# Comparing Gridded and Meteorological Site Data to run the Community Land Model

Steven Billington

Tianyi Hu

Dept of Hydrology & Atmospheric sciences.

#### Introduction

The Community Land Model is the land surface component of the Community Earth System Model. One of the inputs required for this model is forcing data. This is historical meteorological data. We want to see the difference between using gridded data and data from a meteorological site to run the model.

### Methodology

- We used the Arizona Meteorological Network (AZMet) and Analysis of Record of Recalibration (AORC) datasets.
- We took data for Maricopa which is at 33.07 latitude, -111.97 Longitude and 362 meters above sea level.
- The data was first turned into forcing data. which involved converting units, calculating needed variables, and converting into monthly netcdf files.
- The datasets were then compared by looking at diurnal cycles, time series, means, and standard deviations.

Google Earth





# We found that AORC had lower values overall for downward shortwave and longwave radiation and relative humidity, and higher values for Wind Speed.

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## Average Diurnal Cycles for 2000-2023 (Time is UTC)

Downward Longwave Radiation (FLDS)



Downward Shortwave Radiation (FSDS)



#### Relative Humidity (RH)



#### Precipitation (PRECTmms)

#### Wind Speed (WIND)

# Results

	AZMET			AORC	
			Standard		Standard
Variable	Mean		Deviation	Mean	Deviation
ТВОТ		294.86	10.55	295.82	10.36
PRECTmms		0.02	0.32	0.02	0.23
WIND		0.86	1.13	2.24	1.37
RH		39.54	23.41	30.51	17.88
FSDS		548.21	374.51	238.18	311.3
FLDS		343.04	56	327.96	63.52
PSRF		9709	0	97111.21	453.52

- Temperature, precipitation, and relative humidity had similar means and standard deviations between the datasets.
- Wind speed, longwave and shortwave downward radiation, and surface pressure had means and standard deviations that differed more significantly between the datasets

#### Discussion

The differences in values between datasets might lead to different output values for water, energy and carbon fluxes. For example, a higher downward longwave flux may result in larger heat fluxes and more evaporation.

#### Future Research

- Next, we will run this the two datasets through the community land model after recalculating surface pressure and parameterizing the model for Guayule which is a crop used to make rubber
- We will then compare the results to determine the difference between gridded and meteorological site data.

#### References

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