Shelburne Farms: An innovative farming estate observed through the use of digital imagery

Abstract:

In order to better understand the changes in the landscape of Shelburne Farms we compared older photographs to modern photographs of the same locations. We determined that the majority of change in landscape is due to human involvement through the development of rock walls, roadways, [illegible]ivating vegetation. The natural changes affecting the landscape are focused around the water level effects of Lake Champlain. In this involvement with the natural landscape, the Historic Estate has been completely changed. A total of nine photographs were digitally inserted into the text to help compare the change in landscape. Of these nine photographs there are four pairs that show the changes of erosion, water level changes, vegetation, and human interference.

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Shelburne Farms:

Landscape transformation as observed through photographic imagery.

Introduction:

Shelburne Farms has been an area of innovative agriculture, land use practices, a hackney horse breeding enterprise, and a grand family residence since 1886 when the 3,800-acre plot along Lake Champlain was bought by Dr. William Seward and Lila Vanderbilt Webb (Lipke). The Webb family still owns the land today though it is a non-profit organization, the farm still produces enough revenue that it pays for itself yearly (Lipke). The farm produces such produce as milk, butter, pork, pears, apples, eggs and vegetables contributing to the Webb's regular diet and regional exports (Online website).

In 1901 100,000 trees were planted to produce an ever-growing landscape that still flourishes today (Lipke). Approximately 20 miles of crushed rock was laid to craft roads for horses and ease maintenance of the Farms' agricultural and economic interests (Lipke). The farm is an excellent place to further your education of agriculture and learn about Victorian style livelihood and farming techniques of the late twentieth and early twenty-first century.

We determined the changes in the landscape of Shelburne Farms based on digital imagery.

We noted the changes in shoreline based on erosion, growth, and manmade rock walls. We learned of changes due to manmade roads running through different landforms. The majority of the changes in landscape appeared to be based on manmade alternations in the natural landscape; however, lake water levels and shoreline retreat also had a significant effect on the landscape.

Methods:

In order to learn about the changes in the landscape of Shelburne Farms we found old images of the landscape. After speaking with Julie Edwards, the curator of collections at Shelburne Farms, we studied the full collection of photographs taken since the establishment began in 1886. We then focused on certain images of the Shelburne Farms. We found that the most geomorphic changes in history at Shelburne Farms were of the Lake Champlain shoreline.

We then chose five photographs of the landscape that dated back one hundred years. Next, we went to all of these settings and took modern day photographs of the same locations. We compared the two photographs and discussed the differences between the past and present histories. Many of the photographs presented changes in water level, natural vegetation growth, erosion, and finally human involvement's role in the natural landscape.

Presentation of Data:

In attempting to find the present day areas to take new photographs, we found it difficult because in the past one hundred years, the farms landscape has been manipulated with vegetation growth and human development of buildings and new road systems. Thousands of trees have been planted regularly over the years to create the park-like appearance rather than letting the area grow naturally. The photographic images help stabilize the conclusion that significant amounts of erosion in the past one hundred years is contributed to water levels, human interference, and natural weathering.

Figure 1 (from 1901) shows a strange looking peninsula located on the southwestern edge of Shelburne Farms. The vegetation is stimulated on the left side of the picture and along the edges of the right side of the peninsula itself. A land bridge (gap) connects the two areas of land together. No outcrops are located anywhere along the land bridge or along the shores of the peninsula (that are accessible to the public). Figure 2 (from 2003) shows a totally changed

landscape. In figure 2, note that the picture is taken from a closer approach because of prohibiting private lands. The peninsula is still there, stimulating tree growth along the edges of the shoreline but changing along the banks of the land bridge as trees have been added. Also, deposits of large boulders along the land bridge banks have been added. It appears that the slope of the land in figure 1 is shallower than in figure 2. Construction is also occurring in figure 2.

Figure 3 (ca. 1890) shows a man and a dog hunting on a large outcrop of exposed rock. The outcrop is a dark-blue/grey shale limestone. Above the man, trees have begun to fall and a cave has weathered away under an angled tree, exactly ninety degrees. The water level is also very low and hard to calculate quantitatively. Figure 4 (1901) shows the same rock wall approximately ten to twenty years later. The trees are still angled ninety degrees, and are parallel to the Lake's surface, the cave under the above trees is not as easily detected, a significant rock retreat has occurred (again unable to calculate), and the water level is higher. Figure 5 (2003) shows the stonewall is highly weathered (oxidized from the lake water), the falling trees have finally fell into the lake, and the accompanying trees on the cliff are diminishing and have thinned out. Vegetation of the far cliffs have decreased, and to the left of the cliffs trees have grown tall enough to cover the background house noticeable in past photographs.

Figure 6 (1901) shows a flourished landscape of trees in the forefront and in the background. The older rock road appears to be a Macadamized road, characteristic of the first 'paved' road systems in America. To the road's right a bank exists full of boulders that have been washed up by the lake. The cliff to the far right has rich vegetation of trees and a large cliff outcrop on the far right point. Figure 7 (2003) shows a totally changed appearance. The construction of the Coach Barn in the back has caused the disappearance of trees and a new road developed in the form of a 'Y' due to the expanding inter-road connections. The bank on the

right is gone and in place of it is a fully constructed rock wall. To the far right the cliffs have weathered, the water level is apparently higher, and vegetation is sparser.

Figure 8 (1901) shows the future location of the Inn that is vacant as of 1901. The cliffs to the left are exposed to rock and little vegetation. To the right of the cliffs, the landscape is gently sloping to the east with little vegetation. The near cliffs in this figure are discarded. Figure 8 (2003) shows the same cliff and slope, except the Inn is constructed and has left a steep grading slope downwards towards the Lake. It is different that the cliffs in the modern photograph show a highly vegetated area, and little outcrop exposure.

Discussion of Data:

Through the four pairs of photographs, we found that geomorphologically changed features are apparent within the shorelines, peninsula, outcroppings, rockwalls, and roadways of Shelburne Farms. Each of these photographs has changes noticeable to the eye, which implies significant changes in environment. Through the use of these images, we gathered evidence showing weather changes, water level effects, and human interference on the landscape. When examining figures 1 and 2 it becomes clear that there has been significant erosion of the passage from the mainland onto the peninsula, though it could also be a higher water level at this time of year according to figures 10 and 11. All of the natural tree growth has thus disintegrated and trees were planted along the contours of the land to help stabilize wearing soils and rock. We also pondered whether this peninsula would have transformed into an island if not for human interaction?

Not knowing the exact date the older photographs were taken, leads us to assume the they were taken between spring and fall. This evidence is such because there is no sign of snow or fallen leaves, characteristic of early September through late march. In figure 4, looking closely

at three women in the photograph, we noted that they were wearing clothing suitable for colder weather, thus we can conclude that many of the older photographs were taken in late October to mid November before the leaves began to fall and the snow fell. In figure 3 the man hunting is characteristic of late fall duck hunting periods which currently run from mid October to mid December.

We used figures 10 and 11 to better understand the water levels and their effect on shoreline erosion during the estimated time frames on a yearly cycle (historically based). The higher water levels result in increasing rates of weathering and erosion of shoreline rock especially shale at Shelburne Farms. When the water levels are low, rock weathering and erosion steadily decrease and stabilize. Since the outcrops are located on a large lake of 435 square miles (1127 square kilometers) of surface water (Ballinger, online), they are affected by the consistent change of seasons, climates, water temperatures, wind speed and direction, and even ice caps pounding exterior layers.

Summary:

While photographing and studying specific locations at Shelburne Farms we concluded that the majority of change in landscape is attributed to the rising water level's and eroding shorelines and banks of Lake Champlain. Human induced changes have resisted natural erosion through the installation of rock walls to block high water levels, paved roadways, and cultivating trees in specific areas to maintain the stability of shoreline soils. With the human excavation of soil and planting of trees the natural landscape was replaced with a park-lake image making it difficult to determine whether the source of change is natural or otherwise. The natural effects that changed the appearance of the landscape are focused around the high change in water level and cliff landslide-like erosion due to steep slope and the existence of gravity.

Figure 1: 1901 picture of peninsula, south end of Shelburne Farms. Thomas Marr

Figure 2: 2003 picture of peninsula. Ben Psaros

Figure 3: ca. 1890, northern shoreline of Lake Champlain at Shelburne Farms. Unknown

Figure 4: 1901, northern shoreline of Lake Champlain at Shelburne Farms. Thomas Marr

Figure 5, 2003 northern shoreline of Lake Champlain at Shelburne Farms. Ben Psaros

Figure 6: 1901, old rock wall along western shoreline of Lake Champlain. Thomas Marr

Figure 7: 2003, rebuilt rock wall along western shoreline of Lake Champlain. Ben Psaros

Figure 8: 1901, picture looking towards the Inn to the north. Thomas Marr

Figure 9: 2003, Picture looking towards the Inn. Ben Psaros

Figure 10: Yearly historical look of Lake Chaplain water levels. Online: National Weather Service Forecast Center. December 3, 2003.

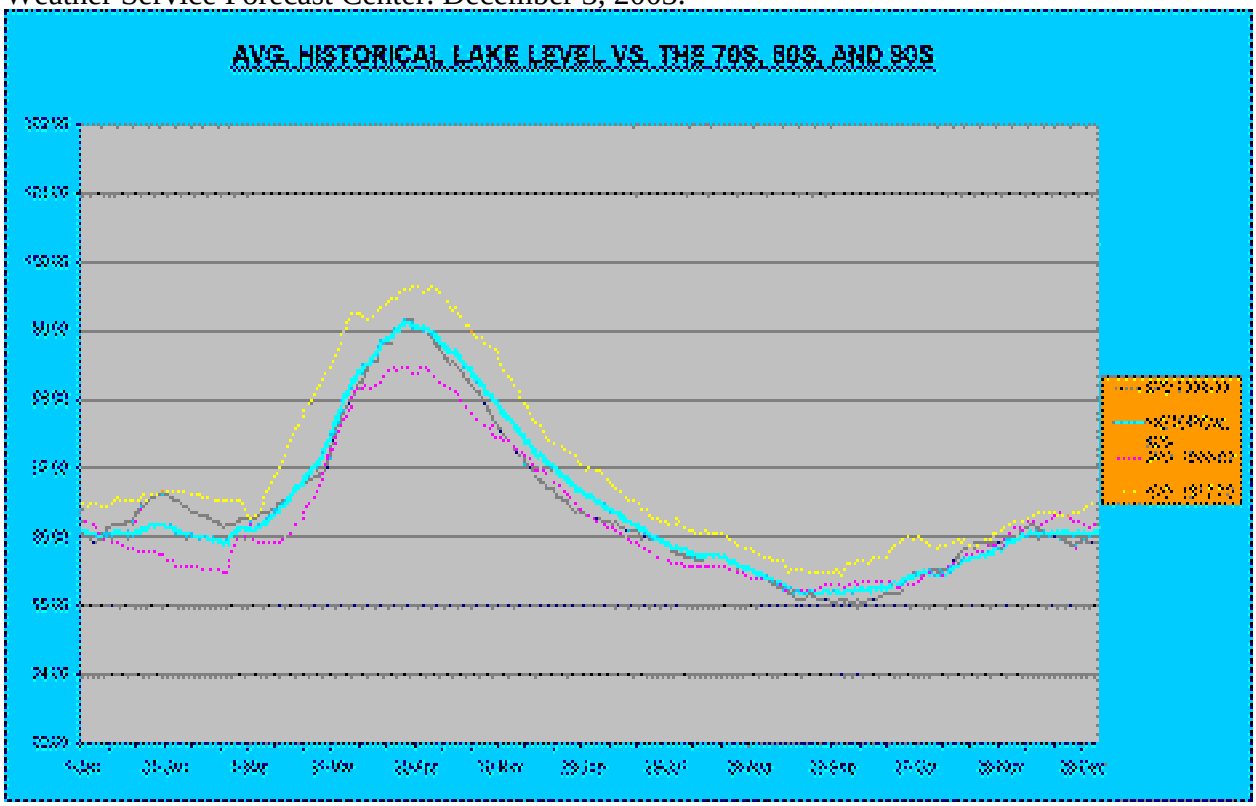
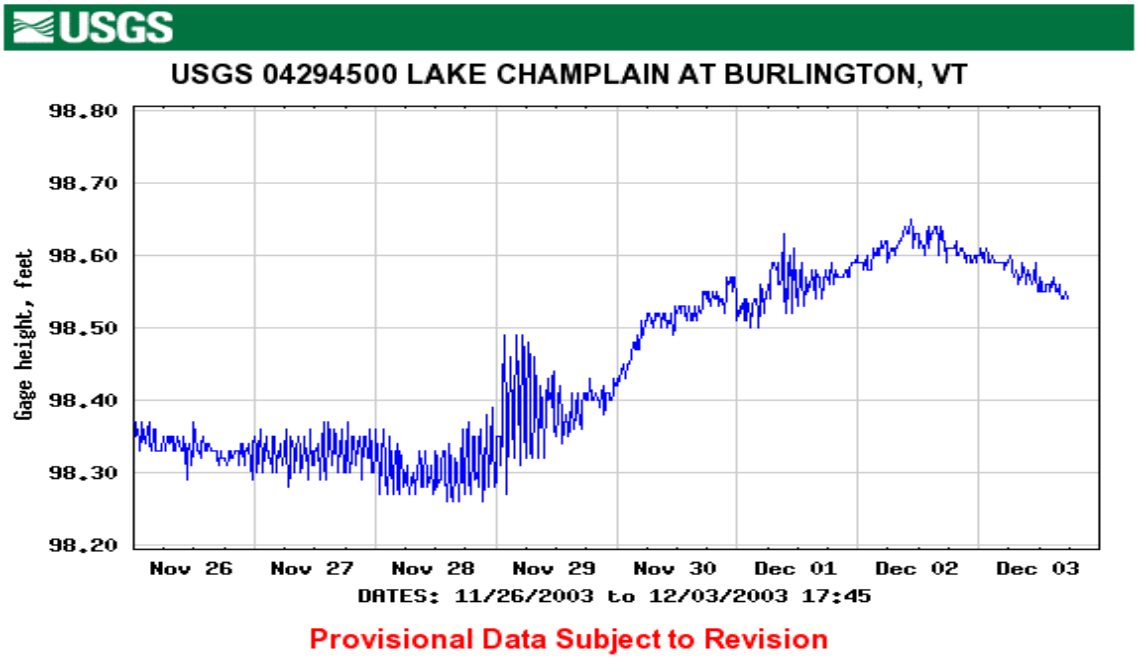


Figure 11: Current Lake Champlain water level. Online: USGS Lake Champlain. December 3, 2003



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