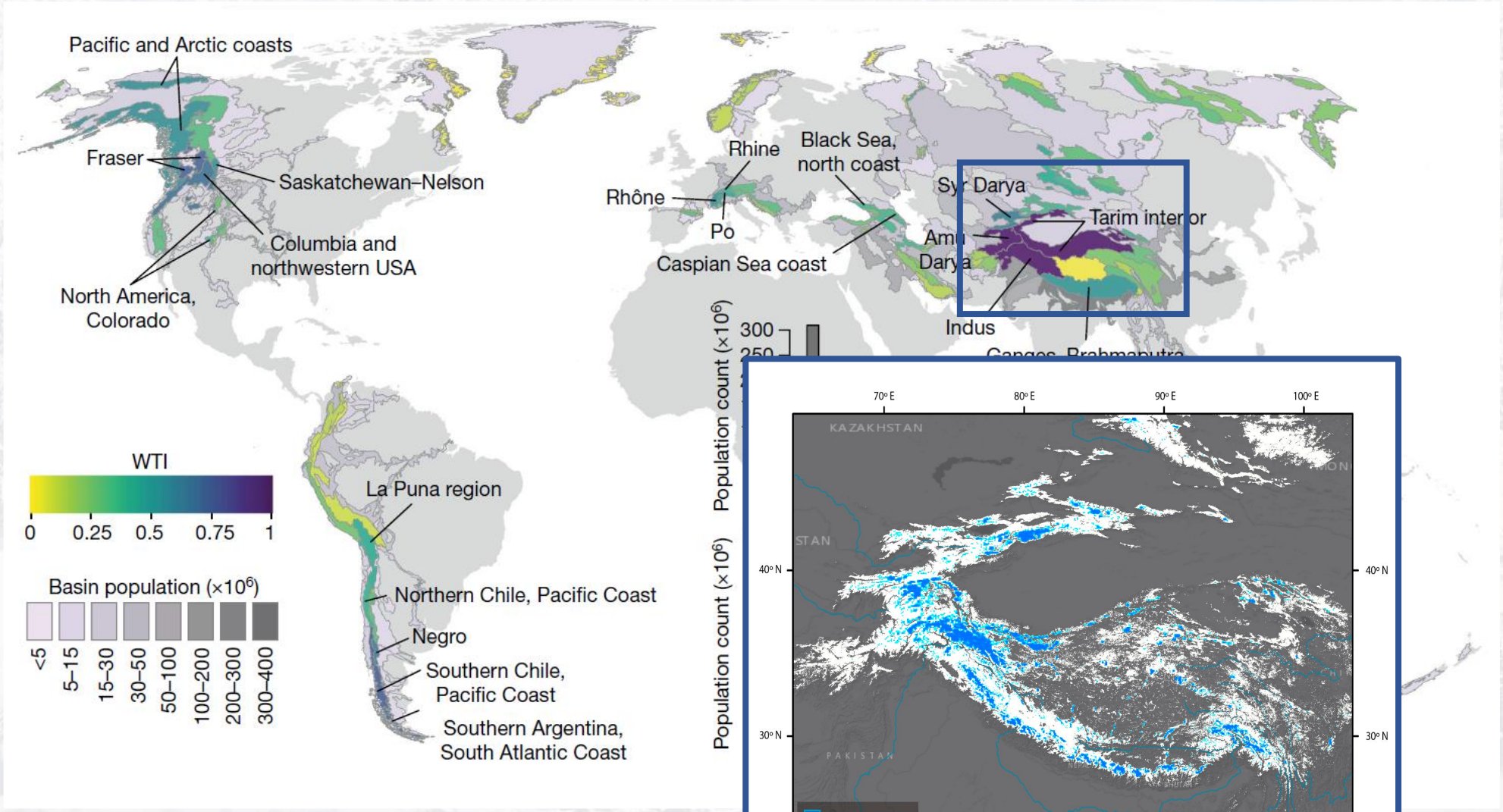
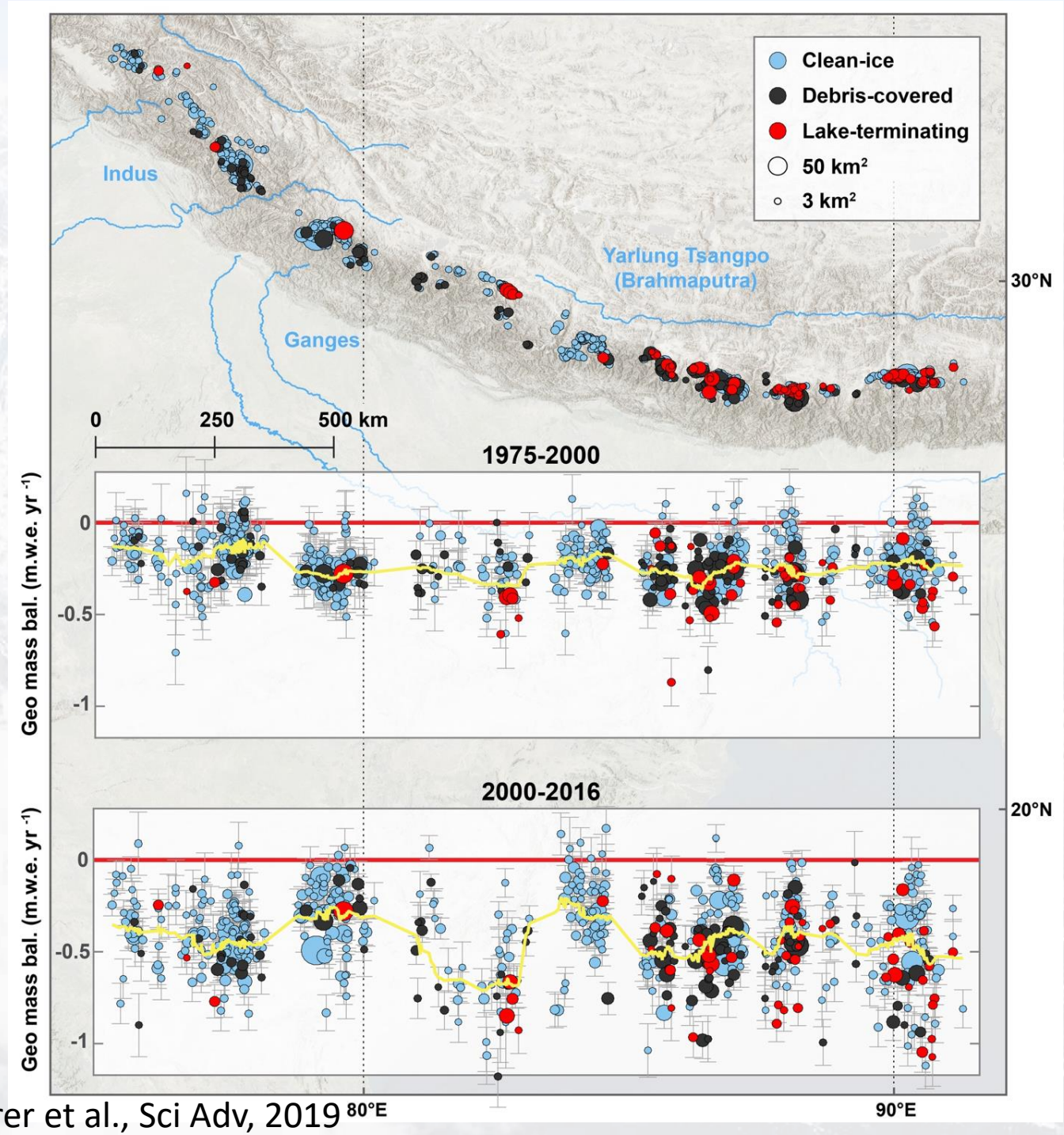
Questions from High Mountain Asia Glaciers

Summer Rupper, Joerg Schaefer, et al.

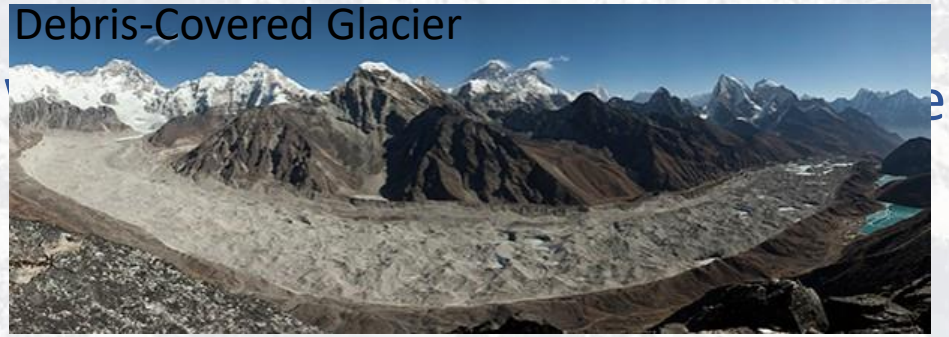
Water Towers

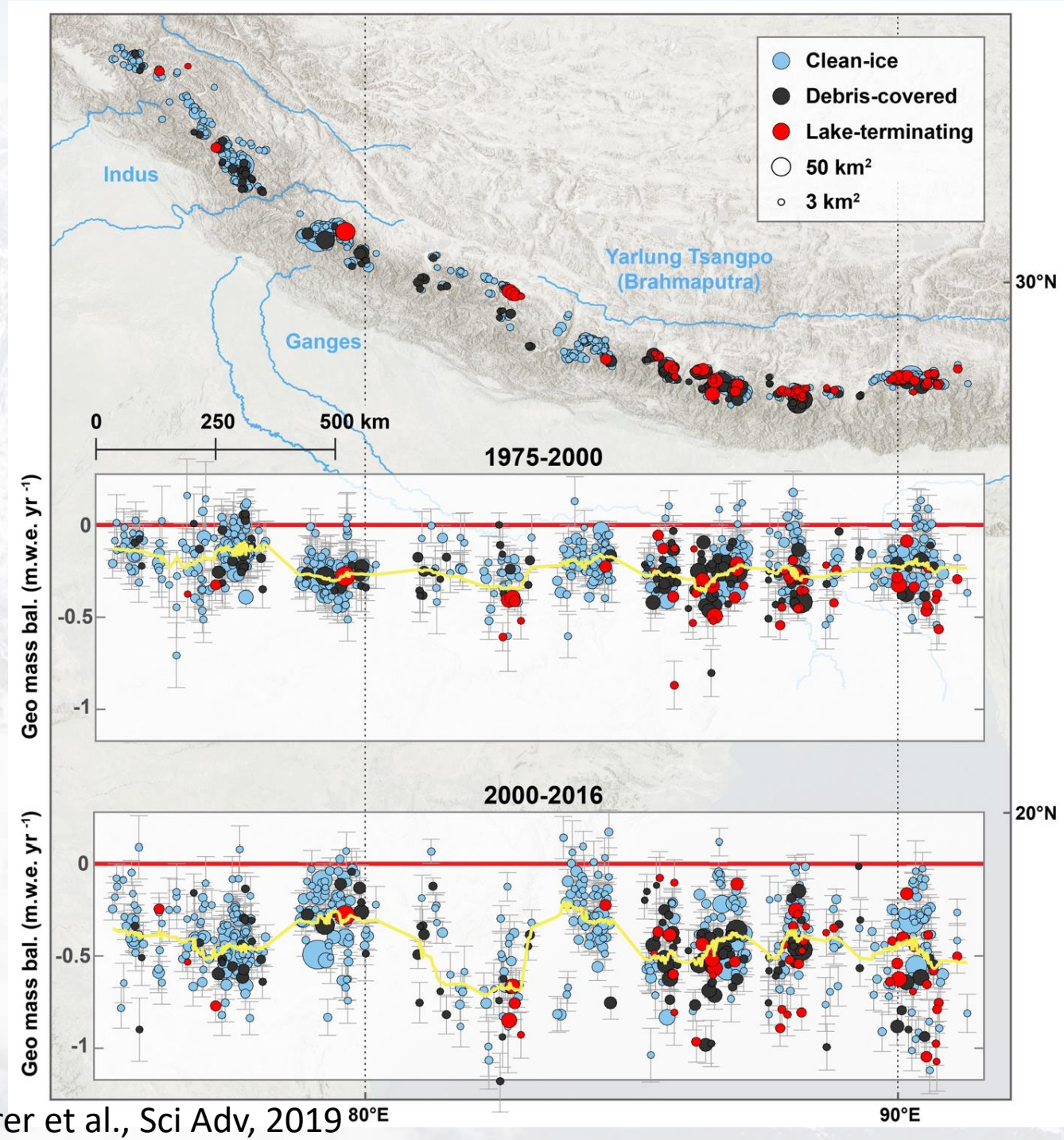


Immerzeel et al., 2019, Nature



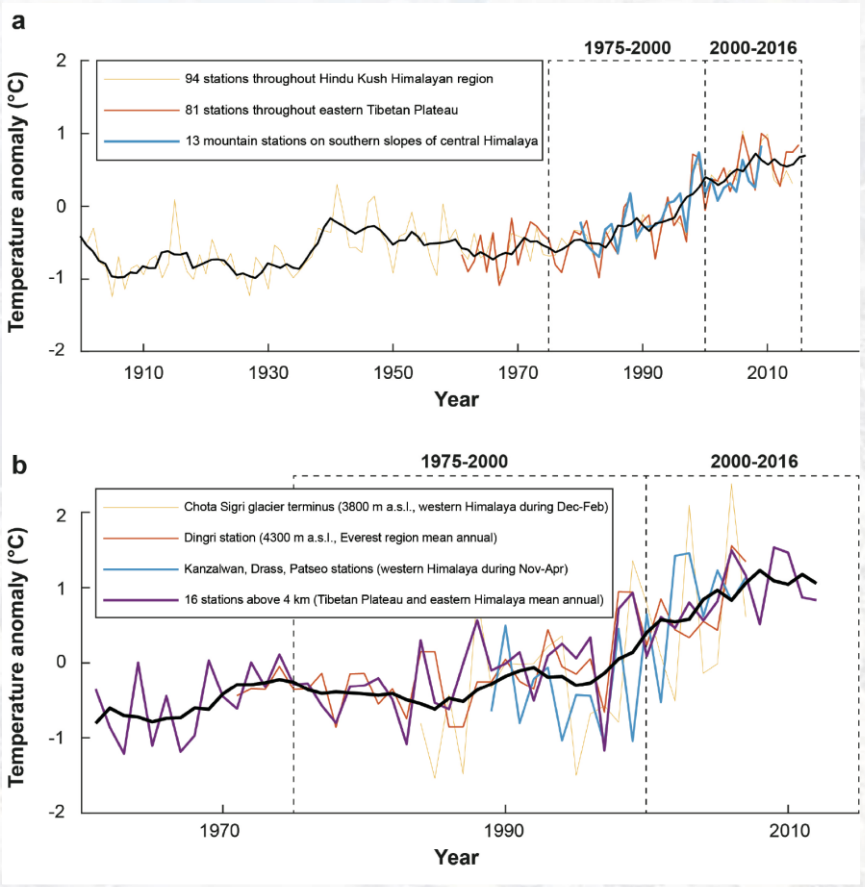
Maurer et al., Sci Adv, 2019





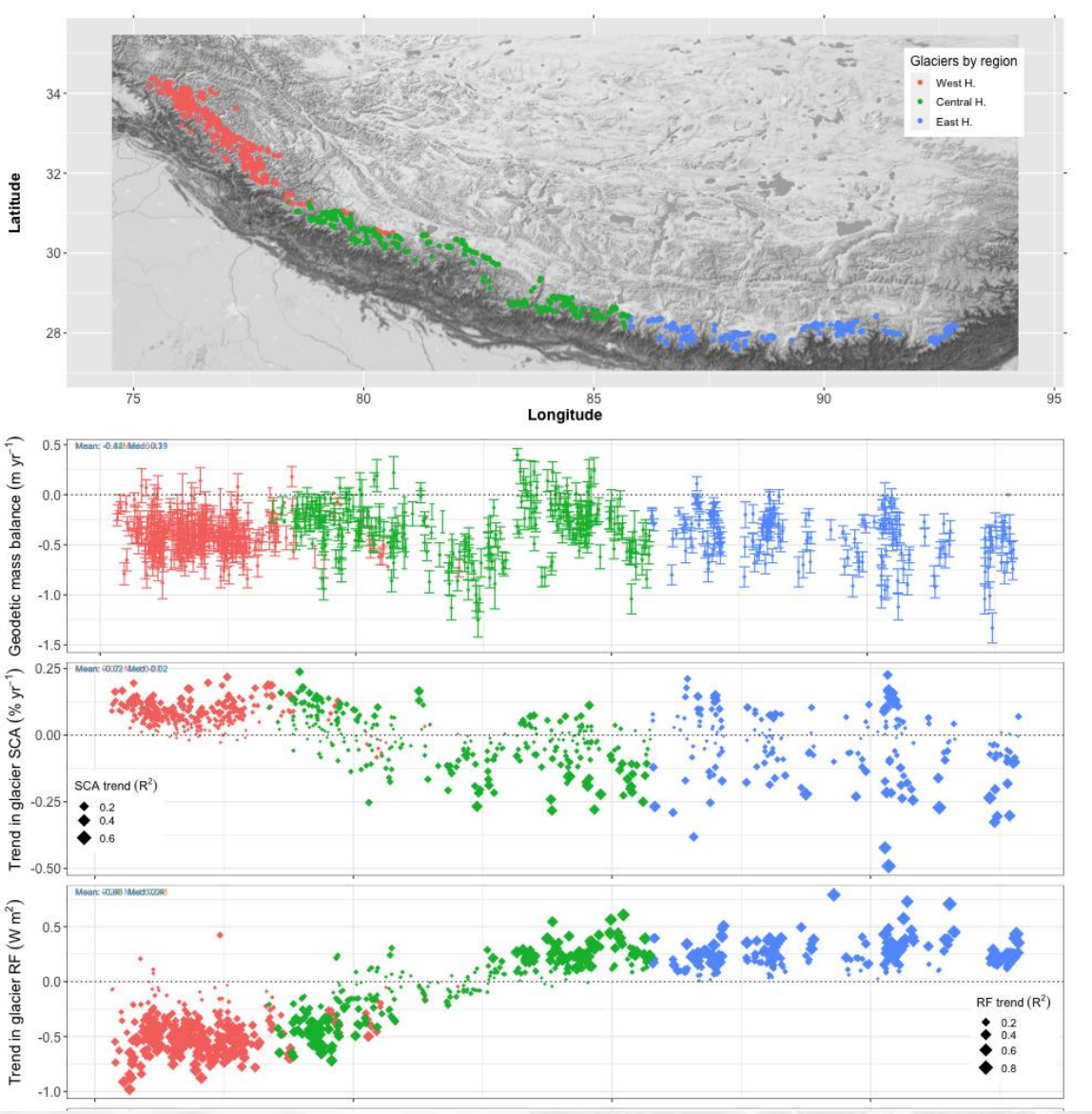
Maurer et al., Sci Adv, 2019

What is driving glacier changes over this period?

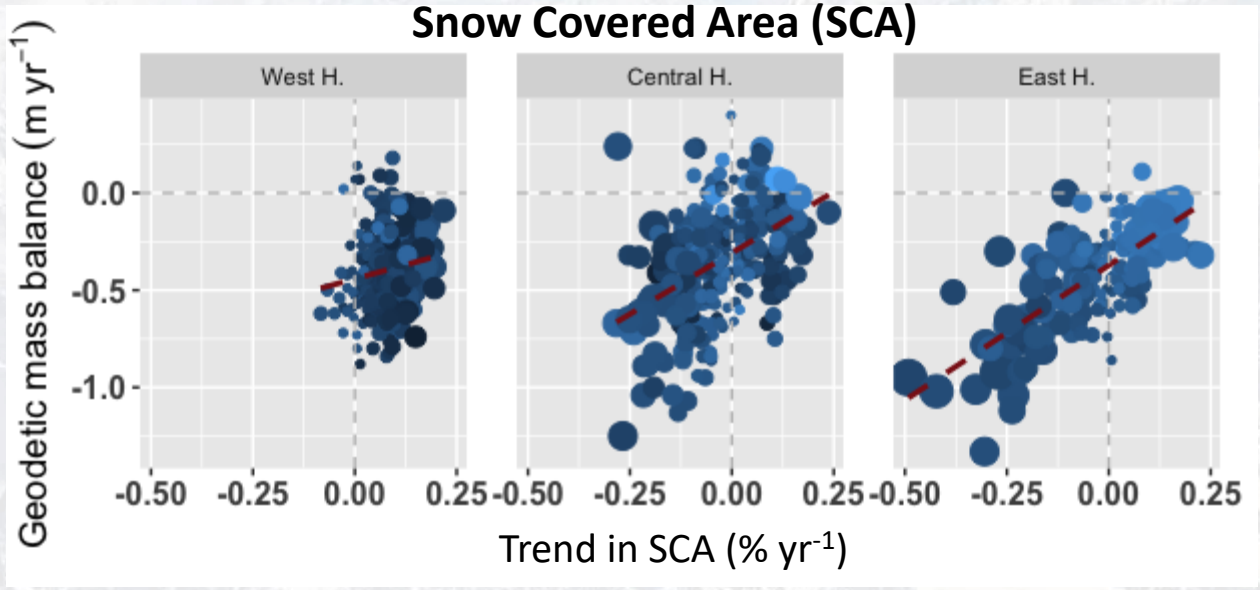


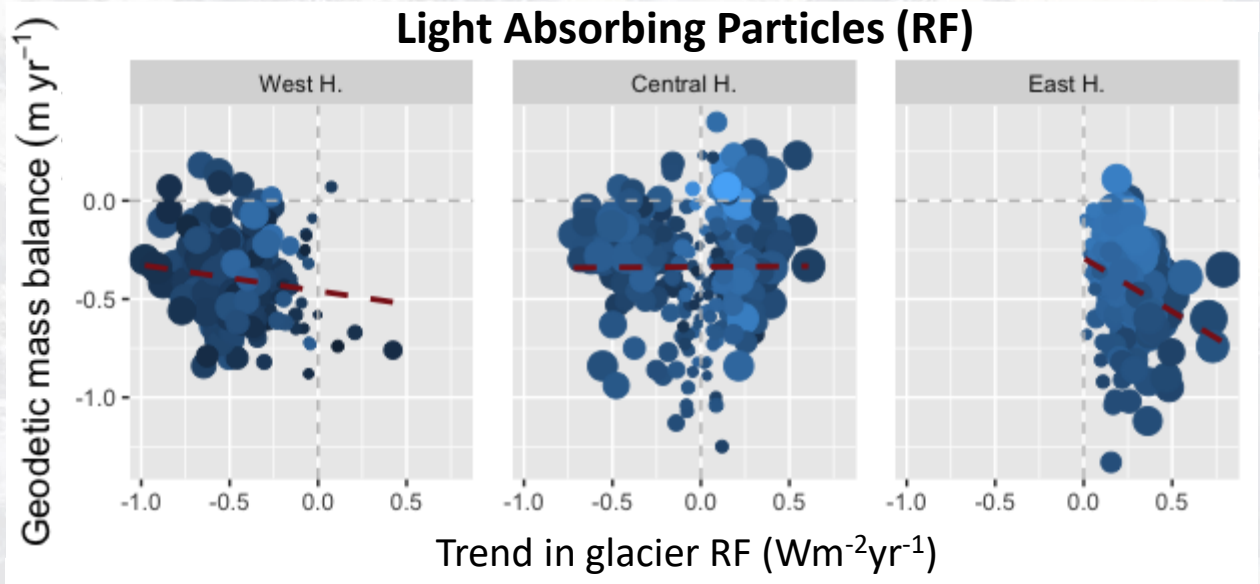
High elevation meteorological stations	Temperature trends (C/decade) 1975-2000	2000-2016
Chota Sigri	+0.7	+1.2
Dingri	+0.9	+1.4
Kanzalwan, Drass, Patseo	+0.7	+1.0
16 stations in the Himalayas	+0.8	+1.3
90 stations on Tibetan Plateau	+0.6	+1.2
Modeled temperature trends	+0.8	+1.2

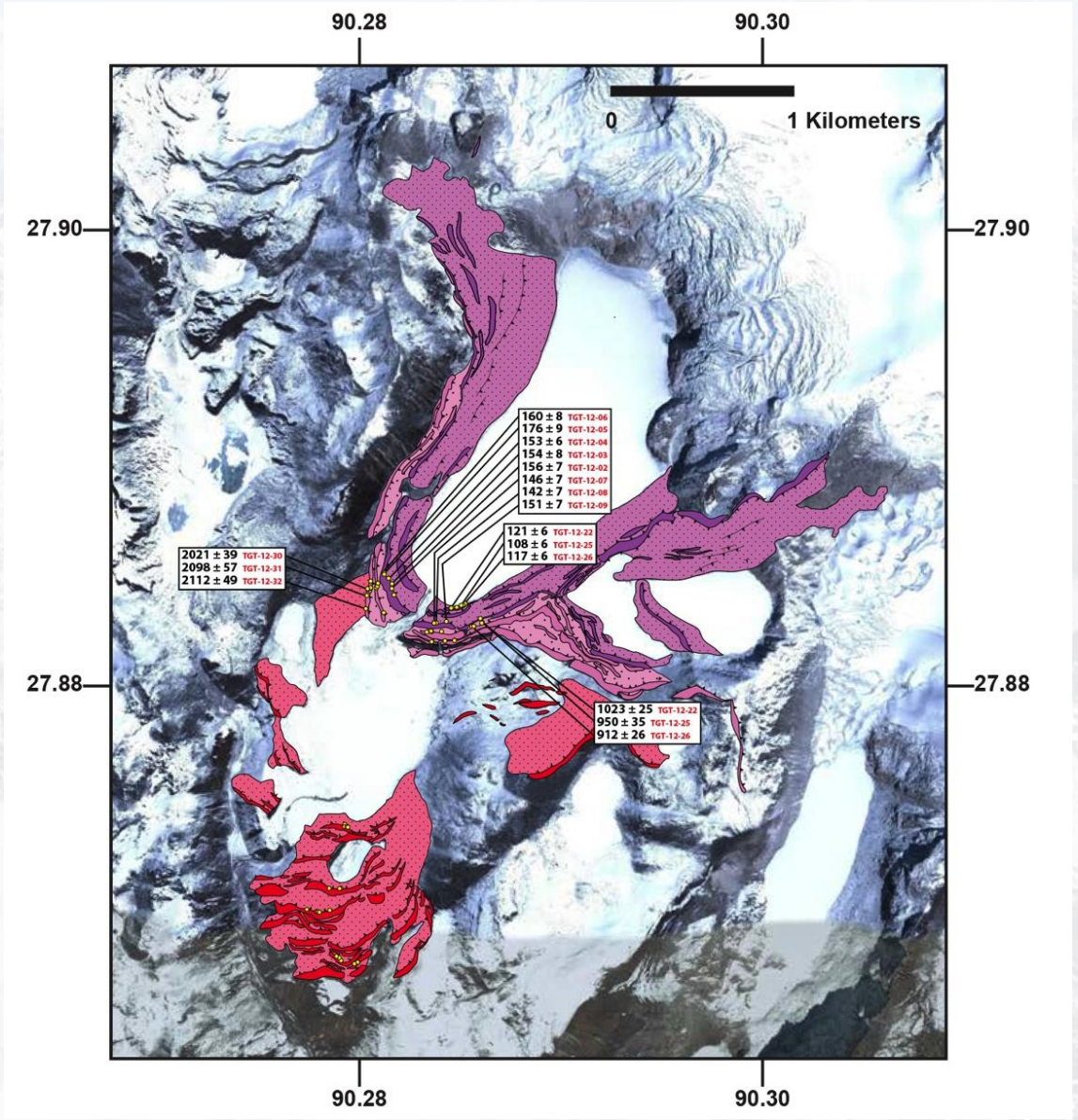
Other potential drivers of loss of glacier ice across the Himalayas?



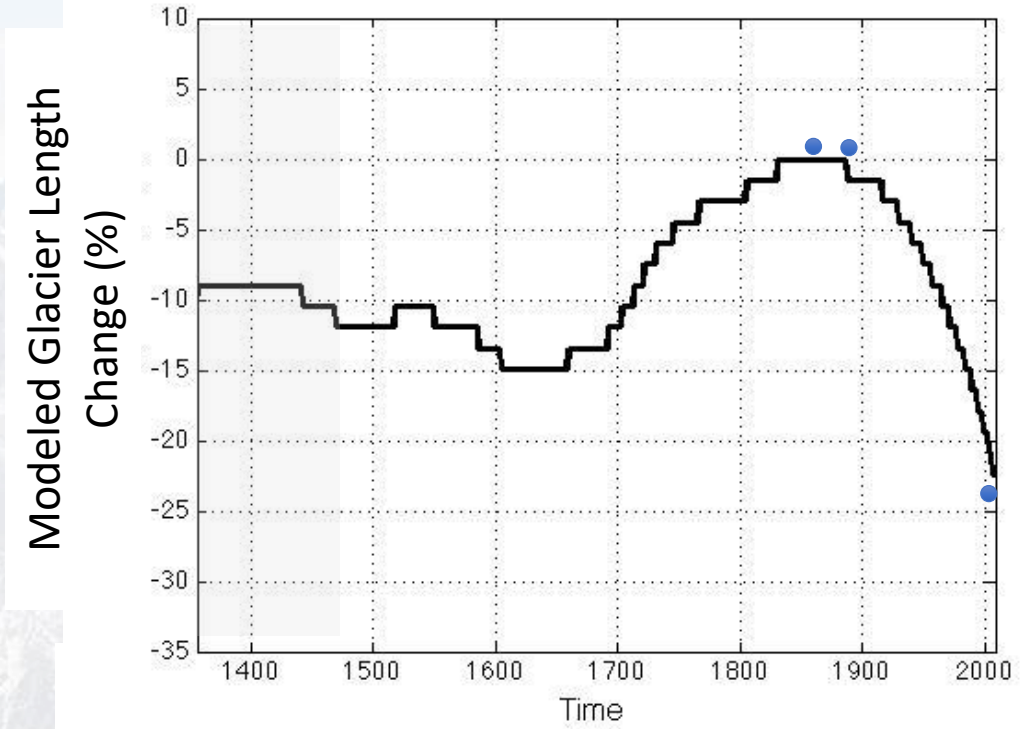
Olson and Rupper, in prep

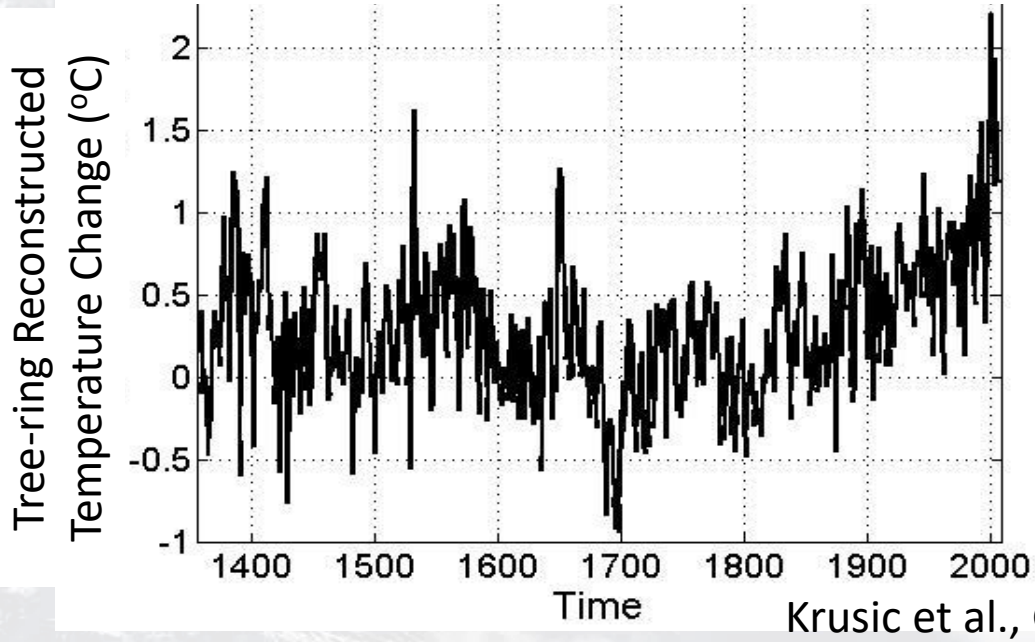






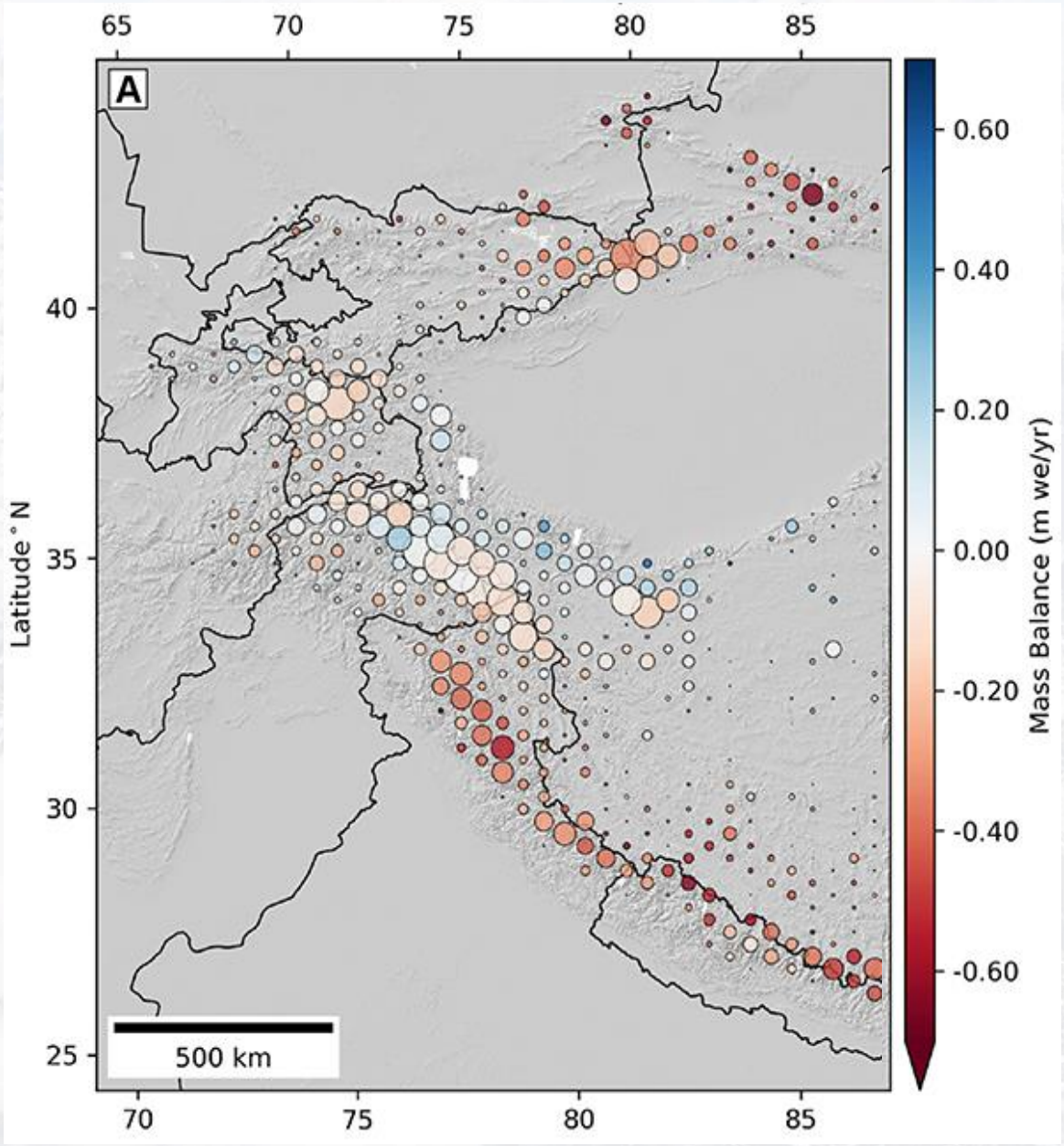
Rupper, Schaefer, Cook, Putnam et al., in prep



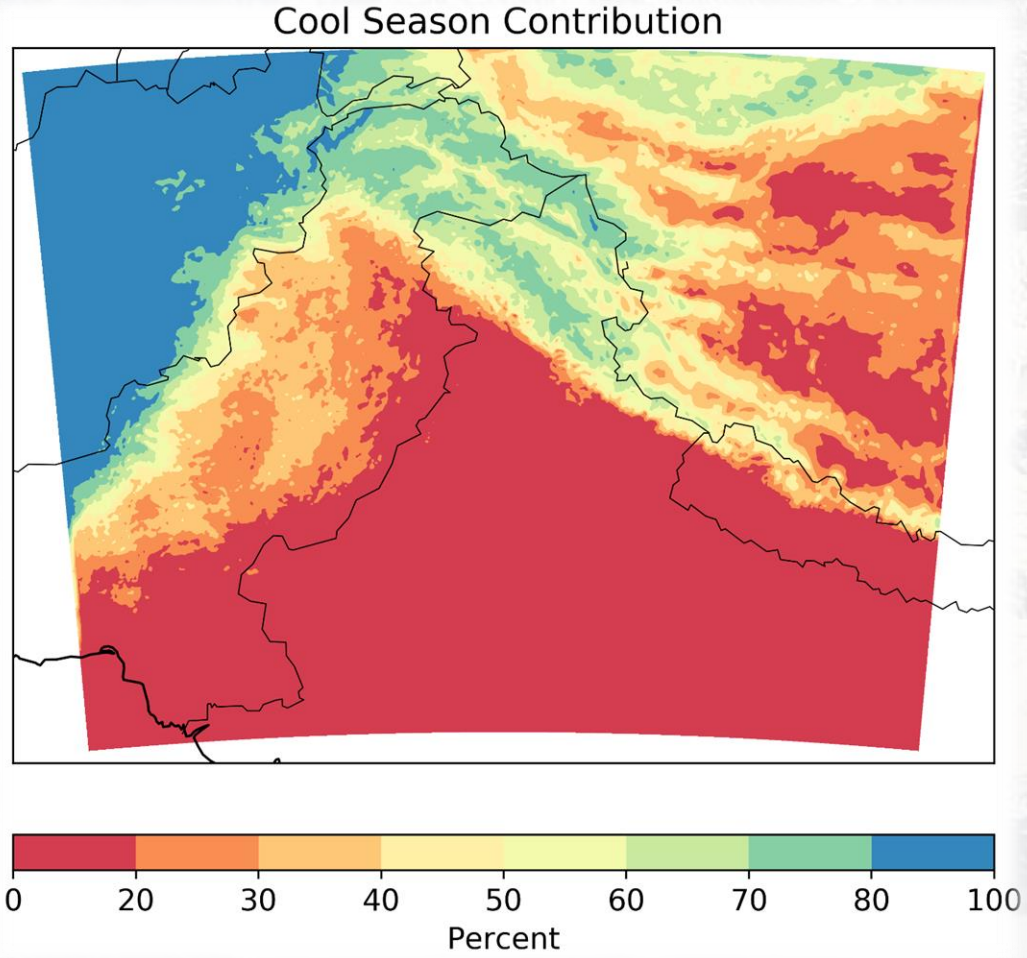


Krusic et al., GRL, 2015

“Karakoram” Anomaly: Regionally more expansive than originally thought

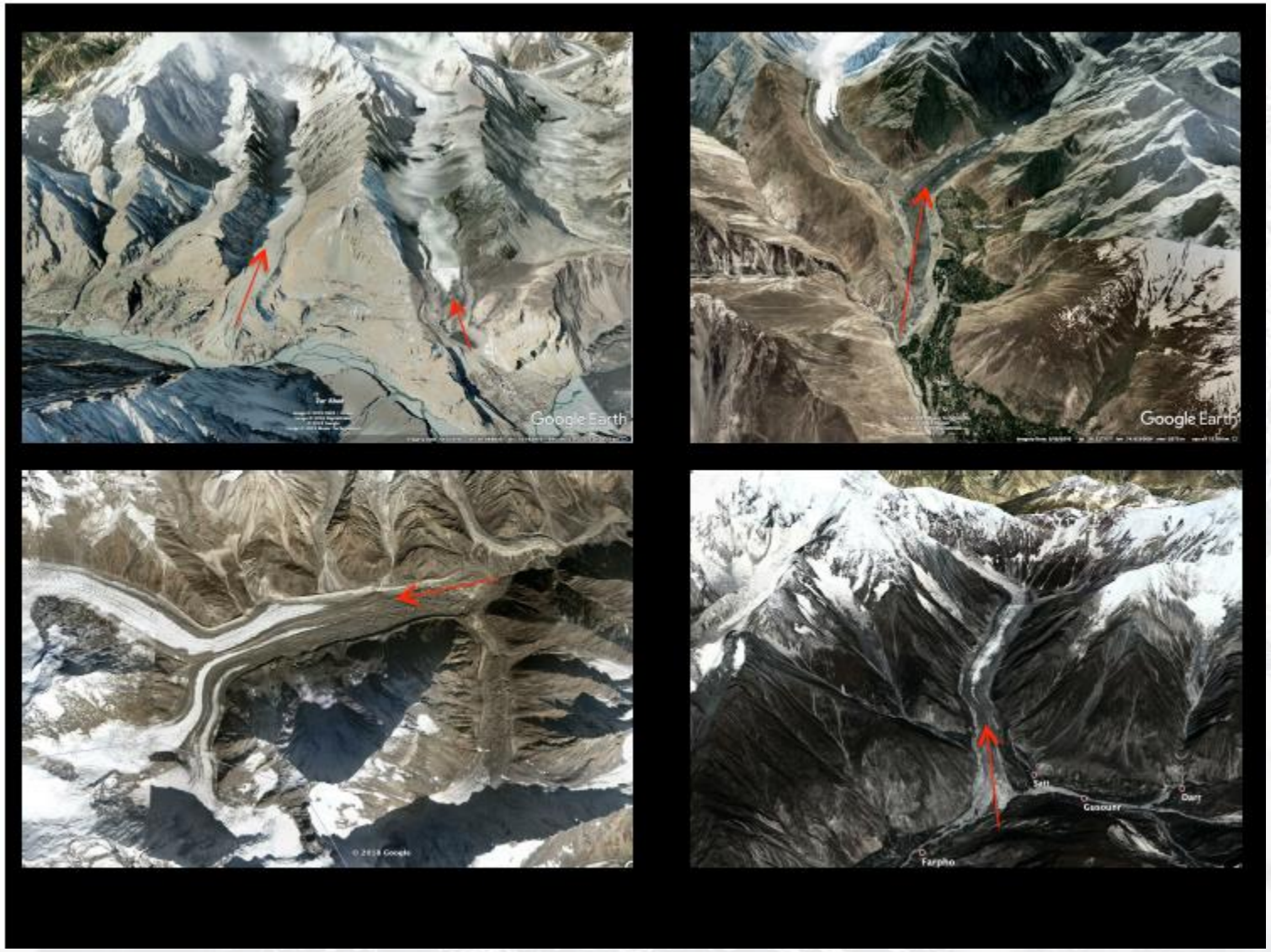


Shean et al., Frontiers of Science, 2020



Riley, Rupper, et al., submitted, JGR

Over what period are the Karakoram glaciers actually an anomaly?



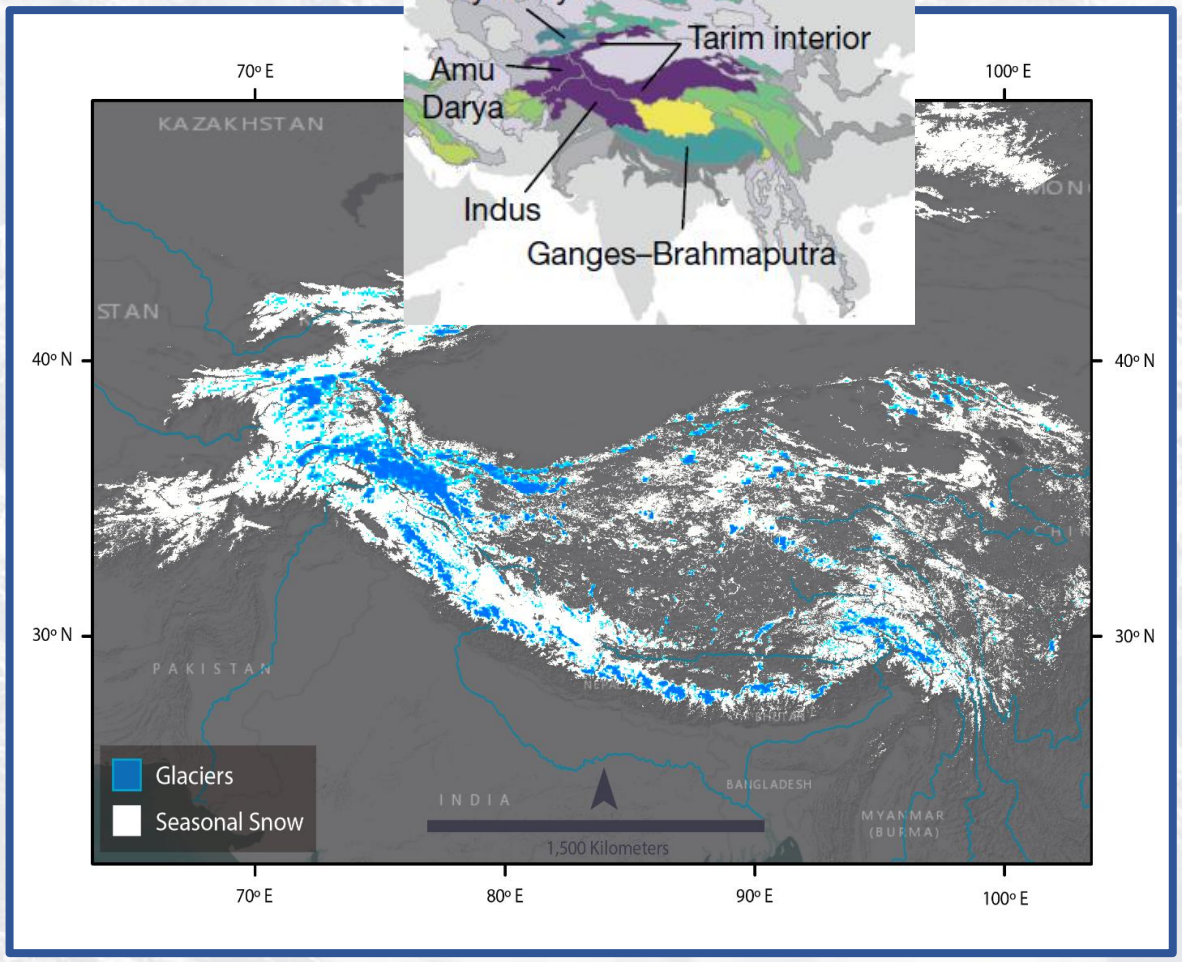
JM Schaefer

Untangling the drivers and timescales of the "Karakoram anomaly"

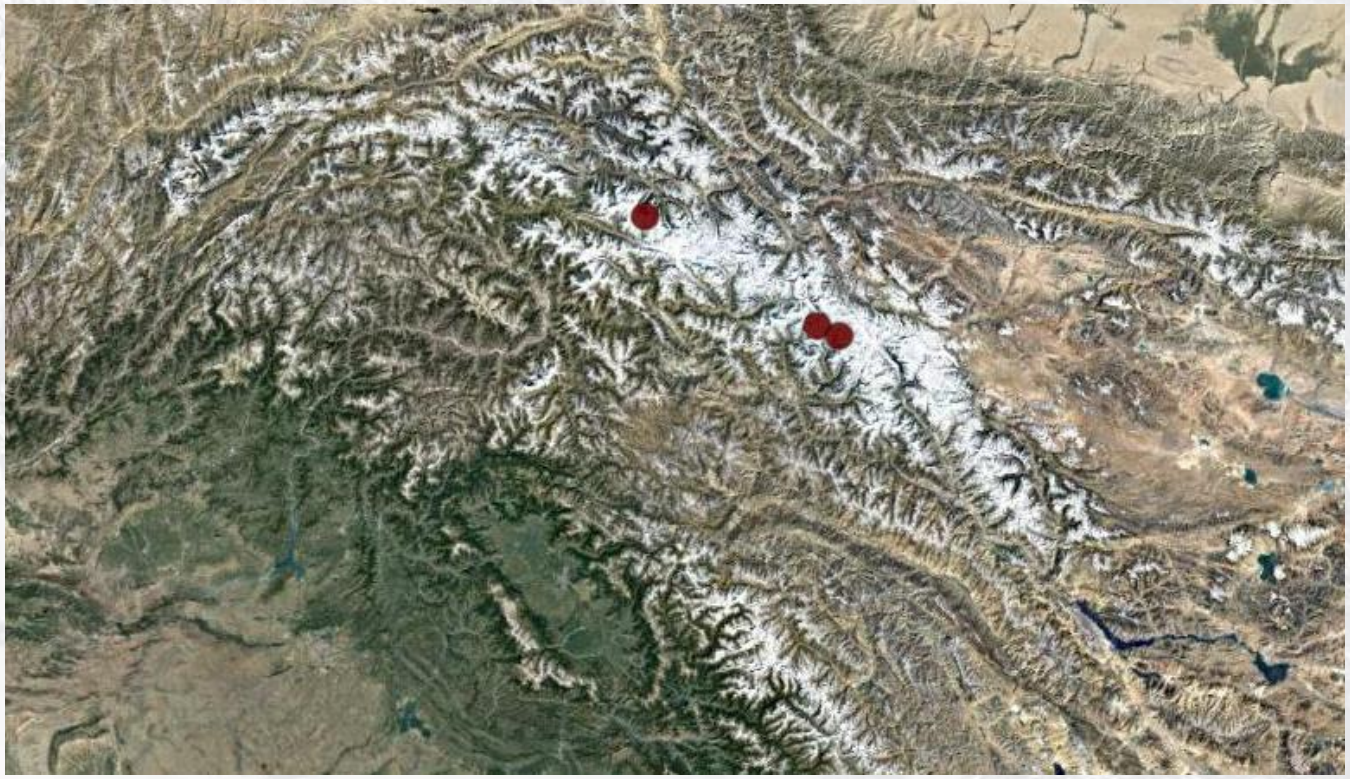
- Integrated approach (with Schaefer, Battisti)
  - Climate and glacier modeling
  - Moraine and bedrock dating
  - Remote sensing and in situ glacier measurements

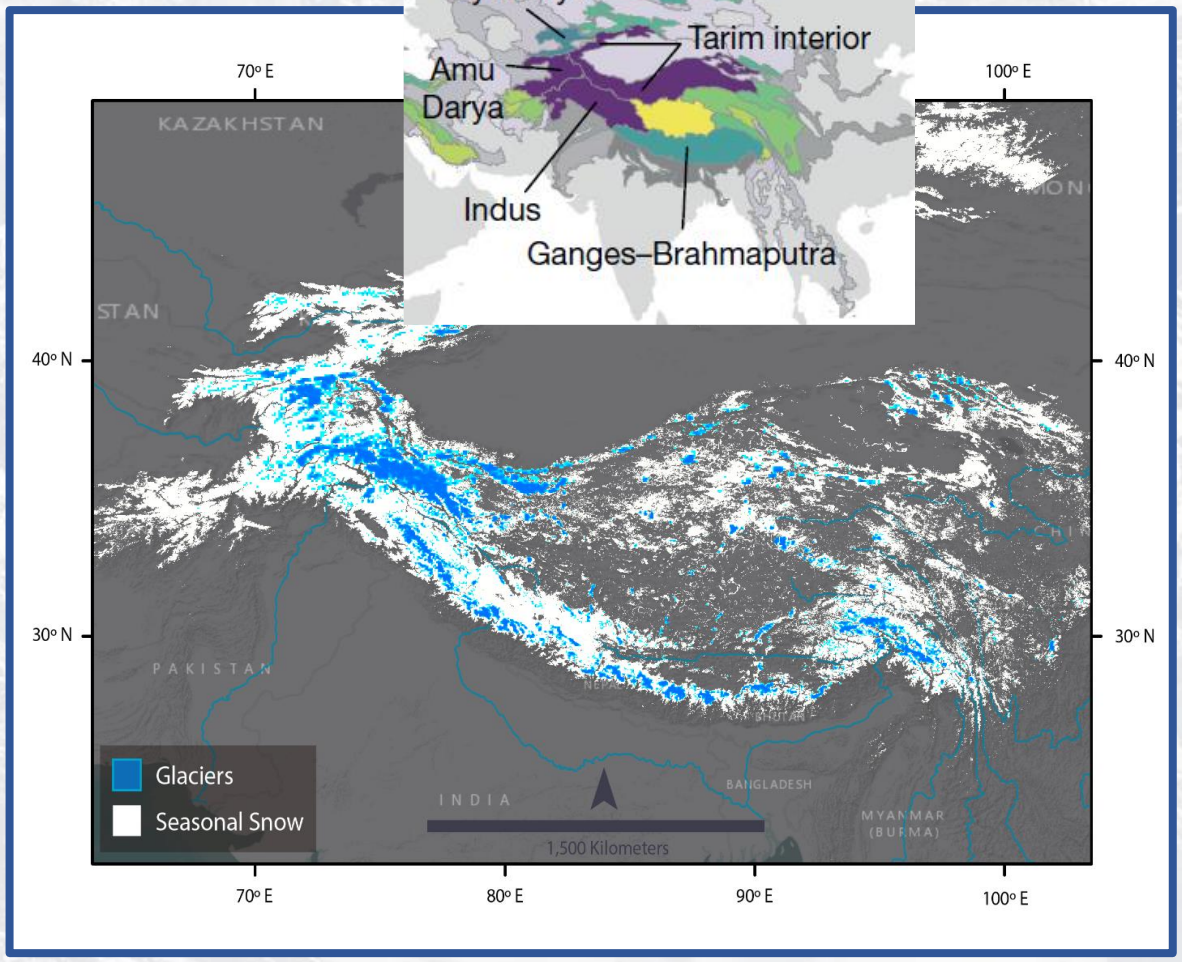
- Ice core drilling targets/goals
  - Reconstruct climate variability and trends over timescales relevant for glacier response
  - Determine when and how often region has been ice free

- Ice core drill needs to be
  - Reasonably lightweight, portable
  - Able to sample basal ice and subglacial bed rock



Untangling the drivers and timescales of the “Karakoram anomaly”





Other Scientific Foci for Ice Cores in HMA

- Monsoon reconstruction
- Aerosols, particularly dust
- Ice Free Himalayas – when and how long
- Heavy metals stored in glaciers