Introduction
Surface water quality can reflect different aspects of the land surface within a watershed. For example, the land cover and degree of urbanization will affect the dissolved and suspended load in stream water. For my research I looked specifically at Cascadilla Creek because it is one of the least studied in the Ithaca area and because it has a varied watershed. The creek starts in a well forested area with very little development or agriculture (figure 2), then it goes through the center of Cornell’s agricultural fields from there it travels through college town ending in a concrete channel that cuts through downtown Ithaca. My goal of this project is to evaluate the dissolved solids and turbidity of the stream and how these vary with different land cover. In addition, I wanted to determine any changes following a storm event. Sectioning the watershed into these four parts along the creek allows for an understanding of the progressive inputs from a rural to urban setting.

Methods
To start I looked at the surrounding land use of Cascadilla Creek watershed (figure 1) and subdivided it into four sections based on different land use types present in the watershed: forested (low development), agriculture, Cornell’s campus, and residential (high development). Within the watershed I focused on a total of six sampling locations, two at the headwaters and then one just before a change in the land usage. At each location I measured water turbidity (figure 3), electrical conductivity, and temperature and I collected a sample to bring back to the lab. The sample that is taken back to the lab is then put through the Ion Chromatograph to determine concentrations of chloride, nitrate, nitrite, phosphate, and sulfide that are dissolved in the water. Note: sample site lab is then put through the Ion Chromatograph to determine concentrations of chloride, nitrate, nitrite, phosphate, and sulfide that are dissolved in the water. For my research I looked specifically at Cascadilla Creek because it is one of the least studied in the Ithaca area and because it has a varied watershed. The creek starts in a well forested area with very little development or agriculture (figure 2), then it goes through the center of Cornell’s agricultural fields from there it travels through college town ending in a concrete channel that cuts through downtown Ithaca. My goal of this project is to evaluate the dissolved solids and turbidity of the stream and how these vary with different land cover. In addition, I wanted to determine any changes following a storm event. Sectioning the watershed into these four parts along the creek allows for an understanding of the progressive inputs from a rural to urban setting.

Results
The following are graphs depicting what was found in the creek on initial testing. Figure 4 shows the relationship between the precipitation of the day and the water temp (a), electrical conductivity (b) and turbidity (c). Figure 5 shows the results from the Ion Chromatograph, depicting the dissolved ions in the water at all 6 locations. When looking at all the graphs for Figure 5 it is important to recognize that all of the ions occur naturally in water, but when at high levels can cause unhealthy water conditions. While there are curious spikes through out the graphs, there is a common trend with most of all the locations from what was dissolved in the water. Most of the time when more water is added to the flow the dissolved ions are diluted and do not show up as strong as other times.

Conclusion
- The water characteristics of Cascadilla Creek change from the headwaters to the outlet with a general increase in turbidity moving downstream.
- Dissolved solids (as measured by electrical conductivity) generally increases downstream, but reaches a peak just below the Cornell College campus.
- Rain events increase turbidity throughout the creek but generally decrease total dissolved solids.
- The exception is site 5 in Cascadilla Gorge that showed an increase in chloride and sulfate after a mid-July storm.
- Highest turbidity occurred after several days of persistent rain.
- Nitrate is highest in the headwaters come from the forested area and then increases going downstream.
- Chloride progressively increases going down stream.