

Demand mapping exercise

Worksession w NNWQT Steering Committee / December 1, 2017

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PARTNERSHIP GOALS

Improve quality and accessibility of information on ecosystem markets – to help actors understand markets, identify opportunities, and make informed decisions.

PARTNERSHIP OUTPUTS TO DATE

Map data: integration of environmental markets data into EnviroAtlas

Report: An Atlas of Ecosystem Markets in the United States

Use cases: Practical applications of the data with partner organizations. Two completed in 2017:

Partner: USFS Conservation Finance Team; USFS Francis Marion and Sumter National Forests

Assessed compatibility of wetlands compensatory mitigation with lands prioritized for protection adjacent to Forest Service-owned lands for Francis Marion and Sumter National Forests in South Carolina

Partner: Magnolia Land Partners, LLC

Evaluated sites for an agricultural wetlands mitigation bank in Illinois

WQT DEMAND SCREENING TOOL

PROPOSED OBJECTIVE OF THE USE CASE

This use case will develop a screening tool to assess compatibility with water quality trading by evaluating potential demand within watersheds for trading or nonpoint source (NPS) water quality improvements. The study will identify key factors driving demand for water quality credits in order to develop a multi-factor index assessing the potential suitability of trading/NPS water quality improvements for watersheds in the United States.

Findings can be used to illustrate broad context of demand drivers in the USA, and to identify watersheds where additional investigation of trading potential may be warranted or where trading is clearly precluded.

Results can also help NNWQT validate its assumptions about demand drivers.

WQT DEMAND SCREENING TOOL

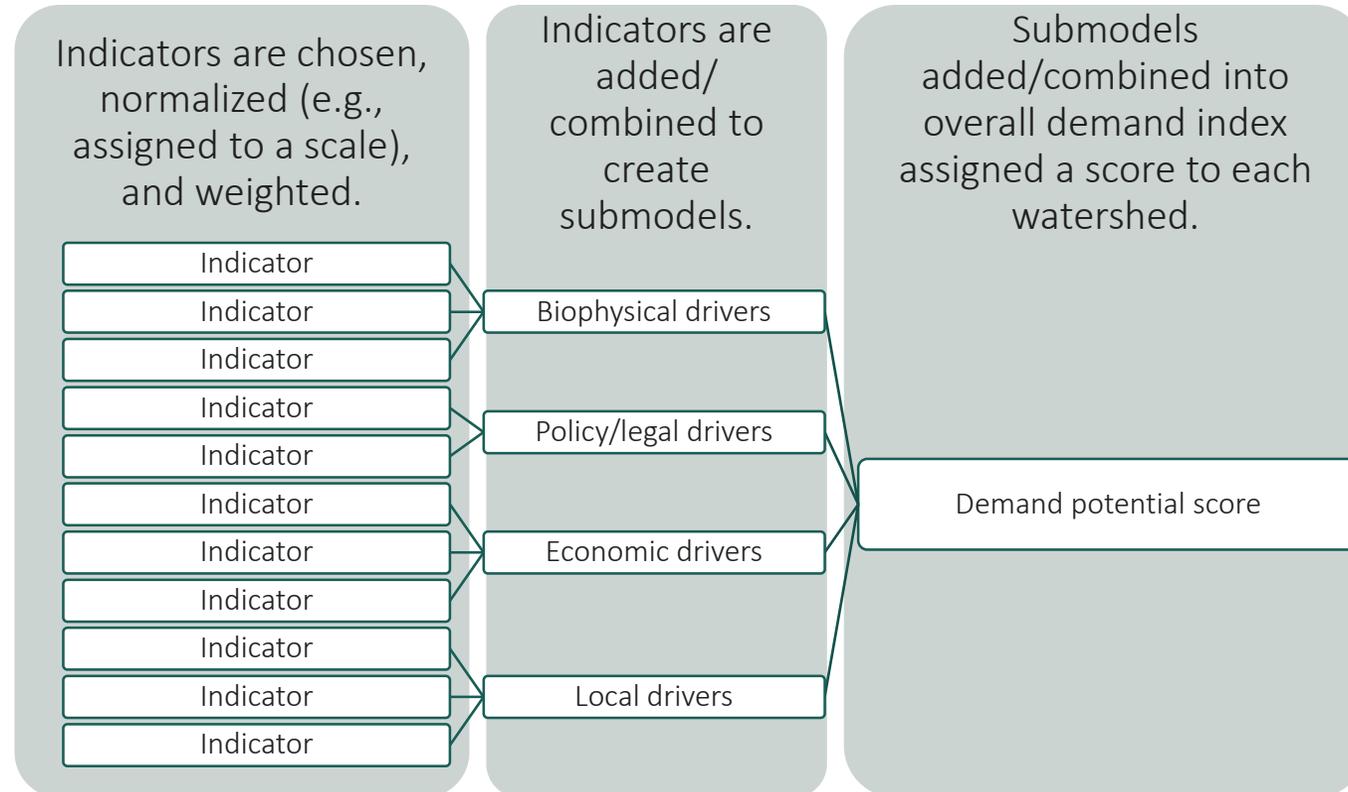
PROPOSED RESEARCH APPROACH

Factors driving demand for water quality trading/NPS water quality improvements can be grouped into several key categories (or submodels):

1. **Biophysical drivers:** Where do water quality impairments exist for nitrogen, phosphorus, DO, TSS, or thermal loads?
2. **Legal/policy drivers:** Where do state programs/policies exist enabling trading? Where has there been a history of demand? Where is litigation a risk?
3. **Local implementation capacity:** Where does local capacity/support for trading exist?
4. **Economic drivers:** Where do POTWs face significant capital costs or treatment capacity gaps that might drive interest in trading/NPS solutions? Where is population growth placing increased demand on POTWs?

WQT DEMAND SCREENING TOOL

PROPOSED RESEARCH APPROACH



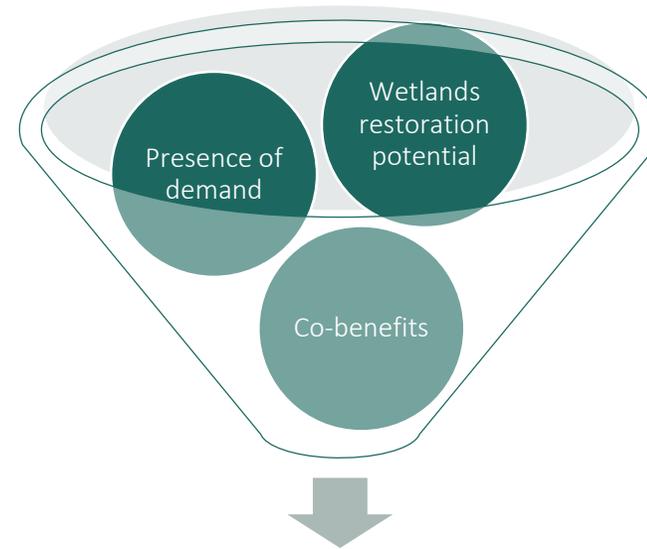
ENVIROATLAS USE CASE

The research question:
Where should a new
agricultural wetlands
mitigation bank be located
in Illinois?

1. Introduction
2. Research question
3. Identify relevant datasets and develop research approach
4. Analysis: Agricultural lands with high wetlands restoration potential
5. Analysis: Potential demand for agricultural wetland mitigation credits
6. Analysis: Ecosystem services co-benefits from wetlands restoration
7. Findings: Combine indices

Key factors identified in evaluating sites for an agricultural wetland mitigation bank

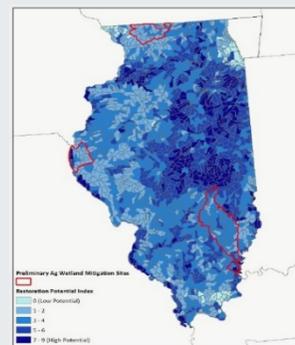
- ✓ **Restoration potential:** Where are restoration efforts most likely to result in healthy wetlands?
- ✓ **Presence of demand:** Demand is anticipated to come from farmers seeking to convert wetlands to agricultural use. One good proxy indicator is wetland determination requests by farmers exiting the Wetlands Reserve Program, since this suggests that they plan to farm wetlands areas and thus may need mitigation credits. Where in Illinois are many of these determination requests occurring, since credits must generally come from the same 8-digit HUC watershed? Are there other agricultural wetland mitigation providers in the vicinity?
- ✓ **Co-benefits:** What other ecosystem services could be protected/enhanced on the site in question?



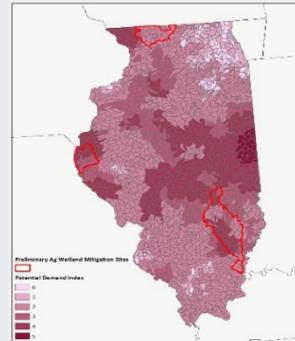
Compatibility with agricultural
wetlands mitigation banking

ENVIROATLAS USE CASE

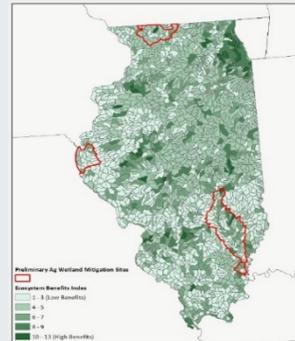
The multi-factor index reflects the relative suitability of HUC-12 subwatersheds for an agricultural wetland mitigation bank, based on a sum of index scores for wetland restoration potential, potential unmet demand for agricultural wetland mitigation credits, and potential ecosystem services co-benefits. Based on these values, the darkest-shaded subwatersheds within the red polygons are the best candidates for a new bank.



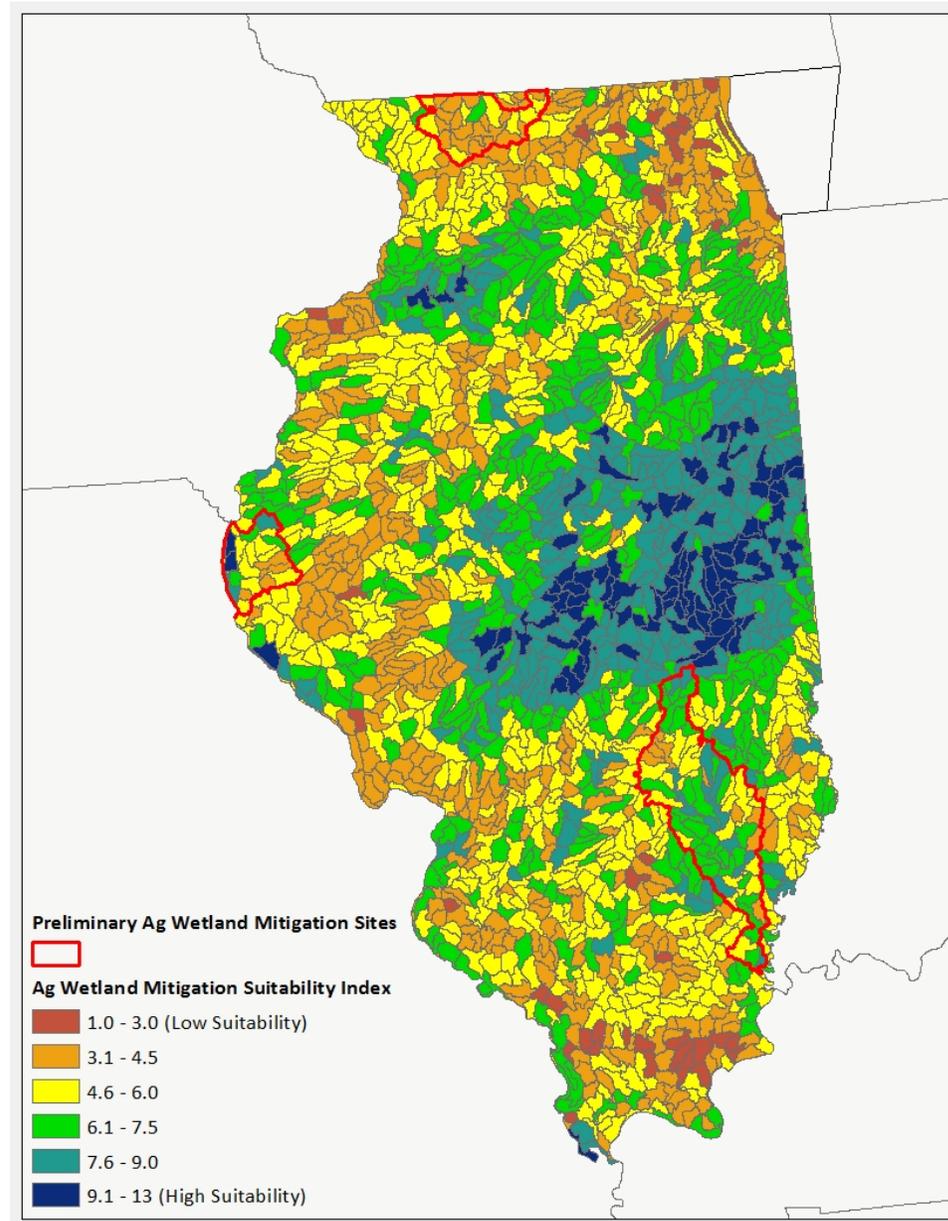
Index: Wetland restoration potential



Index: Potential demand for credits



Index: Potential ecosystem services co-benefits



MULTI-FACTOR INDEX: AGRICULTURAL WETLAND MITIGATION SITE SUITABILITY

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PROPOSED INDICATORS

Submodel	Indicator	Measure	Data source	Status	Notes
Biophysical drivers	Impairment	303(d) listed impaired waters for N/P/TSS/DO/thermal pollution	EnviroAtlas	Map data already exists	
	PS/NPS contributions to impairment	Ratio of PS:NPS contributions to annual pollution loads	USGS SPARROW model	Need to develop map layer – there are plans to add to Enviro-Atlas but timing tbc	Hoag et al. developed this for TN and TP. We might see if they are willing to share data, or replicate their methods. That study used 2:1 as their “threshold.” Ask for NNWQT Steering Committee for their input. 2:1 sets a fairly high bar but that may be appropriate here.
	Point source loads	Total annual loading volume to waterbodies at 12-digit HUC level	USGS SPARROW	Need to develop map layer	We should also look at absolute loads in addition to ratio with NPS pollution to screen out low-volume watersheds.

PROPOSED INDICATORS

Submodel	Indicator	Measure	Data source	Status	Notes
Policy/legal drivers	Presence of trading policy	State-level trading policy or guidance	EnviroAtlas	Need to update layer	
	History of trades	Presence of WQT program with active trades in last three years in same state	EnviroAtlas	Need to update layer	Tells us whether policy has actually been used, or if watershed level trading programs exist in the absence of state policy/guidance
	History of litigation/ letters that could create uncertainty for potential buyers	Presence of groups in state with history of opposition trading	NNWQT	Need to create layer	Ex: NW Enviro Advocates, ID conservation league, Food and Water Watch

PROPOSED INDICATORS

Submodel	Indicator	Measure	Data source	Status	Notes
Local stakeholder drivers (local champions/high-capacity groups that can make trading a “lighter lift” or have some level of comfort/familiarity w trading)	Connections to NNWQT	Presence of NNWQT membership in state	NNWQT	Need to create layer	
	Experience with market-based mechanisms	Presence of payments for watershed services program in state	EnviroAtlas/EM	Need to update layer	
	RCD capacity	To be determined. Potentially districts w tax allotment; measures of budget or # of staff	TBD	Need to create layer	Does NACD collect membership data that could be used?

PROPOSED INDICATORS

Submodel	Indicator	Measure	Data source	Status	Notes
Economic drivers	High capital costs related to water quality challenges for POTWs	Total needs (e.g., unfunded capital costs to address current or projected WQ problem) for facility	Clean Watershed Needs Survey 2012 dataset, summarized @ HUC-8	Need to create layer Annie will see if the new 2016 data is available, but not optimistic.	It would be good to find a way to contextualize the total needs dollar figure. I.e., \$5 million might be a very large or relatively minor figure depending on the system location. We can also include “Official undocumented needs” (i.e. needs not required to be reported in the CWNS survey) and “Unofficial cost estimates.” Incorporating these numbers muddles our ability to directly compare costs between facilities/systems (since categories/calculation methods will no longer be consistent) but gives us more info on actual need.
	Insufficient current capacity/level of treatment in POTWs	Presence of facilities with identified need to increase capacity or increase level of treatment	CWNS 2012 dataset summarized @ HUC-8	Need to create layer	We can break out needs by needs category, e.g. is capital needed for Advanced Wastewater treatment or sewer replacement? It would be helpful for the project team to review the list of needs categories and help us identify the ones where NPS improvements could help address the need.
	Projected growth	% change from present Total (resident + nonresident) receiving population (upstream + sewershed) in 2016 to projected total receiving population in 2036 for POTWs	CWNS 2012 dataset, summarized @ HUC-8 Or ICLUS data – by 90m pixel that we could aggregate	Need to create layer	Similarly costs are classified into some subcategories (ex: contaminated soils, surface water quality, PS problem/NPS solution)