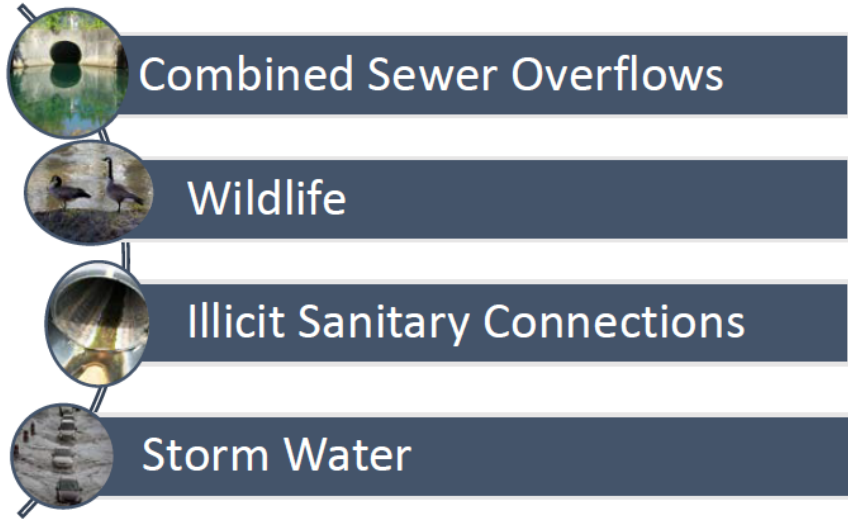




# E. coli Success Stories

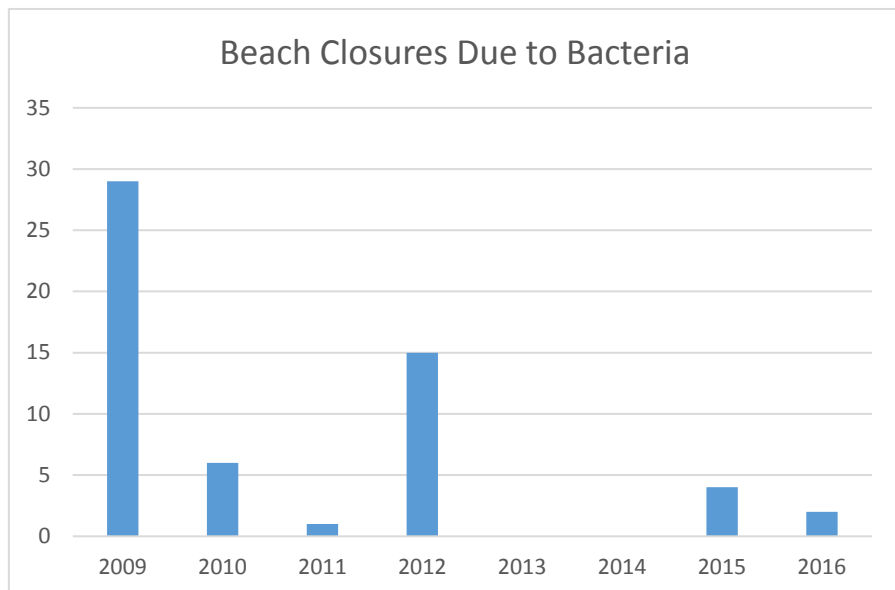
## Chrysler Beach (St. Clair River): Success through Collaboration



Chrysler Beach is 1,000 feet of shoreline located on the St. Clair River in Marysville, St. Clair County, Michigan. It is a valuable economic and recreational resource in a highly urbanized area of southeast Michigan. It is also part of a federally designated [Area of Concern \(AOC\)](#), with beach closings originally listed as a beneficial use impairment (BUI). In 2009, the beach had a record number of closings (29 consecutive days of closure)

due to bacteria and sewage contamination, with daily geometric means as high as 1,518 *E. coli* per 100 milliliters (mL) (Figure 1). The beach was placed on [Michigan's Clean Water Act Section 303\(d\) list](#) as impaired by *E. coli* (Assessment Unit: 040900010307-03), and a Total Maximum Daily Load (TMDL) was scheduled. The Section 303(d) list includes Michigan water bodies that are not attaining one or more of the designated uses and require the establishment of TMDLs to meet and maintain Water Quality Standards. Problems identified as part of the Beach Closing Impairment included [combined sewer overflows \(CSO\)](#) from two nearby communities (Cities of Port Huron and Marysville), sanitary sewer overflows from Marysville, storm water contamination from municipal separate storm sewer systems (MS4), and poor water quality from Canada geese and storm water runoff.

Figure 1. Number of beach closure days by year at Chrysler Beach. There were no closures in 2013 or 2014, and none in 2017 as of August 1, 2017 (date of retrieval from the MDEQ's [BeachGuard Database](#)).



In 2010, the St. Clair County Health Department received \$142,000 of the Great Lakes Restoration Initiative (GLRI) funding (as a subgrantee of the Michigan Department of Environmental Quality [MDEQ]) for the investigation of illicit discharges, sampling of storm sewer outlets, goose deterrents, and goose round-up. The St. Clair County Health Department partnered with the city of Marysville and Environmental Consulting & Technology, Inc (ECT) for this United States Environmental Protection Agency- (USEPA) funded project. The goose round-up resulted in the relocation of 167 geese, leading to a reduction of about 2 pounds of goose feces per goose at the park, per day. Coyote decoys were also placed at the beach and moved weekly throughout the summer to mimic the predator and discourage geese from congregating at the beach. MS4 illicit discharge elimination efforts by the city of Marysville found 3 illicit connections by monitoring, televising storm sewers, and dye testing. The discharges to the MS4 storm sewer, which had an outlet near the beach, resulted in *E. coli* levels above 24,000 *E. coli* per 100 mL in the storm sewer collection system, and above 1,000 *E. coli* per 100 mL at the outlet (ECT, 2013). Construction to correct the discharges was completed in 2014, and follow-up monitoring conducted by the St. Clair County Health Department found wet weather *E. coli* levels in the outlet at less than 50 *E. coli* per 100 mL, well below acceptable levels (ECT, 2013).



*Figure 2. Before (left) and after (right) images of Chrysler Beach GLRI project to deter geese by landscaping. One-hundred and sixty seven geese were removed and relocated by the county, which would yield 2 pounds of goose feces per bird at the park, per day.*

Further work was conducted when the city of Marysville received \$500,000 in GLRI funding (2012) for the Chrysler Beach Storm Water Improvement Project, including; parking lot redesign, rain gardens, and goose deterrent landscaping. Parking lots were regraded and the amount of impervious surface was reduced, which eliminated issues of sheet flow and erosion, and provided a vegetative buffer for storm water infiltration. Geese are deterred by tall vegetation near water because it obstructs their view of potential predators, which is why they tend to congregate in mowed areas directly adjacent to water. Goose deterrent vegetation for the green infrastructure was well established by the end of 2012 (Figure 2), and all parking lot improvements were also installed by that time. The final part of this project was the design of a “Keep Our Beach Healthy” sign in 2013 (Figure 3). An important part of any project that involves landscaping is providing for the maintenance of the vegetation. Often, maintenance crews will unknowingly mow vegetation that was meant to be left tall, or pull native vegetation that was intended to be part of a rain garden. Currently, the Friends of the St. Clair River are partnering with the St. Clair County Health Department in training Marysville Department of Public Works staff and gardening club volunteers to maintain the green infrastructure.



Figure 3. "Keep our beach healthy" sign displayed at Chrysler Beach as a result of grant work.

The nearby communities of Marysville and Port Huron also worked to control their CSOs, which was a long and expensive process. Marysville’s Long-term Control Program (sewer separation project) was completed in 1996, having eliminated all three CSO outfalls. At the cost of approximately \$176 million, Port Huron has reduced the number of active outfalls from 21 to 1. The single remaining outfall serves only 12 acres of property (corrective actions are ongoing with a target completion date of 2022).

Sanitary Sewer Overflows (SSOs) were also an ongoing problem for the city of Marysville prior to 2012. The chronic issues that lead to 6 overflow events in 2011 have been corrected by increasing the flow through capacity of the Marysville wastewater treatment plant and work to reduce infiltration and inflow in their collection system (personal communication with Steven Eick, P.E., MDEQ – August 8, 2017).



The beach is monitored weekly from Memorial Day to Labor Day, and although it remains impaired, and is part of the draft statewide *E. coli* TMDL, it has had significantly fewer closures due to bacteria. *E. coli* data (Figure 4) show the dramatic decline in *E. coli* levels from these efforts (largely completed in 2012-2014), and together, with the reduction in numbers of closings and correction of CSO/SSO issues, has resulted in the MDEQ and USEPA removing the AOCs beach closing BUI in 2016 (Foose, 2016).

Work remains to be done, but this project is a shining example of success through collaboration and fixing problems using a multifaceted approach. For more information, please see the [Beach Closings BUI Removal Recommendation](#) briefing paper.

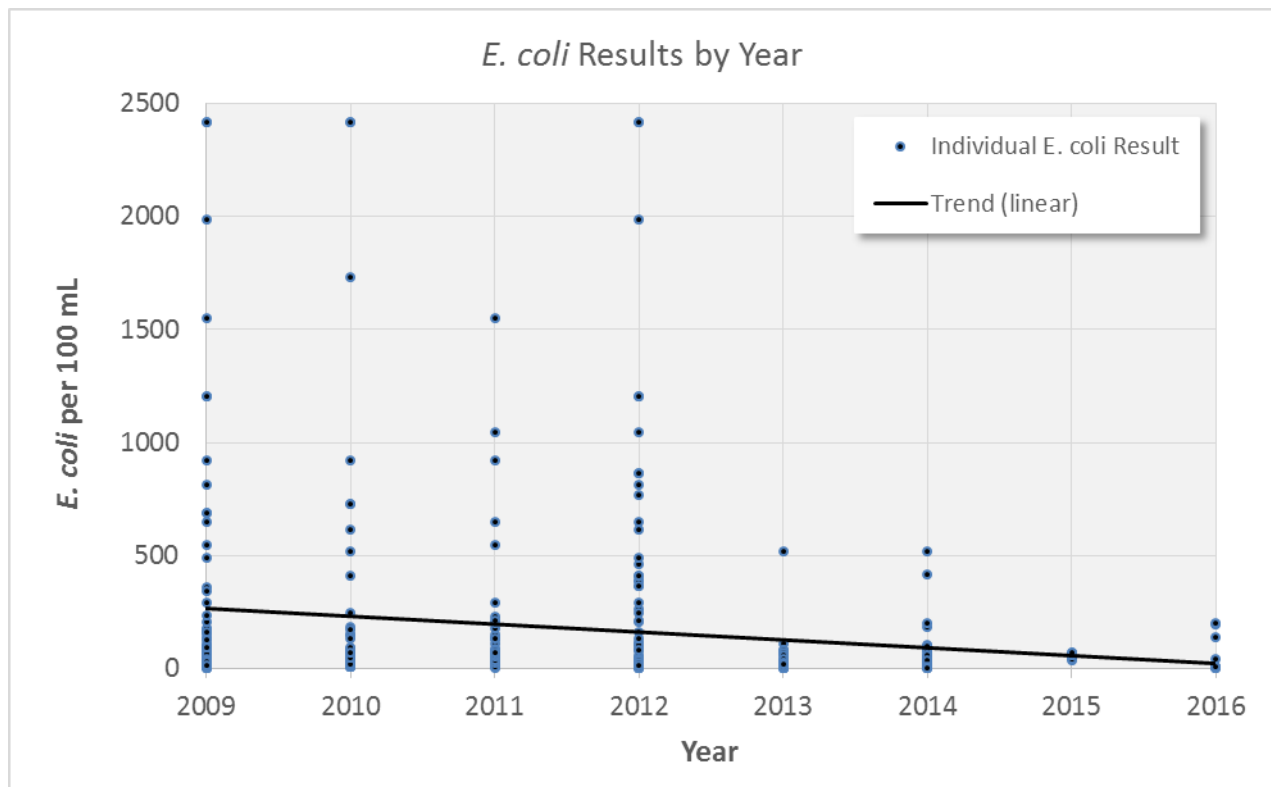


Figure 4. Individual *E. coli* results (by year) from Chrysler Beach. The structural work for the GLRI project and the SSO remedy were completed around 2012, while the illicit sanitary connections to the storm sewer were fixed in 2014.

Acknowledgements: Special thanks to the GLRI and the St. Clair County Health Department; Friends of the St. Clair; St. Clair County Public Works; St. Clair River Binational Public Advisory Council; Cities of Marysville and Port Huron; ECT, Inc.; MDEQ; and USEPA. Sheri Faust (St. Clair County Health Department) provided Figures 1 and 3, and Shannon Briggs provided Figure 4.

**References:**

ECT, 2013. St. Clair County Health Department 2010-2012. Beach Monitoring Final Report. Grant #: 2010-7206. MDEQ.

Foos, M. 2016. Removal Recommendation - Beach Closings BUI. St. Clair River Area of Concern (AOC). MDEQ.