Earth Syst. Sci. Data Discuss., 6, C369–C375, 2014
www.earth-syst-sci-data-discuss.net/6/C369/2014/

Open Access Earth System Science Data Discussions

Interactive comment on "A global historical Radiosondes and Tracked Balloons Archive on standard pressure levels back to the 1920s" *by* L. Ramella Pralungo et al.

L. Ramella Pralungo et al.

lorenzo.ramella-pralungo@univie.ac.at

Received and published: 13 March 2014

Anonymous Referee #1

This paper describes an important observational resource for climate monitoring activities and as such scientifically I have no qualms whatsoever with its acceptance. I do feel, however, that the manuscript in current form does not do full justice to the body of work it describes. As such I would suggest fairly major structural, graphical and text revisions to better do justice to the considerable effort which this manuscript reports upon.

Major comments

First and foremost even after allowance for the fact that the authors'first language is not English I found a lot of spelling and grammatical errors in the manuscript. In minor comments I highlight the more serious examples only. I would urge the authors ïňĄnd a native English speaking colleague to carefully check spelling and grammar on any revision prior to resubmission.

>We apologize for this. We have tried to improve the language by following the referees' comments. Several colleagues who lived in the US and England for quite a while have read the revised manuscript.<

I find the title overly long and not particularly informative as to what then follows. Firstly, only later on do I find out its 16 standard reporting levels. Secondly the earliest record is from 1900 and not the 1920s. Thirdly it tells me nothing about the parameters included. Finally it does not make clear that many values are interpolated to modern standard reporting times and levels. I would suggest a rewording along the lines of: "Archive of upper air temperature and wind profiles interpolated to 16 standard pressure levels and 00 and 12Z reporting hours" This, I believe, is a fairer reflection of the actual paper and dataset. Its still too long, ideally (indeed marginally longer than the original ...), but I ïňĄnd it hard to reduce without losing valuable information. The only element missing is the start date but the 1920 date seemed an ad hoc date to focus on anyway.

>We discussed a lot about the title and we arrived at "A Global Radiosonde and Tracked Balloon archive on 16 standard pressure levels (GRASP) back to 1905: Part I: Merging and Interpolation to 00 and 12GMT". We find that this implies wind and temperature measurements at least. Most authors on the subject stressed the measurement system in the title, not the measured parameters (IGRA, RAOBCORE, RATPAC). Moreover it is important for us to have the acronym of the data set (GRASP) in the paper title. <

Similarly to the title, I found the abstract rather poor a reflection of the underlying paper contents. It focuses too strongly on early records and it dances around the fact that

many of the data are interpolated in vertical coordinate and / or time. It would be better to reorder the abstract along the lines: Point out the availability of (fractured) archives and be explicit about when these start Point out that pre-1958 data are at asynoptic hours / not signiïňĄcant levels Point out that to be useful need to merge these and proxy the early records to look like modern ones.

>We now mention fragmentation and merging already in the first paragraph and we note the beginning year of the archives. The procedures described here are most beneficial for the very early records, hence the emphasis on them. However we agree that we should not overstress this and we hope that we now have found the right balance.<

Much of this is already in the abstract but its not stated clearly or with a good narrative continuity and it is interspersed with programmatic stuff about EU framework funding etc. which really belongs in acknowledgements / discussion. >This is a good point. We freed the abstract of programmatic/funding issues as much as possible.<

On p. 845 ln 19-23 I find this assumption a little dubious given that these early records were generally with sondes which poorly controlled for radiation impacts. My working assumption here is that you are assuming a homogenization will account for this, which is fine. But everything we know from e.g. early CIMO intercomparison campaigns is that radiation impacts had large effects on early sondes so invariability of time departures seems a questionable, if necessary procedure. For the unwary reader / user some greater discussion around this point would appear warranted. Don't assume that readers will use the data appropriately i.e. not use it as climate dataset and therefore be explicit here.

>This comment motivated us to include the reported launch times to the archive since they represent valuable information for later homogenization. We explained that there often is a diurnal cycle of the observation bias which can make the assumption of constant obs-bg differences when interpolating a few hours in time rather inaccurate. We also explain why this is more problematic for temperature than for wind.<

On p. 847 ln 4-6 I would expect to see here some recognition of the desirability to redo this later as new, improved, analyses become available which may provide a better tool. So, when the new ERA 20th Century reanalysis comes along would you redo and re-release this if it showed better performance at these levels than 20CR in the modern era when it can be in some sense validated? If so, I'd expect you to make this point explicitly here. If not, why not?

>We now explained more clearly what would be needed from future reanalyses (ERA20C, SIRCA) to improve the results of the present paper. It was initially planned to redo this with ERA20C but problems during the production of ERA20C prevented this.<

I found Section 8 as a whole poorly structured and repetitious. It also has inconsistencies e.g. p. 850 ln 7 says 1905 to today but line 9 says the first ascent in the database is from April 4th 1900. Both statements cannot, logically, be true. I would look to completely restructure and rewrite this section to be much cleaner and more succinct. Think about what two or three key messages you want to make and then make them. I would, if I were writing this, analyze in three paragraphs and in increasing granuality:

>The apparent inconsistency has been removed. In the Upper ERA-CLIM data sets there are observations (20 ascent) recorded at Lindenberg observatory from 11.05.1900 but they are fragmentary and spiky and they don't survive the quality checks. The earliest record in the merged GRASP dataset is from a tracked balloon launched at Lindenberg on 02.03.1905. We shortened section 8 considerably and reduced redundancies.<

Changing station count through time. Table 1 the columns should be in the order of preference of the merge so that the reason for the gradation in % data used becomes more apparent. The table caption should also repeat, for clarity, this ordering so that the table can be properly interpreted as a stand alone item.

>We agree. The table and its caption have been changed accordingly.<

Many of the ïňĄgures really do not do justice to the paper. Nor are they readily accessible to those not already well versed in such ways of analyzing upper air data. In particular Figures 2, 3, 4 really are 'inside baseball' type ïňĄgures which to anyone outside a very small pool of experts will make no sense. Some effort to make these substantively more accessible to a lay reader audience would be very useful to the authors and the journal.

>We rearranged the figures such that we start with showing data content and global data coverage. We tried to explain the figures better in the captions and in the text. On the other hand this is a scientific journal where some demanding content is reasonable.<

Figure 5 really just shows that 20CR doesn't have a QBO – which we knew ahead of time. Yet I don't see any physics discussion either in the caption or the accompanying text. The maps in Figures 7 and 9 are really too small and too cluttered to be legible. Consideration could be given to instead plotting timeseries traces of counts by regions / histograms of station length or other means of representing the core intended messages which may give a more reasonable way of accessing the information within the conïňĄnes of the journal format.

>We agree, Fig. 5 has been insufficiently discussed despite its importance. It shows the biases of NOAA-20CR vs ERA-Interim and it is now properly discussed. We reduced those figures 7, 9 (now Figs 2 and 10) to four panels. In this form they fit well on a journal page. There is the additional possibility to zoom in in this electronic journal.<

I found a disproportionately large number of references were to work in prep. I am unsure of journal policy but as a rule I am extremely wary of references to work in prep given the frequency with which this work then often ends up never appearing and / or appearing somewhere different. I don't think references to papers in prep are needed or actually aid the current paper and I would drop any reference to anything not yet at least submitted to a journal by the time this article is revised. None of the papers

are required to support this one and the work can be discussed without reference to them. As much as anything titles have a propensity to be suggested to be changed by reviewers (see above) and then the traceability is lost.

>This is correct, but we expected that there will be at least one revision of the initial manuscript and by this time these papers may have been submitted or accepted. In this revised manuscript we have cited only one paper that has been submitted, and none in preparation.<

Minor comments p. 839 ln 14. These references are a little odd. The cite to McCarthy et al., 2008 is a little strange as a choice. If you wish to cite the HadAT record then it would make more sense to either cite the manual intervention approach paper (Thorne et al., 2005) or the final rather than the first in the set of three automated approach papers on which co-author Haimberger was an author (Thorne et al., 2011). Similarly, Free et al is the reference for RATPAC and not Lanzante et al. which covers only the period of record up to 2003 in that dataset. Finally, missing entirely is a reference to the IUK dataset of Sherwood and colleagues. I think it is fine to include one reference for each but in that case I would utilize the most recent so: (Free et al., 2006, Sherwood et al., 2008, Thorne et al., 2011, Haimberger et al., 2012 and references within these to earlier versions of each analysis) would be a more comprehensive and useful reference which hopefully is more equitable in its handling of these disparate efforts.

>We agree and we have followed the reviewer's suggestions regarding the citations.<

p. 840 ln 1 – drought not draught => fixed

p. 840 ln 5 related to a particularly [insert a] =>fixed

p. 843 ln 11 Any one of exchanged / flipped / changed instead of excenged =>fixed

p. 846 ln 11-12 have not been manipulated =>fixed

p. 846 ln 29 Units on 0.05 are?=> Kelvin

p. 847 ln 15-18 it might provide some meaningful context to readers to associate Lindenberg/MOL with its status as the GRUAN lead centre which would also permit some brief allusion to ongoing improvements in instrumentation and also network design for the future. Seidel et al., 2009 could be referenced here.

<We agree and we made the connection to the valuable GRUAN effort. We also tried to improve the error description along the lines suggested in GRUAN/GCOS documents.>

p. 849 ln 5 significant (missing t) =>fixed

p. 849 ln 8 yearly or annual instead of year =>fixed

p. 850 footnote 2 decade (missing d) =>fixed

p. 851 ln 20. 1957/58 was the International Geophysical Year (not Geographical).=> It is somewhat embarrassing that this error went public. Fixed

p. 851 ln 22. Biennium? Not common usage in English (although it is valid usage). Is some more accessible phrasing possible here? =>We changed to “During this campaign”

p. 851 ln. 29 especially (not expectially) =>fixed

p. 852 ln 11 How can a station ‘own’ anything? Stations consist of records may be better here. => We now write: .. 37 station records contain more than 70 years of continuous observations

---

Interactive comment on Earth Syst. Sci. Data Discuss., 6, 837, 2013.