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Geologists: Collier Glacier Is Shrinking

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BEND, Ore. — Between the North Sister and Middle Sister in Oregon's Cascade Range, Collier Glacier has advanced and receded for hundreds of thousands of years. But like many glaciers, it is headed in one direction these days: backward.

It is in serious peril, says geologist Ellen Morris Bishop of the Fossil-based Oregon Paleo Lands Institute. "We have basically a really sad picture of Collier Glacier today."

Geologists blame among other things a warming climate, altering the landscape and perhaps the availability of water to high-elevation ecosystems. Collier is shrinking faster than most of the 35 glaciers in the state.

"Now everything is just in a chaotic shrink," Bishop said.

This summer she led a climate change-themed tour of the Central Oregon Cascades, starting from McKenzie Pass and heading south. Volcanic activity built the Cascades, but over eons the glaciers have worn them down.

At the glacier's base is a moraine, or a ridge of rocks, deposited by the slowly moving glacier when it was bigger. Today an empty valley fills the space between the ridge and the glacial edge.

"This was a full valley in 1906," Bishop said. Since then it has retreated more than a mile.

The ice sheet has visibly shrunk since she first visited the glacier in the 1980s, Bishop said.

"We're in trouble," said David Eddleston, of Bend and a participant in the field trip. "It's right there in front of our eyes."

The shrinking of the glacier started about the same time carbon dioxide emissions started rising, Bishop said.

"It's all tied to climate change, said Peter Clark, a geosciences professor at Oregon State University.

In the late 19th century, many glaciers started to retreat, he said. That shrinking was probably due to natural fluctuations in the atmospheric temperature.

But in the last 20 to 30 years, all of the Cascades' glaciers have been shrinking, he said.

Collier is reflective of glaciers all along the Cascades, Clark said.

And because the actions of glaciers reflect temperatures from two decades ago, even if warming trends were to stop today, glaciers would still be shrinking for at least 20 years to come, he said.

With warming predicted to rise between 3 and 5 degrees by the end of the century, temperature will likely be the main factor that causes glaciers' decline.

"Most people would say that by the turn of the century there will be very little ice left on the mountains," Clark said.

Glaciers store water in the winter and then release it throughout the year, Clark said, spreading out the time when water is flowing. Without the glaciers, many streams will rely more on springtime runoff.

"It will affect the water balance of the mountainous regions," he said.

"At some point, they're going to be so small that they're not going to pump out that water," said Andrew Fountain, a geology professor at Portland State University.

And when that happens, lands at higher elevations will be much drier and subject to droughts, Fountain said. Stream flow will probably decrease, which means that plant life along those waterways would diminish.

Some lakes previously fed by glaciers would become clearer because there would be no sediment but they could also start to evaporate and become smaller.

But while glaciers might shrink, that doesn't mean the ice on mountains will disappear completely, he said.

"It's actually tough to get rid of a glacier," Fountain said. As glaciers retreat, they do so by inching up to higher mountain elevations, where the air is

colder.

"But it's the difference," Fountain said, "between the Collier Glacier today and a little ice patch that might be 100 yards long."

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