

POWELL 150 WORD SEARCH

A	T	O	P	O	G	R	A	P	H	Y	R	N	T
M	S	T	A	O	B	E	G	N	I	M	O	Y	W
C	O	G	R	A	N	D	C	A	N	Y	O	N	O
P	R	E	B	S	H	A	L	E	N	U	T	A	H
R	O	I	M	L	L	R	H	A	E	N	K	S	D
A	A	W	T	M	E	P	C	T	I	C	M	U	P
K	B	F	E	W	A	N	O	I	S	O	R	E	O
T	Y	U	O	L	E	D	L	C	A	N	U	R	G
R	G	E	H	L	L	O	E	R	S	F	N	F	R
O	O	X	G	C	H	U	Y	A	K	O	H	T	E
U	L	P	T	F	P	I	R	D	N	R	S	A	E
T	O	L	A	V	A	D	E	T	W	M	I	G	N
B	C	O	L	O	R	A	D	O	R	I	V	E	R
B	E	R	E	F	T	M	W	Y	E	T	T	O	I
E	W	A	T	E	R	S	G	A	I	Y	R	R	V
W	R	T	R	A	U	O	R	E	D	L	I	A	E
D	Z	I	N	D	L	S	G	T	L	A	B	P	R
O	L	O	R	O	C	D	G	E	O	T	A	H	O
O	T	N	E	M	I	D	E	S	S	H	L	Y	M
F	Y	G	E	M	M	D	A	R	I	Z	O	N	A

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|------------------|----------------|-------------|
| Powell | Erosion | USGS |
| Map | Geology | Glen Canyon |
| Boats | Arizona | Dams |
| <i>Emma Dean</i> | Sediment | Power |
| Exploration | Shale | Chub |
| Green River | Kaibab | Trout |
| Wyoming | Lava | Midge |
| Geography | Unconformity | Food Web |
| Utah | Vishnu | Ecology |
| Grand Canyon | Water | Soldier |
| Topography | Colorado River | Tribal |

John Wesley **Powell** was born in 1834 in Mount Morris, New York. As a young boy, he loved to read and explore plants, animals, and new landscapes. He became a teacher and was also a **soldier** in the Civil War, during which he lost his right arm after being wounded in the Battle of Shiloh. a scientist, a teacher, and a Civil War **soldier**. In 1865, he returned to teaching and was a professor in Illinois. He loved exploring nature and leading field trips to teach students about the natural world. When he was 35 years old, he led a 95-day expedition down the Green and Colorado rivers, exploring details of the west that were not mapped in great detail 150 years ago. There was so much to explore!

The 1869 journey took ten men in four small, wooden **boats** through southern **Wyoming**, eastern Utah, northeastern Colorado, and even through the **Grand Canyon in Arizona**. Powell and his crew climbed steep cliffs to measure elevation so they could use the **topography** (the highs and lows of the natural features in the area) to make more detailed **maps**. Powell also made notes about the rich, **tribal** traditions of Native American cultures and later became the Director of the Bureau of Ethnology at the Smithsonian Institution.

The **Grand Canyon** is a UNESCO World Heritage site and one of the seven wonders of the world. The oldest rocks at the bottom of the Grand Canyon are over a billion years old, yet the canyon itself is relatively young, created over approximately the past six million years by the downcutting power of **erosion** by **water** of the Colorado River.

The Grand Canyon is also an amazing place to study **geology** because it includes many chapters in the book of Earth History. The earliest chapters are the oldest rocks (the Precambrian rocks of the **Vishnu** schist) in the bottom of the canyon and the youngest rocks (the Permian limestones of the **Kaibab** Formation) are at the top. This fundamental principle of geology is known as the Law of Superposition. The Grand Canyon also has chapters that have been torn out of the book, known as an **unconformity**, or a gap in time when rocks were eroded. Near the bottom of the Grand Canyon, you can see an angular unconformity, with tilted rocks below and flat-lying sedimentary rocks, such as sandstone and **shale**, above. At least a dozen times, **lava** flowed into the Grand Canyon and even dammed up the Colorado River!

In the spring and summer of 2019, the United States Geological Survey (**USGS**) and the Sesquicentennial Colorado River Exploring Expedition (SCREE) are celebrating the 150th anniversary of the Powell Expedition with a new **exploration** of the Green River and Colorado River and canyons.

The West has changed over the past 150 years since Powell's journey. Many **dams**, such as the **Glen Canyon Dam** have been constructed in rivers to produce hydroelectric power. Dams also change the speed and temperature of rivers and these changes also affect the plants and animals that live in and near the rivers. Scientists study the **ecology** of rivers, including tracking insects such as a **midge**, which are food for fish like **trout** and humpback **chub**. They also study how **sediment** (sand and mud) moves down the river and how floods and droughts change the landscape.