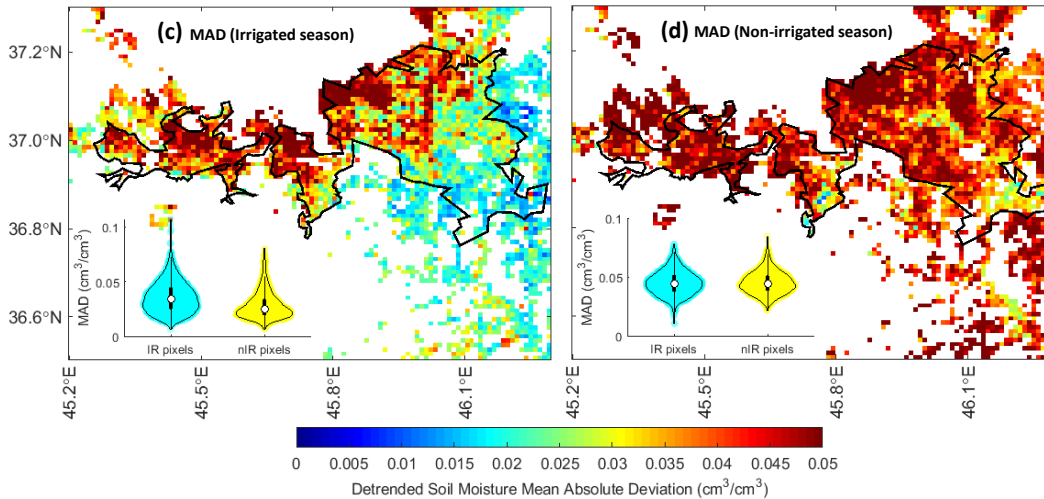




Evaluation of SMAP_Sentinel-1 High-resolution soil moisture data to detect irrigation over agricultural domain

Problem:

- Water use in agriculture as irrigation is the world's largest consumer of global freshwater
- Coarse spatial resolution of MW sensors failed to resolve local irrigation practices
- Can SMAP_Sentinel-1 1km soil moisture (SM) data capture irrigation signals?



Significantly higher variability in SMAP-S1 SM data was observed during the irrigation season over the irrigated cropland areas

Finding:

- Significantly higher MAD value is observed in the SM timeseries over the irrigated area during the irrigation season
- Use of actual VWC over croplands instead of climatology VWC in SM retrievals results in $0.05 \text{ cm}^3/\text{cm}^3$ higher estimates of SM during the summer season that improves detection of irrigation activities.

Impact: Assimilating SMAP_Sentinel-1 SM data (retrieved using dynamic VWC data) into a land surface model will allow quantification of the freshwater used in irrigation over the croplands.