1. **Describe the general features that you see in your contoured analyses.**

Analysis for N=2

* shows the analysis field computed using the 2 nearest observation stations for each grid point.
* Fewer stations contribute to the analysis, so the field exhibits while being influenced by the closest observations.

Analysis for N=4

* uses the 4 nearest stations for each grid point.
* The analysis field is smoother compared to N=2, as more data points are included in the analysis.

Analysis for N=10

* uses the 10 nearest stations.
* The field is much smoother for using larger set of observations at each grid point.

1. **Describe the differences that you see in your contoured analyses. Does one analysis seem to be smoother than the other? If so, what would cause this?**

Smaller N=2 and N=4 captures localized details near the Idaho , Texas area. But too small N like N=2 introduce noise or discontinuities, like in Kansas, New Mexico region.

Larger N=10 smooths the field, emphasizing regional patterns but potentially loses fine-scale information in the southern US.

Analysis increments are sharper for N=2, and reduces as the N increases.

1. **What happens as you increase the number of points considered for the analysis? Is this desirable? Why or why not?**

Answer: The choice of N depends on the application: smaller N for localized analysis and larger N for broader, regional assessments.

As N increases, the analysis field becomes smoother because the interpolation uses more observations, reducing the influence of any single station. So increasing the N would reduce the noise in the map resulting in consistent contour lines. But for small N, the analysis is more localized, which captures fine-scale variability. So if our area of consideration is small and we want to analyze in local basis, decreasing N is preferred.