# CZO Metadata Worksheet

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| Data File Name | Soil Parameters |
| Date Prepared | 11/19/14 |
| Descriptive Title | Susquehanna Shale Hills CZO Model Input Soil Parameters |
| Update Frequency | As Needed |
| Abstract | From detailed soil maps of the Shale Hills CZO and measurement of five soil types at different soil horizons (see USDA Soil Survey Manual, <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054262>), these parameters have been determined which can be used for watershed model input, particularly with the Penn State Intergrated Hydrologic Model (PIHM). The first table includes total porosity, saturated vertical hydraulic conductivity, and horizontal hydraulic conductivity. The second table includes van Genuchten parameters α and β. |
| InvestigatorContact Info | Dr. Yuning Shi, Research Associate, The Pennsylvania State University, 206 Forest Resources Building, University Park, PA 16802, (814) 865-7393yshi@psu.edu. |
| Data Value Descriptions | Table 1:* COL1: label=Soil Type.
* COL2: label=Horizon.
* COL3: label=Depth, Units=m.
* COL4: label=Total Porosity, Units=m3 m-3.
* COL5: label=Saturated Vertical Hydraulic Conductivity, Units=cm min-1.
* COL6: label=Horizontal Hydraulic Conductivity, Units=cm min-1.

Table 2:* COL1: label=Soil Type.
* COL2: label=Depth, Units=m.
* COL3: label=van Genuchten Alpha, Units=m-1.
* COL4: label=van Genuchten Beta.
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| Keywords | Soil, soil porosity, hydraulic conductivity, soil horizon, van Genuchten parameters, numerical modeling, watersheds |
| Methods | * Porosity and Hydraulic Conductivity determined from Lin (2006)
* Van Genuchten parameters determined from van Genuchten (1980) and Baldwin (2011).
* A Flux-PIHM wiki web page has been added (http://cataract.cee.psu.edu/PIHM/index.php/Land\_Surface\_Scheme:\_Flux-PIHM).
* The Flux-PIHM code now is also available for download at a GitHub page (https://github.com/shiyuning/PIHM-MF) for the community to use.
* The Flux-PIHM EnKF system code now is available for download at a GitHub page (https://github.com/shiyuning/Flux-PIHM-EnKF-2.0) for the community to use.
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| 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. |
| Publications | * Baldwin, D., 2011: Catchment-scale soil water retention characteristics and delineation of hydropedological functional units in the Shale Hills Catchment. M.S. thesis, Department of Soil Science, The Pennsylvania State University, 126 pp.
* Lin, H., 2006: Temporal stability of soil moisture spatial pattern and subsurface preferential flow pathways in the Shale Hills catchment. Vadose Zone J., 5 (1), 317–340.
* van Genuchten, M. T., 1980: A closed-form equation for predicting the hydraulic conductivity of unsaturated soils. Soil Sci. Soc. Amer. J., 44 (5), 892–898.
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