

# The Precipitable-water Model Analysis Tool

*An open-source suite for estimating  
precipitable water with low-cost  
instrumentation*

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5<sup>th</sup> Texas Weather Conference  
2 Apr 2022



# Introduction

A computational utility with the purpose of analyzing data to further understand the relationship between local atmospheric brightness temperature and regional precipitable water.

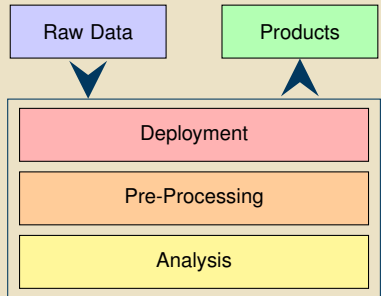


## Open source

Wide compatibility across local and cloud-based systems

The user interface is a file that stores:

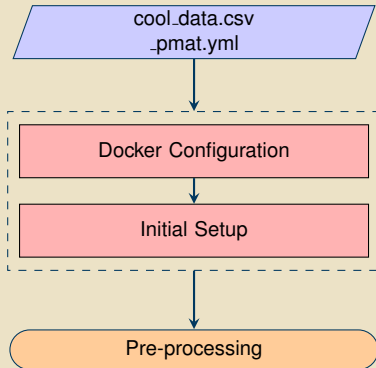
- ▶ Sensor information
- ▶ Data source information
- ▶ Analysis parameters



Packaged in Docker container

Requires raw data and the configuration file.

Deployment template is available at `template.pmat.app`

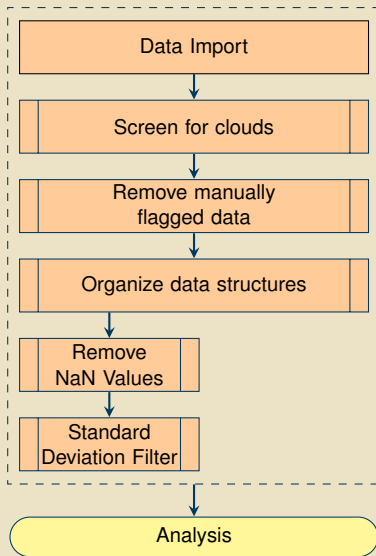


Collects regional atmospheric data from NWS radiosondes and ground stations

Organizes, filters, and computes averages for analysis

Standard Deviation Filter

$$\sigma_i > n \overline{\sigma_i}$$



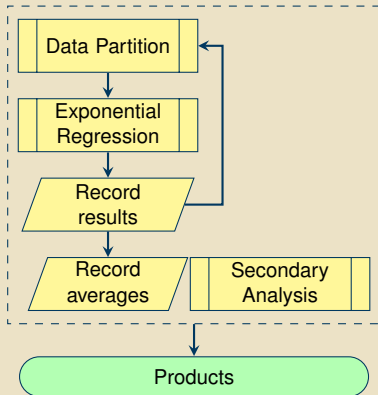
## Primary Analysis

- ▶ Iterative Regression Algorithm

$$\text{PWAT} = Ae^{BT_b}$$

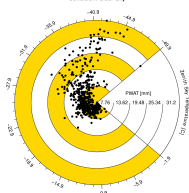
## Secondary Analysis

- ▶ Support Vector Machine
- ▶ Climatology
- ▶ Time Series



# PMAT Suite Products

Correlation between Spatiotemporal Mean PWAT and Temperature  
Condition: Clear Sky



# Roadmap

V3.0

- ▶ Docker rollout
- ▶ Climatology analysis
- ▶ Support Vector Machine
- ▶ Module organization
- ▶ Full documentation

V4.0

- ▶ Monsoon prediction
- ▶ Automated system support
- ▶ Fourier Transform analysis
- ▶ Replace MesoWest database pull



## Questions?

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Project Page

`pmat.app`

Official Manual

`docs.pmat.app`

