

SEBAGO LAKE

WATERSHED NEWS

Photo by Melissa Foss

SPRING 2018

Portland Water District · 225 Douglass Street · Portland, Maine 04104-3553 · 207.761.8310 · www.pwd.org

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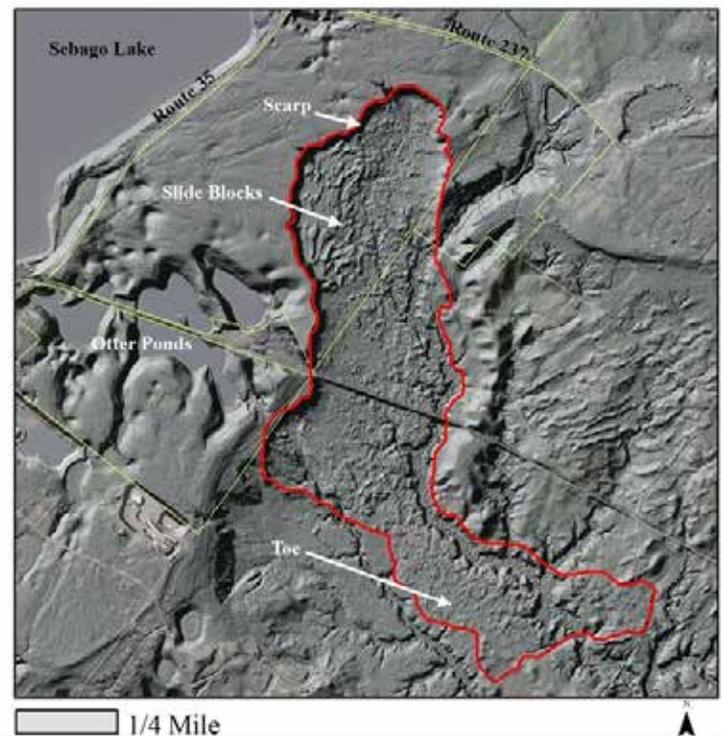
Pre-Historic Landslide Discovered on the Sebago Lake Land Reserve

By Lindsay Spigel and Kirsten Ness

If you have spent any time hiking or biking the 13.5 miles of trails in the Otter Ponds area of the Sebago Lake Land Reserve, you may have noticed some interesting dips and slopes in the landscape. Just recently, we have learned more about the history of this property and how the landscape was formed.

The landscape was shaped by the movement of ice during the last Ice Age, 15,000-20,000 years ago and the depositing of sediments as the glacial ice that covered the area melted. However, sometime after the end of this glacial period a large landslide occurred in the area, changing the topography of the area to what it is today. Surprisingly, the area was not recognized as a landslide until just a few years ago, when a new type of topographic data called LiDAR became available. LiDAR stands for Light Detection and Ranging and is collected by planes that scan the earth's surface with lasers. The lasers reveal the topography of the bare earth in much finer detail than traditional topographic maps – the LiDAR can sort of “see through” the trees. Imagery created from LiDAR data has uncovered over 100 pre-historic landslides that were previously hidden by thick forest cover.

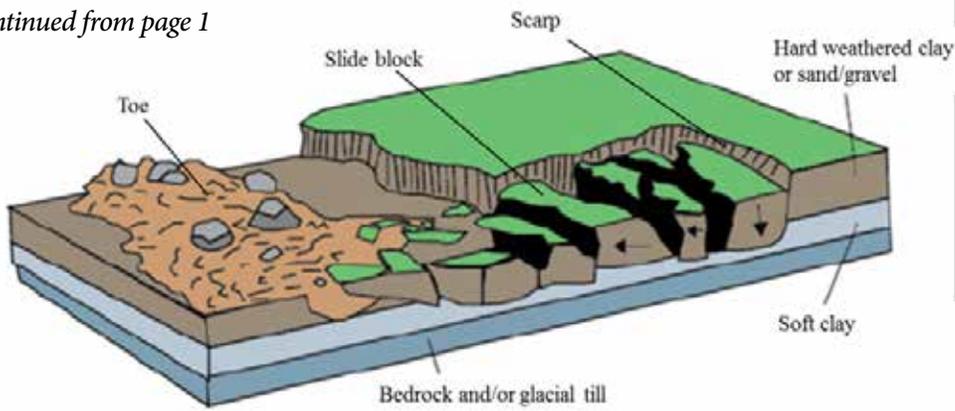
The landslide occurred on the SLLR because the Otter Ponds area consists of a thick section of sand and gravel resting on top of a slippery sediment referred to as “blue clay.” The blue clay is a sediment type found in many places in Coastal Maine from Kittery to Bangor and is known as the Presumpscot Formation. It was deposited under ocean water so when you find it you know that you're standing at a place that was previously covered by the ocean. Imagine the ocean as far inland as where Sebago Lake sits today! Blue clay can occur as a rock hard or slippery material. It was used by Native Americans to make clay pots



LiDAR topographic imagery of the Sebago Lake Land Reserve area. The Reserve properties are outlined in green. The landslide is outlined in red.

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3-D Illustration of a landslide in sensitive clay (modified from USGS figure). This scenario is likely similar to what happened during the Sebago landslide. Compare to features on LIDAR imagery of the Sebago Lake Land Reserve area.

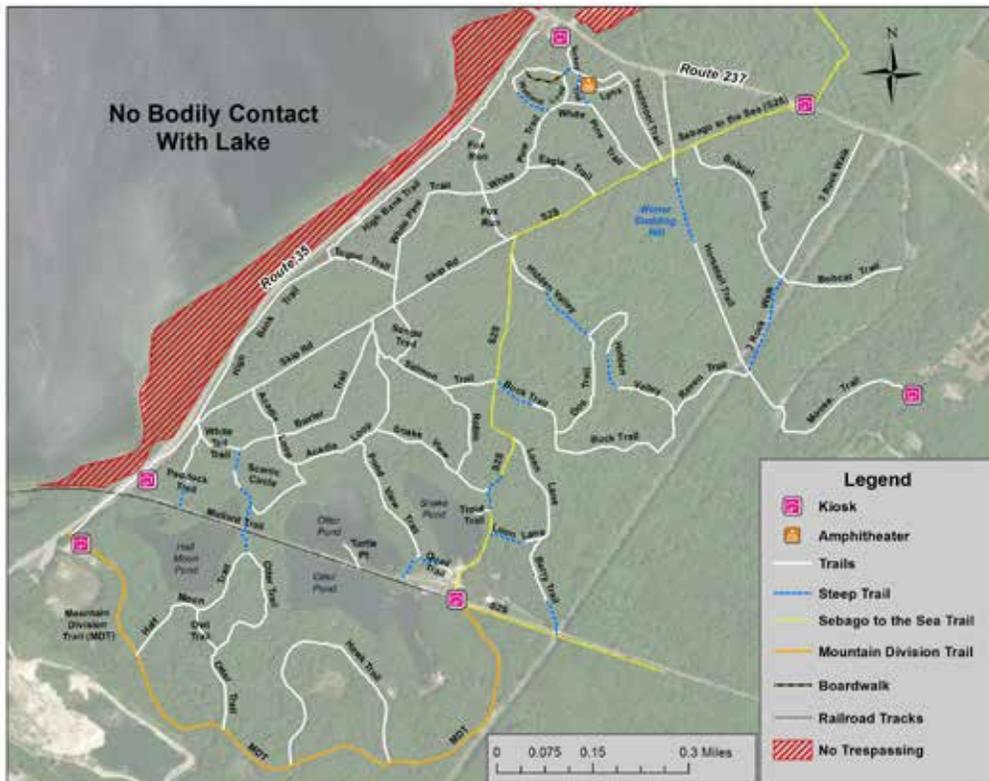
and later in Maine's brick industry. The clay can become unstable and flow if it is disturbed by an event such as an earthquake, or when a slope is overloaded or over-steepened, resulting in a landslide like the one on the SLLR. The steep slope on the Horsetail and Hidden Valley Trails is the scarp, which is the slope that marks the boundary

between the disturbed and undisturbed earth materials. The Sebago landslide scarp is about 50 feet high, which is quite a drop. The rolling topography within the landslide is created by **slide blocks**, which are chunks of earth materials that stayed together during the landslide. The Hidden Valley, Raven, Doe, and Buck Trails are excellent places to see the slide

blocks up close. If you investigate you'll see that they are composed of the sand and gravel that was originally piled on top of the blue clay. Southeast of the SLLR, the slide blocks become smaller and more subtle, degrading into a mix of materials that make up the lower boundary of the landslide known as the toe. From scarp to toe, the Sebago landslide is about 321 acres.

The landslide area is an interesting walk because of the forest vegetation and temperature change as you move from the top to the bottom of the landslide. On a summer day, the top of the landslide is warmer while the bottom is cooler and more shaded. The vegetation also changes from a forest dominated by white pines to one that has more hemlock trees. And as you move down the slope away from the hum of Route 35, the landslide area is a quiet escape with lots to look at and take in.

The Maine Geological Survey has been working on a project to determine the ages of landslides in Maine that were discovered through LiDAR, and the Sebago landslide is part of that study. This project will utilize radiocarbon dating of vegetation that was buried by, caught up in, or deposited on top of the landslide to approximate its age. Once we know the age of the landslide, we can form better guesses about what caused the landslide. Until then, come check out the SLLR and enjoy the landscape that the landslide created.



PORTLAND WATER DISTRICT OWNS 2,500 ACRES of land around the Lower Bay of Sebago Lake, known as the Sebago Lake Land Reserve (SLLR). Some of the land closest to the lake is restricted but 1,700 acres are open to the public for outdoor recreation. The part of the SLLR near the Otter Ponds is home to 13.5 miles of forested trails for activities such as hiking, biking, cross country skiing, snowshoeing, or dog walking.



Lindsay Spigel is a geologist at the Maine Geological Survey. She can be reached at lindsay.spigel@maine.gov



Kirsten Ness is a water resources specialist at the Portland Water District. She can be reached at kness@pwd.org

Native Plant Spotlight:

**LOW BUSH
BLUEBERRY**
(*Vaccinium angustifolium*)



Low Bush Blueberry (*Vaccinium angustifolium*)

Size: Grows 4 to 24 inches high and spreads to form a mat.

Foliage: Leaves are bright green in summer and turn an attractive red in the fall. Small, white bell-shaped flowers turn into edible, blue fruit in late summer.

Bloom time: Spring

Soil conditions: Prefers an acidic, well-drained soil.

Light: Full sun to partial shade.

Notes: Attractive to wildlife and edible for humans. A very popular, easy to grow groundcover shrub that is great for controlling erosion on lakefront properties. It is available at local nurseries as individual plants or rolls of blueberry sod for larger installations.

Zones: 2-6

Visit the Sebago Lake Protection Office to see examples of this and other native plants!





A Lake That Does Many Things Needs Many Levels of Protection

By Paul Hunt

Photo by Patrick Keeley

Sebago Lake is a multi-use lake used by many for so much. Because it provides drinking water to about one of every six Maine residents, it is our state's most important drinking water supply. The lake and the land that drains to it, known as the “watershed,” is also home to many valued fisheries. It is surrounded by many campgrounds and boys and girls camps, provides the backdrop for thousands of prized vacation and year-round homes, supports a boating

economy that includes three public boat launches and about a dozen marinas, and is a vacation destination for tens of thousands of visitors each year. It is one of Maine's most important natural resources. Because of its versatility, we all stand to lose a lot if the lake is mistreated and declines in quality. As a public water supplier, the Portland Water District is required to have what is referred to as a “Watershed Control Program.” This is a protection strategy or plan that identifies what

could adversely impact the lake and prevents those things from happening. Some water supply lakes are mostly off limits to any public activity and, for those, the restrictions on access ARE the watershed control program. Sebago Lake, by contrast, is used for so many things that protecting it also requires that more than one protective measure be employed. The protection strategies that make up the Sebago Lake Watershed Control Program can be grouped into six main categories:



Photo by Mark Hunt

1. WATER QUALITY MONITORING

Ensuring a protection strategy is working requires that you monitor the condition of what you're protecting. The District maintains 14 lake and watershed monitoring programs.



Photo by Mark Hunt

2. SECURITY

Though there are state and federal laws that were passed to protect this and other water supplies, laws have to be enforced in order to ensure they work.



Photo by Mark Hunt

3. INSPECTION AND DIRECT ACTIONS

Development of properties around the lake can impact water quality if not done properly. The District works with municipalities and state agencies to inspect land use projects when they happen and to take action to prevent soil and other contaminants from washing into the lake.



Photo by Mark Hunt

4. EDUCATION

Someday our children will be running things. They will own the properties and businesses around the lake and will be customers of the District. Teaching them about how the lake is protected and why it is important will ensure that they will care for it at least as diligently as we have.



5. ENVIRONMENTAL OUTREACH

You would be hard pressed to find someone who uses the lake who doesn't agree that keeping it clean is important. So we share information about the lake, about what threatens it, and about how to protect it with visitors and residents to enlist their help in protecting it.



6. LAND ACQUISITION, LAND CONSERVATION, and LAND MANAGEMENT

What happens on the land in the watershed impacts the water quality of the lake. The District purchases certain properties from willing sellers, contributes to the conservation of forests

by land trusts, and supports responsible management and development of privately-owned properties.

Over the next several issues of the Sebago Lake Watershed News, we will describe each of these Watershed Control Program elements more fully so you can understand what we do and why. More importantly, maybe you will see a way you can contribute. Protecting the lake is a collaborative effort. You are part of the effort. In almost every component of our lake protection program, we work in concert with individuals and organizations who care as deeply about the long-term health of the lake as we do. We could never protect such an enormous public resource alone.



Paul Hunt is the environmental services manager at the Portland Water District. He can be reached at phunt@pwd.org

Contact us!

Have a comment or question about something you see around Sebago Lake? Are you planning a project and need some technical advice on how to comply with local and state laws?

Would you like a matching grant for making improvements to your property that also protect the lake? Set up a free Lakescaping consultation!

Installing or replacing a septic system within 200 feet of the lake or a tributary to the lake? Be sure to apply for your PWD septic system permit! Your water resources specialist is here to help. Sebagolake@pwd.org 207-774-5961

For a project in:	Call
Standish or Sebago	Kirsten Ness ext. 3336
Windham or Casco	Laurel Jackson ext. 3659
Raymond or Frye Island	Nate Whalen ext. 3338
Naples	Brie Holme ext. 3305

What's Making Waves Around Sebago Lake



Photo by Bruce Small



SEBAGO COVE MILFOIL

The Lakes Environmental Association has been working diligently to control milfoil in Sebago Cove for the past two years. They have laid barriers and pulled hundreds of bags of weeds from the cove. The milfoil infestation in the cove is very thick and they anticipate it being a 10-year effort to control the invasive weed.

SEBAGO CLEAN WATERS

The Portland Water District is a member of the recently formed Sebago Clean Waters (SCW) partnership. Sebago Clean Waters is a group of non-profit organizations that seeks to protect water quality, community well-being, and the health of fish and wildlife in the Sebago watershed through voluntary forestland protection. The great water quality in Sebago Lake is largely a function of the natural filtration provided by the forested watershed. Conserving forested land benefits many, including District customers. In addition to the District, SCW is made up of land trusts and conservation organizations that believe by working together they can achieve greater results than would be possible through individual, independent action. For more information visit sebagocleanwaters.org

RICH MEMORIAL BEACH

The Rich Memorial Beach in Standish completed its first official season without a single beach closure being necessary. Historically, PWD has monitored bacteria levels at the beach throughout the summer. When samples exceeded the State's safe-swimming guidelines, the District would close the beach. As part of their management duties, Standish Parks and Recreation took over sampling in 2016 and continued sampling when the beach officially opened in 2017. In 2017, 88 samples were collected and none exceeded the limit. That is great news for water quality and beachgoers alike!



JOIN US IN 2018 - WATER CONNECTIONS EVENTS

In 2018, the Portland Water District will offer outdoor events that connect Sebago Lake watershed residents and our customers to the resources that affect the lake's water quality. Topics we'll explore include Sebago Lake's Protective Zones, lake-friendly landscaping, and woodland uses that protect Sebago Lake. Each event will inform participants of one of PWD's programs, policies, or accomplishments while visiting one of the many trails, forests, mountains, or rivers that influence Sebago Lake.

To learn more about these upcoming events, follow us on Facebook ([facebook.com/MyPortlandWater](https://www.facebook.com/MyPortlandWater)) and join our email list ([email seabagolake@pwd.org](mailto:sebagolake@pwd.org)).



FREE TREES!

Enhance your waterfront property with native trees, shrubs, and ground covers. **Buy 1, Get 1 Free** through our Lakescaping Program. Please contact us at sebagolake@pwd.org to learn more.

WATER WATCH

The ABCs of Algae

By Laurel Jackson

Photo by Bruce Small

What are algae? Algae are organisms similar to plants that are mainly aquatic and lack roots, stems, and leaves. They may be microscopic or they may be many feet long like seaweed. Algae exist nearly everywhere in nature and there are thousands of different species. Algae are important to lake ecosystems for a few reasons. They serve as an important food source for many species, from microscopic animals called zooplankton to larger animals such as snails, turtles, and fish. They also produce oxygen, a critical component of a healthy lake ecosystem, through a process called photosynthesis.

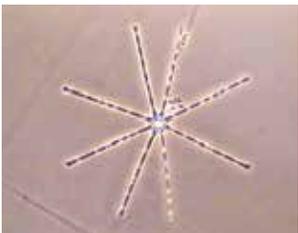
Algae can cause problems in ecosystems if there is too much overall or if there is too much of a certain type. Too

much algae in a lake can be aesthetically unpleasant (green, slimy, scum) and may also negatively impact fish, wildlife, and human populations. All plants need nutrients to grow, and an increase in algae growth is usually due to an increase in nutrients in the lake. A healthy lake will have many types of algae and the amount will vary with the seasons. Some types of algae can cause unpleasant tastes and odors, a particular concern for drinking water supplies like Sebago Lake.

The Portland Water District has been monitoring algae levels since the 1980s and has found that diatoms are the most common type of algae in Sebago Lake. They are microscopic, single-celled organisms that are common in water. While there are many different types of diatoms, they all have the unique feature of having cell walls made of silica. The District's algae monitoring data doesn't show a pattern of increasing or decreasing amounts of algae. This is good news for drinking water quality and for lake users! It is important to continue lake protection efforts so that Sebago Lake's great water quality continues into the future.



A PWD scientist uses a microscope to analyze algae samples from Sebago Lake.



Asterionella is a species of diatom that is commonly found in Sebago Lake. The 200x magnification shows how the cells are often arranged in a star-like formation.



Laurel Jackson is a water resources specialist at the Portland Water District. She can be reached at ljackson@pwd.org

Efforts Continue to Address Erosion Around Sebago Lake

Soil erosion is something we should work on for two reasons:

- 1. it can damage your property and cost you money;*
- 2. soil particles carry nutrients (which feed algae) into the lake.*

The Portland Water District (PWD) and the Cumberland County Soil and Water Conservation District (CCSWCD) have ongoing programs to help property owners deal with erosion and runoff issues.

CCSWCD still has available funds from a federal Sebago Lake protection grant. They can provide cost share funds to address previously identified erosion sites. PWD has a program known as

Lakescaping which can provide you with two forms of assistance. PWD provides free on-site consultations to provide you with ideas for fixing your erosion and runoff issues. Through this program you may also be eligible for up to \$1K for homeowners and up to \$2K for groups (like road associations) who tackle bigger problems.

If you have an erosion concern, please contact either Heather True of CCSWCD at 207.892.4700 or htrue@cumberlandswcd.org or Kirsten Ness of PWD at 207.774.5961 ext. 3336 or kness@pwd.org, for free recommendations and potential cost share assistance.



Before and after of eroding ditch/road shoulder on State Park Road in Naples regraded and stabilized with grass and a mulched berm.

Get PWD News Electronically!

In an effort to reduce waste, be more cost effective, and share news efficiently, the Portland Water District began creating an email distribution list several years ago. The list has grown to over 4,000 recipients who receive emails from PWD about six times a year. Emails contain information about lake protection and our popular outreach events. Twice a year, electronic Watershed News editions, just like the one you are reading, are also distributed via this list.

Be the first to know about our events and save paper, costs, and time – sign up today! Email your request to sebago-lake@pwd.org.

Are you on Facebook? The Portland Water District is! Stay up-to-date with information about Sebago Lake and our events and programs through social media. Search “My Portland Water” and stay connected!



Win a Free Rain Barrel!

Who has a copy of the oldest Sebago Lake Watershed News? Win a free rain barrel if it is you! Contest rules: submit a picture of your oldest copy of the Watershed News to nwhalen@pwd.org. Contest will close on June 1st, 2018. The person with the oldest version will win a rain barrel. Good luck!

Prefer to receive this newsletter by e-mail? Let us know! sebago-lake@pwd.org



The Sebago Lake Watershed News is published by the Portland Water District.

Editorial Team: Michelle Clements, Brie Holme, Paul Hunt

Contributors: Carina Brown, Paul Hunt, Laurel Jackson, Kirsten Ness, Lindsay Spigel, Chad Thompson, Heather True, Nate Whalen

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