Louisiana Use Attainability Analyses (UAAs) & Criteria Revisions

ACWA Conference
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April 16, 2024

Background

- The 2015 Water Quality Standards Regulatory Clarification rule helped to clarify the distinction between UAAs and criteria revisions and described the concept of the highest attainable use (HAU).
- From 1984 to 2004, LDEQ has successfully completed 13 UAAs in which a Section 101(a)(2) designated use was removed and/or sub-categorized.
  - Fishable Uses: Fish & Wildlife Propagation (FWP) > Limited Aquatic Life (LAL)
  - Swimmable Uses: Primary (PCR) > Secondary Contact Recreation (SCR)
- Reasons for sub-categorizing designated uses can include: regionally expected aquatic species are absent, low species diversity and richness, imbalanced trophic structure, irreversible hydrologic modification, irreversible degraded water quality, uniform channel morphology, lack of channel structure, uniform substrate, lack of riparian structure, etc.

UAA Listing

Subsegment	Subsegment Description	Rationale	Designated Use Change(s)	Year
080905	Turkey Creek	Intermittent stream	SCR is the HAU	1984
030105	Kinder Ditch	Man-made channel	SCR is the HAU	1991
030601	Barnes Creek	Intermittent stream	SCR is the HAU	1991
060209	Irish Ditch/Big Bayou	Intermittent stream	SCR is the HAU	1991
100708	Castor Creek Tributary	Intermittent stream	SCR is the HAU	1991
100710	Grand Bayou Triburary	Intermittent stream	SCR is the HAU	1991
100804	Saline Bayou Tributary	Intermittent stream	SCR is the HAU	1991
070504	Monte Sano Bayou	Intermittent stream	SCR & LAL are the HAUs	1993
080912	Tisdale Brake/Staulkinghead Creek	Intermittent stream	SCR & LAL are the HAUs	1995
081003	Deer Creek	Intermittent stream	SCR & LAL are the HAUs	1995
100305	Mahlin Bayou/McCain Creek	Intermittent stream	SCR & LAL are the HAUs	1995
101607	Bayou Cocodrie	Intermittent stream	SCR & LAL are the HAUs	1995
060904	New Iberia Southern Drainage Canal	Man-made channel	LAL is the HAU	2004

New Iberia Southern Drainage Canal UAA

- This UAA was completed in 2004 for an extensive network of canals originally created to improve drainage along the west bank of Bayou Teche, between New Iberia and Jeanerette, LA.
- Since the 1930s, several channels were widened and deepened in order to connect them to the Intracoastal Waterway and expand industrial growth in the area (Port of Iberia).
- The estuarine dissolved oxygen (D.O.) criterion of 4.0 mg/L was reviewed.
- The fishable HAU was evaluated: FWP vs. LAL.

Port of Iberia

New Iberia Southern Drainage Canal UAA (con't)

- LDEQ conducted surveys to document:
  - water quality conditions,
  - the extent of hydromodification,
  - lack of suitable habitat supportive of a stable trophic structure, and
  - prevalence of aquatic species tolerant of pollution and physical perturbations.
- The HAU was sub-categorized from FWP to LAL.
- D.O. criteria were revised from an annual criterion of 4.0 mg/L to seasonal criteria of 2.0 mg/L (May to October) and 3.0 mg/L (November to April).

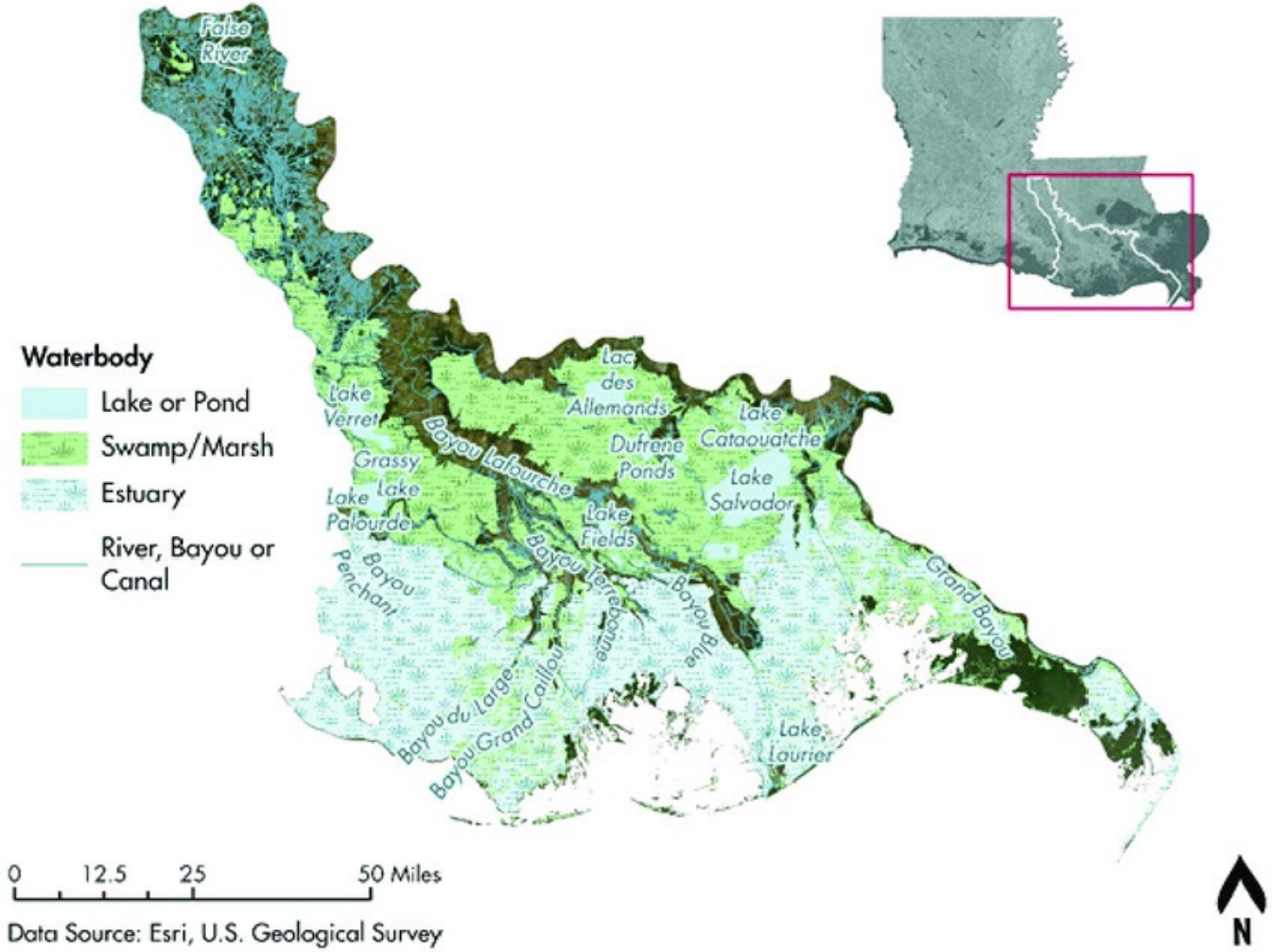
Criteria Revisions

- Criteria revisions are similar to a UAA, but the HAU is maintained.
  - A demonstration of how less stringent criteria maintain support of the HAU is conducted.
- LDEQ uses the triennial review and integrated report to identify areas for potential criteria revision efforts.
- In 2009, LDEQ successfully completed a D.O. criteria revision for portions of the Barataria and Terrebonne watershed basins.
- In 2019, LDEQ successfully completed two criteria revisions:
  - Bayou Chene D.O.
  - Wilson and Bradley Sloughs turbidity

Barataria & Terrebonne Basins Dissolved Oxygen

- Since the 1970s, Louisiana has utilized statewide D.O. criteria of 5.0 mg/L (freshwater and marine) and 4.0 mg/L (estuarine) to support the FWP designated use; both are comparable to EPA criteria recommendations.
- Multiple TMDLs demonstrated D.O. criteria could not be met, even if all point and non-point sources were controlled. Some TMDLs were concentrated in the Barataria and Terrebonne watershed basins. Both basins share multiple biotic and abiotic characteristics, particularly where they overlap with the Lower Mississippi River Alluvial Plain (LMRAP) and Coastal Deltaic Marsh (CDM) ecoregions.
- In order to demonstrate how the FWP designated use is maintained at lower D.O. levels within the survey area, LDEQ developed a methodology to identify least-impacted/reference sites representing optimal physical/habitat conditions.

Barataria-Terrebonne Survey Area



Barataria-Terrebonne Basins Dissolved Oxygen (con't)

- Water quality data was collected 296 times at 26 reference sites and biological data was collected 26 times at 15 reference sites.
- Survey data and secondary data collected by the Louisiana Department of Wildlife & Fisheries were compiled and used to establish critical/non-critical periods for D.O.
  - Months where existing statewide D.O. criteria were met for a given site were used to establish their non-critical period (and vice-versa for months representing the critical period).
  - Data revealed commonality in ecoregional critical periods per waterbody type.
  - Diurnal D.O. variations were taken into consideration.

Barataria-Terrebonne Basins Dissolved Oxygen (con't)

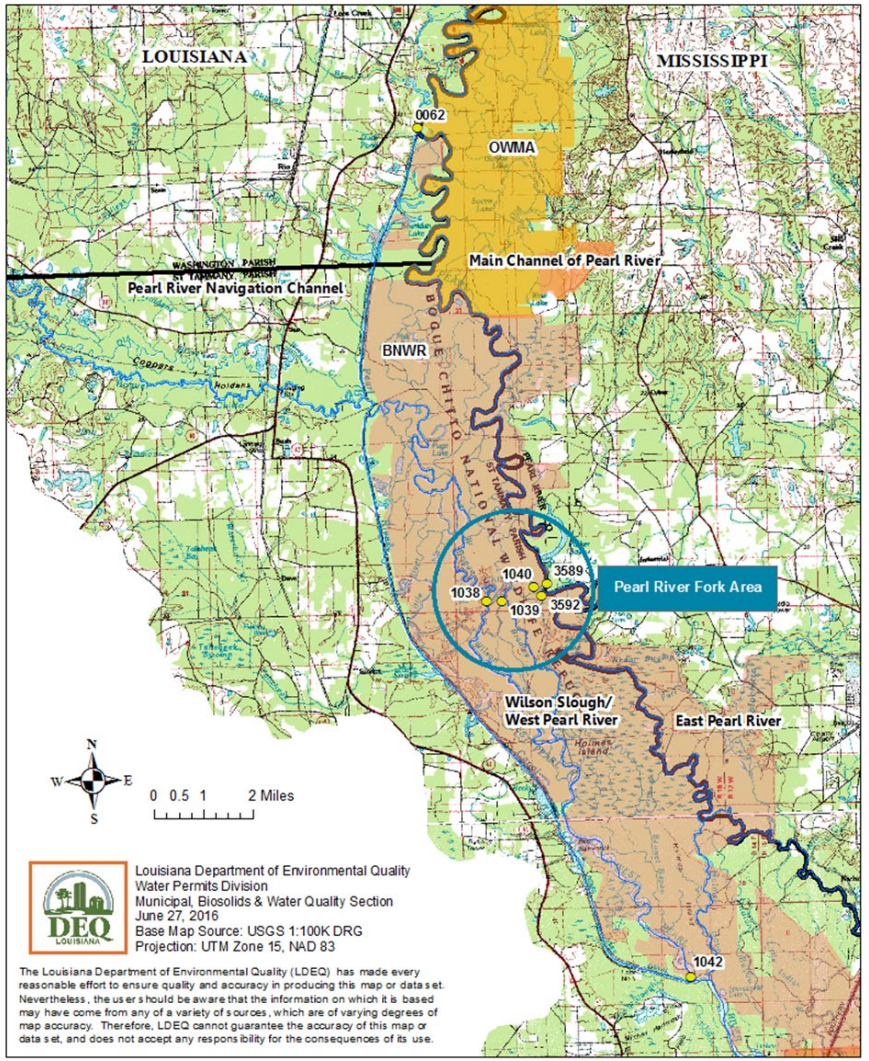
- Biological metrics (e.g., abundance and species richness) were used to validate reference site conditions.
- The 10th percentile of reference site D.O. data (per ecoregion & waterbody type) were compared to existing criteria. Results found four ecoregion/waterbody pairings where the 10th percentile of reference site data was less than applicable D.O. criteria:

ECOREGION	WATERBODY TYPE	CRITICAL PERIOD	Exist. D.O. (mg/L)	Revised D.O. (mg/L)
CDM	Canal	June to August	4.0 (mg/L)	3.8 (mg/L)
CDM	Stream	April to August	5.0 (mg/L)	3.8 (mg/L)
LMRAP	Lake	April to September	5.0 (mg/L)	3.3 (mg/L)
LMRAP	Stream	March to November	5.0 (mg/L)	2.3 (mg/L)

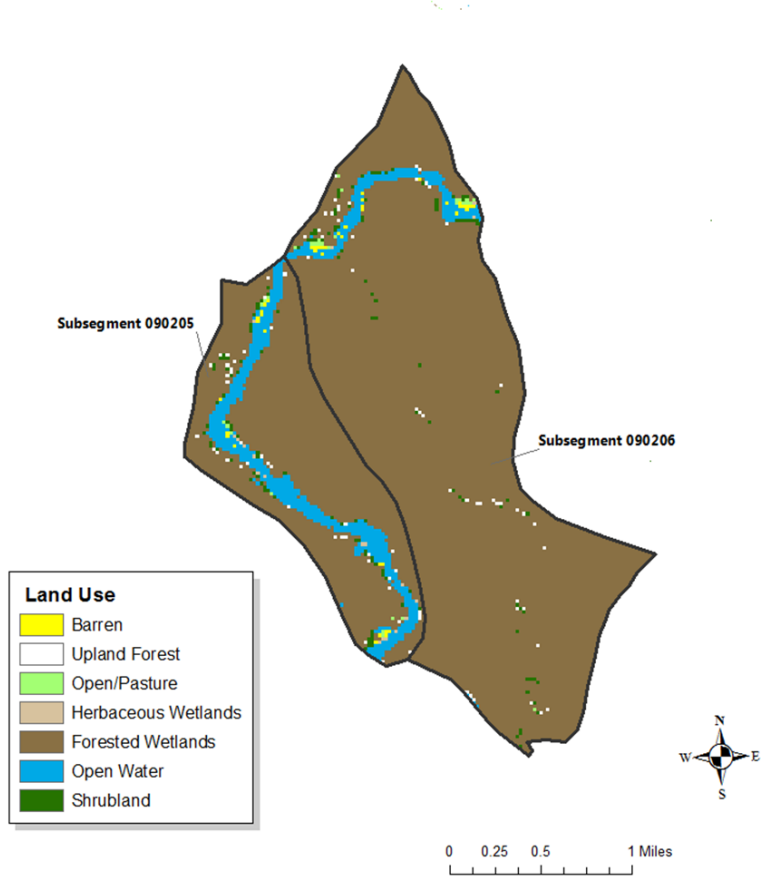
Wilson & Bradley Sloughs Turbidity

- In Louisiana, the outstanding natural resource waters (ONRW) designated use was broadly applied to all Scenic Rivers.
  - Scenic Rivers can be nominated by act of the Legislature, without supporting scientific data.
  - According to regulation, subsegments with the ONRW designated use have a turbidity criterion of 25 NTU, without the consideration of natural background conditions.
- Subsegments 090205 (Wilson Slough) and 090206 (Bradley Slough) both have the ONRW designated use and were often impaired for turbidity.
  - Integrated reports cited natural sources, sediment resuspension, and sources outside of state jurisdiction for the reasons causing impairments.
- LDEQ evaluated whether the application of the 25 NTU turbidity criterion was appropriate for these two subsegments.

Pearl River Survey Area

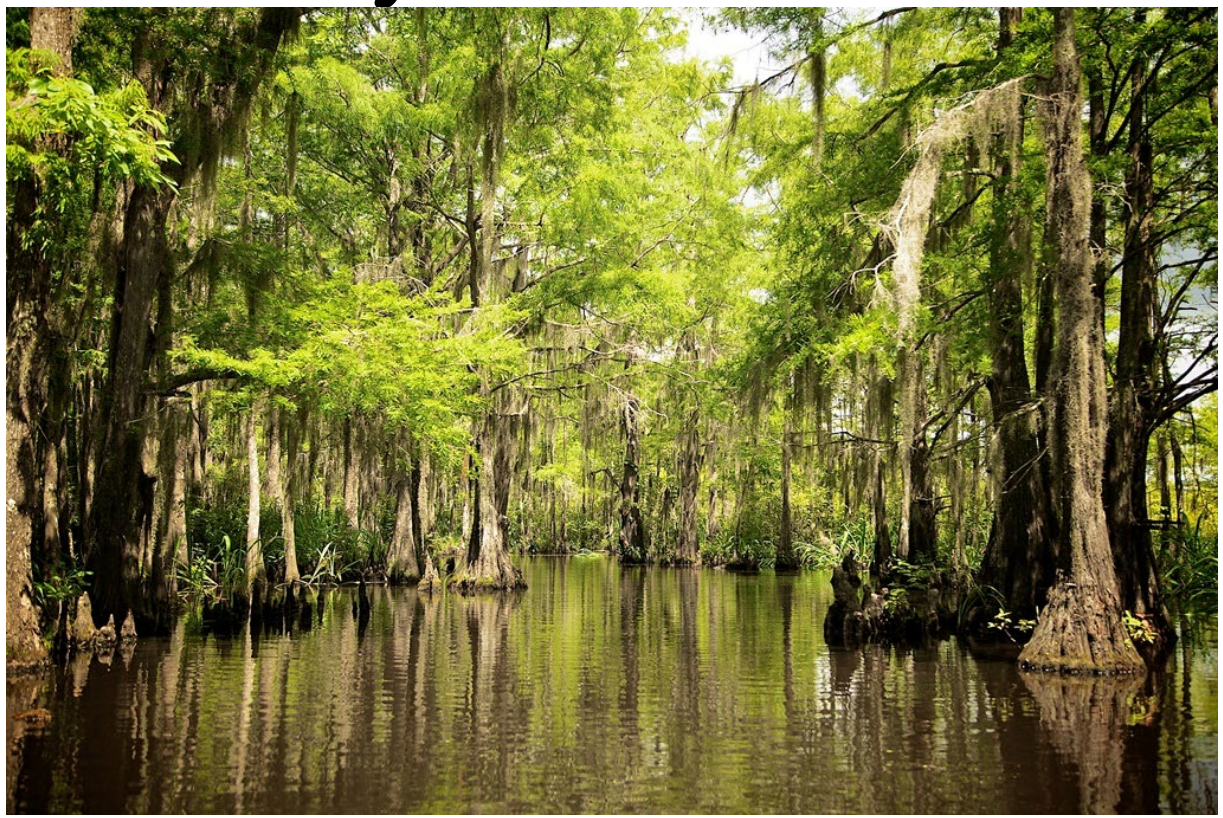


Pearl River Fork Area



Louisiana Department of Environmental Quality
Water Permits Division
Municipal, Biosolids & Water Quality Section
July 19, 2016
Projection: UTM Zone 15, NAD 83

Wilson Slough/West Pearl River and Braided River System



Wilson & Bradley Sloughs Turbidity (con't)

- LDEQ established the natural background condition of turbidity in the survey area, documenting the following considerations:
  - land use (majority of the survey area is natural/undisturbed)
  - discharger inventory (one sand & gravel pit in Mississippi was found in the survey area; turbidity data collected up and downstream of the facility's outfall determined it is not a source of turbidity in the area)
  - water quality data (uniform turbidity concentrations throughout study area, with noticeable seasonal pattern across study area)
  - water quality monitoring site location (physically located in Pearl River, because subsegments themselves are inaccessible)
  - upstream turbidity criteria (Pearl River turbidity criterion is 50 NTU)
  - hydrology (braided system, ~80% of flow into these waterbodies comes from Pearl River, and these waterbodies were virtually the same as Pearl River)
- Turbidity criterion for these subsegments was revised from 25 to 50 NTU to match Pearl River.

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