# CZO Metadata Worksheet

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| Data File Name | ShaleHills\_Stream\_Discharge\_Level\_1 |
| Record Period | 2015-10-22 – 2018-09-19 |
| Descriptive Title | Susquehanna Shale Hills Critical Zone Observatory Stream Flow Data |
| Update Frequency | Quarterly |
| Abstract | A 2.5 foot fiberglass H-flume with 7’ 6” 3D approach section, 10” diameter stilling well, and dual scale staff gauge is located at the outlet of the stream Shale Hills Susquehanna Critical Zone Observatory Stream (40.664848, -77.907245, elevation 259.08 m) is used to monitor stream discharge accurately during high and low flows. Water depths are measured using a Decagon CTD-10 sensor recording in one-minute intervals, integrated to 10 minute values and converted to discharge using a rating curve developed by Open Channel Flow for the specific flume dimensions. An offset of 54 mm has been entered in the Campbell Science CR1000 data-logger program to account for the difference between the pressure sensor spacing and distance from bottom of stilling well to flume. |
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| Data Value Descriptions | * COL1: label = TmStamp\_UTC, UTCOffset=-4, TimeZone=UTC, format=YYYY-MM-DD hh:mm * COL2: label = Stage\_m; Units = meters * COL3: label = Water\_TempC; water temperature at flume; Units = degC * COL4: label =spc\_cond, Units = μS/cm; specific conductivity * COL5: label = dischge\_m3s, Units=m3/s, Method=Rating\_Curve, SampleType=No Sample, SampleMedium=Surface water, ValueType=Derived Value * COL6: label = dischge\_cfs, Units=cfs, Method=Rating\_Curve, SampleType=No Sample, SampleMedium=Surface water, ValueType=Derived Value |
| Keywords | hydrology, stream flow, water, discharge, stage, conductivity, specific conductivity, stream water temperature |
| Methods | Data are measured using a Decagon CTD-10 pressure transducer consisting of depth, water temperature and electrical conductance. The pressure sensor is located 15mm from the head (bottom) of sensor. The additional 39 mm is the distance from the measuring point of the senor to where the flume starts to water depth in accordance with the rating. The 15mm and 39 mm offsets are accounted for in the CRBasic program providing actual values of water depth in the data table. Discharge values are derived from formulas in the Openchannelflow 2.5-ft H-Flume discharge table, and will report values of -9999 when depth is less than 6.1 mm where excessive error due to fluid flow properties and boundary conditions apply.  Quality Control:  **2015**  2015-11-03 to 2015-11-19: no flow and building up ice  2015-11-20 to 2015-12-01: ice  **2016**  2016-12-15 : ice  2016-12-20 to 2016-12-25 : ice  2016-01-05 to 2016-01-08: ice  2016-01-09 to 2016-01-10: ice  2016-01-13 to 2016-01-14: ice  2016-01-18 to 2016-01-31: ice  2016-02-11 to 2016-02-21: ice  2016-04-20: debris buildup  2016-06-10 to 2016-11-30: no flow – summer was dry  **2017**  2017-01-07 to 2017-01-12: ice  2017-05-03: debris buildup  2017-05-17 to 2017-05-29: debris buildup  2017-06-08 to 2017-06-16: debris buildup  2017-06-29 to 2017-07-11: debris buildup  2017-10-17: erroneous data spikes  2017-11-20 to 2017-11-21: ice  2017-12-13 to 2018-01-01: ice  **2018**  2018-11-14: electric heat tape and insulation added to stilling well and connection to prevent sensor from freezing. Water temp and electrical conductivity values from the Decagon sensor are void during this time period (through winter). |
| Citation | The following acknowledgment should accompany any publication or citation of these data: Logistical support and/or data were provided by the NSF-supported Shale Hills Susquehanna Critical Zone Observatory. |
| Sites | Shale Hills Steam Outflow: northing/easting: 147858.026/586703.761; DMS: 40.664848, -77.907245; Elev. 259 meters |
| Publications | none |
| Data Use Notes | The user of Shale Hills Susquehanna CZO data agrees to provide proper acknowledgment with each usage of the data. Citation of the name(s) of the investigator(s) responsible for the data set, in addition to the generic statement above, constitutes proper acknowledgment. Author(s) (including Shale Hills Susquehanna CZO investigators) of published material that makes use of previously unpublished Shale Hills Susquehanna CZO data agree to provide the Shale Hills Susquehanna CZO data manager with four (4) copies (preferably reprints) of that material for binding as soon as it becomes available. The user of Shale Hills Susquehanna CZO data agrees not to resell or redistribute shared data. The user of these data should be aware that, while efforts have been taken to ensure that these data are of the highest quality, there is no guarantee of perfection for the data contained herein and the possibility of errors exists. These data are defined as either public or private, such that a password may be required for access. |