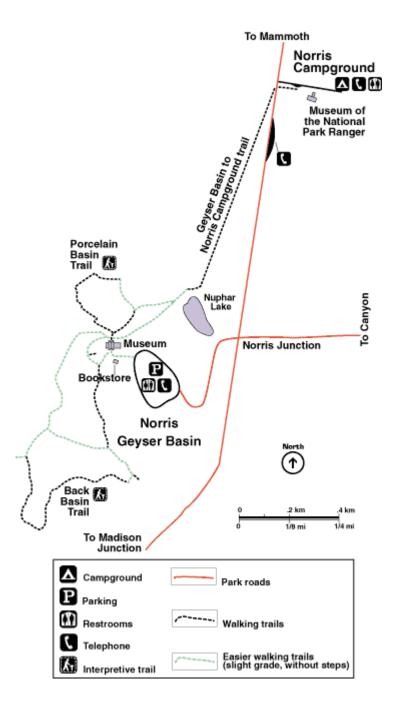
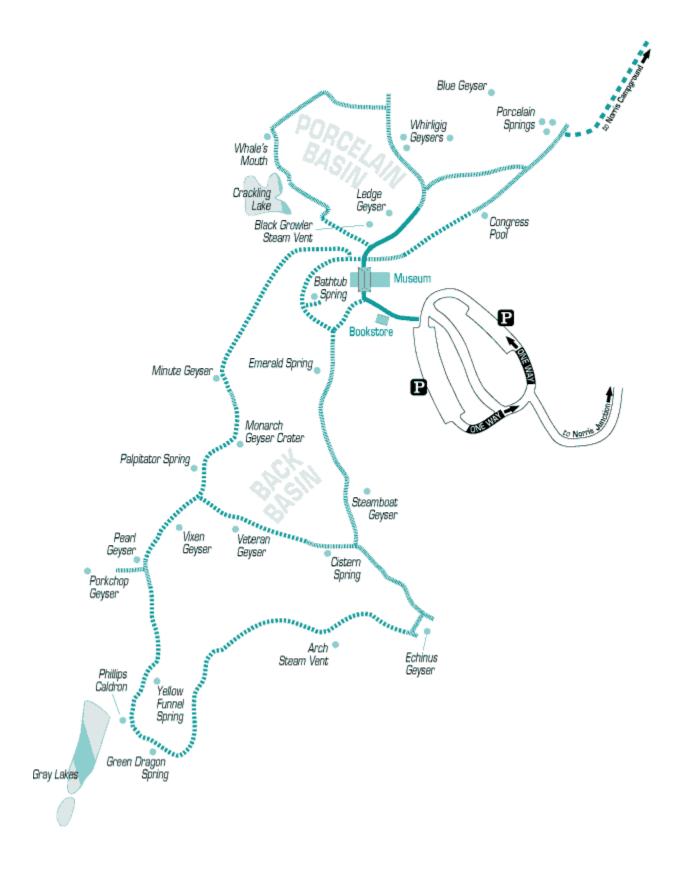
NORRIS MAP



Norris Geyser Basin Tour Map



Norris Geyser Basin Tour Introduction

Norris Geyser Basin is the hottest and most changeable thermal area in Yellowstone. We will explore many of the features you would see if you walked the 2 1/4 miles (3.6 km) of trails. Discover the location of the tallest active geyser, colorful hot springs, and microscopic life in one of the most extreme environments on earth.

Our tour starts at the Norris Museum. The museum houses exhibits relating to the origins of the geothermal features found at the basin. Two loop trails leave from here. They provide a safe route for viewing the Porcelain Basin and Back Basin.

Rainbow Colors, hissing steam, and pungent odors combine to create an experience unique in Yellowstone. Porcelain Basin is open terrain with hundreds of densely packed geothermal features; in contrast, Back Basin is forested and its features are more scattered and isolated. Click the 'Next Stop' link below to begin your tour of Porcelain Basin.

Porcelain Basin

Porcelain Terrace Overlook



Parts of the whitish rock-sheet before you pulsate from the pressure of steam and boiling water beneath them. A number of geysers and other features here have been born suddenly in small hydrothermal explosions. Some features are ephemeral, their activity lasting a few hours, days, or weeks. A few others have become relatively permanent fixtures in the scene.

Black Growler Steam Vent



The hottest of Yellowstone's geothermal features are steam vents (fumaroles). Black Growler Steam Vent, on the hillside in front of you, has measured 199 to 280 degrees F (93 to 138 degrees C). A plentiful water supply would help cool these features; however, steam vents are usually found on hillsides or higher ground, above the basin's water supply. They rapidly boil away what little water they contain, releasing steam and other gases forcefully from underground.

Ledge Geyser



Ledge is the second largest geyser in the Norris Geyser Basin, capable of shooting water 125 feet into the air. Because it erupts at an angle, however, the water will sometimes reach the ground 220 feet away. It has at times in the past erupted at regular intervals of 14 hours. The geyser became inactive between 1979 and late 1993. It erupted on a fairly regular cycle of every four to six days in 1994 and 1995.

Congress Pool



A visit most times of the year will show a Congress Pool that appears pale blue in color as picture on the left. Due to the variable nature of Norris features it is possible to see the same pool looking muddy and boiling violently as pictured below.

At Norris, "disturbances" of geothermal activity take place annually. No other thermal area in Yellowstone exhibits this phenomenon. Mysteriously features throughout the Norris area undergo dramatic behavioral changes literally overnight. Clear pools become muddy and boil violently, and some temporarily become geysers. These "disturbances" often occur in late summer and early fall but have been observed throughout the year.



Features that typically behave as geysers may display altered eruption cycles or temporarily cease erupting. New features may be created during a disturbance, although they seldom remain long-term attractions at the basin. Disturbances tend to last from a few days to more than a week. Gradually, most features revert to "normal" activity.

Why this happens is not fully understood. Further study will no doubt yield new clues that will help unravel the mystery of this phenomenon and lead to a greater understanding of the earth's hidden geologic forces.

Hot Springs of Porcelain Basin



The milky color of the mineral deposited here inspired the naming of Porcelain Basin. The mineral, siliceous sinter, is brought to the surface by hot water and forms a sinter "sheet" over this flat area as the water flows across the ground and the mineral settles out. This is the fastest changing area in Norris Geyser Basin, and siliceous sinter is one of the agents of change. If the mineral seals off a hot spring or geyser by accumulating in its vent, the hot, pressurized water may flow underground to another weak area and blow through it.

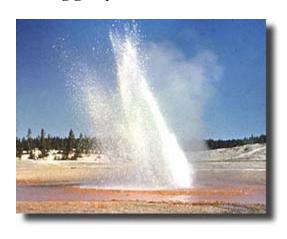
Siliceous sinter is also called geyserite. Deposits usually accumulate very slowly, less than one inch (2.5cm) per century, and form the geyser cones and mounds seen in most geyser basins.

Blue Geyser



Blue Geyser was called Iris Spring in 1886. Due to a misread map label, in 1904 the feature was inadvertently given its current name. It was observed to erupt to heights of over 60 feet from 1993 to 1996. It became almost dormant in 1997 and has remained very quiet ever since. Blue Geyser's last observed eruption was in February of 1997.

Whirligig Geysers



Little Whirligig Geyser Erupting

Little Whirligig got its name because of its close proximity to Whirligig Geyser. Whirligig was so named because while erupting its water swirls in its crater. The orange-yellow iron oxide deposits around Little Whirligig make it one of the most colorful features in Porcelain Basin. It has been dormant for several years.

Colorful Water



Close-up of Water with Cyanidium Algae

Many of Norris' features release acidic water. Amazingly living organisms thrive even in the extreme environments of these acid hot springs! The overflow channels of geysers and hot springs are often brightly colored with minerals and microscopic life forms. Hardy, microscopic, lime-green *Cyanidium* algae thrives in these warm acid waters. Orange cyanobacteria may be found in the runoff streams in Porcelain Basin. From a distance these bacteria look like rusty, iron-rich mineral deposits.

These and other microscopic life forms are links to the emergence of life on earth billions of years ago. They are also a focus of research in the fields of medicine and criminal investigation. New tools for use in such complex areas as AIDS research and DNA "fingerprinting" have been developed from the microscopic thermal organisms found in Yellowstone's hot springs.

Whale's Mouth



This hot spring was named by a park naturalist in 1967 because its shape "resembles the mouth and gullet of a giant fish". This is regarded by many as an especially peculiar thing for a naturalist to say since whales are not fish.

Crackling Lake



The name of this thermal feature was proposed by Ed Leigh in 1967 because of popping sounds from nearby springs on its southern shore. It was formerly simply called Spring #39 in Dr. Peale's publication entitled *Gibbon Geyser Basin*.

Back Basin

Emerald Spring



A hot spring's color often indicates the presence of minerals. In a clear blue pool, the water is absorbing all colors of sunlight except one, blue, which is reflected back to our eyes. Here in Emerald Spring's pool, another factor joins with light refraction to give this spring its color. The 27-foot (8 meter) deep pool is lined with yellow sulfur deposits. The yellow color from the sulfur combines with the reflected blue light, making the hot spring appear a magnificent emerald green.

Hot spring water can dissolve and transport sulfur from underground. The mineral can deposit and crystallize at the earth's surface, sometimes in hot spring pools.

Steamboat Geyser



The world's tallest active geyser, Steamboat can erupt to more than 300 feet (90m), showering viewers with its mineral-rich waters. For hours following its rare 3 to 40 minute major eruptions, Steamboat thunders with powerful jets of steam. As befitting such an awesome event, full eruptions are entirely unpredictable. In recent years, Steamboat has had several major eruptions. More commonly, Steamboat has minor eruptions and ejects water in frequent bursts of 10 to 40 feet.

Cistern Spring



Cistern Spring and Steamboat Geyser are linked underground. During a major eruption of Steamboat, the water in Cistern Spring's pool drains. Normally Cistern is a beautiful blue pool from which water continually overflows. It is quite creative, depositing as much as 1/2 inch (12mm) of grayish sinter each year. By comparison Old Faithful Geyser and many other thermal features may build at the rate of 1/2 to 1 inch (12 - 25mm) per century. Cistern Spring's influence expands throughout the lodgepole pine forest below. This forest has been slowly flooded with silica rich water since 1965. The pioneering lodgepole pine forest at Norris is in constant flux, retreating here and in other areas of increasing heat while advancing in places of diminished thermal activity.

Echinus Geyser



Echinus (e-KI-nus) Geyser was a perennial crowd-pleaser which typically erupted every 35 to 75 minutes. Late in 1998 this geyser altered its interval and now erupts only a few times per day at best. Its pool fills gradually with water; then suddenly, bursts of steam and water explode 40 to 60 feet (12 to 18 m) skyward. Eruptions usually last about 4 minutes but in the past major eruptions have lasted as long as 118 minutes. The major eruptions were believed to be caused by a secondary water source which has mysteriously vanished. There has not been a major eruption in 3 years. In late 1998 Echinus' performance diminished and became erratic. As

of the summer of 2007, its eruptions continue to be far less predictable than they were in the 1990s. Echinus is the largest acid-water geyser known. Its waters are almost as acidic as vinegar with a pH ranging from 3.3 to 3.6. Acid geysers are extremely rare with the majority of the planet's total being found here at Norris Geyser Basin.

Green Dragon Spring



Except on warm summer afternoons, steam frequently fills the cavern of this intriguing hot spring. Visitors must wait patiently for a glimpse of the sulfur-lined cave and boiling green water.

Porkchop Geyser



Porkchop Geyser before the Explosion



Porkchop Geyser after the Explosion

Dramatic behavioral changes have characterized Porkchop Geyser during the last decade. Once a small hot spring that occasionally erupted, Porkchop Geyser became a continuous spouter in the spring of 1985. The force of the spray caused a roar that could be heard at the museum over 660 yards (603m) away. On September 5, 1989, Porkchop Geyser exploded. Rocks surrounding the old vent were upended and some were thrown more than 216 feet (66m) from the feature. Porkchop Geyser is now a gently rolling hot spring.

Minute Geyser





Early Visitors Saw Spectacular Eruptions Every Minute

Typical Eruption Today

Minute Geyser's eruptions have changed dramatically. Its larger west vent is clogged with rocks tossed in by early visitors when the park's main road was near this trail and passed within 70 feet of the geyser. Minute once erupted every 60 seconds, sometimes to heights of 40 to 50 feet (12 to 15 meters). Eruptions now are irregular and originate from its smaller east vent. Removal of the west vent's mineral-cemented rocks would require the use of heavy equipment resulting in severe damage.

Minute Geyser's destruction stands today as a sad reminder of thoughtless behavior on the part of some visitors.



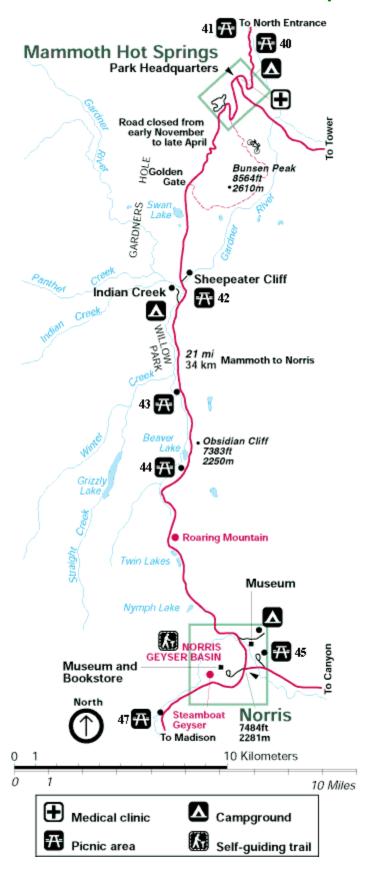


Norris Geyser Basin offers great diversity in thermal features largely because it is at the junction of several disturbances in the earth's crust. A major fault (rock fracture) runs south from the Mammoth Hot Springs area toward Norris. This fault crosses another fault extending eastward from Hebgen Lake to Norris. Both of these breaks in the earth's surface intersect with fractures radiating from the great caldera that dominates central Yellowstone.

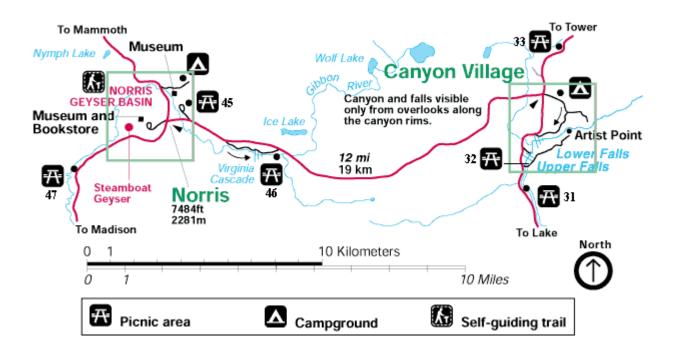
Water from rain and snowfall percolates downward through cracks and fissures and becomes heated, rising to the surface

again as a hot spring, geyser, mud pot, or steam vent. At Norris, a rare combination of ingredients creates a landscape unique on this planet.

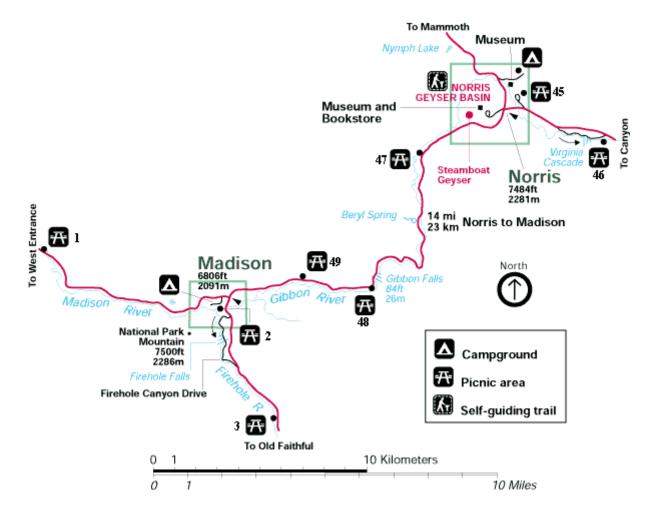
Norris to Mammoth Road Map



Norris to Canyon Road Map



Norris to Madison Road Map



Day Hikes Near Norris

Begin your hike by stopping at a ranger station or visitor center for information. Trail conditions may change suddenly and unexpectedly. Bear activity, rain or snow storms, high water, and fires may temporarily close trails.

Grizzly Lake

This trail passes through a twice-burned lodgepole pine stand (1976 and 1988) and through nice meadows. The lake is long, narrow, and heavily wooded. It can be difficult to access beyond the trail end of the lake. Marshiness and mosquitos can make travel difficult early in the season. The lake is popular with anglers due to a strong population of small brook trout.

Trailhead:1 mile (1 km) south of Beaver Lake on the Mammoth-Norris road

Distance: 4 miles (6 km) roundtrip

Level of difficulty: Moderate with some short, steep climbs and rolling terrain. A log jam crossing is required to continue past Grizzly Lake.

Solfatara Creek

The trail follows Solfatara Creek for a short distance to the junction with Ice Lake Trail, it then parallels a power line for most of the way to Whiterock Springs. It climbs a short distance up to Lake of the Woods (difficult to find as it's off trail a bit) and passes Amphitheater Springs and Lemonade Creek (don't drink it). These are small, but pretty thermal areas in the otherwise non-descript lodgepole pine forest. The trail then continues on to meet the road. There is no trail connection back to the campground except the way you came. Parking a car at both ends is desirable. This is a good place to send folks who don't want to see many other hikers, but it can be under bear restrictions so check before you send people.

Trailhead: Beginning of Loop C in Norris Campground and 3/4 mile south of Beaver Lake Picnic Area on the Mammoth-Norris road

Distance: Campground to trailhead on the Mammoth-Norris road it is 13 miles (20 km) roundtrip Level of Difficulty: Easy to moderate with one climb and descent of about 400 feet.

Ice Lake Trail (direct route)

Ice Lake is a lovely, small lake nestled in the thick lodgepole pine forest. Some of the area was heavily burned in 1988. Hikers can continue from Ice Lake to Wolf Lake, Grebe Lake, and Cascade Lake, and then on to Canyon.

Trailhead: 3.5 miles east of Norris on the Norris-Canyon road

Distance: 0.3 miles (0.5 km)

Level of Difficulty: Easy, handicapped accessible backcountry site on lake, may need assistance to reach lake due to some terrain level change

Wolf Lake Cut-off Trail

The trail follows the Gibbon River for at least 1 mile (1 km), passing Little Gibbon Falls. Dense, partially burned lodgepole pine forest is your main companion the rest of the way to Wolf Lake.

Trailhead: Big pull-out about 1/4 miles east of Ice Lake Trailhead on Canyon-Norris Road. There is no trailhead sign due to lack of regular maintenance on the trail, but orange markers can be seen once hikers cross the road from the trailhead.

Distance:6 miles (10 km) roundtrip; 1 mile (1.6 km) to junction with Wolf Lake Trail, then 2+ miles to Wolf Lake

Level of Difficulty: Moderate due to stream crossings and downfall; trail may be difficult to find at times

Cygnet Lakes Trail

This trail travels through intermittently burned lodgepole pine forest and past small marshy ephemeral ponds to the lush meadows surrounding Cygnet Lakes (small and boggy). Day use only! Trail not maintained beyond Cygnet Lakes.

Trailhead: Pullout on south side of Norris-Canyon road approximately 5.5 miles west of Canyon Junction

Distance: 8 miles (14.4 km) roundtrip

Level of Difficulty: Easy

Artist Paint Pots

This is one of the overlooked yet wonderful short hikes of Yellowstone. The trail winds across a wet meadow on boardwalk then enters a partially burned lodgepole pine forest. The thermal area within the short loop at the end of the trail contains some of the most colorful hot springs and small geysers found in the area. Two mudpots at the top of the hill allow closer access than Fountain Paint Pots. Caution for flying mud! Remind folks to stay on the trail throughout the area.

Trailhead: 4.5 miles south of Norris on the Norris-Madison road

Distance: 1 mile (1 km) roundtrip

Level of Difficulty: Easy with one steep uphill/downhill section, trail erodes easily so may be rutted after

rains

Monument Geyser Basin

This trail meanders along a gentle gradient following the Gibbon River then it turns sharply uphill and climbs 500 feet in 1/2 mile to the top of the mountain! Footing is on eroding geyserite and rhyolite, somewhat reminiscent of ball bearings. The geyser basin is a very interesting collection of dormant cones of varying sizes. One resembles a thermos bottle! Most of the activity here has dried up; hikers looking for exciting thermal activity will be disappointed, but those looking for adventure will find it. Remind folks to

stay on trail!

Trailhead: 5 miles south of Norris Junction on the Norris-Madison road, just after Gibbon River Bridge

Distance: 2 miles (3 km)

Level of Difficulty: Deceptively easy, then difficult!



Did You Know?

Yellowstone contains approximately one-half of the world's hydrothermal features. There are over 10,000 hydrothermal features, including over 300 geysers, in the park.

Norris Area Natural Highlights

Norris Geyser Basin

Norris Geyser Basin is the hottest, oldest, and most dynamic of Yellowstone's thermal areas. The highest temperature yet recorded in any geothermal area in Yellowstone was measured in a scientific drill hole at Norris: 459°F (237°C) just 1,087 feet (326 meters) below the surface! There are very few thermal features at Norris under the boiling point (199°F at this elevation). Norris shows evidence of having had thermal features for at least 115,000 years. The features in the basin change daily, with frequent disturbances from seismic activity and water fluctuations. The vast majority of the waters at Norris are acidic, including acid geysers which are very rare. Steamboat Geyser, the tallest geyser in the world (300 to 400 feet) and Echinus Geyser (pH 3.5 or so) are the most popular features. The basin consists of three areas: Porcelain Basin, Back Basin, and One Hundred Springs Plain. Porcelain Basin is barren of trees and provides a sensory experience in sound, color, and smell; a 3/4 mile dirt and boardwalk trail accesses this area. Back Basin is more heavily wooded with features scattered throughout the area; a 1.5 mile trail of boardwalk and dirt encircles this part of the basin. One Hundred Springs Plain is an off-trail section of the Norris Geyser Basin that is very acidic, hollow, and dangerous. Travel is discouraged without the guidance of knowledgeable staff members. The area was named after Philetus W. Norris, the second superintendent of Yellowstone, who provided the first detailed information about the thermal features.



Roaring Mountain

Located just north of Norris on the Norris-Mammoth section of the Grand Loop Road, Roaring Mountain is a large, acidic thermal area (solfatara) that contains many steam vents (fumaroles). In the late 1800s and early 1900s, the number, size, and power of the fumaroles was much greater than today.

Gibbon River

The Gibbon River flows from Wolf Lake through the Norris area and meets the Firehole River at Madison Junction to form the Madison River. Both cold and hot springs are responsible for the majority of the Gibbon's flow. Brook trout, brown trout, grayling, and rainbow trout find the Gibbon to their liking. The Gibbon River is fly-fishing only below Gibbon Falls.

Virginia Cascades

A three-mile section of the old road takes visitors past 60-foot high Virginia Cascades. This cascading waterfall is formed by the very small (at that point) Gibbon River.

Norris-Canyon Blowdown

This is a 22-mile swath of lodgepole pine blown down by wind-shear action in 1984. It was then burned during the North Fork fire in 1988. This is the site where a famous news anchor said, "Tonight, this is all that's left of Yellowstone." A wayside exhibit there tells the story.

Norris Area Geologic Highlights

Norris sits on the intersection of three major faults. The Norris-Mammoth Corridor is a fault that runs from Norris north through Mammoth to the Gardiner, Montana, area. The Hebgen Lake fault runs from northwest of West Yellowstone, Montana, to Norris. This fault experienced an earthquake in 1959 that measured 7.4 on the Richter scale (sources vary on exact magnitude between 7.1 and 7.8). These two faults intersect with a ring fracture that resulted from the Yellowstone Caldera of 600,000 years ago. These faults are the primary reason that Norris Geyser Basin is so hot and dynamic. The Ragged Hills that lie between Back Basin and One Hundred Springs Plain are thermally altered glacial moraines. As glaciers receded, the underlying thermal features began to express themselves once again, melting remnants of the ice and causing masses of debris to be dumped. These debris piles were then altered by steam and hot water flowing through them.

Madison lies within the eroded stream channels cut through lava flows formed after the caldera eruption. The Gibbon Falls lies on the caldera boundary as does Virginia Cascades.



Did You Know?

There are more people hurt by bison than by bears each year in Yellowstone. Park regulations state that visitors must stay at least 25 yards away from bison or elk and 100 yards away from bears.

Norris Area Historic Highlights



The Norris Soldier Station

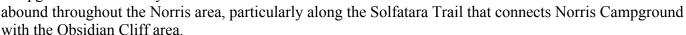
The Norris Soldier Station (Museum of the National Park Ranger)was an outlying station for soldiers to patrol and watch over Norris Geyser Basin. It was among the longest occupied stations in the park. A prior structure was built in 1886, replaced after fire in 1897, and modified in 1908. After the Army years, the building was used as a Ranger Station and residence until the 1959 earthquake caused structural damage. The building was restored in 1991.

The Norris Geyser Basin Museum

The Norris Geyser Basin Museum is one of the park's original trailside museums built in 1929-30. It has always been a museum. It is an outstanding example of a stone-and-log architecture. (More Information)

Archeological Resources

Digs by the Midwest Archaeological Center in Norris and Madison campgrounds reveal that people have camped in these areas for at least 10,000 years. Campfire remnants, obsidian flakes, and chips and bone fragments show that these campgrounds have always been favorites! Other such sites





Did You Know?

At peak summer levels, 3,500 employees work for Yellowstone National Park concessioners and about 800 work for the park.

Norris Area NPS Visitor Facilities



Norris Geyser Basin Museum

The Norris Geyser Basin Museum is located 1/4 mile east of Norris Junction just off the Grand Loop Road. Built in 1929-30, it is National Historic Landmark. Its distinctive stone-and-log architecture became a prototype for park buildings throughout the country known as "parkitecture" (Fishing Bridge Museum and Madison Museum date from the same time period and are of the same style). New exhibits on geothermal geology, Norris Geyser Basin features, and life in thermal areas were installed in 1995. These exhibits replaced old ones from the 1960s with similar subject matter. There is no auditorium in this

building, and it consists of two wings separated by an open-air breezeway. An information desk in the breezeway is staffed by National Park Service interpreters. An adjacent old restroom facility of matching architectural style houses a Yellowstone Association bookstore.

Museum of the National Park Ranger

The Museum of the National Park Ranger is housed in the Norris Soldier Station, located at the entrance to Norris Campground. This building was one of the original soldier stations, built in 1908, as an outlying station for soldiers on patrol. The building has been completely rebuilt, using original materials where possible and staying true to the original floorplan. The original building was taken down on site and rebuilt. Exhibits depict the development of the park ranger profession from its roots in the military traditions through early rangers and to the present array of NPS staff specialized duties. A small auditorium shows a laser-disc



production of the 25-minute movie, "An American Legacy," which tells the story of the development of the National Park Service. There is no Yellowstone Association sales outlet in this museum. The staffing is done primarily by retired National Park Service employees who volunteer for short periods of time. Many of these employees retired as superintendents, chief rangers, regional directors, and from various positions in the Washington office.

Frequently Asked Questions at Norris Geyser Basin

Q. When does Echinus Geyser erupt?

A. For years Echinus erupted every 35 to 75 minutes, depending on how long the previous eruption lasted. Late in 1998 this geyser altered its interval and now erupts only a few times per day at best. Echinus is affected by seismic activity and basin-wide disturbances. Checking in with a ranger at the Norris Museum is always a good idea.

Q. What is a basin-wide disturbance?

A. Periodically, Norris Geyser Basin undergoes a large-scale change. This change is manifested in water level fluctuations, temperature changes, pH changes, color changes, and eruptive pattern changes in features throughout the basin. Some features become murky, others, like Echinus Geyser, are less predictable. Geologists and water chemists have studied these disturbances, and there are several theories about why they occur. Some say the disturbances are a massive fluctuation in the underground reservoirs that provide water to the basin. We do know that Norris has several water systems that supply water to various parts of the area, some call them stacked water systems. Some theorize that because the disturbance usually occurs in the fall there is less surface water mixing with water from deep underground. The water from deep underground holds more silica and clogs the cracks and crevices that supply water, thereby creating a "disturbance" as pressure builds. Who really knows at this point? Exciting things happen during disturbances though. A small geyser, Porkchop, became a continuous jet of steam and water in 1985; during the fall of 1989, at the onset of disturbance, Porkchop clogged with silica and blew up. Rocks from the apron around the geyser flew 200 feet! When you hear the disturbance is on at Norris, come see the changes! Disturbances usually last for a few weeks, and then the basin returns to a more "normal" state.

Q. When can we expect to see Steamboat Geyser erupt?

A. Don't hold your breath. Steamboat Geyser erupts without much warning and with no pattern that we've figured out. The last eruption was in May 2005. Prior to that it had not erupted since October 1991. When active, it can erupt as frequently as every four days, but it has been known to skip 50 years. There are no reliable indicators for Steamboat.

Q. Why is this place so colorful?

A. The colors at Norris, like in other thermal areas, are due to an interesting combination of minerals and lifeforms. Norris tends to have more milky blue features than other areas due to silica in suspension in the water (this is because the water is so hot and dissolves lots of silica). You'll also see a lot of red-orange. Some of the orange is due to cyanobacteria, but a great deal of the red-orange at Norris is due to iron oxides and arsenic compounds. Never drink the water at Norris! There are springs at Norris that are emerald green in color; this is due to the blue of refracted light in combination with the yellow of sulfur lining the pool.

Q. What exactly is a geyser basin?

A. A geyser basin is an area that contains thermal features, especially geysers. We refer to them as basins because they are nearly always lower than the surrounding terrain due to erosion, faults, and the underlying

hot water.

Q. Why can't I smoke here?

A. Geyser basins are fragile places. Litter of all types is a problem, but cigarette butts can become especially numerous if smoking is allowed in an area. Also, most thermal areas have sulfur deposits lying on the surface. When sulfur catches fire, dangerous, sometimes lethal, fumes are given off. This is a chance we just aren't willing to take.

Q. Why can't my dog walk the geyser basin trail with me?

A. Dogs don't seem to recognize the difference between hot and cold water. Dogs have lost their lives diving into hot springs. Dogs also disturb wildlife and frighten other visitors.

Q. Is it really dangerous to walk off the boardwalk?

A. Yes!!!!! Places like Norris are constantly changing and have hollow areas that may have only a thin layer of rock over them. Boiling water surges just under most of the basins. Most burns received in thermal areas are second and third degree. People have died from falling into thermal features.

Q. Do animals ever fall into the hot springs?

A. Yes. Although animals usually know where to walk instinctively, they occasionally break through the thin crust. They also may be frightened by passers-by and run into a hot pool. Always keep your distance from animals, but especially in the thermal areas.