

Equator's glaciers slipping away

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Story Highlights

- Africa's 3 highest peaks to lose all ice sometime in the next 2 to 5 decades
- Almost every one of more than 300 large glaciers studied worldwide is in retreat
- Environmentalist: Glacier loss will gravely impact people, wildlife

NARO MORU, Kenya (AP) -- Rivers of ice at the Equator -- foretold in the 2nd century, found in the 19th -- are now melting away in this new century, returning to the realm of lore and fading photographs.

From mile-high Naro Moru, villagers have watched year by year as the great glaciers of Mount Kenya, glinting in the equatorial sun high above them, have retreated into shrunken white stains on the rocky shoulders of the 16,897-foot peak.

Climbing up, "you can hear the water running down beneath Diamond and Darwin," mountain guide Paul Nditiru said, speaking of two of 10 surviving glaciers.



Mt. Kilimanjaro has already lost 82 percent of its ice cover over 80 years.

Some 200 miles due south, the storied snows of Mount Kilimanjaro, the tropical glaciers first seen by disbelieving Europeans in 1848, are vanishing. And to the west, in the heart of equatorial Africa, the ice caps are shrinking fast atop Uganda's Rwenzoris -- the "Mountains of the Moon" imagined by ancient Greeks as the source of the Nile River.

The total loss of ice masses ringing Africa's three highest peaks, projected by scientists to happen sometime in the next two to five decades, fits a global pattern playing out in South America's Andes Mountains, in Europe's Alps, in the Himalayas and beyond.

Almost every one of more than 300 large glaciers studied worldwide is in retreat, international glaciologists reported in October in the journal *Geophysical Research Letters*. This is "essentially a response to post-1970 global warming," they said.

Even such strong evidence may not sway every climate skeptic. Some say it's lower humidity, not higher temperatures, that is depleting Kilimanjaro's snows, for example.

Stefan Hastenrath of the University of Wisconsin, who has climbed, poked, photographed and measured east Africa's glaciers for four decades, says what's happening is complex and needs more study. But on a continent where climatologists say temperatures have risen an average 1 degree Fahrenheit in the past century, global warming plays a role, he says.

"The onset of glacier recession in east Africa has causes different from other equatorial regions. It's a complicated sort of affair," he said by telephone from Madison. But "that is not something to be

taken as an argument against the global warming notions."

In Kampala, Uganda's capital, veteran meteorologist Abushen Majugu agreed. "There's generally been a constant rise in temperatures. To some degree the reduction of the glaciers must be connected to warming," he said.

It was 10 years ago, on the 100th anniversary of the Italian first expedition to the Rwenzoris, that Majugu and colleagues were struck by an Italian gift to Uganda: photographs from 1896 showing extensive glaciers atop the spectacular, remote, 3-mile-high mountains.

In a scientific paper this May, Majugu and British and Ugandan co-authors reported that this ice, which covered 2.5 square miles a century ago, has diminished to less than a half-square-mile today. The glaciers are "expected to disappear within the next two decades," they concluded. And because the 2nd century Greeks were right, that means a secondary source of Nile River waters will also disappear.

At Mount Kenya, too, "it's a dying glacier," Hastenrath said, referring to its big Lewis Glacier, once a mile-long tongue of ice draped over a saddle between peaks. "At the rate at which it goes, the end could come soon," he said.

In a meticulous new summary, the Wisconsin scientist, who first investigated Mount Kenya in 1971, shows that its ice fields have shrunk from an estimated 400 acres to less than one-fifth that area in the past century. After decades of work, he concludes a complex of phenomena was responsible.

In the early years, sparser clouds and precipitation in east Africa allowed solar radiation to evaporate exposed areas of ice, which then wasn't adequately replenished, Hastenrath says. But more recently the reduction in ice thickness has been uniform, pointing to general warmth, not limited sun exposure, as the cause. Eight of 18 glaciers are already gone.

"Northey's gone. Gregory's about finished," said John Maina, as if mourning old friends. The 56-year-old guide knows Mount Kenya's glaciers and peaks well, having led climbers up its face since he was a teenager. As he readied for yet another trek from Naro Moru, he recalled how it was. "We used to be able to ski on Lewis, but now it's all crevasses. We would climb all the way up Lewis on ice to Lenana peak, but now it's climbing on rocks. And the ice is weak. We're seeing blue ice, weak ice."

Up at 10,000 feet, where he mans a weather station in the clouds, another longtime guide, Joseph Mwangi, 45, makes his own projections. "In five years, Lewis Glacier will be gone," he said. He worries that the water loss may unravel a unique ecosystem that surrounds him -- of high-altitude trees and bamboo groves, blue monkeys and giant forest hogs. "The lobelia trees might die," he said.

Animals are already dying in the foothills and plains below.

Glaciologists say "terminal" glaciers often discharge -- and waste -- large amounts of water in the early years, followed by declining runoff from shrunken ice fields. Villagers here seem to confirm

that: The Naro Moru River and other streams off Mount Kenya ran very high some years back, they say, but are now growing thin. A years-long drought magnifies the problem.

"The more the snow goes down, the lower the rivers," said Roy Mwangi, area water officer here. The trouble has already begun, he said. Miles downstream on the Naro Moru, where the river now vanishes in the dry season, livestock are dying of thirst. Desperate nomadic herdsman have raided points upriver, blocking intakes for farm irrigation systems, he said.

"There's a lot of suffering on the lower side. These are armed men. I'm afraid there will be conflict," Mwangi said.

Hardships may spread even to Nairobi, Kenya's metropolis. Most of this country's shaky electric grid relies on hydropower, and much of that is drawn from waters streaming off Mount Kenya. In a U.N. study issued in early November, scientists predicted that the glacial rivers of Mount Kenya and the rest of east Africa may dry up in 15 years.

"The repercussions on people living down the slopes will be terrible," said Kenyan environmentalist Grace Akumu.

Scientists say such repercussions would multiply across a world where human settlements have come to depend on steady runoffs from healthy glaciers -- in Peru and Bolivia, India and China. And it would extend beyond that, they say, to coastal settlements everywhere, as oceans rise from heat expansion and the melting of land ice.

The October journal report, by European and North American glaciologists, estimates that glacier melt contributed up to one-third of the 1-to-2-inch rise in global sea levels in the past decade. And that contribution is accelerating. Since 2001, they report, dying glaciers apparently have doubled their runoff into the world's rising seas.