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Interactive
comment

Interactive comment on "A Sudden Stratospheric Warming Compendium" *by* Amy H. Butler et al.

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Summary:

The authors describe the Sudden Stratospheric Warming Compendium (SSWC) data set; a collection of data relevant for studying the dynamics and impacts of SSWs from 1958-2014. The SSWC consists of data from 6 reanalysis products: ERA-40, ERA-Interim, JRA-55, MERRA2, NCEP-NCAR I, and NOAA20CRv2c. Pressure-level data, including winds, temperature, geopotential height, PV and ozone mixing ratio is available, along with surface temperature, pressure, and precipitation. These fields can be downloaded as either climatological values, full fields, or anomalies over the 60 days before and after each SSW event. El-Nino-Southern Oscillation, Madden Julian Oscillation, and Quasi-Biennial Oscillation indices are also provided, since these are known to have links with SSWs and their impacts. The authors provide examples of how the SSWC may be used to study composites of SSW events, individual events, as well as

to compare reanalyses. The data set is provided in CF-compliant netCDF-4 format, and hosted publicly at NOAA's National Centers for Environmental Information (NCEI).

This is a well-written paper which I have enjoyed reading, and I hope (and expect) the SSWC data set will a valuable resource for the community. The data is easily accessible, and I applaud the authors for using the widely accepted CF metadata conventions. I recommend this paper for publication, and have included some minor comments below, which I hope the authors find constructive.

Comments:

Data Accessibility:

The drop-down menu for downloading data at http://esrl.noaa.gov/csd/groups/csd8/sswcompendium/ appears not to be working, and only lists JRA-55 on the menu for reanalysis products. While data can be downloaded from the NCEI at https://www.ncei.noaa.gov/data/ssw/, the file names are quite cryptic. I would encourage the authors to ensure that the drop-down menu download is working, and include all of the fields in the SSWC. This would improve the accessibility of SSWC data, particularly for new users.

Text:

1. Line 4/Page 2: Make clear the sign of the impact of SSWs on cold air outbreaks (i.e. "..., such as increasing the likelihood of cold air outbreaks ...")

2. L21/P2: Change "40 degrees K" to "40 K", since Kelvin is absolute, not a 'degree'.

3. L4/P5: "... in final warmings, the vortex breaks down but never recovers back to its climatological westerly state until the following boreal autumn": The climatological state following a final warming may actually be easterly (if it is a late final warming). I think saying "in final warmings, the vortex breaks down and becomes easterly until the following boreal autumn" is more accurate.

4. L12/P5: Perhaps mention the motivation for choosing 20 days between events.

Radiative time scales?

5. L9/P6: Total column ozone is not on pressure-levels as this implies, but is vertically integrated.

6. L19/P6: Mention the value of c_p used for calculating isentropic levels.

7. L20/P6: Could a bit more information on the interpolation be provided? Was it linear interpolation?

8. L9/P7: For data sets that do not provide daily maximum/minimum temperature, how accurate is the calculation from 6-hourly or 3-hourly data? Are the minimum/maximum 6/3-hourly values used, or is there interpolation between them to calculate these values?

9. L24/P8 and L34/P8: How are monthly-mean values interpolated to give daily values? Is it linear interpolation between monthly-mean values centered at the 15th of the month, for instance?

Tables and Figures:

10. Table 2: Mention in the table caption the difference between stars (data available, but no SSW detected), and gray shading (no data available).

11. Figure 3: Mention contour levels for temperature anomaly in (a), and I'm guessing bold is 0 K.