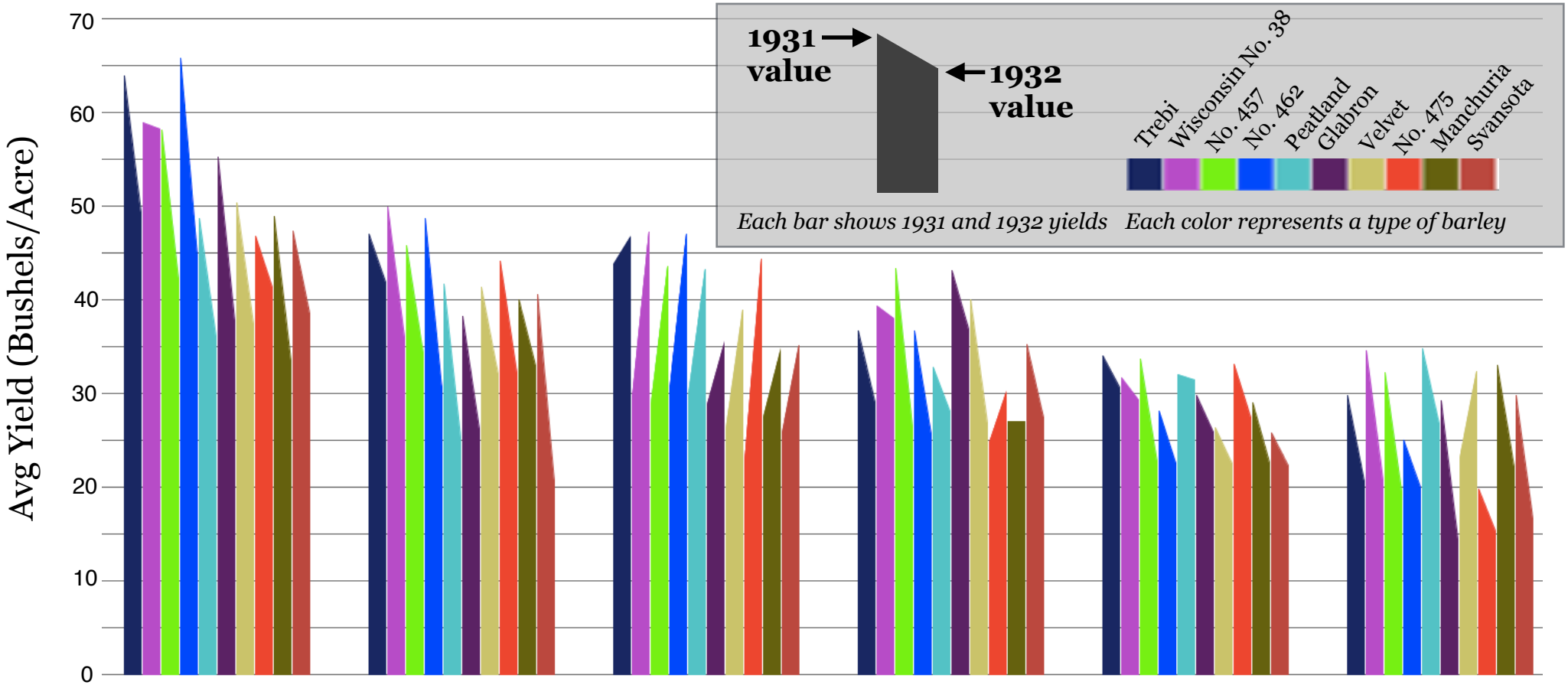
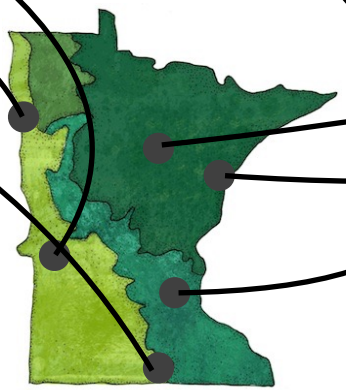
Minnesota Barley Test: Average Yields 1931 and 1932



Across all locations and barley variations, the average yield was 37.1 bushels/acre in 1931 and 31.8 bushels/acre in 1932

**Morris was the only location where the total average was higher in 1932 than in 1931*



Different shades on Minnesota map represent different climates. Source: https://www.climategen.org/blog/minnesotas-changing-climate-updates-may-25/

Design Defense: Minnesota Barley Test
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CS448b Assignment 1

The first task was to identify the trends in the data. The first and largest trend was the variation in average yields based on location. Averaging across all barley types and both years, the highest average yield (Waseca, 48.1 bushels/acre) was 1.93 times the lowest average yield (Grand Rapids, 24.9 bushels/acre). The second trend was the variation in average yields based on barley type. The best performing barley (Trepi, 47.2 bushels/acre) had 1.30 times the average yield of the worst performing barley (Svansota, 36.4 bushels/acre). The third trend was the overall decline in production from 1931 to 1932. The overall average yield in 1931 (37.1 bushels/acre) was 1.17 times the average in 1932 (31.8 bushels/acre). The only exception to this yearly trend was Morris, which performed better in 1932 than 1931.

I thought that using position was the best way to show the difference in quantitative variables, so I used the "small multiple" design. This allowed me to use position for both the location and barley type trends. By ordering the locations by their overall performance and graphing their height with bars, we notice the largest trend first: certain locations clearly outperformed others. The second trend, regarding barley type, is shown by ordering the barley types from best to worst, and labeling each type with a distinct color. The reader can see this trend because bars get smaller from left to right within each of the six location groups. I chose to use bars instead of points because it's easier to see the difference in color between colored bars than between colored points or lines. I also chose to include a grid in the background so that the reader can easily compare a particular barley variation's performance across locations. The final trend I needed to show was the decline from 1931 to 1932. I attempted to do this by having each bar sloped at the top, with the top left corner representing 1931 and the top right corner representing 1932. This subtle touch allows the reader to see that almost all barley types declined from '31 to '32… except the peculiar case of Morris. At Morris, every barley type increased in yield from '31 to '32 - a clear outlier. However, this is a weakness of my design because it is not obvious right away. To make up for this graphical weakness, I added a star with an explanation to highlight the anomaly. I also added text that mentions the overall difference between 1931 and 1932, because this is not totally clear from the graphic.

I had one final touch: the addition of the Minnesota map. I noticed that the higher performing locations tended to be around the south and west/northwest, while the worst locations were in the northeast. When comparing these locations to the different microclimates of Minnesota, it seems there is a correlation. This climate map at the bottom shows this.

Overall I felt I did a good job of showing the most important trends graphically, and I tried to make up for weaknesses by adding short text when appropriate. I used the Java implementation of the design software Processing to read in the data and create the graphs. Then I used Pages to add the final touches.