Groundwater depth prediction

Task 1

Design a regressor that predicts the depth of groundwater at based on the collection:

https://www.kaggle.com/competitions/acea-water-prediction/data?select=Aquifer_Petrignano.csv

(only Aquifer_Petrignano.csv should be used).

The regressor should be in the form of a recursive network neural.

You should:

1. Ignore all values before 2009.

2. Remove outliers from the data.

3. Convert data from daily to weekly (average data for every week).

4. The model is supposed to predict the Depth_to_Groundwater field for 4 weeks in forward (predicting the entire sequence with a single network query).

5. The input values for the model are to be data from the selected numer previous weeks, before the weeks for which we make prediction (choose the number of weeks yourself).

6. Separate the last 40 four-week periods from the dataset, of which the first 20 will serve as the validation set and the second 20 as the set test. All the data in front of them will serve as a training set.

7. Choose the metrics and the cost function yourself.

Useful links:

Removal of outliers, preprocessing:

https://www.kaggle.com/code/iamleonie/intro-to-time-seriesforecasting/notebook#Introduction

Sequence preparation in Keras:
https://www.tensorflow.org/api_docs/python/tf/keras/preprocessing/sequence/TimeseriesGenerator

Keras RNN Tutorial:

https://www.tensorflow.org/tutorials/structured_data/time_series