



NC Wetlands Monitoring Work Group

Potential uses and needs for a centralized, spatial database

Robert Truesdale (RTI), moderator



Today's Program

- Status of NC DEQ's wetlands monitoring efforts (*Cyndi Karoly, DEQ*)
- Overview/status of NCSU's wetland monitoring project (*Mike Burchell, NCSU BAE*)
- Discussion and agreement on Work Group goals and objectives (*group discussion - Kim Matthews, RTI*)
- *break*
- Existing wetland monitoring data in NC – *Who has what? (group discussion – Kim Matthews, RTI)*
- Potential uses and needs for centralized database – *What data do we gather and what do we do with it? (group discussion - Robert Truesdale, RTI)*
- *Wrap-up - adjourn*

Data Uses and Needs - Examples from 2015 NC WPP

Major uses

- Research
- Education
- Public/stakeholder outreach – voluntary restoration and protection;
- Conservation and local planning
- Mitigation purposes
- Regulatory purposes

Example needs/subject areas

- Defining baseline conditions, reference sites
- Conducting inventories of wetlands, wetland ecosystem services
- Tracking functions/ecosystem services on a watershed basis
- Determining trends, climate change and development impacts

North Carolina's Wetland Program Plan
2015-2019

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Wetland Monitoring Data Uses

Data Use Category	Example Requirements / Uses
Research	Scientifically sound data for research collaboration, coordination
Education	Data for a broad audience: K – graduate school
Public/stakeholder outreach	Data for voluntary restoration & protection, resource utilization
Conservation purposes	Data to help with prioritization, impacts
Mitigation purposes	Data to reduce uncertainties in mitigation priorities, selection, siting, design, and performance
Regulatory purposes	Could include legal, permitting; neutral data to inform regulatory priorities, choices, decisions
Local planning	Land use decisions, preservation
Legislative purposes	Not advocacy – data for legislators and other decision makers (neutral)
Farms/agriculture	Data to encourage protection, conservation

Example Wetland Monitoring Database Activities (1 of 3)

Monitoring Database Use	Example Activities
Maintain wetland site inventory	Map wetlands, with ecosystem service estimates (e.g., carbon sequestration, hydrology, water quality)
Store data from voluntary restoration and protection projects	Map and analyze restoration projects in a spatial context for overall watershed hydrologic and water quality impacts and to prioritize and target future actions
	Track effectiveness of restoration methods and/or sites
	Evaluate and share information on successful and unsuccessful voluntary restoration sites, methods, results
Store data from research projects	Identify research goals and objectives for research project
	Track and share research results – links to reports, papers, research data sets
	Avoid duplication of effort and identify opportunities for collaboration; utilize as tool for public and university education, use by restoration/mitigation practitioners

Example Wetland Monitoring Database Activities (2 of 3)

Monitoring Database Use	Example Activities
Store data from (and for) mitigation projects	Map, view, analyze, and prioritize mitigation projects in a watershed context: hydrologic and water quality impacts
	Track effectiveness of mitigation methods and/or sites, including maintenance and monitoring
	Evaluate and share information on successful and unsuccessful mitigation sites, methods, results
	Provide information to encourage successful mitigation outcomes that require minimal ongoing maintenance and monitoring; reduce uncertainty in particular with reference to hydroperiod, hydric soils, vegetation and related services – setting by a range to accommodate uncertainty in climatic and site conditions – in general Corp (and other practitioners) need data to reduce uncertainty, such as information on “optimal wetness” for mitigation projects

Example Wetland Monitoring Database Activities (3 of 3)

Monitoring Database Use	Example/Possible Activities
Regulatory purposes	Store accessible and scientifically sound data on reference sites, baseline conditions, mitigation monitoring and performance, NWCA assessment results (from intensification study), other data of use to working regulatory programs
	Track wetlands across programs to assist with “no net loss” metric
	Track and view trends at different scales: watershed, basin, region, state-wide
	Monitor permitting impacts using DEQ methods and data

Wetland Monitoring Challenges by Data Element

Data Element	Example Challenges
Hydrology	Establishing hydroperiod for different conditions
Vegetation, amphibian, macroinvertebrate	Relating biotic measures to wetland function and services
Water quality	Determining water quality impacts on a watershed basis – what can the wetland do for water quality, and what should the water quality be in the wetland (second is more cloudy – what is “OK”?)
Soil	Relating soil condition to wetland function (carbon sequestration, hydric soil conditions)
Surrounding land use	Relating wetland function and services to surrounding development pressures
Wetland extent	Relating wetland destruction to loss of functions and services; rapid delineation before and after impacts
<i>other?</i>	<i>relating wetland condition → function → services</i>

Wetland Monitoring Data Needs & Associated Challenges

Monitoring Data Need	Requirements/Challenges
Inventory wetlands by watershed	Accurate/rapid delineation and locational data; useful wetland classifications
Identify baseline conditions, reference sites	Definition of “reference” and “baseline”
Identify and track functions and services by watershed	Developing effective functional metrics; relating functions to ecosystem services
Determine trends	Maintenance of time series for data of interest
Determine climate change impacts	Climate projections; climate impacts on wetland functional metrics; projections of sea level rise, weather/climate change . . .
<i>Surface elevation tables SETs (NCSU) NOAA Sentinel sites (some in pocosins)</i>	Utilizing existing data on tidally influenced wetlands to track sea level rise effects.
<i>other?</i>	

Summary of Wetlands Monitoring Data System Requirements *(based on projected needs/uses)*

- Spatially enabled, watershed based system (GIS functionality)
- Monitoring measures (raw data) connected to functional and ecosystem service metrics (e.g., hydrology, water quality, carbon)
- Scientifically sound and useful but publically understandable
- Sites accessible for use but protected from overuse
- Sites classified in multiple systems (DEQ, FWS, Heritage, NWCA, NatureServe, etc. . . .)
- *other*

Summary of Wetlands Monitoring Data System Needs/ Uses

- Assemble and make information available for reducing uncertainty in:
 - Protecting wetlands against sea level rise, etc.
 - Future conservation/preservation/protection/restoration/mitigation decisions
 - Monitoring methods and goals
- Assemble information tying wetland conditions and functions to economic valuation and impacts (i.e., ecosystem services), e.g.:
 - Delaware use of INVEST tool to value DE wetlands
 - Recent APNEP and other NEP efforts
 - Coarseness and uncertainty)
- Collect “lessons learned” from mitigations that have been done to add value to science and have information available to decisionmakers
- Assemble data to reduce hydrologic uncertainty* in justifying the design and placement of constructed wetlands; e.g., how to design to hydroperiod, and target upper (and lower?) end
 - (**hydrology is the greatest uncertainty in mitigation design*).

Wrap-up – Next Steps *(subject to your input!)*

- Post recording, presentations on <https://sewwg.rti.org>
- Use Work Group input and current data to develop plan for developing database requirements
 - Initially based on this meeting
 - With comments from Work Group
 - Design of tables as data inventory progresses
- Develop data inventory
 - Wetland types and locations
 - Initial focus on identifiers (types), locations, hydrology, soils, vegetation
- Begin to address challenges (by data type)
 - Hydrology, water quality, soil
 - Vegetation, amphibians, macroinvertebrate surveys
 - Raw data vs. derived indices/metrics
 - Metrics for functions and related ecosystem services
- *Next Meeting – February 2016*

Adjourn

