Freshwater sources in the Northeast are being polluted every day on large scales. Human impact is a significant source of increased contamination. The following research was carried out to see how human impact, such as using de-icing agents for roads and phosphorus for agricultural purposes, effects the overall flux and concentration of Cl- and P through the course of the year. To do this, discharge measurements of the Castleton River were taken and samples were collected and analyzed through the use of Ion Chromatography and UV Spectrophotometry to find concentrations of chloride and phosphate, respectively. My hypothesis was that concentrations should be higher for both nutrients during the late winter-early spring when run-off was greatest, thus increasing nutrient transport. This research is relevant because in future years the input of specific nutrients at such high levels will ruin the integrity of our freshwater ecosystems and this is already being seen in places like Lake Champlain with algal blooms caused by increased phosphorus. Lastly, increased salt use can increase baseline salinity values of water supplies and ruin drinking water for populations, thus making the study of nutrient flux crucial.