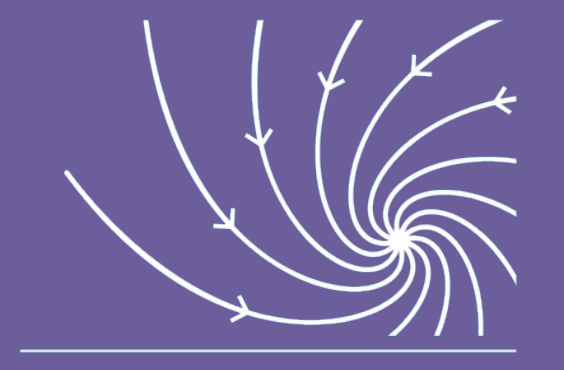


Sensitivity of Folgefonna ice cap to anthropogenic climate change

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How well can we simulate smaller glaciers with current climate models?

What is the future of Norwegian glaciers?

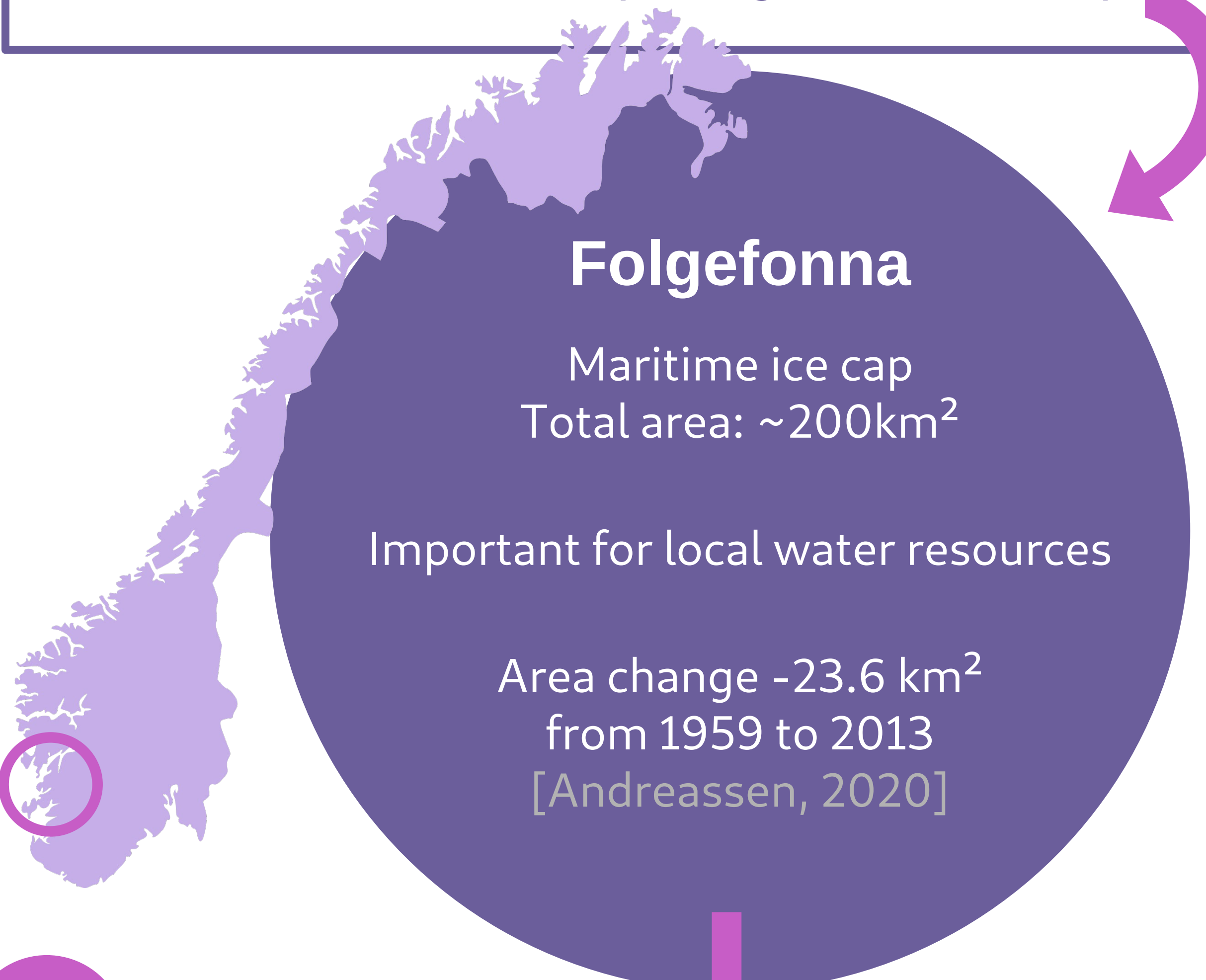
Case study: Folgefonna ice cap

Folgefonna

Maritime ice cap
Total area: ~200km²

Important for local water resources

Area change -23.6 km²
from 1959 to 2013
[Andreassen, 2020]



2

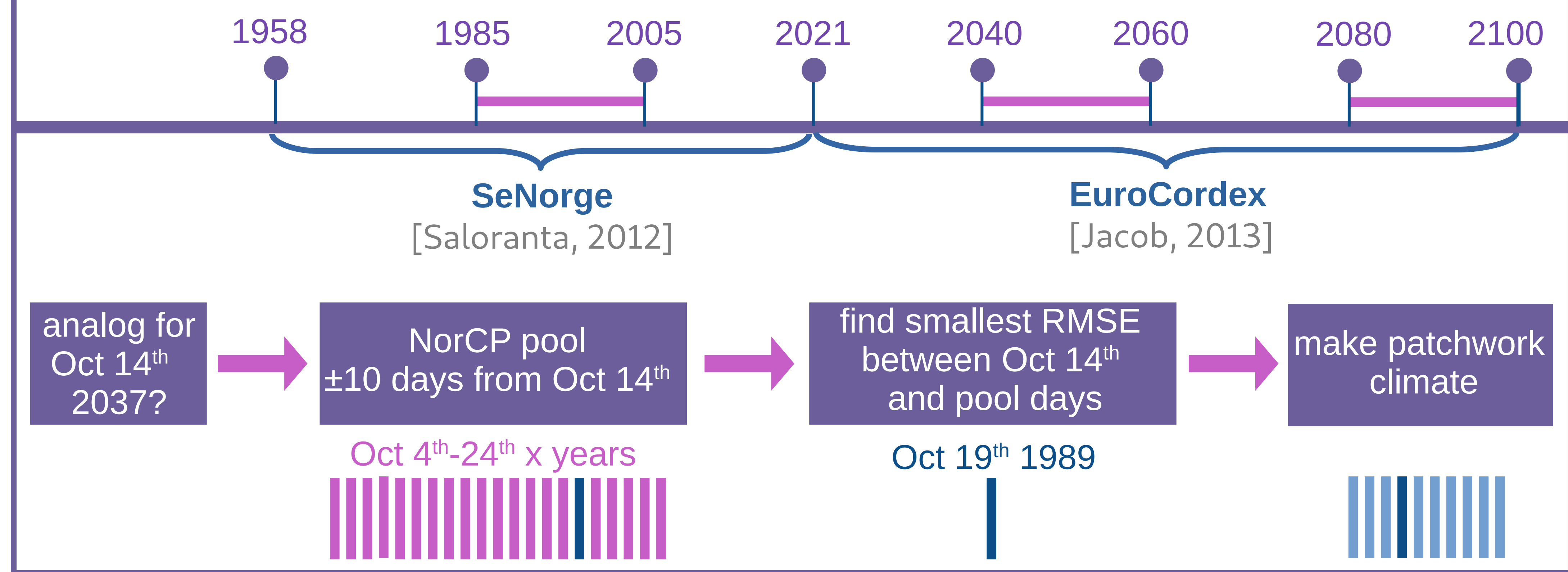
Gap filling method for climate data

Climate forcing of SMB: NorCP [Lind, 2020]

RCP 4.5 and 8.5, 21 year runs → how do we fill the gaps?

Averaging schemes give too high SMB and unrealistic climate

Instead: Use dataset that covers gaps to determine best daily analogs within NorCP



3

1

Surface Mass Balance (SMB) modeling

How sensitive is Folgefonna to climate change?

BeSSi

Bergen Snow Simulator [Born, 2019]
Physically based snowpack and SMB model under continuous development

GitHub: <https://git.app.uib.no/melt-team-bergen/bessi>

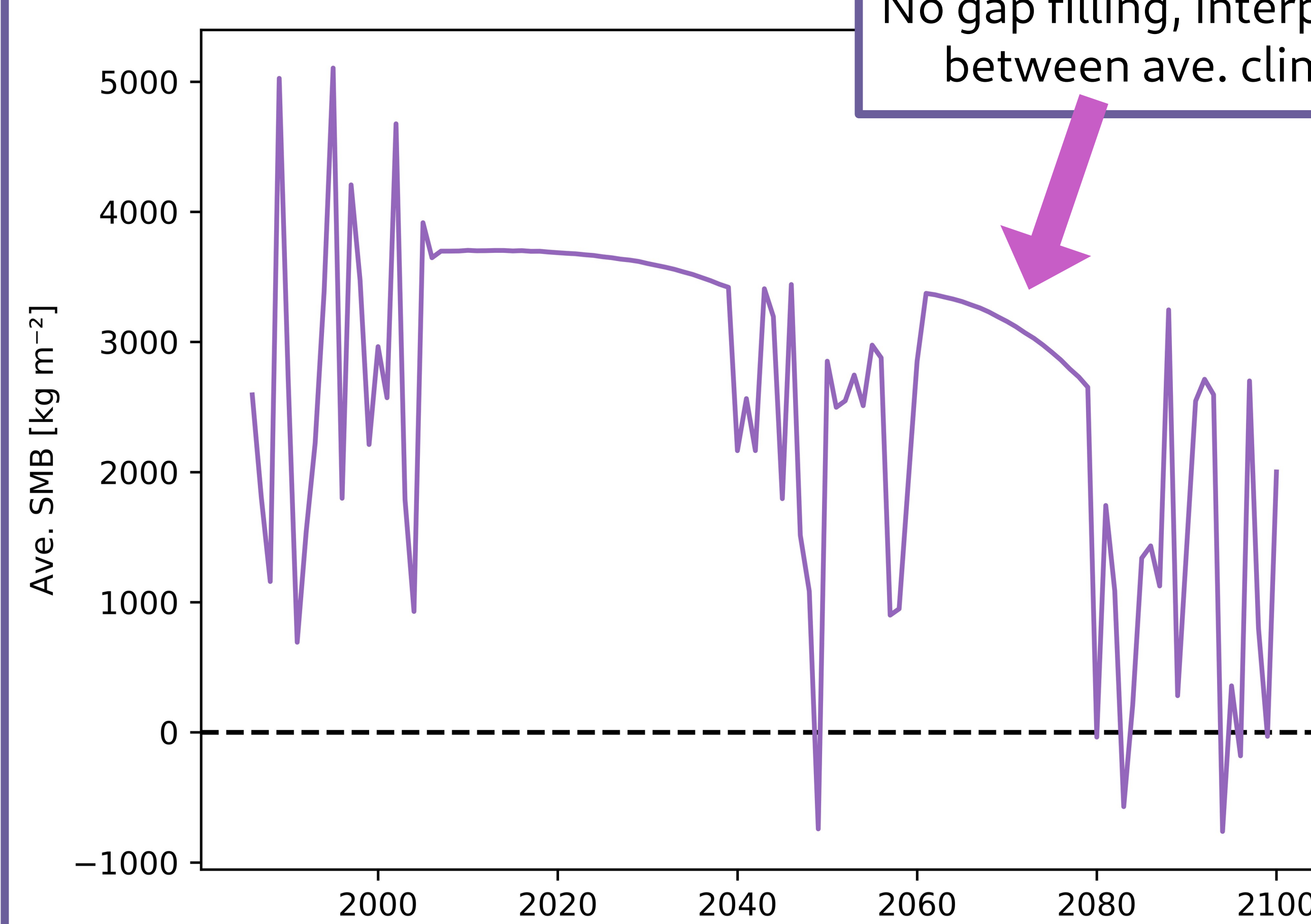
Model setup

100 m grid resolution

Calibration: 1958 – today (current work)
Adjusting BeSSi parameters to Folgefonna from Greenland climate

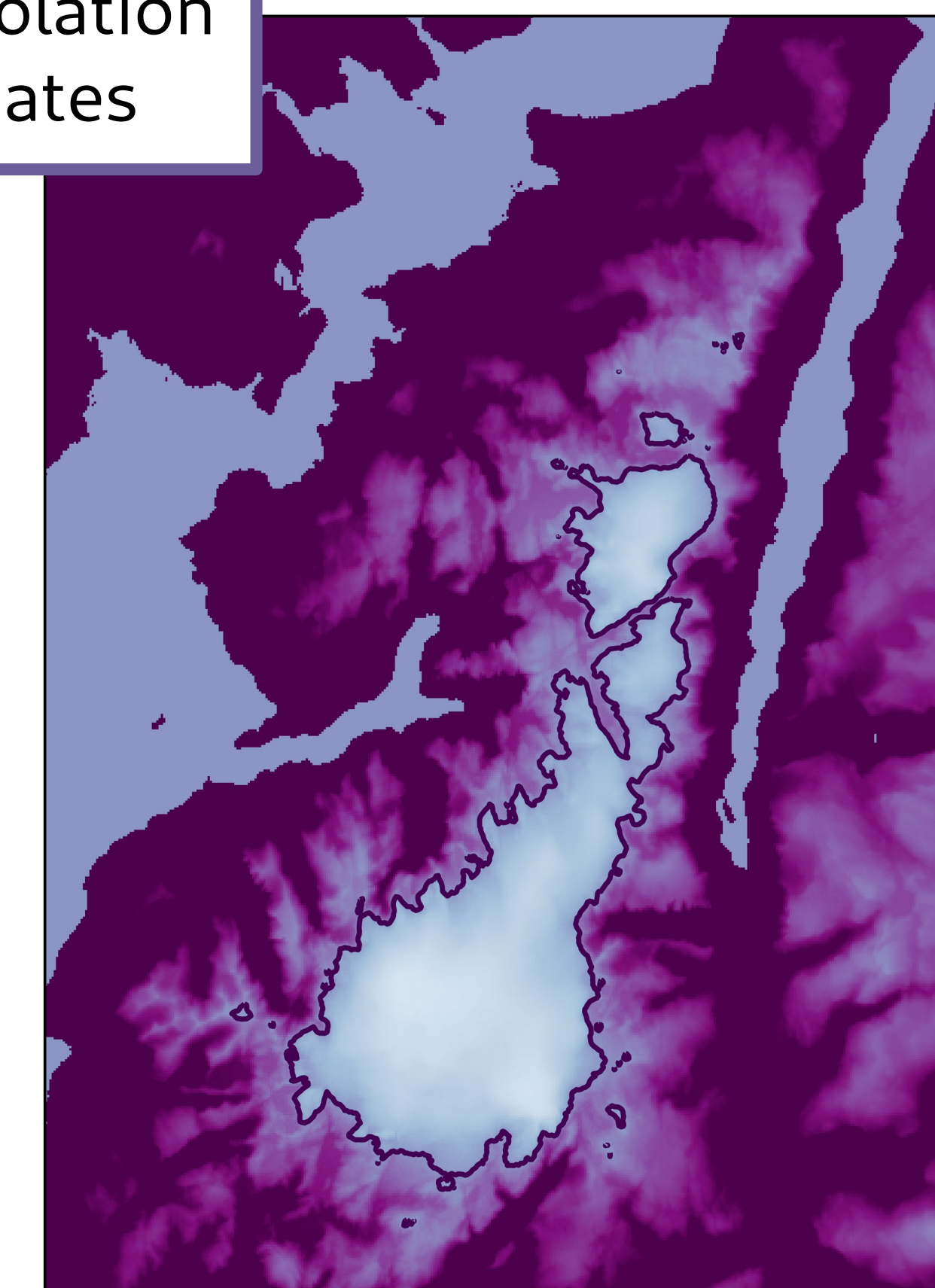
Future: today – 2100

Preliminary results (RCP 4.5)



Ave. gaps give higher SMB than in NorCP years
In general positive → not what we expect

No gap filling, interpolation between ave. climates



Ave. SMB for 2080-2100
Black line marks ELA

!

Suspiciously positive SMB

Calibration of parameters to Folgefonna climate is needed

Averaging of climate yields unreasonably high SMB

Preserving climate variability (for example by gap filling) is important

