

# Communicating What Climate Change Really Means

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This presentation attempts to encapsulate my approach at communicating what climate change really means to the lives of people. Where possible, I foster dialogue between students in a small group setting on the politics and the reasons for skepticism of climate science. This allows me to steer the conversation without coming across as preachy. I explain the uncertainty in a way that does not oversimplify the complexities. I provide examples that are more meaningful to people than average future temperatures such as the number of hot days and the frequency of violent storms. During the discussion, I am mindful about not being overly pessimistic about the future and always try to end the conversation on a hopeful note.

Compare the following two papers:

Hansen, J.; S. Makiko; R. Reto; *et al.* (2006). Global temperature change. *Proceedings of the National Academy of Sciences of the United States of America* 103(39): 14288-14293.

Khilyuk, L.F. & G.V. Chilingar. (2006). On global forces of nature driving the Earth's climate. Are humans involved? *Environmental Geology* 50(6): 899-910.

Rather than reading the papers, do a comparison of the quality of the papers. Answer the following questions. To help answer the questions use the “Web of Science” database available on the GVSU Library webpage:

<http://libguides.gvsu.edu/az.php?a=w>

1. Which Journal is more prestigious (look at the Journal Citation Report)?
2. Which paper is more cited (by other researchers)?
3. Which lead author appears more qualified to do the work reported (look up the author to see what position they hold and what active research they do and any potential bias or conflicts of interest due to funding sources or otherwise)?
4. Which lead author is more respected (as evidenced by the number of papers and number of citations)?

# Group Question

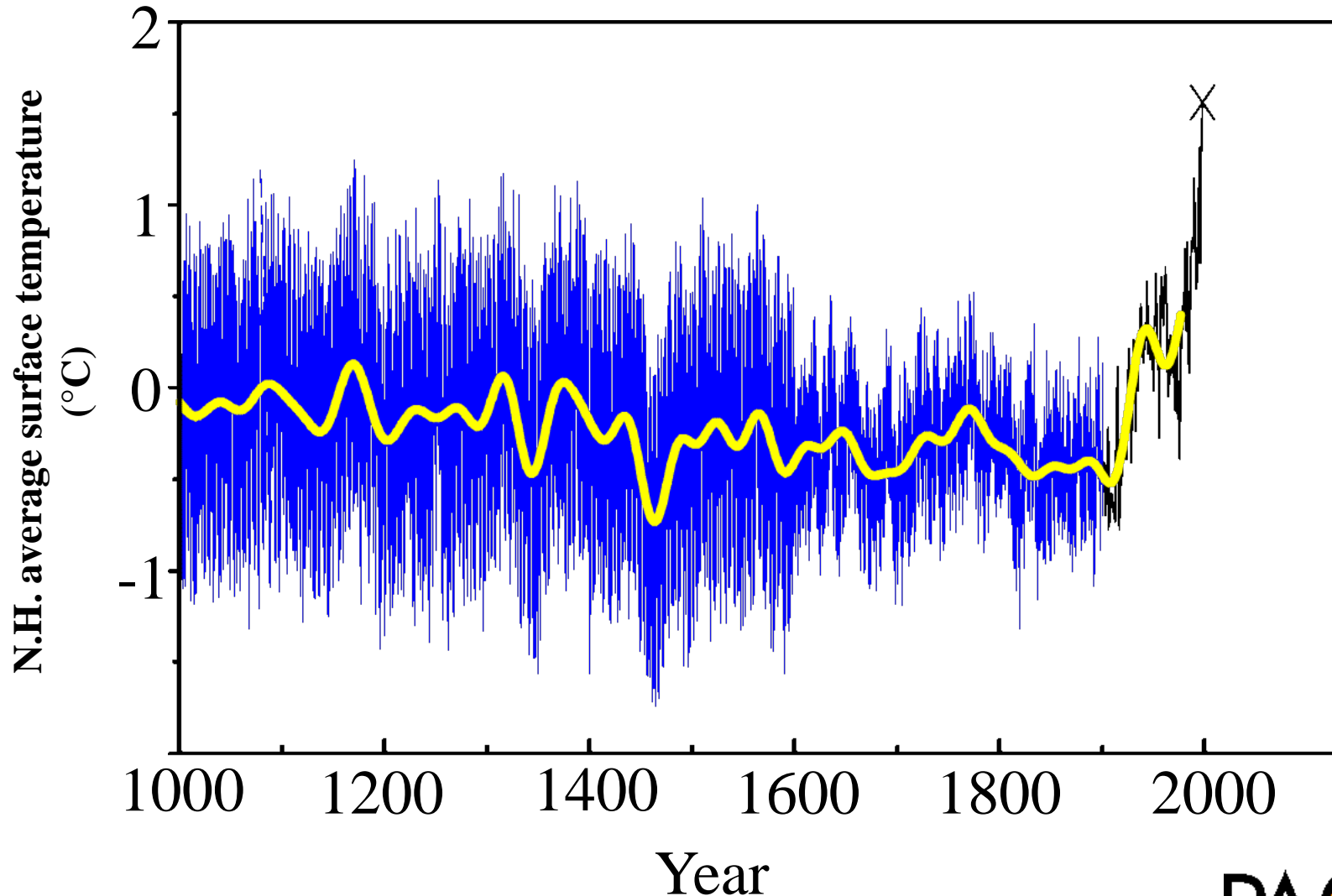
- 1) Why do you think a significant proportion of the US population does not believe in human caused climate change?
- 2) What special interest groups benefit from denying climate change exists?
- 3) What special interest groups benefit from exaggerating climate change implications?

*Thinking about what is said in the news, in your view is the seriousness of global warming -- [ROTATED: generally exaggerated, generally correct, or is it generally underestimated]?*

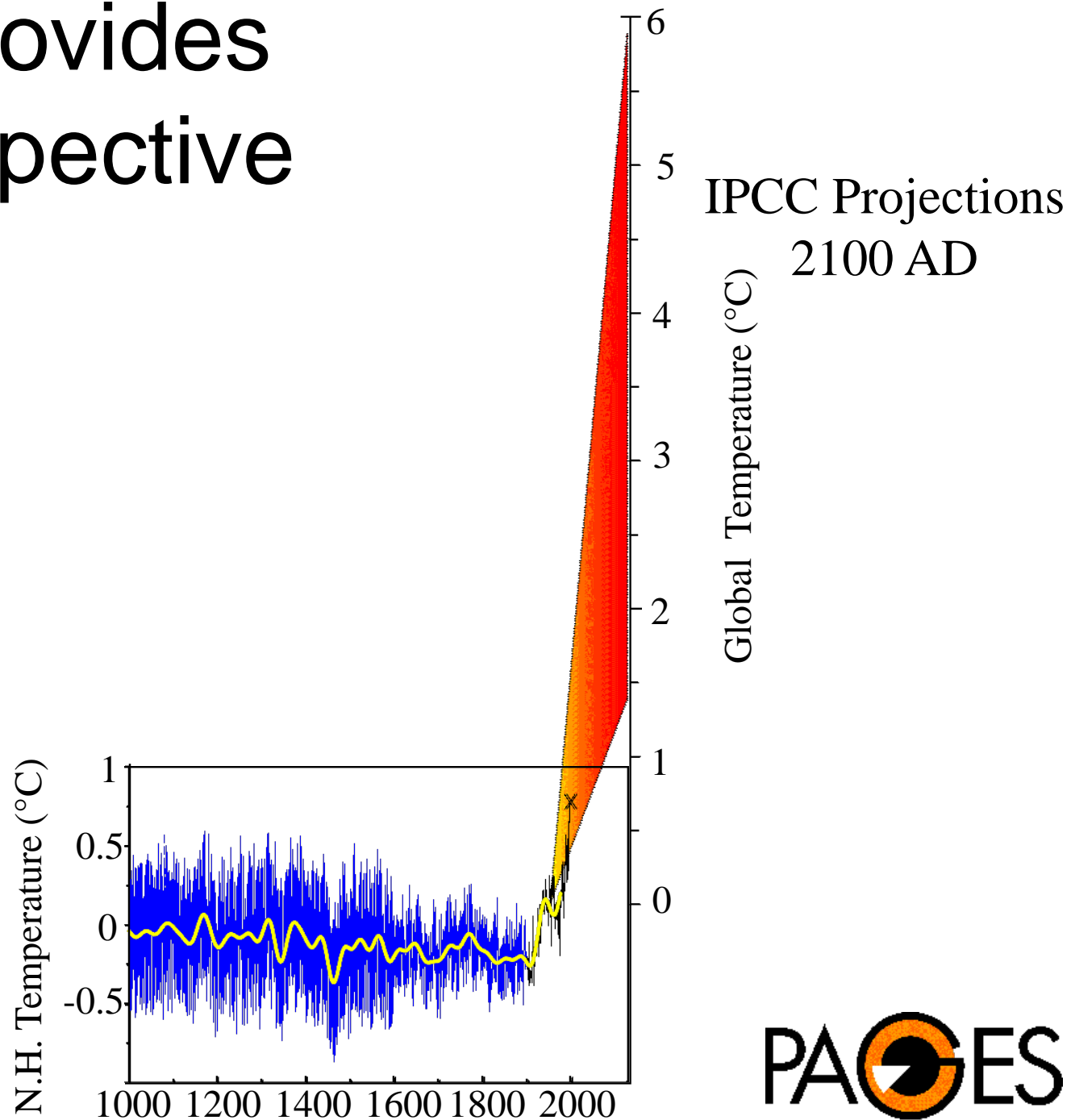


GALLUP

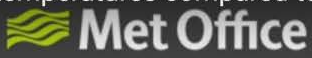
# Past Climate Variability ...



# ...Provides Perspective

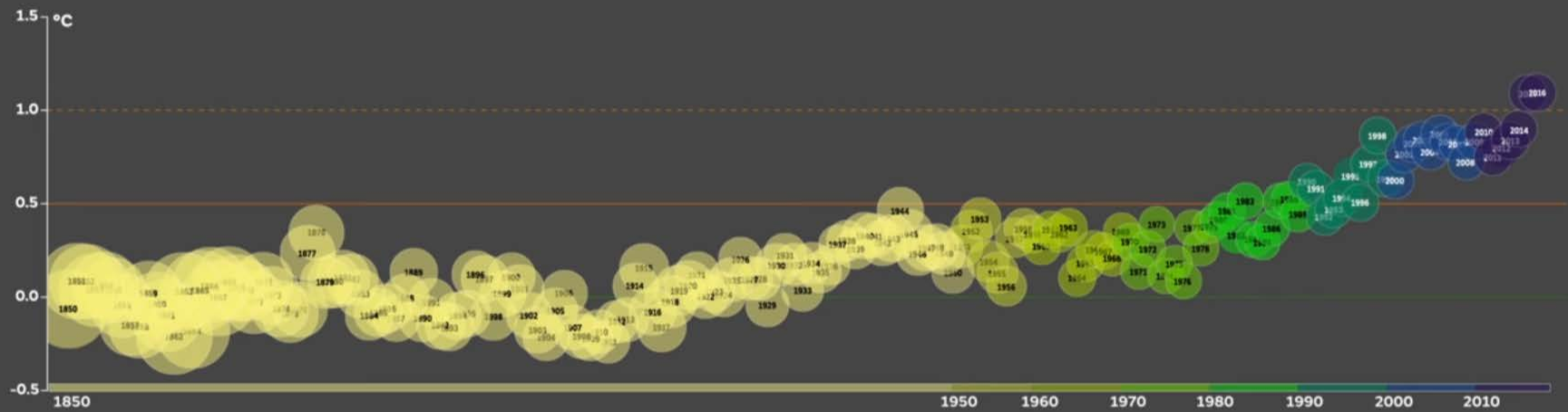


Global temperatures compared to pre-industrial (1850-1900)



# Global temperatures

Compared to pre-industrial (1850-1900)



Data source: HadCRUT4 data set (Morice et al., 2012).

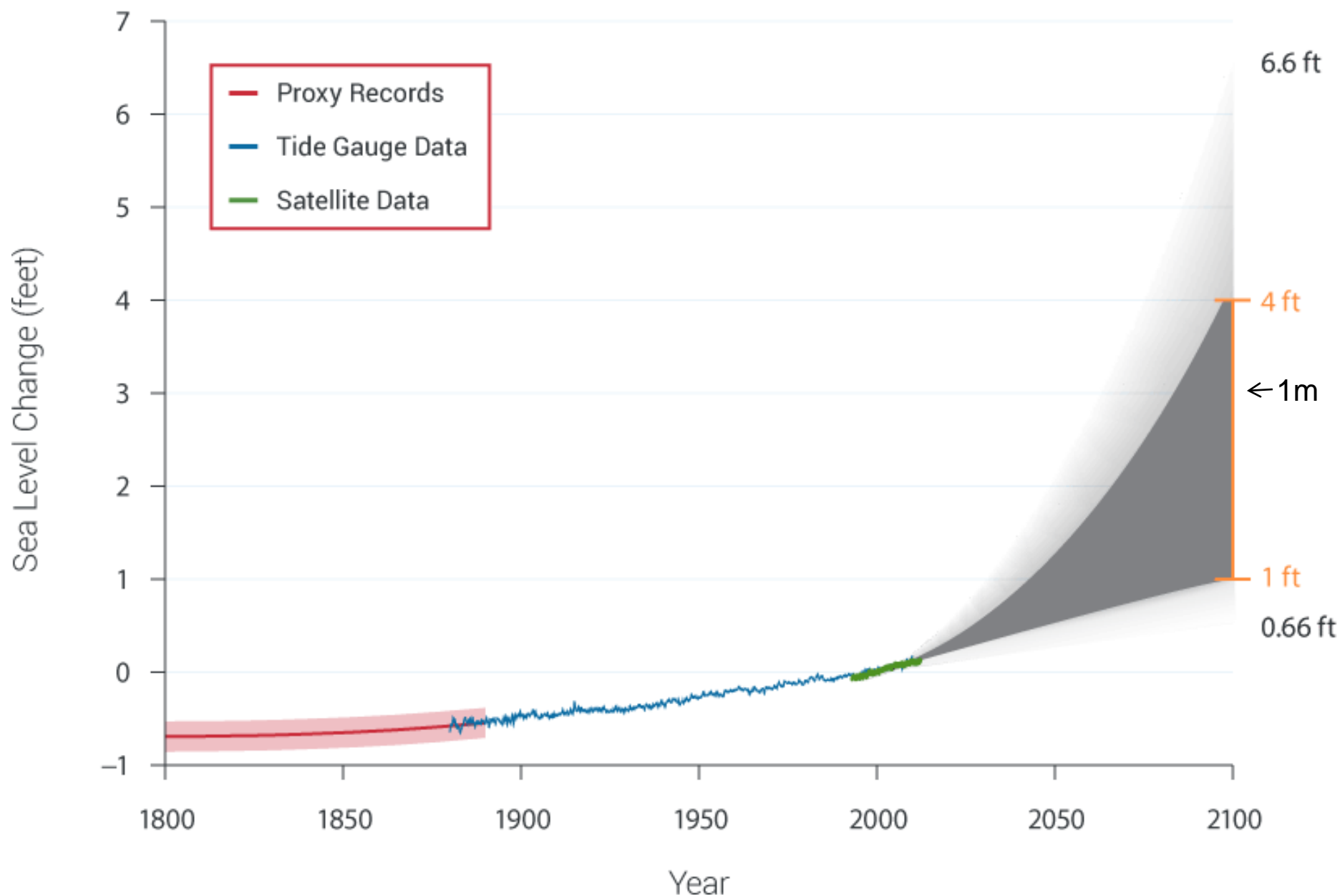
SUBSCRIBE

0:30 / 0:34





# Past and Projected Changes in Global Sea Level



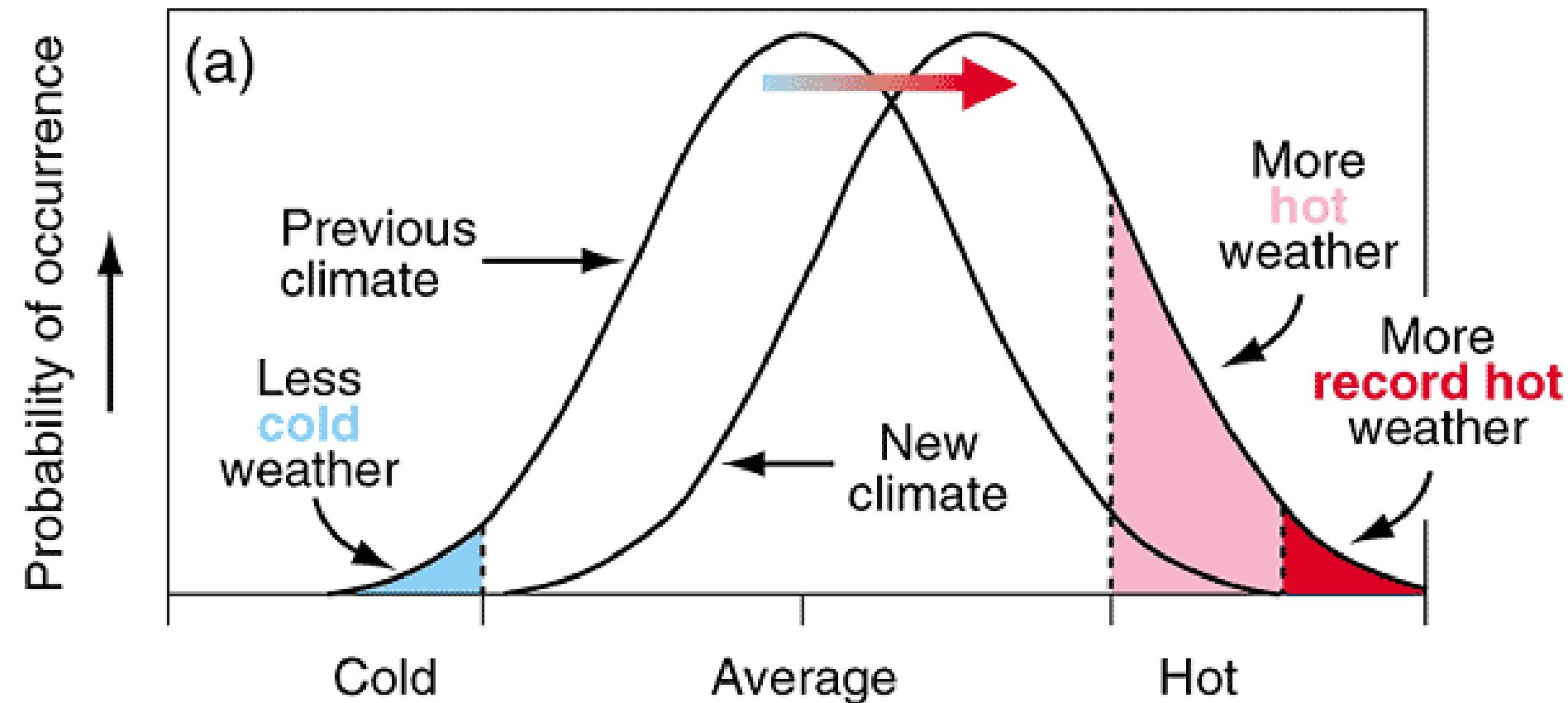


Lower Emissions  
Scenario<sup>31</sup>

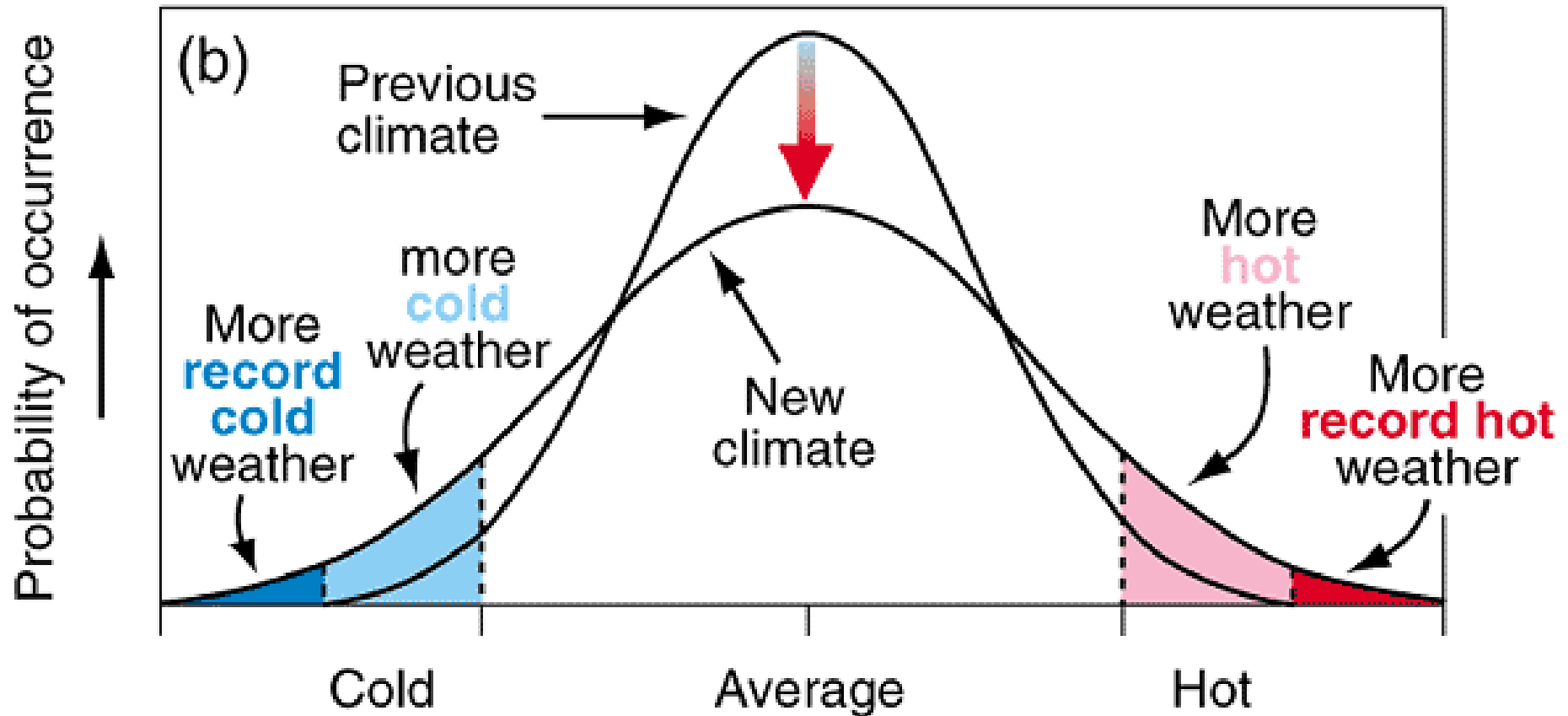
Higher Emissions  
Scenario<sup>31</sup>

Hayhoe et al.<sup>283</sup>

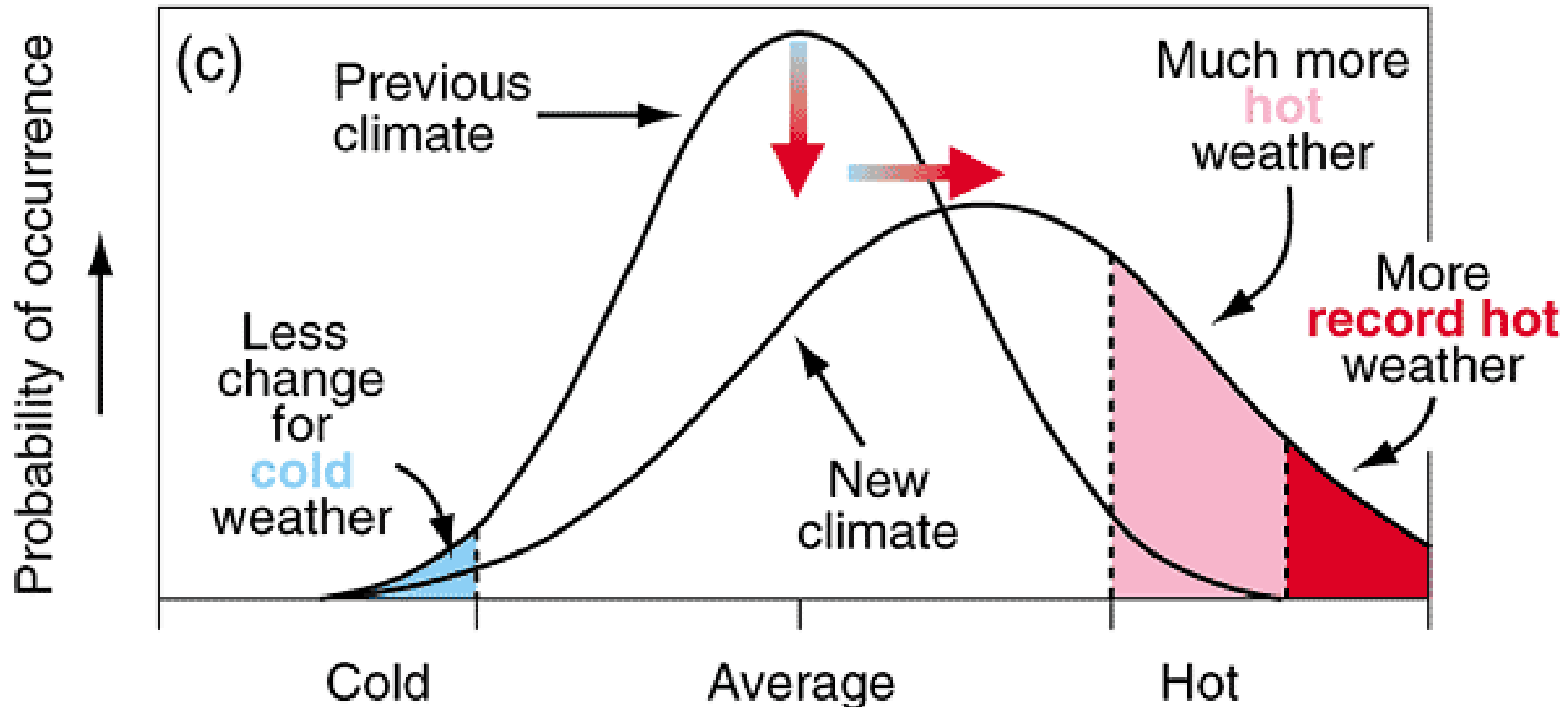
## Increase in mean

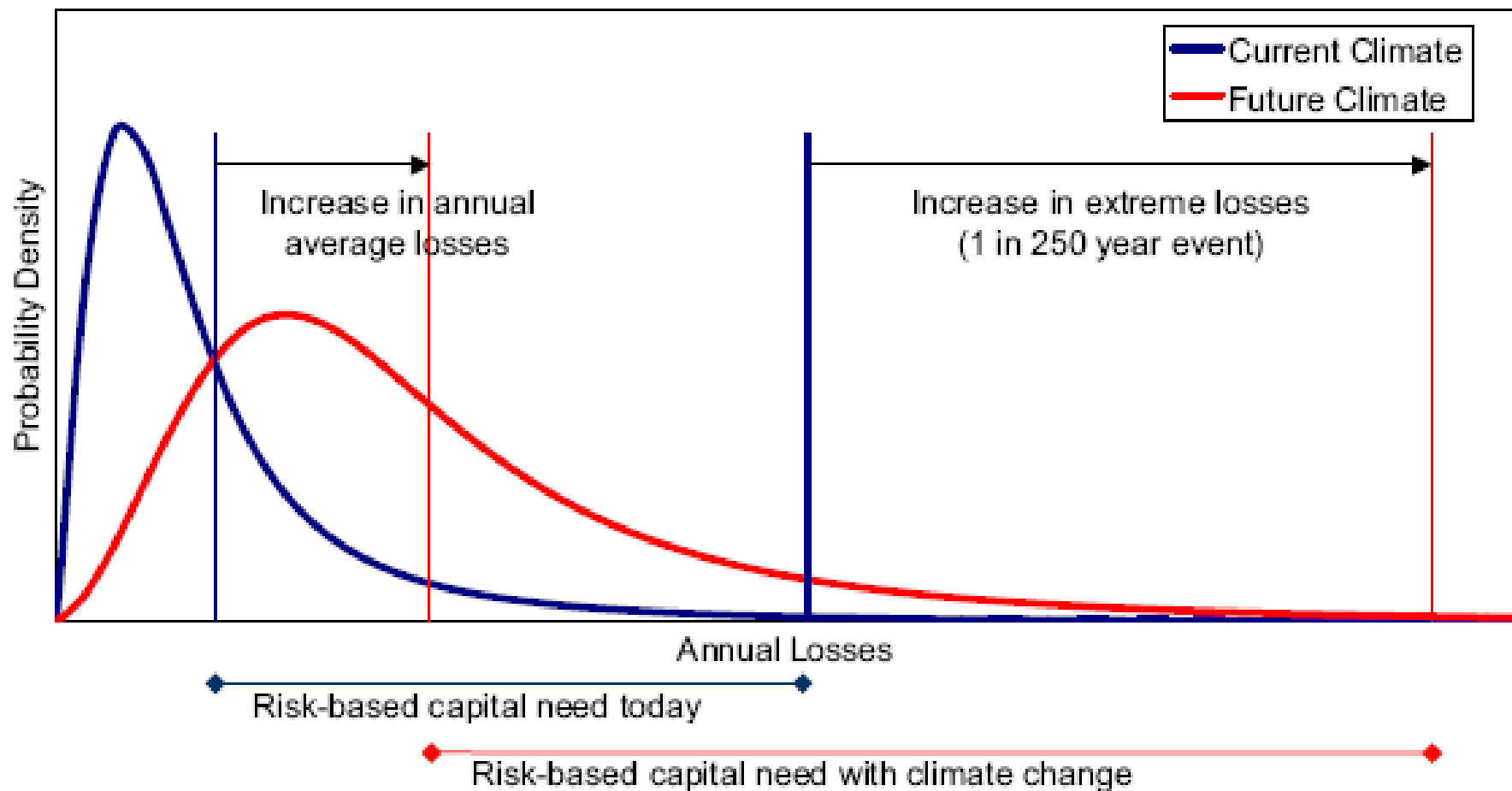


## Increase in variance

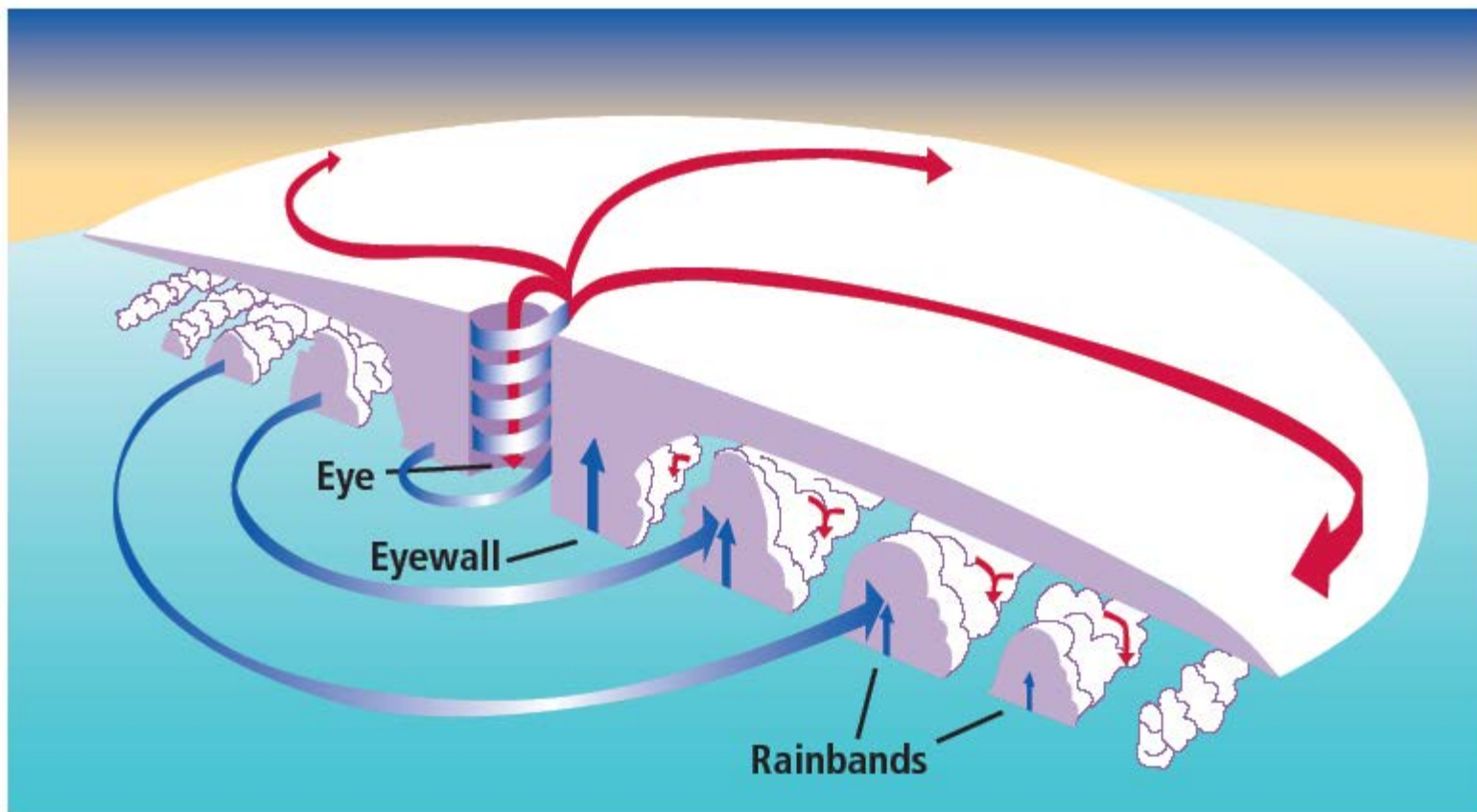


## Increase in mean and variance





Stern Report 2006



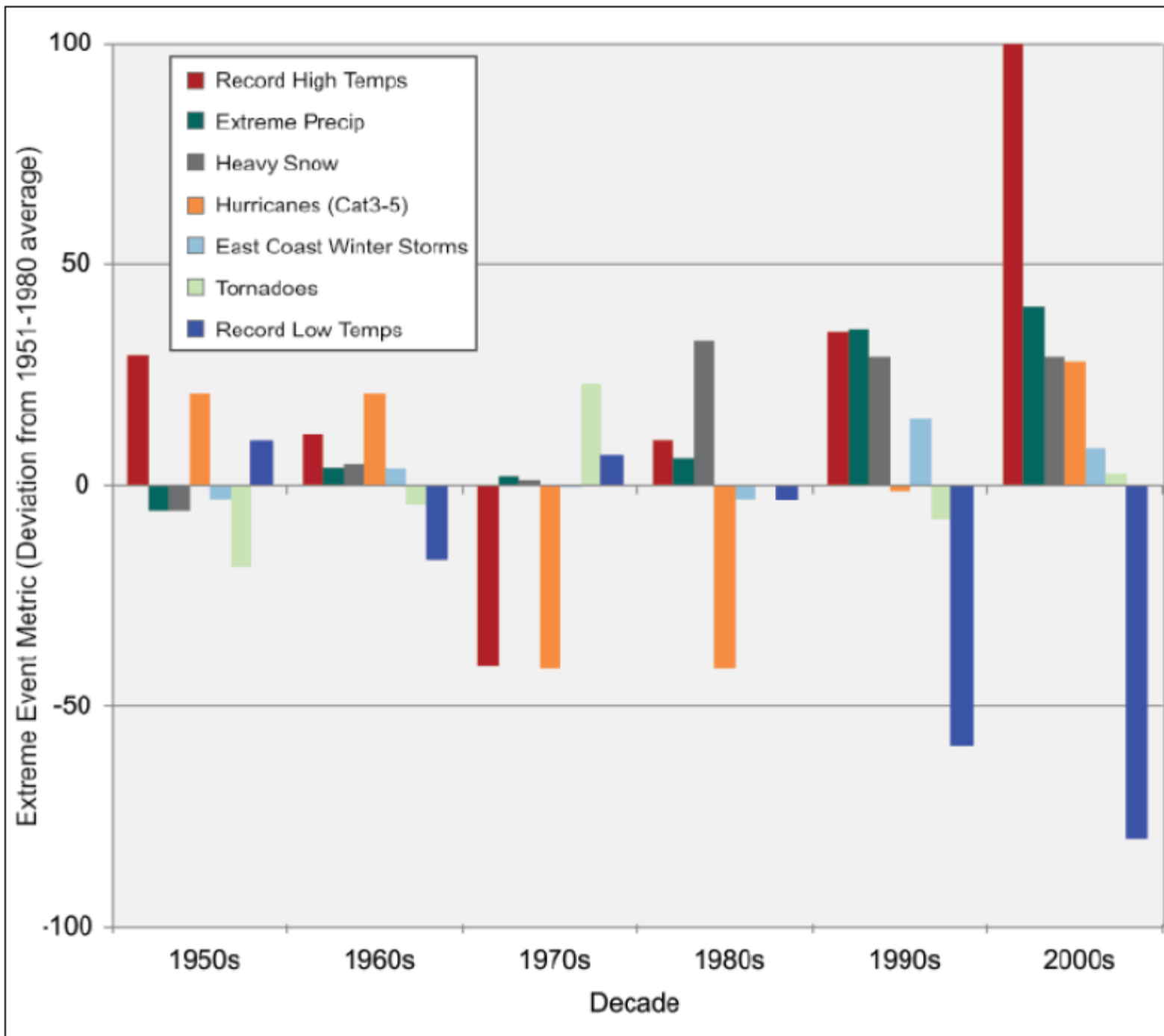
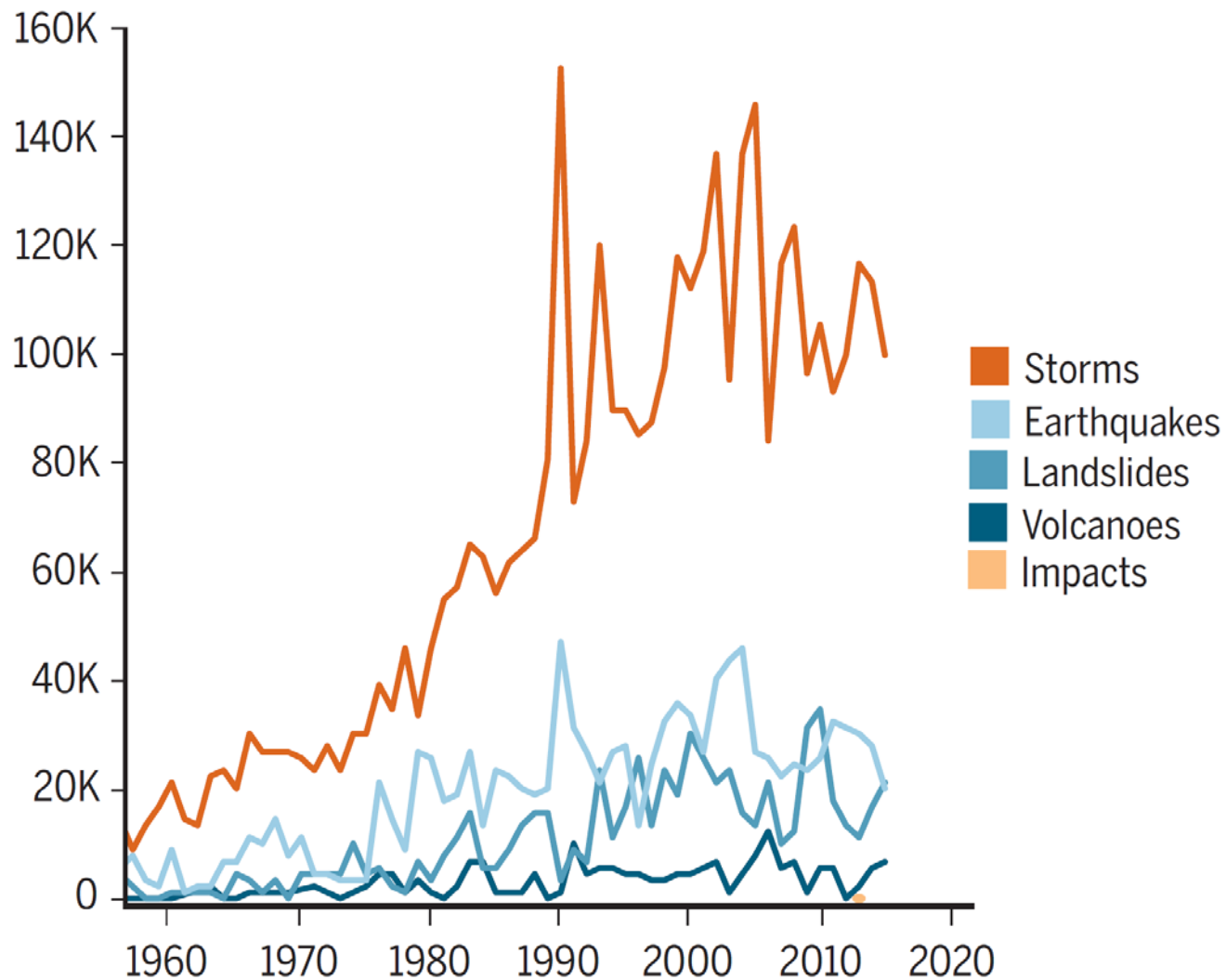


Fig. 1. Extreme weather metrics for recent decades, including the number of record high monthly

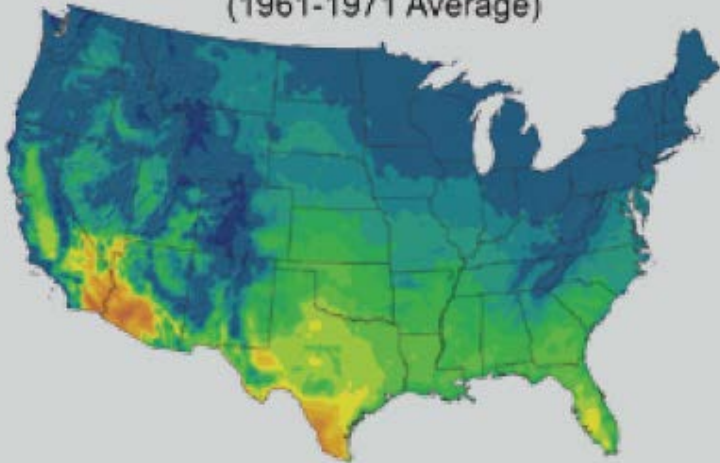


## Number of recorded disasters

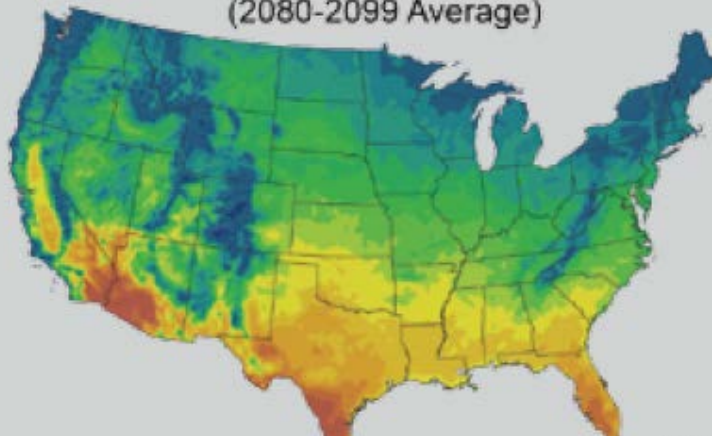


# Number of days above 90 °F

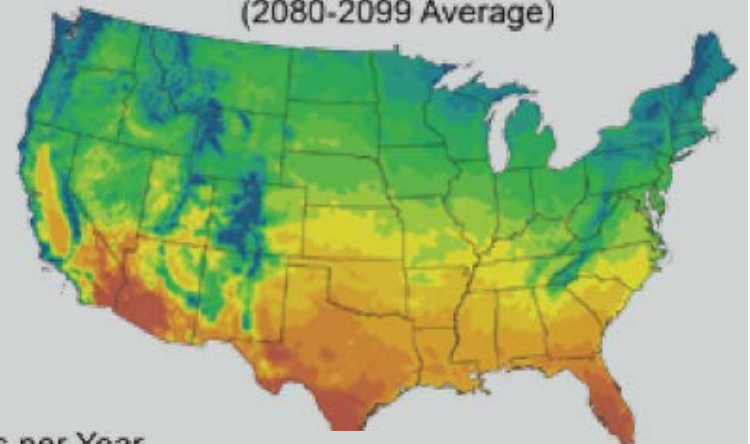
Recent Past  
(1961-1971 Average)



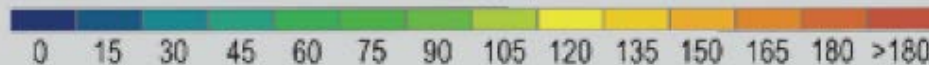
Projected End-of-Century under  
Lower Emissions Scenario<sup>91</sup>  
(2080-2099 Average)



Projected End-of-Century under  
Higher Emissions Scenario<sup>91</sup>  
(2080-2099 Average)



Number of Days per Year

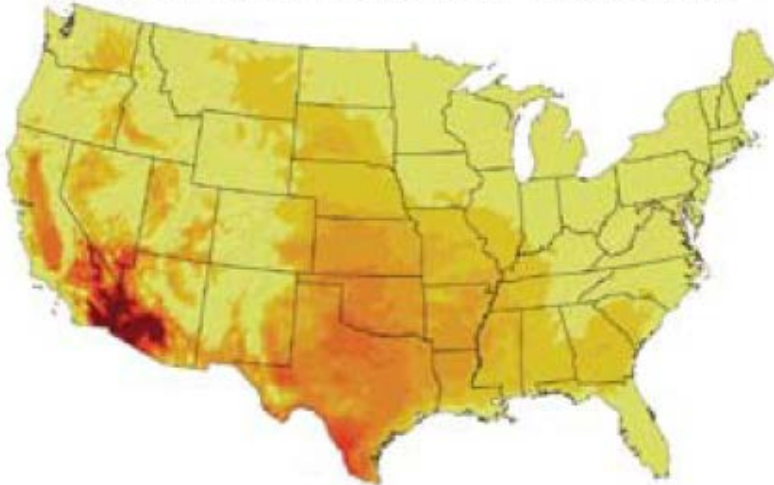


# Number of days above 100 °F

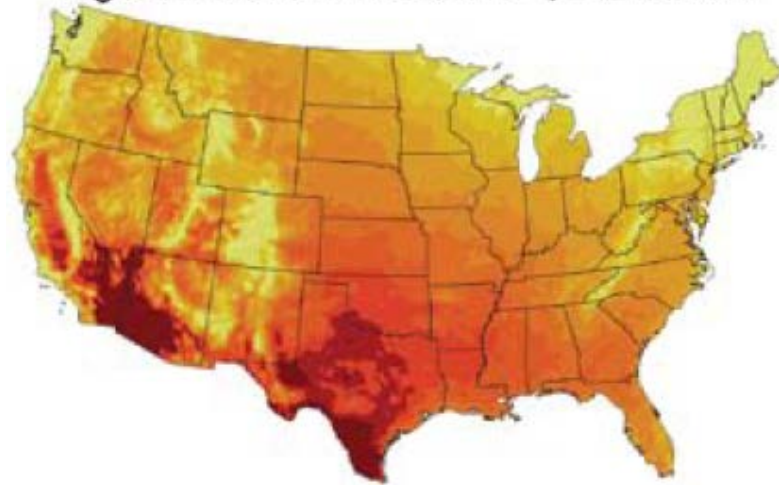
Recent Past, 1961-1979



Lower Emissions Scenario<sup>91</sup>, 2080-2099



Higher Emissions Scenario<sup>91</sup>, 2080-2099

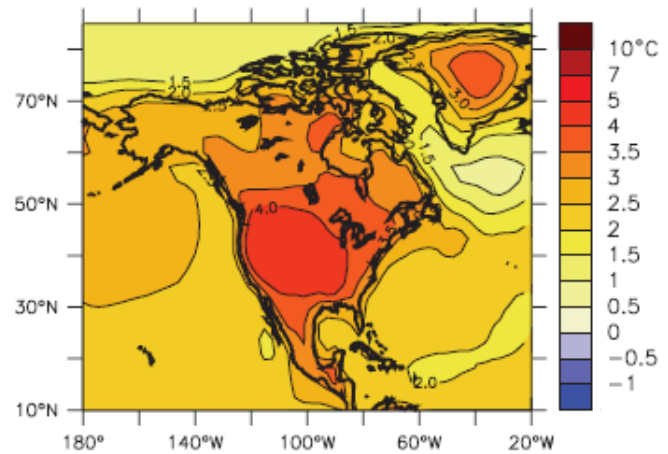
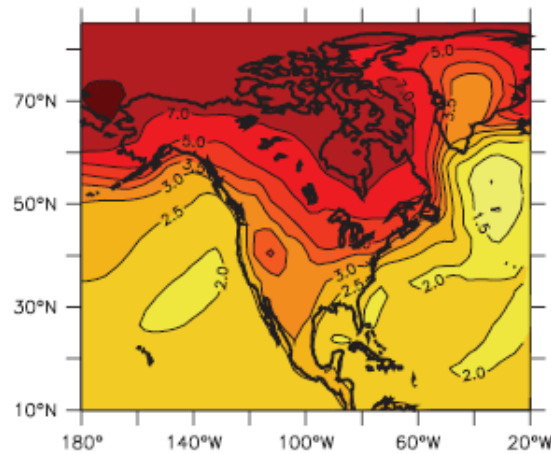
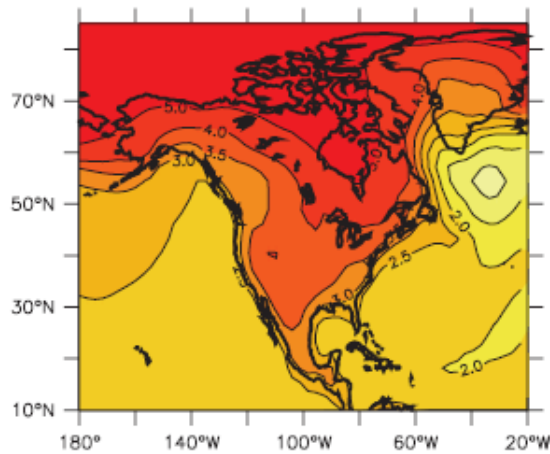


Annual

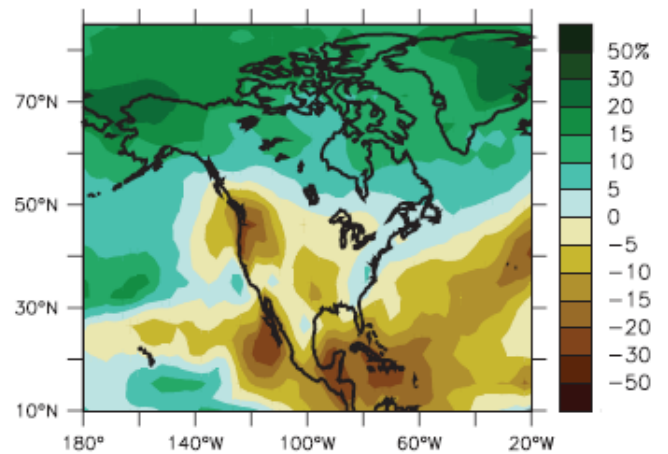
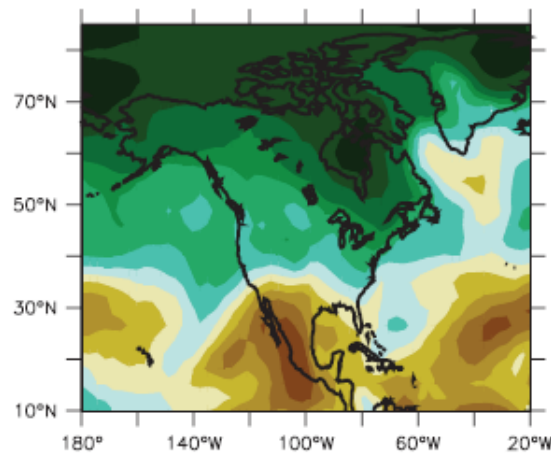
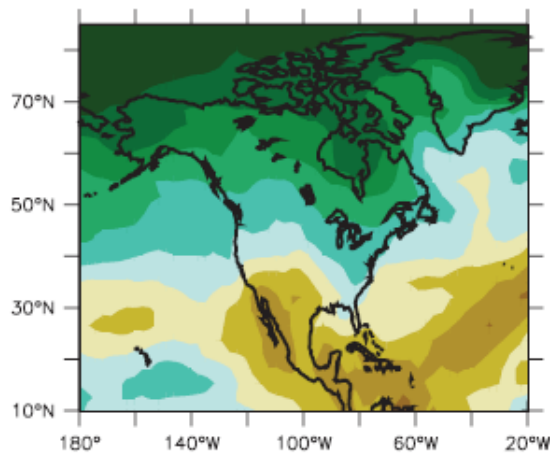
DJF

JJA

Temp Response (°C)



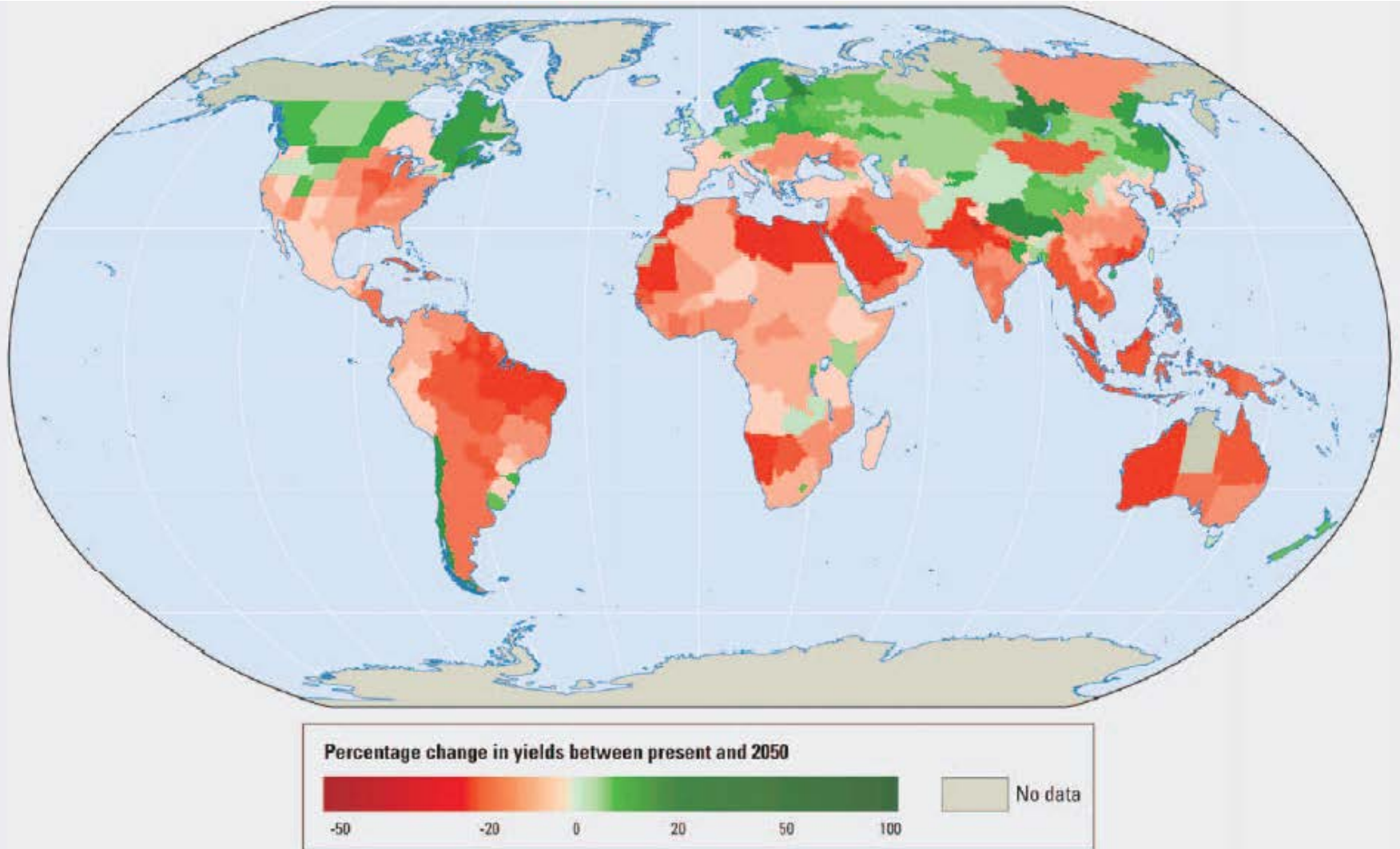
Prec Response (%)



*1980 to 1999 and 2080 to 2099, averaged over 21 models.*



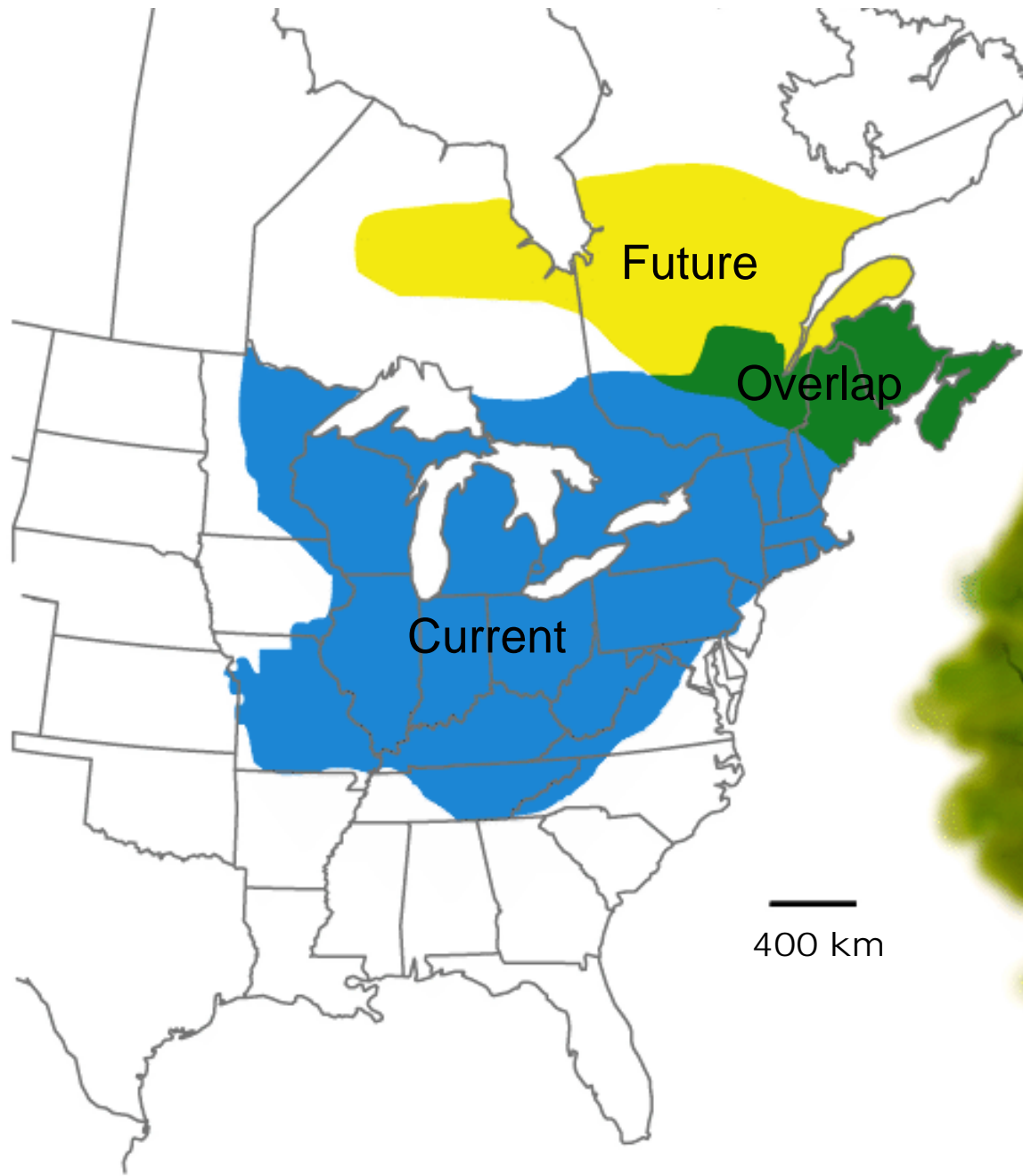
# Projected Yield Change



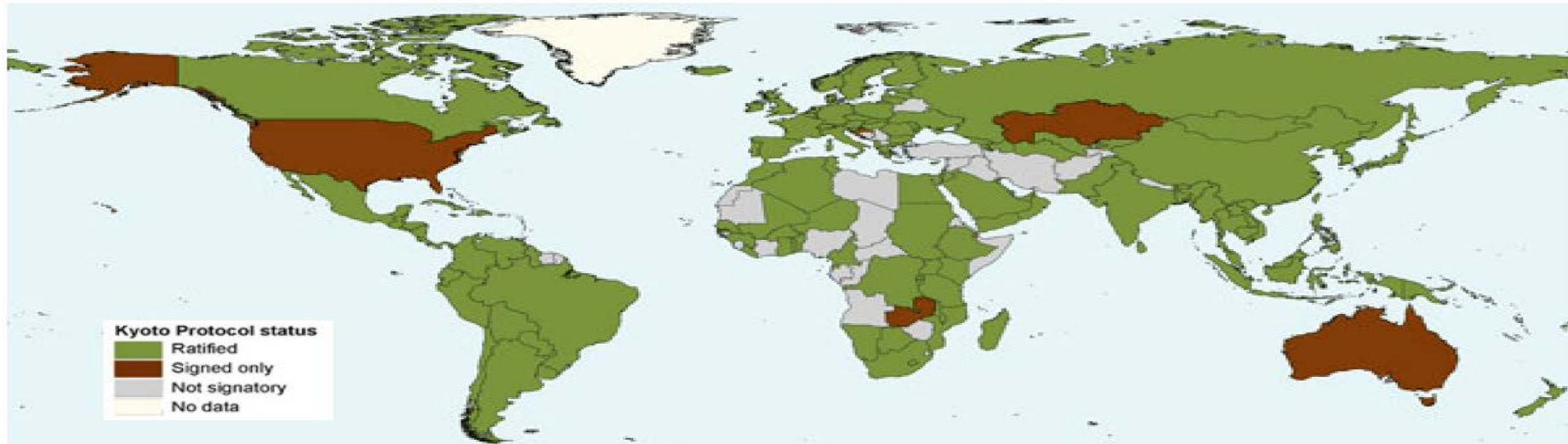
# Agricultural Shifts?



# Change in the distribution of sugar maple

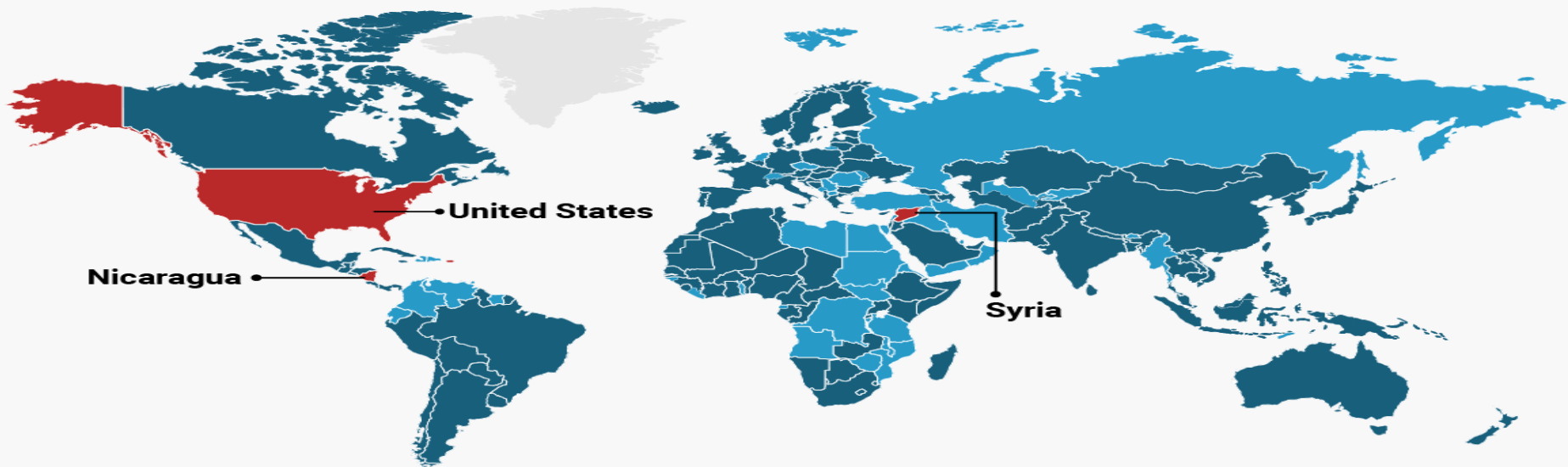


# Signatories to the Kyoto Protocol: June 2005



## COUNTRIES THAT JOINED THE PARIS CLIMATE AGREEMENT

■ Ratified (146) ■ Signed (48) ■ Not signed/Withdrawing (3)





# Summary

- Let students discuss the politics of climate change (steer the conversation but do not dominate it)
- Explain the reasons for uncertainty (do not over-simplify)
- Provide meaningful examples (not global averages)
- Be hopeful