



Status and Trends Report on State Wetland Programs in the United States

**Association of State Wetland Managers
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Status and Trends Report on State Wetland Programs in the United States

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ASWM's nation State Summaries Project Work Group members, in alphabetical order, include:

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Acronyms

ACOE	Army Corps of Engineers
ADID	Advanced Identification Plan
ASWM	Association of State Wetland Managers
BMP	Best Management Practice
BPJ	Best Professional Judgment
CWA	Clean Water Act
EPA	United States Environmental Protection Agency
FTE	Fulltime Equivalent (Staffing)
GIS	Geographic Information System
HGM	Hydrogeomorphic Method
IBI	Index of Biological Integrity
ILF	In Lie Fee Program
JD	Jurisdictional Determination
NPDES	National Pollutant Discharge Elimination System
NWCA	National Wetland Condition Assessment
NWI	National Wetland Inventory
RAM	Rapid Assessment Method
RIBITS	Regulatory In-Lieu Fee and Bank Information Tracking System
SCORP	Statewide Comprehensive Recreation Plan
TMDL	Total Maximum Daily Load
WOS	Water of the State
WOUS	Waters of the United States
WRAP	Wetland Rapid Assessment Protocol
WQ	Water Quality

2015 Status and Trends Report on State Wetland Programs in the United States

Executive Summary



Midland Painted Turtle in Ellis Lake Wetlands, Fairfield, Ohio Photo Credit: AndrewC via Wikimedia

Background

The Association of State Wetland Managers (ASWM) has been conducting state wetland program summaries approximately every 10 years since the 1980s. ASWM's most recent state summaries project provides a snapshot of wetland programs across the United States in 2014. ASWM gathered information about state wetland programs from past state summaries (both by ASWM and the Environmental Law Institute), state and federal reports, websites and other related resources and compiled this information into draft state summaries. To confirm this content, ASWM conducted verification phone calls and correspondence via email with 50 states, ensuring that information for each state summary is up-to-date for the status of state wetland program activities as of December 2014.

ASWM's project has three primary products: 1) fifty individual online state summaries capturing information about 48 specific topics (see Figure 1); 2) a *Status and Trends Report on State Wetland Programs in the United States*, and a fact sheet to help states and other interested parties share information about the resources available from this project and suggestions about how they can be used to build state wetland programs.



A Focus on EPA's Enhancing State and Tribal Programs Initiative (ESTP) Core Elements of State and Tribal Wetland Programs

Information compiled for this project focuses on four core elements identified by the US Environmental Protection Agency as the foundation of state and tribal wetland protections. They are: 1) wetland regulation, 2) wetland monitoring and assessment, 3) wetland water quality standards, and 4) voluntary wetland restoration. The project also compiled and verified information on emerging areas of interest, including wetlands and climate change and state-level integration with other programs, while also documenting state wetland program-related innovations, models and templates. As a final component of the project, ASWM documented estimated levels and sources of funding and staffing support for state-level wetland work in each state. (Photo credit: US Fish and Wildlife Service)

EPA's Enhancing State and Tribal Programs Initiative (ESTP)

A foundation of EPA's [Enhancing State and Tribal Programs Initiative](#) (ESTP) is the document Core Elements of State and Tribal Wetland Programs, also called the [Core Elements Framework](#) (CEF). Drafted in 2008 with state and tribal input, this document describes four core program elements (monitoring and assessment, regulatory activities, wetland restoration and protection, and water quality standards for wetlands) that provide a comprehensive approach to wetland program building activities. Development of a Wetland Program Plan reflecting current and future actions in one or more of the core elements is a voluntary program and not required by EPA. The CEF is intended to be fairly comprehensive so that states and tribes can choose from an array of actions that are best suited to their goals and resources. EPA recognizes that program development activities will continue to be incremental and bounded by the goals and resources within a state or tribe; the Agency does not expect simultaneous development of all core elements by every state and tribe. The ESTP and CEF were designed for state and tribal wetland programs that are in the developing stages but can be useful to all states/tribes including those that are refining more mature wetland programs.

Figure 1. Information Collected on Each State Wetland Program

General Information <ul style="list-style-type: none"> • Description of State's Wetlands • State Definition of Wetlands • Historic Wetland Loss/Gain • State Web-based Information on Wetlands • State Wetland Program Plan • No Net Loss/Gain Goal • Description of Budget and Staffing • State Permitting Fees • Innovative Features • Models and Templates 	Wetland Regulation <ul style="list-style-type: none"> • How Wetlands are Regulated in the State • Wetland Delineation Practices • Wetland Evaluation Methods • Exempted Activities • Penalties and Enforcement • Permit Tracking • Status of Assumption of 404 Powers • Joint Permitting • Special Area Management Plans • Buffer Protections • Mitigation Policies • Mitigation Databases 	Wetland Monitoring and Assessment <ul style="list-style-type: none"> • State wetland M&A program • Agency responsible for wetland M&A • Wetland mapping/inventory • State Wetland map public portal • Wetland classification methods • Wetland assessment methods • Overall wetland loss and gain tracking • Statewide monitoring plan • Levels of wetland monitoring (Level 1,2,3) • Types of wetland monitoring (IBI, Condition, Function) • Frequency of wetland monitoring • Participation in National Wetland Condition Assessment and Intensification Studies
Wetland Water Quality Standards <ul style="list-style-type: none"> • Wetland –specific Designated Uses • Wetland-specific Narrative Criteria • Wetland-specific Numeric Criteria • Anti-degradation Policy that Includes Wetlands 	Voluntary Wetland Resoration <ul style="list-style-type: none"> • Types of Voluntary Wetland Restoration Work Funded by the State • State Voluntary Wetland Restoration Program • State Voluntary Wetland Restoration Program Components • Goals for State Voluntary Wetland Restoration Projects • Landowner Guides and Handbooks 	Other Information <ul style="list-style-type: none"> • State Wetland Program work on climate-change related issues • State Wetland Program work on non-climate change-specific adaptation efforts • State Wetland Program integration work with other state programs • State budget and staffing (FTEs) for each core element • State wetland program development continuum • (by core element) • State wetland program contact information • Useful websites related to state wetland work

Key Findings

Looking Across the Core Elements

State wetland programs are in various stages of development across the United States and take on a wide range of forms - from well-developed formal state programs that comprehensively address all four core elements to programs that rely exclusively on 401 certification as their primary protection effort at the state level and do little else. However, development is happening in a number of key areas. Twenty-six states have EPA-approved Wetland Program Plans and ten more states are in the process of developing these plans.

The area of greatest growth is in monitoring and assessment, both the development of tools and techniques and in the implementation of monitoring and assessment efforts. Only a few states have wetland water quality standards, though a number of other states are in the process of developing wetland-specific standards. This effort is not wide-spread nationally and this core element is not well-developed. The least well-developed element nationwide is voluntary wetland restoration in terms of state-led efforts. Voluntary wetland restoration is happening across large parts of the country; however, this work is often composed of decentralized state activities in partnership with other non-state partners.

Core Element #1: Wetland Regulation

Wetland regulation is the most developed of the four Core Elements among states across the nation. State regulatory programs include states with 401 certification programs that condition federal permits (i.e. 404 permits), states with their own state dredge and fill permitting programs, states with permitting programs for a portion of wetlands in the state and states that have assumed the Section 404 program. All states indicate that their program is structured to provide (at a minimum), the basic regulatory services required for their state's regulatory compliance with the Clean Water Act (whether that be through assumption, a state dredge and fill permitting program, §401 water quality certifications, or some other hybrid arrangement (Note: The study did not evaluate the adequacy or quality of the regulatory services.)).

Twenty-three states have a wetland permitting program. In significant parts of the country there is strong reliance on §401 certification processes to condition federal permits at the state level, rather than state dredge and fill permitting. An additional six states have a coastal permitting program that complements their states' §401 certification program. It is important to note, however, that this study did not evaluate the *quality* of state wetland regulatory programs or their impacts. Thirty-one states have some form of specialized state or regional General Permit(s) issued by the Corps for their wetland work and 17 states have joint permitting with the Corps.

Assumption (similar to delegation) and working towards taking over the Section §404 Program from the Corps and EPA is limited to only a few states. Two states have assumed the program (MI and NJ) and a handful of states are currently working towards assumption. This does not mean that states have not

considered assumption. Seventeen states have explored assumption, but rejected it - usually due to lack of resources and, in a few cases, state regulatory systems that make assumption challenging.

Thirty-five states have their own definition of wetlands. To determine where wetlands exist, the vast majority of states use the 1987 Corps Delineation Manual with regional supplements. Additionally, most states have exemptions comparable to federal 404 exemptions for agriculture and silviculture operations.

Twenty-five states have formal wetland mitigation programs and processes independent from the Corps or are in the process of developing them. States track whatever regulatory permitting or certifications they provide, while leaving tracking of federal actions to the Corps. States have a wide range of penalty and enforcement systems.



Wetland mitigation site – EPA photo

Core Element #2: Wetland Monitoring and Assessment

Nationwide, wetland monitoring and assessment (M&A) to evaluate wetland health has been the greatest growth area among the Core Elements. Monitoring and assessment programs evaluate the ecological health of wetlands. This information is critical to supporting decision-making in other wetland programs. While only fourteen states have a formal wetland monitoring and assessment program, an additional nine states are working on developing their state wetland monitoring and assessment programs. In some cases, those states without a wetland monitoring and assessment program may or may not include monitoring of wetlands as a component of other water resource monitoring programs (11 states). Others find they are not able to do this work because wetlands are excluded from their monitoring and assessment programs (which focus on monitoring lakes, rivers and streams). The reasons for this are diverse and may warrant additional research. **(Photo credit: EPA)**



The vast majority of monitoring and assessment of wetlands across the nation is project-specific, funded by limited-term grants, rather than ongoing, monitoring and assessment programs. In many cases, states are reliant on a successive/progressive series of wetland program grants from EPA to conduct this work and indicate that their monitoring work/program would not exist without this support. There appears to be a shift in methodologies from more intensive and thorough hydrogeomorphic methodologies to rapid assessment models, primarily due to limited resources.

States use wetland maps extensively and are reliant on the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) and NWI+ efforts, though some states have their own mapping program. An area of growth has been the use of online public portals to share this information with a broader audience of stakeholders, including consultants, nonprofits and the general public.

Although most states wish they could track information and make it available about overall wetland gain and loss, very few have the capacity do so, with most only having the ability to track gains and losses from regulatory action (e.g. mitigation work). The ability to gather and compile useful data on non-regulatory wetland gain and loss has proved elusive for most states.



Core Element #3: Wetland Water Quality Standards

Although six states have adopted wetland-specific water quality standards, the majority apply existing water quality standards to wetlands (31 states). Reasons states give for not creating wetland-specific standards range from a lack of resources and too great a range of wetland types to make development feasible, to a lack of support. It is important to note that some states without wetland water quality standards believe that their wetlands are as well or better protected than if they were to develop wetland-specific standards. By not designating special standards in some states, wetlands are by default protected at the highest level. In others, non-wetland water quality standards that cover wetlands are very stringent and encompass measures that effectively protect wetlands. Ten states are currently working on developing their wetland water quality standards. The most common wetland-specific standards are designated uses and anti-degradation policies that include wetlands.

Core Element #4: Voluntary Wetland Restoration

Although voluntary wetland restoration is actively happening across the country, most of this work is not being led by or funded primarily by states. Only 15 states have state-led voluntary wetland restoration programs. The majority of voluntary wetland restoration work is being done through collaborations and is funded using federal grant dollars or other types of non-state funding (e.g. funds raised by nonprofits). Twenty-six additional states participate in non-state-led (decentralized) efforts. The state funding that does exist comes from a wide range of sources, including but not limited to lottery funds, impact fees and allocations from state general funds and grant programs. It is important to note that there is inconsistency in the types of activities reported as voluntary wetland restoration among the states, indicating a need for greater clarity about what is considered applicable for program development activities in support of this Core Element.

Climate Change and State Wetland Program Work

This study finds climate change to be a challenging topic for many wetland program staff. In 16 states wetland program managers are not part of the climate conversation, research or planning work, if it is being done at all by the state. Eighteen state wetland programs do have some formal engagement in

climate-related work, while an additional 13 state wetland programs are connected to this work informally. Importantly, this study found that 16 state wetland programs conduct *no work in the area of climate change*. This does not mean the state does no climate work in other areas, but it documents that there are no linkages between this work and the wetland program. In a number of these states, there are indications that climate work is not encouraged or (in some cases) allowed. **(Photo caption: Xanthium strumarium in Dry Mud - Lua Kealialalo, Hawaii; Photo credit: Forrest and Kim Star)**



Other Adaptation Activities

While state staff may not be working on “climate change” activities, many states are working on adaptation projects. Eight of the 16 state wetland programs not engaged in climate change work on a formal or informal basis, are engaged in some other form of adaptation work to address extreme precipitation events, largely in response to extreme weather events. Examples include drought management efforts, water retention projects, hazards management, stormwater and culvert projects, and low impact development efforts. These findings point to the need to think about some of these issues in a broader sense and the need to be aware of language and barriers (as well as opportunities) when working to share, build, fund, train, research or otherwise connect with states around this work. **(Photo caption: Wetlands can help address flooding problems; photo credit: NRCS)**



Innovative Education and Outreach

Few state wetland programs are doing more than general wetland education (brochures, presentations, common environmental curriculum and programs, such as Project WET, etc.). Some states that had strong wetland education and outreach programs in the past have lost the funding to continue these programs. In some cases this was the first funding to be cut during the recession. Examples of innovative programs include comprehensive training programs, new approaches to public interaction programs, and development of special programs and materials.

Wetland Program Full-time Equivalent Staffing

This study also finds preliminary evidence of a slow erosion of state wetland program staffing and support over the last ten years, with many states losing some level of support in terms of funding, staffing, support for wetland decision-making methodologies or loss of experience through retirements and job changes. This study did not conduct a longitudinal study of staffing, so information contributed on this topic was primarily anecdotal. Additional research is needed to confirm any potential trends.

Integration between Wetland Programs and Other State Programs

ASWM also gathered information about how wetland programs and staff are working with other programs at the state level and the types of integration that have supported improved wetland protection through collaboration. While staff is generally aware of a pressing need to initiate or improve integration with other programs, the number of states actively engaged in integration activities is still limited in some areas. Primary types of integration include various connections with stormwater management (38 states) and



connections with watershed planning activities (35 states). Other areas include floodplain/hazard management and through connections with TMDL implementation. In only a few states are wetland actions or considerations included in Wildlife Action Plans or State Outdoor Recreation Plans (SCORPs).

Photo title: Innovative approaches like the Staten Island Bluebelt Integrate Wetland and Stormwater Management for Multiple Benefits; Photo Credit: Jim Henderson

Wetland Training and Future Research Needs

Although the study did not specifically solicit information about training or future research needs, during the course of the study's verification conversations, states identified numerous training and technical assistance needs and future research topics emerged. Related to training, numerous states referenced the need for low-cost, easy access general training for new staff and training on emerging topics for experienced staff with limitations on travel and training budgets. They also expressed the need for a combination of delivery mechanisms, ranging from online trainings to workshop-based and on-the ground training opportunities. The report breaks down specific training and research topics by Core Element, and includes discussions on climate change, adaptation and integration training topics.

Conclusions

In conclusion, ASWM's study finds wetland programs in various stages of development across the United States. They take on a variety of forms, ranging from well-developed formal state programs that comprehensively address all four core elements to programs that rely exclusively on 401 certification as their primary regulatory protection effort at the state level, with little or no activity on the other three Core Elements. The diversity in state wetland programs indicates that there are no one-size-fits all ways to provide resources or assistance



to states. It may also be useful to conduct further research on how well these programs are protecting wetlands and what resources and technical assistance could strengthen state regulatory work. **(Photo title: Delaware DNREC Staff Studying the Impact of Ditching on Wetlands; Photo Credit: DNREC).**

Across the nation, the area of greatest growth among the Core Elements is in the area of monitoring and assessment - both the development of tools and techniques and the implementation of monitoring and assessment efforts. This work is largely supported by federal initiatives such as wetland program development grants and the National Wetland Condition Assessment. This area of growth provides an opportunity to target resources and technical assistance to strengthen these efforts.

The sharing of both the tools and templates identified in this report and resources that will emerge out of current core element development activities provide an opportunity for sharing and adoption of practices with a track record in other states. On the other hand, there is only limited development in the areas of wetland water quality standards and voluntary wetland restoration programs, with minimal investments of staff and resources and few states that indicate that these will be areas for development in the near future. Although a number of states make the case for alternatives to wetland-specific standards, the role of developing standards for states that rely primarily on 401 certifications merits further exploration.

Voluntary wetland restoration is occurring all across the U.S., and thousands of acres of wetlands have been restored in many states. However, in the majority of cases, states do not lead this work. Instead, they are only one of many collaborative players working together to restore wetlands to the landscape. Wetland and other land managers, both the state and national level, would benefit from exploring how to support these efforts.

Wetland program managers and those that support them may also need to think more broadly about how states can address extreme weather events. With many state wetland programs not actively engaged in climate change work, most states are engaged in responding to extreme weather events. There is an opportunity to look more broadly at state activities (e.g. water retention projects,

stormwater management) to identify how wetlands protection, restoration and management can support these efforts. States need to think in terms of both threats to wetlands and the benefits wetlands can provide when looking at integration opportunities.

Finally, states seek successful examples, lessons learned and tools that they can adapt to their state to bolster wetland program development efforts. ASWM's study has identified both the diversity of wetland programs across the nation and critical examples, models and templates that states have developed and that other states can use as they seek to explore new options and develop their programs. Areas for future training and research that can strengthen state wetland programs across the U.S. are also identified in this report. These resources provide a starting point for wetland program managers, EPA, ASWM and other entities that support state wetland program development to identify opportunities for shared learning.

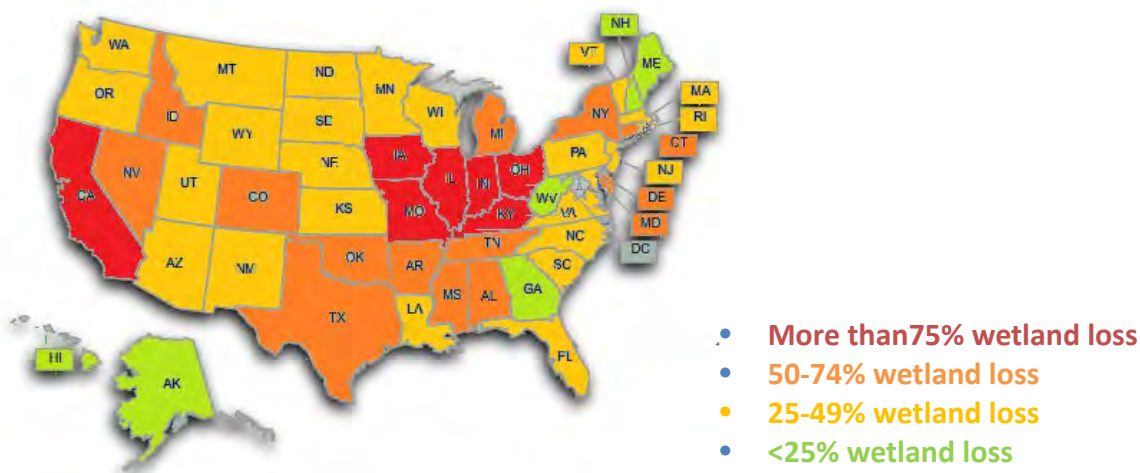


(Photo title: Macroinvertebrate Sampling in Maine Wetlands Photo credit: Maine DEP).

INTRODUCTION

The United States has lost more than half the country's wetlands in the lower 48 states since the 1780s, along with the valuable functions they provide. In order to protect and restore the nation's wetlands, states have adopted a variety of programs and practices. This study looks at the specific contributions of state wetland programs to wetland protection and conservation, focusing on their work associated with EPA's four Core Elements: 1) wetland regulation, 2) wetland monitoring and assessment, 3) wetland water quality standards, and 4) voluntary wetland restoration. Additionally, the report looks at how state wetland programs connect with climate change efforts and integrate with other program areas at the state level.

Wetland Loss in the United States



Data Source: Wetland Losses in the United States

1780s to 1980s – Dahl (1989)

While quite outdated, the majority of states still rely on numbers from this report

The Association of State Wetland Managers (ASWM) has been conducting state wetland program summaries approximately every 10 years since 1980. Information for these studies is taken as a snapshot. In the case of this report, the snapshot is dated December 2014, meaning that all information collected was current in December 2014. This approach was chosen because it allows for comparisons across time. The data collected for each state summary remains relatively similar, but changes with identification of new challenges, alterations in EPA requirements under the Clean Water Act, changes in other federal programs, revisions to the state of the science and scientific methodologies, and innovations in technology. The last ASWM state summary project was conducted in 2002. In 2008, the Environmental Law Institute conducted a state wetland program summary project focusing on legal authorities. Information from both ASWM's 2002 and ELI's 2008 state summaries provided baseline sources of information for the 2014 project.



(Photo credit: US Fish and Wildlife Service)

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Funding support for this project was provided by a U.S. Environmental Protection Agency Wetland Program Development Grant, a Robert and Patricia Switzer Foundation Leadership Grant, and the McKnight Foundation.

Project Guidance and Determining Information to Collect

Although the information in each ASWM state summary remains somewhat the same over time, changes in programs, practices and priorities require a review and revisions to information to be collected for each new summary. ASWM formed a national State Summaries Work Group to help guide the development of a new template for the 2014 state summary research project and assisted in the development of the measures to be used to collect the information with attention to developing tools that could be used in a comparative, replicable manner both during the project and for future state summary projects. The Work Group consisted of representatives of state wetland programs, EPA, the National Council of State Legislatures, and nonprofits including the Wisconsin Wetland Association and the River Network. The Work Group met monthly and identified a key set of questions that could be adapted to collect information from each state through a comparable, yet individualized, information-gathering process.

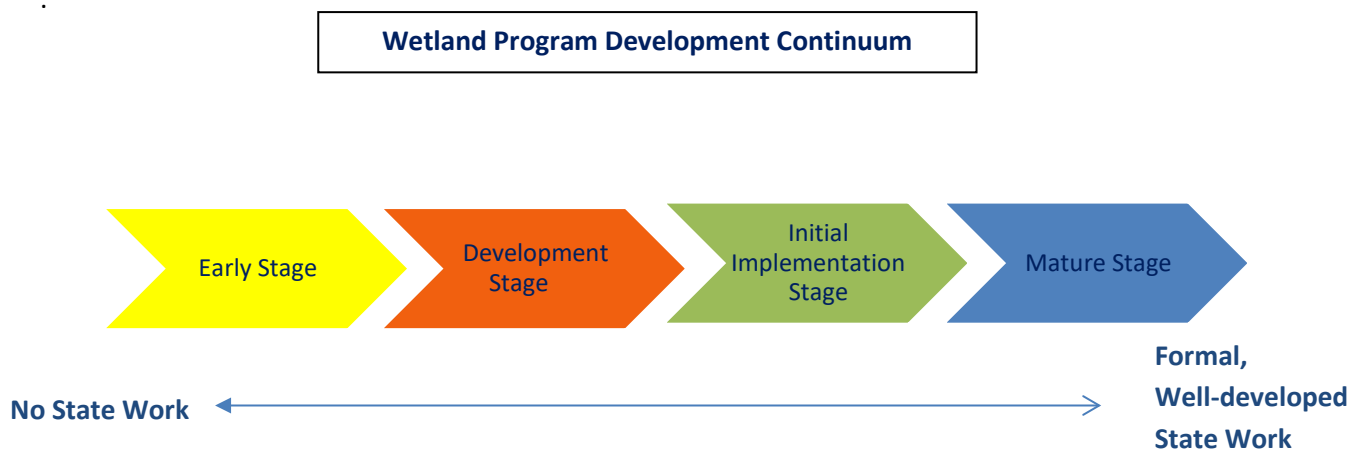
A Focus on EPA's Core Elements

Information compiled for this project focuses on the four core elements identified in the EPA Enhancing State and Tribal Program (ESTP) strategy: 1) wetland regulation, 2) wetland monitoring and assessment, 3) wetland water quality standards, and 4) voluntary wetland restoration. The project also compiled and verified information on emerging areas of interest, including wetlands and climate change and

state-level integration of wetlands management with other programs, while also documenting state wetland program-related innovations, models and templates. As a final component of the project, ASWM documented estimated levels and sources of funding and staffing support for state-level wetland work in each state.

ASWM's New Wetland Program Development Continuum

Each online state summary document provides information about wetland program development --- specifically, how far along an ASWM-developed wetland program development continuum the state lies for each of the Core Elements (as of December 2014). Placement along the continuum was based on the information gathered through the state summary development process and verified by state wetland program staff. Figure 2 illustrates ASWM's continuum, which ranges from early stages of program development to the mature stage, with a development stage and initial implementation stage in between. This continuum does not evaluate the quality of each element, but rather a qualitative assessment of where along a life cycle the state's wetland program lies for each element.



Research Methodology

This research project utilized information collected through a three-phase process. First, ASWM developed draft state summaries based on data collected from the following information sources: Association of State Wetland Managers reports and former summaries, the Environmental Law Institute 2008 State Wetland Program Summaries, US EPA State Wetland Program Plans, The North Carolina Environmental Finance Center, Georgetown University Climate Adaptation Planning study, state plans, assessment tools, statute and regulatory information, and state wetland web pages.

Once drafts were developed, ASWM held a telephone verification conversation with staff responsible for implementation of state wetland work in each state and reviewed the document with them in a formal semi-structured telephone verification calls. Verification included review of 48 areas of information in each state summary. Discussions began with a 3-5 minutes explanation of key characteristics of their program (a "3-5 minute elevator speech" about wetland work in their state) to

provide the ASWM staff with contextual and critical elements to convey through the final state summary document. ASWM and state staff jointly reviewed the contents of the state summary and identified how wetland work had changed over time (or not) and where edits needed to be made to the document.

The final step in completing the state summary documents was returning revised drafts that incorporated interview-identified edits to the state summaries to interviewees for their final edits and approval. Once approval was received to post edited summaries, the individual state summary documents were posted on the ASWM website at aswm.org under “Wetland Programs.”

Conducting a Comparative Analysis of State Wetland Programs:

From the information gathered during the interviews and in the state summaries, ASWM next developed comparative maps based on the key state summary themes: wetland regulation, wetland monitoring and assessment, wetland water quality standards, and voluntary wetland restoration, as well as wetlands and climate change, state-level integration with other programs, and information about innovative outreach and education efforts. The study resulted in 34 comparative maps, associated tables and descriptive text.



Compiling a Status and Trends Report

This report represents the final phase of the project - a comparative analysis among all 50 states, with contextual information: *The State of State Wetland Programs in the United States: A National Status and Trends Report*.



How to Read this Report

The information compiled for this report is organized to allow readers multiple points of access to the information collected. The report includes the following sections:

- **Current Status Information** – In this section, for each Core Element, ASWM provides comparative analysis information about the current state of wetland programs across the nation based on a snapshot of programs in December 2014. For each core element and additional areas explored, the information presented includes:
 - A **background statement** about the issue
 - A **map** of the United States with the color-coded status of each participating state
 - A **narrative** on the results of the study, highlighting map content and putting it in context
- **Conclusions** –This section provides a summary of the study’s findings, organized by core element. It also provides insights into what these findings may mean for wetland managers and those who work in collaboration with them in both current and future regulatory and management contexts.
- **Recommendations for Research and Training** - Recognizing that this study was limited to specific research goals and information collection, ASWM provides recommendations for future research that can build on and enhance the findings of this report.

Additionally, detailed information on state- level activities that serve as the data for this report is available by accessing the **50 individual state summaries on the ASWM website** (<http://www.aswm.org/wetland-programs/state-wetland-programs>). Within the state summaries, the compiled information in this report is broken down for each state by core element area and with contact information and links for the reader to use to access additional information.

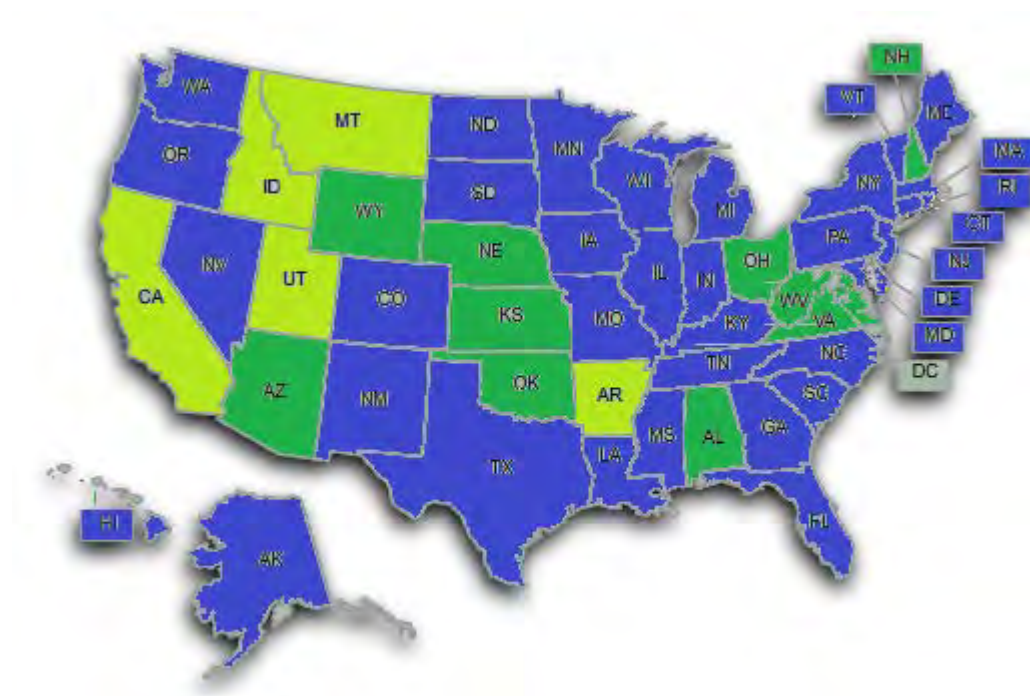
Study Results

Core Element #1: State Definition of Wetlands

Background: For regulatory purposes under the Clean Water Act, at the federal level, the term wetlands means "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." [40 CFR 230.3(t)]



Results: Thirty-five states have a formal state definition of the term “wetland” in either state statute or state administrative rules. Ten states formally designate the above federal definition. The remaining five states default to the federal definition. Specific state wetland definitions are provided in ASWM’s 50 state summary documents. A recommendation for future research and analysis includes exploration of how these state definitions compare with the federal definition. **(Photo Title: Interdunal Wetland in Indiana Dunes National Lakeshore; Photo Credit: Visviva)**



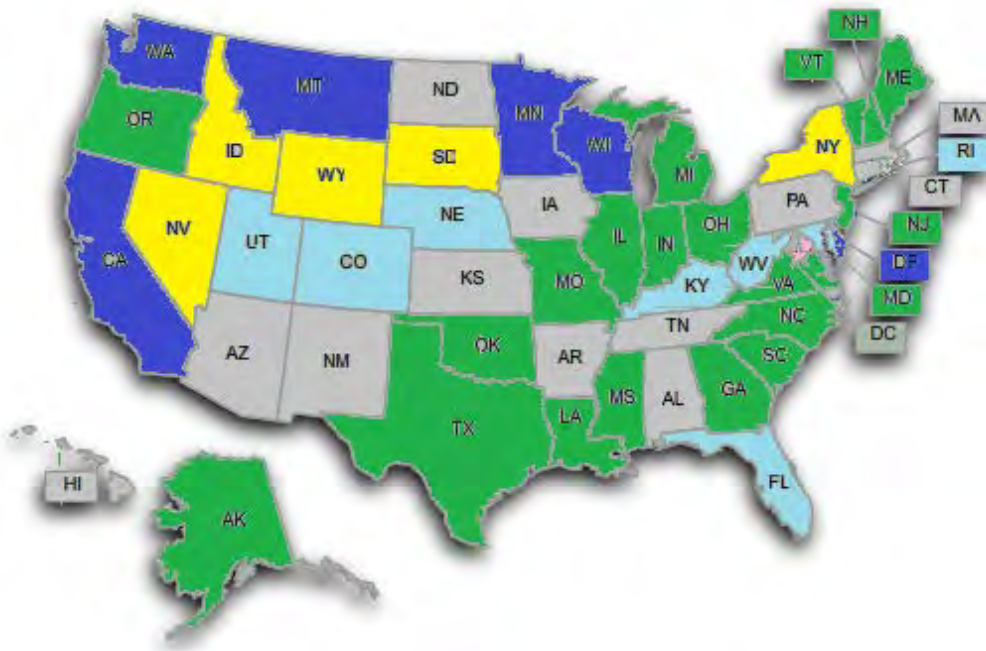
- State definition of wetlands (35 states)
- Designate federal definition (10 states)
- Default to federal definition (5 states)

General: State No Net Loss/Net Gain Goal for Wetlands

Background: “No Net Loss” is a policy goal aiming to prevent and offset the destruction or degradation of wetlands. It is the formal overall policy of the United States and was first adopted as a national goal under George H. W. Bush’s administration in 1988, after he made several statements in support of the policy right after his election. Under this bi-partisan policy, wetlands currently in existence are to be conserved if possible. No net loss is achieved through wetlands protection, creation of new wetlands, restoration of lost wetlands, enhancement, and management, as well as education, research and information sharing.



Results: While a few states go beyond the no net loss goal to formally adopt a “Net Gain” or “Net Increase” goal (only 6 states have a gain/increase-focused goal), many states have formally adopted a no net loss goal (20 states). An additional five states have an informal no net loss goal that guides their wetland work. Seven states have no formal or informal goal regarding wetland loss or gain. Twelve states either did not know whether or not their state had a goal or were not prompted to verify this information.



- **Formal Net Gain/Increase goal** (6 states)
- **Formal No Net Loss goal** (20 states)
- **Informal No Net Loss goal** (7 states)
- **No formal or informal goal** (5 states)
- **Unknown/Not Asked** (12 states)

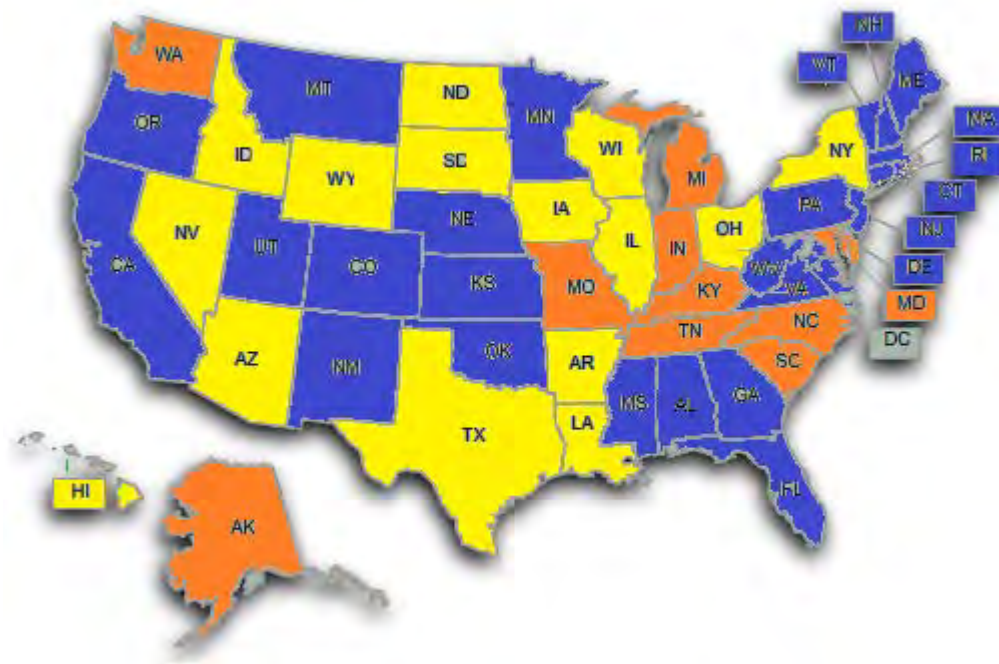
General: EPA-Approved State Wetland Program Plans



Background: Wetland Program Plans (WPPs) are voluntary plans developed and implemented by state agencies and tribes which articulate strategic goals and actions. The US Environmental Protection Agency approves WPPs, which then qualify states and tribes to compete for a larger allocation of the EPA Wetland Program Development Grants, a primary source of funding for states and tribes seeking to develop elements of their wetland programs. Generally, WPPs describe overall program goals along with

broad-based actions and more specific activities that will help achieve the goals. Timelines for the WPPs vary between 3-6 years, with more specific timeframes typically associated with the plan's actions/activities.

Results: Twenty-five states have an EPA-approved Wetland Program Plan, with an additional 10 states either in the process of developing a Wetland Program Plan or in the plan approval process with EPA. Fourteen states have no WPP. Four of these states with no WPP have some other form of wetland plan they use to prioritize wetland protection work, but these plans are not formally approved by EPA. This is an area of significant growth among the states and states are seeking resources and technical support to assist in this planning process.

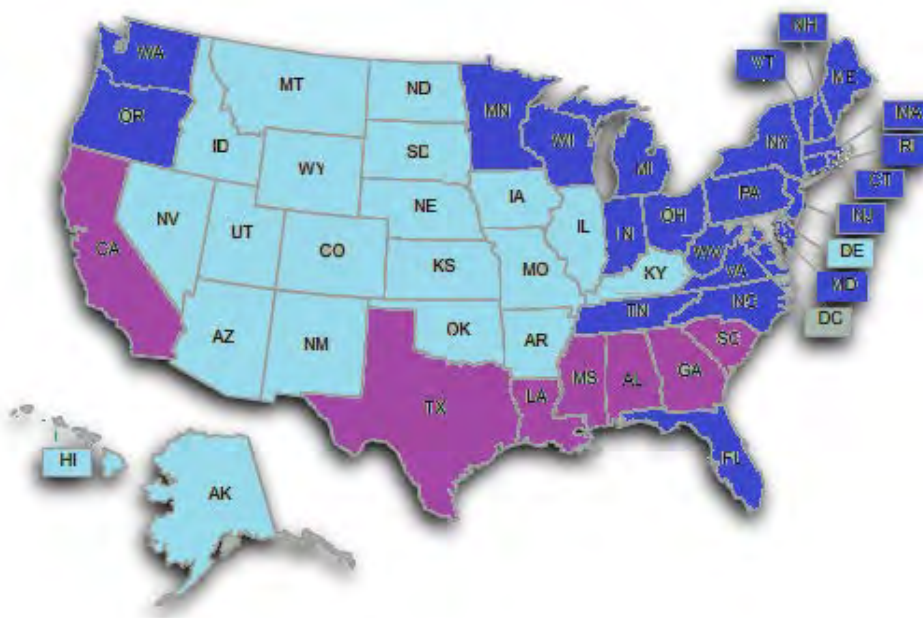


25 States have an EPA-approved state wetland program plan
10 States are the process of developing their plan or getting approval
15 states have no plans

Core Element #1: Wetland Regulation – Regulatory Program Type

Background: To assess state permitting coverage, ASWM worked with states to determine whether or not they are required to issue a state or local permit for activities in freshwater wetlands. Results are presented in the form of three categories: 1) state wetland permitting program as primary mechanism; 2) §401 Certification as primary mechanism, but with additional state permitting for coastal wetlands; and 3) §401 Certification as the state’s only mechanism for impacts to wetlands.

Results: Twenty-three states have a formal state wetland permitting program that serves as their primary regulatory mechanism for protecting wetlands from dredge and fill impacts. Two of these states (Michigan and New Jersey) “assumed” the §404 permitting program, meaning that they have full state control over CWA dredge and fill permitting decisions for the regulating of waters in their state. An additional 21 states rely exclusively on §401 Certifications to provide input into the dredge and fill permitting process. Six additional states rely on §401 certification primarily, but have some other state permitting program that protects at least some portion of the state’s coastal wetlands.



- **State Dredge and Fill Permitting Program** (23 states)
- **Rely on §401 Certification Program + Coastal Program** (6 states)
- **Rely Solely on §401 Certification** (21 states)

Core Element #1: Wetland Regulation – Regulatory Program Type, Continued

Not all permitting is easily categorized into these three categories. For example:

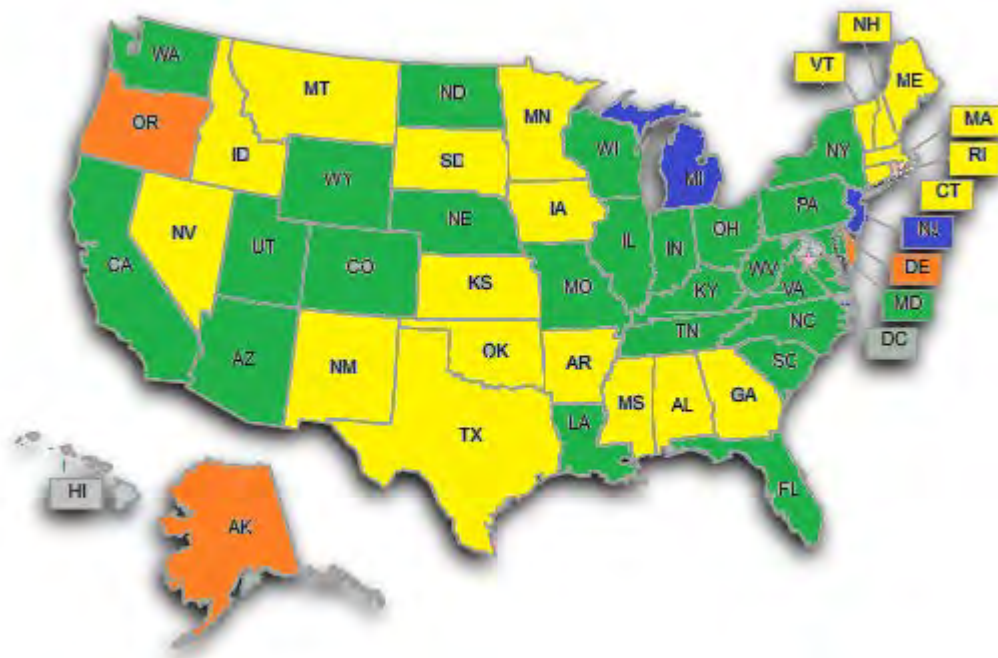
- Washington State provides additional wetland protections through state administrative orders.
- Nebraska and Wyoming rely primarily on §401 certification but have “voluntary” state regulatory programs.
- Connecticut and Washington State rely extensively on municipal permitting, rather than state-level permitting.
- Five states have isolated wetland permitting (CT, IN, OH, WI, and WV).
- Oregon has permitting of wetlands only as they relate to dam safety permitting.
- Alaska permits only when anadromous fish are involved.
- Illinois permits projects on public land.
- South Dakota does some permitting of activities in wetlands through their surface water discharge permits.
- North Dakota’s permitting is based on size of the drainage area (drain 80+acres).
- Examples of other state permitting activities that regulate wetlands are Tennessee’s ARAP Permits and Utah’s Stream Alteration Permits.

State wetland programs vary in their scope from state to state. State wetland programs have evolved independently from the Clean Water Act in large part because there have been no dedicated sources of state wetland program implementation funding under the Clean Water Act. Additionally, assumption of the §404 program has been limited to two states largely due to a lack of resources to support these states (http://www.aswm.org/pdf/lib/cwa_section_404_program_assumption.pdf).

Core Element #1: Wetland Regulation - Assumption of the 404 Permitting Program

Background: The U.S. Congress has provided a mechanism for state/tribal “delegation” of the Clean Water Act Section §404 program (§404) since 1977. In the process known as §404 program assumption, a state or tribe may request to “administer its own individual and general permit program” in place of the federal dredge and fill permit program. The §404 assumption process differs somewhat from the §402 authorized program process which is authorized to serve in lieu of the federal; §402 program. In order to qualify for this provision, the state or tribal program must meet requirements that assure a level of resource protection that is equivalent to that provided by the federal agencies. (Source: ASWM).

Results: Assumption and working towards assumption of the \$404 Program is limited to only a few states. Two states have assumed the program (MI and NJ) and three states are currently working towards assumption (AK, DE, and OR). This does not mean that other states have not *considered* assumption. Twenty-four states have explored assumption, but rejected pursuing it at this time - mostly due to lack of resources, uncertainty over the extent of waters that can be assumed, and state regulatory programs that would need significant modification that make assumption challenging. Twenty states have never explored assumption.

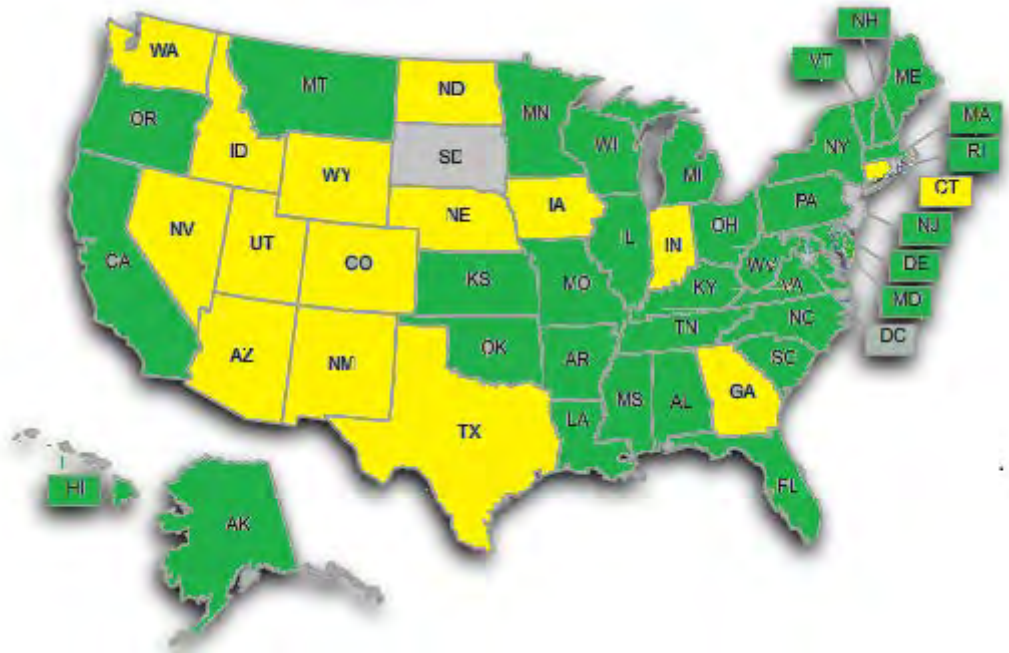


- **Have Assumed the 404 Program** (2 states)
- **Currently Working Towards Assumption** (3 states)
- **Have Explored, but Rejected Assumption** (24 states)
- **Have never Explored Assumption** (20 states)
- Unknown/Data Not Available (1 state)

Core Element #1: State Wetland Permitting Fees

Background: States may charge a permitting fee associated with applying for or continuing a wetland permit and/or §401 certification.

Results: Wetland permitting fees across the country are as varied as the state wetland permitting programs among the fifty states. Thirty-three states currently have some form of wetland permitting fee for one or more wetland permitting processes. For example, the State of Maine has a standard permitting fee system for dredge and fill permits. However, in Kansas, wetland permitting fees are limited to water rights. For specific information about state permit fee arrangements, oversight, amounts and use, please check out ASWM's individual state summaries.

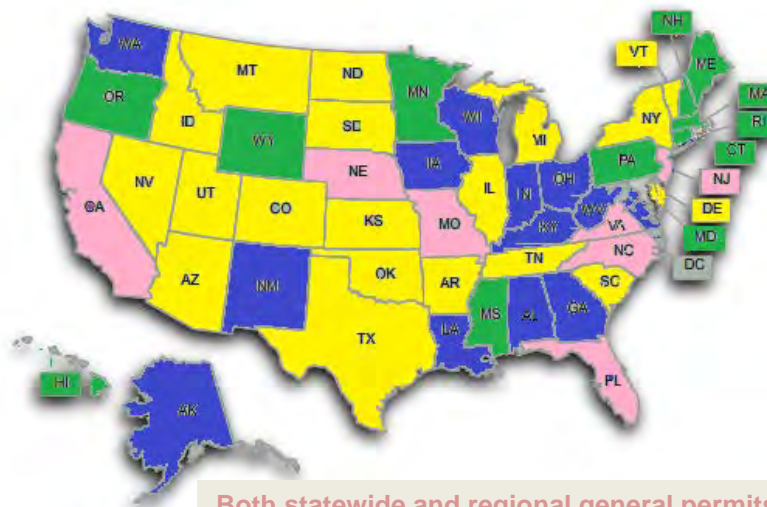


- Have state wetland permitting fees (33 states)
- No state wetland permitting fees (18 states)
- Unknown/Data Not Available (1 state)

Background: The U.S. Army Corps of Engineers (ACOE) can issue a permit on the national or regional level for a category or categories of activities that: 1) are similar in nature and cause only minimal individual and cumulative adverse impacts (Nationwide and Regional General Permits) or 2) would result in avoiding unnecessary regulation for activities already regulated by another federal, state, or local agency and the environmental consequences of the activity would be individually and



Results: Seven states have both categories of General Permits with the Corps (Statewide and regional permits). Twelve states have only regional general permits and nine states have only statewide general permits. The largest number of states (19 states), have no general permits with the Corps. This means that 19 states have statewide permits (including the seven states that have both types) and 19 states have regional permits (including the seven states that have both types).



Both statewide and regional general permits (7 states)
 Statewide general permits only (12 States) (+7 with both) = 19
 Regional general permits only (12 states) (+7 states with both) = 19 states
 No general permits (19 states)

Background: A state may adopt a wetland permitting arrangement that allows one joint (shared) permit application and process to cover permit requirements pursuant to both state and federal rules and regulations for construction activities where the land meets the water, including wetlands, and is often referred to as the land/water interface. It is intended to streamline the processes for permit application and to prevent duplication of state and federal regulations.

[illegible]

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Core Element #1: State Wetland Delineation Methods

Background: Wetland delineation is the process that establishes the existence (location) and physical limits (boundary) of a wetland for the purpose of federal, state or local regulations. Wetland delineation is also the first step of a “jurisdictional determination”(JD), a process which identifies water bodies that meet the definition of a “water of the United States” and/or a “water of the state.” First a wetland is identified and delineated and then a determination is made whether or not the wetland meets criteria that subject it to regulation under federal and/or state law. Wetland delineation can be conducted by different entities and individuals depending on the state.

Results: The vast majority of states (39 states) rely on the Army Corps of Engineers’ 1987 Delineation Manual and Regional Supplements to guide delineation of wetlands in their state. Ten states have their own delineation methods.

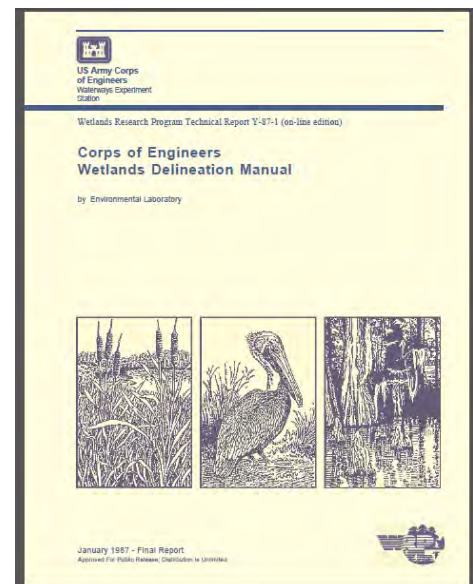


In seven of these states, state delineation methods apply to delineation of all wetlands in their state under state and/or local regulatory programs:

- Florida (Florida Unified Wetland Delineation Method)
- Connecticut (based on soil drainage)
- Louisiana
- Massachusetts (MA Delineation Manual)
- Maryland (Regional maps for tidal wetland delineation)
- New York (Based on vegetation)
- Rhode Island (Delineation requirements in state rules and regulations)

In three states, their state methods only apply to non-federal JD wetlands:

- Maryland (Regional maps for tidal wetland delineation)
- South Carolina (For tidal Critical Areas in Coastal Regulations)
- California (For non-federal jurisdictional wetlands)



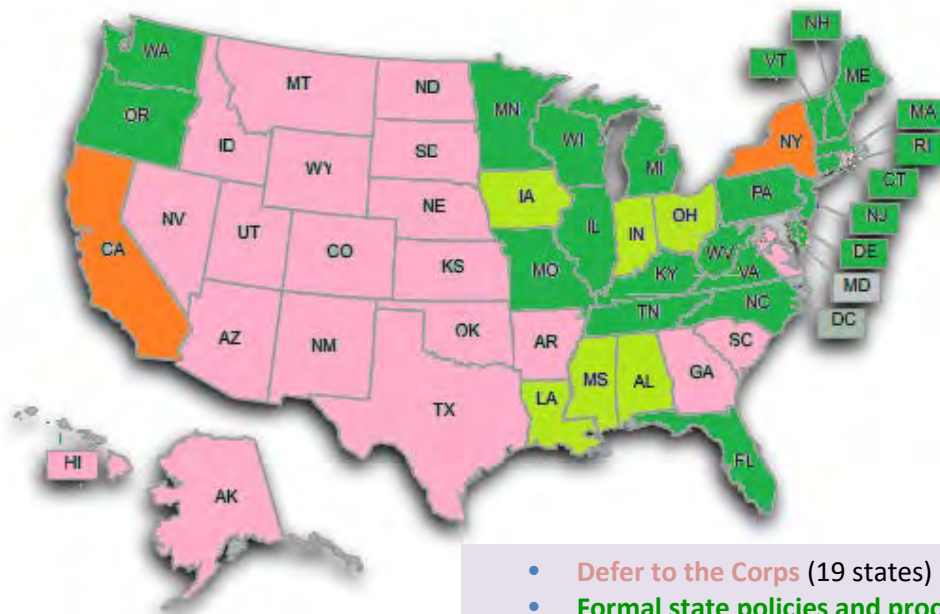
No information on delineation methods was available for Mississippi.

Core Element #1: State Wetland Mitigation Policies and Procedures

Background: In 2008, EPA and the U.S. Army Corps of Engineers jointly promulgated regulations revising and clarifying requirements regarding compensatory mitigation. According to these regulations, the fundamental objective of compensatory mitigation is to offset environmental losses resulting from unavoidable impacts to waters of the United States authorized by Clean Water Act Section 404 permits issued by the U.S. Army Corps of Engineers. Compensatory mitigation is allowable only after a proposed project has incorporated all appropriate and practicable means to first avoid and minimize adverse impacts to aquatic resources. Compensatory mitigation can occur through four methods: aquatic resource restoration, establishment, enhancement, or in certain circumstances, preservation. There are three mechanisms for achieving the four methods of compensatory mitigation (listed in order of preference as established by the regulations): mitigation banks, in-lieu fee programs, and permittee-responsible mitigation. In some states, mitigation is administered by the Corps. In other cases, the state is responsible for administration of mitigation in compliance with state requirements (Source: http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation_index.cfm).

Results: Thirty-one states have some form of policies or procedures, formalized or not, that guides the administration of wetland mitigation in their state under their state wetland program. In these states, twenty-three states have formalized these policies and procedures. Two states (California and New York) are in the process of developing formal procedures. Nineteen states defer overall mitigation decisions to the Corps. Six provide additional state guidance and recommendations to the Corps on appropriate mitigation requirements during the permitting process.

For the most up-to-date data on mitigation banks and in lieu fee programs available in each state, visit the US Army Corps of Engineers' RIBITS website at: https://ribits.usace.army.mil/ribits_apex/f?p=107:2



- **Defer to the Corps** (19 states)
- **Formal state policies and procedures** (23 states)
- **Developing formal state policies/procedures** (2 state)
- **Corps primary, with policies for additional** (6 states)

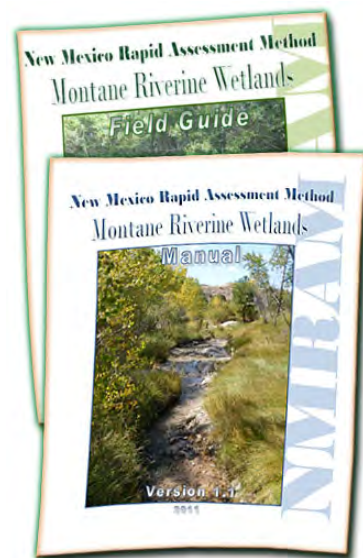
Core Element #1 Area of Innovation - State Wetland Evaluation Methods

Background: Wetland evaluation and assessment methods are science-based analyses of the condition of functions provided by wetlands. There has been substantial growth in the diversity and sophistication of these tools over the past two decades.

Results: Twenty-five states indicate that they rely on some formal evaluation method to inform regulatory decisions. The list below includes a number of tools that may be of interest to other states, including the name of each tool by state and a link to their tool (if available).

Rapid Assessment Wetland Evaluation Tools:

- Use USA RAM (WY)
- Alabama Rapid Assessment Methodology (ALRAM) - Under development
- Alabama WRAP
- Indiana Rapid Assessment Methodology (IRAM)
- Kentucky Rapid Assessment Methodology (KYRAM)
- Michigan Rapid Assessment Methodology (MIRAM)
- Mississippi WRAP
- Montana Wetland Assessment Methodology (MWAN)
- New Mexico Rapid Assessment Method (NM)
- Ohio Rapid Assessment Methodology (ORAM)
- Tennessee Rapid Assessment Methodology (TNRAM)
- West Virginia WRAP
- Wisconsin Rapid Assessment Methodology (WIRAM)
- Other RAMs (AK, CA)



Other Wetland Evaluation Tools:

- Colorado
- Florida (Unified Mitigation Assessment Method – UMAM)
- Wetland Value Assessment Methodology (MA)
- Aquatic Resources Monitoring Guidelines (MO)
- DOT Method (MT)
- North Carolina Wetland Assessment Method (NC)
- WET2 (PA)
- WETCAT (VA)
- Vermont Wetland Rules (VT)
- State wetland rating system (WA)
- West Virginia SWVM (WV)

Nine states rely solely on wetland evaluation methodologies by ACOE district offices (IA, ID, IL, GA, ND, NM, NV, OK, and UT). In some areas of the country hydrogeomorphic (HGM) tools are used primarily for large projects.

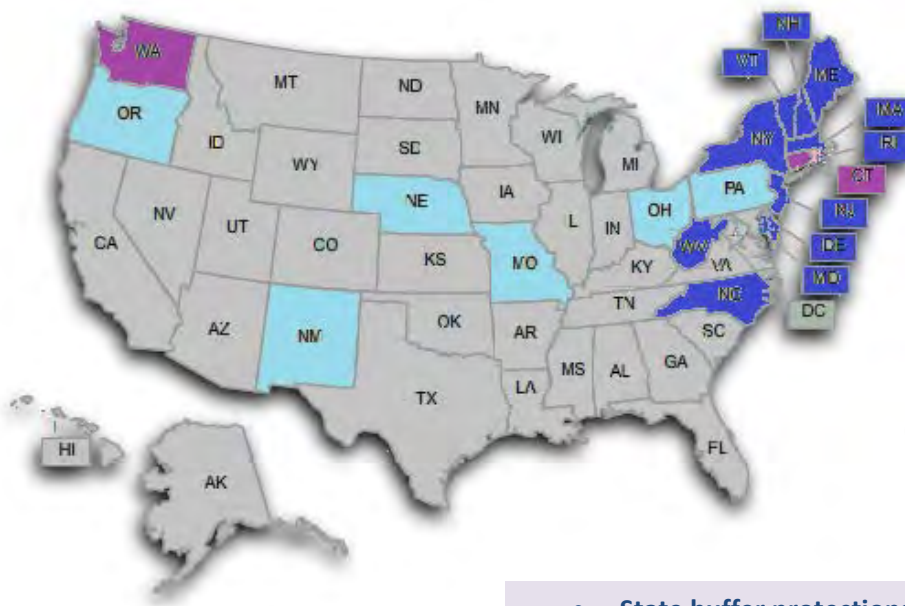
Core Element #1 Innovative Practices: Buffer Protections

Background: Protected areas adjacent to water resources, often referred to as buffer zones, provide a number of functional benefits, including the attenuation of pollutants or excess nutrients, aesthetic value, recreation areas and habitat essential to the life cycle requirements of wetland dependent species. Buffer zones moderate the effects on wetlands and water bodies from actions taking place in adjacent upland areas that can be incompatible with aquatic health. Adverse actions (including activities related to agriculture, urban development and industrial use) in the areas directly adjacent to wetlands and streams can often result in changes to the biological, chemical and physical properties of these aquatic resources. In turn, these changes can lead to a reduction in wetland and stream functional value (Castelle et al., 1994). The Clean Water Act does not explicitly allow for protection of areas directly adjacent to aquatic resources; however, in a growing number of states, buffer protection is being incorporated into state and local water regulations.

Results: A comprehensive assessment of buffer protections was not included in the scope of this report. However, in the course of reviewing state wetland regulatory programs, some states with buffer protections were identified. Eleven states have formal state buffer protections, largely clustered along the Eastern Seaboard. Six additional states were found to offer some other state-level support of buffer protection, even though they did not have formal requirements in state regulation. These included adding buffers in mitigation requirements (e.g. MO, NE, OH, OR, RI), requirements for buffer assessment (e.g. NM) or buffer setbacks from dams in what the state designates as important wetlands (e.g. PA). Two states offer no state-level programs or requirements, but supports local protection of buffers in their critical areas ordinances (CT and WA).

Examples of Different Types of Wetland Buffer Supports

This map does not represent buffer information for all states



- **State buffer protections** (11 states)
- **No state buffer protections, but state includes buffers in mitigation requirements** (6 states)
- **Local buffer protections only** (2 states)

Core Element #1 Innovative Practices: Buffer Protections, Continued

1) Examples of buffer protection:

Delaware provides a range of buffer protections through its regulations. Buffer requirements are included on state wetland jurisdictional maps. For Class 1 wetlands, a 300-foot buffer is required; for Class 2 wetlands, a 100-foot buffer is required. Buffers are treated like wetlands, but one Class lower. Consequently, buffers for Class 1 wetlands are treated as Class 2 wetlands and Class 2 buffers are treated as Class 3 wetlands. Other buffers are assigned buffer designations on a case-by-case basis.

Maine requires 100-foot buffers for Class 1 wetlands and 50-foot buffers for Class 2 wetlands. Both of these classes of wetlands are considered to be sensitive and require buffers.

Maryland has buffer protections in law for non-tidal waters. They provide a 25-foot buffer for most non-tidal wetlands, but a 100-foot buffer for wetland of special state concern (including those with unique or threatened species and those with steep, highly-erodible soils). Maryland's mitigation projects are also required to include buffers for wetlands.

Massachusetts protects 100-foot buffers out horizontally from boundary banks of wetlands, beaches, dunes, marshes, or swamps. The state makes allowances for small disturbances in these "bordering vegetated wetlands" related to transportation and utility mains. The state has plans to strengthen their buffer zone protections in the future. Additionally, the state has developed a manual, entitled "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetland Protection Act," as well as a manual for landowners to assist them with the creation, restoration and maintenance of vegetated buffers.

New Hampshire may require up to a 100-foot buffer if the wetland area has been rated and considered "valuable" resources. **Photo Title: Wetland buffers provide habitat for waterfowl; Photo credit: Scott Bauer**

New Jersey provides some level of buffer protection for all wetlands in the state. Some form of protection is required by state surface water quality standards, Special Area Protections, and state fish and wildlife laws. Statewide, buffer protections range from 50-feet for a wetland of "intermediate value" to 150 feet for a wetland designated as an "exceptional resource." An exceptional resource designation is tied to wetlands that provide habitat for threatened or endangered species." If a wetland is a Category 1 water resource, the state stormwater rules provide protections through "Special Water Protection Areas" under the state's



Flood Hazard Control Act. This provides protections for a 300-foot riparian zone immediately adjacent to the wetland.

New York requires that wetlands meeting specific size criteria are protected by a 100-foot buffer.

North Carolina provides state riparian buffer protections in six watersheds. Buffer protection is included in mitigation, with a buffer authorization required prior to any potentially allowable mitigation. (<http://portal.ncdenr.org/web/wq/swp/ws/401/riparianbuffers/rules>).

Rhode Island maintains maps of wetland areas that are regulated which include an additional regulated 50-foot buffer.

Vermont requires 50-foot buffers for significant wetlands through a recent wetland rule change. There are three special wetlands in the state that have been afforded a 300-foot buffer.

West Virginia includes wetland buffers as a component of its wetland mitigation tool (SVWM). The SVWM tool works in tiers, and can include requirements for up to a 400 foot riparian/wetland buffer.

- 2) Other states that do not have regulatory buffer protections, include requirements for buffer work in their mitigation requirements:

Missouri does not regulate buffers, but allow buffer work as a form of restoration for mitigation. However, if a permittee applies through one of the state's Soil and Water Conservation Districts, the permittee is required to put buffers in place.

Nebraska also does not regulate buffers. However, the state's antidegradation policy requires buffers for mitigation projects. **(Photo Caption: Nebraska buffer; Photo credit: State of Nebraska)**



Ohio requires buffer protections as part of mitigation requirements. The permittee is required to have a basic level of buffer protection and only receives additional credit if they restore additional buffers (<http://codes.ohio.gov/oac/3745-1-54>).

Oregon does not regulate buffers, but does require many comprehensive mitigation plans to include upland buffers.

Rhode Island can require buffer plantings in the vicinity of work in wetlands through the state's freshwater wetland application process.

3) Additional state requirements for buffer protection include:

New Mexico requires the condition of the buffer be assessed any time a wetland condition assessment is conducted. This buffer assessment is a formal 5-metric evaluation.

Pennsylvania only provides buffer protections associated with required setbacks from dams. This results in wetlands buffers of 300-feet around important wetlands for only on projects related to dams.

4) While the state itself may not have buffer protections, local governments may:

In **Connecticut**, municipalities can adopt some form of buffer protection around regulated wetlands. Requirements range from 25 feet to 150 feet in areas that provide significant local habitat functions.

In **New Mexico**, the City of Santa Fe regulates 100-foot buffers for wetlands and streams and prevents specific activities from taking place within this buffer zone.

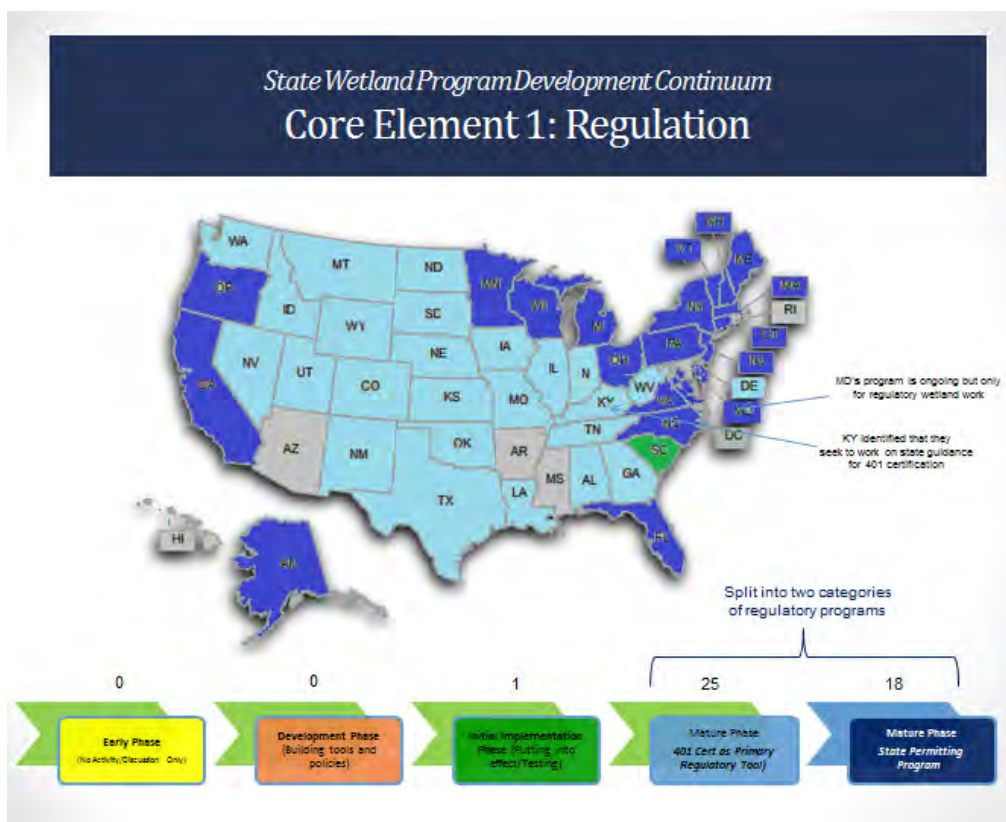
In **Washington State**, many local jurisdictions have included language on buffers in their critical areas ordinances based on Ecology's buffer guidance that was released in April 2005 (Appendices 8-C and 8-D of [*Wetlands in Washington State – Volume 2: Guidance for Protecting and Managing Wetlands*](#)).

In **New Hampshire**, buffer laws allow municipalities to designate “wetlands of high value” for greater protection. Once approved by the state Department of Environmental Service (DES), they are designated as “Prime Wetlands” and a 100-foot buffer surrounding them is afforded special protection by DES under state wetland law.

ASWM Wetland Program Development Continuum: Regulatory Core Element

Background: This section reviews the status of state regulatory wetland program development by examining the placement of state programs along ASWM's *Wetland Program Development Continuum*. (A full description of ASWM's Continuum can be found in the report's Introduction Section on p. 21). ASWM developed the Continuum to share information about each state's progress on developing EPA's four core elements. Placement along the continuum was determined jointly by ASWM and state wetland program staff as part of the study's state verification process. The continuum does not evaluate the quality of the state's performance on the element, but rather provides a qualitative assessment of where along a life cycle the state's wetland program lies for each element.

Results: State wetland regulatory programs mostly lie in the mature stage of wetland program development. Forty-three states indicate that they are in the mature phase, regardless of whether they have a state permitting program or use §401 certification to condition Section §404 dredge and fill permits as their primary regulatory tool. They report having the key components of a regulatory program in place, including regulations, permit or certification processes and at least some resources to implement this work. However, ASWM did not collect information or verify with staff whether their programs are successfully implementing or enforcing these regulatory programs. One state (SC) is in the process of initial implementation. While Kentucky has a functioning §401 certification program, staff verified that they are seeking to strengthen the program by providing formal state guidance to the Corps in the future. Data was not available for four states. (*This page is currently being updated; Alaska relies solely on 401 certification and will be light blue in the graphic*).

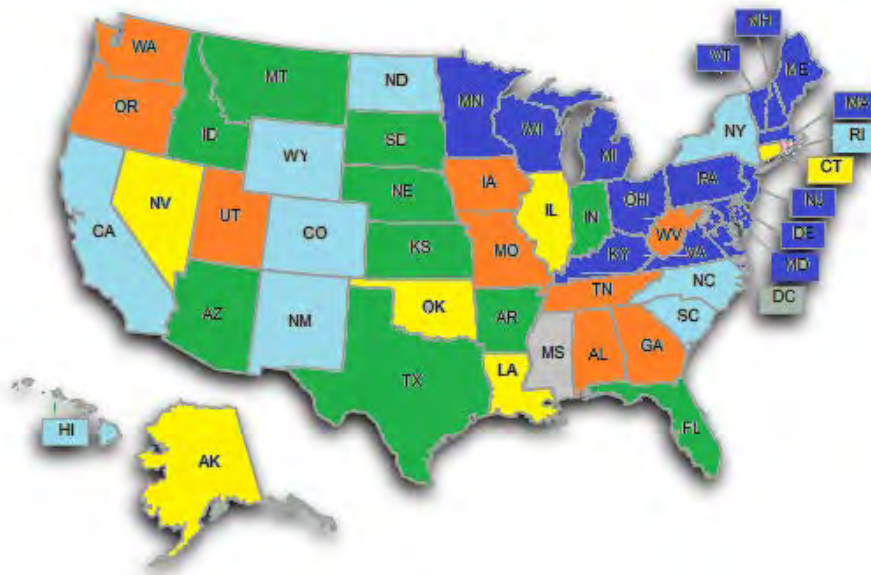


Core Element #2: Wetland Monitoring and Assessment

Background: Wetland monitoring is the systematic observation and recording of current and changing wetland conditions and/or functions, while assessment is the use of that data to evaluate wetlands to support decision-making and planning processes. Wetlands can be characterized both by their condition and functions. EPA defines a “monitoring and assessment program” (M&A) as the establishment and operation of appropriate devices, methods, systems and procedures necessary to monitor, compile, and analyze data on the condition of wetlands in a state or tribe.

Results: Fourteen states have a formal, ongoing wetland monitoring and assessment program. An additional nine states report that they are currently in the process of developing their program. Ten states that do not have a M&A program, report that they only conduct time-limited, project-specific monitoring and assessment efforts, while another ten states that do not have a wetland-specific wetland monitoring program, may or may not monitor at least some of the state’s wetlands through other non-wetland monitoring programs (e.g. in association with stream, surface water and other water resource monitoring programs). Six states do not monitor wetlands through any of their programs or projects.

Most monitoring and assessment is project-specific monitoring, funded by limited-term grants. In many cases, states are reliant on a successive/progressive series of wetland program grants from EPA to conduct this work and indicate that their monitoring work/program would not exist without this support.



- **Ongoing formal M&A Program** (14 states)
- **Program under development** (9 states)
- **Project-specific M&A only** (10 States)
- **May or May not be Part of non-wetland monitoring program only** (10 states)
- **No wetland monitoring** (6 states)
- **Unknown/No data available** (1 state)

Core Element #2: EPA Levels of Monitoring and Assessment



Background: EPA uses a three-tier framework to describe wetlands monitoring and assessment activities. Most states and tribes draw on one or more of these tiers when designing and implementing their wetlands monitoring programs.

- **Level 1** or landscape assessments rely entirely on GIS data, utilizing landscape disturbance indices and other information to assess wetland condition or functions.
- **Level 2** or rapid assessments use relatively simple metrics to assess wetland condition or functions. They are customarily based on the readily observable hydrogeomorphic and plant community attributes of wetlands.
- **Level 3** or intensive site assessments provide a more thorough and rigorous measure of wetland condition or functions by gathering direct and detailed measurements of biological taxa and/or hydrogeomorphic functions.

Wetlands assessment activities at all three levels can be effectively integrated with other surface water monitoring efforts, such as stream or habitat assessments and some states are doing this. Doing so can provide a more integrated understanding of watershed health and a foundation for developing more effective management approaches.

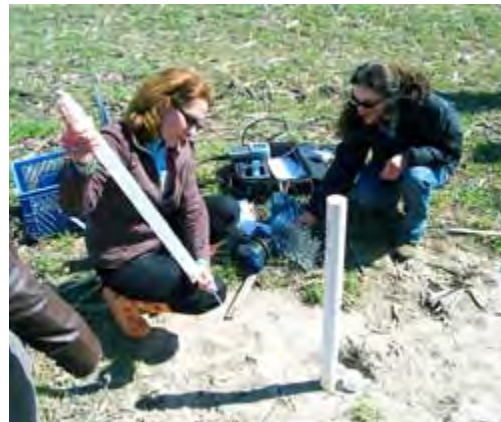
Monitoring and Assessment Capabilities Versus Ongoing Activities: These maps summarize the full extent of wetland monitoring and assessment activity over time. A state may have tools for assessment or have done a study in the past, but may not be conducting monitoring and assessment at that level currently. Conversations with states revealed that not all states understand the formal EPA definitions of monitoring levels or how those definitions relate to the monitoring work happening in their state. Additionally, in a few states, when the state staff indicated that all three levels of monitoring were being undertaken on an ongoing basis, it was unclear how much of this was specific to wetland work.

[illegible]

- Have conducted some wetland M&A at this level
- M&A at this level under development
- None/Unknown/No data available

Core Element #2: Monitoring and Assessment – National Wetland Condition Assessment (NWCA)

The National Wetland Condition Assessment (NWCA) is the first-ever national survey on the ecological condition of the Nation's wetlands. Led by EPA and involving state, tribal and other partners, the survey was designed to provide regional and national estimates of wetland ecological integrity and rank the stressors most commonly associated with poor conditions. The process of designing and conducting the survey was also intended to help build state and tribal capacity to monitor and analyze wetland condition while promoting collaboration across jurisdictional boundaries. Field crews sampled 1,179 sites from Florida to Alaska during the spring and summer of 2011. (Photo credit: EPA)



State Roles in Collecting and Reviewing NWCA Data: States played various roles in completing the NWCA. Many states worked with EPA staff and other partners to conduct sampling and/or analysis. In some cases, state staff applied for funding to conduct the sampling for the NWCA, other states applied for NWCA funds to hire contractors, some joined federal contractors in the field as they did the work, and some states had no role in conducting the sampling, but did review the data that the federal project generated.

State Intensification Studies: Additionally, a number of states conducted NWCA State Intensification Studies, which allowed states to collect adequate data to statistically evaluate the condition of wetlands at the state level. The below map illustrates the 13 states that conducted intensifications. Additionally, Michigan conducted a coastal wetlands intensification study using NWCA protocols which may not be included in the final NWCA report.



The Role of NWCA as Foundation Building for State Wetland Monitoring and Assessment Efforts:

In many states, staff viewed NWCA as a foundation-building/refining tool for the development of portions of the state's own monitoring and assessment program. The ability to develop, test and implement many of the testing protocols and tools will serve as the basis for future wetland monitoring and assessment work in these states.

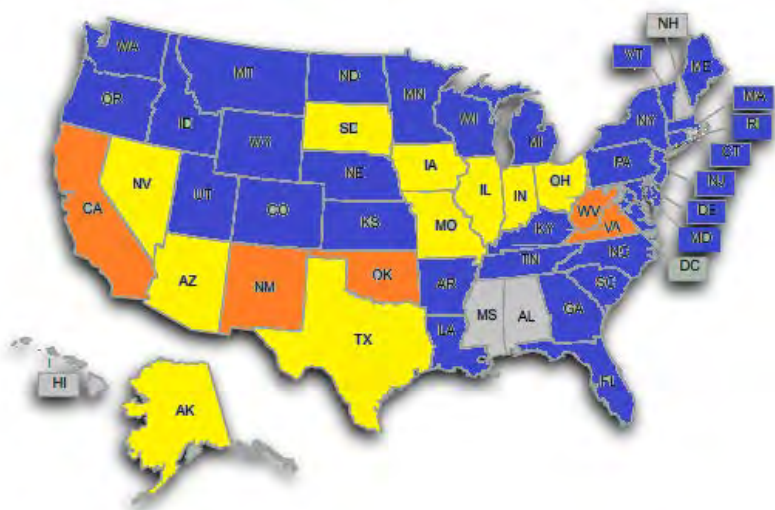
For more information on the NWCA study and final reports, please go to:

<http://water.epa.gov/type/wetlands/assessment/survey/>

Core Element #2: Monitoring and Assessment – Wetland Mapping

Background: Wetland maps play a critical role in wetland regulation, monitoring, and restoration activities. For example, wetland maps may be used in some states for identifying wetlands regulated under state law (e.g. New York State). In other states they are used in landscape level monitoring and assessment. Maps are also valuable for identifying and tracking restoration activities, as well as a number of other uses.

Results: Access to wetland maps is becoming increasingly broad through the proliferation of state online “portals” (web-based sites that are accessible to the public) with links to state wetland maps. Thirty states provide access to state wetland maps through some form of online “portal” or dedicated website. Five additional states are in the process of developing these resources (NM, OK, VA, and WA). These states are identified in the map below.



- **State Online Portal with State Wetland Maps** (30 states)
- **Developing online portal** (5 states)
- **No portal** (10 states)
- **Unknown/No data available** (5 states)

What types of maps? Across the country, mapping and access to web-based maps has been growing. The vast majority states rely on maps from the National Wetland Inventory (NWI). Funding has been limited for NWI, and some states have concerns that the NWI maps do not accurately represent the current extent of their wetlands in the state. Additional states have developed their own maps and some also use NWI+ maps developed Ralph Tiner. For specific information, see individual state summaries.

Challenges with existing maps and lack of resources to update them: In some states, a lack of updated or promulgated maps (maps that are formally approved by a state legislature/governor) causes problems for wetland regulators. Out-of-date maps lead to inaccurate assessment of wetland loss, untracked changes in condition, or even the inability to regulate a wetland unless it is included on a state-approved wetland map (e.g. DE, NY and VT).



Photo credit: NPS

Examples of specific state-developed online portals that provide public access to wetland maps:

AR: Arkansas Wetland Resource Information Management System:

<http://awrim.cast.uark.edu/home/wetland-resources.aspx>

CA: California Environmental Resources Evaluation System (CERES) Program: <http://ceres.ca.gov/>

FL: MapDirect 5.0: <http://ca.dep.state.fl.us/mapdirect/gateway.jsp>

GA: Georgia GIS Portal: <https://data.georgiaspatial.org>

IN: DEC Mapviewer: <http://mtnhp.org/mapviewer/>

ME: Maine DEP Biological Monitoring Program Website:

<http://www.maine.gov/dep/water/monitoring/biomonitoring/data.htm>

MI: DEQ MapsViewer: <http://www.mcgi.state.mi.us/wetlands/>

MT: Riparian Mapping Center: <http://mtnhp.org/nwi/>

NC: Division of Coastal management Estuarine Shorelines GIS Data Download Page

<http://portal.ncdenr.org/web/cm/gis-data-download-page>

NJ: NJ Geo-web: <http://www.nj.gov/dep/gis/geowebsplash.htm>

NY: DEC GIS: <http://gis.ny.gov/gisdata/inventories/member.cfm?organizationID=529>

OK: The Oklahoma Water Resources Board NWI Maps

<https://www.owrb.ok.gov/learn/wetlands/NWImaps.php>

RI: Rhode Island Monitoring and Assessment Wetland Map Links:

<http://www.dem.ri.gov/programs/benviron/water/wetlands/wetdocs.htm>

SC: DNR Mapping Clearinghouse: <http://www.dnr.sc.gov/maps.html>

VA: WETCAT: http://www.mawwg.psu.edu/docs/resources/VA_Assessment_Tool_Summary.pdf

WA: Coastal Atlas Website: <https://fortress.wa.gov/ecy/coastalatlas/>

WI: Surface Water Data Viewer: <http://dnr.wi.gov/topic/surfacewater/swdv/>

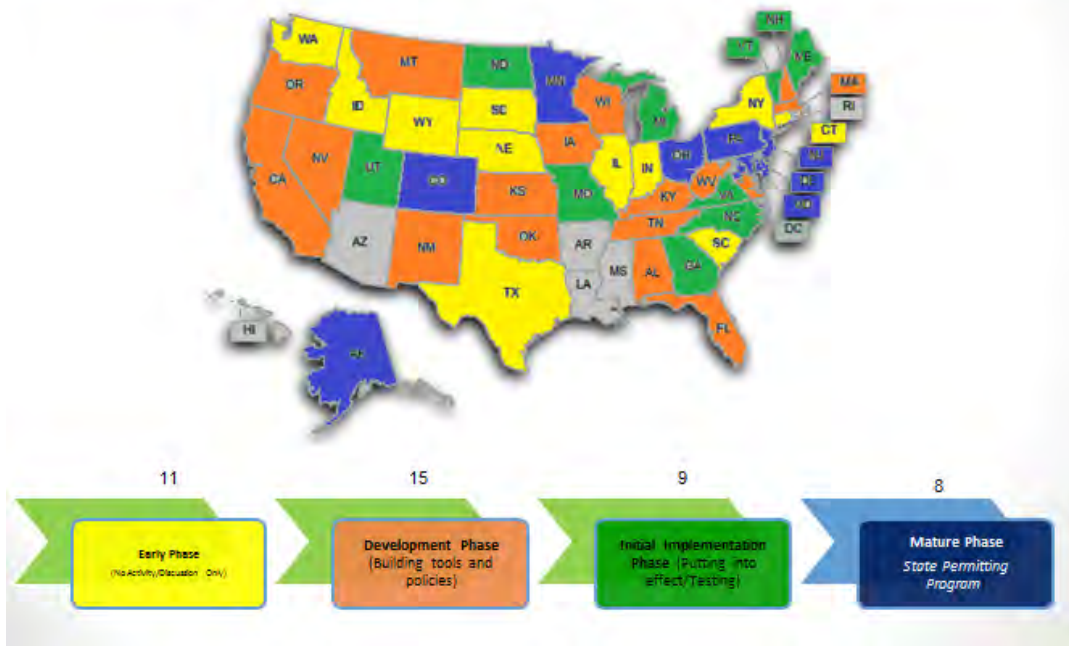
ASWM Wetland Program Development Continuum: Monitoring and Assessment Core Element

Background: This section reviews the status of state wetland monitoring and assessment program development by examining the placement of state programs along ASWM's *Wetland Program Development Continuum*. (A full description of ASWM's Continuum can be found in the report's Introduction Section on p. 21). ASWM developed the Continuum to share information about each state's progress on developing EPA's four core elements. Placement along the continuum was determined jointly by ASWM and state wetland program staff as part of the study's state verification process. The continuum does not evaluate the quality of the state's performance on the element, but rather provides a qualitative assessment of where along a life cycle the state's wetland program lies for each element.

Results: Nationwide, the monitoring and assessment core element appears to be in a period of notable growth. Eight states indicated that their state wetland monitoring assessment programs are in the mature phase, actively working to implement ongoing monitoring and assessment programs and nine states are in the initial implementation phase, having moved to the implementation and evaluation phase with their newly developed plans and tools. Fifteen states are in the development stage, working to design and/or formalize wetland monitoring assessment methods, tools and/or programs. Eleven states are in the early phase, either not working in this area or only beginning to think about monitoring and assessment efforts. Data is not available for the remaining seven states.

State Wetland Program Development Continuum

Core Element 2: Monitoring and Assessment

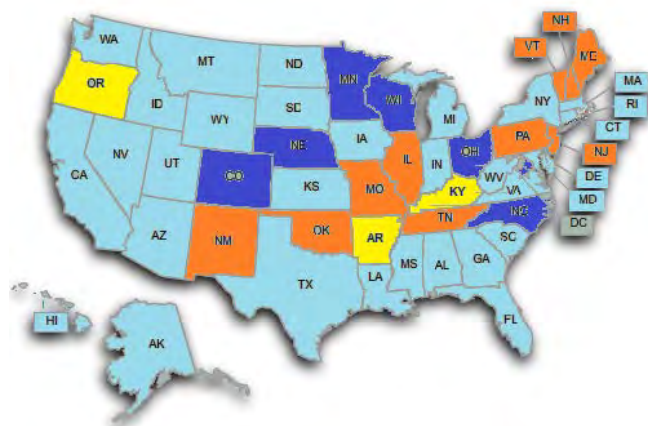


Core Element #3: Wetland Water Quality Standards

Background: Water quality standards are the foundation of the water quality-based pollution control program mandated by the Clean Water Act (CWA). They define the goals for a water body by designating its highest attainable uses, setting criteria that reflect the current and evolving body of scientific information to protect those uses, and establishing provisions to protect water bodies from further degradation. Historically, these standards have been developed for rivers, lakes, streams and other surface waters, often to set limits on point source discharges. Some of these standards can be applied to wetlands, but others cannot. States that use existing standards developed for other waters generally only apply a limited portion of their existing standards to wetlands.

Water quality standards developed specifically for wetlands help ensure that the provisions of the Clean Water Act, which apply to all surface waters, are consistently applied to wetlands. They also provide scientific basis for protecting waters of the state. Whether or not a state has wetland-specific water quality standards can be defined in a number of ways. For the purpose of this report, ASWM was interested in determining whether or not wetland-specific standards existed formally in a state, as well as whether the states without wetland-specific standards applied non-wetland-specific standards to wetlands.

Results: The majority of states apply some form of water quality standards to wetlands. Six states have wetland-specific water quality standards and ten states are in the process of developing them. Thirty-one states report applying existing (not wetland-specific) water quality standards to wetlands. Those that apply other standards to wetlands fell into three different categories: 1) states that want to develop new wetland-specific water quality standards; 2) states that are not planning to develop wetland-specific standards because they believe their current water quality standards adequately protect wetlands -these include AL, CT, FL and WV; and 3) states that identified a need for water quality standards for wetlands, but do not have plans to develop wetland-specific standards. Only three states indicate that they do not apply any water quality standards to wetlands.



* RI has wetland-specific designated uses, but no other wetland-specific water quality standards

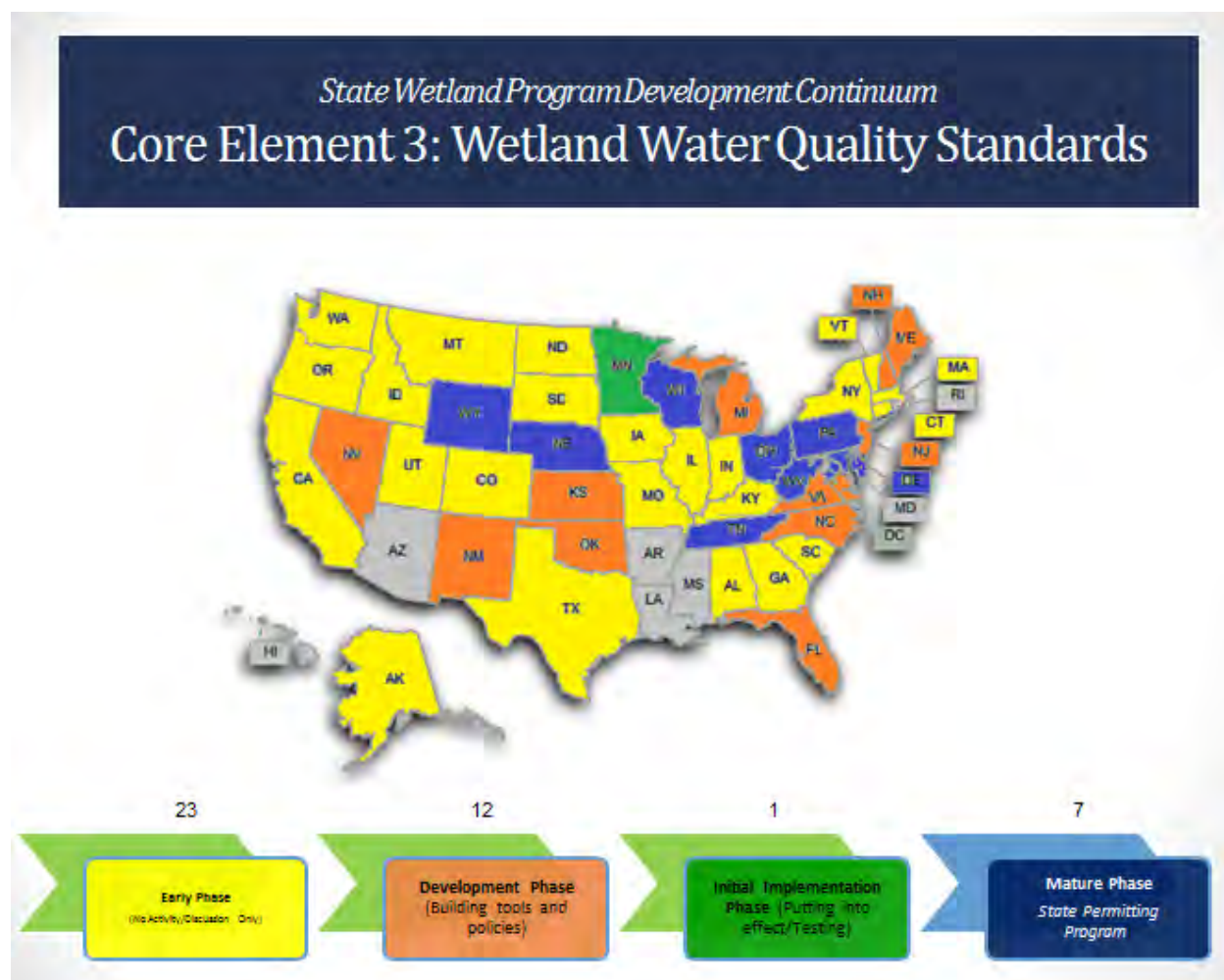
**AR has an antidegradation policy that includes wetlands, but no other wetland-specific water quality standards

- **Have state wetland water quality standards** (6 states)
- **Developing state wetland water quality standards** (10 states)
- **Rely on/apply existing state wetland water quality standards** (31 states)*
- **State has no water quality standards applied to wetlands** (3 states)**

ASWM Wetland Program Development Continuum: Wetland Water Quality Standards Core Element

Background: This section reviews the status of state wetland water quality standards development by examining the placement of state programs along ASWM's *Wetland Program Development Continuum*. (A full description of ASWM's Continuum can be found in the report's Introduction Section on p. X). ASWM developed the Continuum to share information about each state's progress on developing EPA's four core elements. Placement along the continuum was determined jointly by ASWM and state wetland program staff as part of the study's state verification process. The continuum does not evaluate the quality of the state's performance on the element, but rather provides a qualitative assessment of where along a life cycle the state's wetland program lies for each element.

Results: Seven states are in the mature phase of wetland water quality standards development, working to implement an existing set of wetland water quality standards. One additional state (MN) is in the early implementation phase, just starting to implement new standards. Twelve states are in the development stage, working to create new wetland-specific standards or at least formally exploring what it will take to develop them. Twenty-three states are in the early phase (with either no work in this area or only initial conversations about developing standards). Data was not available for seven states.



Core Element #4: Voluntary Wetland Restoration

Background: Voluntary wetland restoration and protection refers to wetland re-establishment, rehabilitation and protection activities undertaken to restore and improve wetland resources. These projects are not required by law and not subject to state or federal permit programs that require mitigation for unavoidable wetlands loss. While voluntary wetland restoration is not always subject to state and federal wetland permit requirements, it is quite common for the construction activities associated with restoration projects to trigger the



need for a permit. Although voluntary wetland restoration is actively happening across the country, most of this work is not being led by or funded primarily by states.

The primary driver behind much of this restoration work is federal dollars, with state programs evolving over the last three decades to support federal restoration programs (e.g. Conservation Reserve Enhancement Program - CREP). In order to target the inclusion of buffers in restoration activities, states provided additional support to complement federal restoration support. Beginning slowly in 1988 with the update of the North American Waterfowl Management Plan (NAWMP), states began broadening their focus in restoration and habitat improvement from work solely in state wildlife programs to a variety of programs, including state wetland programs. Today, the majority of voluntary wetland restoration work is being done through collaborations and is funded using federal grant dollars or other types of non-state funding (e.g. funds raised by nonprofits.) **(Photo caption: Wetland restoration in Kentucky; Photo credit: NRCS)**

Examples of non-state voluntary activities include land trusts purchasing titles or easements to wetland areas, community groups removing invasive species and planting native vegetation, and conservation programs that pay landowners to change practices such as cultivation or grazing that alter wetland areas, and, in some cases, a state run voluntary wetland restoration program. While by definition voluntary protection is not required, it can be secured through legally binding agreements, such as conservation easements. Whether as a stand-alone effort or as a complement to a state/tribal regulatory program, voluntary restoration and protection efforts help stem overall wetland losses.

Results: This study examined two different types of state voluntary wetland restoration efforts. First, the study determined whether or not a state had a **state-led voluntary wetland restoration program**. Only sixteen states have a formal state-run voluntary wetland restoration program plus two states in the process of developing a formal program. Thirty-one states have no formal state-led voluntary wetland restoration program.

State funding for voluntary wetland restoration work, whether state led or in support of decentralized efforts, comes from a wide range of sources, including but not limited to lottery funds, impact fees and 319 funds, as well as allocations from state general funds and grant programs. Technical assistance for voluntary wetland restoration is not universally available from states.

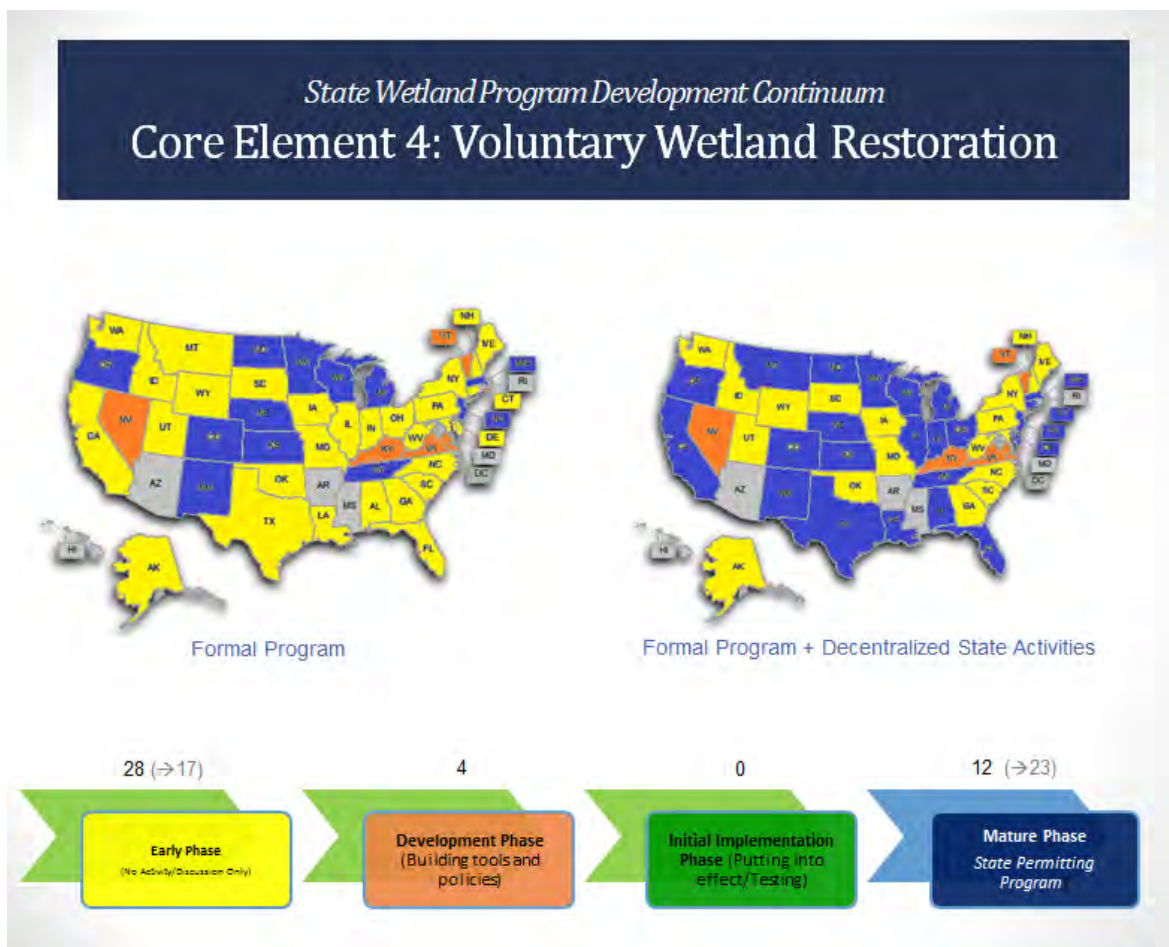


- Have a state-led voluntary wetland restoration program (16 states)
- Developing a state-led voluntary wetland restoration program (2 states)
- No state-led voluntary wetland restoration program (31 states)
- Unknown/no data available (1 state)

ASWM Wetland Program Development Continuum: Voluntary Wetland Restoration Core Element

Background: This section reviews the status of state voluntary wetland restoration program development and state involvement in other voluntary wetland restoration activities by examining the placement of state programs along ASWM's *Wetland Program Development Continuum*. (A full description of ASWM's Continuum can be found in the report's Introduction Section on p. X). ASWM developed the Continuum to share information about each state's progress on developing EPA's four core elements. Placement along the continuum was determined jointly by ASWM and state wetland program staff as part of the study's state verification process. The continuum does not evaluate the quality of the state's performance on the element, but rather provides a qualitative assessment of where along a life cycle the state's wetland program lies for each element.

Results: In light of this report's finding that a large portion of the nations' state voluntary wetland restoration efforts exist in decentralized form (instead of as one, coordinated state-led effort), progress along ASWM's Continuum in each state was looked at through two lenses. The first lens is one of progress towards having a state volunteer wetland restoration program. The other is how developed state engagement is in decentralized voluntary wetland restoration efforts in the state. For the first map (Map A), twelve states are in the mature phase, four are in the development phase and twenty-eight are in the early phase, with little or no progress towards developing a state-led program.



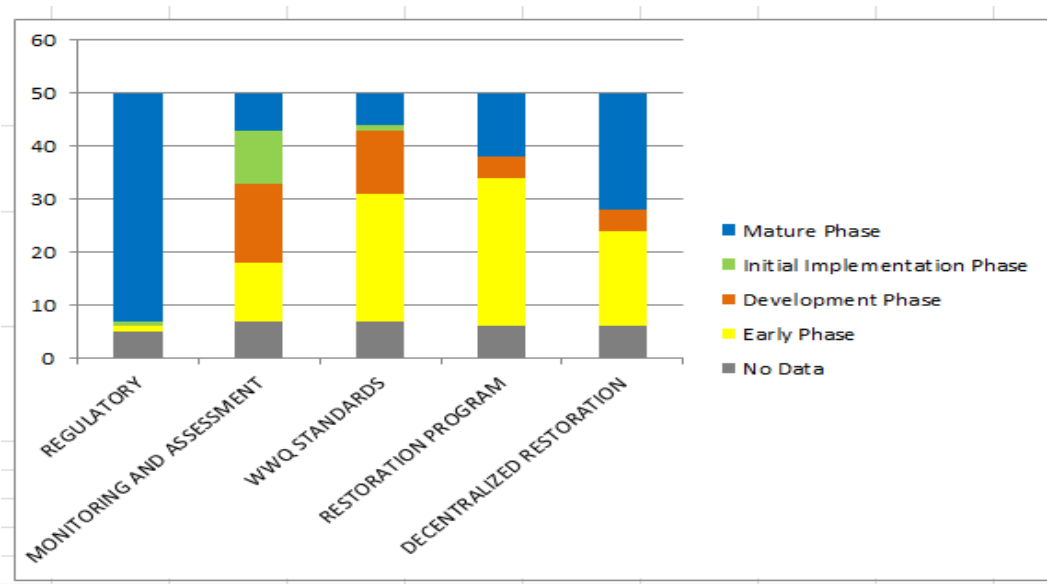
However, looking instead at the level of state engagement in decentralized activities (in this case often not led by the state), the map changes significantly. Map B illustrates the study's findings that when the definition of program development for this core element is expanded to include state involvement in these other efforts, twenty-three states are in the mature phase, four are in the development phase and seventeen are in the early phase.

ASWM Wetland Program Development Continuum: Looking Across the Core Elements

Background: At the end of each Core Element Results Section in this report, a summary is provided indicating how many states are located in each phase of the ASWM's *Wetland Program Development Continuum* for that Core Element. ASWM developed a series of summary graphics to share information about a state's progress on developing the four core elements. Placement along the continuum was arrived upon jointly between ASWM and state wetland program staff during the verification process. The continuum does not evaluate the quality of the state's performance on the element, but rather provides a qualitative assessment of where along a life cycle the state's wetland program lies for each element. This section provides a comparative analysis of state wetland program development across the country across all four Core Elements. A full description of the purpose and development of the Continuum can be found in the report's Introduction Section.

Results: The level of development nationwide in state wetland programs differs based on the Core Element being examined. While most regulatory programs are in the mature phase (at least in terms of having basic regulatory elements in place), wetland monitoring and assessment work is largely in the development phase. The majority of states are at the development or initial implementation stage. Most states are in the early phase of wetland water quality standards development, with a few states actively implementing standards, but most states relying on application of existing water quality standards to wetlands or applying no standards to wetlands at all. The study breaks down the voluntary wetland restoration core element into two forms – if looking at program development as only state-led, coordinated voluntary wetland restoration program, most of the majority of states lie in the early phase and most of the remainder in the development phase (with a few outstanding mature programs). However, if looking at state participation in decentralized voluntary wetland restoration activities, the national scene looks different, with at least half the states in the mature phase or the development phase and much fewer in the early stage.

Figure X. Development of State Programs Compared Across EPA Core Elements

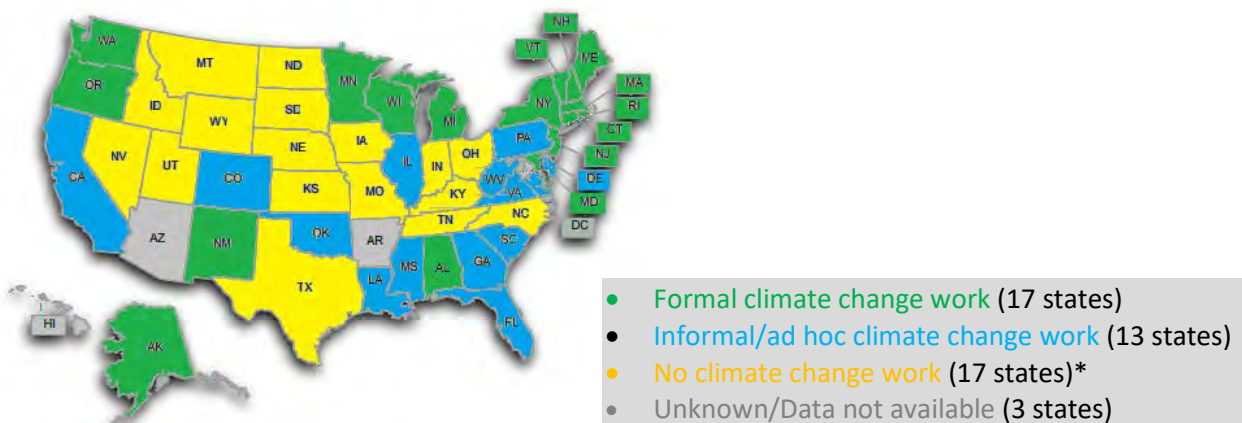


State Wetland Programs and Climate Change Work

Background: Climate change poses a number of threats to the sustainability of wetlands in the U.S. The degree of impact and nature of potential changes to wetland resources vary from region to region. In addition, wetlands provide many functions and services that can reduce the impacts of climate change on humans and wildlife populations, including providing water storage to protect drinking water supplies and reduce flooding and drought, reducing loss of habitat for wildlife, filtering stormwater, and providing buffers for storm surge and sea level rise. ASWM asked states to verify whether or not through their wetland programs they were doing anything formally or informally to address climate change.

Results: Seventeen states have reported that they are *formally* working on or engaged in this work. Thirteen states share that they do some limited work related to climate change on an *informal/ad hoc basis*. Informal involvement with climate change and wetlands includes participation in conversations, thinking through how specific permitting and other activities should be adapted to address climate change and other activities. Many of these informal activities are related to studying or planning for sea level rise, drought and impacts on specific weather-dependent industries (e.g. ski industry). These are activities which are not being *labeled* as formal climate change work, but are working to address the predicted impacts of climate change. Seventeen states had interviewees reporting that they *do no climate change work related to wetlands*.

Additionally, while state wetland programs may not be working on wetlands-related climate change strategies at the *state-level*, many state wetland staff reported that some work on climate change or adaptive planning related to these kinds of events is happening at *regional and/or local levels* (e.g. UT, WY).



*Although Kansas does not have a formal climate adaptation effort that includes wetlands, the state is has a new grant from EPA to study the conversion of farm ponds to wetlands, which impacted by changes in weather patterns in their state.

*WY does not generally work on climate change issues in the wetland program, but have participated in a habitat/species resiliency study.

State Wetland Programs and Natural Hazard and Extreme Weather Events

Background: In addition to the formal and informal climate change activities already mentioned, ASWM has identified a significant body of adaptation planning for extreme weather events that is occurring in states that have not been doing climate change work with wetlands but are addressing natural hazards and extreme precipitation events.

Results: This map shows that 9 of the 17 states that verified their state wetland program does no formal or informal work on climate change issues are doing *adaptation work in response to extreme weather events*. Examples of these adaptation efforts include stormwater management, water retention projects, integrated floodplain management, sea level rise/storm event planning, culvert replacement, and others.



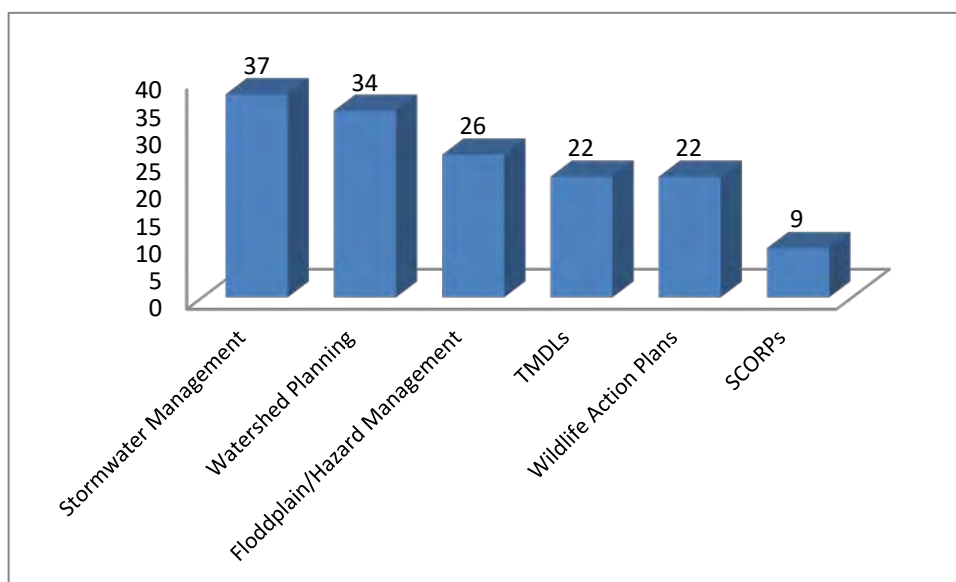
- State wetland programs involved in “other” adaptation work that do not do climate change work (9 states)
- State wetland programs that do no climate change work or other related adaptation work (8 states)
- State wetland programs engaged in either formal or informal climate change work (30 states)
- Unknown/Data not available (3 states)

Integration between State Wetland Program and Other State Management Efforts

Background: Integration and collaboration between various other state programs (i.e. water, wildlife and natural hazards) and state wetland programs can provide a more comprehensive, cost-effective approach to addressing water quality issues. Although this study does not look at the quality of these connections, several types of program integration are documented.

Results: The most common type of integration was with stormwater management (37 states), followed by watershed management (34 states) and flood/hazard control programs (26 states). Coordination activities were found in some states with the state's Total Maximum Daily Load (TMDL) program (22 states). Finally, the formal inclusion of wetlands in two selected state-level resource plans: Wildlife Action Plans (22 states) and Statewide Outdoor Recreation Plans (9 states) was less common and scattered across the nation.

**Number of States with Integration
Between Wetland Program and Other State Program Activities**



For information about the specific types of integration taking place in each state, please refer to ASWM's State Wetland Program Summaries for all 50 states.

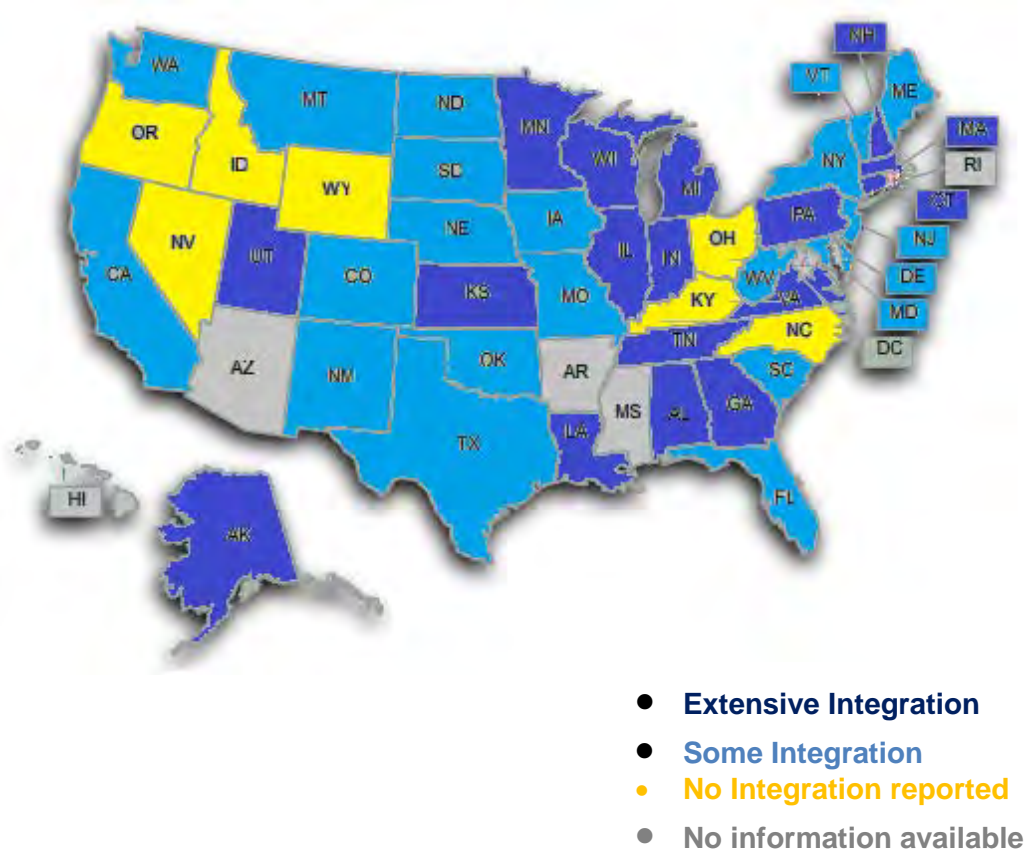
Note: Integration results do not reflect each of the actions related to protecting or conserving wetlands being made by non-wetland program staff. In other words, other state managers may be taking wetlands into consideration, but not through formal coordination with the state wetland program.

Integration: State Wetland Work and Stormwater Management

Background: Stormwater is rainwater and melted snow that runs off streets, lawns, and other sites. Stormwater runoff can cause a number of damaging impacts, including contaminated waterbodies, downstream flooding, stream bank erosion, increased turbidity from erosion, habitat destruction, changes in the stream flow hydrograph, combined sewer overflows and infrastructure damage. The relationship between wetlands and stormwater goes two directions: 1) stormwater carries pollutants into and can change wetlands in a number of potentially problematic ways and 2) wetlands can serve as sinks, filters and buffers for stormwater/extreme weather events for downstream aquatic resources, providing valuable and often underutilized resources for integrated stormwater management. This study focuses on the presence of wetland-stormwater integration in states and types of activities working across programs to make connections between wetland and stormwater management.

Results: Study results show a proliferation of work between wetland programs and stormwater management programs at the state level. Thirty-seven state wetland programs were able to identify some form of wetland-stormwater co-consideration or management. There is great diversity in wetland-stormwater integration activities among the states.

States with Wetland Program-Stormwater Management Integration



Examples of State-level Wetland and Stormwater Management Integration

(The following table provides examples of the range of integration activities that have been identified among states; it does not provide a list of all integration activities in each state).

Type of State-led Integration Effort	Examples of States with this Type of Integration
Have shared/joint permitting between dredge and fill permits/401 water quality certifications and NPDES stormwater permitting	PA Coastal Only - AL, LA
Conduct Joint project reviews	GA, FL, IN, MD, MN, NJ, SC, SD, UT, WI
Coordinate joint involvement in physical site inspections	TN
Developed processes for project-based comment letters between permitting programs	TX
Formalized stormwater standards specifically for wetlands	MA
Developed stormwater standards specifically for wetlands	MA
Formally integrated wetland considerations into stormwater best management practice (BMP) manuals	IN, LA, ND, WV
Formally integrated wetland considerations into stormwater permits	KS
Included wetlands in stormwater post-construction requirements	MO, WV
Developed extensive gray-green infrastructure projects that include natural and/or constructed wetlands in stormwater management projects	NY, WA
Included wetlands in low impact development (LID) projects	NE, NY, WA
Connected/prioritized restoration activities jointly including criteria for stormwater and wetlands	IL, MI
Included wetland considerations in determining buffer requirements for construction projects	MO
Created information linkages through shared posting of information on requirements	RI
Coordination on outreach and education	NH
Cross-training of management staff	NH

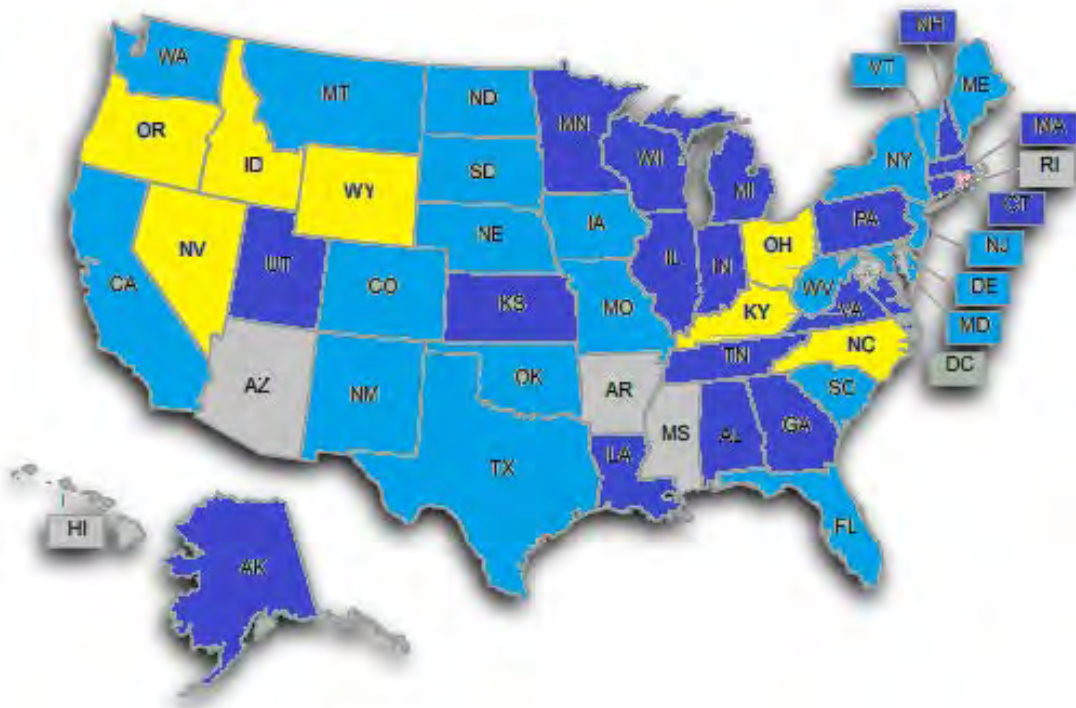
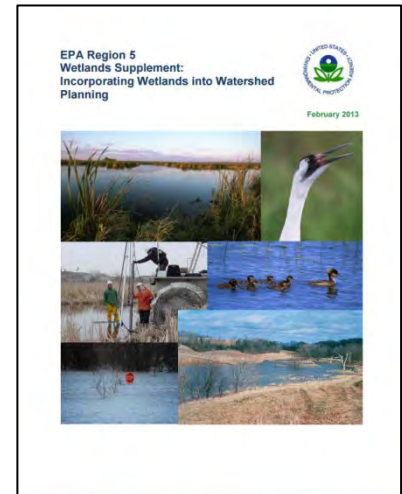
Staff Connections: A number of states indicate that they have regular (monthly, quarterly) meetings between wetland and stormwater managers; others indicated only occasional or project-specific meetings; while yet others said that discussions were limited to informal conversations when a specific concern arose.

The Value of Co-Location or Shared Management Chains: Although this study was not designed to determine causal relationships, the importance of co-location of offices and staff should be explored in future research, as there appears to be some initial evidence that whether or not offices share the same supervisor, management chains or location may have a role in the likelihood (and perhaps even quality) of this integration. Examples of states where proximity has been identified as a key factor in integration include Indiana, Michigan, Pennsylvania, Virginia, and Wisconsin.

Integration: State Wetland Work and Watershed Planning

Background: EPA encourages the inclusion of proactive wetland management into watershed plans because wetlands play an integral role in the healthy functioning of the watershed. EPA promotes a watershed approach that not only protects existing wetlands but that also maximizes opportunities to use restored, enhanced, and created wetlands to address watershed problems such as habitat loss, hydrological alteration, and water quality impairments.

Results: Thirty-eight states have some form of integration between wetlands and watershed planning that involves state staffing and/or other resources. Seventeen states have formal ties between state wetland program work and watershed planning, while twenty-one states have informal connections. Seven states have no integration activities between their wetland program and watershed planning program.



- **Extensive Integration** (17 states)
- **Some Integration** (38 states)
- **No Integration reported** (7 states)
- **No information available** (5 states)

Examples of State-level Wetland Management and Watershed Planning Integration

(The following table provides examples of the range of integration activities that have been identified among states; it does not provide a list of all integration activities in each state).

Type of State-led Integration Effort	Examples of States with this Type of Integration
Integration of wetlands and watershed planning in a comprehensive manner across all four core elements --- through closely-coordinated integrated management	CA, NH, VT
Integration of wetlands and watershed planning in a comprehensive manner - across all four core elements --- as a result of overarching state legislation	MA (e.g. Massachusetts' watershed-based management act)
Building wetland-watershed planning integration into formal state plans (e.g. wetland considerations integrated into basin plans)	WY, ND, WI, VT
Permitting decisions that rely on integrated considerations --- i.e. watershed approaches to permitting	FL*, TN
Integrated restoration activities---including wetlands in watershed restoration plans	MT, NE, NY, VT
Integrated restoration activities ---committing staff time to work on tying together wetland restoration with ongoing and developing watershed planning efforts	IN
Integrated restoration activities ---restorations include watershed assessments	OR
Connecting wetlands with watershed planning through funding requirements	AL, NM, OH
Building wetland-watershed planning integration into urban planning efforts in MO and others, such as the Growing Greener Program in PA.	MO, PA
Adoption of a "one watershed, one plan" approach that includes wetlands as well.	MN
Track data about wetlands and watershed management in one tracking tool	NH
Use a wetland prioritization tool within watershed planning efforts	OK
Wetland management structure has a watershed framework	CO
Integrating wetlands and watershed planning into planning tools (e.g. the State of Virginia's WETCAT Tool)	VA
Including a wetland chapter in zoning manuals	NH
Conducting a statewide culvert inventory (incl. wetlands and looking at watershed level needs)	NH
Cross-training of staff between programs	NH

*However, the State of Florida encourages this approach at the municipal level, rather than requiring it at the state level.

Integration: State Wetland Work and TMDL Program Implementation

Background: A Total Maximum Daily Load (TMDL) is a regulatory term in the U.S. Clean Water Act, describing a value of the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. Each state must develop TMDLs for all the waters on the 303(d) list. It is at the discretion of states to set priorities for developing TMDLs for waters on the 303(d) list. Although states are not required under section 303(d) to develop TMDL implementation plans, many states include implementation plans with the TMDL for an impaired water or develop them as a separate document. When developed, TMDL implementation plans may provide additional information on what point and nonpoint sources contribute to the impairment and how those sources are being controlled, or should be controlled in the future.

Results: A number of states have found ways to integrate wetland management with state TMDL work. A total of twenty-three states link wetland program considerations with TMDL planning or implementation. Information about integration with TMDL work was not available for all states.



- **State Engaged in One or More Type of Integration** (23 states)
- **No Integration reported** (17 states)
- **No information available** (10 states)

Examples of State-level Wetland Management and TMDL Program Integration

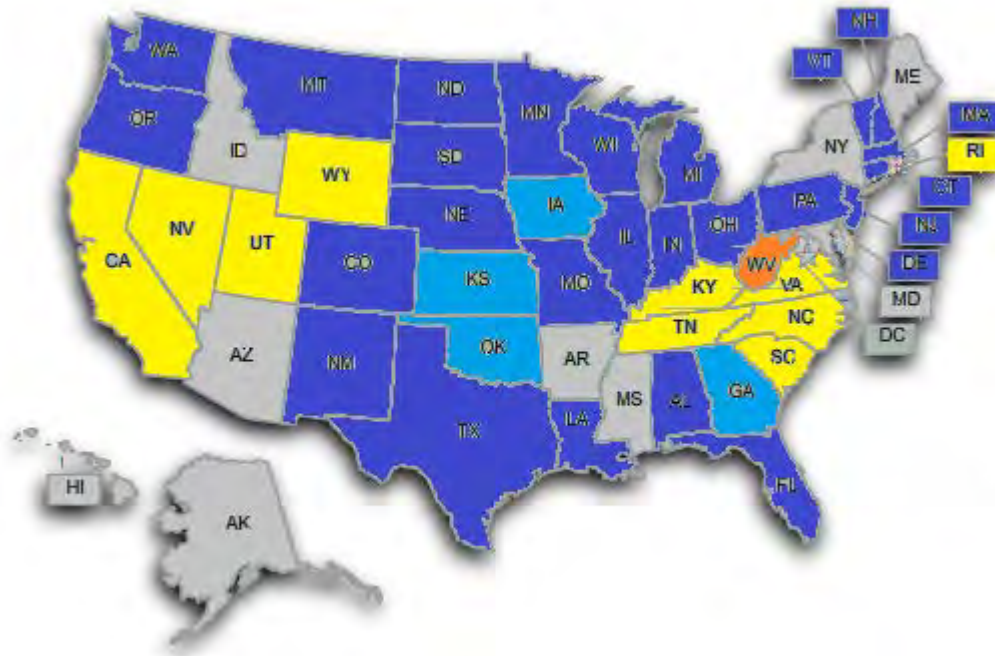
(The following table provides examples of the range of integration activities that have been identified among states; it does not provide a list of all integration activities in each state).

Type of State-led Integration Effort	Examples of States with this Type of Integration
Have TMDLs for some wetlands	KS
Include requirements for discharges to wetlands as part of TMDL-related permit conditions	AK
Restoration of wetlands in specific watersheds as part of TMDL plans	MI, ND
Establishment of wetland complexes to remove pollutants	WY
Use of constructed wetlands to achieve TMDL compliance	AL
Include wetland restoration in Best Practices for TMDL compliance	IN, MD, ND
When staff look at stormwater compliance, also look at wetlands in TMDLs	NJ
Potentially connect wetlands and TMDLs in urban streams, related to mitigating source factors	ME
Efforts to make the state's Low Impact Development (LID) Manual consistent with Wetland and TMDL requirements	AL
Include wetland restoration or creation in best practices to reduce pollutant loads (e.g. reduction of sediment and temperature) (WA)	WA
Technical assistance for cross-pollution issues between wetlands and TMDL work (assistance from same office)	MN
TMDL program relies on some resources from the wetland program	WI
General coordination between programs	SC
There is some overlap, but the work is coordinated by different staff	VA

Integration: State Wetland Work and Flood/Hazard Mitigation

Background: Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and flood waters. Trees, root mats, and other wetland vegetation also slow the speed of flood waters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion. Wetlands within and downstream of urban areas are particularly valuable, counteracting the greatly increased rate and volume of surface- water runoff from pavement and buildings. The holding capacity of wetlands helps control floods and prevents crop damage from flooding. Preserving and restoring wetlands, together with other water retention actions, can often provide the level of flood control otherwise provided by expensive dredge operations and levees. (Source: <http://water.epa.gov/type/wetlands/flood.cfm>)

Results: Twenty-five states have some type of integration with floodplain/hazard mitigation. An additional four states are doing this integration work on an informal level and one (WV) is in the process of developing integrative efforts. Ten states have no integration in this area. Information was not available for nine states.



- **State engaged in formal integration** (25 states)
- **State engaged in informal integration** (4 states)
- **Developing integrative activities** (1 state)
- **No Integration reported** (10 states)
- **Unknown/Data not available** (9 states)

Examples of State-level Wetland Management and Flood/Hazard Mitigation

(The following table provides examples of the range of integration activities that have been identified among states; it does not provide a list of all integration activities in each state).

Type of State-led Integration Effort	Examples of States with this Type of Integration
Permitting <ul style="list-style-type: none"> Deny 401 certification if there is a flood hazard Consider flood storage in wetland permitting decisions (built into Environmental Resource Permitting) Participate in the Corps' public notice process on flooding projects 	OH FL TX
Coordination Between Programs/Program Staff <ul style="list-style-type: none"> Work with Flood Plain/Drainage Program/Staff Wetlands, Dam and Flood Management programs all work together Wetland program integrated with state flood management efforts Floodways and wetland management overlap 	FL, CO, MT, OK WI WA VT
Planning <ul style="list-style-type: none"> Large flood reduction management plans include wetlands Wetlands in State's Natural Hazards Mitigation Plan Redoing regulations to discourage development in floodplain areas (Blue Acres Program) 	MN OR NJ
Wetlands to Address Flooding <ul style="list-style-type: none"> Use of wetlands to reduce flood flow on the Mississippi River Corps has huge focus on Missouri River flooding that includes wetlands Wetlands restoration is often focused on as part of floodplain restoration Promote wetland restoration for upper watershed storage 	MO NE IL ND
Education and Outreach <ul style="list-style-type: none"> Working on education and outreach with state floodplain staff 	MT
Emergency/Hazard Management <ul style="list-style-type: none"> Work with floodplain managers in the FEMA flood zone – including consistency reviews Wetland program staffer serves as representative on state emergency management agency (MEMA) for coastal zones Work closely with Disaster and Emergency Services staff Working on river storage project to reduce fire danger Post-incident river response Integration occurs post-emergency Fluvial erosion hazard work 	CT MA MT NM NH AL NH
Other <ul style="list-style-type: none"> Septic tanks cannot be installed in wetlands Aquatic organism passage Work closely with Conservation Districts Bureau 	SD NH MT

State Total Full-time Equivalent (FTE) Staffing by Core Element

Background: State programs have varying capacities to carry out programs within their state. One important indicator of state wetland program capacity is staffing. States were asked to verify their state's level of staffing for each of the Core Elements in 2014. It is important to note that collecting information about efforts for each core element was a complex process of both document review and verification. First, in many states, staffing is not specific only to wetlands and determining a percentage of time spent on wetland-specific work was difficult to determine. Second, in many cases, staff members'



time spent on wetlands was a small percentage of that person's time or ad hoc. Third, frequently a portion of a state's wetland program funding is supported through one or more indirect or limited term sources, such as university partners, intern and student assistance, non-profit in-kind partnerships, temporary or time-limited grant funded staff, or others sources. Including these in state program FTEs is complicated. Inclusion or exclusion of these hours has drawbacks. Finally, because wetland programs are often run out of different state agencies (e.g. regulatory program in DEP, voluntary restoration in DNR, etc.) State staff interviewed often simply did not know what the staffing levels were in other agencies. Consequently, the data collected provides at **best "ballpark" estimates** of staffing levels by Core Element.

The following maps summarize the **approximate range of full-time equivalent (FTE) staff dedicated to each of the four core elements by state**. The FTE figure represents the summed staff FTE from all appropriate agencies and positions. For example, if DEP has .25 of a staff person dedicated to wetland permitting and DNR has .50 of a staff person reviewing permits, then the total FTE reported on the map for the state's regulatory program would be .75 FTE).

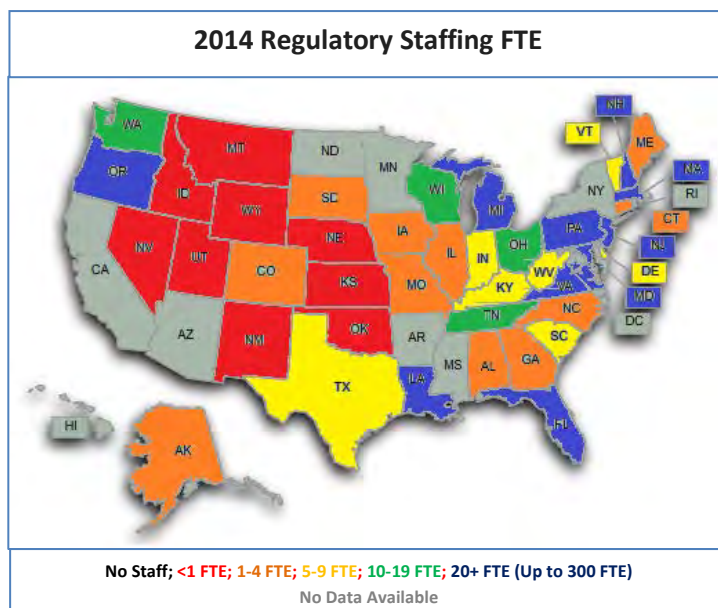
On the maps in the following section, staffing numbers are **grouped into six FTE categories**: None (no staff); less than one FTE, 1-4 FTE, 5-9 FTE, 10-19 FTE and 20+ FTE (up to the highest FTE total of 300 FTE).

Finally, this report documents estimated FTEs, but **does not indicate whether or not the number of FTEs are adequate** to address the wetland program needs of the state. Staffing needs for the same program can be different from state to state. For example, some states have few wetland permit applications annually, while others receive hundreds of applications. Therefore, wetland FTE numbers alone do not indicate whether or not staffing levels are adequate to carry out programs.

For specific information about wetland program staffing in each state, please refer to **ASWM's individual State Summary documents**.

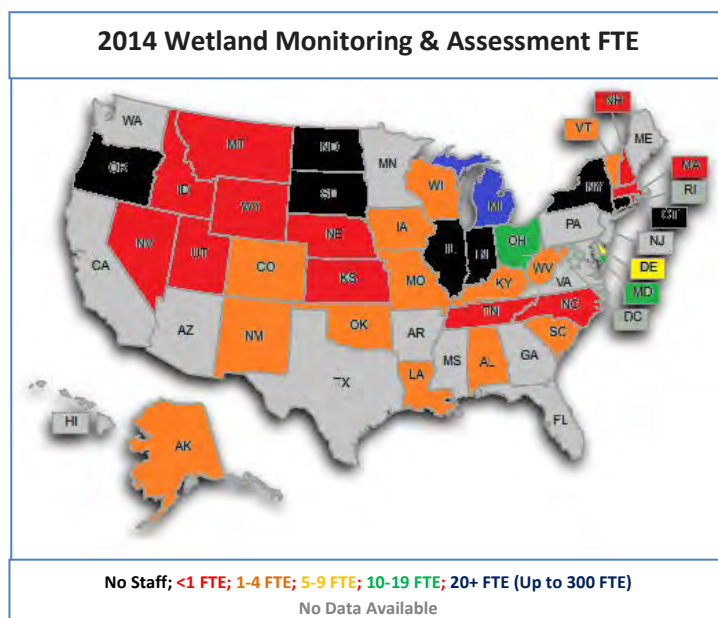
Wetland Regulatory Staffing Results

Forty-two states dedicate at least some staff time to wetland regulatory work. Nine of these states provide less than one FTE for all wetland regulatory work in the state and another 11 states have between 1 and 4 staff for this work. Seven states have between 5-9 FTE working on wetland regulatory issues, with an additional four states having between 10 and 19 FTE and the final ten states have 20 or more FTE. Regulatory staffing FTE data were not available for 9 states.



Wetland Monitoring and Assessment Staffing

Results: Seven states provide no staff time for the task of wetland monitoring and assessment in their state. Eleven states provide less than 1 FTE, 13 states provide between 1-4 FTE of support for this task. One state has 5-9 FTE and only one state has more than 20 FTE dedicated to monitoring and assessment. These FTE numbers are notably less than regulatory FTEs and are often tied to grant funding from EPA and partnerships beyond state agencies. Many states could not verify the number of FTE dedicated to this wetland work. Monitoring and assessment staffing FTE data were not available for 15 states.



Wetland Water Quality Standards Staffing

Results: Staffing is far more limited across the nation for work either developing or implementing wetland water quality standards. Twenty states provide no staff time dedicated to working in this program area. Ten states provide less than one FTE and 2 states provide between 1-4 FTE to support this core element. Many states could not verify the number of FTE dedicated to water quality standards for wetland work. Oklahoma has made a major staffing commitment to developing these standards. Wetland water quality standards staffing FTE data were not available for 15 states.

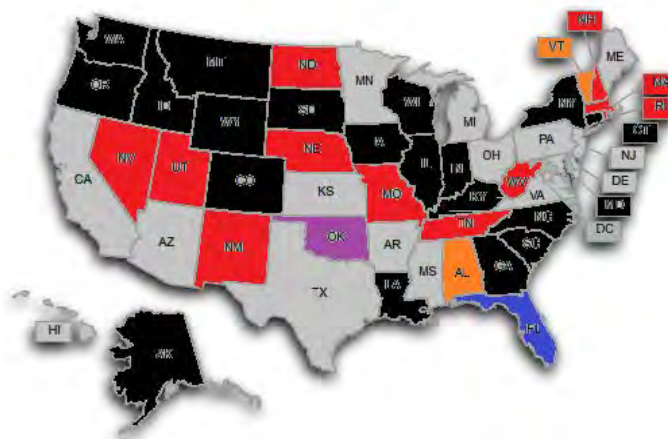
Voluntary Wetland Restoration Staffing Results:

Most states were not able to identify how many staff worked on voluntary wetland restoration, as it was usually not run out of the agency in which the state wetland program was located. In some cases, work related to voluntary wetland restoration projects was not a formal part of a staff position's work, but rather their involvement was ad hoc, usually focused on providing occasional technical assistance as needed. Nine states were able to verify that they had no staff working on these restoration activities. Eight states provide less than one FTE. Six states provide between 1-4 FTE to support this task and one state provided 5-9 staff and one state provided 20+ staff. Many states could not verify the number of FTE dedicated to this wetland work. Voluntary wetland restoration staffing FTE data were not available for 25 states.

Preliminary Indications of a Decline in Staffing Resources and Associated Challenges

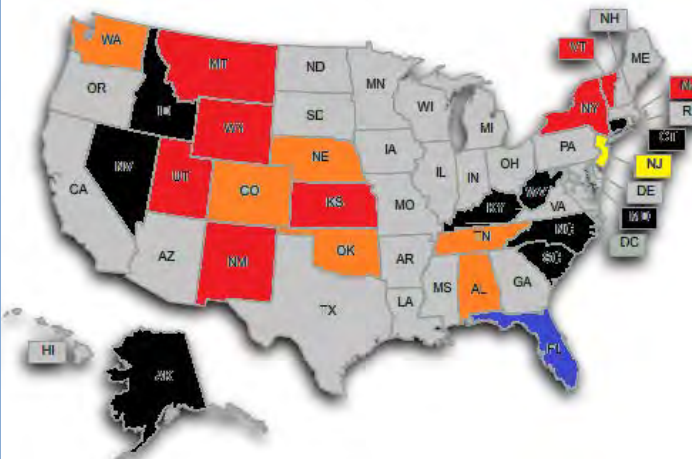
As already noted, this report documents estimated FTEs, but does not indicate whether or not the number of FTEs are adequate to address the programmatic needs of the state to implement the core element programs. However, a number of states did indicate that their staffing numbers have declined without commensurate reduction in workload over the last several years. State wetland program staff indicated that changes in program resources have been in response to the economic downturn and subsequent budget cuts, changes in funding available in state staff budgets, changes in state leadership, retirements and job changes, state agency restructuring, and a lack of access to adequate training.

2014 Wetland Water Quality Standards FTE



No Staff; <1 FTE; 1-4 FTE; 5-9 FTE; 10-19 FTE; 20+ FTE (Up to 300 FTE)
No Data Available

2014 Voluntary Wetland Restoration FTE



No Staff; <1 FTE; 1-4 FTE; 5-9 FTE; 10-19 FTE; 20+ FTE (Up to 300 FTE)
No Data Available

ASWM Status and Trends Study Conclusions

Wetland programs are in various stages of development across the United States and take on a large number of forms, ranging from well-developed formal state programs that comprehensively address all four core elements to programs that rely on 401 certification as their primary area of wetland protection effort at the state level. The area of greatest growth is in monitoring and assessment, both the development of tools and techniques, as well as the expanded implementation of monitoring and assessment efforts. Few states offer the full complement of state wetland water quality



standards or plan to in the near future. The study finds that this is not necessarily a negative in all contexts, since many states are able to apply a portion of their existing water quality standards for other surface waters to wetlands. The least well-developed element nationwide is voluntary wetland restoration under the leadership of a state-led wetlands program. Voluntary wetland restoration is happening across large parts of the country; however, this work is often composed of decentralized state activities in partnership with other non-state partners. **(Photo credit: National Park Service)**

What the Report can tell us and What It Can't

ASWM conducted this study as a snapshot of wetland programs across the United States. Information was collected from a range of official sources and verified by state wetland program staff. However, it does not represent the full range of potential contacts within each state or agency and thus may not capture the full scope of activities in each state. ASWM encourages use of this report as a broad-brush analysis and recommends following up with contacts identified in the individual state summaries to discuss the specifics of individual state activities and efforts.

Wetland Regulation

The study finds that almost all states have active regulatory programs for the permitting dredge and fill activities and/or conditioning federal wetland permits. There is a great deal of variability in state authorities and arrangements with the Army Corps of Engineers to deliver federal/state dredge and fill programs. It may be useful to conduct further research on how well these programs are protecting wetlands and what resources and technical assistance could strengthen this state regulatory work.

Wetland Monitoring and Assessment

Across the nation, the area of greatest growth among the Core Elements is in the area of monitoring and assessment --- both the development of tools and techniques and the implementation of monitoring and assessment efforts. This work is largely supported by federal initiatives such as US EPA Wetland Program Development Grants and the National Wetland Condition Assessment. This time of growth provides an ongoing opportunity to target resources and technical assistance to strengthen these efforts. Both the tools and templates described in this report and resources that will emerge out of current development activities provide a novel (new? Innovative? Unique?) opportunity for sharing and adaptation. **(Photo Title: Macroinvertebrate Monitoring in a Maine Wetland ; Photo Credit: Maine DEP)**



Wetland Water Quality Standards

There is only limited development in the areas of wetland water quality standards, with minimal investments of staff and resources and few states that indicate that this will be an area of development in the near future. Only a handful of states have formally adopted a full set of wetland water quality standards. Although a number of states make the case for alternatives to wetland-specific standards (using existing standards for other surface waters), the role of developing standards for those states that rely primarily on 401 certifications should be explored. There may be benefits to targeting development resources and technical assistance to these states where wetland water quality standards may have greater impact on wetland protection.

Voluntary Wetland Restoration

Voluntary wetland restoration is occurring all across the U.S. However, in the majority of cases, states do not lead this work. Instead, they are one of many collaborative players working together to restore wetlands through voluntary initiatives. There also appears to be limited knowledge of these programs by wetland staff in the other wetland programs in the state. Wetland staff at both the state and national level would benefit from exploring how to support these efforts. In states where the state does not lead voluntary restoration efforts, it could be beneficial to encourage collaborative planning that is in line with the fourth core element.

Wetland Programs and Climate Change

Wetland program managers and those that support them may also need to think more broadly about how states can address extreme weather events. With many state wetland programs are not actively engaged in climate change work or at least not encouraging climate change efforts in ways that are

engaging wetland program staff, there is a need to look more broadly at state activities (e.g. water retention projects, stormwater management) to find points of action that can be supported by state wetland programs. States also need to think in terms of both threats to wetlands and the benefits wetlands can provide when reviewing integration opportunities.

Integration of Wetland Programs with Other State Programs

There is substantial integration work underway between state wetland programs and other state programs across the United States. This report documents a broad spectrum of integration activities, ranging from limited discussion to full integration between regulatory program implementation. Potential models/case studies were identified in the areas of stormwater, watershed planning and flood/hazard management. Better understanding of how, why, in what context and to what end these integration examples have been successful will clarify their potential to be useful as examples for other states.

Wetland Program Staffing

This study also finds preliminary evidence of a slow erosion of state wetland program staffing and support over the last ten years. Many states have lost some level of support in terms of funding, staffing, support for tool development or loss of experience through retirements and job changes. Additional research is needed to confirm these potential trends.

Research and Training Needs

The study finds numerous areas where additional research is required to better understand wetland programs and the support needed, as well as training that would assist state programs in better protecting wetlands and implementing EPA's four Core Elements. In the following two sections, ASWM outlines key areas of future research and training needs that could support state wetland programs and their staff. **(Photo caption: Wetland Soil Types; Photo credit: National Park Service)**



In Conclusion: An Opportunity to Share What Works

ASWM's study describes both the diversity of wetland programs across the nation and identifies examples, models and templates for states to use as they seek to explore new options and develop their respective programs. States, tribes and even federal and local government seek successful examples, lessons learned and tools from other states that they can adapt and present to their leadership to bolster their wetland program development efforts. The resources documented in this report provide a starting point for peer-to-peer sharing among wetland program managers, tribes, EPA, ASWM and other entities that support state wetland program development to identify opportunities for shared learning.

Recommendations for Training

Although the study did not specifically solicit information about training or future research needs, during the course of the study's verification conversations, states identified numerous training and technical assistance needs and future research topics emerged. Related to training, many states referenced the need for low-cost, easy access general training for new staff and training on emerging topics for experienced staff with limitations on travel and training budgets. They also expressed the need for a combination of delivery mechanisms, ranging from online trainings to workshop-based and on-the-ground training opportunities. **(Photo title: Arctic wetlands; Photo title: credit: Torre Jorgenson)**



Specific areas for training include the following:

Wetland Regulation Training

- Training on wetland-specific regulatory topics (especially for junior staff), such as how to determine when to issue, condition or deny a permit, how to integrate requirements into permits; how to develop, implement and evaluate mitigation requirements; and how to evaluate outcomes.
- Training on strategies to strengthen 401 certification programs

Wetland Monitoring and Assessment Training

- Training on targeted monitoring and assessment tools
- Guidance on how to adapt targeted monitoring and assessment tools for state decision-making related to wetlands and other resources
- Training on how and when to use Hydrogeomorphic Assessments (HGM)
- How to develop and use tools to measure success
- How to target data collection to support program goals
- Field-based training to learn and test on real-world examples

Wetland Water Quality Standards Training

- Training for states that rely on 401 certifications on how wetland water quality standards can strengthen their protection of wetlands
- Sharing of models, templates and lessons learned

Voluntary Wetland Restoration Training

- Training on restoration techniques
- Training on the components of restoration success and how to measure success
- Training on how to incorporate applicable recommendations to non-state-run decentralized voluntary wetland restoration planning and implementation efforts

Climate Change, Other Adaptation and Integration Work Training

- Training that explore the impacts to wetlands from climate change and/or the value of wetlands to ameliorate some of the impacts of climate change (flooding, drought, sea level rise, etc.)
- Training on specific technical tools and topics (e.g. scenario based planning, adaptation planning processes; ecosystem services valuation)
- Sharing of integration case studies, models, templates and lessons learned from states that have successfully integrated their wetland program work with other state programs

Finally, considering the findings of this report on state wetland programs and climate change work, planning, promotion and content of wetland training efforts may need to take into consideration challenges and barriers to climate change work that some states face when seeking to involve wetland staff participants from states that do limited work on climate change issues (e.g. thinking about language used and topics to be covered)

Recommendations for Future Research

Through analysis of data from verification conversations a number of key areas were identified as areas for additional future research. This information is important to understanding and evaluating the work to protect and mitigate for wetland impacts undertaken at the state level. The following is a list of additional research needs that have been identified through this study: **(Photo Title: Great Blue Heron - Wakodahatchee Wetlands, Florida; Photo Credit: Dori)**



Overarching Research:

- Longitudinal study of wetland programs over time, using the same information collection process to compare wetland program status and identify statistically relevant trends.
- Longitudinal study of program development, using the Program Development Continuum research tool to identify changes both at the state-level and trends nationwide.
- Use of this study methodology to develop tribal wetland program summaries and assessment of tribal wetland program status and trends nationally.

Wetland Regulation:

- What is the jurisdictional range of regulatory activities taking place in each state? What wetland resources are not protected under either state, local or federal programs? What is the strength of programs for wetlands that are regulated?
- With what frequency do states issue permits? With what frequency do states deny permits? For what reasons? If they don't usually deny permits, why not?
- What efforts have been shown to improve wetland mitigation performance? How transferable are these efforts? What gaps in understanding of mitigation performance still exist?
- What resources do states need to strengthen this core element?
- What training or outreach would be useful to build regulatory capacity?

Wetland Monitoring and Assessment:

- A state-by-state review of monitoring and assessment tool content and how the information is used.
- More in-depth analysis of the use of HGM methods, opportunities for application and barriers
- What resources do states need to strengthen this core element?

Wetland Water Quality Standards

- How are wetland water quality standards used in §401 certification programs? How are other surface water quality standards used? Would the development of wetland water quality standards improve §401 certification program delivery?
- Are one or more types of standards more critical for protection of wetlands than others?
- What resources do states need to strengthen this core element?

Voluntary Wetland Restoration:

- How can states strengthen their role in voluntary wetland restoration efforts?
- How can states encourage the use of core element #4 in collaborative voluntary wetland restoration planning efforts?
- What resources do states need to strengthen this core element?

Staffing

- Development and use of a formal research tool to collect common data that enable comparative analysis of state wetland staffing.
- Research on the differences between existing staff levels and staffing required to effectively implement state programs
- Data on changes in staffing and resources over specific periods of time and trend analysis.

Climate Change

- An in-depth review and development of case studies of states working actively on climate change issues, outcomes and impacts.
- More in-depth study of the range of activities that are being conducted within states to adapt to extreme weather events.

Integration with Other State Programs

- How extensive and/or effective are specific state integration efforts?
- What changes have occurred to institutional goal attainment and environmental outcomes from these integration activities?
- Development of formal case studies and transferable models for sharing effective state integration models. **(Photo Title: *Parnassia glauca* Raf. (fen grass of Parnassus) ; Photo Credit: Robert Mohlenbrock)**



GLOSSARY OF TERMS

- **303(d) Designation** – A waterbody designated by states and approved by the U.S. Environmental Protection Agency under the Clean Water Act as “impaired” and listed on the Sec. 303(d) Impaired Waters List.
- **305(b) Reports** – State reports to the U.S. Environmental Protection Agency describing the overall water quality conditions and trends in a state.
- **§401 Water Quality Certification (Clean Water Act)** - Clean Water Act (CWA) §401 water quality certification provides states and authorized tribes with an effective tool to help protect water quality, by providing them an opportunity to address the aquatic resource impacts of federally issued permits and licenses. The central feature of CWA §401 is the state or tribe’s ability to grant, grant with conditions, deny or waive certification. Granting certification, with or without conditions, allows the federal permit or license to be issued consistent with any conditions of the certification. Denying certification prohibits the federal permit or license from being issued. Waiver allows the permit or license to be issued without state or tribal comment.
- **§404 Dredge and Fill Program (Clean Water Act)** - Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged or fill material into Waters of the United States, including wetlands. EPA and the U.S. Army Corps of Engineers have promulgated a number of regulations to implement the permitting program.
- **Adaptation** – Changes in rainfall, drought conditions, flooding, fire risk and other hazards can all occur over time. Some of these changes may be attributed to climate change, others may not. Adaptation refers to specific management decisions made to address changes that do occur or are expected to occur (or that could potentially occur).
- **Advanced Identification Plan (ADID)** – The ADID process is intended to add predictability to the wetlands permitting process as well as better account for the impacts of losses from multiple projects within a geographic area. The ADID process involves collecting and distributing information on the values and functions of wetlands located in a specific geographic area. EPA conducts the process in cooperation with the U.S. Army Corps of Engineers and in consultation with States or Tribes. The classification is strictly advisory.
- **Ambient Monitoring** – monitoring within natural systems (e.g., lakes, rivers, estuaries, wetlands) to determine existing conditions
- **Antidegradation Policy** - A required process that is part of water quality standards for protecting all existing uses, keeping healthy waters healthy and giving strict protection to outstanding waters.
- **Anthropogenic** – having to do with or caused by humans
- **Assumption (State Assumption of CWA §404 Program)** - The Clean Water Act allows states and tribes to assume administration of the Federal Section 404 permit program in certain waters within

State or Tribal jurisdiction. States and Tribes cannot assume jurisdiction for all waters. The U.S. Army Corps of Engineers retains jurisdiction in a) tidal waters and their adjacent wetlands and b) waters used as a means to transport interstate or foreign commerce and their adjacent wetlands. State assumption under Clean Water Act Section 404 does not affect the Corps' responsibilities to regulate navigable waters under Section 10 of the Rivers and Harbors Act of 1899.

- **Buffer** - Riparian areas typically occur as natural buffers between uplands and adjacent water bodies. They act as natural filters of nonpoint source pollutants, including sediment, nutrients, pathogens, and metals, to waterbodies, such as wetlands, rivers, streams, lakes, and coastal waters.
- **Buffer Zone** – the area of land next to a body of water or wetland, where activities such as construction may be restricted in order to protect water or water quality
- **Classification (Wetland)** – Wetland classification systems are designed to compare and organize wetland information over large areas. The most commonly employed is the system developed by Cowardin et al. (1979), which suggested a hierarchy of wetland systems, subsystems, and classes based on vegetation.
- **Clean Water Act (CWA)**- The series of legislative acts that form the foundation for protection of federal U.S. water resources, including the Water Quality Act of 1965, Federal Water Pollution Control Act of 1972, Clean Water Act of 1977, and Water Quality Act of 1987. CWA Secs. 305(b) and 303(d) deal specifically with water quality assessment and TMDL development.
- **Climate Change** – Any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.
- **Core Element (EPA, Wetland)** – The US Environmental Protection Agency recognizes four key elements for program development in state and tribal wetland programs. The Core Elements include regulatory programs, wetland monitoring and assessment, wetland water quality standards and voluntary wetland restoration.
- **Criteria** – standards, rules, or tests on which a judgment or decision may be based
- **Degraded** – condition of the quality of water that has been made unfit for some specified purpose
- **Delineation** – identification and documentation of the boundary between wetlands and uplands
- **Designated Uses** - Those uses specified in water quality standards for each waterbody or segment. EPA-approved Designated Uses include: Recreational uses; the propagation and growth of a balanced, indigenous population of aquatic life; wildlife; and the production of edible and marketable natural resources are generally stated as "fishable and swimmable" uses. Other uses may be industrial water supply, irrigation, and navigation.
- **Drought** – a prolonged period of less-than-normal precipitation such that the lack of water causes a serious hydrologic imbalance; a period of very dry weather

- **Enhance (wetland)** – to improve existing wetlands to benefit a particular function or value, sometimes at the expense of other functions and values
- **Exempted Activities** - In general, Section 404 of the Clean Water Act requires permits for the discharge of dredged or fill material into waters of the United States including wetlands. However, certain activities are exempt from permit requirements under Section 404(f), principally normal farming and silviculture activities.
- **Flood Attenuation** – a weakening or reduction in the force or intensity of a flood, usually by providing storage capacity for floodwater.
- **Flood Plain** – an area bordering a stream channel that may be inundated at times of high water; the amount of land inundated during a flood is relative to the severity of a flood event
- **Freshwater** – water without salt in it, like ponds and streams
- **Function** – refers to how wetlands and riparian areas work – the physical, chemical, and biological processes that occur in these settings, which are a result of their physical and biological structure and are measured (e.g. flood attenuation, wildlife habitat, etc.)
- **Functions** – the roles that wetlands serve, which are of value to society or environment
- **General Permit** – The U.S. Army Corps of Engineers (ACOE) can issue a permit on the national or regional level for a category or categories of activities that are either: 1) similar in nature and cause only minimal individual and cumulative adverse impacts (Nationwide and Regional General Permits) or 2) that would result in avoiding unnecessary regulatory for activities already regulated by another federal, state, or local agency and the environmental consequences of the activity would be individually and cumulatively minimal (Programmatic General Permit). General Permits must be reauthorized every five years.
- **Groundwater** – in the broadest sense, all subsurface water; more commonly that part of the subsurface water in the saturated zone; a layer of underground water that forms when precipitation soaks into the soil and becomes trapped between the soil above and a rock or clay layer below
- **Hazard Mitigation** – Hazard mitigation refers to any action taken to reduce or eliminate the long-term risk to human life and property from natural (and in some cases manmade) hazards.
- **Hydric Soil** – a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation.
- **Hydrogeomorphic (HGM) Approach** – a method that compares a wetland's functions (e.g., water retention, nutrient cycling) to similar wetlands of the same type (shape and location as defined by HGM classification) that are relatively unaltered; HGM functions normally fall into one of three major categories: (1) hydrologic (e.g., storage of surface water), (2) biogeochemical (e.g., removal of elements and compounds), and (3) habitat (e.g., maintenance of plant and animal communities)
- **Impaired Waterbody** - A waterbody (i.e., stream reaches, lakes, waterbody segments) with chronic or recurring monitored violations of the applicable numeric and/or narrative water quality criteria.
- **Index of Biological Integrity (IBI)** – an integrative expression of site condition across multiple metrics; often composed of at least seven metrics; plural form is either indices or indexes; similar to economic indexes used for expressing the condition of the economy

- **Index of Floristic Quality** – A wetland assessment method that assigns to plant species a rating that reflects the fundamental conservatism that the species exhibits for natural habitats.
- **Isolated Wetland** – wetland not regulated by the COE because it does not have a significant nexus to a jurisdictional water; typically does not have surface water connection to other waters or wetlands
- **Joint Permitting** – A wetland permitting arrangement that covers permit requirements pursuant to both state and federal rules and regulations for Section 404 dredge and fill permits and state dredge and fill permits when they both regulate the same activity. It is intended to prevent duplication of state and federal regulations
- **Jurisdictional Wetlands** – wetlands which are under the jurisdiction of the COE and the EPA pursuant to the federal Clean Water Act. They must meet the COE and EPA definition of wetlands; those areas which "...are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions"; identified in the field based on the 1987 Corps of Engineers Wetland Delineation Manual which requires indicators of the following three parameters: 1) a dominance of wetland plants; 2) hydric soils; and 3) wetlands hydrology. They must also be subject to federal jurisdiction. Many wetlands that meet the first criteria do not meet the second.
- **Level 1 Wetland Monitoring** - A Level 1 or landscape assessment approach involves characterizing the lands that surround wetlands through the use of landscape metrics (e.g., percent forest cover and land use category). Assessment results can provide a coarse gauge of wetland condition within a watershed. Often this is a GIS (geospatial) analysis.
- **Level 2 Wetland Monitoring** - Level 2 or rapid assessments are customarily based on the readily observable hydrogeomorphic and plant community attributes of wetlands. They also can employ the use of a "stressor checklist." Rapid assessment methods typically produce a single score that describes where a wetland generally falls along a gradient of human disturbance and with respect to ecological integrity.
- **Level 3 Wetland Monitoring** - Level 3 or intensive site assessments focus on wetland condition and/or function by gathering direct and detailed measurements of biological taxa and/or hydrogeomorphic functions. Two examples of the type of indicators that might be used in Level 3 assessment are plant composition/structure and soil organic matter content.
- **Mitigation** – a process of minimizing or compensating for damages to natural habitats, caused by human developments; these activities are designed to decrease the degree of damage to an ecosystem and may include restoration, enhancement, or creation; according to the Clean Water Act, mitigation is a sequential process that includes avoiding impacts, then minimizing impacts, and lastly, compensating for impacts
- **Monitoring** – Periodic or continuous sampling and measurement to determine the physical, chemical, and biological status of a particular medium, such as air, soil or water.
- **Narrative Water Quality Standards** – Water quality standards that outline non-numeric, qualitative guidelines designed to achieve a desired water quality goal (called the "designated use").
- **National Pollutant Discharge Elimination System (NPDES)** - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits for discharges of

pollutants into waters of the United States, and imposing and enforcing pretreatment requirements, under Section 307, 402, 318, and 405 of the Clean Water Act.

- **Numeric Water Quality Standards** – Water quality standards based on a measurable value determined for the pollutant of concern that, if achieved, is expected to result in the attainment of a desired water quality goal (called the “designated use”).
- **National Wetland Condition Assessment** – The National Wetland Condition Assessment (NWCA) is a statistical survey of the quality of our Nation’s wetlands. It is one of a series of water surveys conducted by the U.S. Environmental Protection Agency (EPA), states, tribes, and other partners. The first NWCA was conducted in 2011.
- **No Net Loss Goal** - “No Net Loss” is a mitigation policy goal aiming to prevent and offset the destruction or degradation of wetlands. It is the formal overall policy of the United States and was first adopted as a national goal under George H. W. Bush’s administration in 1988. Under this policy, wetlands currently in existence are to be conserved if possible. If not, losses are replaced at another location.
- **Nonpoint Source** – a source (of any water-carried material) from a broad area, rather than from discrete points.
- **Permittee:** For the purposes of this report, the word “permittee” refers to an individual, company or organization that has been approved by a regulating agency responsible for the implementation of Section 404 or a similar state or local law or regulation, to carry out permit requirements, including compensatory mitigation for unavoidable impacts to a wetland.
- **Permittee Responsible Mitigation:** Permittee Responsible (PR) mitigation occurs when a permittee undertakes restoration, establishment, enhancement, or preservation of a wetland in order to compensate for wetland impacts resulting from a specific project. The permittee performs mitigation after the permit is issued and is ultimately responsible for implementation and success of the mitigation. Permittee responsible mitigation may occur either onsite or offsite.
- **Rapid Assessment** – an assessment methodology that can be able to be completed in a short time (i.e., a few hours)
- **Rapid Assessment Method (RAM)** - Rapid assessment methods are tools that employ monitoring methods to assess wetland condition and/or function quickly and inexpensively.
- **Regional General Permit** – A permit issued by the U.S. Army Corps of Engineers to a state for a category or categories of activities that are either similar in nature and cause only minimal individual and cumulative adverse impacts (Nationwide and Regional General Permits) or that would result in avoiding unnecessary regulatory control that is exercised already by another federal, state, or local agency and the environmental consequences of the activity would be individually and cumulatively minimal (Programmatic General Permit).
- **Regulation (Wetland)** –The Clean Water Act’s (CWA) Section §404 establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Section §404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section §404 regulation (e.g. certain farming and forestry activities). State regulation occurs when a state issues a dredge and fill permit under state law. Some states have dredge and till permitting programs while others place reliance solely §401 Water Quality Certification (the ability to condition or deny a federal permit).

- **Resiliency** –The capacity for a socio-ecological system to: (1) absorb stresses and maintain function and (2) adapt, reorganize, and evolve into more desirable configurations that improve the sustainability of the system, leaving it better prepared for future impacts.
- **Restore** – to return a wetland (or other natural habitat) to a close approximation of its condition prior to disturbance by modifying conditions responsible for the loss or change
- **Riparian Zone** - the area of vegetated land along each side of a stream or river, often including much less land than the floodplain. The quality of this habitat varies depending on the slope, width and vegetation growing there. Functions of the riparian zone include reducing floodwater velocity, filtering pollutants such as sediment, providing wildlife cover and food, and shading the stream.
- **Sea Level** – the long-term average position of the sea surface; in this volume, it refers to the National Geodetic Vertical Datum of 1929
- **Special Area Management Plan (SAMP)** – a plan developed through a collaborative interagency planning process within a geographic area of special sensitivity to collect and distribute information on the values and functions of wetlands led by the ACOE (similar to ADIDs)
- **Standard Operating Procedure (SOP)** - an established procedure to be followed in carrying out a given operation or in a given situation.
- **Statewide Comprehensive Outdoor recreation Plan (SCORP)** – A SCORP is a state’s official outdoor recreation plan. States are eligible to receive funds and to pass them on to cities and counties, from the Land and Water Conservation Fund (LWCF) provided they produce an approved SCORP, which defines how those monies will be used.
- **Stormwater** - Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated.
- **Surface Runoff** – water that flows over the surface of the land as a result of rainfall or snowmelt; surface runoff enters streams and rivers to become channelized stream flow
- **Surface Water** – water present above the substrate or soil surface; an open body of water such as a lake, river, or stream. Some wetland types have surface water year-round and others for only limited periods of time.
- **Total Maximum Daily Load (TMDL)** - The sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources and natural background, and a margin of safety. TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measures that relate to a state’s water quality standard.
- **Water Quality** - The biological, chemical, and physical conditions of a waterbody. In the water quality standards context, it is a measure of a waterbody’s ability to support beneficial uses.
- **Water Quality Standard** – a legally established regulation consisting of three parts: (1) designated uses, (2) criteria, and (3) antidegradation policy

- **Watershed** – all the water from precipitation (snow, rain, etc.) that drains into a particular body of water (stream, pond, river, bay, etc.); surface drainage area that contributes water to a lake, river, or other body of water; the area drained by a watercourse; different watersheds are separated by divides or water partings
- **Wetland** – a vegetated or non-vegetated ecosystem where water is a dominant factor in its development and existence
- **Wetland Assessment:** An evaluation of wetland health, which may include data collection and analysis of physical, hydrologic, and ecological conditions/functions within a specific wetland area.
- **Wetland Determination**– the process or procedure by which an area is adjudged a wetland or non-wetland
- **Wetland Delineation:** Establishment of the existence (location) and physical limits (size) of a wetland for the purposed of federal, state or local regulations. Wetland delineation is also an element of a “jurisdictional determination,” a process which identifies water bodies within a project’s boundaries meet the definition of “waters of the United States” and subject to the Clean Water Act.
- **Wetland Function** – a process or series of processes that take place within a wetland that are beneficial to the wetland itself, the surrounding ecosystems, and people.
- **Wetland Program Plan (WPP)** - Wetland Program Plans (WPPs) are voluntary plans developed and implemented by state agencies and tribes which articulate strategic goals and actions. Generally, WPPs describe overall program goals along with broad-based actions and more specific activities that will help achieve the goals.
- **Wetland Restoration** - the process of returning an altered or degraded wetland area to its previous condition, considering recent and future watershed changes.
- **Wetland Soil**– a soil that has characteristics developed in a reducing atmosphere, which exists when periods of prolonged soil saturation result in anaerobic conditions; hydric soils that are sufficiently wet to support hydrophytic vegetation are wetland soils
- **Wetland Vegetation**– the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present; hydrophytic vegetation occurring in areas that also have hydric soils and wetland hydrology may be properly referred to as wetland vegetation
- **Wildlife Action Plan** – Federally-funded, state-developed plans that assess the health of wildlife and habitat in the state, so experts know which species are at risk, and outline steps needed to conserve the “species of greatest conservation need.”
- **Vegetated Buffer** - an area vegetated next to streams that separate aquatic habitat from adjacent land use
- **Verification Conversation** – For the purpose of this study, verification conversations refer to the process of speaking with state wetland program staff to confirm or update information gathered

from peer-reviewed and gray literature, recognized wetland organizations and agencies, and official state documents and websites, summarizing the state's program.

- **Voluntary Wetland Restoration – Wetland restoration** activities undertaken voluntarily on behalf of the land owner and not related to mitigation or other requirements.

Appendix A: Template State Wetland Program Summary



*Click Here to Skip to
Georgia's Information about Wetland:*

[Regulation](#)

[Monitoring & Assessment](#)

[Water Quality Standards](#)

[Voluntary Restoration](#)

[Education and Outreach](#)

[Integration with Other Programs](#)

Photo Title; Photo Credit:

Section A. Quick View

Description of State's Wetlands

State Definition of Wetlands

Historic Wetland Loss/Gain

Original Wetland Acreage	Remaining Wetland Acreage	Acreage Lost	% Lost

Primary State Wetlands Webpage

State Wetland Program Plan

No Net Loss/Net Gain Goal

State Resources for Wetland Work

State Name	Core element #1: Regulation	Core Element #2: Monitoring and Assessment	Core Element #3: Wetland Water Quality Standards	Core Element #4: Voluntary Wetland Restoration
Agency				
Amount				
Source(s)				
FTE				

State Permitting Fees

State Permitting Fee	State Name
Yes/No	
Amount (range)	
Agency	

Innovative Features

Models and Templates

Section B. Regulation

How are Wetlands Regulated in Tennessee?

Wetland Delineation

Delineation Guidance	Yes	No	Detail
Use State's Own Method			
Use Corps' 87 Manual and Regional Supplement			
Other (Please describe)			

Evaluation Methodology

Exempted Activities

Special Provisions for Agriculture and Forestry

Penalties and Enforcement

Permit Tracking

State General Permit (statewide vs. regional coverage)

Permit Coverage	Yes	No	Detail (Type of Permit)
Regional General Permit			
Statewide General Permit			

Assumption of 404 Powers

Assumption Status	Yes	No	Detail
Assumed			
Working Toward Assumption			
Explored Assumption			

Joint permitting

Special Area Management Plans and Advanced Identification Plans

Buffer Protections

Mitigation Policy

Mitigation Database

Section C. Monitoring and Assessment

Agency Responsible for Wetland Monitoring and Assessment

Mapping/Inventory

State Wetland Mapping Public Portal

Wetland Classification and Assessment

Statewide Wetland Monitoring Plan

Overall Wetland Gain and Loss Tracking System

Wetland Monitoring and Assessment Characteristics

Level	None	Level 1	Level 2	Level 3
<i>Tennessee</i>				

Type	None	IBI	Condition	Functional
<i>Tennessee</i>				

Frequency	None	Project Specific	Ongoing
<i>Tennessee</i>			

Description:

Participation in National Wetland Condition Assessment

NWCA Study Type	Yes	No
National Study		
State Intensification Study		

Detail:

Section D. Water Quality Standards

Wetland and Water Quality Standards

Type	None	Use Existing WQ Standards	In Process	Adopted	Future Direction
<i>Wetland-specific Designated Uses</i>					
<i>Narrative criteria in the standards to protect designated wetland uses</i>					
<i>Numeric criteria in the standards based on wetland type and location to protect the designated uses</i>					
<i>Anti-degradation policy includes wetlands</i>					

Description:

Section E. Voluntary Wetland Restoration

Types of Wetland Restoration Work Funded by the State:

Type of Work	YES	NO	Description
Fund Wetland Restoration (may include easement agreements)			
Private Land Restoration			
Public Land Restoration			
Technical Assistance			
Tax Incentives			
Other – Real Estate Transfer Tax			

Description:

Voluntary Wetland Restoration Program Components

Wetland Restoration Efforts	Nothing in the Works	Planning	In Progress	Mature/Complete
Program has a set of restoration goals				
Coordinate with relevant agencies that outline restoration/protection goals and strategies and timeframes				
Developed multi-agency body to coordinate restoration/protection efforts				
Set restoration goals based on agency objectives and available information				

Goals for Restoration Projects

Goal	Yes	No	Description
No Net Loss			
Reverse Loss/Net Gain			
Nonpoint Source Pollution (NPS)/WQ			
Total Maximum Daily Load (TMDLs)			
Habitat			
Coastal Protection			
Floodwater Protection			
Groundwater			
Other (please describe)			

Landowner Guides and Handbooks to Assist with Voluntary Wetland Restoration Efforts

Section F. Innovative and/or Highly Effective Education and Outreach

Section G. Climate Change and Wetlands

Section H. Integration

Entity/Program Area	Yes/No	Description of the Connection
NPDES/Stormwater		
303(d)		
305(b) reporting on wetlands		
Total Maximum Daily Load (TMDLs)		
Climate Change/ Resiliency		
Land Use /Watershed planning		
Flood/Hazard Mitigation		
Coastal Work		
Wildlife Action Plan		
Statewide Comprehensive Outdoor Recreation Plan (SCORP)		
Other		

State Wetland Program Contact and Other Relevant Contacts

State Wetland Program Development Continuum

Continuum Stage		Core Element 1: Regulation	Core Element 2: Monitoring & Assessment	Core Element 3: Wetland Water Quality Standards	Core Element 4: Voluntary Restoration
<div> <div>Mature Stage</div> <div>Initial Implementation Stage</div> <div>Development Stage</div> <div>Early Stage</div> </div> <div> <div>High</div> <div>↑</div> <div>Low</div> </div>					

Section J. Useful Websites

Appendix B: Primary State Verification Contacts

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