

# Can models be trusted?

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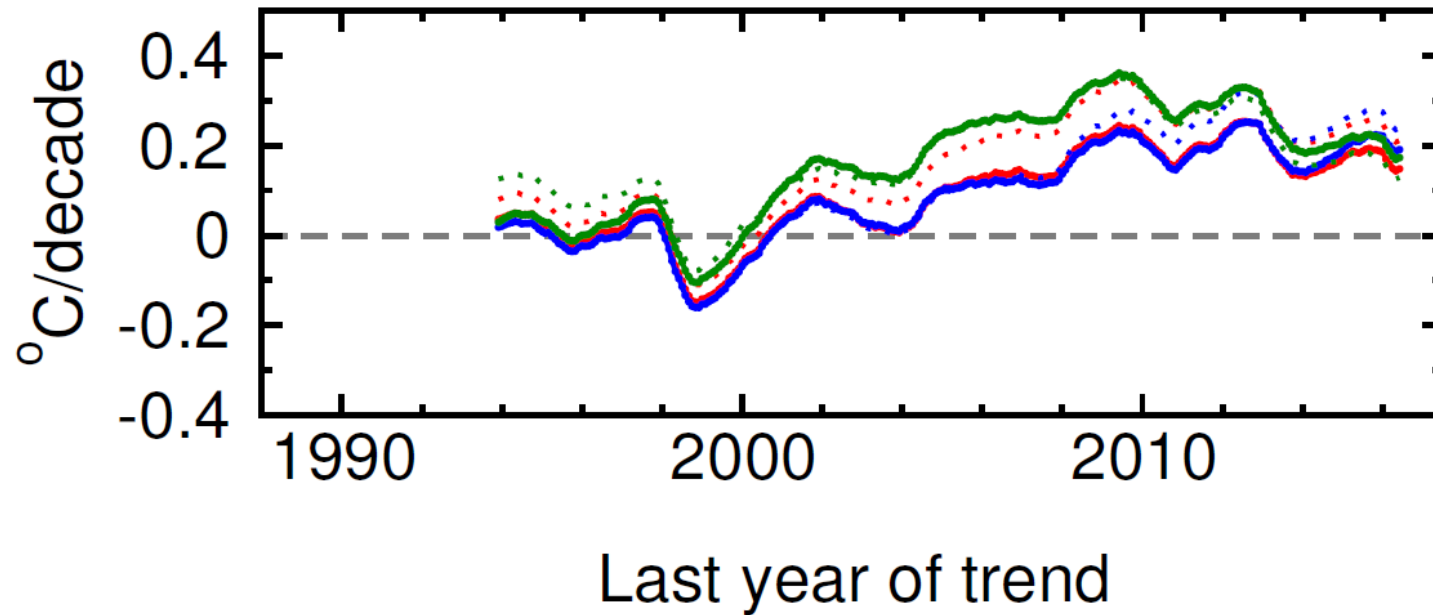
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# IPCC Fifth Assessment

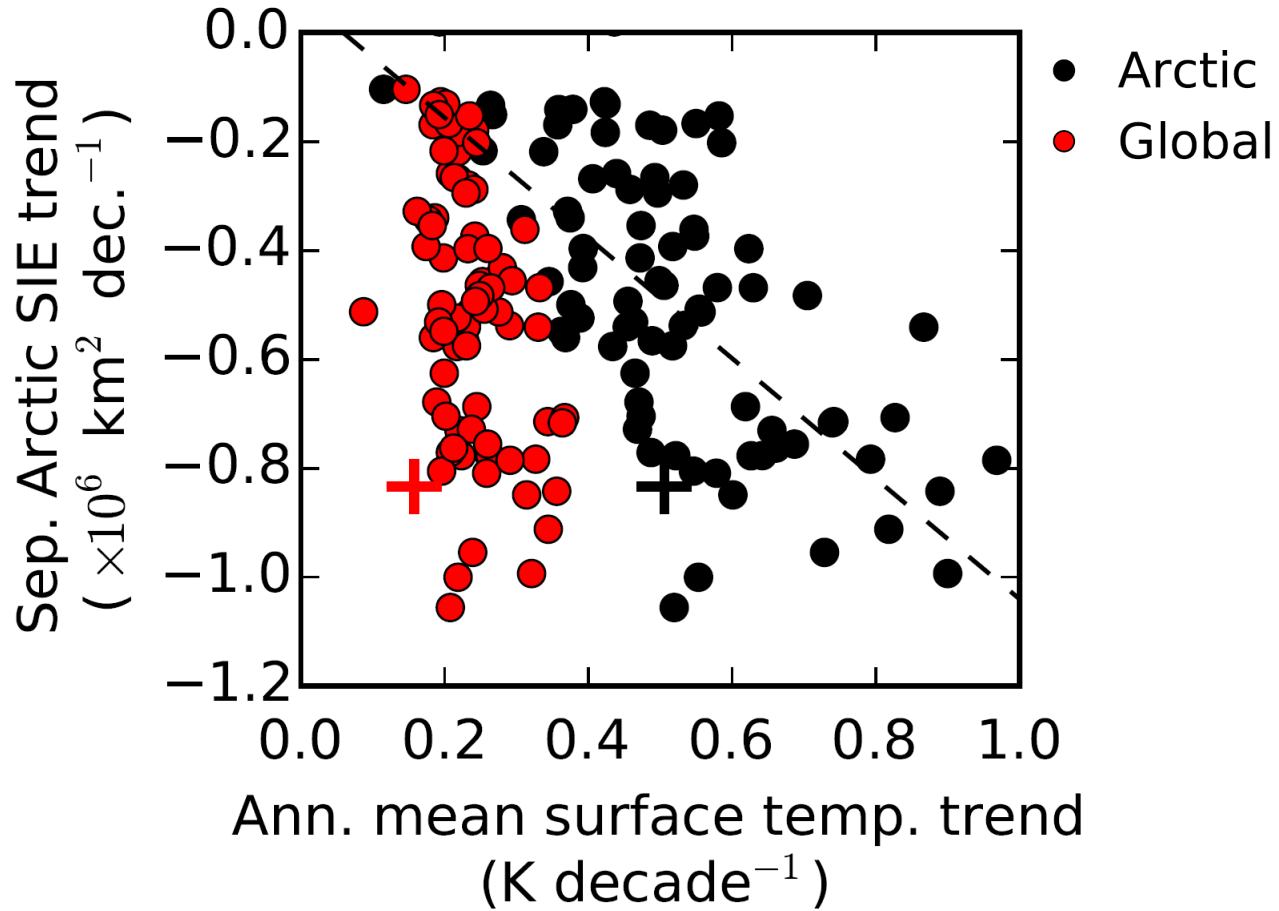
- Trend in Arctic sea ice extent since 1979 is reproduced by more models
- Models reproduce continental-scale warming since the mid-20th century

## 15 year trend difference in TMT



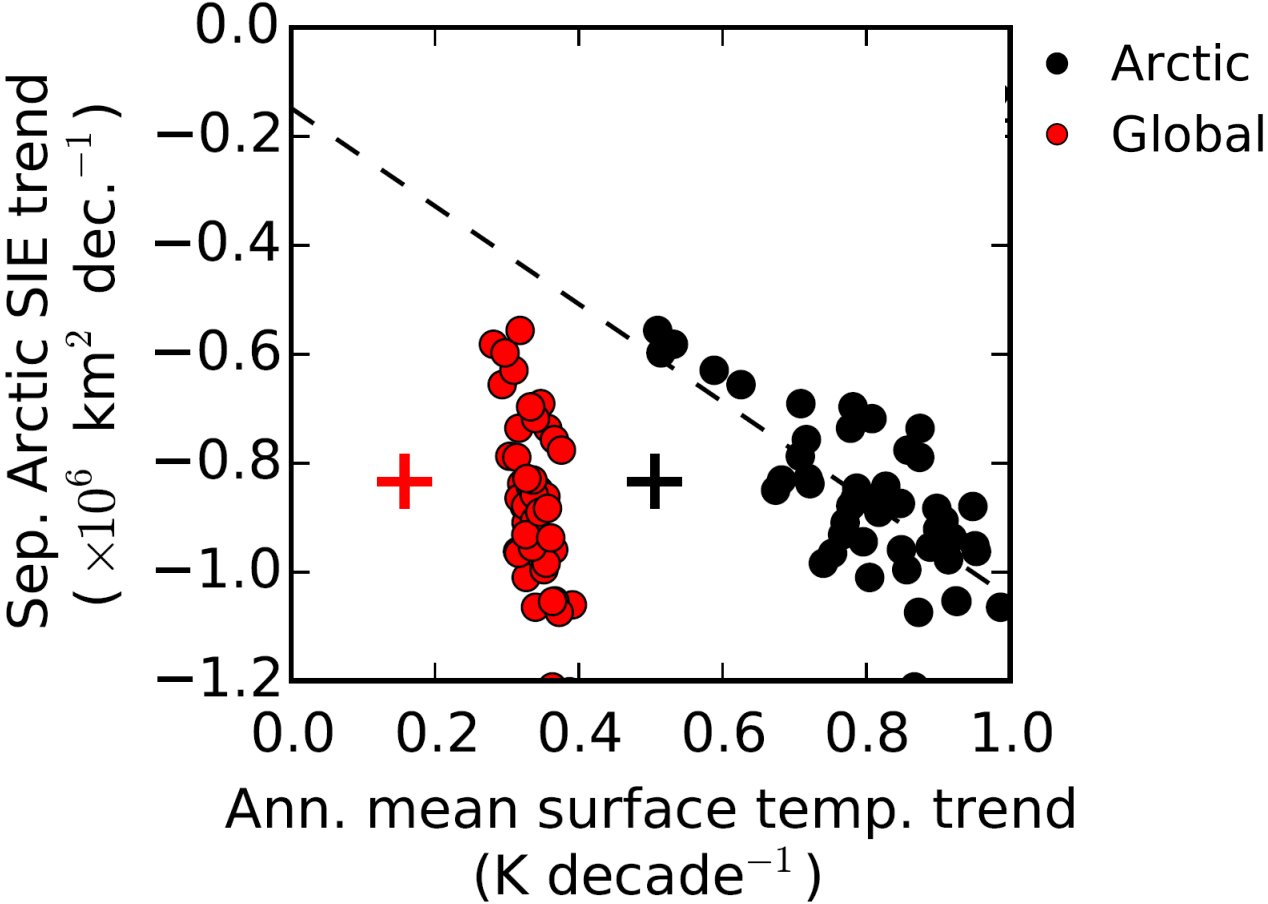
Santer, Fyfe & 14 co-authors (*Nature Geosci.*, 2017)

# CMIP5 (1979-2014)



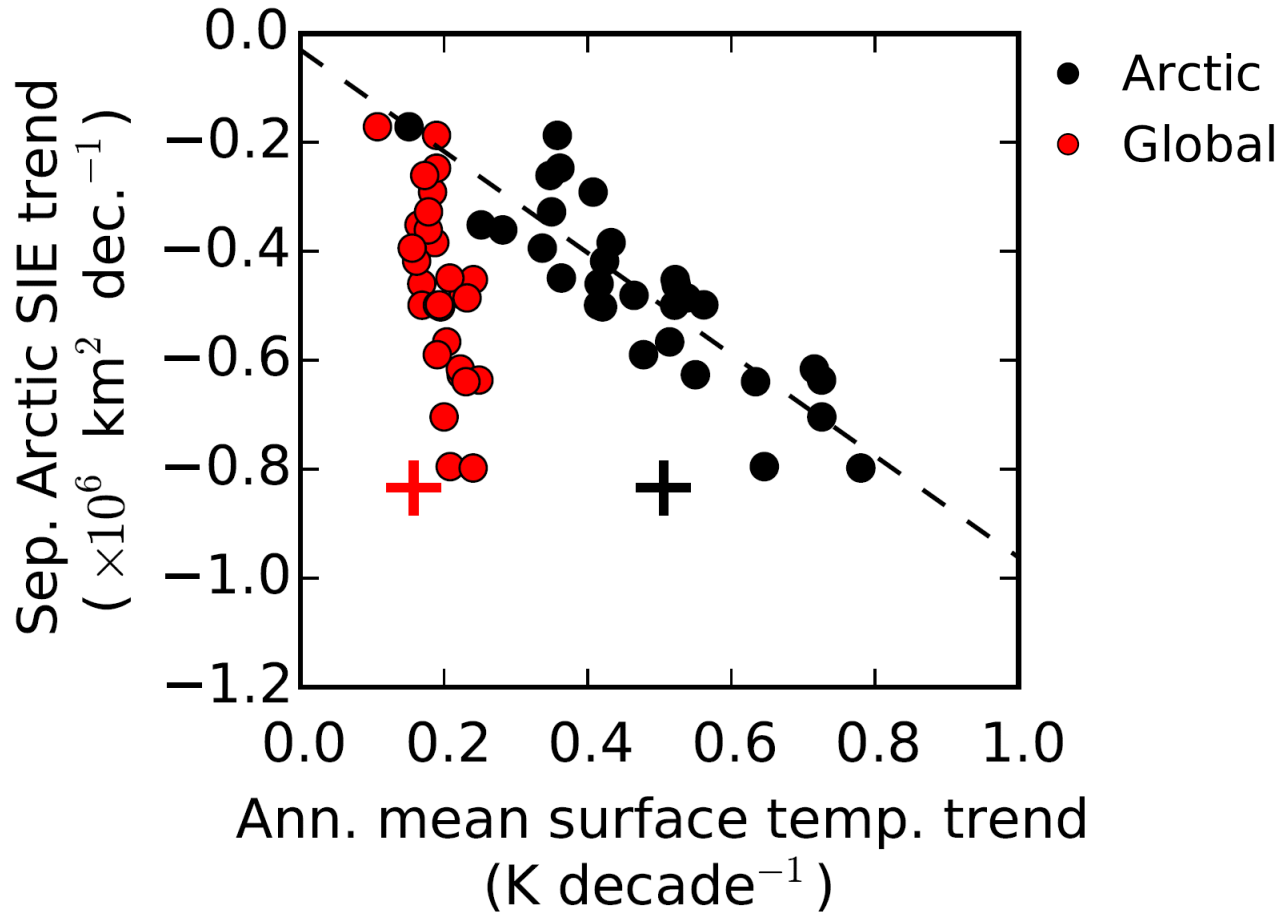
Swart, Flato & Fyfe (*in preparation*)

# CanESM2 (1979-2014)



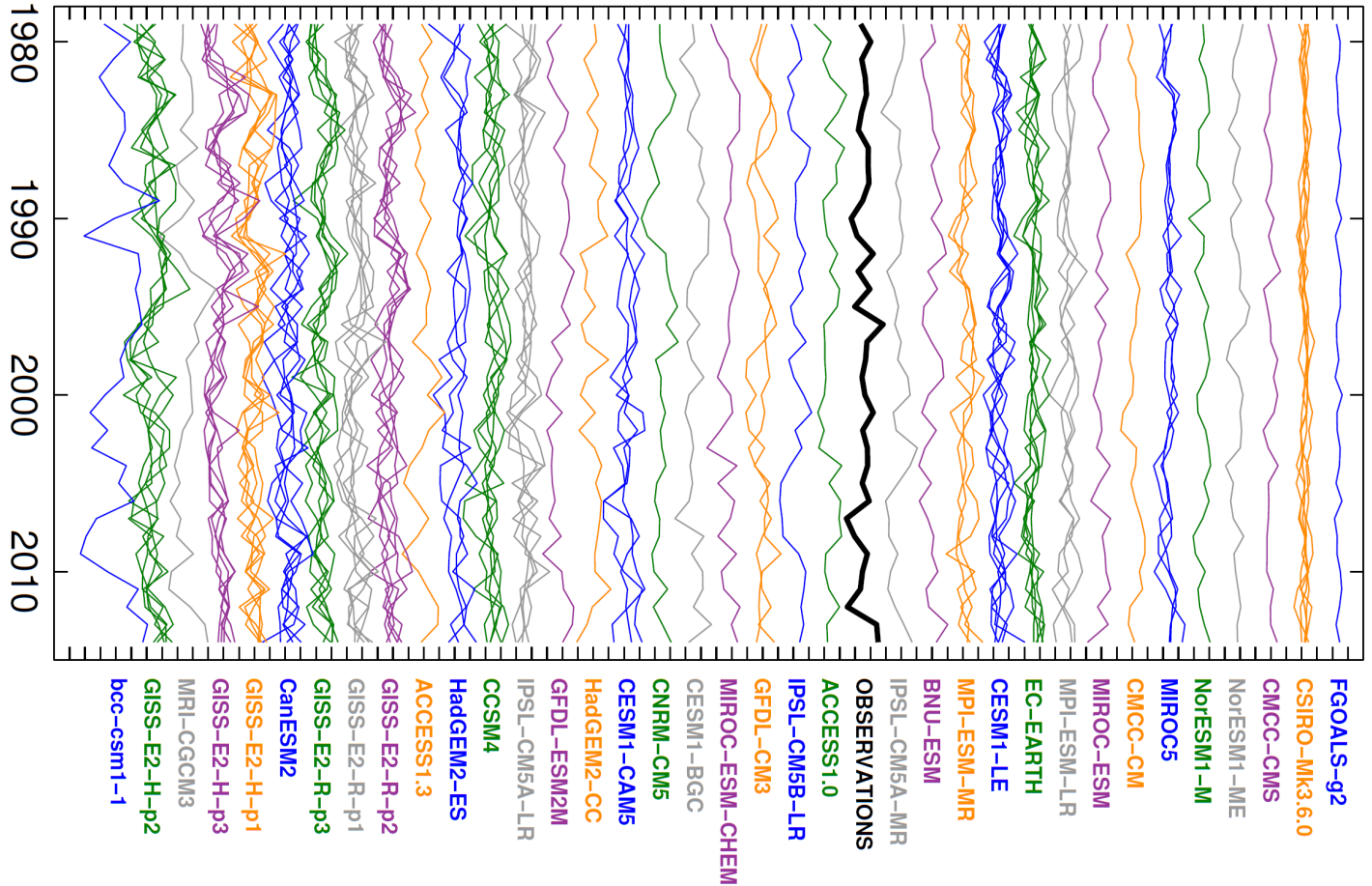
Swart, Flato & Fyfe (*in preparation*)

# CESM1 (1979-2014)



Swart, Flato & Fyfe (*in preparation*)

# September sea ice extent anomaly

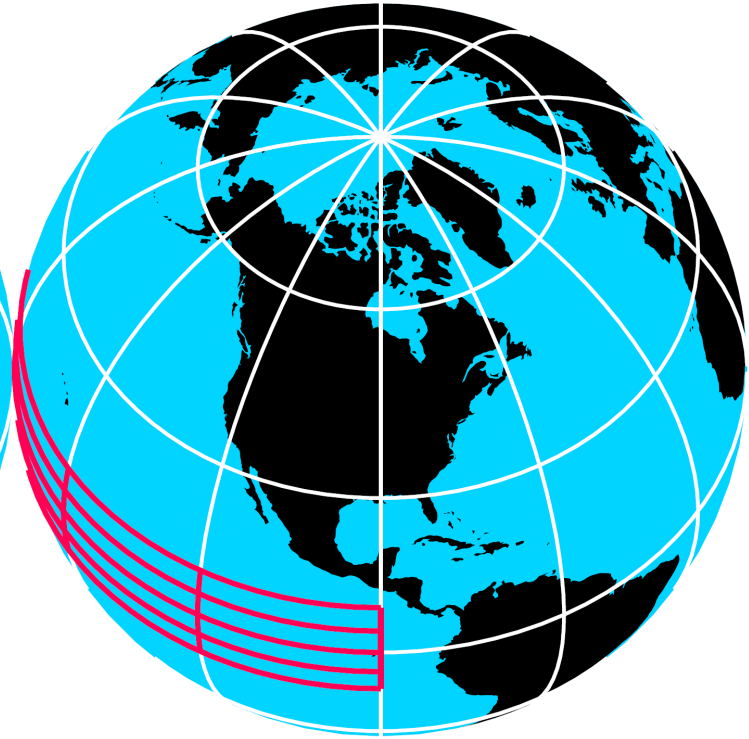


Swart, Fyfe & co-authors (*Nature Clim. Change*, 2015)

Example 1

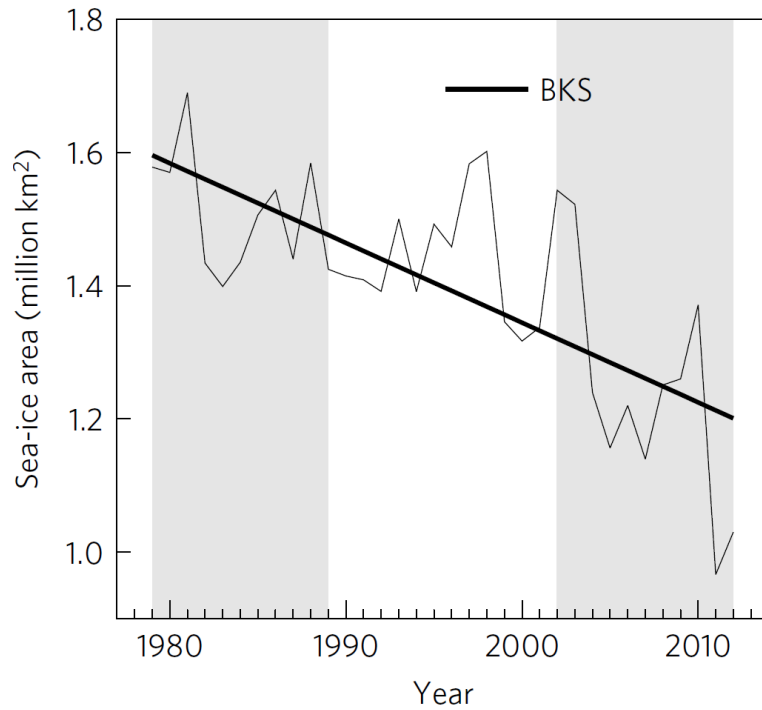


Example 2

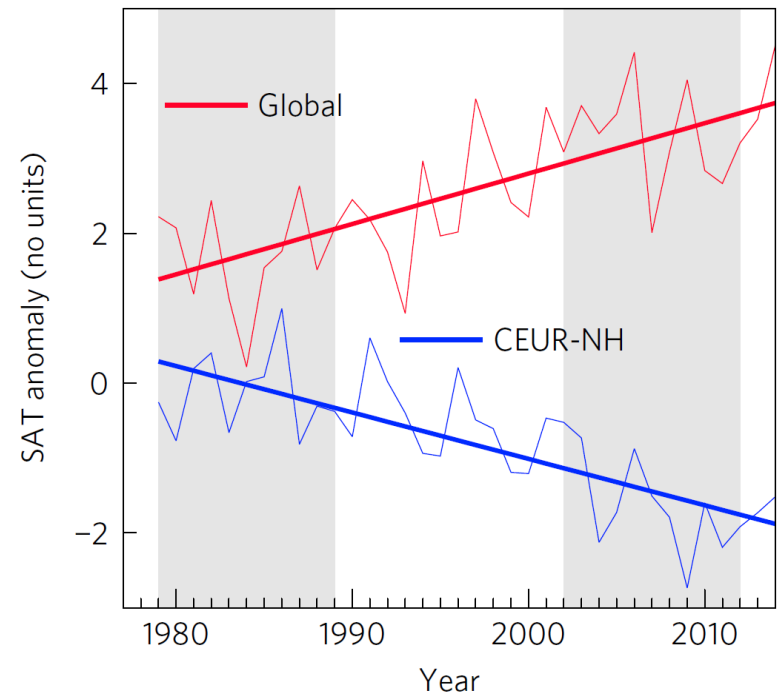




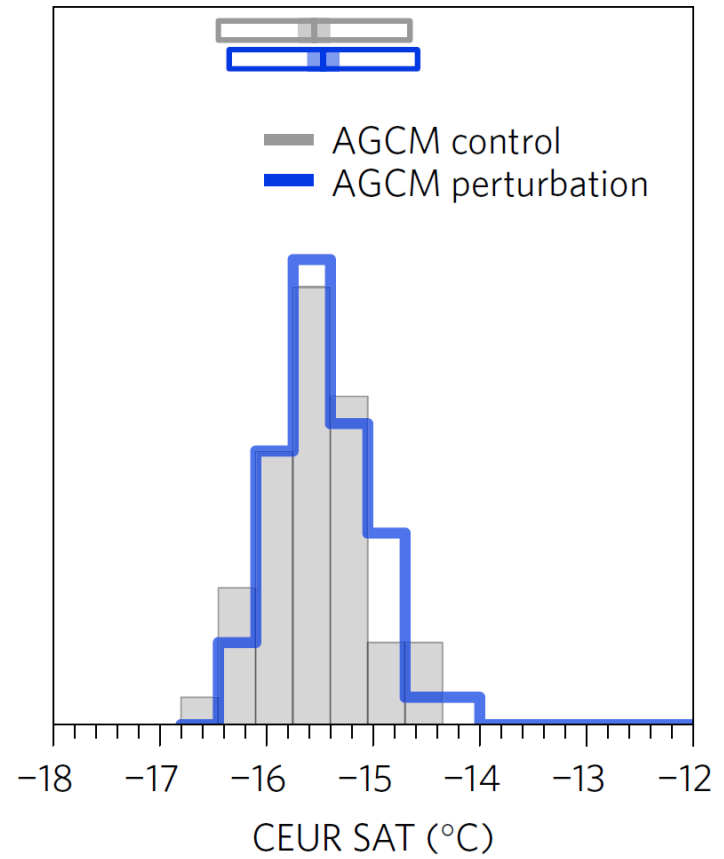
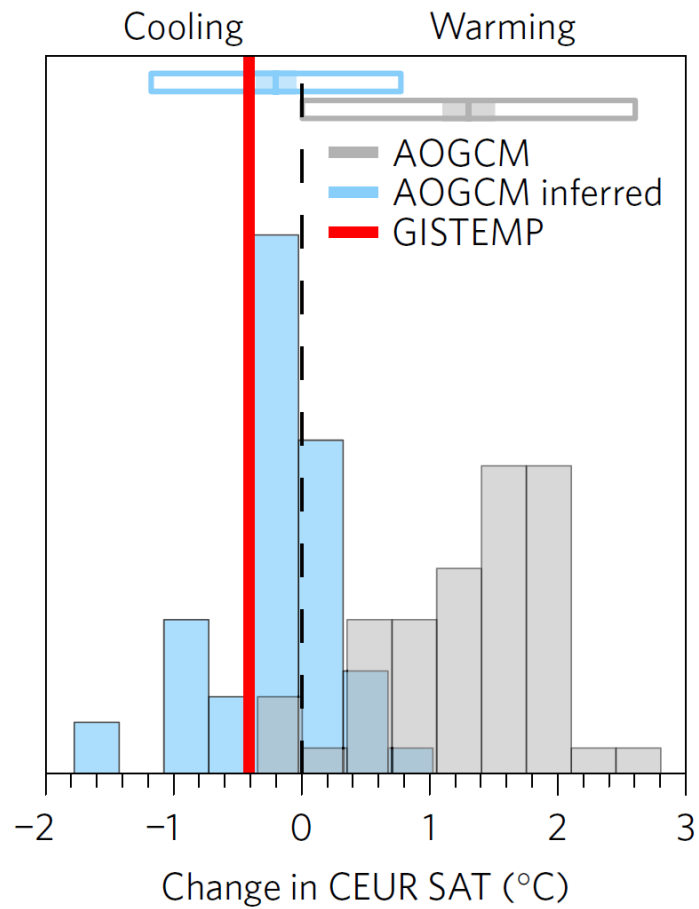
### Barents-Kara sea ice area



### Eurasian surface temperature

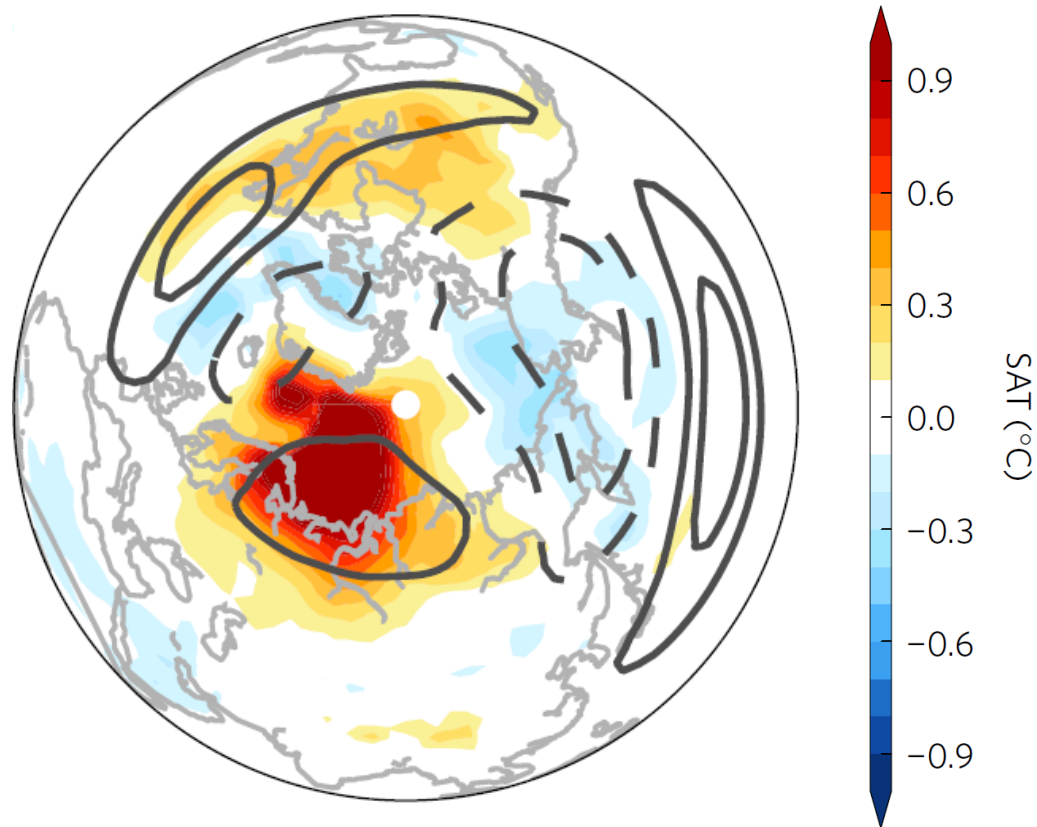


McCusker, Fyfe & Sigmond (*Nature Geosci.*, 2016)



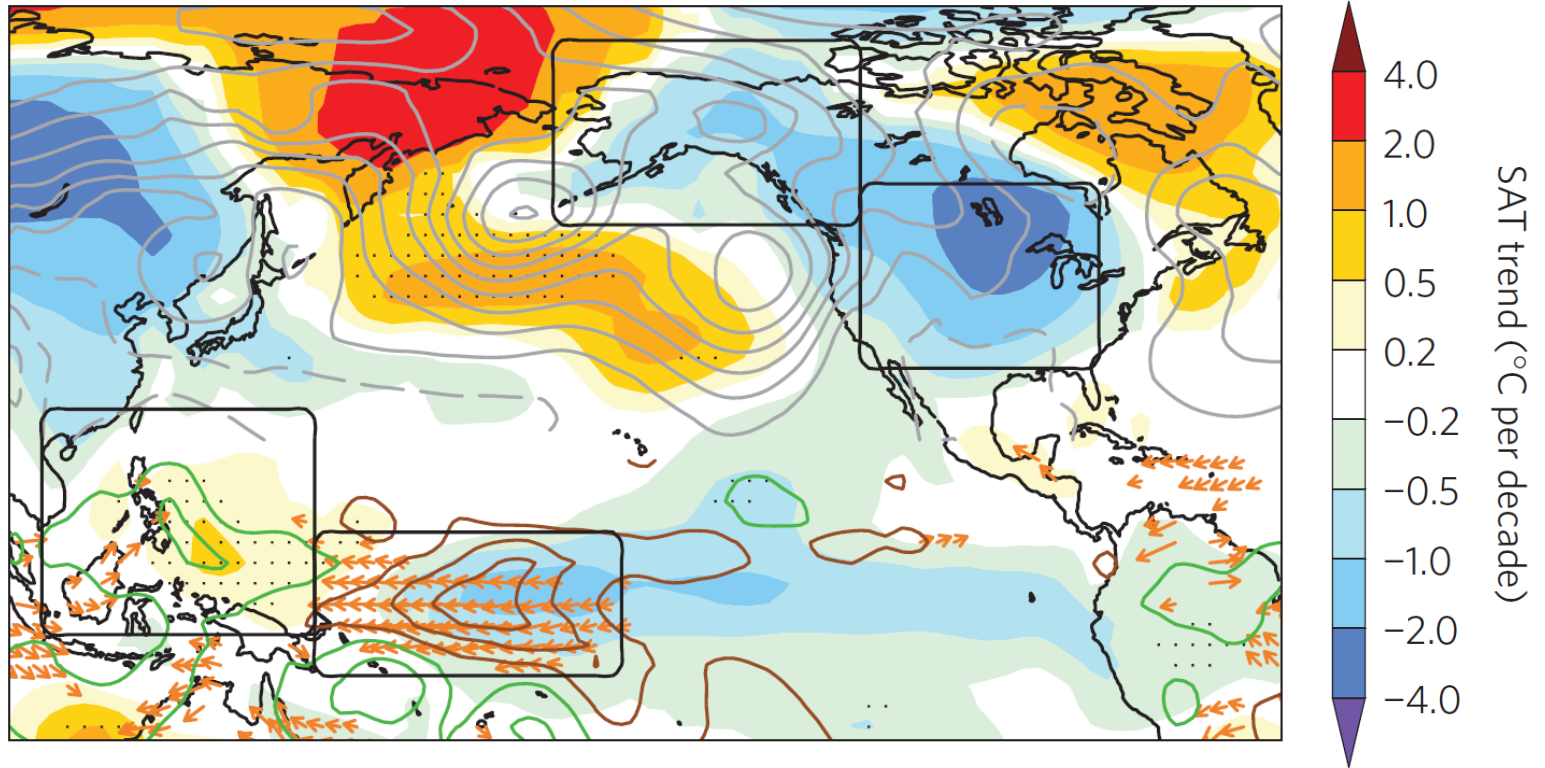
McCusker, Fyfe & Sigmond (*Nature Geosci.*, 2016)

## Sea-ice related change anomalies



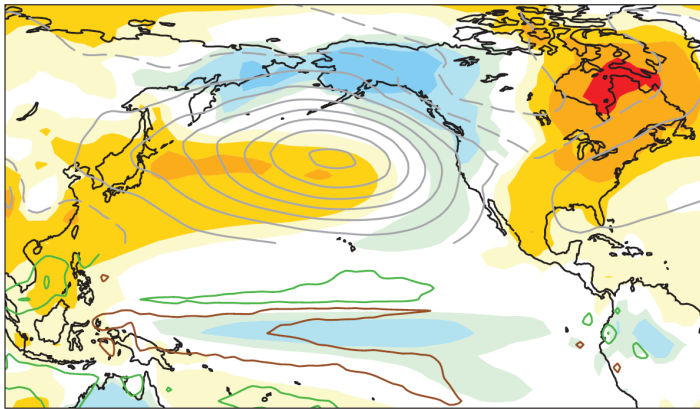
McCusker, Fyfe & Sigmond (*Nature Geosci.*, 2016)

# Winter trends from 2002 to 2014

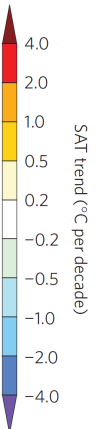
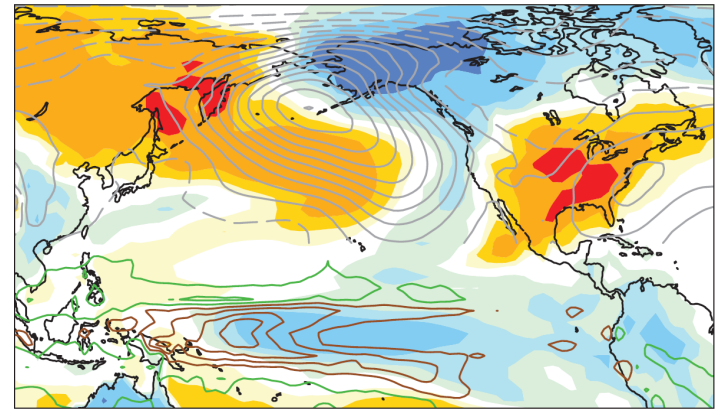


Sigmond & Fyfe (*Nature Clim. Change*, 2016)

# Large ensemble

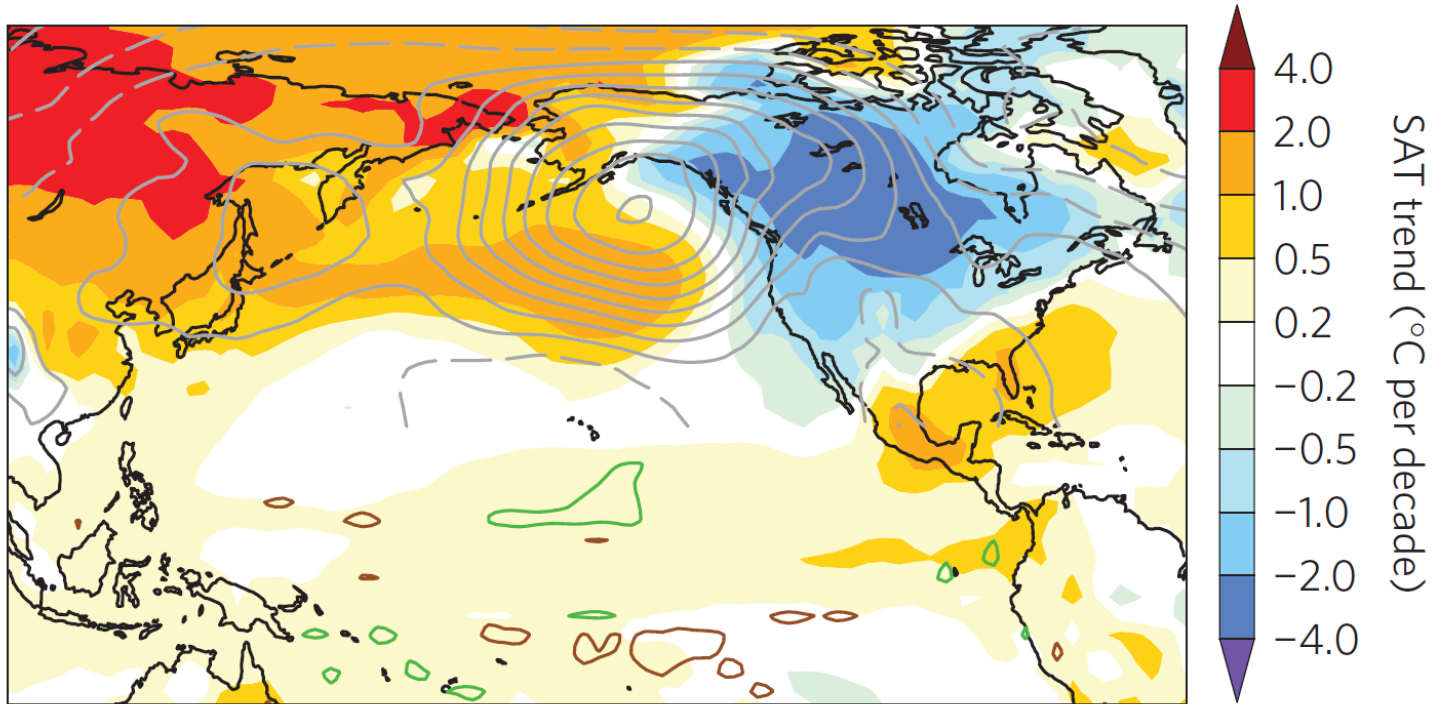


# Pacemaker



Sigmond & Fyfe (*Nature Clim. Change*, 2016)

## Cooling composite from a large ensemble



Sigmond & Fyfe (*Nature Clim. Change*, 2016)

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