Data User Guide

Puerto Rico Radiosondes CPEX-AW

Introduction

The Puerto Rico Radiosondes CPEX-AW dataset consists of atmospheric pressure, atmospheric temperature, relative humidity, wind speed, and wind direction measurements. These measurements were taken from the DFM-09 Radiosonde instrument during the Convective Processes Experiment – Aerosols & Winds (CPEX-AW) field campaign. CPEX-AW was a joint effort between the US National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) with the primary goal of conducting a post-launch calibration and validation activities of the Atmospheric Dynamics Mission-Aeolus (ADM-AEOLUS) Earth observation wind Lidar satellite in St. Croix, U.S. Virgin Islands. Data are available from August 24, 2021 through September 28, 2021 in ASCII format, with associated browse Skew-T graphs in PNG format.

Citation

Rios-Berrios, Rosimar and Naoko Sakaeda. 2022. Puerto Rico Radiosondes CPEX-AW [indicate subset used]. Dataset available online from the NASA Global Hydrometeorology Resource Center DAAC, Huntsville, Alabama, U.S.A. doi: http://dx.doi.org/10.5067/CPEXAW/RADIOSONDE/DATA101

Keywords

NASA, GHRC, CPEX-AW, Puerto Rico, radiosonde, atmospheric pressure, atmospheric temperature, relative humidity, wind speed, wind direction measurements

Project

The Convective Processes Experiment – Aerosols & Winds (CPEX-AW) campaign was a joint effort between the US National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) with the primary goal of conducting post-launch calibration and validation activities of the Atmospheric Dynamics Mission-Aeolus (ADM-AEOLUS)

Earth observation wind Lidar satellite in St. Croix, US Virgin Islands. CPEX-AW was a follow-on to the Convective Processes Experiment (CPEX) field campaign which took place in the summer of 2017 (CPEX). In addition to joint calibration/validation of ADM-AEOLUS, CPEX-AW will study the dynamics and microphysics related to the Saharan Air Layer, African Easterly Waves and Jets, Tropical Easterly Jet, and deep convection in the InterTropical Convergence Zone (ITCZ). CPEX-AW science goals include:

- Better understanding interactions of convective cloud systems and tropospheric winds as part of the joint NASA-ESA Aeolus Cal/Val effort over the tropical Atlantic;
- Observing the vertical structure and variability of the marine boundary layer in relation to initiation and lifecycle of the convective cloud systems, convective processes (e.g., cold pools), and environmental conditions within and across the Intertropical Convergence Zone (ITCZ);
- Investigating how the African easterly waves and dry air and dust associated with the Saharan Air Layer control the convectively suppressed and active periods of the ITCZ;
- Investigating interactions of wind, aerosol, clouds, and precipitation and effects on long range dust transport and air quality over the western Atlantic.

More information about the CPEX-AW field campaign can be found at NASA JPL|CPEX-AW, CPEX-AW 2017 | Campaign Overview, and CPEX-AW ESPO.

Figure 1: CPEX-AW field campaign logo
(Image source: CPEX-AW)

Instrument Description

This dataset was collected by DFM-09 Radiosondes. The DFM-09 Radiosonde instrument is an extremely light, small, and robust upper air sounding instrument that provides measurements in all atmospheric layers. More information about the DFM-09 Radiosonde instrument can be found at DFM-09 | NORIS Group GmbH and DFM-09 - Data Sheet.

Figure 2: DFM-09 Radiosonde
(Image Source: DFM-09 | NORIS Group GmbH)

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Data Characteristics

The Puerto Rico Radiosondes CPEX-AW contains atmospheric pressure, atmospheric temperature, relative humidity, wind speed, and wind direction measurements taken during the CPEX-AW field campaign. Data files are in ASCII format, with associated browse Skew-T graphs in PNG format, at a Level 2 processing level. More information about the NASA data processing levels is available on the EOSDIS Data Processing Levels webpage. The characteristics of this dataset are listed in Table 2 below.

Table 2: Data Characteristics

Characteristic	Description
Platform	Ground station
Instrument	DFM-09 Radiosonde
Spatial Coverage	N: 18.448, S: 17.879, E: -67.003, W: -67.605 (Puerto Rico)
Spatial Resolution	5 m
Temporal Coverage	August 24, 2021 - September 28, 2021
Temporal Resolution	Hourly -< Daily
Sampling Frequency	1 second

Parameter	atmospheric pressure, atmospheric temperature, relative humidity, wind speed, wind direction measurements
Version	1
Processing Level	2

File Naming Convention

The data are within ASCII files with associated quick-look skew-t charts and are named using the following convention:

Data files: PR_Radiosonde_CPEXAW_qc_uprm###_YYYYMMDD.csv
Browse files: PR_Radiosonde_CPEXAW_qc_uprm###_YYYYMMDDskewt.png

Table 3: File naming convention variables

Variable	Description
###	3-digit number indicating the number of radiosonde
YYYY	Four-digit year
MM	Two-digit month
DD	Two-digit day
.csv	ASCII format
.png	Portable Network Graphics format

Data Format and Parameters

The Puerto Rico Radiosondes CPEX-AW contains atmospheric pressure, atmospheric temperature, relative humidity, wind speed, and wind direction measurements. The data files are in ASCII format with associated quick-look Skew-T charts in PNG format. Table 4 describes how these measurements are organized in each file, as well as their units.

Table 4: MetNav CPEX-AW ASCII data fields

Column	Variable	Description	Units
1	Fields	Show that each measurement is a data field	-
2	Time	Time of measurement since start time	s
3	Pressure	Pressure measurement	mb
4	Temperature	Temperature measurement	Degrees C
5	RH	Relative Humidity measurement	%
6	Speed	Wind speed measurement	m/s
7	Direction	Wind direction	degrees
8	Latitude	Latitude	Degrees North
9	Longitude	Longitude	Degrees East
10	Altitude	Altitude of measurement	m

11	GPS Altitude	Altitude measured by GPS	m
12	Dewpoint	Dewpoint temperature measurement	Degrees C
13	Uwnd	Horizontal wind speed	m/s
14	Vwnd	Vertical wind speed	m/s
15	Ascent	Ascent wind speed	m/s

Software

These data are in ASCII format, so no software is required to view these data.

Known Issues or Missing Data

There are no known issues or missing data with this dataset.

References

DFM-09 | NORIS Group GmbH. https://www.graw.de/products/radiosondes/dfm-09/.

GRAW RADIOSONDES DFM-09 Data Sheet. 2019.
https://www.graw.de/fileadmin/cms_upload/en/Resources/.pdf

Related Data

All other datasets collected as part of the CPEX-AW campaign are considered related and can be located by searching the term “CPEX-AW” in the Earthdata Search.

Contact Information

To order these data or for further information, please contact:

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