

Table S2. Datasets for Shale Hills

Location	Measurement Type	PI	Year	URL
Shale Hills	Soil Gas and Soil Moisture (O ₂ , pCO ₂ , CO ₂)	Jason Kaye	2015-2016	http://www.czo.psu.edu/downloads/CZO%20Gas%20Data_GroundHOG_Soil%20gas%20and%20moisture_Lillian%20Hill.xlsx
Shale Hills	Flux tower data (level 0) CO ₂ and water vapor concentration at 10Hz time resolution (1/10 sec.)	Ken Davis	2014 - present	No Web Page (raw 1/10 second data) Data available upon request
Shale Hills	Flux tower 4-way radiation data (10-minute)	Ken Davis	2014 - present	http://www.czo.psu.edu/data_4rad.html
Shale Hills	Flux tower averages (water vapor concentration, virtual temperature, Relative humidity, net radiation, leaf wetness ,photosynthetically active radiation) & meteorology (10-minute)	Ken Davis	2009-2013	http://www.czo.psu.edu/downloads/test/fluxtowermeteo/CZO_FluxTowerMeteo_2009-13_all.xlsx
Shale Hills	Flux Tower, 30-minute averages of component winds: Land/Atmosphere CO ₂ and water vapor concentration	Ken Davis	2014 - present	http://www.czo.psu.edu/data_surfflux.html
Shale Hills	Precipitation (Daily)	Li Li	2006 - present	http://www.czo.psu.edu/data_precipday-sh.html
Shale Hills	Precipitation (Hourly)	Li Li	2006 - 2015	http://www.czo.psu.edu/data_preciphour-sh2.html
Shale Hills	Precipitation, Temperature, Relative Humidity, Wind Speed, and Wind Direction (10 Minute, Raw Data)	Li Li	2009 - present	http://www.czo.psu.edu/data_precip10minraw-sh.html
Shale Hills	Soil moisture at RTH2 Site	Chris Duffy	2009 - 2011	http://www.czo.psu.edu/data_smrth2.html
Shale Hills	Soil moisture at RTH3 Site	Chris Duffy	2009-2012	http://www.czo.psu.edu/data_smrth3.html
Shale Hills	Webcam (PhenoCam, vegetation phenology)	David Eissenstat / Andrew Richardson	2012 - present	http://phenocam.sr.unh.edu/webcam/sites/shalehillsczo/
Shale Hills	Precipitation (Laser Precision Monitor (LPM), Disdrometer)	Chris Duffy	2009 - 2014	http://www.czo.psu.edu/data_rth1lpm.html
Shale Hills	Ground water depth (Well 1, Well 2, Well 3)	Susan Brantley	2009 - 2012	http://www.czo.psu.edu/data_grwater-sh.html
Shale Hills	Ground water Chemistry	Susan Brantley	2008 - 2010	http://www.czo.psu.edu/downloads/Copy_Groundwater_Chemistry_SSHO_2008.xls
Shale Hills	ground water and stream water chemistry (ISCO Time Series) 2017	Susan Brantley	2017	http://www.czo.psu.edu/downloads/SH_2017_SW_GW_ISCO_Data_hKim_DOI.xlsx
Shale Hills	ground water and stream water chemistry (ISCO Time Series) 2016	Susan Brantley	2016	http://www.czo.psu.edu/downloads/SH_2016_SW_GW_ISCO_Data_hKim_DOI.xlsx
Shale Hills	ground water and stream water chemistry (ISCO Time Series) 2015	Susan Brantley	2015	http://www.czo.psu.edu/downloads/SH_2016_SW_GW_ISCO_Data_hKim_DOI.xlsx
Shale Hills	Soil Chemistry	Susan Brantley	2012	http://www.czo.psu.edu/downloads/CZchemDB_V10_PUBLIC_2017.zip
Shale Hills	Streamflow discharge (Flume): 10-minute, level 0, depth, discharge, temperature, RH, air temperature	Susan Brantley	2015 - present	http://www.czo.psu.edu/data_shdischg.html
Shale Hills	Streamflow discharge (Flume): level 1, depth, discharge, water temperature, conductance, and specific conductance	Susan Brantley	2015 - present	http://www.czo.psu.edu/ShaleHills/data_SHDischarge_Level_1.html
Shale Hills	Turbidity	Diana Karwan	2013 - present	http://www.czo.psu.edu/data_shturb.html
Shale Hills	Benthic Macroinvertebrate Survey	Susan Yetter	2012	http://www.czo.psu.edu/downloads/Macroinvertebrate_Summary_Results_for_Shale_Hills_Critical_Zone_Unit.pdf
Shale Hills	Hyporheic Seepage Temperature Data (streambed water)	Susan Brantley	2015 - present	http://www.czo.psu.edu/data_hyporheic_sh.html
Shale Hills	Soil Gas and Soil Moisture	Jason Kaye	2015 - 2016	http://www.czo.psu.edu/downloads/CZO%20Gas%20Data_GroundHOG_Soil%20gas%20and%20moisture_Lillian%20Hill.xlsx
Shale Hills	Soil Gas (O ₂ and CO ₂) NPMS North Planar Mid-Slope	Jason Kaye	2016 - present	http://www.czo.psu.edu/npms_Gas_Sample_Level_0.html
Shale Hills	Soil Gas (O ₂ and CO ₂) SPMS South Planar Mid-Slope	Jason Kaye	2015 - present	http://www.czo.psu.edu/SPMS_Gas_Sample_Level_0.html
Shale Hills	Soil Moisture - Time Domain Reflectometry (TDR)- GroundHOGs	Henry Lin	2006 - 2015	http://www.czo.psu.edu/downloads/SSHCZO_2010TDRSoilMoisture.xlsx
Shale Hills	Soil Temperature - GroundHOGs	Henry Lin	2007 - 2014	http://www.czo.psu.edu/data_hpst_map.html
Shale Hills	Soil Gas (CO ₂ and N ₂)	Jason Kaye	2013 - 2014, 2016	http://www.czo.psu.edu/downloads/ShaleHillsGas_201_2014_2016_Weitzman_DOI.xlsx
Shale Hills	Soil Porewater Concentration (NO ₃ and NH ₄)	Jason Kaye	2013 - 2014	http://www.czo.psu.edu/downloads/Soil_Porewater_Dataset_Shale_Hills-2013.xlsx
Shale Hills	Soil Moisture, Electrical Conductivity, & Soil Temperature Data - GroundHOGs Automated Sensors (level 0)	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghsh_map.html
Shale Hills	Hydropedologic Properties - Air Temperature (level 1)	Henry Lin	2007 - 2014	http://www.czo.psu.edu/data_hpat_map.html

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Shale Hills	Hydropedologic Properties - Electrical conductivity (level 1)	Henry Lin	2009 - 2013	http://www.czo.psu.edu/data_hpec_map.html
Shale Hills	Hydropedologic Properties - Imaginary Dielectric (level 1)	Henry Lin	2010 - 2011	http://www.czo.psu.edu/data_hpid_map.html
Shale Hills	Hydropedologic Properties - MPS Matric Potential (level 1)	Henry Lin	2007 - 2014	http://www.czo.psu.edu/data_hpmpsmp_map.html
Shale Hills	Hydropedologic Properties - Real Dielectric (level 1)	Henry Lin	2010 - 2011	http://www.czo.psu.edu/data_hprd_map.html
Shale Hills	Hydropedologic Properties - Soil Moisture (Automated Probes) (level 1)	Henry Lin	2007 - 2014	http://www.czo.psu.edu/data_hpsm_map.html
Shale Hills	Hydropedologic Properties - Soil Moisture - Time Domain Reflectometry (TDR) (level 1)	Henry Lin	2006 - 2015	http://www.czo.psu.edu/downloads/SSHCZO_2010TDRSoilMoisture.xlsx
Shale Hills	Hydropedologic Properties - Soil Temperature (level 1)	Henry Lin	2007 - 2014	http://www.czo.psu.edu/data_hpst_map.html
Shale Hills	Hydropedologic Properties - Water Table (level 1)	Henry Lin	2007 - 2014	http://www.czo.psu.edu/data_hpwt_map.html
Shale Hills	Real and Imaginary Dielectric - GroundHOGS (level 0)	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghsh_map.html
Shale Hills	Sap Flow Data	David Eissenstat	2009 - 2011	http://www.czo.psu.edu/data_sap1_0910.html
Shale Hills	Sap Flow Data	David Eissenstat	2016 - present	http://www.czo.psu.edu/data_shspms_sapflow.html
Shale Hills	COSMOS (Cosmic-Ray Soil Moisture/Snow Sensing System)	Univ. of AZ	2011-2017	http://cosmos.hwr.arizona.edu/Probes/StationDat/039/index.php
Shale Hills	Aqueous Chemistry (Ground & Stream Water)	Susan Brantley	2006-2015	http://www.czo.psu.edu/data_geochemical_geophysical.html
Shale Hills	Well-CZMW_6: water level and water temperature	Susan Brantley	2014 - present	http://www.czo.psu.edu/well/well_CZMW_6.html
Shale Hills	Well-CZMW_7: water level and water temperature	Susan Brantley	2017 - present	http://www.czo.psu.edu/well/well_CZMW_7.html
Shale Hills	Well-CZMW8&9: water level and water temperature	Susan Brantley	2013 - 2017	http://www.czo.psu.edu/data_sh_CZMW8.html
Shale Hills	Well-DC0: water level and water temperature	Susan Brantley	2014 - 2017	http://www.czo.psu.edu/data_sh_DC_0_Embarg.html
Shale Hills	Well-3: water level and water temperature	Susan Brantley	2017	http://www.czo.psu.edu/well_3.html
Shale Hills	Well-5: water level and water temperature	Susan Brantley	2016 - 20017	http://www.czo.psu.edu/well_5.html
Shale Hills	Well-7: water level and water temperature	Susan Brantley	2014 - 2017	http://www.czo.psu.edu/well/SH_well_7.html
Shale Hills	Well-9: water level and water temperature	Susan Brantley	2013 - 2016	http://www.czo.psu.edu/data_sh_CZMW8.html
Shale Hills	Well-11: water level and water temperature	Susan Brantley	2014 - 2017	http://www.czo.psu.edu/well/SH_well_11.html
Shale Hills	Well-12: water level and water temperature	Susan Brantley	2017 - present	http://www.czo.psu.edu/well/SH_well_12.html
Shale Hills	Terrestrial LiDAR	Rudy Slingerland / Eric Kirby	2011	http://www.czo.psu.edu/downloads/SHG.txt
Shale Hills	Lidar Vegetation Survey	David Eissenstat	2010	http://www.czo.psu.edu/downloads/SH_CZO_VegSurvey_2010.xlsx
Shale Hills	Root Distribution	David Eissenstat	2015	http://www.czo.psu.edu/downloads/rootdistgarnershale.xlsx
Shale Hills	Soil Respiraton	David Eissenstat	2015	http://www.czo.psu.edu/data_doe-soilresp.html
Shale Hills	Soil Geochemistry	Susan Brantley	2014	http://www.czo.psu.edu/downloads/CZchemDB_V10_PUBLIC_2017.zip
Shale Hills	Shrub Data	Kristen Brubaker	2015	http://www.czo.psu.edu/downloads/SSHCZO_Shrubdata2015.xlsx
Shale Hills	Tree Isotope Chemistry	David Eissenstat	2009, 2011, 2014	http://www.czo.psu.edu/downloads/Copy_CZO_TreeIsotopes.xls
Shale Hills	Leaf Litter/Dendroband	Margot Kaye	2011-2013	http://www.czo.psu.edu/downloads/SusquehannaShaleHillsLitterandDendrobandData.xlsx http://www.czo.psu.edu/downloads/vegetationtransects2014/SSHCZOShaleHillsTransects2014_finaldata.xlsx
Shale Hills	Vegetation Transects	Margot Kaye	2014	a.xlsx
Shale Hills	Tree Survey 2008 (species, diameter, height)	Margot Kaye	2008	http://www.czo.psu.edu/Indbphp/TreeSurvey2008_2.php
Shale Hills	Tree Survey 2012 (species, diameter, height)	Margot Kaye	2012	http://www.czo.psu.edu/downloads/SSH_TreeSurvey_2012_Updates.xlsx
Shale Hills	Tree Fall (location, size, orientation, and age of the fallen tree)	Tim White	2014	http://www.czo.psu.edu/downloads/TreeFall_SSHCZO_complete.xls
Shale Hills	Elevation of Bedrock (GPR Bedrock Elevation GIS Shapefile)	Henry Lin	2014	http://www.czo.psu.edu/downloads/bedrockelevation.zip
Shale Hills	Ground Survey	Chris Duffy	2010	http://www.czo.psu.edu/downloads/ShaleHills%20Map.pdf
Shale Hills	Soil Real and Imaginary Dielectric, South Planar Ridge Top (SPRT) Dielectric - Level 0	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghdielsh_sprt.html
Shale Hills	Soil Real and Imaginary Dielectric, South Planar Mid-Slope (SPMS) Dielectric - Level 0	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghdielsh_spms.html

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Shale Hills	Soil Real and Imaginary Dielectric, South Planar Valley Floor (SPVF) Dielectric - Level 0	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghdielsh_spvf.html
Shale Hills	Soil Real and Imaginary Dielectric, North Planar Mid-Slope (NPMS) Dielectric - Level 0	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghdielsh_npms.html
Shale Hills	Electrical Conductivity, & Soil Temperature Data - North Planar Mid-Slope (NPMS) Site	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghsmsh_npms.html
Shale Hills	Electrical Conductivity, & Soil Temperature Data - South Planar Valley Floor (SPVF) Site	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghsmsh_spvf.html
Shale Hills	Electrical Conductivity, & Soil Temperature Data - South Planar Mid-Slope (SPMS) Site	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghsmsh_spms.html
Shale Hills	Electrical Conductivity, & Soil Temperature Data - South Planar Ridge Top (SPRT) Site	Henry Lin	2015 - present	http://www.czo.psu.edu/data_ghsmsh_sprt.html
Shale Hills	Watershed Reanalysis (level 4)	Chris Duffy	1979 - 2010	http://www.czo.psu.edu/watershedreanalysis/index.php
Shale Hills	Streamflow/Discharge Reanalysis (level 4)	Yuning Shi	2008 - 2015	http://www.czo.psu.edu/downloads/shdisre/SSHCZODischgRean2008-2015.zip