

# Hampton Roads:

## Climate Change and Sea Level Rise

“... hundreds of Virginians come together to map our road toward a safe coast and stable climate.”

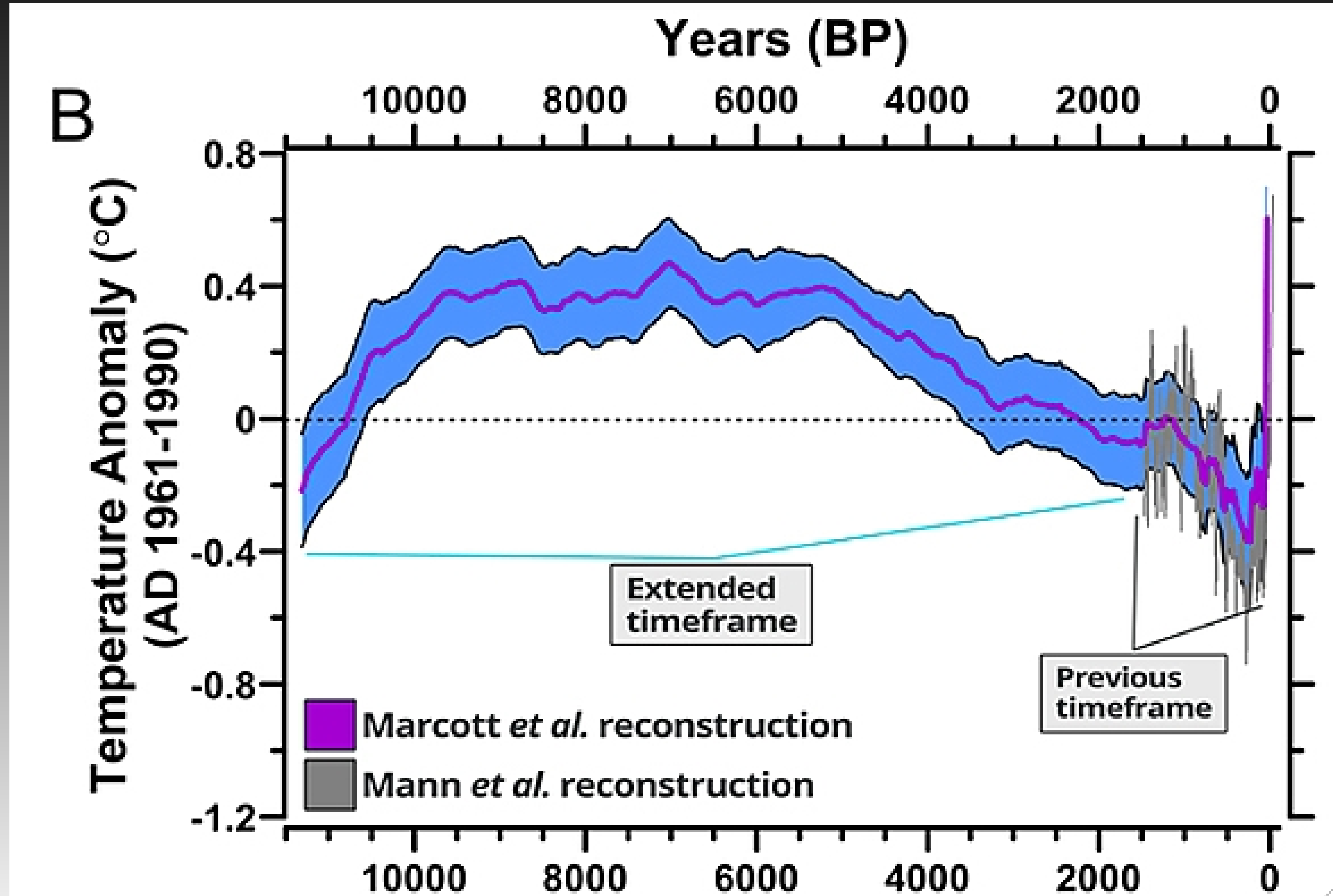
Two Questions:

- Is a stable climate (in Hampton Roads/the U.S./globally) an option?
- What is a “safe coast” under an unstable climate and with a variable sea level?

**Hans-Peter Plag**

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Old Dominion University, Norfolk, VA)  
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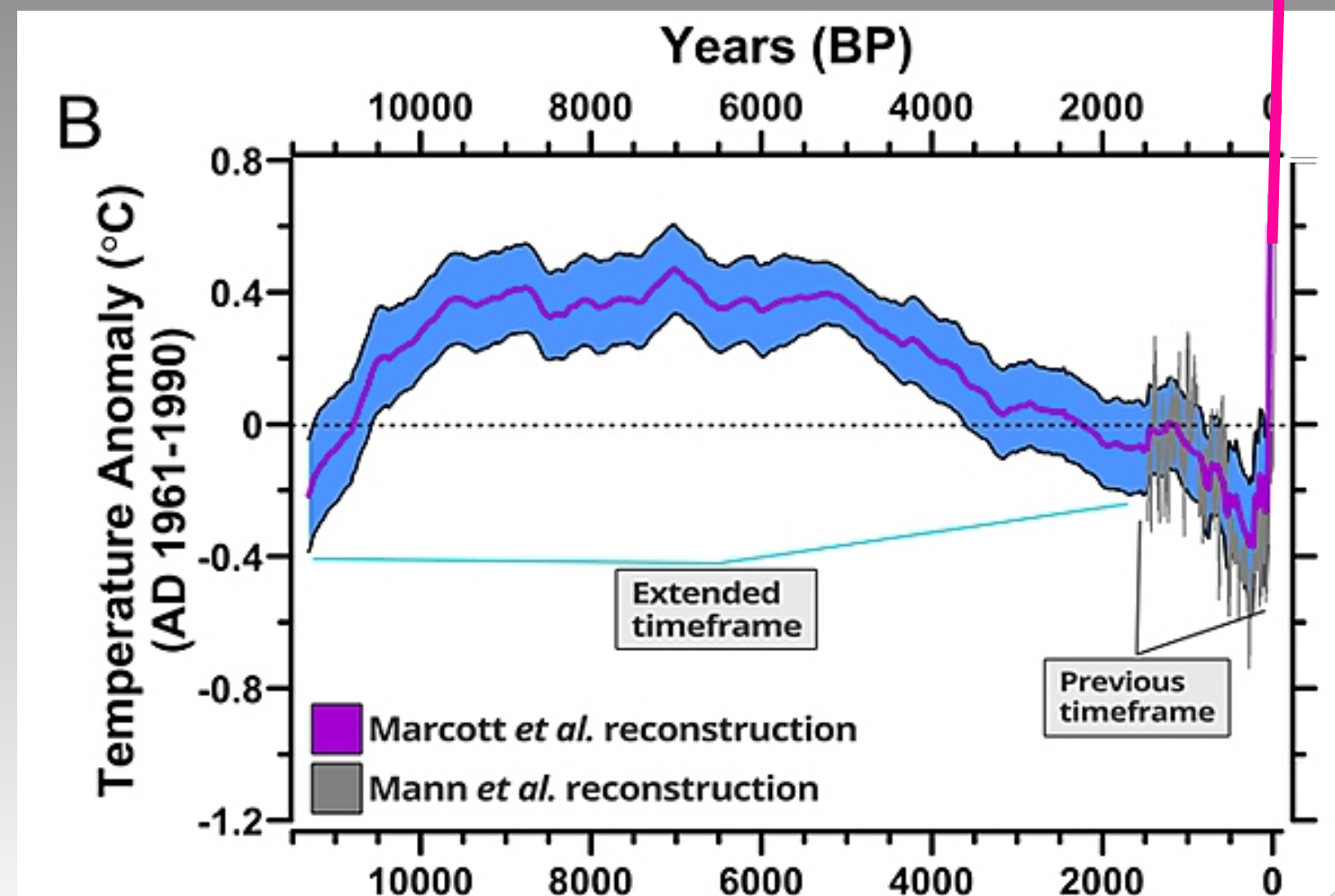
# Climate Change ...



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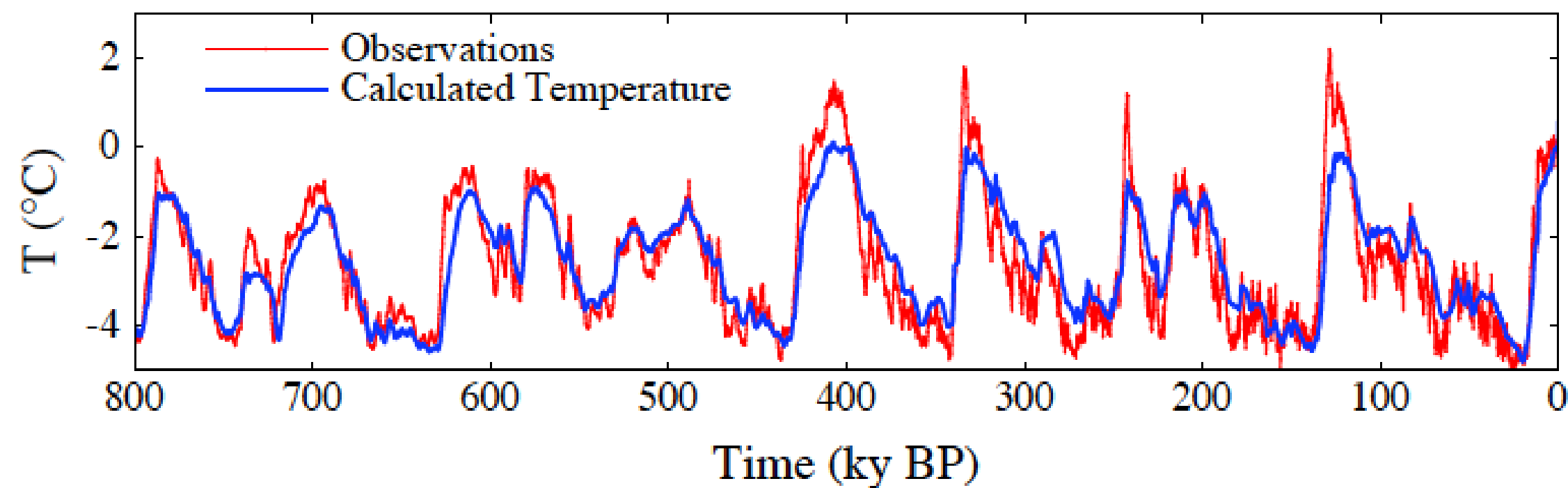
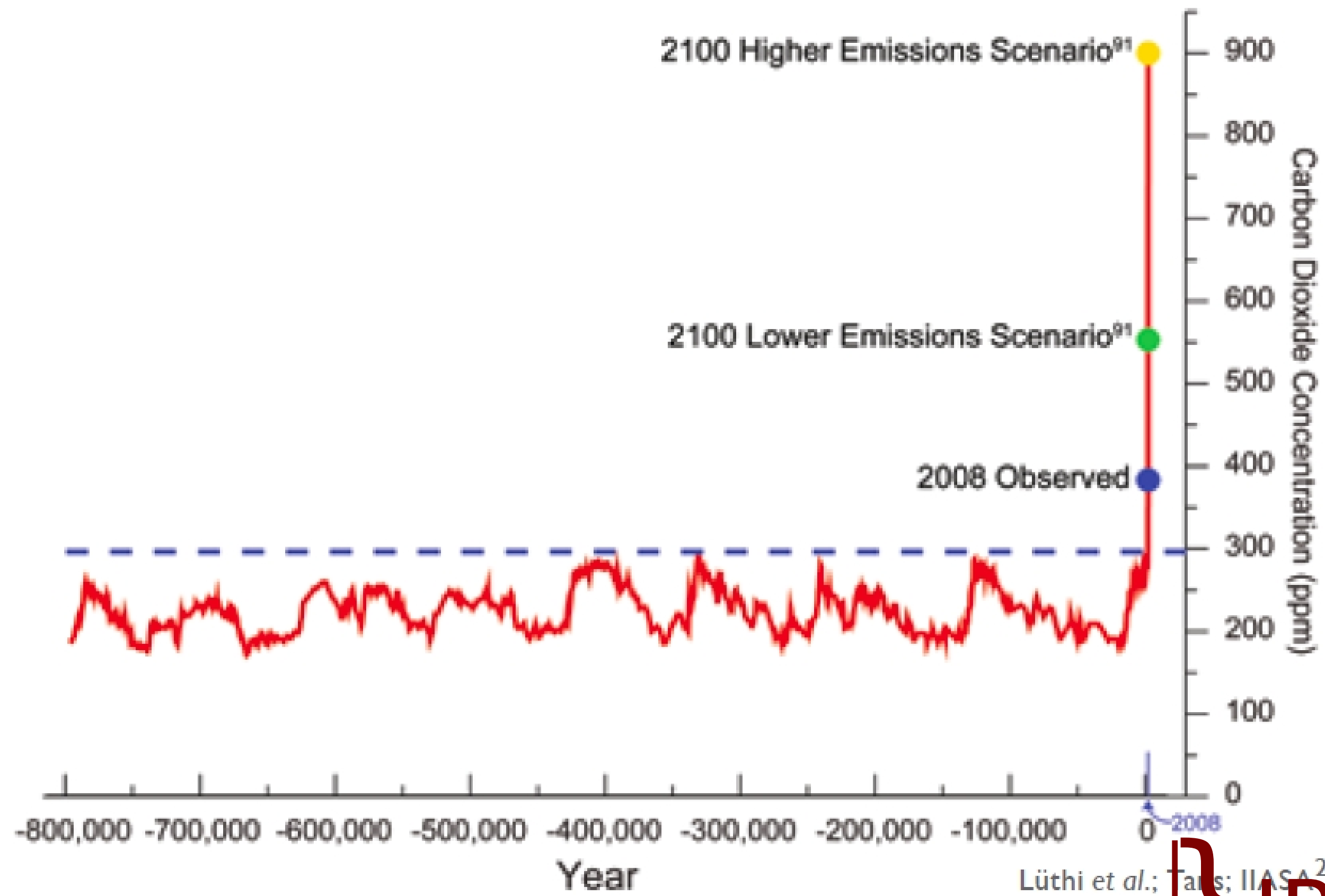
4  
3  
2  
1°C

IPCC Assessment:  
Very Likely



Marcott et al., 2013

# Climate Change ...

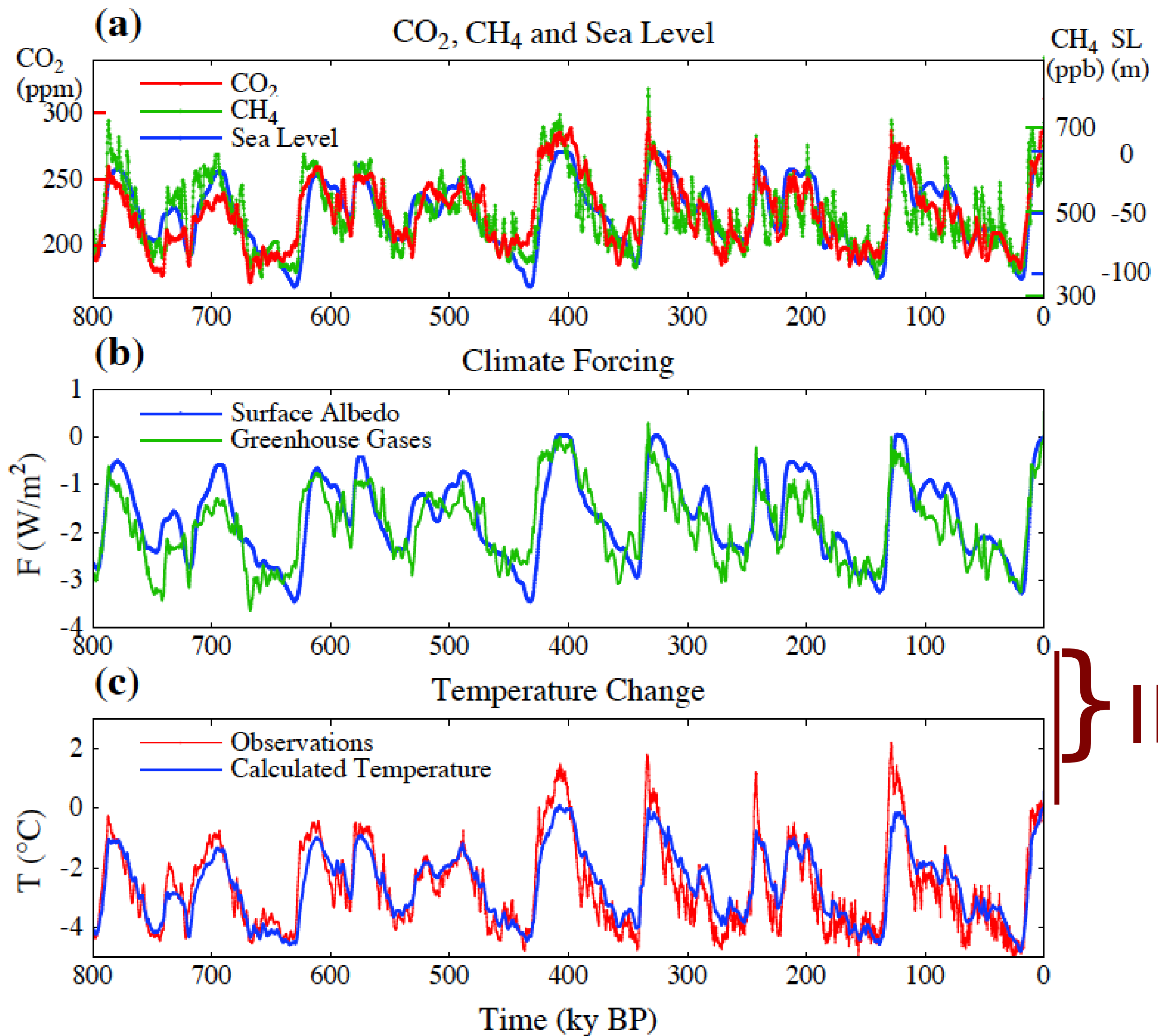


Climate change is happening:

- now, certain
- everywhere, globally
- rapidly
- expected to get worse

} IPCC<sub>t</sub>

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# Climate Change ...

Population

GDP

CO<sub>2</sub>

CH<sub>4</sub>

1750 2000

Temperature Floods

**We are Reengineering the Planet**

**Earth becomes Eaarth ...**

Cars

Deforestation

Extinction

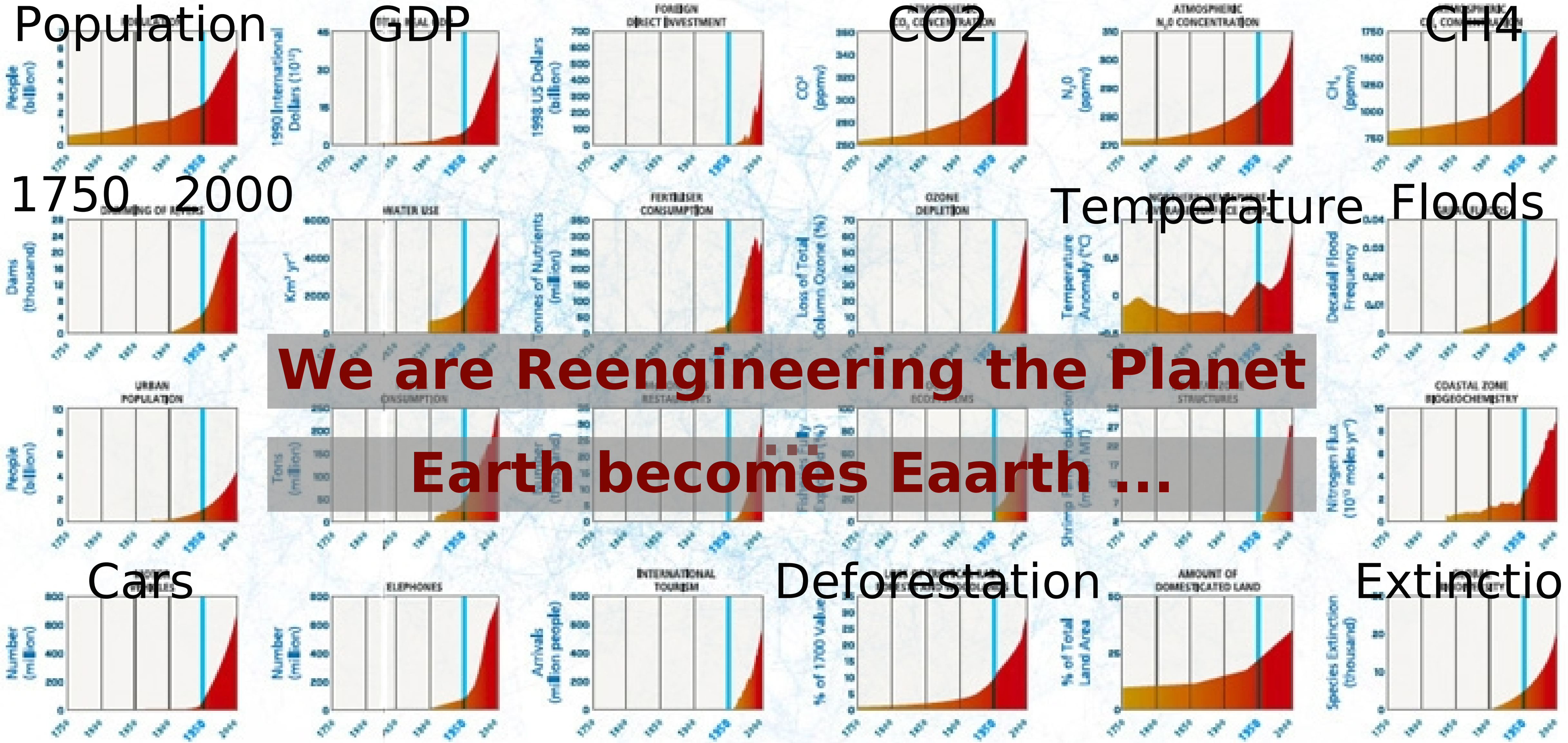


Figure 1. An enterprise to reckon with. Human manipulation of their environment began in earnest during the Industrial Revolution and accelerated markedly after the 1950s, as IGBP's Great Acceleration graphs show. Modified after Steffen W et al. (2004).

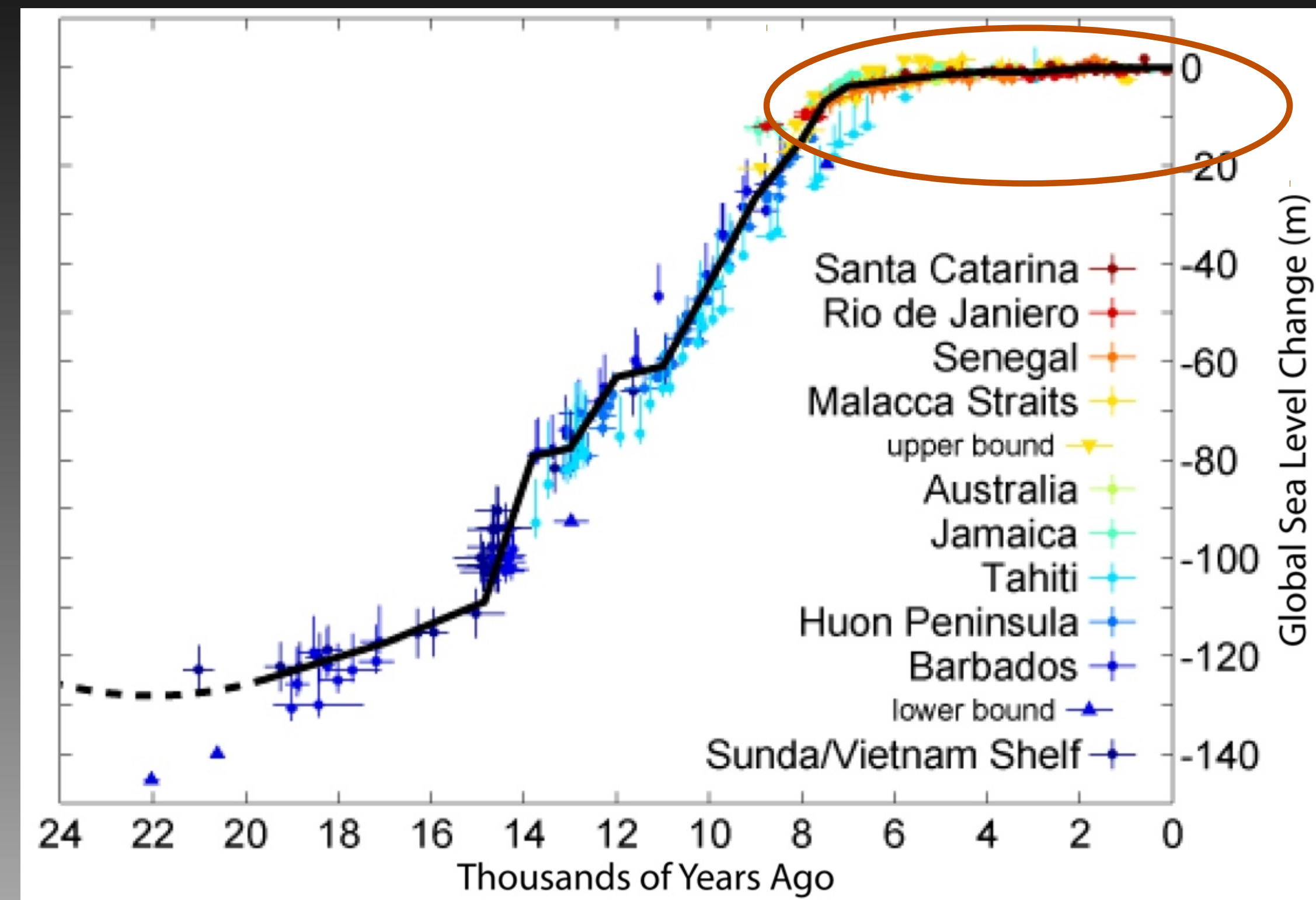
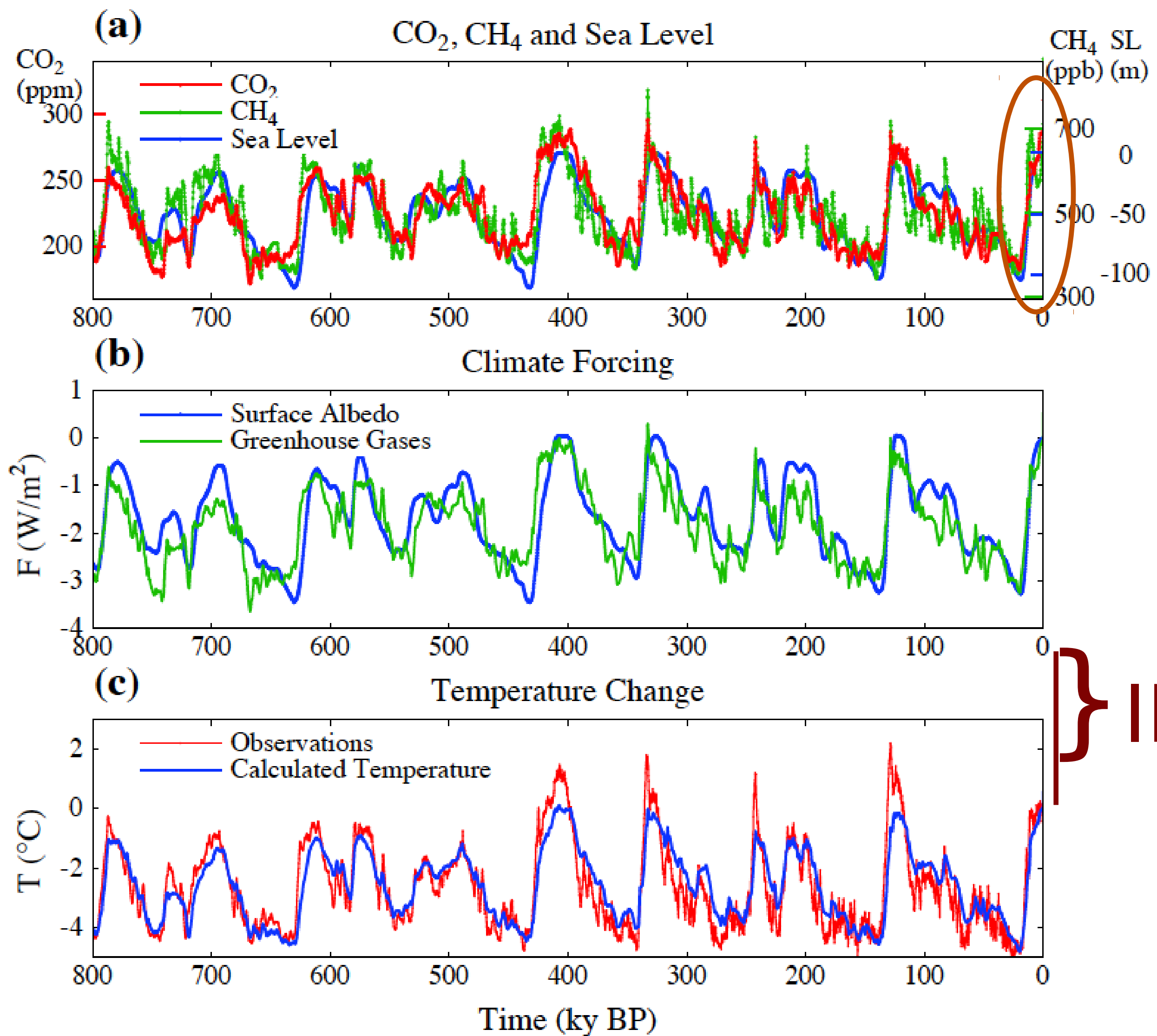
Climate change is a symptom, not the cause ...

Climate change is the result of global processes ...

A stable climate is no longer an option ...

**We need a fundamental change of how we are  
in the world ...**

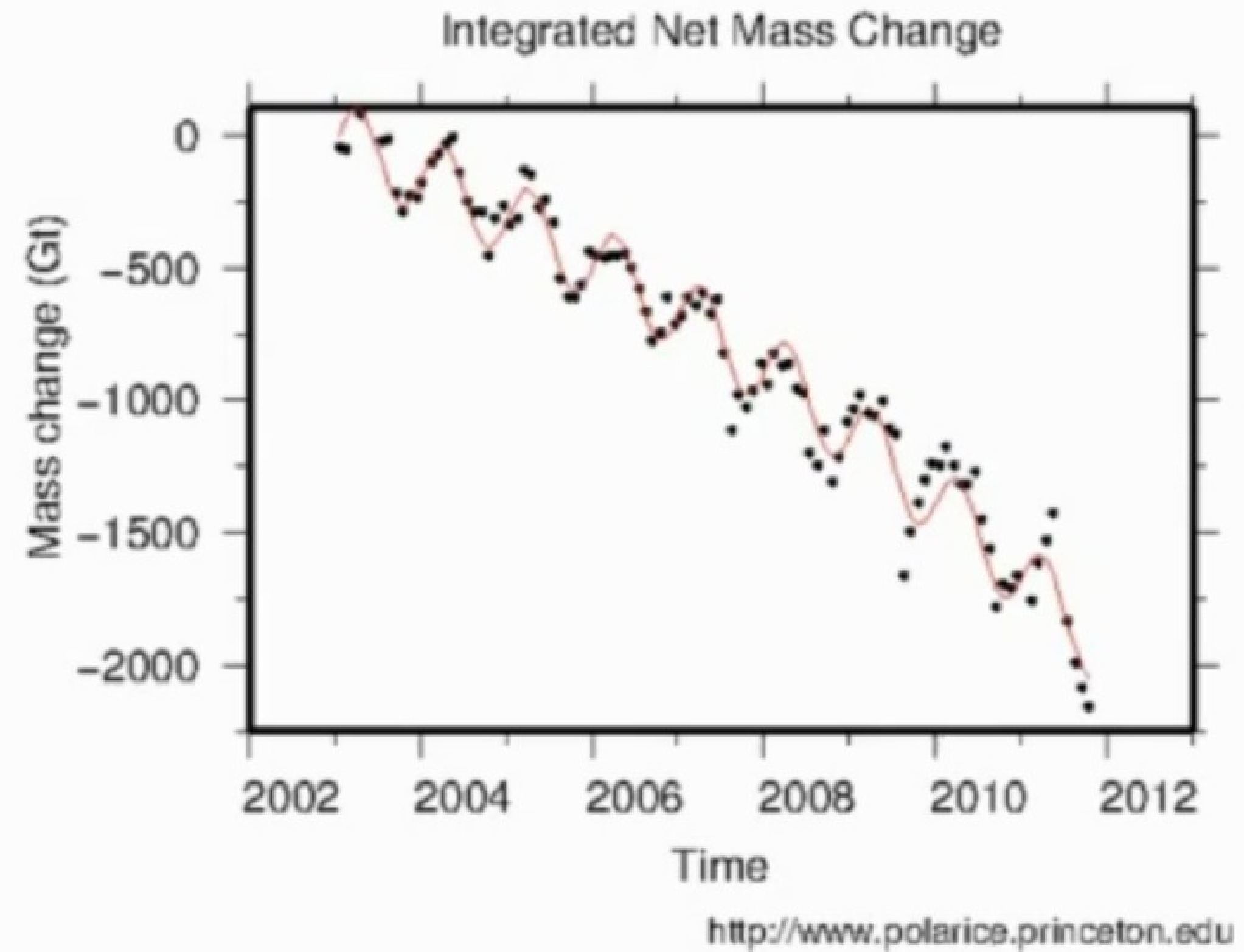
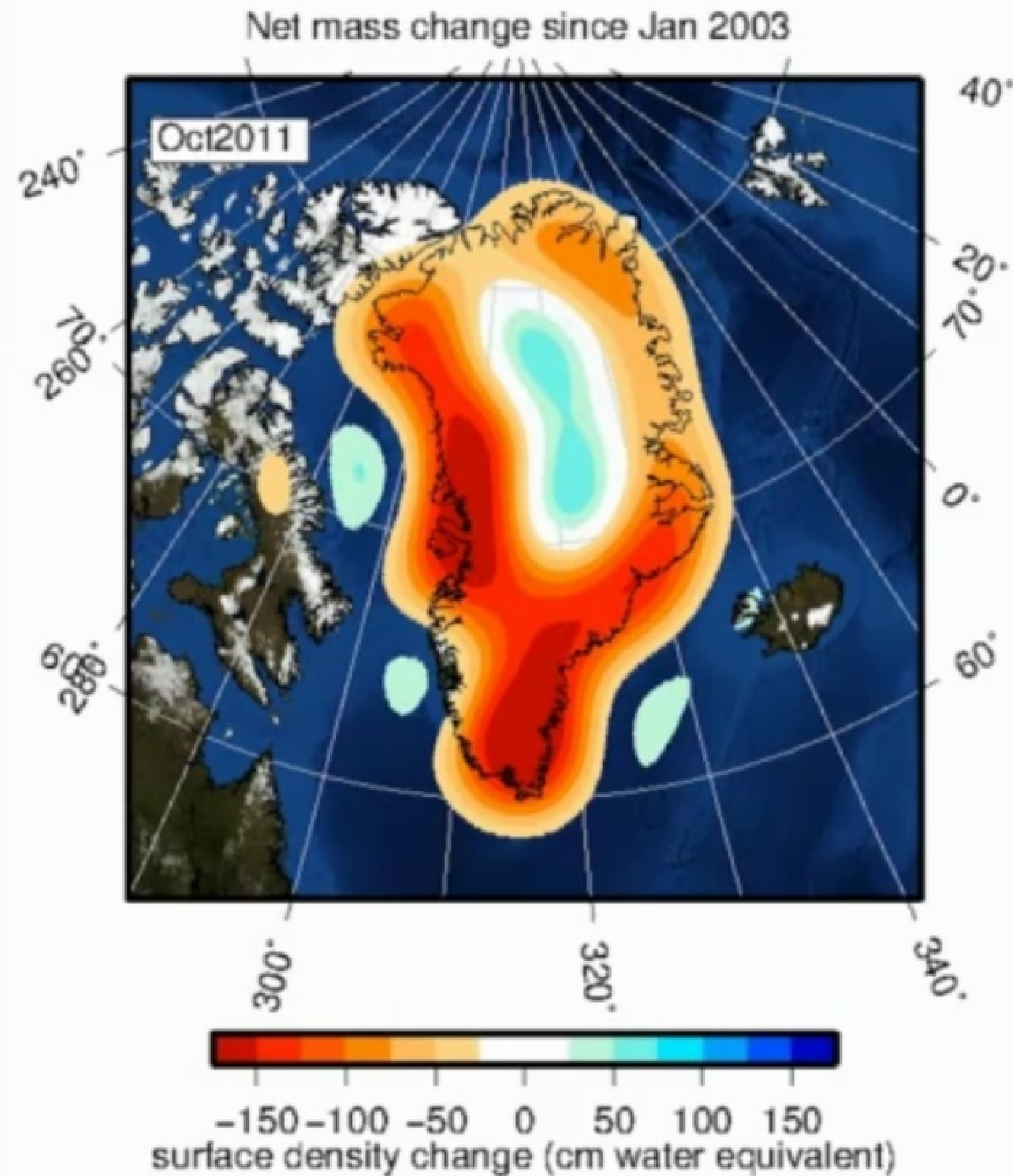
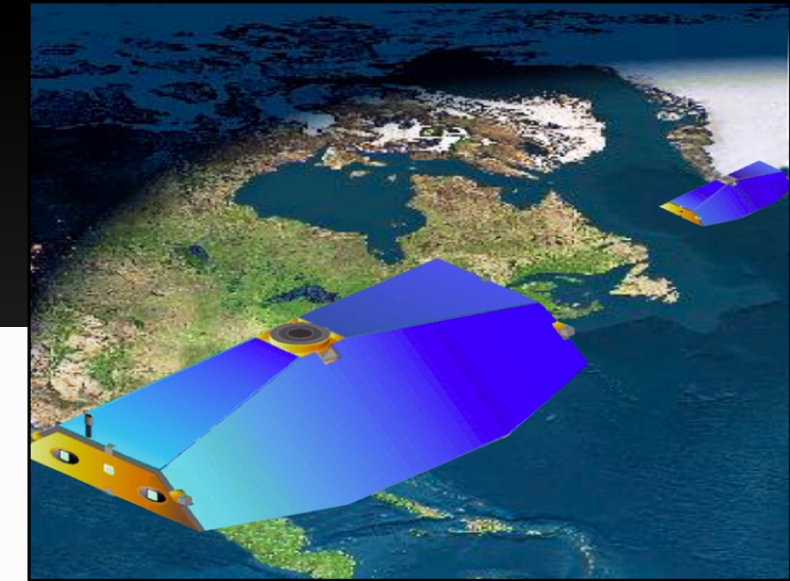
# ... and Sea Level Change



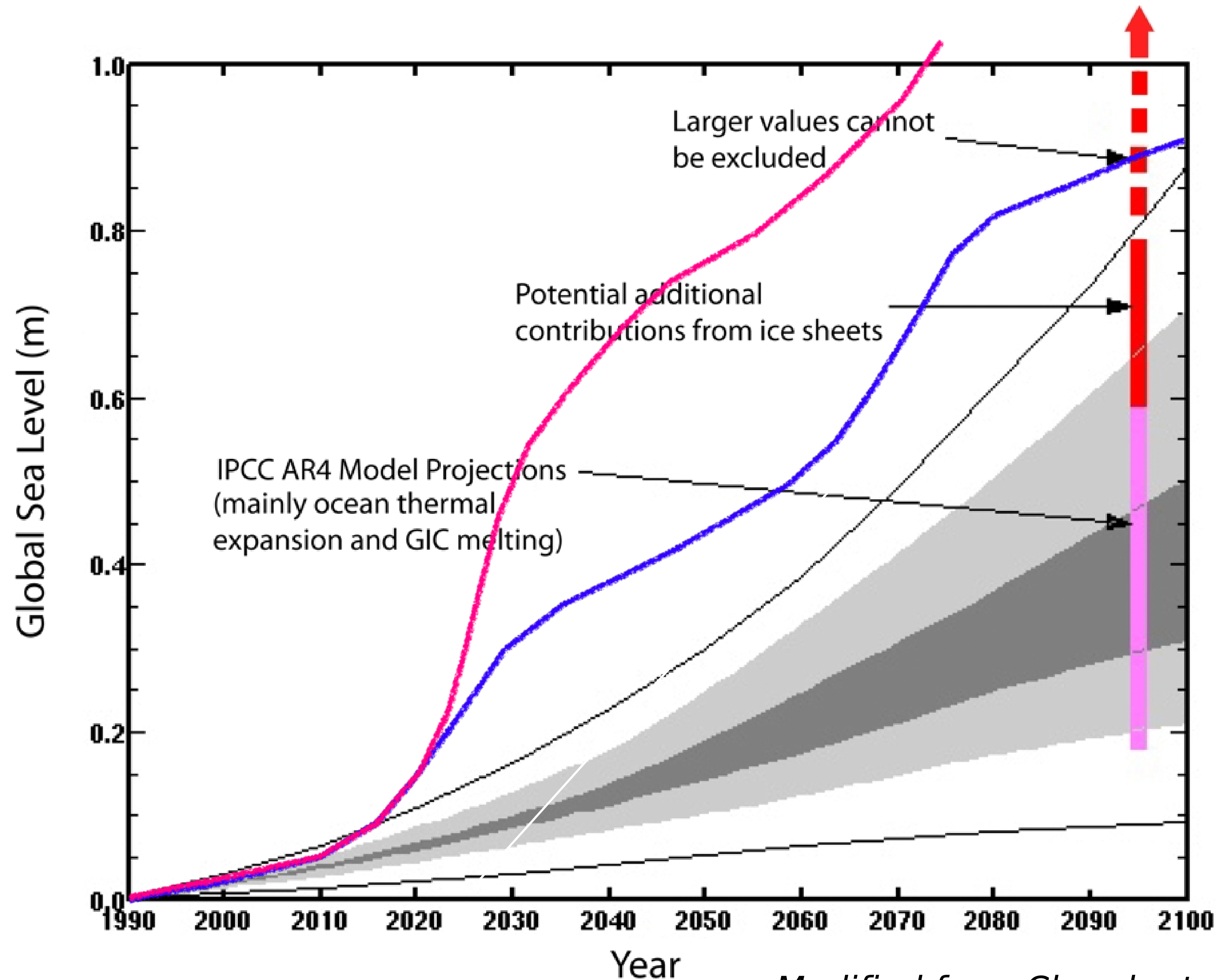
} IPCC<sub>t</sub>

“Normal” sea level variability:  
 1.5 m/century  
 (5 feet/century)

# ... and Sea Level Change



# ... and Sea Level Change



Modified from Church et al. (2010)

Sea level change is happening:

- now, certain
- everywhere, globally
- rapidly
- expected to get worse

Example Hampton Roads

Today's rate:

5 mm per year

(about 1.5 feet in 100 years)

Soon could get as high as:

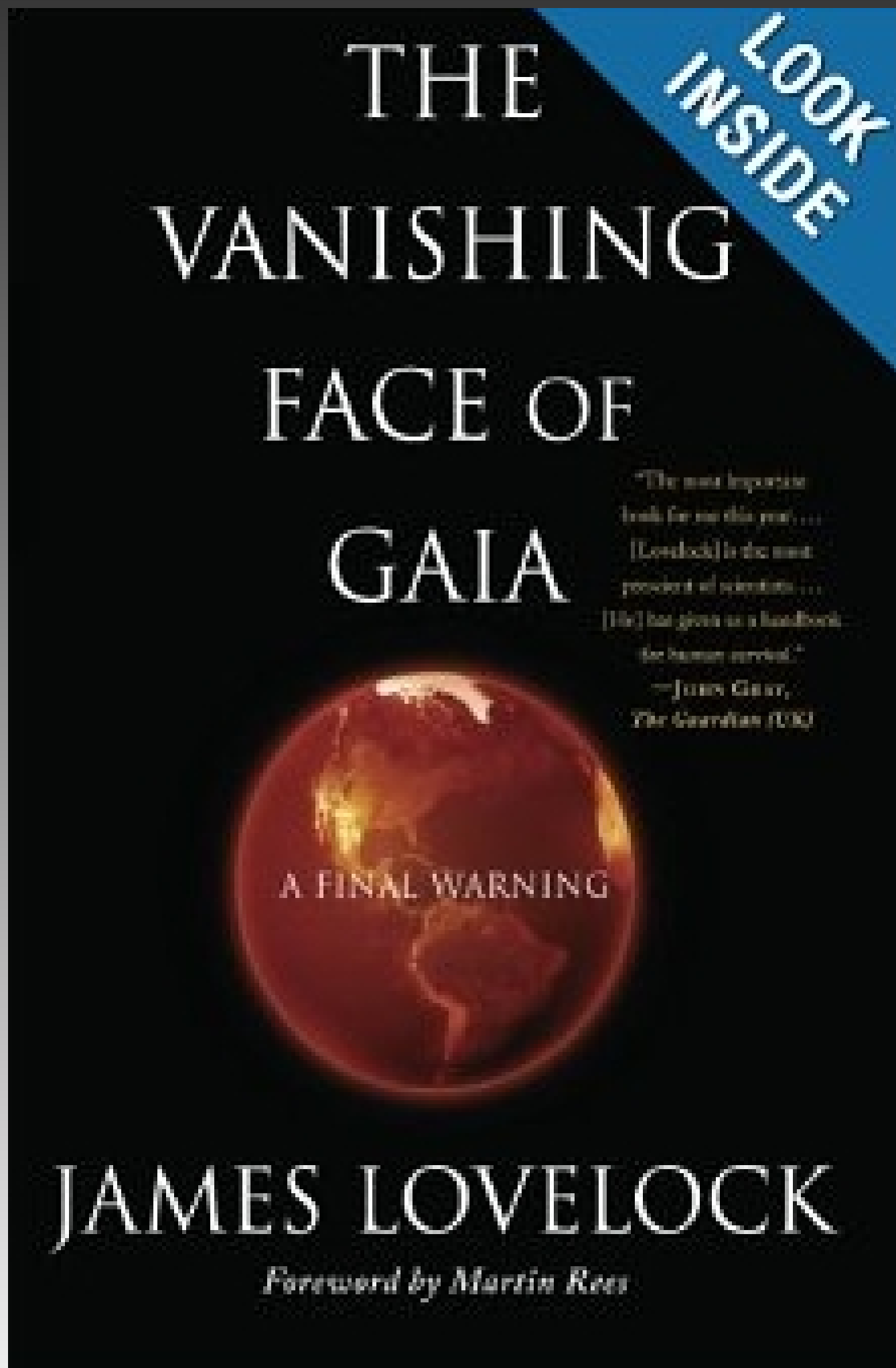
20 mm per year

(about 6 feet in 100 years)

Sea Level is very likely going to change rapidly

Under an unstable climate, a “safe coast” is a coast prepared for rapid sea level changes ...

# The Global Perspective ...



Lovelock (and many others):

- Planet is on a run-away path; could reach a warm state (5 C warmer) already in 2050

Lovelock: Carrying capacity of Earth would be reduced to 1 Billion people

We are on Titanic after it hit the iceberg!



Lovelock's Recommendation: Look for the lifeboats

# A Fundamental Change ...



Economy is the link between humanity and Earth's life support system

An economy (and lifestyle) that meets our needs by burning fossil fuels is like a doctor who practices medicine by killing the patients.

Economy for humanity:

“An economy that meets our needs while safeguarding Earth's life-support system, on which the welfare of current and future generations depends.”



“No problem can be solved with the same consciousness that created it.”  
Albert Einstein

“It is difficult to get a man to understand something when his  
job depends on not understanding it”

*Upton Sinclair*