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A region's vitality, melting away

Hood River farmers thought the water flowing from shrinking Mt. Hood glaciers was essential to their prized fruit crops; new OSU research shows just how essential

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HOOD RIVER -- The melting of Mount Hood's signature glaciers raises a crucial question for the region: How much do we depend on them and the cool meltwater they pour into rivers and creeks?

New findings by Oregon State University researchers show that in certain places, the answer is: quite a bit. That is important news for Hood River and its famous fruit crop, which drinks in glacier water throughout the summer.

Almost three-quarters of the water rushing down the Upper Middle Fork of the Hood River in late summer comes from glaciers and permanent snow and ice fields on the mountain, according to research by OSU professor Anne Nolin and graduate student Jeff Phillippe.

They are the first to measure how much of the mountain's runoff comes from glaciers that are melting at an accelerating pace. They looked specifically at the late summer months, when other water sources such as seasonal snowmelt dry up or grow scarce.

The results hint at how heavily communities, farms and economies around Mount Hood depend on snow and ice for their water. That carries extra significance because the glaciers are shrinking, and snowfall is changing to rain as the climate warms, studies have found.

Although rapid melting of the glaciers could release extra water in the near term, the glaciers eventually may retreat to higher, cooler and, in the case of north-facing Eliot Glacier, shadier reaches of the mountain, where their melting would slow, Nolin said.

That could leave even less water in the creeks below during the driest time of the year -- when growers of the valley's fruit crops need water the most.

Nolin's team is starting further research to calculate more specifically how continued melting of the glaciers could affect amounts and timing of runoff in the future.

Eliot Glacier -- the mountain's largest -- supplies more than 85 percent of the August water in Eliot Creek, which flows from the glacier and provides an important water source for a local irrigation district.

Neighboring Coe Glacier provides at least one-third of the water in Coe Creek. But if the small nearby Langille Glacier and other small glacial remnants in Coe's drainage are included, nearly 90 percent of the water in Coe Creek in August comes from glacial ice and snowfields, the researchers found.

Other glaciers on the mountain probably also supply similarly high volumes of meltwater to rivers and creeks below, the researchers told a standing-room-only meeting of the Hood River Watershed Group in Hood River last month.

They installed gauges to measure the flow of the main streams below the glaciers. They also analyzed the water for chemical isotopes that reveal the proportion of glacier water even lower in the streams, which helped capture contributions from other tributaries where they had no gauges installed.

Nolin said she was surprised by how much of Mount Hood's water came from the glaciers, especially because they are relatively small compared with those in other mountain ranges.

"Anything that affects the water and the availability of water will affect the whole valley," said Chuck Gehling, chairman of the Hood River Watershed Group.

Northwest glaciers sit at lower elevations and in a milder climate than many others, and they depend on heavy snows to sustain them. But more of that snow is falling as rain instead, and small changes in temperature can speed melting.

The flow of streams draining the glaciers rises notably when nights remain warm, because the ice continues melting round the clock, Nolin and Phillippe found.

Some of Mount Hood's glaciers have lost as much as about 60 percent of their surface area to melting since the early 1900s, according to research by Portland State University scientists. Eliot and Coe glaciers have shrunk less than most.

Although Nolin and her team are providing the first clear picture of how much water comes from the glaciers, local farmers have long recognized how crucial that water is and the potential that it will decline, said Dave Compton, manager of the Middle Fork Irrigation District. The district is considering building a new reservoir to store extra water for summer use.

Although the glaciers are an important water source, they come with some drawbacks. Glacier runoff holds lots of silt, and irrigation districts try to avoid drawing that into their systems, or they hold the water in ponds where the silt can settle out.

Nolin also is studying the potential influence of a changing climate on the likelihood of large debris flows or landslides off Mount Hood and other volcanoes in the region.

A major debris flow in late 2006 tore apart Oregon 35 on Mount Hood, and another that started below Eliot Glacier badly damaged irrigation works far below.

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