Data Set Title:
UW King Air Manually Corrected Nevzorov Liquid/Total/Ice Water Content

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General Dataset Description:
There exists one file from each UW King Air (UWKA) research flight from SNOWIE. The files contain CDP liquid water content as well as manually corrected Nevzorov liquid, total, and ice water content. Data quality flags are included for each of the corrected variables (0 = raw, 1 = good/corrected, 2 = bad). Data coinciding with a bad data quality flag (2) was not omitted from the corrected variables. Detailed information on variables, naming convention, and missing data is listed below. Note – these data are version 1.

Time of Interest:
2017/01/08 *02:06:05* -- 2017/01/08 *06:03:14*
2017/01/09 *03:56:14* -- 2017/01/09 *07:45:31*
2017/01/11 *02:02:57* -- 2017/01/11 *05:51:36*
2017/01/18 *19:43:50* -- 2017/01/18 *23:18:45*
2017/01/19 *15:14:58* -- 2017/01/19 *18:37:02*
2017/01/19 *22:18:52* -- 2017/01/20 *02:09:04*
2017/01/21 *21:49:18* -- 2017/01/22 *01:45:31*
2017/01/22 *20:42:46* -- 2017/01/23 *00:35:55*
2017/01/31 *19:35:01* -- 2017/01/31 *22:36:35*
2017/02/03 *19:34:28* -- 2017/02/03 *21:56:06*
2017/02/04 *21:21:09* -- 2017/02/05 *01:33:18*
2017/02/07 *19:30:25* -- 2017/02/07 *23:29:55*
2017/02/16 *23:21:27* -- 2017/02/17 *00:58:01*
2017/02/18 *21:20:49* -- 2017/02/19 *00:53:19*
2017/02/19 *17:18:48* -- 2017/02/19 *21:02:31*
2017/02/20 *14:21:06* -- 2017/02/20 *17:46:54*
2017/02/21 *14:18:22* -- 2017/02/21 *18:21:53*
2017/03/04 *13:01:41* -- 2017/03/04 *16:58:56*
2017/03/05 *11:45:57* -- 2017/03/05 *15:07:15*
2017/03/07 *13:49:20* -- 2017/03/07 *17:55:09*
2017/03/09 *13:46:14* -- 2017/03/09 *17:03:20*
2017/03/09 *19:45:34* -- 2017/03/09 *23:51:07*
2017/03/16 *00:40:30* -- 2017/03/16 *04:34:55*

Area of Interest:
Locations are specific to aircraft flight track for a given day/flight/file. The geographical grid that encompasses all flights is as follows: 43.5 degN, 45.0 degN, 117.0 degW, 114.5 degW.

Data Frequency:
1 Hz

Data Spatial Type:
Data were collected via aircraft. Data are time and lat/lon-tagged.

Data Restrictions:
None

Instrument Description:

All files contain variables from the following instruments:

CDP, 2DS, and Nevzorov probes– variables for the CDP and Nevzorov probes contain the appropriate 3 letter identifier at the end of the variable name (lwc = liquid water content, twc = total water content, iwc = ice water content). Variables for the 2DS probe consist of the concentration of particle sizes 50 μm – 1 mm, and the concentration of particles 100 μm – 1 mm to isolate the presence of ice.

All variables are provided at 1 Hz. The variable 'time' is given in HHMMSS for a UTC clock.

Data Collection and Processing:

Data Collection:
Data were collected via University of Wyoming King Air (UWKA) during the SNOWIE field campaign in 2017.

Size Distribution Processing:
Data used to compute the 2DS number concentration are from UWKA size spectra files, located at https://doi.org/10.5065/D6GT5KXK. Two variables (listed below) were computed: the concentration (in cm^{-3}) for all particles with 50 μm < D < 1000 μm and for particles with 100 μm < D < 1000 μm.

Quality Control Procedures:
Data quality control procedures for the Nevzorov probe were applied manually using some assumptions since a baseline shift can occur at any time in or out of cloud. These assumptions are discussed below.

- When the CDP liquid water is near 0 g m^{-3}, so should the Nevzorov liquid water. Therefore, the baseline was adjusted as needed. This adjustment was made consistently with time until a new baseline shift was apparent. If no baseline shift was obvious, no new correction was made.

- For total water content, similar adjustments were made, though only in areas where CDP was near 0 g m^{-3} and no ice was present. With ice present, it is expected that the Nevzorov total water content will show values > 0 g m^{-3} even though CDP liquid water is near 0 g m^{-3}, so no correction could confidently be applied here. Again, any adjustment was kept consistent until a new shift was apparent.
- A subtraction of 5% of the difference between the total and liquid water contents is then applied to the liquid water content to account for ice build-up on the probe.

Data Format:

File Naming Convention:
Files are named as [YYYYMMDD].c1.nevcorr.nc where YYYY is 4 number identifier for year (2017), MM is 2 number identifier for month, DD is 2 number identifier for day. All files end in .c1.nevcorr.nc (indicating 1Hz data, Nevzorov corrected, netCDF file) If there are more than one flight for a given day, a letter is appended to the end of the 2 number day identifier.
For Example*: 2nd flight on Jan 19* --- 20170119b.c1.nevcorr.nc

File Names:
20170108.c1.nevcorr.nc
20170109.c1.nevcorr.nc
20170111.c1.nevcorr.nc
20170118.c1.nevcorr.nc
20170119a.c1.nevcorr.nc
20170119b.c1.nevcorr.nc
20170121.c1.nevcorr.nc
20170122.c1.nevcorr.nc
20170122.c1.nevcorr.nc
20170203.c1.nevcorr.nc
20170204.c1.nevcorr.nc
20170207.c1.nevcorr.nc
20170216.c1.nevcorr.nc
20170218.c1.nevcorr.nc
20170219.c1.nevcorr.nc
20170220.c1.nevcorr.nc
20170221.c1.nevcorr.nc
20170304.c1.nevcorr.nc
20170305.c1.nevcorr.nc
20170307.c1.nevcorr.nc
20170309a.c1.nevcorr.nc
20170309b.c1.nevcorr.nc
20170316a.c1.nevcorr.nc

List of Variables:

Variable Name	Long Name	Units	Data Type
time	HHMMSS, UTC	UTC	int
lat	Latitude	degrees north	float
lon	Longitude	degrees east	float
lwcflag	Liquid Water Content Quality Flag	n/a	int
twcflag	Total Water Content Quality Flag	n/a	int
iwcflag	Ice Water Content Quality Flag	n/a	int
cdplwc	CDP Liquid Water Content	g m^{-3}	float
nevlwc	Nevzorov Liquid Water Content	g m^{-3}	float
nevtwc	Nevzorov Total Water Content	g m^{-3}	float
neviwc	Nevzorov Ice Water Content	g m^{-3}	float
conc2ds100	2DS Number Concentration (100 μm < D < 1 mm)	cm^{-3}	float
conc2ds50	2DS Number Concentration (50 μm < D < 1 mm)	cm^{-3}	float

Data Quality Flags:

For each Nevzorov water variable, there exists a separate variable containing an integer data quality flag (lwc/twc/iwcflag) which is either 0, 1, or 2.

- 0 means that the data are raw and have not been evaluated. This will mainly take place between flight legs as the data were corrected on a leg-by-leg basis.
- 1 means that the data have been evaluated, and a correction has been applied if needed.
- 2 means that the data is suspect, and no correction has been applied. This flag was typically applied to data that varied more than the instrument sensitivity of 0.025 g m^{-3} while the aircraft was out-of-cloud. “Out-of-cloud” is defined using data from the CDP probe. While the CDP shows liquid water ~ 0 g m^{-3}, the segment is assumed to be out-of-cloud with respect to liquid.

Data Remarks:

- Nevzorov data that are suspect are flagged as such, as described above.
- IOPs 3, 19, and 20 contain no 2DS data