

**Lithostratigraphic Column of Capitol Reef National Park and Vicinity, Emery, Garfield, Millard and Wayne Counties, Utah**

**References: Billingsley, G.H., Breed, W.J. and Huntoon, P.W.; 1987; Geologic Map of Capitol Reef National Park and vicinity, Utah; Utah Geologic Survey; available online at: <http://geology.utah.gov/maps/geomap/parkmaps/index.htm>**

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<b>Era</b>	<b>Period</b>	<b>Epoch</b>	<b>Formation</b>	<b>Member</b>	<b>Map Unit</b>	<b>Description</b>
Cenozoic	Quaternary	Holocene	Alluvial Deposits		Q <sub>al</sub>	Includes stream and flood plain deposits bordered by low terraces of boulders, gravel and alluvial fan deposits that consist of boulders, gravel, sand, silt, and clay.
			Rock Glacier Deposits		Q <sub>mr</sub>	Unconsolidated boulder deposits near the tops of Boulder Mountain and Mt. Pennell.
			Eolian Deposits		Q <sub>ed</sub>	Wind blown sand, fine to medium grained. Forms small dunes and sandsheet deposits.
			Colluvial Deposits		Q <sub>ms</sub>	Includes rockslides, slumps and talus slopes consisting of a mixture of boulders, gravel, sand, and silt.
			Terrace Gravel Deposits		Q <sub>at</sub>	Higher stream deposits of boulders, gravel, sand and silt. Includes unconsolidated glacial outwash and pediment gravels.
		Pleistocene- Early Pliocene	Glacial Till		Q <sub>gt</sub>	A mixture of unsorted angular boulders, gravel and sand. Includes some glacial outwash deposits.

			Pediment Deposits		Q <sub>ap</sub>	Gently sloping surfaces covered with boulders, cobbles, sand and gravel several hundred feet above adjacent streams and valleys, also on some flat-topped hills and benches. On Mt. Pennell, thinner and less bouldery on lower benches.	
			Boulder Deposits		Q <sub>nb</sub>	Unconsolidated deposits of a diverse mixture of soil and boulders that generally mantle the upper slopes of Thousand Lake and Boulder mountains. Includes undifferentiated glacial, landslide and alluvial deposits.	
			Extrusive Volcanics		T <sub>v</sub>	Chiefly lava flows with interbedded tuffaceous sedimentary rocks overlain by unmapped glacial deposits on Boulder and Thousand Lake mountains.	
	Tertiary	Pliocene-Middle Miocene		Diorite Porphyry		T <sub>dp</sub>	Intrusions of diorite porphyry; includes some monzonite porphyry on Mt. Pennell.
				Shattered Sedimentary and Igneous Rocks		T <sub>s</sub>	Sedimentary and igneous rocks irregularly intruded by igneous material. Many dikes and sills.
				Intrusive Volcanics		T <sub>i</sub>	Intrusive rocks' dikes, sills and a few plug-like dikes with intrusive breccias. Thicknesses of dikes are not drawn to scale but do reflect later variations.
				Flagstaff Limestone		T <sub>f</sub>	White fossiliferous limestone, tuffaceous sediment and conglomerate in the northwest' forms ledges and slopes. Thickness is more than 500 feet; top and bottom contacts concealed
		Eocene-Paleocene					

Mesozoic	Cretaceous	Early-Late	Mesa Verde	K <sub>mv</sub>	Light brown, thick-bedded sandstone and thin interbedded dark gray shale; intertongues with Masuk Member of the Mancos Shale; forma a cliff. Thickness ranges between 300 and 400 feet. Top is concealed	
			Mancos Shale	Masuk	K <sub>mm</sub>	Yellowish-gray mudstone and minor bluish-gray to black mudstone with interbedded light gray sandstone; forms slopes and ledges; thickness ranges from 650-750 feet due to uncertainty of the lower contact with the Emery Sandstone Member.
				Emery Sandstone	K <sub>me</sub>	Light gray to yellow, medium-bedded sandstone containing interbedded carbonaceous shale and coal beds in the upper part; lower beds intertongue with the Blue Gate Shale Member, forms a cliff. Thickness about 300-400 feet.
				Blue Gate Shale	K <sub>mb</sub>	Laminated blue-gray and black shale with a few interbedded light yellow sandstone and limestone lenses; forms a slope. Thickness ranges from 1200 feet in the south to 1500 feet in the north.
				Ferron Sandstone	K <sub>mf</sub>	Fine-grained laminated brown sandstone and white cross bedded sandstone containing interbedded carbonaceous gray shale and impure coal in the upper part; intertongues with the Tununk Shale Member; forms a cliff and some ledges. Thickness ranges from 205 feet to 385 feet.
				Tununk Shale	K <sub>mt</sub>	Bluish gray and black shale; locally fossiliferous; forms a slope. Thickness ranges from 540 feet to 720 feet.

Mesozoic	Cretaceous	Early-Late	Dakota Sandstone		K <sub>d</sub>	Yellowish-brown to gray sandstone and conglomerate with interbedded carbonaceous shale and thin coal beds; locally fossiliferous; forms ledges and slopes. Thickness ranges from 0-150 feet.
			Cedar Mountain		K <sub>cm</sub>	Variiegated mudstone and sandstone and conglomerate at the base. Thickness ranges from 0-166 feet in the north.
	Jurassic	Early-Late	Morrison Formation	Brushy Basin Shale	J <sub>mb</sub>	Variiegated mudstone including some white, gray, and brown sandstone and conglomerate containing abundant red and green chert pebbles; forms a slope. Thickness averages 200 feet in the south and 200-350 feet in the north.
				Salt Wash Sandstone	J <sub>ms</sub>	Thick-bedded, light gray sandstone and conglomeratic sandstone interbedded with greenish to reddish mudstone; forms ledges and cliffs. Thickness varies from 100-200 feet in the north to 500 feet in the south.
Mesozoic	Jurassic	Early-Late	Summerville		J <sub>s</sub>	Thin beds of reddish-brown siltstone and mudstone; forms a slope when weathered; about 50-250 feet thick. Map unit includes interbedded red and gray mudstone, pink and white gypsum, gray limestone and gray sandstone in the Tidwell unit of the Morrison Formation. Thickness is about 30-100 feet and thins southward.
			Curtis		J <sub>cu</sub>	Thin to thick bedded, white, fine-grained calcareous sandstone and minor sandy limestone; forms a cliff. Formation is discontinuous to the south and increases to approximately 175 feet in the north. Grades upward into the Summerville Formation.
			Entrada Sandstone		J <sub>e</sub>	To the south, a slope-to-cliff-forming, thick-to-thick-bedded reddish brown sandstone and siltstone in the upper and lower part separated by a middle silty slope unit. In the north, generally a red-brown, slope-forming siltstone. Thickness ranges from 400-900 feet.

Mesozoic	Jurassic	Early-Late	Carmel		J <sub>c</sub>	Very fine grained, thin-bedded, orange-red sandstone and siltstone; calcareous mudstone common in the lower half and pink gypsiferous siltstone and gray limestone beds in the upper part; forms ledges and slopes. Thickness ranges from 200 feet in the south to 1000 feet in the north.	
			Navajo		J <sub>TRn</sub>	White, yellow, and light reddish-brown, large-scale crossbedded, fine-grained sandstone; forms cliffs and hummocky knobs. Thickness ranges from 950 feet in the north to 1400 feet in the south. Includes Page Sandstone of Middle Jurassic age at top. The Page Sandstone consists of light reddish-brown fine-grained, large-scale cross bedded sandstone and is about 30-60 feet thick	
	Triassic	Early-Late	Kayenta		T <sub>Rk</sub>	Irregularly bedded, grayish-purple to reddish-brown, thin-bedded, fine-grained sandstone and siltstone; forms ledges and cliffs. Thickness averages 350 feet.	

			Wingate		$T_{RW}$	Reddish-brown, thick-to-thick-bedded, fine-grained sandstone; massive and crossbedded; forms sheer cliffs. Thickness averages 350 feet and thins slightly from east to west.
		Chinle		Shinarump	$T_{RC}$	A ledge-forming, medium-to-coarse-grained crossbedded sandstone and conglomerate.
				Petrified Forest	$T_{RC}$	A slope-forming greenish-gray bentonitic mudstone, sandstone and minor conglomerate.
				Owl Rock	$T_{RC}$	A slope-forming and ledge-forming, thin-bedded, green limestone unit interbedded with red, brown, and greenish-gray sandstone.
				Church Rock	$T_{RC}$	A ledge-forming fine-to-medium-grained red sandstone and siltstone unit.
	Early-Late	Moenkopi		Sinbad Limestone	$T_{Rm}$	White to light gray dolomitic sandstone in the south and a red mudstone and sandstone with gypsum veinlets and stringers in the north; thin-to-thick-bedded, brownish-orange and yellow conglomeratic and sandy dolomite.

				Lower ledge-forming unit	T <sub>Rm</sub>	Grayish-red to brownish-red interbedded sandstone and siltstone with crossbedding and ripple marks.
				Slope forming unit	T <sub>Rm</sub>	Reddish brown siltstone and some brown, fine-grained sandstone beds
				Upper ledge-forming unit	T <sub>Rm</sub>	Dark reddish-brown, thin-bedded mudstone, sandstone and dolomitic sandstone with veinlets and stringers of gypsum and selenite.
Paleozoic	Permian	Early-Late	Kaibab Limestone		P <sub>k</sub>	Thin-bedded, fine-grained, white, calcareous siltstone and porous oolitic dolomite containing chert layers in the upper part; forms a cliff. Formation becomes discontinuous to the south and averages 200 feet thick in the north.
			Cutler Group Undivided		P <sub>c</sub>	Includes the White Rim Sandstone and Cedar Mesa Sandstone. Light yellow to white, very fine-grained crossbedded sandstone which is thick-bedded and dolomitic in the upper part; lower units may be in part of the Cedar Mesa Sandstone Member; forms a cliff. Thickness is over 800 feet; base is not exposed