

# Long-Term Correction methods with time-patterns recognition

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## Background

Long-term correction (LTC) methods aim to produce a long-span time-series characteristic of a site by combining limited-span observations with hindcasted time-series from weather models. These procedures can be broadly classified as Model-Output Statistics (MOS) models encompassing a variety of techniques, such as statistical multi-regression models <sup>[1]</sup>, Analog Ensemble (AnEn) <sup>[2]</sup> or Machine Learning models <sup>[3]</sup>.

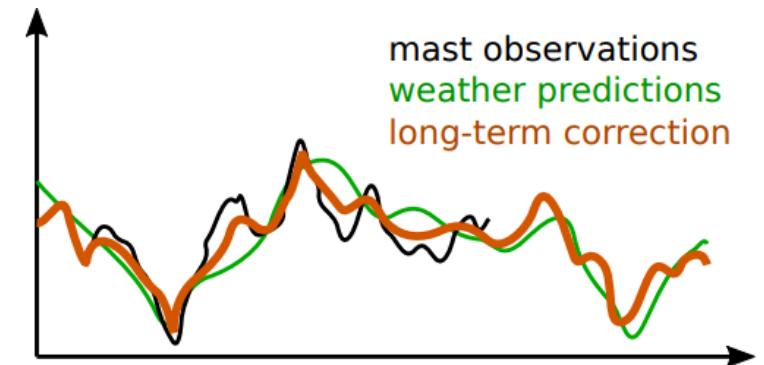
## Scope

Current LTC procedures focus on creating a function that translates record-by-record the input to the output, based on climate statistics or sophisticated machine learning methods. Yet, results may be hindered by time lags generally found in the weather modelled timeseries.

The purpose of this study is the exploration of techniques to identify and counter temporal lags and improve LTC methods.

The following activities are expected from a student enrolled in this topic;

- Perform a literature review to get acquainted with LTC procedures.
- Establish a reference dataset with data from multiple meteorological towers and results from other LTC techniques.
- Develop time-recognition capabilities in a LTC model so to identify time-lag patterns and produce a consistent output.
- Benchmark and compare the model against the reference dataset and explore the limits of the new model.



**Keywords:** Long-term correction, Model output Statistics, Artificial Intelligence, Neural Networks