

*2006 Louisiana
Nonpoint Source Annual Report*

*Prepared and Submitted by the
Louisiana Department of
Environmental Quality*

*Cover Page Photo: Cypress Trunk in the Bluebonnet Swamp in Baton Rouge, Louisiana.
Photographer: John Hartgerink*

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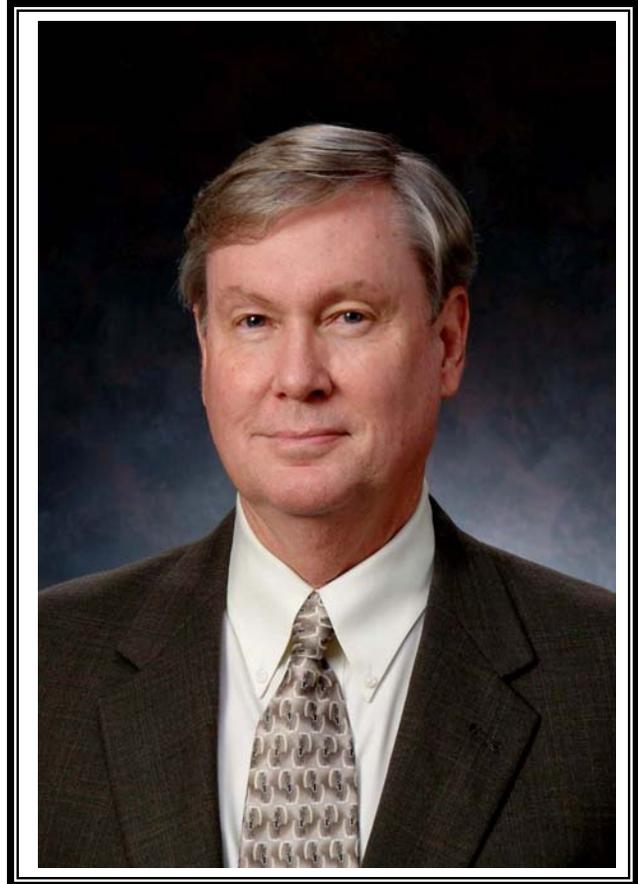
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Comments from Secretary Mike McDaniel on Water Quality Goals and Louisiana's NPS Program

In order to stimulate efforts for the improvement of quality of surface waters in Louisiana, Governor Kathleen Blanco in late 2004 set a goal of restoring the “fishable-swimmable” uses in 25 percent of the state’s impaired surface waters by 2012. The Louisiana Department of Environmental Quality (LDEQ) has since been developing strategies to achieve this goal. An overarching strategy is to integrate and enhance the Department’s existing water quality protection programs to achieve Governor Blanco’s goal.

Given that the majority of the state’s water quality impairment can be attributed to nonpoint sources of pollution, it is obvious that the state’s nonpoint source (NPS) program is a very important element in our water quality improvement efforts. The development and successes of the state’s NPS program have already resulted in reduction of nonpoint source pollution throughout the state. We expect that the continuation and enhancement of these efforts will be critical to meeting our water quality goal and overall improvement of quality of the state’s surface waters.



We are very proud of our NPS program and what it has accomplished. The success of this program can be largely attributed to the effective collaboration of federal, state, and local governments, as well as universities and independent watershed groups. It is essential to continued progress that this effective collaboration be maintained.

Highlights of the state’s NPS program activities for 2006 include:

- Worked with the Coastal Wetland Forestry Advisory panel on a set of Recommendations to the Governor to Manage and Protect these Wetlands
- Worked with East Baton Rouge Parish Planning Commission on best management practices for urban development and new ordinances to protect water quality and wetlands
- Finalized a set of best management practices for the Sand and Gravel Mining with the Concrete and Aggregate Industry
- Continued progress in implementing approximately 50 projects to address nonpoint source pollution problems across the state to address runoff from agricultural crops, forestry activities, urban communities and individual home sewage systems

- Continued working on watershed plans as the mechanism to implement the nonpoint source component of the TMDLs in the Barataria and Ouachita Basins (watershed plans are developed along same cycle as the court ordered schedule)
- Continued to work with the GIS Lab on detailed land-use classification, with the work being completed for the entire Barataria and Terrebonne Basins in 2006, the field work completed for classification in the Red River Basin during 2006 and scheduled for the Lake Pontchartrain Basin during 2007

For 2007, LDEQ looks forward to continuing NPS program efforts in accordance with established long-term program plans with a heightened interest in bringing unfinished projects to fruition and in identifying and initiating projects aimed at producing measurable water quality improvements.

Also this year, LDEQ will be working to further engage our NPS program partners in strategic planning and project development as an integral element for our overall efforts to achieve our water quality improvement goal. NPS projects may be woven into other LDEQ program efforts such as water quality permits, surveillance, enforcement, planning, and public outreach using a watershed (or in some cases a micro-watershed) approach to improve water quality in selected watersheds or stream segments.

Louisiana's Nonpoint Source Pollution Program

The Louisiana Department of Environmental Quality (LDEQ) is the state's lead agency for the Nonpoint Source Management Program. This means that they are responsible for planning, managing and coordinating nonpoint source related activities. Nonpoint source (NPS) pollution is the largest remaining water quality problem that needs to be solved in order to restore the state's and the nation's impaired waters. Nonpoint sources of pollution typically do not enter the water body through a discharge pipe, but flow freely across exposed surfaces, transporting sediments from construction sites, agricultural fields and harvested forests. The State of Louisiana has identified agriculture, forestry, urban runoff, home sewage systems, sand and gravel mining operations, construction activities and hydromodification as the types of nonpoint sources of water pollution that need to be managed, if the goals of the Clean Water Act are to be met. These goals are to restore the recreational uses (i.e. contact recreation and fish and wildlife propagation) to all impaired waters.

Highlights from Louisiana's Nonpoint Source Management Program during 2006 include:

- Developed seven watershed plans which describe how nonpoint source pollution should be managed within the 303(d) listed waters of the Barataria Basin;
- Working on five watershed plans for impaired water bodies which have had total maximum daily loads (TMDLs) completed for them within the Terrebonne Basin;
- Approved six watershed plans that were written by USDA-ARS for impaired water bodies within the Ouachita River Basin;
- Finalized 14 projects and received EPA approval on the final reports;
- Completed all of the work and closed the FY 1999 Section 319 Grant;
- Completed the Model Landscape Code for communities in Louisiana, which was approved by EPA;
- Completed and approved the website <http://www.abbey-associates.com/splash-splash> to educate the public about model landscaping designs;
- Finalized the text for the BMP manual for the sand and gravel mining operations and began preparing it for public comment during 2007;
- Tracked and managed the spending of over \$6.5 million of Section 319 grant funds;
- Received an additional \$2.7 million in Section 319 grant funds for project implementation during the next three years;
- Completed an implementation project in the Ouachita River Basin, in which BMPs on three farm sites prevented over 30,000 tons of soil from entering water bodies;
- Worked with the LSU AgCenter to gather data on the extent of crawfish acreage in the Mermentau and Vermilion-Teche Basins, using GIS;
- Finalized a project in which a critical drainage map for watershed planning in St. Tammany Parish was posted on the St. Tammany Parish Government website;
- Sponsored a watershed management workshop with East Baton Rouge Parish Planning Commission for builders, developers, parish employees, and engineers;
- Finalized a project where a public service announcement highlighting the need for proper maintenance of home sewage systems was implemented;
- Finalized a project with The Nature Conservancy that included printing and distribution of ten thousand copies of a Pearl River educational brochure;
- Sponsored a project in which The Nature Conservancy hosted a symposium in Jackson, Mississippi on ecological values and water quality issues of the Pearl River, which was attended by 82 people from 40 agencies;

- Completed a project in which the LSU AgCenter hosted four field days, demonstrating agricultural BMPs on Model Farms;
- Worked with East Baton Rouge Parish Planning Commission on an ordinance and Master Development Program for East Baton Rouge Parish.

LDEQ has continued to work with federal, state and local governments and non-profit organizations on more than 50 projects that address nonpoint source pollution throughout the state. All of these entities are working together to improve the quality of water in Louisiana and help reach the Governor's goal of restoring the "fishable-swimmable" uses in 25% of the state's impaired waters by 2012.

2006 NPS Program Funds

Section 319(h) of the Clean Water Act (CWA) established an annual grant that Congress allocates to the states, through EPA, to be used for nonpoint source-related activities that support the goals of the Act. Louisiana's allocated funds are split between LDEQ and the Louisiana Department of Agriculture and Forestry (LDAF). The incremental funds which are received by LDAF are strictly used for the implementation of agriculture and forestry BMPs in watersheds for which watershed plans and TMDLs have been completed.

The base funds which are awarded to LDEQ are available for a wider range of activities, including watershed planning and working with cities, parishes and local organizations on watershed implementation. LDEQ's portion of the grant is used to fund specific nonpoint source projects that are designed for reduction of NPS pollution, evaluation of the effectiveness of projects to improve water quality and educational projects designed to increase public awareness about nonpoint source pollution and the actions that can be taken to reduce and control it. In addition to the specific projects, Section 319 funds are also utilized to pay salaries of the staff that work on nonpoint source related activities.

The Louisiana Department of Environmental Quality expended over \$6.5 million of Section 319 funds during calendar year 2006 (Table 1 and Figure 1) to implement over 50 projects directed at reducing nonpoint source pollution and improving water quality. Of these funding expenditures, \$4,500,501 were federal funds and \$2,053,261 were provided as matching funds. For grant years 1999 through 2001, LDEQ was responsible for both the base and incremental funds. Beginning with the 2002 grant, incremental funds were awarded directly to the Louisiana Department of Agriculture and Forestry while LDEQ continues to manage the base funds.

Table 1. LDEQ Section 319 Grant Expenditures in Calendar Year 2006

Grant Year	Federal	Match	Total
1999	921,773	111,550	1,033,323
2000	1,114,125	650,410	1,764,535
2001	627,547	554,089	1,181,636
2002	1,142,223	451,362	1,593,585
2003	563,973	217,031	781,004
2004	24,044	-2,391	21,653
2005	106,816	71,210	178,026
Total	\$4,500,501	\$2,053,261	\$6,553,762

Figure 1. LDEQ Section 319 Grant Expenditures in Calendar Year 2006

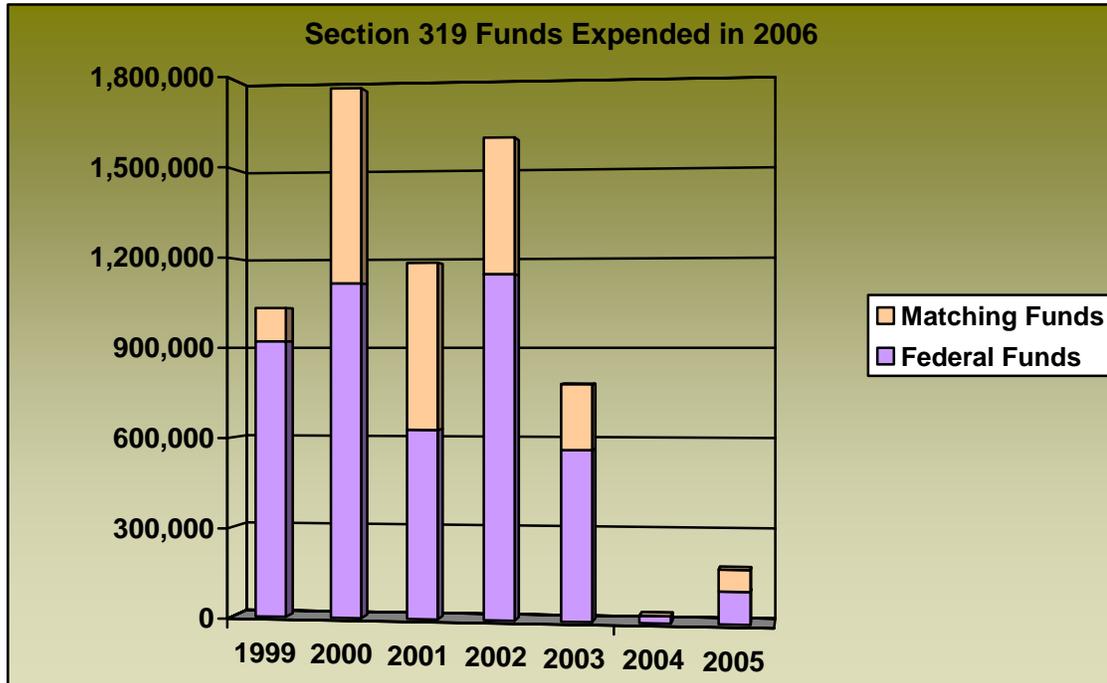


Table 2. Number of Projects in Each Basin

Basin	Number of Projects
Barataria	2
Calcasieu	1
Lake Pontchartrain	9
Vermilion-Teche	3
Ouachita River	10
Red River	5
Pearl River	1
Terrebonne	1
Mermentau	5
Mermentau and Vermilion-Teche	2
Pontchartrain and Pearl	1
Sabine and Red	1
Statewide	14
Total Number of Projects	55

A total of 55 projects were implemented by the LDEQ NPS Program in 2006 (Table 2 and Figure 2). The largest percentage of projects was implemented statewide. The Pontchartrain and Pearl Basins, Mermentau and Vermilion Basins, and Red and Sabine Basins were combined because some of the projects covered both basins. Table 3 provides more detail on the five main project categories in order to more specifically illustrate the nature of the projects.

Figure 2. Percent of Projects Implemented in Each Basin

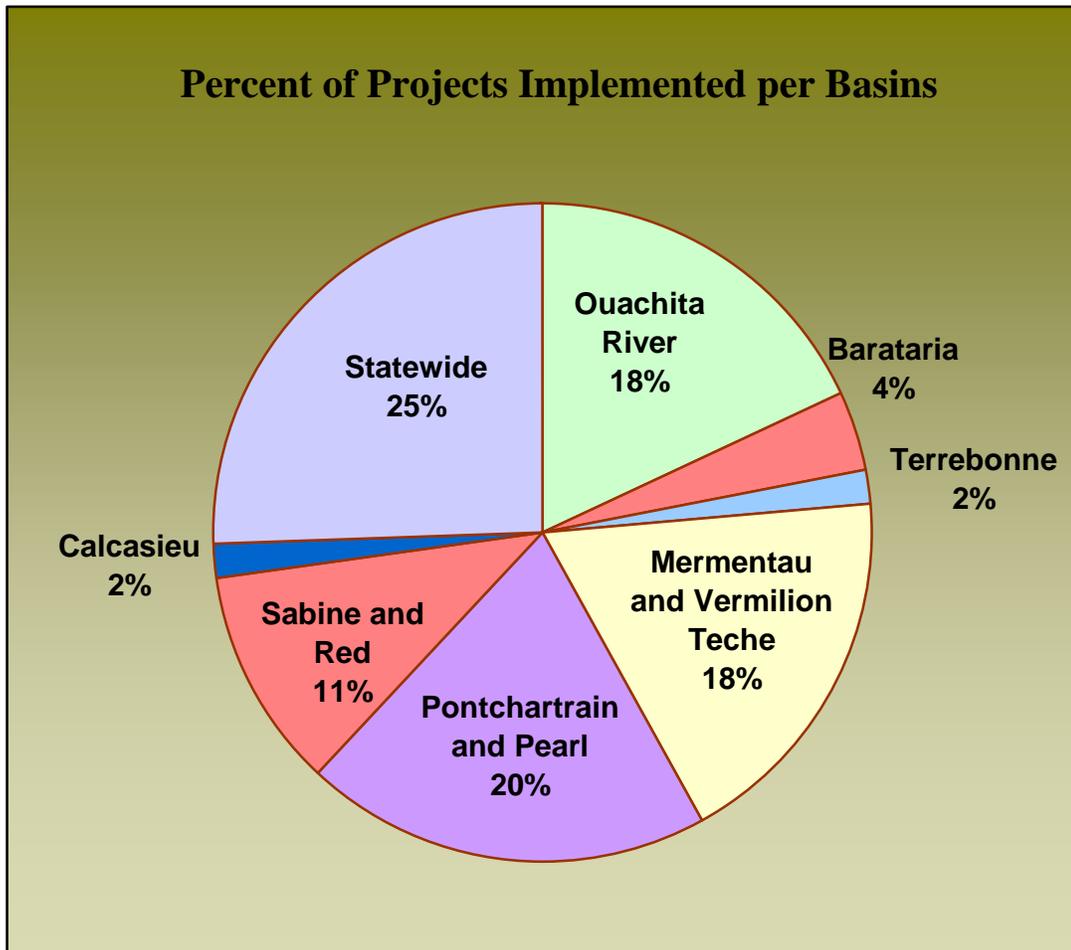


Table 3. Breakdown of Project Types

Project Category	Number of Projects	Project Category	Number of Projects
<u>Implementation</u> BMP Demonstration and Effectiveness		<u>Implementation</u> Education	
home sewage treatment systems	1	urban runoff	3
agriculture	3	website	2
<u>Implementation</u> BMP Effectiveness		<u>Implementation</u> BMP Implementation	
forestry	4	urban runoff	5
modeling	1	runoff*	3
agriculture	1	agriculture	12
		home sewage treatment systems	3
<u>Watershed and Statewide Planning</u>		monitoring	2
urban runoff	2	modeling	2
standards development	2		
modeling	1		
sand and gravel mining	1		
agriculture	1		
mapping	5		
database	1		

*runoff includes urban and agricultural runoff.

Figure 2 and Table 4 show how the federal and match funds were distributed among the basins. Since there were more statewide projects than projects in any one basin, there was also the largest percentage of funds spent on statewide projects.

Figure 2. Percent of Total Funds Spent per Basin

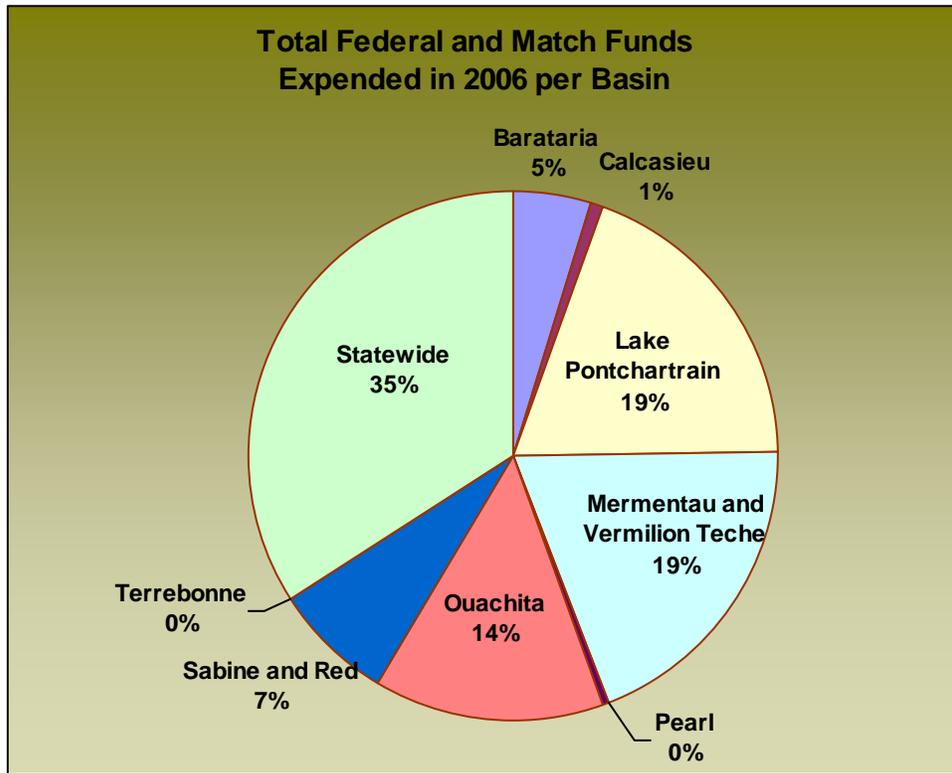


Table 4. Total Funds Spent per Basin

Basin	Total Funds Spent
Barataria	\$318,159
Calcasieu	\$43,375
Lake Pontchartrain	\$1,250,441
Mermentau and Vermilion-Teche	\$1,273,668
Pearl River	\$29,685
Ouachita River	\$925,252
Sabine and Red	\$467,406
Terrebonne	\$3,540
Statewide*	\$2,242,236

*includes salaries, travel, supplies, operating costs, etc.

Figure 3 and Table 5 show how the Federal and Match funds were distributed among the five categories of projects. There are two main categories, Planning and Implementation. The categories of Education, Implementation, BMP Effectiveness, and BMP Demonstration and Effectiveness all fall under the main category of Implementation.

Figure 3. Percent of Total Funds Spent per Project Category

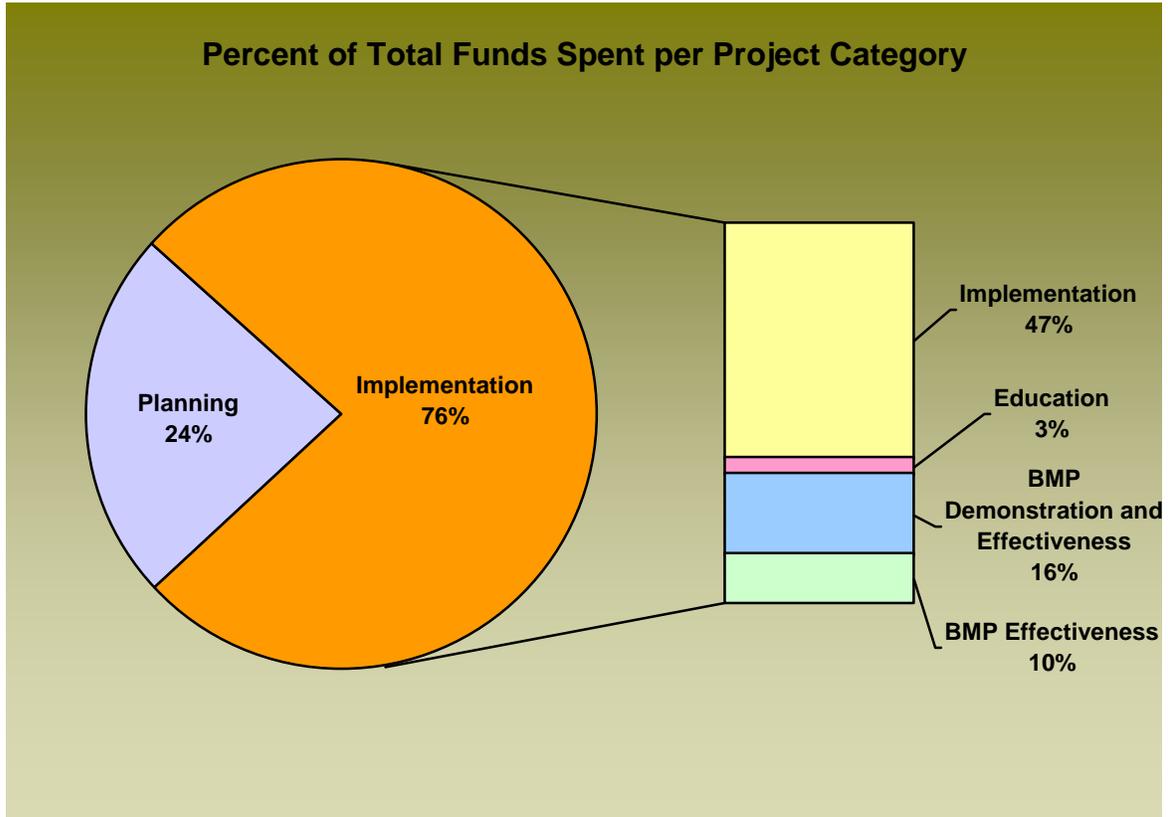


Table 5. Total Funds Spent per Project Category

Categories	Total Funds
BMP Demonstration & Effectiveness	\$1,051,167
BMP Effectiveness	\$625,452
Implementation*	\$3,108,135
Planning	\$1,549,956
Education	\$219,052

*includes salaries, travel, supplies, operating costs, etc.

Water Quality Improvements

During 2006, LDEQ finalized the 2006 Integrated Report, which provides information on the level of attainment of all of the water bodies within the state, based on water quality data from 2000 to 2005. These data indicated that water quality had improved (i.e., one or more causes of impairment had been removed) in 80 water bodies across the state between the 2004 and 2006 listing cycle (Table 6). In addition to these improvements, there were 254 water bodies that had one or more causes of impairment removed between the 2002 and 2004 listing cycle, due to water quality improvements. The improvements are distributed in 10 of the 12 river basins, with the Sabine and Mermentau River Basins not exhibiting improvements.

Table 6. Water body Improvement per Basin

River Basin	Number of Water Bodies Improved in 2004 IR	Number of Water Bodies Improved in 2006 IR	Reason for Improvement
Atchafalaya	6	3	New data shows attainment
Barataria	27	10	New data shows attainment
Calcasieu	13	8	New data shows attainment
Lake Pontchartrain	56	2	Data shows attainment
Vermilion-Teche	6	2	New data shows attainment
Mississippi River	11	0	New data shows attainment
Ouachita River	35	36	New data shows attainment
Red River	33	6	New data shows attainment
Pearl River	8	0	New data shows attainment
Terrebonne	59	13	New data shows attainment
Total	254	80	

These water quality data indicate that there has been substantial progress made in improving water quality. One example of where these improvements can be linked with nonpoint source implementation is within the Ouachita River Basin. In 2002, LDEQ completed 10 TMDLs for water bodies that were included on the State's 303(d) list of impaired waters. During 2002, EPA completed more than 20 individual TMDLs and a TMDL that covered groups of water bodies that were impaired within the Ouachita River Basin. Therefore, more than 30 TMDLs were completed for impaired water bodies within the Ouachita River Basin. Nonpoint sources of pollution were identified as a major contributor to these water quality problems, including sediments, nutrients, dissolved oxygen and turbidity, primarily from watersheds that are predominantly agricultural (row crops, pastures or poultry operations). During 2005, watershed plans were developed for 13 watersheds within the Ouachita River Basin, incorporating TMDLs that both LDEQ and EPA had done for the various water quality impairments that existed in these water bodies. Prior to 2005, there had already been extensive implementation of agricultural best management practices (BMPs) through both USDA Farm Bill Programs and Section 319 projects administered by both LDEQ and Louisiana Department of Agriculture and Forestry (LDEQ). During 2005, the Conservation Reserve Enhancement Program (CREP) was implemented in watersheds of the eastern portion of the Ouachita River Basin, which has resulted in 47,992 acres of highly erodible lands being taken out of production and planted to permanent pastures and trees or restored to bottomland hardwood forests. During 2006, an estimated 49,490 acres of agricultural BMPs were implemented within these watersheds through the Environmental Quality Incentive Program

(EQIP). An additional 389 acres of agricultural BMPs were implemented through the Wildlife Habitat Incentive Program (WHIP). Approximately 193,261 acres of agricultural BMPs were also implemented during 2006 through the Conservation Reserve Program. All of these programs collectively have resulted in less sediment and nutrients entering the water body and the water quality has responded positively to these changes.

The Louisiana Department of Environmental Quality (LDEQ) outlined a 15-year timeline within the 2000 NPS Management Plan to implement a watershed strategy for the state. Within that timeline, LDEQ anticipated that it would take three cycles of water quality data collection over those 15 years to see water quality improvements as a result of watershed implementation. Data was collected in the Mermentau and the Vermilion-Teche River Basins during 1998, the Calcasieu and Ouachita River Basins in 1999, the Barataria and Terrebonne Basins in 2000, Lake Pontchartrain and Pearl Basins in 2001, and the Red and Sabine Basins in 2002. The cycle began again in 2003 for many of the water bodies in the Mermentau and Vermilion Basins and continued into 2004 for the Mermentau, Vermilion, Ouachita and the Barataria Basins. Therefore, much of the data presented represents the first 5-year cycle of that 15-year timeline.

These tables include annual averages for dissolved oxygen and fecal coliform bacteria from selected water bodies within each of the basins in which nonpoint source projects have been or are in the process of being implemented. It is important to note that 1998-2000 and 2005 were drought years in Louisiana; so much of the variability that is seen in the data may be attributed to that rather than to an in-stream response to BMP implementation. The data also indicates that there is some stability in the water bodies from year to year, with only minor fluctuations in dissolved oxygen conditions. However, low dissolved oxygen may be partially caused by drought conditions. A lack of rainfall could lead to lower stream flow, lower water levels, and higher warmer temperatures, which result in lower dissolved oxygen. There is a wider variation in fecal coliform concentrations from year to year, with drought years producing lower numbers and rainy years producing higher numbers. However, as more practices are implemented at the watershed level, the nonpoint source pollutant load should decrease and the water bodies should eventually respond, so that in-stream water quality improvements can be detected and measured.

Mermentau River Basin

During 2006, LDEQ continued to focus on the water quality problems that exist in the southwestern part of Louisiana, where rice fields, sugarcane and crawfish ponds dominate the landscape. These are difficult water bodies to work in because of the low flow, sluggish conditions and the naturally high organic levels that exist within the bayous. The historical water quality data for the water bodies within the Mermentau River Basin indicated declining trends in the concentration of dissolved oxygen between 1978 and 1998 but higher values of oxygen in some of the water bodies from 1998 through 2005. Dissolved oxygen concentration relates to the protection of the water body for fish and wildlife propagation.

Average Dissolved Oxygen Concentrations Measured in mg/L for the Water Bodies in the Mermentau River Basin

Water Body	1998	2003	2004	2005	2006*
Mermentau River	3.63	3.43	3.89	2.15	3.69
Bayou Queue de Tortue	2.08	2.84	2.35	4.48	no data
Bayou Lacassine	3.92	3.91	no data	1.18	no data
Bayou Plaquemine Brule	3.65	3.54	3.30	2.33	no data
Bayou Des Cannes	4.60	no data	4.20	1.76	no data
Bayou Nezpique	4.35	4.37	7.7	3.10	no data

*partial year data in 2006

LDEQ collects monthly water quality data each year for the Mermentau River, but samples the other water bodies on a cyclic basis, recently changed to a 4-year cycle. The total maximum daily loads (TMDLs) for these water bodies indicated that there would need to be a 30-100% reduction, depending on the water body, of nonpoint source pollutant loading before these water bodies would meet the water quality standard for dissolved oxygen during critical conditions. The NPS Management Plan outlined a 15-year schedule to improve water quality and will sample these water bodies again in 2008 to determine if the watershed implementation strategy has been effective in improving water quality.

Average Fecal Coliform Concentrations Measured in cells per 100 mL Sample for the Water Bodies in the Mermentau River Basin

Water Body	1998	2003	2004	2005	2006*
Mermentau River	467.08	4152.33	473.64	119.23	82
Bayou Queue de Tortue	268.53	577.5	498.89	105	no data
Bayou Lacassine	248.05	192.09	no data	50	no data
Bayou Plaquemine Brule	235.54	14,024	328.18	no data	no data
Bayou Des Cannes	1067	no data	182.2	45	no data
Bayou Nezpique	444.95	655.58	no data	100	no data

*partial year data in 2006

The water quality data for fecal coliform indicates that many of the water bodies have improved since 2003. The 2005 data indicates that fecal coliform had declined within many of the water bodies since 2003, and has even fallen below the levels that existed in 1998. Since 1998-2000 and 2005 were drought years within Louisiana, this may partially explain the lower numbers during those years since rainfall events would not have delivered the fecal bacteria to the water bodies. These data relate to protection of the primary and secondary contact recreation use.

Vermilion-Teche River Basin

LDEQ continued to focus resources and time within the Vermilion-Teche River Basin during 2006, and collected water quality data during 2005 and 2006 to determine whether water quality was improving as a result of these activities. Water quality data will be collected again during 2008 to determine whether the watershed projects that have been implemented have resulted in reductions of nonpoint source pollutants and improvements in water quality.

Average Dissolved Oxygen Concentrations Measured in mg/L for the Water Bodies in the Vermilion-Teche River Basin

Water Body	1998	2003	2004	2005	2006*
Vermilion River	7.32	4.61	4.03	6.01	4.94
Bayou Teche	6.47	6.71	4.70	5.14	6.03
Bayou Cocodrie	5.15	no data	5.32	4.74	no data
Chicot Lake	5.30	no data	4.68	3.05	no data

*partial year data in 2006

The water quality data for the Vermilion River and Bayou Cocodrie indicates that average dissolved oxygen concentrations have fluctuated since 1998, but the most recent data shows the concentration is not as high as it was in 1998. The water quality data for Bayou Teche indicates that the average dissolved oxygen concentrations decreased from 2003 to 2004, but has begun to improve since 2005. The average dissolved oxygen concentrations in Chicot Lake has steadily decreased since 1998.

Average Fecal Coliform Concentrations Measured in cells per 100 mL Sample for the Water Bodies in the Vermilion-Teche River Basin

Water Body	1998	2003	2004	2005	2006*
Vermilion River	4904	1193	2860.91	197.69	133
Bayou Teche	851	1024.83	480	366	121.5
Bayou Cocodrie	142.28	681.17	190.5	no data	no data
Chicot Lake	98.17	289	130.78	no data	no data

*partial year data in 2006

The water quality data for fecal coliform indicated improvements in the Vermilion River, Bayou Teche, and Bayou Cocodrie since 1998, and in Chicot Lake since 2003. The range of fecal coliform levels is higher for three of the water bodies in 2003-2004 than in 1998, but since 1998 and 2005 were drought years, there would have been a lower number of runoff events and consequently lower in-stream concentrations of bacteria.

Calcasieu River Basin

During 2004 and 2005, LDEQ continued to collect and analyze water quality data for the Calcasieu River Basin to determine if water quality had improved since 1999, which was the last cycle when data was collected. The most recent data does indicate that water quality has improved for dissolved oxygen in Indian Bayou and Mill Creek, while the Little River has remained almost constant. Three of the water bodies has lower dissolved oxygen in 2005 compared to 1999.

Average Dissolved Oxygen Concentrations Measured in mg/L for the Water Bodies in the Calcasieu River Basin

Water Body	1999	2004	2005
Barnes Creek	5.41	5.60	3.20
Bayou Serpent	3.80	no data	2.69
Marsh Bayou	2.76	no data	1.56
Indian Bayou	2.35	4.23	no data
Mill Creek	2.92	4.31	no data
Little River	3.01	2.91	no data

*partial year data in 2006

The data for fecal coliform indicated higher values in 2005 than in 1999 for water bodies in the Calcasieu River Basin. Only Barnes Creek had lower values in 2004 than in 1999.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for the Water Bodies in the Calcasieu River Basin

Water Body	1999	2004	2005
Barnes Creek	2050.83	677.5	2907.9
Bayou Serpent	71	no data	562.6
Marsh Bayou	349.75	no data	2236.9
Indian Bayou	223.33	4677.5	no data
Mill Creek	243.33	589.42	no data
Little River	379.75	814.67	no data

*partial year data in 2006

Ouachita River Basin

The Ouachita River Basin is bisected by the Ouachita River which enters Louisiana from the Arkansas and flows south until it joins with the Red River. The eastern portion of the basin is dominated by cropland while forestry dominates the western portion of the basin. LDEQ collected water quality data for some of these water bodies during 2004 through 2006 to determine whether there had been improvements since 1999. These dissolved oxygen data indicate that the water quality has improved in the Ouachita River, Boeuf River, and Castor Creek, but has declined in the others.

Average Dissolved Oxygen Concentrations Measured in mg/L for the Water Bodies in the Ouachita River Basin

Water Body	1999	2004	2005	2006*
Ouachita River	6.175	5.81	6.35	6.32
Bayou Bartholomew	6.53	6.36	6.53	6.26
Boeuf River	5.91	2.9	6.29	no data
Bayou Lafourche	6.28	no data	5.22	no data
Joe's Bayou	6.11	no data	4.95	5.40
Tensas River	6.03	5.48	no data	no data
Bayou Macon	7.09	6.23	no data	no data
Big Creek	6.78	4.97	5.28	no data
Flat Creek	4.74	no data	4.03	no data
Bayou D'Arbonne, Middle Fork Bayou D'Arbonne, Corney Bayou	7.06	6.62	4.81	no data
Castor Creek	6.13	4.72	7.54	no data

*partial year data in 2006

The data for fecal coliform indicates that most of the water bodies in the Ouachita River Basin has either improved or remained constant.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for the Water Bodies in the Ouachita River Basin

Water Body	1999	2004	2005	2006*
Ouachita River	40.583	143.29	128.4	74.2
Bayou Bartholomew	334.33	266.08	no data	120.4
Boeuf River	402.83	no data	167	no data
Bayou Lafourche	148.17	605	172.9	no data
Joe's Bayou	543.33	no data	1229.2	143.29
Tensas River	140.67	336.67	no data	no data
Bayou Macon	217.42	no data	no data	no data
Big Creek	249.08	no data	250.33	no data
Flat Creek	98.09	no data	259.9	no data
Bayou D'Arbonne, Middle Fork Bayou C'Arbonne, Corney Bayou	80.2	505.75	174.92	no data
Castor Creek	195.67	no data	265	no data

*partial year data in 2006

Barataria and Terrebonne Basins

The TMDLs for the Barataria Basin were completed in 2004, and staff within the NPS Unit has completed the watershed plans in 2006. Data was collected in 2000 and again in 2004 through 2006 in order to determine whether water quality has improved. The most recent data indicates that the concentration of dissolved oxygen has increased in the Bayou Verret system, Bayou des Allemands, the St. Charles Canals, and Bayou Lafourche. Bayou Segnette has a lower concentration of dissolved oxygen in 2004 than in 2000. The Terrebonne Basin is the next area to be targeted for TMDL development with the deadline for completion in 2007.

Average Dissolved Oxygen Concentrations Measured in mg/L for the Water Bodies in the Barataria and Terrebonne Basins

Water Body	2000	2004	2005	2006*
Bayou Boeuf-Halpin Canal, Theriot Canal and Lake Boeuf	3.79	3.64	no data	no data
Bayou Verret, Bayou Chevreuil, Bayou Citamon, Grand Bayou	3.21	2.49	no data	3.25
Bayou des Allemands	5.84	6.46	6.87	no data
Bayou Segnette	5.67	4.34	no data	no data
St. Charles Canals	5.67	3.34	8.52	no data
Bayou Lafourche	5.75	6.43	6.66	6.46

*partial year data in 2006

The data for fecal coliform indicated water quality improvements in the Bayou Verret, Chevreuil, Citamon, Grant Bayou watershed system, the Bayou Boeuf-Halpin Canal, Theriot Canal and Lake Boeuf watershed system, and in Bayou des Allemands, but higher levels of bacteria in the Bayou Segnette watershed.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for the Water Bodies in the Barataria and Terrebonne Basins

Water Body	2000	2004	2005	2006*
Bayou Boeuf-Halpin Canal, Theriot Canal and Lake Boeuf	202.5	95.91	no data	no data
Bayou Verret, Bayou Chevreuil, Bayou Citamon, Grand Bayou	341.64	185.2	no data	87.56
Bayou des Allemands	110	94.64	73.3	no data
Bayou Segnette	535	2114.75	no data	no data
St. Charles Canals	7271.67	1578.58	36.5	no data
Bayou Lafourche	128.18	666.38	322.5	250

*partial year data in 2006

Red River and Sabine River Basins

All of the water bodies within the Red and Sabine River Basins were sampled during 2002. The schedule for completion of the TMDLs in the Red and Sabine River Basins is 2007. LDEQ has already implemented several projects within these watersheds to address the types of nonpoint source pollutant problems that exist there. These data indicate that the dissolved oxygen concentrations have improved in the Flat River since 1995, but are lower than they were in 1998. The dissolved oxygen concentrations have steadily improved in the Red Chute Bayou from 1995 to 1998, but the most current data shows it is currently lower than it was in 1995. Wallace Lake and Cross Lake were added to the ambient water quality sampling network in 2002, and the data shows the dissolved oxygen concentrations have decreased.

Average Concentrations of Dissolved Oxygen for Selected Water Bodies in the Red River and Sabine Basins

Water Body	1995	1996	1997	1998	2002	2004	2005
Flat River	5.05	6.11	7.63	8.68	5.45	no data	no data
Red Chute Bayou	5.81	7.04	8.05	9.94	7.91	no data	3.57
Wallace Lake	no data	no data	no data	no data	5.67	3.76	no data
Cross Lake	no data	no data	no data	no data	9.92	9.65	7.54

The concentration of fecal coliform in the Flat River and Red Chute Bayou has increased from 1995 to 2002, except for 1998 which was a drought year. Wallace Lake and Cross Lake were added to the ambient water quality sampling network in 2002, and the data shows the fecal coliform concentrations have decreased or remained almost constant.

Average Concentrations of Fecal Coliform Bacteria for Selected Water Bodies in the Red River and Sabine Basins

Water Body	1995	1996	1997	1998	2002	2004	2005
Flat River	82.17	172.5	1531.5	41	210.25	no data	no data
Red Chute Bayou	115.83	430.33	1831.17	59.5	456.08	no data	no data
Wallace Lake	no data	no data	no data	no data	48.25	69.17	no data
Cross Lake	no data	no data	no data	no data	104.48	50	65.4

Lake Pontchartrain and Pearl River Basins

During 2006, LDEQ continued to collect water quality data for many of the water bodies within the Lake Pontchartrain and Pearl River Basins. Data from several of these water bodies have been included here to provide information on the whether the water quality is improving or not. The data indicates the average concentration of dissolved oxygen for all of the water bodies (except Bayou Manchac) indicate good water quality, with the dissolved oxygen levels exceeding the water quality standard for fish and wildlife propagation.

Average Concentrations of Dissolved Oxygen for Selected Water Bodies in the Lake Pontchartrain and Pearl River Basins

Water Body	2000	2001	2002	2003	2004	2005	2006*
Tickfaw River	8.09	7.34	7.69	7.67	6.33	7.45	7.95
Tangipahoa River	8.38	7.67	7.83	8.12	8.04	7.80	8.27

Water Body	1996	1997	1998	2001	2004	2005	2006*
Pearl River	8.84	9.73	7.95	7.39	no data	8.29	6.26
Bayou Manchac	3.46	3.38	3.41	3.87	no data	3.22	no data
Tchefuncte River	8.83	8.68	8.73	7.77	5.95	5.33	6.30
Amite River	5.53	6.31	6.35	8.06	5.76	no data	6.88

*partial year data in 2006

The fecal coliform data indicated a wide range of values with no real trends that fluctuated with rain fall events, except for Bayou Manchac which showed steadily decreasing levels of fecal coliform bacteria.

Average Concentrations of Fecal Coliform Bacteria for Selected Water Bodies in the Lake Pontchartrain and Pearl River Basins

Water Body	2000	2001	2002	2003	2004	2005	2006*
Tickfaw River	113.5	644.17	2998.89	717.3	1398.89	813.75	395.45
Tangipahoa River	100	526.7	280	1998	2588.89	472.93	930

Water Body	1996	1997	1998	2001	2004	2005	2006*
Pearl River	143.65	483.33	3854	108.18	509.17	13	161.1
Bayou Manchac	10,150	4305	3244	3132	no data	814.25	no data
Tchefuncte River	433	676	6007	722	99.17	439.12	271.25
Amite River	290.83	732.5	511.6	854.42	no data	no data	37.84

*partial year data in 2006

Progress in Meeting NPS Management Milestones

The state's NPS Management Plan contained a timeline to meet water quality standards within 15 years for each of the water bodies that were included on the 303(d) list of impaired waters. The NPS Management Plan has two main goals to accomplish by the year 2012: to restore the designated uses in 25% of the impaired water bodies and to improve water quality in the Mermentau, Vermilion-Teche, Ouachita, Calcasieu and Barataria Basins.

During 2006, the state has adhered to this timeline. LDEQ has implemented projects and programs to reduce nonpoint source pollutants in the Mermentau, Vermilion-Teche, Calcasieu, and Ouachita River Basins. Specific details of these projects are provided within the respective sections of this report. Final Watershed Management Plans were completed in the Barataria River Basin, and Draft Watershed Management Plans are currently being written for the Terrebonne Basin. TMDLs were developed for six watersheds in the Terrebonne River Basin and three watersheds in the Red River Basin. One water quality survey was completed in the Atchafalaya River Basin and two water quality surveys were completed in the Red River Basin. Two water quality surveys were scheduled for the Pontchartrain Basin but were canceled due to rain and low water temperatures.

Table 7. Schedule of Milestones for Louisiana’s NPS Management Program

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Mermentau	Black Stripes	Light Grey	Green	Green	Green	Black Stripes	Yellow	Yellow	Yellow	Yellow	Black Stripes	Blue	Blue	Blue	Blue	Black Stripes	Blue	Blue	Blue
Vermilion	Black Stripes	Light Grey	Green	Green	Green	Black Stripes	Yellow	Yellow	Yellow	Yellow	Black Stripes	Blue	Blue	Blue	Blue	Black Stripes	Blue	Blue	Blue
Calcasieu		Light Grey	Light Grey	Light Grey	Light Grey	Green	Black Stripes	Yellow	Yellow	Yellow	Yellow	Black Stripes	Blue	Blue	Blue	Blue	Black Stripes	Blue	Blue
Ouachita		Light Grey	Light Grey	Light Grey	Light Grey	Green	Black Stripes	Yellow	Yellow	Yellow	Yellow	Black Stripes	Blue	Blue	Blue	Blue	Black Stripes	Blue	Blue
Barataria			Black Stripes				Light Grey	Black Stripes	Green	Green	Yellow	Yellow	Black Stripes	Yellow	Blue	Blue	Blue	Black Stripes	Blue
Terrebonne			Black Stripes				Light Grey	Black Stripes			Green	Green	Black Stripes	Yellow	Yellow	Yellow	Yellow	Black Stripes	Blue
Pontchartrain				Black Stripes					Black Stripes		Light Grey	Light Grey	Light Grey	Black Stripes	Green	Green	Green	Yellow	Black Stripes
Pearl									Black Stripes	Light Grey	Light Grey	Green	Green	Black Stripes	Yellow	Yellow	Yellow	Yellow	Black Stripes
Red					Black Stripes			Light Grey	Light Grey	Black Stripes	Green	Green	Green	Yellow	Black Stripes	Yellow	Yellow	Blue	Blue
Sabine					Black Stripes			Light Grey	Light Grey	Black Stripes	Green	Green	Green	Yellow	Black Stripes	Yellow	Yellow	Blue	Blue
Mississippi				Black Stripes					Black Stripes	Light Grey	Light Grey	Light Grey	Light Grey	Black Stripes	Green	Green	Yellow	Yellow	Black Stripes
Atchafalaya					Black Stripes				Light Grey	Black Stripes	Light Grey	Light Grey	Green	Green	Black Stripes	Yellow	Yellow	Yellow	Yellow

- 1- Black Stripes = Collect Water Quality Data to Develop Total Maximum Daily Loads (TMDLs) and to Track Water Quality Improvement at the Watershed Level
- 2- Light Grey = Develop Total Maximum Daily Loads for the Watersheds on the 303(d) List
- 3- Green = Develop Watershed Management Plans to Implement the NPS Component of the TMDL
- 4- Yellow = Implement the Watershed Management Plans
- 5- Blue = Develop and Implement Additional Corrective Actions Necessary to Restore the Designated Uses to the Water Bodies

Ambient Monitoring Schedule

LDEQ revised its monitoring program in May of 1998 to operate on a five-year cycle with monthly sample collections occurring in two or three basins each year and rotating from year to year (calendar year). In this manner, the entire state had been covered at the end of 2002. Although the five-year cycle completed the goal of collecting water quality data from every sub-segment in the state, it did not correspond with the even year §305(b) reporting cycle and placed a disproportionate amount of responsibility on the regional field staff during the one-year surveys. Additionally, LDEQ prefers to use two cycles of monitoring data for a more accurate assessment. When two cycles of data are used, the five-year rotating cycle causes large time gaps in the datasets used for some water bodies in each assessment cycle. In an effort to equalize the number of basins assessed every two years, balance the field staff work load, and minimize data gaps, LDEQ implemented a four-year rotating sampling plan in January, 2004 (Table 8).

Within each basin, all monitored sub-segments will be sampled over the year or years specified under each cycle period. Water quality assessments for the Integrated Report will be conducted for each basin following the last year of its monitoring period. Approximately 125 water body sub-segments are typically monitored each month under this program.

Table 8. Ambient Monitoring Schedule

Basin	First 4-Year Cycle	Second 4-Year Cycle
Mermentau	2004, 2005, 2006, 2007	2008, 2009, 2010, 2011
Vermilion-Teche	2004, 2005, 2006, 2007	2008, 2009, 2010, 2011
Calcasieu River	2004, 2005	2008, 2009
Ouachita River	2004, 2005	2008, 2009
Barataria	2004, 2005	2008, 2009
Terrebonne	2004, 2005	2008, 2009
Mississippi River	2004, 2005	2008, 2009
Lake Pontchartrain	2006, 2007	2010, 2011
Pearl River	2006	2010
Red River	2004, 2005, 2006, 2007	2008, 2009, 2010, 2011
Sabine River	2006, 2007	2010, 2011
Atchafalaya River	2004, 2005	2008, 2009

Assessment procedures follow U.S. EPA guidance documents for §305(b) assessments, U.S. EPA's Consolidated Assessment and Listing Methodology (CALM) guidance (U.S. EPA, 2002), U.S. EPA's Integrated Report guidance (found within CALM guidance), as well as Louisiana's surface water quality standards, and ERC 33:IX.1101-1123.

LDEQ's Source Water Protection Program

During 2006, LDEQ incorporated the Source Water Protection Program into the State's NPS Management Plan. The Source Water Protection Strategy is implemented through its Source Water Assessment Program and Source Water Protection Program. LDEQ's Source Water Protection Program is officially known in Louisiana as the Drinking Water Protection Program, however for this document, it will be referred to as the Source Water Protection Program to fit with EPA's nomenclature. The main goal of the LDEQ's Protection Strategy is to protect all sources of potable water for public water systems from contamination. Under the Source Assessment Program, LDEQ has located all public water supply sources and evaluated their susceptibility to contamination. The information derived from this Program is used by various sections within LDEQ, by various outside agencies, and directly in the implementation of the Source Water Protection Program in order to protect water supplies. The Source Water Protection Program operates on a parish or regional (combination of parishes) basis, depending on the local situation.

Key elements of the Louisiana Source Water Protection Strategy consist of the following:

1. Maintenance of updated Source Water Assessment Program data, which includes information on sources of drinking water (wells or intakes) and a list of potential sources of contamination located near those drinking water sources.
2. Development of contingency plans for all water systems in each targeted community that will give those water systems a plan in place in the event of an emergency or the loss of the water supply.
3. Implementation of public education/awareness campaigns to educate the local public on where drinking water comes from, why it's important to protect it, and how it can be protected.
4. Formation of Source Water Protection Committees made up of local residents from the parish(s) being targeted at the time. Each Committee is trained on its role in drinking water source protection within its community and best management practices (BMPs) that may be used to control pollution in the vicinity of their drinking water supplies. Source water protection goals are set and carried out with each committee.
5. Distribution of BMPs to various businesses/activities that are considered potential sources of contamination as identified in the Source Water Assessment Program, in conjunction with the Source Water Protection Committees.



6. Development and distribution of educational/outreach material as needed for the community to help protect its drinking water, in conjunction with the Source Water Protection Committees.
7. Addressing the most threatening potential sources of contamination in each community.
8. Addressing specific issues affecting water sources that each committee and local community deem necessary.
9. Addressing the specific nonpoint sources of contamination that have been identified as affecting water supplies.
10. Working with each committee to get an ordinance passed by local governments which affords further protection of the drinking water source.

Louisiana Source Water Protection Strategies Implemented in 2006

Implementation of scheduled source water protection strategies over the past six months included:

- Signage: 392 Drinking Water Protection Area Signs were delivered to communities in 14 parishes for placement on the highways at the boundaries of Source Water Protection Areas,
- Workshops: 17 local committee training meetings took place within three parishes with emphasis on NPS pollution,
- Public Education and Outreach: 719 potential sources of contamination were visited by committee members mainly in urban areas educating citizens about potential pollution of their local drinking water source,
- Passage of Ordinances: 10 ordinances were passed by local governments in six parishes prohibiting some nonpoint type activities within a certain distance from public drinking water wells,
- A meeting was held with the City of Natchitoches about their concern of malfunctioning on-site septic systems in the watershed that feeds the Sibley Lake drinking water source, and this resulted in the city applying for a Nonpoint Source § 319 Grant to help resolve the problem.



Drinking Water Protection Sign

Examples of NPS Issues Being Addressed in 2006 by the Source Water Protection Program

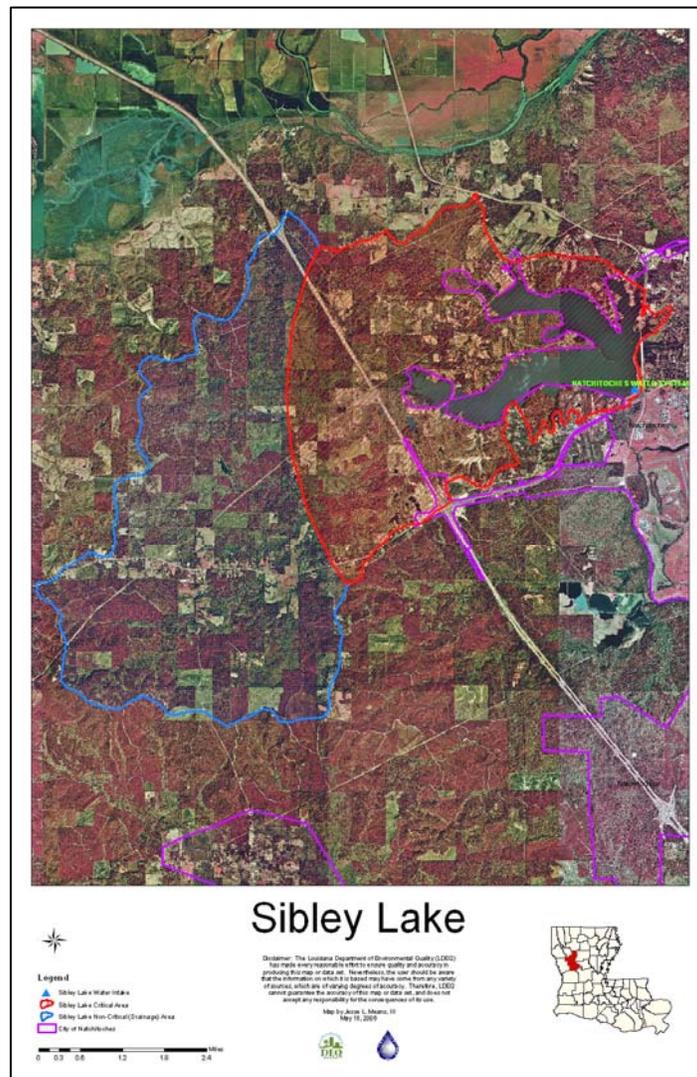
Natchitoches Parish

LDEQ strives to address specific nonpoint sources of contamination that have been identified as affecting water supplies within the framework of its Source Water Protection Program. This has become particularly important when working with surface water supplies. However, it is done as well for ground water supplies. Specific projects are utilized to address nonpoint source contamination, some of which have been mentioned above, such as used oil recycling education and visits to potential sources of contamination (some of which are nonpoint sources). LDEQ has also worked in some communities to educate citizens on individual sewage treatment system maintenance.

The Sibley Lake Watershed Individual Sewage Treatment System Improvement Project offers the most current example of one way LDEQ addresses specific nonpoint sources of contamination around a water source. Located in the Red River Basin in Natchitoches Parish, Sibley Lake is the

drinking water supply for the City of Natchitoches, the Village of Clarence, and the community of Hagewood. It is also the water supply for the unincorporated areas around the lake and along the water distribution system between the above listed municipalities. The total population served is almost 25,000. The critical watershed drainage area (a maximum of five miles upstream from the intake) is outlined in red on the map at right. The area in blue represents the lake's total watershed. The watershed surrounding the lake consists of urban and rural land. The area immediately surrounding the lake has a significant amount of residential development and most of this development is located outside the corporate limits for the City of Natchitoches. On the map, the corporate limits of the City of Natchitoches are shown in purple. Because most of this development is located outside the municipal limit, no centralized sewage system exists there, and therefore it is served by individual sewage treatment systems. These sewage treatment systems are in varying degrees of operational condition. Many of these systems are located within only a few hundred feet of the lake or its tributaries. Development of the property directly adjacent to and around the lake is expected to continue, which will increase the potential for sewage loading going into the lake.

LDEQ has worked with the City of Natchitoches to protect their water source. As part of this effort, the City of Natchitoches, with LDEQ's encouragement and assistance, submitted a proposal for the Sibley Lake Watershed Individual Sewage Treatment System Improvement Project. This proposed 319 funded project will enable the City of Natchitoches to inventory and inspect all individual sewage treatment systems within a half-mile of Sibley Lake, and, to the extent permitted by time and funding, additional areas beyond a half-mile which are immediately adjacent to tributaries. These systems will be located by GPS and all pertinent information on each system will be entered into the City's GIS System. Owners of failing individual sewage treatment units will be served notice that their systems must be repaired or replaced. Funding will be provided for the repair/replacement of failed systems. Owners of repaired/replaced systems will be required to sign a document stating that they will abide by the continued maintenance requirements specified by City ordinance for as long as they own the repaired/replaced system. This project will enable the City



of Natchitoches to mitigate the future threat of sewage loading in Sibley Lake and protect their source of drinking water and the health of those who swim and boat in the lake.

Assumption, Lafourche, and Terrebonne Parishes

A public education campaign was launched for Assumption, Lafourche, and Terrebonne Parishes in August of 2006, and four community meetings were held in the area. A source water protection committee has been formed for these three parishes which are located within the Barataria and Terrebonne Basins. Bayou Lafourche, which flows from the Mississippi River at Donaldsonville (in Ascension Parish) through Assumption and Lafourche Parishes from north to south toward the Gulf of Mexico, is a major source of drinking water for the entire area. It is the source of drinking water for every public water system in both Assumption and Lafourche Parishes and also for one of the public water systems in Terrebonne Parish. The remaining water systems in Terrebonne Parish also use water from Bayou Lafourche to blend with their existing water sources whenever those sources receive too much salt water from the Gulf of Mexico.



Teaching School Children about Drinking Water

LDEQ's sampling efforts show that where Bayou Lafourche is a drinking water source, it is not meeting its primary contact recreation (swimming) and fish and wildlife propagation (fishing) designated use standards for nutrients, non-native aquatic plants, dissolved oxygen, and total fecal coliform. Further downstream where the bayou is not a drinking water source, it is not meeting



Algae in Bayou Lafourche

its fish and wildlife propagation standard for dissolved oxygen and its oyster propagation standard for total fecal coliform. These sampling results highlight a problem of sewage loading in the bayou. LDEQ plans to work with local officials and the drinking water source protection committee it formed for the area to address this situation and come up with a way to reduce the sewage loading in the bayou.

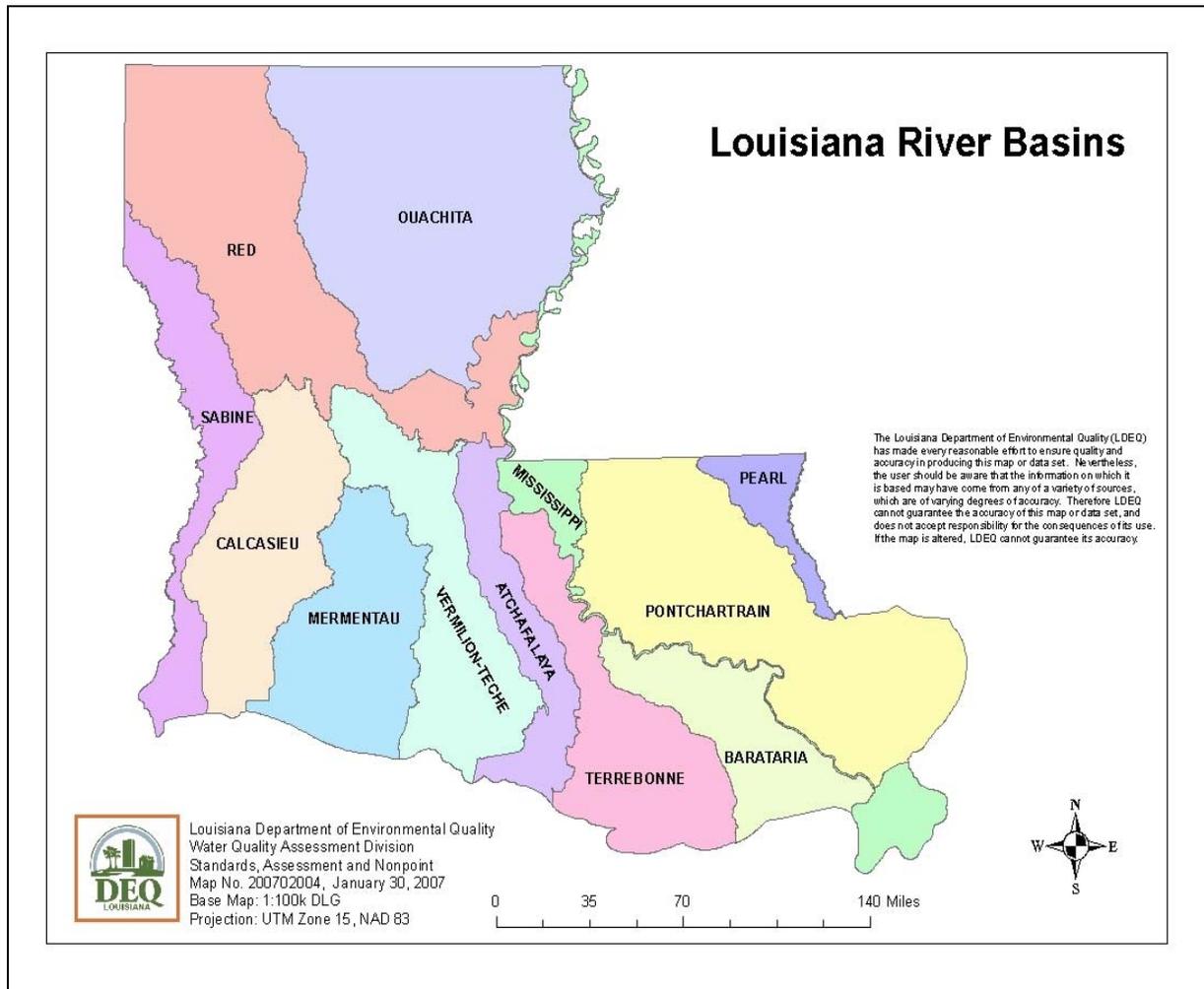
Additionally, salt water intrusion is a major issue with Bayou Lafourche. This problem increases farther downstream and affects

major drinking water supply systems. The local committee that LDEQ formed has expressed interest in working toward a solution for this problem.

Also in the same area, Bayou Black, in Terrebonne Parish, is one of the drinking water sources for the City of Houma. This water body is heavily littered. The local water operators in Houma constantly have to clear their filters and they receive constant complaints about the litter situation from the public. This is another issue that LDEQ plans to address in this area.

Watershed Implementation

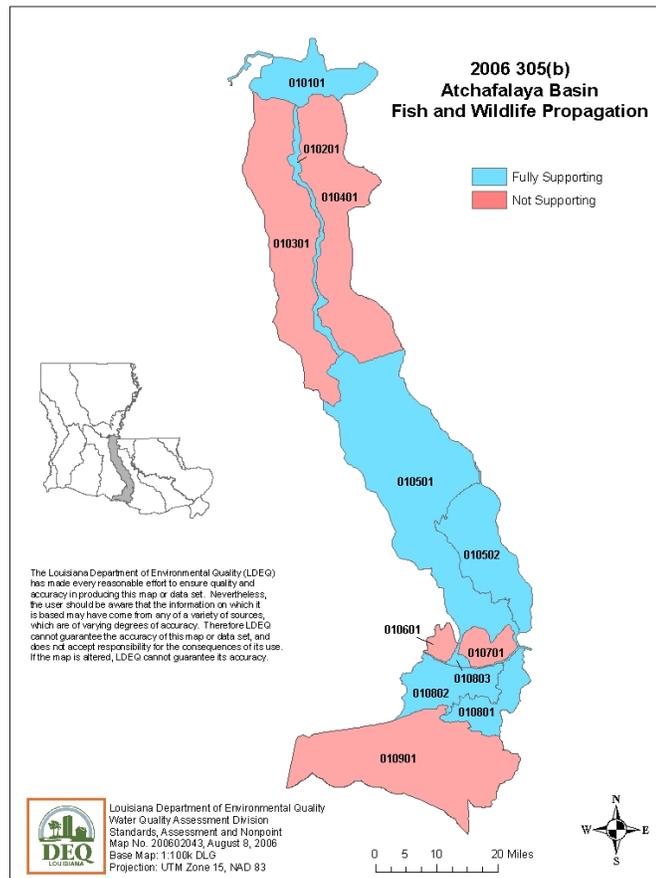
One of the strengths of Louisiana’s NPS Program is the watershed planning and implementation strategy. This strategy utilizes TMDLs combined with detailed land-use classification from satellite imagery and watershed modeling. During 2006, seven Watershed Plans were developed for the Barataria Basin, and the field work for satellite imagery classification was completed for the Red River Basin. These watershed plans are the basis for implementing nonpoint source projects by both LDEQ and the Louisiana Department of Agriculture and Forestry’s (LDAF’s) Office of Soil and Water Conservation. The incremental component of the Section 319 grant is utilized for implementing BMPs in these watersheds where TMDLs and watershed plans have been completed.



Atchafalaya Basin

The Atchafalaya River Basin comprises 12 sub-segments, all of which are in full compliance with the contact recreational uses. There are no exceedances of the water quality standard for fecal coliform within the Atchafalaya Basin. The 2006 Integrated Report indicated that six of the 12 water quality sub-segments were not fully meeting the fish and wildlife propagation use. The water quality problems were either related to mercury or dissolved oxygen.

Total maximum daily loads (TMDLs) are scheduled to be completed for these impaired water bodies by 2009. The East Atchafalaya Basin, Morganza Floodway south to I-10 Canal, Crow Bayou, and Bayou Blue and its tributaries would be scheduled for TMDLs for dissolved oxygen, chloride, sulfates and total dissolved solids from irrigated and non-irrigated crop production, home sewage systems and natural sources.



During 2006, the NPS Program did not implement any projects within the Atchafalaya Basin but the USDA has worked with the landowners and farmers on best management practices (BMPs).

USDA Programs*

During 2006, the USDA implemented approximately 7,051 acres of BMPs within the Atchafalaya Basin through the Environmental Quality Incentive Program (EQIP). An additional 486 acres of practices were implemented through the Conservation Reserve Program (CRP), 1,096 acres of practices were implemented through the Wetlands Reserve Program (WRP), 515 acres of practices were implemented through the Grasslands Reserve Program (GRP), and 86 acres of practices were implemented through the Wildlife Habitat Incentives Program (WHIP).

*All USDA information was taken from the 2006 PRS Report.

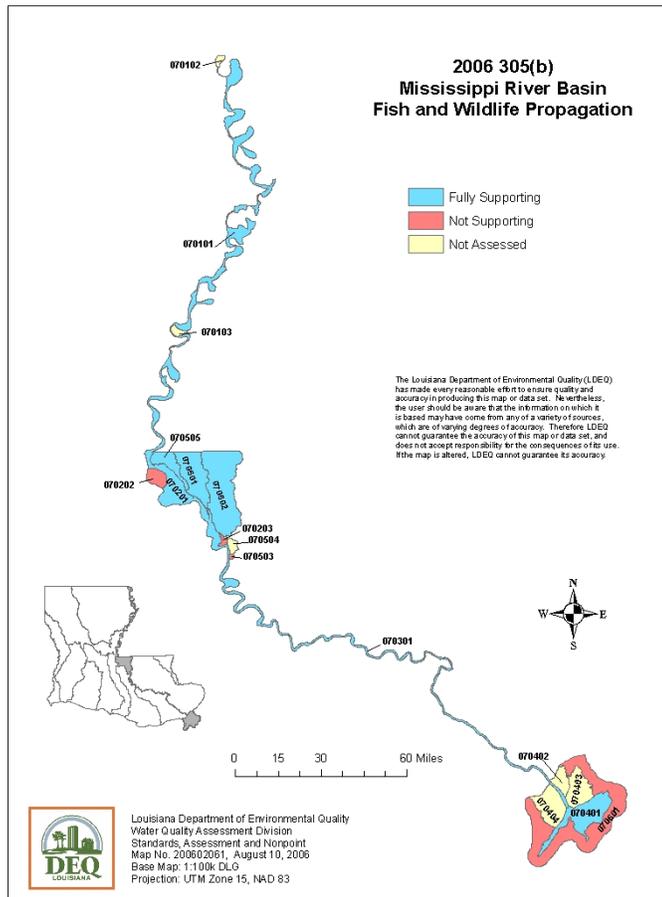
The Louisiana Department of Natural Resources coordinates the Atchafalaya Basin Program which is involved in a watershed project for Iberville, Pointe Coupee and West Baton Rouge Parishes. This is a watershed program that involves all of the stakeholders in outlining the problems and identifying the solutions that can be implemented to solve water quality and habitat issues that exist within this part of the Atchafalaya Basin. More information about the Atchafalaya Basin Program can be found at their website:

<http://dnr.louisiana.gov/sec/atchafalaya/>

Mississippi River Basin

The Mississippi River Basin comprises 17 sub-segments within Louisiana. The river is in full support of its designated uses from the Arkansas State line to the Old River Control Structure and on to Monte Sano Bayou and to Head of Passes. Old River Lake or Raccourci Lake is not fully meeting the fish and wildlife propagation use. Devil’s Swamp is impaired because of contaminated sediments and municipal separate storm sewers. There are fecal coliform problems in the lower passes and at Bayou Sara, Capitol Lake Thompson Creek and Tunica Bayou. TMDLs for the impaired water bodies within the Mississippi River Basin are scheduled to be completed by 2010.

During 2006, the NPS Program did not implement any projects within the Mississippi River Basin.



USDA Programs

During 2006, the USDA implemented approximately 1,890 acres of BMPs within the Mississippi River Basin through the EQIP. An additional 613 acres of practices were implemented through the CRP, 577 acres of practices were implemented through the WRP, 43 acres of practices were implemented through the GRP, and 36 acres of practices were implemented through the WHIP.

Barataria Basin

The Barataria Basin lies within southeastern Louisiana and is bordered by the Mississippi River on the east and the Atchafalaya River on the west. The land-use within the basin is primarily agriculture, mostly sugarcane along the ridges, with forested wetlands and marshes occupying the lower elevations.

The 2006 Integrated Report indicated

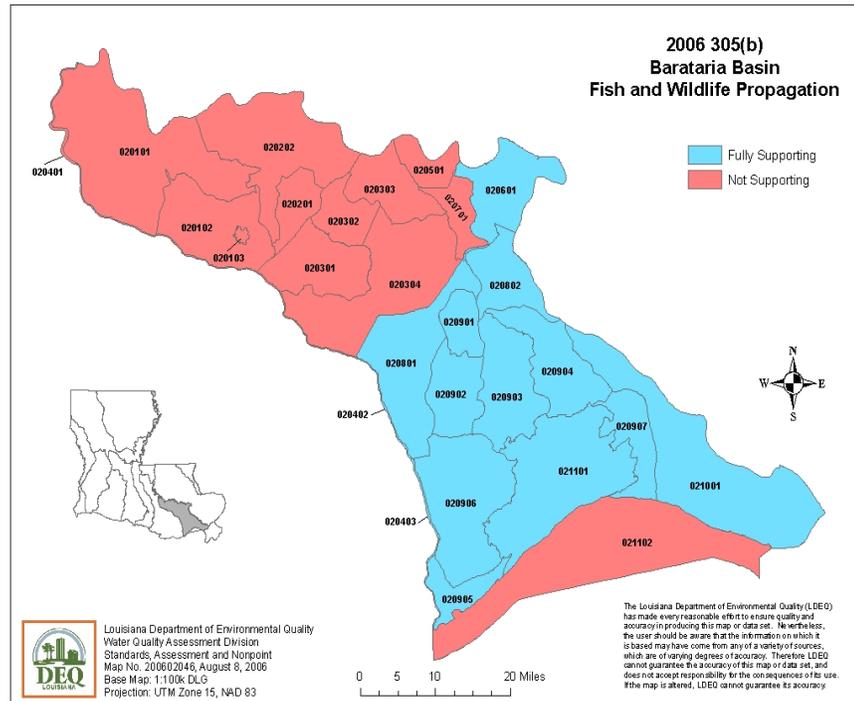
that 11 water bodies were fully meeting the contact recreational uses but were not meeting the fish and wildlife propagation use. As this map illustrates, the majority of the water quality problems exists within the upper portion of the Barataria Basin. This information indicates how difficult it is for the dissolved oxygen standard to be met within both the agriculture and forested watersheds. The agricultural lands drain to the low lying areas, delivering sediments, nutrients, and organic material to the bayous. The bayous have been channelized for agricultural drainage, oil and gas production, and navigation. The slope of the water body is so slight that the flows are very low or non-existent during the summer months, making it difficult for the water bodies to re-oxygenate themselves. Approximately 10 TMDLs have been completed and six watershed plans have been drafted for the Barataria Basin. Information on these TMDLs can be found at LDEQ's website: <http://www.deq.louisiana.gov/portal/default.aspx?tabid=1563>

During 2006, the NPS Program implemented two projects within the Barataria Basin to address two of the major types of issues that exist within this basin: one of the issues was to demonstrate the type of sewage treatment system effective in the Barataria marshes that could be used for camps and the second issue was to focus on quantifying the nonpoint source pollutant load from natural wetland systems compared to sugarcane fields with (BMPs):

- Marsh Upwelling System Demonstration Project in the Bayou Segnette Watershed, Phase II
- Water Quality of Upper Barataria Basin: Impact of NPS Pollution Associated with Sugarcane Production

Marsh Upwelling System Demonstration Project in the Bayou Segnette Watershed, Phase II

The Marsh Upwelling System (MUS) project was completed in 2006. The MUS represents a new technology in treating wastewater and is believed to be particularly effective in the saline marsh. The project is located at two sites on the Bayou Segnette Louisiana Waterway (LDEQ water quality sub-segment 020701): a single camp that is permanently occupied and a camp cluster that

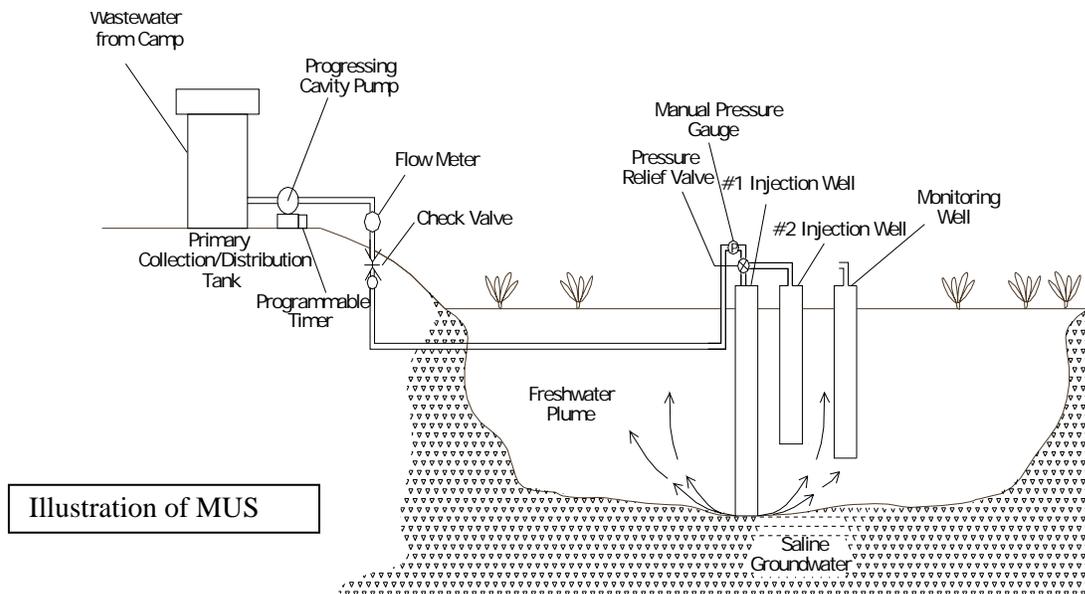


is occupied part-time. Wastewater from the camps is intermittently pumped three meters below the surface of the saltwater marsh by injection well. Buoyancy of the wastewater (freshwater) forces it to travel upward in the saltwater marsh. Mechanical and biological filtration of the wastewater occurs as the plume moves upward through the soil, plant roots, and organisms. Bayou Segnette is in the Barataria-Terrebonne National Estuary, from which 95% of Louisiana's shellfish are harvested, and has been on the 303(d) list of impaired water bodies for low DO and elevated coliform bacteria levels. Sources of Barataria-Terrebonne pollutants include improperly functioning or nonexistent sewage treatment systems.

Phase I of this project revealed coliform reductions in finished effluent and optimal wastewater injection rates. In order for this technology to be certificated by state health and environmental divisions, a large database must be constructed comprising data collected from a range of marsh/soil structures and salinity concentrations. The database collected during this project will add to the general knowledge base of the MUS system and will provide evidence of the transferability of the technology to the private sector, mainly camp owners. This project addresses coastal management issues of contaminant mitigation, pathogens and toxic substances, and transfer of technology and information.

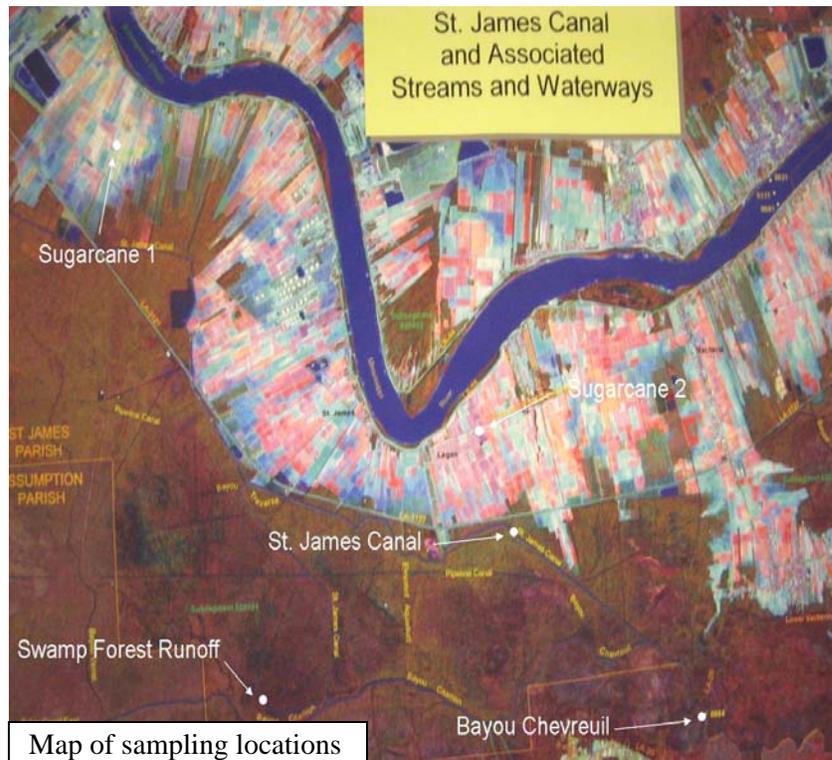
Overall, the MUS systems produced effluents (CBOD5, bacteria) below established regulatory limits of 25 mg L⁻¹ for CBOD5 and 14 MPN (100 mL)⁻¹ for fecal coliforms and *E. coli*. No signs of clogging have been observed. Since no evidence of clogging has been observed, system longevity could not be established at this point.

The second part of the project monitored the recovery of the systems after the hurricane season of 2005 that left the area without power and with less use of camp facilities. Nearly a year after shutdown, the data indicated that CBOD5 and bacteria dropped to below the NPDES and shellfish waters limits. CBOD5 reached a consistent level of 15 mg L⁻¹, but it remained above previously measured background levels. This indicated a possible new organic matter steady state in the subsurface environment. Both fecal coliform and *E. coli* levels dropped to single digit concentrations, and this indicated complete recovery of the system area with respect to bacteria.



Water Quality of Upper Barataria Basin: Impact of NPS Pollution Associated with Sugarcane Production

This project is currently being implemented and is scheduled to be completed in 2007. Water sampling equipment has been installed at two locations adjacent to private sugarcane fields, and automated samples are being collected. Grab samples are being collected at three additional sites – one canal that receives runoff directly from the fields, one downstream from the fields in a bayou, and one swamp drainage site, farther away, that is still somewhat pristine. These grab samples are being used for comparison.



There were several sampling events in 2006. Samples were analyzed for nutrients and pesticides. Early findings indicate runoff may potentially impact receiving canals and streams. Nutrient concentrations become lower as water moved downstream in the canal, away from the sugarcane fields. Phosphorus has shown a correlation with total suspended solids.

USDA Programs

During 2006, the USDA implemented approximately 1,918 acres of BMPs within the Barataria River Basin through the Environmental Quality Incentive Program (EQIP). An additional 806 acres of practices were implemented through the Wildlife Habitat Incentives Program (WHIP).

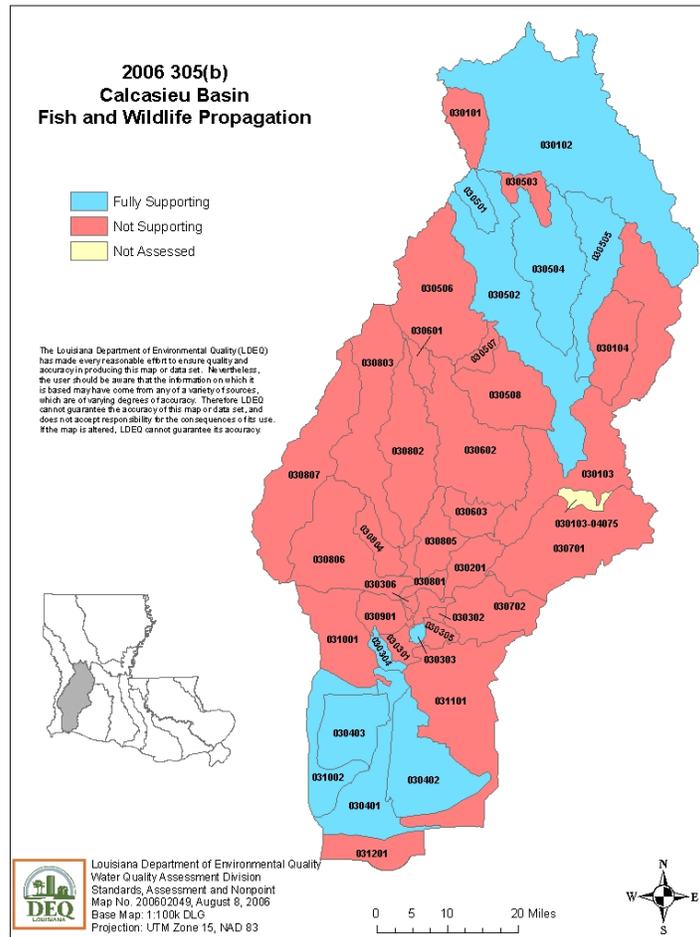
During 2006, LDEQ provided the Barataria-Terrebonne National Estuary Program (BTNEP) with data and hard copies of the maps that were produced by the GIS Center of the detailed satellite imagery classification of land-uses that exist throughout the BTNEP area. These maps can be utilized in their educational programs to illustrate the types of land-uses that comprise the watersheds within these two basins. More information on the types of activities that the BTNEP is involved in can be found at their website: <http://www.btnep.org/home.asp>

Calcasieu River Basin

The Calcasieu River Basin lies within southwestern Louisiana and was prioritized for TMDL development in 2002 and for watershed plans in 2004. TMDLs were developed for 16 water bodies within the Calcasieu River Basin, and watershed plans were developed for six watersheds, including: *Mill Creek, Barnes Creek, Marsh Bayou, Bayou Serpent, Little River and Indian Bayou.*

These watershed plans indicate that agricultural production in the eastern part of the basin is contributing to the water quality problems. Residential and urban areas also contribute to the load have been targeted for a project in the FY 2006 Section 319 Work Plan.

During 2006, LDEQ continued to work on the project with the Allen Parish Soil and Water Conservation District to reduce nonpoint source pollutants entering Bayou Serpent, and the Office of Soil and Water Conservation also utilized a portion of their incremental funds to work with farmers and landowners on implementing agricultural BMPs within these eastern watersheds of the Calcasieu River Basin.



➤ **Central Calcasieu River Watershed 319 Nonpoint Source Project**

There is a future project planned with funds from the 2006 Grant in the Calcasieu River Basin. LDEQ will cooperate with the Louisiana Yards and Neighborhoods Program to educate residents on how to adopt environmentally friendly landscape practices that will reduce storm water runoff. The Work Plan is currently waiting for approval from EPA and is expected to begin in 2007.

Central Calcasieu River Watershed 319 Nonpoint Source Project

The Central Calcasieu River Watershed Project was completed in July 2006, and the Final Report is currently being written. In this project, the Allen Soil and Water Conservation District



Rice Crop

provided financial and technical assistance to landowners in the Kinder area of Allen Parish. Local farmers adopted conservation practices with the District's assistance for a period of three years and agreed to have their lands available as demonstration sites. About ten landowners signed on to participate and most of the 4255 acres involved were planted with rice.

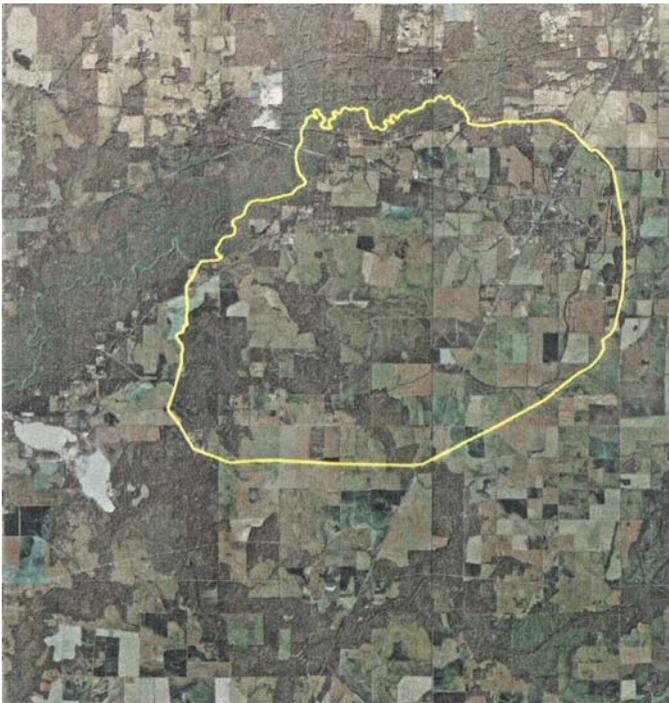


Houseboat on Bayou Serpent

Drought conditions during the project did cause some delays. However, participants did successfully adhere to BMPs. In particular, wetland wildlife habitat management and irrigation land leveling were broadly practiced. Some delays have occurred from Hurricane Rita on September 24, 2005.

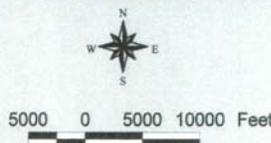
The project has produced significant results establishing solid conservation efforts on the ground. In particular, winter wildlife habitat has been significantly improved for

migratory waterfowl and neo-tropical birds. Soil erosion savings, from conservation practice implementation, has been calculated to exceed 5,100 tons of soil saved. Producers are reducing the amount of sediments and nutrients in the surface waters and improving the overall health and productivity of the natural resources on their operations.



Central Calcasieu River Watershed
319 Nonpoint Source Project
in, Louisiana

Map of Central
Calcasieu Watershed

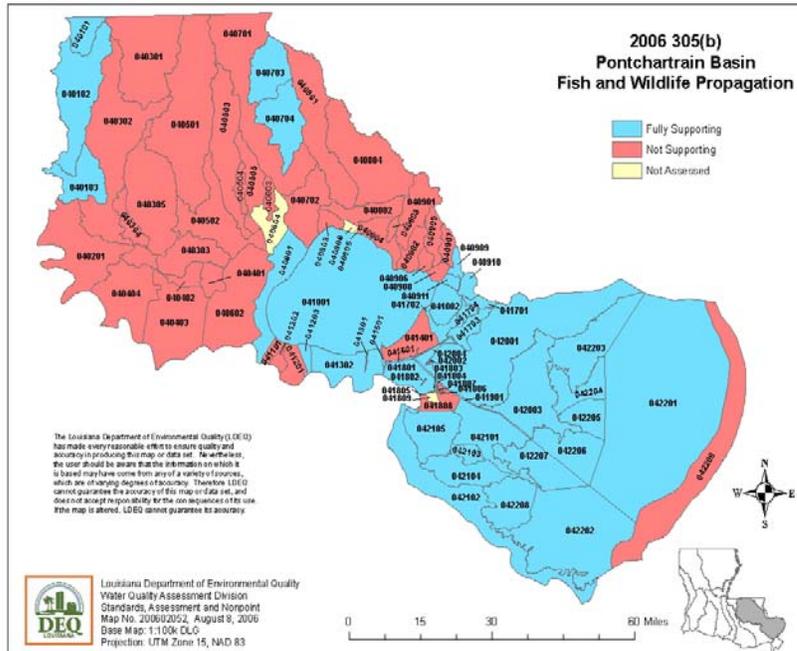


USDA and SWCD Programs

During 2006, the USDA implemented approximately 10,877 acres of BMPs within the Calcasieu River Basin through the EQIP. An additional 7 acres of practices were implemented through the Conservation Reserve Program (CRP), 367 acres of practices were implemented through the Wetlands Reserve Program (WRP), and 784 acres of practices were implemented through the WHIP.

The Surface Water Conservation District spent \$555,050 of Incremental 319 funds in the Calcasieu River Basin. This money funded 17 contracts, which covered 8,138 acres in Jefferson Davis Parish.

Lake Pontchartrain and Pearl River Basins



The impacts of Hurricane Katrina affected the water quality of water bodies on the north shore and south of New Orleans. The LDEQ Water Quality Assessment Division (WQAD), the LDEQ Surveillance Division, and the USGS have been collecting and continue to collect water quality data in these impacted areas to determine whether water quality or aquatic biota have been affected by the storms.

With regard to Lake Pontchartrain, there were virtually no impacts to the lake caused by the hurricane or the pumping of floodwaters from the New Orleans area. Dissolved oxygen, fecal coliforms, metals, organic compounds, and other parameters all remained at or below water quality criteria. Fish tissue testing conducted by EPA, NOAA, and LDEQ indicated that there was no contamination of fish resulting from the pumping of floodwaters.

The 2006 Integrated Report indicated that most of the water bodies were meeting the water quality standard for dissolved oxygen, but were not fully meeting the designated use for fish and wildlife propagation because of mercury. Many of the water bodies did not meet the primary contact recreation use because of fecal coliform concentrations. TMDLs are scheduled for these impaired water bodies during 2007-2011, and detailed satellite imagery classification of the land-uses is scheduled for 2007-2008.

During 2006, the NPS Program implemented the following projects within the Lake Pontchartrain Basin, in order to address the types of problems that have been identified within the Integrated Report as contributing to water quality impairment within the Lake Pontchartrain Basin:

- Watershed Education Project for Bayou Duplantier in EBR Parish
- Modeling and Monitoring of NPS Pollutants in the Blind and Tickfaw Rivers
- St. Tammany Parish Watershed Coordinator, Implementation and Educational Outreach
- NPS Pollution Abatement Program through the Inspection of Existing On-Site Sewage Disposal Systems and Educational Outreach for St. Tammany Parish
- Mandeville Neighborhoods
- Mitigating NPS Pollution in Urban Watersheds with Spatial Modeling, BMPs for Wetlands, and Community Outreach
- Public Outreach Program for NPS Pollution in the Lake Pontchartrain Basin

- Storm Water BMPs in Wetland Landscape Design Planning, Construction at Woodlawn High School
- Watershed Implementation within St. Tammany Parish: St. Tammany Parish Tchefuncte and Bogue Falaya Watershed Implementation Project

Watershed Education Project for Bayou Duplantier in EBR Parish

The project has been completed and the Final Report was approved by EPA in 2006. LDEQ worked with Baton Rouge Green to address water quality within Bayou Duplantier watershed. A program was established at Lee High School where teachers and students were educated about the watershed planning process. LSU staff persons trained teachers and students in basic water sampling. Water samples were being collected at four sites on the Bayou Duplantier as part of the Lee High School environmental science class. A forest ecosystem analysis was conducted with the assistance of Southern University. Specialized software was used in this analysis to determine the added benefits derived from forest cover in the Duplantier watershed. Future projections and forecasts concerning forest cover were also made. Students participated in tree plantings in areas of the watershed that have been identified as lacking native forest cover.

The Modeling and Monitoring of Nonpoint Source Pollutants in the Lake Pontchartrain and Pearl River Basins

The project has been completed and the Final Report was approved by EPA in 2006. The Modeling and Monitoring of Nonpoint Source Pollutants in the Lake Pontchartrain and Pearl River Basins Project made use of a Geographic Information System (GIS), the EPA's BASINS tools, and the HSPF water quantity and quality modeling program to accurately quantify and differentiate the sources of pollution that arise from storm water runoff coming from agriculture, forestry, and other sources. This information has provided LDEQ with the type of information necessary to focus implementation efforts in those areas that appear most critical for solving water quality problems. An assessment analysis was performed to determine the loadings of nitrogen and phosphorus coming from each current and potential land-use. Various land-use scenarios were created in Tickfaw and Blind watersheds and total loading resulting from these land-uses were integrated with the watershed in a GIS for graphical presentation. Several land-use scenarios were created in both watersheds based on the current and future land-uses.

The Modeling and Monitoring of Nonpoint Source Pollutants in the Lake Pontchartrain and Pearl River Basins Project helped identify the current land and future land-use scenarios that will have the greatest impact on water quality. These results will help future planners and developers make educated decisions on land-use and zoning. This is especially important as development continues to increase dramatically in this area of the state in the wake of the devastating hurricanes of 2005.



Failed Erosion Control in St. Tammany

St. Tammany Parish Watershed Coordinator, Implementation and Educational Outreach

The project was completed in 2006 and the Final Report is currently under review. This project incorporated erosion control inspections, educational workshops, demonstration projects, online resources, a public access video presentation, complaint response, floodplain conservation, and ordinance revision, among other efforts to improve the ambient water quality of St. Tammany Parish.

Educational workshops were conducted for the St. Tammany Homebuilders Association, engineering firms, and area developers to address nonpoint source pollution and storm water runoff. St. Tammany Parish hosted a Nonpoint Source Pollution Workshop, an LDEQ Storm water Pollution Prevention Plan presentation, a LDNR Louisiana Clean Marina Program presentation, and a six hour Watershed Management Workshop and Field Demonstration Project with a cumulative total attendance of 182 contactors, engineers, and developers.

A Critical Drainage Map was developed as a useful tool for contractors, developers, realtors, engineers, and the general public to determine the critical drainage status of particular sites in St. Tammany Parish. A total of 119 new subdivision plans were reviewed for sediment barrier implementation and erosion control methods; 9,617 building permits were reviewed in an effort to reduce impacts of erosion due to excess fill and sedimentation; 19,234 erosion control inspections were performed during drainage inspections, with a pre-pour inspection and a final inspection required for each building permit.

NPS Pollution Abatement Program through the Inspection of Existing On-Site Sewage Disposal Systems and Educational Outreach for St. Tammany Parish



Absorption Field for home sewage disposal system

The project was completed in 2006 and the Final Report is currently being reviewed by EPA. Most of the soils in St. Tammany Parish are not suitable for effective use of septic tank absorption fields. As a result, many individual homes in rural and other unanswred communities have installed septic tank systems that do not operate effectively and may not be maintained properly. The prevailing factors which decrease the efficient operation of many on-site

sewage disposal systems are poor soil absorption, the lack of adequate maintenance, and homeowners who are unfamiliar with the proper operation of such on-site systems.

The goal of this project is to improve the water quality in St. Tammany Parish, and ultimately the Lake Pontchartrain basin, by 1) inspecting existing on-site sewage disposal systems to insure proper functioning prior to connection of electrical services, and by 2) educating homeowners with on-site sewage disposal systems of the need for proper operation and routine maintenance.



Large Drain Pipe to Existing Ditch

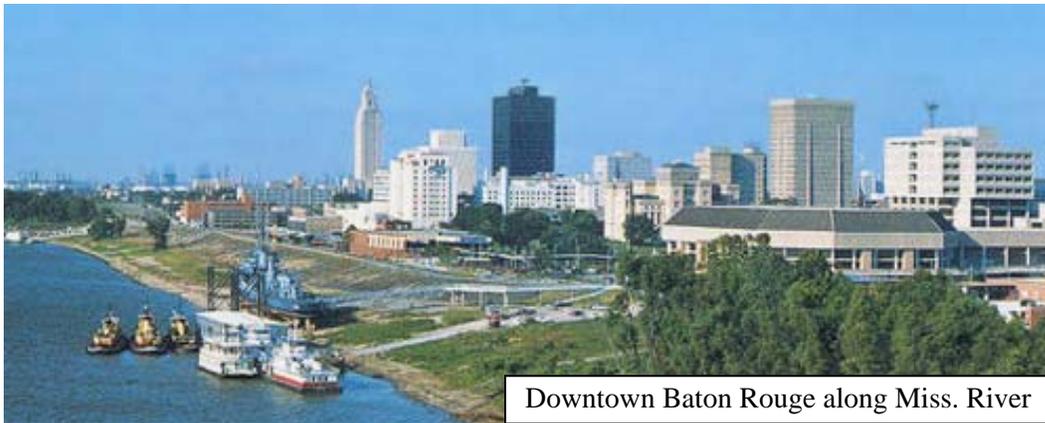
Mandeville Neighborhoods

This project is currently in progress and scheduled to end in September 2007. The objectives of the project are to demonstrate BMPs for controlling urban NPS water pollution; to monitor the effectiveness of the storm water controls; to serve as

a neighborhood recreational area for walking, jogging, and public environmental education and outreach opportunities. The final design plans for the project site have been completed. The project website is up and running. A public meeting was held on December 11th, and the citizens of Mandeville were pleased with the Master Plan site design and are looking forward to the completion of the project. Pre-construction monitoring has begun on the project and grab water samples have been taken and analyzed.

Mitigating NPS Pollution in Urban Watersheds with Spatial Modeling, BMPs for Wetlands, and Community Outreach

This project is currently in progress and scheduled to end in 2007. Urban landscapes are a mixture of various land-uses and land cover types. In Louisiana this consists of various combinations of urban and suburban development with native and regenerated forest, wetlands, and riparian habitats. As East Baton Rouge Parish continues to develop, many of the vegetated areas are replaced with impervious land uses. As a result of this, local hydrologic conditions are altered. The dis-equilibrium causes water quality degradation and flooding problems in areas that previously experienced little or no impact.



The goal of this project is to address the contribution of urban runoff to nonpoint source pollution, identify and implement strategies to reduce pollutants associated with urban land use activities, and examine the effectiveness of various BMPs in East Baton Rouge Parish (EBRP). To attain these objectives, EBRP Planning Commission, working with LSU, will analyze the spatial patterns of urban land use and land cover, identify and evaluate specific BMPs applicable to EBRP, develop and evaluate functional assessment protocols for water quality functions of urban wetlands, propose ordinance(s) or amendment(s) to existing regulations in East Baton Rouge Parish, and develop educational materials to inform governmental, private contractors, and the public about best management practices to reduce nonpoint source pollution.

The Master Development Program document is being developed by the City-Parish Planning Commission. It incorporates established BMPs for the parish. The BMPs will be recommendations and technical information that will be given to developers that can be used to reduce runoff during pre- and post-construction. The expected outcome of this document will be incorporated into the existing code (ordinance) for the parish.

Public Outreach Program for NPS Pollution in the Lake Pontchartrain Basin

This project is currently in progress and scheduled to end in 2007. This project involves demonstration of residential BMPs at two sites: one in Jefferson Parish (Lafreniere Park) and one in East Baton Rouge Parish (LaHouse on LSU Campus). A homeowner's manual is being

developed. Fact sheets and a web site which will focus on BMPs for reducing nonpoint source pollution in residential areas are also under development.

Materials have been planted for a sustainable gardening practices site at Lafreniere Park near an administration building. The contractor has toured demonstration sites where others have implemented a permeable concrete parking lot and cistern for garden irrigation. Information has been obtained on installation and maintenance requirements. It is planned that some of these will be installed at LaHouse.

Storm Water BMPs in Wetland Landscape Design Planning, Construction

This project at Woodlawn High School (WHS) has just begun and will utilize Best Management Practices for creating and enhancing wetlands to reduce nonpoint pollution from storm water to determine how wetland systems in East Baton Rouge will decrease urban runoff into local watershed systems. Currently, WHS has a detention pond system that is being used to reduce the volume of storm water runoff from the adjacent school parking lot. This detention pond will be converted into a created wetland not only to reduce the volume of storm water runoff, but also to increase residence time, to uptake and sequester nutrients, and to provide an educational training ground for the East Baton Rouge Planning Commission and the East Baton Rouge Parish School System. These improvements will benefit the water quality in the Amite River (sub-segment 040302) in the Pontchartrain Basin.

Woodlawn High School's detention pond has little ecological function and value for wildlife. In addition, it lacks hydric soil conditions for properly supporting wetland plants. This is a result of no retention of base flow from storm water runoff. These problems can be corrected by creation of a serpentine (meandering) channel in the detention pond and installation of a weir drainage system at the far end of the detention pond that will maintain a minimum water level within the created wetland system. Storm water runoff from WHS will be rerouted through the new meandering channel, slowing water velocity, increasing water residence time, and decreasing downstream flooding and sediment transport. At this time, a contract has been executed, and outreach work has begun to inform students and the community of the pending upgrades to the detention pond.

Watershed Implementation within St. Tammany Parish: St. Tammany Parish Tchefuncte and Bogue Falaya Watershed Implementation Project

This project is currently in progress and scheduled to end in 2007. Baseline information, such as land-use and point and nonpoint source pollutant loading, has been collected but needs to be compiled and modeled with the ultimate goal of predicting the impacts of future development on water quality. Watershed characterization evaluations will be a major component of the project and will gather physical, chemical, and biological data from a reference stream location and from locations throughout the Tchefuncte River and Bogue Falaya River watersheds.



Tchefuncte River

This information will be used along with existing data gathered on watershed characteristics to 1) identify primary causes of stream impairments with respect to water quality standards and designated uses, 2) identify the extent to which the Parish's decentralized wastewater system is impacting water quality, and 3) support the calibration of the hydrodynamic model and a Watershed Management Tool.

USDA Programs

During 2006, the USDA implemented approximately 10,346 acres of BMPs within the Lake Pontchartrain Basin through the EQIP. An additional 162 acres of practices were implemented through the Conservation Reserve Program (CRP), 565 acres of practices were implemented through the WHIP, and 10 acres of practices were implemented through the Grasslands Reserve Program (GRP).

In the Pearl River Basin, the USDA implemented approximately 1,817 acres of BMPs through the EQIP in 2006. An additional 3 acres of practices were implemented through the CRP, 87 acres of practices were implemented through the GRP, and 116 acres of practices were implemented through the WHIP.

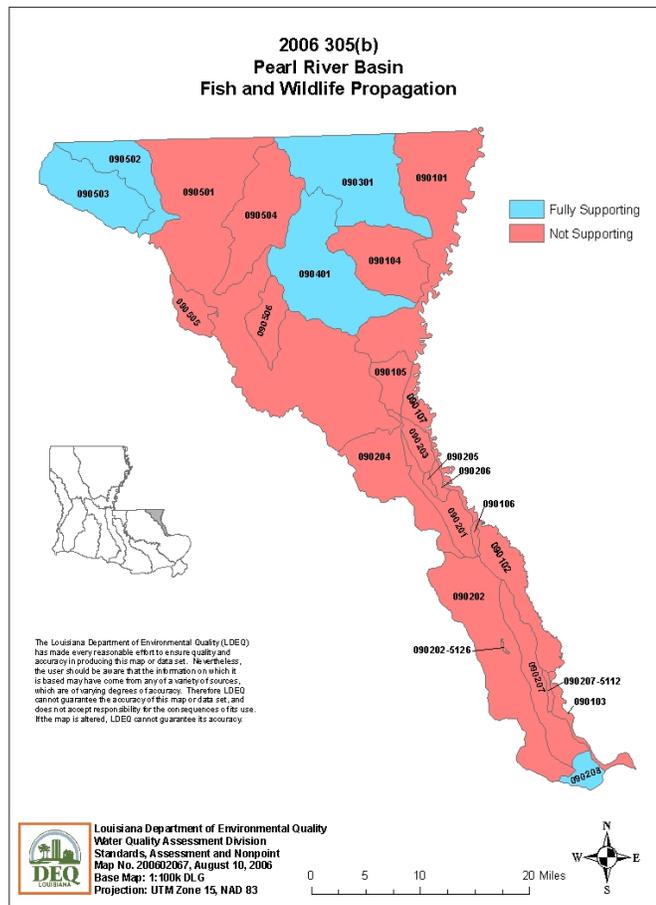
The Pearl River lies along the Louisiana-Mississippi border and is bordered on the north by the Mississippi state line and on the west and south by the Lake Pontchartrain. The 2006 Integrated Report indicated that water quality problems primarily were associated with fecal coliform bacteria, turbidity and mercury. The fecal coliform problems were attributed to on-site disposal systems, wildlife and waterfowl. The turbidity problems were associated with silviculture, sand and gravel mining and sources from outside of the state. TMDLs are scheduled for these impaired water bodies in 2008-2009.

During 2006, the NPS Program implemented the following project within the Pearl River Basin:

- Development of Site Conservation Plan and Addressing NPS Pollution on the Pearl River, Louisiana

Development of Site Conservation Plan and Addressing NPS Pollution on the Pearl River, Louisiana

This project was completed in 2006 and the Final Report is currently being finalized. The overall goals of this project were to work with experts to develop a conservation plan for the Pearl River that identifies priority sites and potential problems; to survey state agencies about their roles in sand and gravel operations in the state (sand and gravel mining is prevalent in the project area); and to educate all partners and private citizens about watershed protection within the Pearl River Basin.



The Pearl River educational brochure was completed. Ten thousand copies were printed and distribution is underway. Three stakeholder field trips were held along the West Pearl River and into Honey Island Swamp in April and May of 2006. The Pearl River Symposium was held in Jackson, Mississippi on May 5 and 6, 2006. Approximately 82 participants from 40 agencies/groups attended to discuss the ecological values of the Pearl River, water quality issues, smart growth and watershed management.

A Technical Advisory Committee meeting was held on June 23, 2006. The Louisiana Nature Conservancy worked with participants from federal and state agencies to review priorities for conservation action. It is planned that this new group may help guide future conservation efforts. The Nature Conservancy has worked with state agencies that have relevant oversight and drafted a report on sand and gravel mining in Louisiana. It is presently being reviewed by contributors before finalization.

During 2006, the NPS Program implemented the following project within both the Lake Pontchartrain and Pearl River Basins:

- Eastern Florida Parishes Water Quality and Grazing Land Management 319 Demonstration Project

Eastern Florida Parishes Water Quality and Grazing Land Management 319 Demonstration Project

This project was completed and the Final Report was approved by EPA in 2006. The Eastern Florida Parishes Water Quality and Grazing Land Management 319 Demonstration Project was completed through a cooperative agreement between LDEQ and the Bogue Chitto Pearl River SWCD. The goal of the project was to develop and implement conservation plans on 120 farms which were to serve as demonstration sites and help catalyze additional BMP implementation.



Concrete Watering Facility and Cross Fencing

The project was very successful and resulted in 120 producers implementing at least part of their conservation plan and 86 of those fully implementing their plan. This included:

- 35,706 acres of nonstructural land management BMPs implemented,
- 200,788 ft of fence constructed,
- 39 heavy use protection areas established,
- 6 new ponds,
- 52 watering facilities installed.



Unprotected Watering Facility

The educational component was also successful. Two field days were held at producer farms, a 2 1/2 day Grazing Land Management Workshop was held which had 44 participants, and the program was promoted at LSU Research Station field days, cattle grower association meetings, and

during Congressman Vitter's Agricultural Forum. This project has increased awareness of potential nonpoint source pollutants, identified specific BMPs that were needed, and implemented those BMPs to reduce nonpoint source pollution in the Lake Pontchartrain and Pearl River Basins.

Mermentau River and Vermilion-Teche River Basins

The Mermentau Basin lies in southwestern Louisiana and was one of the initial basins targeted for development of TMDLs. The watershed plans were written in 2002.

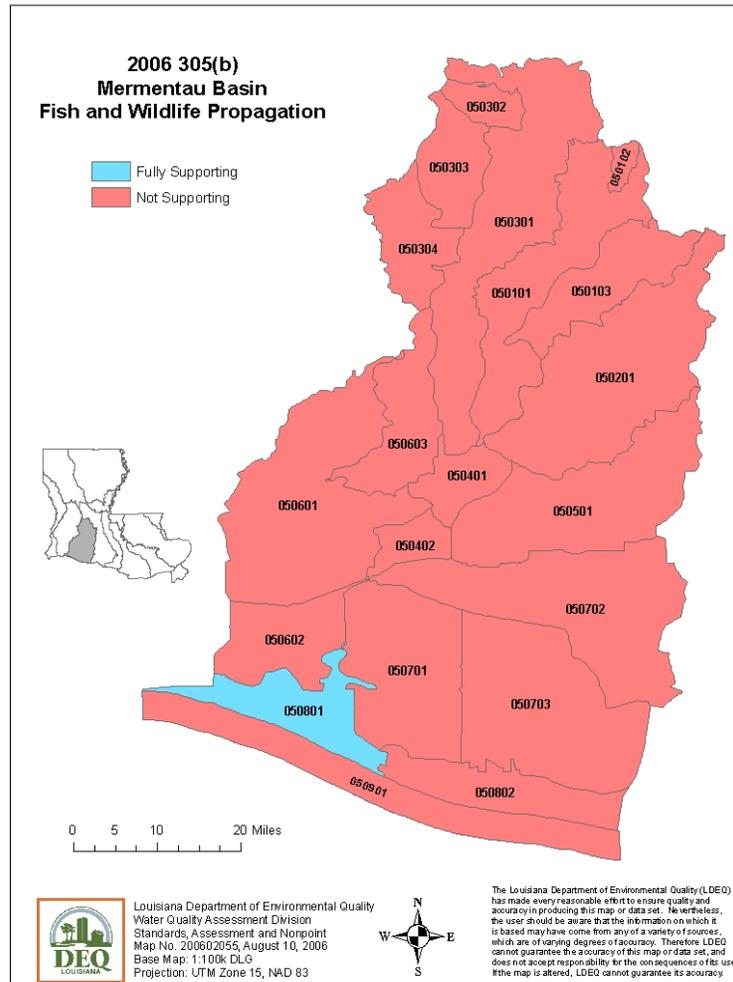
The 2006 Integrated Report indicates that the majority of the water bodies within the Mermentau River Basin are not meeting the designated uses for fish and wildlife propagation because the dissolved oxygen standard can not be met during the summer months. This is an agricultural basin in which rice, soybeans, sugarcane and crawfish are the major crops grown. Watershed plans and TMDLs have been completed for most of these water bodies. Reports and information on projects can be found at LDEQ's website: <http://www.deq.louisiana.gov/portal/>

During 2006, the NPS Program implemented the following projects within the Mermentau Basin:

- Bayou Plaquemine Brule Watershed Water Quality Monitoring Project, Phase 2
- Reducing NPS Discharge from Agriculture Fields in the Bayou Wikoff Sub-watershed
- Reducing NPS Pollution from Agriculture Fields in the Cole Gully Sub-watershed
- Soybean BMP Demonstration and Education Program, Phase 3
- Modeling Nonpoint Source Pollution and Land Use Types in Bayou Plaquemine Brule Watershed

Bayou Plaquemine Brule Watershed Water Quality Monitoring Project

In 2006, this project was completed and the Final Report was approved by EPA. The objective was to analyze historical water quality data to determine seasonal and/or annual trends in Bayou Plaquemine Brule. From this data, nonpoint pollution sources and land uses were related to in-stream water quality. Historically, dissolved oxygen levels and nitrogen loadings were identified as major factors for water quality impairment in the Bayou Plaquemine Brule. Historical dissolved oxygen levels were below 2 mg/L during many years, at least once during the year.



Based on three years of monitoring data, University of Louisiana at Lafayette (ULL) stated that



surface water quality for Bayou Plaquemine Brule decreases from upstream to downstream. Bayou Plaquemine Brule tributaries have higher suspended solids compared to the main channel. A strong seasonal variation exists in surface water quality across the watershed. Dissolved oxygen is lower in warmer months, with a mean dissolved oxygen level of 5.3 ± 0.11 mg/L during the months of March through November and of 8.4 ± 0.15 mg/L for the months of December through February. Monthly average total suspended solids

(TSS) ranged between 17 – 285 mg/L during summer months (March – November) when rice fields and crawfish ponds are drained and 23 – 142 mg/L for winter months (December – February). These results indicate that there is a temporal and spatial variation in surface water quality in Bayou Plaquemine Brule watershed, and land-use types and agricultural practices influence surface water quality. Excessive littering in the bayou and heavy loads of TSS in agricultural drainage water were observed. Therefore, a strong public awareness program to control littering, better quantification of the impact of land-use types on surface water quality and the implementation of BMPs for nonpoint source pollution control in the watershed were suggested by UL in Lafayette.

Reducing NPS Discharge from Agriculture Fields in the Bayou Wikoff Sub-watershed



Instrumented in-stream location

This project was completed and the Final Report was approved by EPA in 2006. The LDEQ selected the Bayou Plaquemine Brule sub-basin in south Louisiana for initial implementation of a number of BMPs for the purpose of reducing in-stream pollutant loads. Therefore a major goal of this sub-watershed project was to quantify control measures for implementation of BMPs that reduce the runoff of water, sediments, and contaminants.

As a result of this project, the following conclusions can be made:

Pasture

- Based on the two years of data collected, the average reduction in the concentration of suspended solids from the rotational grazed pasture was 65% compared to the continuous grazed pasture.

- The concentration of total solids in the effluent from the rotational grazed pasture was significantly reduced by 40% compared to traditional pasture management of continuous grazing.
- The concentration of total and dissolved phosphorus in the effluent from rotational grazing was significantly reduced by 49% and 40%, respectively, when compared to continuous grazing.
- A statistically significant reduction in turbidity of 58% was achieved in rotational grazing when compared to the traditional practice of continuous grazing.
- Therefore, the TMDL reduction goal of 30% for Bayou Plaquemine Brule may be achievable if rotational grazing is adopted.



Sugarcane

- Highest concentrations of the total solids and suspended solids were measured from the edge of field of the fallow sugarcane site when compared to all established sugarcane fields. Nevertheless, no significant statistical differences were obtained among the different sites due to limited number of samples and lack of replications.
- The presence of mulch residue on the soil surface following harvest is recommended since it resulted in a reduction of total solids, suspended solids, turbidity, and total phosphorus by 34%, 26%, 60%, and 8%, respectively when compared to burn treatment.

Pristine

- To adequately gauge the impact of agricultural practices in the watershed, a minimally disturbed site, referred to here as the pristine site, was necessary to obtain an expected level of natural background nonpoint source loadings.
- Based on results from the pristine site, there is strong evidence that the presence of grass cover on the soil surface throughout the year minimized sediment losses and erosion.
- Total solids, suspended solids, turbidity, and total phosphorus from the pristine site were not significantly different from the rotational grazing pasture. Overall, the results of these constituents mimic those from the pasture site where rotational grazing and lower stocking rates are recommended BMPs.
- In contrast, significantly higher average values were found between the pristine site and the traditionally managed continuous grazing site.

AnnAGNPS Modeling

- The use of AnnAGNPS to predict suspended solids from the pristine site is recommended provided that the appropriate parameter for the curve number (SCS-CN) is selected. The model was least successful in describing total P and N concentrations in the effluent.
- For the pasture site under continuous grazing, the use of the AnnAGNPS model to describe effluent concentrations for suspended solids and N and P concentrations from edge of field is also recommended, provided that the appropriate curve number (SCS-CN) is selected.

- For the pasture site under rotational grazing, the use of AnnAGNPS to describe effluent concentrations consistently provided poor predictions and its use is not recommended.
- For sugarcane, the AnnAGNPS model consistently under-predicted the concentrations of suspended solids by as much as an order of magnitude. Therefore the use of AnnAGNPS is not recommended for the fallow or the plant cane year of the sugarcane growing cycle.
- For sugarcane under no-burn treatment (first and second stubble), the AnnAGNPS model provided adequate descriptions for suspended solids, total N and P concentrations, and its use as a predictive tool is recommended.

Reducing NPS Pollution from Agriculture Fields in the Cole Gully Sub-watershed

This project was completed and the Final Report was approved by EPA in 2006. The major objective of this project was to demonstrate that agricultural nonpoint source loadings in a sub-watershed of Bayou Plaquemine Brule, Cole Gully, could be reduced if the best management practices being recommended for rice and soybeans were implemented. Although sugarcane, along with rice and soybeans, are the major crops grown in the Bayou Plaquemine Brule watershed, this project examined source reductions of BMPs only for rice and soybeans. The Bayou Wickoff Sub-Watershed Project examined the effectiveness of sugarcane and pasture BMPs. Another objective was to generalize the results obtained for one sub-watershed in the Bayou Plaquemine Brule watershed, not only to others in this watershed but also to other watersheds of similar climate and soils along the Gulf Coast. Although it can be argued that results for one representative sub-watershed are expected for other watersheds that are similar to it, more convincing generalization is possible if improvements in water quality brought about by use of BMPs can be shown to be quantitatively predictable. Therefore, this project focused on modeling water quality for rice discharges and soybean runoff.

Soybean BMP Demonstration and Education Program

The Soybean BMP Demonstration and Education project was completed and the Final Report was approved by EPA in 2006. The specific goal of this project was to determine which soybean tillage practice (conventional (CT), stale seedbed (SS), or no-till (NT)) discharged the least amount of nutrients, sediment, and runoff flow from fields after selected rainfall events. In addition to quantifying the results of the BMPs, the LSUAgCenter hosted field days in order to disseminate the project information to farmers within the Mermentau River Basin and surrounding areas to encourage BMP implementation. In addition to the description of the water quality benefits of the BMP, tillage effects on soybean yields were investigated.



The results of the project, relative to each other, are provided in the table below.

Parameter	Parameter Ranking		
	CT	SS	NT
Total Flow (gal)	least	medium	greatest
Flow Time (hrs)	greatest	least	medium
NH4+- N (lbs/A)	medium	greatest	least
NO3- -N (lbs/A)	greatest	least	medium
TKN-N (lbs/A)	least	greatest	medium
Ortho-P (lbs/A)	least	greatest	medium
Total P (lbs/A)	medium	greatest	least
TOC (lbs/A)	least	medium	greatest
TS (lbs/A)	greatest	least	medium
2003 Yield (bu/A)	greatest	medium	least
2005 Yield (bu/A)	medium	greatest	least

Modeling Nonpoint Source Pollution and Land Use Types in Bayou Plaquemine Brule Watershed

This project started in 2006 and is currently in progress. The specific goal of this project is to quantify the contribution of land use types on nonpoint source pollution in the Bayou Plaquemine Brule watershed. In order to accomplish this goal, a watershed-based water quality modeling program will be needed. Information generated from this project will allow LDEQ and the cooperating federal, state, and local agencies to focus their limited resources, staff, and efforts within the portions of the watersheds that contribute the largest part of the problem. The Louisiana Department of Environmental Quality has developed watershed plans for each of the watersheds where the TMDLs were developed. These watershed implementation plans include management strategies for each of the types of land use activities that exist within the watersheds.

USDA and SWCD Programs

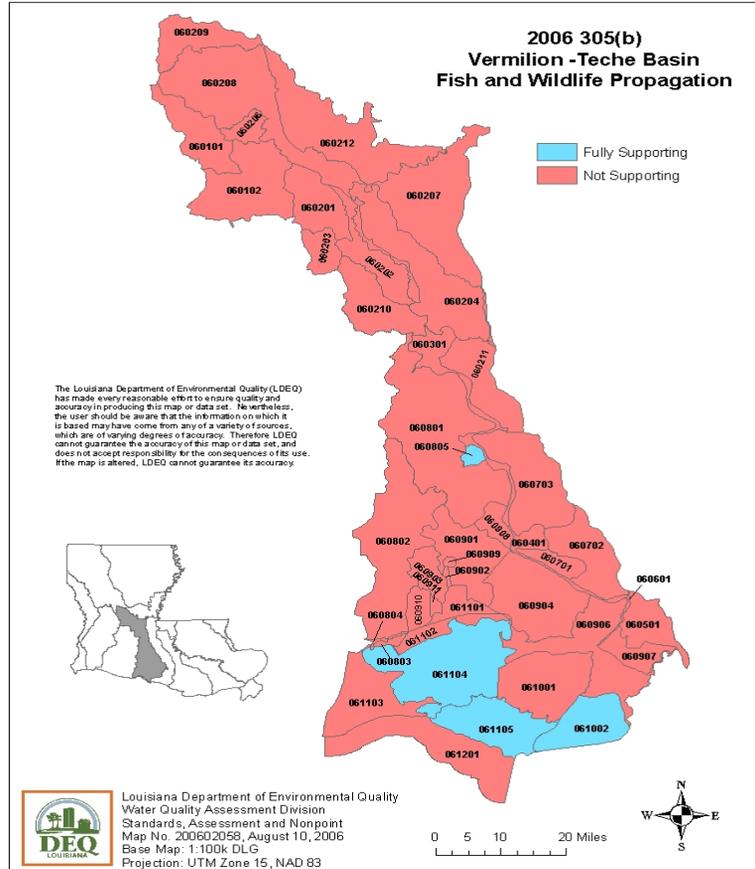
During 2006, the USDA implemented approximately 15,734 acres of BMPs within the Mermentau River Basin through the EQIP. An additional 392 acres of practices were implemented through the CRP, 57 acres of practices were implemented through the GRP, 297 acres of practices were implemented through the WRP, and 152 acres of practices were implemented through the WHIP.

The Soil and Water Conservation District spent \$246,000 of Incremental 319 funds in the Vermilion-Teche River Basin. This money funded 14 contracts, which covered 2,435 acres in Vermilion Parish. They also spent \$953,466 in both the Vermilion-Teche and Mermentau Basins. This money funded 61 contracts, which covered 10,922 acres in Vermilion Parish. In the Mermentau River Basin, they spent \$672,969 of Incremental 319 funds. This money funded 26 contracts, which covered 17,566 acres in Jefferson Davis Parish.

During 2006, the USDA implemented approximately 10,721 acres of BMPs within the Vermilion-Teche River Basin through the EQIP. An additional 810 acres of practices were implemented through the CRP, 30 acres of practices were implemented through the GRP, 2,246 acres of practices were implemented through the WRP, and 324 acres of practices were implemented through the WHIP.

The Vermilion-Teche River Basin is primarily composed of the Vermilion River and Bayou Teche. The Basin extends from Alexandria, which is in the central part of the state, down to the Gulf of Mexico. The Basin comprises 44 watersheds, 25 of which do not fully meet the designated use for fish and wildlife propagation. Similar to the Mermentau River Basin, the problems are primarily associated with failure to meet the water quality standard for dissolved oxygen. The majority of the basin is in agricultural production of rice, sugarcane, pastures, soybeans and crawfish operations.

LDEQ and USEPA completed TMDLs for the impaired water bodies and LDEQ has completed watershed plans for several of the impaired water body. Copies of the TMDLs and the watershed plans can be found at LDEQ's website: <http://www.deq.louisiana.gov/portal/>



During 2006, the NPS Program implemented the following projects within the Vermilion-Teche River Basin:

- Vermilion-Teche River Basin Water Quality Monitoring Project, Phase 2
- Evaluating the Effects of Reduced Cultivation and Elimination of Burning of Combine-Harvest Residue on Soil and Water Quality and Sugarcane Profitability in Louisiana
- Lower Vermilion River Watershed 319 NPS Project



The Vermilion-Teche River Basin Water Quality Monitoring Project, Phase 2

This project is completed and the Final Report was approved by EPA in 2006. The Vermilion-Teche River Basin Water Quality Monitoring Project helped to identify BMPs that will be successful in reducing nonpoint source pollution in sugarcane, pasture, and urban land uses. The unique environment of coastal Louisiana and the Vermilion-Teche Basin makes BMP implementation particularly difficult. High annual

precipitation, low elevation, and the proximity to the Gulf of Mexico make drainage a high priority. These conditions complicate BMP implementation, which may alter the expected performance of drainage practices. Six sites (three experimental and three control) were used to evaluate the effectiveness of various BMPs for sugarcane, pasture, and urban land uses. Load reductions were particularly evident in sugarcane and pasture sites. Limited resources make BMP implementation difficult across the state. These detailed evaluation results will significantly aid in identifying priority areas for BMP implementation. By targeting limited resources at priority areas, Louisiana can continue to invest in nonpoint source implementation while ensuring the highest possible level of water quality improvements.

Evaluating the Effects of Reduced Cultivation and Elimination of Burning of Combine-Harvest Residue on Soil and Water Quality and Sugarcane Profitability in Louisiana

This project is currently underway and is scheduled to be completed in 2007. Specific objectives of the project are to evaluate the effects of four combine-harvest residue management treatments on runoff water quality and sugarcane growth, development and yield at two sites within the Vermilion-Teche watershed, and to educate the public, scientific community and the sugarcane industry concerning the findings as they relate to opportunities for enhanced sugar production and a cleaner environment.

Combine-harvest residue management treatments include two treatments designed to mitigate the adverse effects of retained residue – the applications of stabilized urea plus composted biologicals and the shredding of the residue for accelerated decomposition – and two treatments currently employed by the industry – ground burning of the residue and post-harvest retention of the residue. A randomized block experimental design is being used to statistically evaluate treatment effects. Two replications only are being used for water quality sampling, but four replications are being employed for cane and sugar yield determination.

At both sites end-of-field collections are made using H-flumes and ISCO samplers instrumented with submerged probe flow modules. Samplers were calibrated to composite 300ml samples at 50 gal/min flow. Analyses are made for TSS, TDS, turbidity, TKN, nitrite and nitrate nitrogen, chloride, bromide, sulfate, total P and BOD5. Field determinations are made for EC, pH and DO.

Crop agronomic data include the monitoring of crop development and the measuring of cane tonnage, sugar yield and nutrient leaf concentration. Soil analyses include the evaluation of macro- and certain secondary and micronutrients, as well as soil N and C. Soil respiration and



temperature measurements are being taken at the Youngsville site. Rate of disappearance of harvest residue is also measured. Preliminary observations suggest that the treatments designed to enhance residue degradation did not materially influence the disappearance rate of the residue. Sugarcane yield was indifferent to residue management as none of the

treatments was statistically superior. While there were not significant differences among the treatments for sugarcane yield at either site, the trend, however, for burning to yield higher subsequent production is consistent with reports in the literature of a 5 to 10% yield advantage for

burning. TSS for the residue burned and residue retained plots were 6.65 and 5.08 tons/acre (P = .05), respectively. TSS was consistently higher for the burned plots until full canopy occurred in late June and July, after which time the treatments were comparable in soil loss. It appears the disparity in tons of soil removed was primarily due to higher soil removal in the burned plots prior to crop canopy. Nitrate concentrations were considerably higher for the urea/compost treatment. It is clear that the application of stabilized urea (at the high rate of 180 lb N/acre) in the fall is not an environmentally acceptable practice.

Lower Vermilion River Watershed 319 NPS Project

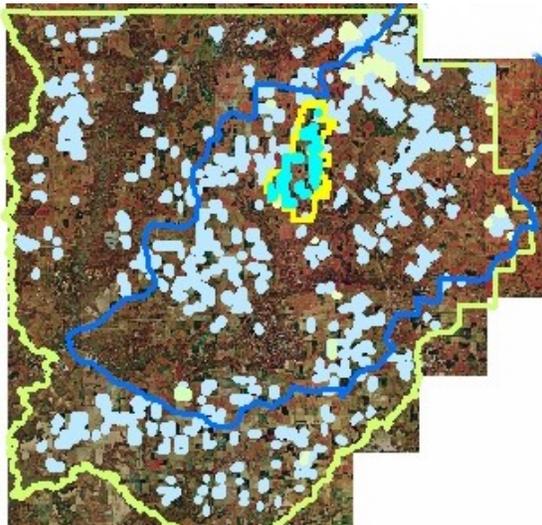
This project was extended due to the hurricanes in 2005, but it is currently scheduled to end in 2007. The objective of the project is to demonstrate NPS Cost-Share BMPs that are known to decrease the NPS load in the Lower Vermilion River Watershed caused by agricultural land use and to organize field days for public outreach and education. This project had 12 participants



conducting field surveys for the BMP of Irrigation Land Leveling, 13 participants certified for Record Keeping and Wetland Wildlife Habitat Management and ten participants conducting field surveys for the BMP of Grade Stabilization Structure. Also, four participants were certified for Irrigation Water Management, Irrigation Land Leveling, and Grade Stabilization Structure. The Soil and Water Conservation District conducted a Master Farmer Model Field Day (all day presentation and model farms and field tours)

on May 12, 2005.

During 2006, the NPS Program implemented the following projects in both the Mermentau and Vermilion-Teche River Basins:



Blue dots identify commercial crawfish ponds in Cole Gully sub-watershed, Bayou Plaquemine watershed, Acadia Parish. Acadia parish is identified by green boundary, Bayou Plaquemine Brule watershed identified by blue boundary, and Cole Gully sub-watershed by the yellow boundary.

- Improving the Stream Quality in S. LA by Reducing Impact from Crawfish Cultivation Ponds, Phase 2
- Statistical Evaluation of the Effectiveness of BMPs in Improving Water Quality within the Mermentau and Vermilion-Teche River Basins

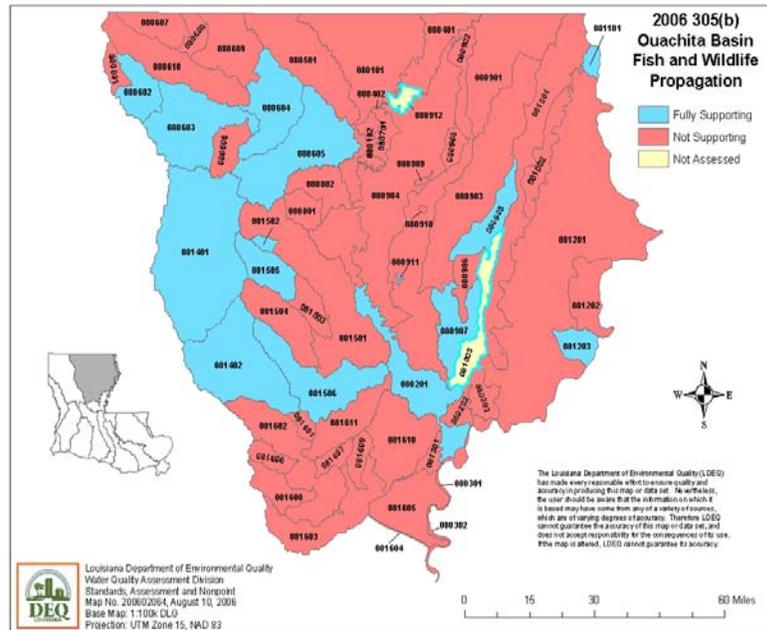
Phase 2: Improving the Stream Quality in S. LA by Reducing Impact from Crawfish Cultivation Ponds

This project is currently in progress and is scheduled to end in 2007. Most of Louisiana's 130,000-acre crawfish farming industry is located in south-central and southwest Louisiana in the Mermentau and Vermilion Teche river basins, but the impact of crawfish aquaculture effluents on stream water quality in southern Louisiana is not known. Implementation of this project will provide data to assess the contribution of crawfish pond effluents to

Ouachita River Basin

The Ouachita River Basin is located in the northeastern part of the state comprises of two major different types of land-use: row crop agriculture and forestry. The Ouachita River bisects the basin, with the eastern quadrant being primarily row crop agriculture and the western quadrant being forestry and pastures.

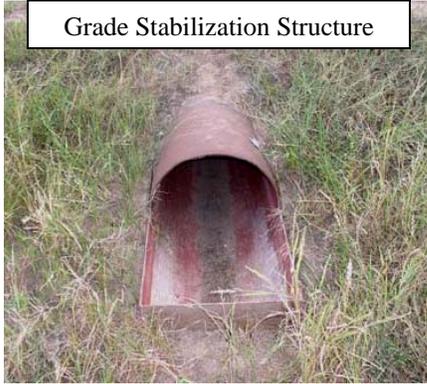
Approximately 23 TMDLs were completed by LDEQ and EPA Region 6 in 2002 and 2003 for the impaired water bodies within the Ouachita River Basin. Nonpoint source pollutant loading was identified as the primary factor that contributed to the water quality impairments in this river basin, with a range of load reductions from 50 to 100% to meet water quality standards. In order to determine how those loads could be reduced, LDEQ's NPS Unit staff worked on 7 watershed plans and contracted with the USDA-Agricultural Research Service on 6 plans. The 2006 Integrated Report indicated that 32 of the water bodies were not meeting the fish and wildlife propagation use, but mercury and turbidity were the primary problems, with only a few water bodies impaired because of dissolved oxygen. The Ouachita River Basin is a diverse system with urban areas, forests, pastures and croplands, so there have been a wide range of projects implemented there in order to address the various sources of pollution that exist.



During 2006, the NPS Program implemented the following projects within this Basin:

- Cost-Share and Technical Assistance for NPS BMPs within the Bayou Lafourche/Boeuf River Watersheds
- Watershed Monitoring and Modeling of Bayou Lafourche and Boeuf River Watersheds, Phase 2
- Reduction in Nutrient and Pesticide Runoff from the Chennault Park Golf Course in the Ouachita Basin, Phase 2
- The Tensas River Watershed Comprehensive Nonpoint Source Pollution Reduction Program
- The Delta Technical Assistance Program for BMP Implementations and Reduction of NPS Pollution
- Utilization of Annualized Agricultural Nonpoint Source Pollution Model (AnnAGNPS) in the Ouachita River Basin and LDEQ Implementation Plans
- Monitoring the Effectiveness of Forestry BMP Implementation in the Flat Creek Watershed, Ouachita River Basin
- Reduction in Nonpoint Source Contaminant Loads to Bayou Chauvin in the Ouachita River Basin

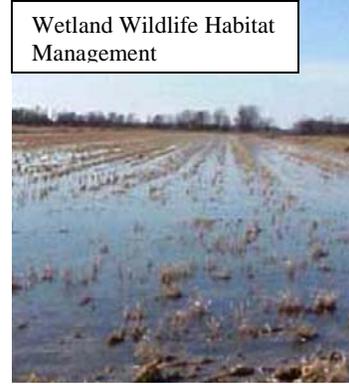
Cost-Share and Technical Assistance for NPS BMPs within the Bayou Lafourche/Boeuf River Watersheds:



Grade Stabilization Structure

This project is completed and the Final Report was approved in 2006 by EPA. Water quality was improved within the Boeuf River/Bayou Lafourche watersheds by providing technical and cost share assistance to producers who implemented BMPs on both row crop agricultural land and/or pastureland. The BMPs on the three farm sites (Ouachita, Richland, and Caldwell)

were significantly successful. Concerning soil savings, Richland parish saved 46,940,600 lbs., Ouachita saved 13,146,260 lbs., and Caldwell parish saved 801,400 lbs. This project helped to provide public awareness concerning NPS pollution and the use of BMPs.



Wetland Wildlife Habitat Management

The Tensas River Watershed Comprehensive Nonpoint Source Pollution Reduction Program

This project is completed and the Final Report was approved by EPA in 2006. The goal of this project was to reduce sediments, nutrients and pesticides associated with the production of row crop agriculture in the Tensas River watershed. The project also facilitated closer coordination between local, state and federal water quality monitoring programs within the Tensas Watershed and conducted much public outreach.

There was extensive coordination of conservation groups in the northeast part of the State. The Northeast Delta Resource Conservation and Development District (RC&D) also worked with local youth and held summer camps which focus on local environmental issues. The RC&D also assisted The Nature Conservancy with other nonpoint work in the Tensas River Basin, helping local landowners implement conservation practices.

Watershed Monitoring and Modeling of Bayou Lafourche and Boeuf River Watersheds - Phase 2

In 2006, this project was completed and the Final Report was approved by EPA. In this project, a watershed monitoring strategy was implemented to provide NPS pollutant loading data resulting from various types of land-use. This data can be utilized to develop and implement watershed management plans for



Urban Site

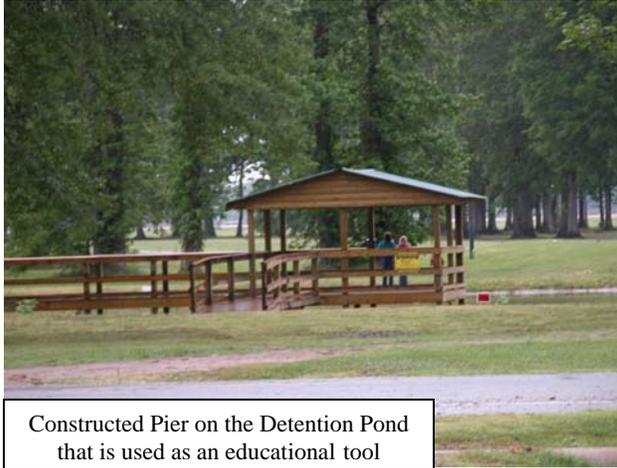


Agricultural Site

the TMDLs for the eastern portions of the

Ouachita River Basin. The impact of different sampling strategies on both load accuracy and precision for total phosphorus and total suspended solids for the agricultural sites was addressed. This data can be used for future investigations. Concerning the sensitivity of water quality models including BASINS to estimate pollutant loads at the watershed level, only a preliminary investigation was done due to limited amount of data collected and time. Further study should be conducted to determine if locally derived loading estimates are applicable to other locations in the state.

Reduction in Nutrient and Pesticide Runoff from the Chennault Park Golf Course in the Ouachita Basin, Phase 2



Constructed Pier on the Detention Pond that is used as an educational tool

This project is completed and the Final Report was approved by EPA in 2006. Golf courses can be a source of nonpoint pollutants, such as nutrients and pesticides. The major goals of this project are to improve water quality in the Bayou Lafourche Watershed and to determine the effectiveness of Golf Course BMPs in improving water quality.

A BMP was developed that included creating a wetland detention system to capture and reduce contamination runoff from the golf course. This system design consists of three alternating shallow

shelves and deep pools that increase holding time for the runoff and allow for natural uptake of nutrients by aquatic plants and allow for the hydrolysis of pesticide runoff from the golf course. Varieties of wetland plants were planted on the different shelves that were best suited for that particular area.

A pier was constructed for educational field days to provide the public with information and functionality of the constructed wetland system. Simazine was the only pesticide detected in surface water following rain events as a result of the water quality monitoring.



Students planting aquatic plants in Detention Pond

The Delta Technical Assistance Program for BMP Implementations and Reduction of NPS Pollution

This project is complete, and the Final Report is awaiting approval by EPA. For impaired water bodies in the Northeast Delta RC&D Area, water quality was greatly improved due to the availability of technical services, the educational outreach effort to inform the public on the importance of best management practices and the use of best management practices. From the starting date of September 1, 2002 to August 31, 2005, approximately 8,074 conservation plans were designed, developed and implemented. These plans consisted of basic conservation plans, and contracts for the Environmental Quality Incentive Program, Wetland Reserve Program, Wildlife Habitat Incentive Program, Conservation Reserve Program and Continuous

Conservation Reserve Programs. During the duration of this project, Louisiana's approved best management practices (BMPs) were planned for several hundred acres in the RC&D Area. The locations of these practices were determined according to NRCS standard and specification requirements in order to achieve a balance between water quality and the production of agriculture and forestry operations.

The availability of technical services was provided by hiring staff members to work in the local soil and water conservation district offices to assist the landowner and land users. These hired staff members were titled as conservation technicians. During the project period, eight conservation technicians were hired to provide technical services to eleven parishes working with seven different soil and water conservation districts. These technicians were trained on best management practices and about the benefits and importance of best management practices. They were trained that BMPs or combinations of practices are an effective, practical, structural or nonstructural method to prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water.



An educational program was established and was a very effective part for this project. This program resulted in continuous day-to-day outreach efforts to inform the landowners/users about informational materials available to them. These materials were distributed to the landowners/users; mail outs were sent to the local community and newsletters and newspaper articles were developed. Field days, workshops and seminars were conducted during the project period to inform the

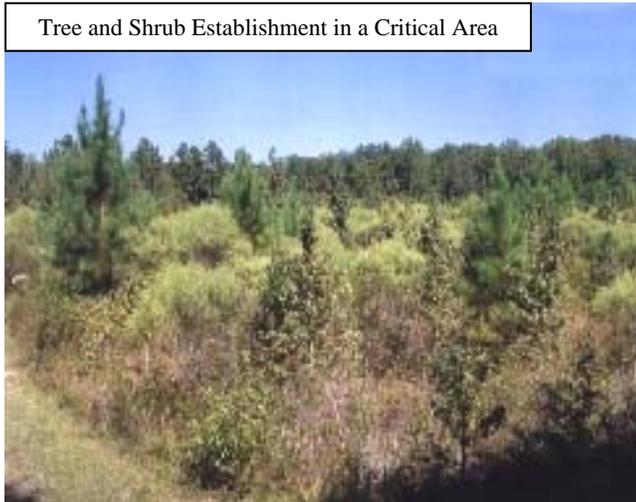
landowners/users about BMPs. Newsletters were sent out on a quarterly basis to local landowners and producers to inform them about the different BMPs that will best enhance their land and bodies of water. Each BMP that was planned and implemented was explained to the landowners/users. Each BMP consists of a national conservation practice standard sheet that explains the definition, purpose, conditions where practices are applied, and criteria for distribution, as well as a conservation practice information sheet that was distributed to each landowner/user. The conservation technicians also explained to them the process of planning, designing and the procedure of installing the practice. The technicians emphasized the water quality improvement and different benefits to the landowners and to the environment for each of the BMPs. These technicians assisted in the annual Wild Woods Wandering Environmental Camps, which are two one-week camps for high school level students throughout the state, for all three years of the project. The main purpose of this camp was to allow the high school students in Louisiana to experience first-hand the diverse dynamics of a forested wetland ecosystem within a predominately agricultural watershed.

The conservation technicians diligently worked in the soil and water conservation district offices to provide assistance to implement this project. During the three years of the project, BMPs were

installed which benefited thousands of acres of land. The conservation technicians met with the landowners and/or producers to determine the most favorable site to implement best management practices that were most suitable for their land. They helped promote and implement best management practices for a nonpoint source management and water quality improvement effort in the 12 parishes of Northeast Delta RC&D's designated area in north Louisiana, plus another parish in north central Louisiana. Within this Louisiana Delta area, these technicians assisted the agricultural, forest industry and urban residents. They planned, designed and implemented BMPs for the landowners'/users' operations to enhance the impaired water bodies. The technicians assisted the Soil and Water Conservation Districts in developing approved conservation plans for the implementation of BMPs. These plans determined the types of BMPs that were needed for impaired water bodies throughout the Delta area. They assisted in developing over 8,000 conservation plans for landowners, farm producers and local units of government in the Delta.

The lesson learned from this project was that technical services are necessary to educate, plan, and implement best management practices in Louisiana. Due to the budget constraints that all agencies (federal, state and local) are experiencing, projects such as these need to be continued in order to address the economic and environmental concerns of the citizens

Tree and Shrub Establishment in a Critical Area



Northeast Delta RC&D was and is very proud of the success of this project. From this project, landowners/users were able to receive

technical service when previously they were unable to due to lack of staff members to meet the demanding workload in the soil and water conservation district offices. Also, out of the original eight technicians first hired, six technicians are now currently employed by USDA-NRCS in permanent full-time jobs. The RC&D Council proudly spreads the word on the success of the Delta TAP project at area, regional, and national meetings as well as local conservation district board, police jury and community meetings. This project has been discussed at area, state and regional USDA-NRCS meetings.

Utilization of Annualized Agricultural Nonpoint Source Pollution Model (AnnAGNPS) in the Ouachita River Basin and LDEQ Implementation Plans

In 2006, this project was completed with the development of six Watershed Plans for water bodies in the Ouachita Basin. The NPS Management Plan contains a schedule for completion of 14 TMDL watershed plans in the Ouachita River Basin. In January 2004, the NPS Unit staff moved into the Ouachita River Basin to begin work on watershed implementation plans for water bodies within the Basin. LDEQ contracted with the USDA-ARS to write six watershed implementation plans utilizing the AnnAGNPS watershed model. A watershed plan describes a plan of action to reduce NPS pollution in a watershed until the water body complies with EPA/LDEQ water quality standards. The following table shows all 6 watershed implementation plans completed by ARS.

Name of Watershed	Subsegment	TMDL Constituent
Ouachita River	080101	DO
Bayou Chavin	080102	DO and Nutrients
Ouachita River	080201	DO and Nutrients
Bayou Desiard	080701	DO
Bayou Bonne Idee	080902	DO and Nutrients
Bayou LaFourche	080904	DO and Nutrients

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) has extensive knowledge of and experience with the impacts of various BMPs on field systems. ARS utilized the model called **Annualized Agricultural Non-Point-Source** (AnnAGNPS) to evaluate current sediment loadings in the watershed. AnnAGNPS is a multi-temporal, continuous-simulation model that was set up to simulate several years of local climate data. This model is used to evaluate the effectiveness of various BMPs and compare them to current agricultural practices. The AnnAGNPS model produces estimates of the amounts of sediment, phosphorus, nitrogen, and organics as the constituents travel overland, through the reaches and the watershed outlet. It is an extremely robust model having over 900 input parameters. Pollutant loadings can then be identified at their source and tracked as they move through the watershed system.

The AnnAGNPS watershed modeling technology can estimate the load reductions of various agricultural BMPs. Given the relationship of ARS and NRCS and their expertise with watershed modeling, ARS was in an excellent position to produce watershed plans for LDEQ in the Ouachita River Basin. ARS modeled the watersheds, inputting current land management practices for runoff, sediment, and nutrient loadings within the six designated watersheds and then they reran the model with BMPs until the results met NPS load reductions within the watershed sub-segment outlined in the TMDL. If the TMDL load reductions were too great to achieve by BMP implementation with the model simulations, then ARS/NRCS recommended a set of BMPs that would accomplish the desired NPS load reductions over a reasonable period of time.

Monitoring the Effectiveness of Forestry BMP Implementation in the Flat Creek Watershed

This project is currently in progress and is scheduled to be completed in 2007. This project is being implemented to evaluate effectiveness of Louisiana's current Forestry BMPs and to improve BMP guidelines for site preparation of timber harvested sites. Calibration of the automatic water sampling equipment was completed in January 2006. Since then, storm water samples at six intensive monitoring sites were collected throughout the year. Monthly samples at these locations and seven other extensive monitoring locations within the Flat Creek Watershed were collected. The water samples were analyzed for nitrate, nitrite, total Kjeldahl nitrogen (TKN), ammonia, total and dissolved phosphorus, total suspended solids (TSS), fixed solids (FS), volatile solids (VS), and total solids (TS). In addition, monthly water quality field measurements including temperature, dissolved oxygen (DO), specific conductance, pH, and turbidity were conducted at all the intensive and extensive sites.

Stream channel morphology and cross sectional area of the eleven monitoring sites were characterized. Monthly stream flow velocity and stage height were recorded to develop stage-

discharge rating curve. Relevant weather parameters were recorded to investigate site hydrology conditions in the Flat Creek Watershed. These parameters include hourly air temperature, humidity, precipitation, wind speed, and solar radiation.

A GIS framework integrating spatially-referenced soil, land use, and weather data has been developed under BASINS 3.1. The framework will be used for simulation of stream discharge and nutrient and sediment loads, and the system is being calibrated against observed measurements.

Reduction in Nonpoint Source Contaminant Loads to Bayou Chauvin in the Ouachita River Basin

This project recently began in 2006. The specific goal of this project is to identify specific sources of NPS loading to Bayou Chauvin watershed and implement BMPs that will improve water quality. This project will use existing water quality data, TMDLs, and inventory mapping and reconnaissance surveys to select and target locations along the watershed that are likely to contribute to NPS loading. Through targeted water quality monitoring, land use areas (agricultural/pasture, suburban, wetland) will be selected for implementation of BMPs and demonstration projects. Educational outreach programs will be developed to inform land owners of NPS issues through workshops, demonstration projects, and organization and training of action groups.



Bayou Chauvin

To date, visual observation of Bayou Chauvin has been conducted, and monitoring and TMDL reports were reviewed to determine starting points for sample site selection. Two sampling events were conducted and, based on both events, the significant sources of NPS appeared to be agricultural runoff and suburban storm drains.

USDA and SWCD Programs

During 2006, the USDA implemented approximately 34,342 acres of BMPs within the Ouachita River Basin through the EQIP. An additional 33,876 acres of practices were implemented through the CRP, 76 acres of practices were implemented through the Conservation Security Program (CSP), 9,376 acres of practices were implemented through the WRP, and 390 acres of practices were implemented through the WHIP.

The Soil and Water Conservation District spent \$381,544 of Incremental 319 funds in the Ouachita Basin, specifically in the Turkey Creek and Turkey Creek Extension watershed. This money funded 35 contracts, which covered 2,561 acres in Franklin Parish. In East Carroll Parish, they spent \$374,157 of Incremental 319 funds in the Joe's Bayou watershed. This money funded 24 contracts, which covered 3,231 acres.

Red and Sabine Basins

The Red and Sabine Basins are located in the northern and western portions of the State and consist of forests, row-crops, pastures and urban areas. Both the Sabine and the Red River Basins have a substantial number of water bodies not fully meeting their uses. All of the TMDLs for the impaired water bodies will be completed by 2008 and watershed plans will be developed for those watersheds that have impaired waters.

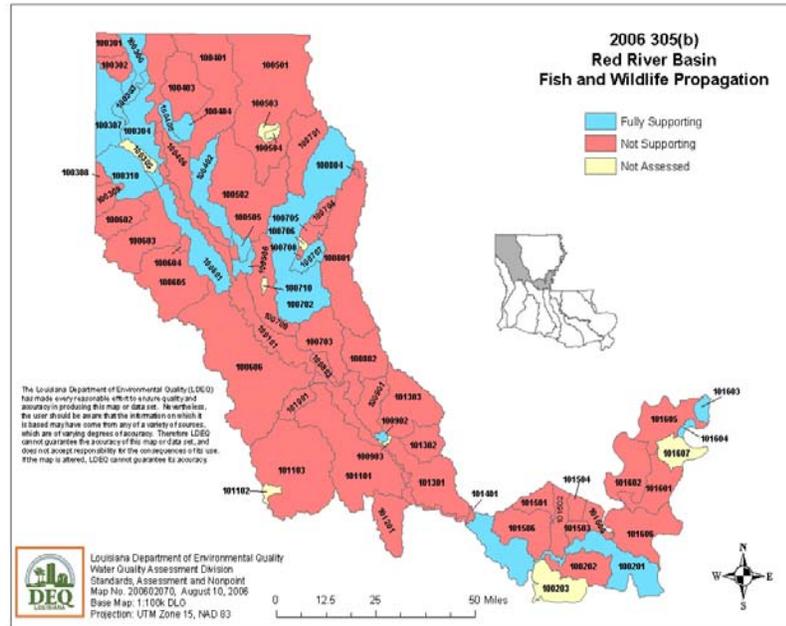
The 2006 Integrated Report indicated that dissolved oxygen and mercury were the primary reasons that the fish and wildlife propagation use was not being met. Of the 50 water quality sub-segments, 34 were not meeting the fish and wildlife propagation use. There are a wide range of causes for these impairments, including: municipal point sources, package treatment plants, small flows, residential areas, irrigated and non-irrigated crop production and natural conditions. All of the field work for TMDLs and the detailed level crop analysis has been completed, so the remaining tasks include developing the TMDLs and the watershed plans.

During 2006, the NPS Program implemented the following projects within the Red River Basin:

- Wallace Lake Watershed Restoration Action Strategy
- Constructed Wetlands to Improve Water Quality for Whole-Farm Operations
- Evaluation of Application of Poultry Litter on Water Quality and Wood Production in Forested Lands, Phase 2
- Water Quality and Crop Production Response to the Use of BMPs and Poultry Litter, Phase II
- Cross Lake Watershed Individual Sewage Treatment System Improvement Project

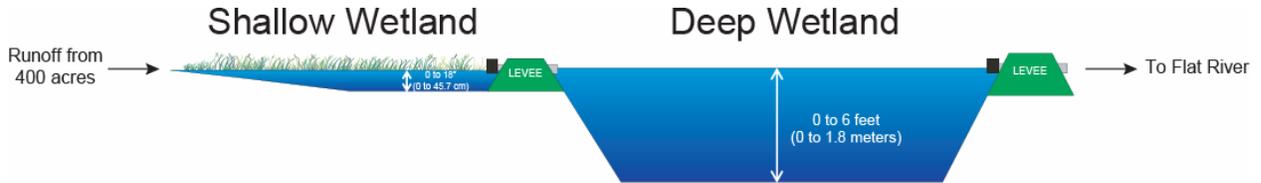
Wallace Lake Watershed Restoration Action Strategy

This project is complete and the Final Report was approved in 2006. Three demonstration sites addressed various nonpoint source issues (animal wastes, forestry, and urban development). Also, initial hydrological, water quality, biological, and pollutant loading data was collected to establish baseline information for the implementation of BMPs at each site and to perform periodic monitoring of the aforementioned parameters at each of the sites to evaluate the success of each BMP, identify trends and problem areas, and design a plan to improve water quality. All three demonstration sites have been developed with community education and outreach as a priority.



Constructed Wetlands to Improve Water Quality for Whole-Farm Operations

This project was completed in June 2006, and the Final Report is currently being reviewed. Over 25,000 acres of agricultural crop land and 29,000 acres of pasture land reside within the Louisiana Department of Environmental Quality’s (LDEQ’s) water quality sub-segments 100402 and 100406. The Flat River and Red Chute Bayou drain these segments and, based on the 2000 Water Quality Inventory 305(b) Report; these two water bodies only partially meet their designated uses. The Flat River/Red Chute Bayou watershed is on the 1999 court-ordered 303(d) list of impaired waters in Louisiana. The primary suspected causes of this impairment are organic enrichment, low dissolved oxygen, nutrients, pesticides, suspended solids, siltation, and pathogen indicators resulting from non-irrigated crop production. LDEQ is currently developing total maximum daily loads (TMDLs) for this watershed.



Cross Section and Photo of Constructed Wetland

Although agricultural practices such as conservation tillage help reduce nonpoint source discharges, they are only partially effective. However, limited information indicates that constructed wetlands have been used successfully for the treatment of nonpoint discharges from agricultural sources, removing 90 percent of total phosphorus and suspended solids, 80 percent of chlorpyrifos and metolachlor, and 50 percent of atrazine (DuPoldt et al., 1993 and M. T. Moore, 1999). Constructed wetlands remove sediment through physical means and pesticides and fertilizer through biological means provided by plants and microorganisms.

The LSU AgCenter’s Red River Research Station consists of 573 acres of agricultural land located in the Red River Basin within sub-segment 100406. Much of the Red River Research Station’s land area is subdivided into 4-to-8 acre blocks where various crops are grown. The crops grown include cotton, soybean, corn, grain sorghum, and wheat. All blocks are maintained according to Louisiana State University Cooperative Extension Service guidelines with practices similar to those used on conventional arable land in the area. Runoff water from the station drains into the Flat River which is located less than one-third mile away. As mentioned



Construction of Wetland

previously, the Flat River is on the 303(d) list of impaired water bodies in Louisiana.

Approximately 400 acres of discharge water from the station flows to the southeastern corner where it enters Lay’s Bayou, then Flat River. The southeast corner of the station was therefore identified as an ideal location to construct a wetland to demonstrate

the potential for improving the water quality of discharge from agricultural lands prior to drainage into state water bodies.



School children visiting constructed wetland

Results from this project have shown that a constructed wetland system can be beneficial in improving the water quality of runoff from agricultural land. The system significantly lowered phosphates, total phosphorus, total Kjeldahl nitrogen, total suspended solids, and slightly increased dissolved oxygen

content. Nitrates also were lower in the deep wetland grab samples in contrast to runoff samples, indicating the importance of anaerobic conditions for reduction. Some of the results from this study were not expected and further investigation will be necessary in order to fully understand these findings. The herbicides atrazine and metolachlor significantly increased in concentration by the time runoff water reached the deep wetland, the final phase of the system. It has been hypothesized that these pesticides may have been bound to soil particles that were filtered as part of the laboratory procedure for their measurement. Since the deep wetland samples were lowest in suspended solids, the opportunity for these pesticides to bind to soil particles was not as prevalent as in the other stages of the system. This hypothesis could easily be tested by running pesticide analyses on the filtered soil particles.

Evaluation of Application of Poultry Litter on Water Quality and Wood Production in Forested Lands, Phase 2

This project is currently in progress and is scheduled to end in 2007. Forestry is a major land use activity in the northern portion of Louisiana close in proximity to poultry producing areas. The utilization of forests for application of poultry litter may increase forest (tree growth) and wildlife (browse growth) production through improvement in soil condition (organic matter content and cohesive properties) and by providing a slow release of nutrients and trace elements. The improvements in tree and browse growth and soil condition should improve water quality by reducing nutrient and sediment loading to receiving waters. This project will be useful in identifying and demonstrating the proper application of poultry litter on forest land in a manner that will assist in improving water quality, and provide more land area for beneficial land application.

The information provided through this project will be beneficial to the poultry producers, the Local Soil and Water Conservation Districts, and the Natural Resource Conservation Service in making determinations in how they should utilize their poultry wastes most effectively. The results of the project will be incorporated into educational/outreach activities and included as recommendations made to forest land owners and poultry producers in the watersheds of north central Louisiana.

Water Quality and Crop Production Response to the Use of BMPs and Poultry Litter, Phase 2

This project is currently in progress and is scheduled to end in 2007. Large quantities of organic wastes generated by the poultry industry have been recognized as a potential source of nutrients and organic matter for crop production. This is an attractive source of nutrients because it provides an avenue for the disposal of poultry litter and would increase the soil organic matter content over time. The largest area of poultry production in Louisiana is in the north central part of the state and is expanding into the Red River parishes.

A demonstration project will be continued on a Red River alluvial soil in which poultry litter will be applied as a fertilizer source to cotton grown with conservation and conventional tillage practices. Subsequently, information gathered from the demonstration will be disseminated in educational programs emphasizing the benefits of these alternative management practices. Expected benefits of the demonstration and educational program include farmer adoption of alternative methods for the disposal of poultry litter as an inexpensive source of fertilizer. This should result in an environmentally friendly means of disposing of poultry litter, while improving soil tilth, reducing erosion, and reducing nutrient runoff loss. This project will quantify nutrient losses in surface runoff resulting from five alternative cotton production/ management techniques by collecting and analyzing soil and water samples from each test plot.

Cross Lake Watershed Individual Sewage Treatment System Improvement Project

This project is currently in progress. Cross Lake serves as a drinking water supply for Barksdale Air Force Base and the City of Shreveport. Defective onsite residential sewage treatment systems present a significant nutrient, solids, and pathogen loading problem for the lake. This project will create a GPS-based inventory of individual sewage treatment systems within one-half mile of Cross Lake and enter data into the city's GIS system. Targeted areas within one-half mile of Cross Lake will be identified and prioritized. The owners of targeted property will be notified that their systems must be repaired or replaced. This project will result in the provision of funding for the repair/replacement of failed systems in the identified areas. Program participants will be required to sign a document stating that they will abide by the continued maintenance requirements specified by City Ordinances for as long as they own the replaced/upgraded sewage treatment system. So far, this project has inspected all sewage treatment systems within 1,000 feet of Cross Lake and entered them into the database. Approximately 90 of the 400 systems are malfunctioning. Prioritization of these 90 systems with subsequent repairs/upgrades of as many as possible, funding permitting, will begin soon.



Cross Lake

USDA Programs

During 2006, the USDA implemented approximately 24,923 acres of BMPs within the Red River Basin through the EQIP. An additional 2,909 acres of practices were implemented through the CRP, 53 acres of practices were implemented through the GRP, 5,208 acres of practices were implemented through the WRP, and 329 acres of practices were implemented through the WHIP.

During 2006, the USDA implemented approximately 7,419 acres of BMPs within the Sabine River Basin through the EQIP. An additional 39 acres of practices were implemented through the CRP, 11 acres of practices were implemented through the WRP, and 225 acres of practices were implemented through the WHIP.

The Sabine River Basin lies along the Texas-Louisiana border, encompassing more than 2,900 square miles of drainage area. The basin extends from Texas state line near Shreveport to the Gulf of Mexico. The Sabine River is composed of 19 water quality management sub-segments and only 6 that were not meeting the fish and wildlife propagation use with the problems primarily associated with mercury and a few problems with turbidity and low dissolved oxygen. There are four watersheds that are not fully meeting the contact recreation use because of fecal coliform concentrations.

During 2006, the NPS Program implemented the following project within both the Sabine River Basin and Red River Basins:

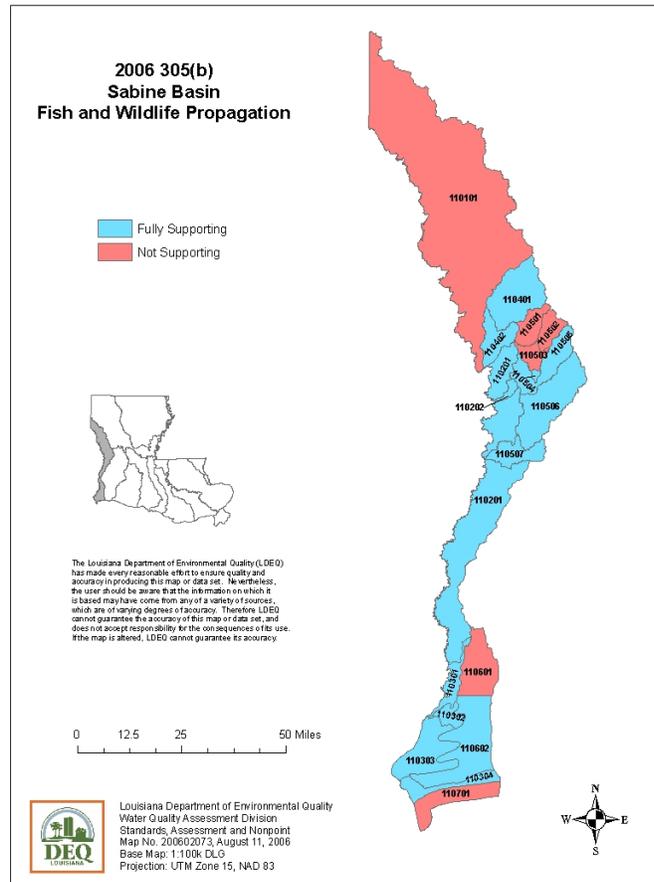
- Desoto SWCD Dairy Waste System Cleanout

Desoto SWCD Dairy Waste System Cleanout

This project was started in 2002, and now it is complete and the Final Report was approved by EPA in 2006. A cooperative agreement between the Louisiana Department of Environmental Quality and the Desoto Soil and Water Conservation District was formed with the intent of developing nutrient management plans and pumping out lagoons for 27 dairy farmers in the Bayou Pierre and Toledo Bend Watersheds. During this time period:

- A total of 156 people attended the four meetings which were held to inform the public about the Dairy Lagoon Cleanout Project;
- A Dairy Lagoon Cleanout Demonstration was held with approximately 21 people attending;
- Numerous articles were printed in the local newspapers; and
- Seven dairy lagoons were pumped out and the nutrients from the lagoons were sprayed on approximately 472 acres.

Over the course of the project, financial hardships in the local dairy industry made producers less likely to commit to pumping out their lagoons, and several dairies went out of business. The Desoto Soil and Water Conservation District views this project as a success and will continue promoting the lagoon cleanouts and helping the dairymen in the area even after the termination of the project.



Terrebonne Basin

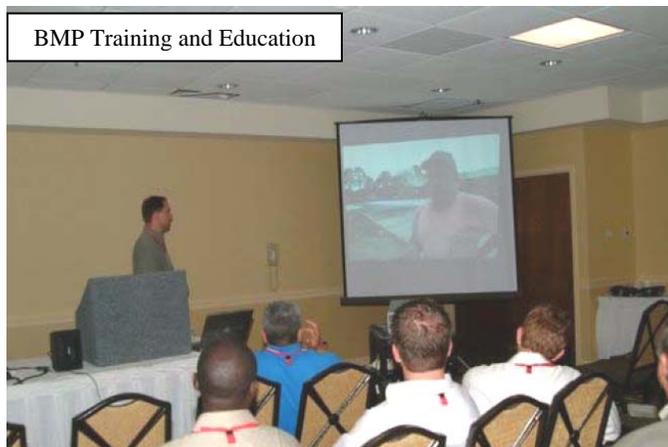
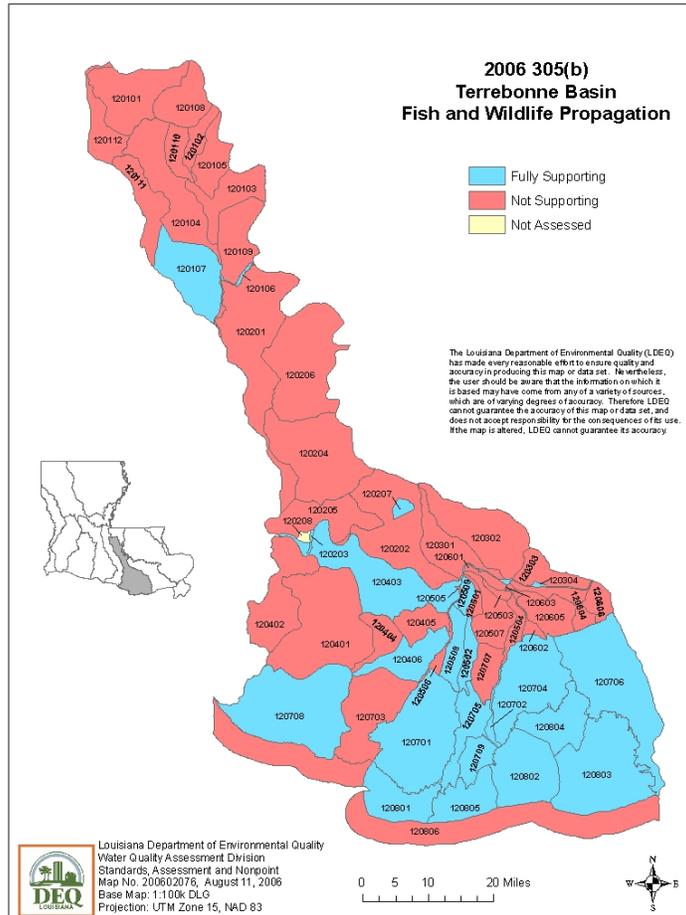
The Terrebonne Basin covers an area extending approximately 120 miles from the Mississippi River to the Gulf of Mexico on the south. The Basin comprises of 60 water quality sub-segments, 28 of which do not meet the fish and wildlife propagation use. The primary problems are low dissolved oxygen and elevated turbidity. EPA and LDEQ are working on a Use Attainability Analysis (UAA) for the Terrebonne Basin to determine what the appropriate water quality criteria should be for dissolved oxygen. Through the UAA process, the chemical and biological data are examined to determine if the use is being met.

Even though Watershed Implementation Plans for the Terrebonne Basin are still in their draft stages, the NPS Program did implement one project within this Basin in 2006:

- Urban BMP Training and Education and Home Sewerage Education Awareness

Urban BMP Training and Education and Home Sewerage Education Awareness

This project is currently in progress and is scheduled to be completed in 2007. The new building that was constructed to house the South Central Planning & Development Commission at which the pervious parking lot was installed had its ribbon cutting ceremony in 2006. The video that is being compiled for the project is currently being used in presentations and classrooms as an educational tool to demonstrate the parking lot as a BMP to treat storm water runoff. A

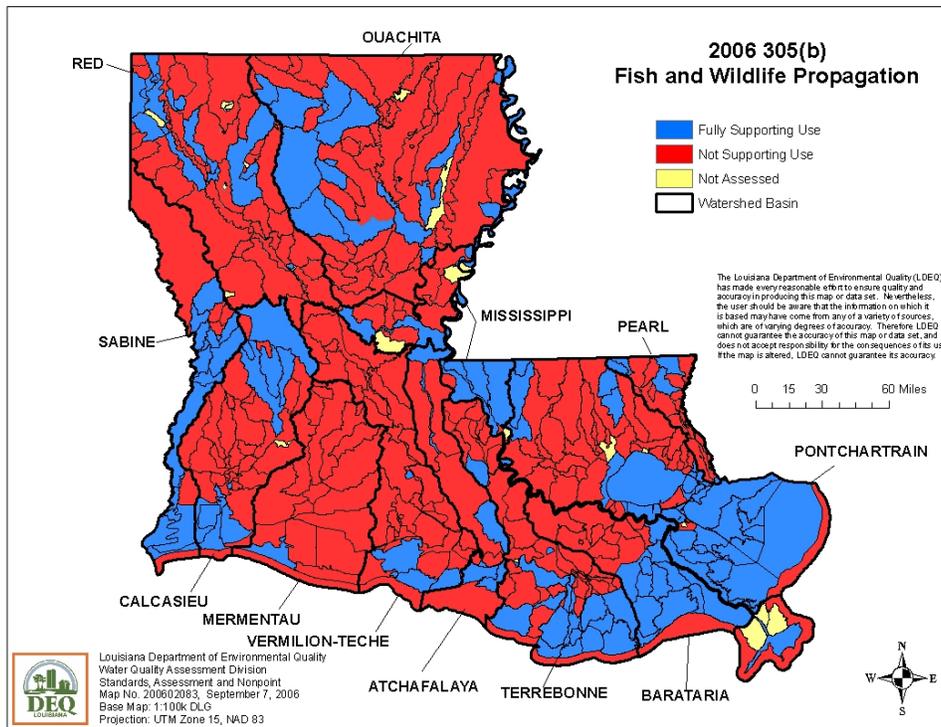


door hanger on the importance of the use of BMPs to treat storm water runoff and reducing nonpoint source pollution is currently being developed.

USDA Programs

During 2006, the USDA implemented approximately 9,088 acres of BMPs within the Terrebonne Basin through the EQIP. An additional 515 acres of practices were implemented through the GRP, 39 acres of practices were implemented through the WRP, and 672 acres of practices were implemented through the WHIP.

Statewide Implementation



In addition to nonpoint source projects that have been targeted at the watershed level, there have also been programs implemented during 2006 to address nonpoint source concerns on a statewide scale. This allows progress to be made across the state rather than only in targeted watersheds. The NPS Management Plan also included tasks and milestones for implementation of statewide programs for agriculture, forestry, urban runoff, home sewage, hydromodification, construction and resource extraction. During 2005, LDEQ has worked with many entities to make progress in implementing the statewide NPS Programs.

USDA Programs

The USDA spent \$14,497,485 of Farm Bill funds (which are not 319 funds) in 2006 on 1,003 EQIP contracts, which covered 149,168 acres throughout the state. In 2006, the USDA also spent \$346,129 of Farm Bill funds on 48 WHIP contracts, which covered 2,571 acres throughout the state. The USDA also spent \$16,096,590 in 2006 on 4,559 CRP contracts, which covered 307,878 acres throughout the state.

Throughout the state of Louisiana, the USDA implemented approximately 39,295 acres of BMPs through the Conservation Reserve Program, 76 acres through the Conservation Security Program, 1,310 acres through the Grasslands Reserve Program, 19,218 acres through the Wetlands Reserve Program, 136,127 through the Environmental Quality Incentives Program, and 4,481 acres through the Wildlife Habitat Incentives Program.

Through all of its programs, the USDA implemented a total of 367,705 acres of BMPs throughout the state. The following chart shows approximately the total number of acres of implemented BMPs per basin.

Basin	Acres of Implemented BMPs
Atchafalaya	21267
Barataria	7406
Calcasieu	24999
Mermentau	35604
Mississippi	5525
Ouachita	110276
Pearl	3805
Pontchartrain	26504
Red	45320
Sabine	14025
Vermilion-Teche	55453
Terrebonne	17521

During 2006, the NPS Program implemented the following projects throughout the state:

- Model Landscape Code for Communities in the State of Louisiana
- Approaches for Developing Attainable Nutrient Criteria for Louisiana Water bodies: Rivers and Streams
- Promoting the Adoption of BMPs through the Use of Model Farms
- Nonpoint Source Pollution Website/ArcIMS Application
- Louisiana Forestry Best Management Practices Education Project
- The Relationships Between Nutrients, Dissolved Oxygen Conditions, Habitat, and Fish Assemblage Composition in Louisiana Streams

Approaches for Developing Attainable Nutrient Criteria for Louisiana Water Bodies: Rivers and Streams

This project is currently being implemented and a draft Final Report is under review. This project is developing approaches for developing ecoregional nutrient criteria for Louisiana based upon the nutrient conditions found in least-impacted reference water bodies. Reference conditions will be evaluated for rivers and streams in the four ecoregions where nutrient criteria will be developed. Previously collected data will be evaluated on nutrients, dissolved oxygen, and other pertinent parameters in identified water bodies. Data will be analyzed to develop approaches for evaluating nutrient conditions in least-impacted reference water bodies.

To date, an extensive literature review of historical and current ecological indicators of ecological health and water quality has been conducted. A data base containing all water quality data pertaining to the reference water bodies has been developed. Summary statistics of various water quality parameters are being provided for each ecoregion. This contract is being executed jointly with another contract in the same EPA project. The other project includes extensive field sampling. Although there was a delay due to the 2005 hurricane season, both projects have resumed and will be completed.

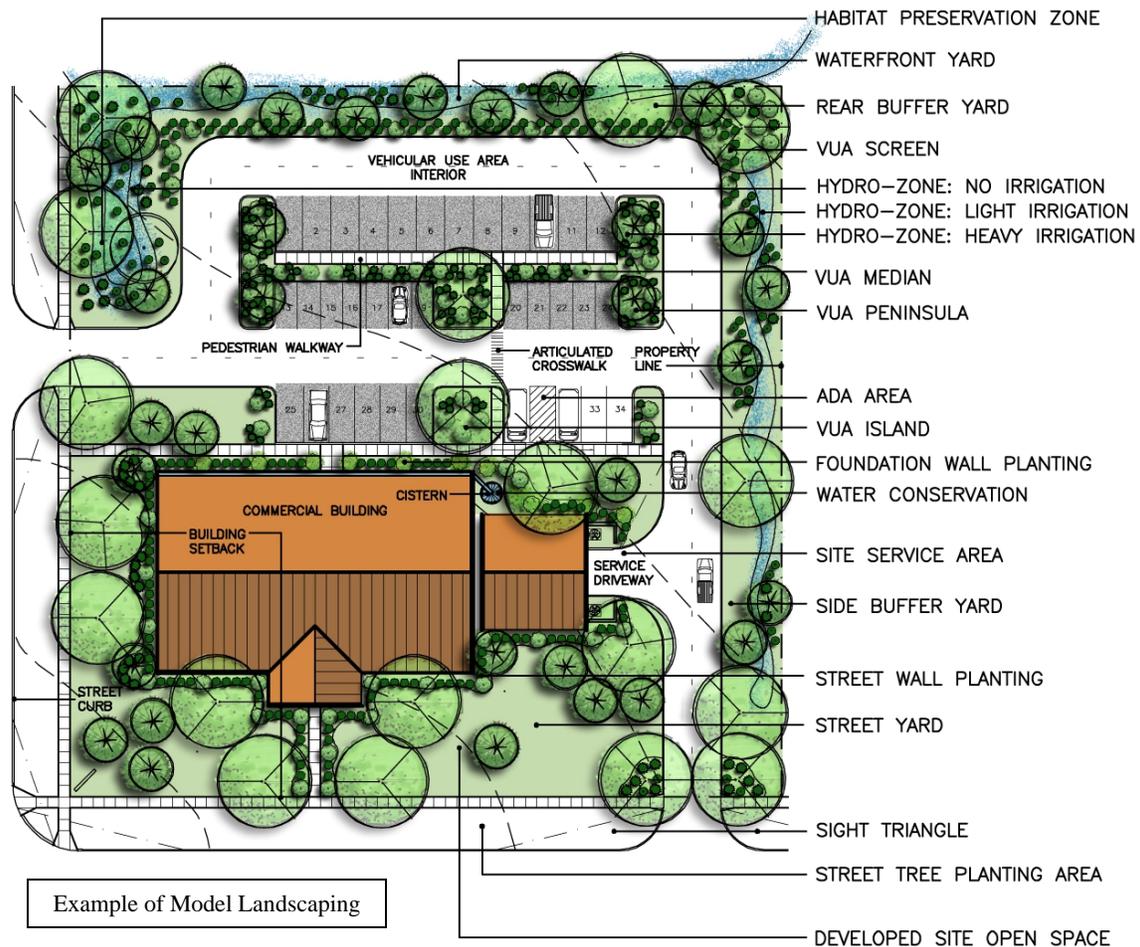
Nonpoint Source Pollution Website/ArcIMS Application

This project was completed in 2006, and the Final Report is currently being reviewed by EPA. The objective of the upgraded Nonpoint Source Pollution Website was to provide the public with an internet-based application that provides a user-friendly approach for obtaining information related to LDEQ's Nonpoint Source Pollution 319 projects, implementation plans, and links to the LDEQ's GIS center for mapping information. LDEQ is completely satisfied with the information that was produced as a result of the development of the ArcIMS application for the Nonpoint Source Website. The website address is <http://nonpoint.deq.louisiana.gov/wqa>.

Model Landscape Code for Communities in the State of Louisiana

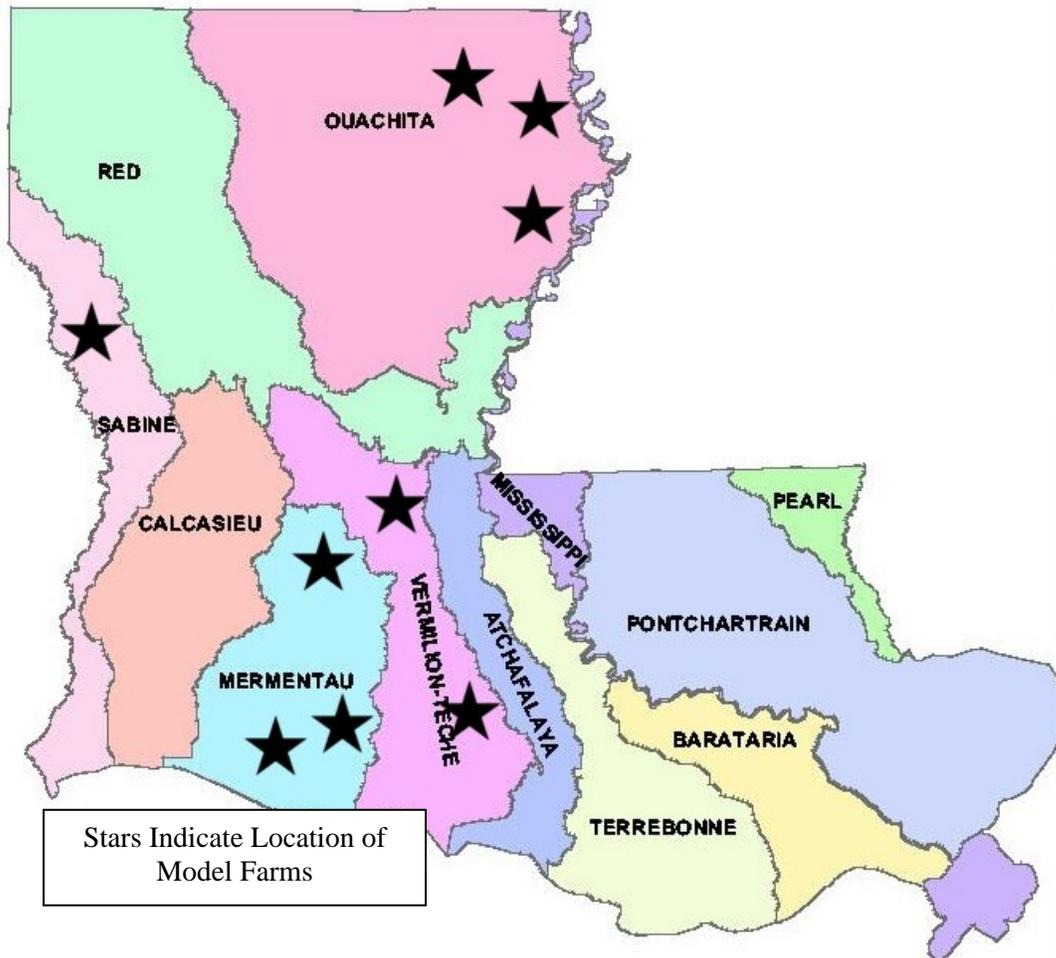
This project is complete and the Final Report was approved by EPA in 2006. This is a user-friendly and adaptable landscape code that can be written into any community's zoning laws. It is an aid in the planning strategy for managing storm water on small development sites along with irrigation, water conservation, and tree and habitat preservation.

The Model Code demonstrates solutions through low impact development and smart growth techniques. This version of the model code is the first of its kind in Louisiana. A project website (<http://www.abbey-associates.com/splash-splash>) and CD were developed that contain a printable version of the Model Code, the interactive Model Code, the Model Code Slide Presentation, and a BMP presentation.



Promoting the Adoption of BMPs through the Use of Model Farms

This project was completed in 2006 and the Final Report is in review. The Louisiana State University AgCenter, with cooperation of multiple state agencies and agricultural groups, has been working on the implementation of the Master Farmer program since 2001. A vital phase of this program is having producers visit a Model Farm, and see firsthand the proper use of conservation practices in agriculture. This project implemented nine Model Farms in four major river basins, consisting of three pasture/cattle operations, three rice/crawfish operations, and three row crop operations.



Several Model Farm field days were hosted during this project. There was at least one field day representing each of the Model Farms. These field days provided an opportunity for concerned and innovative producers to see what their peers are doing and planning in terms of conservation. Participants were able to see first hand how these practices are implemented on a real farm in their area, not just a temporary setup on a research station used for demonstration. The cooperators as well as personnel from state and federal agencies presented information which is valuable in making decisions about responsible conservation farming. The attendance for these field days averaged around 40 people per event.



The current status of producers' knowledge and perception of conservation farming was assessed using a survey mailed to over 3,100 producers around the state. Over 42% responded with a completed survey. This information will lead to an increased understanding of how conservation education should be approached. The Master Farmer program as well as future

conservation programs will benefit. This project has played a vital role in the development and execution of phase II of the Master Farmer program in the state of Louisiana, providing the support for key personnel, the setup of monitoring stations, water quality analysis, travel throughout the state and region, and all material produced to enhance the success of Model Farm field days. Today the Master Farmer program is a model for the nation; many states have shown interest in developing similar programs in their respective states.

Louisiana Forestry Best Management Practices Education Project

This project is currently in progress and is scheduled to end in 2007. Forestry occupies more land than any other agricultural commodity in Louisiana, and trees are the state's number one crop. Louisiana's forest industry has for some time realized the necessity of encouraging environmental stewardship with respect to the maintenance of water quality in areas utilized for forest production. Even though the forestry community leads Louisiana in implementing Best Management Practices, there is the desire among public and private sector leaders that the forest products community in Louisiana continue to lead the state and, indeed, the region in striving to achieve the highest possible compliance with voluntary forestry best management practices (FBMPs). One strategy to increase compliance that has been recognized by all concerned parties is continued education of the forestry community, the logging community, forestry



Timber Harvesting BMP

educators themselves, and the general public. During 2003, the new forestry BMP Manual was completed and an initial 40,000 copies were printed. These copies were distributed within the first six months after they were finalized. There is such a demand for forestry BMP manuals and educational materials within the state that it is difficult to keep pace with the demand. One way to

achieve greater efficiency with educational programs is through the use of new and emerging communication technologies such as the Internet. Whereas all of the landowners and foresters may not have access to the Internet, many of them do and can access information on a regular basis. As more people rely on electronic media to obtain information,



Fireline BMP

government and private sectors need to maximize the efficiency of this tool for distribution of information on a broad scale. Louisiana's Nonpoint Source Management Plan committed to a 15-year schedule for measurable water quality improvement from statewide educational activities, so it is important that these programs reach the largest audience possible.

The overall goal of the project is to educate a diverse audience of loggers, foresters, forest industry leaders, non-industrial private forest landowners, educators, and other interested stakeholders by means of an interactive website and CDROM. The focus is on environmental and economic benefits of FBMPs, the proper implementation of FBMPs, proper contracting to ensure compliance with FBMPs, site evaluation by non-industrial private forest landowners or their professional representatives to ensure contractual performance, and other miscellaneous issues associated with FBMPs. The website and CDROM will be developed by the Louisiana Cooperative Extension Service with input from a broad working group of experts on FBMPs.

The Relationships Between Nutrients, Dissolved Oxygen Conditions, Habitat, and Fish Assemblage Composition in Louisiana Streams

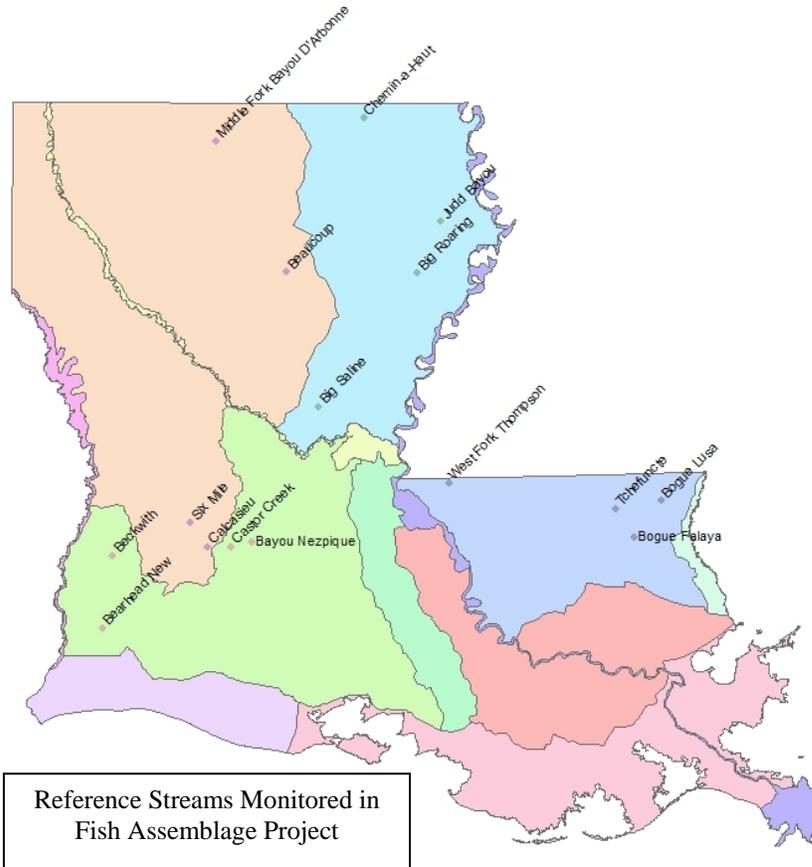
This project is currently in progress and is scheduled to end in 2007. Hypoxia (DO levels less than 2.0 ppm) has probably been a periodic if not pervasive condition affecting fish assemblages in many Louisiana streams for centuries. The central questions focus on whether DO conditions in streams on the 303(d) list have deteriorated as Louisiana land use patterns have changed, and if so, what are the relative contributions of natural and anthropogenic factors to hypoxic conditions, how can anthropogenic impacts be mitigated, and what effects have hypoxic conditions had on resident stream biota.



Picking Fish from Seine

This project will involve the monitoring of water quality, habitat, and fish community structure in 16 Louisiana streams that have historically received minimal impacts from anthropogenic activities. These data will provide information on seasonal variability in stream oxygen dynamics and whether DO conditions are related to the structure of the resident fish communities.

It is hypothesized that low-DO conditions in many Louisiana streams are caused by high rates of breakdown of allochthonous organic material from riparian vegetation, low current velocities, and warm temperatures during the extended growing season. If DO depressions in these streams are problematic to the resident biota, one would expect impacts on the abundance of more sensitive fishes, and changes in community dominance and diversity. Alternatively, if periodic hypoxia does not represent a significant impact on reproduction, foraging, and growth, then one would expect similar community composition (at least at the level of functional groups or Order/Family, if not the same set of species) across stream systems.



Progress in Sand and Gravel Mining BMPs

During 2006, LDEQ continued to work with the Concrete and Aggregate Association on a BMP manual for sand and gravel mining. A Final Draft BMP manual has been completed and is expected to be available for review and comment by the public in 2007. The manual concentrates on the types of BMPs that need to be implemented, from the initial stages of site clearing to site restoration following the mining operation. The goal of the manual is to standardize the range of practices for sand and gravel mining operations in order to limit the impacts that these operations have on water quality within the State of Louisiana.

Coastal Nonpoint Pollution Control Program

During 2006, LDEQ and Coastal Management Division of Louisiana Department of Natural Resources have made substantial progress toward full approval of the State's Coastal Nonpoint Pollution Control Program (CNPCP). There was a conference call with LDEQ, LDNR, USEPA and National Oceanic and Atmospheric Administration (NOAA) to discuss the remaining tasks that needed to be complete in order for the conditionally approved program to gain full approval.

- LDEQ will provide a letter in which we describe how implementation of the agricultural section of our NPS Program works in the Coastal 6217 management area.
- Within this same letter, LDEQ will describe how the state is working to protect its Coastal Wetland Forests and provide a copy of the report that was provided to the Governor's Office by the Science Working Group.
- LDEQ and LDNR will contract with an entity to utilize information that has been compiled through previous contracts to prepare a guidebook for developers on BMPs for all new commercial and private developments;
- LDEQ will provide a copy of a watershed plan and describe how watershed protection is managed within Louisiana;
- The State will provide description of how management measures are factored into home sewage system systems for Coastal Louisiana;
- The State will provide description of how management measures are met for roads, highways and bridges;
- The State will need to describe how hydromodification BMPs are implemented through Coastal Use Permit and 401 Water Quality Certification;
- The State will describe how wetlands are restored and protected (include Coastal Restoration Program, EBRP program for protecting wetlands through new ordinances, etc.)
- The State will describe how MOUs provide a mechanism for interagency coordination and how 4-year cyclic monitoring tracks whether water quality is improving as a result of program implementation.

In response to this conference call LDNR and LDEQ have met with LDAF, LDHH and LDOTD to discuss how implementation of the management measures will be achieved in a post-hurricane environment. All of the agencies agreed that these issues were a priority for the state, so cooperative agreements are being developed to finalize the guidebooks for developers, roads, highways and bridges and hydromodification. The work involved in these projects will begin in 2007 and will result in training workshops for the specific audiences that implement these types of practices within the parishes of South Louisiana. Within the next five years, Louisiana will see major decisions made on how restoration and re-development will occur. All of these cooperating agencies agree that it is important to work together on ensuring that wetlands and water quality are protected during this time of rebuilding coastal Louisiana.



Photo Provided by John Hartgerink

One of the major activities that LDEQ and LDNR have been involved in during 2006 is continued discussions on how to protect Louisiana's coastal wetland forests. The cypress-tupelo forests are an integral part of the landscape in south Louisiana and yet the majority of these forests are privately owned. The combined stresses of saltwater intrusion and subsidence have caused a large portion of these coastal wetland forests to remain flooded during much of the year, and in many cases may not be able to regenerate naturally. The Advisory Panel has worked for two years on a set of recommendations for the Governor on what types of policies and programs would be necessary to protect the forests and the rights of the landowners that own the forests. These recommendations are expected to be completed in 2007 and will provide a basis for future management, protection and sustainability of these important coastal habitats in Louisiana.