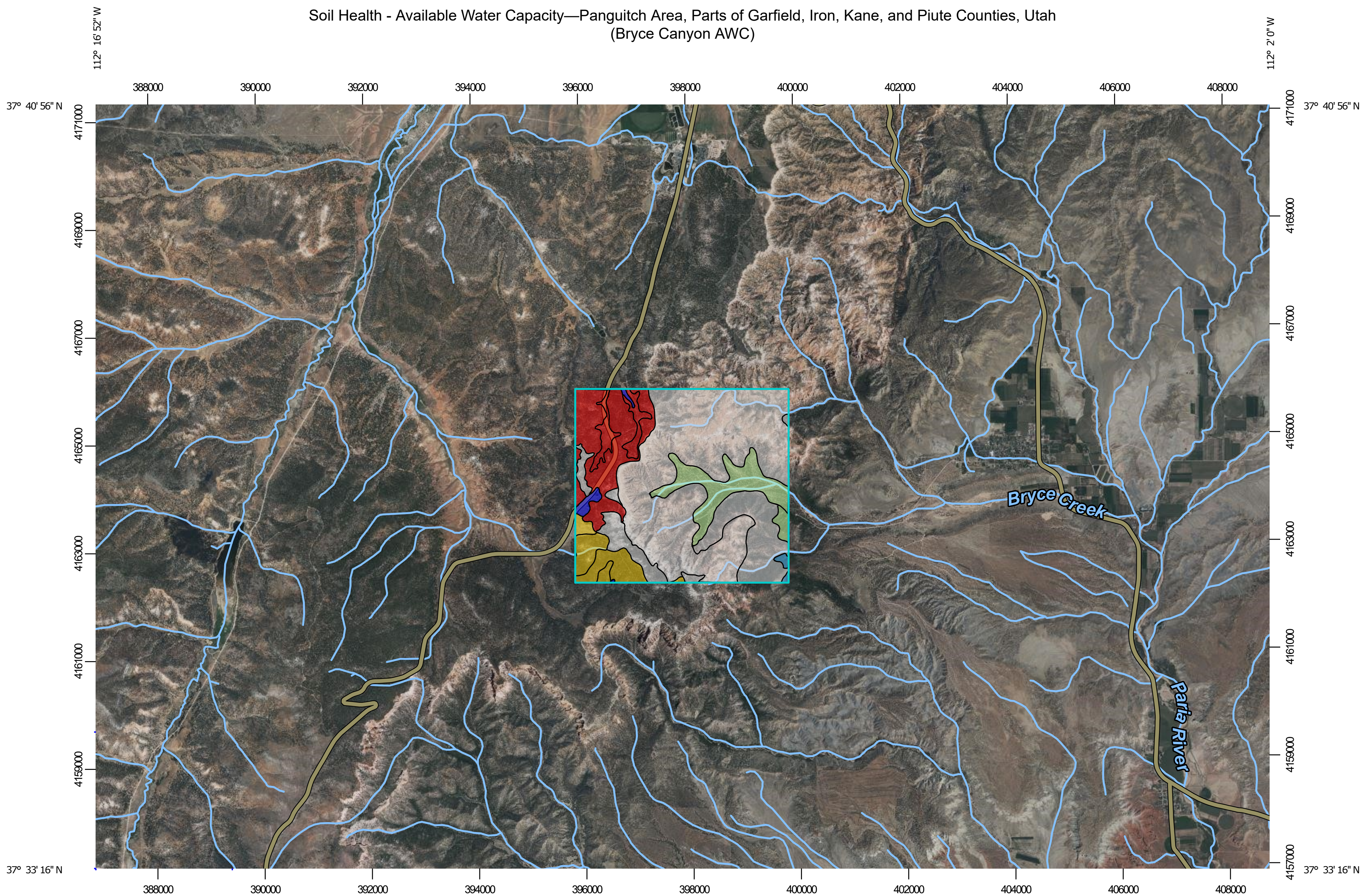
Soil Health - Available Water Capacity—Panguitch Area, Parts of Garfield, Iron, Kane, and Piute Counties, Utah
(Bryce Canyon AWC)



Map Scale: 1:100,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 1000, 2000, 4000, 6000

Feet: 0, 4500, 9000, 18000, 27000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

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Soils

Soil Rating Polygons

- <= 0.09
- > 0.09 and <= 0.10
- > 0.10 and <= 0.12
- > 0.12 and <= 0.14
- > 0.14 and <= 0.17
- Not rated or not available

Soil Rating Lines

- <= 0.09
- > 0.09 and <= 0.10
- > 0.10 and <= 0.12
- > 0.12 and <= 0.14
- > 0.14 and <= 0.17
- Not rated or not available

Soil Rating Points

- <= 0.09
- > 0.09 and <= 0.10
- > 0.10 and <= 0.12
- > 0.12 and <= 0.14
- > 0.14 and <= 0.17
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Panguitch Area, Parts of Garfield, Iron, Kane, and Piute Counties, Utah
Survey Area Data: Version 18, Aug 28, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 5, 2021—Nov 26, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Soil Health - Available Water Capacity

Map unit symbol	Map unit name	Rating (centimeters per centimeter)	Acres in AOI	Percent of AOI
8	Badland-Cannonville-Rock outcrop complex, 30 to 50 percent slopes		180.3	5.1%
9	Badland-Rock outcrop-Paunsaugunt complex, 2 to 20 percent slopes		4.8	0.1%
25	Brycan very fine sandy loam, 1 to 6 percent slopes	0.17	34.3	1.0%
26	Brycan very fine sandy loam, 6 to 15 percent slopes	0.16	0.4	0.0%
36	Clapper cobbly loam, 30 to 60 percent slopes	0.12	31.0	0.9%
96	Neto fine sandy loam, 1 to 5 percent slopes	0.10	29.3	0.8%
105	Pahreah-Sheege complex, 1 to 20 percent slopes	0.10	121.8	3.4%
107	Pahreah-Swapps complex, 25 to 65 percent slopes	0.10	98.1	2.8%
110	Paunsaugunt gravelly loam, 2 to 15 percent slopes	0.09	489.6	13.8%
115	Podo-Wiggler complex, 10 to 50 percent slopes	0.13	4.2	0.1%
122	Rock outcrop		1,747.7	49.3%
124	Rubble land		368.2	10.4%
147	Tridell gravelly loam, moist, 4 to 25 percent slopes	0.14	11.0	0.3%
150	Ustic Torrifluvents, occasionally flooded, 2 to 8 percent slopes	0.11	317.8	9.0%
152	Venture very cobbly silt loam, 4 to 25 percent slopes	0.09	106.5	3.0%
Totals for Area of Interest			**3,545.2**	**100.0%**

Description

Available water capacity (AWC) refers to the quantity of water that the soil is capable of storing for use by plants. It is expressed in centimeters of water per centimeter of soil for each soil layer.

Significance:

Available water capacity is an indicator of a soils ability to retain water and make it sufficiently available for plant use. In areas where daily rainfall is insufficient to meet plant needs, the capacity of soil to store water is very important (USDA-NRCS, 2008). Water held in the soil is needed to sustain plants between rainfall or irrigation events and provide a buffer against periods of water deficit. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure, with corrections for salinity and rock fragments. Available water capacity determinations are used to develop water budgets, predict droughtiness, design and operate irrigation systems, design drainage systems, protect water resources, and predict yields (Lowery et al., 1996). They also are an important factor in the choice of plants or crops to be grown. The available water capacity can be increased by applying soil management that maximizes the soils inherent capacity to store water. Improving soil structure and ameliorating compacted zones can improve both the storage capacity of the soil itself and increase the depth to which plant roots can penetrate.

Factors Affecting Available Water Capacity:

Inherent factors.Available water capacity is affected by soil texture, amount of rock fragments, and a soils depth and layers. It is primarily controlled by soil texture and structure. Soils with higher silt contents generally have higher available water capacities, while sandy soils have the lowest available water capacities. Rock fragments reduce a soils available water capacity proportionate to their volume, unless the rocks are porous. Soil depth and root-restricting layers affect the total available water capacity since they can limit the volume of soil available for root growth.

Dynamic factors.Available water capacity is affected by soil organic matter, compaction, and salt concentrations. Organic matter can increase a soils capacity to store water, on average, equivalent to its weight in available water (Libohova et al., 2018). Indirectly, organic matter improves soil structure and aggregate stability, resulting in increased pore size and volume. These soil improvements result in increased infiltration and movement of water through the soil. Greater amounts of water entering the soil can then be used by plant roots. Compaction reduces the available water capacity by reducing the total pore volume. Soils with high salt concentrations have a reduced available water capacity. Solutes in soil water attract water (osmotic potential), making it difficult for plant roots to extract or uptake the water.

Measurement:

Available water capacity is determined in the lab by measuring the water content at field capacity (33 kPa) and wilting point (1500 kPa) and calculating the difference (Soil Survey Staff, 2014). Pressure plates or membranes are used to bring the soil sample to a desired matric potential (33 kPa or 1500 kPa). When at equilibrium, the soil sample is removed and dried to determine its water content.

References:

Libohova, Z., C. Seybold, D. Wysocki, S. Wills, P. Schoeneberger, C. Williams, D. Lindbo, D. Stott, and P.R. Owens. 2018. Reevaluating the effects of soil organic matter and other properties on available water-holding capacity using the National Cooperative Soil Survey Characterization Database. Journal of Soil and Water Conservation 73(4):411-421.

Lowery, B., M.A. Arshad, R. Lal, and W.J. Hickey. 1996. Soil water parameters and soil quality. In: J.W. Doran and A.J. Jones (eds.) Methods for assessing soil quality. Soil Science Society of America Special Publication 49:143-157.

Soil Survey Staff. 2014. Kellogg Soil Survey Laboratory methods manual. Soil Survey Investigations Report No. 42, Version 5.0. R. Burt and Soil Survey Staff (eds.). U.S. Department of Agriculture, Natural Resources Conservation Service.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2008. Soil quality indicatorsAvailable water capacity.

Rating Options

Units of Measure: centimeters per centimeter

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 30

Units of Measure: Centimeters