Lessons Learned: Why Wetland Restorations Fail

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

Photo credit: Delaware DNREC

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 of 22 experts
- 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 "success"
  - Implementation: identity current actions & key future actions

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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- Webinars
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- Newsletters
- Insider's Edition
- ASWM Webinars/Calls

Improving Wetland Restoration Success Project

Wetland restoration panel discussion moderated by Jeanne Christie (with Joseph Shisler and Rob Brooks; Robin Lewis and Joy Zedler participated in the panel by remote broadcast)

Recent news articles from 2013, such as Architects of the Swamp published in Scientific American, have sounded the alarm about the success, or lack thereof, of wetland restoration. ASWM responded by completing two publications in 2013. The first publication titled, Permits for Voluntary Wetland Restoration: A Handbook was completed in November of 2013. However, during discussions among the stakeholder workgroup, it became apparent that some 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 Issues in the Regulation of Restoration Projects was 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 Wetland Restoration: What It Is, How To Do It, and Best Practice Recommendations, as a way to improve wetland 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.

Future Webinar Schedule | Past Webinar Materials | Restoration Bibliography

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

And now it's time for a poll.....

Overall Challenges

1) Inconsistent Evaluation of Wetland Restoration Outcomes

"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."

Lessons Learned: How to Improve Wetland Restoration Outcomes

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Association of State Wetland Managers

Photo credit: Delaware DNREC

2) Inadequate & Vague Performance Criteria

- Water quality inputs and existing soil conditions.
- 3-5 years time window.
- Reference wetlands.

3) Universal Regulations & Permit Applications

- Wetlands are diverse.
- Regions of the U.S. vary ecologically.
- Site location on the landscape and surrounding land use practices matter.
- Different goals and methods for wetland restoration (voluntary vs compensatory), enhancement, creation & construction.

4) Lack of Access to Expertise & Training

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

Photo credit: Jeanne Christie

5) Underestimation of Restoration Costs in Developing Cost Estimates

- Restoration 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…?

6) Lack of Accountability & Enforcement

- Monitoring and assessment reports rarely result in revisions and changes.
- There is no penalty for a restored wetland that doesn't meet performance criteria.
- Monitoring reports are usually provided by the permit applicant.

Photo credit: See-ming Lee

7) Altered & Changing Landscapes

- 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

Photo credit: Edwin Ami

8) Climate Change

- Wetlands are at risk.
- An effective tool to both mitigate and adapt.
- Flora, fauna, hydrology and soil condition may not be suited to that site in the future.
- Barriers may prohibit marsh migration.

Photo credit: Jeanne Christie

9) Silos For 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.

Photo credit: Rennet Stowe

And now it's time for a poll.....

PRE-RESTORATION: PLANNING & DESIGN PHASE

Planning & Design

- Poor site selection.
- Inadequate assessment of hydrology.
- Failure to fully assess and plan for soils.
- Inappropriate plant selection.
- Lack of an adaptive management framework.

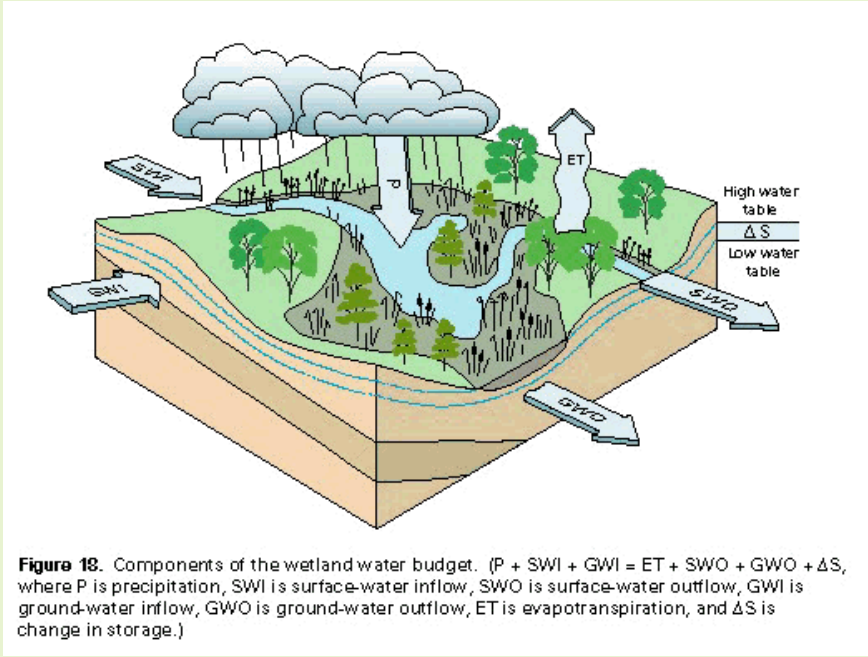


Figure 18. Components of the wetland water budget. (P + SWI + GWI = ET + SWO + GWO + ΔS, where P is precipitation, SWI is surface-water inflow, SWO is surface-water outflow, GWI is ground-water inflow, GWO is ground-water outflow, ET is evapotranspiration, and ΔS is change in storage.)

Source: USGS

DURING RESTORATION: CONSTRUCTION PHASE

Construction

- Failure to adequately implement design.
- Soil compaction.
- Lack of consistent oversight.
- Lack of sufficiently experienced construction teams.
- Lack of adaptive management plans.

Photo credit: Erik Stockdale

POST-RESTORATION: MONITORING & ASSESSMENT PHASE

Monitoring & Assessment

- Poor record keeping.
- Monitoring period too short.
- Lack of regional data depositories.
- No standards for competency.

Photo credit: Jeanne Christie

And now it's time for a poll.....

OVERALL RECOMMENDATIONS

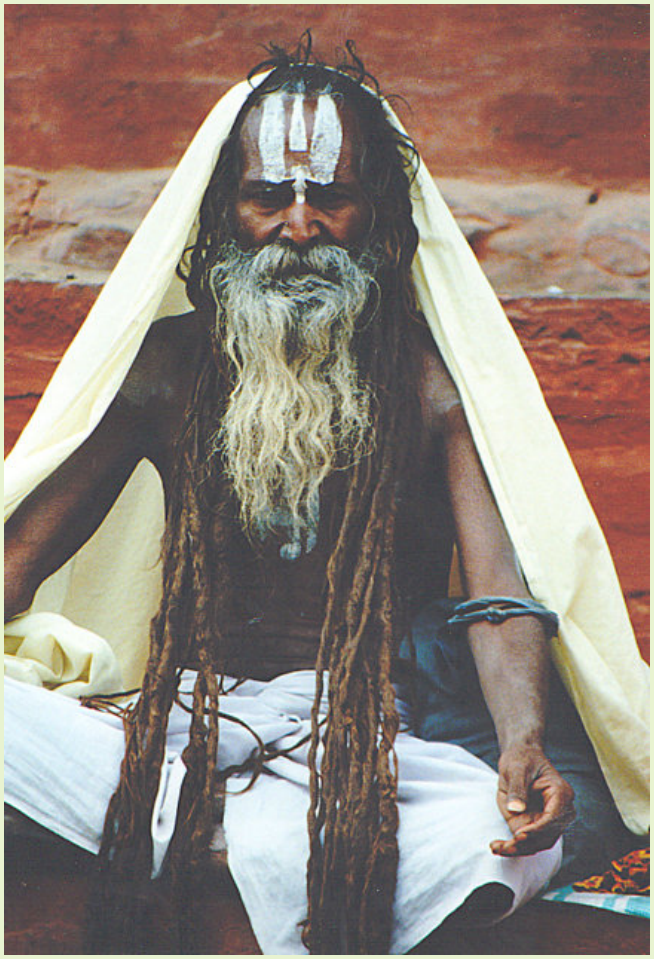


Photo credit: Peter van der Sluijs

Provide a meaningful way to define wetland goals.

Photo credits: Jeanne Christie

Create adaptive & quantifiable performance criteria.

Photo credit: Jeanne Christie

Create a common taxonomy by type.

Racquette River floodplain wetland.
Photo credit: John McShane

Riverine wetlands. Photo credit: Montana DEQ

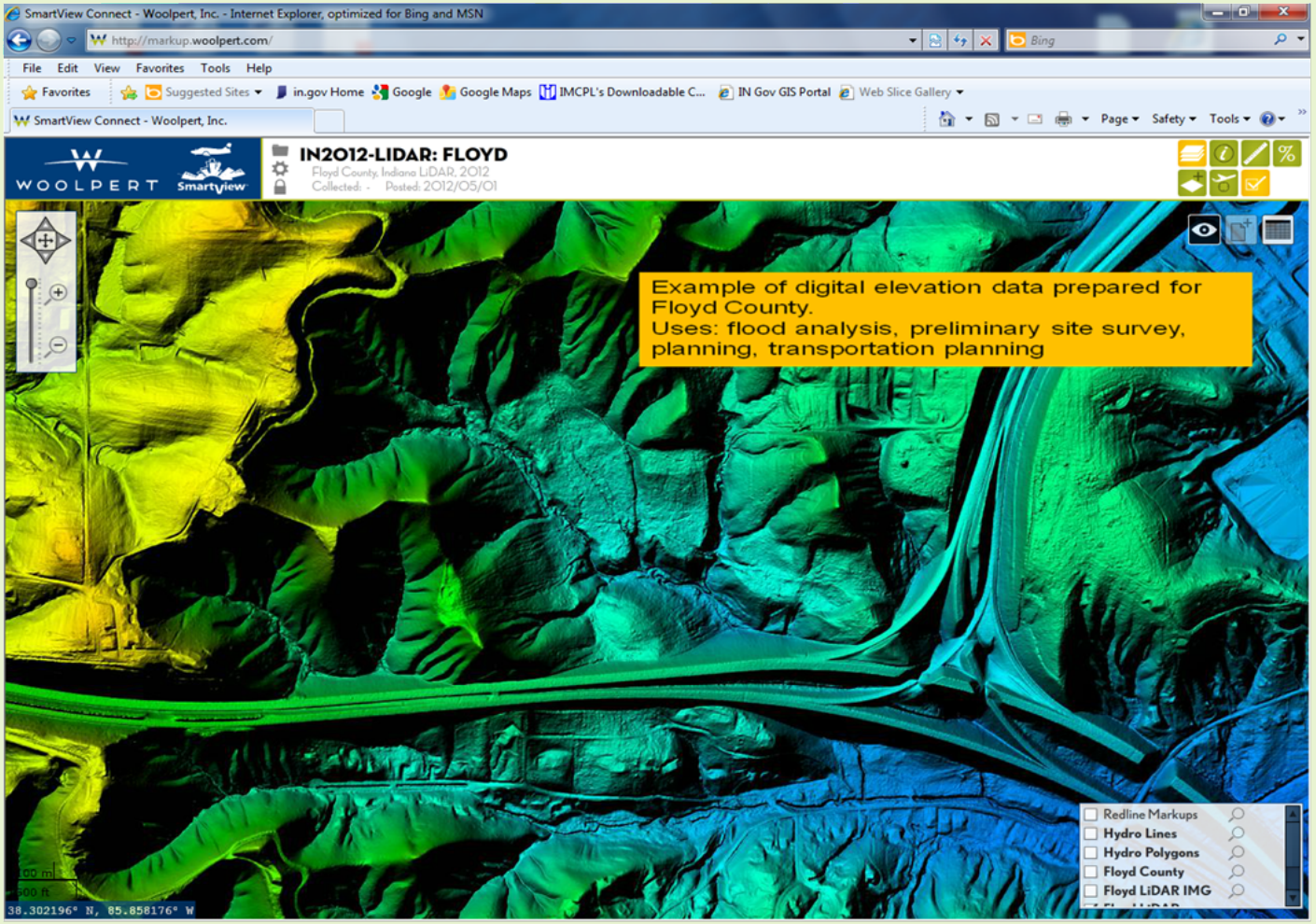
Prairie Pothole wetlands.
Photo credit: USFWS

Bog. Photo credit: Jeanne Christie

Tidal salt marsh. Photo credit: US EPA

Vernal pool. Photo credit: Jeanne Christie

Adopt new science and technological advances in regulations & guidance.



Source: Indiana Geographic Information Office

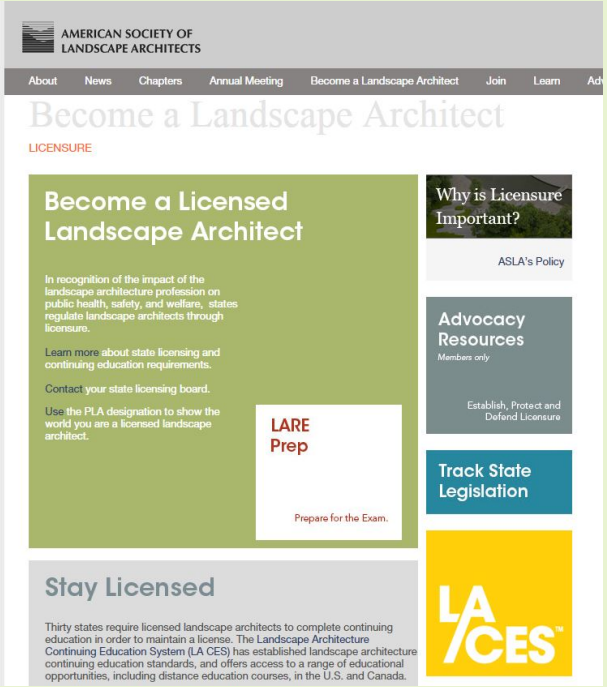
Enforce accountability.

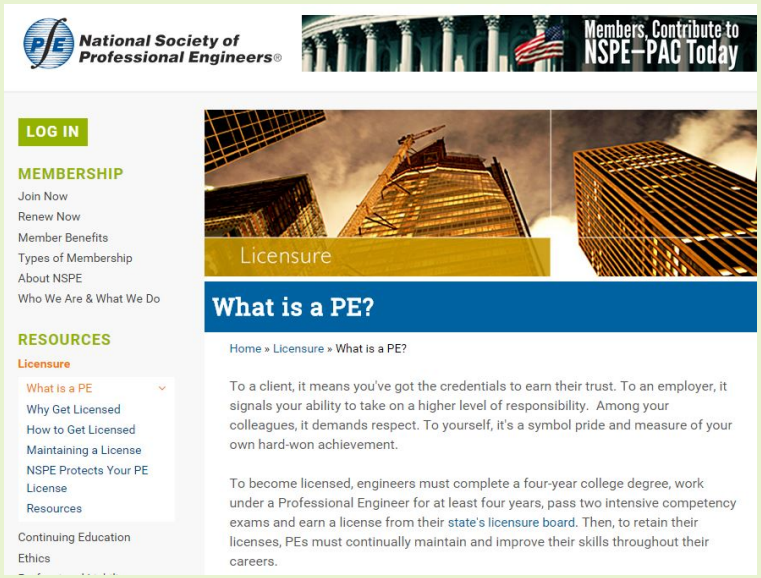
Photo credits: Jeanne Christie

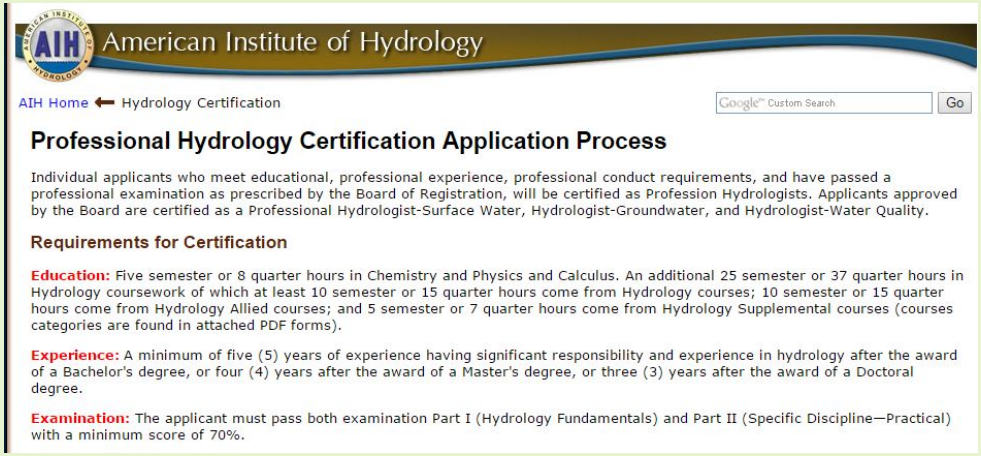
Improve access to knowledge & training.

Photo credit: Jeanne Christie

Require documentation of credentials.







Engage Multi-Disciplinary, Integrated Teams.

Photo credit: Jeanne Christie

Next Steps: Implementation

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

ASWM Wetland Restoration Work Group

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- Marla Stelk, Association of State Wetland Managers (Facilitator)
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Thank you also to:

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- Charles "Si" Simenstad
- John Callaway, PhD
- Christina Schaefer, MLA, PhD
- Aram Calhoun, PhD
- Susan Galatowitsch, PhD
- Carter Johnson, PhD

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)
  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
- Permits for Voluntary Wetland Restoration: A Handbook
  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
- ASWM Restoration Webpages
  http://www.aswm.org/wetland-science/wetland-restoration

Questions?

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