

POLK SOIL & WATER CONSERVATION Quarterly

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WHAT IS A THERMAL BELT?

Polk County is widely known for a unique climatic phenomenon known as the thermal belt. The term thermal belt refers to a band on a hillside or mountain where air temperatures inside the band or belt are warmer than areas above and below the belt. Typically most people have little understanding of where our local thermal belts are located in the county. It is unlikely there are any thermal belts in the eastern half of Polk County.

Macon County (NC) citizen Silas McDowell coined the term “thermal belt” in 1858. McDowell described the area as a temperate zone on the mountain. Frequently frost and freezing temperatures are less likely to occur in these temperate zones or thermal belts.

Cold air situated near the ground moves down the hillsides and mountain slopes into the valley below. During certain weather patterns there is a continuous movement of air above the mountain ridges. This rapidly moving air helps trap warm air rising from the valley below. As a result a band of warmer air is formed with colder air above it and cold air below it. Today this band is identified as a thermal belt.



In 1923 the US Weather Bureau performed a study at 16 different locations across Western North Carolina. One of the weather station sites was placed inside the Pacolet Valley in Polk County. Three additional locations were on Warrior Mountain, each at a different elevation. According to a Weather Bureau Report, there are some “peculiar topographical features near Tryon that affect the flow of air causing some remarkable variations in temperature.” The report went on to say “on no other slope is the center of the thermal belt found so close to the valley floor.”

Camp Skyuka**

Temps 48.6 F
Humidity 41%

Pacolet River Valley*

Temps 30.0 F
Humidity 99%

Melrose Mountain**

Temps 46.9 F
Humidity 44%

Tryon, NC*

Temps 31.3 F
Humidity 86%

This data is from February 11, 2022 at 7:27 am.

**Elevations below 1,200 feet*

***Elevations over 2,350 feet*

Polk Soil & Water Board member John Vining rented a house inside a thermal belt for nearly eight years. According to Vining he had frost only twice in that eight year period. He also has a theory about the locations of Polk County’s best thermal belt areas. Vining believes the old timers understood the advantages of a thermal belt to farming. If you can identify where the earliest grape vineyards were planted in the 1920’s and ‘30’s, you’ll find the most significant thermal belts.

Today nearly all of those locations are residential areas.