

# Exploring WNY's Climate Change Signal



**BUFFALO STATE**  
The State University of New York

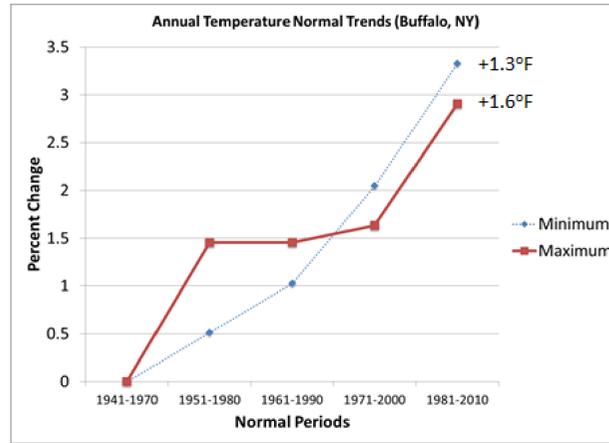
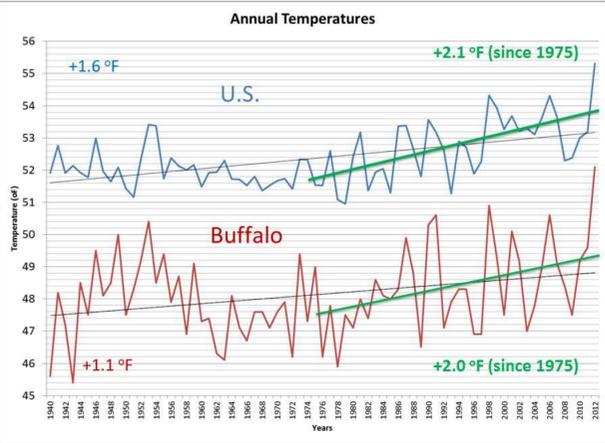
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Includes some data from Fred Bloom's and Elvis Valerio's Senior Theses

Data Source: National Weather Service. Using weather data since 1940 as the Buffalo Weather Office moved from downtown Buffalo, NY to its present airport location in early 1940's. Rochester, NY weather monitoring is also at the same site 1940.

## Annual Temperature Trends

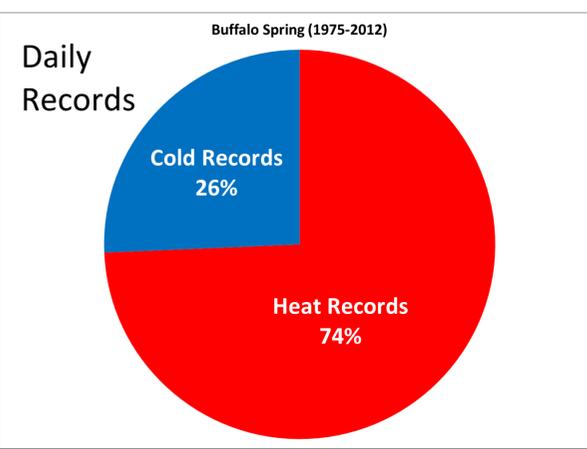


Annual trends since 1940 show temperature increases over time, with the rate of increase steepening since 1975. Temperature 'Normals' (30-year averages) also show increases since 1940 for both minimum and maximum temperatures.

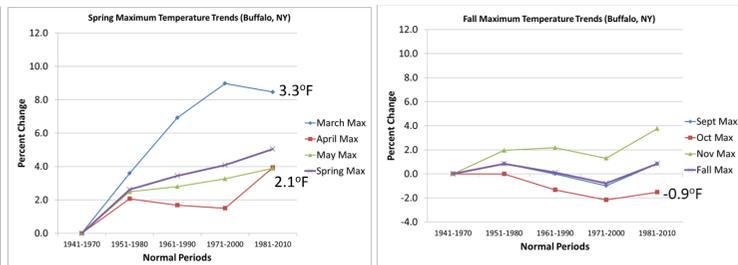
**A strong warming trend, with both daytime and nighttime temperatures increasing.**

## Seasonal Temperature Trends

Numbered scale represents warming trend for each month. Red dash lines represent yearly data warming trends (as above). Solid red line represents the monthly warming trends. For example, the month of January shows a warming of 4°F and 5°F since 1975, as compared to an annual warming of around 2°F.

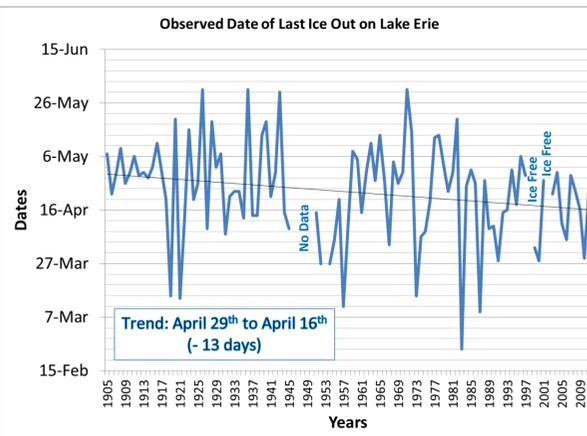


March shows a dramatic increase in daily maximum temperatures, and it is no surprise that March 2012 had so many record daily high temperatures. October shows a decrease in temperatures since 1940.

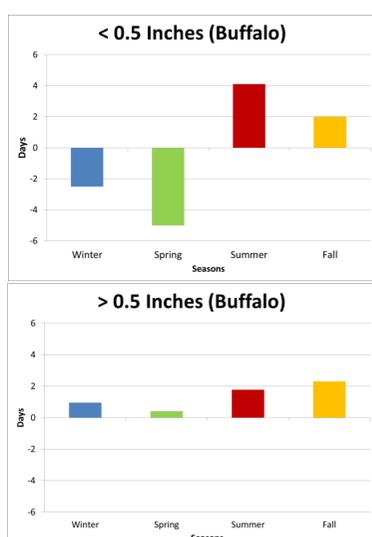
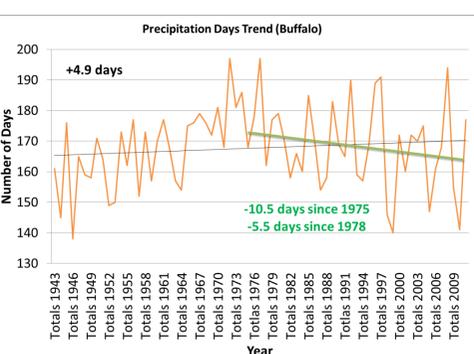
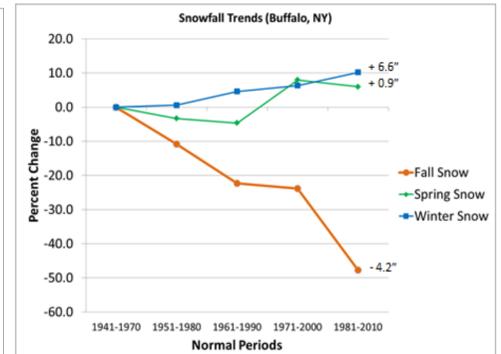
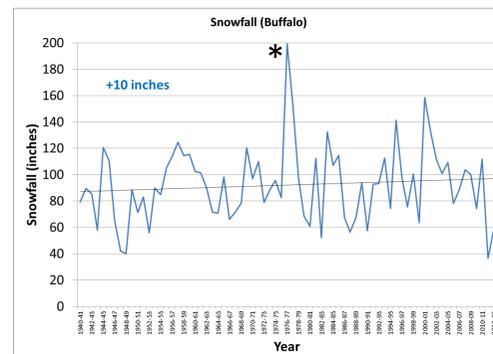
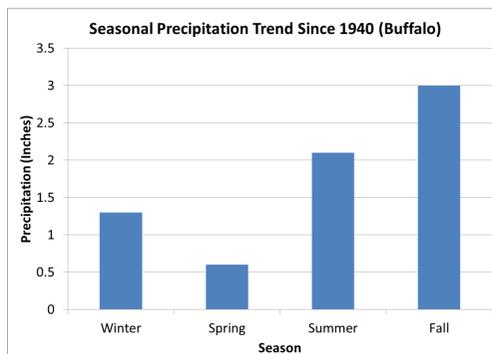
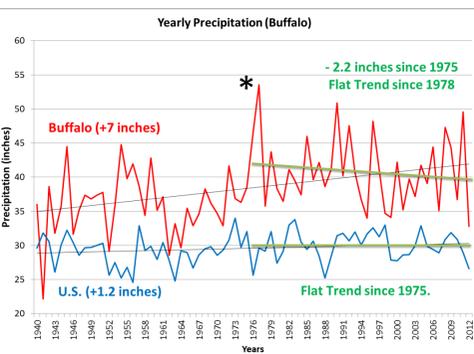


Winter and early Spring (March) show the greatest warming trend. The Summer season shows little change in temperatures and the Fall season, notably October, is cooling since 1940. In addition, significantly more daily heat records are broken (versus cold records) during the Spring than in any other season. The date of last ice-out on Lake Erie has been trending earlier since 1905.

**Warming greatest in Winter and Spring, and least in Fall (cooling in October).**



## Precipitation Trends



WNY's precipitation has increased since 1940, increasing at a greater rate in the Summer and Fall. The number of precipitation days has also increased with days of lighter precipitation shifting from Winter and Spring to Summer and Fall, and days of heavier precipitation increasing at a greater rate in Summer and Fall. More recent trends (from mid- to late 1970's)\* shows either a decreasing or flat trend with precipitation and precipitation days. Snowfall shows an increasing trend since 1940, with most of the increase trending toward the Winter. The Fall season (November) shows a trend of decreasing snowfall since 1940.

**Wetter (more so late in the year) and increased snowfall which is becoming more confined to Winter months (less in Fall).**

\* The large precipitation and snow totals from 1976-77 and 1977-78 skew the precipitation and snow trends downward since 1975. Data since 1978 shows a more realistic 'recent' trend.