Title – NOAA PSL Radar Wind Profiler, Radio Acoustic Sounding System, and Surface Meteorology Data

Authors

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1.0 Data Set Description

This dataset contains data from five sites with radar wind profiler, radio acoustic sounding system, and surface meteorology measurements that were deployed during the Propagation, Evolution and Rotation in Linear Storms (PERiLS) experiment in Oakdale, LA, Columbia, LA, Greenwood, MS, Starkville, MS, and Courtland, AL. At all five sites, radar wind profiler operating at 915 MHz are deployed. At Courtland, AL, a radar wind profiler operating at 449 MHz is additionally deployed. All instruments are operationally since spring 2022, some of them even earlier, and are operated continuously. In this dataset, data until 31 May 2022 are available so far. More data will be added.

- Data status: Final
- Time period:
  - Oakdale, LA: 13 April 2022 – 31 May 2022
  - Columbia, LA: 12 August 2021 – 31 May 2022
  - Greenwood, MS: 26 March 2022 – 31 May 2022
  - Starkville, MS: 23 March 2022 – 31 May 2022
  - Courtland, AL: 22 November 2019 – 31 May 2022
- Site information:
  - Oakdale, LA: https://psl.noaa.gov/data/obs/sites/view_site_details.php?siteID=acp
  - Columbia, LA: https://psl.noaa.gov/data/obs/sites/view_site_details.php?siteID=clb
  - Greenwood, MS: https://psl.noaa.gov/data/obs/sites/view_site_details.php?siteID=gwo
  - Starkville, MS: https://psl.noaa.gov/data/obs/sites/view_site_details.php?siteID=stf
  - Courtland, AL: https://psl.noaa.gov/data/obs/sites/view_site_details.php?siteID=ctd
- Site identifier:
  - Oakdale, LA: acp
  - Columbia, LA: clb
  - Greenwood, MS: gwo
  - Starkville, MS: stf
  - Courtland, AL: ctd
- Physical location:
  - Oakdale, LA: 30.746645 N, 92.686859 W, 32 m above mean sea level
  - Columbia, LA: 32.124322 N, 92.055569 W, 20 m above mean sea level
  - Greenwood, MS: 33.495967 N, 90.089298 W, 47 m above mean sea level
  - Starkville, MS: 33.430225 N, 88.845552 W, 95 m above mean sea level
  - Courtland, AL: 34.66 N, 87.35 W, 187 m above mean sea level
- Data Frequency:

Wind profiler: ~24-minute average every 15 minutes (subhourly) and ~54-minute average every 60 min (hourly)
Radio acoustic sounding system: ~5-minute average every 30 minutes
Surface meteorology: 2-minute average every 2 minutes

- Data set restrictions: none

2.0 Instrument Description

Radar wind profiler
Instrument description: https://psl.noaa.gov/data/obs/instruments/WindProfilerDescription.html

Radio acoustic sounding system
Instrument description:
https://psl.noaa.gov/data/obs/instruments/RadioAcousticSoundingSystem.pdf

Surface meteorology
Instrument descriptions: On the site-information pages listed above, instruments are listed under the 'Active Instruments' link while the measurements are still ongoing, and under the 'Inactive Instrument' link after the measurements finished. Each ''Instrument Name' is linked to the manufacturer documentation.

3.0 Data Collection and Processing

Data are collected continuously. Processing is done with an inhouse software. To assure high quality, the data were quality controlled for ground clutter (Jordan et al. 1997), radio frequency interference, intermittent hard targets (Bianco et al. 2013) and second trip echos. The wind profiles are available with two different vertical resolutions (high-resolution and low-resolution mode), with high-resolution mode having a higher vertical resolution but less vertical range and vice versa.
Hourly and subhourly wind profiles are uploaded. The hourly wind profiles are considered the most accurate because they are based on a higher sample size and are less affected by ground clutter. The subhourly wind profiles are subject to ground clutter contamination when the winds are weak and should be reviewed before they are blindly used in a quantitative analysis.

Data availability is given in Fig. 1 until May 31 2022.

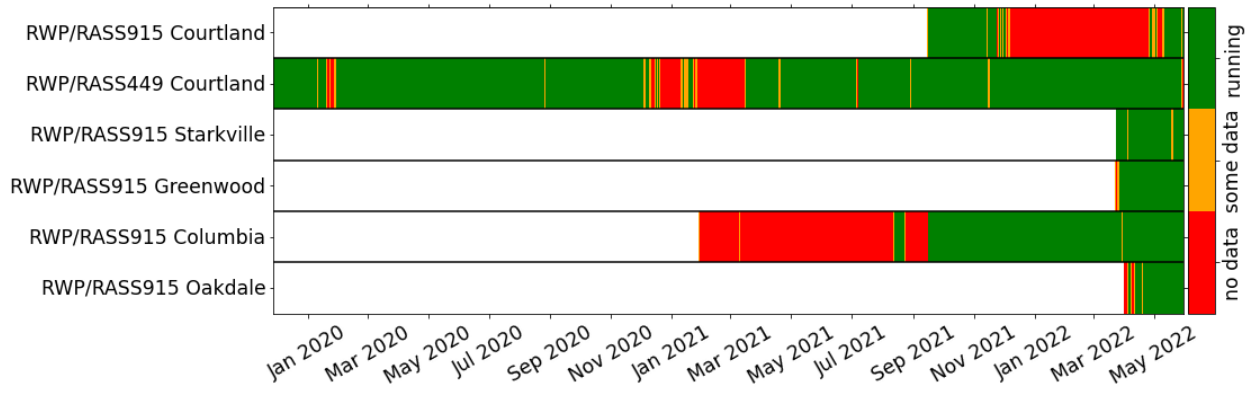

Figure 1: Data availability for the RWP/RASS systems.

4.0 Data Format

Radar wind profiler
File format: https://psl.noaa.gov/data/obs/data/view_data_type_info.php?DataTypeID=52

Radio acoustic sounding system
File format: https://psl.noaa.gov/data/obs/data/view_data_type_info.php?DataTypeID=53

Surface meteorology
Oakdale, LA:
https://psl.noaa.gov/data/obs/data/view_data_type_info.php?DataTypeID=14&SiteID=acp
Columbia, LA:
https://psl.noaa.gov/data/obs/data/view_data_type_info.php?DataTypeID=14&SiteID=clb
Greenwood, MS:
https://psl.noaa.gov/data/obs/data/view_data_type_info.php?DataTypeID=14&SiteID=gwo
Starkville, MS:
https://psl.noaa.gov/data/obs/data/view_data_type_info.php?DataTypeID=14&SiteID=stf
Courtland, AL:
https://psl.noaa.gov/data/obs/data/view_data_type_info.php?DataTypeID=14&SiteID=ctd

The file naming conventions are as follows:

sssYYJJJ.type

where sss = 3-letter site identifier; YY = 2-digit year; JJJ = 3-digit day of the year; type = 'windhr' (for hourly wind profiler data), 'windsubhr' (for subhourly wind profiler data), 'vtemp' (for radio acoustic sounding system data), and 'met' (for surface meteorology data)

The time stamp of all data is in UTC.

5.0 Data Remarks

None

6.0 References

Bianco, L., D. Gottas, and J. M. Wilczak, 2013: Implementation of a Gabor transform data quality-control algorithm for UHF wind profiling radars. J. Atmos. Oceanic Technol., 30, 2697–2703

Jordan, J. R., R. J. Lataitis, and D. A. Carter, 1997: Removing ground and intermittent clutter contamination from wind profiler signals using wavelet transforms. J. Atmos. Oceanic Technol., 14, 1280–1297.

7.0 Appendix

GCMD keywords

EARTH SCIENCE	SPECTRAL/ENGINEERING	RADAR	RADIAL VELOCITY				829e91f4-f351-4012-bb0a-208302fb11c2

EARTH SCIENCE	SPECTRAL/ENGINEERING	RADAR	RADAR REFLECTIVITY				46975e66-863a-49c9-b673-b2e099a04c85
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC WINDS	UPPER LEVEL WINDS	WIND DIRECTION			272ffe8a-2949-4b58-bb81-52cb1c879f4a
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC WINDS	UPPER LEVEL WINDS	WIND SPEED			661591b3-6685-4de7-a2a4-9ce8ae505044
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC TEMPERATURE	UPPER AIR TEMPERATURE	VIRTUAL TEMPERATURE			3afb06fa-96b7-4bf4-a6b7-b5fa626afc04
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC PRESSURE	SURFACE PRESSURE				b54de5cd-4475-4c7b-acbc-4eb529b9396e
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC TEMPERATURE	SURFACE TEMPERATURE	AIR TEMPERATURE			f634ab55-de40-4d0b-93bc-691bf5408ccb
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC WATER VAPOR	WATER VAPOR INDICATORS	HUMIDITY	RELATIVE HUMIDITY		a249c68f-8249-4285-aad2-020b3c5aefc3
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC WINDS	SURFACE WINDS	WIND SPEED			a92f49f3-e2ee-4ef4-b064-39311ffb95d3
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC WINDS	SURFACE WINDS	WIND DIRECTION			e987550e-d443-48eb-93eb-0bc47a62d4b4
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC RADIATION	INCOMING SOLAR RADIATION				6b3be650-6625-40b5-9b40-9e7c8a9fd336
EARTH SCIENCE	ATMOSPHERE	ATMOSPHERIC RADIATION	NET RADIATION				50ee8910-449b-46c8-a59b-1cd76d632b44
EARTH SCIENCE	ATMOSPHERE	PRECIPITATION	PRECIPITATION AMOUNT				cad5c02a-e771-434e-bef6-8dced38a68e8