

***Informing Gulf Coast (DWH-NRDA)
Ecological Restoration Options with the
Recovery Potential Screening Tool***

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A Quick History of DWH-NRDA

- 2010: Deepwater Horizon drilling unit exploded and released over 3 million barrels of oil in 87 days
- Federal and State Trustees conducted a Natural Resource Damage Assessment (NRDA) and restoration plan
- Trustee Implementation Groups (TIGs) were established in each state to implement projects funded by the \$8.1 billion settlement

A Challenging Decision Process

- Project evaluation and selection is:
 - A multi-year process
 - Involves many TIG member agencies/organizations (16)
 - Involves large numbers of project ideas (e.g., 1240 projects proposed in FL alone)
- As a participating Trustee, EPA contributed geospatial, comparative assessments of project themes and options
 - Recovery Potential Screening (RPS) Tool
 - Iterative analyses in 5 Gulf States

What is Recovery Potential Screening?

An approach and tool to help compare relative conditions across large numbers of watersheds

Geospatial indicators/indices of:

ecological condition

exposure to stressors

social context

Contributes a systematic yet flexible approach
to early-stage comparative assessment

Some Example RPS Uses in States



General Watershed Health

- Restoration
- Protection



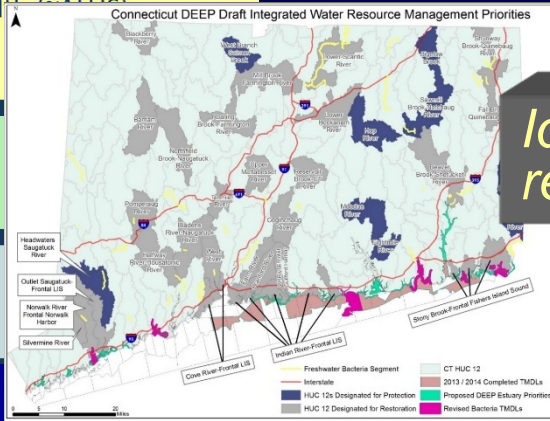
Stormwater

- Restoration
- Protection



Nutrients

- Restoration
- Protection



Identify TMDL/303(d) Vision restoration priorities (CT, others)

Support NPS/319 state program five year plan (MI, MA)

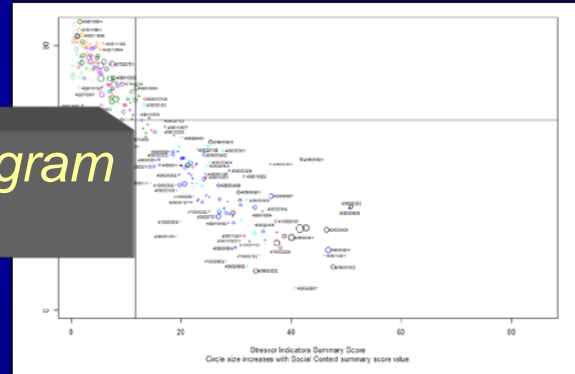
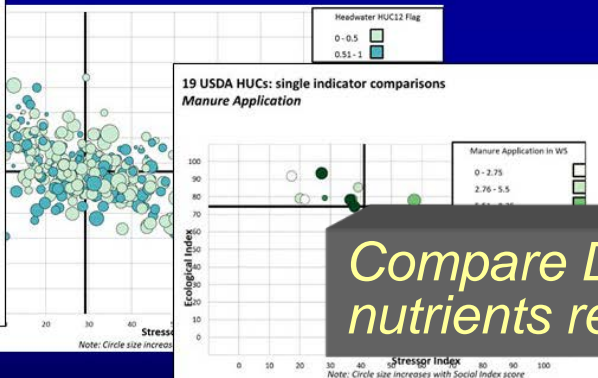
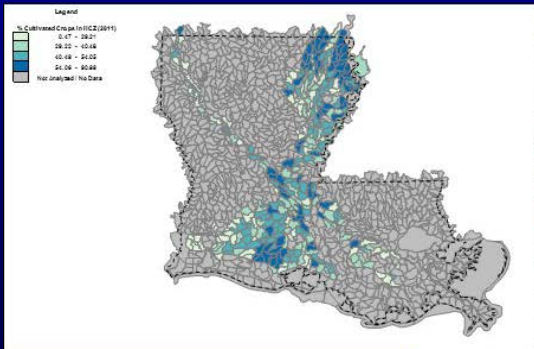
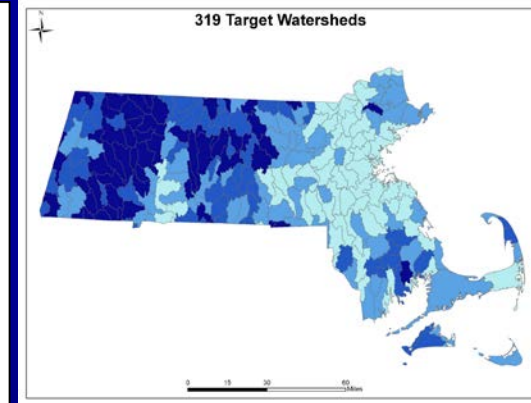


Figure 3.1. Plot of summary scores for Michigan's watersheds color coded by sub-basin.



Compare Deepwater Horizon NRDA nutrients restoration project options

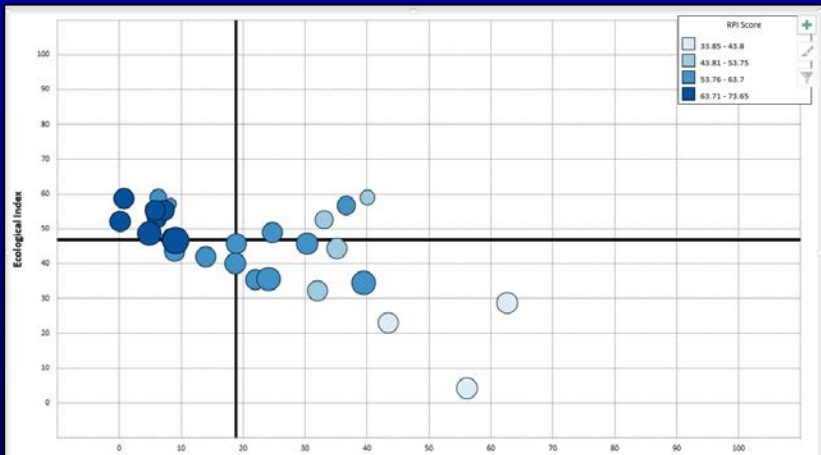
Products from RPS Statewide Tools

Watershed Name	Ecological Index	Ecological Rank	Stressor Index	Stressor Rank	Social Index	Social Rank	RPI Score	RPI Rank
Sherman Creek-Lower West Branch Delaware River	49.18	474	6.63	199	14.57	1385	52.37	790
Balls Creek-Lower West Branch Delaware River	48.84	504	12.20	388	31.60	1300	56.08	499
Upper Equinunk Creek	49.14	476	12.70	413	33.33	776	56.59	466
Lower Equinunk Creek	50.66	361	6.33	192	33.33	776	59.22	244
Factory Creek-Delaware River	51.48	300	5.50	172	21.00	1360	55.66	534
Little Equinunk Creek	48.50	534	9.33	284	33.33	776	57.50	382
Pea Brook-Delaware River	51.74	278	3.15	106	6.33	1426	51.64	850
Hankins Creek-Delaware River	49.82	422	8.35	252	14.37	1387	51.95	826
Beaverdam Creek-Delaware River	47.40	616	9.58	293	24.37	1342	54.06	651
North Branch Calkins Creek	46.28	705	16.00	531	33.33	776	54.54	619
South Branch Calkins Creek	46.10	728	18.10	616	33.33	776	53.78	681
Peggy Run-Delaware River	49.54	444	7.23	212	15.53	1378	52.62	772
Masthope Creek	52.10	255	7.43	218	33.33	776	59.34	238
Westcolang Creek-Delaware River	51.00	333	3.98	132	15.17	1381	54.06	651
Johnson Creek	46.80	665	18.73	646	33.33	776	53.80	675
Van Auken Creek	47.16	641	19.13	662	33.33	776	53.79	678
Belmont Lake-West Branch Lackawaxen River	46.20	715	18.48	635	33.33	776	53.69	688
East Branch Dyberry Creek	49.74	427	6.35	193	33.33	776	58.91	267
West Branch Dyberry Creek	50.00	411	12.15	384	33.33	776	57.06	421

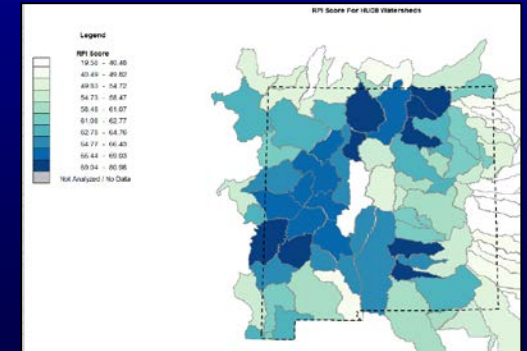
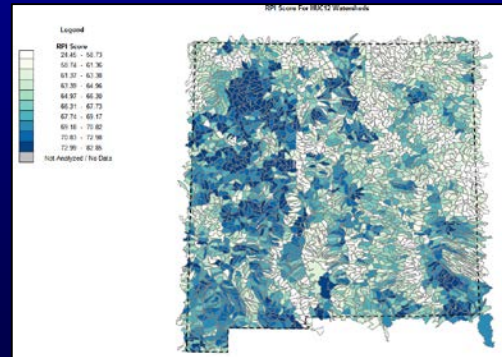
302 indicators on HUC12 watersheds

Hydrologic Unit Code 12-Digit (HUC12)	Name HUC12 Watershed	Area Of Watershed (Square Meters (Grid))	% Riparian Zone (RZ) in Watershed	% Hydrologically Connected Zone (HCZ) in Watershed	% Water in Watershed	% Land in Watershed	Watershed NHDPlus2 Streamlength	Watershed NHDPlus2 Waterbody Area
020401010305	Sherman Creek-Lower West Branch Delaware River	95209200.0000	19.9238	9.3980	4.6603	95.3397	63.9700	1.5200
020401010307	Balls Creek-Lower West Branch Delaware River	94473000.0000	23.8668	10.6992	5.4330	94.5670	62.9300	1.6700
020401010401	Upper Equinunk Creek	60305400.0000	37.8966	16.1001	10.3274	89.6726	39.2700	2.0300
020401010402	Lower Equinunk Creek	88650900.0000	25.3886	13.2222	6.7603	93.2397	43.2100	1.5600
020401010403	Factory Creek-Delaware River	57411900.0000	20.0843	12.0095	5.3691	94.6309	33.8900	0.6000
020401010405	Little Equinunk Creek	64941300.0000	29.3180	12.8470	6.9515	93.0485	46.6400	1.4300
020401010406	Pea Brook-Delaware River	93491100.0000	17.8814	9.1173	4.2010	95.7990	55.3200	0.6900
020401010501	Hankins Creek-Delaware River	108261900.0000	19.0796	10.8736	4.1982	95.8018	65.7700	0.5100
020401010506	Beaverdam Creek-Delaware River	63308700.0000	20.4071	12.7873	4.7866	95.2134	40.2700	0.4200
020401010601	North Branch Calkins Creek	55646100.0000	24.9802	10.9754	5.0623	94.9377	43.1800	0.6500
020401010602	South Branch Calkins Creek	58320900.0000	28.7480	11.6063	5.8718	94.1282	53.8800	0.2800
020401010604	Peggy Run-Delaware River	98454600.0000	23.0790	12.6296	5.6630	94.3370	75.1600	0.5200
020401010605	Masthope Creek	80787600.0000	29.8694	18.6935	9.5395	90.4605	46.9500	4.0400

4 auto-calculated indices and ranks



customizable mapping



customizable graphs

General Approach in Each Gulf State

- *Initially examine all HUC12s for coastal proximity and potential influence*
- *Filter down to a subset of HUCs that also meet a high nutrient loading source threshold*
- *Then focus on those that also have ecological and social attributes that could aid restoration success*

Louisiana DWH-NRDA, 2017

Filtering down to HUC12s of high interest for nutrients.....

Statewide

1275 HUC12s

In 3 Coastal Ecoregions

318 HUC12s

Also >25% Ag

119 HUC12s

Also NPS priority 31 HUC12s

Subset selection

> Name your subset, then follow the rest of the sequence below

Define Watershed Subset...

On this menu you can define and store a subset of watersheds of interest based on one or more indicators. For example, a subset could include all watersheds with agricultural land cover greater than 50%. Use the controls below to specify which watersheds you would like to include in your subset. The selected watershed IDs will be stored as a new list on the HUC_Subsets sheet and can be copy/pasted onto the Setup sheet for screening.

1 SubsetName (required, 50 character): NUTRIENT AND SEDIMENT IMPAIRED HUC12s

SubsetName (optional):

2 Indicator Type: Stressor

Indicator: Sediment 303d-Listed Segments Count (2015)

3 SubsetName: Unique Values

4 Add Condition

5 Watersheds must meet: At Least One Condition All Conditions

6 Add Subset to HUC_Subsets Sheet

*Indicators selected for initial RPS screening and comparison
(customized for each major nutrients project theme)*

<i>Ecological metrics</i>
<i>PHWA Landscape Condition sub-index</i>
<i>PHWA Hydrologic Condition sub-index</i>
<i>PHWA Geomorphic Condition sub-index</i>
<i>PHWA Habitat Condition sub-index</i>
<i>PHWA Biological Condition sub-index</i>
<i>PHWA Water Quality sub-index</i>

<i>Stressor metrics</i>
<i>% Agriculture in WS</i>
<i>% Agriculture in RZ</i>
<i>% Cropland in WS</i>
<i>% Cropland in RZ</i>
<i>% Pasture/Hay in RZ</i>
<i>Ag water demand</i>
<i>Synth N fertilizer applic</i>
<i>Impaired segments count</i>
<i>% streamlength nutrient impaired</i>
<i>% waterbody area nutrient impaired</i>
<i>Manure application in WS</i>

<i>Social metrics</i>
<i>State NPS Priority Subsegmt</i>
<i>DW Source Protection Area</i>
<i>Ratio TMDLs to Impairments</i>
<i>% Streamlength w/TMDLs</i>
<i>% Waterbody area w/TMDLs</i>
<i>NPS Control Projects Count</i>
<i>Nutrients NPS Project Presence</i>

* Indicator selection can be refined by correlation analysis. Final indicators can be weighted.

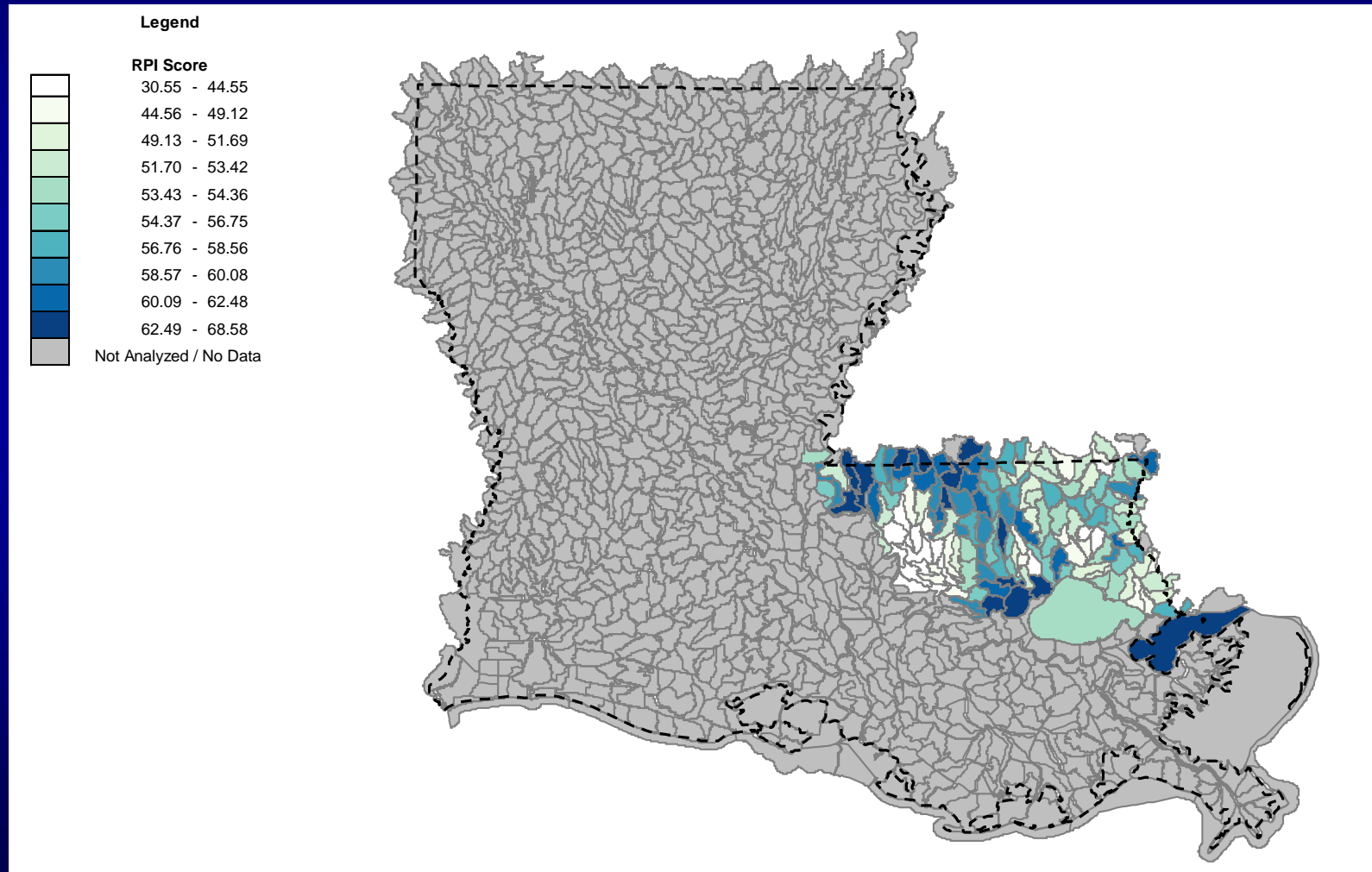
RPS Analyses for Alternative Nutrients Management Themes/Areas

- 1. Florida Parishes: Dairies nutrient management and BMPs*
- 2. Ouachita/Lafourche/Terrebonne: Agricultural BMPs*
- 3. SW Louisiana: Winter water holdings*

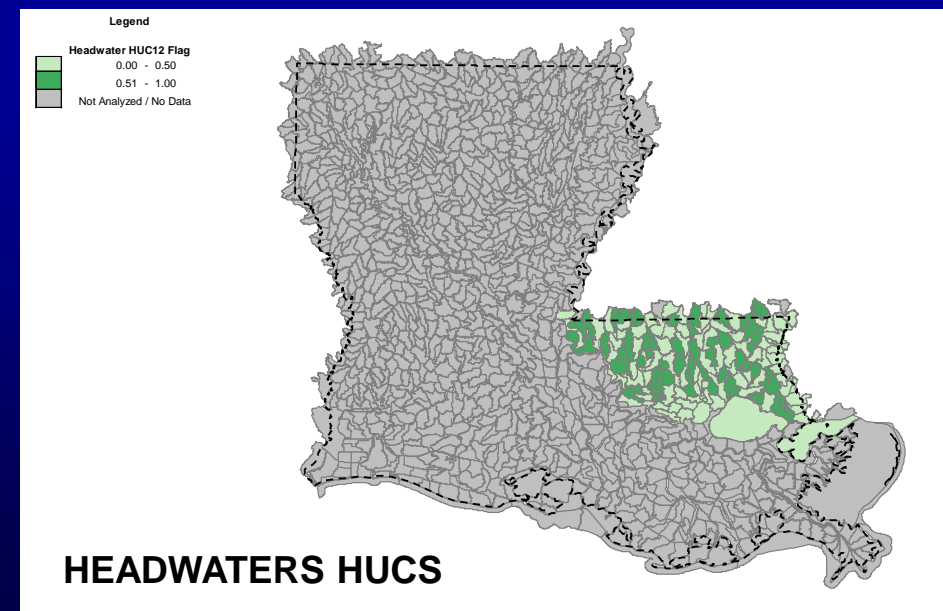
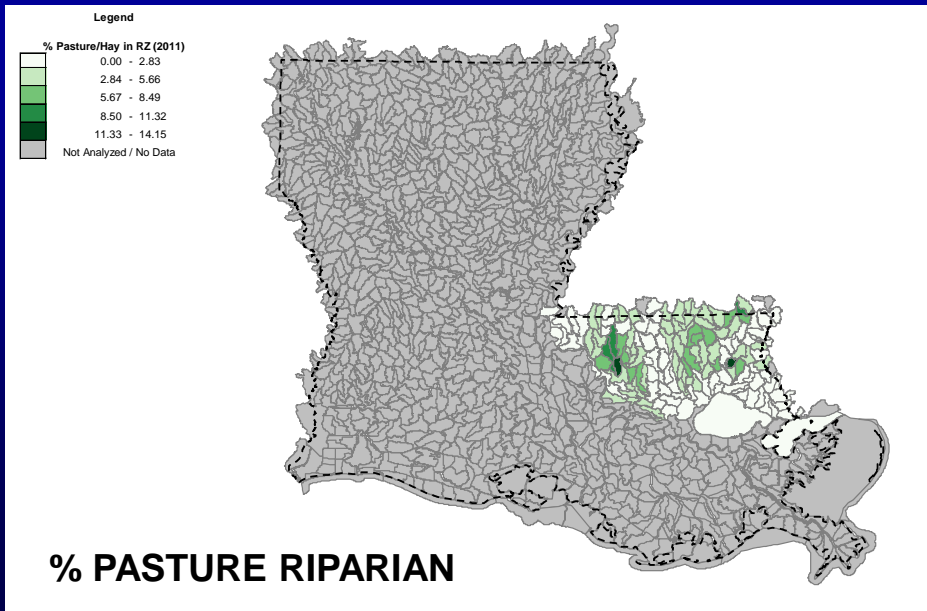
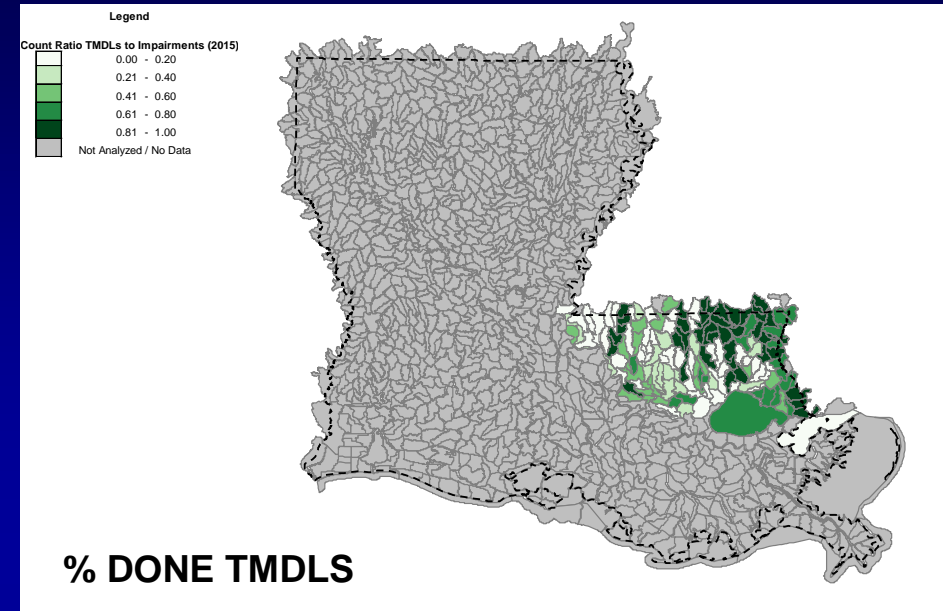
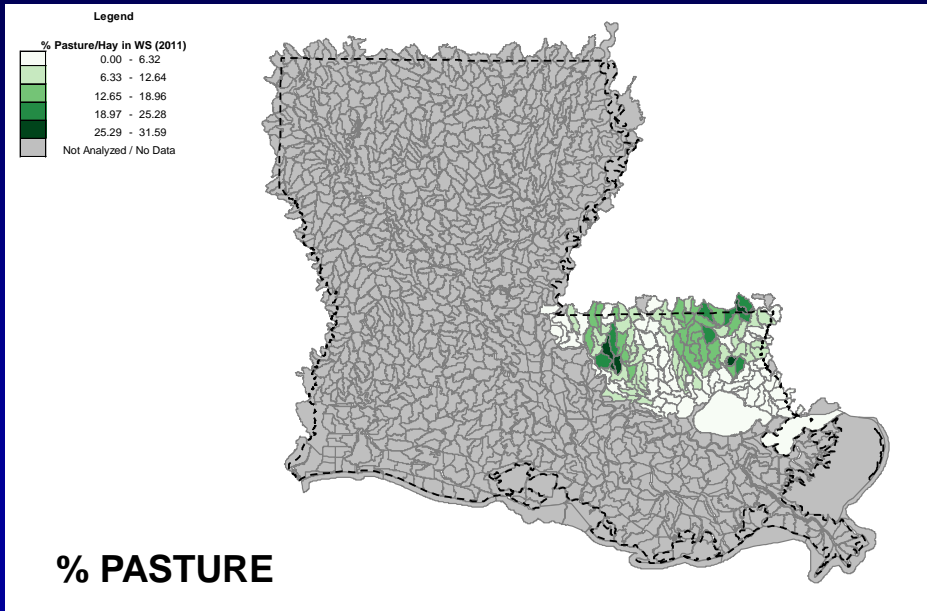
Also considered: Homeowner onsite waste systems outreach

Theme 1. Florida Parishes: Dairies nutrient management and BMPs

RPI Score (darker blue = better condition; paler = possibly more loading)

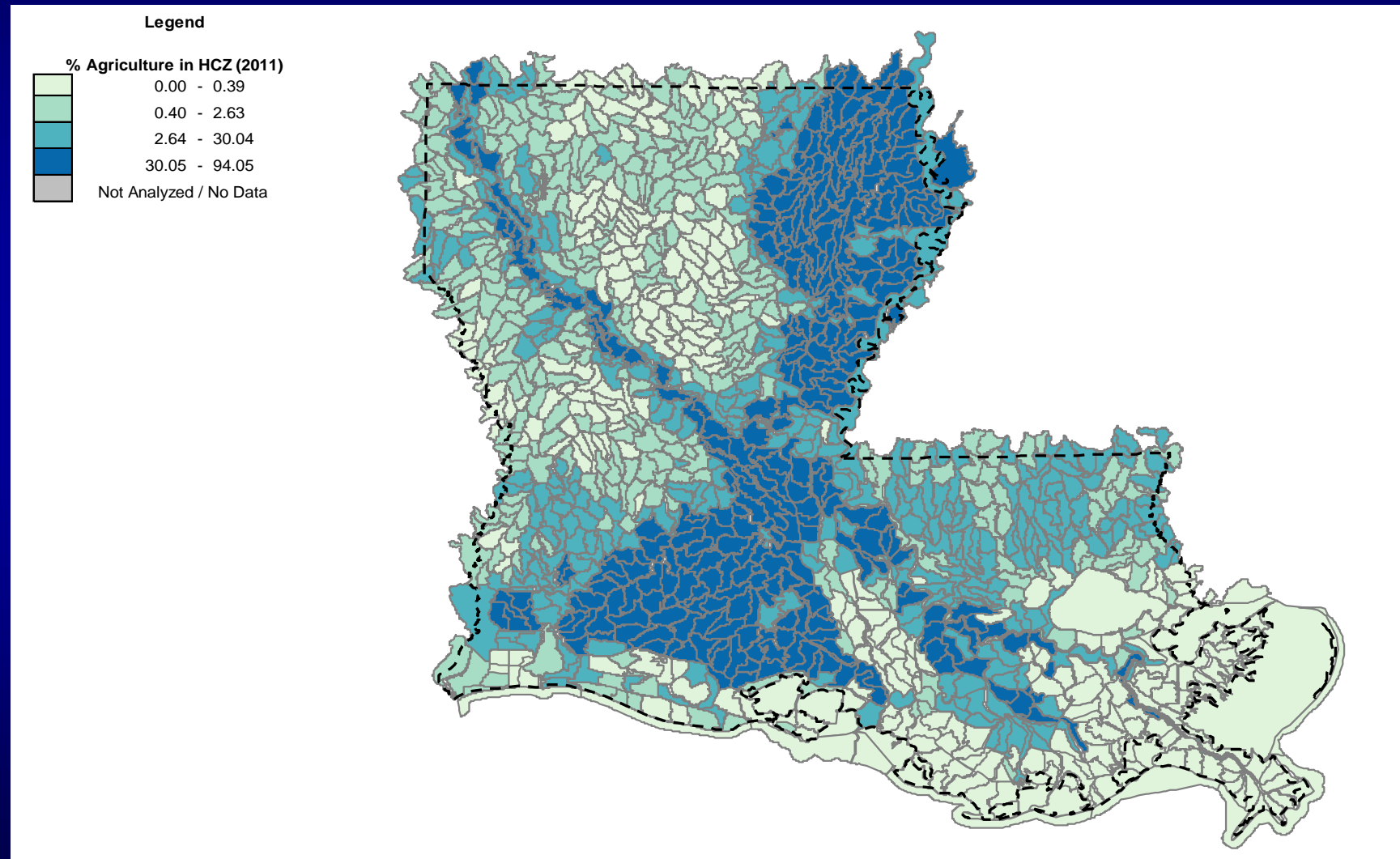


Theme 1. Dairies nutrient management: four highlighted factors

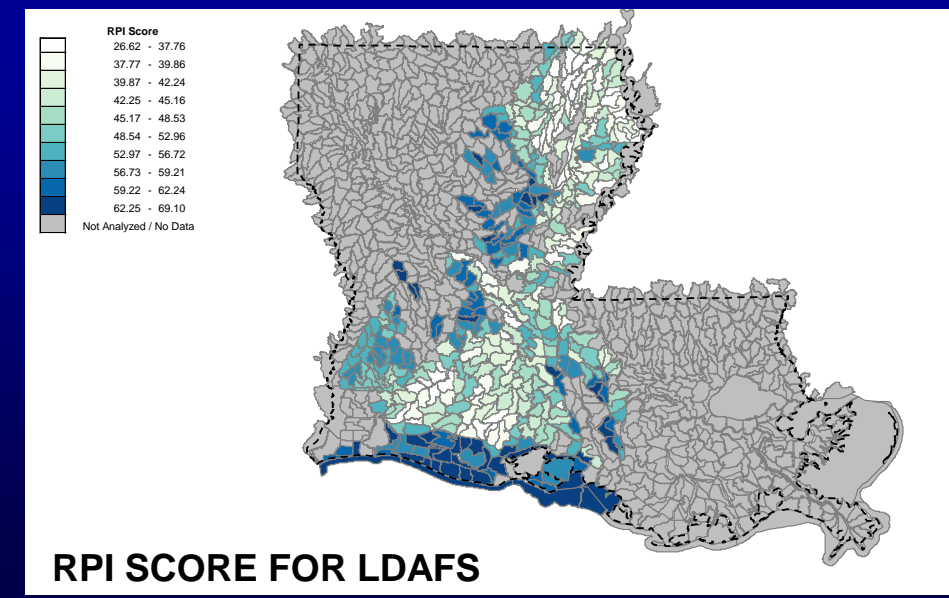
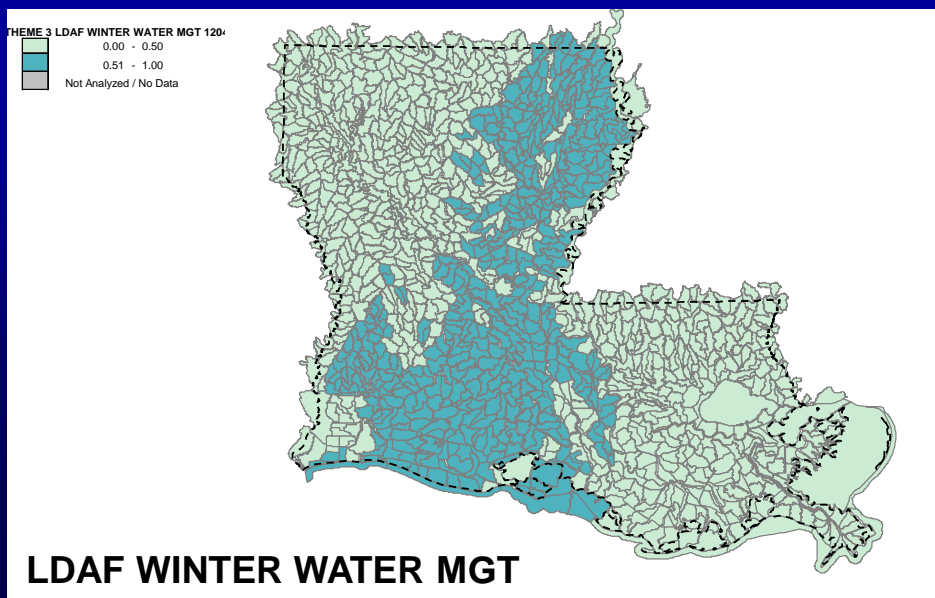
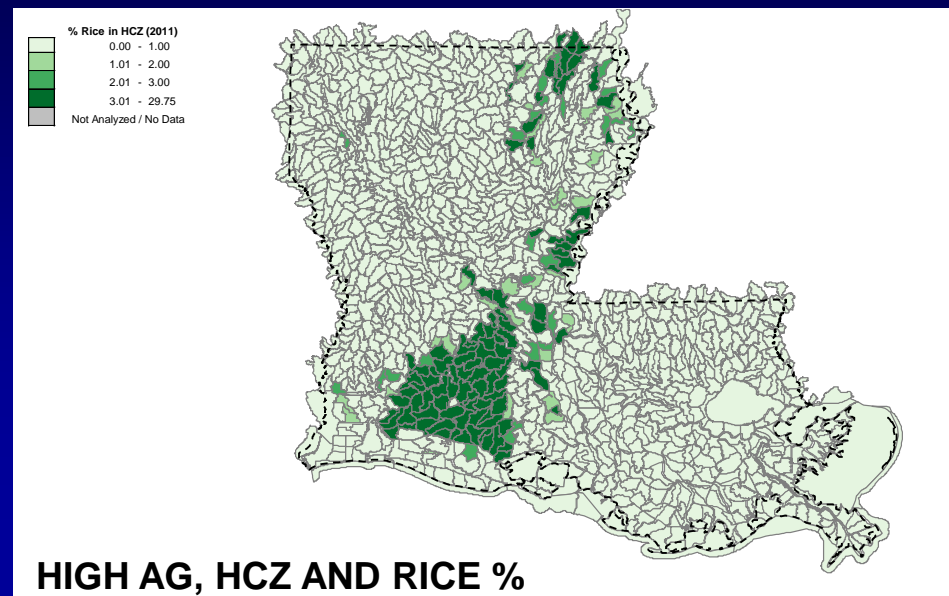
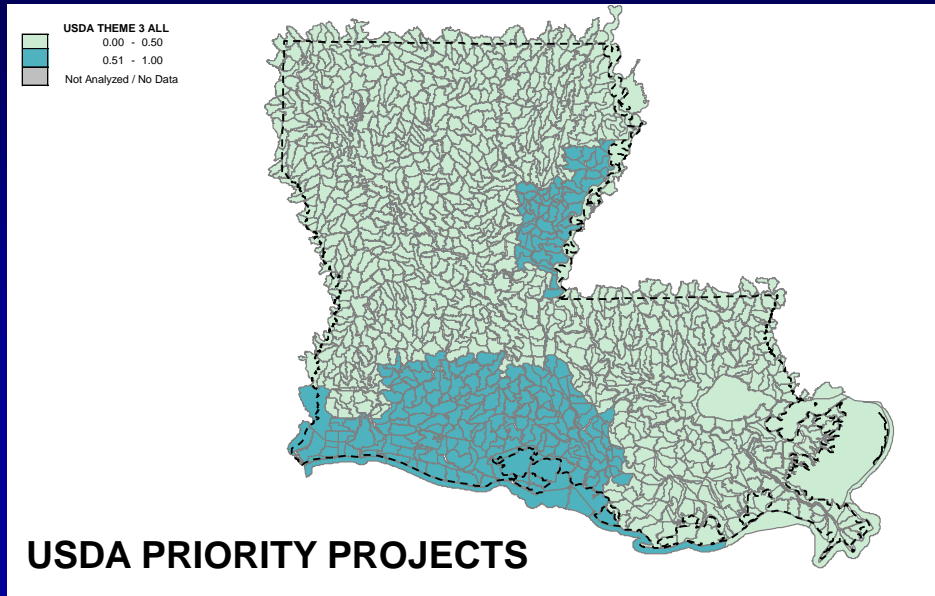


Theme 3. SW Louisiana winter water holdings

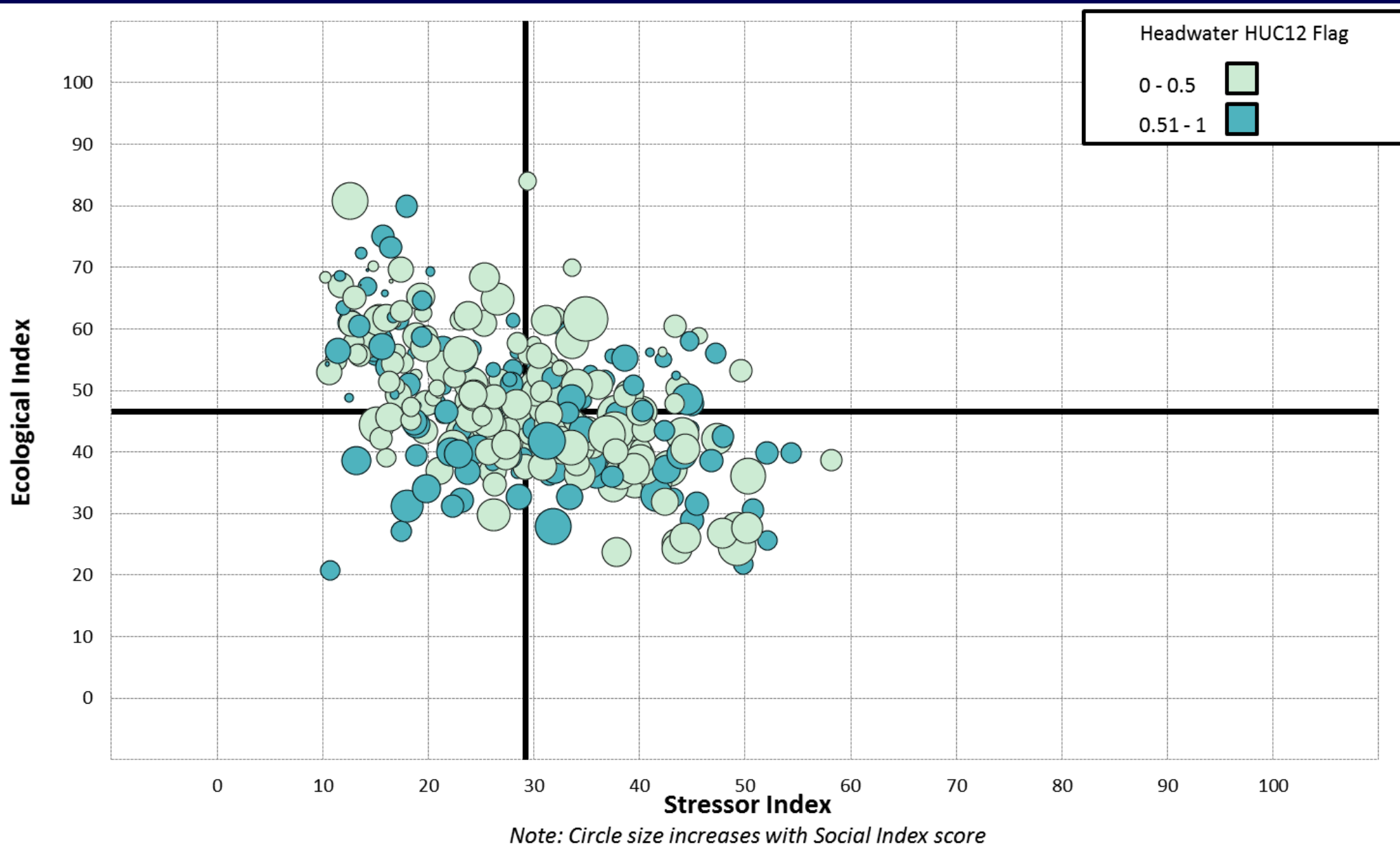
top quartile of “% AG IN HCZ”



Theme 3. SW Louisiana winter water holdings: other highlighted factors



Theme 3. SW Louisiana winter water holdings: Bubble Plot



Where the RPS Tools Were Useful

Compare many watersheds based on their condition and the opportunity to improve it (2 main options):

Better watershed health, more restoration success

Stressor exposure, more opportunity for load reduction

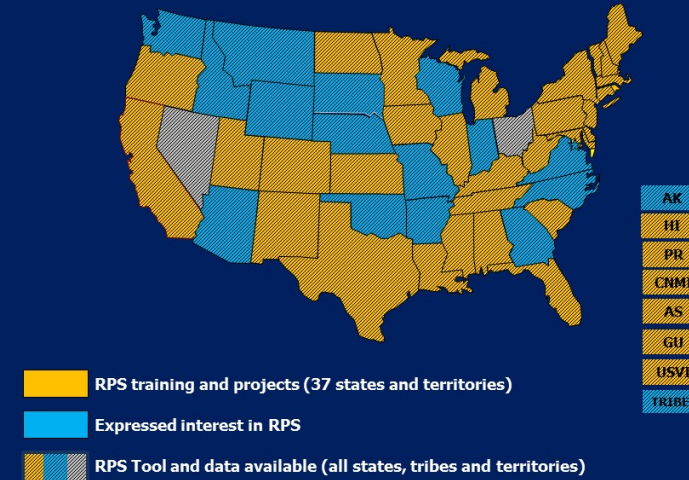
Enable many more managers and staff to do rapid desktop comparisons of watersheds

Provide “Discussion Support”

Recovery Potential Screening

www.epa.gov/rps

Recovery Potential Screening Tools and Support



Projects in 37 states and territories

RPS Data and Tools for all states/territories

step by step instructions – indicators – tools
(for more watershed indicator data also see www.epa.gov/wsio)