

**Louisiana's 2016 Integrated Report and  
Section 303(d) List  
Methods and Rationale**

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## **Introduction**

### **Statutes and Regulations**

The Louisiana Department of Environmental Quality (LDEQ) prepared reports to meet the requirements outlined in §303(d) and §305(b) of the federal Water Pollution Control Act (United States Code, Title 33, §1251 et seq., 1972) (commonly known as the Clean Water Act (CWA)) and supporting federal regulations found in Title 40 of the Code of Federal Regulations (CFR), Parts 130.7 and 130.10 (40 CFR 130.7, 130.10). Section 303(d) of the CWA and supporting regulations require each state to identify water quality-limited segments (i.e., Louisiana subsegments that do not meet water quality standards) requiring development of Total Maximum Daily Loads (TMDLs) and to prioritize the water quality-limited segments for TMDL development. States are required to assemble and evaluate existing and readily available water quality-related data and information to develop the list. Additionally, each state must provide documentation to support listing decisions, including: a description of the method used to develop the list; a description of the data and information used to identify (i.e., list) waters; a rationale for any decision not to use existing and readily available data and information; and other information to demonstrate “good cause” for not including waters on the §303(d) list pursuant to 40 CFR 130.7(b)(6).

Section 305(b) of the CWA and supporting regulations require states to report on the quality of state waters every two years; the biennial reports are due April 1 of even-numbered years. Section 305(b) requires a description of all navigable waters in each state and the extent to which these waters provide for the protection and propagation of fish and wildlife and allow for recreational activities in and on the water.

### **Guidance**

The United States Environmental Protection Agency (USEPA) issues guidance for the assessment, listing, and reporting of states' water quality to meet the requirements of CWA §303(d) (impaired waters list) and §305(b) (water quality inventory) (USEPA various dates). USEPA guidance outlines the compilation and reporting of state water quality in a combined report—the Integrated Report (IR). USEPA's guidance further outlines the use of categories to classify the quality of watersheds in each state. Integrated Report categories are outlined in table 1.

### **Integrated Report Development**

The 2016 IR contains new assessments for subsegments in all 12 Louisiana basins: Atchafalaya (01), Barataria (02), Calcasieu (03), Pontchartrain (04), Mermentau (05), Vermilion/Teche (06), Mississippi (07), Ouachita (08), Pearl (09), Red (10), Sabine (11), and Terrebonne (12). Due to the four-year cyclical nature of LDEQ's Ambient Water Quality Network (AWQN) approximately ½ of the assessments for the 2016 IR will be new, while the remaining ½ will be carried forward from the 2014 IR. Data from October 1, 2011 through September 30, 2015 were used for the 2016 IR.

Table 1. U.S. Environmental Protection Agency Integrated Report Methodology guidance categories used to categorize water body/impairment combinations for the *Louisiana 2016 Integrated Report*; includes IRC 5RC and IRC 5-Alt developed by LDEQ and approved by U.S. Environmental Protection Agency.

<b>IR Category (IRC)</b>	<b>IR Category Description</b>
IRC 1	<i>Specific Water body Impairment Combination (WIC)</i> cited on a previous §303(d) list is now attaining all uses and standards. Also used for water bodies fully supporting all designated uses.
IRC 2	Water body is meeting some uses and standards but there is insufficient data and/or information to determine if uses and standards associated with the <i>specific WIC</i> cited are being attained.
IRC 3	There is insufficient data and/or information to determine if uses and standards <i>associated with the specific WIC</i> cited are being attained.
IRC 4a	WIC exists but a TMDL was completed for the <i>specific WIC</i> cited.
IRC 4b	WIC exists but control measures other than a TMDL are expected to result in attainment of designated uses <i>associated with the specific WIC</i> cited.
IRC 4c	WIC exists but a pollutant (anthropogenic source) does not cause the <i>specific WIC</i> cited.
IRC 5	WIC exists for one or more uses, and a TMDL is required for the <i>specific WIC</i> cited. <b>IRC 5 and its subcategories represent Louisiana's §303(d) list.</b>
IRC 5RC (Revise Criteria)	WIC exists for one or more uses, and a TMDL is required for the <i>specific WIC</i> cited; however, LDEQ will investigate revising criteria due to the possibility that natural conditions may be the source of the water quality criteria impairments.
IRC 5- Alt (5- Alternative)	WIC exists for one or more uses, and a TMDL is required for the <i>specific WIC</i> cited; however, LDEQ will implement alternative strategies under its 303(d)/Vision process to ensure the water body will meet water quality standards in the future.

## Water Quality Assessment Methods

The following outlines the methods LDEQ used to develop the CWA §303(d) list and water body categorizations found in the 2016 IR. LDEQ used assessment procedures developed and updated over a number of years. Procedures followed USEPA guidance documents for §305(b) reports and §303(d) lists and USEPA's Consolidated Assessment and Listing Methodology (CALM) guidance (USEPA various dates). LDEQ based water quality assessments and §303(d)

listings on specific water body subsegments as defined in Louisiana’s Surface Water Quality Standards (Louisiana Administrative Code (LAC) 33:IX.1101-1123). Louisiana surface water quality standards define eight designated uses for surface waters: primary contact recreation (PCR), secondary contact recreation (SCR), fish and wildlife propagation (FWP) (with “subcategory” of limited aquatic and wildlife use (LAL)), drinking water supply (DWS), oyster propagation (OYS), agriculture (AGR), and outstanding natural resource waters (ONR). Designated uses have specific suites of ambient water quality parameters used to assess their support. Links between designated uses and water quality parameters, as well as water quality assessment procedures, can be found in table 2. Additional details of Louisiana’s IR assessment process can be found in Louisiana’s Standard Operating Procedures for Production of Water Quality IR (LDEQ 2014a).

Table 2. Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana’s 2016 Integrated Report.<sup>1</sup>

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting <sup>2</sup>	Not Supporting
Primary Contact Recreation (PCR) (Designated swimming months of May-October, only)	Fecal coliform <sup>3</sup>	0-25% do not meet criteria	-	>25% do not meet criteria
	Enterococci <sup>4</sup>	0-10% of single exceedances do not meet criteria; Overall geometric mean ≤ 35 cfu/100 ml		>10% of single exceedances do not meet criteria; overall geometric mean > 35 cfu/100 ml
	Temperature	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals <sup>5,6,7</sup> and Toxics	<2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	≥2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters

Table 2. Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's 2016 Integrated Report.<sup>1</sup>

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting <sup>2</sup>	Not Supporting
Secondary Contact Recreation (SCR) (All months)	Fecal coliform <sup>3</sup>	0-25% do not meet criteria	-	>25 % do not meet criteria
	Metals <sup>5,6,7</sup> and Toxics	<2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	≥2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters

Table 2. Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's 2016 Integrated Report.<sup>1</sup>

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting <sup>2</sup>	Not Supporting
Fish and Wildlife Propagation (FWP)	Dissolved oxygen (routine ambient monitoring data) <sup>8</sup>	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
	Dissolved oxygen (follow-up continuous monitoring data, if needed) <sup>8</sup>	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
	Temperature, pH, chloride, sulfate, TDS, turbidity	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals <sup>5,6,7</sup> and Toxics	<2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	≥2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters

Table 2. Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's 2016 Integrated Report.<sup>1</sup>

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting <sup>2</sup>	Not Supporting
Drinking Water Source (DWS)	Color	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Fecal coliform <sup>3</sup>	0-30% do not meet criteria	-	>30 % do not meet criteria
	Metals <sup>5,6,7</sup> and Toxics	<2 exceedances of drinking water criteria in most recent consecutive three-year period, or one-year period for newly tested waters	-	≥2 exceedances of drinking water criteria in the most recent consecutive three-year period, or one-year period for newly tested waters
Outstanding Natural Resource Waters (ONR)	Turbidity	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
Agriculture (AGR)	None	-	-	-
Oyster Propagation (OYS)	Fecal coliform <sup>3</sup>	Median fecal coliform ≤ 14 MPN/100 mL; and ≤ 10% of samples > 43 MPN/100 mL	-	Median fecal coliform > 14 MPN/100 mL; and > 10% of samples > 43 MPN/100 mL
Limited Aquatic and Wildlife (LAL)	Dissolved oxygen <sup>8</sup>	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria

Table 2. Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's 2016 Integrated Report.<sup>1</sup>

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially Supporting <sup>2</sup>	Not Supporting
<b>Footnotes</b>				
<ol style="list-style-type: none"> <li>1. Where deviations from the decision process described in table 2 occur, detailed information will be given to account for and justify those deviations. For instance, circumstances that may not be accounted for in the plain electronic analysis of the data will be explored and may be used to either not list the water body or to put the Water body Impairment Combination (WIC) into a different category. Those circumstances will be fully articulated.</li> <li>2. While the assessment category of "Partially Supporting" is included in the statistical programming, any use support failures will be recorded in the Assessment Database (ADB) as "Not Supporting." This procedure was first adopted for the 2002 §305(b) cycle because "partially supported" uses receive the same TMDL treatment as "not supported" uses.</li> <li>3. For most water bodies, criteria are as follows: PCR, 400 colonies/100 mL; SCR, 2,000 colonies/100 mL; DWS, 2,000 colonies/100 mL; OYS, 43 colonies/100 mL (see LAC 33:IX.1123).</li> <li>4. For enterococci, Louisiana Department of Health and Hospitals (LDHH's) single sample criterion for beach monitoring is 130 colony forming units (cfu)/100 ml. For marine waters, the geometric mean criterion over the period of record is 35 cfu/100 ml. LDHH beach data only applies to the LDHH monitored beaches. Refer to page 15 for details.</li> <li>5. Determination of the application of marine or freshwater metals criteria is made based on LAC 33:IX.1113.C.6.d.</li> <li>6. Parameters collected quarterly (metals and organics) required a minimum of three samples.</li> <li>7. Beginning in April 2013, LDEQ resumed ultra-clean metals sampling at selected sites across the state. Sites were selected based on previous Water Quality IR assessments showing impairment for one or more metals. Ultra-clean metals sampling is conducted by the Water Surveys Section under Quality Assurance Project Plan (QAPP)_1031_03 (LDEQ 2015). The QAPP is available through LDEQ's Electronic Document Management System (EDMS) as document # 9626986. EDMS can be found at:  <a href="http://www.deq.louisiana.gov/portal/ONLINESERVICES/ElectronicDocumentManagementSystem.aspx">http://www.deq.louisiana.gov/portal/ONLINESERVICES/ElectronicDocumentManagementSystem.aspx</a>.</li> <li>8. In the event that analysis of routine ambient monitoring data for dissolved oxygen results in partial- or non-support, continuous monitoring (CM) data, where available, was used for follow-up assessment. CM data runs were approximately 48-72 hours in duration. CM data was evaluated as follows: All of the 15-minute interval dissolved oxygen observations from a CM sample run were analyzed to determine if more than 10% of the data points were below minimum criteria. Water bodies that fell below the criteria greater than 10% of the time were reported as IRC 5 and are therefore on the §303(d) list. Water bodies that fell below the criteria less than or equal to 10% of the time were placed in IRC 1, fully supported. If ambient monitoring indicated impairment and CM data was not available for analysis, the water body was placed in IRC 5 until CM data can be collected during the critical season of May 1 through October 31. In some cases, CM data was not collected because it was determined by LDEQ headquarters and regional staff that CM data collection efforts were not warranted due to conditions in the field.</li> </ol>				

## **Water Quality Data and Information**

LDEQ prepared assessments using existing and readily available water quality data and information in order to comply with rules and regulations under §303(d) of the CWA (33 U.S. Code, §1313 and 40 CFR 130.7). LDEQ used monitoring procedures and data for the 2016 IR that remained essentially the same as those used to collect data for the 2014 IR.

LDEQ primarily relied on data and information supplied through LDEQ's routine ambient monitoring program to conduct water quality assessments for the 2016 IR. LDEQ conducts monitoring on nearly all water quality subsegments on a four-year statewide monitoring cycle. Approximately one-quarter of the state's subsegments are monitored each year; a limited number of subsegments are monitored (and continue to be monitored) every year (i.e., long-term monitoring stations). Each monitoring cycle or "water-year" begins in October and ends in September of each year; concluding the monitoring cycle in September allows time to process data and generate the IR by April 1 of even-numbered years. LDEQ collected monthly and quarterly (metals and organics) water quality data (LDEQ 2010; LDEQ 2014a; LDEQ 2014b; LDEQ 2014c; LDEQ 2015); ambient water quality data are available on LDEQ's website at: <http://www.deq.louisiana.gov/portal/Default.aspx?tabid=2421>.

LDEQ compiled and assessed data from the Ambient Water Quality Monitoring Network (AWQMN) collected between October 1, 2011 and September 30, 2015; up to four years (48 samples) of data were available for subsegments with long-term monitoring sites (LDEQ 2014b).

### **Subsegments with Downstream or Upstream Monitoring Sites**

LDEQ used ambient monitoring data and information collected from within or immediately downstream or upstream of a water body subsegment to evaluate each of the subsegment's designated uses, using the decision processes shown in table 2 ("immediately downstream" typically means within approximately 600 yards (0.34 miles) or less of the subsegment boundary). Four subsegments used for the 2016 IR had sites immediately downstream or upstream of the subsegment boundary; in each case there were no known inputs between the subsegment boundary and the sample site. One subsegment had a site immediately upstream of the subsegment boundary (0.28 mile). Six subsegments had sample points between one and five miles downstream from the subsegment boundary. One subsegment had a site located in the coastal waters, and the flow would be largely influenced by tidal activity. One subsegment had a sample point 6.7 miles downstream. In each case, there were no reasonable alternatives for sampling at or above the subsegment boundary, and each site was determined to be representative of the assessed subsegment.

### **Subsegments with Long-Term Monitoring Sites**

LDEQ collected data at 21 sites in subsegments with long-term monitoring stations. Typically, LDEQ applied assessments for a monitoring station indicating use impairment to the entire subsegment, even if the second monitoring station did not indicate use impairment.

#### **Metals**

Beginning in April 2013, LDEQ resumed ultra-clean metals sampling at selected sites across the state. Sites were selected based on previous Water Quality IR assessments showing impairment for one or more metals. Ultra-clean metals sampling was conducted by the Water Surveys Section under QAPP\_1031\_03 (LDEQ 2015). The QAPP is available through LDEQ's Electronic Document Management System (EDMS) as document # 9626986. EDMS can be found at:

<http://www.deq.louisiana.gov/portal/ONLINESERVICES/ElectronicDocumentManagementSystem.aspx>. Metals data was assessed using the decision processes shown in table 2.

#### **Dissolved Oxygen**

Beginning in 2008, LDEQ from time to time collected two sets of data to conduct dissolved oxygen (DO) assessments. If routine ambient monitoring DO data indicate potential impairment of the use, LDEQ may collect and use continuous monitoring DO data sets to make a final determination on use support. Continuous monitoring data allows evaluation of the 24-hour diurnal DO fluctuations and an improved determination of whether the frequency of DO exceedances is impairing the use (LDEQ 2008). Deployment of continuous monitors was also dependent on available resources and a determination of whether collecting the extra data set was appropriate (e.g., if stream impairment was already known, there was no benefit to be gained by deploying a continuous monitor until additional pollution control measures were implemented). In some cases it was determined that conditions in the water body were severely impacted by drought or other natural or anthropogenic conditions. If such conditions were considered severe enough, it was determined the subsegment would be unable to attain DO criteria even with the use of continuous monitoring. In these cases continuous monitors were not deployed in order to reduce costs and eliminate risk to equipment.

#### **Coastal Subsegments with Shared Monitoring Sites**

LDEQ evaluated coastal subsegments for the potential to have shared data points for contiguous and similar subsegments. This was done to address subsidence and other land-altering activities that have created open water areas between subsegments that were previously separated by land. Paired and/or adjacent subsegments were sampled on an alternating basis (one subsegment sampled one month, the similar subsegment sampled the next month) beginning in the 2010/2011 ambient monitoring cycle (Table 3). For the 2016 IR, all historical data for each site/subsegment for dissolved oxygen, turbidity, pH, temperature, salinity, alkalinity, and hardness and all fecal data from 2004 to present was analyzed to determine which sites/subsegments were not significantly different statistically and, therefore, could be combined for assessment purposes. The addition of

salinity, alkalinity, and hardness to the analysis, outside of the assessed parameters, provides further support to the validity of the shared monitoring approach. Each set of paired subsegments was analyzed using a non-parametric randomized complete block design, or Friedman test. Year was used as a block to reduce the variability between each site/subsegment comparison. Each parameter was analyzed individually and the resulting p-value ( $\alpha=0.05$ ) was adjusted using the Bonferroni-Holm method (Holm 1979). Any paired site/subsegment having at least one significant value was considered as statistically significant and the site/subsegments were assessed separately. Paired sites/subsegments not statistically significant for all parameters were assessed together. The data assessed were from October 1, 2011, to September 30, 2015. One site/subsegment had only four sampling dates during this timeframe, and was not assessed (results are presented for general knowledge). Only four site/subsegment(s) had criteria for turbidity. The percentages of site/subsegment(s) exceeding the criteria are presented in table 4.

Table 3. List of paired coastal subsegments/sites used for shared water quality monitoring and assessment.

<b>Subsegment</b>	<b>Site</b>	<b>Subsegment</b>	<b>Site</b>
010901	1204	042205	1088
061002	0692	042206	1087
041701	0035	060803	0678
041704	1072	060804	0679
042104	0007	061104	0316
042102	1080	061001	0691
042201	1090	110303	1158
042202	1082	110304	1159
042203	1089	120406	0937
042204	1091	120708	0955
042207	1083	120802	0958
042208	0006	120804	0960
		120803	0959

Table 4. The exceedance percentage for each water quality parameter and subsegment(s) pair from the period of October 1, 2011, to September 30, 2015. Subsegments that are fully supported are labeled as “0% FS,” whereas subsegments not fully supported are labeled as “X% NS,” where X is the percentage of exceedances. Subsegments paired together were not significantly different statistically; therefore, data from both subsegments were used for the assessment. See text for description of statistical analysis performed. Subsegments and parameters containing less than five data points were deemed to have insufficient data (INSD); however, the exceedance percentage is listed for information purposes.

Subsegment	Site	Water Quality Parameters					
		Dissolved Oxygen	Fecal OYS	Fecal PCR and SCR	pH	Turbidity	Temperature
010901	1204						
061002	0692	0% FS	no data	no data	0% FS	--	0% FS
041701	0035						
041704	1072	0% FS	N/A <sup>b</sup>	0% FS	0% FS	0% FS	0% FS
042104	0007	0% FS	0% FS	0% FS	0% FS	--	0% FS
042102	1080	0% FS	0% FS	0% FS	0% FS	0% FS	0% FS
042201	1090						
042202	1082	0% FS	0% FS	0% FS	0% FS	--	0% FS
042203	1089						
042204	1091	0% FS	0% FS	0% FS	0% FS	--	0% FS
042207	1083						
042208	0006	0% FS	0% FS	0% FS	0% FS	--	0% FS
042205	1088						
042206	1087	0% FS	0% FS	0% FS	0% FS	-- <sup>1</sup>	0% FS
060803	0678			INSD			
060804	0679	0% FS	N/A <sup>2</sup>	0% FS	0% FS	42% NS	0% FS
061104	0316	0% FS	50% NS	0% FS	0% FS	--	0% FS
061001	0691	0% FS	50% NS	0% FS	0% FS	--	0% FS
110303	1158	0% FS	67% NS	0% FS	0% FS	0% FS	0% FS
110304	1159	0% FS	83% NS	0% FS	0% FS	0% FS	0% FS
120406	0937						
120708	0955	0% FS	0% FS	0% FS	0% FS	--	0% FS
120802	0958						
120804	0960	0% FS	0% FS	0% FS	0% FS	--	0% FS
120803	0959	INSD, 0% FS					

1. There is no turbidity criteria for these sites.

2. The most stringent designated use for these sites is primary contact recreation, all others are oyster propagation.

### **External Data and Information**

LDEQ's routine ambient monitoring data (described above) provided the primary set of data and information used for water quality assessments and listing decisions. However, LDEQ also used external data sets and information.

LDEQ used LDHH fishing and swimming advisory information and enterococci and fecal coliform bacteria data sets collected for the state's Beach Monitoring Program. For water bodies within a subsegment with fish consumption or swimming advisories, the advisory water body was also named in the 2016 IR. Impairments of this nature are water body-specific issues not directly related to the overall subsegment.

LDEQ evaluated the LDHH beach monitoring data based on the federally-promulgated enterococci criteria for Louisiana and used by LDHH for determining beach closures. USEPA uses a single sample criterion of 130 colony forming units (cfu)/100 ml. For marine waters, a geometric mean > 35 cfu/100 ml over the period of record used for the IR results in an impairment. Enterococci data collected as part of LDHH's beach monitoring were evaluated using USEPA's new assessment rule of 10%. Under this rule, if more than 10% of samples exceed the statistical threshold value of 130 cfu/100 ml over the period of record used for the IR, then an impairment for enterococci is reported. If the enterococci geometric mean was > 35 cfu/100ml over the period of record used for the IR, then an impairment is reported. Duplicate samples in the dataset were treated as QC samples and were not averaged with the target sample to keep evaluation methods consistent with LDEQ protocol.

Finally, LDEQ solicited data and information from the public. LDEQ published a request for data and information during a 30-day public notice period which ended December 2, 2015. As a result of the public request for data no additional data was provided.

### **Rationale for Not Using Readily Available Data and Information**

In accordance with LDEQ's QAPP for the AWQMN (LDEQ 2014b) approved by USEPA-Region 6, LDEQ required at least five data points for parameters collected monthly and a minimum of three data points for parameters collected quarterly; otherwise, insufficient data were available for assessment purposes. LDEQ conducted additional evaluations of data sets to determine usability in accordance with standard operating procedures for the IR (LDEQ 2014a) and data quality objectives outlined in the QAPP cited above. Data quality issues that may have necessitated qualifications to data sets resulting in limited and/or no usability include, but are not limited to: limited geospatial data and/or representativeness; limited temporal data and/or representativeness; limited quality control data; and quality control data indicating data that are of limited use (e.g., blank contamination, incorrect laboratory procedures).

## **Good Cause for Not Listing Waters**

In accordance with CWA §303(d) and federal regulations, LDEQ listed waters as impaired and requiring TMDL development (IRC 5, IRC 5RC, and IRC 5-Alt; see table 1) if sufficient data of appropriate quality were available. Conversely, if insufficient data was available through LDEQs ambient water quality monitoring or other sources, then the water body was reported as unassessed or prior IR assessments were carried forward.

## **Coastal Subsegments Affected by Oil Spill and/or Cleanup Activities**

On April 20, 2010, BP's Deepwater Horizon drilling rig operating in the Gulf of Mexico approximately 50 miles off the Mississippi River delta exploded and sank. This triggered an oil spill from the damaged riser at the bottom of the Gulf that continued until August 4, 2010 when a static kill procedure effectively closed the well. The well was then cemented and permanently closed by September 19, 2010. The resulting oil spill affected a large portion of Louisiana's coastline. LDEQ and other agencies continue to analyze the impact of the spill on Louisiana's coastal waters. Results of this analysis will be presented in future reports by LDEQ as well as by other national and state agencies and academic researchers.

For the 2012 IR, LDEQ estimated that 42 coastal area subsegments were impaired by the oil spill and associated cleanup activities. LDEQ assessed these subsegments as being potentially and/or temporarily impaired for FWP, OYS, and/or PCR. The suspected impairments were based on fish, crab, shrimp, and shellfish closures issued by LDWF and LDHH, as well as Shoreline Cleanup and Assessment Technique (SCAT) Team surveys of the region. Closure information was taken from the Environmental Response Management Application (ERMA) Gulf Response Website (National Oceanic and Atmospheric Administration (NOAA) 2010).<sup>1</sup>

With the 2014 IR, LDEQ reduced both the number and size of subsegments assessed as impaired by residual surface and sub-surface oil/tar balls/tar mats. This was done based on more recent SCAT Team surveys available at that time. The aerial extent of impairment was significantly reduced or eliminated in each of the previously impaired subsegments. For the 2016 IR, the following sections outline the most recent assessment of these areas.

### **Fish and Wildlife Propagation and Oyster Propagation Uses**

During development of the 2016 IR, LDEQ reviewed Louisiana Department of Wildlife and Fisheries (LDWF) and LDHH fishing and oyster closure areas to determine if oil spill-related closures remain in effect. This review identified that all LDWF and LDHH commercial fishing closures for finfish, shellfish, and oysters have been rescinded. As a result, all spill-related FWP and OYS impairments originally reported in the 2012 and 2014 IRs have been changed to full support due to lifting of the LDWF and LDHH fishing closures. Refer to the LDWF Oil Spill Response website for full details on the revised fishing closures (<http://www.wlf.la.gov/oilspill>).

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<sup>1</sup> Disclaimer: The analysis of water quality contained in this report does not rely on information collected as part of the Deepwater Horizon Natural Resource Damage Assessment (NRDA), and is not intended to analyze impacts resulting from the Deepwater Horizon oil spill and related response for NRDA purposes.

### Primary Contact Recreation

Among the 42 subsegments first reported as impaired due to oil spill impacts in the 2012 IR, for the 2014 IR LDEQ identified 22 partial subsegments for suspected impairment of the designated use of PCR. Suspected PCR impairments were based on the location of SCAT oiling observations found on the ERMA Website (NOAA 2010).

For the 2016 IR, LDEQ evaluated the latest LDEQ monitoring for the region conducted through October 2015. Based on this review, six limited portions of subsegments have been assessed as being potentially and/or temporarily impaired for PCR. As with the 2014 IR assessments, the 2016 IR assessments represent only specific and limited portions of full subsegments. Table 5 contains the list of these partial subsegments. The portions of subsegments identified in table 5 are areas found to still have oil, tar mats, or tar balls present. The areas of the subsegments affected are shown in figure 1. The full subsegments are assessed based on routine ambient monitoring data or in some cases other information. These six portions of subsegments were placed in IRC 4b. The suspected causes of impairment will be reevaluated for the 2018 IR based on possible future LDEQ monitoring or other surveys of the area.

All partial subsegments no longer impaired for PCR or FWP in the 2016 IR will be listed in the Appendix B-Category 1 Addendum of the final 2016 IR when it is released. Appendix B lists all suspected causes of impairment from the 2014 IR that are no longer impaired for the 2016 IR.

Other water quality impairments in the impacted region not related to the oil spill may or may not still be present on these subsegments. These will be handled according to normal IR procedures.

Table 5. Partial subsegments suspected of impairment to primary contact recreation use due to ongoing indications of oiling based on SCAT surveys following the Deepwater Horizon oil spill.<sup>1</sup>

<b>Partial Subsegment Number</b>	<b>Partial Subsegment Description</b>
LA021101_005	Shoreline and open water areas within 100 yards of shorelines near Bay Jimmy and St. Mary's Point, within northern LA021101_00. This unit is added for spill impact tracking purposes only and is not a subsegment as defined by LAC 33:IX.1123.A. et seq. No other assessments were made for these water bodies.
LA021101_006	Gulf side of Grand Terre II Island, approx. 500 meters of open beach and adjacent waters, eastern tip of island, within LA021101_00. This unit is added for spill impact tracking purposes only and is not a subsegment as defined by LAC 33:IX.1123.A. et seq. No other assessments were made for these water bodies.

Table 5. Partial subsegments suspected of impairment to primary contact recreation use due to ongoing indications of oiling based on SCAT surveys following the Deepwater Horizon oil spill.<sup>1</sup>

<b>Partial Subsegment Number</b>	<b>Partial Subsegment Description</b>
LA021101_007	Gulf side shoreline of eastern tip of Elmers Island, 500 meters of open beach and adjacent waters, within LA021101_00. This unit is added for spill impact tracking purposes only and is not a subsegment as defined by LAC 33:IX.1123.A. et seq. No other assessments were made for these water bodies.
LA021101_008	Back bay side of Elmers Island, approximately 400 meters of isolated areas of open beach and adjacent waters, within LA021101_00. This unit is added for spill impact tracking purposes only and is not a subsegment as defined by LAC 33:IX.1123.A. et seq. No other assessments were made for these water bodies.
LA120802_002	Gulf side of West Timbalier Island, 200m of beach face along western tip of island, within southeast area of LA120802_00. This unit is added for spill impact tracking purposes only and is not a subsegment as defined by LAC 33:IX.1123.A. et seq. No other assessments were made for these water bodies.
LA120803_002	Bay side of West Timbalier Island, at eastern end of island, within southern area of LA120803_00. This unit is added for spill impact tracking purposes only and is not a subsegment as defined by LAC 33:IX.1123.A. et seq. No other assessments were made for these water bodies.

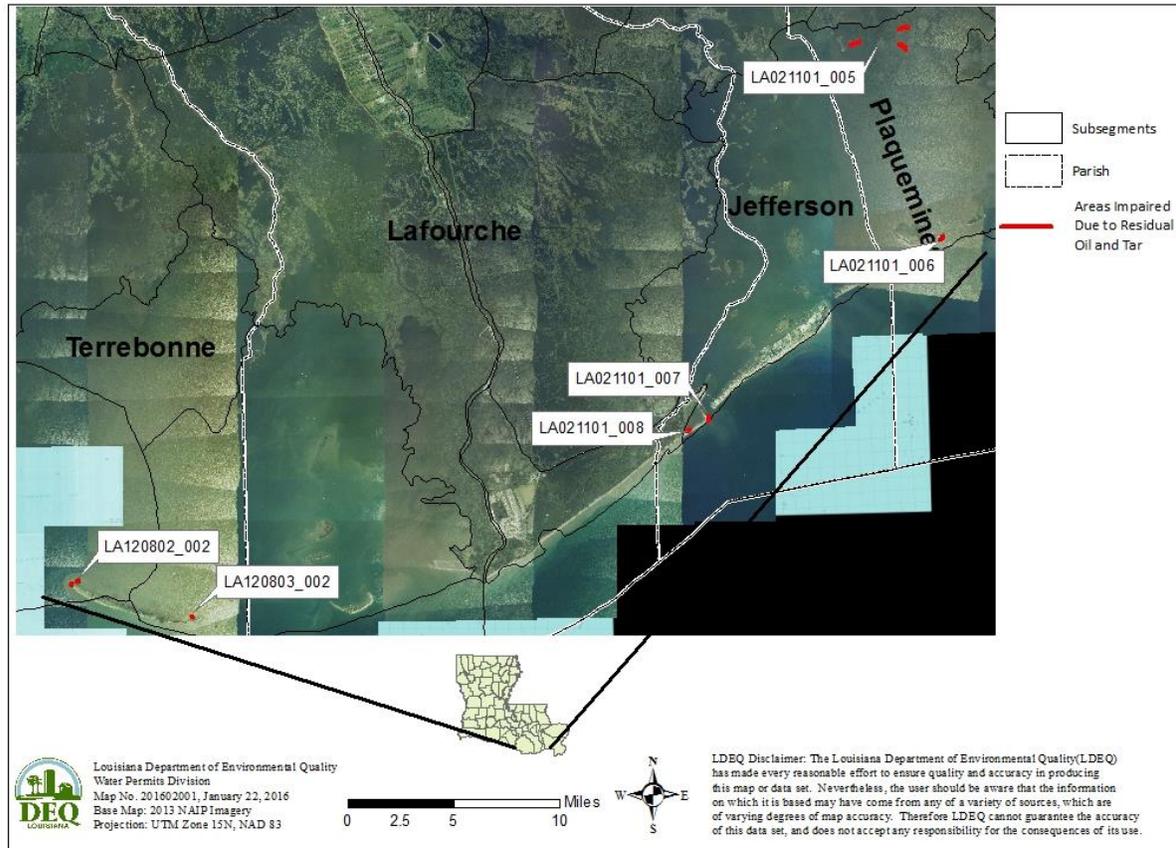
To better reflect current conditions in these subsegments, the suspected cause of impairment was reported as:

<b>Cause Name</b>	<b>Cause Description</b>
Residual Surface and Sub-surface Oil/Tar Balls/Tar Mats	Remnant oil, tar balls, or tar mats remaining on shoreline/intertidal areas following past open water oil spills.

The suspected source of impairment will be:

<b>Source Name</b>	<b>Source Description</b>
Accidental Release/Spill/Petroleum/Natural Gas Well	Accidental release/spill: Unintentional release of a substance/pollutant from a petroleum/natural gas well to the surrounding environment

Figure 1. Partial subsegments classified in 2016 Integrated Report as category 4b for primary contact recreation use due to 2010 Gulf of Mexico oil spill.



## Coastal Louisiana Dissolved Oxygen Study and Assessment

In order to better understand depth profile DO levels in Louisiana waters, starting in December 2014 LDEQ initiated data collection for DO and related *in situ* meter data to expanded spatial and temporal coverage for these parameters. Data was collected in three subsegments of Louisiana's state territorial waters of the Gulf of Mexico:

- LA021102\_00 – Barataria Basin Coastal Bays and Gulf Waters to the State 3-mile limit
- LA070601\_00 – Mississippi River Basin Coastal Bays and Gulf Waters to the State 3-mile limit
- LA120806\_00 – Terrebonne Basin Coastal Bays and Gulf Waters to the State 3-mile limit

In particular, the data was used to characterize and assess DO concentrations at multiple depths and times of year in order to contribute to characterizing the depth profile observations for DO, salinity, temperature and related parameters in Louisiana territorial waters.

Electronic meter readings were taken at one meter intervals beginning at one meter below the surface and extending to approximately one to 0.5 meter above the bottom. Each subsegment in the study had a total of eight sample sites located along two transects running approximately parallel to the coast. Each transect had four sample sites (Figure 2, Table 6).

Sample runs were conducted quarterly in each subsegment over a 12-month period. Subsegments were rotated on a monthly basis, such that the first subsegment was sampled in December, the second in January, the third in February, then returning to the first subsegment in March. This pattern was repeated until all three subsegments were sampled a total of four times through the 12-month period. Sample dates within the month for each subsegment varied according to weather conditions in the Gulf of Mexico and the work schedule of field staff responsible for the sampling. All sampling was completed in November of 2015. Subsegments and dates sampled are listed in table 7. February and May sampling events were delayed to the following months due to weather related safety concerns.

For 2016 IR assessment purposes, dissolved oxygen data was analyzed using the routine criterion assessment procedure for dissolved oxygen. Under this procedure, if more than 10% of the cumulative data collected over the course of the one-year study in a particular subsegment fell below the DO criterion of 5.0 mg/L, then the subsegment was reported as not supporting fish and wildlife propagation (FWP) use. Data from all sites, depths, and dates for each subsegment were combined to assess each subsegment separately. Based on the data, subsegments LA021102\_00 (Barataria coastal subsegment), and LA070601\_00 (Mississippi coastal subsegment) did not meet the DO criterion for FWP. For the Barataria coastal subsegment a total of 36.7% of DO results were < 5.0 mg/L, while in the Mississippi coastal subsegment a total of 42.7% of DO results were below the criterion. The Terrebonne coastal subsegment (LA120806\_00) was found to be fully supporting the DO criterion for FWP with only 6.0% of results below the DO criterion.

As a result, LA021102\_00 and LA070601\_00 were reported as impaired for FWP in the 2016 IR. LA120806\_00 was reported as fully supporting FWP. In both the 2012 and 2014 IRs all three of these subsegments were reported as insufficient data (IRC 3) by LDEQ; however, this decision was overturned by USEPA, which assigned the subsegments to IRC 5 (TMDL required). For the 2016 IR, LDEQ has determined the most appropriate Integrated Report Category for the two subsegments not meeting the DO criterion is IRC 5RC (revise criteria). This decision is based on the following discussion.

As part of the sampling effort described above, salinity and temperature readings were collected along with DO. During the course of the field sampling and preliminary data analysis it was quickly recognized that salinity, in particular a sharp salinity increase or halocline with increasing depth, was a primary contributor for many of the low DO readings at greater depths below the surface.

Figures 3, 5, and 7 are examples of the apparent effect of salinity, temperature and pressure on DO. The combination of these three parameters, density, is expressed as Sigma-t and shows a corresponding pycnocline. The charts are for all eight sites on various months in the three coastal subsegments studied. Each of the charts shows a sharp halocline and pycnocline at a depth of between three and seven meters, depending on the subsegment, site and overall depth. The haloclines are marked by a rise in salinity from approximately 15 parts per thousand (ppt) at and

Figure 2. Sample sites for Coastal Louisiana Dissolved Oxygen Study, December 2014 – November 2016.

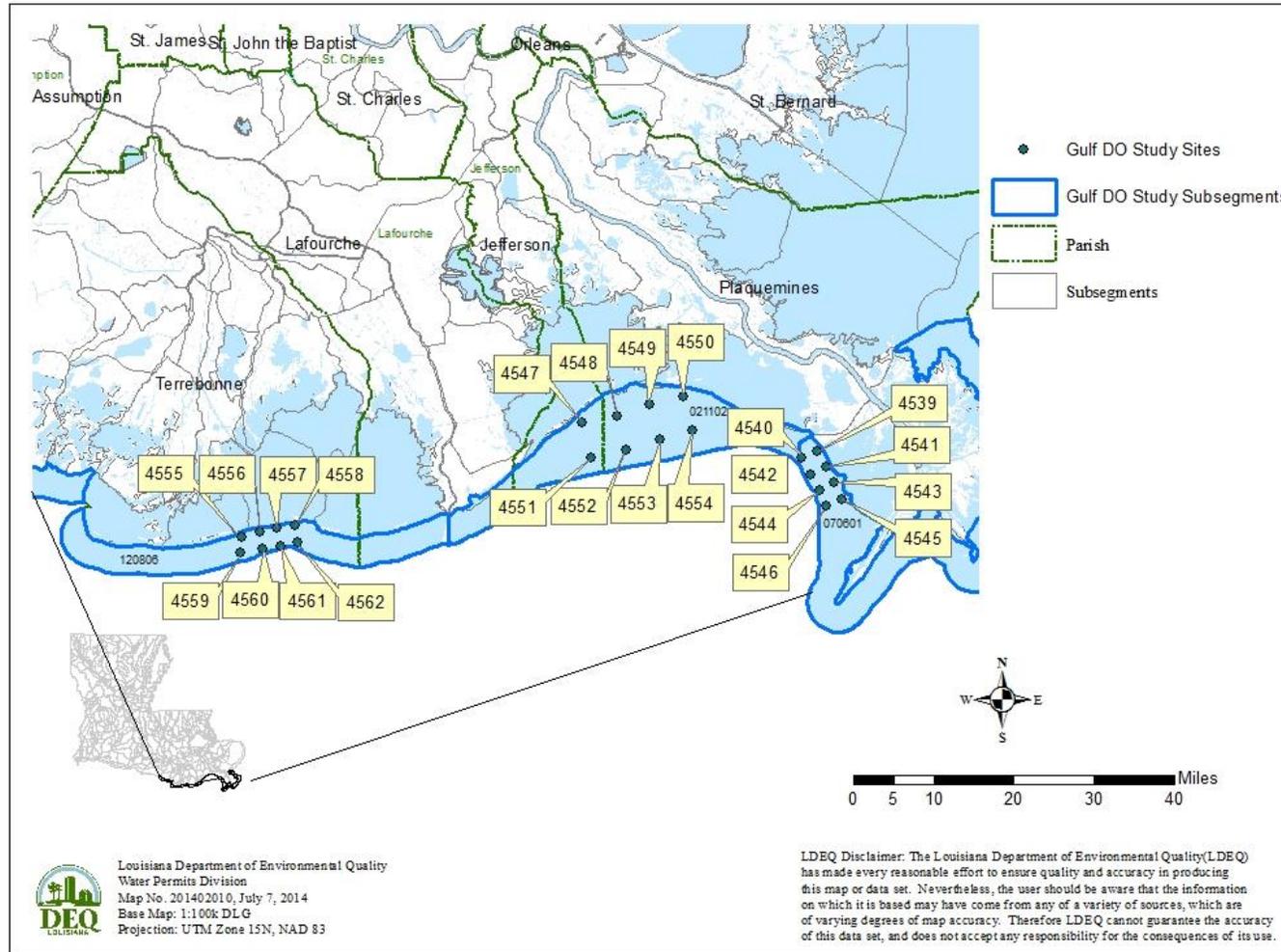


Table 6. Site number and coordinates for sample sites used in Coastal Louisiana Dissolved Oxygen Study, December 2014 – November 2015.

<b>Subsegment Number</b>	<b>LDEQ Site Number</b>	<b>Inner or Outer Transect</b>	<b>Latitude</b>	<b>Longitude</b>
LA021102_00	4547	Inner	29.2432	-89.9433
LA021102_00	4548	Inner	29.2562	-89.874
LA021102_00	4549	Inner	29.2725	-89.805
LA021102_00	4550	Inner	29.2862	-89.734
LA021102_00	4551	Outer	29.1805	-89.9272
LA021102_00	4552	Outer	29.1939	-89.8563
LA021102_00	4553	Outer	29.2109	-89.7856
LA021102_00	4554	Outer	29.2242	-89.7176
LA070601_00	4539	Inner	29.182	-89.4621
LA070601_00	4541	Inner	29.153	-89.446
LA070601_00	4543	Inner	29.1244	-89.4295
LA070601_00	4545	Inner	29.0936	-89.4143
LA070601_00	4540	Outer	29.1684	-89.4943
LA070601_00	4542	Outer	29.1389	-89.478
LA070601_00	4544	Outer	29.1099	-89.4617
LA070601_00	4546	Outer	29.0808	-89.4477
LA120806_00	4555	Inner	29.0536	-90.652
LA120806_00	4556	Inner	29.0614	-90.6141
LA120806_00	4557	Inner	29.0673	-90.5775
LA120806_00	4558	Inner	29.0714	-90.5417
LA120806_00	4559	Outer	29.0234	-90.6542
LA120806_00	4560	Outer	29.0296	-90.6079
LA120806_00	4561	Outer	29.0353	-90.5724
LA120806_00	4562	Outer	29.0394	-90.5362

Table 7. Subsegments and sample dates for nearshore Gulf of Mexico dissolved oxygen profile study.

<b>Coastal Mississippi (LA070601_00)</b>	<b>Coastal Barataria (LA021102_00)</b>	<b>Coastal Terrebonne (LA120806_00)</b>
December 18, 2014	January 29, 2015	March 2, 2015
March 24, 2015	April 23, 2015	June 19, 2015
June 30, 2015	July 10, 2015	August 14, 2015
September 18, 2015	October 7, 2015	November 24, 2015

above three meters to > 30 ppt one to two meters deeper. In many cases the salinity changed abruptly within the span of approximately one meter. Temperature showed a reversed but less pronounced change, with temperature falling slightly at approximately the same depth. In each of these cases the DO concentrations went from > 5.0 mg/L (meeting criterion) to < 4.0 mg/L (not meeting criterion). For many of the months and sites with strong haloclines DO dropped from meeting the criterion near the surface to < 1.0 mg/L near the bottom of the water column.

By contrast, figures 4, 6, and 8 are examples of either the lack of, or a more moderate, halocline for the same subsegments but different months. For the Barataria and Terrebonne subsegments, figures 4 and 8, there is little or no substantial rise in salinity at any of the sites and subsequently no marked decrease in DO, with no DO concentrations below 5.0 mg/L. However, for the Mississippi subsegment, figure 6, while the halocline is less pronounced than in figure 5, there is still a substantial rise in salinity with a corresponding decline in DO. Among all three subsegments, the Mississippi subsegment shows the most pronounced haloclines across all sites and dates, which were associated with the greatest drop in DO through the water column.

This last finding agrees with the Mississippi subsegment having the highest number of criterion failures overall, with 42.7% of DO readings falling below 5.0 mg/L. The Barataria subsegment had the next lowest number of sample sites with a significant halocline effect, resulting in a lower number of DO readings, 36.7%, below 5.0 mg/L. Finally, the Terrebonne subsegment, which is furthest from the Mississippi River discharge, had the lowest number of significant haloclines in the data and was found to be fully supporting the DO criterion with only 6.0% of DO readings below 5.0 mg/L.

Due to the high freshwater input from the Mississippi River, the Mississippi coastal subsegment experienced the most pronounced salinity gradients, ranging from near 0.2 ppt at the top of the water column to 38.2 ppt near the bottom. This occurred across all sites and dates. For a single site and date within the subsegment, the greatest range was from 0.4 ppt near the top to 37.9 ppt near the bottom in water approximately 7.0 m deep. This occurred on March 24, 2015. The corresponding DO concentrations ranged from 0.1 mg/L near the bottom to 9.7 mg/L at a depth of 1 m. This period also corresponded with nearly the highest discharge rate from the river for 2015.

While more investigation is needed on the mechanics and variability of halo/pycnocline development, it appears that the Mississippi River, through both discharge flow and distance from the subsegments, has a large effect on the establishment of strong haloclines. Strong haloclines in turn have a large effect on the resulting low DO readings near the bottom of the water column.

In addition to DO and salinity, figures 3-8 also show density as Sigma-t. Density Sigma-t is a unit-less calculated value that takes into account the temperature, salinity, and pressure of a water sample at the time of sampling. The density for the majority of the samples strongly track the corresponding salinity, indicating that salinity was the primary driver of the stratification of nearshore waters during this study. Based on this relationship, salinity and density are believed to be strong components among the causes for low DO at greater depths when a halo/pycnocline is established.

Across all three subsegments and all dates, nine of twelve sampling events (runs) resulted in DO values < 5.0 mg/L. During one of these nine runs only one of eight sites had DO values < 5.0 mg/L. This occurred in the Terrebonne coastal subsegment on June 19, 2015. That one site had two results < 5.0 mg/L but  $\geq 4.3$  mg/L. A slight but apparent halocline effect was seen. All other sites that day had relatively uniform salinity from top to bottom at approximately 18-20 ppt. The remaining three sample runs with no DO values < 5.0 mg/L occurred in January (Barataria), March and November (both Terrebonne).

While more investigation is needed, this halocline/pycnocline stratification is believed to be caused in part by differences in wind and wave patterns at the surface. In many cases, when the halocline was evident surface conditions were relatively calm, resulting in less mixing of the water column, particularly at greater depths. When no halocline was evident surface water conditions tended to be rougher, with higher seas. For example, on the last sample collection date of November 24, 2015 seas were reportedly running at six to eight feet, much rougher than normal. During that time, no halocline was noted and all DO results were > 7.0 mg/L. Another component under investigation is the effect of tidal period on the establishment of haloclines. There is some evidence that during periods of high tidal movement, both rising and falling tides, there were fewer strong haloclines and, therefore, fewer cases of low DO below the surface waters. By contrast, during periods of slack tide, both high and low tides, there appears to be more opportunity for strong haloclines to set up in the water column. Both meteorological and hydrographic components will be further developed in the final report on the Gulf DO study.

Figure 3. Dissolved oxygen, salinity, temperature, and density sigma-t vs. depth below surface in the Barataria Coastal subsegment (LA021102\_00) on April 23, 2015. Not supporting DO with 42.9% below 5.0 mg/L criterion.

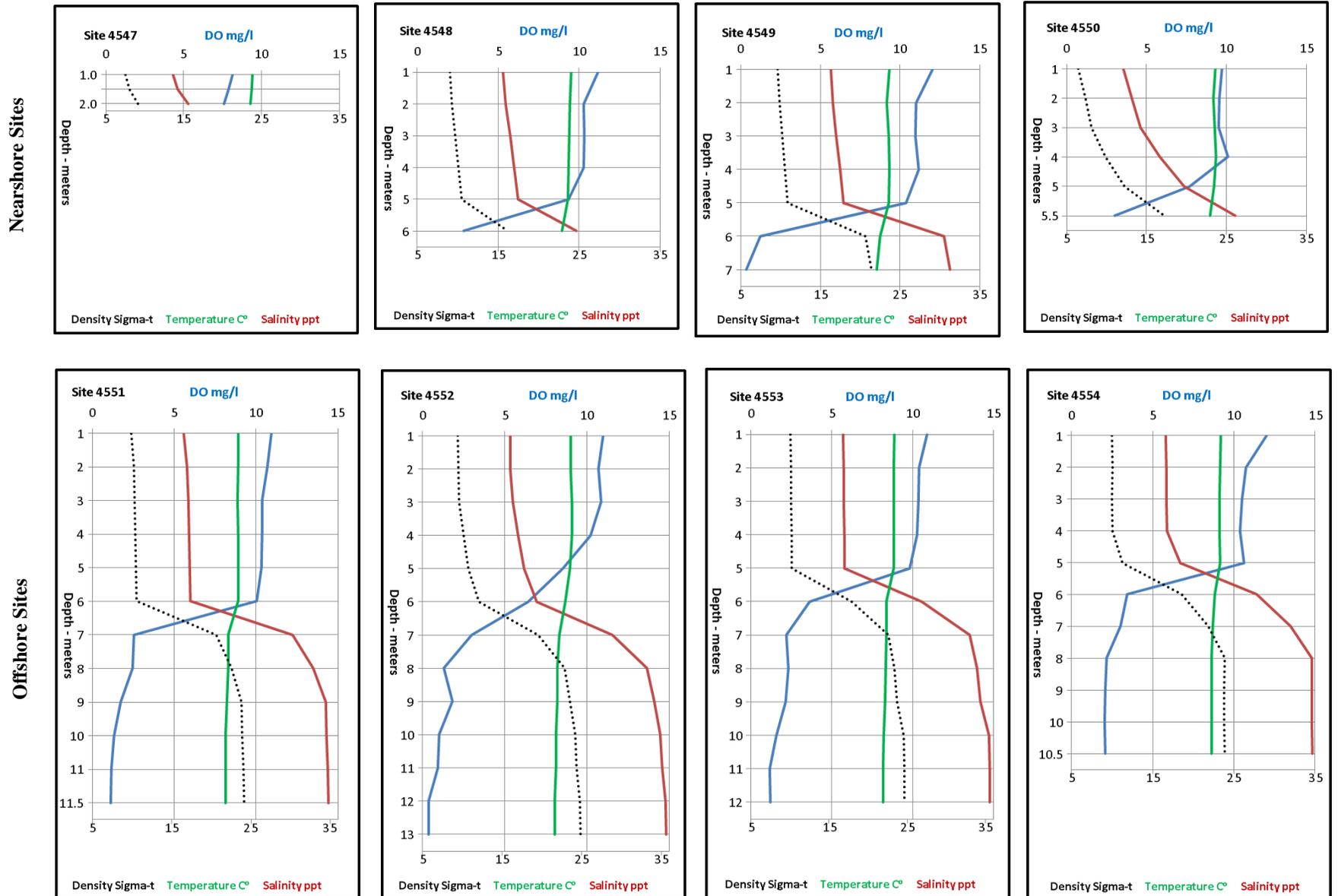


Figure 4. Dissolved oxygen, salinity, temperature, and density sigma-t vs. depth below surface in the Barataria Coastal subsegment (LA021102\_00) on January 29, 2015. Fully supporting DO criterion with 0% below 5.0 mg/L criterion.

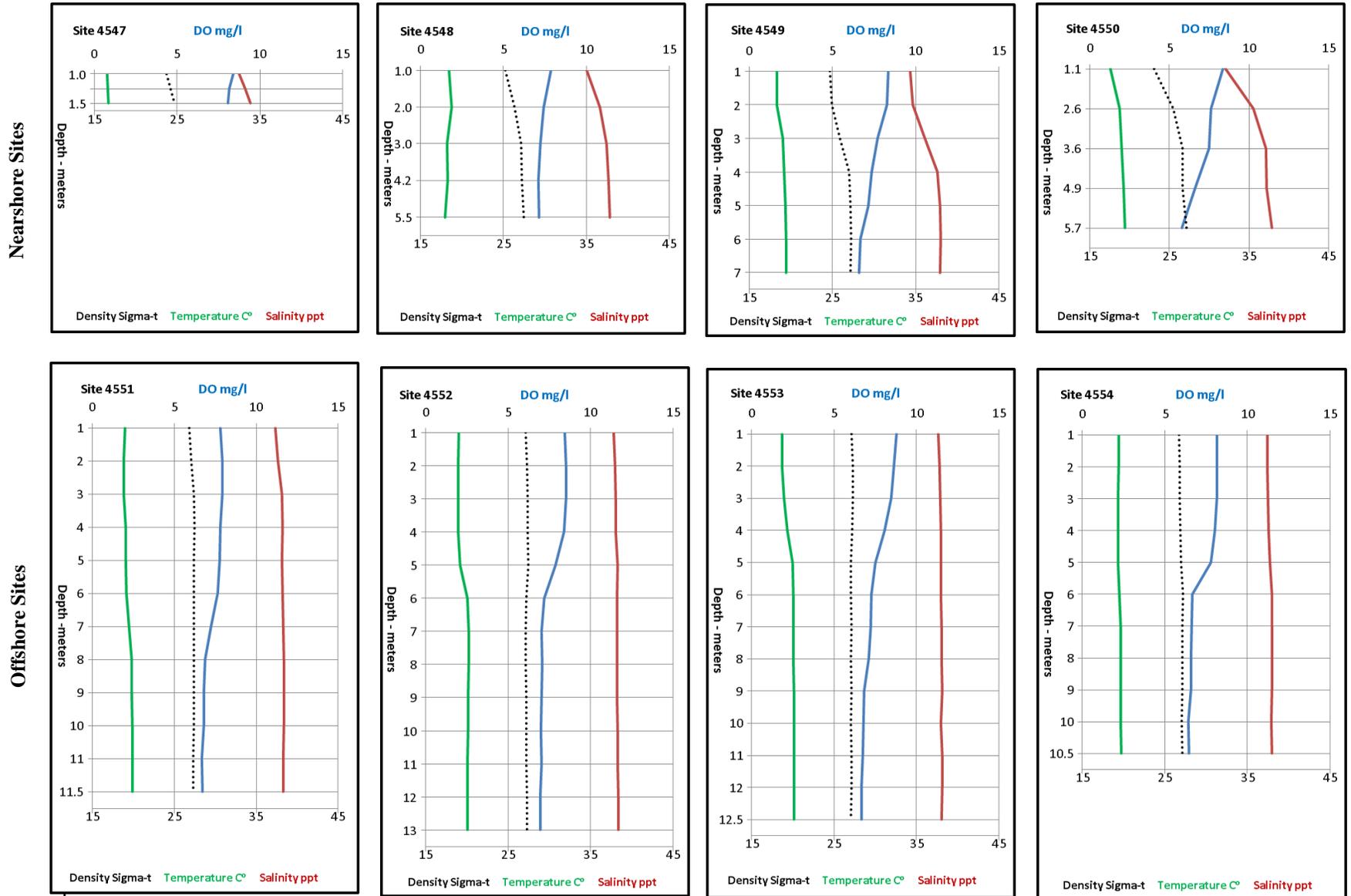


Figure 5. Dissolved oxygen, salinity, temperature, and density sigma-t vs. depth below surface in the Mississippi Coastal subsegment (LA070601\_00) on March 24, 2015. Not supporting DO with 64.1% below 5.0 mg/L criterion.

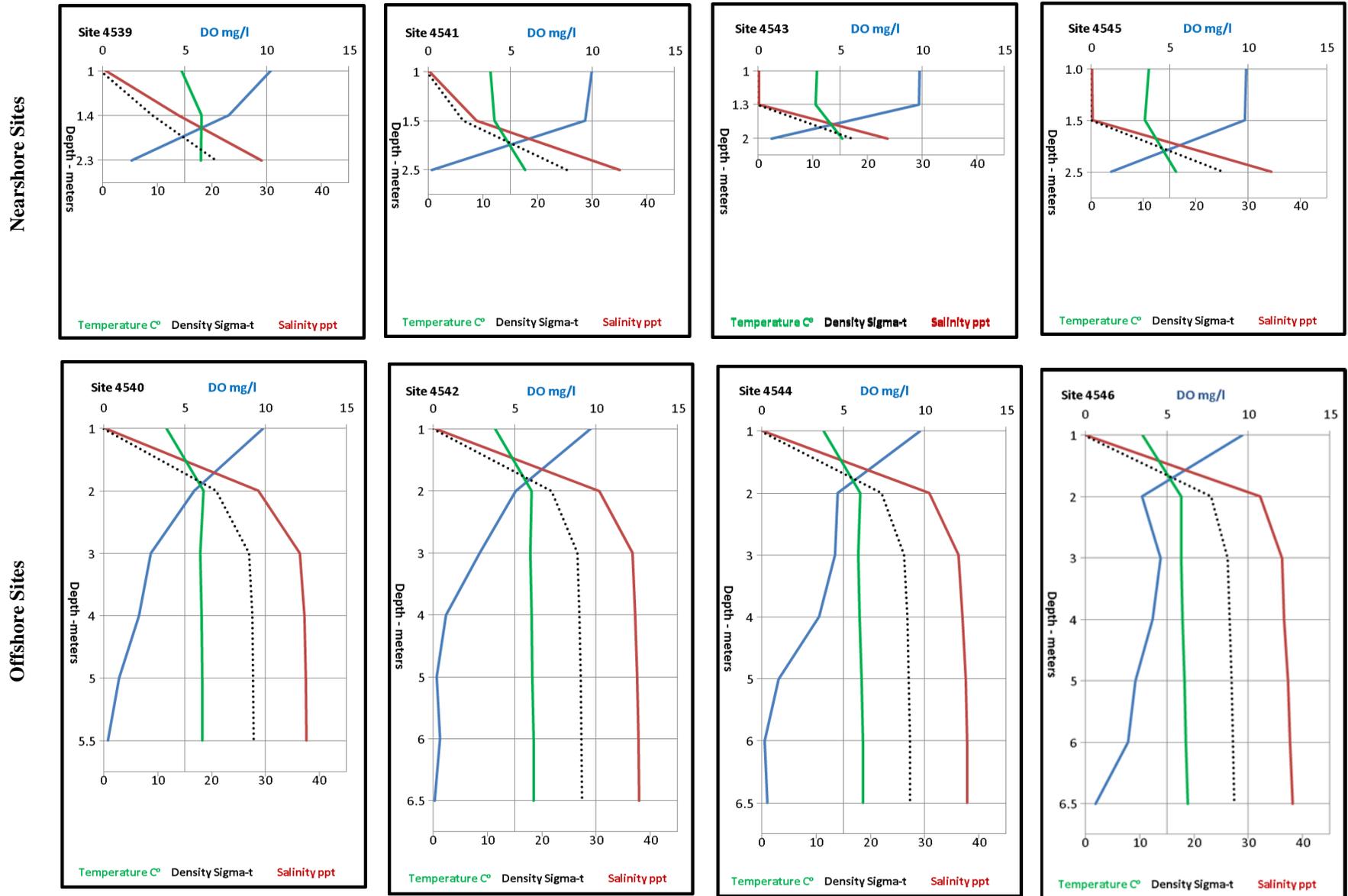


Figure 6. Dissolved oxygen, salinity, temperature, and density sigma-t vs. depth below surface in the Mississippi Coastal subsegment (LA070601\_00) on June 30, 2015. Not supporting DO with 15.0% below 5.0 mg/L criterion.

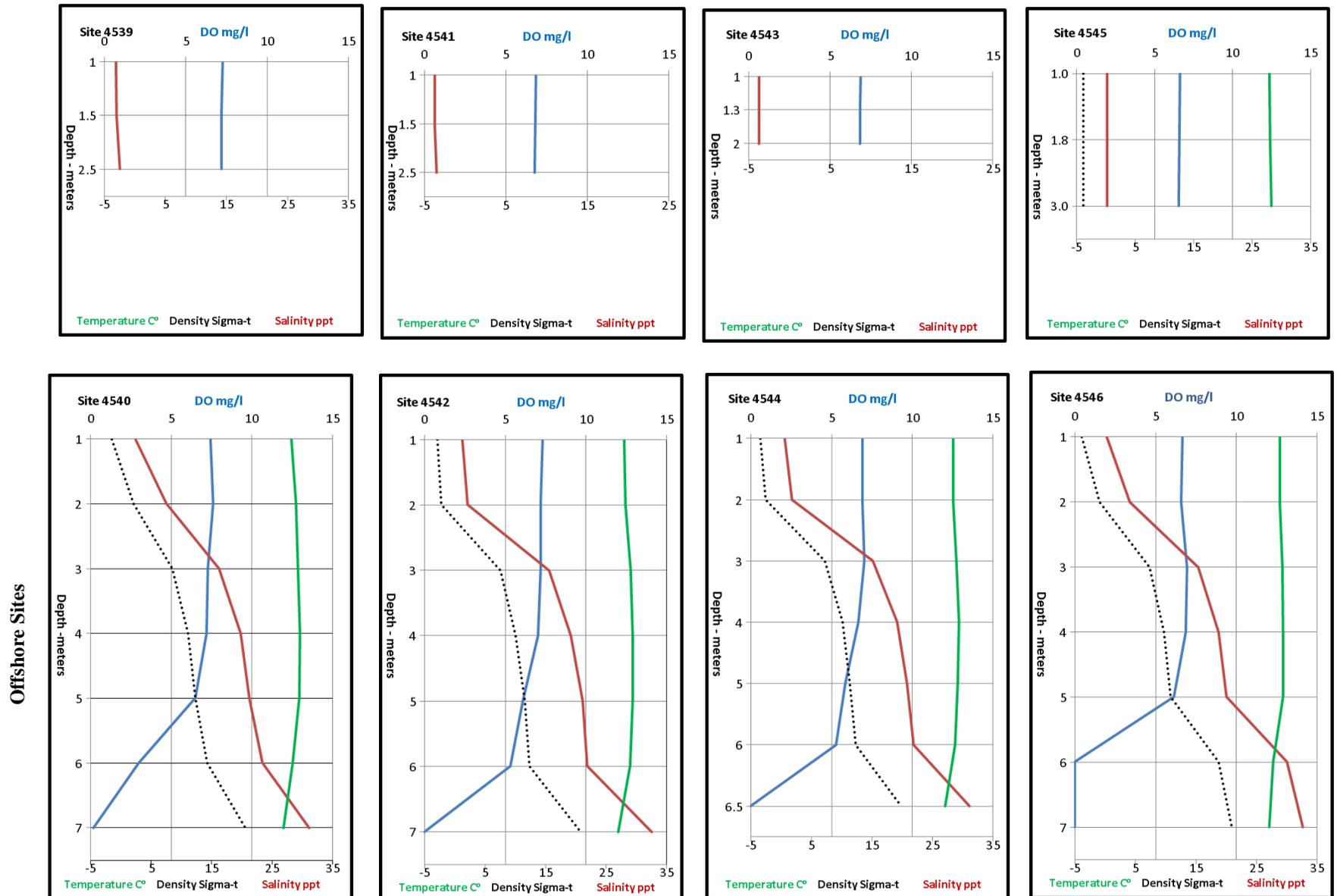


Figure 7. Dissolved oxygen, salinity, temperature, and density sigma-t vs. depth below surface in the Terrebonne Coastal subsegment (LA120806\_00) on August 14, 2015. Not supporting DO with 18.9% below 5.0 mg/L criterion.

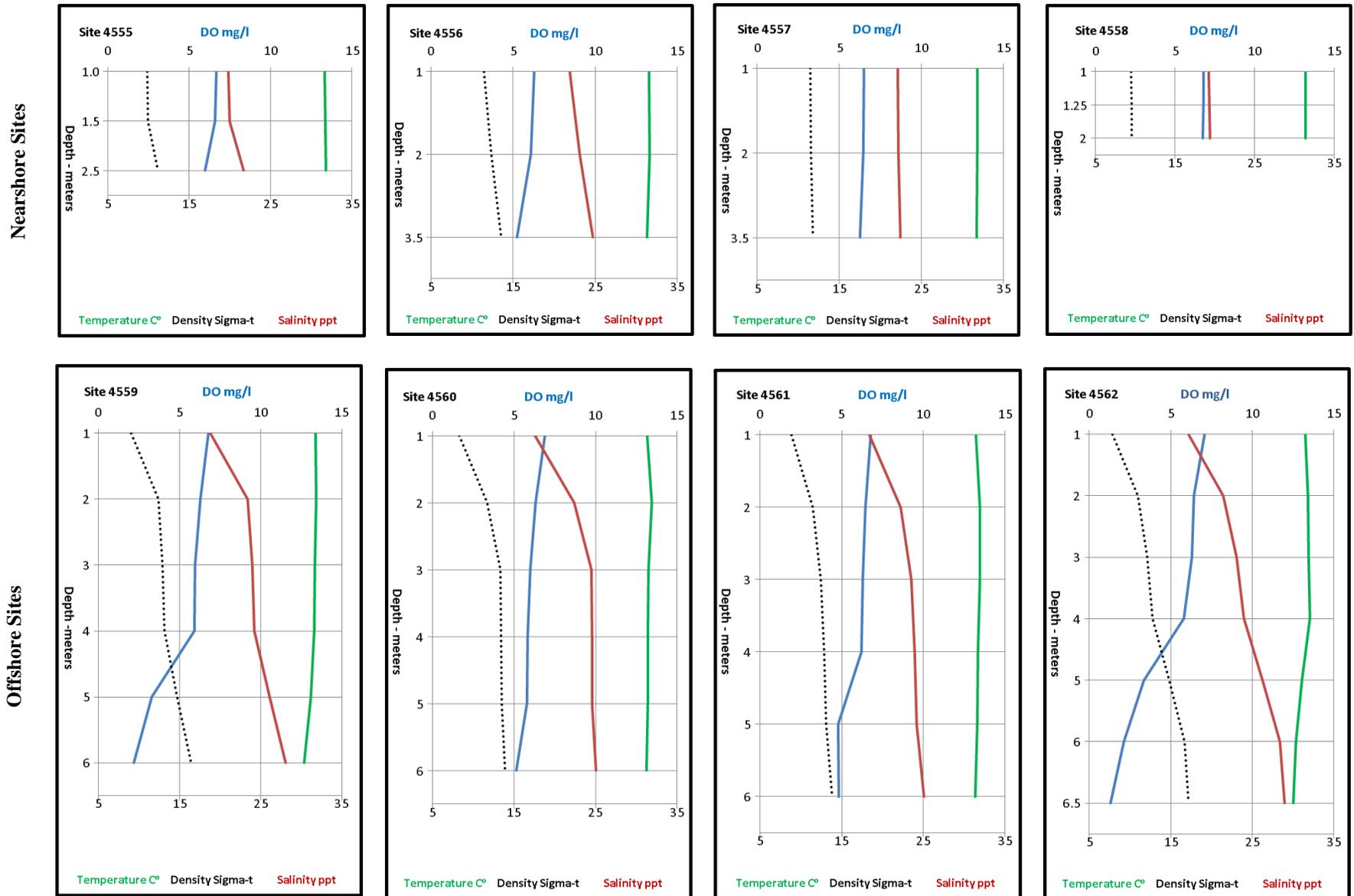
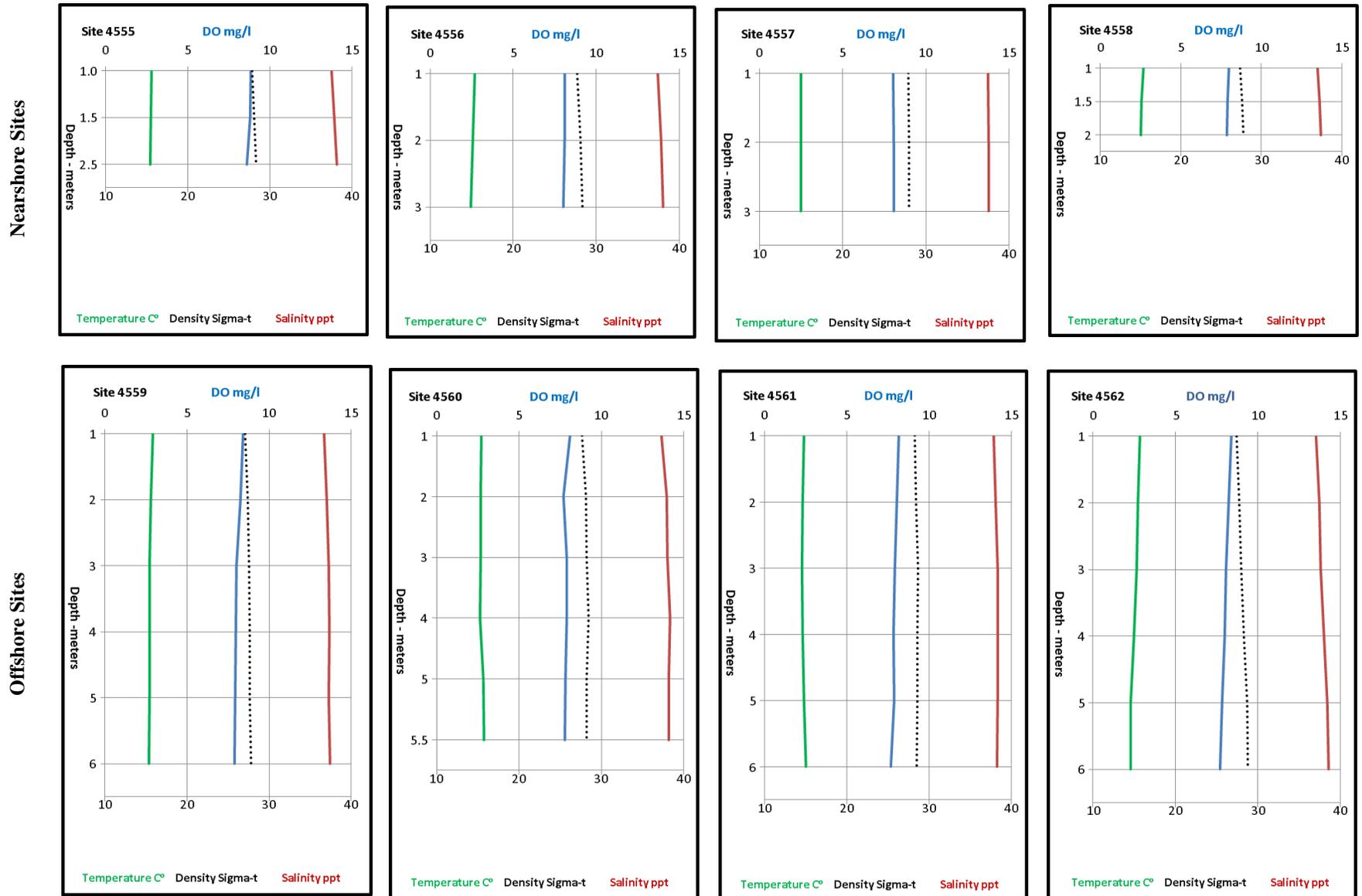


Figure 8. Dissolved oxygen, salinity, temperature, and density sigma-t vs. depth below surface in the Terrebonne Coastal subsegment (LA120806\_00) on March 2, 2015. Fully supporting DO with 0.0% below 5.0 mg/L criterion.



## **Suspected Sources of Impairment**

In addition to the use of water quality data in making assessments, LDEQ, Office of Environmental Compliance (OEC), Inspection Division (ID) staff familiar with local watershed conditions and activities provide input regarding significant suspected sources of impairment. Inspection Division staff also provide input in cases where natural sources were potentially causing criteria exceedances. In such cases, LDEQ will evaluate the need for a UAA or other water quality survey for potential criteria revision. Suspected sources for all water body impairment combinations are not required at this stage of IR development but will be provided in the final 2016 Integrated Report.

## **Integrated Report Category Determination**

LDEQ made a preliminary determination of IR categorization (Table 1) based on statistical assessment of criteria exceedances and subsequent determination of a water body's designated use support (Table 2). LDEQ used additional information such as previous TMDL development (IRC 4a), insufficient data determinations (IRC 3), environmental events (e.g., droughts, severe weather, oil spill) (IRC 3 or 4b), remediation activities (IRC 4b), and suspected sources of impairment to determine appropriate IR categories. Multiple IR categories may be assigned to a single subsegment which has multiple criteria for multiple uses.

IR Category 3 was used for subsegments with potential nutrient enrichment concerns. Listings for nitrate/nitrite nitrogen and total phosphorus were historically based on evaluative assessments. However, the evaluative assessments were based on best professional judgment with no numeric nutrient criteria basis. LDEQ is currently coordinating with USEPA to collect data that will inform the nutrient criteria development process and allow more appropriate assessments in the future.

## **Total Maximum Daily Load Prioritization**

The Clean Water Act (CWA) Section 303(d) Program provides a mechanism for integration of implementation efforts to restore and protect the nation's aquatic resources. Through this process the nation's waters are assessed, restoration and protection objectives are systematically prioritized, and Total Maximum Daily Loads (TMDLs) and alternative approaches are adaptively implemented to achieve water quality goals with collaboration of State and Federal agencies, tribes, the regulated community, and the public. A new long-term vision has been described whereby states may identify and prioritize water bodies for these restoration and protection efforts under the 303(d) Program (Environmental Law Institute (ELI) 2014a, 2014b; USEPA 2013). The primary goals of this new long-term vision include prioritization, assessment, protection, alternatives, engagement, and integration.

This long-term vision requires that states establish a prioritization framework by which the states will establish a list of priority watersheds to be addressed during the period FY2016-FY2022. LDEQ developed such a framework and solicited public feedback. The comment period ended

May 1, 2015. Comments received were considered during the development of the final list of priority watersheds. The prioritization framework was made available to the public via LDEQ's website at

<http://www.deq.louisiana.gov/portal/DIVISIONS/WaterPermits/CWA303dVisionProgram.aspx>. Electronic notices were sent out via Louisiana's electronic notification system.

In addition to conducting a public review of the prioritization framework, LDEQ delivered presentations at various conferences and workshops to inform stakeholders and the public. LDEQ also met with various state agencies, local governments, and watershed-based organizations. LDEQ commits to continuing engagement with stakeholders and the general public as it investigates and develops watershed protection and/or restoration plans in the priority watersheds. The resulting list of priority watersheds is listed below in table 8.

Table 8. List of priority watersheds for the period FY2016 – FY2022.

<b>Projected Completion Year</b>	<b>Subsegment</b>	<b>Waterbody Name</b>	<b>Projected Plan Type</b>	<b>Target Percentage</b>
2016	LA070505_00	Tunica Bayou – from headwaters to Mississippi River	TMDL Alternative	6
2017	LA070501_00	Bayou Sara – from Mississippi state line to Mississippi River	TMDL Alternative	25
2018	LA080905_00	Turkey Creek – from headwaters to Turkey Creek Cutoff; includes Turkey Creek Cutoff, Big Creek, and Glade Slough	TMDL Alternative	37
2019	LA040504_00	Yellow Water River – from headwaters to Ponchatoula Creek	TMDL Alternative	39
2020	LA040503_00	Natalbany River – from headwaters to Tickfaw River	TMDL Alternative	57
2021	LA040403_00; LA040401_00	Blind River - from headwaters to Amite River Diversion Canal; Blind River – from Amite River Diversion Canal to mouth at Lake Maurepas	TMDL Alternative	87
2022	LA040404_00	New River – from headwaters to New River Canal	TMDL Alternative	100

LDEQ expects that alternative plans are the most appropriate means to achieve the water quality standards since the impairment issues are likely caused by conditions outside the regulatory impacts of traditional TMDLs. Such conditions may include nonpoint source loads (including individual treatment units in unsewered areas), unpermitted dischargers, or permitted dischargers that are not meeting the limits provided in the current permit limits.

LDEQ anticipates that, in general, the alternative plans may include the tasks listed below. The actual plans may vary on a case-by-case basis based on the conditions and characteristics of the individual water body.

#### General Alternative Plan Structure

1. Investigative activities
  - a. Water body monitoring
  - b. Discharger inventory review
  - c. Loading estimations (as needed based on the appropriate available data)
  - d. Facility inspections
  - e. Individual unit inspections
  - f. Work with local stakeholders, governments, & organizations
    - i. Education and outreach
  - g. Pre-plan monitoring
2. Plan development
3. Implementation
  - a. Assist local stakeholders, governments, & organizations
    - i. Education and outreach
    - ii. Development of ordinances as needed
    - iii. Regionalization
  - b. Implementation of BMPs
  - c. Assist with required upgrades for
    - i. Permitted
    - ii. Unpermitted facilities (acquire permits)
    - iii. Individual homes
  - d. Compliance schedules/orders, penalties (as needed)
  - e. Monitoring during implementation
4. Post-plan implementation monitoring

LDEQ has identified several potential partners to assist in activities conducted in the priority watersheds, including but not limited to:

1. United States Environmental Protection Agency (USEPA);
2. United States Geological Survey (USGS);
3. the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS);
4. the Louisiana Department of Health and Hospitals (LDHH);
5. the Louisiana Department of Agriculture and Forestry (LDAF);
6. the Louisiana Department of Wildlife and Fisheries (LDWF);
7. the Louisiana Department of Natural Resources (LDNR);
8. the Coastal Protection and Restoration Authority (CPRA);

9. the Lake Pontchartrain Basin Foundation (LPBF);
10. the Louisiana Conference;
11. local governments;
12. local watershed-based organizations; and
13. local watershed coordinators currently under LDEQ contract.

Funding is expected to be provided by various sources. The primary sources are expected to be performance partnership grants, 106 grants (pollution control), 319 grants (nonpoint source management), and the State Revolving Loan Fund. Additional funding may be provided by partnering agencies and organizations. Monitoring will be conducted to evaluate the progress of each individual plan. Ambient monitoring may serve as the primary source of monitoring, with additional monitoring conducted as needed. Plans will be adaptively managed to allow for necessary updates or changes in conditions. Plans will also be reviewed periodically to determine if the activities are being effective or if changes are needed and ensure that activities are being conducted appropriately.

All water body impairment combinations in IRCs 5 or IRC 5RC and not previously identified under the 303(d) Vision protocols were prioritized as follows.

- WICs listed in IRC 5 with drinking water source or oyster propagation designated uses with suspected impairments due to fecal coliforms or organic compounds were given medium priority.
- WICs listed in IRC 5 with suspected impairments due to fecal coliforms or organic compounds in subsegments *without* drinking water source or oyster propagation designated uses were assigned low priority for TMDL development.
- WICs listed in IRC 5RC were assigned low priority for TMDL development to allow LDEQ time to evaluate the need for updated criteria.
- WICs listed in IRC 5 based on LDHH beach monitoring data for enterococci bacteria impairments were assigned low priority to allow LDEQ time to coordinate with USEPA on source and epidemiological studies.
- WICs listed in IRC 5 for the following suspected impairments were assigned low priority due to the non-critical nature of the impairments or due to uncertainty regarding the validity of the suspected impairment (e.g., natural conditions, lack of apparent anthropogenic sources, sources outside the scope of TMDL development):
  - Low or high pH
  - Metals
  - Chlorides, sulfates, total dissolved solids
  - Temperature
  - Turbidity
  - Mercury in fish tissue (primary source is regional/global atmospheric deposition)
- All other WICs not previously mentioned were assigned low priority.

## SUMMARY

The 2016 IR §303(d) list represents a compilation of primarily four different sources of information: (1) the 2014 IR; (2) new data assessments for all 12 Louisiana basins with

monitoring data (internal and external) between October 2011 and September 2015; (3) all recent TMDL activities occurring during or after development of the 2014 §303(d) list; and (4) current fish consumption and swimming advisories in Louisiana. It is important to note that removal of a water body from the §303(d) list, for any reason, does not remove water quality protections from that water body. All water bodies in Louisiana, listed or not listed, are subject to the same protections under federal and state laws and regulations, in particular the CWA and Louisiana's surface water quality standards (LAC 33:IX.Chapter 11). LDEQ will continue to monitor and assess the quality of Louisiana's waters; permitted facilities are subject to conditions of their permits; unpermitted point source dischargers are required to obtain a permit or face enforcement actions; violators of permit conditions are subject to enforcement action; and contributors to nonpoint sources of pollution are encouraged to follow BMPs as developed by LDEQ's Nonpoint Source Program and its many collaborators.

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