

### Background

NICE Net is a network of agricultural weather stations created to gain a better understanding of evaporative demand and irrigation water requirements as well as support irrigation management throughout the state of Nevada.

- Established in 2010 (collaboration between DRI, NDWR, USBR)
- Used to support numerous consumptive use studies, the development of evapotranspiration products, and irrigation management for agricultural water users
- Prior to NICE Net, the majority of Nevada's weather stations were situated in arid, non-irrigated areas
- Up to 30% inaccuracy can occur when calculating irrigation demand metrics using data from these dry or ambient stations

### Meteorological Stations



Step toe Valley North, NV

Currently consists of 18 agricultural weather stations located throughout the state of Nevada. Data products provided include hourly and daily time series of measured climate and computed variables.

#### Measurements

- Wind Speed
- Wind Direction
- Precipitation (x2)
- Soil Moisture
- Soil Temperature
- Solar Radiation
- Relative Humidity
- Air Temperature

### Eddy Covariance Flux Stations

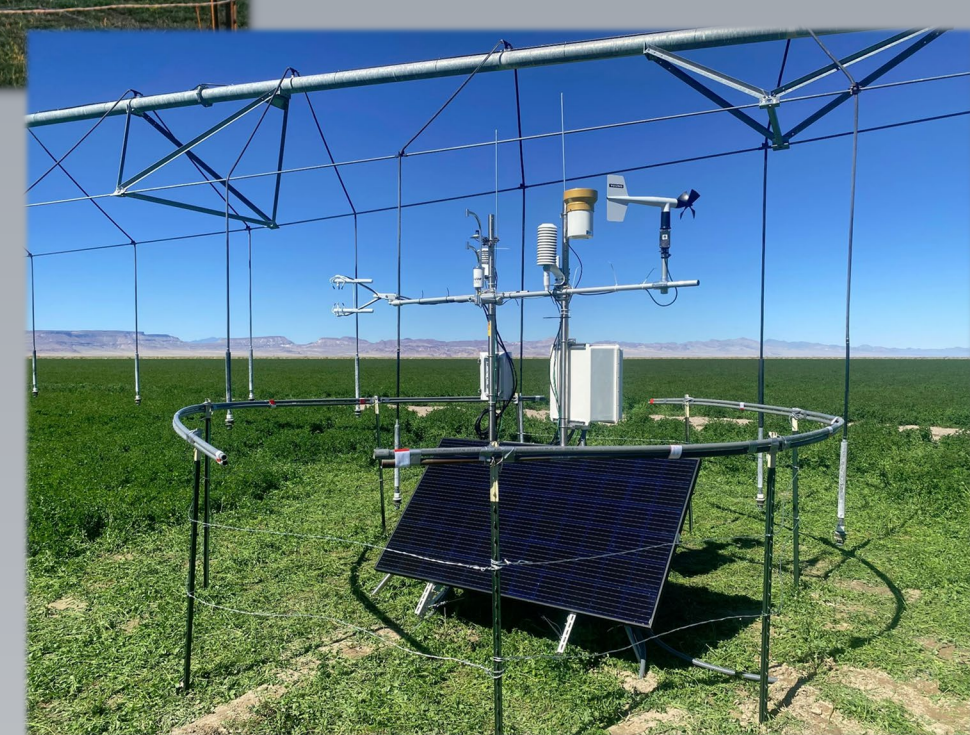


Railroad Valley, NV

NICE Net currently monitors three flux stations, two located within irrigated farmland (alfalfa, grass hay), and one station located in a phreatophyte area.

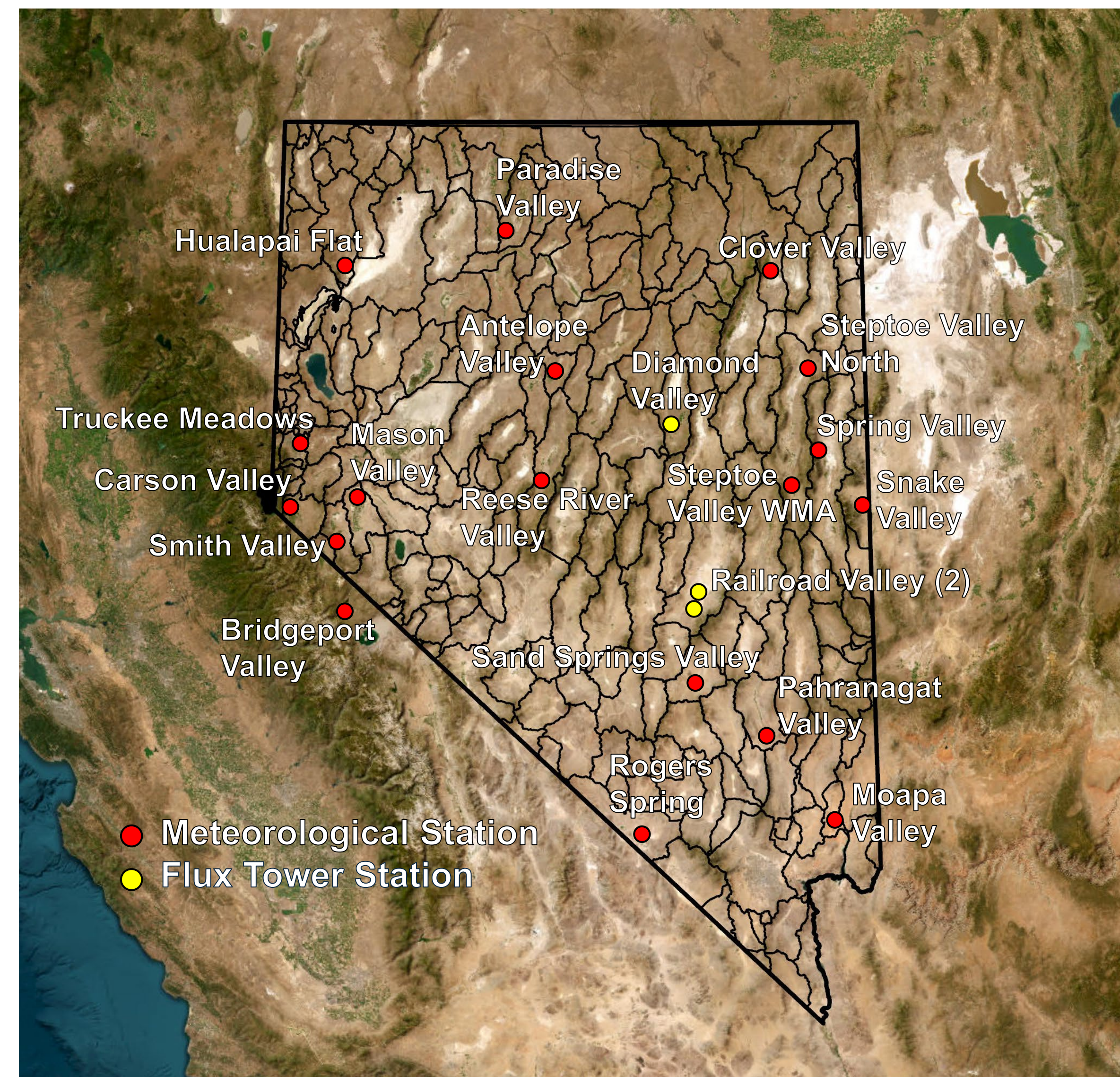
#### Measurements

- Precipitation
- Short & Longwave Radiation
- Humidity
- Temperature
- Evapotranspiration
- 3D Wind speed
- Soil temperature and moisture content

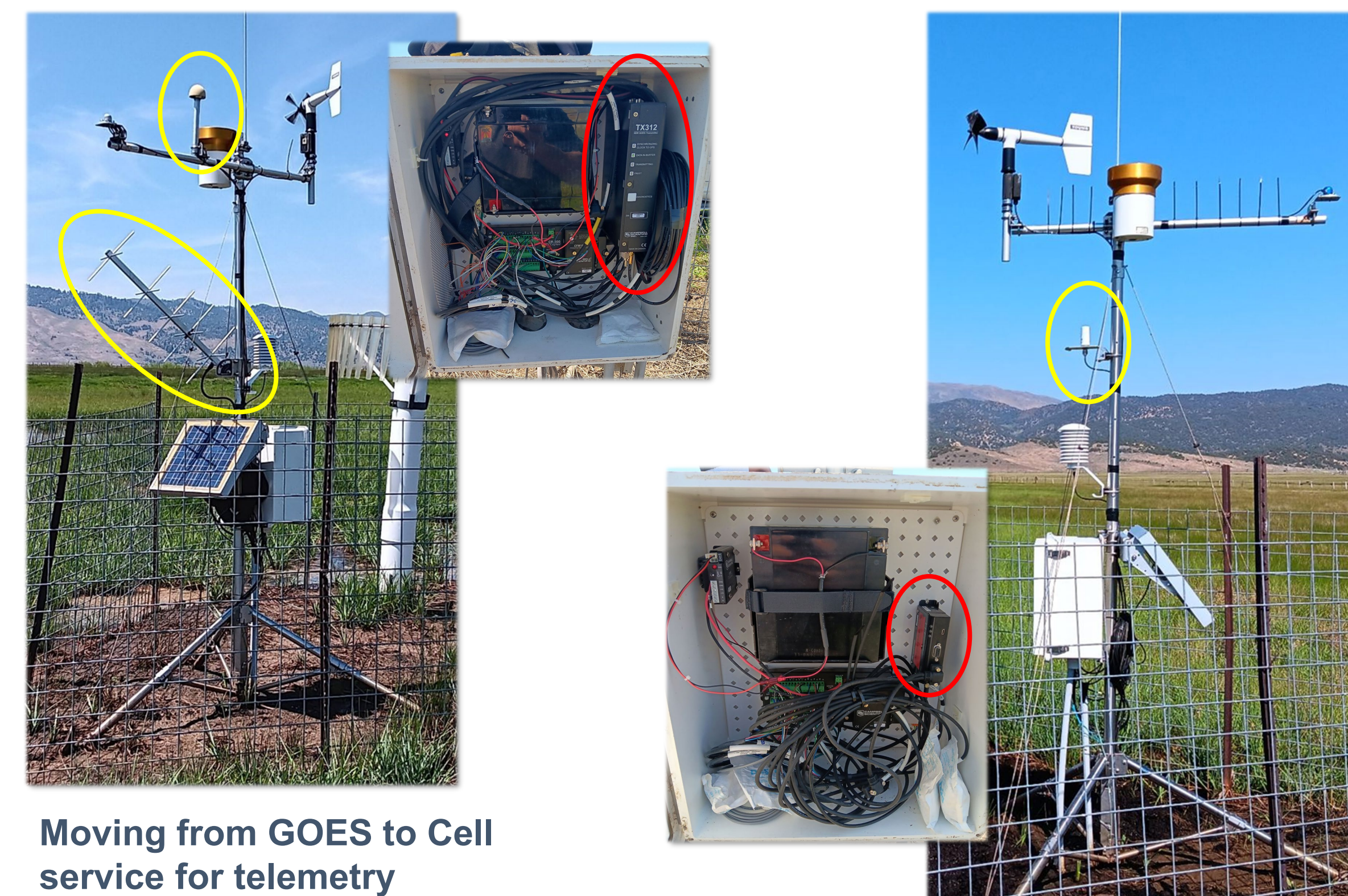


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### NICE Net Locations



### Improvements and Upgrades



Moving from GOES to Cell service for telemetry



#### NICE Net Upgrades

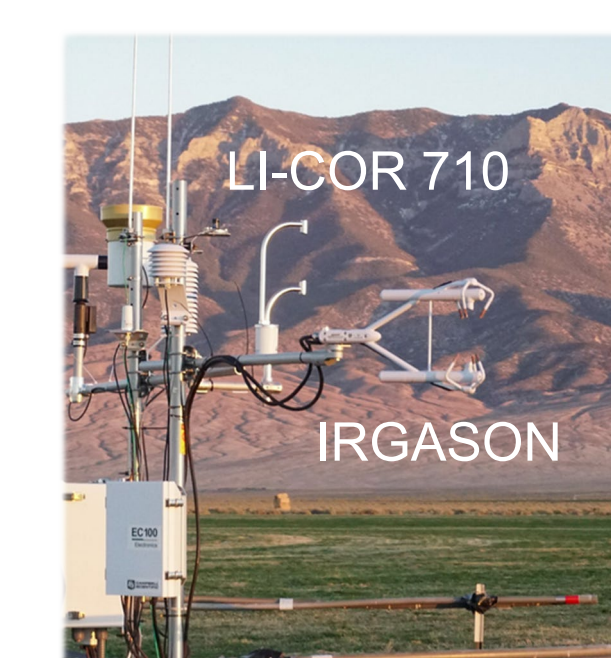
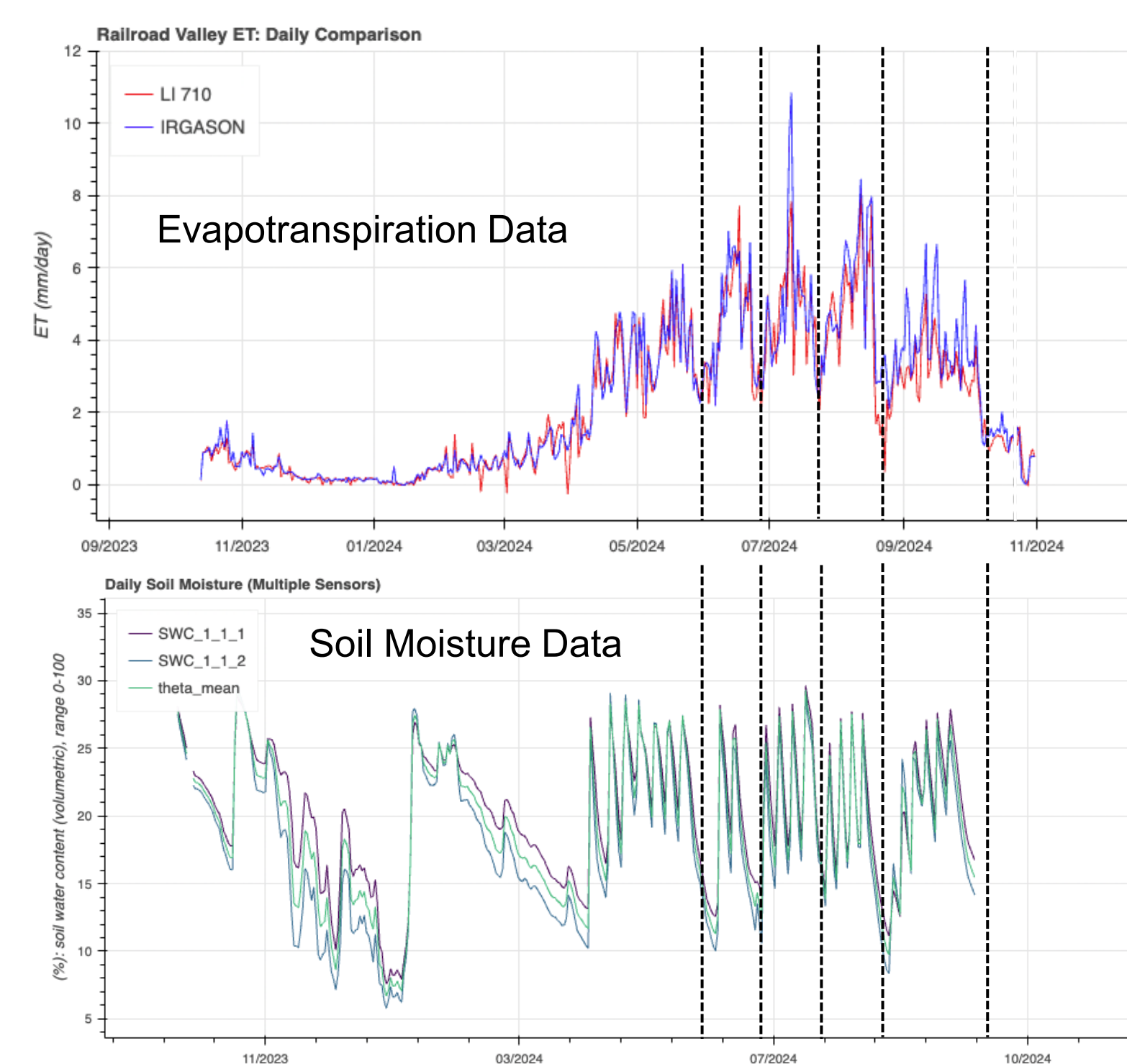
- 80% of stations now upgraded and require only routine maintenance
- Replaced or upgraded:
  - Temperature and Humidity probes
  - Pyranometers
  - Rain Gages
  - Anemometers
  - Power systems
- Continued process of moving stations from GOES to Cell service
- Coordinating with Pacific Northwest AgriMET to improve data access and integrate into irrigation scheduling software

### Objectives

- Improve agricultural water use and decision support in the state of Nevada
- Upgrade and maintain existing NICE Net meteorological station network
- Expand network to increase coverage and observation density
- Monitor and compare in-situ ET data to satellite-based estimates and ET-demands
- Improve quality of data used to compute irrigation demand metrics (i.e., reference ET) and apply satellite-based remote sensing and consumptive use models (i.e., Open ET)

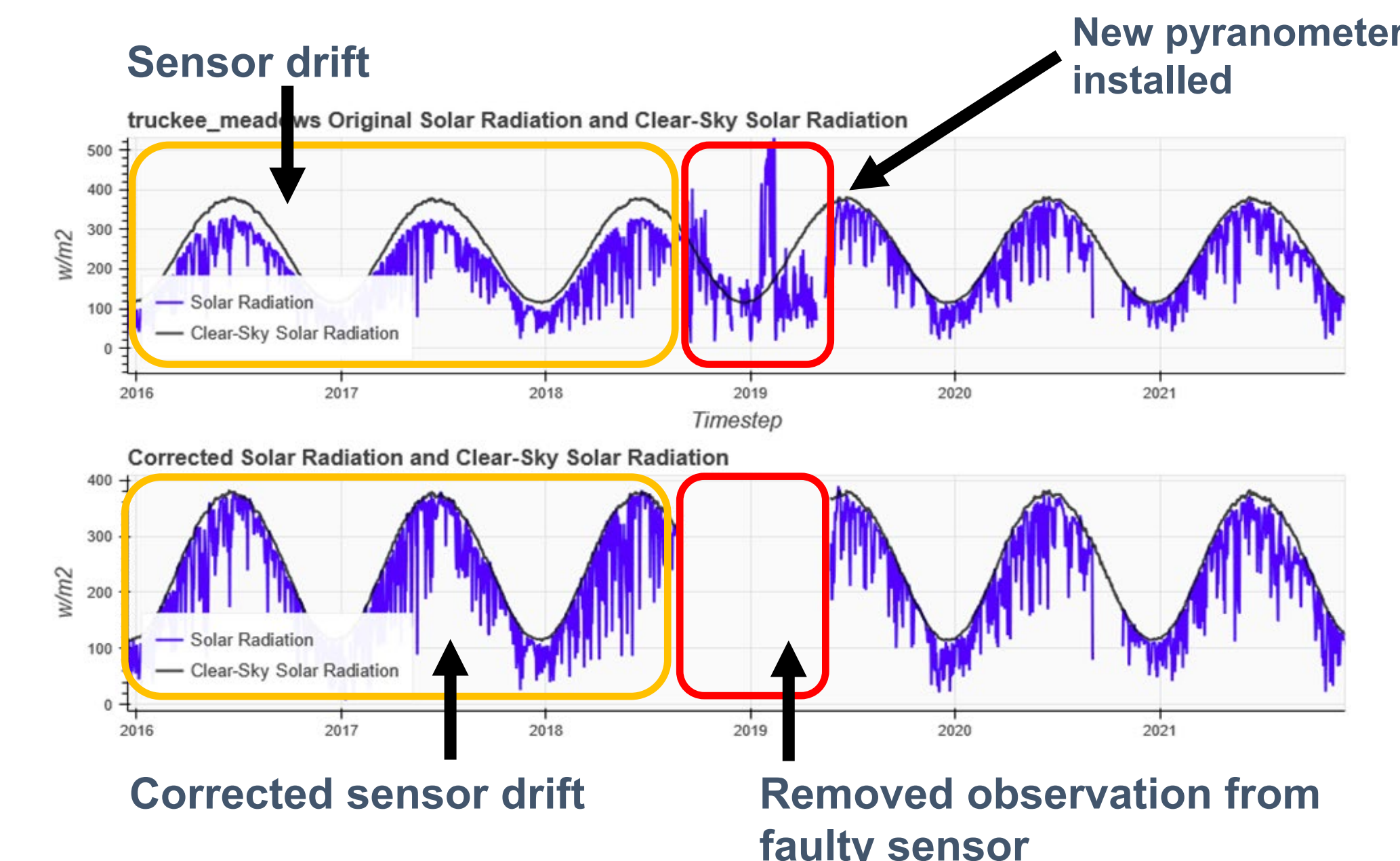
### Benefits to Nevada Water Users

- Provide weather, soil moisture and temperature, and water use information to irrigators in real-time
- Improve irrigation scheduling and water use efficiency (crop yield / applied water)
- Better understand evaporative demand and water use



### Quality Assurance and Control

- Weather data is QAQC'd and raw data is replaced in the database



### Challenges

Lack of dedicated financial and personnel resources has resulted in:

- Damage and disrepair to multiple stations
- Sensor age leading towards drift and malfunction
- Loss of contact with landowners



Damaged station (Paradise Valley, NV) "Ask me about the moose."



Before and After – station renovation (Mason Valley, NV)



(Bridgeport Valley, CA)

### Conclusion

There is substantial need for an agriculture-specific weather network in Nevada. For over 15 years, NICE Net has successfully fulfilled that necessity, helping Nevadans understanding evaporative demand and water use.

#### Next steps:

- Update three remaining stations
- Expand the network (8 new stations proposed)
- Improve data access – [nicenet2.dri.edu](http://nicenet2.dri.edu)
- Continue to QAQC new data and update database