Canyonlands

National Park Service
U.S. Department of the Interior

Canyonlands National Park

Upheaval Dome

Upheaval Dome is an anomaly in the relative geologic order of canyon country. Here rock layers are dramatically deformed in a roughly circular or "bull's-eye" pattern nearly three miles (5 km) across. What caused this deformation at Upheaval Dome? Geologists do not know for sure, but there are two main ideas which are still hotly debated.

Competing Ideas

Salt Dome
A thick layer of salt, left from the evaporation of ancient, landlocked seas, underlies much of southeast Utah and Canyonlands National Park. When under pressure from thousands of feet of overlying rock, the salt can flow plastically, like ice moving at the bottom of a glacier. Salt is less dense than sandstone and can, over millions of years, rise up through and deform surrounding rock layers to create a dome or "salt bubble."

The name "Upheaval Dome" was given to this feature when geologists first suggested that it was a salt dome. Initially they believed the salt bubble was still underground here. A new idea proposes that the salt bubble—as well as the overlying rock—were entirely removed by erosion, and that the present surface of Upheaval Dome is the pinched-off stem below the missing bubble. If true, Upheaval Dome would earn the distinction of being the most deeply eroded salt structure on earth.

Impact Crater
When meteorites collide with the earth they leave impact craters like the well known "Meteor Crater" in Arizona. Some geologists propose that between 60-160 million years ago, a meteorite 500 to 1,000 feet across hit the Earth at what is now Upheaval Dome. The impact would have created a large explosion, sending dust and debris high into the atmosphere and creating a deep crater. In the rebound stage that followed, rock layers at the bottom of the crater thrust upward to fill the void left by the impact—like a drop of water hitting the surface of a pond.

Subsequent erosion has revealed this "tipped up" core. If this hypothesis is true, Upheaval Dome provides a unique glimpse into the lower depths of an impact crater, where erosion has exposed rock layers once buried thousands of feet underground.

Upheaval Dome Today
Recent research findings support the meteorite hypothesis, but questions still remain. Within Canyonlands National Park, Upheaval Dome serves as a protected geologic laboratory where all can learn about, and be inspired by, the mysteries of nature. Perhaps, with time, we may solve the mystery of this crater and others on our planet. You can find more information about Upheaval Dome on our website: nps.gov/canyonlands.

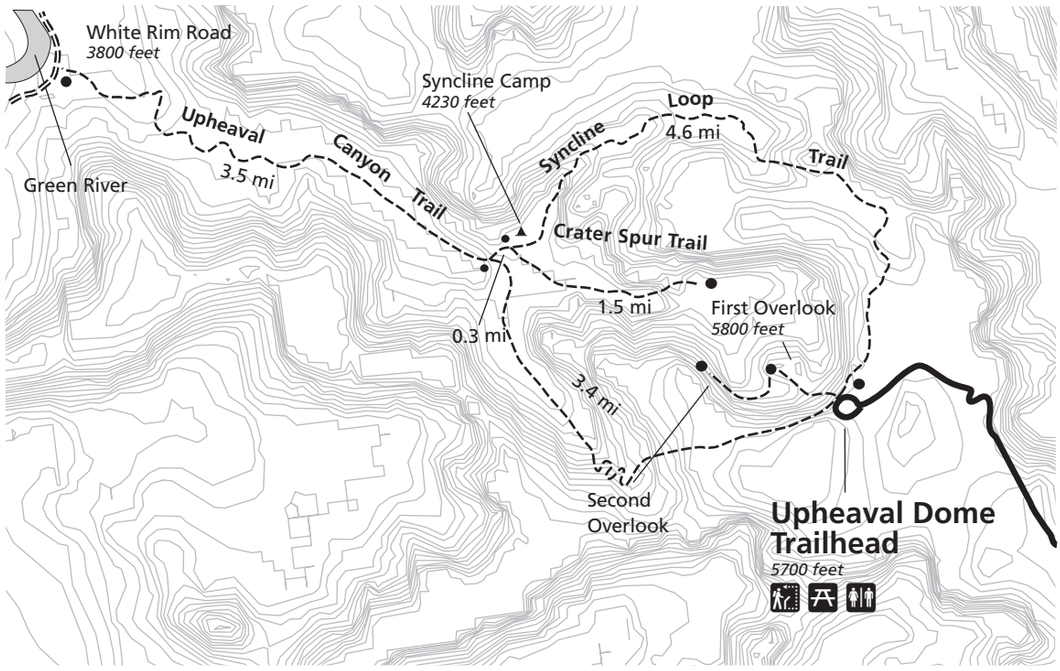
Trail Information

Upheaval Dome Trail
This trail leads to two overlooks, which offer the best views of Upheaval Dome. The First Overlook is a 0.8 mile (1.3 km) round-trip hike with an elevation change of 100 feet (30 m) each way. Signs at the first overlook discuss the two main theories about Upheaval Dome. The Second Overlook is a 1.8 mile (2.9 km) round-trip hike with an elevation change of 150 feet (45 m) each way, ending at a fenced overlook into the canyon.

Syncline Loop Trail
This is a loop trail with a round-trip distance of 8.3 miles (13.3 km), and an elevation change of 1,300 feet (396 m). This trail is very strenuous, often difficult to follow, and recommended for experienced hikers only. The trail has sections of steep terrain, some areas require scrambling, and it is always uphill on the way out! Due to extreme temperatures and lack of water, we do not recommend hiking the Syncline Loop Trail in July and August.

Upheaval Crater Spur Trail
This spur off the Syncline Loop Trail ends at the center of Upheaval Crater, an additional 3 miles (4.8 km) round-trip to your total hiking distance and 350 feet (107 m) of elevation gain.

Upheaval Canyon Trail
This is a 3.5 mile (5.6 km) one-way spur from the Syncline Loop Trail which leads to the White Rim Road via the sandy wash bottom of Upheaval Canyon. This route drops an additional 400 feet (112 m).



Cairns Lead the Way
Follow the rock cairns to stay on the trail and to protect fragile soil crusts. Do not build additional cairns which could mislead other hikers. Paying attention to the trail can make the difference between an enjoyable hike and an unplanned night out. If you feel you have lost the trail, don't keep hiking; instead, backtrack your own footprints to the last point where you knew you were on the trail and look closely for the next cairns.

Be Prepared
Don't overestimate your capabilities. Wear good hiking shoes. Always carry water and food and be sure to drink and eat. Hike with a buddy, tell a friend, or leave a note with your hiking plans. On longer hikes, bring a topographic map, compass, sun protection, and extra clothing (weather can change quickly). Always bring a flashlight to give yourself the option of hiking out after dark in the event that illness, injury, or enjoyment should slow you down.

Backcountry Safety

Drink Often
Drink 1 to 2 gallons (4 to 8 liters) of water or sports drinks with electrolytes per person, per day. Do not wait until you are thirsty to start drinking. By the time you feel thirsty, you are already dehydrated.

No Food, No Fuel, No Fun
Remember that it is important to eat as well as drink. Eat high-energy foods and salty snacks on the trail. Food is your most important defense against exhaustion and hyponatremia (water intoxication). Eat before, during, and after your hike.

Wait for the Shade
Avoid hiking in direct sun. Temperatures may be 15–20 degrees F (8–12 degrees C) warmer than in the shade. Begin hiking at sunrise and seek shade between the hours of 10 am and 2 pm. Wear a hat, light-colored clothing, long sleeves and sunblock to protect yourself from sun exposure.

Take a Break
Take a five-minute break every half hour. Eat some food, drink some fluids, and enjoy the view. Efficient breaks will recharge you and, in the long run, will not slow you down.

Be Kind to Yourself
Do not exceed your normal level of physical activity or training. If you have asthma, diabetes, heart, knee, back, or other medical problems, limit your exertion and exposure to heat. Altitude, strenuous climbing, dehydration, and extreme temperatures can make medical problems worse.

Heat Kills! Hike Smart!
Heat exhaustion is the result of dehydration due to intense sweating. If not treated, heat exhaustion can progress to heat stroke, a life-threatening emergency. To prevent: drink electrolyte drinks as well as water and eat food before, during, and after your hike.

Hyponatremia (water intoxication) is also a life-threatening emergency. To prevent: drink electrolyte drinks as well as water, and eat salty snacks during your hike.

In cold and/or wet weather, avoid hypothermia by wearing layered clothing and being prepared for bad weather. Eat and drink often. Check the local weather and trail conditions before your hike.