

Science and Conservation to Support Water Quality Trading Program Decisions

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Water Quality Trading

2.1 Trading Areas

Trades need to occur within a defined geographic boundary, known as the Trading Area, incorporated into a watershed trading framework, where available, or permit water quality trading plan. Relevant trading documents that define the Trading Area should include both a visual map of the area and general description of the boundaries. Trading Areas must be based on the science of a watershed. A Trading Area helps ensure there are no localized or downstream impacts and that trades do not cause or contribute to a violation of water quality standards.

Trading Areas will be defined by an applicable water quality strategy or TMDL, and in general will be upstream of a point of concern. The point of concern for Louisiana is the Gulf of Mexico which is the ultimate receiving water body of waters of the state. In some cases, to ensure that trades do not result in temporary exceedances above water quality standards, trading will be restricted to upstream of a point of discharge. Trading between basins may be allowable in specific situations where the science supports it. Any watershed trading framework or water quality trading plan needs to analyze the potential for localized impacts and be specific about measures and/or monitoring that will be completed to ensure there are no localized impacts. If a TMDL has already conducted some or all of this analysis, it should be used.

Key Terms and Phrases

“...a visual map of the area.”

“...defined geographic boundary.”

“...based on the science of the watershed.”

“...defined by an applicable water quality strategy or TMDL.”

“Trading between basins may be allowable where the science supports it.”

“...upstream of a point of concern.”

“...analyze the potential for localized impacts.”

“...measures and/or monitoring...”

Two Projects to Support Water Quality Trading


- 1. The Louisiana Freshwater Assessment and the “Conservation Delivery App.”*
- 2. Scoping the Potential for Water Quality Trading in Louisiana.*



Promoting freshwater conservation by making scientific information available for decision making.

FRESHWATER NETWORK


Our Work ▾ Innovation Water News [Launch Mapping Portal ▾](#)



Welcome to the Freshwater Network

This network provides scientific information to support decision making about freshwater resources in a user-friendly, online mapping system. You can interact with complex scientific data about the status and trends of freshwater resources, use ready-made decision support tools, or create your own, unique tools to meet your needs. From catchments, to watersheds, and even state-wide scales, you have access to a wealth of information about water resources and watersheds.

| |
|---|
| Perform Robust Analyses and Run Models to Explore: |
| Watershed Health and Landscape Integrity |
| Water Quality |
| Surface Flow |
| Wetland Restoration Potential |
| Ecological Flows |



The Louisiana Freshwater Assessment Project

...to provide comprehensive scientific information regarding the status and trends of freshwater supply in Louisiana and the connection of fresh water to coastal resources.



Watershed Health



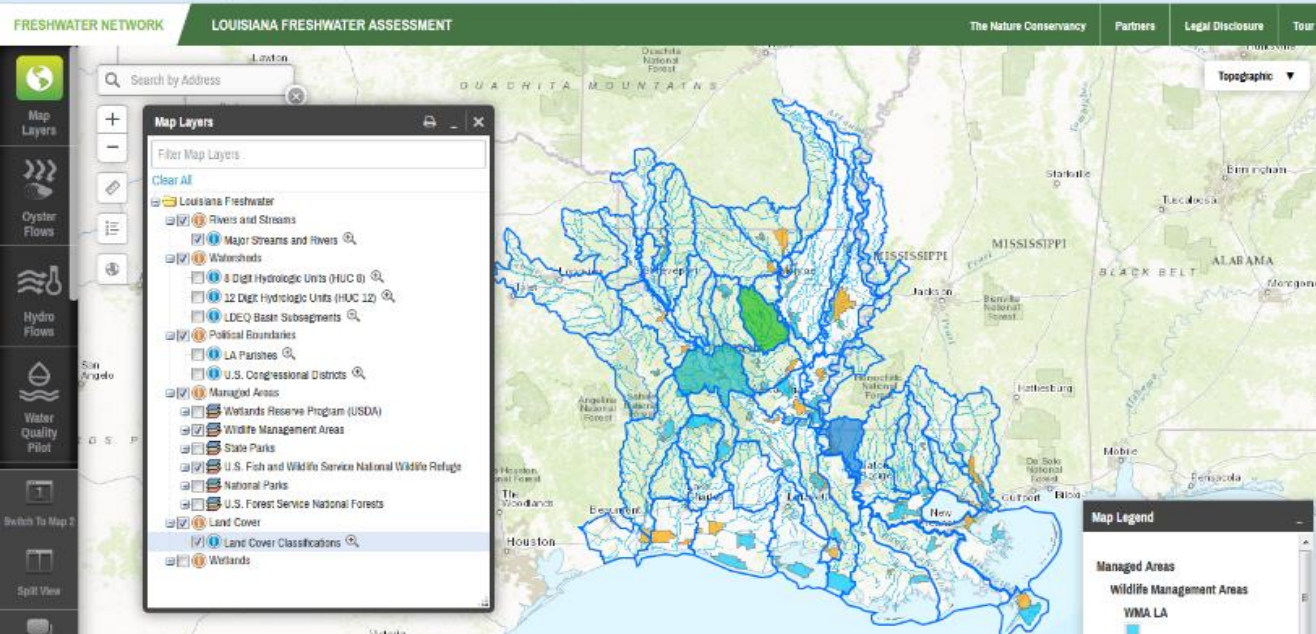
Surface Flow



Groundwater



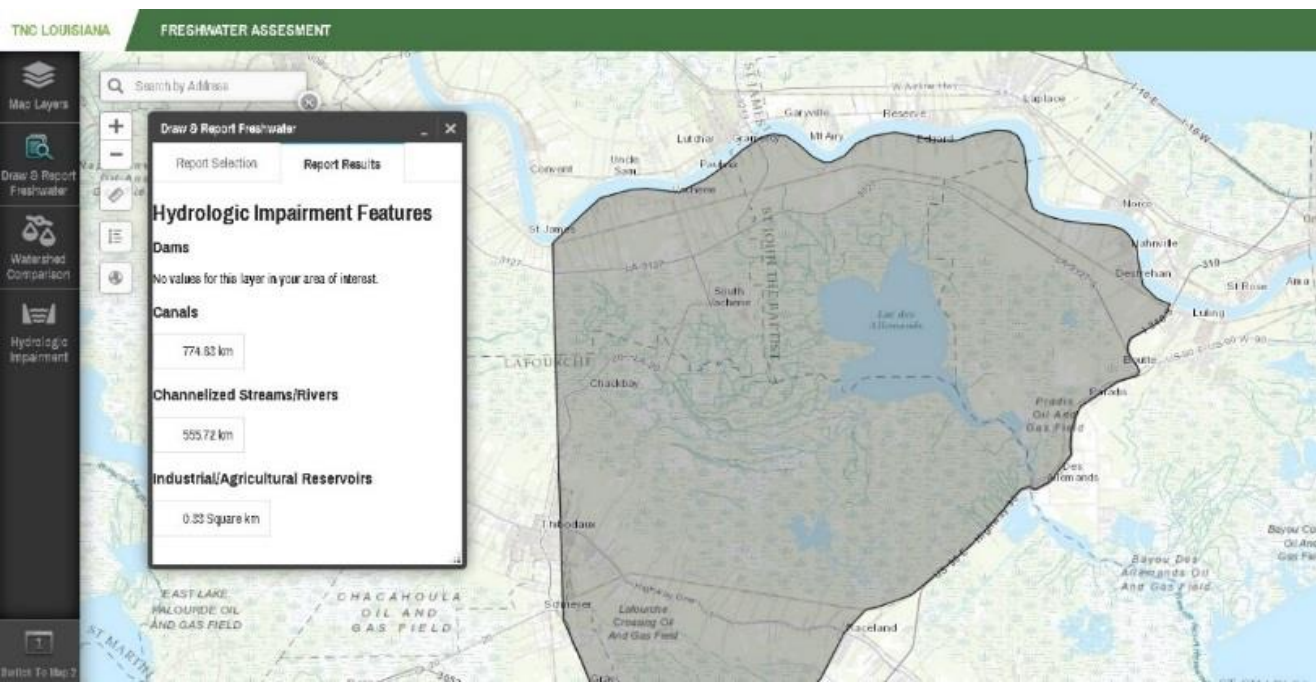
Coastal Connectivity



Data Mapper and Web Apps

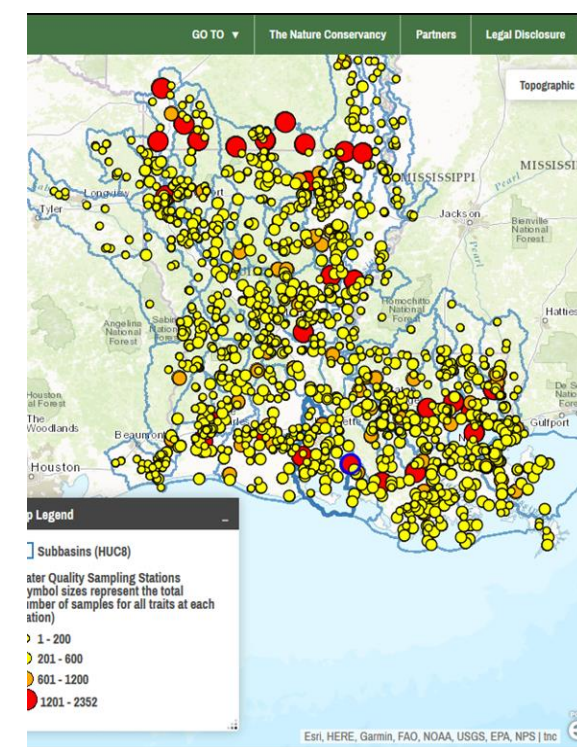
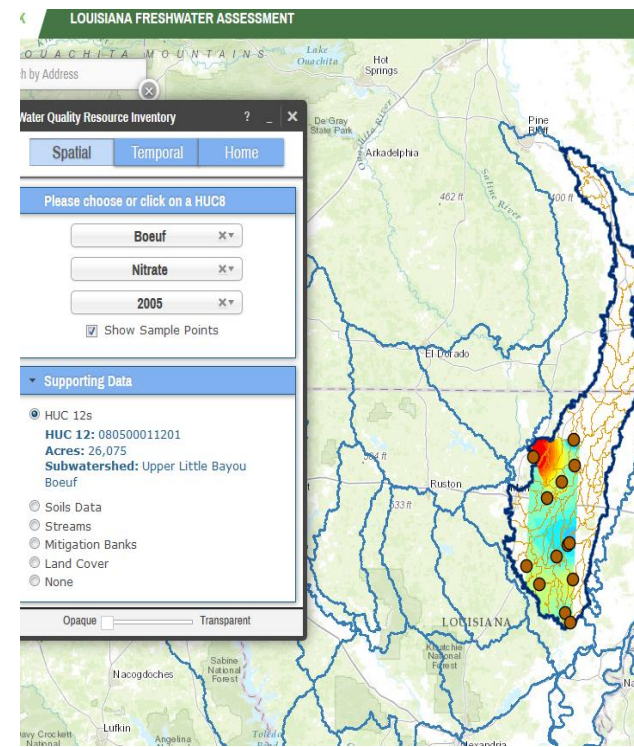
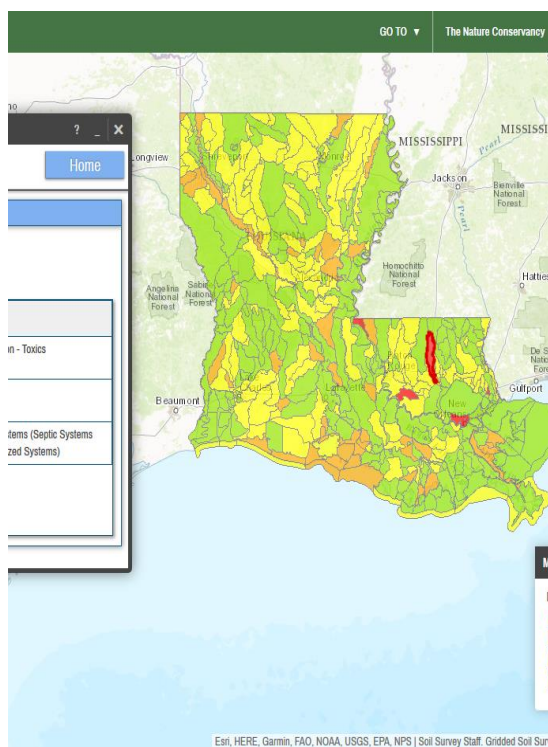
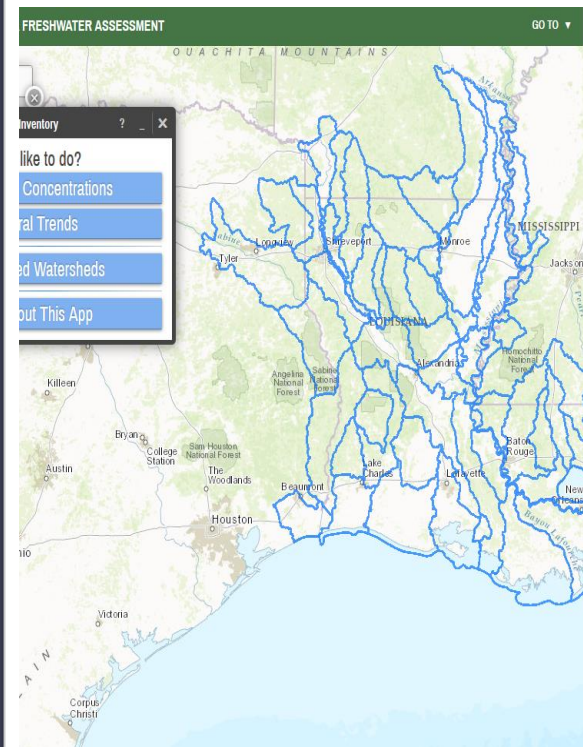
• Data Layers

- Comprehensive data layers important to support local and regional landscapes.
- Examples include:
 - Land Use and Cover
 - Conservation Lands
 - Wetlands
 - Nutrients
 - Groundwater wells and recharge areas



• Web Apps

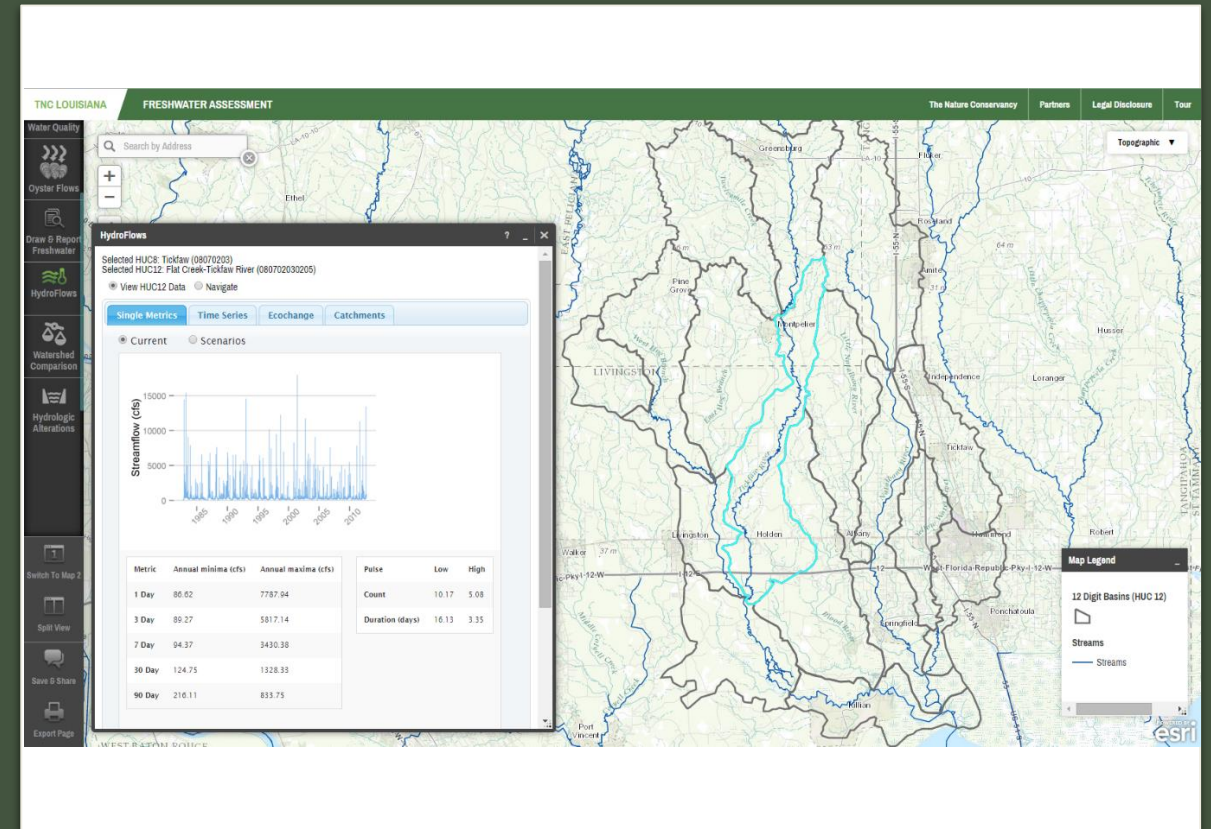
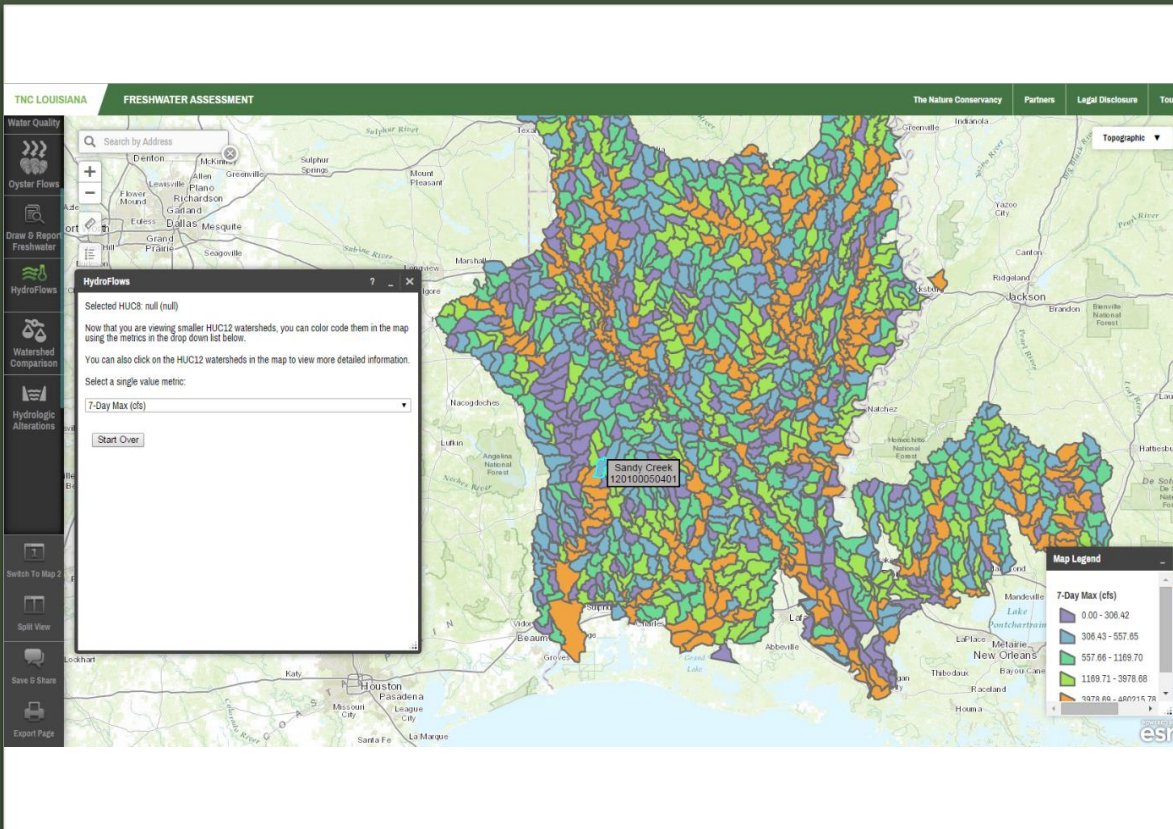
- Designed with partners to support decision making.
- Hydrologic Alterations, Surface Flow, Groundwater, Water Quality, Flow-ecology



Watershed Health

“Water Quality Resource Inventory” App

- Spatial and Temporal Trends of Water Quality Data.

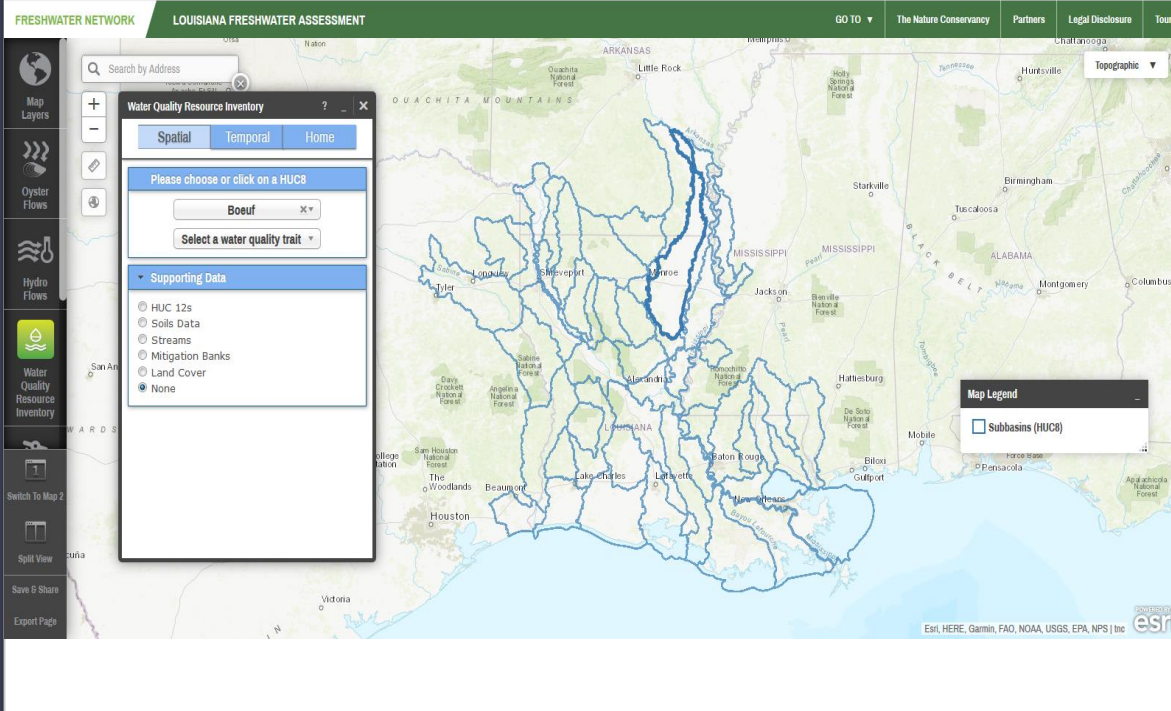


Surface Flow

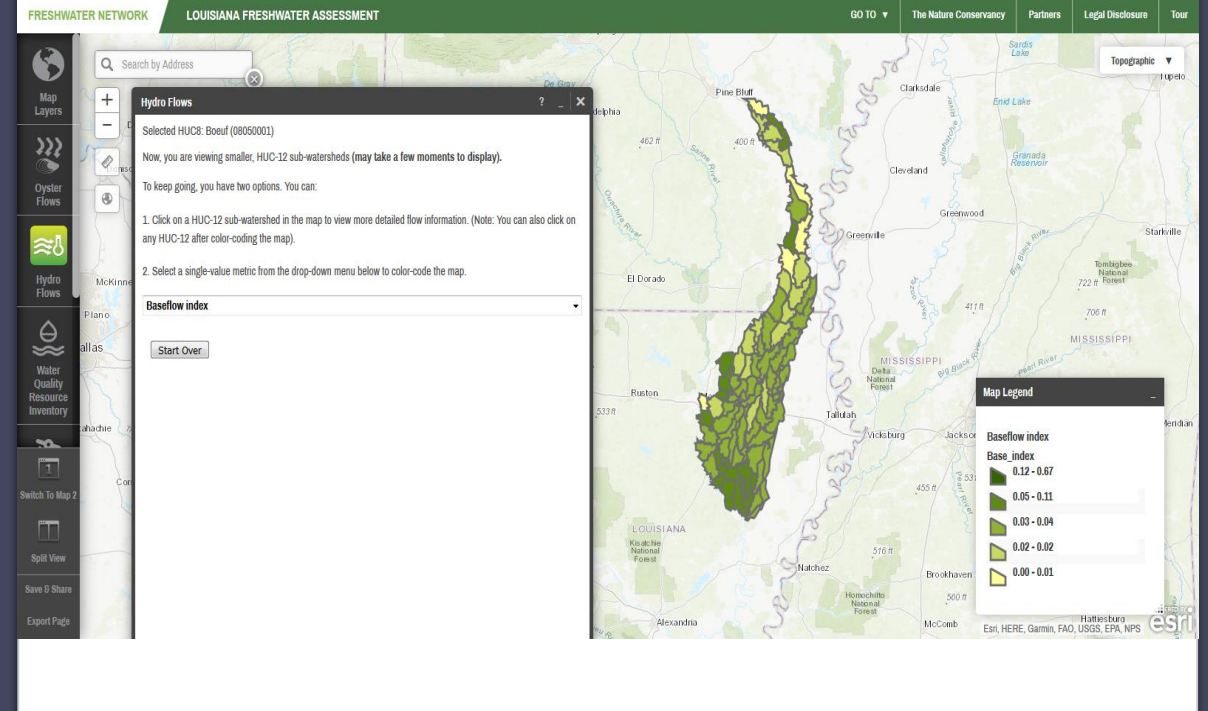
“HydroFlows” App

- presents results as maps, flow metrics, and charts.
- Linkage to groundwater models.

Water Quality Resource Inventory



HydroFlows



These apps together can support WQT

Water Quality Resource Inventory

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Map Layers



Oyster Flows



Hydro Flows



Water Quality Resource



Switch To Map 2



Split View



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Export Page

Search by Address

Topographic ▾

Water Quality Resource Inventory

Spatial Temporal Home

Please choose or click on a HUC8

Boeuf



Nitrate



2005



Show Sample Points

Supporting Data

HUC 12s

HUC 12: 080500011201

Acres: 26,075

Subwatershed: Upper Little Bayou Boeuf

Soils Data

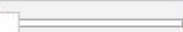
Streams

Mitigation Banks

Land Cover

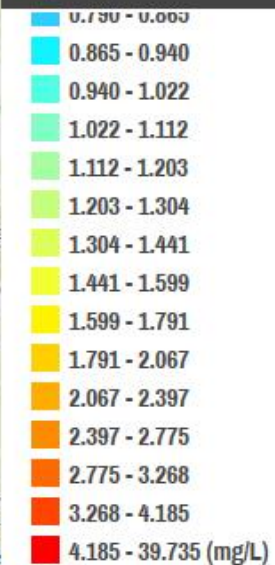
None

Opaque



Transparent

Map Legend



Water Quality Resource Inventory

Search by Address

Topographic ▾

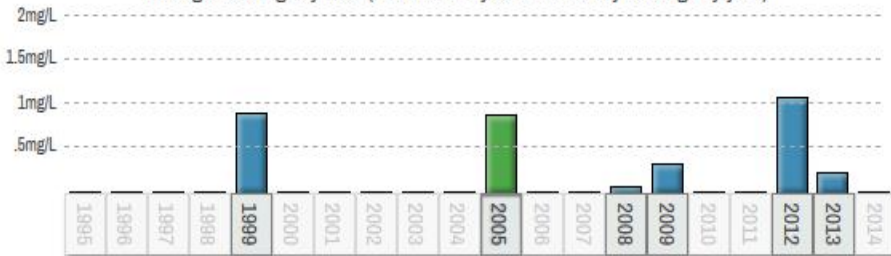
Water Quality Resource Inventory

Spatial Temporal Home

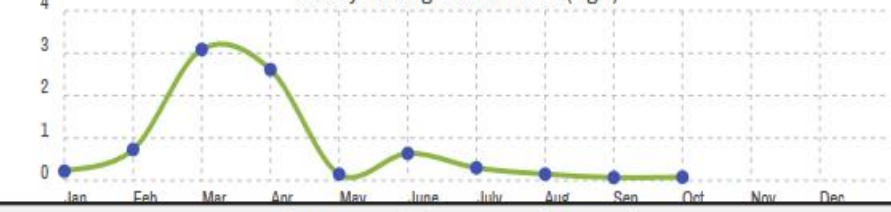
Station ID: Little Bayou Boeuf west of Collinston, Louisiana

DO N P TDS TSS TUR PHOS #2 NH3 NO3

Average Readings by Year (Click bars or years for monthly readings by year)



Monthly Readings Taken in 2005 (mg/L)



Opaque Transparent

Map Legend

Subbasins (HUC8)

Subwatersheds (HUC12)

Water Quality Sampling Stations
(Symbol sizes represent the total number of samples for all traits at each station)

- 1 - 200
- 201 - 600
- 601 - 1200
- 1201 - 2352

Land Cover Classifications

- Vegetation
- Agriculture
- Developed
- Water

HydroFlows – flow information and metrics



Map Layers



Oyster Flows



Hydro Flows



Water Quality Resource



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Split View

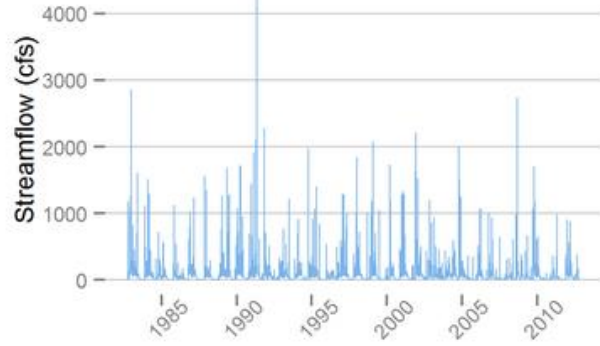


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Hydro Flows



Magnitude and Duration of Annual Extreme Water Conditions

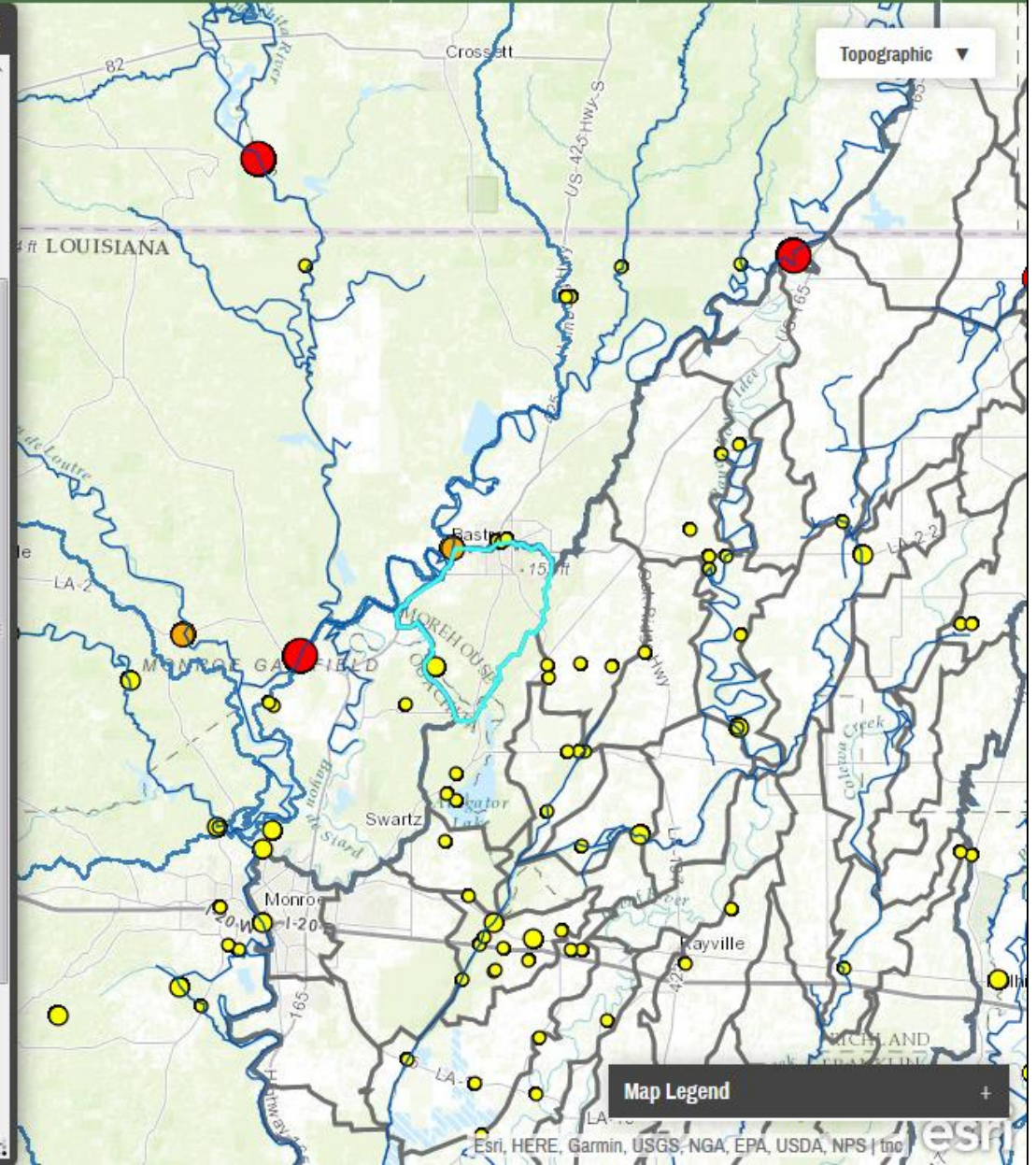
| Metric | Annual minima (cfs) | Annual maxima (cfs) |
|--------|---------------------|---------------------|
| 1 Day | 4.18 | 1587.83 |
| 3 Day | 4.26 | 1088.4 |
| 7 Day | 4.48 | 606.47 |
| 30 Day | 6.76 | 279.43 |
| 90 Day | 17.12 | 172.19 |

Rate and Frequency of Water Condition Changes

| Pulse | Low | High |
|-----------------|------|-------|
| Count | 3.6 | 22.17 |
| Duration (days) | 15.3 | 2.72 |

Timing of Annual Extreme Water Conditions

| | | | |
|-----------------|------|-------------|-----|
| Zero flow days: | 0 | Date of Min | 287 |
| Baseflow index: | 0.06 | Date of Max | 193 |



HydroFlows – tracking flow networks downstream from hotspots

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Map Layers



Oyster Flows



Hydro Flows



Water Quality Resource



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Hydro Flows

Selected HUC8: Boeuf (08050001)

Navigation Results Map View HUC12 Data

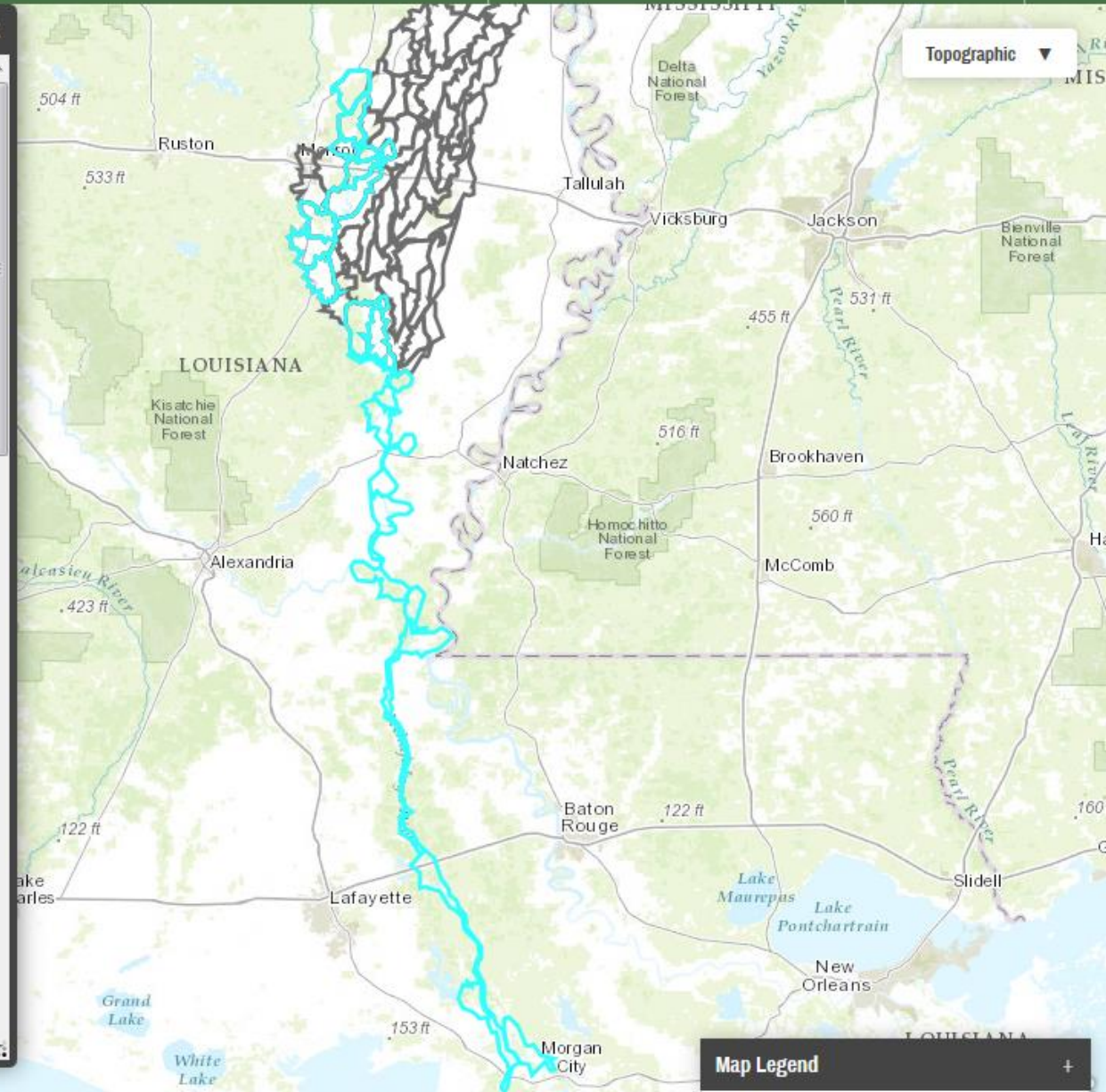
HUC12s from Navigation Results:

Middle Little Bayou Boeuf (080500011202)

Single Metrics | Time Series | Ecochange | Catchments

Current Scenarios

| | Baseline | Projected Water Use | Δ, %Δ | Climate Change | Δ, %Δ | Projected Water Use with Climate Change | Δ, %Δ |
|--|----------|---------------------|----------|----------------|--------------|---|--------------|
| Magnitude and Duration of Annual Extreme Water Conditions (cfs) | | | | | | | |
| 1-Day Min (cfs) | 7.23 | 7.39 | 0.16, 2% | 6.98 | -0.25, 3% | 7.14 | -0.09, 1% |
| 1-Day Max | 2468.32 | 2468.52 | 0.2, 0% | 1498.78 | -969.54, 39% | 1499 | -969.32, 39% |
| 3-Day Min | 7.42 | 7.58 | 0.16, 2% | 7.18 | -0.24, 3% | 7.33 | -0.09, 1% |
| 3-Day Max | 1729.98 | 1730.18 | 0.2, 0% | 1132.48 | -597.5, 35% | 1132.69 | -597.29, 35% |
| 7-Day Min | 7.9 | 8.06 | 0.16, 2% | 7.59 | -0.31, 4% | 7.75 | -0.15, 2% |
| 7-Day Max | 975.1 | 975.3 | 0.2, 0% | 696.33 | -278.77, 29% | 696.54 | -278.56, 29% |



Map Legend

Conservation Delivery App – HUC 12 view



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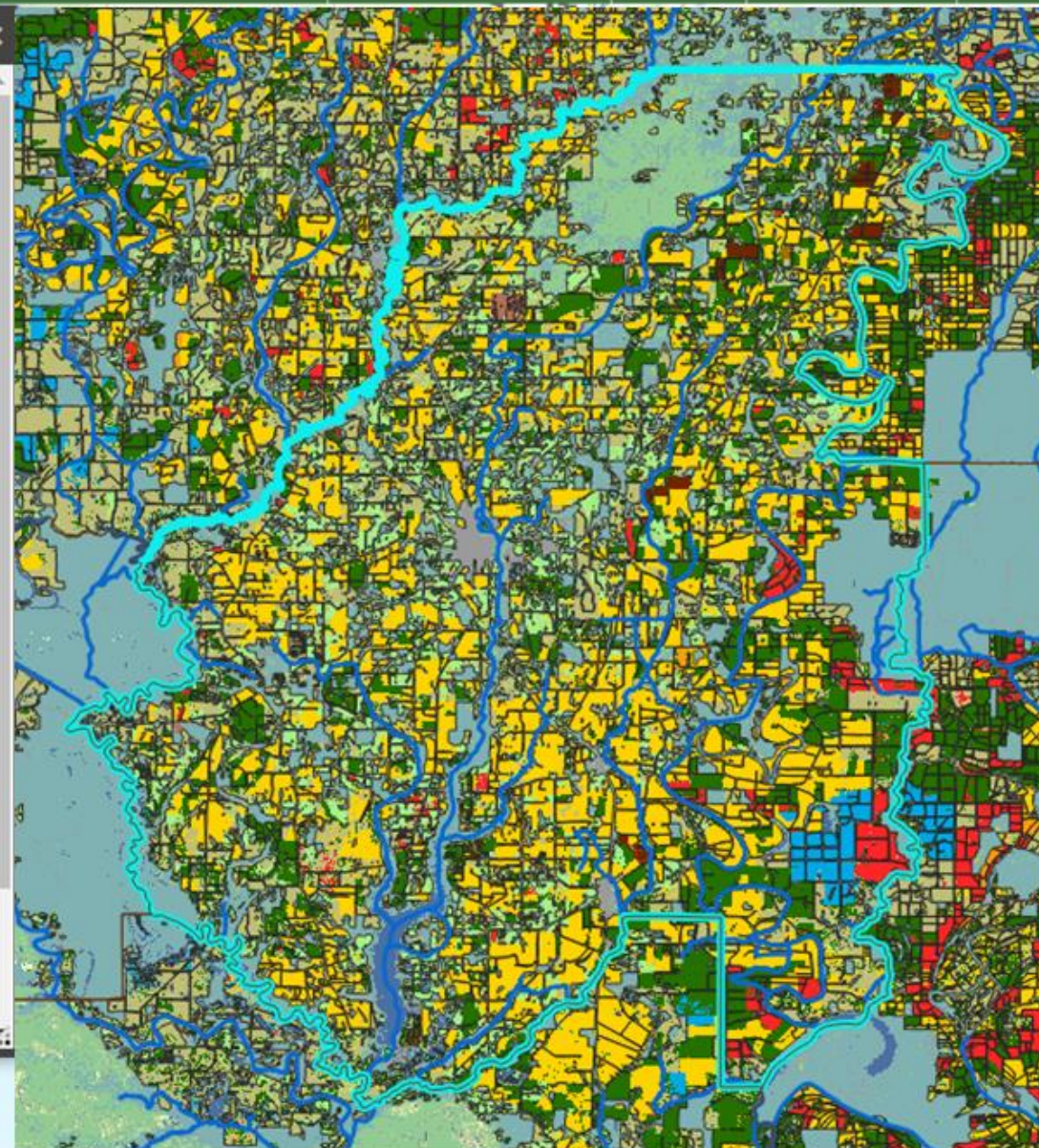
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Conservation Delivery

Assessment Type: Generalized Group Scenario

Selected RU: Franklin

| | Corn | Soy | Cotton |
|-----------------------|--------------|----------------------|--------------------|
| Total Area (ha) | 156,254 | 21,563 | 1,457 |
| Conservation Practice | Cover Crop 1 | Conservation Tillage | Wetland Conversion |
| Area Impacted (%) | 60 | 40 | 10 |
| N Efficiency | 0.008 | 0.15 | 0.9 |
| P Efficiency | -- | 0.356 | 0.12 |



New Icon Here

Oyster Flows



Hydro Flows



Water

1

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Conservation Delivery App – Field Project View

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Map

New Icon Here

Oyster Flows



Hydro Flows



Water

1

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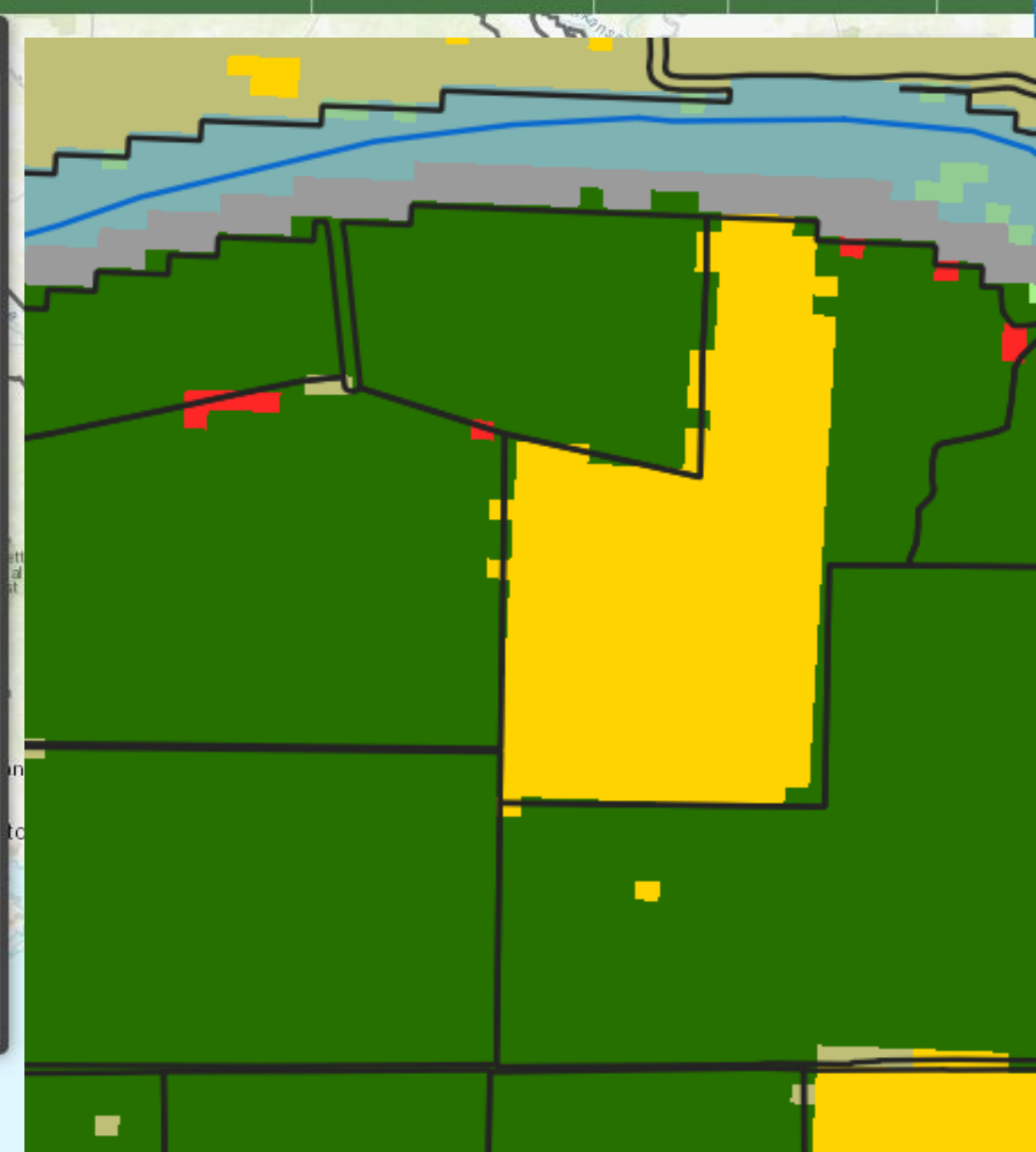
Conservation Delivery

Assessment Type: Individual Project

Field ID: 13343234

NHDPlus COMID: 9876888

| | Base Value | Scenario Value |
|-----------------------|------------|----------------|
| Crop Type | Corn | Corn |
| Area of Field (ha) | 10 | 10 |
| # of Practices | --- | 1 |
| Conservation Practice | --- | Cover Crop 1 |
| K | 0.43 | 0.3 |
| LS | 0.07 | 0.07 |
| C | 0.16 | 0.14 |
| P | 0.75 | 0.75 |
| R | 0.23 | 0.23 |
| Transport Factor | 0.85 | 0.80 |
| N Efficiency | --- | 0.19 |
| P Efficiency | --- | 0.06 |



Scoping the Potential for Viable WQT in Louisiana

1. Technical Feasibility Study

- Analysis of adoption potential, opportunities and barriers.
- Modeling and analysis of implementation costs, credit supply, and potential ROI.



2. On-the-ground Implementation

- 3 restoration scenarios
- Monitoring of nutrient reduction and other ecosystem service benefits

3. Industry and Municipal Support to advance WQT.

