



KNAW

NTW Domeinmiddag, 2 maart 2020



Mondiaal gemiddelde zeespiegelstijging

...en de toenemende bijdrage van smeltend landijs

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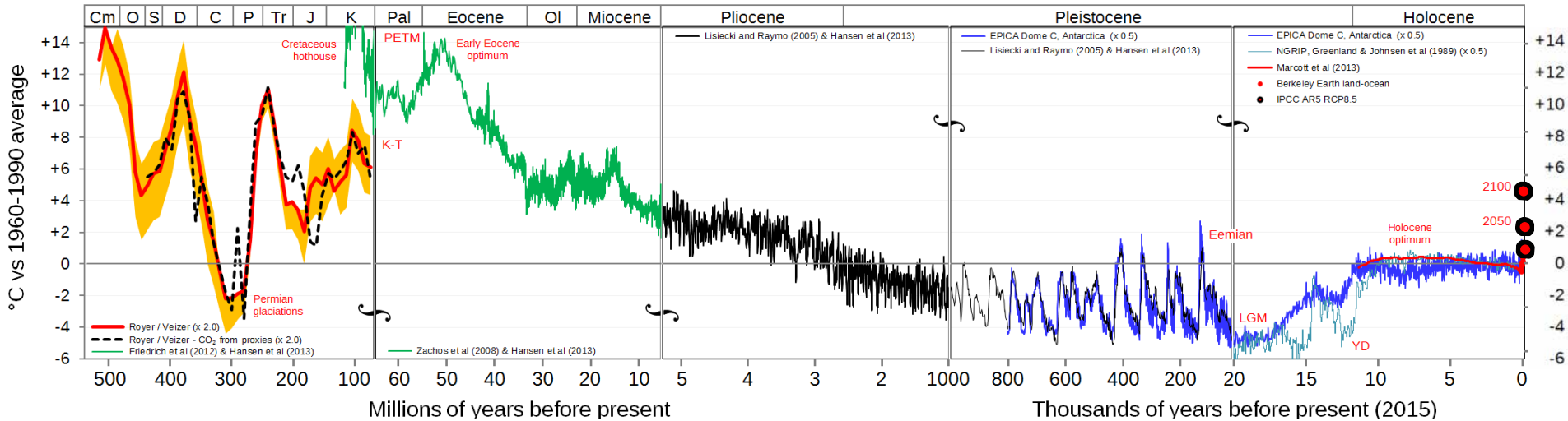


Universiteit Utrecht



We leven in een ijstijd!

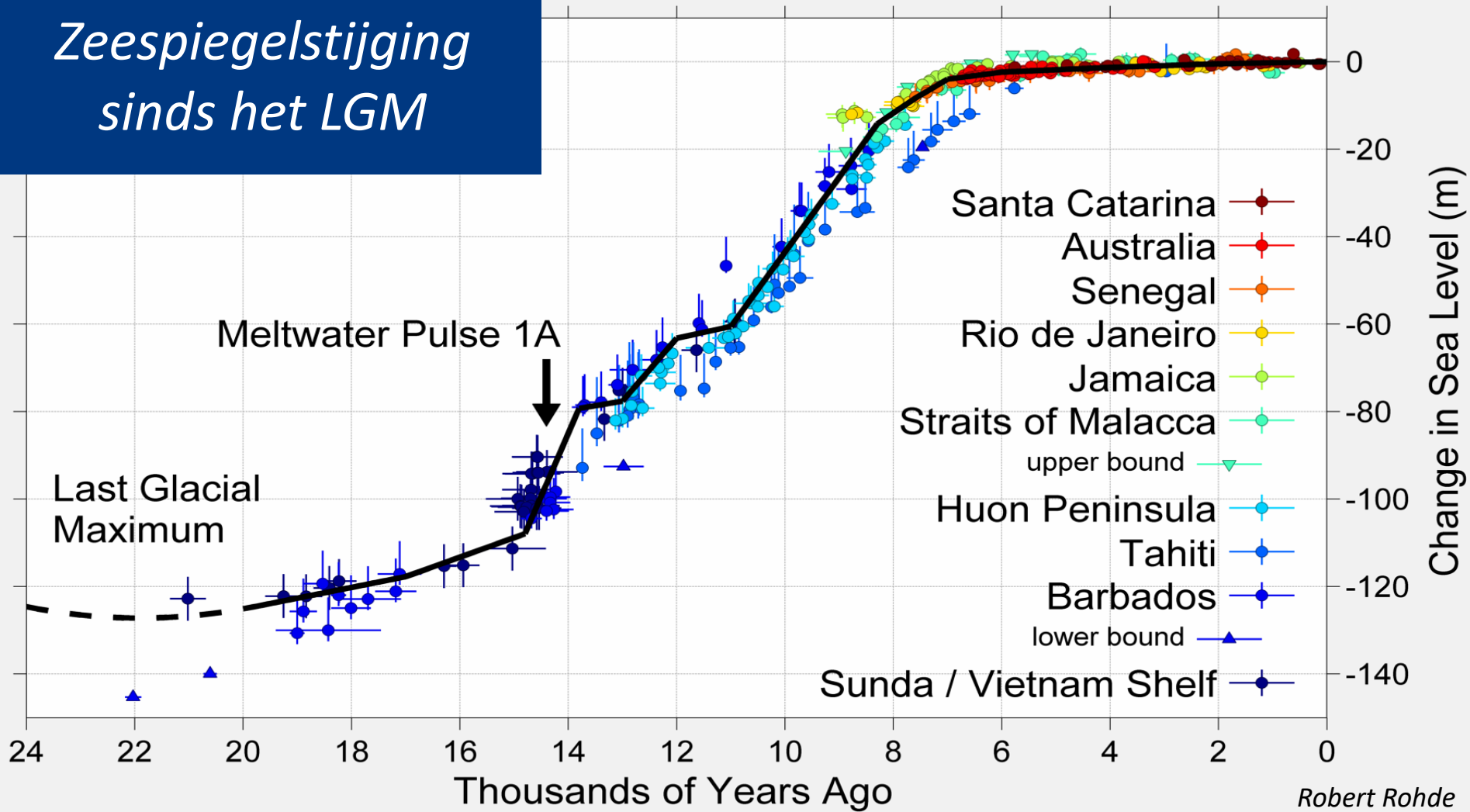
Temperature of Planet Earth



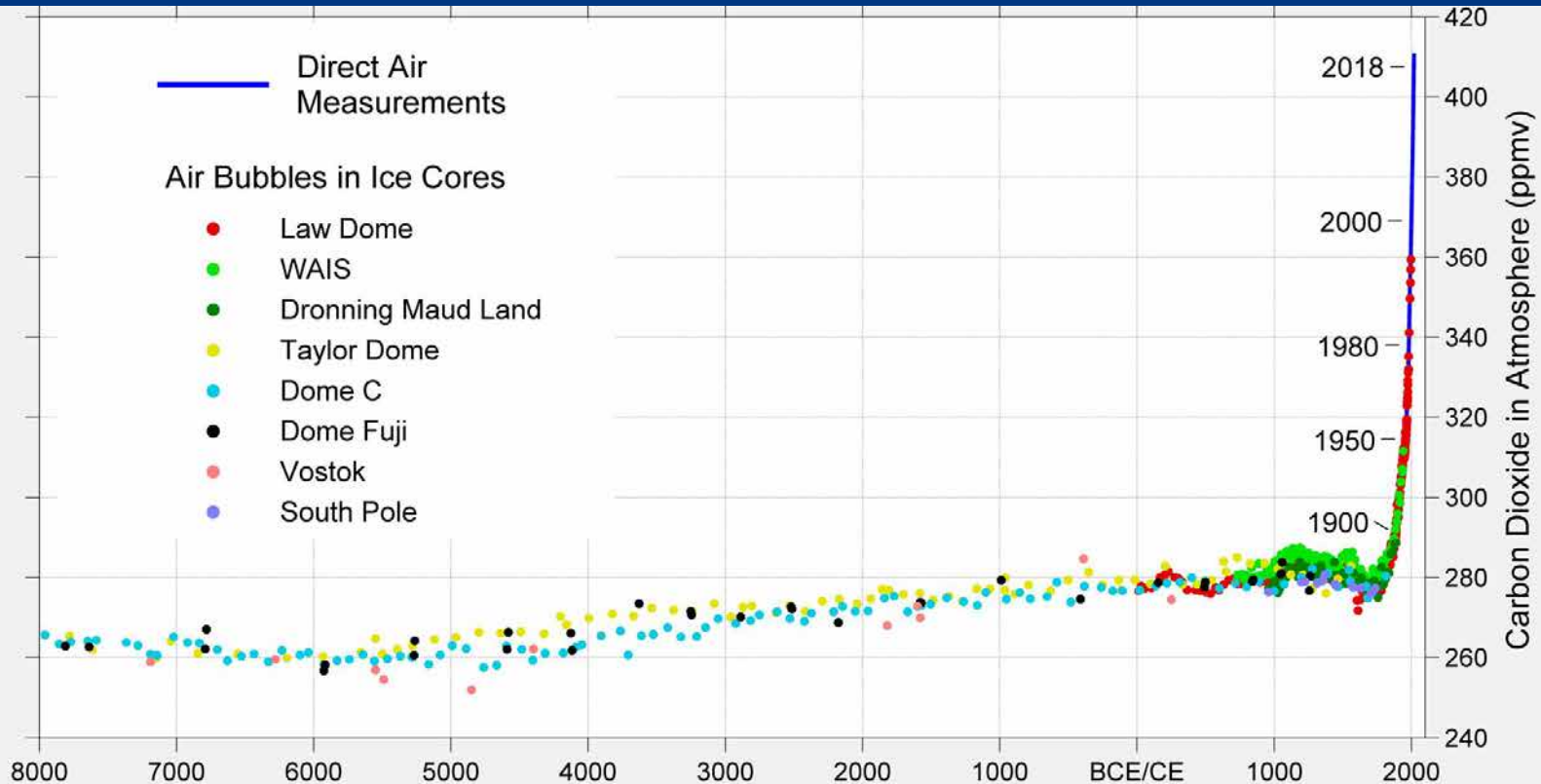
Het laatste glaciale maximum (LGM)



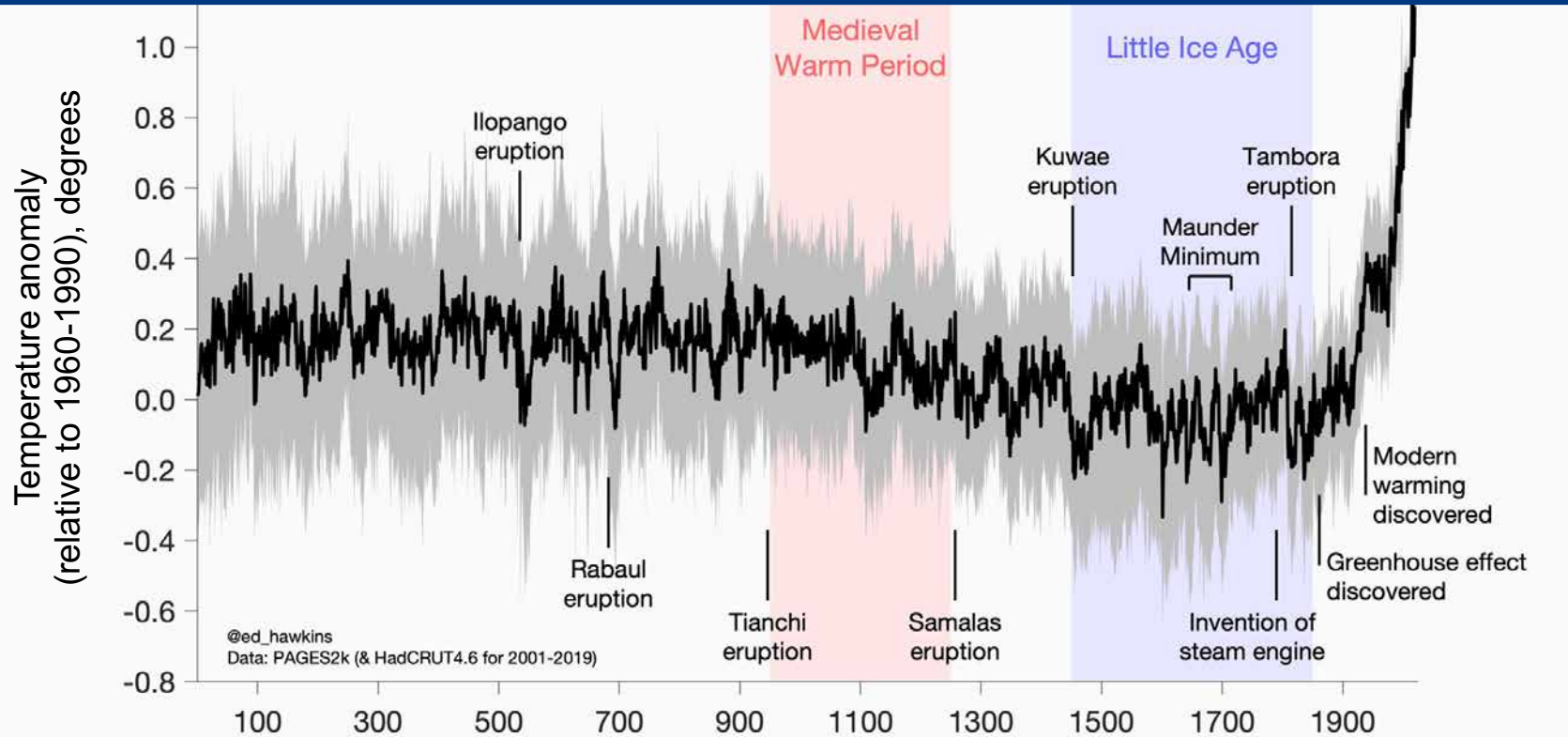
Zeespiegelstijging sinds het LGM



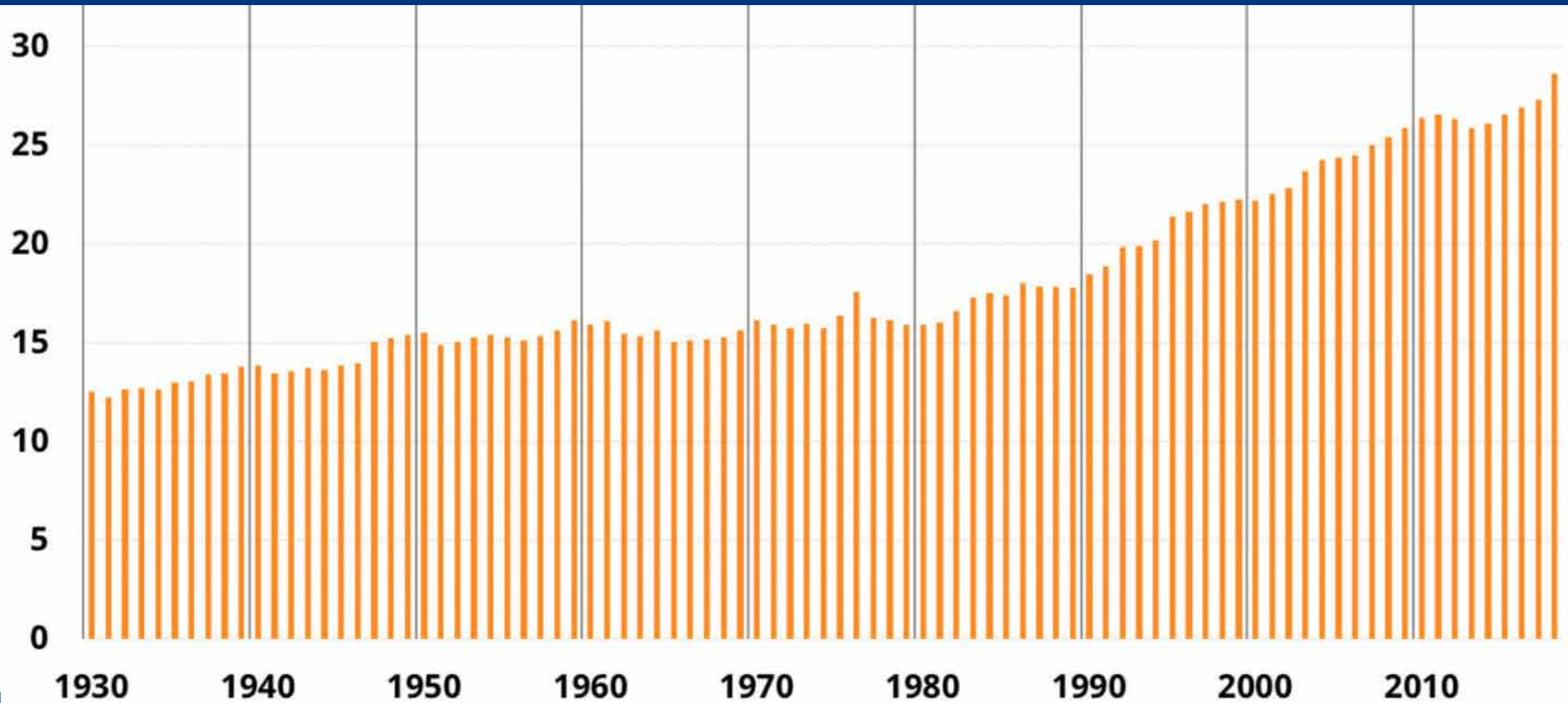
Het Antropoceen



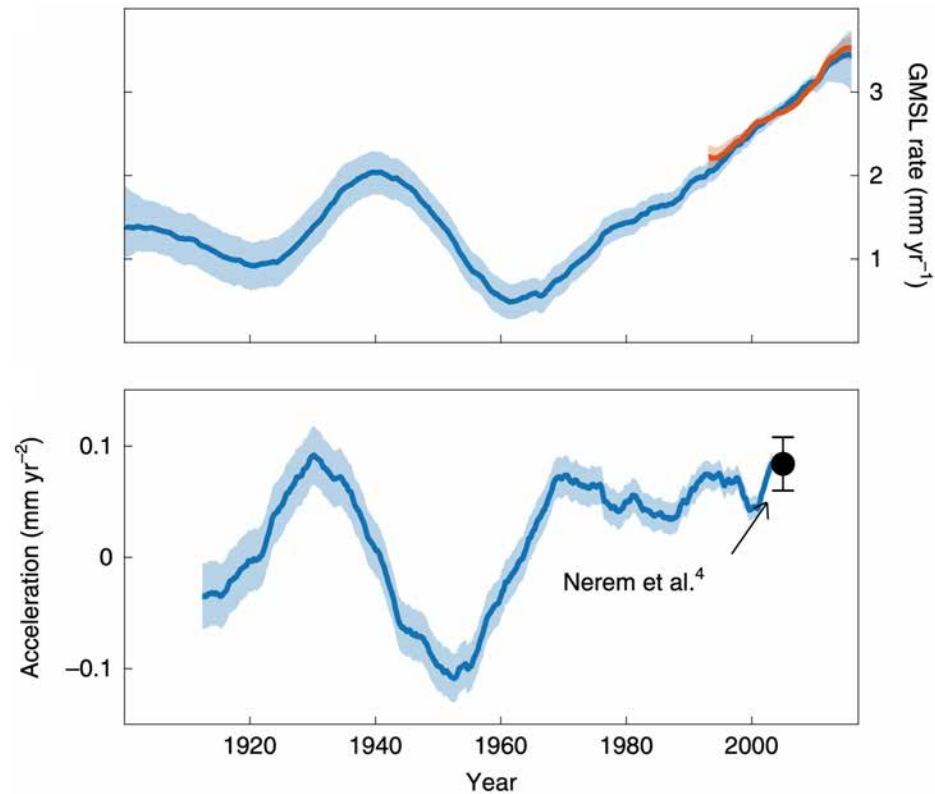
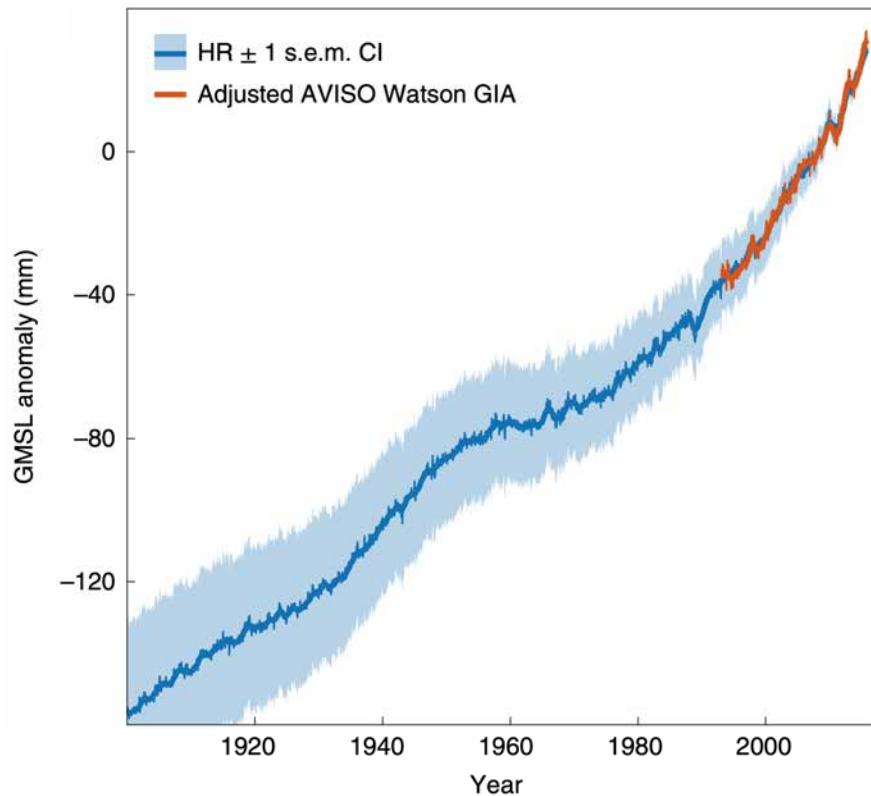
Het Antropoceen



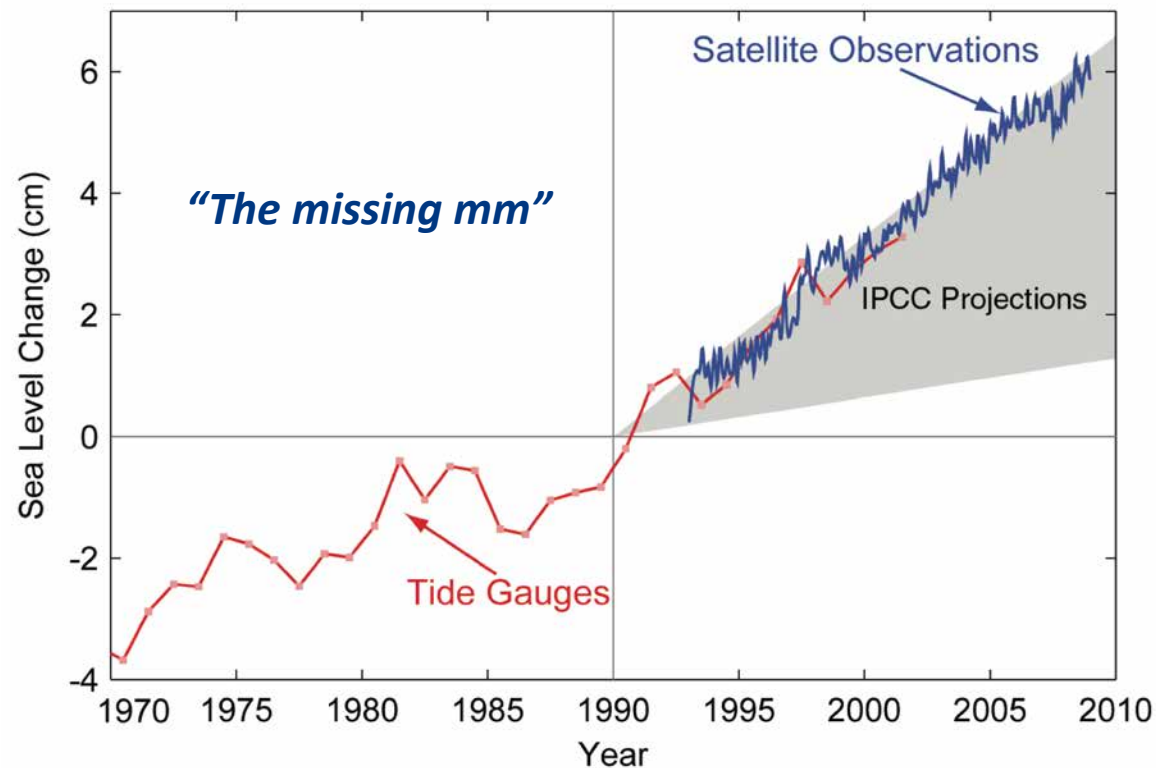
Aantal zomerse dagen, de Bilt



Zeespiegelstijging sinds 1900



IPCC First Assessment Report (1990)



The Copenhagen Diagnosis, 2009

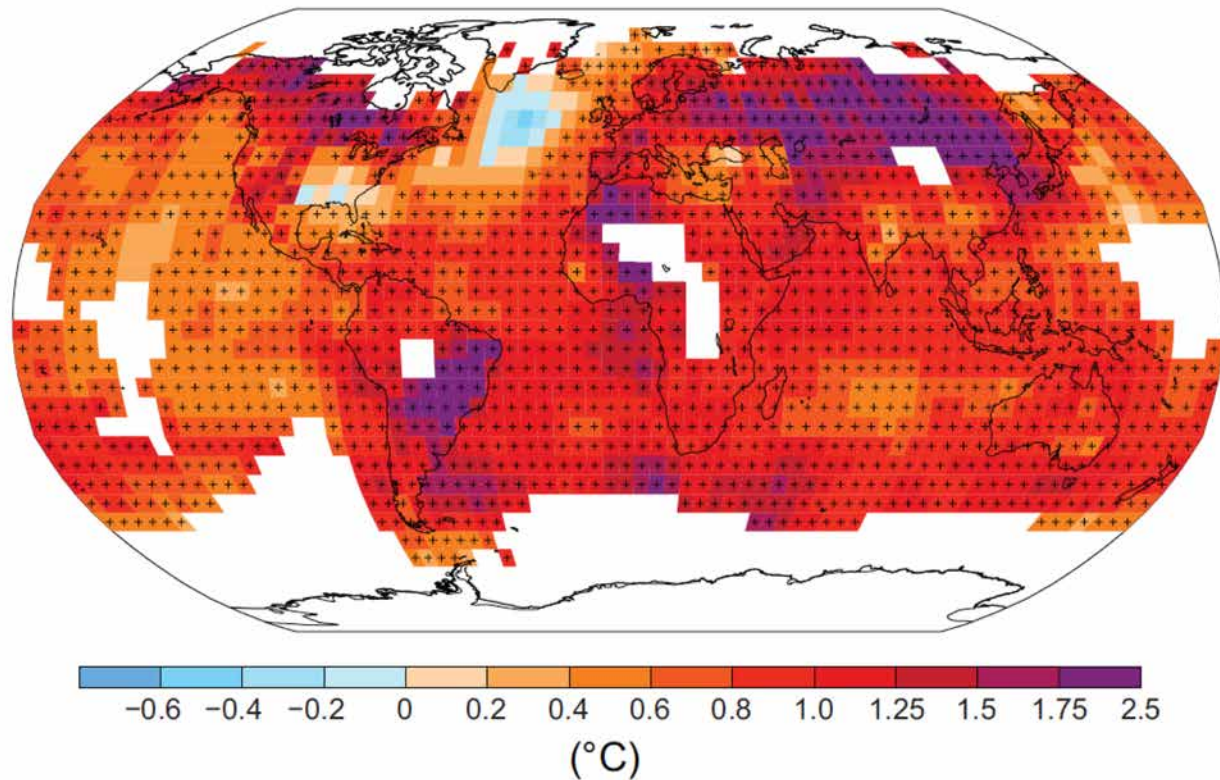
CLIMATE CHANGE

The IPCC Scientific Assessment

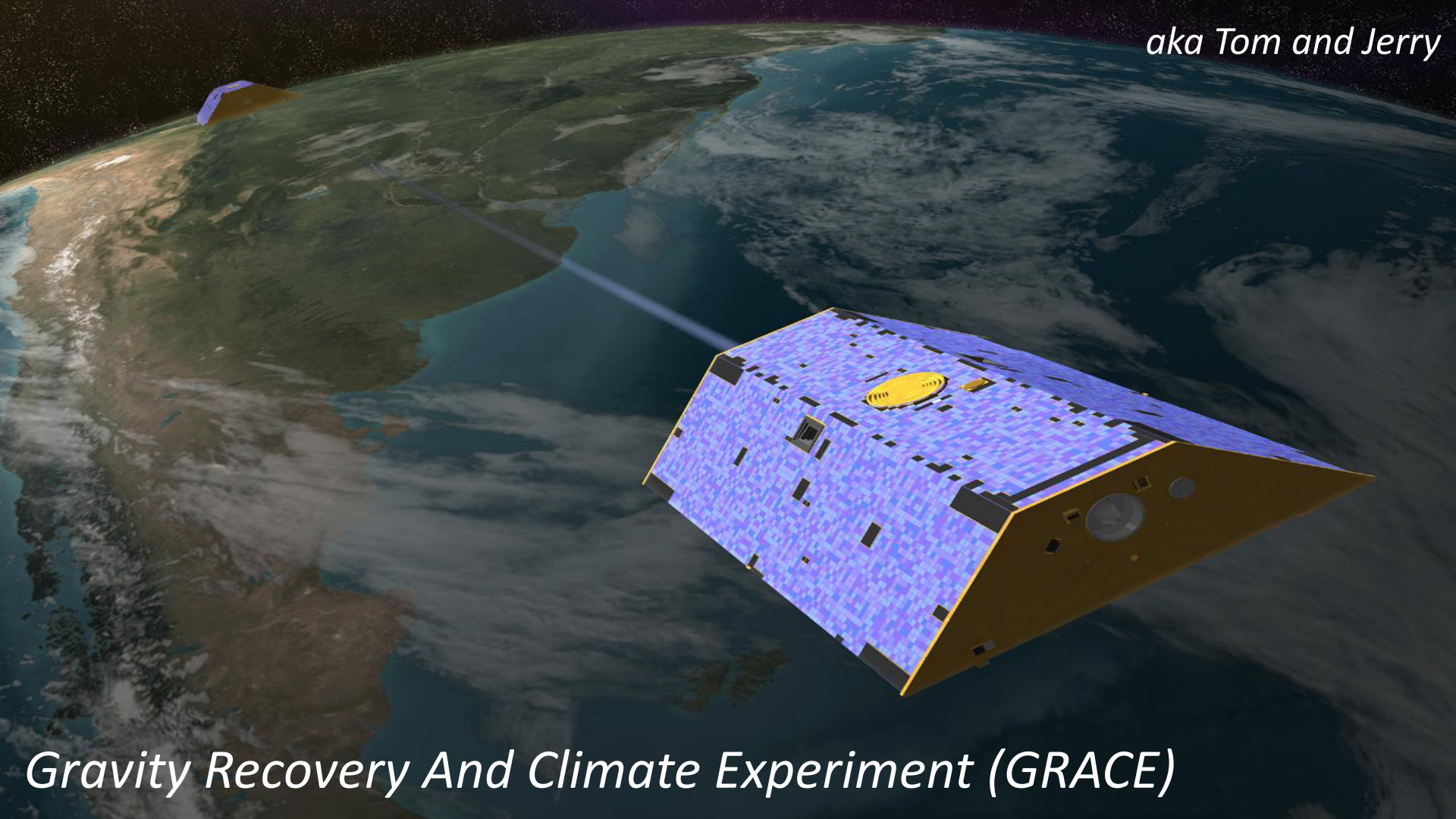
WORLD METEOROLOGICAL ORGANIZATION UNITED NATIONS ENVIRONMENT PROGRAMME

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

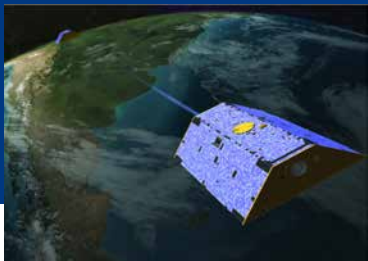
Gemeten temperatuurverandering sinds 1900



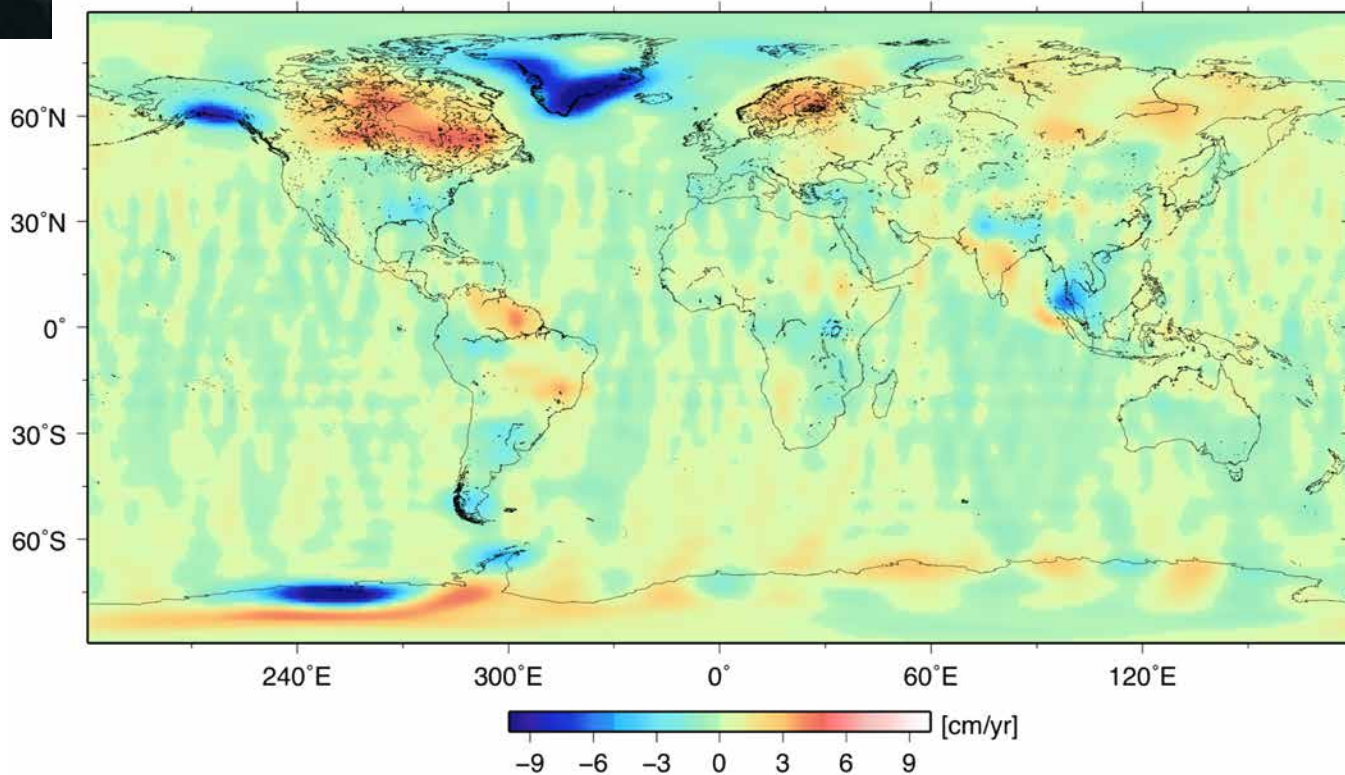
aka Tom and Jerry



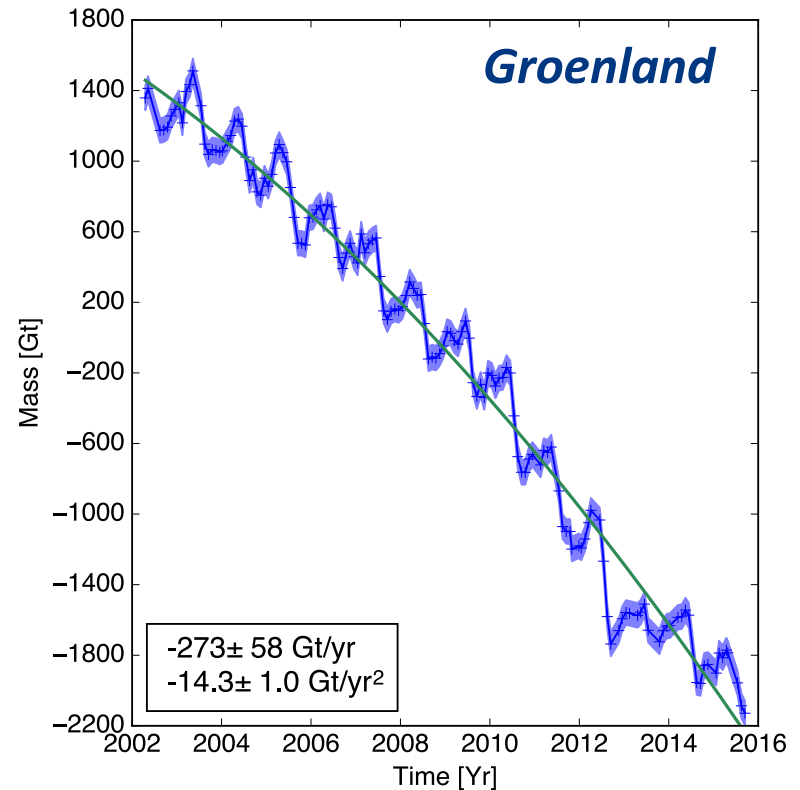
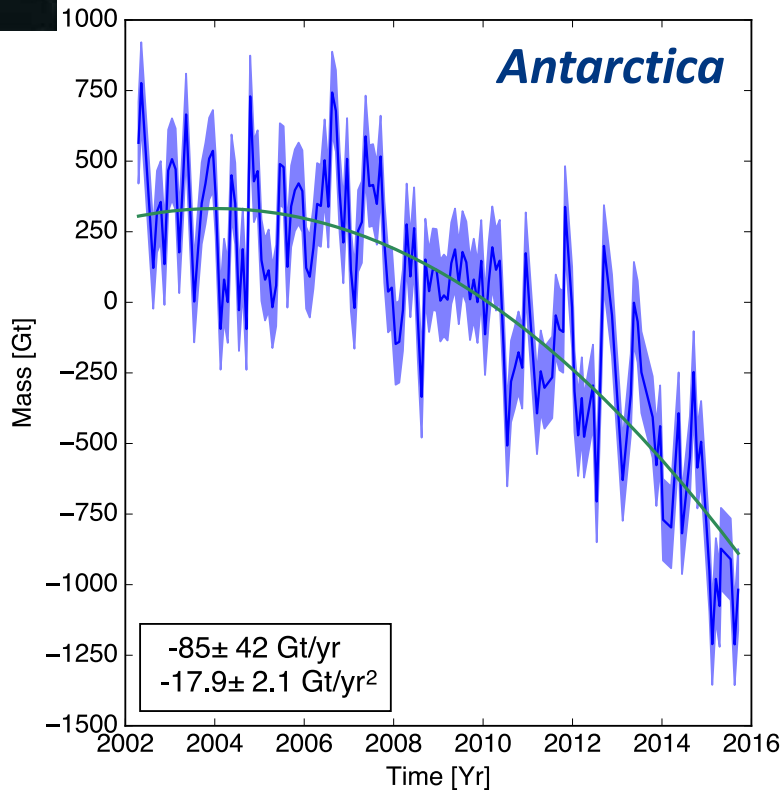
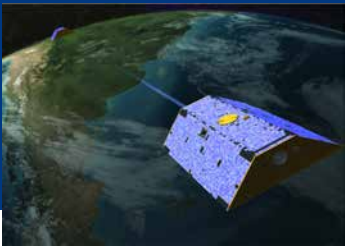
Gravity Recovery And Climate Experiment (GRACE)



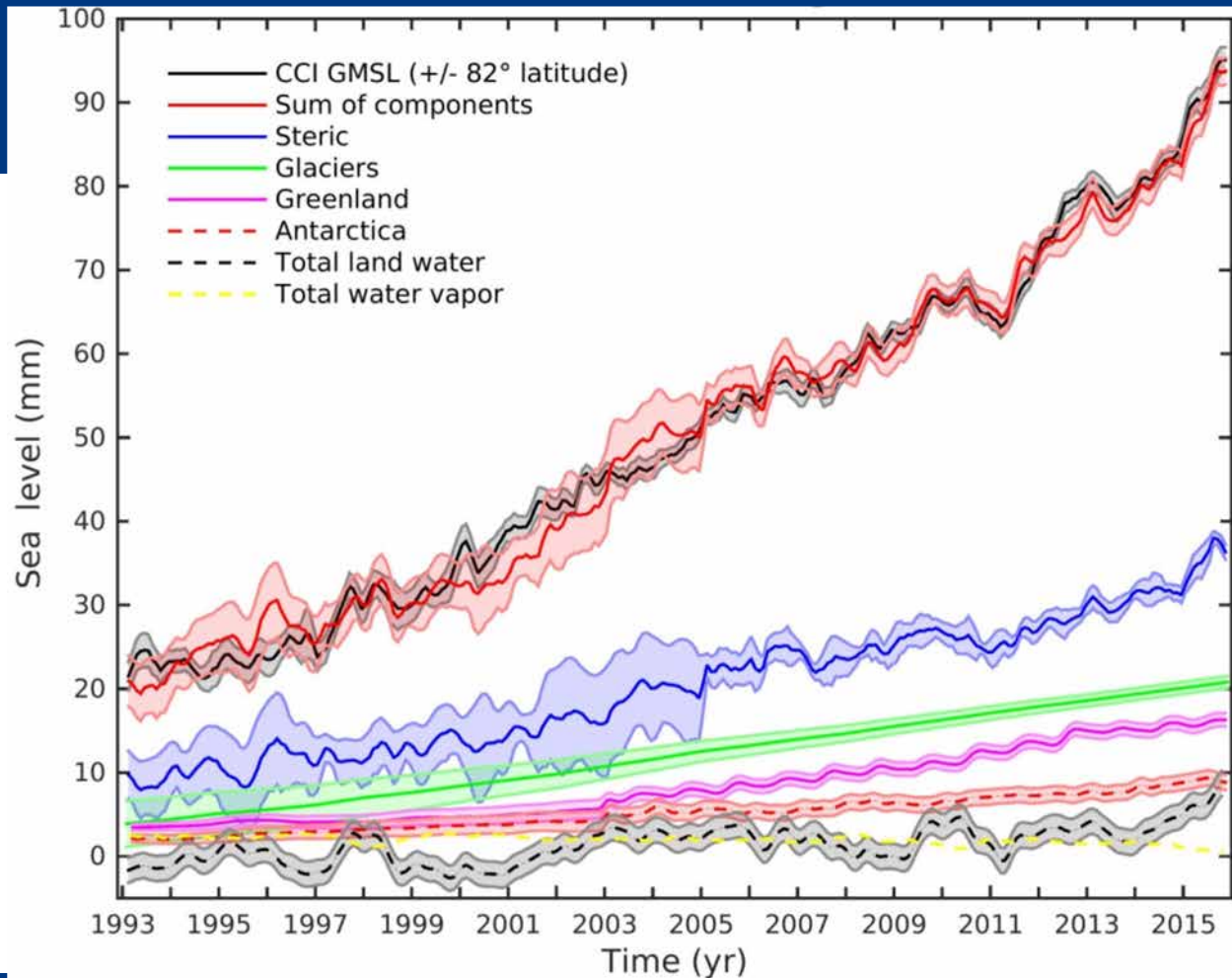
Massaveranderingen (2002-2007)



Massaveranderingen (2003-2016)

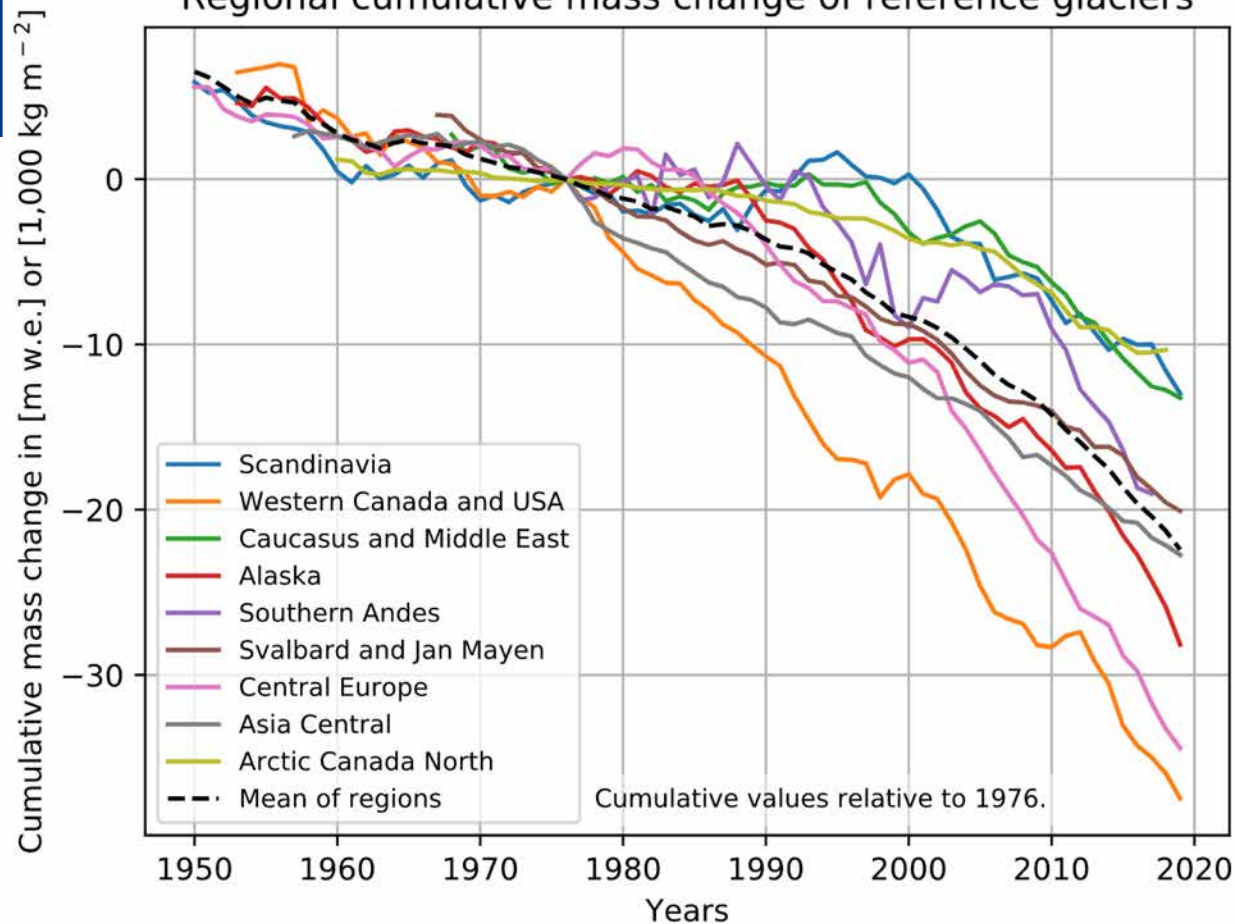


Componenten van zeespiegelstijging

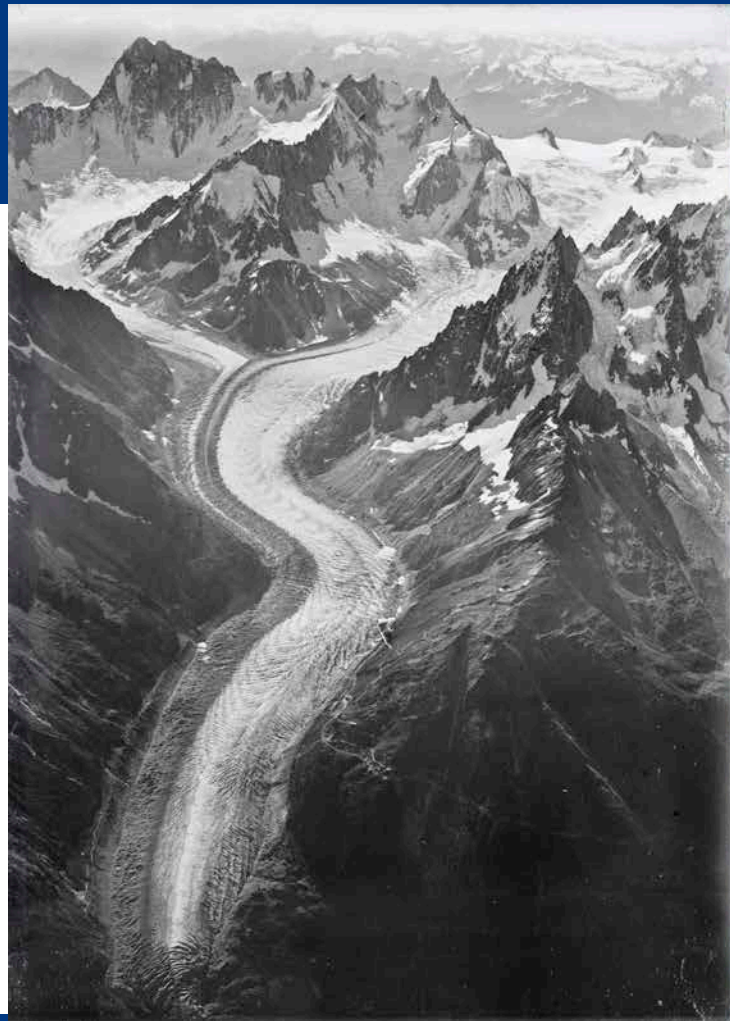


Gletsjers smelten wereldwijd

Regional cumulative mass change of reference glaciers



Mer de Glace, 1919-2019



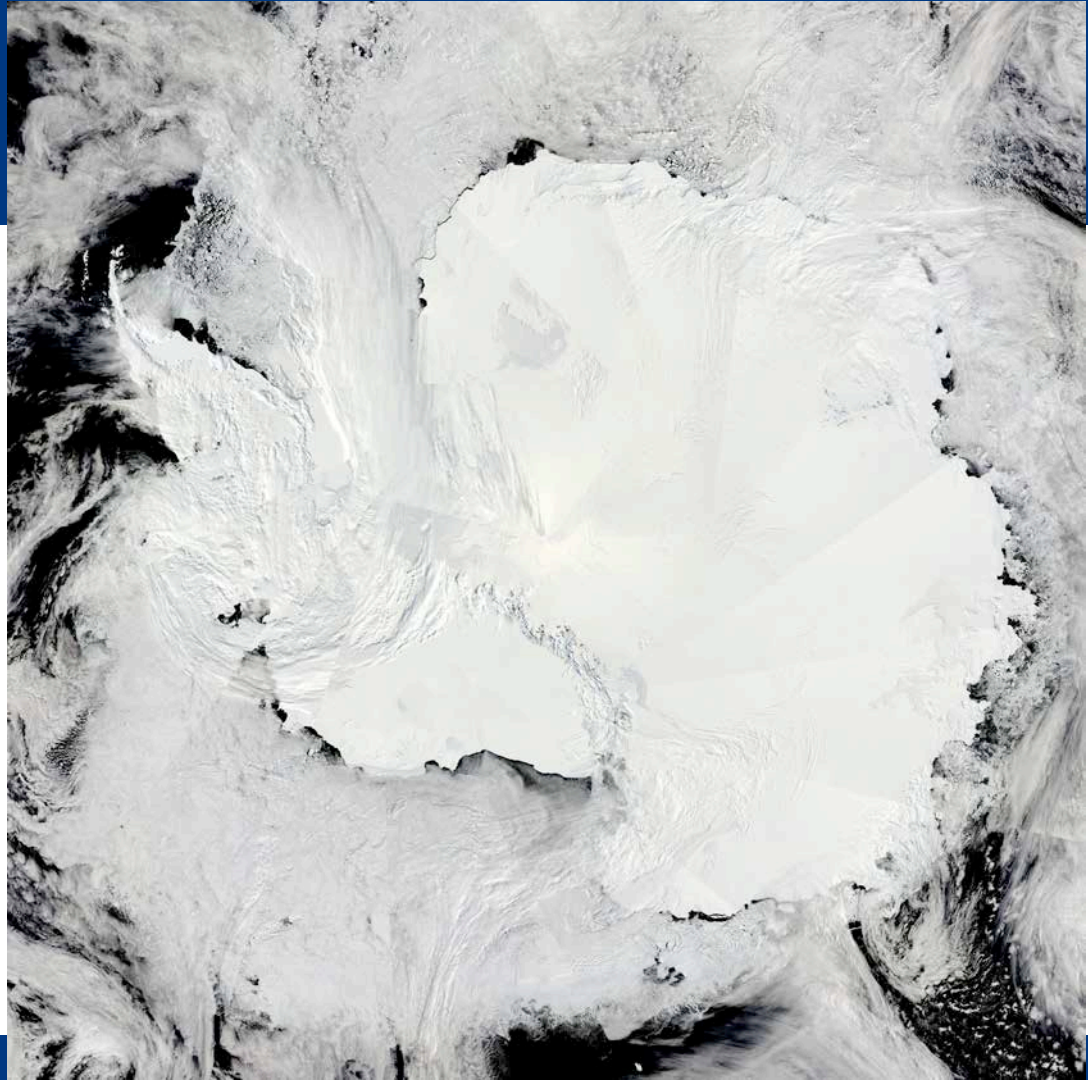
Potentieel voor zeespiegelstijging

<i>Schatting</i>	Antarctica	Groenland	Alle andere gletsjers
Oppervlak (10^6 km ²)	12.3	1.7	0.5
Gemiddelde dikte (m)	2000	1700	100-260
Volume (10^6 km ³)	24.7	2.9	0.05-0.13
Eq. stijging zeespiegel (m)	56.6	7.3	0.15-0.37

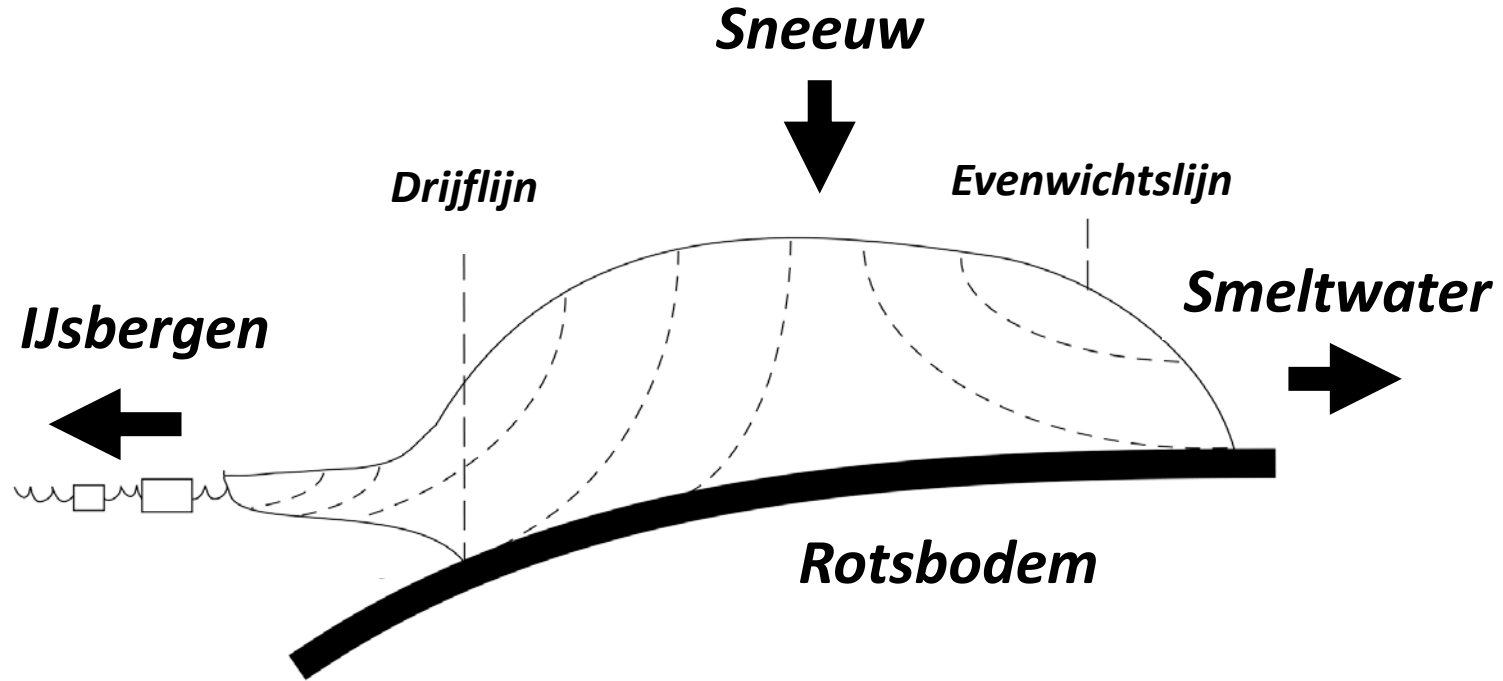
Antarctica



Nederland op schaal



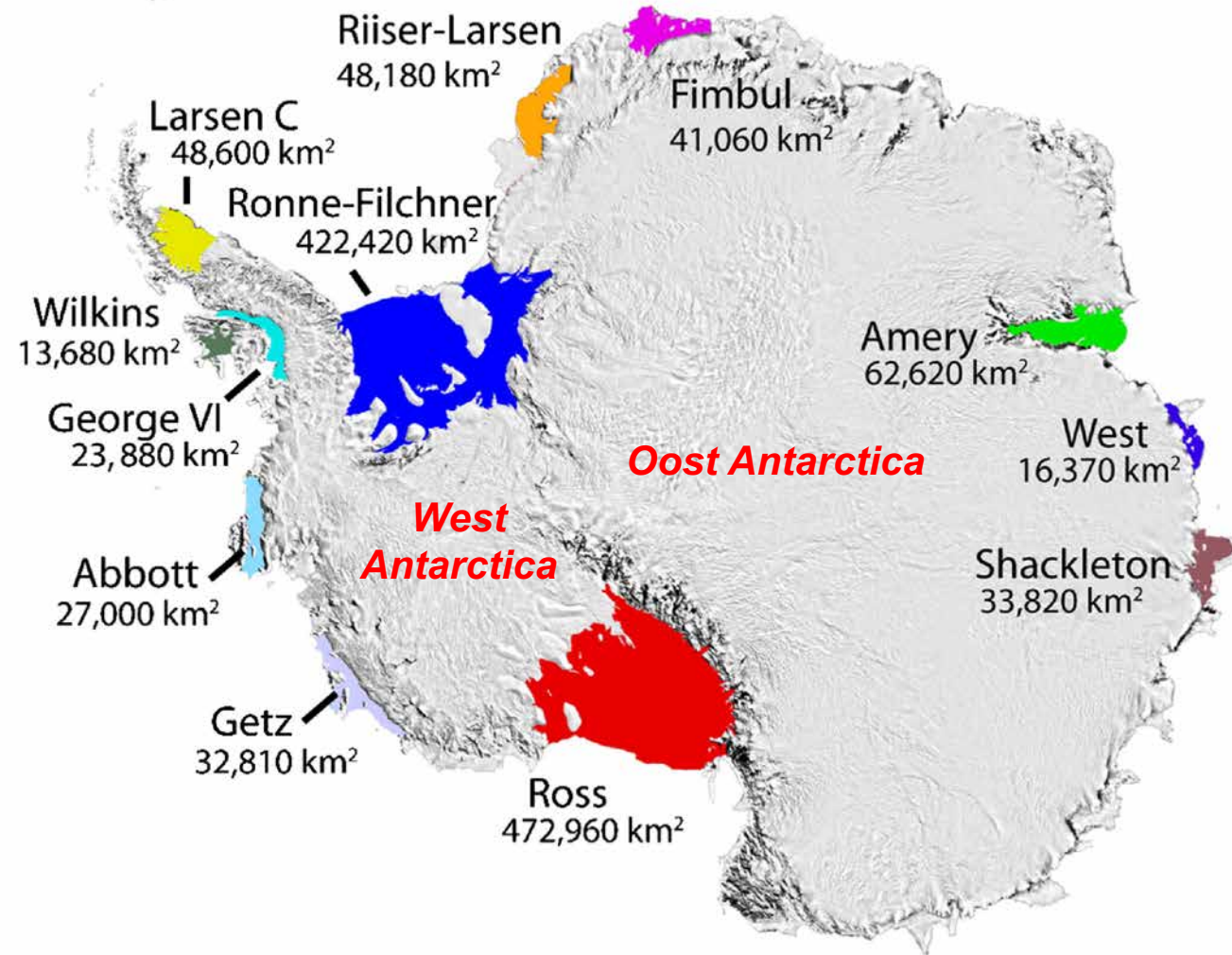
Hoe werkt een ijskap?



De ijsbreker Polarstern bij Fimbul ijsplaat

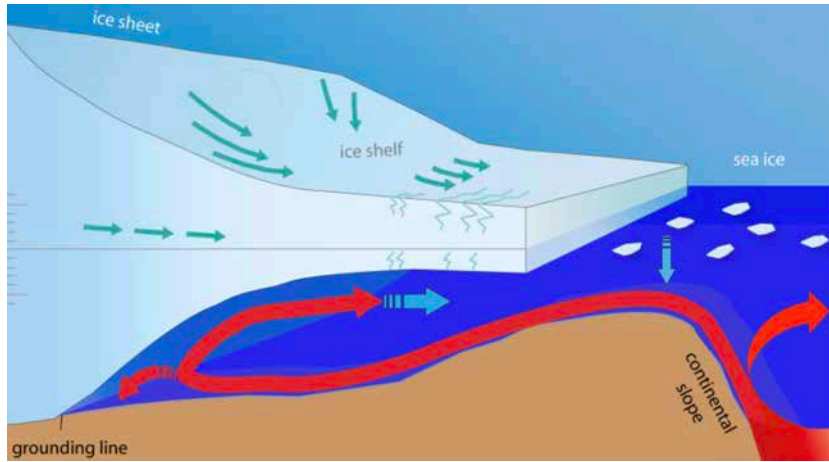


De ijsplaten van Antarctica

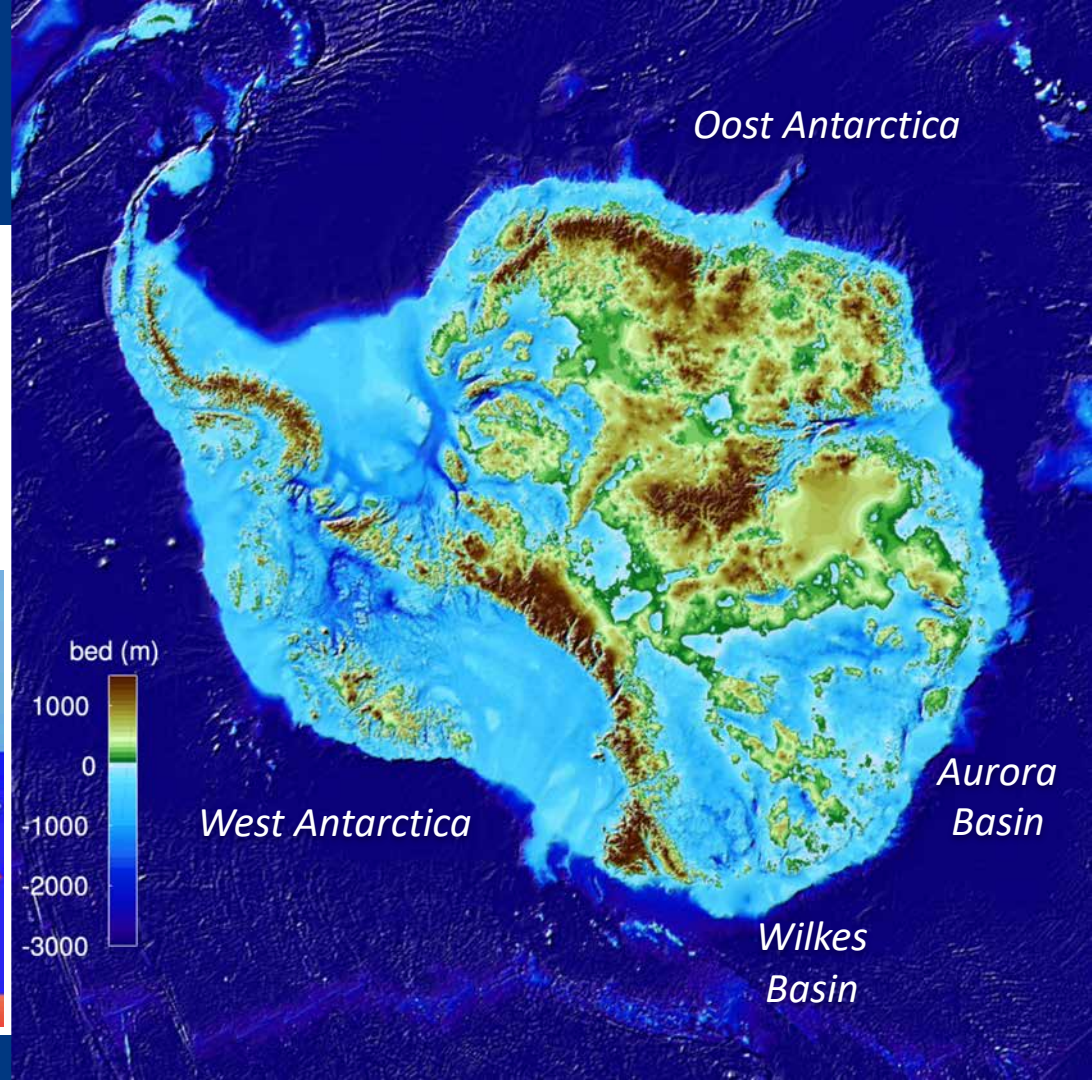


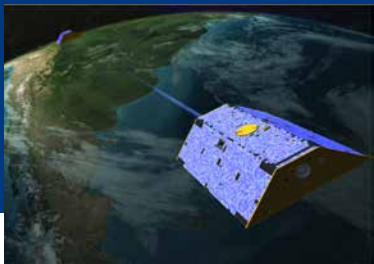
 *Nederland op schaal*

Antarctica zonder ijskap

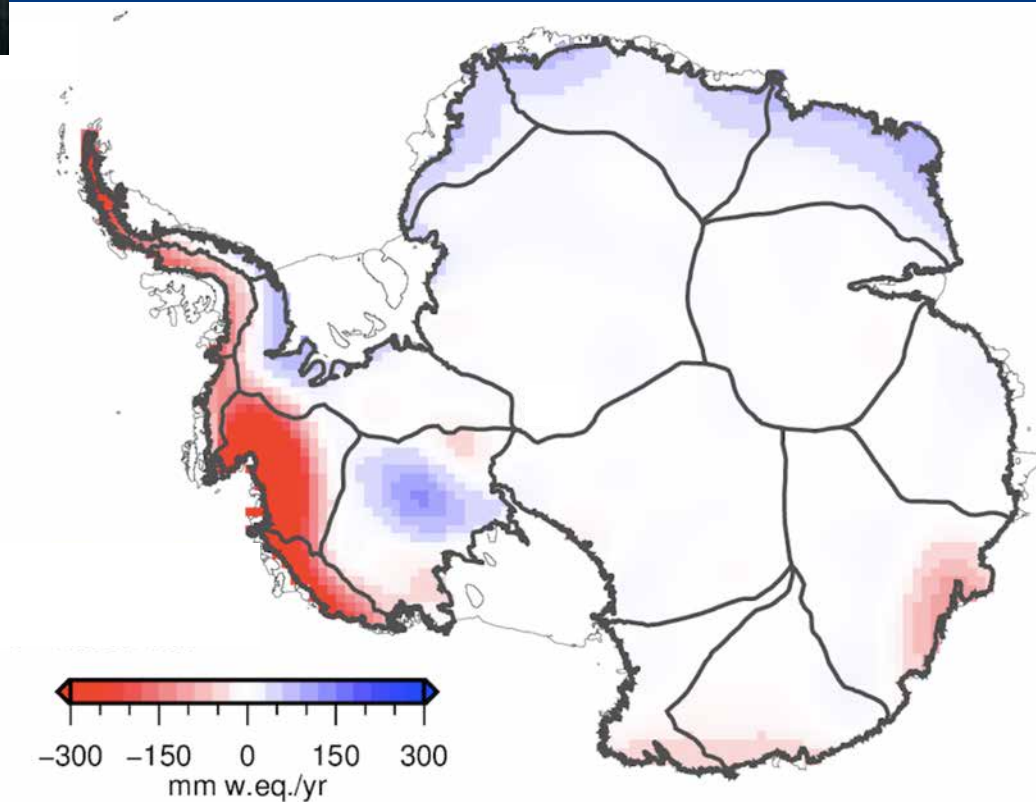


Morlighem et al., 2019

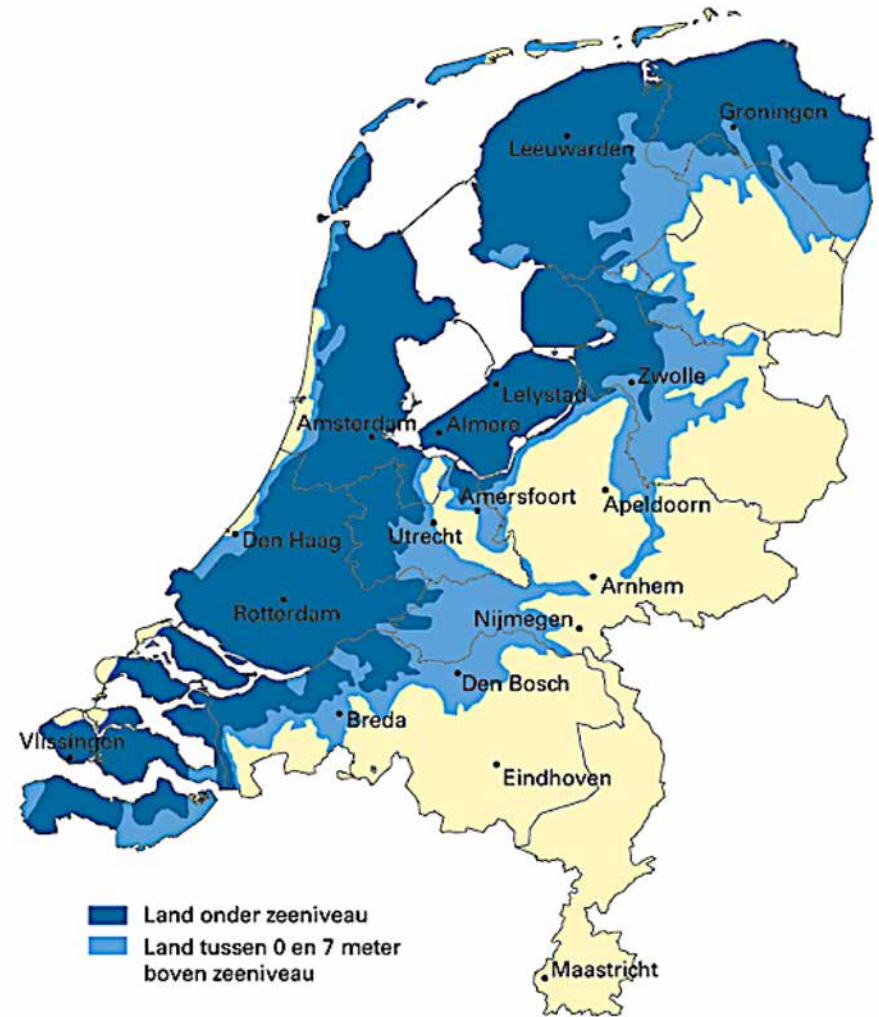




Gemeten massaverlies (2002-2017)



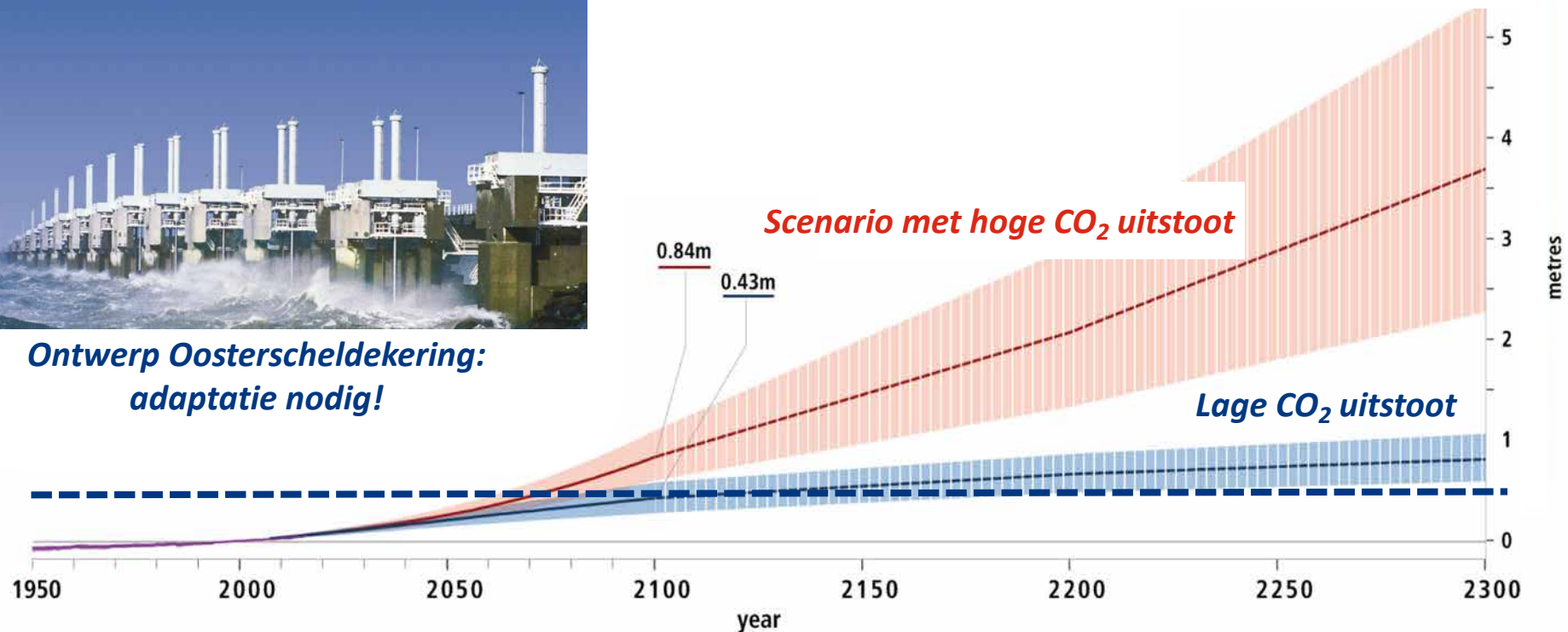
AD 2300: Utrecht aan Zee?



Geprojecteerde zeespiegelstijging (IPCC, 2019)



*Ontwerp Oosterscheldekering:
adaptatie nodig!*



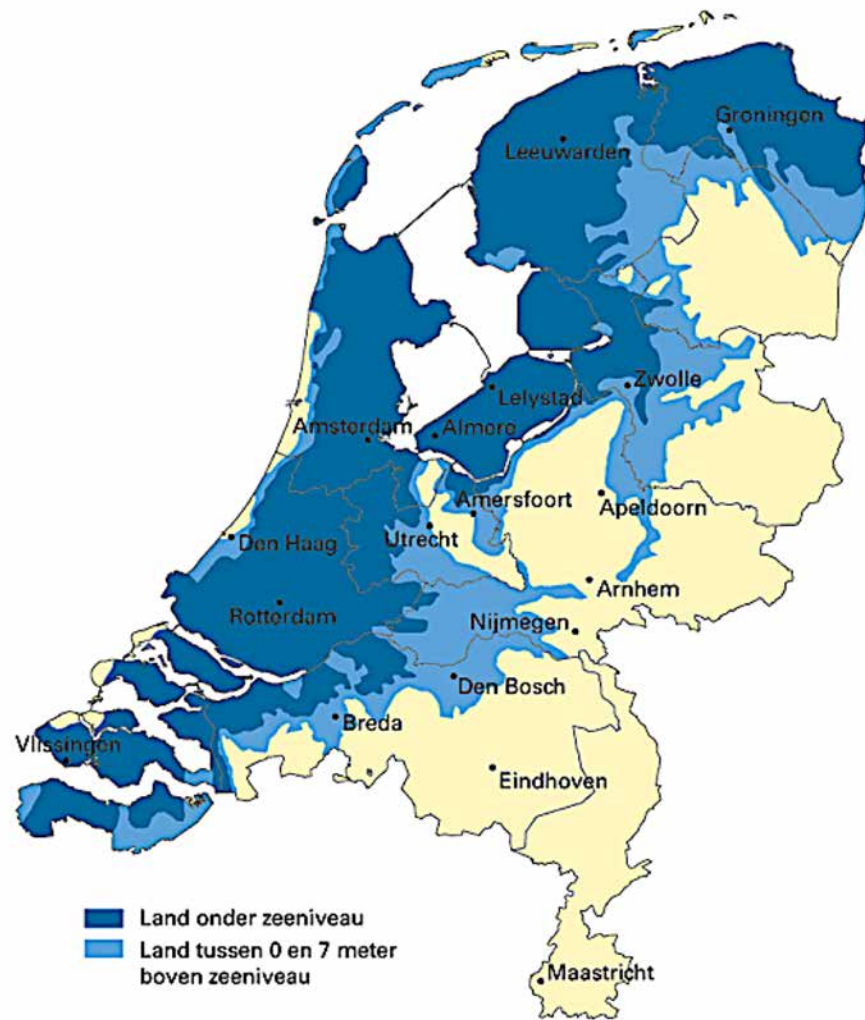
AD 2300: Utrecht aan Zee?

Dat bepalen wij zelf!

Om Utrecht aan Zee te voorkomen, zijn twee dingen nodig:

Mitigatie (verminderen CO₂ uitstoot)

Adaptatie (nieuwe Deltawerken)



Bedankt voor de aandacht!

