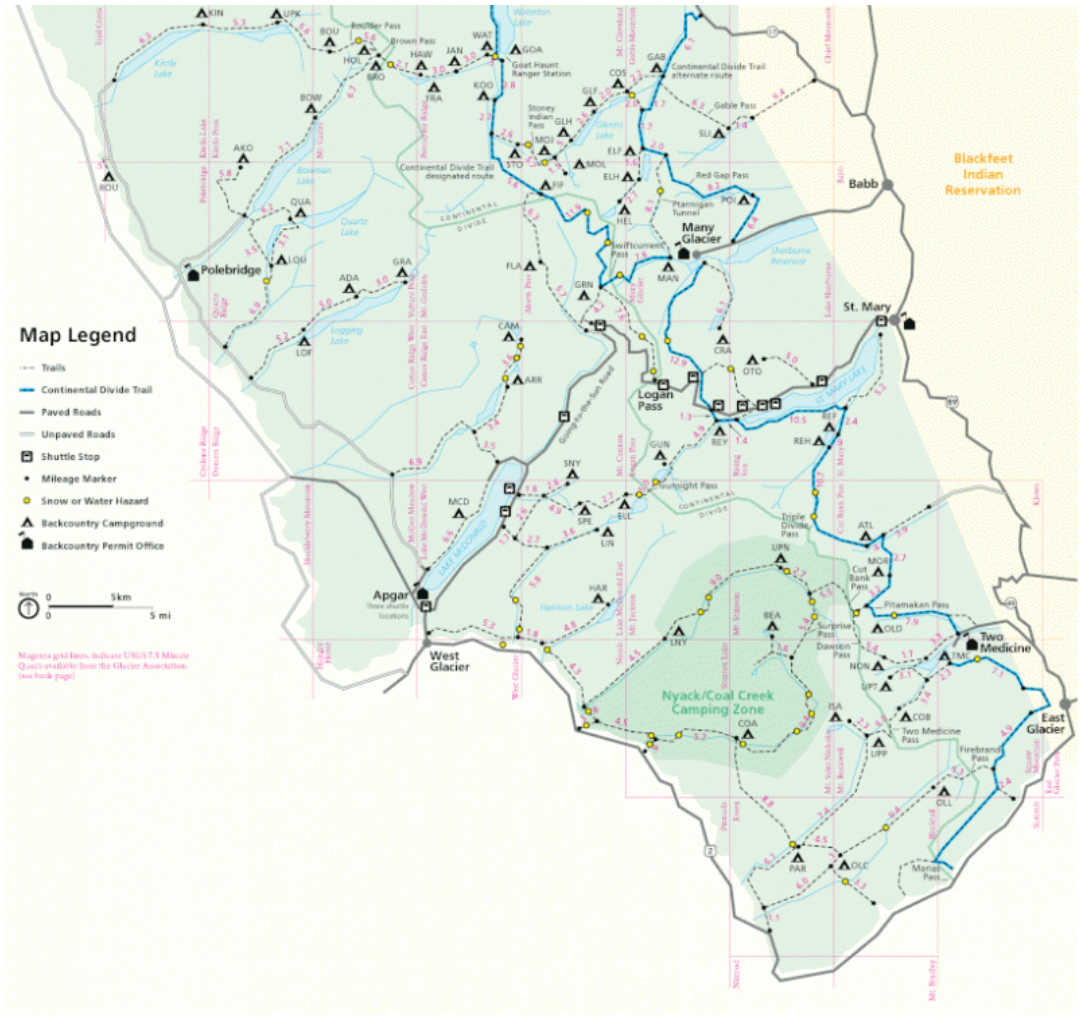
The Melting "Crown of the Continent": Visual History of Glacier National Park

Dori Gorczyca, Salma Monani, and Sarah Principato

Summary

Located in northwest Montana, US, Glacier National Park sits high among the mountains, home to a wide variety of flora and fauna. Known as the "Crown of the Continent," the park has seen dramatic changes over time in both its management strategies and environment. Today, the park is known as the poster child for climate change within the Park Service and acts a prime example of the rapid rate of glacial retreat. From over 150 glaciers to 25 today, park scientists have modeled future changes to the park and suggest that glaciers could no longer be present in Glacier National Park as early as 2030.

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Map of Glacier National Park. The park is just over a million acres. Along with the Waterton Lakes National Park across the Canadian border it was designated as the first International Peace Park in 1935

Unknown cartographer. Click here to view Wikimedia source.

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Glacier National Park (GNP), located in northwest Montana, US, was signed into existence on 11 May 1910 by then President William Howard Taft. Conservationist George Bird Grinnell was instrumental in lobbying for the park's creation and negotiated the sale with the Blackfeet Indians. As an editor of the outdoor magazine *Field and Stream*, Grinnell learned about the region from writer James Willard Schultz and made his first visit there in 1885. Enticed and amazed by the glaciers of the area, the high Rocky Mountain alpine terrain, and the flora and fauna that thrived here, Grinnell advocated for the creation of the park, nicknaming it the "Crown of the Continent."

Grinnell recognized glaciers as a geological wonder. As historian Gerald Diettert records in his 1992 book, Grinnell called the glaciers the "jewels" in the crown. Setting aside land to enjoy the glaciers seemed like a logical means to conserve the landscapes and ecosystems that they supported. Yet today, just about a hundred years from when the park was founded, the glaciers that form GNP's snow-capped crown are close to extinction.

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George Bird Grinnell and his wife on Grinnell Glacier, 14 March 1925

Unknown photographer. Courtesy of Library of Congress, Prints & Photographs Division, LC-USZ62-93186 (b&w film copy neg.). Click here to view source.

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At the time of the park's establishment, a survey by geologist Bailey Willis suggested a lack of mining and agricultural prospects, which helped with Grinnell's conservation efforts. However, like all parks in the developing US National Park Service system, the GNP's conservation strategies have evolved over the years. In the early days, the park's mandate focused more on tourism than on science. By the mid-1930s, there were more concerted scientific studies. Most recently, in 2012, the National Park Service (NPS) instituted a climate change action plan and response, which includes "repeat photography" as historical documentation of glaciers over time.

Historical photographs of glaciers began to be systematically used in the United States Geological Survey's (USGS) collaboration with GNP in 1997. They provide a visual representation of glacier retreat. When combined with other types of geological information, such as USGS mapping and fieldwork, they help pinpoint the changing park landscape.

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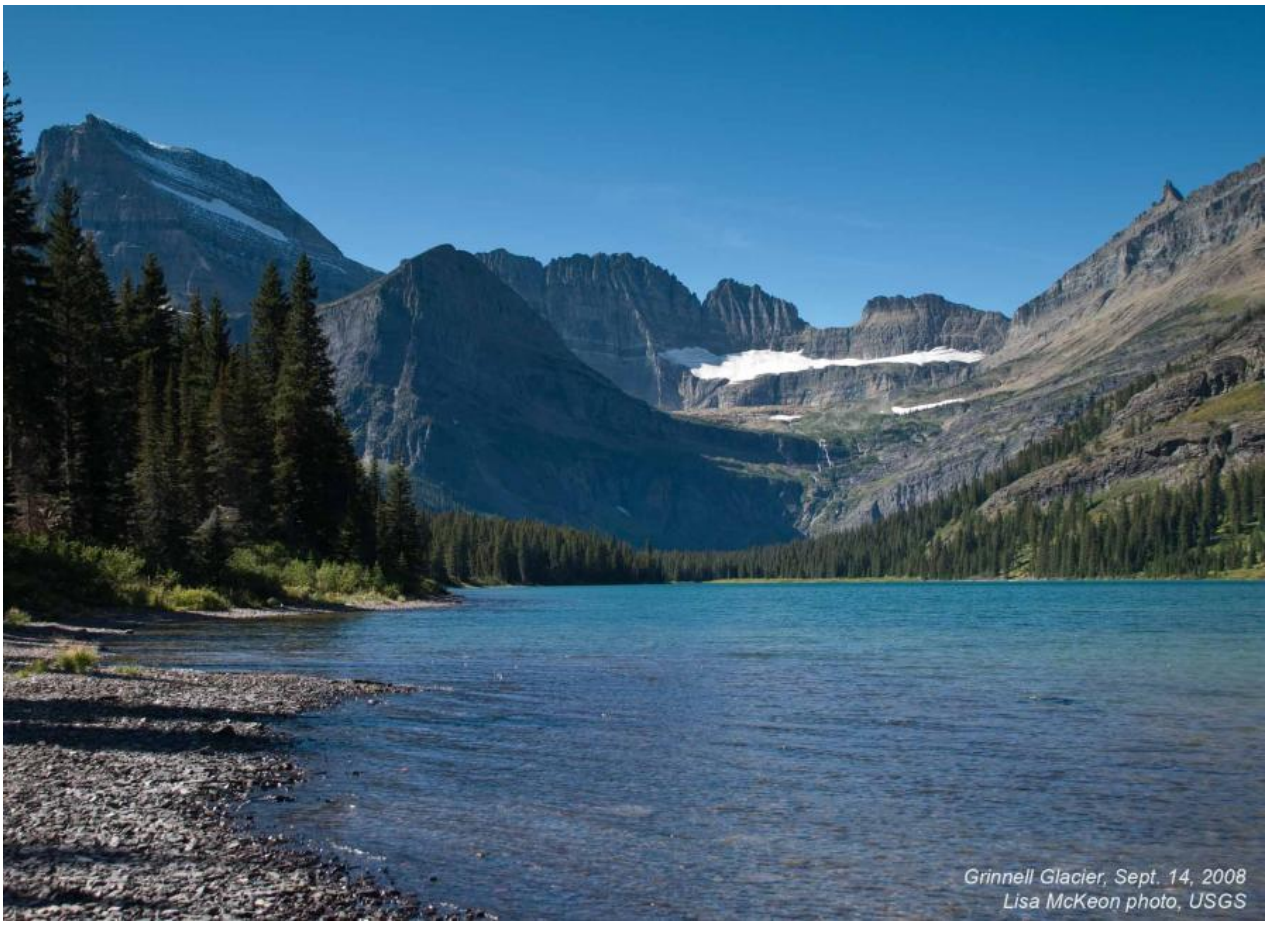
Grinnell Glacier from the shore of Lake Josephine in 1914.
Photograph by Marble Photo. Courtesy of the Glacier National Park Archives. Click here to view source.

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Grinnell Glacier from the shore of Lake Josephine in 1938.
Photograph by T. J. Hileman. Courtesy of the Glacier National Park Archives. Click here to view source.

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Grinnell Glacier from the shore of Lake Josephine in 2008.
Photograph by Lisa McKeon. Courtesy of USGS. Click here to view source.

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Visually documenting Grinnell glacier as part of the repeat photography project in 2010

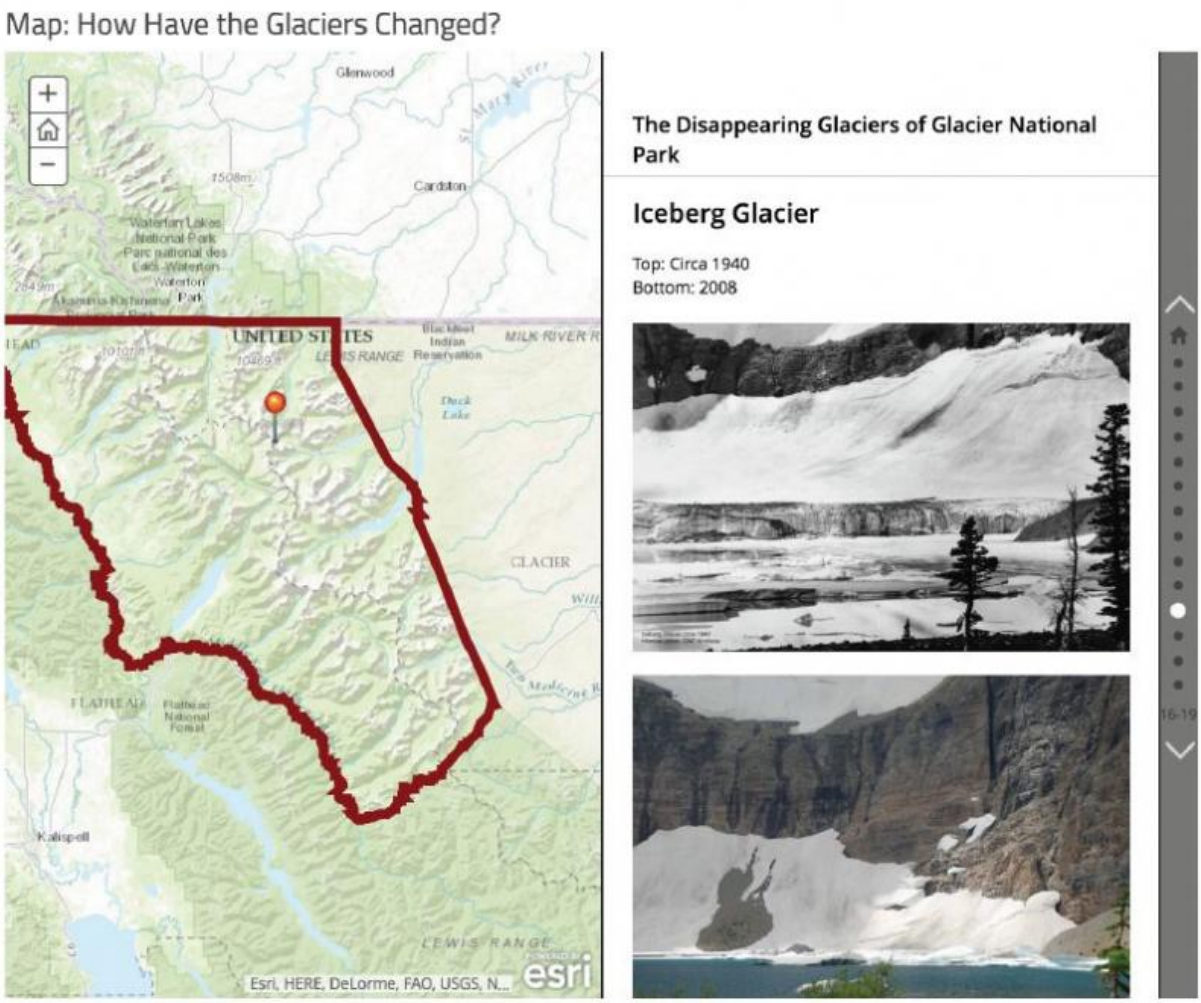
Photograph by Lisa McKeon. Courtesy of USGS. Click here to view source.

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Geological records suggest that 150 glaciers existed in 1850. Today, the USGS reports that only 25 glaciers are currently recognized as "active"—that is, big enough (0.1 km^2 or approximately 25 acres) to showcase the classic dynamics of movement we associate with glaciers.

It is important to note that glaciologists expected to see the park's glaciers retreat from their 1850 extent. In fact, early investigations showed that glaciers had retreated from their maximum extent even at the time of the park's establishment. This finding made scientific sense since geological records mark 1850 as the end of the Little Ice Age, a period of global cooling that began in the 1400s in North America, and had favored the growth of the glaciers.

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A screenshot from an environmental studies digital project conducted by the authors that showcases GNP's "repeat photography" in a visually interactive way. Click here to visit the webpage "The Disappearing Glaciers of Glacier National Park."

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However, what is alarming to geologists and park managers working on the historical, scientific, and recreational value of the park's glaciers is the recent rapid rate of retreat. Climate model simulations reported by geologists Myrna Hall and Daniel Fagre in 2003 suggest that by 2030 GNP might be devoid of glaciers. USGS observations of actual rates of glacial retreat suggest this reality might come sooner than 2030.

The loss of glaciers has a cascade effect on the entire region, from water supply concerns to the struggle by species to adapt or perish with the changing landscape and climate conditions. While global temperature trajectories do not bode well for the park's glaciers, interdisciplinary studies that combine visual history with science give the reality of climate change a "face." Like the writings of GNP's early conservationists—Schutz, Grinnell, and Wallis—these images can evoke environmental concern, and in this case, fuel legislative action to curb anthropogenic climate change.

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Further readings:

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Related links:

- Official website of Glacier National Park
  https://www.nps.gov/glac/index.htm
- United States Geological Survey: Glacial Research at GNP
  https://www.usgs.gov/centers/norock/science/science-glacier-national-park
- Digital Environmental Communication Project: "Is it Hot Out There?" Our Changing Climate at Glacier National Park
  http://www.gettysburgcollegeitt.org/glacierclimate/
- How Does Elevation Affect Glaciers?
  http://www.gettysburgcollegeitt.org/glacierclimate/
- The Disappearing Glaciers of Glacier National Park
  http://www.gettysburgcollegeitt.org/glacierclimate/
- Repeat Photography Collections for Sustainability and Working Forests
  http://repeatphotography.org/intro/
- Monani, Salma, Sarah Principato, Dori Gorczyca, and Elizabeth Cooper. "Loving Glacier National Park *Online*."

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https://doi.org/10.1007/978-3-319-70479-1_4

- Dani Inkpen, *Capturing Glaciers: A History of Repeat Photography and Global Warming* (excerpt) https://www.environmentandsociety.org/node/9767

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Websites linked in image captions:

- https://commons.wikimedia.org/wiki/File:NPS_glacier-backcountry-campsite-map.gif
- https://www.loc.gov/item/93513261/
- http://repeatphotography.org/item/186/
- http://repeatphotography.org/item/187/
- http://repeatphotography.org/item/188/
- https://www.usgs.gov/centers/norock/science/citizen-science-repeating-historic-photographs-glaciers-glacier-national-park?qt-science_center_objects=0#qt-science_center_objects
- http://www.gettysburgcollegeitt.org/glacierclimate/?page_id=49

About the authors:

Dori Gorczyca
Dori Gorcyzka works as a park ranger for the National Park Service. Currently she is stationed at the Everglades National Park in Florida. She was employed at Glacier National Park as a student intern during the summer of 2013, when she embarked on her senior honors thesis regarding climate change communication.

Salma Monani
Salma Monani is Associate Professor at Gettysburg College. She is an environmental humanist, with a research focus in visual media and ecocriticism. (Her publications are available at: www.salmamonani.org/research.)
https://orcid.org/0000-0002-7260-1193

Sarah Principato

Sarah Principato is Associate Professor at Gettysburg College. She is a glacial geologist, with a number of geological publications: http://sarahprincipato.sites.gettysburg.edu/.
https://orcid.org/0000-0003-0113-1515

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