



“Where do lakes come from?”

by Andrea LaMoreaux, NH LAKES (Spring 2012)

“Mom, I was wondering,” began my three-year-old daughter a couple of weeks ago while we were driving past Lake Massasecum—the lake we call home. I had no idea what was going to come next from my inquisitive, little scientist. “Where do...” she continued. At that point, I began to panic. Was she going to ask the question that most parents dread—was she going to ask where babies come from? Please, no, I begged, I’m not ready for that yet.

“Mom, where do lakes come from?” Panic was replaced with relief, and then, quite truthfully, with disbelief—did she really ask me, her lake scientist mother, where lakes come from? “Mom, did you hear me? Where do lakes come from?” I admit—I couldn’t have been more proud or happy at that moment. “MOM...DID YOU HEAR ME?”

Ah, the patience of a three-year-old. I needed to respond fast to capitalize on the teachable moment, but wondered how to sum up complicated geological processes, some that take thousands of years, in a way that a preschooler might make sense of. “Well, lakes are big holes,” I began. “Really big holes in the ground that took a really, really long time to fill up with rain and melted snow.”

“But, how did the holes get there?” This, of course, was her next question.

“Now, that’s a good question, a very good question.” I responded, trying to buy some time. “Well, you see, the holes could have been made by the ground moving, volcanoes erupting, or mud sliding around. In New Hampshire, most of the holes were made by huge chunks of ice moving around.”

“Hmm...ok.” She seemed satisfied, but not terribly intrigued by the explanation. As quickly as her curiosity about how lakes came to be was piqued, it vanished. The conversation abruptly transitioned into an interrogation about what we were going to have for lunch.

A few mornings later, much to my surprise, she continued our “how lakes came to be” discussion. “Mom, you know what I think?” I hadn’t a clue, but knew that she was going to tell me. “I think Lake Massasecum was dug out by a bunch of workers with shovels. It took about a week and then they left and dug out Lake



No matter how your favorite lake in New Hampshire was formed, there’s plenty to enjoy!

Sunapee.” All I could do was laugh—can you just imagine New Hampshire’s approximately 1,000 lakes and ponds being dug out by hand? What an undertaking that would have been! Of course some lakes have been partly constructed in that way, but most have had more exciting origins, exciting at least in geological terms.

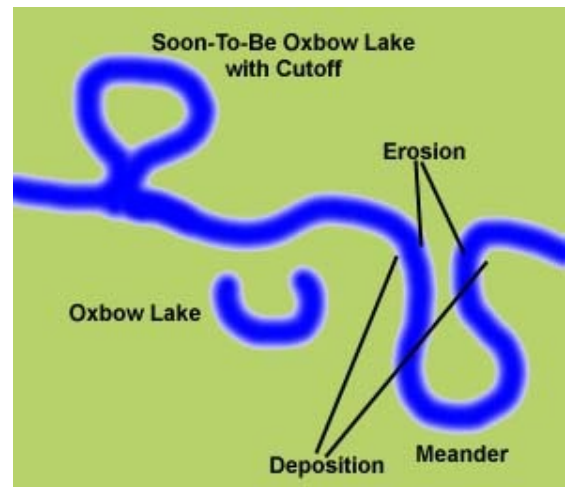
Most of New Hampshire’s lakes were formed by the movement of glaciers approximately 15,000 years ago. As the glaciers moved across the landscape, tops of mountains and hills were sheared off and other areas of the landscape were gouged out under the tremendous weight of the ice sheet which was, at times, a mile thick over New Hampshire. As a result of this action, the face of the landscape was permanently altered. When the glaciers began to melt and recede north, they left behind huge basins and piles of rocks and boulders strewn across the landscape. Over time, the basins filled up with water, forming many of the lakes we now know. Lake Winnepesaukee, formed by glacial activity, and with a surface area of approximately 72 square miles, maximum length of 21 miles, and width of up to nine miles, is the state’s largest lake. Newfound Lake in Bristol, also formed by glacial activity, with a maximum depth of 183 feet, is the deepest lake in the state.



Newfound Lake, the deepest lake in New Hampshire, along with most lakes in the state, was formed by glacial activity.

Receding glaciers also left behind blocks of ice buried under sand and gravel. As the remnant ice melted, the sand and gravel caved in leaving behind relatively circular basins that eventually filled with water. These types of lakes, referred to as ‘kettle ponds,’ include: Chocorua Lake in Tamworth; Pea Porridge Pond in Madison and Conway; and Mirror Lake—one of the most highly studied kettle ponds in the world—in the Hubbard Brook Experimental Forest in the White Mountain National Forest.

Some of New Hampshire’s lakes were formed by rivers. As a river winds its way across the landscape, the water going around the outside edge of a bend in the river has a great deal of speed and power which leads to the wearing away (erosion) of the outer bank of the river. This action allows the river to meander further and further out into that eroded bank and the surrounding landscape. The eroded materials (dirt, sand, gravel, and rocks) are carried by the fast-flowing water, eventually being deposited and accumulating where the river has less energy, typically the inner portion of a river bend. Over time, the course of the river may change, seeking a straighter path of less resistance. The outside areas of the meanders may then be cut off from the main river channel forming an ‘oxbow lake.’ Oxbow lakes are typically shaped like a ‘U’ or ‘C’ and, relatively speaking, are not very deep or old. In New Hampshire, Horseshoe Pond in Concord is an example of an oxbow lake formed by the meandering of the Merrimack River.



Some lakes in New Hampshire were formed by rivers, as show in this diagram. Source:<http://geography.about.com/library/weekly/aa010601a.htm>

Lakes are formed by the movement of the earth’s crust. The outer portion of the earth’s crust is made up of approximately a dozen or so slabs of thick rock (tectonic plates) that fit together like a jigsaw puzzle. Forces

from deep within the earth cause these plates to move and sometimes collide, creating mountains and basins. These basins may eventually fill up with water, creating 'tectonic lakes.' Notable tectonic lakes include: Lake Baikal in Siberia, the world's oldest (at least 25 million years old) and deepest lake (5,387 feet); and Lake Tahoe in California and Nevada, which is approximately 2 million years old and 1,645 feet deep.

Lakes are formed by volcanic activity. When forces from deep within the earth cause volcanoes to erupt, sometimes rock and other earthen material are violently ejected upward and a depression is left behind. Other times, molten rock seeps slowly out of a volcano, making it a hollow cave with a relatively thin and heavy roof which may collapse. Both volcanic processes can result in a basin sealed off with solid rock on the bottom that eventually fills with water. Some of the deepest lakes in the world are 'volcanic lakes.' Crater Lake in Oregon, formed approximately 7,700 years ago by the collapse of the volcano Mount Mazama, is, at 1,949 feet deep, the seventh deepest lake in the world and the deepest lake in the U.S.

Lakes are formed by landslides. Landslides are sudden movements of large quantities of loose soil and rocks and other earthen material, usually caused by excessive rainfall or earthquakes. A temporary or permanent 'landslide lake' can form when a large amount of earthen material falls from a steep slope into a stream valley, damming the flow of a stream or river. In New Hampshire, the south side of Profile Lake, located in Franconia Notch at the base of Cannon Mountain, is dammed by landslide debris.

Lakes are formed when underground rocks are dissolved by water running across the landscape. Rock formations made of salt or limestone are easily eroded away by water which can result in basins that fill up with water. These types of lakes, referred to as 'solution lakes,' are most common in Florida, and can also be found in the mid-west. Since most of the rock formations in New Hampshire contain primarily granite which is not easily eroded, and few contain significant amounts of limestone, solution lakes in the Granite State are not common.

I wouldn't a good mom if I didn't acknowledge that my daughter was at least partially right—some lakes are indeed man-made. Throughout history and across the globe, man-made lakes have been constructed to provide drinking water, power, recreation, and flood control to the public. These lakes usually go hand-in-hand with dams which control the amount of water in them. One of America's most well-known man-made lakes is Lake Meade which was created by the construction of the Hoover Dam. In New Hampshire, man has made many lakes and ponds larger than Mother Nature originally designed them by putting in dams at their outlets.

No matter how each of New Hampshire's approximately 1,000 lakes and ponds were made, each one is unique and has much to offer—boating, fishing, bird watching, swimming, waterskiing, tubing and more. Enjoy!

NH LAKES is the only statewide, member-supported nonprofit organization working to keep New Hampshire's lakes clean and healthy, now and in the future. The organization works with partners, promotes clean water policies and responsible use, and inspires the public to care for our lakes. For information, visit www.nhlakes.org, email info@nhlakes.org, or call 603.226.0299.

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