

<><> Time Stamp <><>

29/06/2022 - 00:33:34

<><> Data Summary <><>

Bore ID: GW036872.1.1

Bore Coordinates: (-30.923963, 153.044423)

Silo Grid Point Coordinates: (-30.9, 153.05)

<><> Code Checks <><>

GWL Date Chronological Order Check: No Error

SILo Date Chronological Order Check: No Error

<><> Model Functionality <><>

Input Variables (Daily):

SWL (m)

Rainfall (mm)

Maximum Temperature (°C)

Minimum Temperature (°C)

Vapour Pressure (hPa)

Vapour Pressure Deficit (hPa)

Evaporation - Class A Pan (mm)

Evaporation - Synthetic Estimate (mm)

Evaporation - Combination (Synthetic Estimate pre-1970, Class A Pan 1970 Onwards) (mm)

Evapotranspiration - Morton's Shallow Lake Evaporation (mm)

Solar Radiation - Total Incoming Downward Shortwave Radiation on a Horizontal Surface (MJ/m<sup>2</sup>)

Relative Humidity at Time of Maximum Temperature (%)

Relative Humidity at Time of Minimum Temperature (%)

Evapotranspiration - FAO56 Short Crop (mm)

Evapotranspiration - ASCE Tall Crop (mm)

Evapotranspiration - Morton's Areal Actual Evapotranspiration (mm)

Evapotranspiration - Morton's Potential Evapotranspiration

Evapotranspiration - Wet-Environment Areal Evapotranspiration Over Land (mm)

Mean Sea Level Pressure (hPa)

Input Time Lags: Current day + 29 proceeding days

Output: SWL (m) in 30 days time

Data Range: 02/04/2010 - 01/09/2021

<><> Hyperparameters <><>

Number of Epochs: 1000

Learning Rate: 0.001

Number of Features in Hidden State: 2

Number of Staked LSTM Layers: 1

Number of Output Classes: 1

Percentage of Data for Training: 80.0%

<><> Model Results <><>

Run Time: 138.61488509178162s

Network Structure:

```
(lstm): LSTM(19, 2, batch_first=True)
(fc_1): Linear(in_features=2, out_features=128, bias=True)
(fc): Linear(in_features=128, out_features=1, bias=True)
(relu): ReLU()
```

Final Training Loss: 0.0035610892809927464

Training Set RMSE: 0.0930863190914888

Testing Set RMSE: 0.18284006988151663

Epoch: 0, Loss: 0.28071

Epoch: 100, Loss: 0.02095

Epoch: 200, Loss: 0.02052

Epoch: 300, Loss: 0.00966

Epoch: 400, Loss: 0.00509

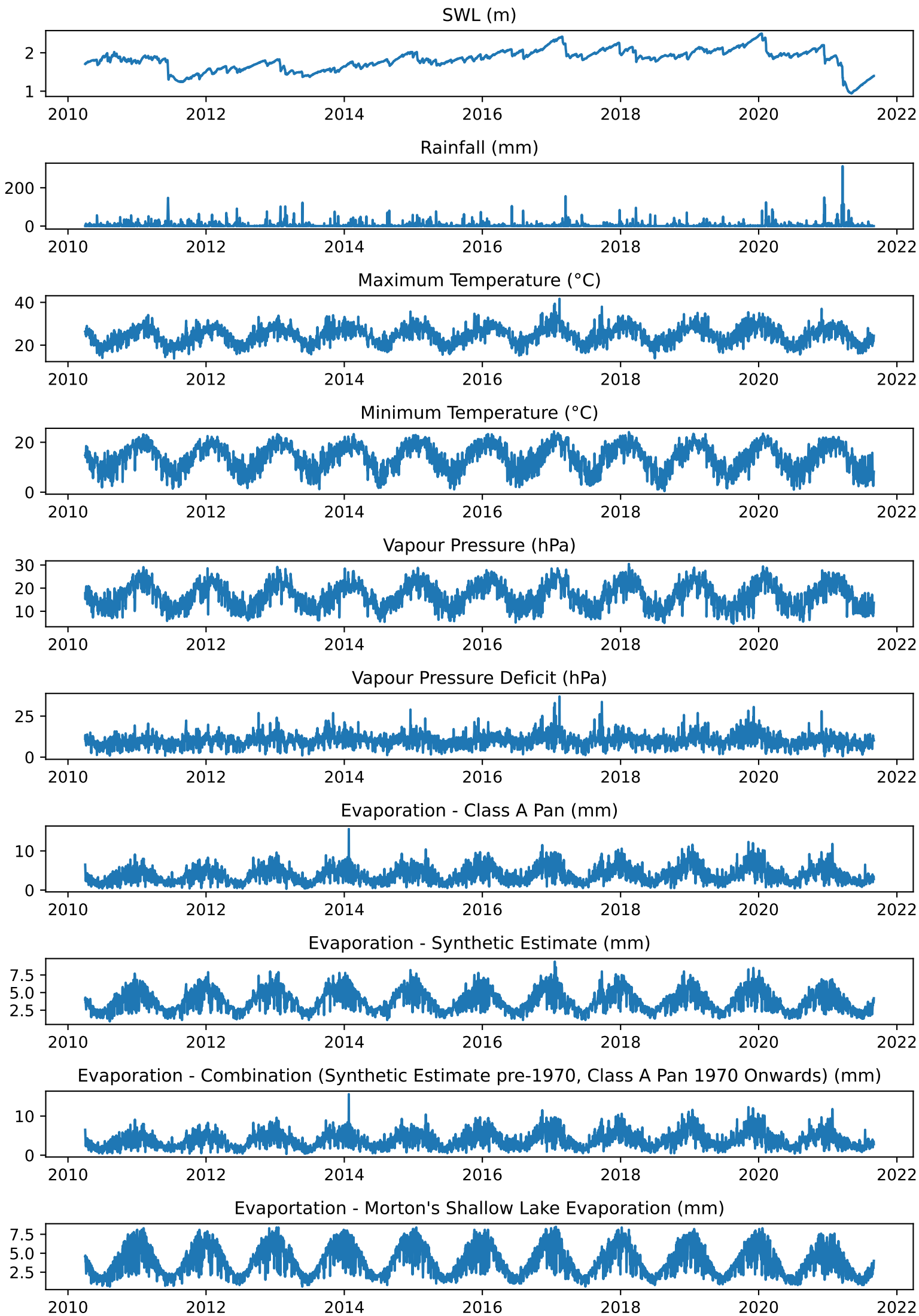
Epoch: 500, Loss: 0.00420

Epoch: 600, Loss: 0.00392

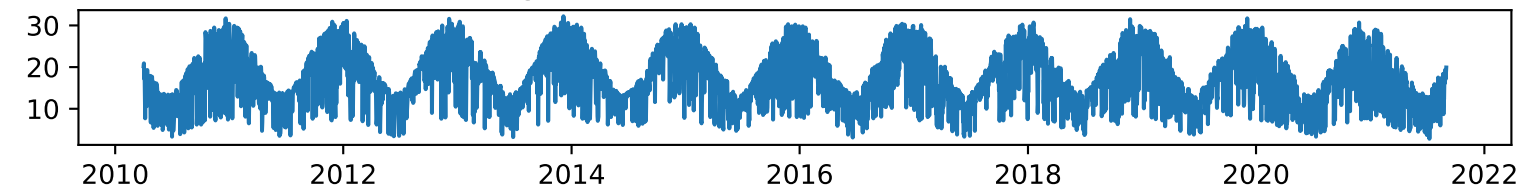
Epoch: 700, Loss: 0.00377

Epoch: 800, Loss: 0.00368

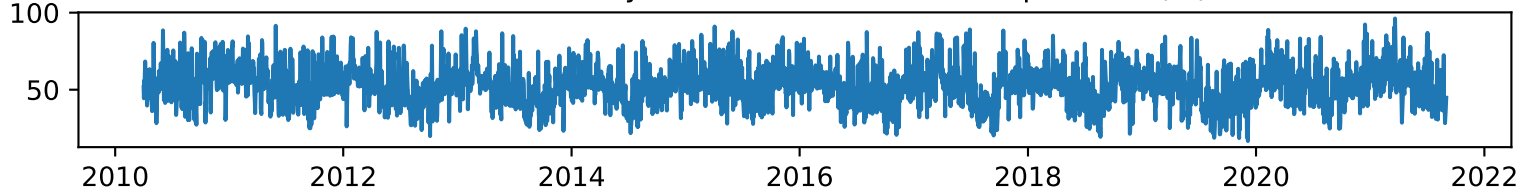
Epoch: 900, Loss: 0.00362



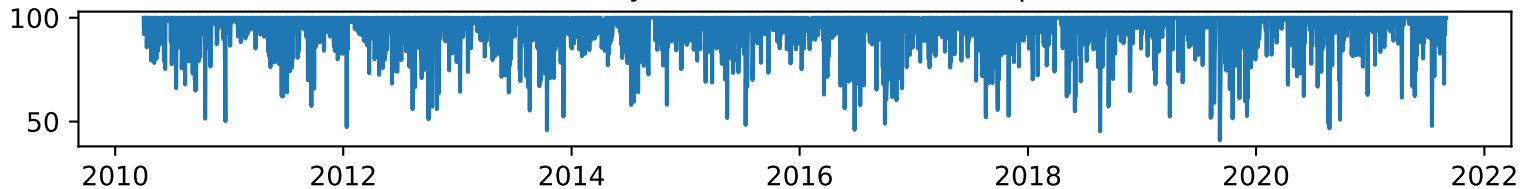
Solar Radiation - Total Incoming Downward Shortwave Radiation on a Horizontal Surface ( $\text{MJ}/\text{m}^2$ )



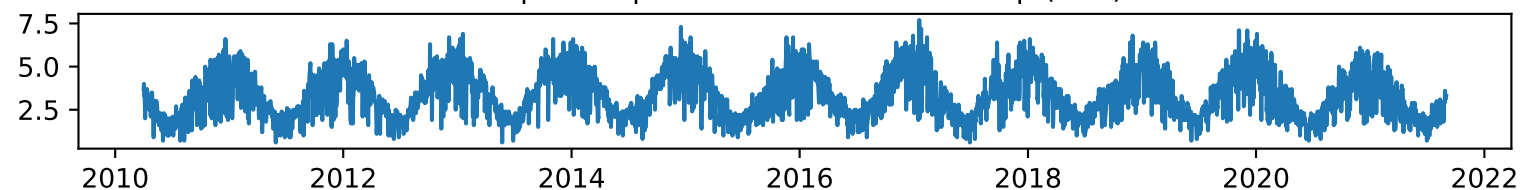
Relative Humidity at Time of Maximum Temperature (%)



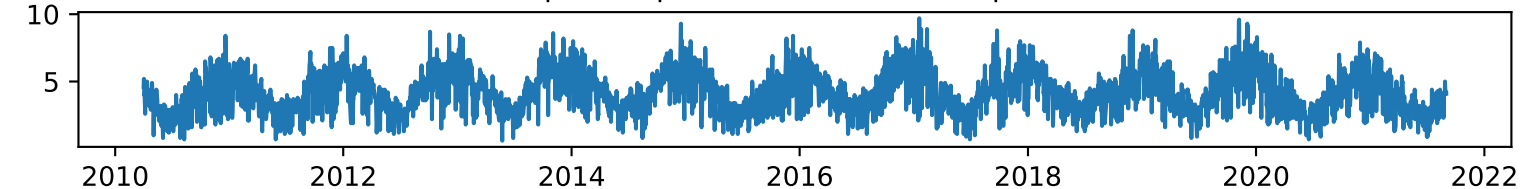
Relative Humidity at Time of Minimum Temperature (%)



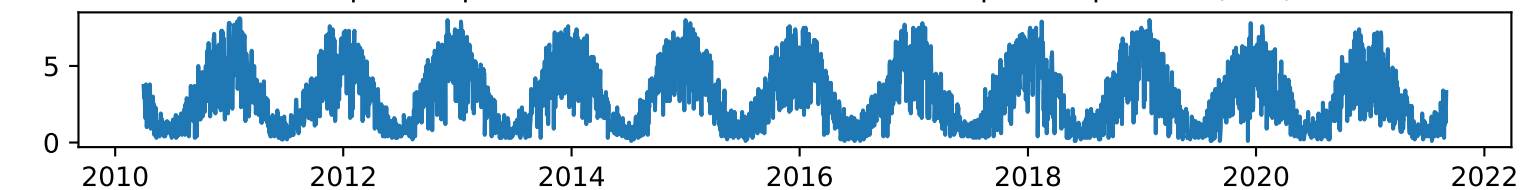
Evapotranspiration - FAO56 Short Crop (mm)



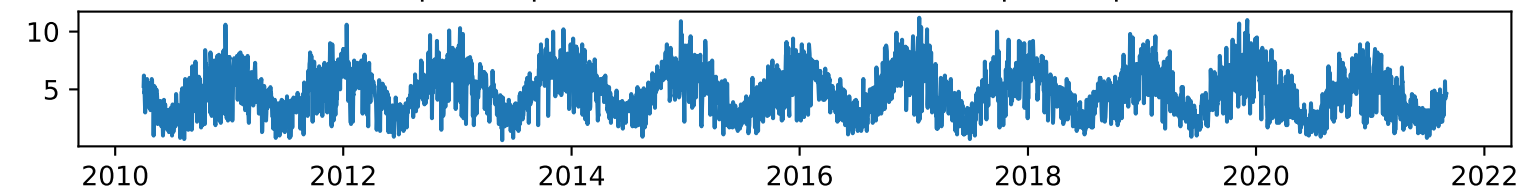
Evapotranspiration - ASCE Tall Crop (mm)



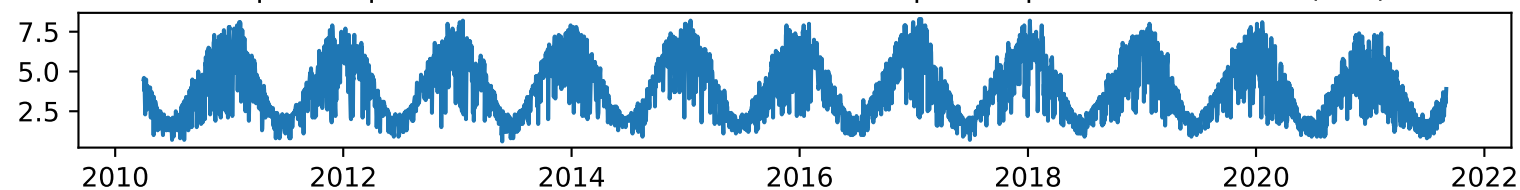
Evapotranspiration - Morton's Areal Actual Evapotranspiration (mm)



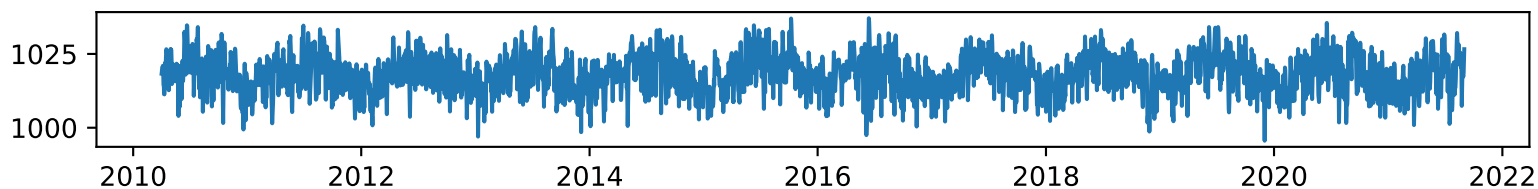
Evapotranspiration - Morton's Potential Evapotranspiration



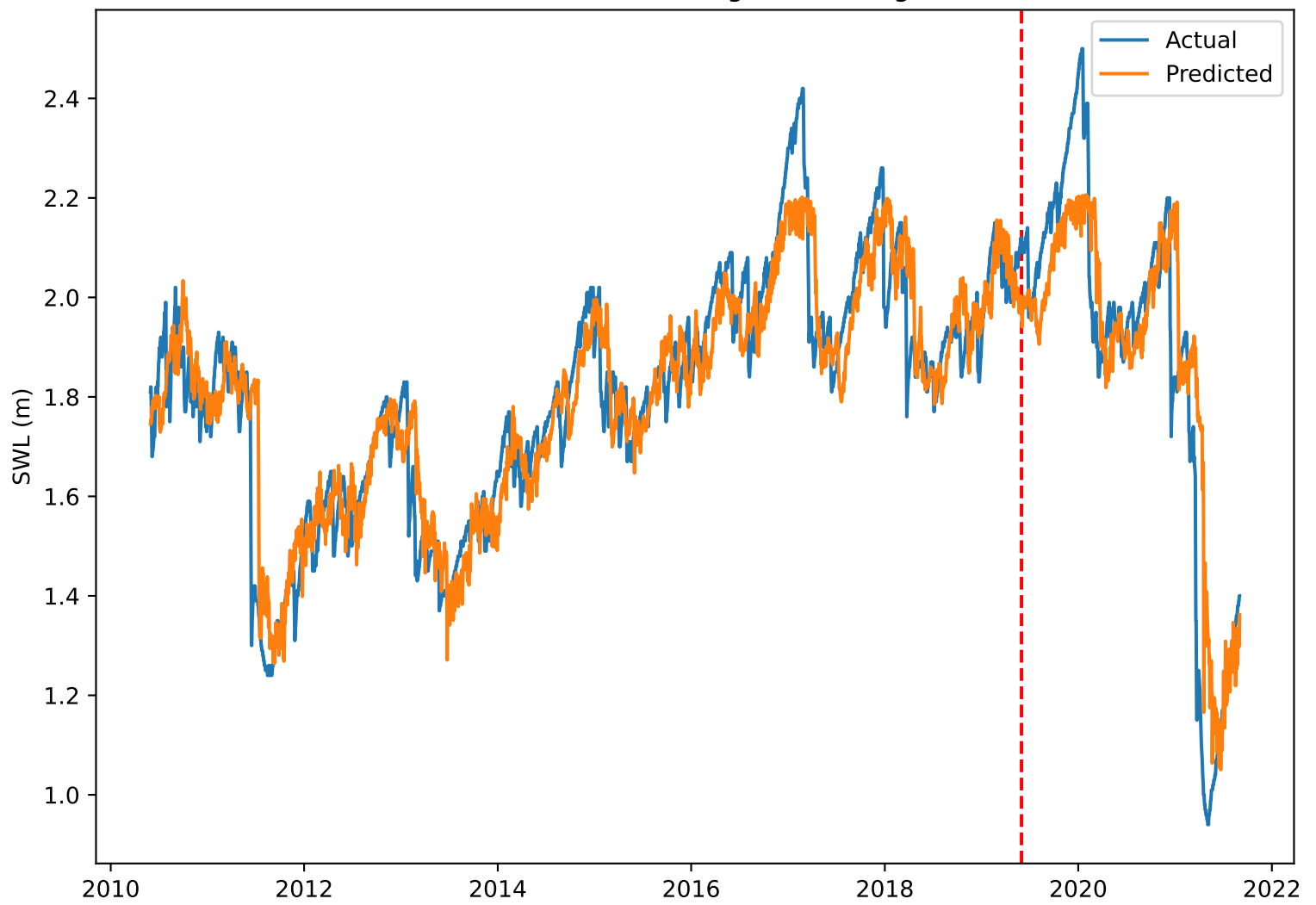
Evapotranspiration - Wet-Environment Areal Evapotranspiration Over Land (mm)



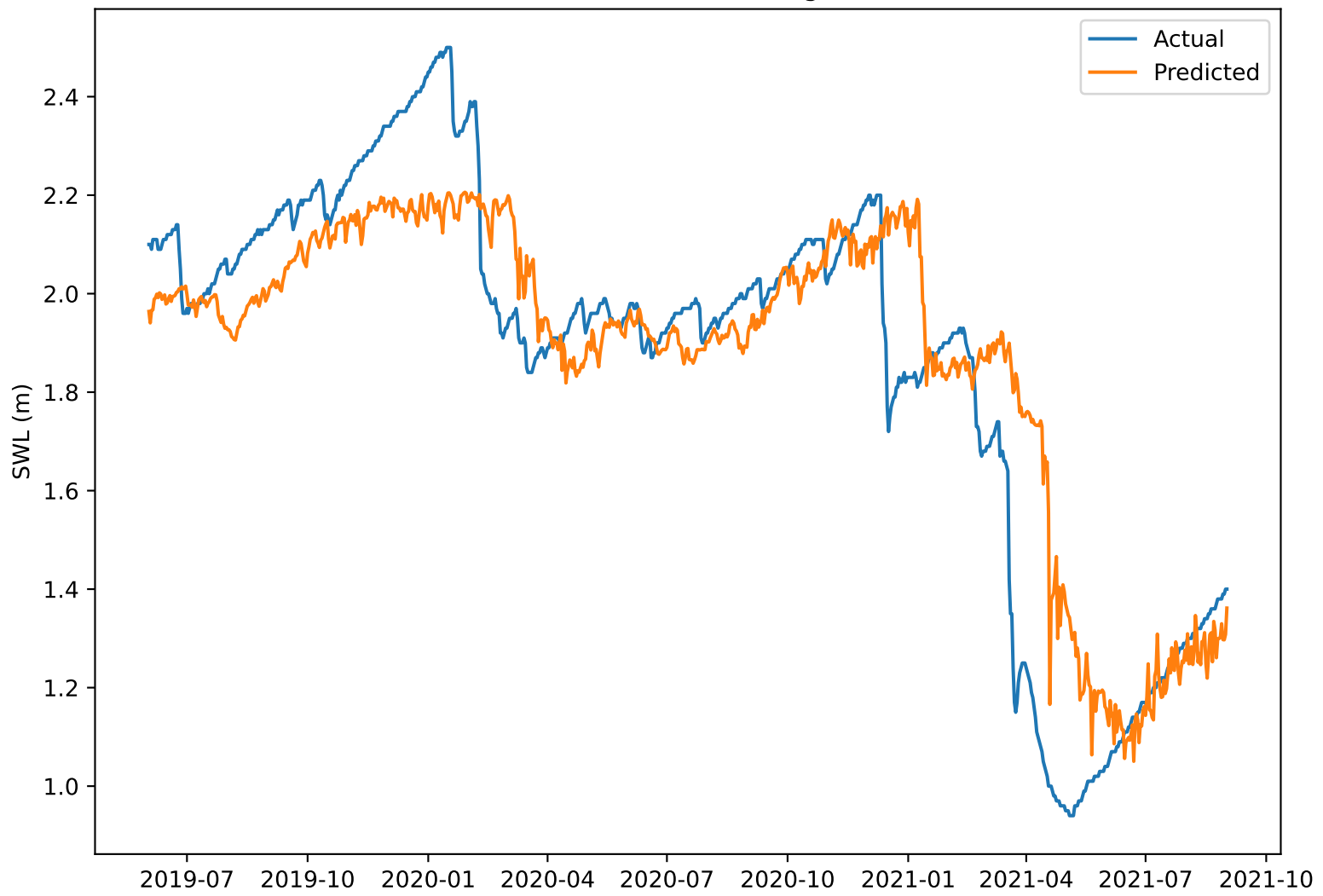
Mean Sea Level Pressure (hPa)



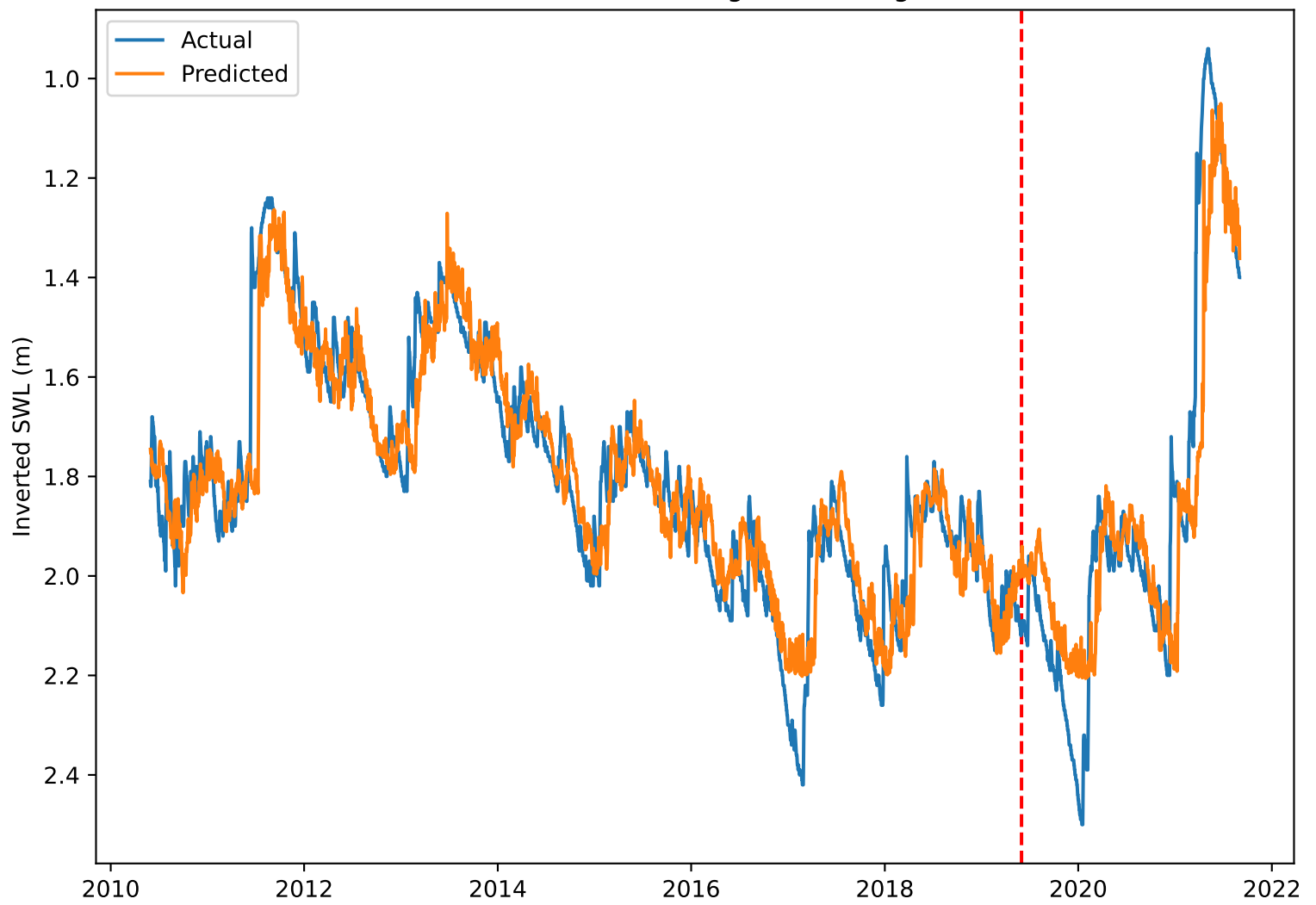
GW036872.1.1: Training and Testing Sets



GW036872.1.1: Testing Set



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