by the end of 2016. Chapter Two will be extensively revised after significant consultation with federal and state agencies and non-governmental organizations involved in wetland restoration efforts in order to identify actions that are already being done, new actions that can be done, and agencies/organizations that can implement them.

Wetland Restoration

Contemporary Issues & Lessons Learned

v. 3.8.16

Additional Information: <u>http://www.aswm.org/wetland-science/wetland-restoration</u>

Association of State Wetland Managers - Protecting the Nation's Wetlands.



ASWM Upcoming Webinars

- Using Beaver as a Wetland Restoration Tool July 29, 2015
- The Florida Wetlands Integrity Dataset: Part 2 September 16.2015

For a complete list of ASWM webinars, click here.

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Improving Wetland Restoration Success Project

Recent news articles from 2013, such as Architects of the

in 2013. The first publication titled. Permits for Voluntary

alarm about the success, or lack thereof, of wetland

Wetland Restoration: A Handbook was completed in

stakeholder workgroup, it became apparent that some

Issues in the Regulation of Restoration Projects was

Swamp published in Scientific American, have sounded the

restoration. ASWM responded by completing two publications

November of 2013. However, during discussions among the

positions or concerns advanced by participants could not be

readily resolved through the publication of a handbook. So a

white paper titled. Voluntary Restoration of Wetlands: Complex

developed in order to document those unresolved concerns -

including suggested program modifications that would require regulatory and or statutory changes beyond the purview of

most wetland program managers. In July of 2014, ASWM

published a report titled. Ecosystem Service Valuation for

Practice Recommendations, as a way to improve wetland

Wetland Restoration: What It Is, How To Do It, and Best

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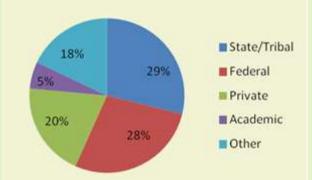


Wetland restoration panel discussion moderated by Jeanne Christie (with Joseph Shister and Rob Brooks; Robin Lewis and Joy Zedler participated in the panel by remote broadcast) restoration planning, prioritization and garner more public and policy support.

However, in March of 2014, ASWM held its annual Federal/State/Tribal Coordination Meeting at the NCTC in West Virginia. During that 4 day meeting, an expert panel session was held on Why Do Wetland Restoration and Mitigation Projects Fail? Robin Lewis, Joe Shisler, Joy Zedler and Rob Brooks participated on the panel. During that panel and in a later evening restoration workshop, ASWM was able to glean some insight in to some of the barriers to successful restoration and suggestions for potential solutions. In April of 2014, ASWM continued this effort by developing a Wetland Restoration Work Group consisting of twenty-five experts including practitioners, regulators, policy makers, scientists and academics. The work group was tasked with developing a series of webinars to delve into the issue more deeply as well as contribute to a white paper and a restoration bibliography. This webinar series is the result of this collective effort.



Webinar Participants



http://www.aswm.org/aswm/aswm-webinarscalls/6773-improving-wetland-restoration-

success-project

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



"Mom likes it, so it's a success."





Why it's time to publish research "failures"

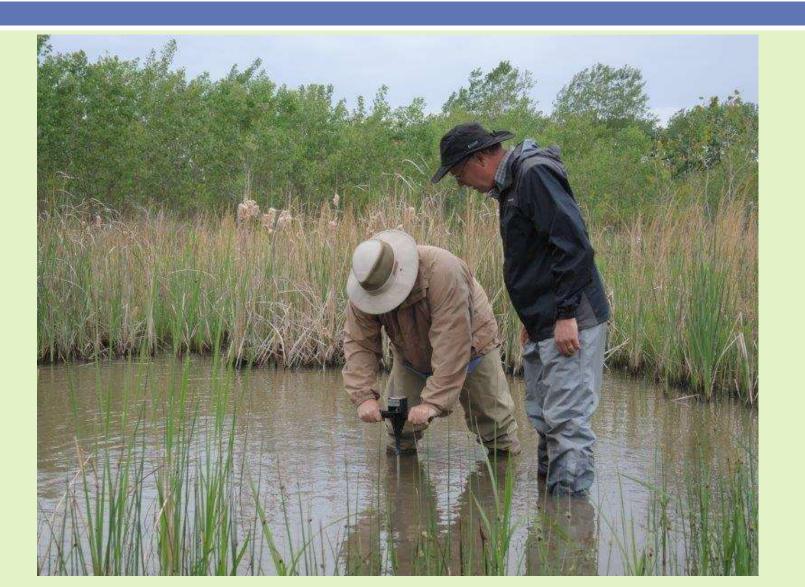
Publishing bias favors positive results; now there's a movement to change that. Source: Elsevier.com

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 □ Water quality inputs and existing soil conditions □ Reference wetlands

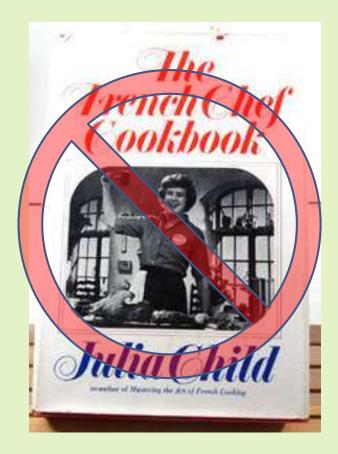


Recommendation: Develop Achievable Performance Criteria For Short Term Evaluation And Establish A Long-term Management Plan



#3: NARROWLY FOCUSED REGULATIONS & PERMIT CONDITIONS

- Wetland types & regions are ecologically diverse
- Voluntary vs compensatory
- Different goals and methods for wetland restoration (voluntary vs compensatory), enhancement, creation & construction



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 and rivers
- Future LULC



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

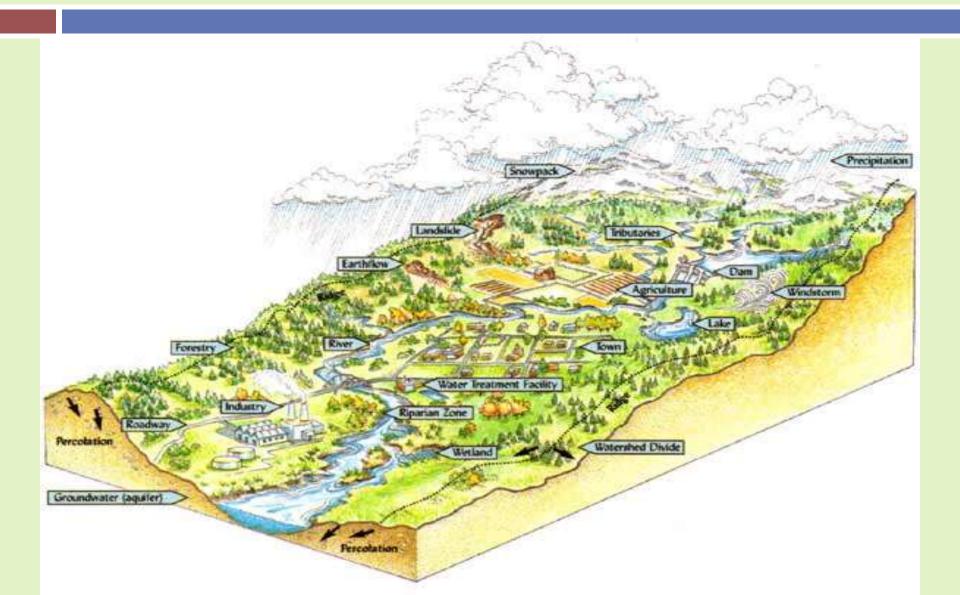


#5: SEPARATION OF WETLAND & STREAM RESTORATION

- 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



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
- 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





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To a client, if means you've got the orisferitials to sam their trust. To an employer, it signals your ability to take on a higher level of responsibility. Among your colleagues, it domainds respect. To yourself, it's a symbol pride and measure of your sam hard-sum achievement.

To become licensed, eighteens must complete a four-year college degree, work under a Professional Engineer for al least four-years, pass two intensive compartency exama and earn a locate from their static licensor board. Then, to retain their locatees, PEs must continually maintain and improve their skills throughout their careers.

AIH American Institute of Hydrology

AIH Home 🖛 Hydrology Certification

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Professional Hydrology Certification Application Process

Individual applicants who meet educational, professional experience, professional conduct requirements, and have passed a professional examination as prescribed by the Board of Registration, will be certified as Profession Hydrologists, Applicants approved by the Board are certified as a Professional Hydrologist-Surface Water, Hydrologist-Groundwater, and Hydrologist-Water Quality.

LICENSURE

Become a Licensed

Requirements for Certification

Education: Five semester or 8 quarter hours in Chemistry and Physics and Calculus. An additional 25 semester or 37 quarter hours in Hydrology coursework of which at least 10 semester or 15 quarter hours come from Hydrology courses; 10 semester or 15 quarter hours come from Hydrology Allied courses; and 5 semester or 7 quarter hours come from Hydrology Supplemental courses (courses categories are found in attached PDF forms).

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

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

#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 Multi-Disciplinary Interdisciplinary Teams



Next Steps: Determine Actions Needed

- Identify concrete <u>actions</u> that can be taken within specific practice areas (i.e., regulatory, policy, planning & design, construction, etc.).
- Identify <u>who</u> and/or <u>what</u> organization(s) is best suited to implement those actions (or is already working on them).
- Determine <u>how</u> actions can be best implemented.
- Develop a <u>national strategy</u> for improving wetland restoration practice and outcomes.

Resources

- ASWM Wetland Restoration Bibliography http://www.aswm.org/pdf lib/restoration webinar/wetland restoration bibliography 0415. pdf
- Wetland Restoration: Contemporary Issues & Lessons Learned (draft white paper) <u>http://www.aswm.org/pdf_lib/wetland_restoration_whitepaper_041415.pdf</u>
- 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_restor_ation.pdf
- A Comparative Analysis of Ecosystem Service Valuation Decision Support Tools for Wetland Restoration <u>http://www.aswm.org/pdf_lib/ecosystem_service_valuation_032116.pdf</u>
- Permits for Voluntary Wetland Restoration: A Handbook
 <u>http://www.aswm.org/pdf_lib/permits_for_voluntary_wetland_restoration_handbook.pdf</u>
- Voluntary Restoration of Wetlands: Complex Issues in the Regulation of Restoration Projects <u>http://www.aswm.org/pdf_lib/voluntary_restoration_of_wetlands.pdf</u>
- ASWM Restoration Webpages <u>http://www.aswm.org/wetland-science/wetland-restoration</u>



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