Antarctic snowfall variability and forced change

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Snowfall 2229 Gt/yr* 6.1 mm/yr SLD

Sublimation Calving Shelf Melt

*Van Wessem et al., 2017

Snowfall **Sublimation** 2229 Gt/yr* Calving **Shelf Melt** 6.1 mm/yr SLD SLR **3.2 mm/yr** *Van Wessem et al., 2017 /sealevel.nasa.gov

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Snowfall 2229 Gt/yr* 6.1 mm/yr SLD SLR 3.2 mm/yr

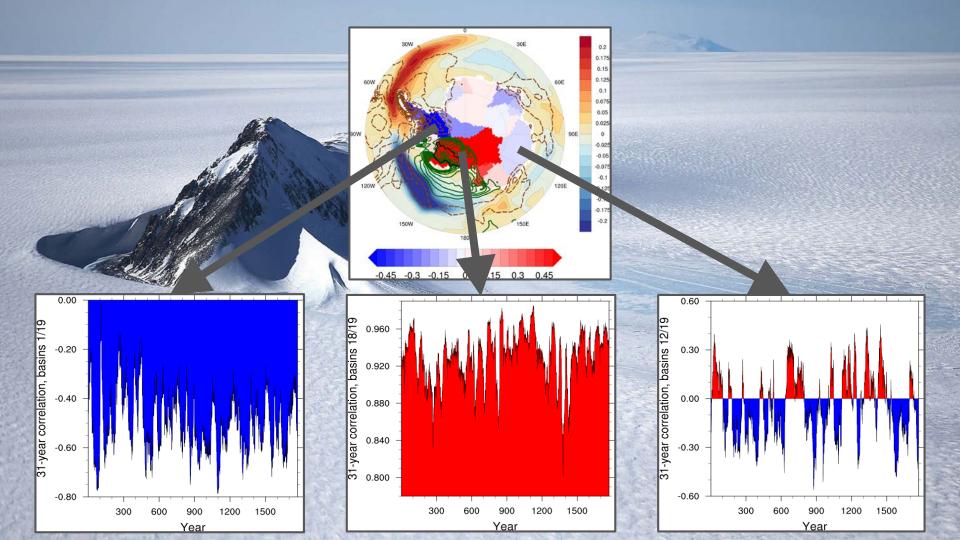
*Van Wessem et al., 2017 ^sealevel.nasa.gov

Patterns in AIS variability controlled by regional atmospheric circulation

(Fyke, Lenaerts and Wang, 2017, The Cryosphere)

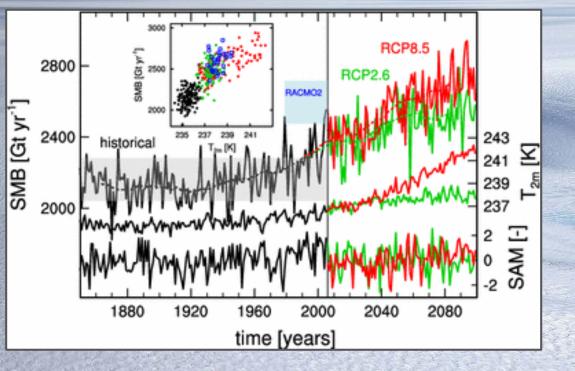
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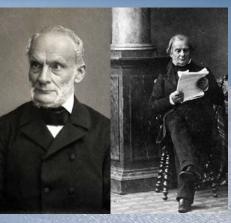
(Fyke et al., 2017, The Cryosphere)



AIS snowfall will strongly increase in response to anthropogenic forcing

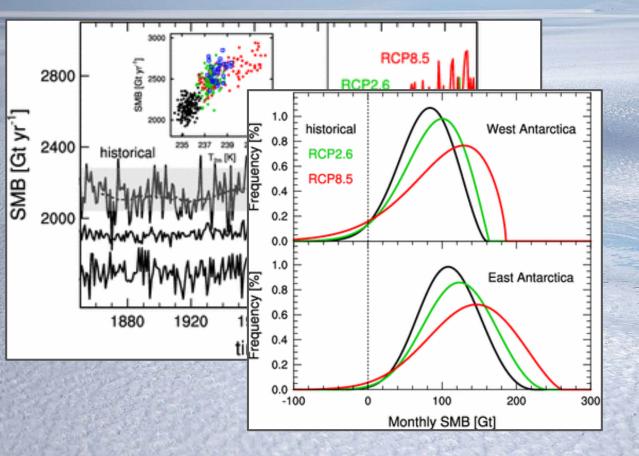
(Lenaerts et al., 2016, Climate Dynamics)

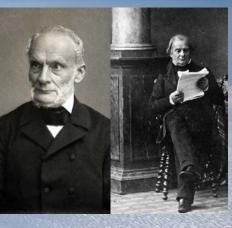




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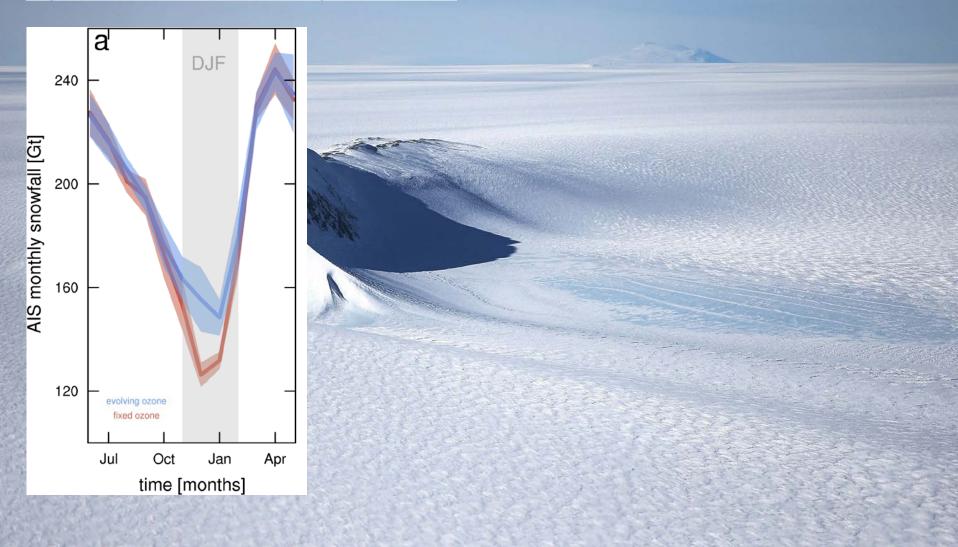
(Lenaerts et al., 2016, Climate Dynamics)





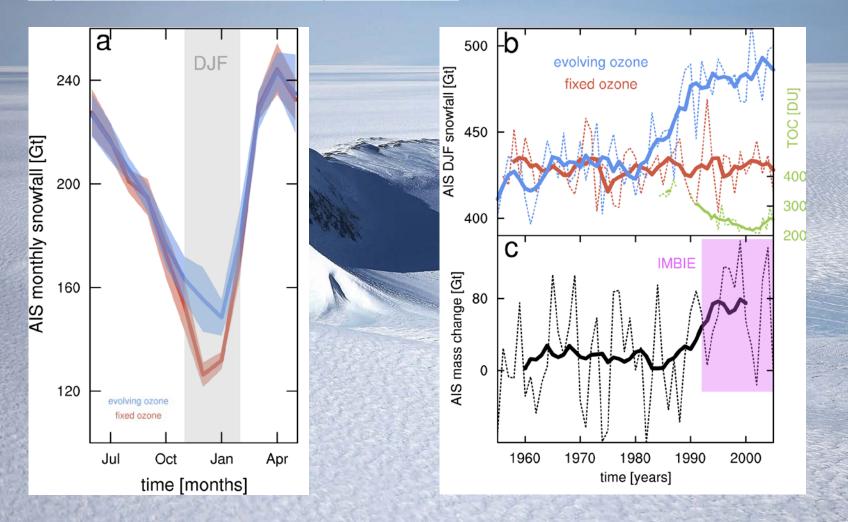
AIS snowfall will strongly increase in response to anthropogenic forcing (Lenaerts et al., 2016, Climate Dynamics) RCP8.5 SMB [Gt yr 2800 2500 RCP2 6 1.0 SMB [Gt yr West Antarctica historical 0.8 2400 historical RCP2.6 0.6 RCP8.5 2000 0.2 0.0 1.0 East Anta 0.8 0.6 90W 1880 1920 0.4 0.2 0.0 -100 0 100 200 Monthly SMB [Gt] SIC trend [days yr1] PR change [%] 20 50 80

Recent snowfall trends display strong ozone signature

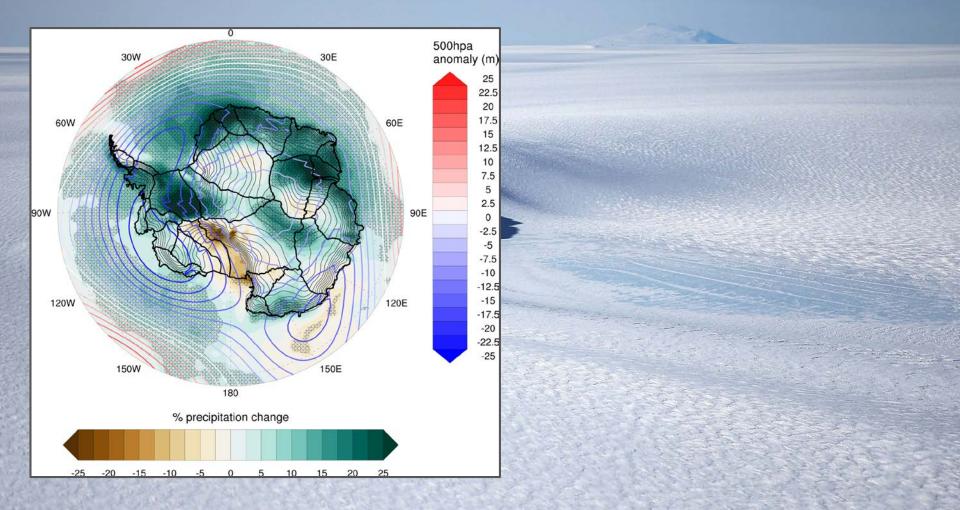


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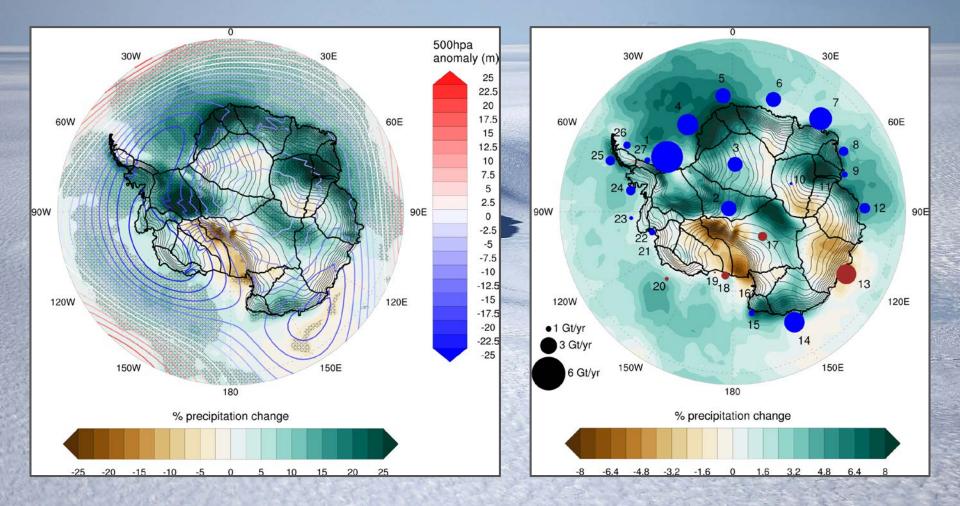
(Fyke/Lenaerts and Medley, in review)



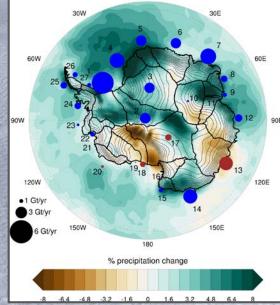
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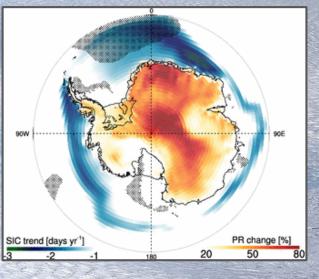
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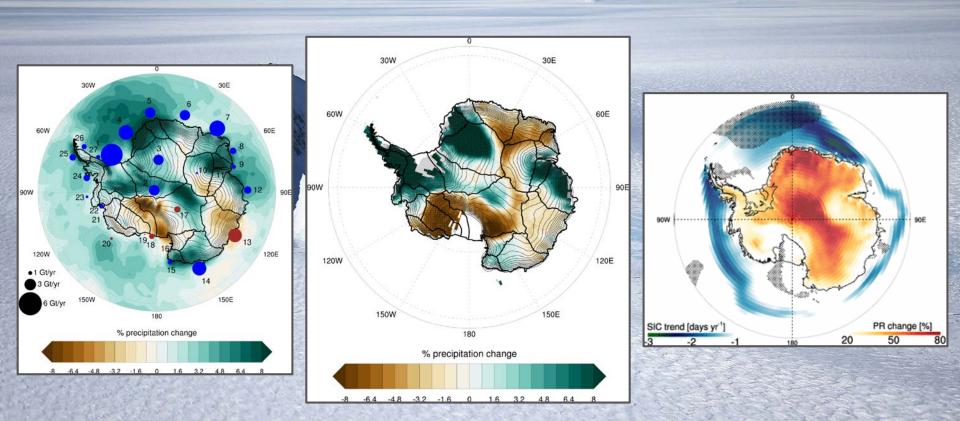
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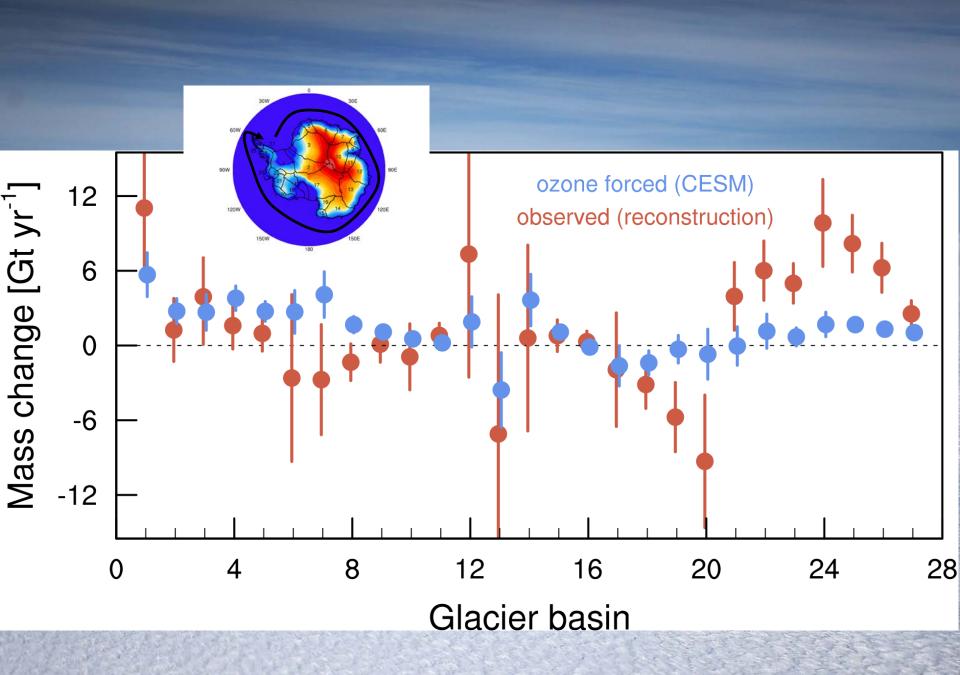


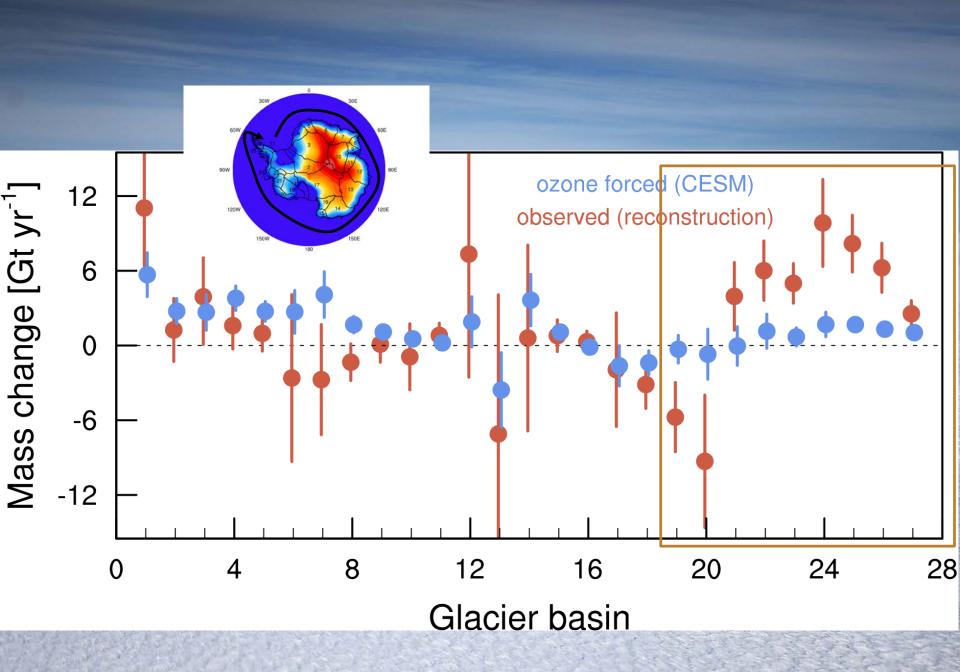




ozone signature







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Antarctic snowfall is important for sea level!

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Future work

- Moisture tracking
- Extreme precipitation analysis
- Single level forcing
- CESM2: better surface melt climate