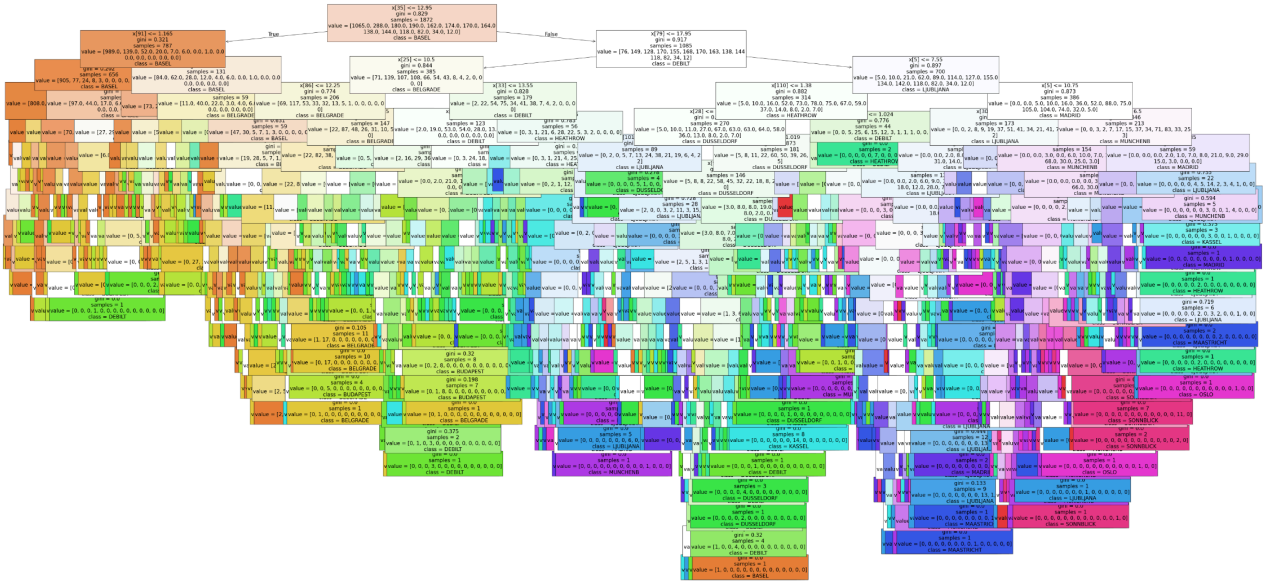
Kirsten Currie
Career Foundry
Machine Learning | 2.3
2.22.25

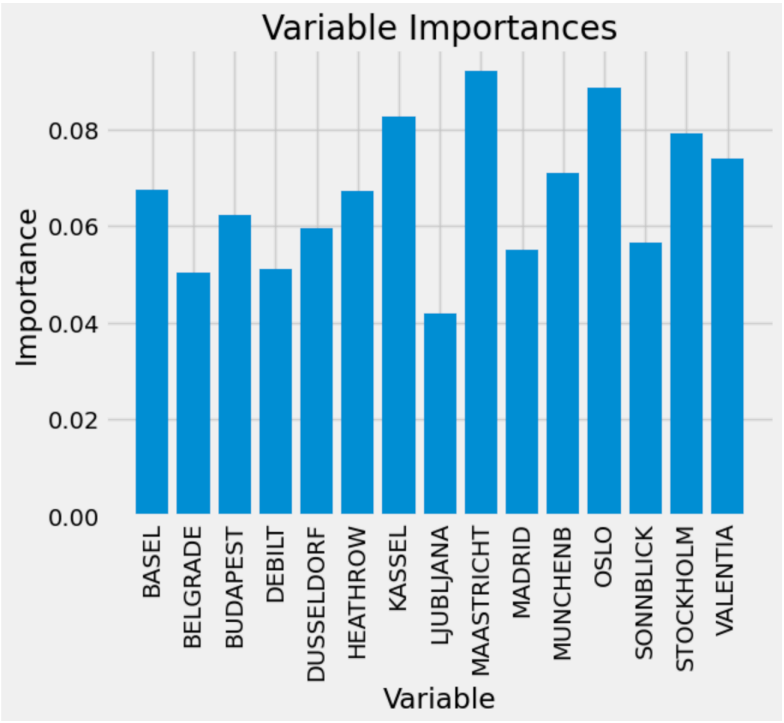
Random Forest - 2010's

- 1st Tree:

- Number of Estimators: 100
- Max Depth: None
- Model Accuracy: 0.5636114911080712



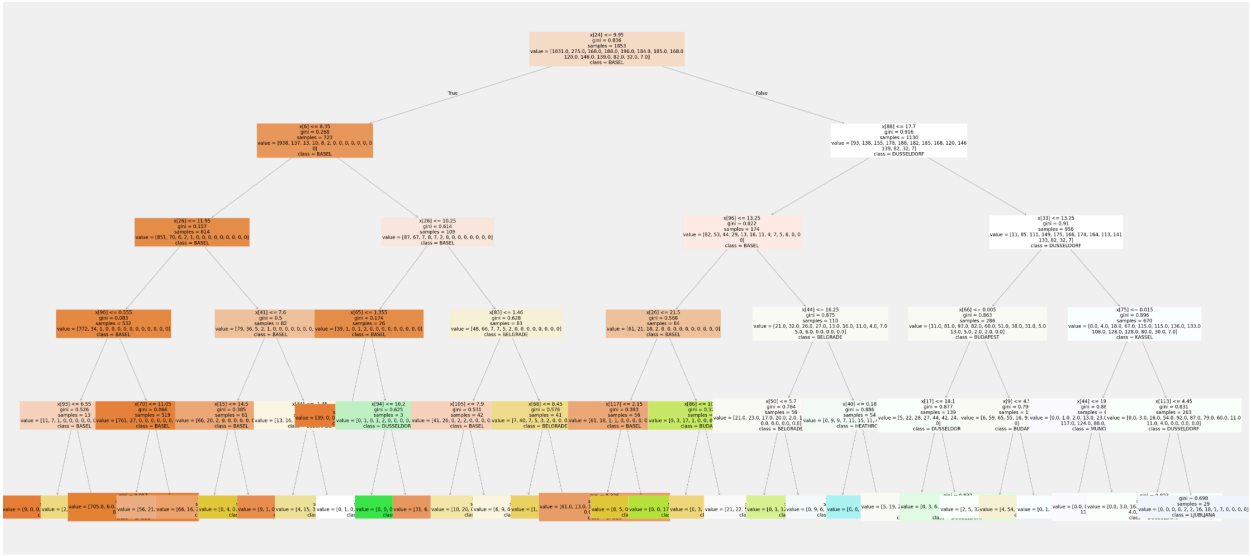
- Important Stations:
  - BASEL 0.067494
  - BELGRADE 0.050492
  - BUDAPEST 0.062383
  - DEBILT 0.051225
  - DUSSELDORF 0.059634
  - HEATHROW 0.067196
  - KASSEL 0.082726
  - LJUBLJANA 0.041976
  - MAASTRICHT 0.092052
  - MADRID 0.055065
  - MUNCHENB 0.071136
  - OSLO 0.088789
  - SONNBLICK 0.056562
  - STOCKHOLM 0.079209
  - VALENTIA 0.074063



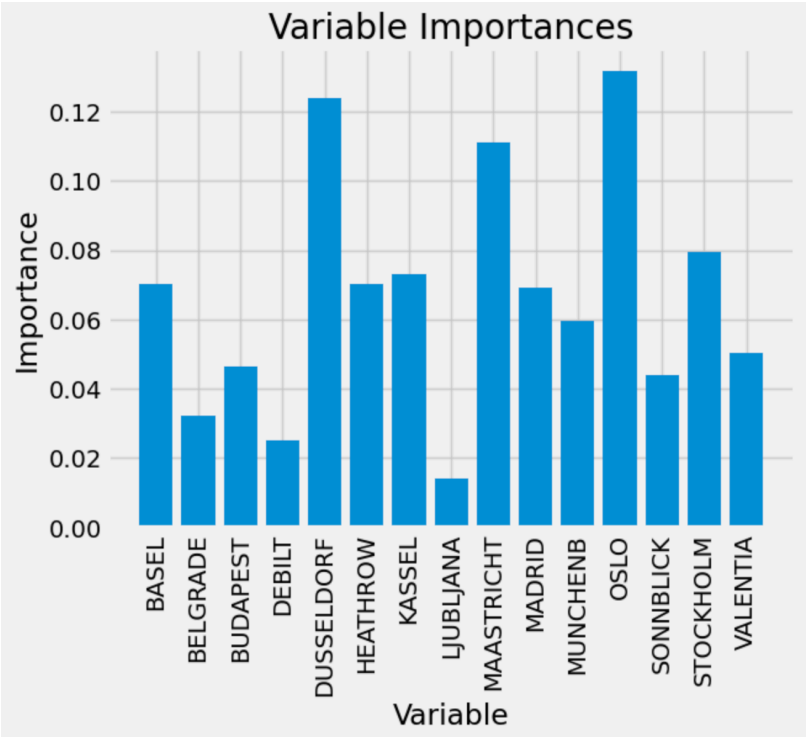
Random Forest - 2010's

- 2nd Tree:

- Number of Estimators: 100
- Max Depth: 5
- Model Accuracy: 0.5430916552667578

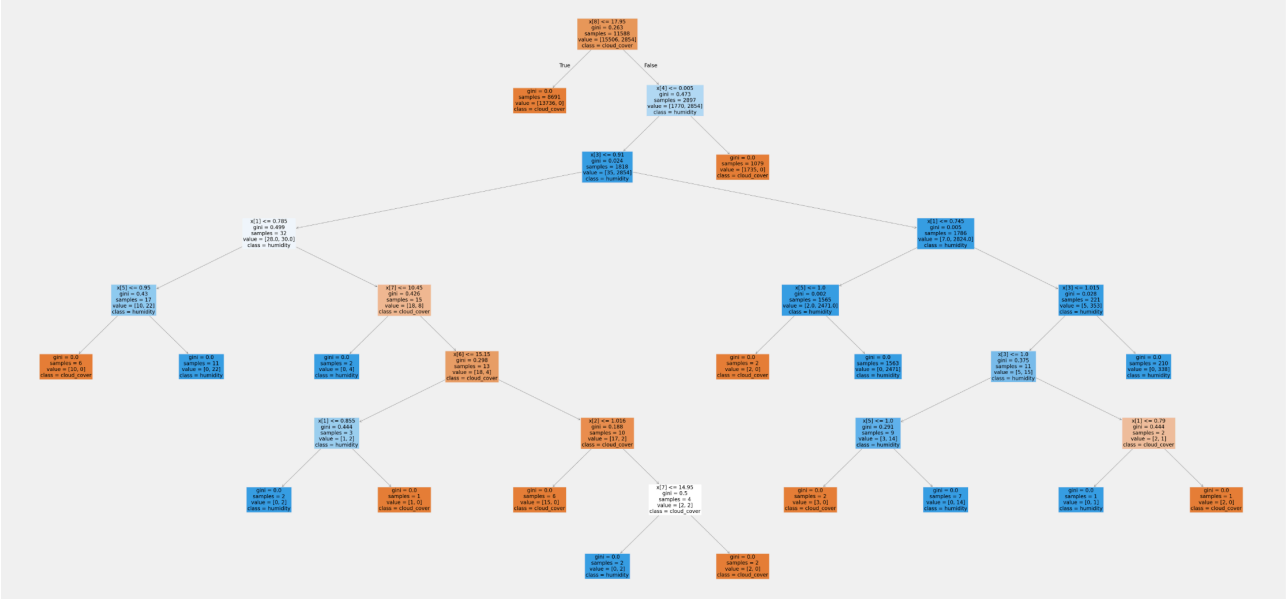


- Important Stations:
  - BASEL 0.070357
  - BELGRADE 0.032340
  - BUDAPEST 0.046307
  - DEBILT 0.025049
  - DUSSELDORF 0.123922
  - HEATHROW 0.070310
  - KASSEL 0.073035
  - LJUBLJANA 0.014049
  - MAASTRICHT 0.110949
  - MADRID 0.069110
  - MUNCHENB 0.059520
  - OSLO 0.131554
  - SONNBLICK 0.043778
  - STOCKHOLM 0.079402
  - VALENTIA 0.050318



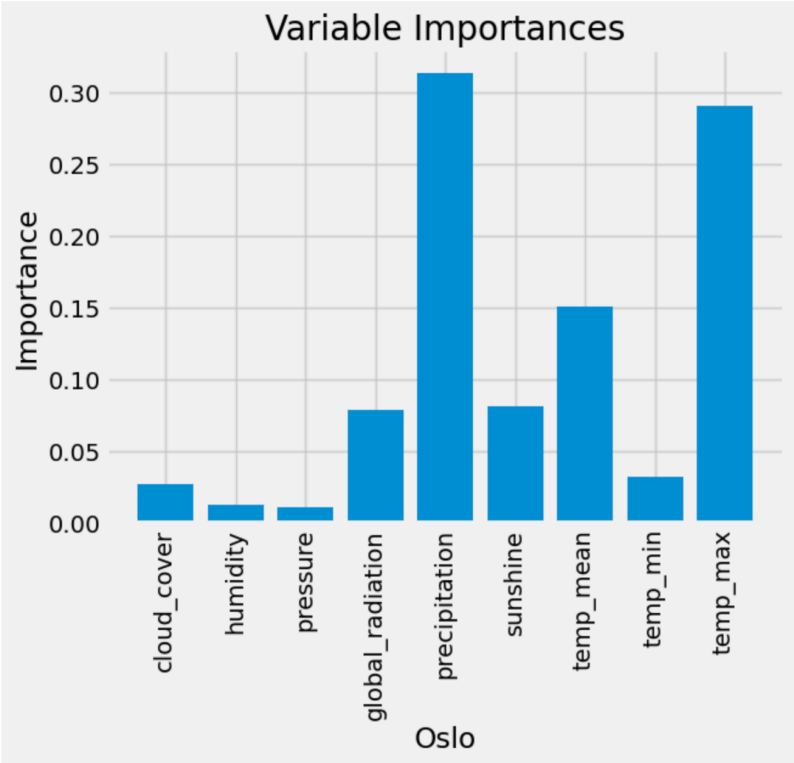
Random Forest - Oslo

- Number of Estimators: 100
- Max Depth: None
- Model Accuracy: 0.9997821350762527



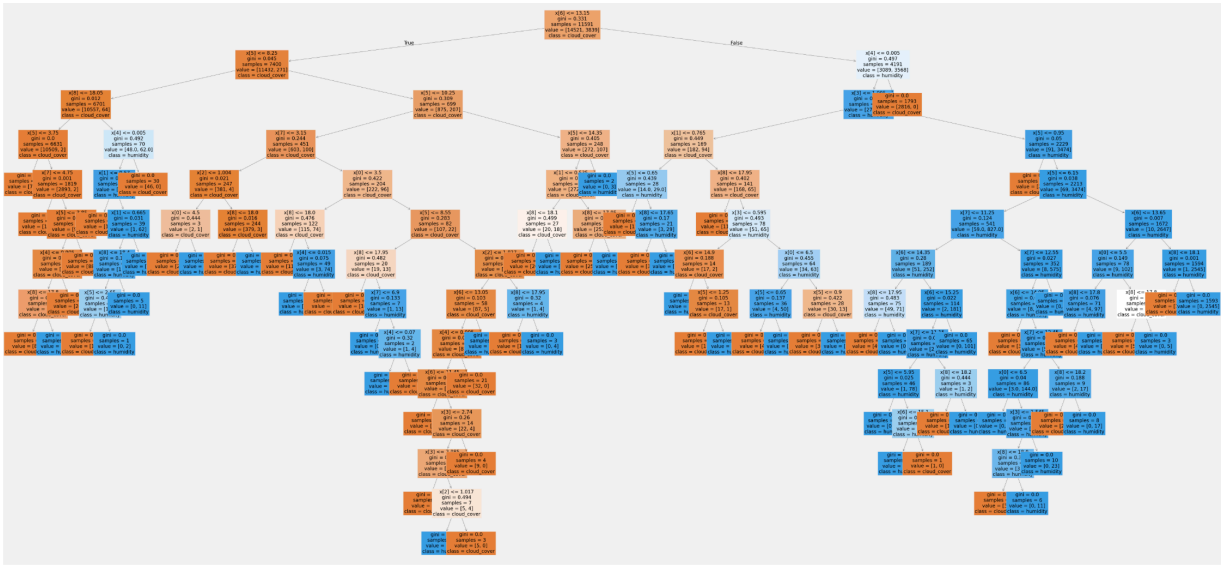
Important Features:

- cloud_cover 0.027386
- humidity 0.012625
- pressure 0.010963
- global_radiation 0.078682
- precipitation 0.314060
- sunshine 0.081668
- temp_mean 0.151339
- temp_min 0.032576
- temp_max 0.290700



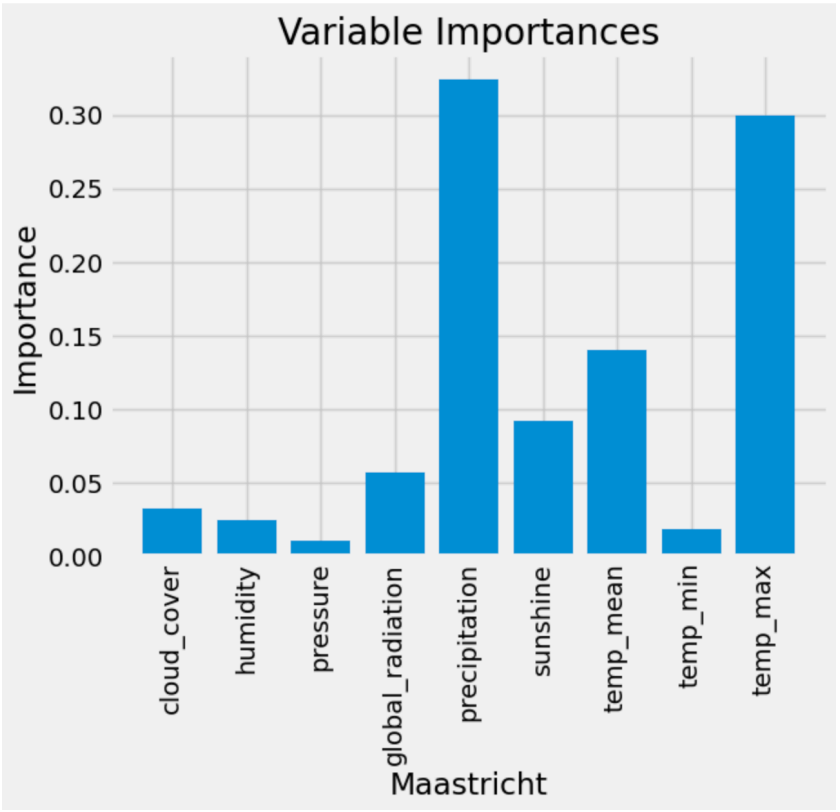
Random Forest - Maastricht

- Number of Estimators: 100
- Max Depth: None
- Model Accuracy: 1.0



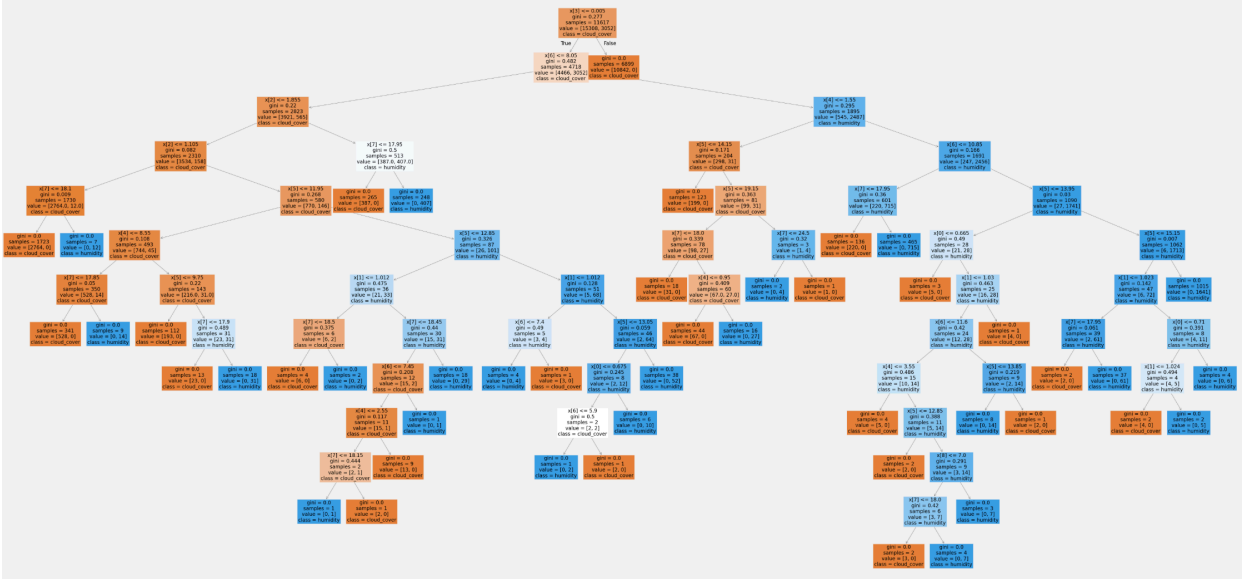
Important Features:

- cloud_cover 0.031979
- humidity 0.024716
- pressure 0.010911
- global_radiation 0.057296
- precipitation 0.324638
- sunshine 0.091942
- temp_mean 0.140066
- temp_min 0.018412
- temp_max 0.300041



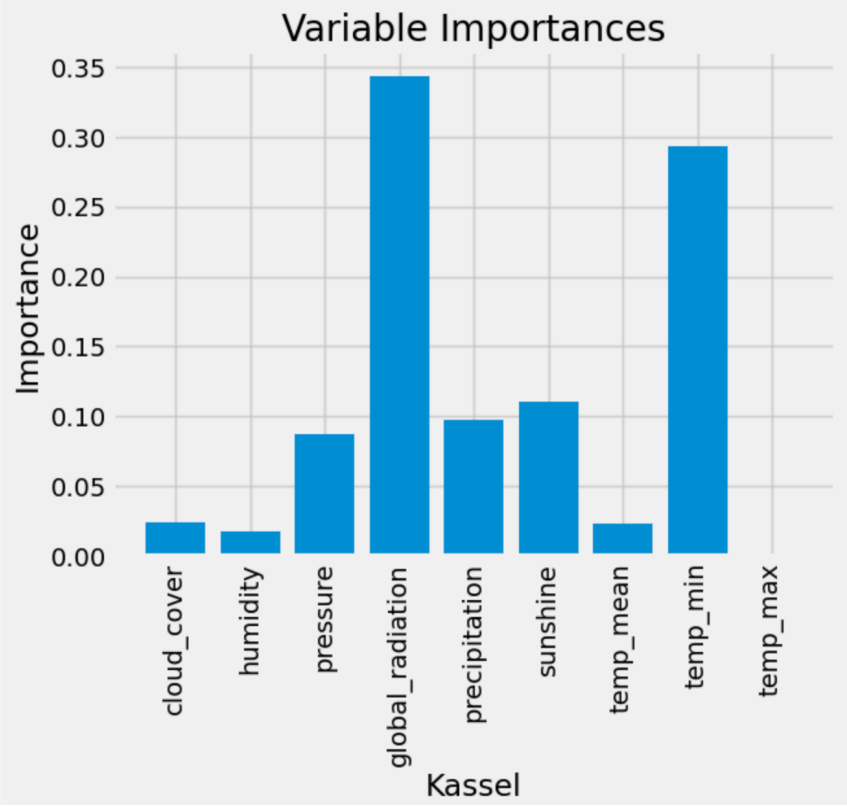
Random Forest - Kassel

- Number of Estimators: 100
- Max Depth: None
- Model Accuracy: 1.0



Important Features:

- cloud_cover 0.024496
- humidity 0.017811
- pressure 0.087528
- global_radiation 0.343895
- precipitation 0.097295
- sunshine 0.110453
- temp_mean 0.023606
- temp_min 0.293348
- temp_max 0.001568



Observations:

Top Stations that Influence Pleasant Ratings:

Though with lower accuracies of 56% and 54%, top stations that model ranked as “important” included Oslo, Maastricht, Kassel, and Dusseldorf. **Oslo** and **Maastricht** were both ranked highest in the decision tree (with and without depth) for the 2010s.

For the individual cities across all years, Oslo, Maastricht, and Kassel were selected for their own individual random forests.

Top Features within each Stations:

The stations received much higher accuracy scores which could possible indicate overfitting (99% for Oslo and 100% for Kassel & Maastricht).

Features that were ranked as important for predicting pleasant weather:

- Precipitation (Oslo & Maastricht)
- Temp Max (Oslo & Maastricht)
- Global Radiation (Kassel)
- Temp Min (Kassel)

Tracking the temperatures and investing in equipment that can properly monitor this will be vital across all stations. Global radiation and rain levels are also important, but certain stations may still experience more or less of this depending on location (rain levels) and whether or not the station could be in an urban or rural environment (global radiation). Knowing the more important features will help ClimateMax & weather stations prioritize spending on equipment that will be essential for understanding how weather patterns are impacted by climate change.