

How did the geology of Vergennes help win the War of 1812?

A look at Vergennes and its role in the defense of Lake Champlain

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Background

Despite America having “won” its independence from Britain a couple years earlier, in 1812, the two countries came to blows once again. Britain sought to divide the country by gaining control of important waterways. One of these waterways was Lake Champlain.

Lieutenant Thomas Macdonough, sent to command the American fleet on the lake, chose to bolster his strength by building more ships and, in 1814, he set up winter headquarters below the falls of Vergennes (Macdonough Centennial, 1914).

“Her site was in the midst of a fertile and productive country, her water power was unrivaled, the whole body of water in Otter Creek, with a fall of thirty-seven feet was available for industrial purposes, the location for mills were particularly free from danger by reason of freshets, her means of transportation were all that could be desired, her people were intelligent, numbering among them some of the brightest minds in the state.” – Comment About Vergennes at Macdonough’s Centennial Celebration

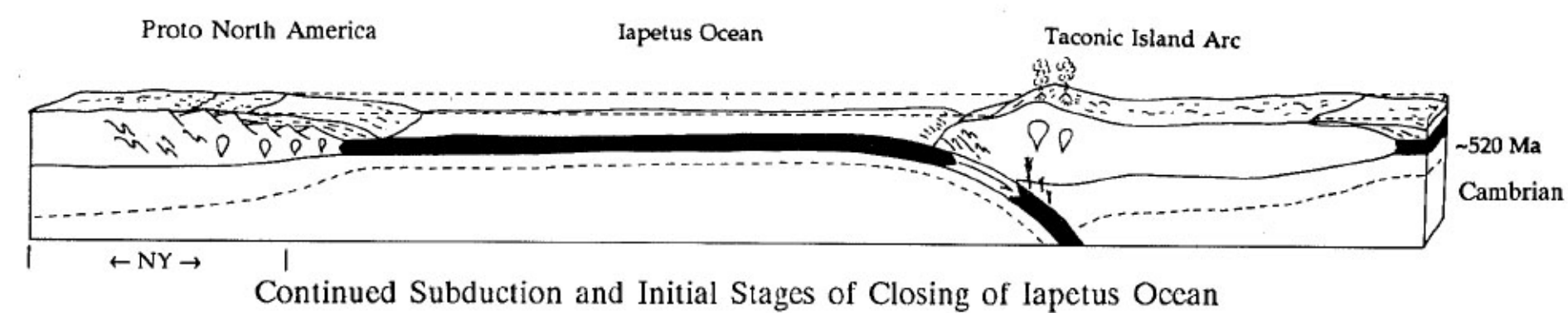
Vergennes, already having established a shipyard below its falls, was a logical site for Macdonough to construct the vessels that would eventually lead him to deny the British control of the waterways and help to win the war of 1812.

An Iron Defense

Iron deposits found in nearby Monkton were critical to the war effort. In the early 19th century, iron was used for making weapons, building ships, and for making ammunition, or “shot.” So, the fact that Vergennes had a ready supply of iron and sites that were already built for extracting and working with iron was no coincidence.

The first iron works in Vergennes had been established in 1786 but went through many difficulties and closed down in 1811. However, the War of 1812 reinvigorated operations at the iron works as they were required to supply 300 tons of shot to prepare for the war (Rolando 1992). This ammunition was a key factor in Macdonough’s victory in the Battle of Plattsburgh where he outlasted the monster of a ship Confiance by rattling her with 105 holes versus the 55 that the American Saratoga took (Millard 1997).

How did the iron that was to be used in the Battle of Plattsburgh form? And why can it be found in Monkton? Unfortunately there has not been very much research done on the iron deposits of Vermont, but from studying the surrounding geology, the history of Monkton’s iron ore can be pieced together. It all begins millions of years ago when the Grenville supercontinent rifted and pulled apart to form the Iapetus Ocean. About 550 Million years ago, the plates stopped diverging and the Proto-North American Plate started subducting under the Taconic plate, creating the Taconic Island Arc. When the Taconic Island Arc ended up colliding with the Proto-North American plate, parts of the sea bed were pushed above other surface rocks due to thrust faulting, leaving remains of the Iapetus ocean on the Taconic and Green Mountain ranges (Isachsen, 2000).



Iron would most likely have concentrated near sources of heat (heat vents and the subduction zone) on the Iapetus Ocean floor, which would later have been thrust above older rocks on North America to help form what would be the Green Mountains.

(Right)
This map shows the proximity of Vergennes to its iron resource as well as to Lake Champlain. The 7 miles of Otter Creek downstream of Vergennes is highlighted in yellow.

(Below Left)
Lieutenant Thomas Macdonough saw the need for adding ships to his fleet in order to compete with the British. Under his command, the American navy was able to repel the invasion from the North.



The Power of the River

Vergennes was a very strategic location for a shipyard. The river itself afforded protection for Macdonough, putting some distance between the lake shores and the shipyard. Vergennes was a sheltered location, far enough away from the lake to be inconvenient for British attack (especially with Fort Cassin’s defense of the river mouth), but close enough to allow quick response to other lake threats (lcmm.org). The delta and the river itself were also wide and deep enough to allow Macdonough’s warships weighing as much as 700 tons with drafts of 6 ½ feet (Hughes, 2012) easy passage to the lake.

Of course, none of this would have mattered without the falls at Vergennes, which gave the city the energy necessary to establish itself as an industrial center, which in turn became the foundation upon which Macdonough built his ships. Early on, the falls were harnessed for their power to run “eight forges, two furnaces, a wire factory, a rolling mill, gristmills, and sawmills” (lcmm.org). Without this solid base, the ships would not have been able to be constructed in the rapid manner that they were, if at all. The ship, Saratoga, was converted from growing trees into a 143 foot long frigate in only 40 days—20 less than expected. The quick turnaround was necessary to keep the British at bay and deny them access farther down Lake Champlain. Over the course of the winter of 1814, nine ships were constructed at Vergennes: Saratoga, Ticonderoga, Allen, Borer, Burrows, Centipede, Nettle, Viper, and Eagle/Surprise (Millard, 1997).



(Left)
Macdonough’s shipyard would have been found in the waters below the falls. Today, a park exists in its place to commemorate the impressive feats of the shipbuilders.

(Above Right)
This map shows the origin of the rock of Vermont. The area of Vergennes and Monkton (red box) is primarily made up of limestone and marble created from the sediments of an ancient ocean floor. Limestone is easier to erode than many of the other types of bedrock that are present in Vermont.

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So what lead to the creation of a river that was so appropriate for Macdonough’s needs? This river runs between the Taconic and Green Mountain ranges in what is called the Vermont Valley which was created partially by the last glacial cycle as well as erosion by the rivers that ran through the valley after the glacier receded. There most likely would have been a lot of erosion from the rivers after the glacier moved north because of the lack of vegetation to hold soil together, the extra sediment left over from the glacier, as well as the isostatic gradient that created a steeper grade for the old Otter Creek. The composition of the underlying rock would have also contributed to the amount of erosion; the mountainous areas are made primarily of gneisses, phyllites, and schists which are harder to erode than the softer limestones and marble of the Champlain Valley that was formed from what was once an ocean bottom. So, downstream, the river was probably able to cut deeper and wider into the land (Blazewicz 2009).

But where was all the sediment going? It would have been deposited in the river’s delta, creating a substantial alluvial fan, but since the lake was more extensive in earlier periods, much of this sediment would have ended up on what are now the kane terraces that lie in the Champlain Valley (Chernicoff 2006). We know that isostatic movement of the plates has caused Vermont’s waterways to change dramatically over the last thousands of years, and so Otter Creek has also changed its course and mouth on Lake Champlain, leading to less buildup of sediments, and therefore a more convenient entryway for ships.

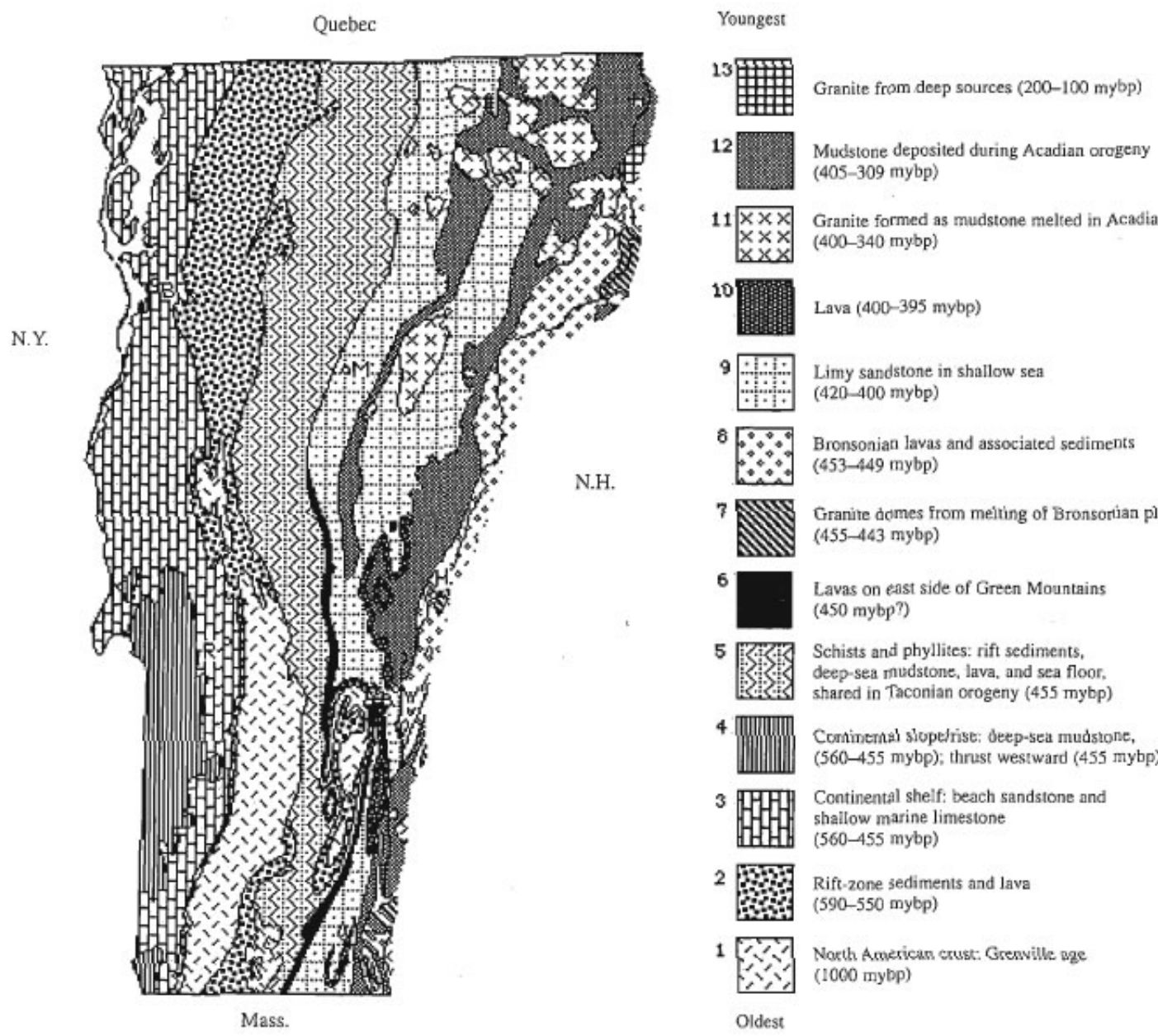


Figure 1. Generalized geologic map of Vermont and New Hampshire produced by David Lang, 1992. NYBP = Millions of years before the present. B = Burlington, M = Montpelier, R = Rutland, W = Windsor, H = Hanover, New Hampshire.

The change in water flow may also have been the reason that the vital falls exist today. The fact that there are waterfalls in this river indicates that it is a recently formed waterway, or that it has changed its course drastically enough that it has yet to erode the waterfall/knickpoint. Knickpoints are formed when there has been a shifting of the land creating a sharp change in elevation or when a river runs over different materials creating different rates of erosion. For example, downstream may have eroded away easily where the river was flowing over softer rocks, whereas upstream, if the river was flowing over harder rock, it would erode its surroundings slower. This may have been the case with the Vergennes Falls which drops a full 37 feet and, like all knickpoints, slowly migrates upstream due to erosion at the lip of the falls (Chernicoff, 2006).

However the Vergennes Falls were formed, they were undeniably crucial to the development of the city of Vergennes and the building of Macdonough’s ships that helped America win the war of 1812.