

# Investigating the potential of the Community Collaborative Rain, Hail & Snow Network (CoCoRaHS) to serve as a reference to the NPRECiSe NOAA satellite precipitation products validation system

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## Objective

Investigate the potential of CoCoRaHS dataset to be used as ground-reference data to evaluate satellite-based precipitation products.

## CoCoRaHS

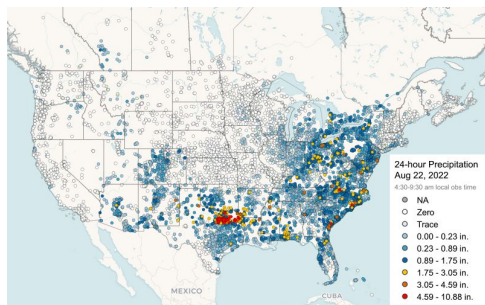
A community volunteer network of rain gauges with over 24,000 active observers across the United States and Canada started in 1998 by the Colorado Climate Center at Colorado State University.

## Tech Stack

- Python 3
- PyKrig
- GeoPandas
- Pandas, Numpy, Matplotlib
- TimezoneFinder
- PyTz

## Python Scripts Flow

- Convert raw CoCoRaHS dataset reporting time into standard datetime format
- Convert polling station datetime from local timezone time to UTC using station longitude and latitude
- Perform additional quality control on CoCoRaHS dataset
- Perform Ordinary Kriging or Universal Kriging on CoCoRaHS data over a specified area
- Plot and export MRMS data over a specified area
- Process exported Kriging and MRMS data to determine the probability of detection, along with other statistics and plots



## Results

Our Ordinary Kriging method produces consistent models that track with MRMS data, generally slightly overestimating areas with rainfall.

- Average probability detection: **~99%**
- Average false positive rate: **~7%**

