

**Dominic Carrese**  
Junior Division Environmental Sciences  
*Give Me Oxygen!: The Effects of Wastewater Treatment*

The purpose of this project was to test how a wastewater treatment plant affected the coliform bacteria and dissolved oxygen levels of a stream. I hypothesized that as treated sewage was put into the stream, the coliform bacteria levels would rise, because treatment does not kill all the bacteria; and, that dissolved oxygen levels would drop, because the biochemical oxygen demand would rise due to increased coliform bacteria (which consume oxygen), and also due to increase in nutrients, causing eutrophication (spike in plant growth). The experiment assessed water quality via two variables ... coliform bacteria colony levels and dissolved oxygen levels ... because these variables seemed to have a direct correlation. I decided to test directly above the plant, directly below the plant, and farther below the plant (0.5 mile) to see if fluctuation in my variables was caused by treated wastewater, and to see if the environment brought those levels back to normal. The averages of the data collected supported my hypothesis: coliform bacteria colony levels spiked below the plant (14.75 colonies), then eventually dropped (7 colonies) to the levels observed above the plant (7.25); while dissolved oxygen levels did the opposite (4.98 parts per million above plant; dropping to 4.45 ppm directly below; returning downstream to 4.83 ppm). I concluded that the output of a typical wastewater treatment plant negatively affects a flowing stream, although low levels of imported bacteria are relatively quickly absorbed and a stream can return to normal levels in a relatively short distance of flow.