BJERKNES CENTRE
for Climate Research

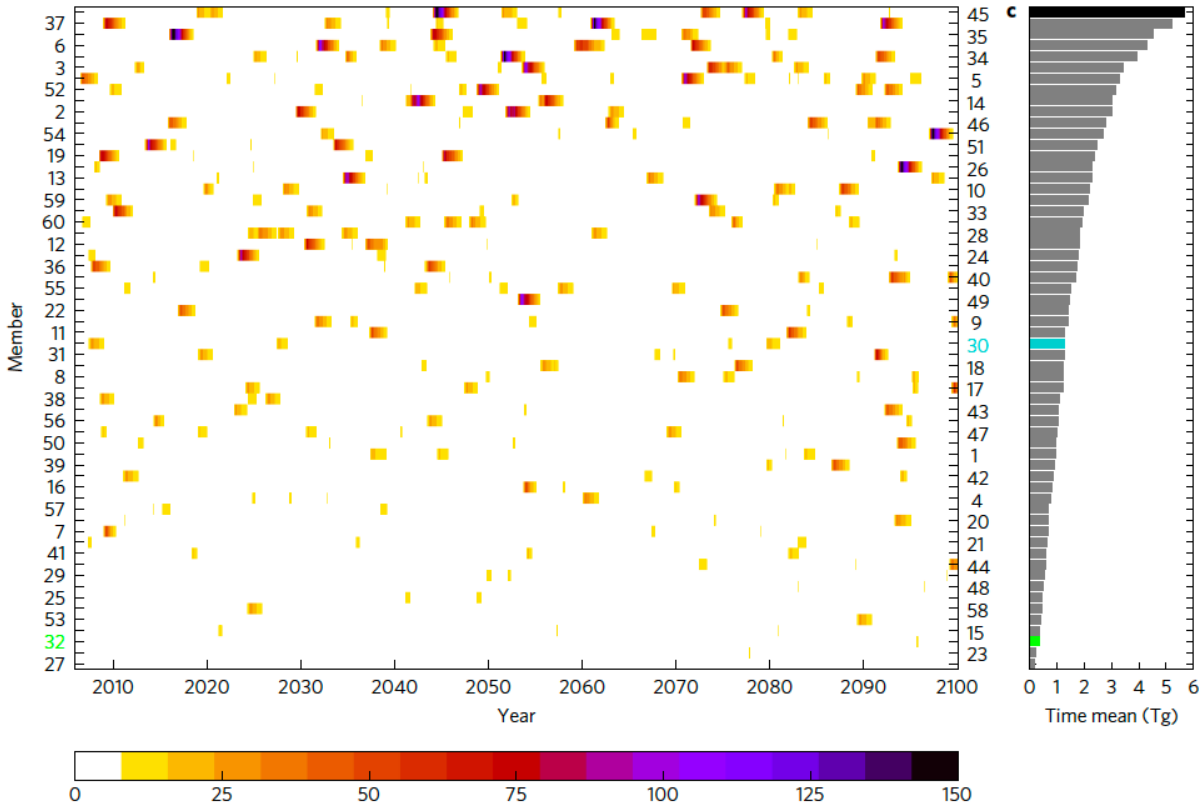
HOW WILL WE KNOW WE HAVE REACHED 1.5?

4.5.3 Assessment of sensitivity to plausible volcanic futures

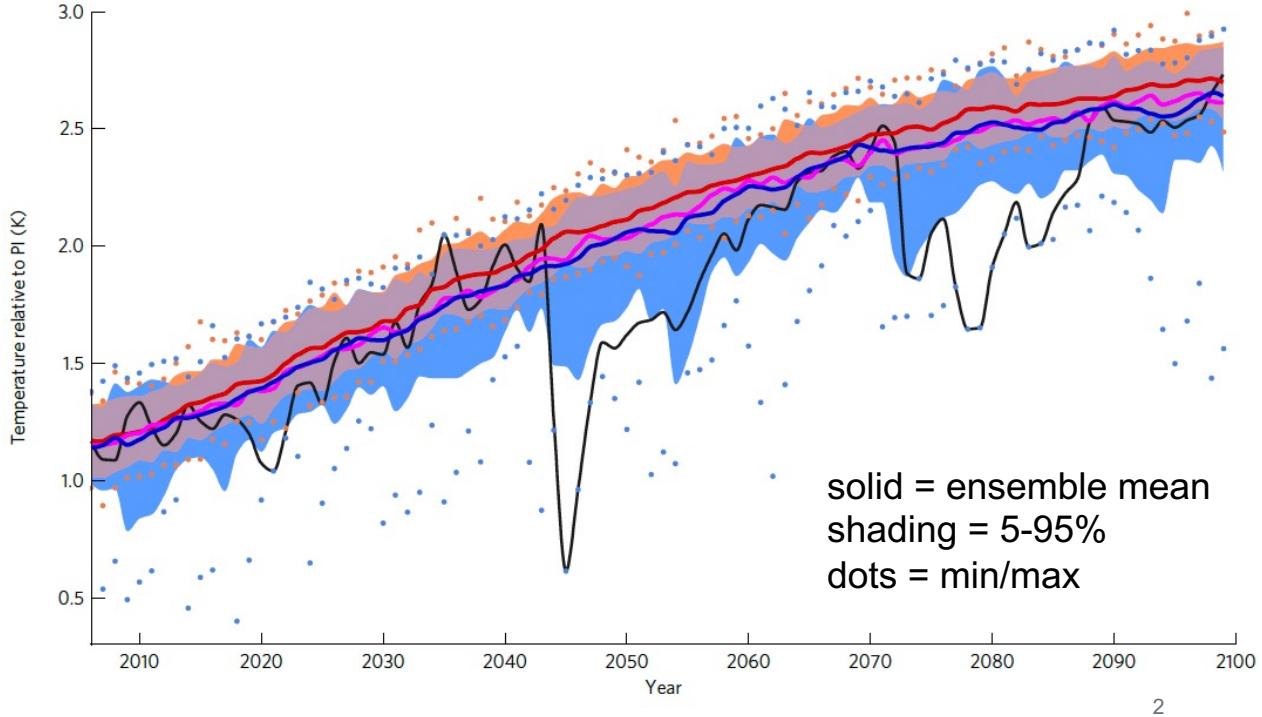
Bethke et al. 2017 – 21st Century projections using realistic volcanic forcing variability

rcp45NoVolc	2006-2099, 60 members, no volcanic forcing
rcp45VolcConst	2006-2099, 60 members, constant (1850-2005-mean) volcanic forcing
rcp45Volc	2006-2099, 60 members, 60 ice core-based volcanic forcing futures

Volcanic forcing



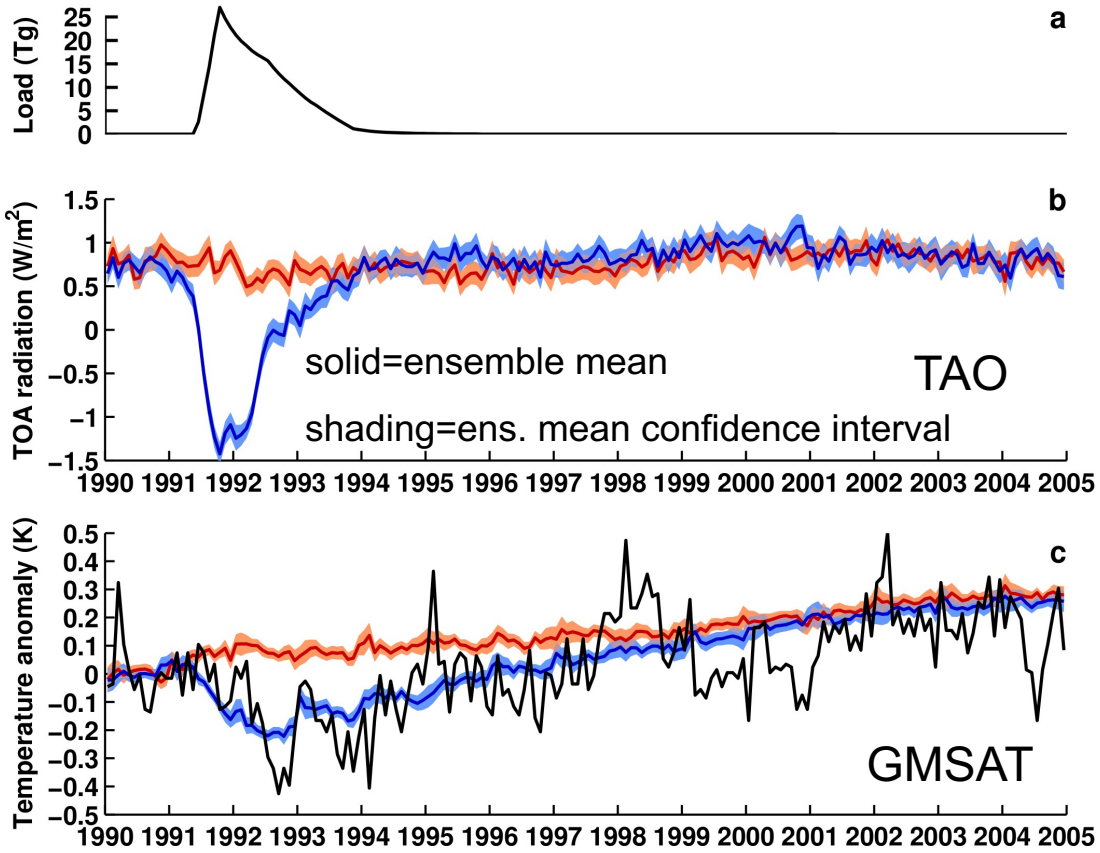
Annual GMSAT



Bethke et al. 2017 – 21st Century projections using realistic volcanic forcing variability

historicalVolc 1980-2005, 60 members, historical volcanic forcing

historicalNoVolc 1980-2004, 60 members, no volcanic forcing



Paper: https://doi.org/10.1038/nclimate3394

Output: https://ns9039k.web.sigma2.no/datapeak/ingo/ThorneEtAl_1.5deg/BethkeEtAl2017/readme

Sospedra-Alfonso et al. 2024 – Decadal prediction centers prepare for a major volcanic eruption

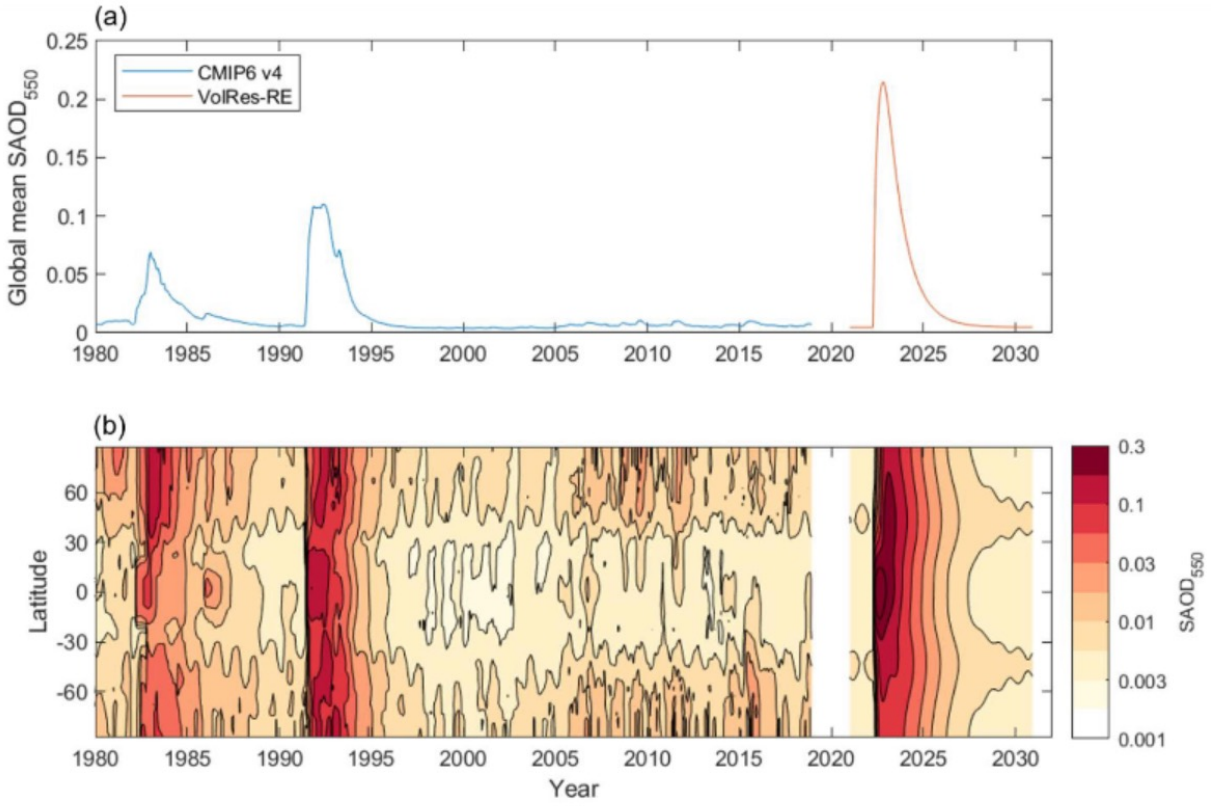
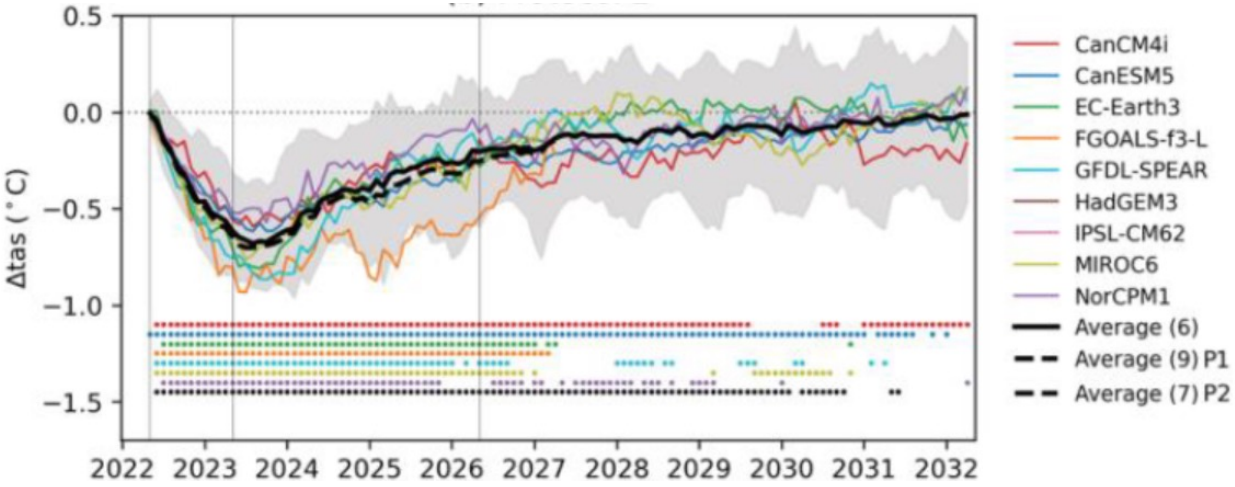


Figure 2: (a) Global mean stratospheric aerosol optical depth (SAOD) at 550 nm from version 4 of the CMIP6 volcanic aerosol forcing dataset (1980-2018), including from the climatically impactful eruptions of El Chichón in 1982 and Mount Pinatubo in 1991 (blue), and from the hypothetical VolRes-RE eruption from 2021 to 2030 (orange). (b) Same forcings as in (a), displayed in terms of zonal mean SAOD at 550 nm as a function of time and latitude.

- 8 climate prediction models, 10 member per model
- 2022-2032 decadal forecast with hypothetical eruption
- 2022-2032 decadal forecast with no eruption



Paper: https://doi.org/10.1175/BAMS-D-23-0111.1

Output: https://crd-data-donnees-rdc.ec.gc.ca/CCCMA/products/VolRes-RE