Grand Canyon

Grand Canyon National Park
Arizona

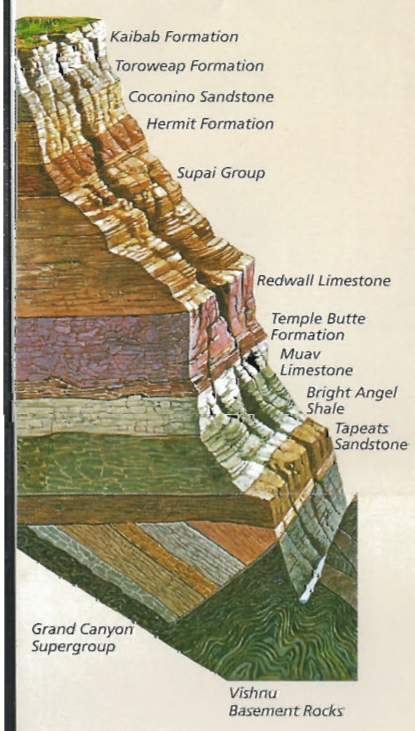
National Park Service
U.S. Department of the Interior

A Land To Inspire Our Spirit

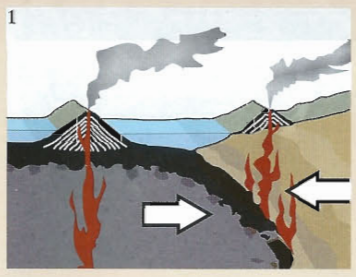
Grand Canyon—one of Earth's most powerful, inspiring landscapes—overwhelms our senses. Its story tells of geologic processes played out over unimaginable time spans as a unique combination of size, color, and dazzling erosional forms: 277 river miles (446 km) long, up to 18 miles (29 km) wide, and a mile (1.6 km) deep. Its rugged landscape hosts a fascinating variety of plant and animal communities, from the desert next to the Colorado River deep in the canyon to montane forests atop its North Rim.

Humans have played parts in the story for thousands of years. Broken spear points, enigmatic split-twig figurines, decorated pots, abandoned mines, and historic hotels suggest some who have called the canyon home. Enjoy the views, discover the history, and learn about the plant and animal stories. Today is just the latest page in a history still being written. Grand Canyon National Park is a gift presented to us. Our responsibility as good stewards is to pass on this gift, pristine and preserved, to future generations.

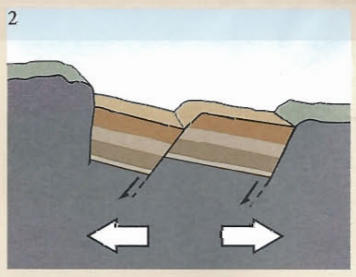
Geologic Layers of Grand Canyon



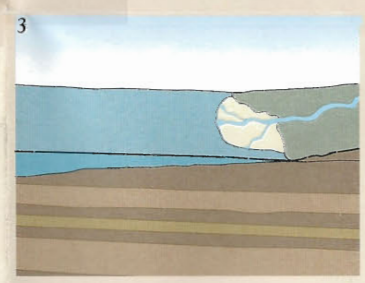
Rocks Form



Vishnu Basement Rocks
Tectonic plates move slowly across Earth's surface. Almost two billion years ago a plate carrying an island chain and the plate that became North America collided. Heat and pressure from this process changed those existing rock layers into dark metamorphic rock, the basement of the canyon. Molten rock squeezed into cracks and hardened as light bands of granite.

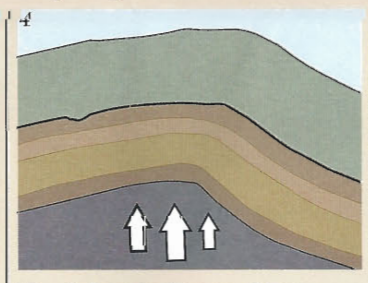


Grand Canyon Supergroup
The red shale, fossil-bearing limestone, and dark lava of the Grand Canyon Supergroup are revealed in only a few areas. The many strata of the Supergroup accumulated in basins formed as the land mass pulled apart. The expansion caused blocks to tilt, inclining the Supergroup layers. The same process caused Nevada's alternating basins and mountain ranges.



Layered Paleozoic Rocks
Nearly horizontal layers of sedimentary rocks comprise the upper two-thirds of the canyon's walls. These rocks formed near sea level and at the edge of the continent. The remains of marine life accumulated on the ocean floor to form limestone. Rivers deposited sediments in swamps and deltas that then became mudstones. Dunes solidified into sandstone.

Uplift Occurs

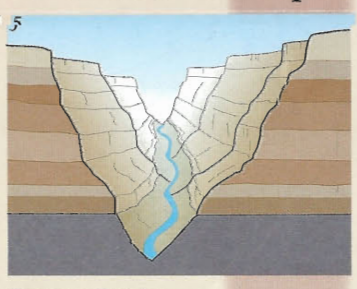


The Colorado Plateau Rises
About 70 million years ago the Rocky Mountains began to form, pushed up as the North American Plate overrode the Pacific Plate. As a result, a large section of what is now eastern Utah, northern Arizona, western Colorado, and a corner of New Mexico rose from sea level to elevations of thousands of feet, forming the Colorado Plateau. This uplift occurred with remarkably little tilting or deformation of the sedimentary layers.

The stage was set for the carving of Grand Canyon.

Top photo: Grand Canyon and the North Rim as seen from Grand Canyon Village, South Rim. NPS / MICHAEL QUINN
GEOLOGY ILLUSTRATIONS: BRONZE BLACK, © GRAND CANYON ASSOCIATION

Erosion Sculpts



Canyon Carving
By five or six million years ago the Colorado River flowed across the Colorado Plateau on its way from the Rocky Mountains to the Gulf of California. Each rain washed sparsely vegetated desert soils into the river. A steep gradient and heavy sediment loads created a powerful tool for erosion. The river's volume varied seasonally and over time. As the last Ice Age ended 12,000 years ago, the flow may have been 10 times today's volume.

As the river cuts down, the canyon deepens. Tributaries erode into the canyon's sides, increasing its width. Erosion carves faster into the softer rock layers, undermining harder layers above. With no foundation these layers collapse, forming the cliffs and slopes profile of the canyon. Erosion wears away the ridges separating adjacent side canyons, leaving buttes and pinnacles.

Age of Earth
4,500 million years

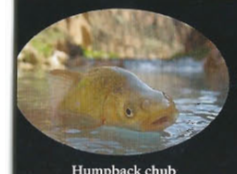
Deep Time, Changing Landscapes

Grand Canyon reveals a beautiful sequence of rock layers that serve as windows into time. The carving of the canyon is only the most recent chapter, a geologic blink of an eye, in a long story. That long story includes rock nearly two billion (2,000,000,000) years old in the bottom of the canyon, land masses colliding and drifting apart, mountains forming and eroding away, sea levels rising and falling, and relentless forces of moving water. Several factors make Grand Canyon's geology remarkable. Many canyons form as rivers cascade among mountain peaks, but Grand Canyon sits incised into an elevated plateau. The desert landscape exposes the geology to view. It is not hidden under a cloak of vegetation. The strata revealed preserve a lengthy, although incomplete, record of Earth's history. Take time to pause on the rim and enjoy this work of the ages.

Communities of Life

Extreme changes in elevation, exposure, and climate support a remarkable range of plant and animal communities unusually close together.

Riparian


Humpback chub
© ARIZONA DAILY STAR / DAVID SANDERS


Beaver
© JOHN WHITE

Water is the lifeblood of Grand Canyon. Nowhere does water so transform landscapes as in the desert. A small seep, a cascading tributary, or the ever-flowing Colorado River supports an abundance of life fostered by the presence of water.

Desert


Grand Canyon rattlesnake
© MANNY RUBIO


Desert bighorn sheep
NPS / © DENNIS HAMM

Three of the four North American deserts come together in low elevations of the park. Mesquite trees from the Sonoran Desert line portions of the river. Blackbrush sparsely cloaks the inner canyon in typical Great Basin Desert fashion. Joshua trees represent the Mojave Desert.

Pinyon-Juniper


Pinyon jay
© PAINET / ERWIN NIELSEN


Mountain lion
© CALIFORNIA ACADEMY OF SCIENCES
GERALD AND BUFF CORSI

A dwarf forest of pinyon pine and juniper covers vast stretches of the mid-elevation Southwest. The scale-like, resin-coated leaves of the juniper and the short, two-needled clusters of the pinyon conserve water in a dry land.

Ponderosa Pine


Abert's squirrel
© TOM AND PAT LEESON


Kaibab squirrel
© TOM AND PAT LEESON
PHOTO RESEARCHERS, INC

Ponderosa pines thrive with more rainfall and deeper soils. Smell the bark—vanilla or butterscotch? Tassel-eared squirrels depend on the ponderosa for food and shelter. North Rim's Kaibab squirrel, now isolated for generations, sports different colors than South Rim's Abert's squirrel.

Mixed Conifer


Wild turkey
© KIM CABRERA


Mule deer
© JOSEPH DOUGHERTY, M.D.
ECOLOGY.ORG

The higher elevation of the North Rim captures more precipitation and supports a diverse forest of fir, spruce, and Douglas fir. Aspen trees shimmer golden in the fall. Watch for mule deer and wild turkeys in meadows that interrupt the thick forest.

FIVE COMMUNITIES OF LIFE PHOTOS: NPS

People of the Canyon

The whole canyon and everything in it is sacred to us, all around, up and down. — Rex Tilousi, Havasupai elder

Grand Canyon has sustained people both materially and spiritually for thousands of years. Clovis hunters found a wetter, more verdant area, with large mammals that are now extinct. Ancestral Puebloan people relied on agriculture, living off the land in a different way. Visitors today come from a world these earlier groups could never imagine. This special landscape offers an opportunity to consider the powerful ties between people and place.

PALEO-INDIAN
12,000–9,000 years ago


Folsom Point

Use spears to hunt large mammals.

ARCHAIC
9,000–2,500 years ago


Split-twig figurine

Hunt smaller animals and gather wild foods.

BASKETMAKER
2,500–1,200 years ago


Basket

Introduce the bow and arrow, pit houses, pottery, and agriculture.

ANCESTRAL PUEBLOAN
800–1300 Common Era


Bowl

Masonry architecture; grow corn, beans, and squash; population declines after 1150.

LATE PREHISTORIC
1300–1500 CE


Wickiup

Ancestors to Hualapai, Havasupai, Southern Paiute, and Navajo move into the area.

RECENT PAST

1540 Hopis guide Spanish explorers to South Rim.

1869 John Wesley Powell leads expedition through Grand Canyon.

1901 Railroad arrives at South Rim, greatly boosting tourism (*right*).

1908 President Theodore Roosevelt sets aside Grand Canyon National Monument.

1919 Congress creates Grand Canyon National Park.

ALL IMAGES NPS "DESERT FOLSOM POINT" DOUG CARR / ILLINOIS STATE MUSEUM

Exploring Grand Canyon

가장자리를 걸을 때는 위험할 수 있으므로 주의해 주십시오.

接近边缘请务必小心；底脚可能有危险。
側端に注意してください；足元が危険です。

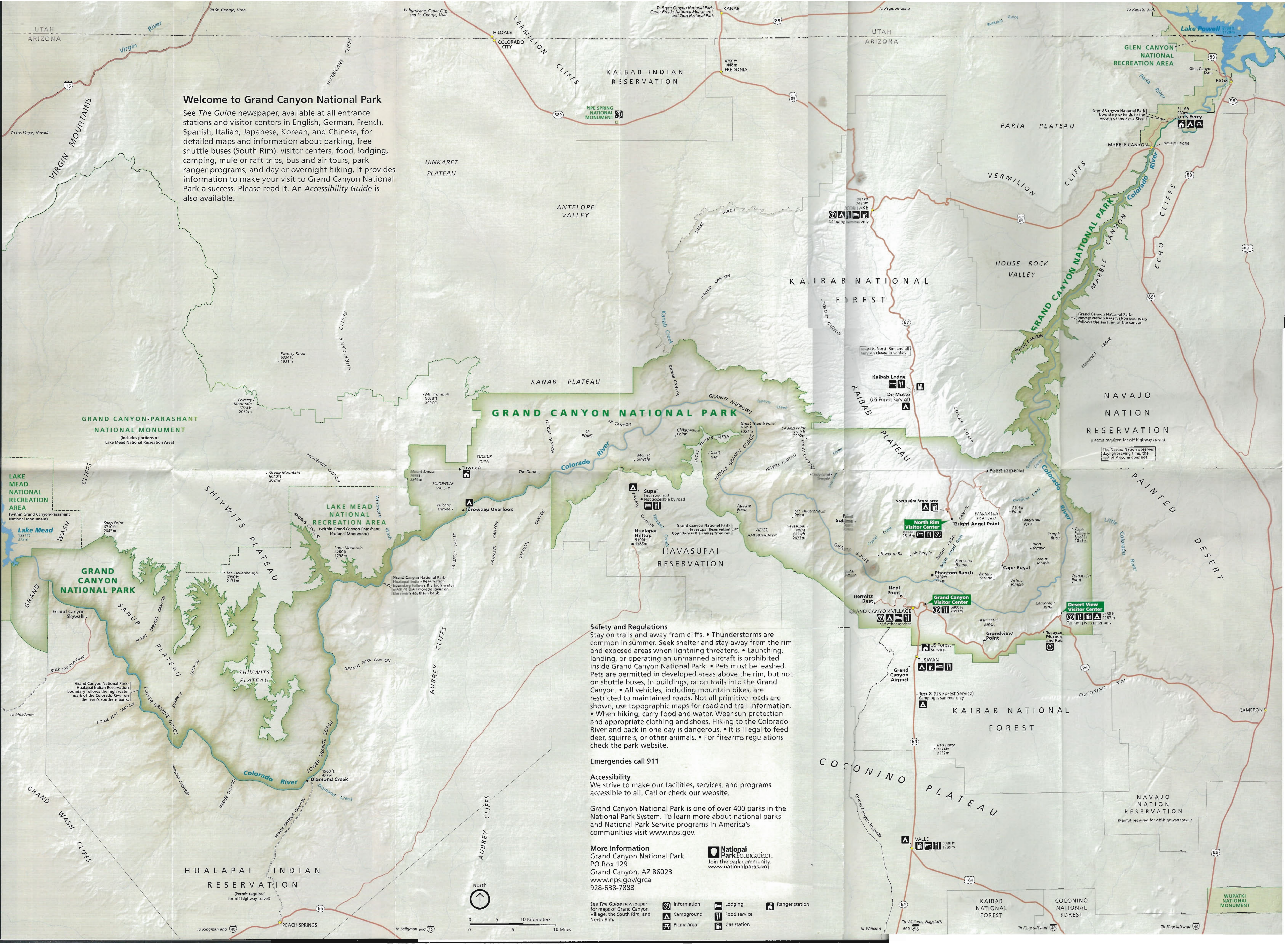
がけの縁近くでは要注意。
足場に危険あり

Use caution near the edge; footing can be dangerous.

Bitte nicht zu dicht an den Rand treten wegen Abrutschgefahr!

Attention en vous approchant du bord. Danger de perdre pied.

¡AVISO! Tenga Vd. cuidado si se acerca el borde. Hay peligro de perder pie.



Welcome to Grand Canyon National Park

See *The Guide* newspaper, available at all entrance stations and visitor centers in English, German, French, Spanish, Italian, Japanese, Korean, and Chinese, for detailed maps and information about parking, free shuttle buses (South Rim), visitor centers, food, lodging, camping, mule or raft trips, bus and air tours, park ranger programs, and day or overnight hiking. It provides information to make your visit to Grand Canyon National Park a success. Please read it. An *Accessibility Guide* is also available.

Safety and Regulations

Stay on trails and away from cliffs. • Thunderstorms are common in summer. Seek shelter and stay away from the rim and exposed areas when lightning threatens. • Launching, landing, or operating an unmanned aircraft is prohibited inside Grand Canyon National Park. • Pets must be leashed. Pets are permitted in developed areas above the rim, but not on shuttle buses, in buildings, or on trails into the Grand Canyon. • All vehicles, including mountain bikes, are restricted to maintained roads. Not all primitive roads are shown; use topographic maps for road and trail information. • When hiking, carry food and water. Wear sun protection and appropriate clothing and shoes. Hiking to the Colorado River and back in one day is dangerous. • It is illegal to feed deer, squirrels, or other animals. • For firearms regulations check the park website.

Emergencies call 911

Accessibility

We strive to make our facilities, services, and programs accessible to all. Call or check our website.

Grand Canyon National Park is one of over 400 parks in the National Park System. To learn more about national parks and National Park Service programs in America's communities visit www.nps.gov.

More Information

Grand Canyon National Park
PO Box 129
Grand Canyon, AZ 86023
www.nps.gov/grca
928-638-7888

National Park Foundation.
Join the park community.
www.nationalparks.org

See *The Guide* newspaper for maps of Grand Canyon Village, the South Rim, and North Rim.

Information · Campground · Picnic area · Lodging · Food service · Gas station · Ranger station