

# Restoring Lake Carmi

## A Commitment to Clean Water

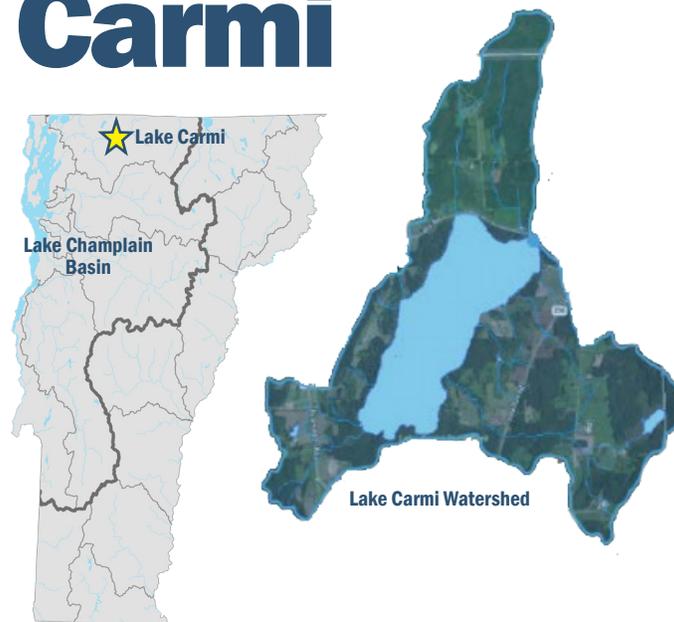
**The health of Lake Carmi is threatened by high levels of phosphorus.**

Phosphorus is a nutrient that causes excess plant and algae growth. While some phosphorus is necessary for aquatic life, in Lake Carmi, too much phosphorus has led to frequent algae blooms, reduced water clarity, and excess aquatic plant growth. Changing weather patterns also play a role in accentuating phosphorus fueled conditions. Abnormal temperature and precipitation patterns led to prolonged cyanobacteria (also called blue-green algae) blooms in fall 2017.

The Department of Environmental Conservation (DEC) determined the target in-lake phosphorus concentration using monitoring results when residents were satisfied with the lake's condition. The target concentration, expressed as the average annual concentration (in micrograms per liter or  $\mu\text{g}/\text{L}$ ) during the best three years (1997, 1998, and 2002) in the monitoring record, is 22  $\mu\text{g}/\text{L}$ .

**Understanding phosphorus sources and estimating needed reductions is the first step in restoring lake health.**

Because phosphorus levels exceed this standard of 22  $\mu\text{g}/\text{L}$ , Lake Carmi is listed as impaired, which requires a TMDL—or Total Maximum Daily Load—by the federal Clean Water Act. In 2008, DEC developed the Lake Carmi TMDL, which was approved by the United States Environmental Protection Agency. A TMDL is a pollution budget that estimates phosphorus pollution reaching the lake from sources in the watershed and establishes phosphorus pollution targets that would allow Lake Carmi to meet its phosphorus standard (22  $\mu\text{g}/\text{L}$ ).



**The Lake Carmi Action Plan, Lake Champlain TMDL Implementation Plan, and Act 64 identify the actions, tools, and resources needed to achieve clean water.**

The Lake Carmi Action Plan, developed by DEC with federal, state, and local partners, identifies specific actions in the watershed to meet phosphorus targets, as well as additional monitoring and assessment needs.

The most recent update of the action plan reflects the resources provided by the adoption of the 2016 Lake Champlain Phosphorus TMDL Implementation Plan. The Lake Champlain implementation plan outlines how we will reduce phosphorus loading within the entire Lake Champlain Basin, which includes Lake Carmi. The Legislature made resources available to support implementation through passage of the Vermont Clean Water Act. Both the Lake Champlain implementation plan and Act 64 will directly support efforts to achieve clean water in Lake Carmi.



Kayakers at Lake Carmi State Park (Photo credit: Mark Sweeney)

Learn more at [dec.vermont.gov/watershed/cwi/restoring/carmi](https://dec.vermont.gov/watershed/cwi/restoring/carmi)  
karen.bates@vermont.gov • (802) 490-6144



## All in – we are all part of the solution.

Whether you are a landowner, farmer, municipal official, developer, or logger, as Vermonters, we all have a responsibility to protect and restore clean water. A 40% reduction in phosphorus loading is required across all land uses in the Carmi watershed, including agricultural lands, state and municipal roads, and lakeshore properties. This requires a long-term commitment from all of us.

The Vermont Department of Forests, Parks, and Recreation recently designed a new wastewater treatment system for the Lake Carmi State Park, to be completed in 2018. This will nearly eliminate phosphorus discharges from the park facilities.

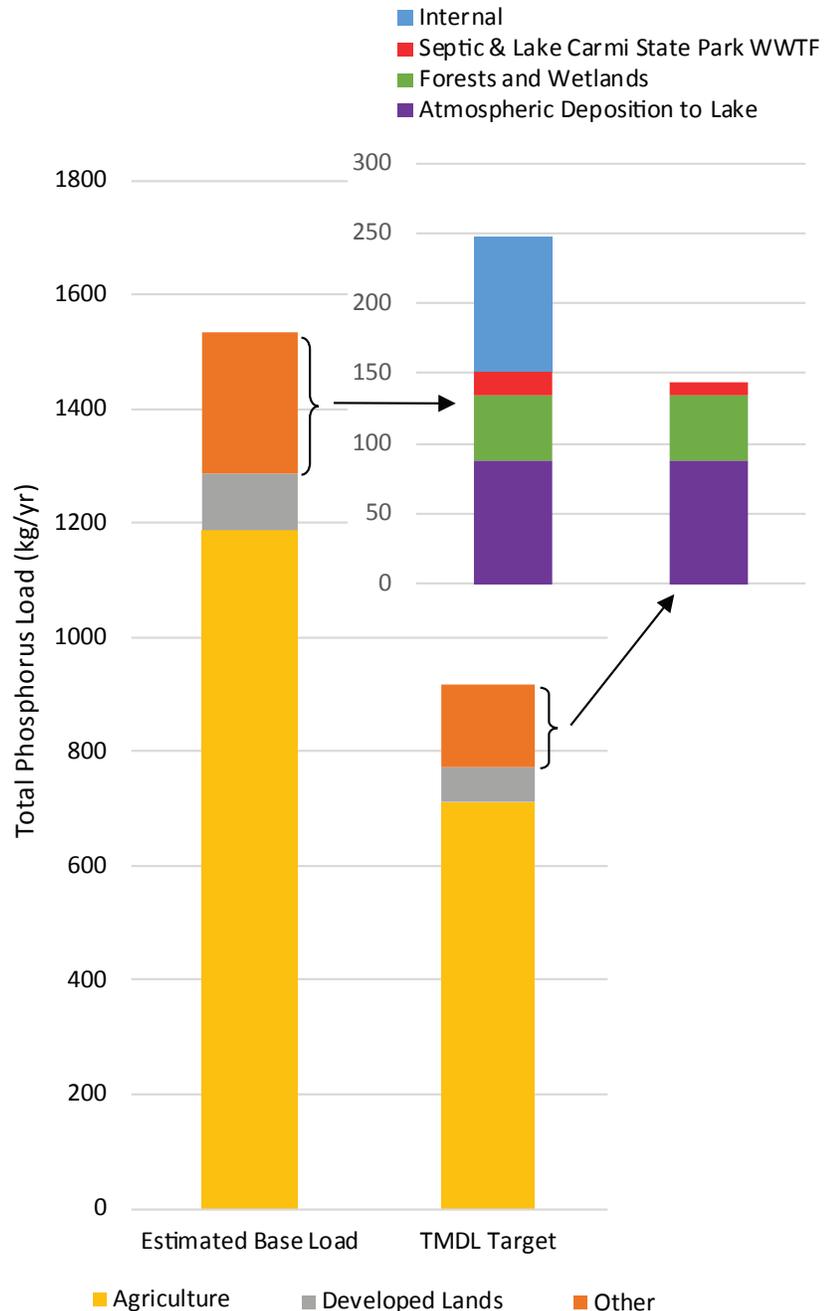
Additionally, in-lake treatment options to address internal phosphorus loading from lake sediment are being considered, which may aid the lake in its recovery as phosphorus inputs from the watershed are reduced.

## Vermont's tracking and reporting systems will measure progress toward meeting phosphorus targets.

The State summarizes pollutant reductions of State-funded clean water projects implemented each year, including agriculture, stormwater, road erosion control, natural resources restoration, and forestry and logging erosion control projects. This data is available through the annual Clean Water Initiative Investment Report. For more information, visit: [dec.vermont.gov/watershed/cwi/reports](http://dec.vermont.gov/watershed/cwi/reports).



## Estimated phosphorus pollution sources (below, left) and TMDL phosphorus target (below, right), which is a 40% reduction in the total phosphorus load.



DEC staff and local partners monitor water quality in Lake Carmi (left).

Learn more at [dec.vermont.gov/watershed/cwi/restoring/carmi](http://dec.vermont.gov/watershed/cwi/restoring/carmi)  
[karen.bates@vermont.gov](mailto:karen.bates@vermont.gov) • (802) 490-6144



**VERMONT**  
 AGENCY OF NATURAL RESOURCES  
 Department of Environmental Conservation