Flint Hills Weather: A Kaleidoscope of Seasons and Patterns

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A KALEIDOSCOPE OF SEASONS AND PATTERNS

The world's largest area of native tallgrass prairie covers the Flint Hills in Kansas. The vista of waving grass forms an ever-changing landscape that continues to inspire visitors and locals alike. Weather is also a part of the Flint Hills landscape, and it's just as ever-changing as the grass.

Severe weather – thunderstorms, strong winds and tornadoes – tend to get the most notice, but the region's weather is a kaleidoscope of seasons and patterns. Let's explore four of the weather components: precipitation, temperature, wind and severe weather.

PRECIPITATION

Precipitation includes both rainfall and snowfall. Based on the period of record from 1895 to 2020, annual average rainfall across the entire region is 35.87 inches, with a sharp gradient in the averages from north to south (northern parts average 33.90 inches, central 36.04 inches and southern 37.67 inches).

However, the precipitation story isn't just about the annual averages. The Flint Hills also feature a cycle of heavy rains and drought. The extremes aren't as variable from north to south. In the north, the highest annual average is 55.17 inches in 1973; the low is 19.27 inches in 1988. In contrast, the highest annual average in the southern stretch is 57.60 inches in 2019; the lowest is 21.93 inches in 1963. Not surprisingly, the central area falls in the middle, with a highest annual precipitation of 56.98

inches in 1951 and the lowest of 21.01 inches in 1936.

The timing of the precipitation is important as well. In the Flint Hills, over 80% of the annual precipitation falls during the growing season, which stretches from April to October. This distribution holds true in both wet years and years of drought. This distribution pattern, coupled with the deep roots of the prairie grasses, allows the prairie to benefit from any available moisture. During wet years, top growth on the grasses is abundant. During drought years, the top growth is limited while the roots wait for a more favorable pattern.

As mentioned earlier, precipitation is made of both rain and snow. Since most of the moisture falls during the growing season, it isn't a surprise that snowfall is not a major factor in the Flint Hills. The region does get snow, but not nearly as much as the shortgrass prairies in western Kansas. In the northwest corner of the state, the average annual snowfall is in the 35-inch range. In the Flint Hills, it is more in the 10- to 14-inch range.

Although snowfall is more limited, that doesn't mean winter storms and blizzards aren't present. From 2000 to 2020, the Flint Hills averaged eight days per year with winter storms. Heaviest snow events tend to be in February. Since 1981, Le Roy in Coffey County holds the single day highest record with 16 inches on February 9, 2011.

Still, there often are years where no snow at all is recorded in the Flint Hills. While the winter moisture is only a fraction of the annual total, dry winters usually result in more spring days with burn bans in place. In turn, that means greater difficulty in completing the typical prescribed burns used to reduce invasive species and maintain prairie health.

TEMPERATURE

The Flint Hills region has a continental climate, which means it's an area in the middle of a landmass without the moderating features of large bodies of water and with the presence of prevailing winds originating over the landmass. The continental climate is also characterized by large swings in temperatures occurring over annual, seasonal and daily timescales.

Temperatures in the Flint Hills have reached 115 degrees and dropped as low as 35 below zero, a temperature swing of 150 degrees. When looking at average temperatures, the swing between seasons is still large. On average, the coldest winter of record was in 1979. The average temperature for the Flint Hills that winter (December – February) was just 22. In contrast, the warmest growing season (April – October) occurred in 1934 with an average of 72. That is a difference of 50 degrees.

Highs above 100 usually occur every year. While the warming climate has resulted in milder winters, sub-zero temperatures still occur. As recently as February 2021, all areas of the Kansas Flint Hills saw lows below minus 20. It is amazing that the ecosystem that is the Flint Hills can survive and even thrive with the variability in the region's weather.

WIND

Kansas gets its name from the Kanza branch of the Dhegihan-Siouan peoples. Kanza has often been translated as "People of the South Wind." The south wind is the dominant wind in the Kansas Flint Hills, particularly during the summer months.

During the winter, wind patterns shift due to the frequent passage of frontal systems. During the months of December through February, the prevailing wind direction is almost evenly split between north and south. This shift in direction helps explain the rapid temperature swings that can occur in the Flint Hills during the winter. With prevailing winds out of the south, mild temperatures will dominate. When the winds shift to the north, rapid temperature drops occur. A daily swing of 50 degrees is not uncommon. Depending on the timing of the system, the warmest temperature of the day may actually be during the night before the arrival of the front.

SEVERE WEATHER

Winter storms, heatwaves, drought, tornadoes and flooding are all features of the Flint Hills. Severe thunderstorms are common, bringing lightning, heavy rain, hail, high winds and sometimes tornadoes. In fact, during most years, hail and high winds from thunderstorms result in more damage than tornadoes.

As for tornadoes, the Flint Hills region has a few factors that help limit the damage: low population density, a tendency toward late afternoon/early evening storms, and the open view that allows people to see what is coming.

And weather watchers in the Flint Hills are always interested in what is coming!

Mary Knapp was born and raised in northeast Kansas. She retired in the fall of 2021 after 30 years with the Kansas Office of the State Climatologist at Kansas State University.