Downloading rainfall data from weather radar

Motivation

Rainfall is the main source of water for plants, animals and humans and doubles as the input variable in the soil water balance. Accurate rainfall measurement is important for monitoring environmental events such as drought and flooding. Rainfall measurement is typically measured with rain gauge, which only gives point data. In recent times, there is increased interest in rainfall measurement at the mesoscale and global level and thus radar data has become very useful in undertaking this purpose. Although many weather-mentoring agencies make their data freely available for download through their website, obtaining radar data via websites is often complicated. In addition, the data usually contain missing values which need to be replaced.

Objective

Create a python function to retrieve hourly rainfall data with replaced missing values from the NOAA weather radar

Outcome

I want to create a .csv file with hourly radar-derived rainfall data for a particular location.

Sketch

Access the data URL of NOAA and find available radar stations in Kansas

Select the closest radar to SOI and place order for hourly data based on the date range

Compute the distances between SOI and the radar stations based on Haversine formula.

User input: Zip code of station of interest (SOI), start date, end date, and user email address

C:\Users\Parker\Dropbox\Nathaniel Parker\Projects\Mesonet_soil_properties\Figures\Figure1_map\radar_map.tif

Wait about 30 minutes to 2 hours to receive an email with URL to the requested data

Download \*.tar.gz file using the URL received

Replace missing values

Decode the data using Python ART Radar Toolkit (Py-ART) and extract rainfall data

Rainfall datasets without missing values

Export result to a csv file