

Mount Bethel Fens
Interim Report
August – November 2000

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Introduction:

The Lehigh Earth Observatory (LEO) has continually monitored the Mount Bethel Fens since July of 1997. This report is an update of information acquired since August 2000. LEO, in conjunction with The Nature Conservancy is studying numerous aspects of the fens including, water quality testing, well monitoring, stream gauging, and weather data collection.

The Mount Bethel Fens are a cluster of sensitive wetland areas. The fens are home to many endangered plant and animal species, which can only exist in this rare environment. LEO and The Nature Conservancy are monitoring the fens in order to gain a more complete understanding of the ecosystem. A full understanding of this region is necessary in order to protect, maintain, and preserve the full variety of species that reside there.

An understanding of the sources and patterns of groundwater flow are being studied. The study is working to determine how much water flows through the fens, how the fens affect the quality of the water, and how much flow the fens area can support without disturbing the sensitive equilibrium. Continued testing has been done on the wells for pH, specific conductivity, temperature, cation analysis, anion analysis, and nutrient analysis. Water samples are also being taken from Jacoby Creek, the main waterway in the area. Samples are being taken from three points along the creek, in order to see the changes in the water quality as the water passes through the fens.

This interim report contains the data for August – November 2000. This paper includes one set of water quality data, since water quality testing is done on a quarterly basis. Monthly readings from the wells and Jacoby Creek have also been compiled.

Results:

Water level data from July of 1997 to November of 2000 for the four fens is contained in Appendix A. Graphs A1-A4 display the water levels in each well. Graph A5 shows the four water levels together throughout time. The data points obtained during this time do not support any existing trends and have different patterns in each well.

Water quality testing for the fens and Jacoby Creek has not been completed at this time. Water quality samples were collected on November 6, 2000 and properly prepared for testing. The samples were

filtered, and nitric acid was added to them. Alkalinity testing and the nutrient analysis were completed. The standards for the ICP machine have not been available so the cation testing was not available. The samples are being properly refrigerated so when the standards arrive the testing will begin immediately. The same standards are also used in the IC machine for testing the anions, so those results are also being hindered.

Discussion:

The water elevation at the Taylor Seep Well has begun to level off at 8572 cm. The water elevations are about 6-7 cm less than they were last year. The Taylor Shrub fen reached a peak in September and has been falling since, although this year's values are also 5-6 cm lower than last year. Water elevations for the Bartlett Fen well are fluctuating around the same values as they were last year. The Savage Fen values have dropped significantly since the summer but are within 5 cm of last year's values.

The temperature of the wells will be declining as the average daily temperature decreases due to the seasonal changes in weather. Taylor Seep has been recording a slightly higher temperature than the other three wells, which is consistent with previous trends. Currently, the Taylor Seep well is approximately two degrees warmer. The temperature graphs can be found in Appendix B, more specifically graphs B1-4.

A recent increase in pH has been seen throughout all of the wells sampled in the fens. Taylor Shrub Fen and Bartlett Five have recorded similar pH values between 7.5 and 7.75 with recent measurements showing increasing pH values. Savadge fen has recorded the lowest values with its recent high occurring at 7.56. Taylor Seep's pH has remained steady at 7.60. See Appendix C1-C4 for pH graphs.

The specific conductivity of the wells has also increased, although the change in each well is significantly different. Bartlett Five had the smallest change increasing by only 13 uS/cm. Bartlett's specific conductivity is now at 542 uS/cm, while Savadge fen increased by 49 uS/cm and now stands at 771 uS/cm. Taylor Seep actually experienced the largest increase in specific conductivity. Taylor Seep's specific conductivity increased from 603 uS/cm to 684 uS/cm. This is an increase of 81 uS/cm. These

trends are interesting and do not follow the same patterns as last year. The specific conductivity in each of the wells decreased last year during the winter months. These results can be seen in Appendices D1-D4.

A discussion of the water quality data will be added to this report once the appropriate testing has been completed. The data for Jacoby Creek will also be included for comparison.

Conclusion:

This report contains results of water sampling and water elevations from August-December 2000. Some of the results were expected, for example, an overall decrease in temperature. While other results were surprising, for example, an increase in specific conductivity in every well.

The data collected during this time has been added to the cumulative lists. The fens will continually be monitored in this manner until permanent conclusions can be developed.