

Powell near Arches National Park



Delicate Arch in the northeastern part of the park. Photo: USGS/Phil Stoffer

Situated approximately 40 miles north of the confluence of the Green and Colorado rivers, and just five miles north of Moab, UT, Arches National Park contains the world's densest concentration of natural sandstone arches. Over 2000 rock arches lie within the park's boundaries, along with many other interesting formations including pinnacles, fins, and giant balanced rocks.

What makes this region such a perfect place for natural rock arches? It is all in the geology and the climate. Around 300 million years ago, this area was a shallow sea, and when that evaporated and dried up, thick layers of salt and gypsum

"The landscape was rock - cliffs of rock, tables of rock, plateaus of rock, terraces of rock, crags of rock - ten thousand strangely carved forms. Rocks everywhere and no vegetation, no soil, no sand."

*John Wesley Powell
July 17, 1869*

were left behind. Next, vast sand dunes covered the land. This wind-blown sand makes up the rock you see today, the Jurassic-aged (144-208 million years old) Entrada sandstone. Now salt, when it is being squeezed by heavy layers of rock, isn't strong or stable. It migrates through cracks and pores into the rock above it, creating areas of weakness in an otherwise very strong sandstone.

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Learn more about Arches National Park at: www.nps.gov/arch & at <https://www.usgs.gov/science-support/osqi/yes/national-parks>

Climate takes over when the rock is exposed. Water, ice, and wind erode softer parts of the rock faster than the harder layers. Erosive processes are a vicious circle we call a positive feedback loop; once erosion begins along a crack or a hole, it removes material and exposes more rock to the weather, which causes more erosion, exposing more rock, and so on and so on. When the harder layer sits on top of a softer layer that is eroding, an arch, bridge, or balanced rock can form. Arches generally change shape through the

very slow process of erosion, but dramatic changes can happen as well, including the natural collapse of Wall Arch in 2008 and Rainbow Arch in 2018. All surface features are geologically temporary. If given enough time, all the arches in this park will eventually collapse, although probably not in your lifetime.

The 1869 Powell Expedition

Near Arches National Park



Landscape Arch along the Devil's Garden Trail in Arches National Park. [USGS/Phil Stoffer]

On May 24, 1869, John Wesley Powell and nine other men stepped into their boats in present-day Green River, WY and set forth on an expedition of the Green and Colorado rivers. During the second month of their journey, Powell and his crew were just out of reach of this spectacular location, and his crew did not experience the iconic arches for which this park is aptly named. Just imagine, though, how he may have described them in his journals if they had traveled just ~40 miles north of the confluence.



John Wesley Powell (1834-1902) was an American explorer, geologist, soldier, and the second director of the U.S. Geological Survey.

Find this and other information about the Powell expedition at: <https://www.usgs.gov/Powell150>

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Learn more about the Sesquicentennial Colorado River Exploring Expedition (SCREE) at: <https://www.powell150.org>

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By this point in their journey, the men had already experienced many challenges. Frank Goodman had already left the expedition and they had lost one boat, many supplies, and a large portion of their food. They did not know how much farther they had to go, nor what obstacles they would still overcome.

Up against the odds, only six of the ten original men completed the journey. Just two days before the journey's end, Billy Dunn and brothers Oramel and Seneca Howland left the expedition concerned

that it was too dangerous to continue. The trio were never heard from again. The six remaining explorers arrived in present-day Lake Mead on August 30th, 1869. Powell's 1869 trip is credited with being the first successful expedition to travel the entirety of the Grand Canyon.