# SSHCZO Metadata Worksheet

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| Data File Name | **SSHCZO\_GroundHOG\_SM\_ST\_Level\_1** |
| Date Prepared | 8/3/2016 |
| Descriptive Title | Soil Moisture & Soil Temperature Data |
| Update Frequency | Quarterly |
| Abstract | The Ground Hydrological Observation Gear (GroundHOG) sites in the Susquehanna Shale Hills Critical Zone Observatory provide integrated observation of water, energy, and temperature in the Shale Hills and Garner Run field sites within the greater Shavers Creek watershed. Soil moisture, electrical conductivity, and soil temperature are measured at 3 depths at 12 sites. Each of these measurements is made using HydraProbes from Stevens Instruments. |
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| Data Value Descriptions | * COL1: label = TmStamp, TimeZone=UTC.
* COL2: label = SoilMoist\_10, Units=m3/m3, TimeSupport= 10 min, Offset = -10 cm
* COL3: label = Flag\_sm10, data evaluation codes
* COL4: label = SoilMoist\_20, Units=m3/m3, TimeSupport= 10 min, Offset = -20 cm
* COL5: label = Flag\_sm20, , data evaluation codes
* COL6: label = SoilMoist\_40, Units = degC, TimeSupport = 10 min, Offset = -40 cm
* COL7: label = Flag\_sm40, data evaluation codes
* COL8: label = SoilT\_C\_10, Units = degC, TimeSupport = 10 min, Offset = -10 cm; soil temperature
* COL9: label = Flag\_TC10, data evaluation codes
* COL10: label = SoilT\_C\_20, Units = degC, TimeSupport = 10 min, Offset = -20 cm: soil temperature
* COL11: label = Flag\_TC20, data evaluation codes
* COL12: label = SoilT\_C\_40, Units = degC, TimeSupport = 10 min, Offset = -40 cm: soil temperature
* COL13: label = Flag\_TC40 , data evaluation codes
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| Keywords | Soil, water, hydrology, hydropedology, soil science, soil moisture, soil electrical conductivity, soil temperature |
| Methods | Soil moisture, soil electrical conductivity, and soil temperature are measured at each site with Stevens Hydra Probe II ([www.stevenswater.com](http://www.stevenswater.com)). These are automated sensors wired to a Campbell Scientific CR1000 or a CR3000 data logger recording with a 10 minute interval. Quality Control:

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| Mark | Meaning | Explanation |
| NR | No reading | sensor doesn’t read data, it looks like ‘-999’ or ‘-9999’ or left it blank;(And for soil moisture, value under 0 is a non-reading data, because it is based on volumetric water content);For soil temperature, values like ‘-999’ or ‘-9999’ were marked as non-reading data;* For Hydra Probe, Soil moisture and soil temperature have no definite relationship with each other (e.g. A good soil moisture reading doesn’t mean soil temperature at this depth is good), so double-check is needed for the soil moisture and soil temperature;
 |
| LR | Low reading | Sensor reading lower than what it should be, we mark it as LR (low value);Usually the method is based upon referring soil moisture records over different periods to find inconsistency; |
| HR | High reading | Sensor reads data higher than what it should be, we mark it with HR (High Value); |

1. One column after each soil moisture, soil conductivity and soil temperature column, namely Flag\_#### ; column to above data codes; No change is put on the original data;
2. **Explanation** is needed for “low value” and “high value” every time.

For V1.0,* 1. The Shale Hills **SPMS** has long time low value for 20cm sensor before 5/26/2017 6:00 (in periods 11/14/2016 ~ 2/24/2017 it works well) until the new sensor was installed. The long gap was possibly due to bad sensor connection, which resulted in the gap between the stainless steel tine.
	2. The Garner Run **LRMS** has low soil temperature value for 20cm and 40cm around (1/19/2015, 5/13/2016) by referring to other periods.
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| Sites | Sites:* Garner Run:

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| --- | --- |
| Name | Leading Ridge Ridge Top (LRRT) |
| Latitude | 40.6940002 |
| Longitude | -77.918602 |
| Elevation (m) | 587.1983032 |

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| --- | --- |
| Name | Leading Ridge Mid-Slope (LRMS) |
| Latitude | 40.6949997 |
| Longitude | -77.9197998 |
| Elevation (m) | 554.5892334 |

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| --- | --- |
| Name | Leading Ridge Valley Floor (LRVF) |
| Latitude | 40.6962013 |
| Longitude | -77.9210968 |
| Elevation (m) | 511.9537048 |

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| --- | --- |
| Name | Tussey Mountain Mid-Slope (TMMS) |
| Latitude | 40.6996002 |
| Longitude | -77.9244995 |
| Elevation (m) | 596.8 |

* Shale Hills:

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| --- | --- |
| Name | South Planar Ridge Top (SPRT) |
| Latitude | 40.6638985 |
| Longitude | -77.9064026 |
| Elevation (m) | 283.9821777 |

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| --- | --- |
| Name | South Planar Mid-Slope (SPMS) |
| Latitude | 40.6641998 |
| Longitude | -77.9063034 |
| Elevation (m) | 274.1767578 |

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| Name | South Planar Valley Floor (SPVF) |
| Latitude | 40.6645012 |
| Longitude | -77.9063034 |
| Elevation (m) | 263.3868103 |

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| --- | --- |
| Name | North Planar Mid-Slope (NPMS) |
| Latitude | 40.6652985 |
| Longitude | -77.9044037 |
| Elevation (m) | 289.367981 |

* Cole Farm:

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| --- | --- |
| Name | Cole Farm Ridge Top (CFRT) |
| Latitude | 40.637215 |
| Longitude | -77.943056 |

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| Name | Cole Farm West Mid-Slope |
| Latitude | 40.636138 |
| Longitude | -77.942354 |

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| --- | --- |
| Name | Cole Farm East Mid-Slope |
| Latitude | 40.636397 |
| Longitude | -77.942061 |

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| --- | --- |
| Name | Cole Farm Valley Floor |
| Latitude | 40.63367 |
| Longitude | -77.94095 |

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| 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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