

WORLD METEOROLOGICAL ORGANIZATION

DPFS/TT-SV/Doc. 4.1b

COMMISSION FOR BASIC SYSTEMS
OPAG on DPFS

(X.IX.2014)

**MEETING OF THE CBS (DPFS) TASK TEAM ON
SURFACE VERIFICATION**

Agenda item : 4.1

GENEVA, SWITZERLAND
20-21 OCTOBER 2014

ENGLISH ONLY

**On the use of 3rd party prepared site climatologies within a verification
framework**

(Submitted by Rachel North)

Summary and purpose of document

This document provides background information on the experiences we have gained at the Met Office on the use of precipitation climatologies provided by ECMWF, required for calculating the Stable Equitable Error in Probability Space (SEEPS).

Action Proposed

The meeting is invited to take note of these and in particular we want to encourage WMO to revisit their master station lists and ensure that sufficient precision (at least 4 decimal places) for latitude-longitude is provided for each site.

Reference: -

1. Introduction

The UK Met Office (hereafter MO) has been using the daily precipitation climatology files prepared at ECMWF to calculate the Stable Equitable Error in Probability Space (SEEPS) score for use in monitoring the forecast model performance. As a result, several issues have come to light, which it is felt need clear guidance on how centres should be proceeding if the SEEPS were adopted as a metric exchanged between global modelling centres.

2. Main points

2.1. *Different station master lists in use at different centres*

There are several discrepancies in the position information between the station lists in use at ECMWF and Met Office. Many of these are of order of magnitude several hundredths of a degree, which of course is equivalent to arc minutes, and some stations do not have a position recorded with arc seconds. In this day that should not be necessary. Is the WMO listing updated yearly? Should the WMO listing be used by default as a centres' station list. As an example of a typical difference between the station position used in the EC climatologies and the MO, station 03313 (Rhyl No 2) is in the MO database at 53.267 degrees, but the EC climatology files at 53.25 (and WMO list at 53.259). Obviously, most issues are due to rounding. The worst cases differ by tenths of a degree, but there are very few of these.

2.2 *There are also historical differences between site locations*

A look on the internet provides evidence here. Are the WMO lists version-controlled? Can we go back to a previous version to look at the data?

2.3 *There appear to be several sources of site location information*

With the advent of Google maps, can we verify that the locations listed, especially those in the WMO list, are pointing to the site of a meteorological enclosure? In several instances where the difference in latitude-longitude between the MO site list value, and the ECMWF value was larger than about 0.05 degrees, it was not possible to visually identify an enclosure in the vicinity on Google maps. In addition, different site lists appear to be of different precision. It should be possible, in this day and age, to get the coordinates of a meteorological enclosure (maybe even the Stevenson screen?), to an acceptable accuracy. This would reduce potential for introducing error.

As an example, in June 2014, in the UK Met Office observation database, there are 5922 unique station locations, and there are 4761 unique locations in the SEEPS climatology file. Of those sites, the intersection between the two contains 3587 sites. That leaves us with 1174 sites in the climatology which are not in the observations, and 2335 sites in the observations which are not present in the climatology. We have not yet delved into which stations these are, but could do further investigation were it requested.

3. Implications and discussion items

On a broader scale with many high-resolution NWP models now running at resolutions of 0.015 deg or better, it is very difficult for verification code to identify the nearest model grid-point to an observing location when, in some cases, a location is only provided with 1-decimal place precision.

We strongly recommend that WMO considers:

- a mandatory review of station location information, requesting member states to provide details to 4 decimal places,
- regularly updating and version controlling the station master lists, and
- placing the version-controlled master lists in an easy-to-find location on the WMO web site, where it is clear that this is the authoritative source.