

A satellite image of the Earth, centered on North America. The continent is visible in shades of green and brown, surrounded by blue oceans and white clouds. The image is set against a black background.

# Recent Scientific Findings from Climate Change Studies

January 25, 2007



**California Air Resources Board**

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**California Environmental Protection Agency**

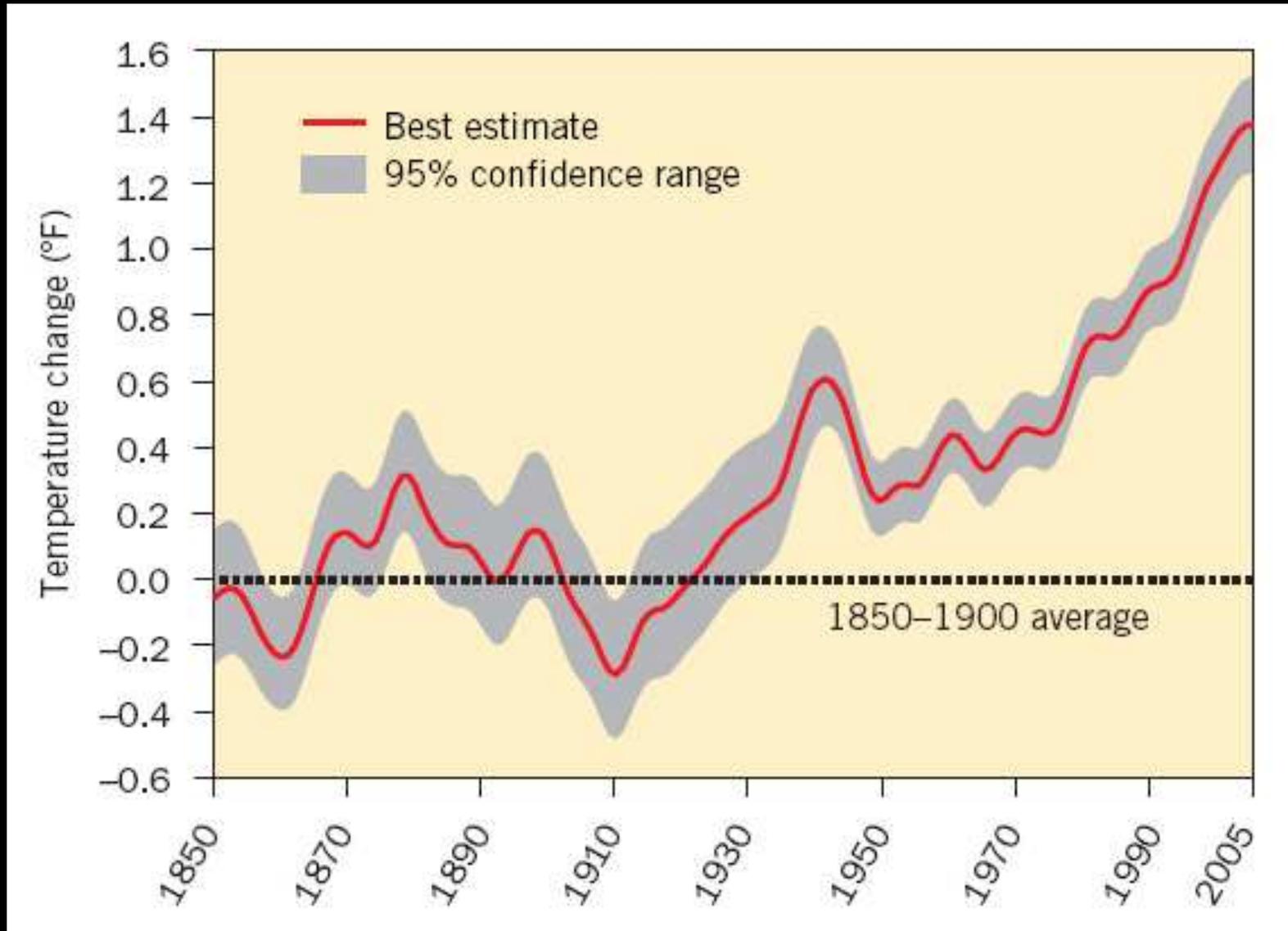
# Introduction

**Twice yearly updates on most important findings**

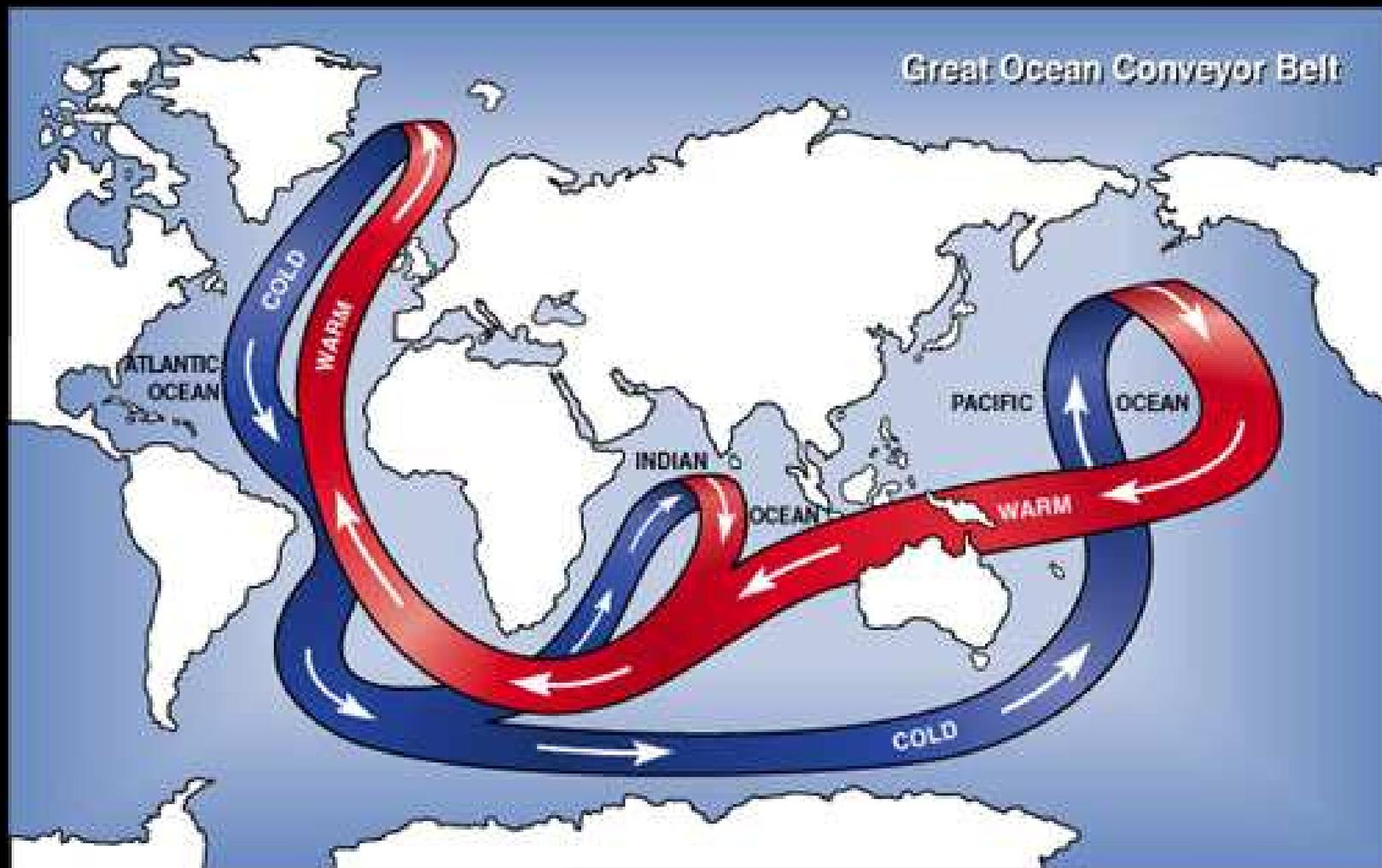
**Today's focus:**

- increasing evidence of serious climate change**

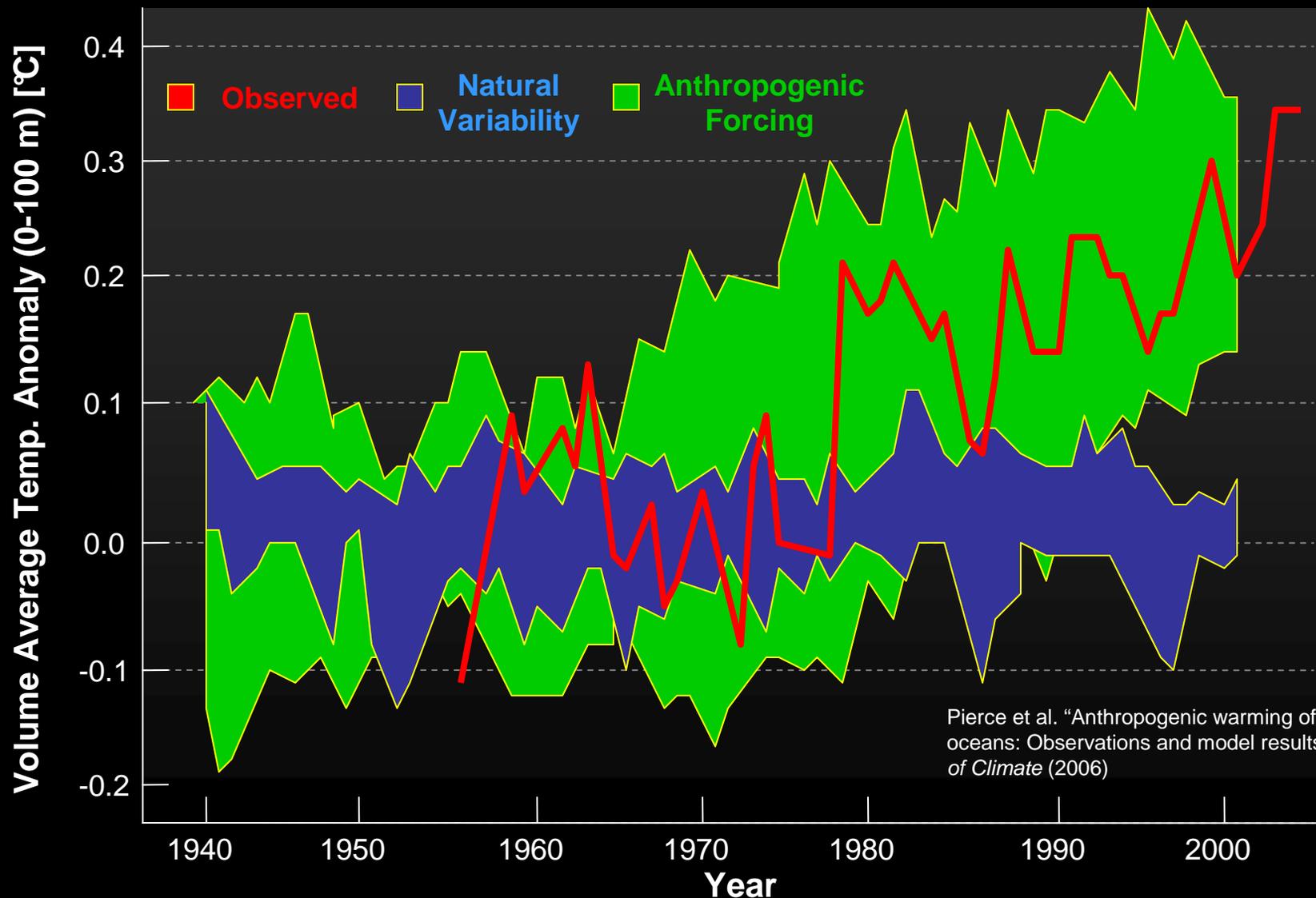
# Global Temperatures Since 1850



# Ocean Currents and Natural Temperature Variations



# Predicted and Observed Upper-Level Ocean Temperatures, 1940-2004

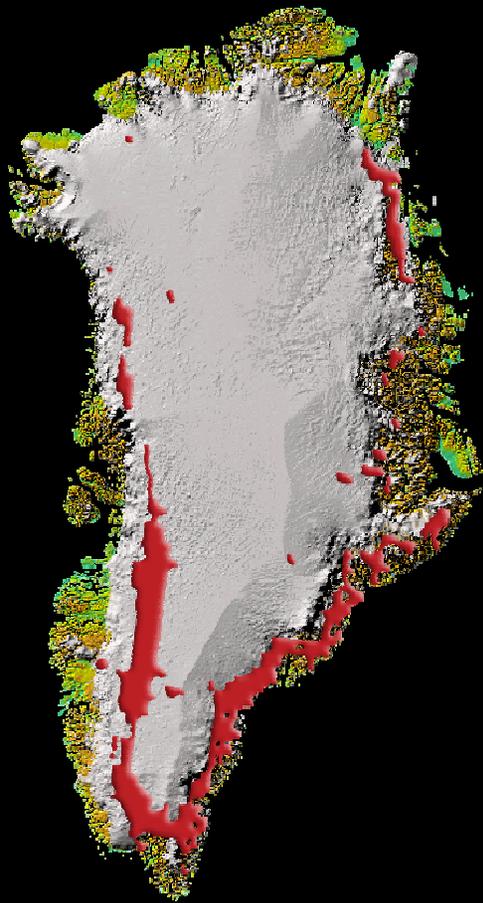


Pierce et al. "Anthropogenic warming of the oceans: Observations and model results", *Journal of Climate* (2006)

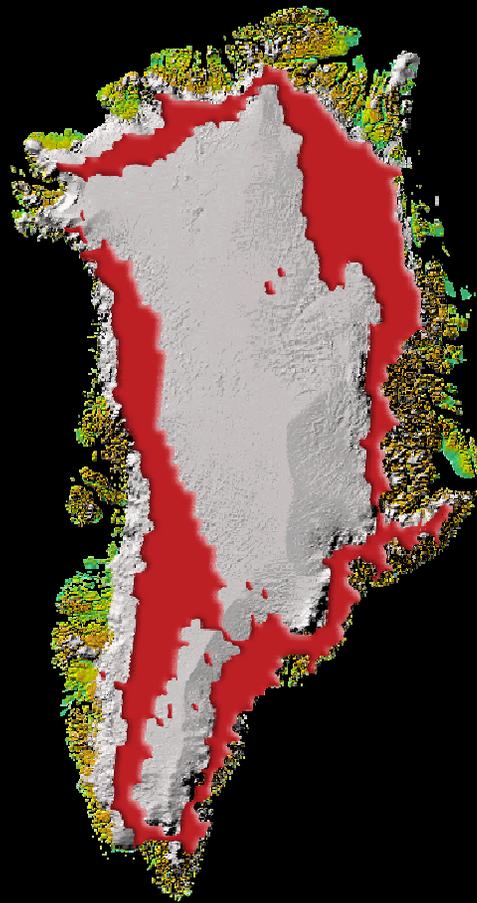
**Ice surface melt in Greenland**



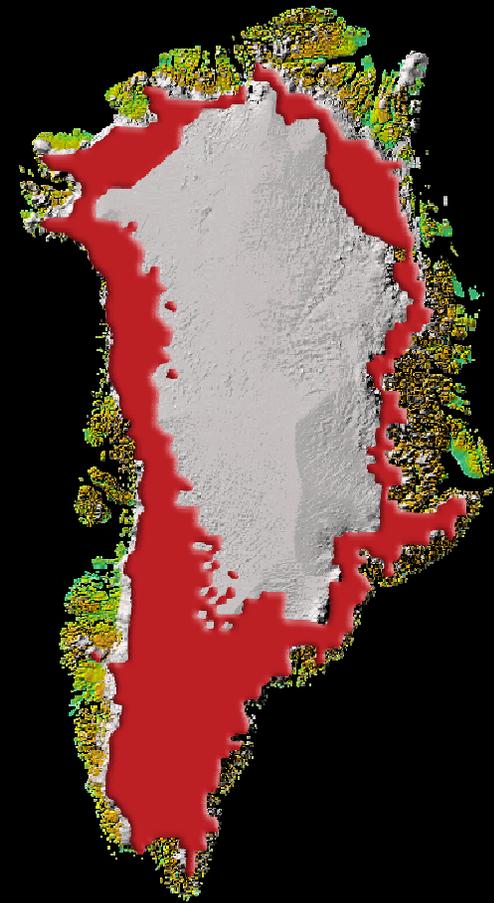
# Increasing Extent of Greenland Seasonal Ice Melt



1992



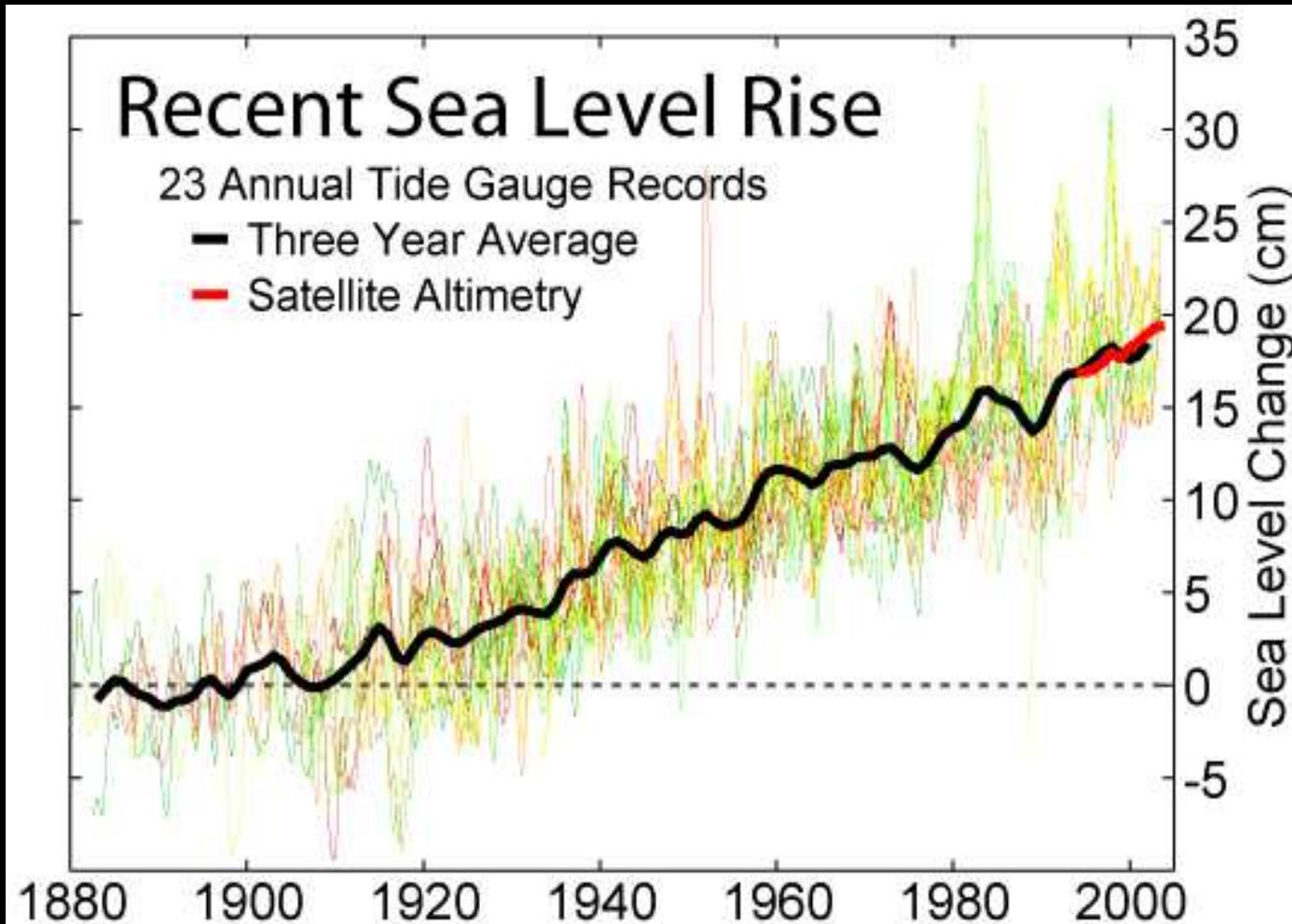
2002



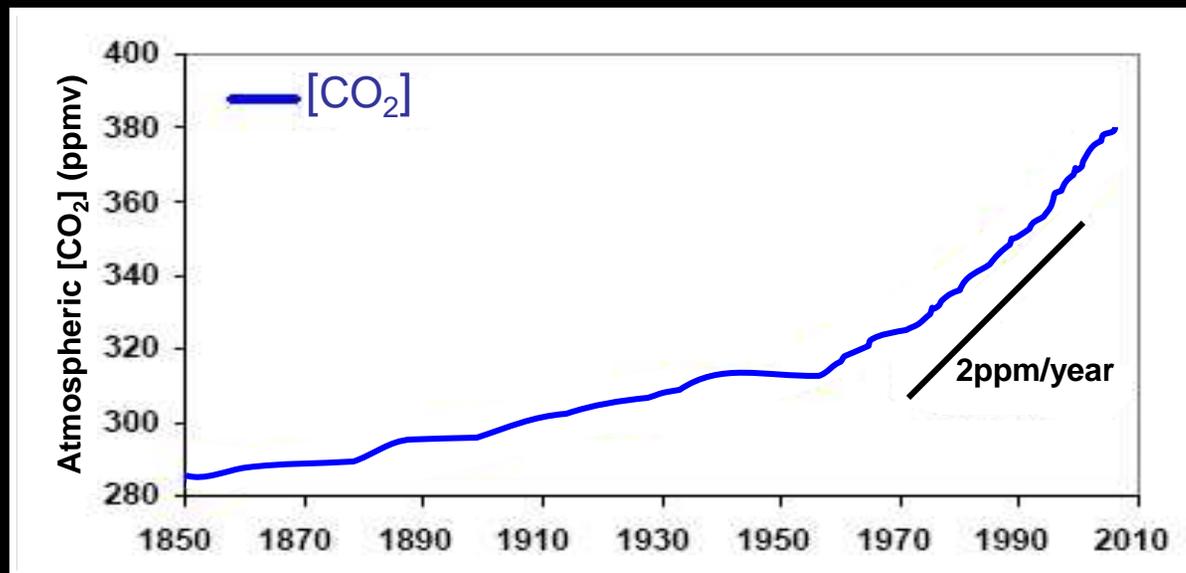
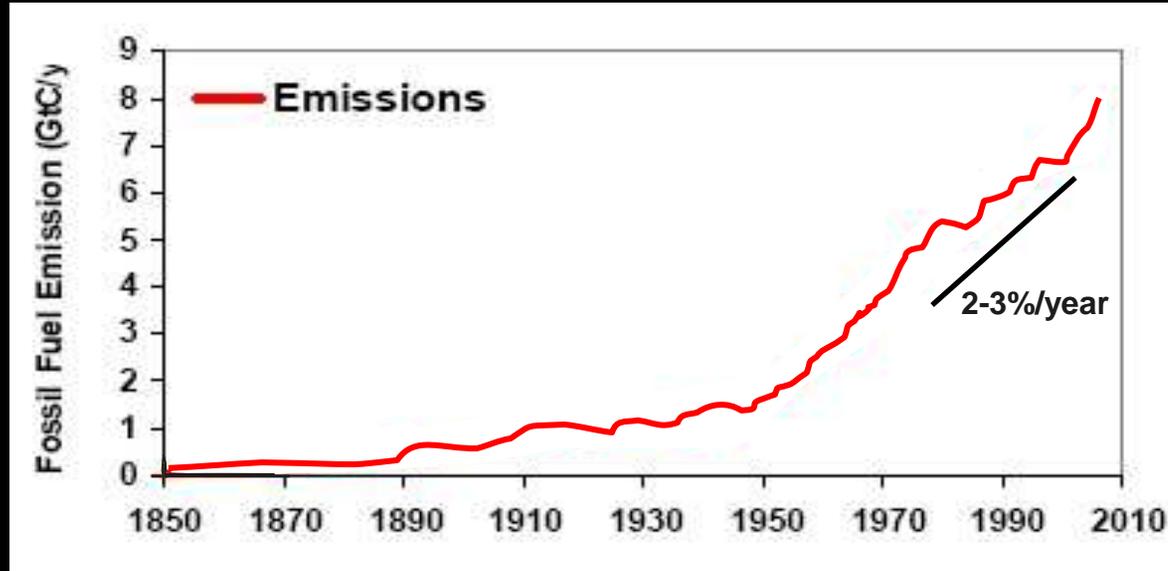
2005

Velicogna and Wahr, "Acceleration of Greenland ice mass loss in spring 2004", *Nature* (2006)

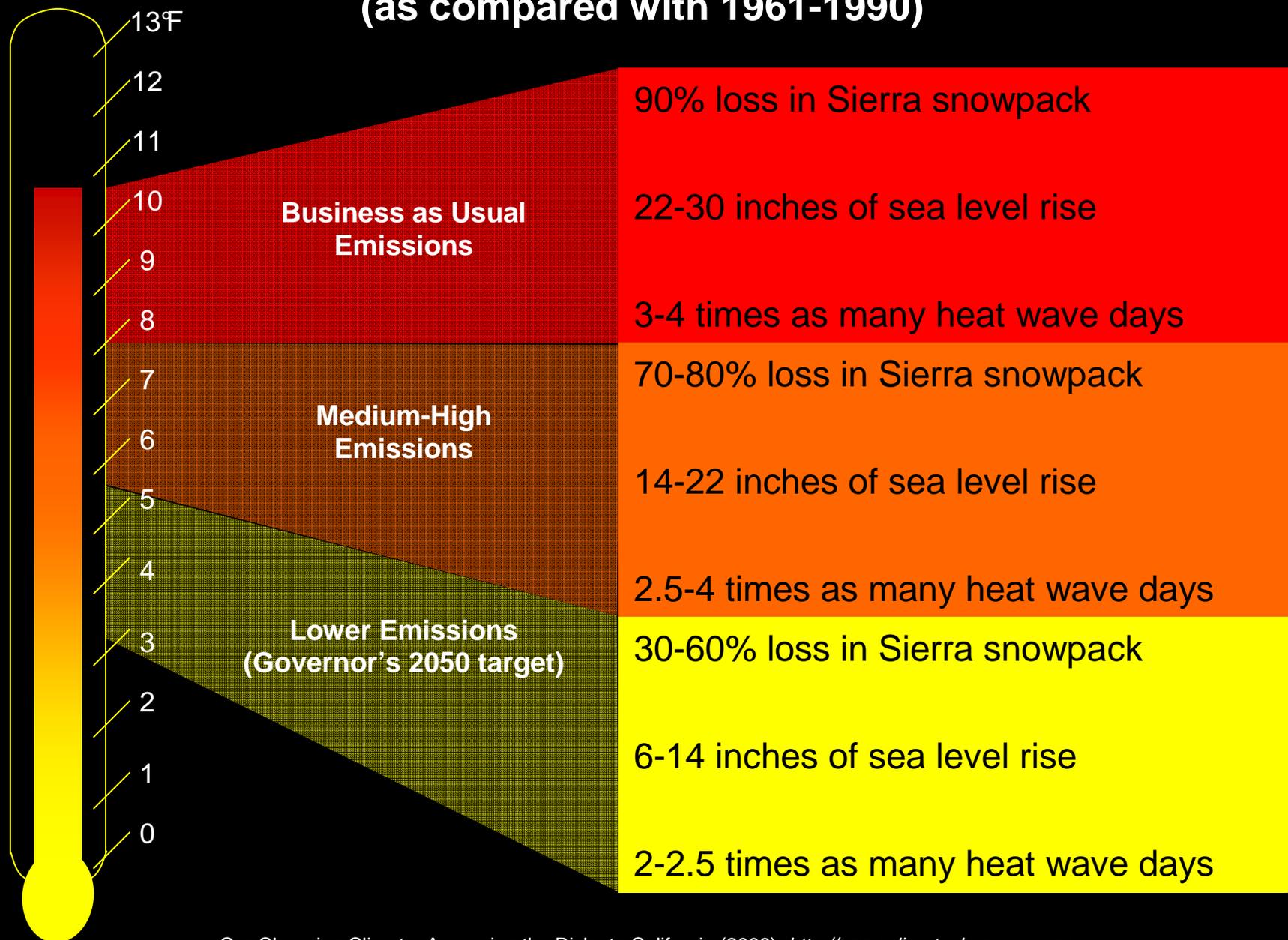
# Global Sea Level Rise



# CO<sub>2</sub> Growth Accelerating



# Projected Global Warming Impact on California, 2070-2099 (as compared with 1961-1990)



## COSTS OF INACTION

Loss of 1.5 to 5% of global GDP each year based on 4.5 °F warming<sup>1</sup>

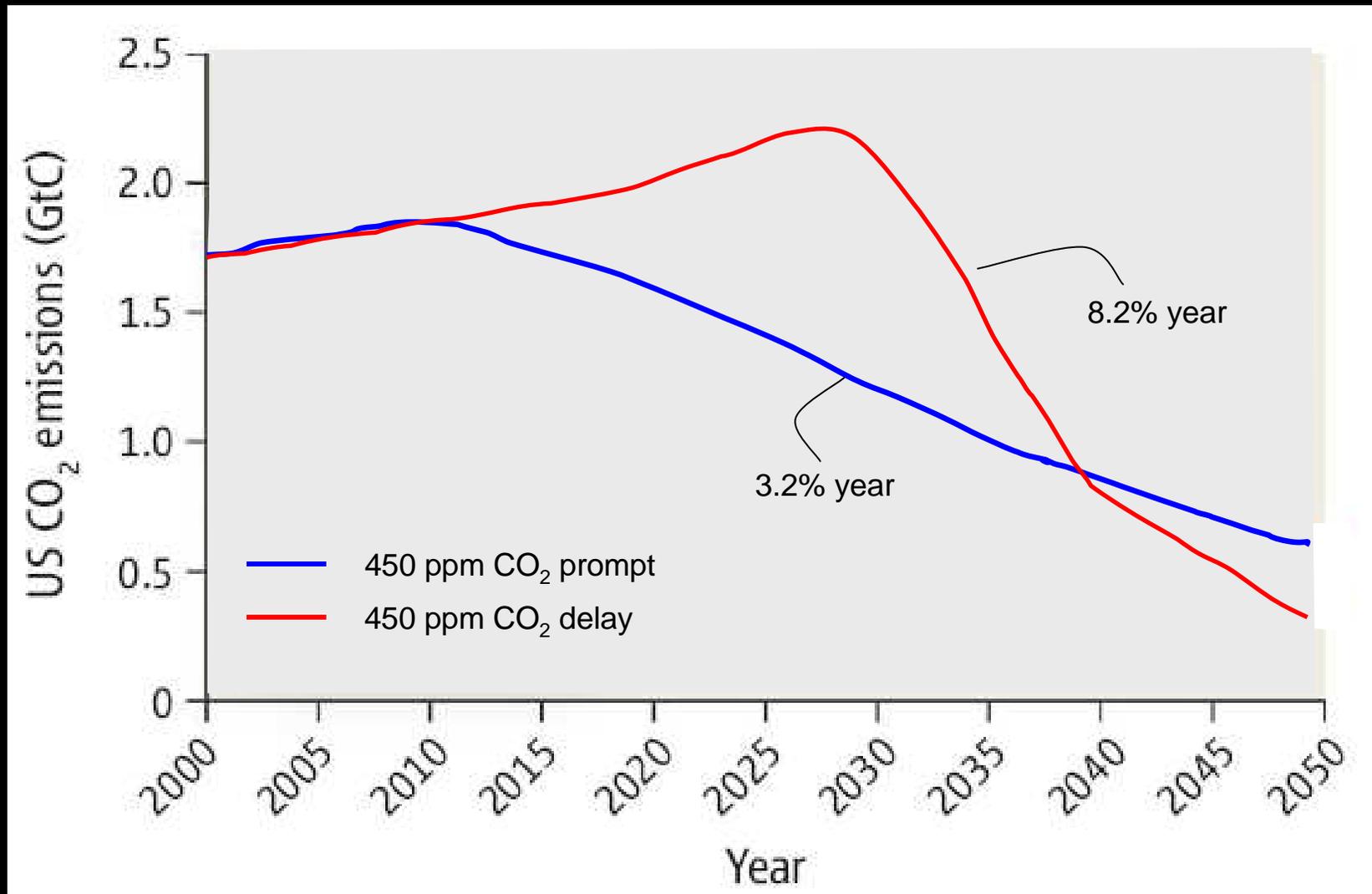
## COSTS OF ACTION

~1% of global GDP each year to stabilize CO<sub>2</sub> levels at 450 to 550 ppm<sup>2</sup>

<sup>1</sup>Nordhaus and Boyer, "Warming the World: Economic Models of Global Warming" (2000)

<sup>2</sup>Stern Review: The Economics of Climate Change" (2006)

# Putting off Action Is Costly



# Conclusions

More evidence for human-induced climate change.

New evidence of accelerated global warming.

Significant, adverse environmental and economic impacts.

# **IPCC 4<sup>th</sup> Assessment Report**

<b>Feb 2007</b>	<b>The Physical Science Basis</b>
<b>Apr 2007</b>	<b>Impacts, Adaptation and Vulnerability</b>
<b>May 2007</b>	<b>Mitigation of Climate Change</b>
<b>Nov 2007</b>	<b>Final Synthesis Report</b>

# Thank you



**The U.S. Department of Interior proposed listing polar bears as a threatened species due to global warming.**