# **SSHCZO Metadata Worksheet**

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| Data File Name | **SH\_SPMS\_sapflux.csv** |
| Date Prepared | 2018-05-09 |
| Descriptive Title | Sap Flux measurements |
| Update Frequency | Continuous – streaming data |
| Abstract | Measurement of sap flux in mature oak trees at the CZO Shale Hills catchment in Penn States Stone Valley Experimental Forest throughout the year. Motivation for study is to monitor actual water usage of trees in order to understand water flux rates throughout the water catchment. The tree ID numbers are 1051, 1165, 915, 1170. Additionally, the data helps to understand the soil, plant, atmosphere continuum (SPAC) at the CZO. Measurements are made using four Dynamax Thermal Dissipation sensor (TDP) with 30 millimeter probes. These are connected to a Campbell Scientific CR1000 data logger that are manually downloaded monthly. |
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| Data Value Descriptions | COL1: Label = TmStamp; Timezone = UTC; format yyyy-mm-dd hh:mm:ss  COL2: Label = RecNum; data logger record number  COL2: Label = T1051\_dT\_Avg, Difference in Voltage between paired sensors in tree1051  COL3: Label = T1165\_dT\_Avg, Difference in Voltage between paired sensors in tree 1165  COL4: Label = T915\_dT\_Avg, Difference in Voltage between paired sensors in tree 915  COL5: Label = T1170\_dT\_Avg, Difference in Voltage between paired sensors in tree 1170 |
| Keywords | Sap Flux, SPAC, Shale Hills, Water Usage, Water Flux |
| Methods | Data collected using paired temperature probes installed in trees and insulated. In each tree one probe produces a small amount of heat, the other probe measures the ambient temperature of the sap. The greater the sap flux in a tree the greater the voltage difference in the probes.  The difference in temperature between the upper and lower probes (in degrees Celsius) were reported as delta values. Delta values were collected once a minute and averaged every 10 minutes. Sapflux density can be calculated from the delta values, first by calculating k from the maximum daily delta values for each probe set: (dTmax- dT)/dT. In this method, the maximum daily delta is assumed to be the baseline, or point of zero flow.  Then sapflux density, J, can be calculated as follows: Js (g/m2/s) = 119\*k^1.231  Delta values that are negative or close to zero may indicate probe failure. |
| Sites | Shale Hills: Four trees near SPMS  Tree 1051:  Tree 1165:  Tree 915:  Tree 1170: |
| Publications |  |
| 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. |
| 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. |