STRATIGRAPHY OF SOUTH FLANK OF EASTERN UINTA MOUNTAINS AND UINTA BASIN

ERA (ERATHEM)	PERIOD (SYSTEM)	EPOCH (SERIES)	NORTH AMERICAN AGE (STAGE)	ICS AGE (STAGE)	TIME (Millions of Years Ago) (not to scale)	BEDROCK UNIT NAMES and QUATERNARY DEPOSITS	(not to	(NESS scale)	DOMINANT ROCK TYPE	LITHOLOGY	NOTES	DEPOSITIONAL NVIRONMENTS
CENOZOIC	Quaternary	Pleistocene	Holocene Rancholabrean Irvingtonian	Upper Middle	— 0.0117 — — 0.126 — 0.781	Alluvium and colluvium Eolian (wind-blown sand) deposits Landslide deposits Glacial till-outwash and older alluviu	thin to 160	Meters 1-30 5-10 thin to 50 1-10	Unconsolidated sand, silt, gravel, and boulders; fine- to coarse-grained deposits in stream channels and on several levels of benches; landslides and slumps in unconsolidated and bedrock units suscep- tible to failure on steep slopes and in some active channels		Alpine glaciers in Uinta Mountains; capture of Green River by the Colorado River system within the las 2 million years Crustal relaxation and collapse of eastern Uinta Mountains; drainage	
	Tertiary (Paleogene)	Oligocene	Arikareean Whitneyan Orellan	Chattian Rupelian	0.781 23 28	Bishop Conglomerate	0-490	0-150	Sandstone and boulder conglomerate with ash beds		 patterns changed about 25 million yea ago to the present configuration; unconformity of about 22 million yea 	
			Chadronian	Priabonian Bartonian	34 36 38	Duchesne River Formation	1560-4430	475-1350	Sandstone, siltstone, and mudstone with ash beds		Unconformity of <2 million years; Gil — Peak erosion surface formed after th Laramide uplift ended	
		Eocene	Uintan		41 48	Uinta Formation	1230-2000	375-610	Upper mudstone; lower sandstone, siltstone		 Known for abundant brontothere and turtle fossils 	
			Bridgerian	Lutetian		Green River Formation	1000-5400	305-1645	Limestone, sandstone, shale, and oil shale with some salt, gypsum, and nahcolite beds		Lake Uinta; known for fossil insects and leaves; contains Mahogany oil shale and other oil shale beds	
		Paleocene	Wasatchian Clarkforkian Tiffanian Torrejonian	Ypresian Thanetian Selandian	56 59	Wasatch Formation	1115-2800	340-855	Interbedded sandstone, siltstone, and conglomerate; intertongues with overlying Green River Formation		Unconformity of about 4 million years Tertiary-Cretaceous (TK) boundary and the extinction of non-avian	s;
MESOZOIC	Cretaceous	Upper	Maastr	richtian	62 <u>66</u> 66 72 —	Mesaverde Group Castlegate Sandstone	515-2500	155-760	Sandstone, siltstone, and carbonaceous mudstone with some coal beds		 dinosaurs Laramide uplift of the Uinta Mount begins Buck Tongue of Mancos Shale; last marine transgression deposit of the 	tains
				onian acian	84 86 90	Mancos Shale	4600-6200	1402-1890	Mudstone, silty mudstone, and siltstone		Giant marine reptiles swam in the Western Interior Seaway	Μ
			Turo	onian		Frontier Formation	145-280	44-85	Sandstone, carbonaceous mudstone, coal; large concretions in upper part	◎ · · · · ◎ · · · · ◎	Tununk Shale; unconformity of about	3
			Cenor	92 92 Senomanian 95 95 101 101 101		Mowry Shale	30-140	10-40	Siliceous shale		 million years at base Contains fossil fish scales 	
		Lower	Alb			Dakota Formation	80-175	25-55	Sandstone, carbonaceous mudstone, coal		 K-1 unconformity of about 1 million y 	ears
		LOwer	Apt Barre	tian emian	125 129 145	Cedar Mountain Formation	70-230	20-70	Varicolored mudstone and soil carbonate (calcrete) beds forming nodules		Emergence of flowering plants — K-0 unconformity of about 16 million	N
	Triassic Jurassic	Unnor		onian eridgian	145 152 157 159	Morrison Formation	550-700	165-215	Upper varicolored mudstone; lower sand- stone, siltstone, thin pebble conglomerate		Contains abundant dinosaur remains	5
		Upper		rdian	159	Stump Formation Entrada Sandstone	130-265 100-250	40-80 30-75	Mudstone, limestone, glauconitic sandstone Fine-grained, cross-bedded sandstone		Contains belemnite fossils J-3 unconformity of about 1 million y	Т
		Middle	Callovian Bathonian Bajocian		166 168	Carmel Formation	105-400	30-125	Mudstone and siltstone with lower limestone or sandstone		Contains <i>Isocrinus</i> crinoid fossils	R
			Toar	rcian	170 174 183						 J-1 unconformity about 4 million yea 	rs
		Lower	Pliensbachian Sinemurian Hettangian		191 199 201	Nugget Sandstone	655-1030	200-315	Fine-grained sandstone with large-scale trough and planar cross-beds		Ancient sand dunes	
		Upper	Carnian Olenekian		209 227 237 247	?? Chinle Formation	210-440	65-135	Mudstone and siltstone with rippled sandstone at top and pebble conglomerate (Gartra Member) at base		 Unconformity of unknown duration Gartra Member; contains fossil wood unconformity of about 10 million year 	
		Lower			247 — 251 —	Moenkopi Formation	525-1115	160-340	Interbedded siltstone, sandstone, mudstone		Contains abundant trace fossils and ripple marks	
		Cuedelunian		Wordian	252 265	Dinwoody Formation	0-195	0-60	Shale, siltstone, sandstone, some limestone		— T-1 unconformity of about 13 million	years
NEOPROTEROZOIC	Permian	Guadalupian (Middle)	Guadalupian	Roadian Kungurian	269 272 284	Park City and Phosphoria Formations	65-195	20-60	Limestone and dolomite with interbedded mudstone, siltstone, and sandstone; basal phosphatic shale		Contains phosphate and marine deposits	т
		Cisuralian (Lower)		Artinskian Sakmarian	286 292						 Unconformity of about 6 million years 	s
	Pennsylvanian	Upper	Wolfcampian Virgilian Missourian	Asselian Gzhelian Kasimovian	295 299 304	Weber Sandstone	655-1310	200-400	Fine-grained sandstone with thin limestone interbeds in lower part		Forms cliffs and Steamboat Rock in Dinosaur National Monument	Ν
		Middle	Desmoinesian Atokan		307	Morgan Formation	625-950	190-290	Interbedded shale, siltstone, cherty limestone			R
		Lower	Morrowan	Bashkirian	315	Round Valley Limestone	210-395	65-120	Cherty limestone		Forms ledges, contains jasperized marine fossils	т
	Mississippian	Upper	Chesterian	Serpukhovian	323	Doughnut Shale Humbug Formation	280-300 245-295	85-95 75-90	Carbonaceous shale and thin limestone Interbedded sandstone, shale, limestone			R
		Middle	Meramecian	Visean	331				Upper (Deseret Limestone equivalent) and lower thick-bedded cherty limestone		Forms cliffs, contains marine fossils Deseret Limestone equivalent 	
		Lower	Osagean Kinderhookian	Tournaisian	347	Madison Limestone	590-985	180-300	separated by thin-bedded shaley limestone (Delle Phosphatic Member equivalent); sinkholes and caves (karst)		 Delle Phosphatic Member equivalen 	т
	-	Upper Cambrian		359 — 485 —	Lodore Formation	0-590	0-180	in the upper limestone Sandstone and pebble sandstone		Unconformity of about 126 million ye marine sand deposited in low areas		
		Middle			501 642	Red Pine Shale		550-1200	Shale and arkosic sandstone		 Unconformity of about 140 million ye uplift of ancestral Uinta Mountains and erosion creating a rolling landscape 	
	Cryogenian					formation of Hades Pass		1800-2200	Quartz sandstone shale thin pebble			
						formation of Crouse Canyor		1280-2700	Quartz sandstone and some thin beds		Forms the exposed core of the Uinta Mountains; ancient faulted basin repeatedly flooded by marine waters that contained single-celled and earl	м
							165-330	50-100	Shale and arkosic sandstone		colonial microfossils	
NEC						formation of Diamond Break		485-975 225-500	Quartz sandstone and orthoquartzite Conglomerate and shale	REAL REAL REAL	 Unconformity of about 800 million ye 	ars
PALEOPROTEROZOIC						Red Creek Quartzite		as much as 6100			F Metamorphosed rocks N a ii	 = Marine transgression R = Marine regression N = Non-marine A = Marine transgression Ind regression cycles with ntervening non-marine leposition

Red line denotes an unconformity (no rock record preserved); two numbers give time gap.

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Plate 1 Utah Geological Survey Open-File Report 651 Stratigraphy of South Flank of Eastern Uinta Mountains and Uinta Basin

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