



GeoContext: *A social and political context for geoscience education*

<https://geo-context.github.io>

Companion Document for “Glaciology, Race, and Masculinity”

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Keywords: glaciology, masculinity, feminism, Indigenous peoples, scientific racism

Location: United States, global

People: Louis Agassiz, Jan Carstenszoon

Last updated: March 3, 2021

This companion guide accompanies the slides for “Glaciology, Race, and Masculinity.” For each slide, we provide a summary of content and a list of sources. For accessibility purposes, we provide alternative text for images.

Additional Context for Slides

Slide 1 | Glaciology, Race and Masculinity

This title slide contains a list of tags for the work, which are reproduced below. The background is a photograph of Gornergletscher in Switzerland taken by the author.

Content: glaciology, masculinity, feminism, Indigenous peoples, scientific racism

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Slide 2 | Glaciology is a male-dominated field

This slide contains information on the state of the gender makeup of glaciology. It features a figure from the 2010 paper *Women in Glaciology, a Historical Perspective* by Hulbe and others. The figure shows the number of female authorships in *Journal of Glaciology* and *Annals of Glaciology* from 1947 to 2009. The first year with over 10 female first authorships was 1985.

Sources

¹Women in Glaciology, a Historical Perspective (Hulbe et al 2010)

Slide 3 | Female exclusion in glaciology

This slide contains a timeline of events showing that the Western university system existed for hundreds of years before women were included. It includes the founding of Oxford (1100s), the founding of the Royal Society of London (1660), Oxford's opening to women (1920), and the first woman elected to the Royal Society (1945). The slide also contains information about women in glaciological field work and the role of outdoorsmanship in the culture of glaciology.

Sources

¹Women in Glaciology, a Historical Perspective (Hulbe et al 2010)

²For more info on gender and the outdoors, REI provides a decent place to start:

<https://www.rei.com/blog/hike/closing-gender-gap-great-outdoors>

³Glaciers, gender, and science: A feminist glaciology framework for global environmental change research (Carey et al 2016)

Slide 4 | Outdoorsmanship in glaciology

This slide contains a brief summary of the rivalry between two scientists, James Forbes and John Tyndall. Forbes believed that glaciers moved by flowing, while Tyndall believed that glaciers moved by sliding. Tyndall's reputation as an extraordinary mountaineer helped his ideas to receive acceptance at the time.

Sources

¹Sixth Letter on Glaciers (Forbes 1846-1847)

²The Heroic Science of Glacier Motion (Hevly 1996)

Slide 5 | Glacial Hazard and Indigenous Peoples

This slide contains a brief summary of the disproportionate impacts of ice sheet mass loss and glacier melting on indigenous peoples. The hazards discussed include water scarcity, glacial lake outburst floods, and sea level rise. Each is accompanied by a specific example.

The slide contains two figures. The first is reproduced from the 2020 paper *Losses and damages connected to glacier retreat in the Cordillera Blanca, Peru* by Motschmann and others. It shows how much glaciers in the Cordillera Blanca mountains of Peru have shrunk since 1970, and how much they are expected to retreat under two different emissions scenarios by 2100.

The second figure shows the current shoreline of Lenox Island, home to the Mi'kmaq people. It also shows how much the island's area would be reduced by 3 meters of sea level rise.

Sources

¹Glacier recession and water resources in Peru's Cordillera Blanca (Baraer et al 2012)

²Losses and damages connected to glacier retreat in the Cordillera Blanca, Peru (Motschmann et al 2020)

³Climate change and the global pattern of moraine-dammed glacial lake outburst floods (Harrison et al 2017)

⁴Living and dying with glaciers: people's historical vulnerability to avalanches and outburst floods in Peru (Carey 2005)

⁵<https://climate.org/rising-sea-levels-and-indigenous-communities/>

⁶<https://globalnews.ca/news/2705582/rising-sea-levels-erosion-threatens-lennox-island-off-coast-of-pei/>

Slide 6 | Indigenous Peoples in Glaciology

This slide contains a summary of factors that presently and historically have prevented indigenous peoples from being represented in glaciology. The factors discussed include access to education, the focus on earth-scale processes in glaciological research, and the lack of a system for facilitating interaction between glaciologists and indigenous peoples.

Sources

¹<https://www.un.org/development/desa/indigenouspeoples/mandated-areas1/education.html>

Slide 7 | Indigenous perspectives improve glaciology

This slide contains an example of how including indigenous knowledge improves the quality of glaciological science. The slide discusses the Sámi people, an indigenous population in parts of Norway, Finland, and Sweden. Sámi people and their observations provide valuable information that improves understanding of ice and snow dynamics and benefits local communities.

The slide contains a table from the 2011 paper *Sámi traditional ecological knowledge as a guide to science: Snow, ice and reindeer pasture facing climate change* by Riseth and others. The table shows the Sámi words for 8 distinct types of snow, as well as a description of the properties and relevance to reindeer herding of each snow type. Precise information about material properties of snow may be overlooked by non-local researchers.

Sources

¹Sámi traditional ecological knowledge as a guide to science: Snow, ice and reindeer pasture facing climate change (Riseth et al 2011)

Slide 8 | Glaciology and Race: Louis Agassiz

This slide contains a summary of Louis Agassiz, a famous glaciologist and proponent of scientific racism from the mid 1800s. The slide gives a summary of his professional career, his views on race, and members of Agassiz' academic family tree who spread his racist beliefs throughout American academia.

The slide contains one figure, reproduced from the 1854 book *Types of Mankind*. The figure, by Agassiz, shows drawings of the skulls of four people of different races. Below each skull is a column of animal drawings. The figure is meant to convince the viewer that the morphological differences between species like giraffes and buffalo are equivalent to the differences in human skull shape. The figure is an egregious example of scientific racism.

Sources

¹https://en.wikipedia.org/wiki/Louis_Agassiz

²The Roots of the I.Q. Debate: Eugenics and Social Control (Quigley 1995)

³<https://scalar.usc.edu/works/measuring-prejudice/one-race-or-several-species>

Slide 9 | Naming of Glaciers and Glacial Landforms

This slide contains information about renaming in glaciology. Geographic locations relevant to glaciology are often named after people with a legacy of racism and imperialism. Renaming may be a way to stop perpetuating the legacy of racists, though care must be taken to avoid masking information about racism in geosciences. The slide discusses the Carstenz glacier in Indonesia, named for Jan Carstenz, an imperialist hired by the Dutch East India Company. It also provides a truncated list of the many things named after Louis Agassiz.

The slide contains two figures. The first is a photograph of the Carstenz Glacier. The second is a screenshot from the EGU website, showing their statement on the renaming of the Louis Agassiz Award.

Sources

¹<https://www.kb.nl/sites/default/files/docs/carstens-translation.pdf>

²<https://www.flickr.com/photos/46179870@N04/14122786124>

³<https://www.egu.eu/awards-medals/julia-and-johannes-weertman/>