

# Different Applications of Regional Watershed Planning

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Photograph: Mississippi Department of Marine Resources

**The Mississippi River Delta, which is the largest delta system in the United States, pumps a considerable amount of freshwater into the Mississippi Sound, one of the region's primary coastal ecosystems. Human interventions over time have degraded this ecosystem, by pouring pollution, sediment, and excessive freshwater into the Sound. This year has been especially tough for coastal Mississippi. High rainfall in the Midwest has flooded the northern Mississippi River. To avoid flooding New Orleans, officials in Louisiana opened the Bonnet Carré Spillway. With half of its bays open, the Bonnet Carré Spillway released 147,000 cubic feet of water per second into Lake Pontchartrain and the Mississippi Sound.<sup>1</sup> This massive influx of freshwater has been a significant disruption to the ecology of the Mississippi Sound, for example, killing 128 dolphins and 154 sea turtles as of early June. The impacts of the**

Bonnet Carré Spillway opening underscore the need for water management and planning practices that are regional in scale. To accomplish a regional water planning approach, one must consider the whole watershed.

A watershed is essentially the base foundation for all water monitoring activities, as it is an area of land where all surface water drains into the same place.<sup>2</sup> Proactive watershed planning that transcends political boundaries can monitor key stressors within a large, aquatic ecosystem and can be useful in determining key conservation needs. It can also provide regulatory consistency, as many large watersheds cross multiple jurisdictional boundaries. Although regional watershed planning is not a substitute for local water management, it can provide an additional layer of regulatory oversight that can augment environmental restoration occurring in coastal communities.

### Chesapeake Bay: A History of Water Management

With over 18-trillion gallons of water and 11,684 miles of shoreline, the Chesapeake Bay is the nation's largest estuary, including parts of Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia and all of the District of Columbia.<sup>3</sup> It is also the focus of a large, multi-state planning effort to improve water quality outcomes, and is a noteworthy example of the positive momentum that can arise from watershed planning.

The story of watershed planning in the Chesapeake Bay begins in 1973 when the Army Corps of Engineers released a large, multivolume existing conditions report on the bay.<sup>4</sup> The report chronicled many of the major causes of pollution within the bay and concluded by calling for a regional water management plan for the region. The first major step towards adopting such an approach was taken in 1983 with the Chesapeake Bay Agreement.<sup>5</sup> The agreement was a simple, one-page pledge signed by the governors of Maryland, Pennsylvania, Virginia, the mayor of Washington, D.C., the administrator for the U.S. Environmental Protection Agency (EPA), and the Chair of the Chesapeake Bay Commission, calling for a cooperative approach to the bay's water pollution. With this agreement in place, a coordinating office for the venture was established in Annapolis, and the Chesapeake Bay Program was born. In 1987 a new, much longer, agreement established numeric goals to reduce pollution within the bay, such as reducing nitrogen and phosphorous totals within the area by 40 percent by the year 2000.

The defining legacy of the Chesapeake Bay Program is its multi-state monitoring partnership. The Chesapeake Bay Monitoring Program established consistent standards for water monitoring in the states of Maryland, Pennsylvania, Virginia, and the District of Columbia. About 160 stations monitor water quality from across the entire Chesapeake Bay watershed to help ensure that the participating partners are in compliance with the standards set forth by the program.<sup>6</sup> In 2014 the monitoring program was extended further to include the states of New York, Delaware and West Virginia. While these states may not directly border the bay, there are many rivers and streams within these states that drain into the Chesapeake Bay and have an impact on water quality. Also, by maintaining a comprehensive monitoring partnership, the Chesapeake Bay Program is

able to further enhance its goal setting and long-term planning process. For example, the Chesapeake Bay Watershed Agreement, established in 2014, includes 10 interrelated goals and 31 outcomes that worked towards advancing protection of the bay.<sup>7</sup> Some of the notable outcomes include population targets for key aquatic species, such as blue crabs and oysters, and acreage goals for wetland habitats and submerged aquatic vegetation.<sup>8</sup> This type of goal setting process would not be possible without the continual monitoring and regulatory oversight provided by the foundation.

Since the inception of the program in the 1980s, water quality has been steadily improving for the Chesapeake Bay. Recent data compiled by the Chesapeake Bay Program found that 42 percent of the bay and its tidal tributaries achieved clean water standards, which is the highest water quality ranking the bay achieved since monitoring first began in 1985.<sup>9</sup> In 2017 the program recorded the largest amount of submerged grasses in the bay since monitoring began, with an estimated 104,843 acres of grasses within the bay. These environmental achievements are solid proof of the power and transformative potential of watershed based planning. By implementing a consistent set of standards and monitoring practices for multiple states and jurisdictions, the Chesapeake Bay Program is able to effectively address the challenges associated with a vast watershed covering thousands of square miles.

### Sowing Seeds of Change in Lake Pontchartrain

A different style of watershed management is found concerning Lake Pontchartrain in Louisiana. With a width of more than 40 miles, Lake Pontchartrain is the second largest inland saltwater body in the United States and one of the great natural treasures of the State of Louisiana.<sup>10</sup> The 5,000-sq. mile watershed for Lake Pontchartrain includes one of the most densely populated urban areas in the state and, over time, this heavy, urban footprint has adversely affected water quality within the lake. In the 1980s sewage and other pollution from nearby cities had reached a point where Lake Pontchartrain was becoming unsafe for human recreation.<sup>11</sup> In response to this problem, a group of Tulane and University of New Orleans professors wrote a report entitled "To Restore Lake Pontchartrain," which outlined a proposal to improve the

lake's water quality. This proposal helped inspire local citizens to form the Lake Pontchartrain Basin Foundation in 1989, an organization tasked with improving water quality in Lake Pontchartrain and other waterways throughout the basin.

The first major success of the program occurred in 1990 when the foundation was able to ban the dredging of Rangia clam shells, which had caused increased sedimentation in the lake and harmed the clam populations. The foundation also gave support to an EPA mandate requiring New Orleans to update its sewage and drainage system. Another important outcome of the foundation's work is its basic mapping services, which enhance local understanding about the Lake Pontchartrain basin. For example, visitors to the foundation's website can sign up to receive hydrocoast maps. These maps, which are updated biweekly, provide comprehensive information on water movement and the most recent distribution of water salinity across the basin.<sup>12</sup> Like the Mississippi Sound, Lake Pontchartrain is highly sensitive to high rainfall events and river diversions, which can dramatically alter the salinity of the lake.

The array of data provided by the foundation goes beyond mapping as the foundation conducts regular water quality monitoring within Lake Pontchartrain. Ten recreational sites are sampled on a weekly basis and another 10 sites of interest along Lake Pontchartrain are sampled monthly.<sup>13</sup> Basic water quality parameters, which are measured during the process, include: fecal coliform levels, water salinity, and dissolved oxygen levels. The findings from the weekly water sample sites can be found on the foundation's webpage.

Since its founding in 1989, the Lake Pontchartrain Basin Foundation has made considerable advancements in improving the water quality outcomes of the lake. In 2006, the majority of the lake was declared safe for recreation, as bacteria levels in the lake dropped significantly. Also, because of the significant strides made in improving water quality within the lake, Lake Pontchartrain also became the largest body of water to be taken off the national impaired water list. These results are a powerful testament that a watershed group cannot only be a strong advocate for environmental change; it can also be the organizational personification of Lake Pontchartrain's environmental concerns and issues.

## Conclusion

The difficulty with watershed planning is that water pollution does not respect political boundaries. In the case of large river systems like the Mississippi, the adverse effects of water pollution upstream can be significantly compounded several hundred miles downstream. While the challenge of watershed planning for a large water body like the Mississippi Sound can be immense, the upside is that water bodies can heal quickly and recover if appropriate measures are taken to restore habitat and monitor water quality on a consistent basis. A good watershed planning effort can help forge uniform water quality standards for multiple government jurisdictions.

Watershed planning and organization are not static efforts. A watershed group must be mindful of whether it is making full use of its cultural and financial resources and, it must occasionally evolve to develop new resources and institutional connections. If a watershed organization can establish uniform standards and monitoring protocols while also growing and adapting to confront emerging issues within the watershed, then it has the makings of an exemplary watershed organization. Examples from Chesapeake Bay and Lake Pontchartrain are testaments to the lasting impact watershed planning can have upon the environment and in promoting better stewardship of valuable natural resources. 🦋

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## Endnotes

1. Henry Grabar, *Hell is High Water*, Slate, (June 18, 2019).
2. Canadian Geographic, *Watershed 101*, (2011).
3. Maryland Sea Grant, *Chesapeake Bay Facts and Figures*, (2019).
4. William G. Thomas III, *The Chesapeake Bay*, Southern Spaces, (April 16, 2004).
5. Chesapeake Bay Program, *Bay Program History*, (2019).
6. Joan Smedinghoff, *Chesapeake Bay Program fueled by science, driven by partnership*, Bay Journal, (November 29, 2018).
7. Chesapeake Bay Program, *Accomplishments*, (2019).
8. Chesapeake Bay Program, *Chesapeake Bay Watershed Agreement*, (2014).
9. Tamara Dietrich, *Experts say Chesapeake Bay water quality is the best since water monitoring began*, Daily Press, (March 27, 2019).
10. Environmental Protection Agency, *Urban Water and the Lake Pontchartrain Area/New Orleans (Louisiana)*, (2019).
11. Allie Mariano, *When 'Save Our Lake' became a New Orleans rallying cry*, NOLA.com, (November 12, 2017).
12. Lake Pontchartrain Basin Foundation, *Hydrocoast Maps*, (2017).
13. Lake Pontchartrain Basin Foundation, *Weekly Data Report*, (2017).