# SSHCZO Metadata Worksheet

|  |  |
| --- | --- |
| Data File Name | **Hyporheic Seepage Data** |
| Date Prepared | 3/15/2016 |
| Descriptive Title | streambed water temperature |
| Update Frequency | yearly |
| Abstract | Streambed water temperature was monitored at 6 streambed piezometers at the Shale Hills Critical Zone Observatory since May 2015 at a 15-min interval. These are RAW data to estimate the groundwater seepage rates. Each piezometer has two thermal probes at about vertically 15-20cm apart. The daily seepage rate is inferred from the amplitude and phases differences between the two streambed temperature measurements (Hatch et al., 2006). |
| Investigator  Contact Info | Dr. Tess A. Russo – Assistant Professor, Department of Geosciences, 310 Deike Building, Pennsylvania State University, University Park, PA 16802  [russo@psu.edu](mailto:russo@psu.edu)  (814)865-7389 |
| Data Value Descriptions | * Col1: label = TmStamp; value=TIMESTAMP, UTCOffset=-4, TimeZone=EDT, format=YYYY-MM-DD hh:mm:ss.0000000 * Col2 : label = CZ\_20; Units = deg(C) * Col3 : label = CZ\_21; Units = deg(C) * Col4 : label = CZ\_35; Units = deg(C) * Col5 : label = CZ\_36; Units = deg(C) * Col6 : label = CZ\_22; Units = deg(C) * Col7 : label = CZ\_23; Units = deg(C) * Col8 : label = CZ\_24; Units = deg(C) * Col9 : label = CZ\_25; Units = deg(C) * Col10 : label = CZ\_26; Units = deg(C) * Col11 : label = CZ\_27; Units = deg(C) * Col12 : label = CZ\_28; Units = deg(C) * Col13 : label = CZ\_29; Units = deg(C) |
| Keywords | streambed temperature, seepage rate |
| Methods | The daily seepage rate at each streambed piezometer point is inferred from the amplitude and phase differences between a pair of water temperature measurements. The detailed method is available in Hatch et al. (2006). Matlab codes for the seepage rate computation are available (contact Tess Russo at russo@psu.edu).  Hatch C.E., Andrew T. Fisher, Revenaugh J. S., Constantz J., and Ruehl C. (2006) Quantifying surface water-groundwater interactions using time series analysis of streambed thermal records: Method development. Water Resources Research, 42, W10410. doi:10.1029/2005WR004787 |
| Sites | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | piezometer | Name | Latitude | Longitude | Offset1(cm) | Offset2(cm) | Elevation(m) | | 1 | CZ-20 | 40.66475 | -77.9071 | -43 | -24 | 260.05 | | CZ-21 | 40.66475 | -77.9071 | -10 | -9 | 260.05 | | 2 | CZ-35 | 40.66467 | -77.907 | -7.2 | -6 | 260.27 | | CZ-36 | 40.66467 | -77.907 | -42 | -24 | 260.27 | | 3 | CZ-22 | 40.6646 | -77.9068 | -1 | -1 | 260.88 | | CZ-23 | 40.6646 | -77.9068 | -36 | -18 | 260.88 | | 4 | CZ-24 | 40.66446 | -77.9057 | -16.5 | -15 | 264.94 | | CZ-25 | 40.66446 | -77.9057 | -52 | -33.5 | 264.94 | | 5 | CZ-26 | 40.66445 | -77.9054 | -16.5 | -11 | 266.69 | | CZ-27 | 40.66444 | -77.9054 | -50 | -30 | 266.6 | | 6 | CZ-28 | 40.66448 | -77.9052 | -20.5 | -8 | 266.74 | | CZ-29 | 40.66448 | -77.9052 | -53 | -25 | 266.74 |   1 initial deployment – the distance between two thermal probes (May/1/2014-3/7/2016)  2 the distances between thermal probes were adjusted (3/7/2016-) |
| Publications | The data is not yet published. Please embargo public access. |
| 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. |
| Data Use Notes | The user of Susquehanna Shale Hills 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 Susquehanna Shale Hills CZO investigators) of published material that makes use of previously unpublished Susquehanna Shale Hills CZO data agree to provide the Susquehanna Shale Hills CZO data manager with four (4) copies (preferably reprints) of that material for binding as soon as it becomes available. The user of Susquehanna Shale Hills 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. |