

# WEATHERING CHANGE IN WNY

# WNY'S 5 Climate Zones



### Methodology

Building the WNY climate zones began first by defining boundaries based on three climate controls: elevation, proximity to Lakes Erie or Ontario, and population density. Modeled climate data (PRISM data), using the 1981-2010 Normal, were superimposed over the controls to validate these boundaries and to define the climate within each zone. Individual station data were used to validate the modeled data. Lastly, the USDA Plant hardiness zones and severe weather frequencies, obtained from NOAA's severe weather database, were used to further define the climate in each zone.

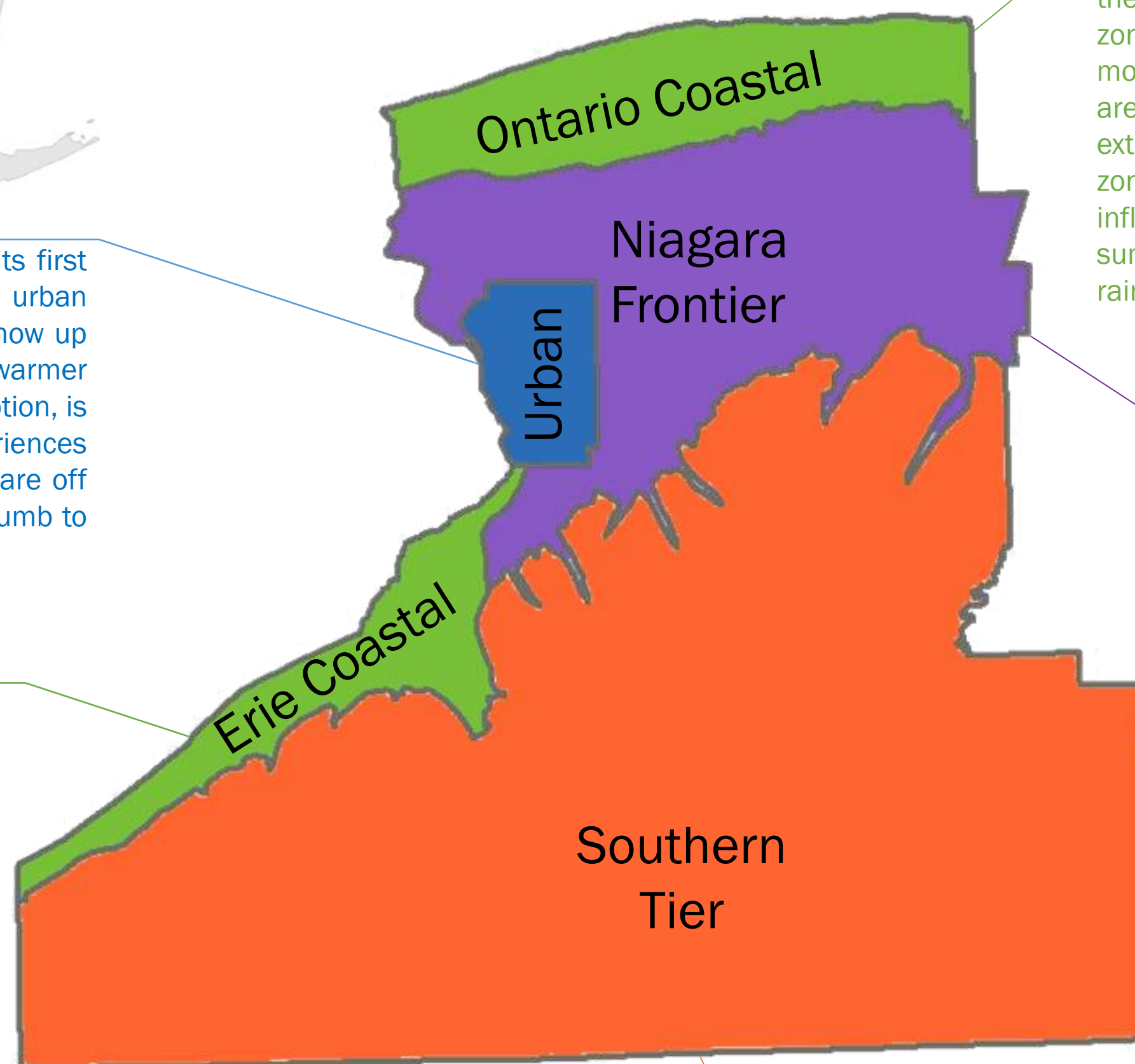
Results show a good fit – climate boundaries, as derived by the climate controls, match the modeled data boundaries. And the climate within each zone are distinct from one another. The exception is the Urban zone which requires additional data and study.

### Urban (U)

The 'Urban' zone is defined by the City of Buffalo, and its first ring suburbs. The temperatures are warmer due to the urban heat island effect. The increased temperatures do not show up on our maps (insufficient data at this point), but expect warmer temperatures, by a few degrees, in all seasons. The exception, is the area immediately adjacent to Lake Erie which experiences cooler temperatures in spring and summer when winds are off the lake. The Urban zone will be the last in WNY to succumb to frost in the autumn.

### Erie Coastal (EC)

The EC zone is bound by Lake Erie, to the west, and the Chautauqua Ridge, to the east. Moderated winter and autumn temperatures – some of the warmest in WNY – conform well to the prescribed boundary. The EC zone experiences mild extremes in winter temperature (0 to -5°F in the south; and -5 to -10°F in the north). In spring and summer a sharp temperature gradient is apparent (coolest along shoreline), especially where the zone is most confined in the south. The EC zone experiences more rain and lake effect snow than the OC zone, and is more prone to severe thunderstorm and tornadoes.



### Ontario Coastal (OC)

The boundary of the OC zone is defined by Lake Ontario, to the north, and the Niagara Escarpment to the south. This OC zone is seasonal, best manifested in the autumn and winter months where temperatures are moderated by the lake and are some of the warmest in WNY - experiencing the least extreme in winter temperatures (0-5°F). In spring, the OC zone is confined to only a few miles from the cooling influence of the Lake Ontario shoreline. It is absent in the summer. The OC zone consistently experiences the lowest rain and snow totals of WNY.

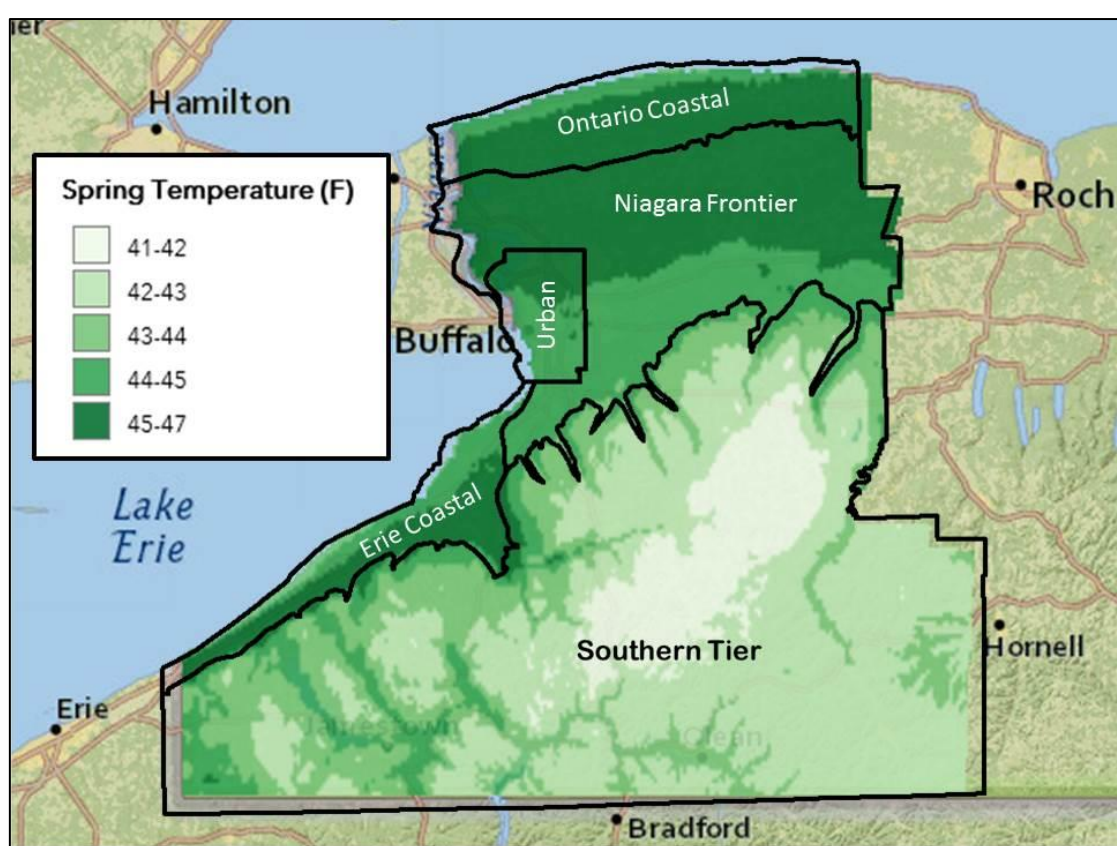
### Niagara Frontier (NF)

The NF zone is a transition between the OC and ST zones. Temperatures conform to the prescribed boundaries in the autumn and winter, exhibiting a temperature midway between the OC and ST zones, as are the winter cold extremes (-5 to -10°F). In spring and summer, the NF zone divides into north and south subzones, where the northern part of the NF zone exhibits the warmest temperatures in WNY (extending north across the Niagara Escarpment), and the southern subzone exhibits cooler temperatures – following a cooling gradient to the ST zone. Precipitation generally increases from north to south, and is most apparent with snowfall. Similarly, for severe weather.

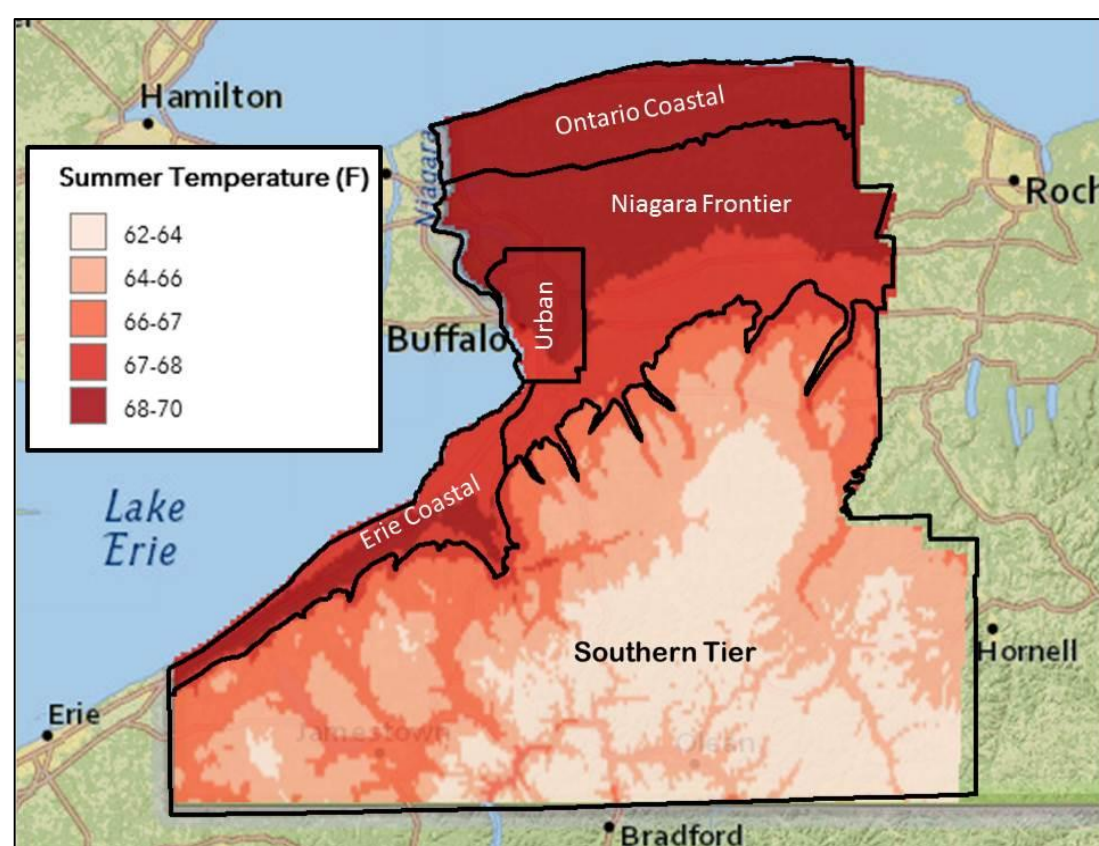
### Southern Tier (ST)

The ST zone is defined by its elevation – highest in WNY. Temperatures are consistently the coolest in WNY (warmer temperatures confined to river valleys within the zone). The ST zone experiences the greatest extreme in winter temperatures (-10 to -20°F). Precipitation is the highest in WNY, due to the prevailing southwest winds and upslope flow. Precipitation is relatively consistent across the zone in spring and summer, but exhibits a west to east decreasing gradient in the autumn and winter (snowfall). The ST zone is most prone to lake effect snow, thunderstorms and tornadoes.

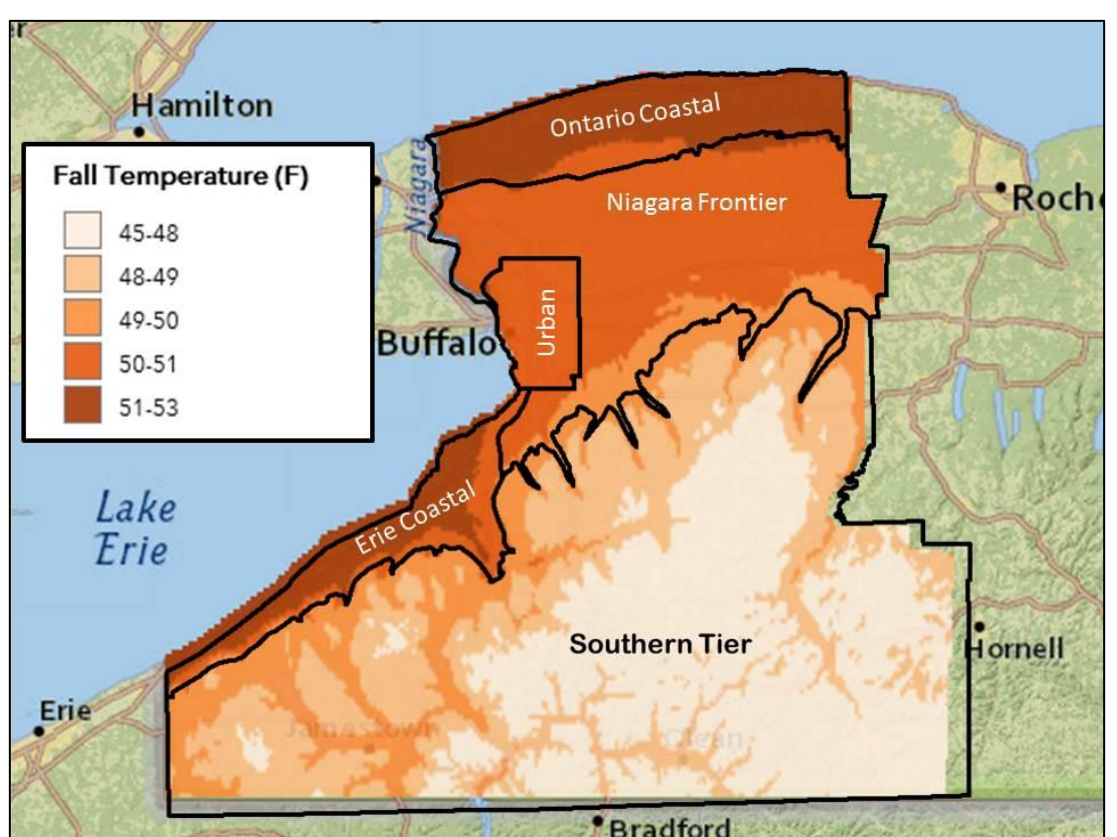
### Spring



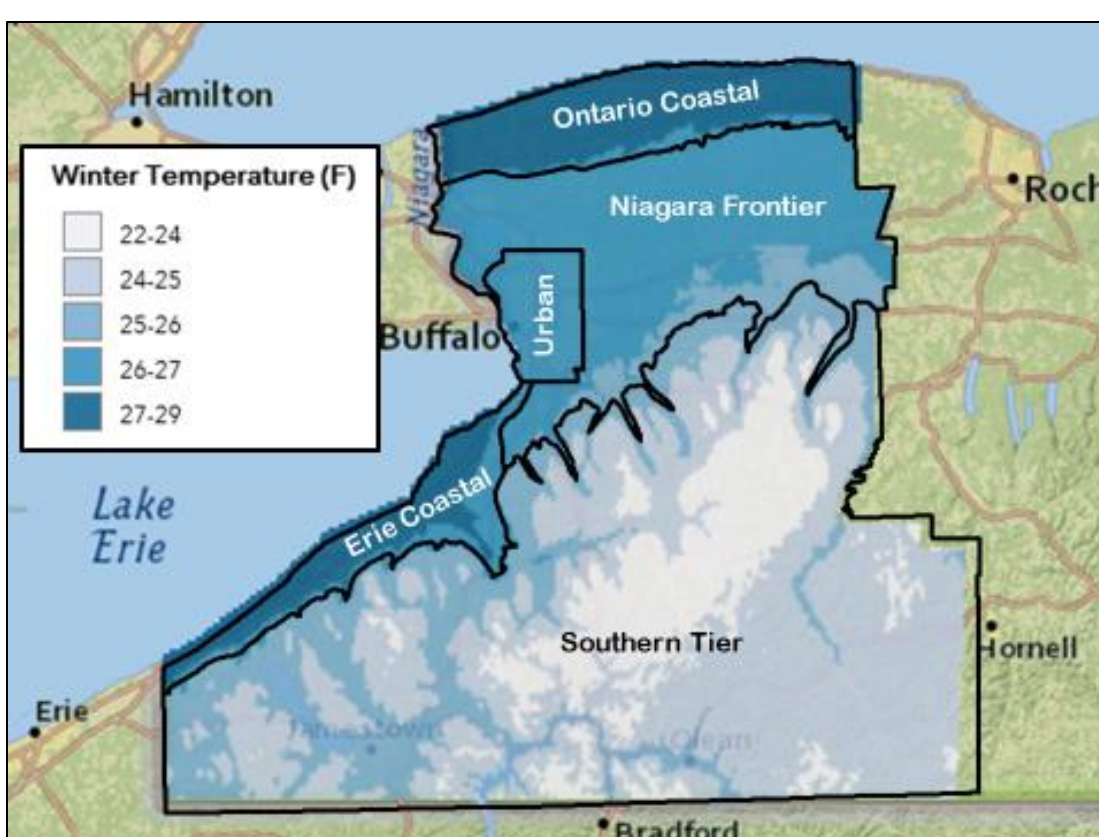
### Summer



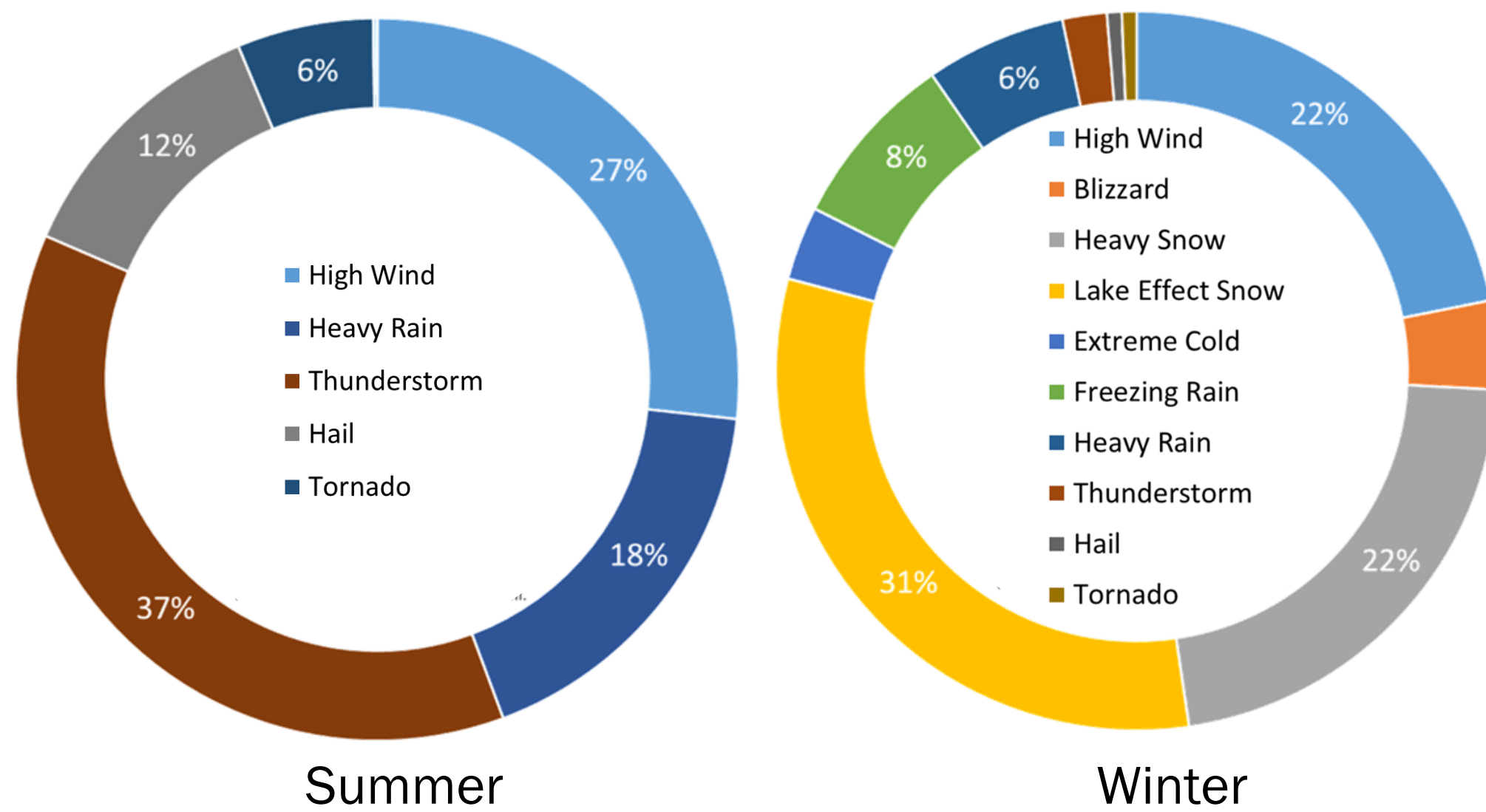
### Autumn



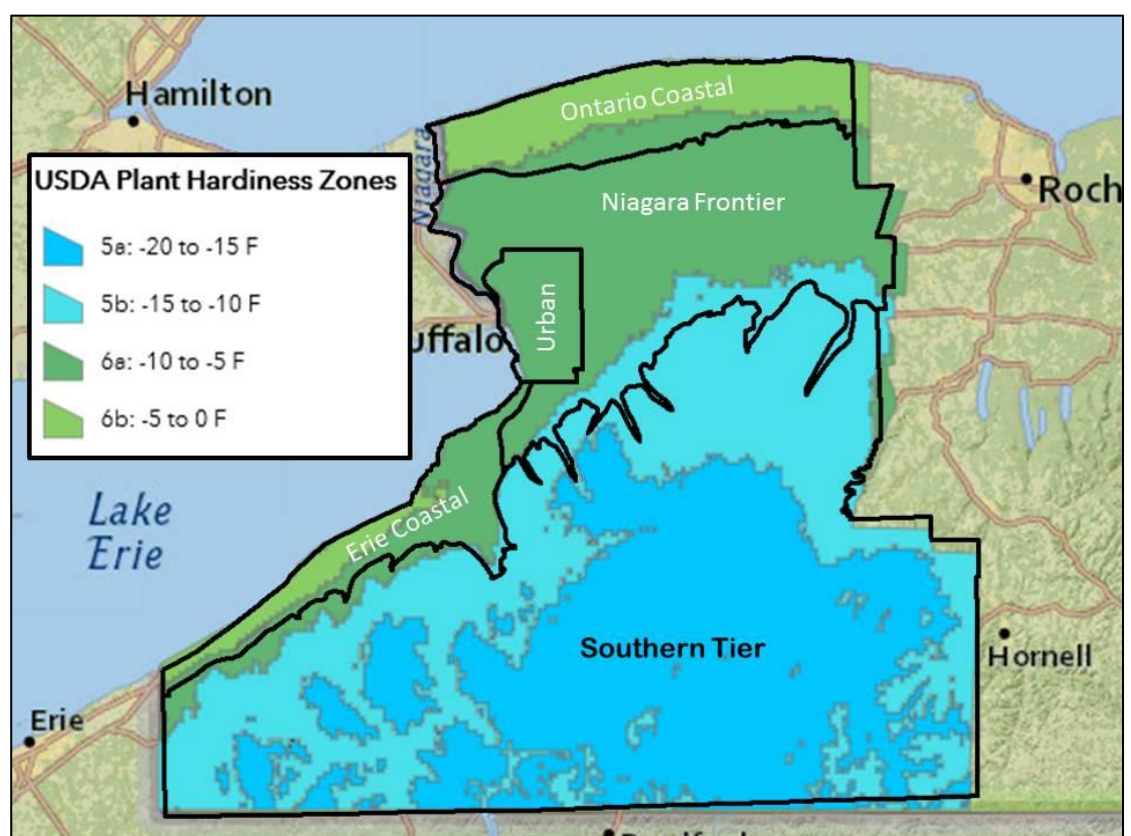
### Winter



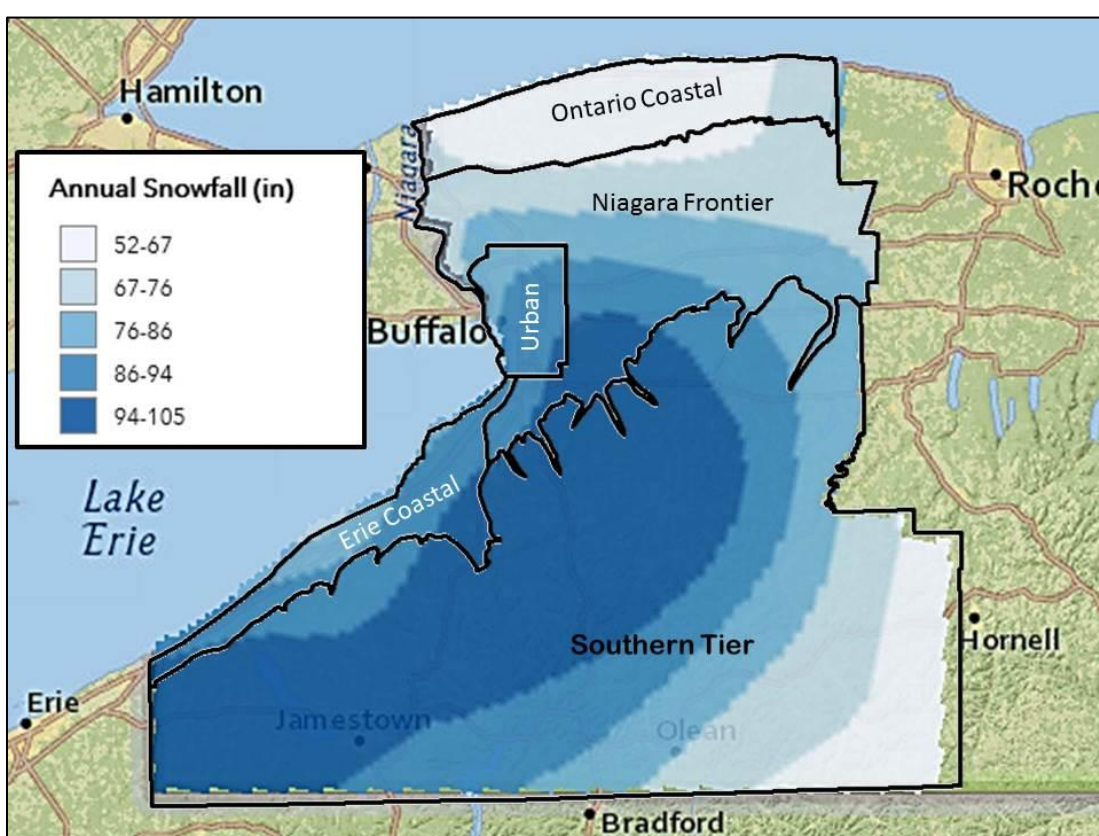
### Severe Weather Events in WNY



### USDA Plant Hardiness Zones



### Snowfall



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