

## DAMS AND RESERVOIRS IN THE LAKE CHAMPLAIN RICHELIEU RIVER BASIN

### MYTH

**Water released from tributary dams in the United States causes flooding in Lake Champlain and the Richelieu River.**

### FACT

**Water levels in Lake Champlain and the Richelieu River are primarily affected by precipitation from rain or snowmelt.**

Because of its size, Lake Champlain can store a lot of water; the flood control dams and reservoirs in the basin, which are very small in comparison to the lake, do not significantly change water levels of the lake and river as they release water.

This is true even during high water and flooding events. Consider, for instance, when Lake Champlain and the Richelieu River experienced extreme flooding between April and June 2011, the additional releases flowing from Waterbury Reservoir—the largest flood control reservoir in the Vermont portion of the basin, contributed less than 2 centimetres ( $\frac{3}{4}$  inch) to the elevation of Lake Champlain and the upper Richelieu River.

Generally, mass releases of water from flood control dams are avoided. In addition to compromising the structural integrity of the dams, mass releases would also endanger the very communities that these dams are built to protect.

When conditions force the release of more water than hydropower plants can handle, the increase in water levels immediately below the dam will be much greater than the increase on Lake Champlain.

## FACT

**Dams in the US portion of the basin are built for one of two purposes: flood control or hydroelectric power.**

Dams and reservoirs built for flood control typically protect downstream communities from flooding by storing or slowing down water flow. Hydroelectric dams have little to no capacity to store water and are not typically used for flood control.

## FACT

**Waterbury Reservoir in Vermont is the largest reservoir built for flood control in the Lake Champlain basin.**

Its drainage area represents about 10% of the Winooski River's total drainage area, and a little over 1% of the entire Lake Champlain drainage area.

[The Waterbury Reservoir](#) is located on the Little River, a tributary to the Winooski River. This river begins on Mount Mansfield and drains the Stowe ski area. The dam is owned by the State of Vermont Department of Environmental Conservation.

Waterbury Reservoir is drawn down during winter months to better accommodate spring snowmelt runoff. During spring flooding, the dam is operated in flood control mode to capture the melting snow pack and spring rain events. Though water releases from the reservoir typically occur throughout the spring, outflows at Waterbury Dam do not significantly influence water levels in Lake Champlain.



Waterbury Reservoir. Photo Credit: Barry Solman, courtesy Vermont State Park

## FACT

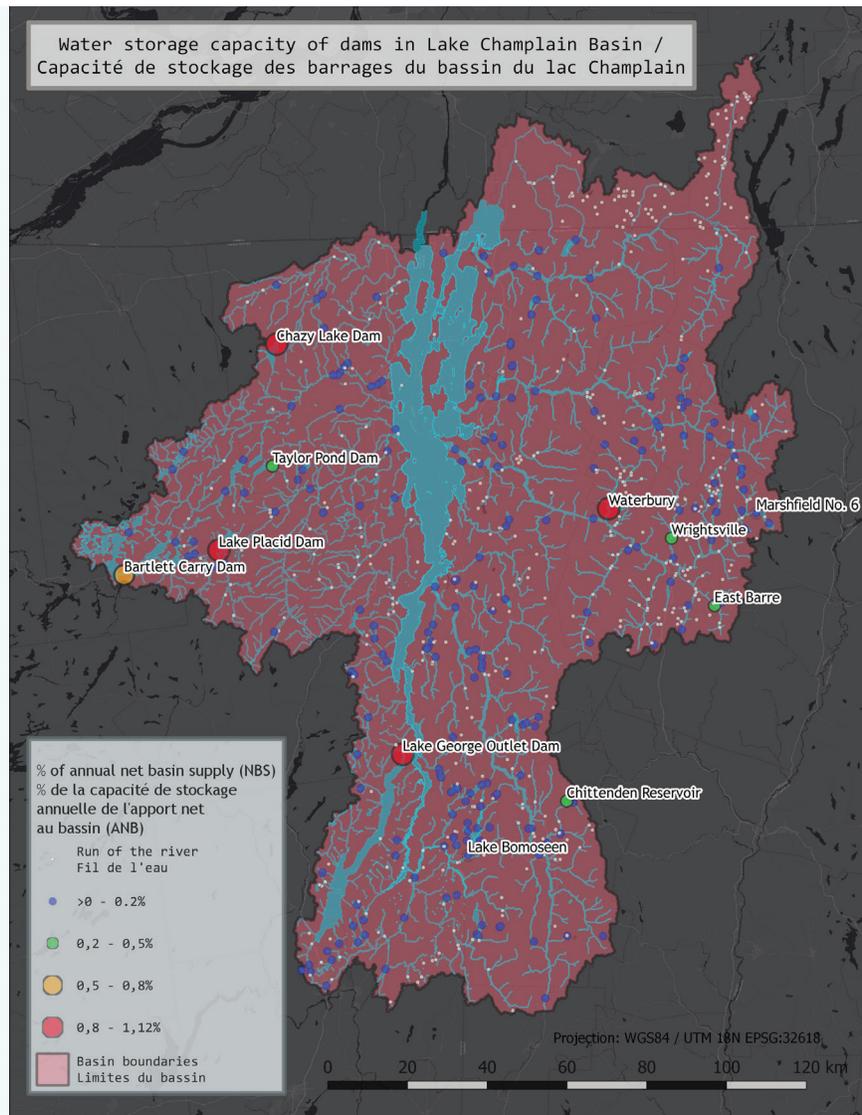
### The operation of dams and reservoirs in the basin has a minimal effect on water levels in Lake Champlain.

This map shows the location of dams and reservoirs in the Lake Champlain drainage basin. The legend explains the maximum amount of water they can store.

The storage capacity is represented as a percentage of the total water in Lake Champlain—also known as Net Basin Supply (NBS) of water flowing to the Richelieu River during a year.

The majority of these dams, shown with small white and blue dots, have very little storage capacities, with each able to store less than 0.2% of the annual NBS.

Dams represented by green, yellow, and red dots are larger, with storage capacities between 0.2 and 1.12% of the annual NBS.



## Other dams and reservoirs in the basin

[Wrightsville Reservoir](#), on the North Branch Winooski upstream of Montpelier, VT, and East Barre Dam on the Jail Branch upstream of Barre, VT, were constructed, along with the Waterbury Reservoir, after the Great Flood of 1927.

Wrightsville Reservoir is also used for recreation and is typically maintained at one-third of the flood storage surface area. The impoundment behind East Barre Dam is commonly kept dry. These reservoirs are intended to protect the municipalities that are immediately downstream. Releases are controlled to minimize downstream flooding.

[Marshfield Dam](#) on Molly's Brook in Cabot, VT is owned and operated by Green Mountain Power. It is not designated for flood control and is primarily operated for power generation and recreation. The drainage area of Marshfield Dam is fairly small—approximately 22 square miles (57 square kilometres) and, as with Waterbury Reservoir, outflows from the dam have no significant influence on Lake Champlain elevations.

[Lake George](#) in New York State is the largest tributary lake draining to Lake Champlain, with approximately 10 times the volume of all the other basin reservoirs put together. It has a dam at its outlet to manage its levels.

As a natural lake, excess water is never held back at the outlet; the lake primarily exists for recreational purposes and any water discharge is used to manage Lake George levels.

On the Saranac River, which flows through Plattsburgh, New York, flows are driven by the volume of runoff—not dam operations, since most of the hydroelectric dams were not designed for water storage and flood control. The hydroelectric dams with limited ability to store water include Union Falls, Franklin Falls and the Lake Flower Dam in the village of Saranac Lake.

Numerous other dams exist in the basin, such as those in the tributaries of Lamoille River, Otter Creek and Missisquoi River, in Vermont. As is the case on the [Saranac River](#), these are for the most part run-of-river power generation dams, meaning that they have little or no water storage capacity and do not impact flood levels.

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