Viewing The Handiw

The most vivid way to see a glacier is to view its snout. Usually the glacier maw or terminus is a thick layer of dirty ice, out of which pours sediment-laden glacial milk

Can you hike close enough to view a terminus? Yes, you can.

The Scott Paul Trail near Mount Baker is about 5 miles and takes you along a glacial moraine and across a seasonal suspension bridge over a glacial stream. When you get to the deep gorge below **Easton Glacier**, you can gaze up at Mount Baker and then directly at the glacier's snout. Or travel up the Railroad Grade Trail for a longer view. This is an active glacier, grinding boulders and turning them into rubble and silt. Pause and listen to it chew.

From Artist Point at Mount Baker, you can look across to the crevasses of the glaciers of Mount Shuksan, which plunge steeply down ice falls on the north and west sides of the mountain. Close-up views of the hanging **Curtis Glacier** can be seen on the hike to Lake Ann.

The wonderfully healthy **Coleman Glacier** on Mount Baker advanced for a number of years, when most all others were receding. It was pushing over living alder trees for a time but is now retreating. You can see it up close from the Kulshan Trail. To easily view the entire Coleman-Roosevelt glacial system, continue up the road to its end.

Hanging glaciers drop off cliffs on the north side of Mount Johannesburg alongside the Cascade Pass Trail. Occasionally an avalanche will thunder down from the glaciers between the trail and Johannesburg, startling hikers.

From Burroughs Mountain on Mount Rainier, you can look up at the vertical ice walls on Willis Wall, where glaciers pour themselves over cliffs, and then look down to the massive ice fields of **Emmons, Carbon, and Winthrop Glaciers**, the largest ice mass in the lower 48 states. In between the two is **Inter Glacier**, slowly receding but still crevassed. Look for climbers on their way to Camp Schurman.

You can also walk to the snout of **Carbon Glacier** by following the Carbon River Road on foot, about 6 miles. At the end, cross a scenic suspension bridge and find the glacier's terminus nearby, although it too has been receding up the mountain. You can also view the enormous Carbon Glacier from above and get a bigger picture by visiting Moraine Park or Spray Park.

The snout of **Nisqually Glacier** on the Longmire side of the mountain used to lie at the level of the bridge over the Nisqually River there. Since the turn of the twentieth century, the glacier has receded more than a mile up its gorge. If you would like to see it up close, a trail will take you through the boulders to the terminus of this long glacier.

Here is another aspect of the handiwork of glaciers to ponder. Moraines, or lateral ridges of boulders created by the glacier, lie on either side of the ice, and newly uncovered land or re-colonized soil is being revealed again as the ice shrinks up the mountain.

In the upper basin of the Enchantment Lakes, new land is also being recolonized with microscopic plants and lichens germinated by air-blown seeds. This land may not have been ice-free for thousands of years. Look around at the true alpine gardens.

The lowest elevation glacial moraines in the state are probably found at the Big Four Ice Caves, with permanent snowfields and alpine plants typical of 5,000-foot elevations. The ice caves are formed by yearly avalanches coursing down Big Four to add to snowfields lying against cliffs.

From Norway Pass in the Mount St. Helens National Volcanic Monument, at about 2 miles, you can look across timber-covered Spirit Lake into the crater of the volcano. The small volcanic

Joan Burton

In more than sixty years of hiking, Joan has visited glaciers on four continents and in numerous mountain ranges including the Alaska Range, Rocky Mountains, the Andes, the Alps, the Himalayas and, of course, the Cascades and Olympics.

work of Glaciers

dome in the center has a new glacier, **Crater Glacier,** a horseshoe-shaped piece of ice growing around the new lava dome. This is the youngest glacier in the state.

Blue Glacier in Olympic National Park, studied and monitored for more than fifty years by glaciologists, can be seen from Hurricane Ridge. Hiking to it is possible, but to reach it requires more than 18 miles along the Hoh Valley. If you climb Mount Olympus, you must cross and ascend the crevassed Blue Glacier, which is honeycombed with small streams of water that bubble up and then disappear down into the ice. You can reach the main body of the glacier at Glacier Meadows.

Hikers crossing ice need to be prepared with gear and good skills. Roping up on a glacier is valuable protection from slipping into the crevasses, which open up because an ice river moves at different rates in its center and on its sides. You can look down on crevasses if you hike above Paradise to Nisqually Vista. The National Park Service provides helpful interpretive signs about glaciers at Paradise.

A day hike to Emerald Ridge on Mount Rainier is a veritable classroom of glacial features. The hike takes you past old moraines to newer ones resting on glacially polished bedrock. At the head of Emerald Ridge, the receding **Tahoma Glacier** is splitting into two lobes.

Glacial tarns are small lakes carved by glaciers, often deep, almost round, lying at the foot of a cirque, or circular shaped valley. In the North Cascades, Lake Ann and Rainy Lake are tarns, reached at the end of short trails. Blue Lake lies in a glacial cirque alongside Liberty Bell Mountain. Image Lake lies alongside Glacier Peak and was surely formed by glacial action. The entire Alpine Lakes area is filled with numerous lakes and tarns. A notable area to visit for viewing glacial tarns scoured out of bedrock is Rampart Ridge above Rachel Lake.

Sometimes, but not always, the lake water of these lakes is an unearthly turquoise blue because of suspended sediment.

Rivers draining from glaciers are also usually milky, and the White River on the north side of Mount Rainier is an example of one that is filled with rock flour sediment. Near Skookum Flats, the clear Greenwater River drains into the White River and quickly becomes milky. The Carbon and Nisqually Rivers are others filled with sediment which turns them milky. Mount Baker's rivers are also heavily silted, particularly the turbulent Nooksack.

Wonderful examples of the handiwork of glaciers are available for hikers to find all through our Cascade and Olympic Mountains. Their work continues to change our landscape. ♦

Above: This banner photo is a detail from Carbon Glacier. Photo by Julie Bennett.

At right: Mount Baker reflected in a glacial tarn. Photo by Dugan Lange.

Center: Hiker and "The Mountain." Photo by John Mauro.

Below: The sediment-rich Nisqually River flowing down from Mount Rainier. Photo by Colleen Ponto.

Northwest Explorer »

A Weekend With Glaciers

Exploring Spider Gap, Lyman Lakes and the disappearing glaciers in the north-central Cascades' Glacier Peak Wilderness *By Annaliese Eipert*

Above left: The author amidst clouds near Spider Gap.

Above right: Cascade peaks reflected in the glacial silt of Lyman Lakes. Photo by Ben Corwin.

Riding out the rainstorm under the giant rock at the foot of the glacier-fed lake, the spontaneous peak climb, the scurrying marmots, the long-awaited sunbreak ... these pieces made up that particular weekend's adventure. Adventure is what we seek and must be prepared to welcome whenever we journey outdoors, and it always rewards us manyfold for our efforts, in the currency of memories.

We approached Spider Gap via the WTA-maintained Phelps Creek Trail, and we were not alone along this stretch of the trail. I easily understood the popularity of the hike as we ventured up the classic U-shaped glacially carved valley, wound through the pleasant meadow, and soaked up the warm fall colors as we neared the switchbacks up to Spider Gap.

Spider Gap, a narrow pass midway between Chiwawa and Dumbell Mountains, is home to **Spider Glacier**. Like the other 317 North Cascades glaciers, this one has been shrinking in recent years, and in fact is hardly a glacier anymore except in historical terms. Now a shadow of its former self, it more closely resembles a slowly melting snowfield.

After plodding up Spider Glacier and across Spider Gap, we began to weave our way down through the talus slope on the north side of the pass, moving from faint cairn to faint cairn. Through the dense fog we caught a few glimpses of **Lyman Glacier** and the chain of meltwater lakes pooled at its foot, and I was fascinated, a humble observer drawn into the fleeting moment between glacier and glacially shaped terrain. And indeed, I was standing in one of the best places in the contiguous United States to observe glaciation in action, since the North Cascades are home of two-thirds of the glaciers in the lower 48 states. Clearly once grand and majestic, Lyman Glacier now occupies only a fraction of the footprint it is leaving behind. And yet still, the glacier feels massive and imposing, and it operates on a scale that is hard for me to imagine.

The rain began as we descended, and it continued to pick up as we reached the valley floor and began winding along a narrow path towards the far side of Lyman Lake. Here we found shelter under a large overhanging rock and decided it was dinnertime. Two servings of Thai noodles later, we set up our tent and escaped from the rain behind a magical single layer of nylon and into warm sleeping bags.

The morning greeted us with quiet sunshine, scattered clouds, and a quickly drying tent. We decided to head up nearby Cloudy Peak and set off on a pleasant ramble through grassy meadows, past squeaky and well-fed marmots, and up a gentle rock ridge. The clouds were shifting quickly, exposing one peak and then obscuring its neighbor, as if the whole landscape would have been just too much for us to absorb all at once.

Then it was back down Cloudy Peak, it was packing up our tent and reshouldering heavy packs, it was back up the talus field to Spider Gap and to the striking views down into the Phelps Creek Valley, to the many switchbacks and down, down, down, and finally reaching the long flat trail back out ... and then only memories. Until next time. ♦

Northwest Explorer articles describe backpacking trips in the Northwest and beyond.

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Glacier Research

More Glacier Features
- Glaciers & Climate, p.34
- How to Cross a Glacier, p.36

In the early 1950s, Richard Hubley at the U.S. National Science Foundation proposed establishing some permanent glacier research programs in Washington. Here is a look at those programs.

Research at South Cascade Glacier in the North Cascades

Mark Meier and Austin Post in the United States Geological Survey (USGS) started the program at South Cascade Glacier, a glacier so named for being the source of the South Fork of the Cascade River. The USGS began intensive study in 1957 and has monitored it continuously ever since. In terms of the wide array of glacier properties and meteorological conditions measured, and the frequency of the measurements, it is far and away the foremost glacier research program in the Western Hemisphere. In addition to the routine monitoring, numerous specialized studies have been staged at South Cascade over the decades, by both USGS scientists and others from universities both in the United States and abroad. The USGS began monitoring programs on two glaciers in Alaska in 1962, but they are not nearly as extensive as the one at South Cascade.

South Cascade Glacier, site of the foremost glacier research program in the Western Hemisphere, as seen from above in 2004. Photo by John Scurlock.

Research at Blue Glacier in the Olympics

Ed LaChapelle at the University of Washington began the program at Blue Glacier on Mount Olympus in 1956. Because routine glacier monitoring is not within the mission of U.S. universities, the program at Blue has not been as continuous or extensive as the one at South Cascade. Nevertheless, numerous specialized studies have taken place here.

Different Glaciers, Interesting Results

Although it was not foreseen when these monitoring programs began in the 1950s, South Cascade and Blue have dramatically illustrated a fundamental characteristic of glacier behavior. Over the past fifty years, South Cascade has lost about 40 percent of its area, whilst Blue has lost little. The reason for the difference is that the terminus of Blue at the end of the Little Ice Age, about 1850 in the Pacific Northwest, was on steep terrain, whereas that of South Cascade was not.

Because a glacier's thickness is inversely related to its surface slope, the ice was thin on Blue's extended position down the steep bed in front of its modern terminus position. On South Cascade, by contrast, the ice was very thick on its extended position over flatter terrain across and slightly beyond the lake. By fifty years ago, the warming climate after the end of the Little Ice Age was able to melt the thinner extended part of Blue. South Cascade, on the other hand, is still undergoing adjustment to the end of the Little Ice Age. ♦

—Al Rasmussen

Glaciers At a Glance

Number of glaciers in Washington's national parks

North Cascades: 318. Olympic: 60. Mount Rainier: 25.

Glacier Glossary

Ablation – The loss of snow and ice from a glacier due to melting, sublimation, calving or erosion.

Alpine glacier – Glacier formed in the mountains, may be limited to a small cirque or flow down valleys.

Glacier – The compaction and recrystallization of ice and snow on land that forms a large creeping mass.

Ice sheet – Large ice mass covering more than 50,000 square miles that is not restricted by the topography.

Moraine – A ridge or mound of mixed clay, sand, gravel and boulders dumped by the glacier along its margins or at its terminus.

Scour – As a glacier moves, the rocks imbedded in the ice erode the surface of the landscape by removing the surface material and polishing the bedrock.

Striation – A line cut into the bedrock by the scouring of the glacier. Striations are usually a group of parallel lines indicating the direction that the glacier moved.

—Lee Whitford