

David Inouye has been working summers, and more recently winters, since 1971 as a scientist at the Rocky Mountain Biological Laboratory in Gothic, accumulating (along with Gothic's resident hermit billy barr) a vast store of longitudinal data about the Upper Gunnison Valleys, which he has been translating into useful information.

Mining the Data

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Gunnison county has a wealth of natural resources, some of which require mining. Coal (there's still one active mine near Somerset that exports a 100-car coal train each day), silver (the metal that created the boom-town of Gothic), lapis lazuli (Italian Mountain used to have a mine), marble (by Marble), and uranium (over a million kg of ore was removed from the county) are examples. But I'm not a geologist, so my mining has not required pick and axe, but a computer, to mine data (a renewable resource!).

One way to contextualize the changes in our current climate is to compare it to what the climate used to be like. We have multiple sources of this historical data, ranging from the sediments in lakes and ponds that captured grass, tree, and other pollen, telling us what the vegetation in the area used to be (grassland or forest). Those bodies of water also have records in their sediment of fires, from bits of charcoal. This source of information has not been as well developed in the Gunnison area as it has been in other parts of the world, so there may still be secrets hidden there for future investigation.

There has been a gauge on the East River at Almont since 1935, and it provides a good record of spring runoff, which in turn can tell us about how much snow fell in the upstream mountains (which determines the peak runoff) and when it melted (which determines the timing of the runoff). By putting those data together with the 50 years of snowpack and snowmelt data from Gothic, I've found a way to estimate snowfall back to 1935.

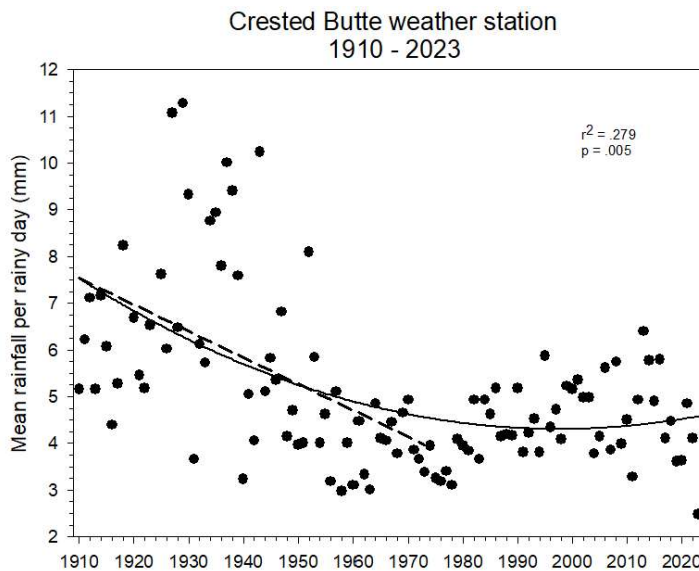
Another historical perspective, dating back hundreds of years, is the information recorded in tree rings. For example, Connie Woodhouse compared tree ring data from 1569 – 1999 for the Gunnison basin to 1 April snow water equivalent (SWE) readings, and found that the tree rings are a very good proxy for the recent instrumental snowpack measurements taken since 1942. She found that 22% of the years in the 1500s were notable drought years, and 1654 was the driest in the whole record, but was followed in 1655 by the wettest. Maybe someday a bristlecone pine from the Gunnison Basin will be able to provide additional centuries of historical insights from an even longer series of tree rings.

A more recent source of historical data about the area's climate comes from weather stations. Gunnison has had a weather station since 1893, and Crested Butte since 1909, and the

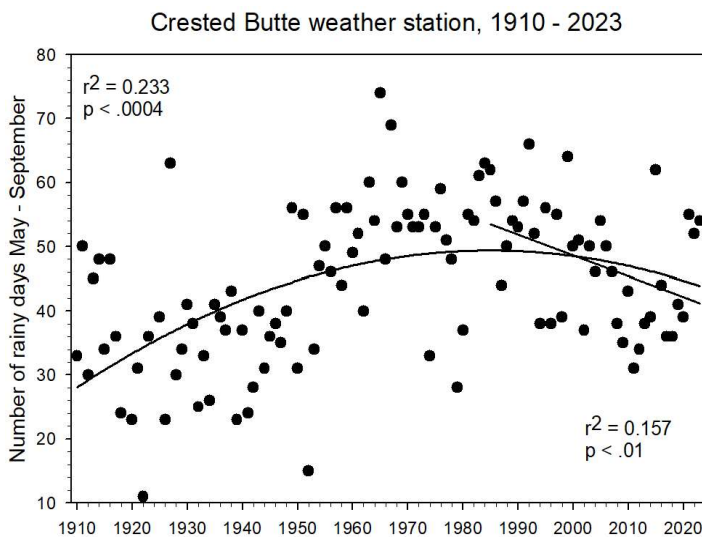
data from those stations are freely and easily accessible now online, courtesy of NOAA's National Centers for Environmental Information. billy barr's remarkable and detailed record for daily snowfall and snowpack in Gothic started in 1975, and continues to this day.

I've spent many hours in the past few years looking at what the weather station data can tell us about how the climate is changing, and how what we're experiencing compares to what Gunnison county experienced as far back as 130 years ago. Because of its proximity to Gothic, where I work at the Rocky Mountain Biological Laboratory, I've mostly worked with the Crested Butte data, and with billy's records. Examples of what I've learned include:

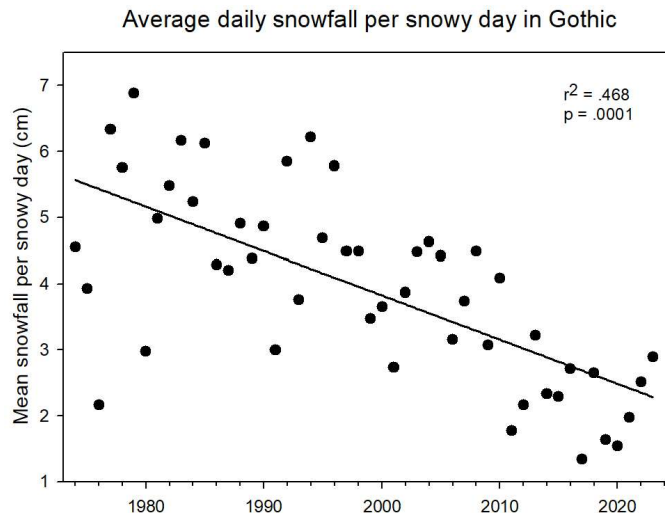
- 1) When we get a rainy day, not as much rain falls as it did a century ago:



- 2) The number of rainy days each summer has been changing:



3) The average snowfall per snowy day in Gothic is declining:



4) Snow is getting denser (wetter), which makes sense as temperatures are getting warmer. So “champagne powder” (Steamboat’s registered trademark for dry, fluffy snow) may not be a feature of Upper Gunnison Country winters for much longer.

These are only a few of the insights to be gleaned by mining local climate data. I think the results of my deep digging will be instructive both for the other biologists working at RMBL, and for Gunnison county residents who are curious about how our lived experience with the climate compares to that of older generations.
