

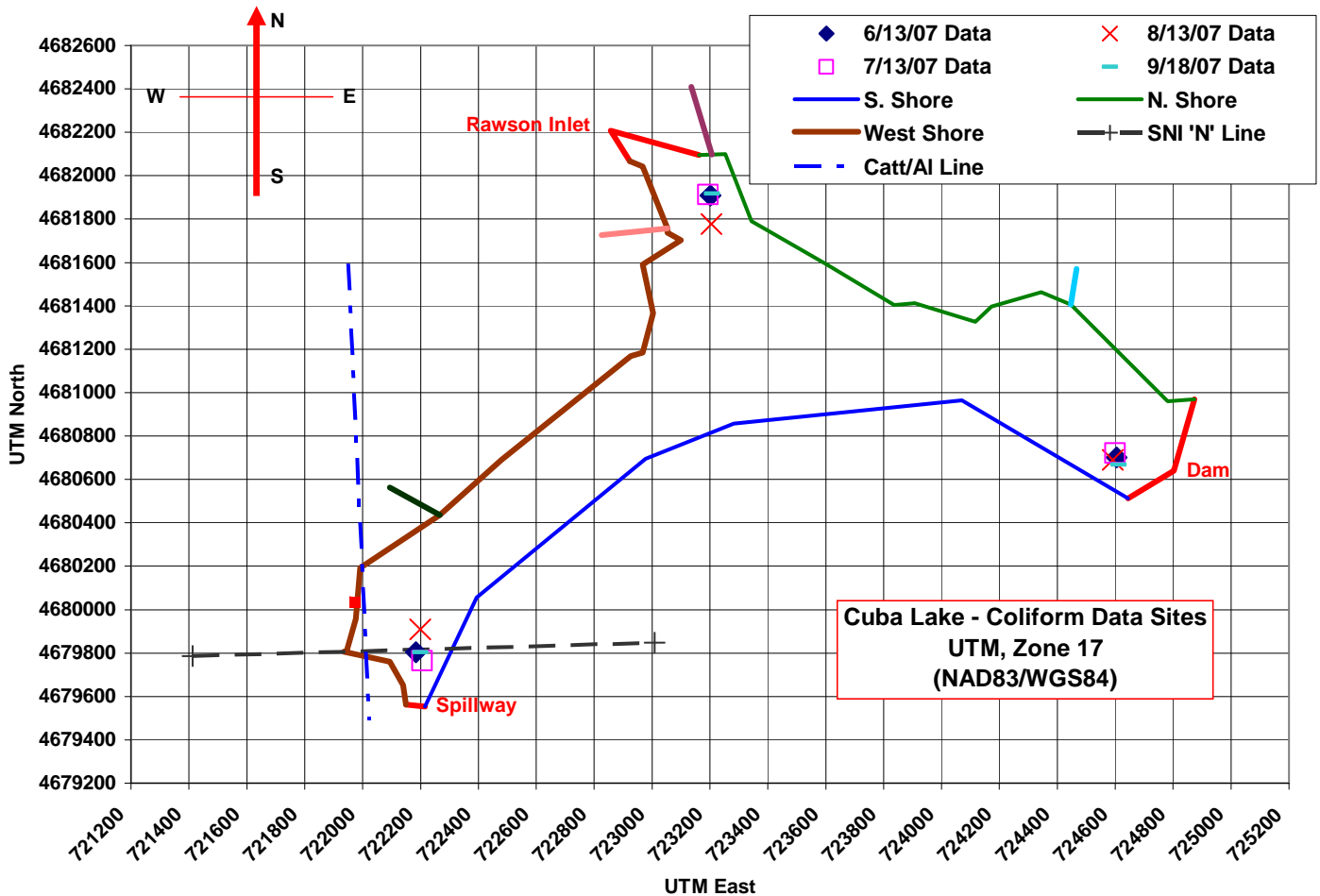
2007 - Bacteria Testing - Cuba Lake

After a manure spill into Rawson Creek above the North end of Cuba Lake, it was decided to take single point test Samples for the months of June, July, August and September of 2007.

The Lake Manager and the writer took on the project.

Samples were taken and delivered to the Cattaraugus County Health Department Labs for analysis according to the procedures advised by the CCHD and using their prepared sample containers.

The location of all tests were as shown on the following map of the lake.



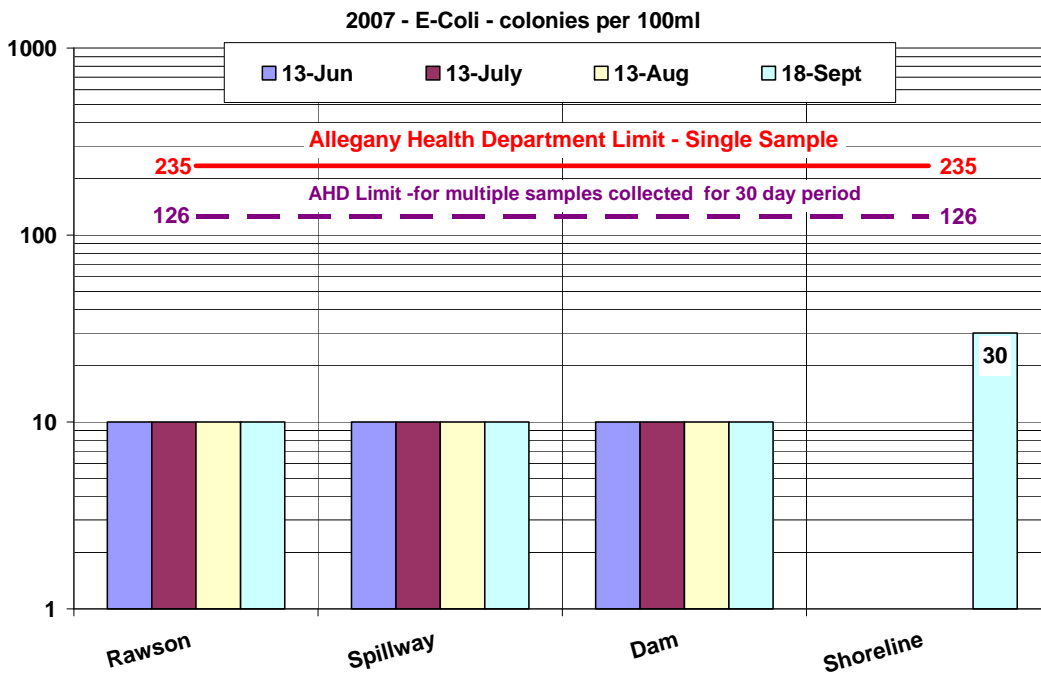
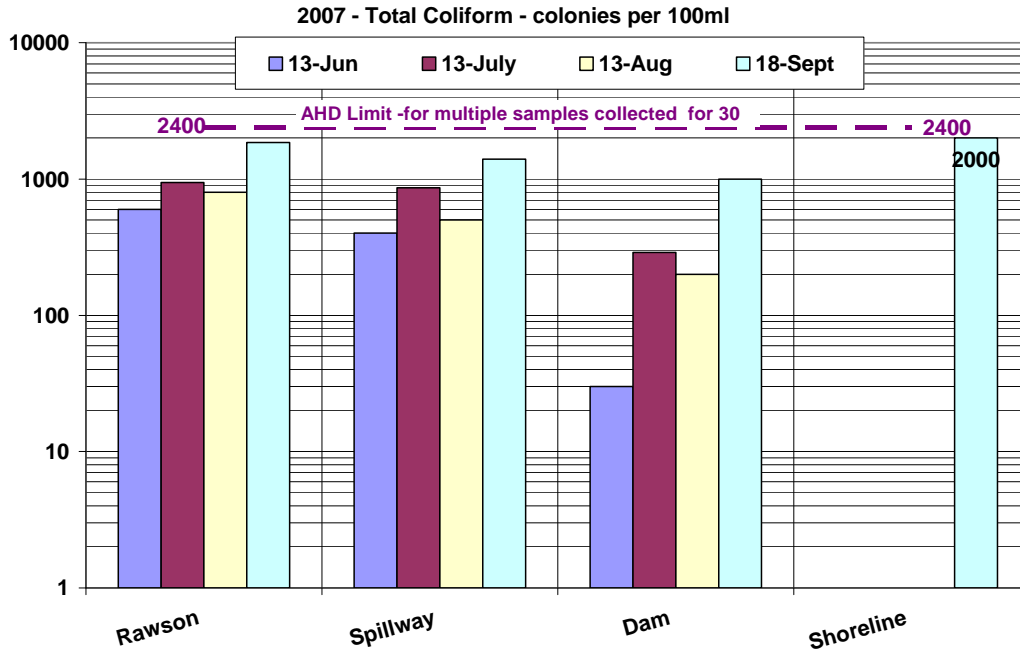
Samples were collected approximately one foot below the surface of the water.

The samples were analyzed for Total Coliforms, E-Coli and Fecal Coli in terms of colonies per 100ml.

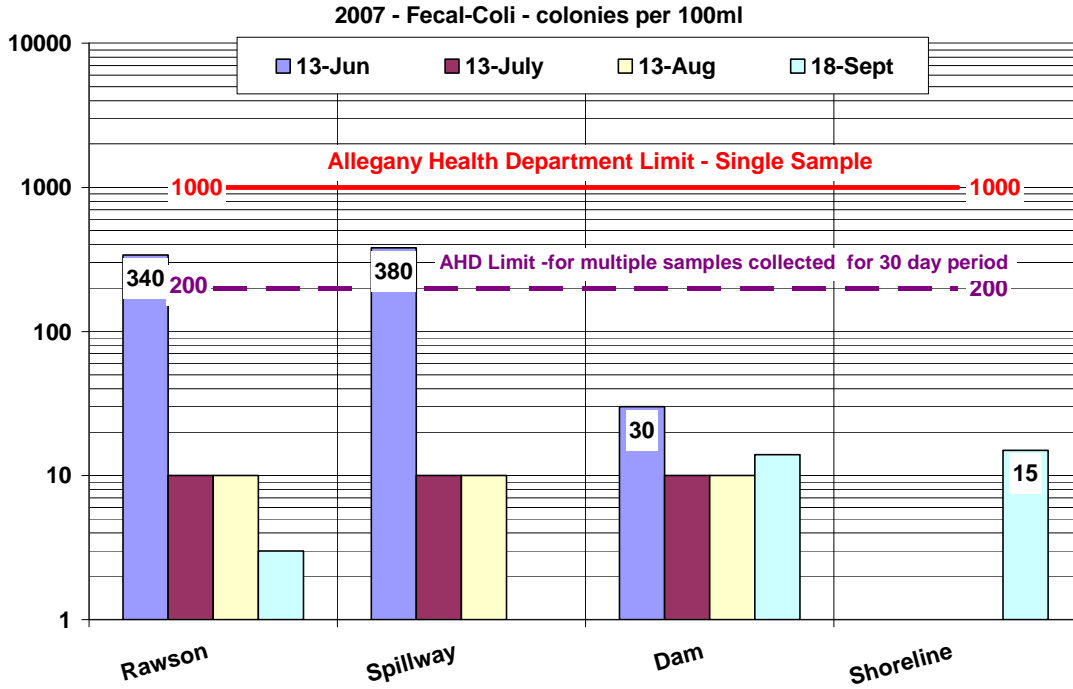
The following charts show the results of the testing as compared to the Allegany Health Department Water Quality Standards for bathing beaches. While both the single sample and the multiple sample limits are shown, the single sample limits are applicable to the testing done.

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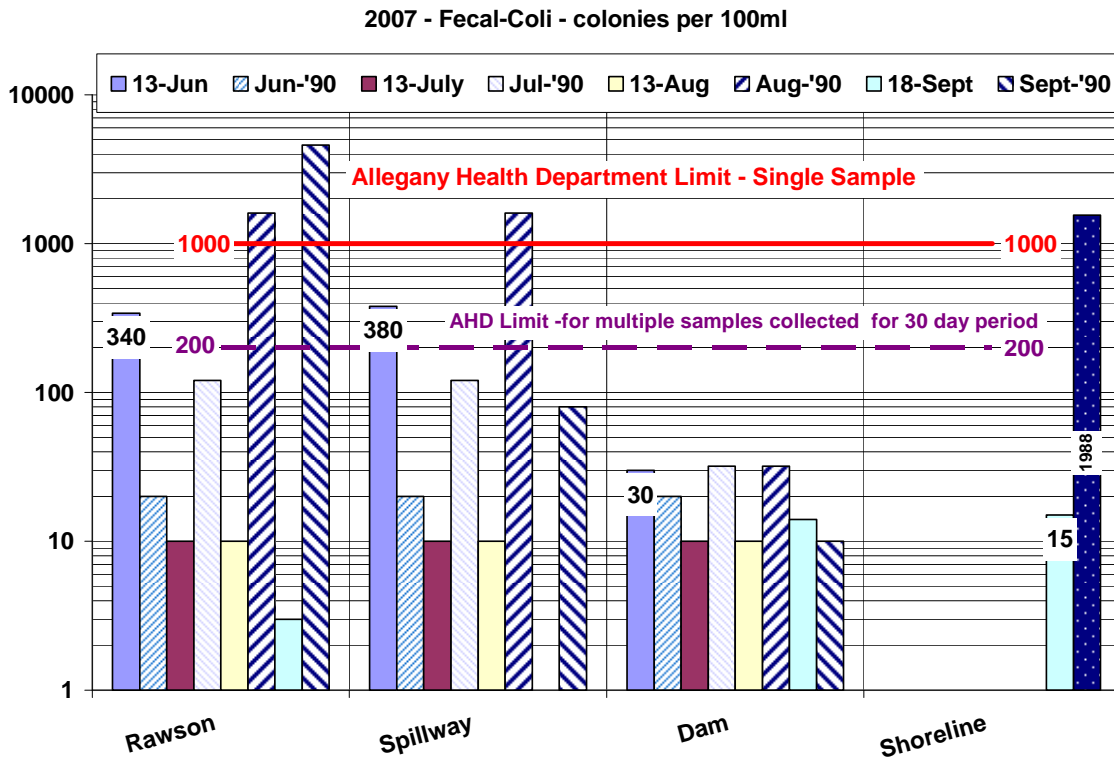
All data lies well below the limits even the data one week after the manure spill. Note that due to the low values a shoreline sample was taken in September to verify testing. Also the test lab used a modified method to get the actual readings rather than reporting <10 (less than 10.)



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The following chart shows a comparison to earlier data from 1990 and 1988 tests. The data including the shoreline data are from close to the same locations as the 2007 tests.



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Note – 1990 data was taken from a 1993 report by the Allegany Soil & Water District. 1988 data is from a report by Ecocience.

Allegany Health Department upper value for density limit of bacteria (per 100 ml) based on single sample used in assessing waters of bathing beaches:

- 1,000 fecal coliform; or, 51 enterococci (not commented on in the results from Catt Cty Lab); or, 235 E-coli.

Criteria for more extensive type testing is based on the mean of the logarithms of the results of the total number of samples collected in a 30 day period, the upper value of density of bacteria shall be (per 100 ml):

- 2,400 total coliform bacteria; or, 200 fecal coliform bacteria; or, 31 enterococci bacteria; or, 126 E-coli.

If values are found above these levels “---the permit issuing official shall cause an investigation to be made to determine the source or sources of pollution and, along with other factors in Section 6-2.15 (a) determine if the beach shall be closed.”

What are coliform bacteria?

Coliform bacteria are organisms that are present in the environment and in the feces of all warm-blooded animals and humans. Coliform bacteria will not likely cause illness. However, the presence of coliform bacteria in water indicates that disease-causing organisms (pathogens) may be present in the water system. Most pathogens that can contaminate water supplies come from the feces of humans or animals. Testing water for all possible pathogens is complex, time-consuming, and expensive. It is relatively easy and inexpensive to test for coliform bacteria. If coliform bacteria are found in a water sample, steps are taken to find the source of contamination and restore safe water. There are three different groups of coliform bacteria; each has a different level of risk.

Total coliform, fecal coliform, and E. coli:

Total coliform, fecal coliform, and E. coli are all indicators of water quality. The total coliform group is a large collection of different kinds of bacteria. The fecal coliform group is a sub-group of total coliform and has fewer kinds of bacteria. E. coli is a sub-group of fecal coliform. When a water sample is sent to a lab, it is tested for total coliform. If total coliform is present, the sample will also be tested for either fecal coliform or E. coli, depending on the lab testing method.

Total coliform bacteria are commonly found in the environment (e.g., soil or vegetation) and are generally harmless. If only total coliform bacteria are detected in water, the source is probably environmental. Fecal contamination is not likely. However, if environmental contamination can enter the system, there may be a way for pathogens to enter the system. Therefore, it is important to determine the source and to resolve the problem.

Fecal coliform bacteria are a sub-group of the total coliform group. They appear in great quantities in the intestines and feces of people and animals. The presence of fecal coliform in a water sample often indicates recent fecal contamination – meaning that there is a greater risk that pathogens are present than if only total coliform bacteria is detected.

E. coli is a sub-group of the fecal coliform group. Most E. coli are harmless and are found in great quantities in the intestines of people and warm-blooded animals. Some strains, however, may cause illness. The presence of E. coli in a water sample almost always indicates recent fecal contamination – meaning that there is a greater risk that pathogens are present.