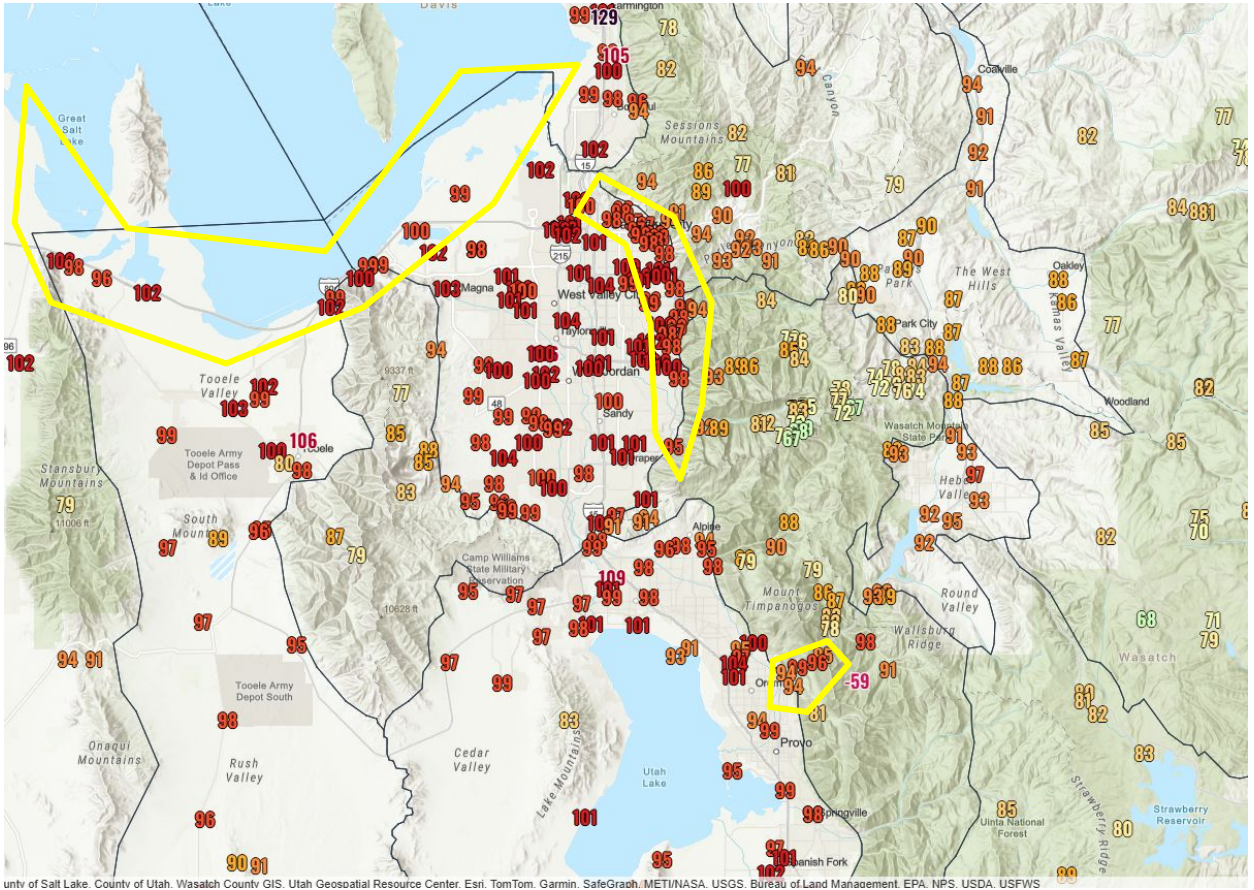
RTMA/URMA Terrain Gradient Temperature Issue

David Church - SOO SLC

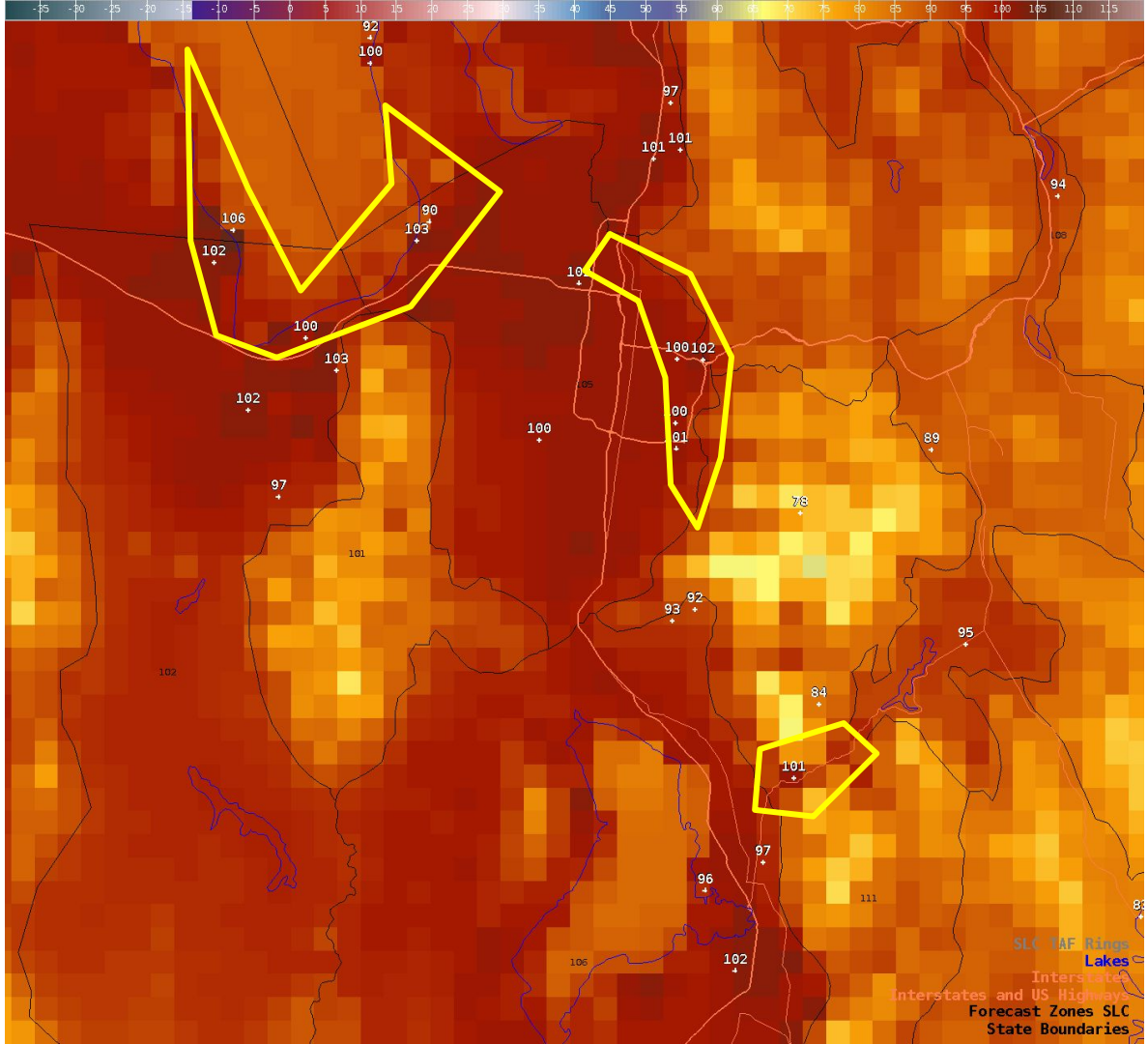
23Z Observations

- Note generally cooler temperatures along the benches than the valley floor (yellow outline)
  - Benches are the transition zones between the valley and the mountains
- No observations of warmer temperatures near the Great Salt Lake Shoreline



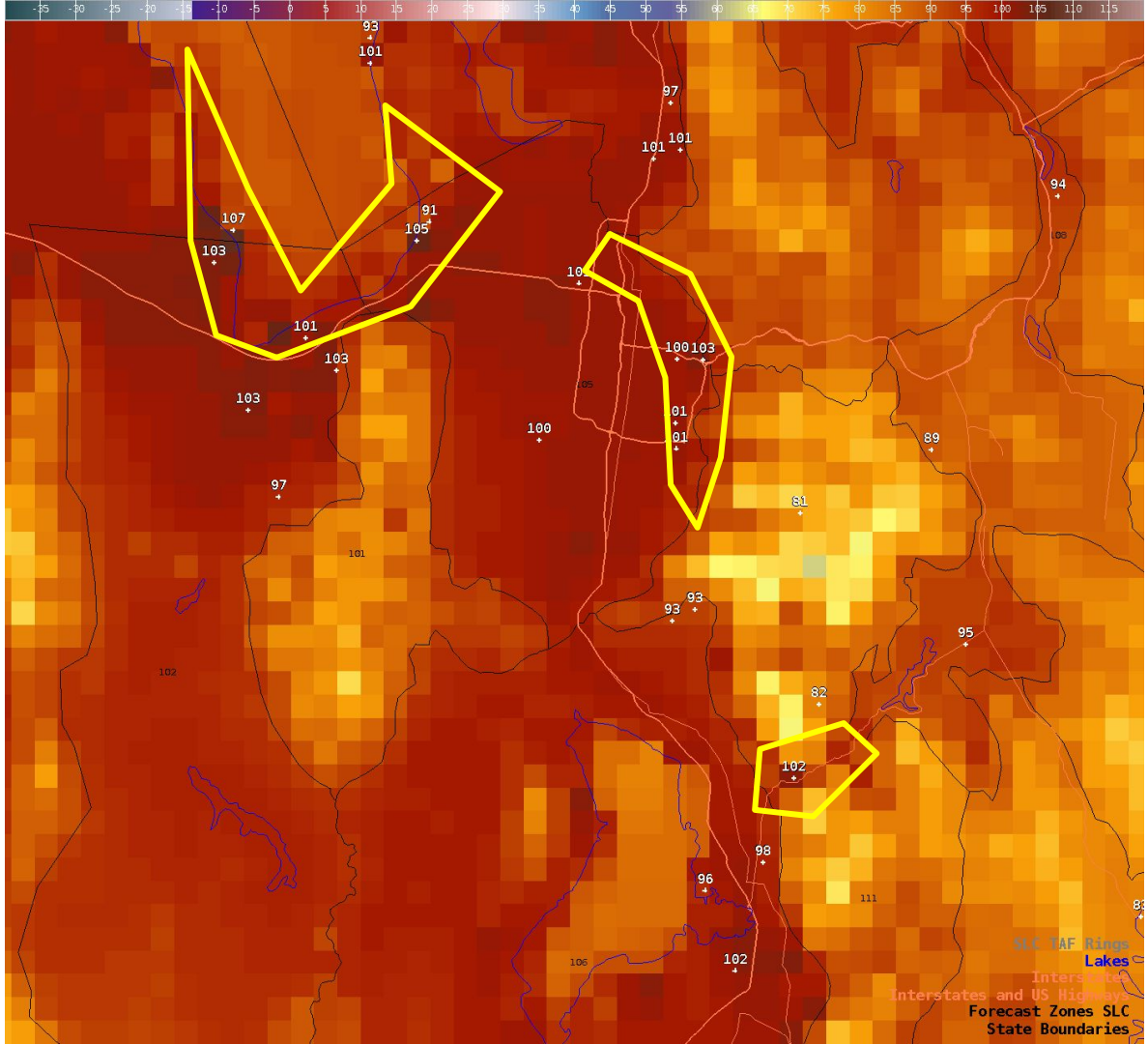
23Z RTMA

- Hotspots along the benches don’t align with observations
- Hotspots along the Great Salt Lake shoreline also not supported by observations
- Yellow outlines generally match the same areas highlighted on previous slide



23Z URMA

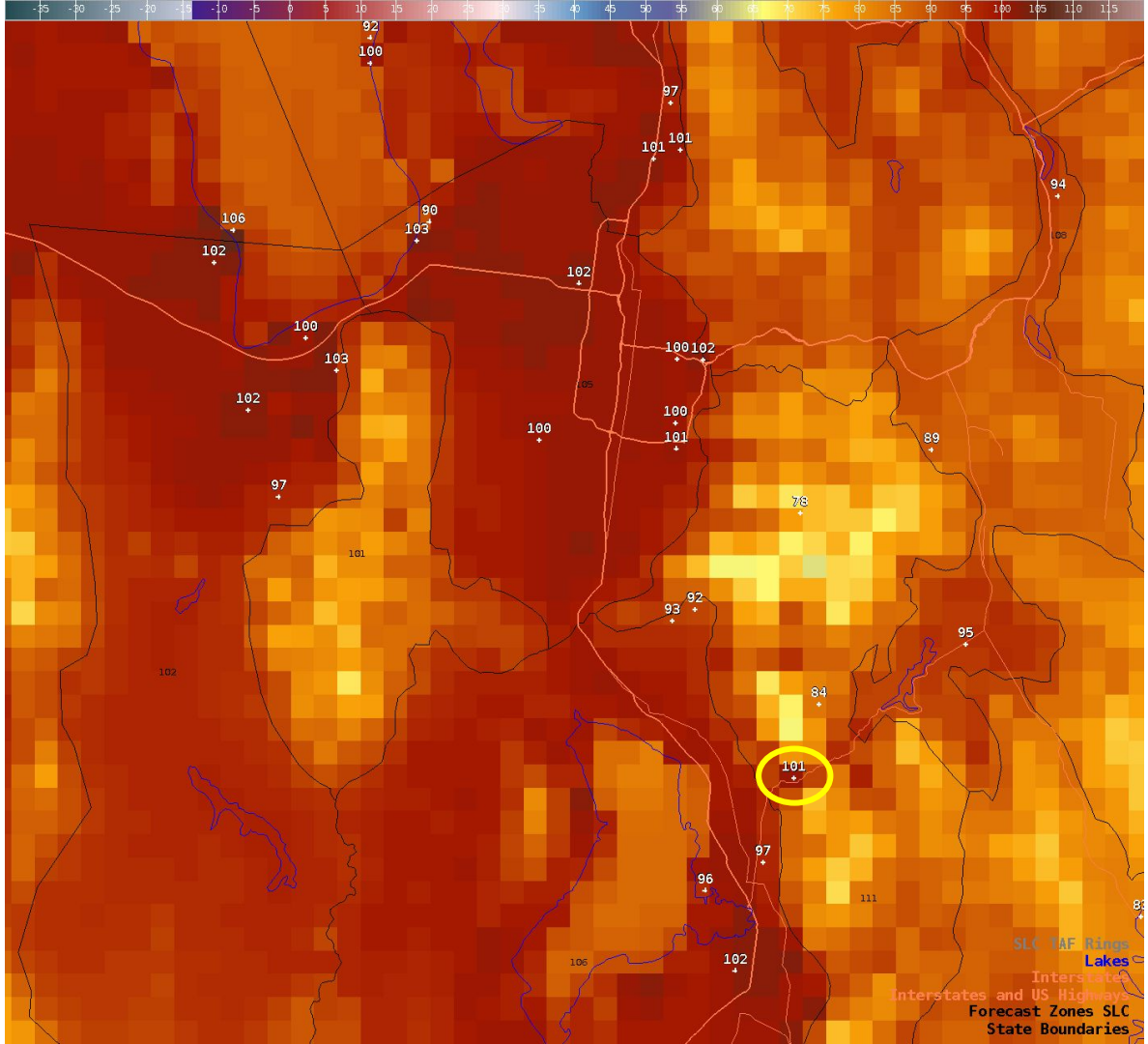
- This issue seems to be amplified by another 1-2 degrees warmer in the URMA analysis from the RTMA analysis



Point Case Study At 23Z - RTMA

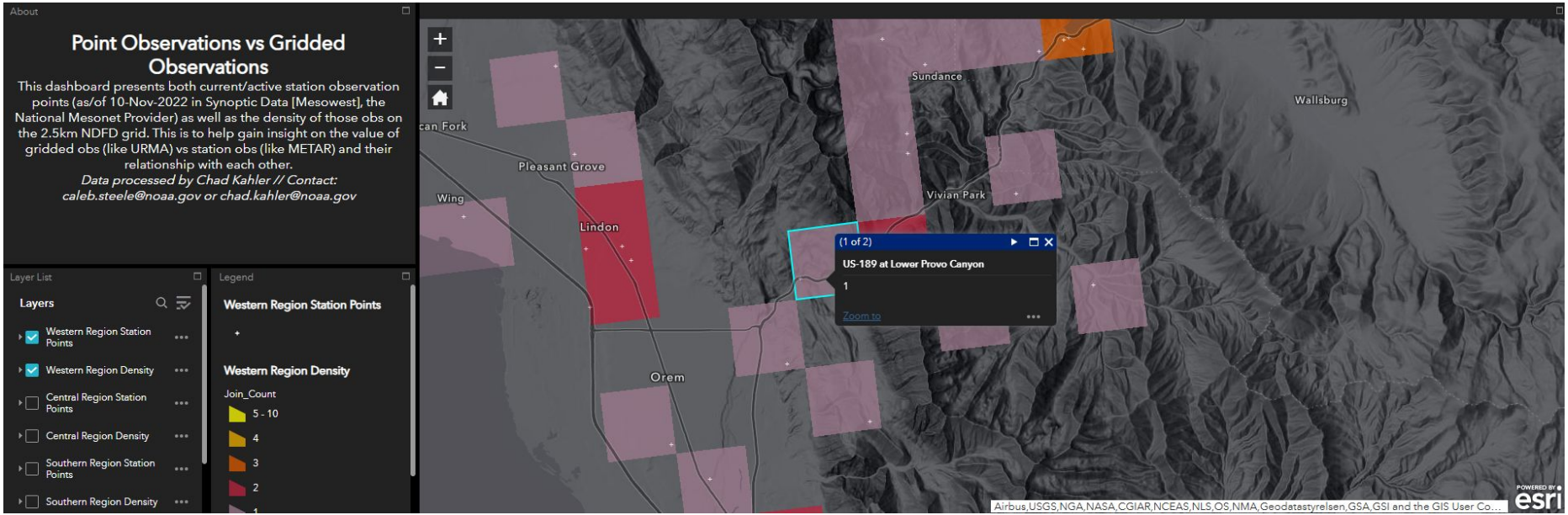
Let’s examine this 101 in Provo Canyon (yellow circle at left) in the RTMA

This point get raised to 102 in the URMA analysis



Point Case Study At 23Z - Obs Influence

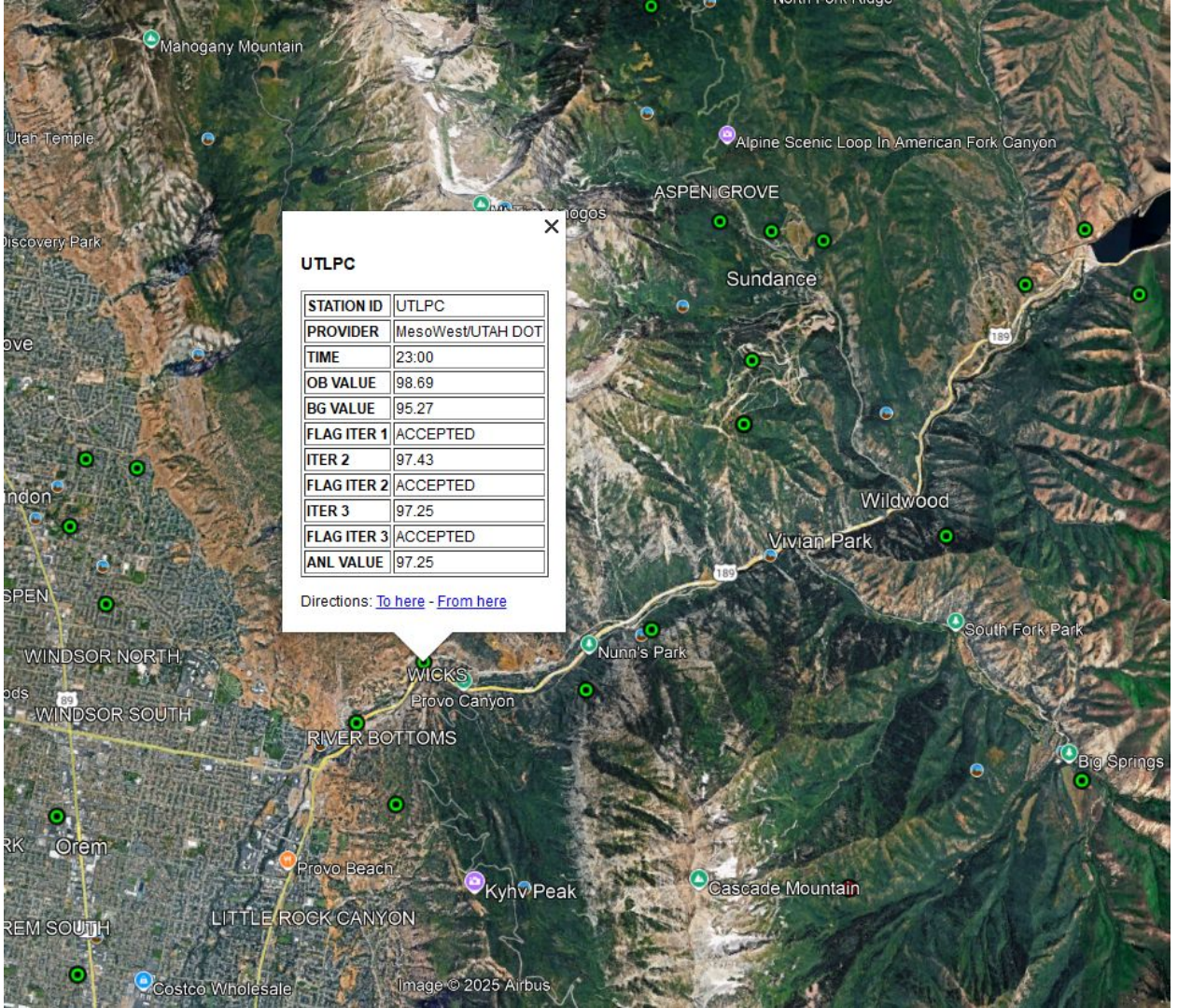
This point has 1 ob influencing - US 189 at Lower Provo Canyon (UTLPC)



Point Case Study At 23Z - Obs

The 23Z RTMA KML file shows an observation value at UTLPC of 98.69 and a background grid value of 95.27, with a final accepted value of 97.25

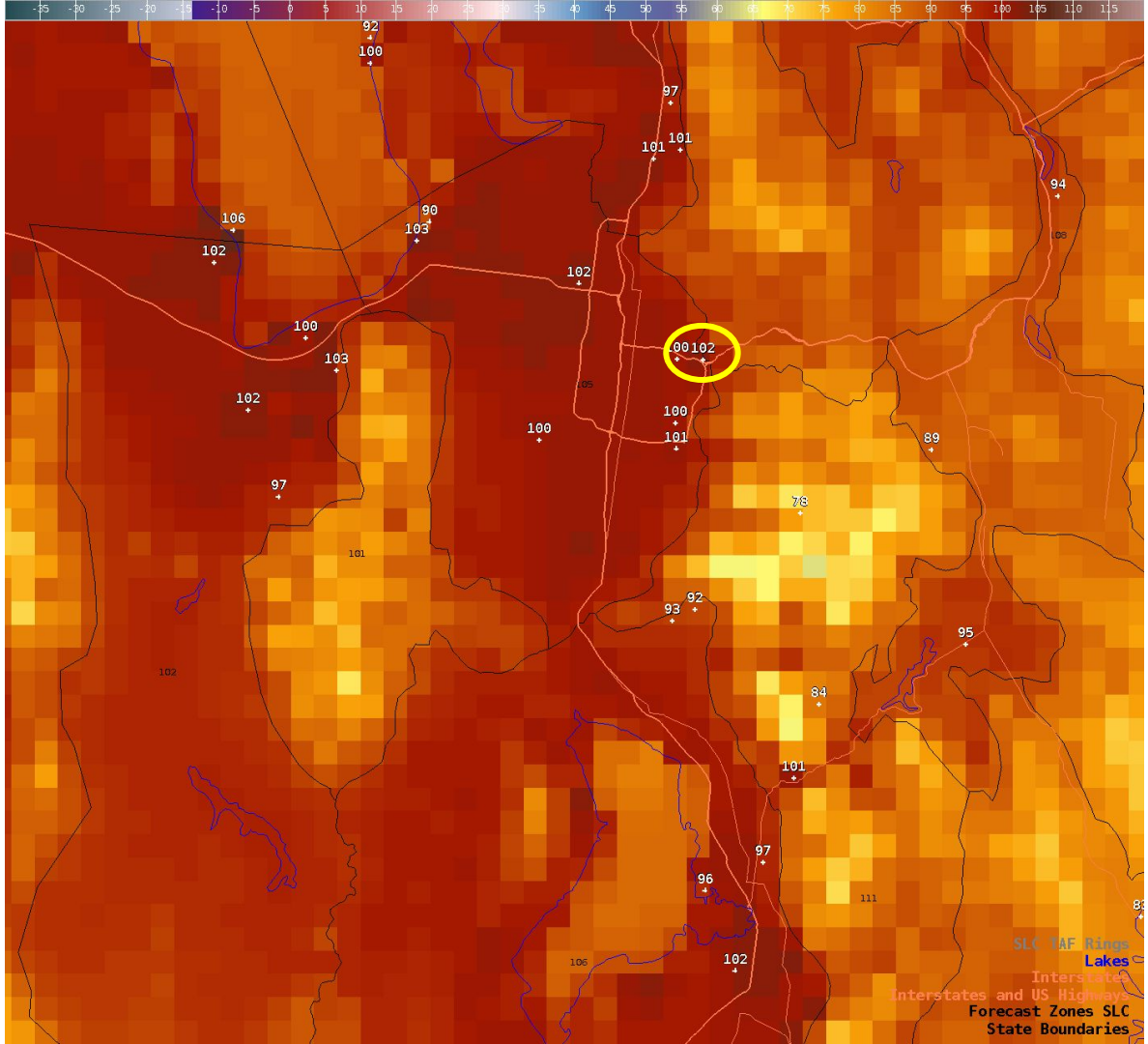
This final value of 97.25 **does not match** the RTMA value of 101 or the URMA value of 102 at this point - where are the high values coming from?



Point Case Study At 23Z - RTMA

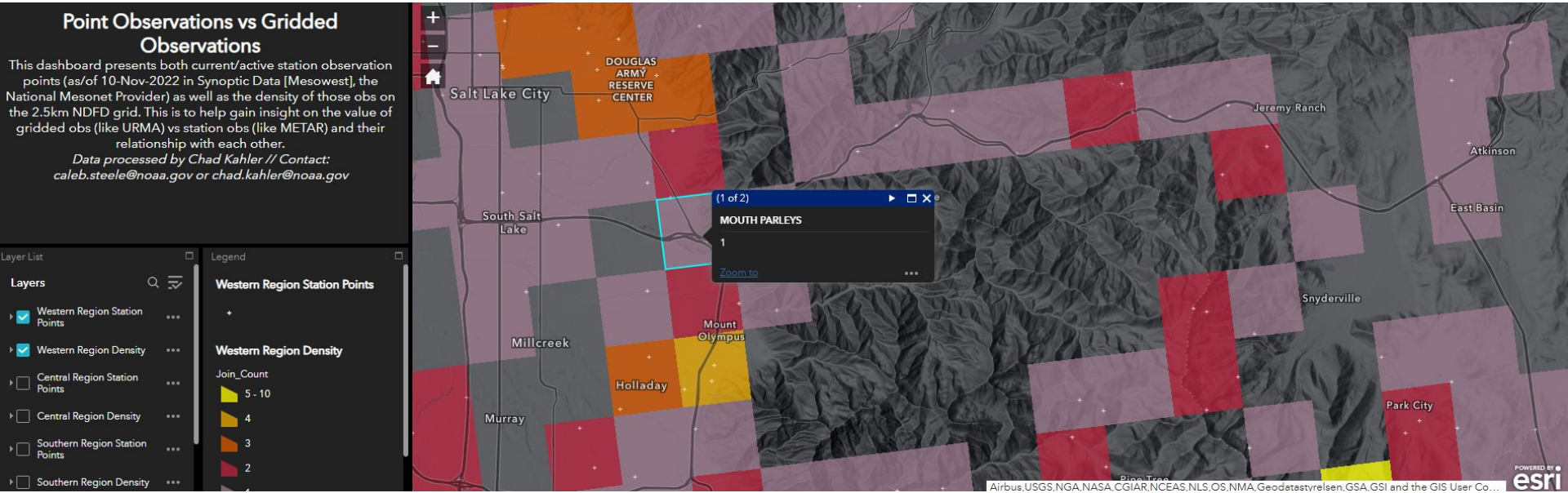
Let’s examine this 102 at the mouth of Parley’s Canyon

This point get raised to 103 in the URMA analysis



Point Case Study At 23Z - Obs Influence

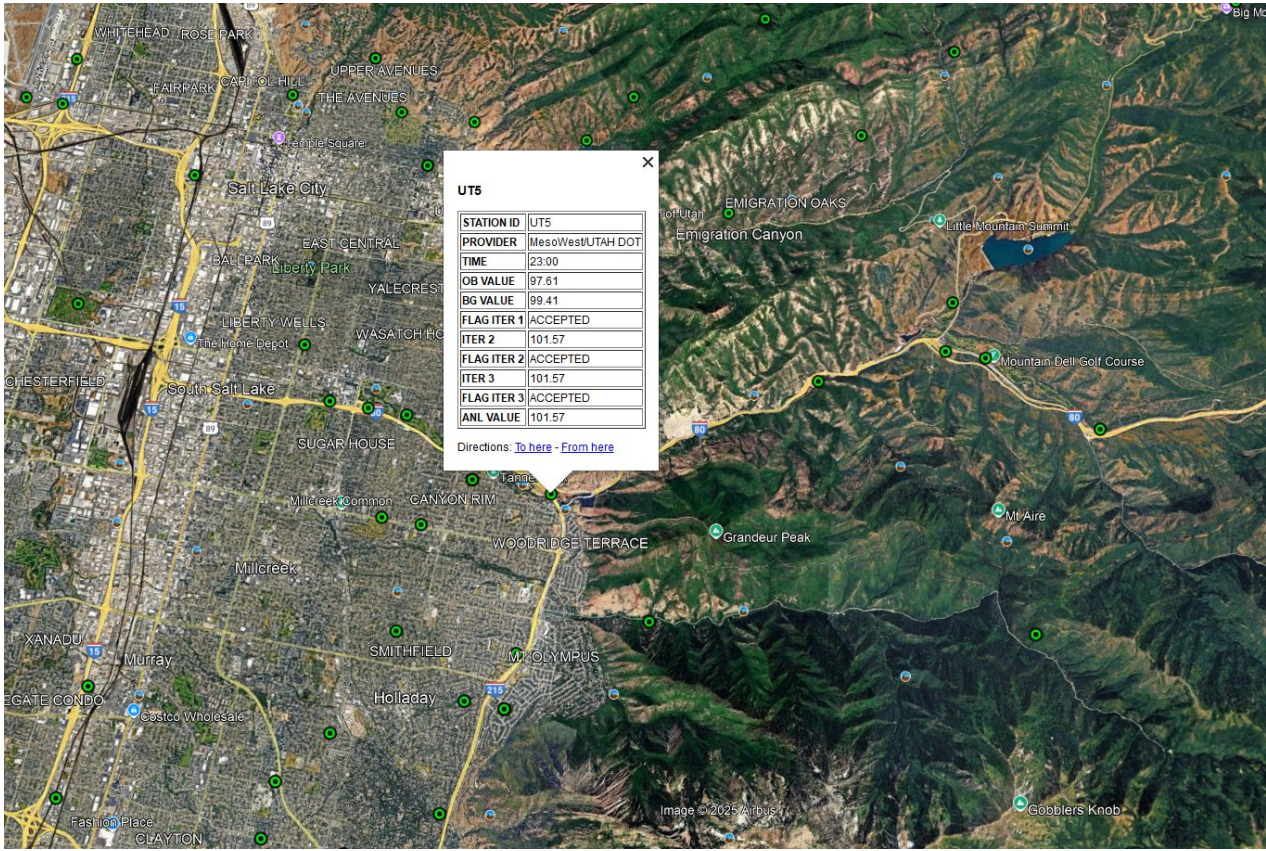
This point has 1 ob influencing - Mouth Parleys (UT5)



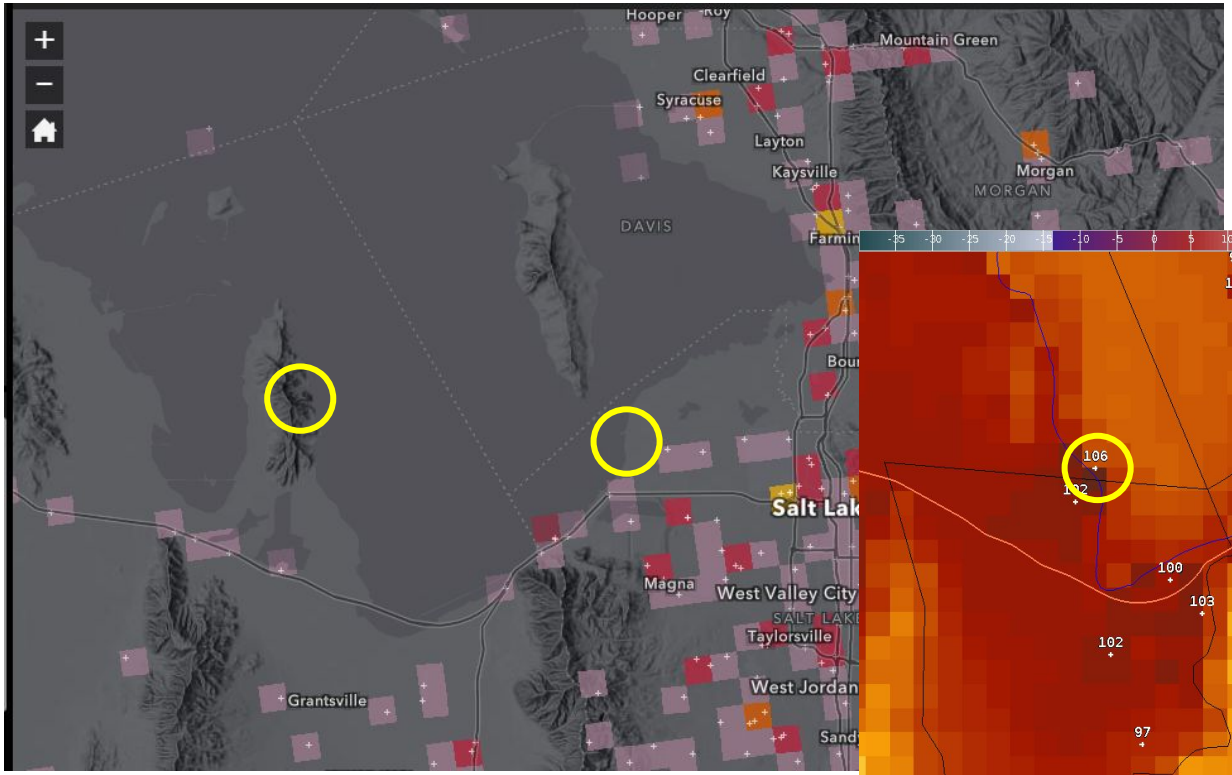
Point Case Study At 23Z - Obs

The 23Z RTMA KML file shows an observation value at UT5 of 97.61 and a background grid value of 99.41, with a final accepted value of 101.57

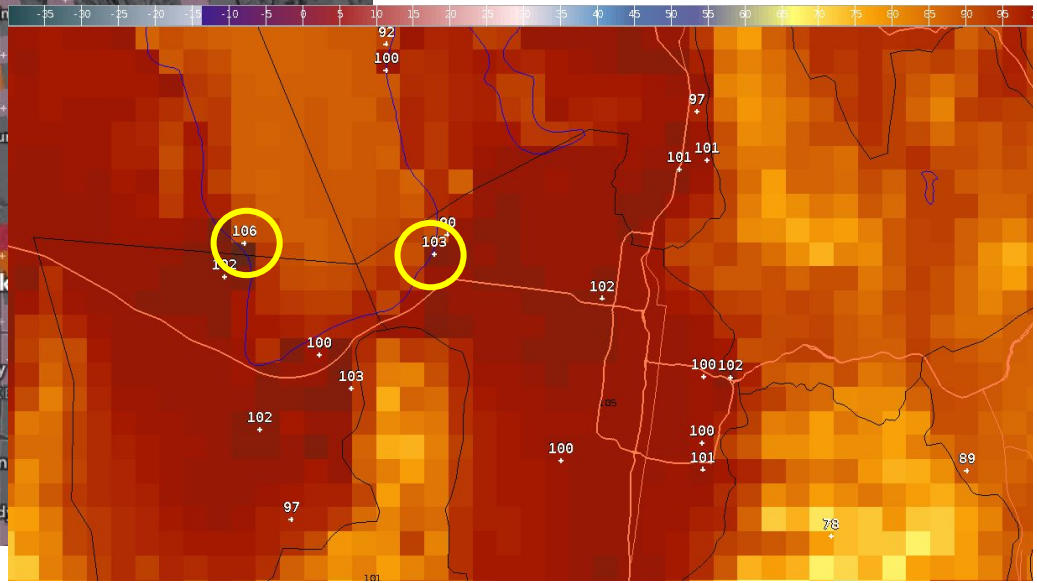
This final value of 101.57 DOES match the RTMA value of 102, HOWEVER, **the value is higher than either the background grid or the observation**.



Hot Lakeshore Points have No Obs Influence



Does the background grid run too warm along the lake shore?



Summary

- Pattern repeats on any given day - doesn’t seem to depend on being overly hot or cool days
- Numerous pixels affected along the steep terrain gradient along the Wasatch Front - this is a high population area. Also noted around the shoreline of the Great Salt Lake.
- Downstream impacts to the NBM forecast, and other forecast tools like HeatRisk - can impact heat impact messaging on hottest days.
- Quick analysis across Western Region, this seems more evident along the Wasatch Front, possibly noted in the transition from the Central CA valley into the Sierra Mountains as well - but didn’t look into that further.