

# White Sands

National Monument  
National Park Service  
U.S. Department of the Interior

At the northern end of the Chihuahuan Desert lies a mountain-ringed valley known as the Tularosa Basin. Rising from the heart of this basin is one of the world's great natural wonders--the glistening white sands of New Mexico.

Here, great wave-like dunes of gypsum cover nearly 300 square miles of desert. The dunes are everchanging; growing, cresting,

then slumping, but always advancing. Slowly, relentlessly, the sand covers all.

White Sands National Monument preserves a major portion of the world's largest gypsum dune field, along with the plants and animals that have successfully adapted to this harsh environment. You are invited to explore this vast undulating landscape of brilliant white sand.

## The Tularosa Basin

The gypsum that forms the white sands was deposited at the bottom of a shallow sea that covered this area 250 million years ago. Eventually turned into stone, these gypsum-bearing marine deposits were uplifted into a giant dome 70 million years ago when the Rocky Mountains were formed. Beginning 10 million years ago, the center of this dome began to collapse and create the Tularosa Basin. The remaining sides of the original dome formation now form the San Andres and Sacramento mountain ranges that ring the basin.

## A rare form of sand

The common mineral gypsum, a hydrous form of calcium sulfate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), is rarely found in the form of sand because it is soluble in water. Rain and snow that fall in the surrounding mountains dissolve gypsum from the rocks and carries it into the Tularosa Basin. Normally, dissolved gypsum would be carried by rivers to the sea. But no river drains the Tularosa Basin. The water, along with the gypsum and other sediments it contains, is trapped within the basin.

## Lake Lucero

With no outlet to the sea, water flowing into the Tularosa Basin either sinks into the ground or pools up in low spots. One of the lowest points in the basin is a large playa called Lake Lucero. Occasionally, this dry lake bed fills with water. As the water evaporates, the dissolved gypsum is deposited on the surface. Even more gypsum deposition occurred during the last Ice Age when a larger lake, Lake Otero, covered much of the basin. The Alkali Flat is the exposed bed of this Ice Age lake.

## Crystal beds

During wet periods, slowly evaporating water on the floor of the playa causes gypsum to be deposited in a crystalline form known as selenite. Along the shore of Lake Lucero and the Alkali Flat, beds of selenite crystals, some up to three feet long, cover the ground.

The forces of nature--freezing and thawing, wetting and drying--eventually break down the crystals into sand-size particles that are light enough to be moved by the wind.

## How dunes develop

Strong winds blowing across the playa pick up gypsum particles and carry them downwind. As the sand grains accumulate into dunes, they bounce up the gentle windward side of the dune, creating ripples on the surface. At the steep leading edge of the dune, sand builds up until gravity pulls the sand down the slip face, moving the dune forward.

## Four Types of Dunes

can be found in the white sands dune field:

**Dome dunes.** The first dunes to form downwind of Lake Lucero are low mounds of sand that move up to 30 feet per year.

**Barchan dunes.** Crescent-shaped dunes form in areas with strong winds but with a limited supply of sand.

**Transverse dunes.** In areas with plenty of sand, barchan dunes join together into long ridges of sand.

**Parabolic dunes.** Along the edges of the dune field, plants anchor the arms of barchans and invert their shape.

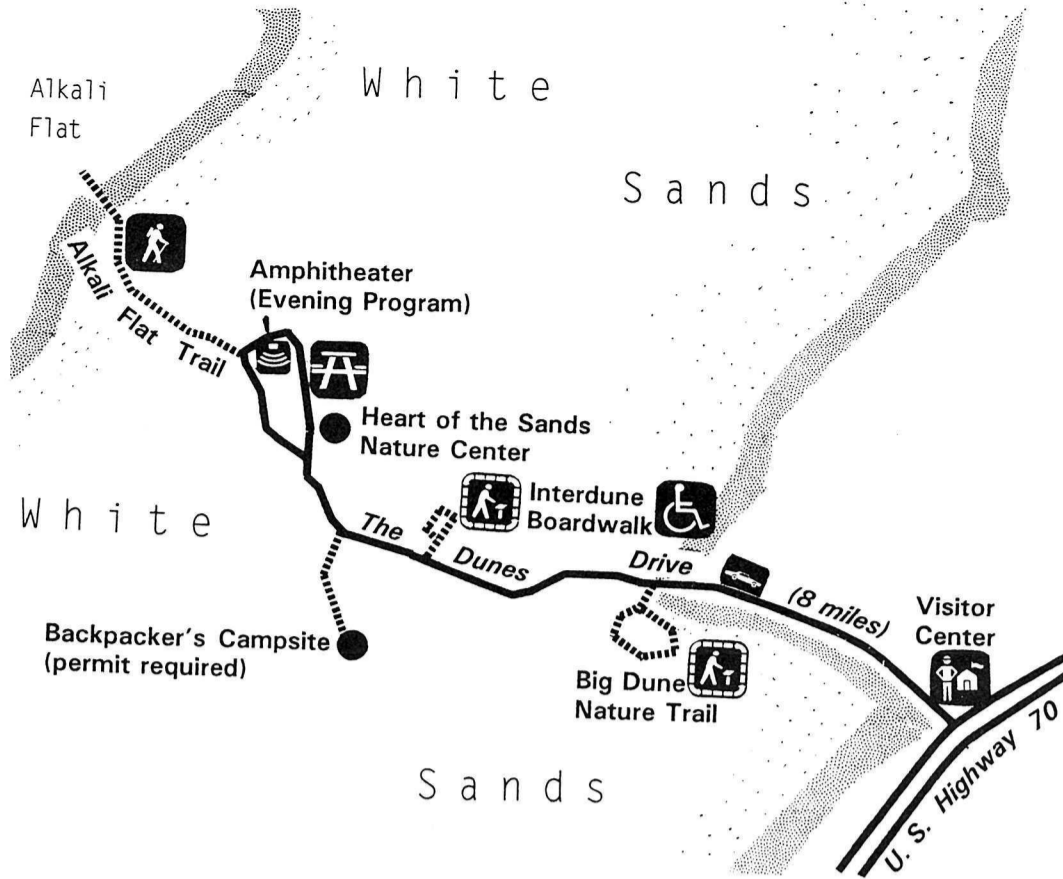
# Seeing the Park

## By Car

Your first stop should be the White Sands Visitor Center, which includes a museum, information desk, book store, gift shop and rest rooms.

An eight-mile scenic drive leads from the Visitor Center into the heart of the dunes. Wayside exhibits at pullouts along the drive provide information about the natural history of the park.

Numerous parking areas along the drive allow visitors to stop and walk in the white sands. Allow 30 minutes driving time for the 16-mile round trip, plus additional time for walking, photography or stopping at pullouts.



## Foot Trails

The Big Dune Trail is a one-mile self-guided nature trail. The Interdune Boardwalk is a wheelchair-accessible 1/4-mile nature trail. The Alkali Flat Trail is a 4 1/2-mile round trip backcountry trail through the heart of the dunes and is recommended for experienced hikers only.

## Ranger-Led Activities

From Memorial Day to Labor Day, ranger-led activities are scheduled throughout the day, including orientation talks, nature walks, and evening slide programs. Check at the Visitor Center for the day's activities.

## Picnicking and Camping

Picnic areas with sheltered tables are located at the end of the scenic drive, and are available on a first-come, first-served basis. **No water is available anywhere along the dunes drive.**

There are no campgrounds in the park. Both public and private campgrounds are available in the area. For backpackers, a backcountry campsite is available in the park. Please register at the Visitor Center upon arrival to use the backcountry site.

## Food and Lodging

There is no dining or lodging within the Monument. The nearest restaurants and motels are in Alamogordo, 15 miles east. Refreshments and snacks can be purchased at the Visitor Center Gift Shop from 8:30 AM to 4:30 PM. (Summer 8 AM - 6 PM.)

## Disabled Visitors

All facilities in the Visitor Center and Picnic Areas are wheelchair accessible, as is the Interdune Boardwalk. The sand dunes are accessible to wheelchairs to a limited degree. Free Golden Access passports are available.

## For More Information:

call (505) 479-6124

## Park Regulations

White Sands National Monument is a protected natural area. Removal or disturbance of archeological or natural objects, including sand, selenite crystals, plants and animals, is prohibited.

Speed limits are posted and enforced. Driving or parking on the dunes or outside established parking areas is not permitted. Keep vehicles locked.

Pets must be leashed or under physical restraint at all times.

Help keep White Sands clean by using trash containers and fireplaces. Ground fires and collection of firewood are prohibited.

**Alcohol is prohibited within the park at certain times of the year.** Check at the Visitor Center for specific restrictions. Metal detectors and fireworks are prohibited in the park.

## Safety Tips

Do not stop on the roadway; pull off the road into an established parking area before stopping. The gypsum-surfaced portion of the dunes drive can be slick when wet--drive carefully. Pedestrians in picnic areas should be careful of heavy traffic. Children should not play near the road.

White sand reflects sunlight. Use sun-screen to prevent sunburn.

Do not tunnel into sand dunes. Tunnels collapse easily and can cause suffocation. Sand surfing can cause injuries--be careful.

It is easy to become disoriented when hiking in the dunes. Before starting, orient yourself to landmarks along the horizon. Do not hike alone.

## Park Closures

Due to missile testing on the adjacent White Sands Missile Range, it is occasionally necessary, for visitor safety, to close the Dunes Drive for periods of up to two hours. Check the Visitor Center bulletin board for closure information.