Visit the Sinnott Overlook

Plus 10 Other Ways to Enjoy Your Park

The Sinnott Memorial Overlook offers one of the finest views of Crater Lake. You can peer down a sheer drop of nearly 900 feet (274 meters) to the shore! It also features the park’s best exhibits. A small museum describes the lake’s geology, formation, and exploration. (Of special interest is the original device used by scientists to measure the lake’s depth in 1866.)

Finding this special viewpoint can be a challenge. It’s hidden behind the Rim Visitor Center, perched on a promontory 50 feet (15 meters) below the rim. Landscape architect Merel Sager, who oversaw its construction in 1930, designed it to be nearly invisible. He spent hours on the lake in a rowboat, devising ways to conceal it against the caldera’s wall.

Unfortunately, the steep path to the overlook is not accessible to people with limited mobility. And because of snow, the viewpoint is not open year-round. This summer, it will probably open on July 1 and close in late October (see hours on page 2). Most days, rangers present talks around a relief model (see page 3 for times, and posted flyers for topics). The overlook was named in honor of Nicholas Sinnott, a congressman who represented Oregon from 1913 to 1928 and was an ardent supporter of the park. For the plaque that bears his name. Here are 10 more suggestions to make the most of your Crater Lake visit:

Watch the Park Film
Explore the park’s violent past and its present tranquility in this 22-minute film, shown on the hour and half-hour at the Steel Visitor Center at Park Headquarters.

Drive Around the Lake
Rim Drive is a 33-mile (53-km) road that encircles Crater Lake. More than 30 pullouts offer dramatic views of the park’s volcanic scenery. Allow 2 to 3 hours (see page 3).

Attend a Ranger Program
Discover the wonders of Crater Lake with those who know the park best. Talks, walks, kids programs, boat tours, and trolley tours are offered daily (see page 3).

Find the Phantom Ship
Anchored near the lake’s south shore is an island that seems to be sailing away. To see it, hike to Sun Notch or drive to the viewpoint named in its honor (see page 3).

Visit the Pinnacles
Formed during the same eruption that gave birth to the lake, these colorful volcanic spires are tucked away in the park’s southeast corner (see page 3).

Tour Crater Lake Lodge
For a glimpse into an earlier era, check out the history exhibits—and walk through the Great Hall—of Crater Lake Lodge, renovated in the 1990s but first opened in 1915 (see page 2).

Have a Picnic
The viewpoints and picnic areas along the Rim Drive are perfect for outdoor eating (see page 3). Stop by the Rim Village Cafe for grab-and-go sandwiches, salads, and snacks.

Savor the Sunset
Sunsets in the park can be spectacular. Join a ranger for a hike up Watchman Peak (see page 1) or pick a private viewpoint on the East Rim Drive.

View the Milky Way
On moonless nights, the park offers some of the darkest night skies in America. Look up to see meteors, satellites, planets, and the starry arms of our galaxy.

When is the Park Open?
Crater Lake National Park is open year-round, 24 hours a day. Some roads, trails, and facilities, however, are closed seasonally due to snow. Much of the year, the park’s North Entrance Road and Rim Drive are closed to cars. They close for the season on November 1 (or earlier if there is significant snowfall).

Crews begin plowing these roads in April, but opening dates vary. The North Entrance and West Rim open between mid-May and late June. The East Rim opens between mid-June and late July. This year, roads will likely open late due to heavy winter snows. Highway 62 and the road to Rim Village are open year-round.

Welcome!

Thank you for visiting your national park. Here at Crater Lake, you’ll find opportunities to refresh your spirit, absorb awe-inspiring scenes, and connect with the natural world.

The National Park Service protects more than 400 special places, saved by the American people so that everyone can experience our heritage. We at Crater Lake are proud to be stewards of this national treasure.

Park rangers and maintenance staff are here to assist you in making your visit safe, rewarding, and fun. If there is anything we can do to help, please ask. Enjoy your park!

Craig Ackerman
Superintendent

Reflections Visitor Guide
Summer/Fall 2017

2... Camping, Lodging, Food
3... Ranger Programs
4... Hiking Trails
5... Driving Map
6... In the News: Bull Trout
7... Feature Article: Lake Level
8... Climate Chart

Look Inside!

Park Profile

Crater Lake National Park protects the deepest lake in the United States. Fed by rain and snow (but no rivers or streams), the lake is considered to be the clearest large body of water in the world. The water is exceptional for its clarity and intense blue color.

The lake rests inside a caldera formed approximately 7,780 years ago when a 12,000-foot-tall (3,600-meter) volcano collapsed following a major eruption. The eruption may have been the largest in North America in the past 640,000 years. Later eruptions formed Wizard Island, a cinder cone near the southeast shore. Today, old-growth forests and open meadows blanket the volcano’s outer slopes, harboring a variety of plants and animals, including several rare species. The area is central to the cultural traditions of local American Indian tribes, and the park provides unique opportunities for scientific study and public enjoyment.

• Established: 1902
• Size: 183,000 acres (74,060 hectares)
• Visitors last year: 796,000
• Lake depth: 1,943 feet (592 meters)
• Lake width: 4.5 to 6 miles (7 to 10 km)
• Annual snowfall: 43 feet (13 meters)
• Last time the lake froze over: 1949

When you travel in the park, keep in mind:

• Plants and rocks are not to be collected or removed.
• Pets are not permitted on trails.
• Pets are not permitted on the beaches.
• Pets are not permitted on the Rim Drive.
• Pets are not permitted in the park.

Park News

Water Restrictions in Effect
Please help us conserve water during your visit. The park’s ability to provide water is currently restricted as we transition from a surface water source to a groundwater well. If you’re reading this before arriving, please stock up on water outside the park. While you’re here, please take short showers, don’t run the tap, and reuse towels and sheets if staying overnight in park lodging. Thanks for your help!

Leave Your Drone at Home
Operating remote-controlled aircraft in the park is prohibited. Please report violations to the nearest employee.

Road Work: 30-Minute Delays are Possible
Road construction may delay your trip through the park this summer. The Federal Highway Administration is undertaking a 3-year, $13.8 million rehabilitation of 10.7 miles (17.2 km) of the park’s historic Rim Drive. Built in the 1930s, the road is badly in need of repair. Decades of harsh weather and the erosion of underlying soils have destabilized its shoulders and retaining walls. Be prepared for delays of up to 30 minutes. Thanks for your patience!

East Rim Drive will be Vehicle-Free on Sept. 9 & 16
On two Saturdays this September, motor vehicles will not be allowed on the park’s East Rim Drive. Bicyclists and pedestrians will have an opportunity to enjoy 24 miles (39 km) of scenic roadway without vehicle noise and traffic. Check the park’s website (www.nps.gov/crla) for details.

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Accessibility
Except for the Sinnott Memorial Overlook, developed areas in the park are accessible to individuals with limited mobility and other impairments. Wheelchair-accessible paths include the Rim Village promenade and the Pinnacles Trail. Accessible entrances include the Goldmyer Glen Sun Notch, and Paifs (the switchback on Rim Drive). Access to wheelchair-users is available with assistance (see page 3). Walk-ons and wheelchairs can be accessed in some areas with accessible pathways. Some water spigots and toilets are accessible to people with limited mobility and other impairments (see page 3). We are working hard to improve our level of accessibility for all park visitors. We welcome your comments.

ATMs
The Mazama Village Store and Mazama Village Gift Shop have ATMs.

Drinking Water
Water and showers are available at Rim Village, Mazama Village, and inside the Steel Visitor Center. Bottled water can be purchased at the top and bottom of the Clemtwood Crater overlook (when boat tours are operating).

Electric Vehicle Charging Station
A 24-hour charging station is located by the Annie Creek Gift Shop. It has one standard (S1722) connector and one Tesla connector.

Emergencies
Dial 911 for any emergency, 24 hours a day, and ask to speak with a ranger at visitor centers and the ranger stations at Park Headquarters.

Entrance Fee
The park’s entrance fee is $20 per vehicle for motorcycles and $30 per vehicle for other vehicles. The fee is valid for two weeks and is included in the price of the National Park Pass. Senior citizen, group, and individual discounts are offered. 

Food & Dining
The Rim Village Café serves light fare including grilled and sandwich salads, soda, soup, and snacks.
- May 18–June 8 10:00 am–6:00 pm
- June 9–Sept. 4 9:00 am–8:00 pm
- Sept. 5–Oct. 1 10:00 am–5:30 pm
- Oct. 2–Nov. 4 10:00 am–5:30 pm
- Nov. 5–Dec. 31 10:00 am–4:00 pm

The Annie Creek Restaurant in Mazama Village offers hearty breakfasts and lunches, burgers, pizza, and a soda and salad bar.
- May 27–Oct. 1
  - Breakfast 8:00 am–10:30 am
  - Lunch 11:00 am–4:00 pm
  - Dinner 5:00 pm–8:00 pm
- *7:00 am June 16–Sept. 4
- *9:00 pm June 16–Sept. 4

Crate Lake Lodge features fine dining in a casual atmosphere, with gourmet cuisine made fresh each day. Reservations are recommended for dinner (541-954-2255 ext. 3217) but are not taken for breakfast or lunch. Appetizers, drinks, and dessert are also available from 3:00 pm until completing in the Great Hall and on the back patio.
- May 26–Oct. 1
  - Breakfast 7:00 am–10:30 am
  - Lunch 11:30 am–2:30 pm
  - Dinner 5:00 pm–9:00 pm
- *10:00 pm June 9–Sept. 23

The Mazama Village Store sells groceries, camping supplies, firewood, and gasoline.
- May 26–June 1 10:00 am–5:00 pm
- June 2–Sept. 4 7:00 am–4:00 pm
- Sept. 5–Oct. 2 8:00 am–8:00 pm

*Gasoline available through Oct. 8

Gifts & Books
Books, maps, postcards, and souvenirs are available at both visitor centers (see page 8). The park’s concessioners, Xanterra Parks & Resorts, operates two other gift shops:

The Lime Village Gift Shop has the same hours as the Rim Village Cafe (see above).

The Annie Creek Gift Shop in Mazama Village has similar hours to the Annie Creek Restaurant (see above). You can also visit online at www.crateterelakeshop.com.

Guns
Firearms are allowed in the park in accordance with Oregon state laws. They are prohibited, however, in all park buildings.

Hiking and Climbing
Stay on trails. This prevents erosion, protects vegetation, and protects other hikers. Hiking and climbing inside the crater are strictly prohibited. The only exception is the Crater Lake Trail, the only safe and legal access to the lake shore. Serious injuries and deaths have occurred from falls inside the crater. The walls consist of unstable rocks and soils.

Marijuana
Possession of marijuana is prohibited. Oregon state laws allow the use of marijuana do not apply in the park. Federal and state laws take precedence.

Overnight Parking
The park is open 24 hours, but overnight parking is not allowed except in the park’s campgrounds, for guests at the park’s motels, and for back-packers (permit required).

Park Features
Leave rocks, plants, animals, and artifacts undisturbed for others to enjoy. It is prohibited to collect, de- face, disturb, or destroy wildlife.

Water Sports
Snorkeling, scuba diving, and long-distance swimming are not allowed in Crater Lake. In 2012, after reviewing the threats posed by aquatic invasive species, the park placed a ban on the use of skis, water ski, diving gear, flotation devices, and other equipment that might serve as a vector for the introduction of non-native organisms. This includes rafts, canoes, and kayaks. Swimming is allowed at Chelsworth Cove and at Waldo Island, using standard swim suits.

Exhibits
The Sinnott Memorial Overlook, perched on a rock ledge behind the Rim Village Center, features an indoor exhibit room and open parapet with spectacular lake views. The overlook has a relief model and exhibits on the park’s geology and lake research. Ranger talks are presented daily July 1 to September 3 (see page 4). The overlook is open daily (weather permitting) from July through October. Hours are 9:30 am–6:30 pm in July and August, 9:30 am–5:00 pm in June and September, and 10:00 am–4:00 pm in October. The overlook is located down a steep, historic walkway with stairs and, unfortunately, is not accessible to people with limited mobility.

Crater Lake Lodge features exhibits on tourism and the history and renovation of the lodge. The exhibits are open daily, around-the-clock, May 19–October 15. They are on the ground floor, west of the lobby.

Lodging
The park has two motels, both operated by Xanterra Parks & Resorts. For reservations or information visit www.crateterelakeslodging.com or call 888-272-2728. For a list of lodging outside the park, ask at a visitor center.

Crater Lake Lodge (71 rooms) overlooks the lake at Rim Village. In 2017, it will be open May 19–October 15. Rooms begin at $190 per night. Advance reservations are highly recommended.

The Cabins at Mazama Village (40 rooms) are located 7 miles south of Rim Village. Rooms are $160 per night. Operating dates for 2017 are May 26–October 1.

Visitor Centers
At the park’s two visitor centers, rangers can answer questions and help plan your trip.

The Steel Visitor Center at Park Headquarters is open daily 9:00 am–5:00 pm. A 22-minute film is shown every half hour. It explores the park’s significance and the lake’s violent, volcanic past.

The Rim Visitor Center at Rim Village is open 9:30 am–5:00 pm late May to late September.
Activities are free of charge except for trolley & boat tours. Programs are subject to cancellation due to weather or unforeseen circumstances.
Let's Go Hiking!

Hi, I'm Ranger Madeline. We have 90 miles (145 km) of hiking trails here at Crater Lake. Our most popular day hikes are listed on this page. If you are visiting in June or July, be aware that some trails might still be closed by snow. Please help us protect this special place by following a few important rules:

- No hiking or climbing inside the caldera! The walls are dangerously steep and unstable.
- The one exception is the Crater rim Trail, the only legal access to the lake shore.
- Leave all rocks, plants, animals, and artifacts undisturbed for the enjoyment of future hikers.
- Overnight backpacking requires a permit, available at Park Headquarters between 9:00 am and 5:00 pm. Some areas are not open to backcountry camping.
- Pets are allowed on the Godfrey Glen Trail, Lady of the Woods Trail, and Pacific Crest Trail. Pets must be leashed; only one pet per hiker (see page 2).
- To protect vegetation and prevent erosion, please stay on the trails.

### Castle Crest
<table>
<thead>
<tr>
<th>Lady of the Woods</th>
<th>Sun Notch</th>
<th>Trail</th>
<th>The Pinnacles</th>
<th>Godfrey Glen</th>
<th>Plaikni Falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 miles (0.8 km) loop trail</td>
<td>0.7 miles (1.1 km) loop trail</td>
<td>Roundtrip</td>
<td>0.8 miles (1.3 km) loop trail</td>
<td>1.1 miles (1.8 km) loop trail</td>
<td>2.0 miles (3.2 km) loop trail</td>
</tr>
<tr>
<td>100 feet (30 meters)</td>
<td>120 feet (37 meters)</td>
<td>110 feet (34 meters)</td>
<td>10 feet (3 meters)</td>
<td>50 feet (16 meters)</td>
<td>100 feet (30 meters)</td>
</tr>
<tr>
<td>20 minutes</td>
<td>30 minutes</td>
<td>30 minutes</td>
<td>30 minutes</td>
<td>30 minutes</td>
<td>1 hour</td>
</tr>
</tbody>
</table>

### Flowers, Meadow, Creek
<table>
<thead>
<tr>
<th>Historic Architecture</th>
<th>Views of Phantom Ship</th>
<th>Highlight</th>
<th>Nature Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop trail through a lush meadow. Abundant wildflowers from late July to late August. The trail is rocky and slippery in places. Self-guiding brochures are available at the trailhead.</td>
<td>Loop trail around Park Headquarters. Self-guiding brochures, available at the trailhead, describe how early park architects integrated their designs with the natural landscape.</td>
<td>Short uphill walk through a meadow to the rim of Crater Lake. Great views of the Phantom Ship. Use caution near cliff edges. Accessible to strong wheelchair users with assistance.</td>
<td>The trail's name refers to a sculpture of a woman carved into a boulder along the trail. This U-shaped valley was carved by glaciers that once flowed down Mt. Mazama.</td>
</tr>
</tbody>
</table>

### East Rim Drive
<table>
<thead>
<tr>
<th>Location</th>
<th>Trailhead Location</th>
<th>Elevation Gain</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beyond the Steel Visitor Center, on the south side of the building.</td>
<td>End of the Pinnacles Road; 8.7 miles (9.7 km) southeast of the Phantom Ship Overlook.</td>
<td>150 feet (46 meters)</td>
<td>30 minutes</td>
</tr>
<tr>
<td>East Rim Drive, 4.4 miles (7.1 km) east of Park Headquarters.</td>
<td></td>
<td>420 feet (128 meters)</td>
<td>1 hour</td>
</tr>
</tbody>
</table>

### The flowers here are nourished by springs emerging from the landslide.

### Discovery Point
<table>
<thead>
<tr>
<th>Trail</th>
<th>Fumarole Bay</th>
<th>Watchman Peak</th>
<th>Annie Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 miles (3.2 km)</td>
<td>1.7 miles (2.7 km)</td>
<td>1.6 miles (2.6 km)</td>
<td>1.7 miles (2.7 km)</td>
</tr>
<tr>
<td>100 feet (30 meters)</td>
<td>110 feet (34 meters)</td>
<td>110 feet (34 meters)</td>
<td>200 feet (61 meters)</td>
</tr>
<tr>
<td>1 hour</td>
<td>1 hour</td>
<td>1½ hours</td>
<td>1½ hours</td>
</tr>
</tbody>
</table>

### Lake Views
<table>
<thead>
<tr>
<th>Highlight</th>
<th>Swimming, Fishing</th>
<th>Panoramic Views</th>
<th>Creek, Canyon, Flowers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trail along the rim of Crater Lake through a pretty forest of whitebark pines and mountain hemlocks. Fine views of the lake and Wizard Island. Use caution near cliff edges.</td>
<td>Rocky trail on Wizard Island leading to a shallow cove with clear water. Upon reaching Fumarole Bay, the maintained trail ends but a rough path continues to the far end of the cove.</td>
<td>Abundant lichen on the tree trunks is an indication of excellent air quality.</td>
<td>Moderate ascent to a fire lookout above Wizard Island. Spectacular views in all directions. Great place to watch the sunset. Trail may be closed until August due to snow.</td>
</tr>
<tr>
<td>West and of Rim Village, where the paved walk becomes a dirt path. Can also start from Discovery Point.</td>
<td>Wizard island rock, reachable only by boat tour or shuttle from Crescent Cove. Forage for information.</td>
<td>Built in 1932, the peak’s historic fire lookout is still used by rangers today.</td>
<td>Moderately strenuous hike through a deep, stream-cut canyon. Lots of water, wildflowers, and sometimes wildlife. Self-guiding brochures are available at the trailhead.</td>
</tr>
</tbody>
</table>

### Gold prospector John Wesley Hillman first spotted Crater Lake near this point in 1853.

### Plaikni Falls
<table>
<thead>
<tr>
<th>Highlights</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The spring at the head of Annie Creek is the source of the park’s drinking water.</td>
<td>The water is clear and excellent air quality. The spring is used by rangers today.</td>
</tr>
</tbody>
</table>

### Wizard Summit
<table>
<thead>
<tr>
<th>Hiking!</th>
<th>Hiking!</th>
<th>Hiking!</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 miles (3.5 km)</td>
<td>2.2 miles (3.5 km)</td>
<td>3.6 miles (5.8 km)</td>
</tr>
<tr>
<td>760 feet (232 meters)</td>
<td>750 feet (237 meters)</td>
<td>1,010 feet (308 meters)</td>
</tr>
<tr>
<td>1½ hours</td>
<td>1½ hours</td>
<td>2 to 3 hours</td>
</tr>
</tbody>
</table>

### Garfield Peak
<table>
<thead>
<tr>
<th>Hiking!</th>
<th>Hiking!</th>
<th>Hiking!</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4 miles (7.1 km)</td>
<td>6.5 miles (10.5 km)</td>
<td>8.9 miles (15.8 km)</td>
</tr>
<tr>
<td>1,250 feet (381 meters)</td>
<td>765 feet (233 meters)</td>
<td>1,600 feet (448 meters)</td>
</tr>
<tr>
<td>3 hours</td>
<td>3½ hours</td>
<td>5 to 6 hours</td>
</tr>
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</table>

### Mount Scott
<table>
<thead>
<tr>
<th>Hiking!</th>
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<th>Hiking!</th>
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<tr>
<td>2.0 miles (3.2 km)</td>
<td>50 feet (16 meters)</td>
<td>200 feet (61 meters)</td>
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<table>
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<th>Hiking!</th>
<th>Hiking!</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4 miles (3.9 km) south of Park Headquarters.</td>
<td>2.4 miles (3.9 km) north of Rim Village. Park at the viewpoint surrounded by weges depth is only 14 feet.</td>
<td></td>
</tr>
</tbody>
</table>
Highlights of the Rim Drive

Rim Drive is a 33-mile (53-km) road that encircles Crater Lake. It is one of America’s most scenic byways, with spectacular views in all directions. The full loop is typically open from early July to late October. It can be driven, without stopping, in about an hour, but plan on at least 2 to 3 hours to enjoy the varied sights. The road is narrow, so buses and motorhomes should use caution. There are more than 30 scenic pullouts along the route, many of which have roadside exhibits. Be sure not to miss these 7 “must-see” stops. For more information, pick up the excellent Road Guide to Crater Lake National Park (48 pages, $6.95) at either visitor center.

**Discovery Point**
Imagine seeing Crater Lake by accident. It was near this spot, on the back of a mule in 1853, that gold prospector John Hillman became the first European-American to stumble across what he called “Deep Blue Lake.”

**Watchman Overlook**
This pullout offers an unmatched view of Wizard Island, a cinder cone that escaped out of Crater Lake approximately 7,300 years ago. To find this unmarked pullout, drive 3.8 miles (6.1 km) west of Rim Village and look for a viewpoint lined with wooden fences.

**Cloudcap Overlook**
This overlook sits at the end of a 1-mile (1.6-km) spur road, the highest paved road in Oregon. Whitebark pines cling for survival here, dwarfed and contorted by the harsh winds.

**Pumice Castle Overlook**
Stop here to see one of the park’s most colorful features: a layer of orange pumice rock that has been eroded into the shape of a medieval castle. Watch carefully for this unmarked viewpoint, located 1.1 miles (1.8 km) west of the Cloudcap Overlook junction and 2.4 miles (3.9 km) east of the Phantom Ship Overlook.

**Phantom Ship Overlook**
Nestled against the shore, Crater Lake’s “other island” escapes detection by many park visitors. Though it resembles a small sailboat, the island is as tall as a 16-story building. It’s made of crossan-resistant lava, 400,000 years old—the oldest exposed rock within the caldera.

**Pinnacles Overlook**
This overlook is well worth the 6-mile (10-km) detour from Rim Drive. Colorful spires, 100 feet (30 meters) tall, are being eroded from the canyon wall. The Pinnacles are “fossil fumaroles” where volcanic gases once rose up through a layer of volcanic ash, cementing the ash into solid rock.

**Vidae Falls**
Look for this cascading waterfall between Phantom Ship Overlook and Park Headquarters. A spring-fed creek tumbles over a glacier-carved cliff and drops 100 feet (30 meters) over a series of ledges. In summer, wildflowers flourish in the cascade’s spray.
Meet the Park’s Research Natural Areas

While Crater Lake may be the scenic and scientific centerpiece of the park that bears its name, it’s not the only feature of national importance to be found here. The park is also home to four Research Natural Areas (RNAs). RNAs are federal lands that have been singled out because they represent prime examples of particular habitats. In Oregon, there are more than 160 such sites, on lands managed by the Department of the Interior, Department of Agriculture, and Department of Defense. Each one safeguards a different type of environment in a relatively undisturbed state.

RNAs are selected administratively, rather than established legislatively. Ours were designated in 1994 by the park’s superintendent. They are managed to preserve natural features and processes, and to protect genetic diversity (including rare species), and promote non-manipulative scientific research (i.e. research that observes, but does not alter, existing conditions). Roads, trails, and camping are not allowed. At a few sites, public entry is excluded altogether, where recreational pursuits could have negative impacts. Otherwise, off-trail exploration is permitted, and can be of great interest to someone with a background in botany or ecology.

The park’s largest RNA can actually be seen from the road—no hiking required! The Pumice Desert RNA abuts the North Entrance Road and covers 2,950 acres (1,190 hectares). It’s an outstanding example of a subalpine pumice field, a treeless plain that has yet to recover from the eruption of Mount Mazama 7,700 years ago. The collapse of the mountain filled this valley with a fiery flow of ash and pumice that’s estimated to be 200 feet (60 meters) thick. Today, researchers come here to study plant succession and adaptation. Only 15 plant species can tolerate the Pumice Desert’s infernal, short growing season, so the RNA is a laboratory for the greening action of pocket gophers. A greater variety of plants can be found 5 miles (8 km) to the west, in the much smaller Spaghnum Bog RNA. At least 170 species have been identified in this 160-acre (65-hectare) wetland, including carnivorous sundews and bladderworts. The bog, fed by springs, is a complex mosaic of habitats: 8 distinct plant communities, 2 forest types, and 4 aquatic environments are represented. It’s also an easy place to get lost—and a guaranteed place to get your feet soaked—so prospective visitors should be cautious. Atop its foundation of Mazama pumice, a spongier peat, 3 to 6 feet (1-2 meters) deep, has developed over the past 3,000 to 4,000 years.

Setting foot in the Llao Rock RNA won’t get you wet, but it will get you fined: this 435-acre (175-hectare) RNA has been off-limits to summer hiking since 2013 to protect several rare and sensitive plant species. Llao Rock is a prominent peak that towers almost 1,900 feet (580 meters) above the northwest shore of the lake. It’s capped by a layer of beige pumice, which is home to a natural garden of miniature plants that somehow survive in this windswept location. One species of concern is the Llao Rock reindeer lichen (Cladonia lanata). This ground-attached, fan-shaped, blue-green flower found almost exclusively in Crater Lake National Park. Another is the pumice moonwort (Botrychium), and the graswing action of pocket gophers.

Fortunately, through a public-private partnership involving more than a dozen agencies, organizations, tribes, and landowners, a solution was devised. The nonprofit group Trout Unlimited, among others, purchased the water rights to 267 acres (108 hectares) of private land. They dedicated the rights to “imstream use” (rather than irrigation), ensuring that, even in mid-summer, Sun Creek will now flow in perpetuity. A new channel was excavated, across one of catchets, to accommodate the water. Workers planted native vegetation along the channel and constructed a fence on either side to exclude cattle. While much of Sun Creek’s water will continue to be diverted during the grazing season, a new, more efficient irrigation system—featuring covered pipes rather than open ditches—will limit water loss from the evaporation and seepage. And a “fish screen” at the point of diversion will keep trout safely in the creek and out of the irrigation network.

Last but not least, the 1,830-acre (740-hectare) Desert Creek RNA protects two habitats that are rarely found in such pristine condition. First is a spectacular, old-growth ponderosa pine forest. Unlike most ponderosa stands in the Cascades, this one was never logged, owing to the park’s early establishment in 1892. Second is a dry grassland dominated by bitterbrush shrubs. Bitterbrush grasslands were once common along the eastern slope of the Cascades but have been decimated due to livestock grazing and fire suppression. By saving remnant biological communities like these—and encouraging scientific investigation—the nationwide network of Research Natural Areas plays an important role in protecting our natural heritage.
that occurred here historically every 10-30 years. Both prescribed and natural—to mimic the fires Ponderosa pines need fire to keep rival species humans but are favored by wildlife. The Desert Creek RNA, browsing on bitterbrush. Their reproductive spores are held in tiny capsules on Llao Rock. They’re also known as grapeferns: Pumice moonworts are 2-inch-tall ferns that live in the Lake’s rim. Unlike the steep slopes above and these submerged shelves from overlooks on the rim. Unlike the steep slopes above and their profile is fairly flat. They could only have formed by the action of waves, lapsing against the walls of the caldera for hundreds of thousands of years. As water, which has a density of about 1,000 kg per cubic meter, or 1,000 grams (0.62 pounds). Since 1896, much has been learned about Crater Lake’s water budget. But with such complex dynamics—and so many unanswered questions—the level of the lake is sure to remain a subject of worse than curiosity, and scientific study far into the future.

In 1901, Joseph Diller of the US Geological Survey painted this scale on a rockshale—one of the first attempts to measure the lake level over time.

In late summer, a white “bathtub ring” becomes evident along the shore of Crater Lake. It’s a deposit of silica, composed of the skeletons of diatom algae (diatoms). Its upper limit approximates the high-water mark from late spring.

The presence of broad, gently sloping “beaches”—like this one, on Wizard Island—is evidence that the lake’s level has held relatively steady, within 20 feet (6 meters) or so, for hundreds, and probably thousands, of years. It would have taken that long for waves, pounding against the rocky cliffs, to sculpt these level platforms. The Palisades are a series of cliffs that loom over the lake’s north shore. Below the cliffs is a pile of rubble, left behind by ancient glaciers, through which most of the lake’s seascape is thought to occur. More than 2 million gallons (7.6 million liters) of water leak out of Crater Lake every hour!

What Determines the Water Level in Crater Lake?
Precipitation and Evaporation Are Not the Only Factors

Most people who visit Crater Lake eventually find themselves wondering about the water level. Indeed, questions about the lake’s “hydrologic budget” have perplexed scientists for more than a century. Unlike most lakes, Crater Lake does not completely fill its basin. Why it’s the deepest lake in the USA, with an official depth of 1,943 feet (592 meters), its surface less than 300 feet (91.52 m) below the lowest point on its rim. So, what governs the water level? To what degree does it fluctuate? Could it someday rise up and overflow? Or is it destined to drop in the future due to climate change?

Scientists have been monitoring the lake’s level since 1896. They’ve noticed that it fluctuates with the seasons (see graph below) and that it also follows periodic patterns of wet or dry weather. Drought in the 1920s caused the surface to drop to its lowest recorded mark of 6,163 feet (1,879 m) above sea level in the 1930s and early 1940s. A series of snowy winters in the early 1970s pushed it to a record high elevation of 6,179 feet (1,883 m) in 1975. Although 16 feet (5 m) of variation might seem like a lot, it represents less than 1% of the lake’s total depth. And there’s evidence that the lake has stayed within this narrow range, or close to it, for much of the lake’s history.

Along the shore of the lake, researchers have marked a number of sites, gently-sloping “beaches.” Right now, they’re largely underwater: they extended from just above the present lake level to a depth of about 18 feet (5.5 m). On a calm day, you can see many of these submerged shelves from overlooks on the rim. Unlike the steep slopes above and their profile is fairly flat. They could only have formed by the action of waves, lapsing against the walls of the caldera for hundreds of thousands of years.

How do we account for the relative long-term stability of the water level? Has the lake achieved a rough balance between precipitation and evaporation? On the contrary, the evaporation rate is more than twice that of evaporation! Each year, Crater Lake receives an average of 80 inches (203 cm) of water, much of which falls as snow that melts during the summer. So how does this water get removed from the lake’s surface? (No streams or rivers feed into the lake, and just 17% of its input consists of runoff from the surrounding cliffs.) Only about 30 inches (76 cm) of water are removed from the lake annually through evaporation.

Instead, it’s steady “seepage” that maintains the lake’s balance. Water is leaking through the caldera’s walls at the rate of 76 cubic feet (2.1 m³ per day), or more than 2 million gallons (7.6 million liters) every hour! Scientists were able to calculate the rate of seepage in 1985, by observing how much the lake dropped when it was briefly covered by a layer of skim ice, observing how much the lake dropped when it was briefly covered by a layer of skim ice, preventing evaporation. Much of the seepage seems to be occurring along the northeast caldera wall. Below a line of cliffs known as the Palisades, geologists have identified a permeable layer of rock, which continues below lake level to a depth of 140 feet (43 m). The layer consists of loose rubble evidently dropped by a glacier that flowed down the north flank of Mount Mazama several hundred thousand years ago. Essentially, Crater Lake is a giant bathtub: water flows up the side of it and has an overflow drain” that keeps it from filling.

More was learned in the year 2000, when a sonar-equipped boat collected 16 million soundings and created a detailed topographic map of the lake floor. The map revealed the existence of additional “drowned beaches”—bands of flat terrain running parallel to the shore—at various locations around the lake.

The beaches occur at different depths, ranging from 21 to 108 feet (6.5 to 33 m) below the surface. None is near as broad as the beach near the present waterline, but each likely represents an extended period of time—either decades or centuries—when the lake held at that particular level.

These clues, and others, have led scientists to conclude that Crater Lake filled rapidly and steadily for several hundred years following the collapse of Mount Mazama 7,000 years ago. Then, when the lake reached its “overflow drain,” the rate of filling slowed (and periodically stalled) as the water level climbed to its present, long-term zone of minor fluctuation. There is no indication that the lake has ever been significantly higher than it is today. The absence of “stranded beaches” and the presence of lakeside lichens and large trees suggest the opposite. Researchers have found pines greater than 400 years old growing less than 15 feet (5 m) above the water.

But what about climate change? Could the water level drop as our climate heats up? It’s certainly possible. One model predicts that a lake of this size has a liquid content of 1.6 billion cubic meters (about 560 billion gallons). If the lake is 10 feet (3 m) lower, the surface area decreases by about 5.5 square miles (14.3 square kilometers). The effect is not insignificant, especially when you consider that the lake’s surface area and volume are closely related because of the lake’s near-spherical shape.

Yet another mystery—and one of the park’s most frequently asked questions—concerns the fate of the water that seeps out of the lake. Where does all that water go? As yet, nobody knows! In the 1980s, researchers from the US Geological Survey analyzed the water chemistry of 28 springs in the vicinity of the lake, both inside and outside the park. None of the samples matched the profile of Crater Lake. The lake’s water is more enriched in boron, lithium, and other elements that are introduced by hydrothermal vents on the lake floor. Two springs northwest of the caldera (Crater Springs and Oasis Spring) were found to share some of the lake’s characteristics, but this was probably a coincidence. Calculations showed that, at most, only 7% of their output could be coming from the lake.

What resembles an outhouse at the bottom of the Crleetwood Core Trail is actually a scientific instrument. Installed by the US Geological Survey in 1981—and now solar-powered—it measures the lake level, with great precision, every half hour. You can view (and graph) the data online. The instrument is pointable—so please keep your distance. Thanks for your participation!
Climatic Chart

Summer at Crater Lake is short but sunny. Even so, there are some days when the lake is shrouded in clouds. July, August, and September are your best bets for warm, dry weather. In May, June, and October, sunny days alternate with periods of rain and snow. Winters are long and snowy. Storms from the Pacific Ocean dump an average of 43 feet (13 meters) of snow at Park Headquarters. The park’s tremendous snowfall is a result of its position at the crest of the Cascade Mountains.

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Support Your Park

Volunteer Your Time
Looking for a hands-on way to help the park?
Consider sharing your time and talents as a Crater Lake VIP (Volunteer-In-Parks).
Full-time volunteers are needed throughout the year to help staff visitor centers, present interpretive programs, and assist with research and monitoring projects. Opportunities are advertised at www.volunteer.gov. Volunteers are provided free housing in exchange for 3 months or more of service.

To volunteer periodically, join The Friends of Crater Lake, a non-profit organization founded in 1993. Members remove non-native plants, build and maintain trails, answer questions at park viewpoints, assist with special events, and more. For details, visit www.friendsofcraterlake.org. Or join the Crater Lake Ski Patrol, which has been assisting winter visitors and maintaining the park’s cross-country ski trails since 1983. Members, identifiable by their bright red parkas, receive training in wilderness first aid, survival skills, search and rescue, map and compass use, and avalanche safety in exchange for at least 6 days of service each winter. To learn more, visit www.craterlakeskipatrol.weakly.com.

Other Useful Items

- **Crater Lake Topo Map**
  - Waterproof and tearproof.
  - 1:55,000 scale.
  - $11.95.

- **Crater Lake Water Bottle**
  - This plastic bottle’s flip-top lid makes it easy to quench your thirst.
  - $3.99.

- **Star & Planet Guide**
  - Rotating “planisphere” for locating stars, planets, and constellations.
  - $11.99.

- **Crater Lake Reusable Shopping Bag**
  - Earth-friendly and great for groceries.
  - Made from recycled materials.
  - $3.99.

- **Wolves Have Returned to Crater Lake National Park!**
  - Learn about their journey—and celebrate their arrival—with books, toys, and stuffed animals available for purchase in the visitor center bookstores.

Contribute to the Crater Lake Trust

The Crater Lake National Park Trust is a nonprofit organization that raises private funds to support park projects and connect the park with surrounding communities. It helps fund, for example, field trips to the park for more than 5,000 grade-school students each year in a program called “Classroom at Crater Lake,” kids engage in hands-on science and learn about wildlife, old-growth forests, and winter ecology. For most of the kids, it’s their first visit to the park. To learn more about the Trust and its activities, visit www.craterlaketrust.org.

Share Your Comments

Whether you have a compliment, concern, or suggestion, we’d like to hear from you! This is your national park, and we value your input on how best to manage it. You can provide feedback in several ways. Ask for a comment form at a visitor center, send an email to craterlake@nps.gov, or write to: Superintendent, Crater Lake National Park, PO Box 7, Crater Lake, OR 97604.