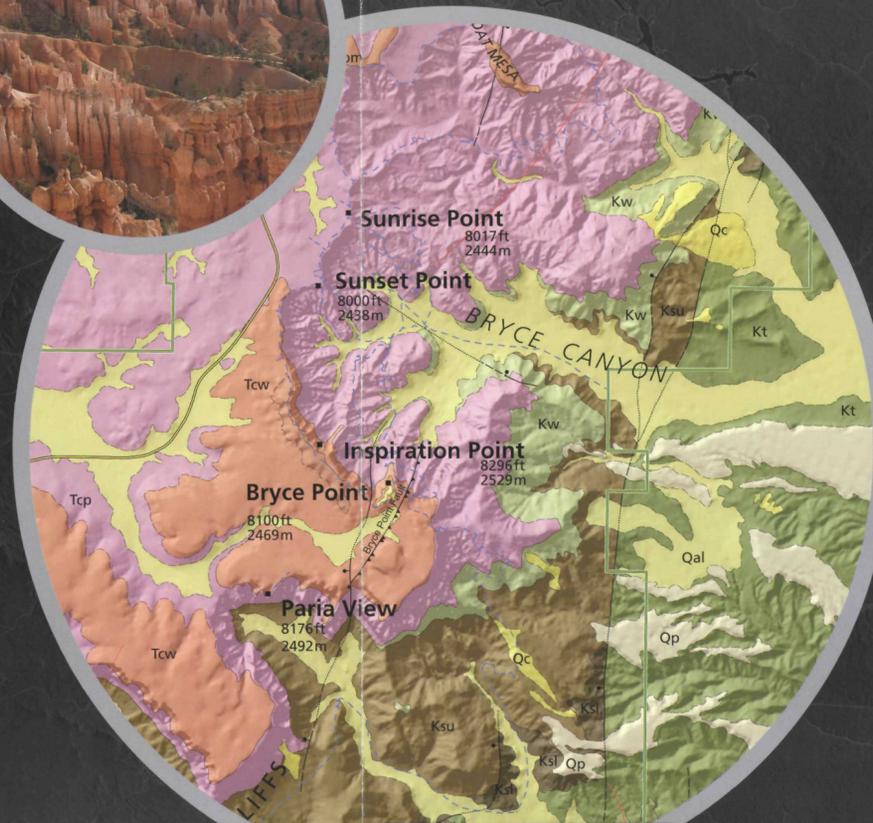
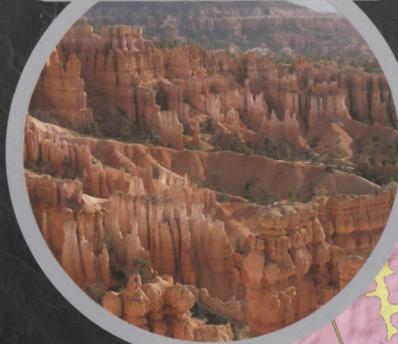


Bryce Canyon, Utah



COLORFUL SANDSTONE

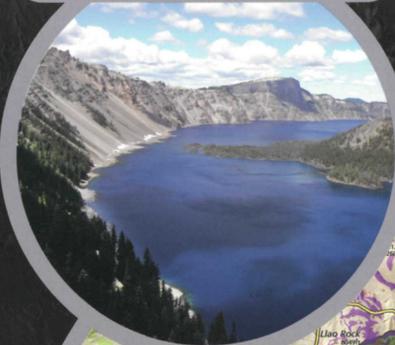
SCULPTED GRANITE



Acadia, Maine

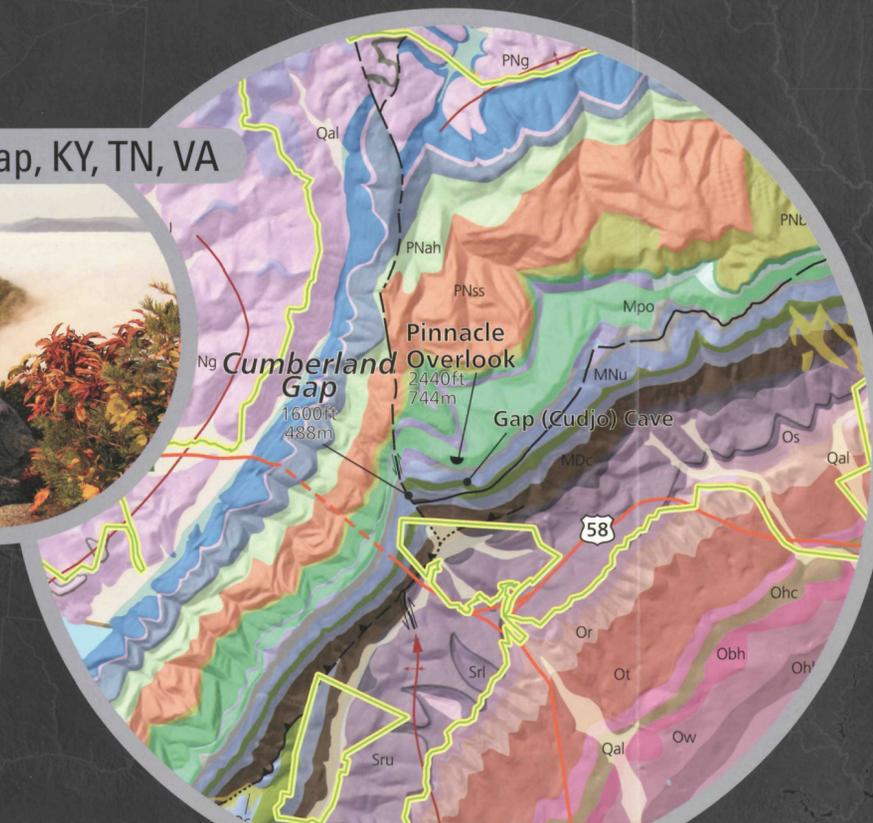


Crater Lake, Oregon



DORMANT VOLCANOES

Cumberland Gap, KY, TN, VA



FAULTED MOUNTAINS

# GEOLOGIC MAPS OF NATIONAL PARKS

## WHAT'S BENEATH YOUR FEET?



National Park Service



American Geosciences Institute

# GEOLOGIC MAPS OF NATIONAL PARKS

Geologic maps use colors and symbols to portray the location and orientation of rocks and geologic deposits. Thin lines show contacts between different units of rock, and thick lines show where faults or folds are located. Geologic maps also show features related to geology, such as mines, quarries, caves, fossil collection sites, and where samples have been collected. Geologic maps often are presented on top of topographic or shaded relief maps to illustrate the connection between underlying geology and landforms.

## PARK MAPS GO DIGITAL

Because geologic maps are so useful to park managers, the National Park Service's Geologic Resources Inventory (GRI) program is providing digital maps to hundreds of parks. The U.S. Geological Survey, state geological surveys, universities, museums, and national parks create these maps. The GRI then transforms the source maps into digital data as part of a geographic information system (GIS).

Unlike paper maps, geologic maps in a GIS format can be layered with other resource information (soils, vegetation, roads, trails, etc.) to answer questions. Maps are also used outside of GIS through printable maps and Google Earth™ displays produced by the GRI program.

## LEARN MORE

### GEOLOGIC MAPS AND REPORTS

<http://go.nps.gov/gripubs>

### ABOUT GRI MAPS

<http://go.nps.gov/geomaps>

### NATIONAL GEOLOGIC MAP DATABASE

[http://ngmdb.usgs.gov/ngmdb/ngmdb\\_home.html](http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html)

### AGI GEOLOGIC MAPS

[www.agiweb.org/environment/publications/mapping](http://www.agiweb.org/environment/publications/mapping)

### NATIONAL GEOLOGIC MAP DAY

[www.earthsciweek.org/geologicmap/](http://www.earthsciweek.org/geologicmap/)

## Learning Activity:

## Plan a trail!

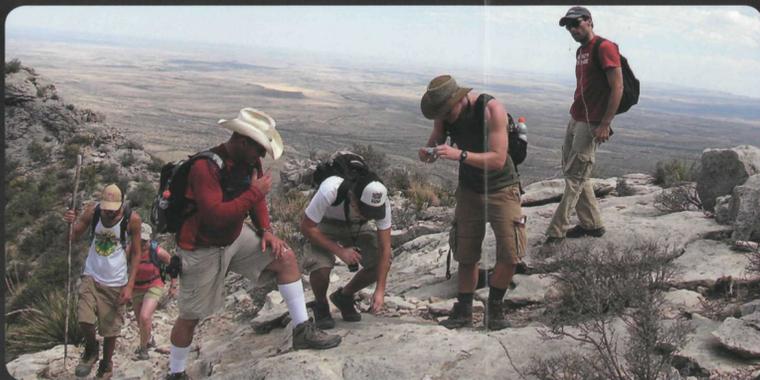
Grade Level: 4-7

Source: National Park Service

Trails in national parks lead visitors to intriguing features and rewarding vistas. Geologic maps are used to plan the routes.

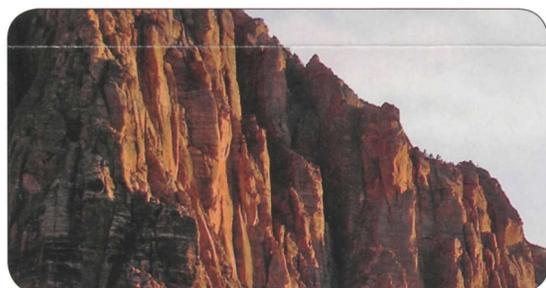
The web site below offers a geologic map of the fictional Mount Stupendous National Park. The map shows fascinating features as well as areas where rock fall is common, fossils have been discovered, and rare plants grow. In this activity you will draw a trail to maximize fun (pass by different types of rocks), minimize impacts (avoid trampling rare plant habitat), and bypass hazards (don't hike beneath steep cliffs).

To find detailed instructions for this learning activity, download the map, and start planning your trail, go online to <http://go.nps.gov/LearnGeoMap>.



## GEOLOGIC MAPS IN ACTION

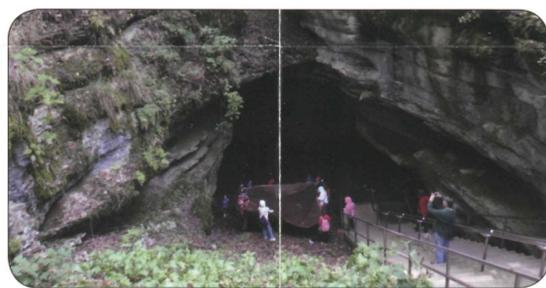
Geologic maps are critical to understanding a national park. Park staff use geologic maps for many purposes. These are just a few examples. Can you think of other uses for geologic maps in national parks?



**IDENTIFY HAZARDS.** The Navajo sandstone of Utah's **Zion National Park** is responsible for much of the dramatic scenery that draws visitors to the site. This sandstone is also the source of dangerous rock falls. Large boulders routinely fall to the valley floor and cause damage. A geologic map is used to determine where these events are most likely to occur.



**SUPPORT SCIENCE.** **John Day Fossil Beds National Monument** in Oregon is home to one of the planet's most diverse and expansive fossil records of the past 65 million years. Park paleontologists are crafting a highly detailed geologic map to better correlate past and future fossil discoveries. The map is expected to increase understanding of the changes experienced over time by animals, plants, ecosystems, and climate during the Age of Mammals.



**PROMOTE EDUCATION.** Kentucky's **Mammoth Cave National Park** preserves the longest known cave in the world, featuring almost 400 miles of mapped interconnected passages. Examination of a geologic map shows limestone rock, through which the cave is formed, beneath a layer of sandstone. The sandstone protects the underlying limestone cave, similar to the way a roof protects your home.



**DISCOVER CONNECTIONS.** **Capitol Reef National Park** of Utah is home to dozens of rare, endemic plant species. Microhabitats that support these plants are sometimes connected to the underlying rocks. A prime example is Winkler's cactus, which only grows on exposures of the Salt Wash Member of the Jurassic Morrison Formation. A digital geologic map, combined with soil and slope data, is used to determine potential habitat areas and focus resource management efforts.



**DOCUMENT CHANGE.** **Assateague Island National Seashore**, spanning Maryland and Virginia, is a barrier island shaped by coastal processes. Because the islands are primarily sand, this geologic map of the park differentiates deposits based on how they formed (dunes, beaches, etc.) rather than by material or age. Such maps can be used to predict future alterations of the coast as climate continues to change and sea level rises.

