

Title: CCOPE-2015 Arauco surface meteorological station data

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1.0 Data Set Overview:

This dataset contains data from an automated surface meteorological station deployed at Arauco, Chile during CCOPE-2105. Information on the overall goals of CCOPE, deployment strategy, and some results are found in Massmann et al. (2017). During most of the winter storms, Arauco is located ~60 km upstream of the foothills of Nahuelbuta Mountains, in coastal southern Chile. The location where the Arauco automatic weather was deployed is provided in Table 1 and Figure 1 below.

Time period covered: 13 May 2015 – 14 August 2015

Table 1: Summary of surface meteorology observation site.

Abbreviated name	Full name	Latitude [deg.]	Longitude [deg.]	Elevation [m, MSL]	Observation period
ARA	Arauco	-37.2499	-73.3393	58	13 May 2015 – 14 August 2015

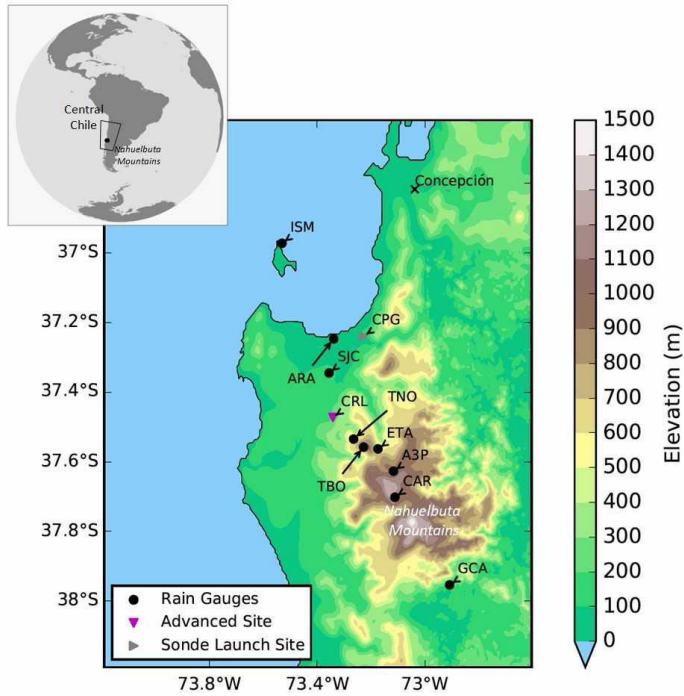


Figure 1: Locations of Arauco surface meteorology sites (ARA) as well as other observations sites. Figure adapted from Massmann et al. (2017).

2.0 Instrument Description:

Data were logged using a Campbell CR3000 data logger. The specific instruments used and selected instrument attributes are provided in Table 2. Figure 2 shows photos of the weather station and its surroundings.

Table 2: Selected instrument attributes

Variable	Model	Accuracy (range)	Comments
Air Temperature	Vaisala, HMP60-L	$> \pm 0.5^{\circ}\text{C}$ (-40° to 60°C)	Solar shielded
Relative Humidity	Vaisala, HMP60-L	$\pm 3\%$ (0-98% RH)	Solar shielded
Wind Speed	Young, 05103 Wind Monitor	± 0.3 m/s (0-100 m/s)	Starting Threshold: 1 m/s
Wind Direction	Young, 05103 Wind Monitor	$\pm 3^{\circ}$ (0° - 360°)	
Pressure	Vaisala, CS106	± 3 mb (500-1000 hPa)	
Rainfall	Texas Instrument, TR-525M	0.1 mm	Tipping bucket style rain gauge



Fig. 2: Photos of ARA weather station during deployment. Viewing directions are (clockwise from upper-left) roughly towards the: north, northeast, east, south, west.

3.0 Data Collection and Processing:

Samples were taken at 15 second intervals and data were averaged and logged at 5 min intervals.

The data presented are raw, without any post-processing or quality assurance/control applied.

4.0 Data Format:

The file is named with the following format:

surface_met_ARA_YYYYMMDD_HHMM_to_YYYYMMDD_HHMM.csv

where ARA is the abbreviated site name (as in Table 1) and “YYYYMMDD_HHMM_to_YYYYMMDD_HHMM” denote the start and end times (UTC) of the period covered by the data file.

Data file is in ASCII comma separated text (CSV) format.

The first four lines are a header:

- (1) miscellaneous info
- (2) variable names for each column of data.
- (3) units for each column of data
- (4) sampling information for each column of data

Data columns correspond to the following:

- 1) Time stamp (UTC)
- 2) Record number (integer)
- 3) Battery voltage (average) (volts)
- 4) Temperature (average) (C)
- 5) Relative Humidity (sample) (%)
- 6) Pressure (sample) (mbar/hPa)
- 7) Solar Rad (avg) (IGNORE DATA - no sensor)
- 8) Net SW RAD (avg) (NO DATA: NAN - no sensor)
- 9) Net LW RAD (avg) (NO DATA: NAN - no sensor)
- 10) Wind Speed (avg) (m/s)
- 11) Wind Direction (sample) (degrees) (broken until 2015-06-19)
- 12) Wind Speed (avg) (m/s) (same as column 10, redundant)
- 13) Wind Direction (average) (degrees) (broken until 2015-06-19)
- 14) Wind Direction (std. deviation) (degrees) (broken until 2015-06-19)
- 15) Rain (sum) (mm)

5.0 Data Remarks:

Missing data

No radiation sensors were deployed on the tower so those columns are empty or NaN.

Instrument problems and potential biases

Wind Direction wiring broken for the entire period before 19 June 2015, so wind direction data from that period should be disregarded

Sheltering from nearby vegetation (Fig. 2) may affect measurements, particularly winds.

6.0 References:

Massmann, A.K., J.R. Minder, R.D. Garreaud, D.E. Kingsmill, R.A. Valenzuela, A. Montecinos, S.L. Fults, and J.R. Snider, (Accepted – 2017): The Chilean Coastal Orographic Precipitation Experiment: Observing the influence of microphysical rain regime on coastal orographic precipitation. *J. Hydrometeor.*, <https://doi.org/10.1175/JHM-D-17-0005.1>