



# Who am I?



- \* I am a slash:
- \* a physics/math nerd,
- \* a professor of meteorology/climate dynamics,
- \* a pragmatist/realist,
- \* and a biker/hiker/outdoor dad.



# What are my goals?

- \* For this workshop?
- \* For this talk?
- \* For my research?
- \* For my planet?









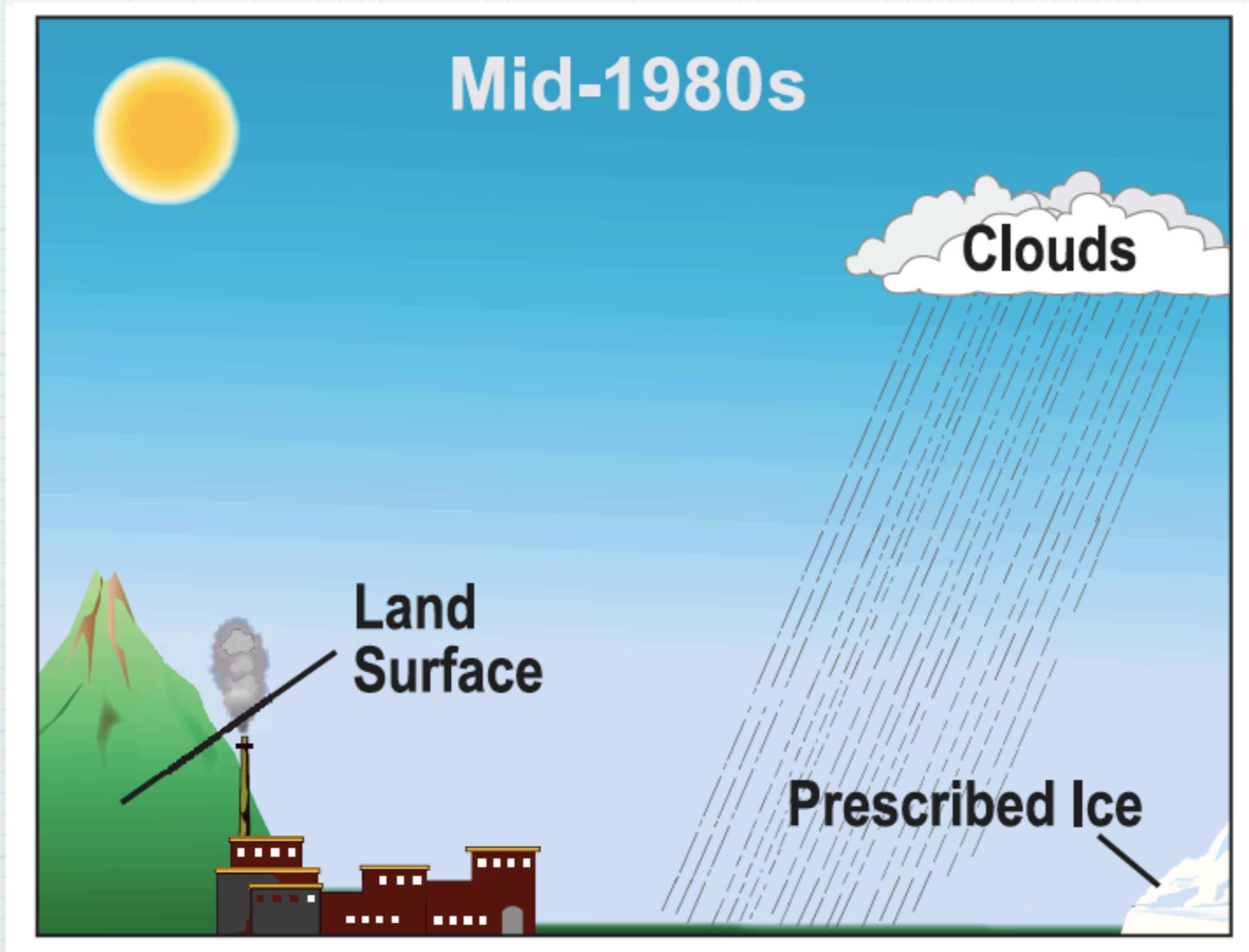
# Climate Model History

Components/Complexity





# Climate Model History



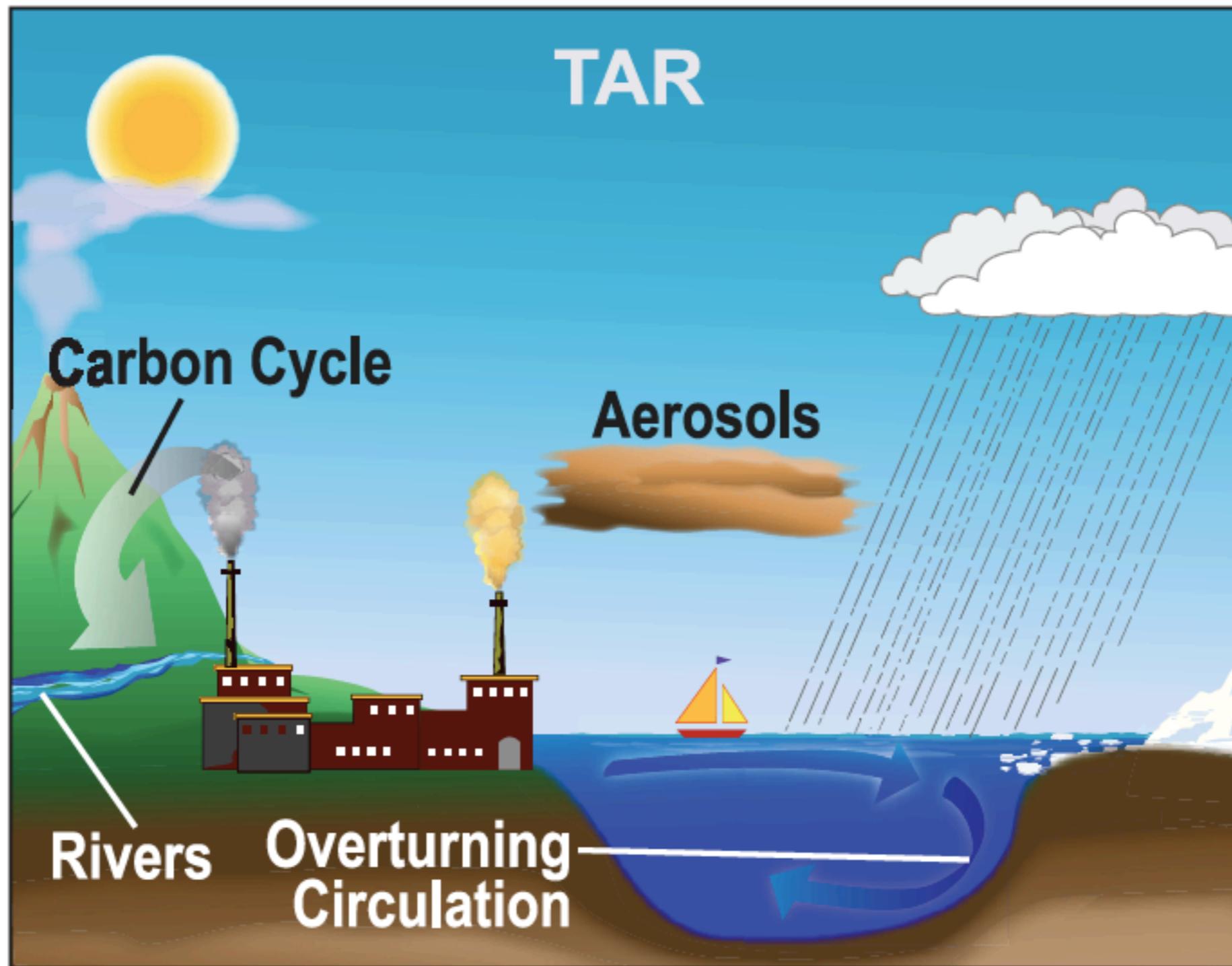
Components/Complexity







# Climate Model History



Components/Complexity





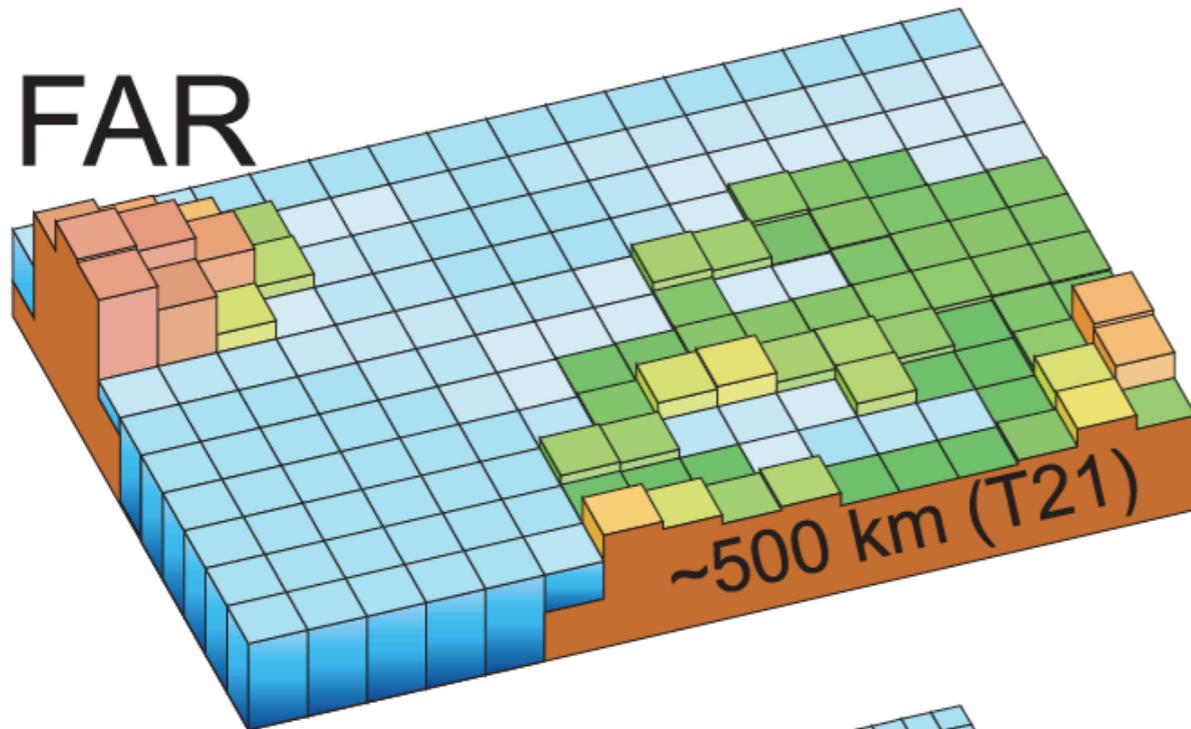
# Sources of Uncertainty

- \* Observational uncertainty (measurements)
- \* Model uncertainty (representation)
- \* Statistical Uncertainty (i.e., random?)
- \* Chaotic Uncertainty (internal/natural/unforced variability)

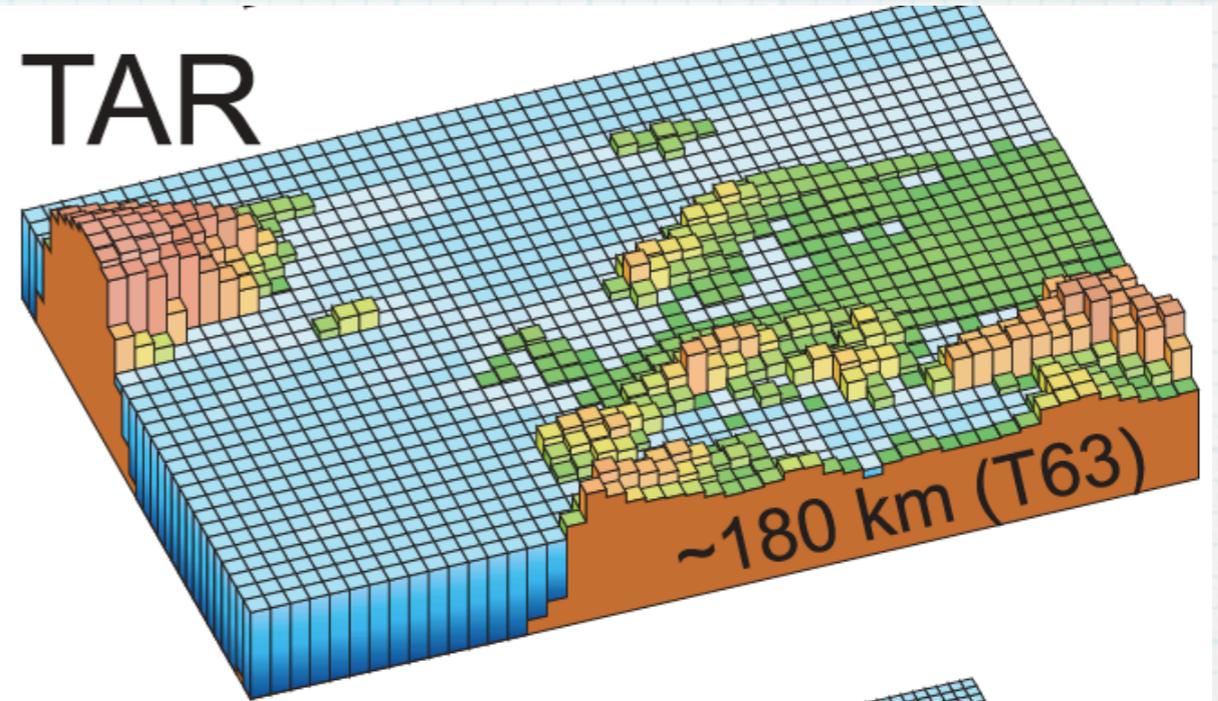


# Climate Model History

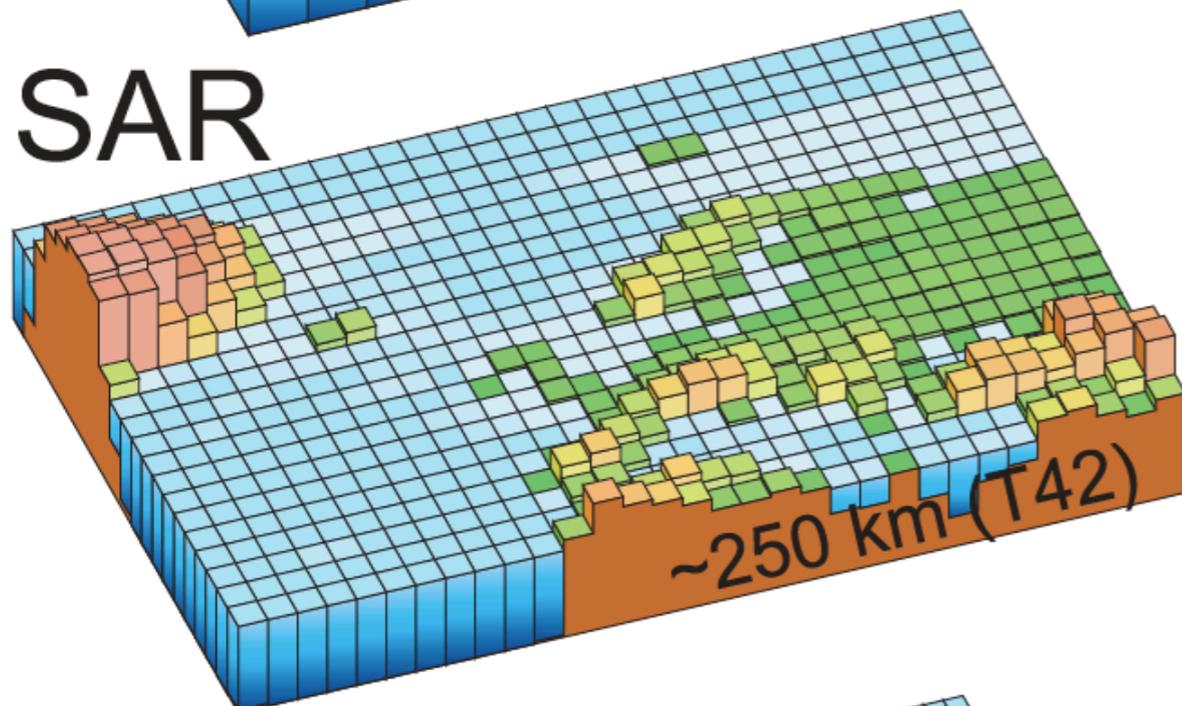
FAR



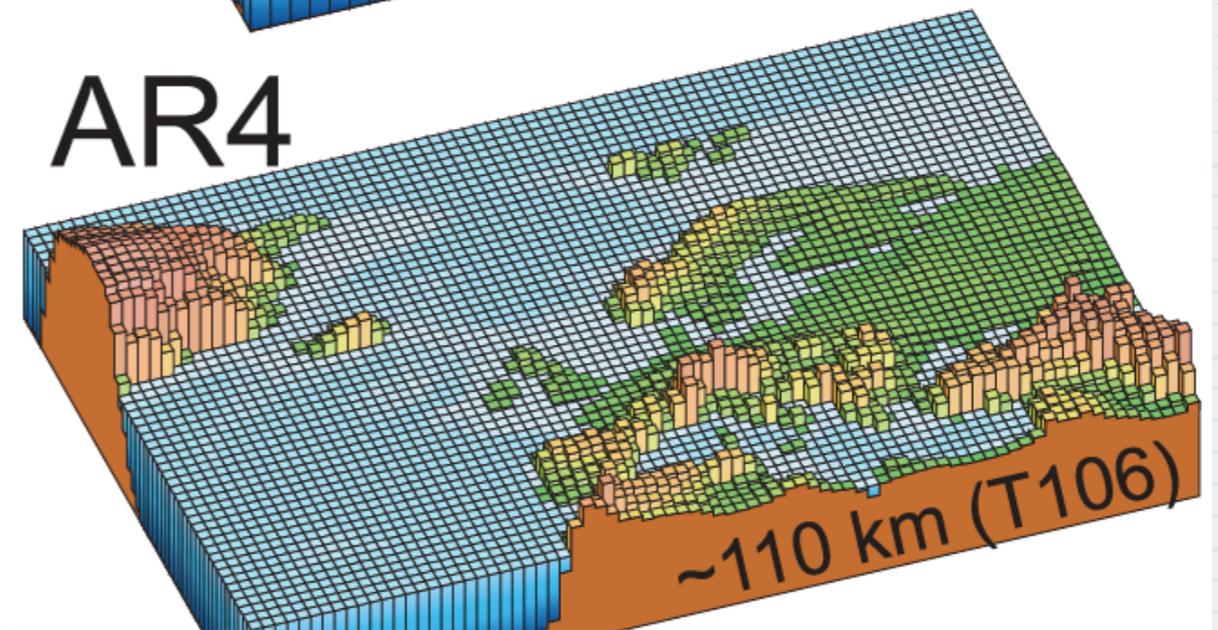
TAR



SAR



AR4



From IPCC Fourth Assessment Report



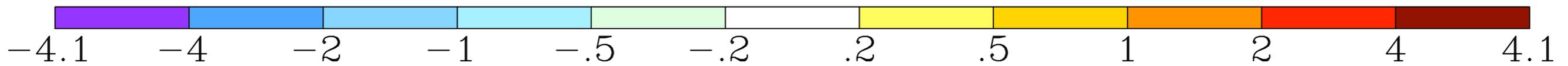
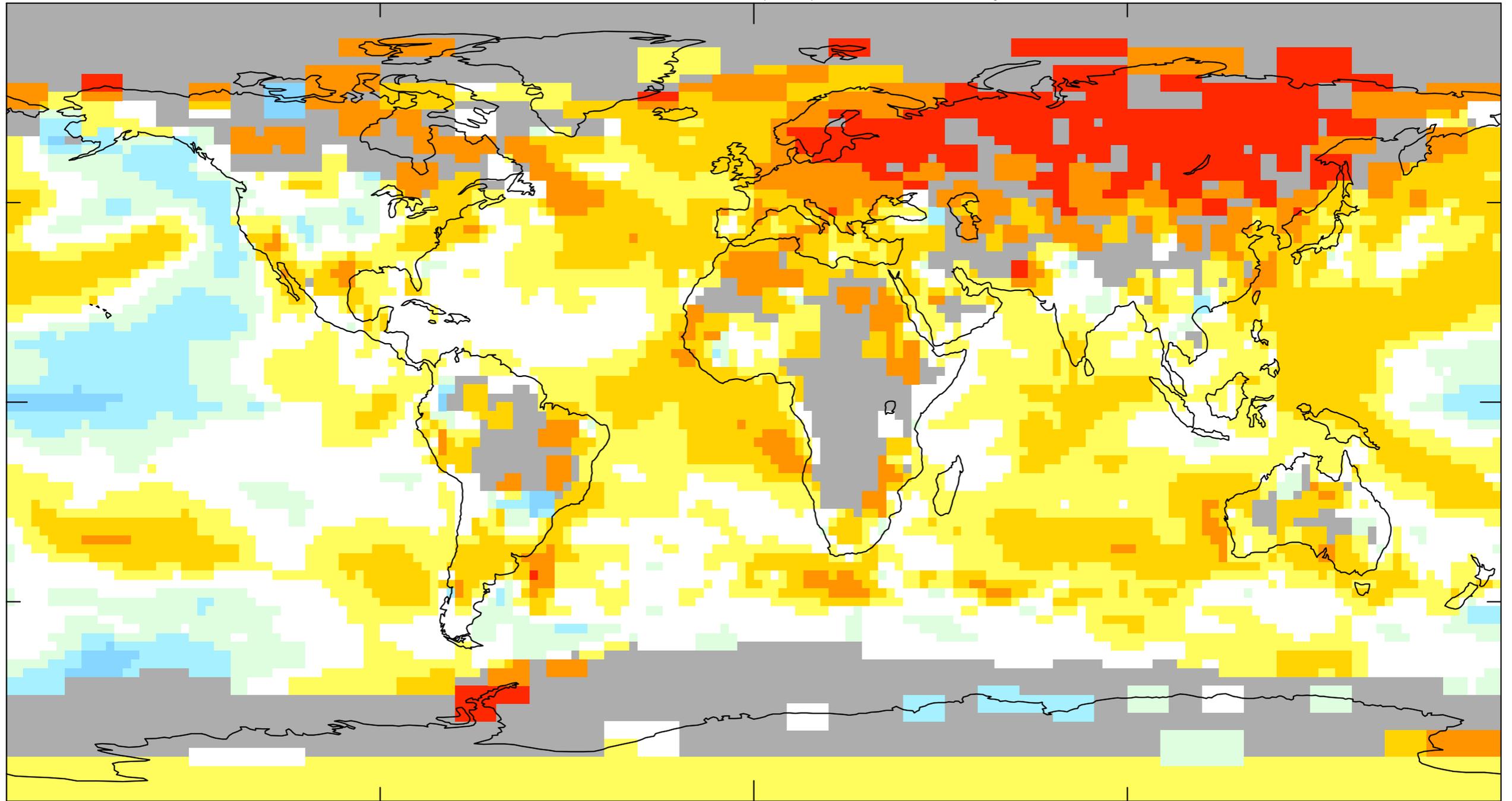


# All data: Surface Temperature (2008)

Annual D-N 2008

L-OTI(°C) Anomaly vs 1951-1980

.39



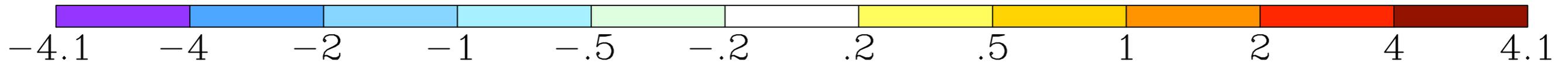
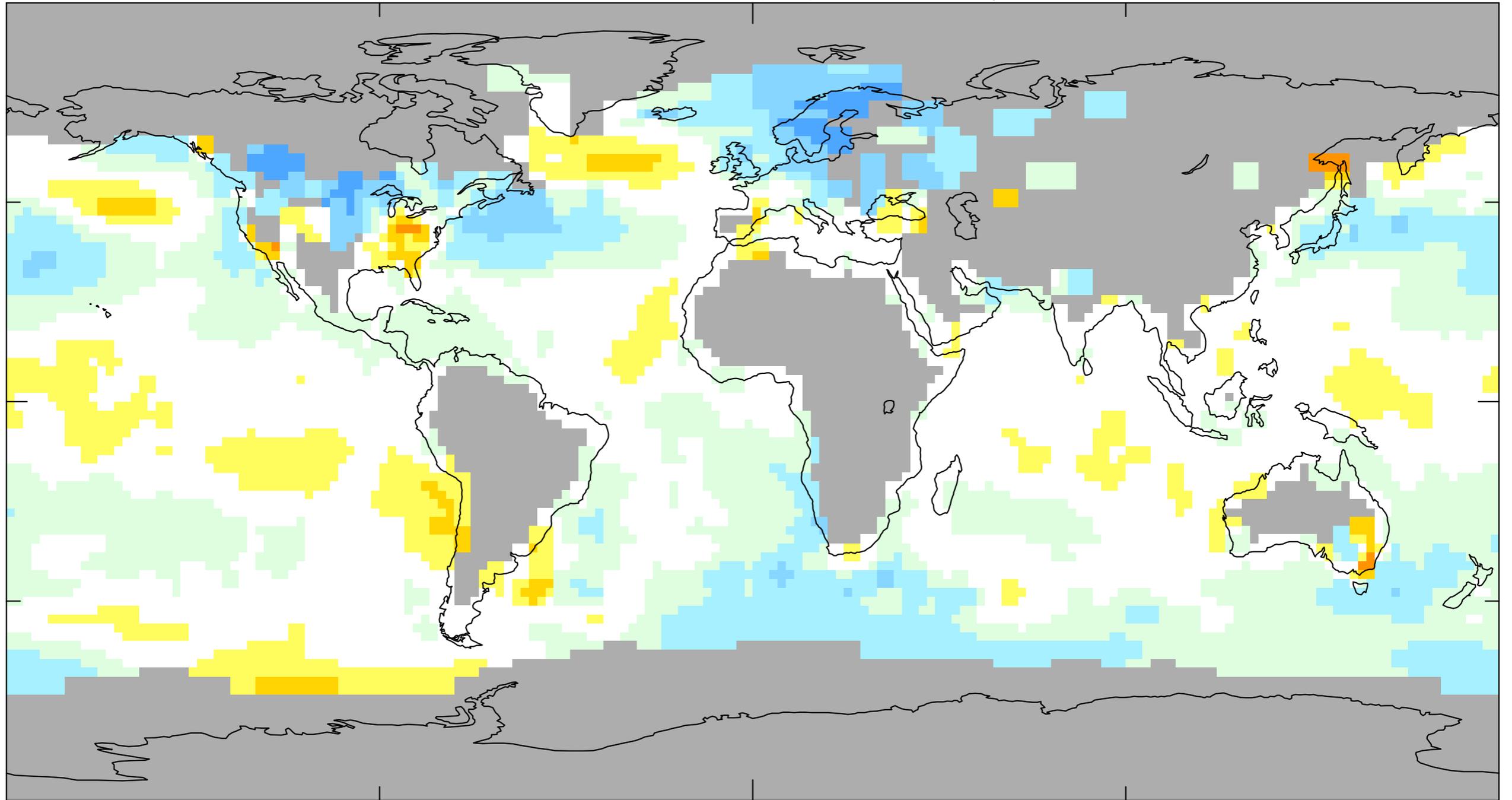
<http://data.giss.nasa.gov/>

# Surface Temperature (1881)

Annual D-N 1881

L-OTI(°C) Anomaly vs 1951-1980

-.18



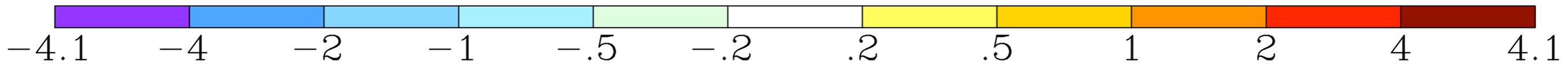
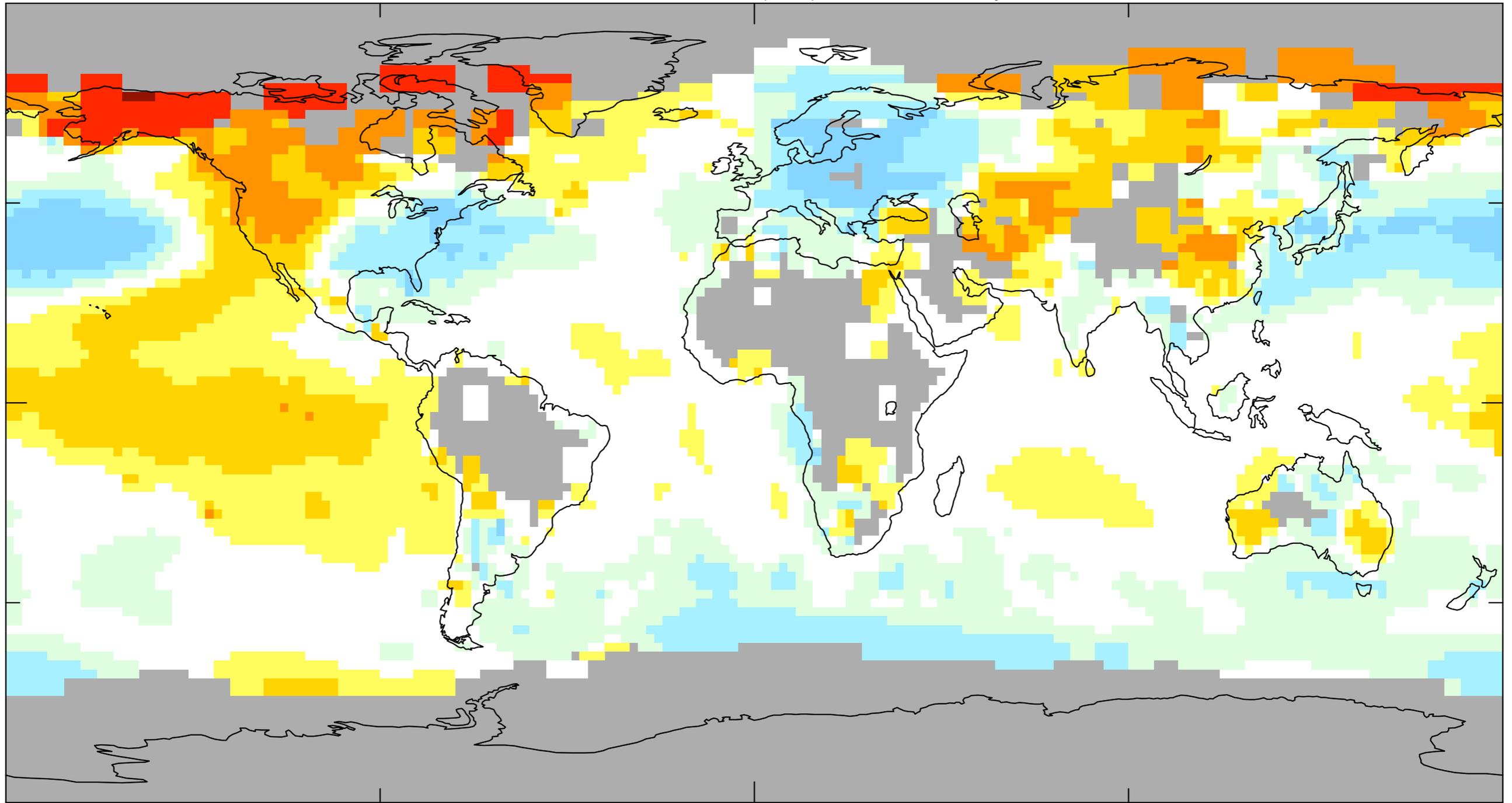
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# Surface Temperature (1940)

Annual D-N 1940

L-OTI(°C) Anomaly vs 1951-1980

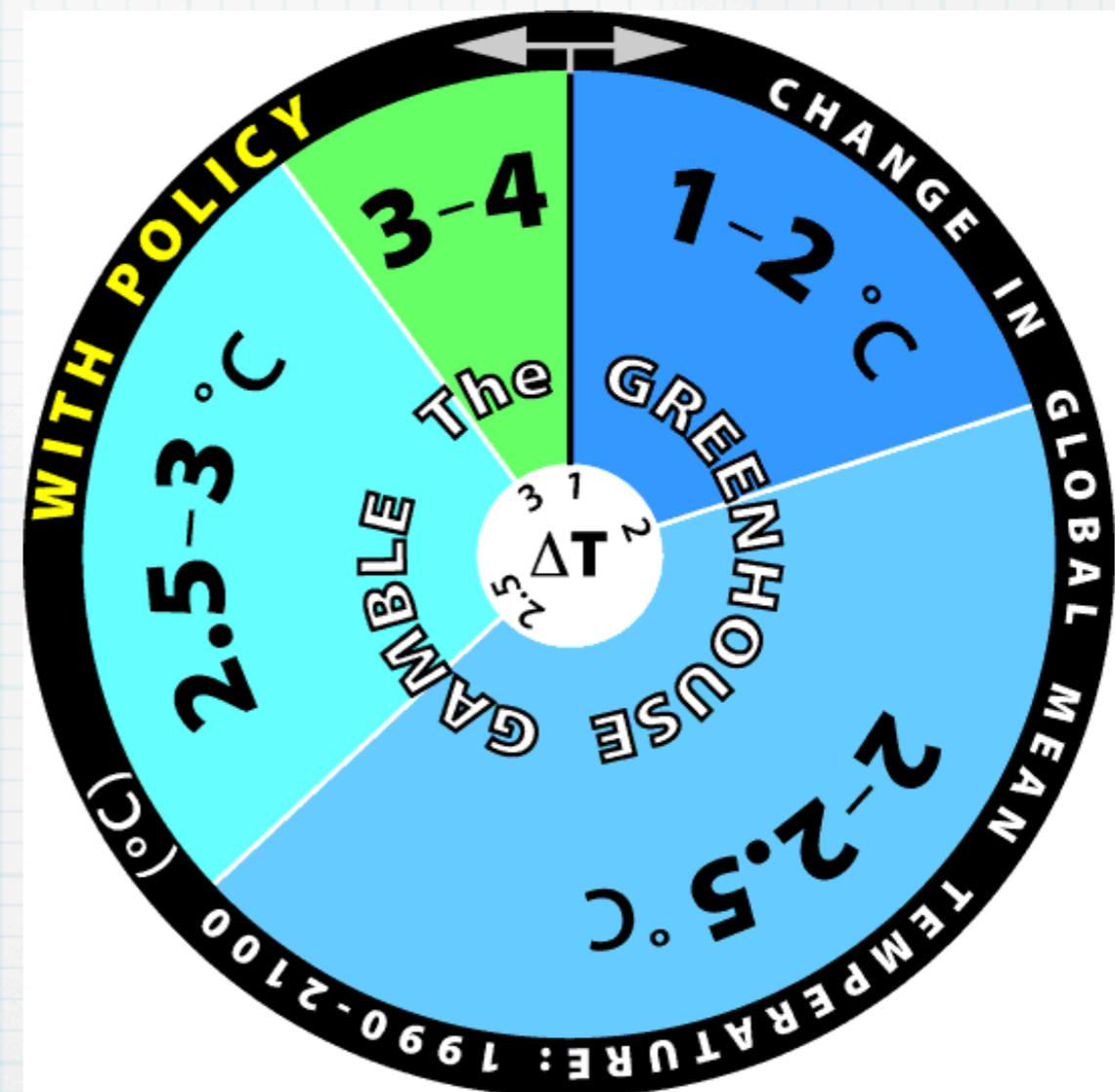
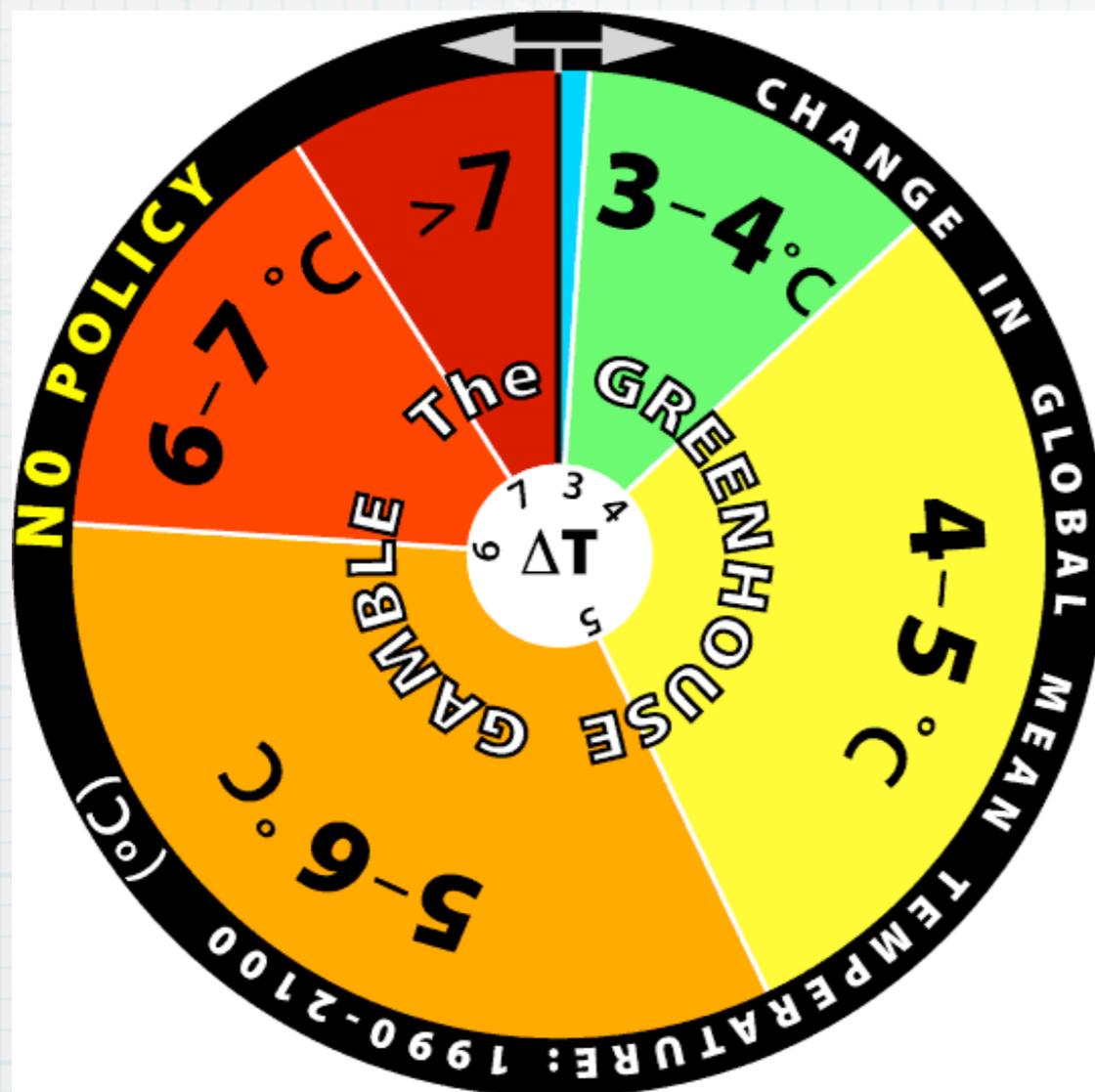
.04



<http://data.giss.nasa.gov/>



# Uncertainty in Global Climate Response in 2100



Global-mean, Decadal-mean, Surface Air Temperature  
Based on Sokolov et al. (2009); Webster et al. (2011)





