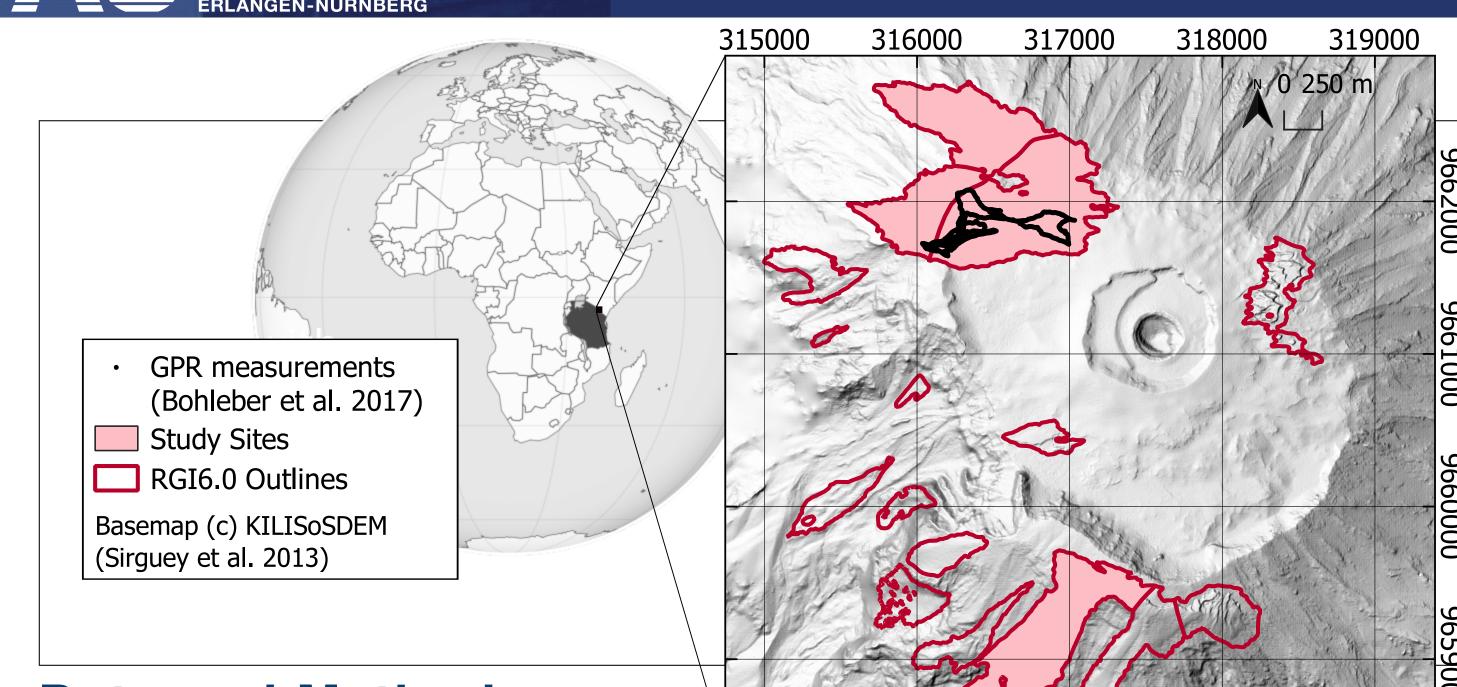
The state of Kersten Glacier and the Northern Icefield on Mt. Kilimanjaro

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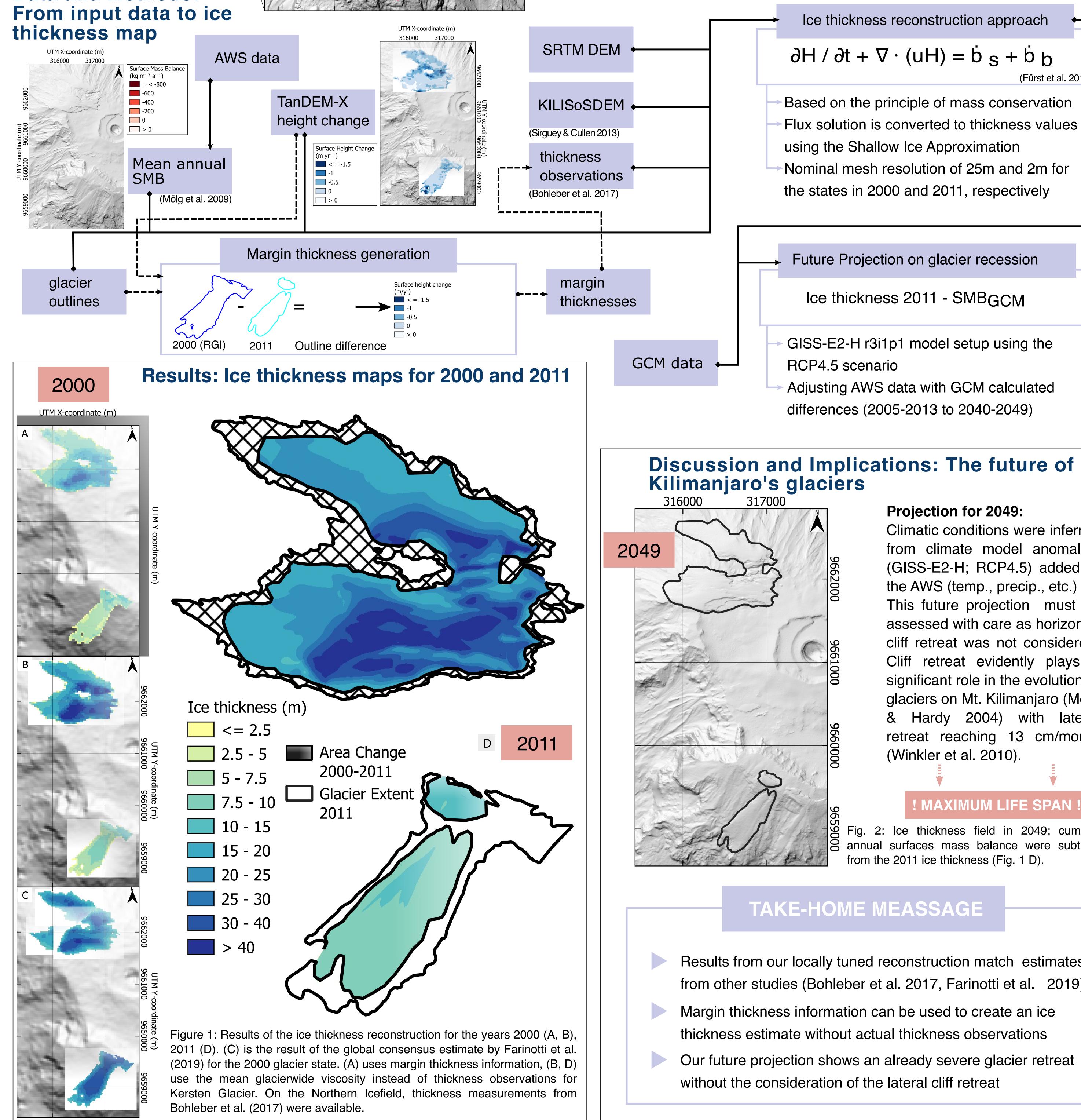


Introduction: Glaciers on Kilimanjaro

The glaciers on Kilimanjaro are unique indicators for climatic changes in the tropical mid-troposphere of Africa. Glaciers in the tropics have shown a severe retreat since the Last Glacial Maximum and the glaciers on Mt. Kilimanjaro are no exception, with an 85% reduction in glacier area from 1912 to 2013. This history of severe glacier area loss raises concerns about an imminent future disappearance. Yet, the remaining ice volume is not well known.

On this poster, we present well constrained thickness maps for the two largest remaining ice bodies on Mt. Kilimanjaro and a first estimate of their state in 2049.

Data and Methods:



Discussion and Implications: The future of

Projection for 2049:

Climatic conditions were inferred from climate model anomalies (GISS-E2-H; RCP4.5) added to the AWS (temp., precip., etc.) This future projection must be assessed with care as horizontal cliff retreat was not considered. Cliff retreat evidently plays a significant role in the evolution of glaciers on Mt. Kilimanjaro (Mölg & Hardy 2004) with lateral retreat reaching 13 cm/month (Winkler et al. 2010).

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(Fürst et al. 2017)

! MAXIMUM LIFE SPAN !

Fig. 2: Ice thickness field in 2049; cumulated annual surfaces mass balance were subtracted from the 2011 ice thickness (Fig. 1 D).

Bohleber, P., et al., The Cryosphere, 11, 469–482, doi: 10.5194/tc-11-469-2017, 2017. Fürst, J. J., et al., The Cryosphere, 11, 2003–2032, doi: 10.5194/tc-11-2003-2017, 2017. Mölg, T. and Hardy, D.R., J. Geophys. Res., 109, D16104, doi: 10.1029/2003JD004338, 2004. Mölg, T., et al., J. Clim., 22, 4162–4181, doi: 10.1175/2009JCLI2954.1, 2009a. Sirguey, P. and Cullen, N. J., Survey Quarterly, 76, 5–7, 2013. Winkler, et al. (2010), Erdkunde 64 (2), 179–193. doi: 10.3112/erdkunde.2010.02.05.

TAKE-HOME MEASSAGE

- Results from our locally tuned reconstruction match estimates from other studies (Bohleber et al. 2017, Farinotti et al. 2019)
- Margin thickness information can be used to create an ice thickness estimate without actual thickness observations
- Our future projection shows an already severe glacier retreat without the consideration of the lateral cliff retreat

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