

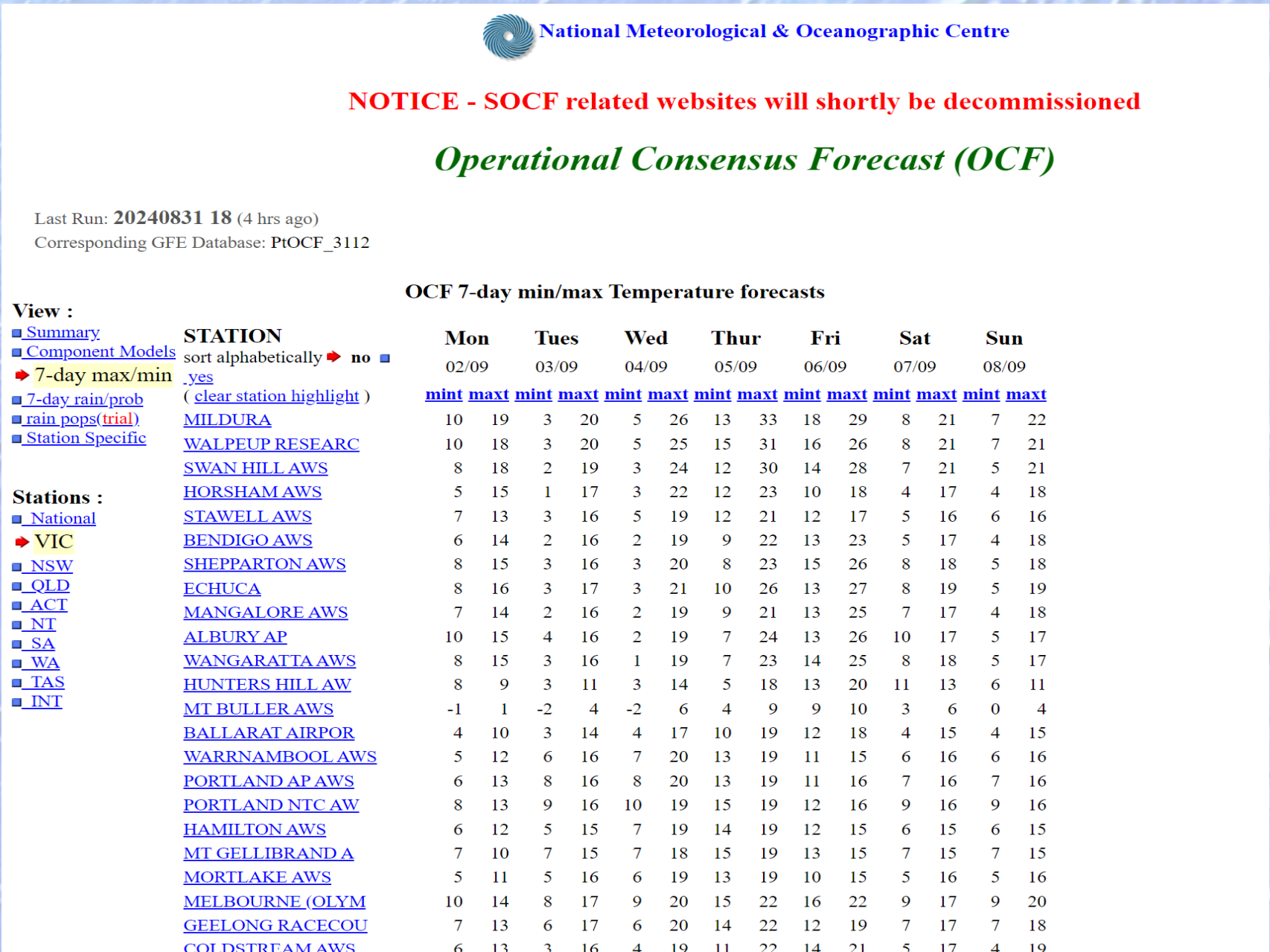
# Democratization of NWP Postprocessing

Bias correction of Numerical Weather Prediction Forecasts at sites using Google Sheets

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## 1. Why Postprocess NWP Forecasts?

It is well known that postprocessing of NWP forecast products can improve their skill. For example, site-based Operational Consensus Forecasting (a type of postprocessing) has been used at the Bureau of Meteorology for almost twenty years.



## 2. The Problem

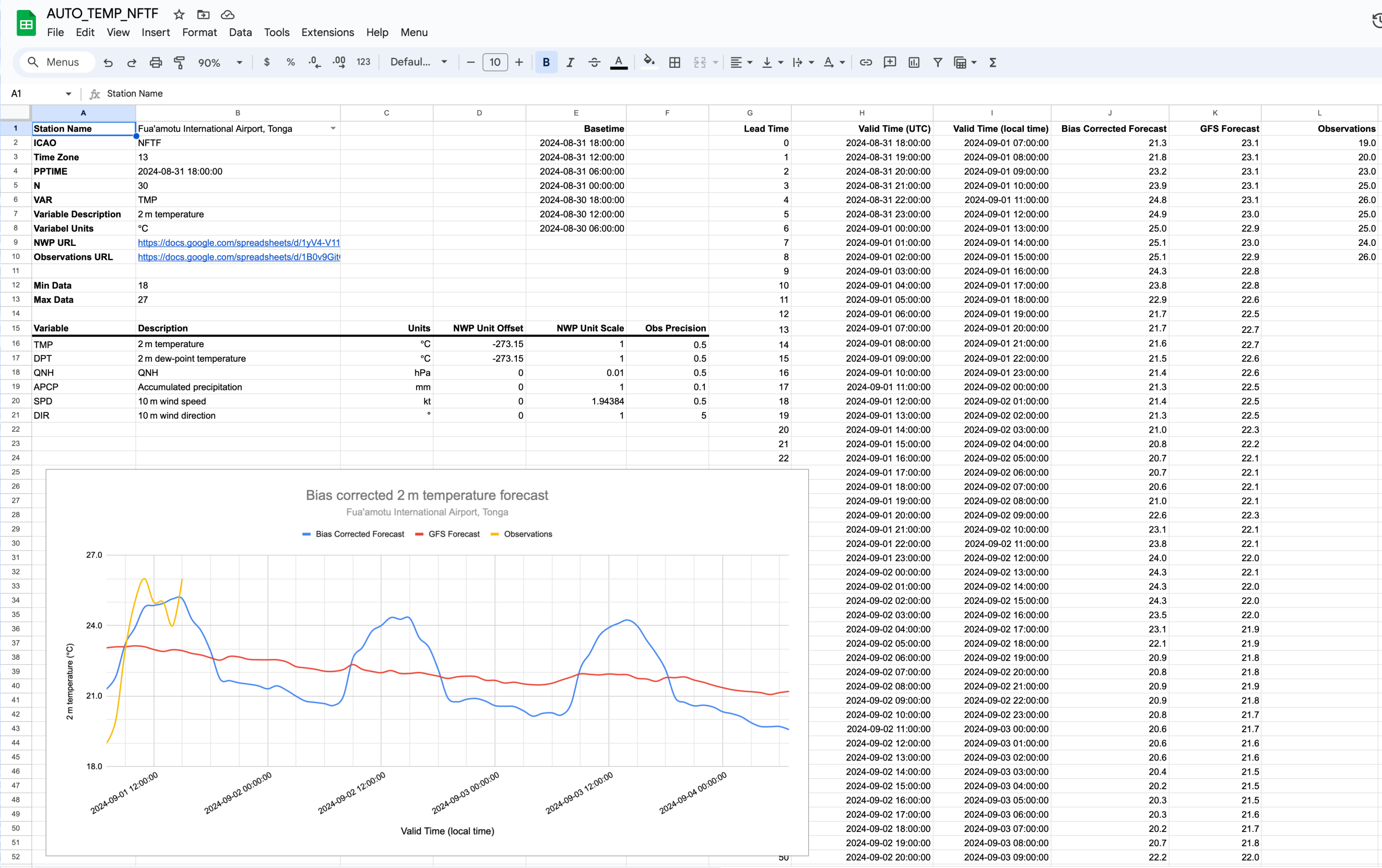
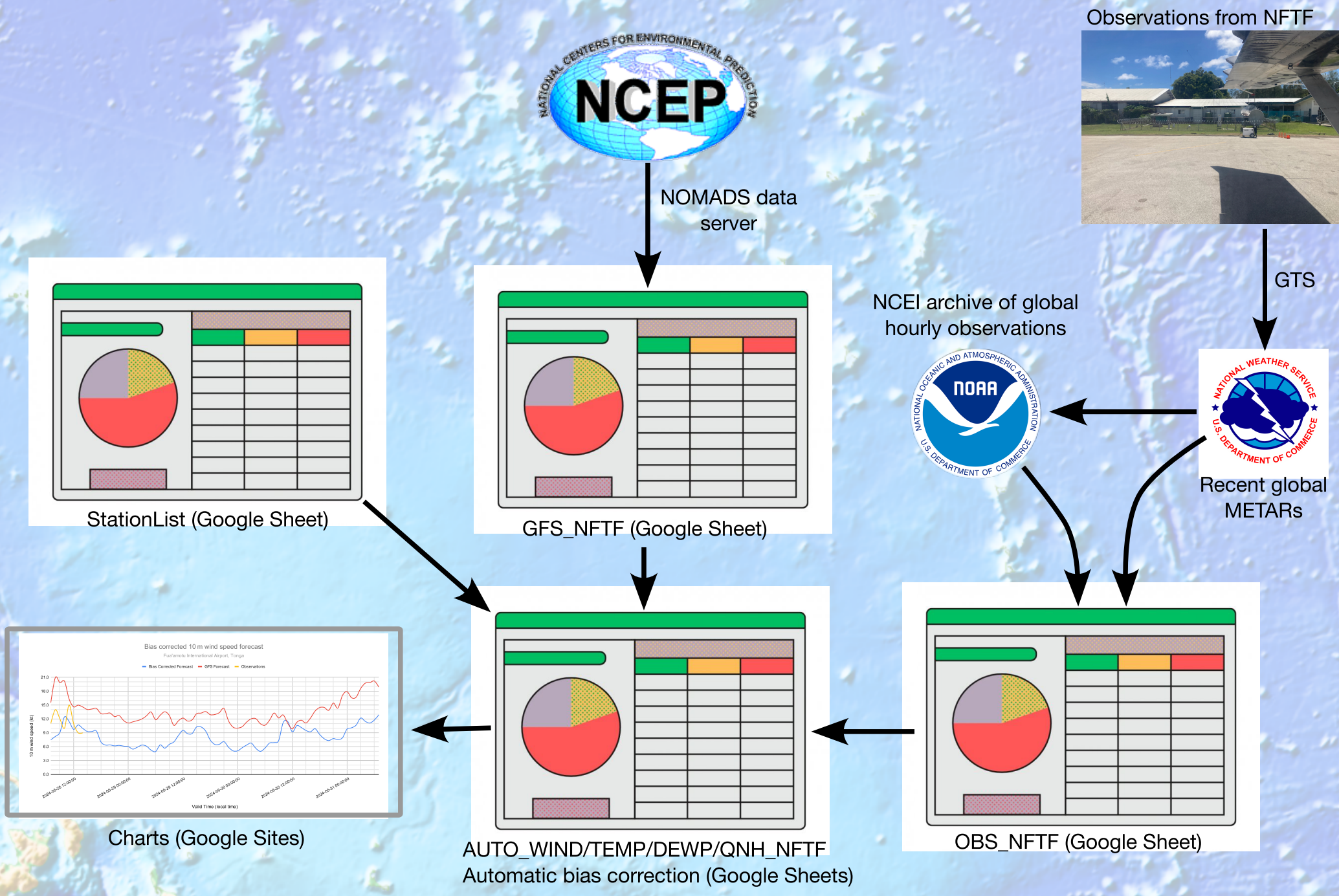
- NWP datasets can be large and difficult to obtain.
- Modern post-processing techniques can be computationally intensive.
- Small and remote meteorological services may not have the resources to implement postprocessing methods.



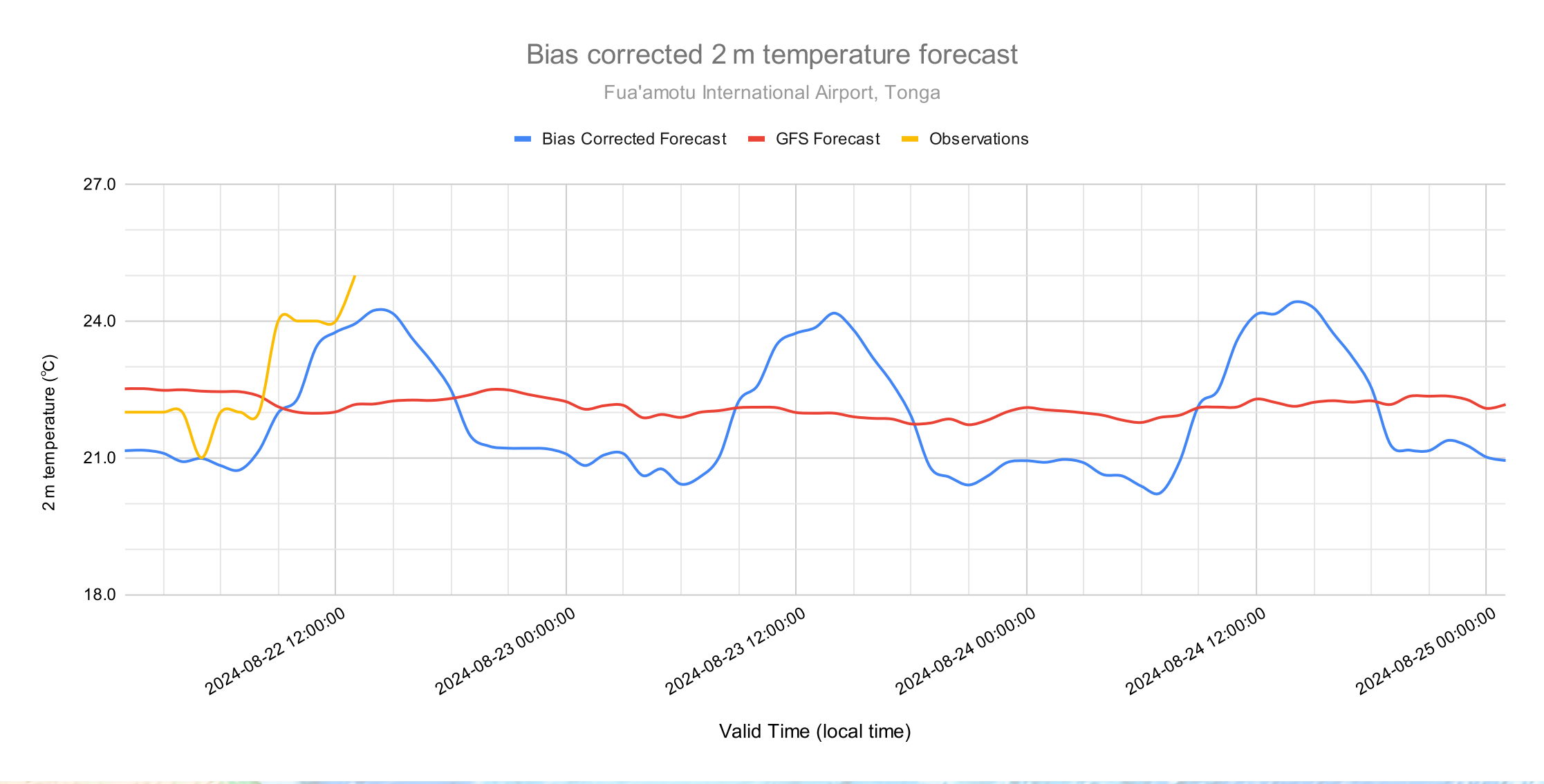
Some NWP post-processing is now performed on supercomputers

## 3. A Solution - Postprocessing in the "cloud" using Google Sheets

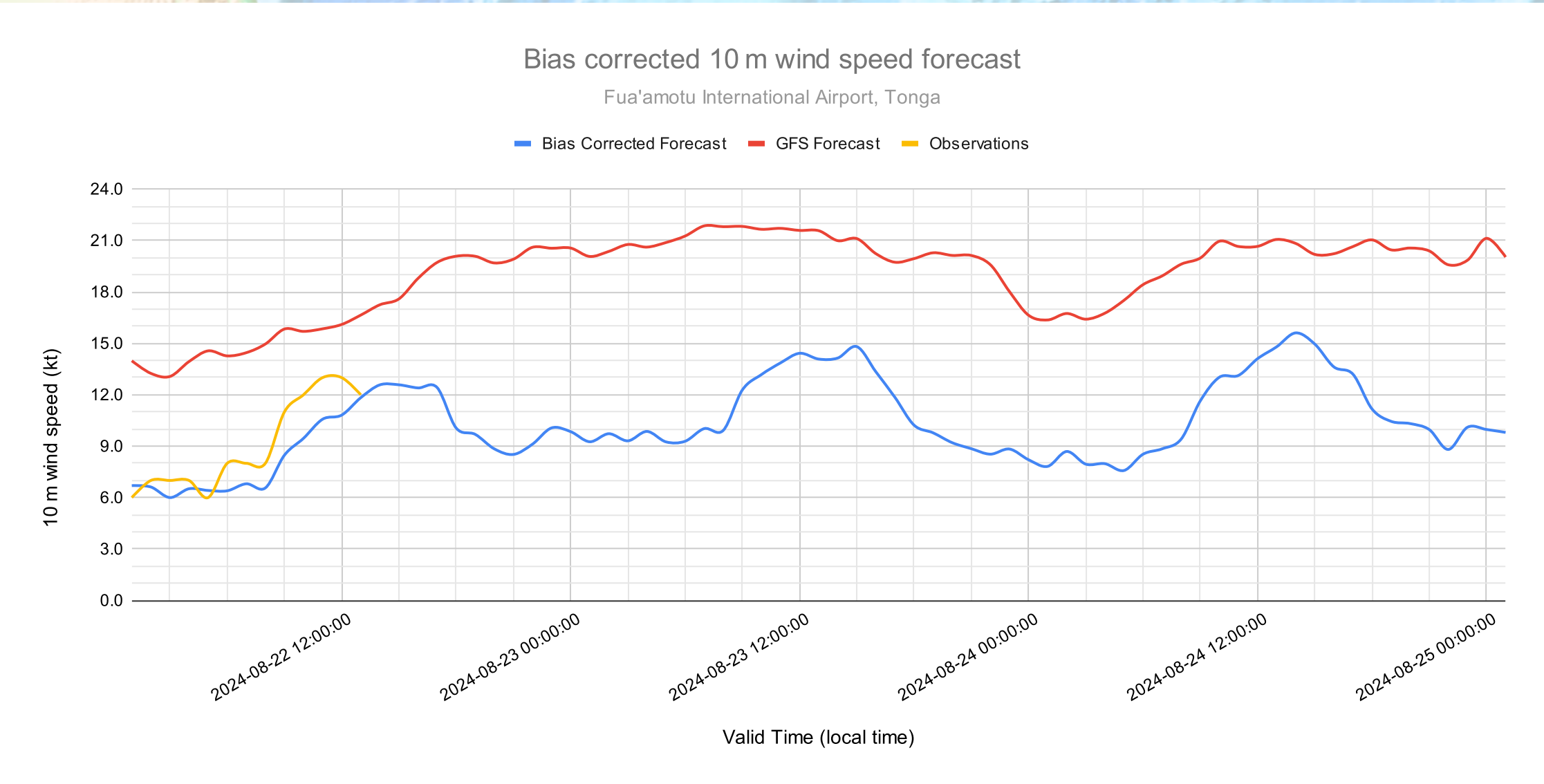
Google Sheets are online spreadsheets. They are capable of ingesting NWP and observation data from online sources, and then apply a simplified version of the site OCF method. Internet bandwidth and computer resources required are minimal.



## 4. Examples - Fua'amotu Airport, Tonga



Postprocessed 2 m temperature forecasts for Fua'amotu Airport, Tonga. Notice how the raw NWP (red) does not resolve the diurnal temperature variation, but the postprocessed forecasts (blue) do, and more closely follow the observed temperature (gold).



Postprocessed 10 m wind speed for Fua'amotu Airport. Notice how the raw NWP overestimates the wind speed, but the postprocessed forecasts are much better.

## 5. Conclusions

- The method is simple and requires few resources to run.
- It is not cutting edge science or technology, but provides useful improvements to raw NWP forecasts.
- The method is reliable and robust. It has been running on a free Google account for about six months with no manual intervention.
- The spreadsheets can be easily modified to run for anywhere in the world where METAR reports are available.

Real time forecasts for Fua'amotu Airport are available online:

<https://sites.google.com/view/tongaweather>

Contact for more information: [timothy.hume@bom.gov.au](mailto:timothy.hume@bom.gov.au)

## Acknowledgements

This work was conducted at home in my spare time. I would like to acknowledge my family for encouragement. There have been helpful suggestions from a number of people, including current and former Bureau of Meteorology staff and others. The underlying maths is based on the Site OCF method used by the Bureau of Meteorology for many years.