Data Format Documentation

Instrument: Pluvio^2

Overview:

This dataset consists of measurements collected with Pluvio^2 model 200 and model 400. The Pluvio200 has a 200 cm^2 orifice which was heated, and the Pluvio400 has a 400 cm^2 orifice which was not heated. During GCPEx, the Pluvio200 (400) was sited outside (within) the wind abatement fence, which was constructed similar to a Double-Fence Intercomparison Reference (DFIR). Each Pluvio had a Tretyakov fence installed around it, whereas the Pluvio200 also had an 8 foot diameter Alter shield (Alter 1937). There was no Pluvio200 deployed at the BobMorton site during GCPEx.

Dataset Organization:

The Pluvio^2 data set is contained within daily tar archives. The daily archive is named with the following convention,

pluvio_[sn]_gcpex_[site]_[latitude_longitude]_[date].tar

where [sn] = serial number of parsivel instrument (e.g., apu01)
    [site] = site name
    [latitude_longitude]=geographic location of instrument
    (e.g., N363442.07_W0972640.90 is North 36°34'42.07" and West 97°26'40.90")
    [date] = YYYYmmDD (e.g., 20110422)

and consists of ASCII encoded files containing information on the amount of precipitation.

The following files are found within the daily tar archive:

- pluvio[200;400]*_minute.txt: 1-minute accumulations in Pluvio [200;400]
- pluvio[200;400]*_hourly.txt: 1-hour accumulations in Pluvio [200;400]

Additional Pluvio data sets, not contained within a daily tar archive but with a similar file naming convention, provides a summary of the precipitation events for the entire campaign.

- pluvio[200;400]*_eventTotal.txt: total accumulation measured by Pluvio [200;400] for a precipitation event. An event is separated by a non-precipitation period lasting two or more hours.

File Format:

Level 1A: Minute files

Format: ASCII

Format of each line:
year, month, day, day of year, hour, minute, Intensity RT (mm/hr), Accumulated RT (mm), Accumulated NRT (mm), Total Accumulated NRT (mm)

Level 1A: Hourly files

Format: ASCII

Format of each line:
year, month, day, day of year, hour, Intensity RT (mm/hr), Accumulated RT (mm), Accumulated NRT (mm), Total Accumulated NRT (mm)

Level 3: eventTotal files

Format: ASCII

Format of each line:
year, event start day of year, beginning time (HH:MM), event end day of year, ending time (HH:MM), number of precipitation observations (minutes), Accumulated NRT (mm), Total Accumulated NRT (mm)

Note: Description of variables are provided in the Appendix

<u>**APPENDIX: Precipitation Variable Descriptions**</u>

Intensity RT (mm/hr):
  Real time precipitation intensity in mm per minute. Discrimination threshold is 0.2 mm/min or 12 mm/hr for Pluvio200 and is 0.1 mm/min or 6 mm/hr for Pluvio400. This measurement is considered suitable to determine the heavy precipitation for alarm management and not for daily and monthly totals.

Accumulated RT (mm):
  Accumulated real time precipitation that has equal to or larger than 0.1 mm/min precipitation, and non real time precipitation where the accumulation is less than 0.1 mm/min. Discrimination threshold is 0.2 mm within an hour for Pluvio200 and is 0.1 mm within an hour for Pluvio400. If the amount of precipitation exceeds the discrimination threshold, Pluvio outputs the measurement result in real time. Otherwise, it collects the fine precipitation over a maximum of an hour and outputs the measured value in non-real-time. If the fine precipitation does not reach the discrimination threshold within an hour, there is no output. This is particularly suitable for daily or monthly totals and for alarm management.

Accumulated NRT (mm):
  Accumulated non real time precipitation over the sampling interval with a fixed delay of 5 minutes. Discrimination threshold is 0.2 mm within an hour for Pluvio200 and is 0.1 mm within an hour for Pluvio400. If the amount of precipitation reaches the discrimination threshold within an hour, Pluvio outputs the measurement in 5-minute delay, otherwise there is no output. This is suitable for daily and monthly totals.

Total Accumulated NRT (mm):
  Accumulated total non real time precipitation since the Pluvio started operation with a fixed delay of 5-minutes. Discrimination threshold is 0.2 mm within an hour for Pluvio200 and is 0.1 mm within an hour for Pluvio400. If the amount of precipitation reaches the discrimination threshold within an hour, Pluvio outputs the measurement in 5-minute delay, otherwise there is no output. *No loss of collected precipitation amounts* and it is suitable for daily and monthly totals.

References:

Alter, J. C., 1937: Shielded storage precipitation gauges. *Mon. Wea. Rev.*, **65**, 262–265.
doi: http://dx.doi.org/10.1175/1520-0493(1937)65<262:SSPG>2.0.CO;2