

## **Possibility for Climate Influence on Flood Recurrence in the North Eastern United States**

Predictions for future climate changes in the Northeastern United States are for higher precipitation but more drought periods. This translates to fewer, but more intense storm events which should increase the likelihood of flood events. In this study, we use long-term USGS stream gauges to evaluate if this trend has been occurring over the last 80 years. The Winooski River watershed is located in northern Vermont, flowing through Montpelier and discharging into Lake Champlain. Three gauging stations exist in the Watershed, two on the main trunk stream (Burlington and Montpelier) and one on a tributary (North Branch). The area drained by the North Branch is rural and population in the area is relatively unchanged for many decades. The North Branch provides an opportunity to evaluate changing precipitation patterns that might influence surface hydrology with minimal anthropogenic influence. When looking at daily average discharge values for the entire record, only 81 of the top 100 days have occurred in the last 25 years. Interestingly, 18 of the remaining 19 days were in the mid-1930's. An analysis of the top 500 daily average discharges further supports this with a large majority occurring since 1982. A graph of peak annual discharge versus year shows an increasing trend with time that is significant at 95% confidence. An evaluation of 10-year events by decade also shows an increasing trend with an  $r^2$  of 0.84 that is significant at 95% confidence. Similar analyses for the gauging stations at Montpelier and Essex Junction do not show similar trends. This might suggest that watershed management in the more populated areas has overshadowed a possible climate signature for stream discharge. The preceding represents preliminary results to research in progress.