# SSHCZO Metadata Worksheet

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| Data File Name | **SH\_CZMW10.csv** |
| Date Prepared | 2018-03-09 |
| Descriptive Title | CZMW 10 |
| Update Frequency | Quarterly |
| Abstract | CZMW 10 was drilled on 2017-11-21 using an Acker Soil Scout® Track Mounted Drill Rig by [Mountain Research, LLC](http://www.mountainresearch.com/index.php). A direct push drilling method was used to collect overburden soil from 0 to 10 feet (0 to 3.05 meters) below ground surface. A 6.25 inch inner diameter HSA was used to auger from 0 to 3.05 meters. A Mission SD 6 inch diameter down-hole pneumatic driven rotary percussion hammer was used to drill from 10.0 to 40.0 feet (3.05 to 12.19 meters). Competent rock was observed about 30 feet (9.14 meters) below ground surface. 4 inch inner diameter PVC/riser casing was installed and sealed with 5 50 pound bags of 3/8 inch bentonite chips (Halliburton Baroid Industrial Drilling Products).  CZMW10 well was completed using an air rotary Mission SD 4 inch diameter down-hole pneumatic driven rotary percussion hammer from 40 to 115.0 feet (12.19 to 35.05 meters). The completed well is 4 inch diameter open bedrock borehole from 40 to 115.0 feet (12.19 to 35.05 meters).  CZMW\_10 is continuously monitored using a vented [Meter Environment HYDROS 21 sensor](https://www.metergroup.com/environment/products/hydros-21-water-level-monitoring/). The sensor measures depth, water temperature, and conductivity (CTD). Measurements are made every 3 minutes, averaged, and are recorded every 15 minutes to a Campbell Scientific CR1000 data logger. The logger is programed and calibrated to manual water level measurements below ground. If changes are made in the offset between top of casing (TOC) and water level, the program will automatically store the old offset after the new offset is entered.  Data are reviewed and QA’ed quarterly. The QA process is accomplished using precipitation data, other nearby well data, and manual water level measurements. Manual water level measurements are made periodically Solinist Electric Well tape and recorded in a spreadsheet. |
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| Data Value Descriptions | * COL1: label = TmStamp; Timezone = UTC * COL2: label = WL\_BLG\_m; Units = meters; Corrected water level below ground * COL3: label = WaterTemp\_C; Averaged; Units = degC * COL4: label = Spc\_Cond; Units = uS/cm |
| Keywords | Groundwater Depth, Groundwater Temperatures, Hydrology |
| Methods | Groundwater level measurements are recorded every 15 minutes with a vented [METER Environment HYDROS 21 sensor](https://www.metergroup.com/environment/products/hydros-21-water-level-monitoring/) (previously Decagon CTD) wired to a [Campbell Scientific CR1000](https://www.campbellsci.com/cr1000) data logger. Data are streamed to campus via Ethernet and fiber optic connections to the University network.  TOC above land surface = 0.29 meters  Sensor location down borehole from TOC = 7.00 meters  Sensor location from ground level = 6.71 meters  WL\_BLG\_m is measured with the in-situ sensor by recording the water pressure and known distance to the ground surface resulting in the actual water level below ground in meters. The manual measurements using the well tape are used to verify and correct the data. Corrections are applied when the manual well measurements are different from what is recorded by the sensor. The difference between the sensor data and manual data is applied and prorated visit to visit.  Conductance values are converted to Specific Conductance ) (SpC) using the following formula:  ([Cond]/((1)+(0.0191)\*([WaterTemp\_C]-(25))))  SpC values are QA’ed and corrected to calibrated YSI data by comparing sensor data to the YSI data and applying the difference. These corrections are prorated visit to visit.  Data Gaps/Issues:  2018-02-23 to 2018-03-15: sensor broken and was removed for repair |
| Sites | Shale Hills Valley: 40.66477, -77.90712(NAD\_1983\_StatePlane\_Pennsylvania\_South\_FIPS\_3702) |
| Publications | none |
| Citation | The following acknowledgment should accompany any publication or citation of these data: Logistical support and/or data were provided by the NSF-supported Susquehanna Shale Hills Critical Zone Observatory. |
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