This is a very useful paper, bringing disparate Antarctic AWS data sources together to one accessible point. I think that it should be published, although I do recommend some changes and improvements as follows.

General comments:

1. There is another paper also in discussion in ESSD at the moment that provides more details of one of the Antarctic AWS networks included in this compilation. That paper is ESSD-2022-188, "The PANDA automatic weather station network from coast to Dome A, East Antarctica", Ding et al. If both papers are accepted for publication, then it would be useful if they referenced each other.
2. In the tables and graphs, the AWS are ordered firstly by the deploying institution and then alphabetically by name. It would be much more logical if they were sorted geographically, for example by elevation (from 0 to 4000+ m).
3. I can see no rationale for plotting the data availability Figure 8 and Figures S1-S4 in rainbow colours. They would be simpler and clearer if they were just black and white.
4. If there are missing values in Tables S2, S3 and S4 they are reported as NaN (not a number). They should just be shown blank.
5. Maximum and minimum wind directions (in Table S2, S3, S4) are physically meaningless concepts: a maximum of 360 is the same direction as a minimum of 0. Mean wind direction is also subject to calculation error: for example, the arithmetical average of a 90- and 270-degree wind is 180 degrees; but the direction could also be 0 degrees. A more useful statistic to show would be constancy of the wind direction (defined as the ratio of the magnitude of the mean wind vector to the scalar average wind speed).
6. It would be useful if Table S5 also included a column giving the duration (in years) that each station provided data (up to the end of 2021).
7. The English language is generally reasonable although it could be improved. Several of the authors are native English-speakers and should review the text.

Specific comments by line number

52-53 Remote AWS became practical with the introduction of the ARGOS data relay system. This is discussed later, but should be introduced here. The relevant satellites are not in "outer" space.

59-60 The first (successful) Australian AWS in Antarctica was deployed inland of Casey, not in the Lambert Basin. The early Australian AWS are reported in Allison, I. and Morrissy, J.V. (1983). Automatic weather stations in Antarctica. Australian Meteorological Magazine, 31(2),71-76. A network inland of Casey station was deployed during the International Antarctic Glaciology Program: those are the stations discussed in the Allison et al. 1993 paper that is cited. Details of the Lambert Glacier Basin AWS are given in Allison, I. (1998) The surface climate of the interior of the Lambert Glacier basin: 5 years of automatic weather station data. Annals of Glaciology 27, 515-520.

83 "Southern Ocean island stations" NOT "South Pacific island stations"

113 Define what the acronym "PNRA" actually is

118 The supporting framework for AWS instruments differ greatly between models. They are not "mostly tripod".

137 It would be better to give a height range. There is considerable difference between stations.

159 Table 1. The pressure range of the AAD stations is NOT 530-791hPa: this would be useless for an AWS near sea level. The Paroscientific sensor covers a full range of atmospheric pressure, but the

structure of the data transmitted from the stations is truncated to give a shorter message. The range is set for each AWS to cover the likely pressure range at the deployment site. The 530-791hPa range applies only to Dome A (4000+ m). Similarly, under the CHINARE stations, the range 530-791hPa is also only for the Dome A station.

160 The image of the Eagle AWS (Fig 1f) is a very poor picture of a partly buried station. I can, if requested, supply a much better image of an AAD AWS (as also deployed at Eagle and Dome A).

188-194 I found this description of cooperative links very hard to understand. I think it is incorrect in several cases.

206 Figure 4. This Figure make a lot more sense if it comes after the discussion in Section 3.2, not before. (There are also minor typographical errors in this Figure).

239 What does this mean? Surely, the purpose of an AWS is to be "unattended".

249 Not all AWS use a platinum resistor temperature probe.

253-268 With the very strong surface inversions that occur over the Antarctic plateau, a small difference in sensor height (due to different AWS design or with from accumulation with time) can be very significant. It can lead to a measured temperature difference of a degree or more over 1 metre. There is also at least one error in Table S2: aws05 (at a near coastal elevation of only 150 m) has a 3-hourly minimum temperature of -87.7! A plot of temperature vs surface elevation would be more informative than the table (and would reveal any errors).

270-271 All the AAD AWS use Paroscientific digiquartz barometers

277 A plot of pressure against surface elevation would also be more informative than the tables

289-292 The AAD AWS have included humidity measurements since about 1990. The Humicap sensor calibrations need to be corrected at very low temperatures – has this been done for all data?

329 What are the white circles in Fig. 5?

360-363 It is the length of record from the site that is important, not the length of record from an individual AWS. For example, the stations named LGB00, LGB00-A, LGB00-B and LGB00-C are all at the same site, which has a total record of ~23 years. In the Australian program, a new AWS at the same site is given a different name because it has a different calibration file: other programs may retain the same name for a replacement AWS.

409 "Antarctic AWSs" NOT "AIS AWSs". Not all stations are on the ice sheet.