Map Unit Properties Table: Oregon Caves National Monument

Source map: Barnard (2007). King et al. (2011) mapped different units and revised ages for the rocks within the monument. Notably, the Rattlesnake Creek terrane in the monument is interpreted as pre-Late Triassic and not Jurassic.

Age	Map Unit (Symbol)	Geologic Description	Geologic Issues	Geologic Features and Processes	Geologic History and Park Connections
Diorite dikes of the Grayback pluton					
UPPER JURASSIC	Diorite dikes (Jd)	Mostly dioritic to slightly gabbroic dikes of the granitic Grayback pluton. Contain pyroxene or hornblende, euhedral plagioclase crystals, biotite, and quartz; also amphibole and microcline crystals. Range from 15 m (50 ft) to 107 m (350 ft) in length at the surface.	None.	Cave features—Dikes visible within cave. Grayback pluton—Largest pluton in the Wooley Creek suite. Evidence of mixing and mingling of magma from several different mantle sources. Mining and mineral resources—Concentration of gold deposits surrounding the north end of the pluton. Pegmatite veins with high-purity quartz and feldspar, as well as minor gold, copper, and molybdenite.	Igneous intrusive event occurring approximately 160 million years ago that helped to weld the Rattlesnake Creek terrane to the North American continent and metamorphose limestone to marble in the Rattlesnake Creek terrane. Exposed throughout the national monument.
Rocks of the Rattlesnake Creek terrane					
MIDDLE–UPPER JURASSIC	Marble (Jml)	Gray to white, mostly bedded marble composed of calcite crystals. From aphanitic to up to 4 mm (0.2 in) in size, with many black graphite layers 1 mm (0.04 in) thick or less and folded chert layers with cleavage. Average strike and dip 085°/28°/SE. Near-vertical joints appear in conjugate pairs. Average strike and dip of one set is 164°/81°/SW or NE (overturned), and the other set averages 020°/70°/W.	Boundary expansion—May incorporate entire marble block within monument boundaries, providing additional cave protection. Paleontological resources—Quaternary fossils within cave sediments. Crinoid and foraminfer fossils. Potential for echinoid spines and conodonts.	Cave features—Marble cave and associated calcite speleothems. Mining and mineral resources—High-purity limestone (marble) is an important commodity in Josephine County.	Originated as limestone (marine fauna) within a seamount setting. Metamorphosed to marble as a result of accretion (~170 million years ago) and igneous intrusion (~160 million years ago). Occurs as large block, approximately 750 m (2,460 ft) × 1,000 m (3,280 ft), in the northwestern half of the national monument, with some smaller blocks in the southwestern and northeastern corners of the national monument.
	Argillite (Ja)	Dark gray to black, aphanitic, layered, metamorphosed mudstone with weathered, rust-colored areas. Most outcrops have a 6 cm (2.4 in) foliation oriented 222°/53°/NE. Some outcrops with thin-layered foliation. Some outcrops with phyllitic or micaceous luster.	None.	Mining and mineral resources—Near-surface pockets of gold.	Formed near island arc. Contains clasts of Precambrian rock from western cordillera. Surrounds all map units except serpentinite (Jsr), which is surrounded by peridotite (Jp).
	Metasediments (Js)	Metamorphosed sedimentary rock of many grain sizes, with moldic porosity, often composed of quartz or igneous grains in an aphanitic gray matrix. Some mineral grains are lineated with a trend of 26°.	None.	Mining and mineral resources—Hosts high-purity limestone (marble) and rhodonite (pink, rose, or violet garnet).	Scattered around marble (Jml) block. Sediments deposited at the top of ophiolite sequence.
	Metachert (Jc)	White to pink to black metamorphosed chert, with conchoidal fracture perpendicular to the cleavage. Generally very smooth but resembles granular quartzite in some places. Generally oriented 212°/32°/SE. 2 cm (0.8 in) to 8 cm (3 in) thick.	Paleontological resources—Potential for conodont and radiolarian fossils.	Cave features—Chert beds are visible in cave.	Scattered around marble (Jml) block. Chert deposited at the top of ophiolite sequence.
	Mélange (Jm)	Mixed body of rock composed of fragments and blocks of all sizes. Contains chert, marble, igneous rock, and serpentinite pieces.	Mass wasting—Very unstable (geothermally altered and friable). Paleontological resources— Radiolarians, coral, and conodonts elsewhere.	Cave features—Dissolution occurs in marble. Mining and mineral resources—High-grade limestone (marble) is an important commodity in Josephine County.	Mixture of rock resulting from accretion of terrane. Underlies the lower visitor parking lot in the national monument.

Source map: Barnard (2007). King et al. (2011) mapped different units and revised ages for the rocks within the monument. Notably, the Rattlesnake Creek terrane in the monument is interpreted as pre-Late Triassic and not Jurassic.

Age	Map Unit (Symbol)	Geologic Description	Geologic Issues	Geologic Features and Processes	Geologic History and Park Connections
Ophiolite complex of the Rattlesnake Creek terrane					
MIDDLE–UPPER JURASSIC	Metavolcanic rock, basalt (Jv)	Metamorphosed basalt, commonly with rusty weathered surfaces. Slightly magnetic and consist of glassy black crystals, as well as some brown to green vitreous mineral. Pyrite, or similar mineral, can occur in highly magnetic aphanitic samples; radiated pyroxene also common.	None.	Mining and mineral resources—Hosts metallic minerals, including numerous gold-bearing quartz veins. Gold mineralization occurs in quartz veins that penetrate several different rock types, including altered lava flows, tuff, argillite, chert, and quartzite.	Originated as oceanic crust and island arc. Exposed in both the No Name Creek streambed and Cave Creek drainage channel behind the Chalet.
	Metavolcanic rock, gabbro (Jg)	Metamorphosed gabbro, commonly with rusty weathered surfaces. Slightly magnetic and consist of glassy black crystals, as well as some brown to green vitreous mineral. Pyrite, or similar mineral, can occur in highly magnetic aphanitic samples; radiated pyroxene also common.	None.	Mining and mineral resources—Hosts metallic minerals, including numerous gold-bearing quartz veins. Gold mineralization occurs in quartz veins that penetrate several different rock types, including altered lava flows, tuff, argillite, chert, and quartzite.	Originated as oceanic crust and island arc. Exposed in both the No Name Creek streambed and Cave Creek drainage channel behind the Chalet.
	Skarn (Jsk)	Metamorphosed, multi-layered, silica-rich limestone with an aphanitic, gray matrix.	None.	Mining and mineral resources—Large veins of quartz, garnet, and other accessory minerals, including calcite.	Oceanic crust. Crops out at the top of Mount Ruchi in the southeast corner of the national monument. Superposed on top of the mass of argillite by a thrust fault in the southeast corner of the national monument.
	Peridotite (Jp)	Aphanitic, ultramafic rock with olivine crystals.	Mass wasting—Less susceptible to landsliding than serpentinite.	Ultramafic rock—Supports rare plant species. Originated in Earth's mantle. Very rare at Earth's surface. Largest concentrations of ultramafic rocks in North America are in the accreted terranes of the Klamath Mountains. Mining and mineral resources—Chromite, nickel, and minor amounts of copper and gold in ultramafic rocks.	Mantle material. Superposed on top of the mass of argillite by a thrust fault in the southeast corner of the national monument.
	Serpentinite (Jsr)	Black to light green serpentine with a greasy luster. Surrounded by peridotite (Jp).	Mass wasting—Prone to landsliding.	Ultramafic rock—Supports rare plant species. Originated in Earth's mantle. Very rare at Earth's surface. Largest concentrations of ultramafic rocks in North America are in the accreted terranes of the Klamath Mountains. Mining and mineral resources—Chromite, nickel, and minor amounts of copper and gold in ultramafic rocks.	Mantle material. Superposed on top of the mass of argillite by a thrust fault in the southeast corner of the national monument.