

# The Velocity of Climate Change: 2010

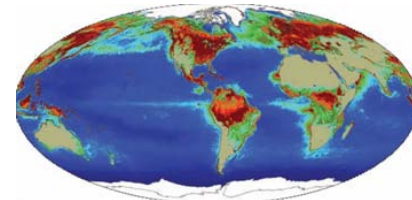
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[www.global-ecology.org](http://www.global-ecology.org)

**CARNEGIE**  
INSTITUTION FOR  
**SCIENCE**

DEPARTMENT OF  
**GLOBAL ECOLOGY**



Year 2060: The search for a breakthrough technology to solve climate change continues.

IT'S A TIME MACHINE WE HOPE WILL TAKE US BACK 50 YEARS WHEN WE SHOULD HAVE PUT A PRICE ON CARBON.

WE BETTER HURRY!

NO! THAT'S THE GREAT THING ABOUT THIS TECHNOLOGY!

TALS

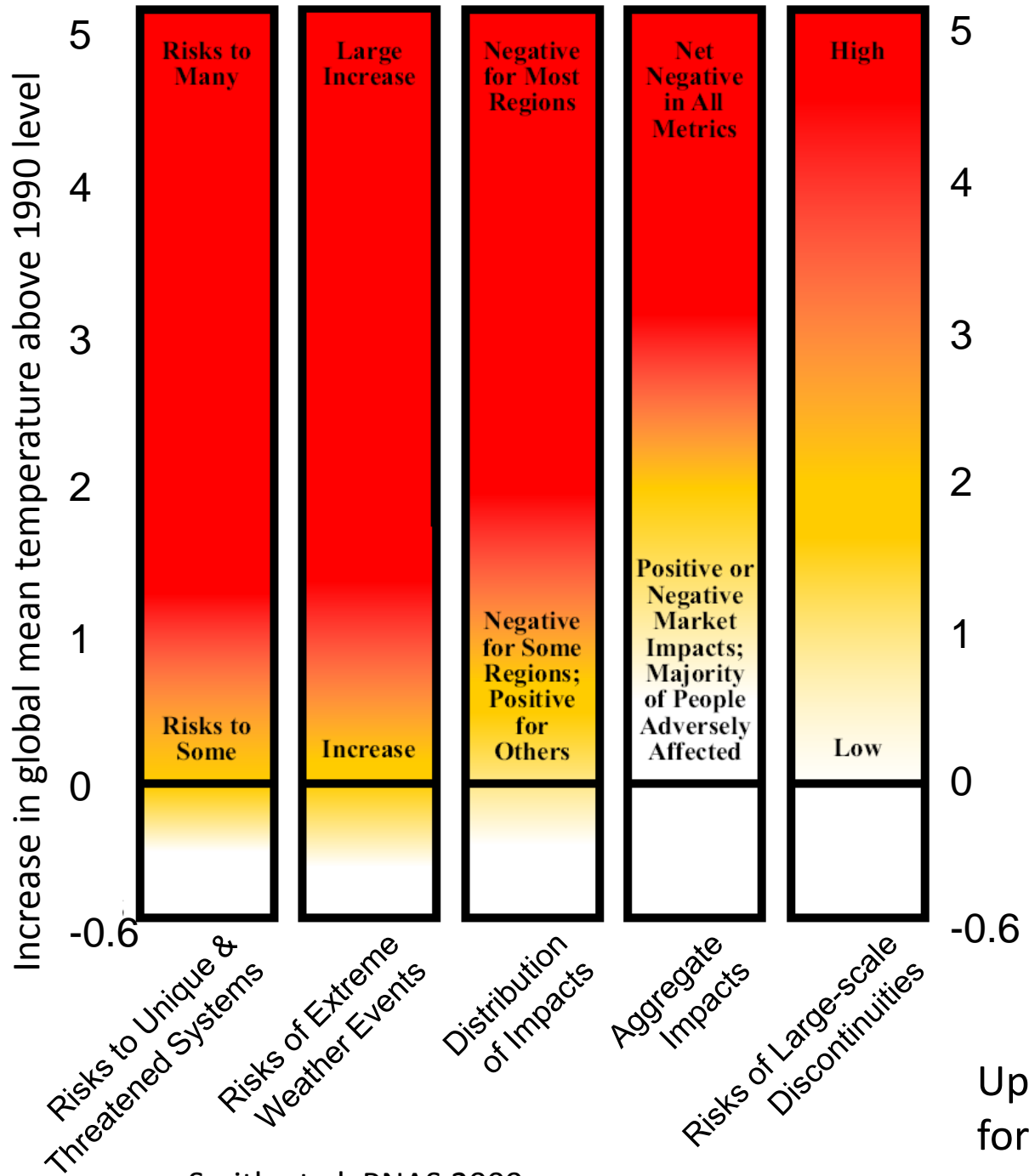
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# Steve Schneider's Legacy

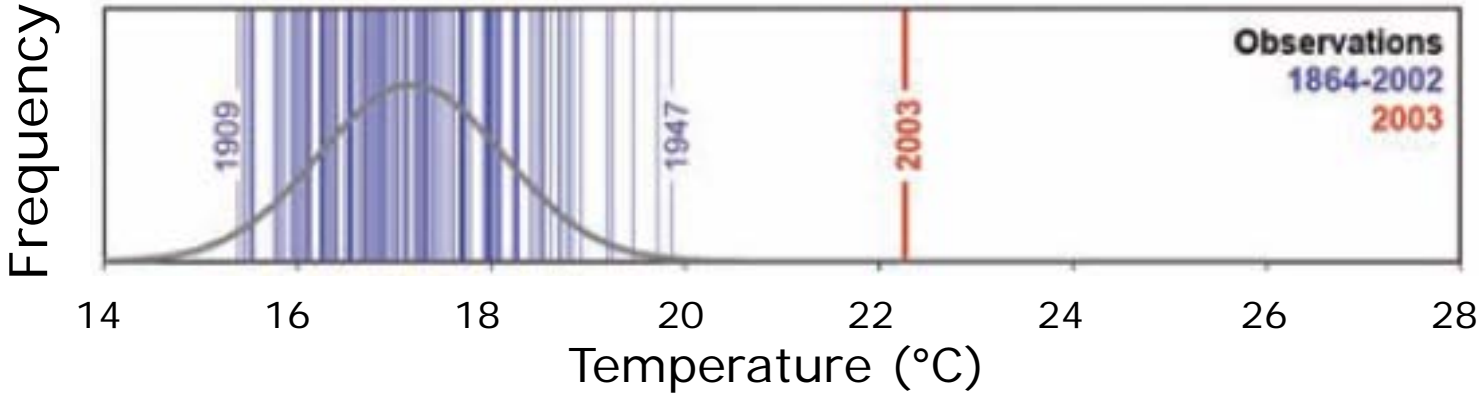
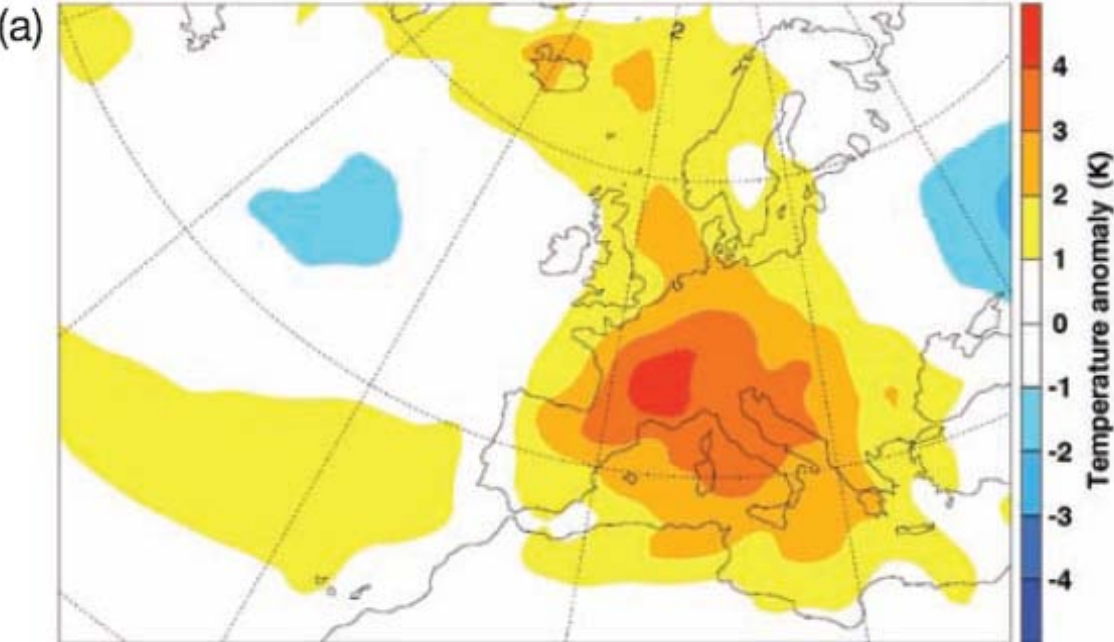
- Risk
- Communication
- Values

Risk = probability x consequence

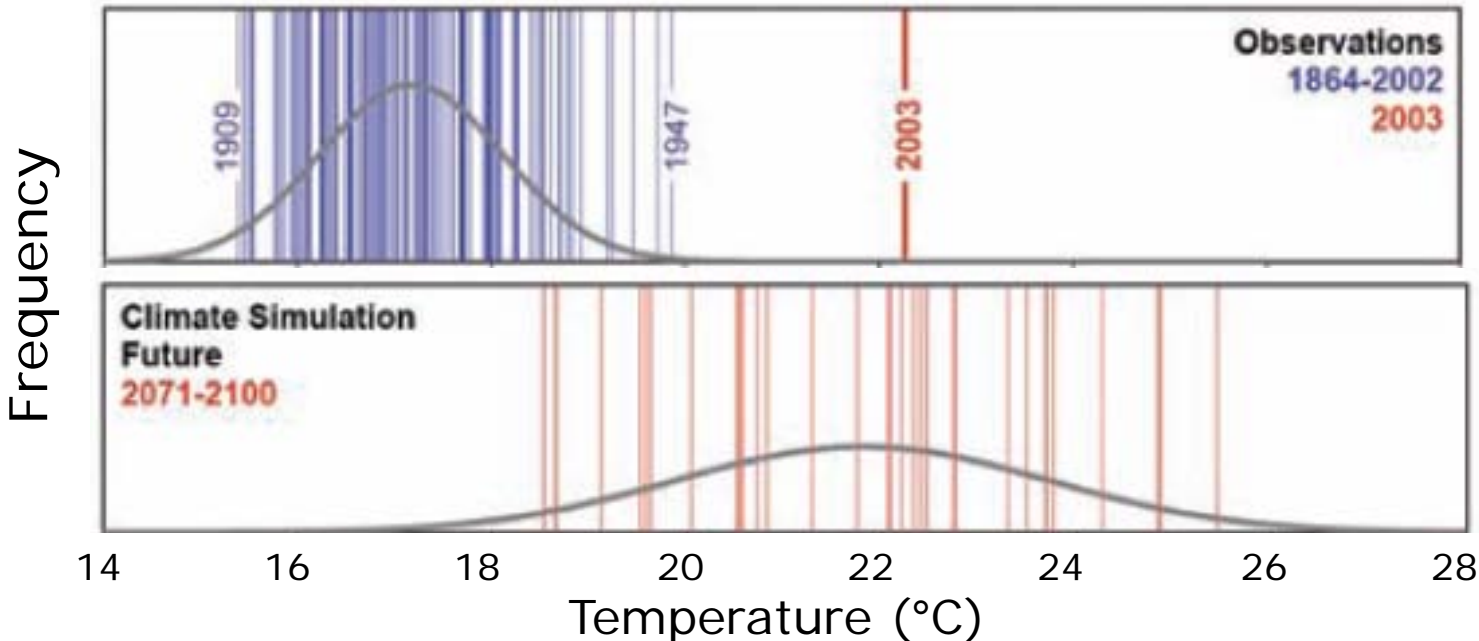
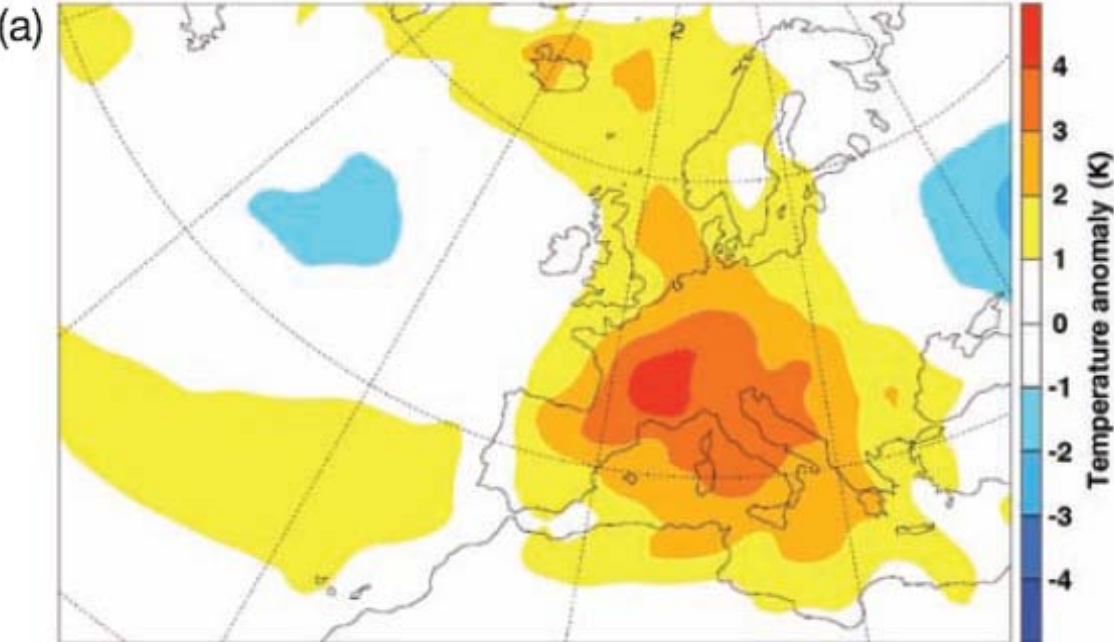
- Loaded dice
- Dumping nails on the road of life



# Risk of extreme events



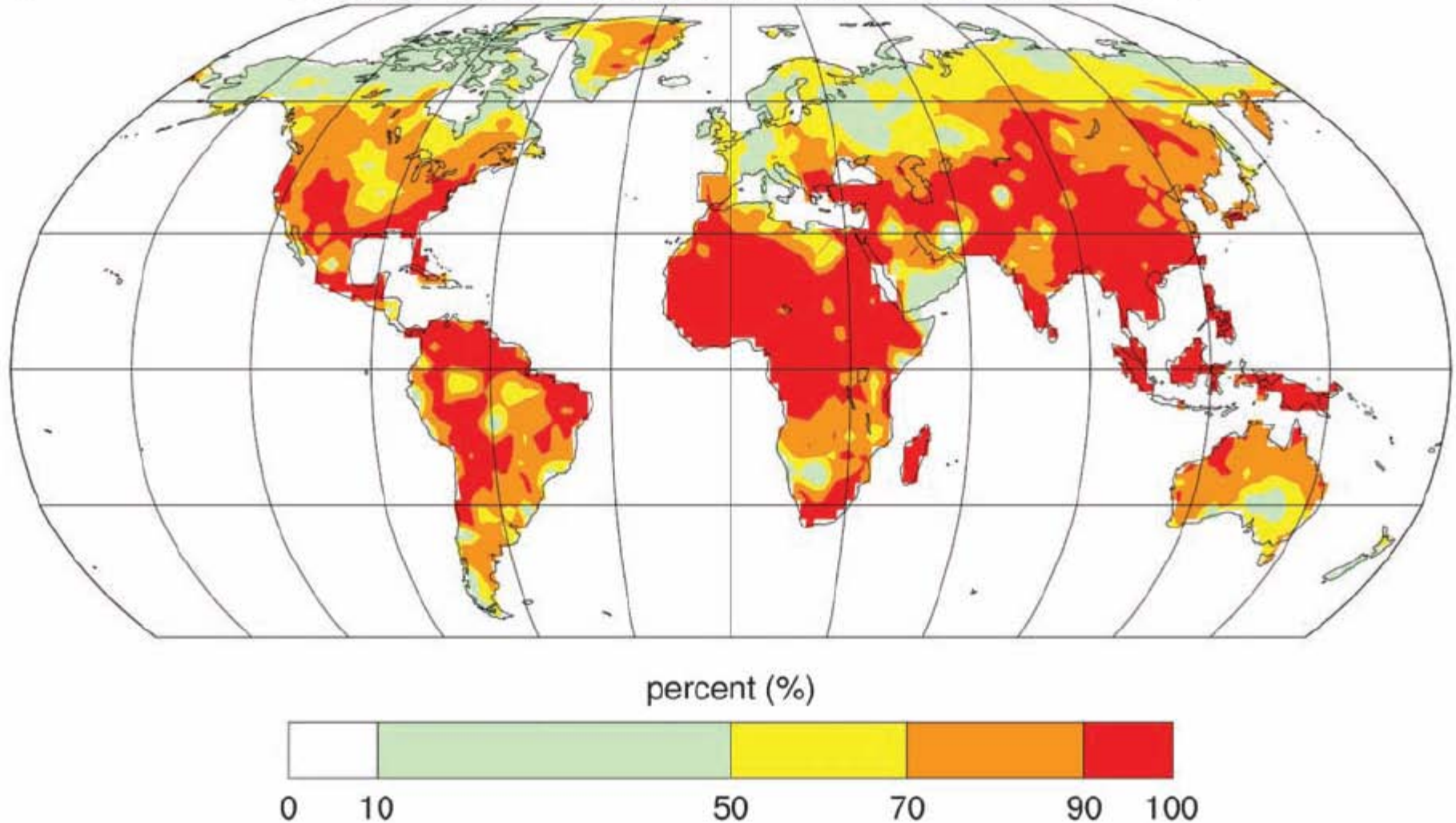
# Risk of extreme events



# Risk of extreme heat

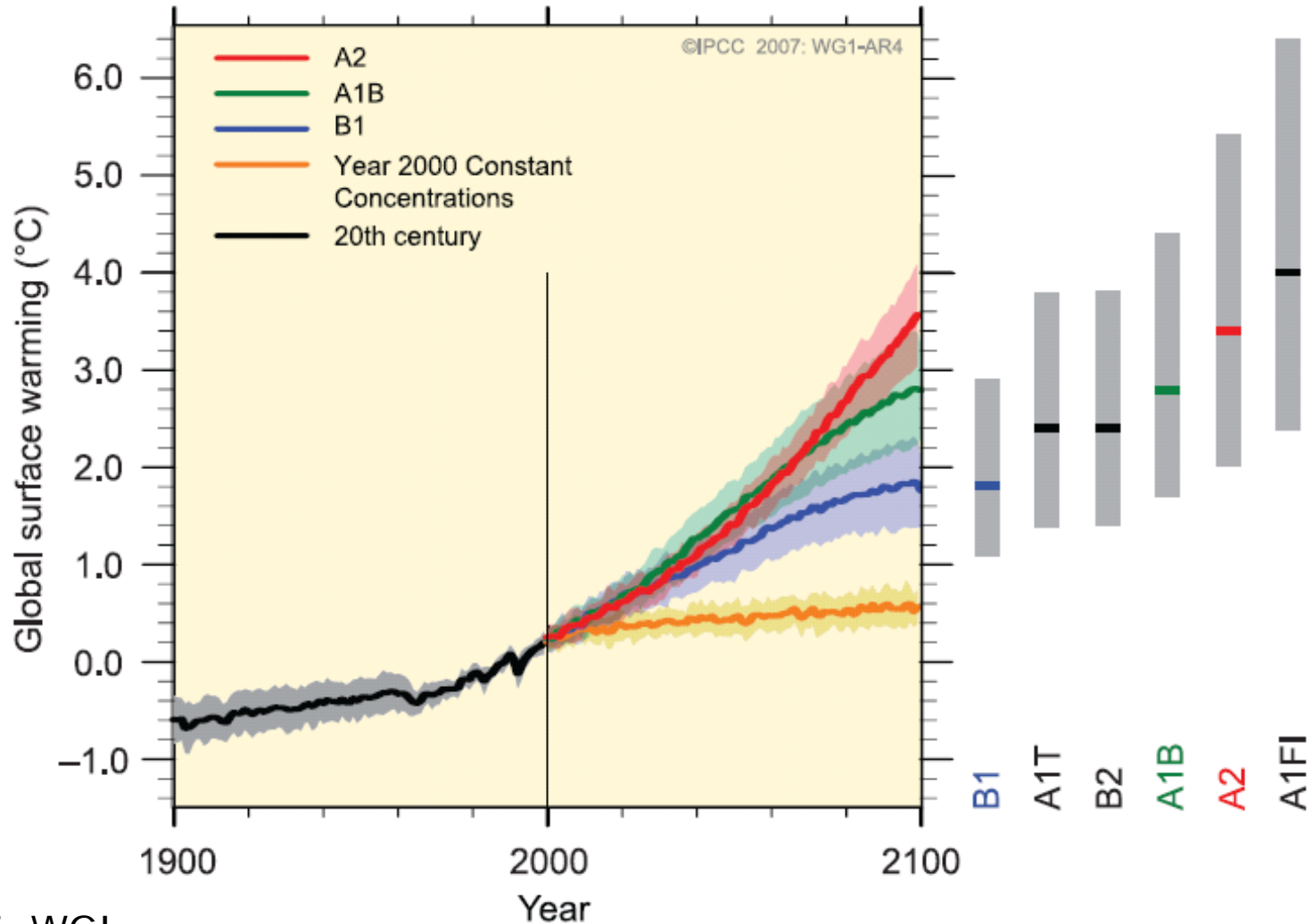
B

Summers in 2080-2100 Warmer than Warmest on Record

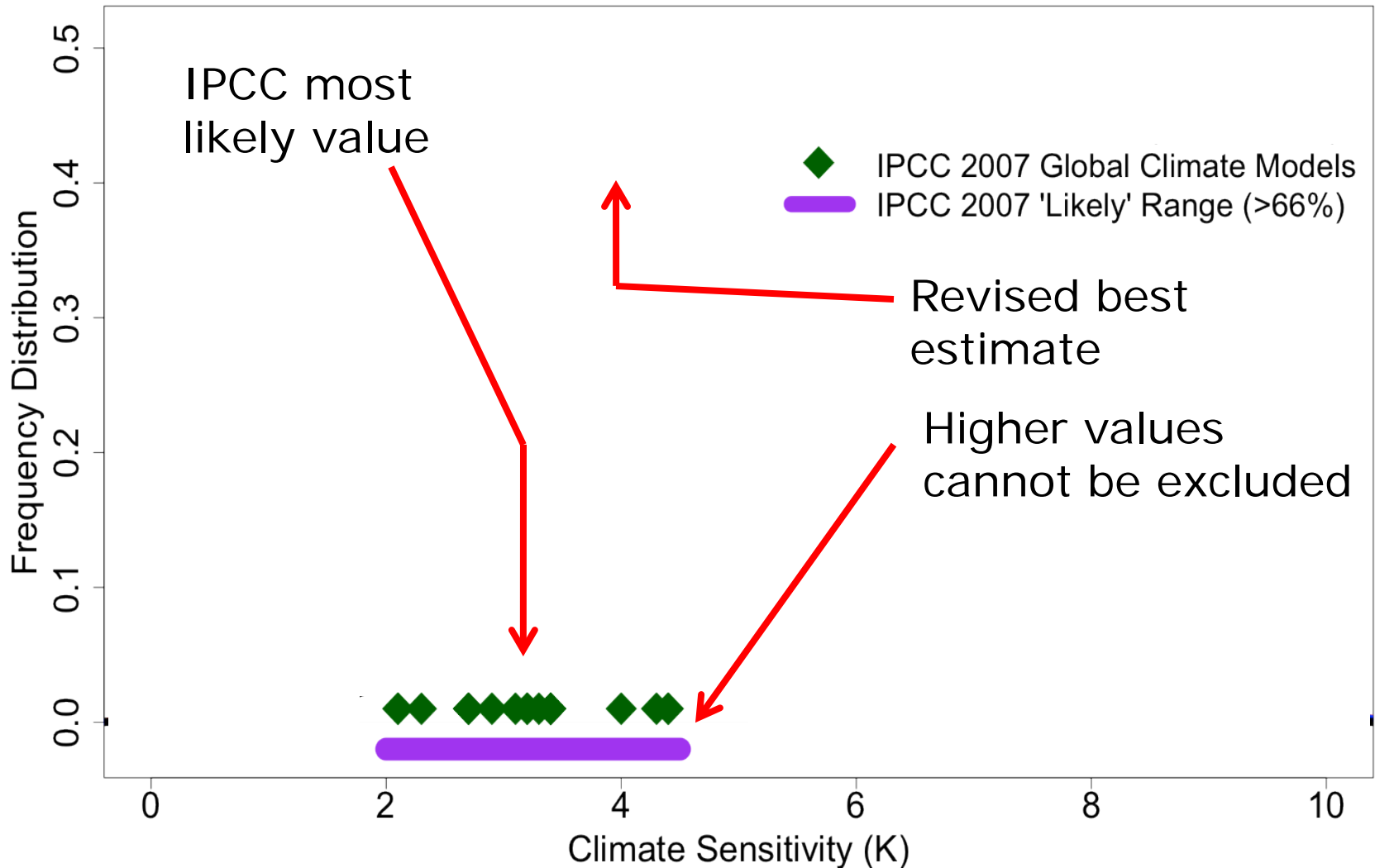


# Risk of outcomes higher than "best estimate"

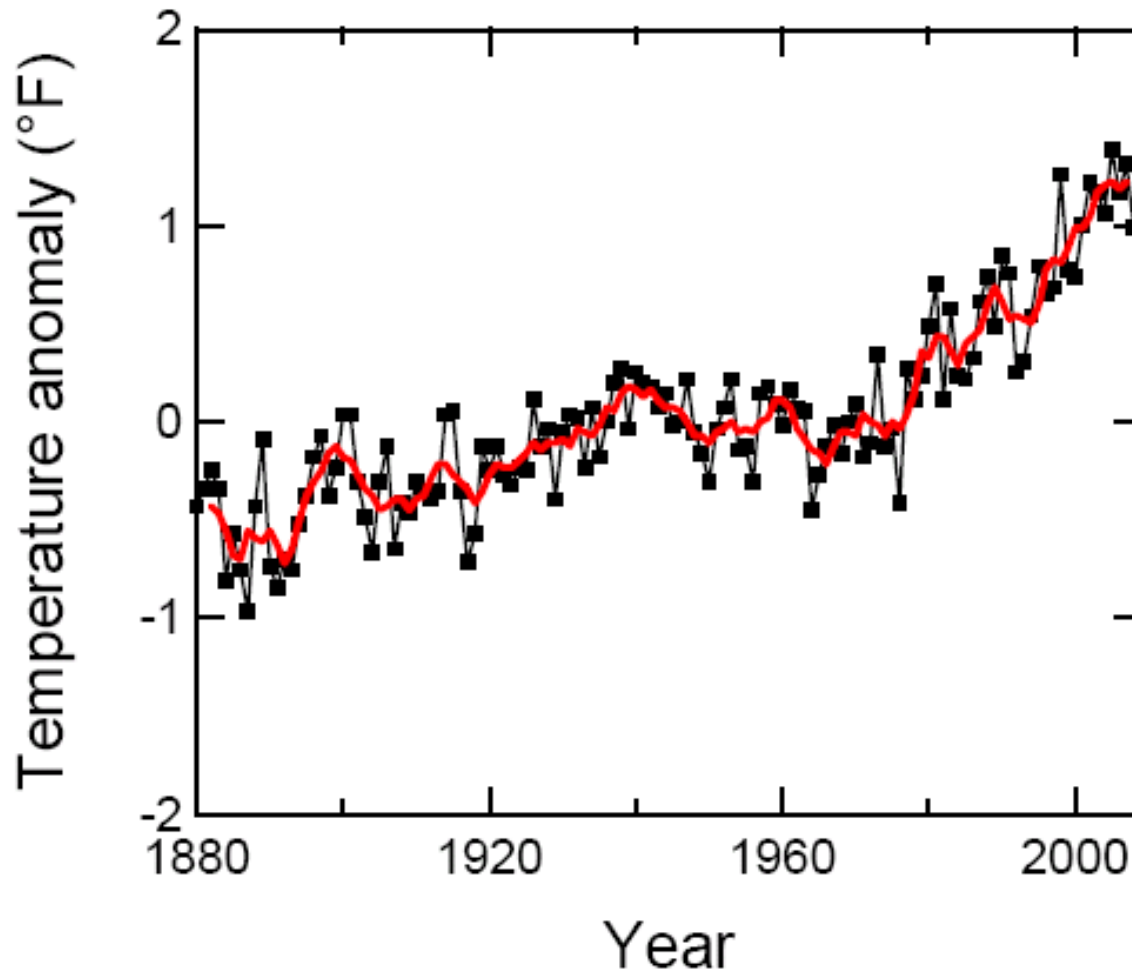
MULTI-MODEL AVERAGES AND ASSESSED RANGES FOR SURFACE WARMING



# Climate sensitivity: Uncertainty in a key parameter



“Warming of the climate system is unequivocal”



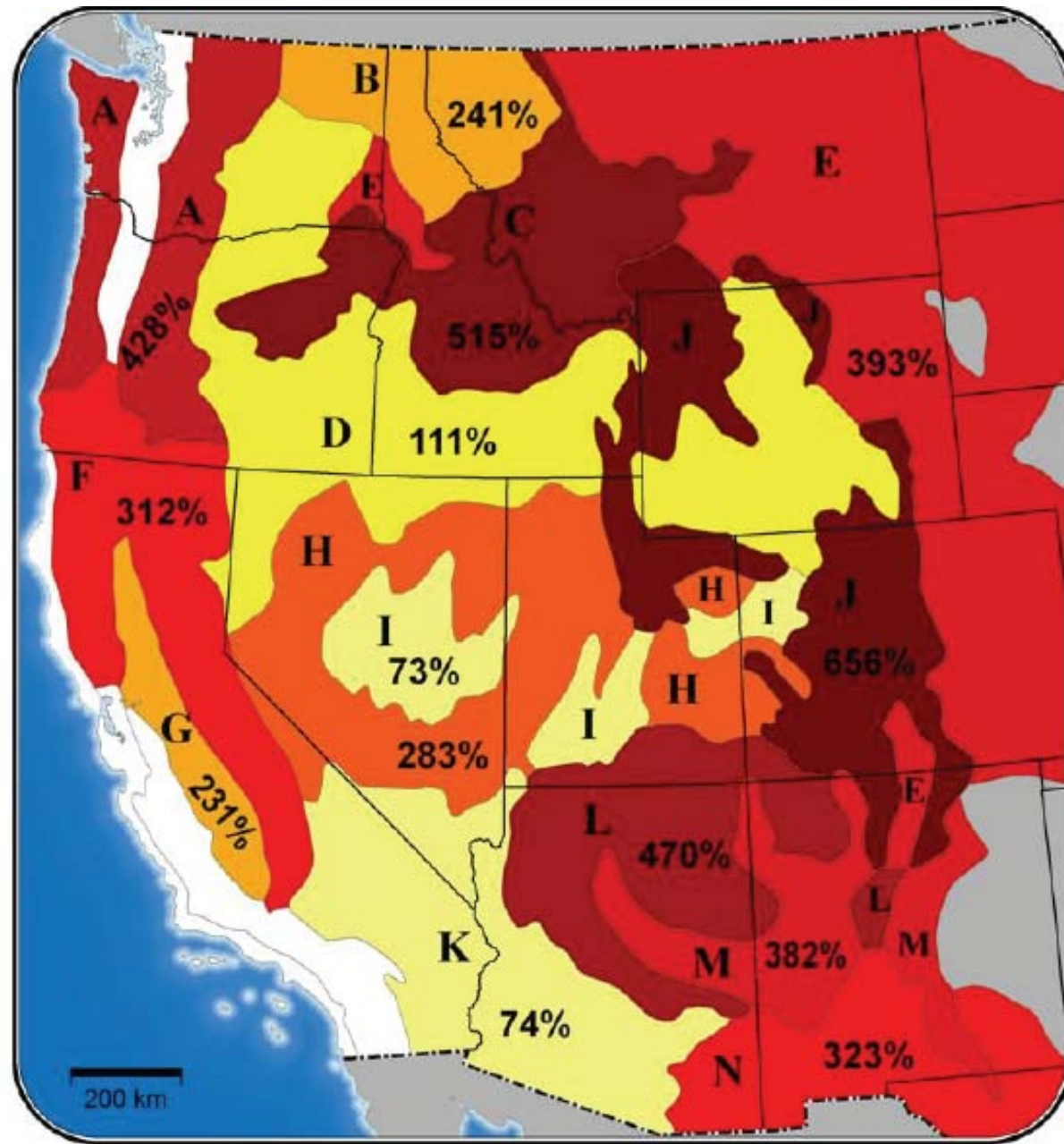
Black : annual mean, global met stations

Red: 5-year running mean, global met stations

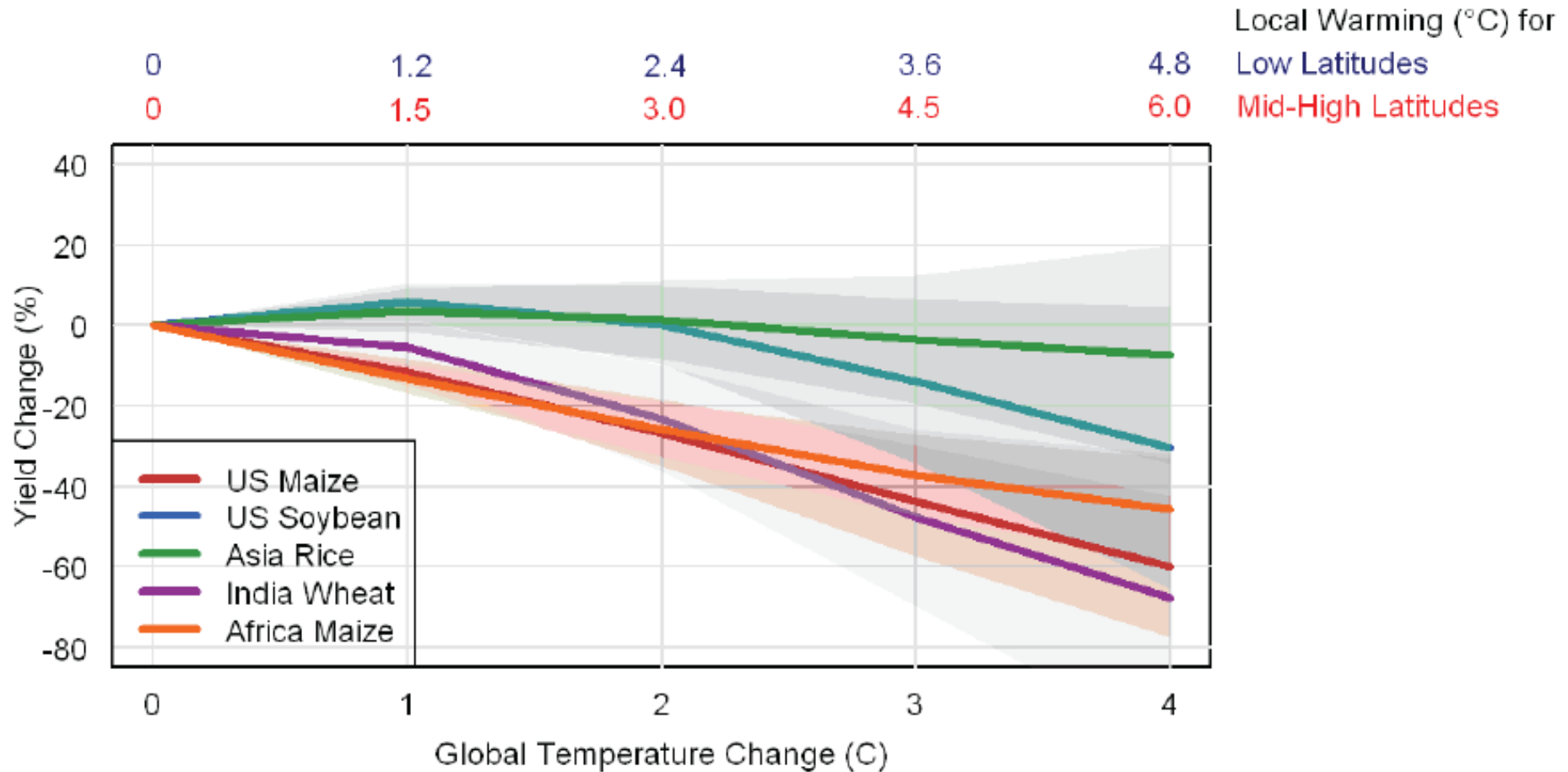
NASA Goddard Institute for Space Studies, updated through 2009

# Fire in the west

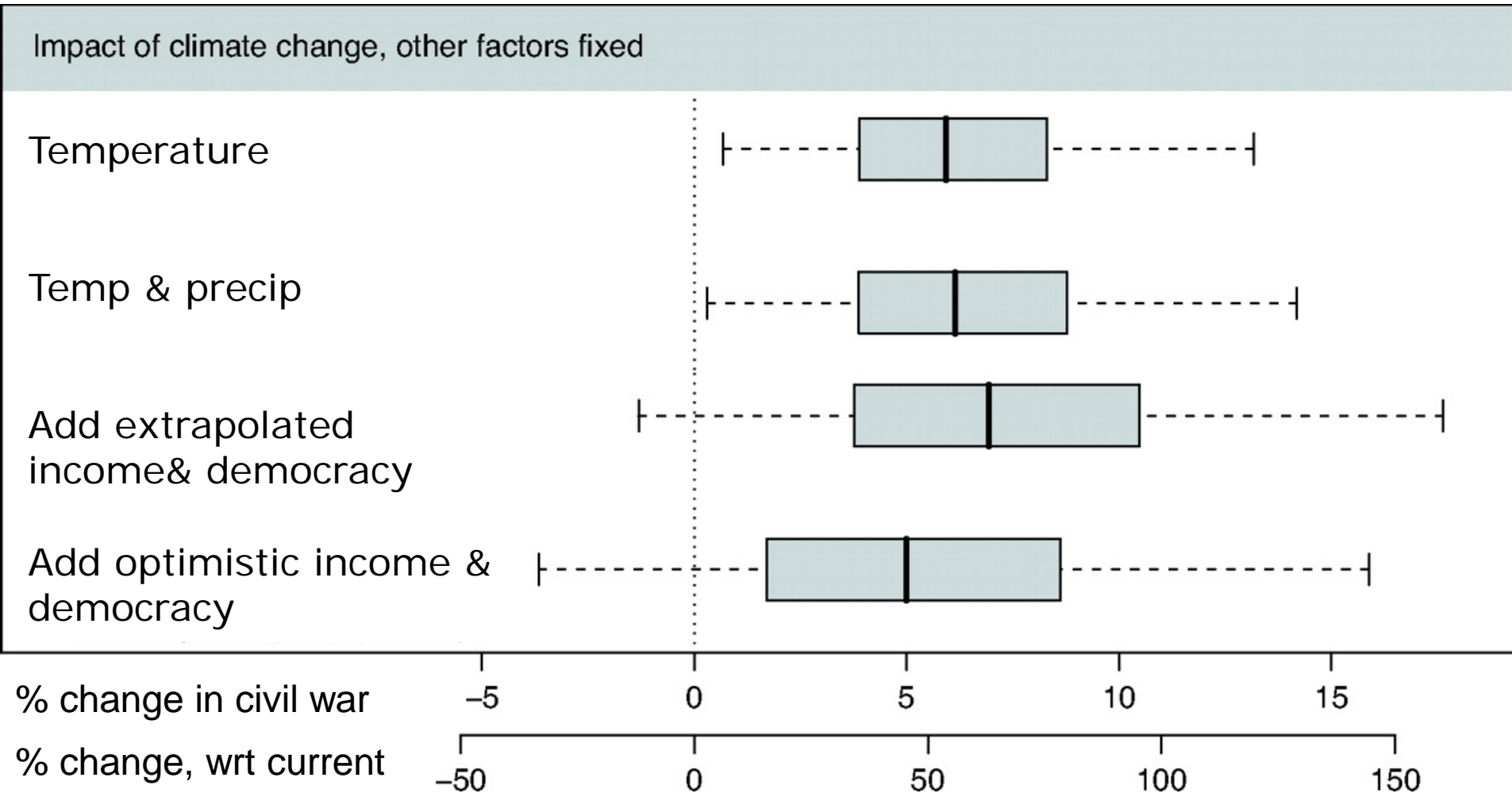
- Increase in area burned annually for each 1°C increase in temperature



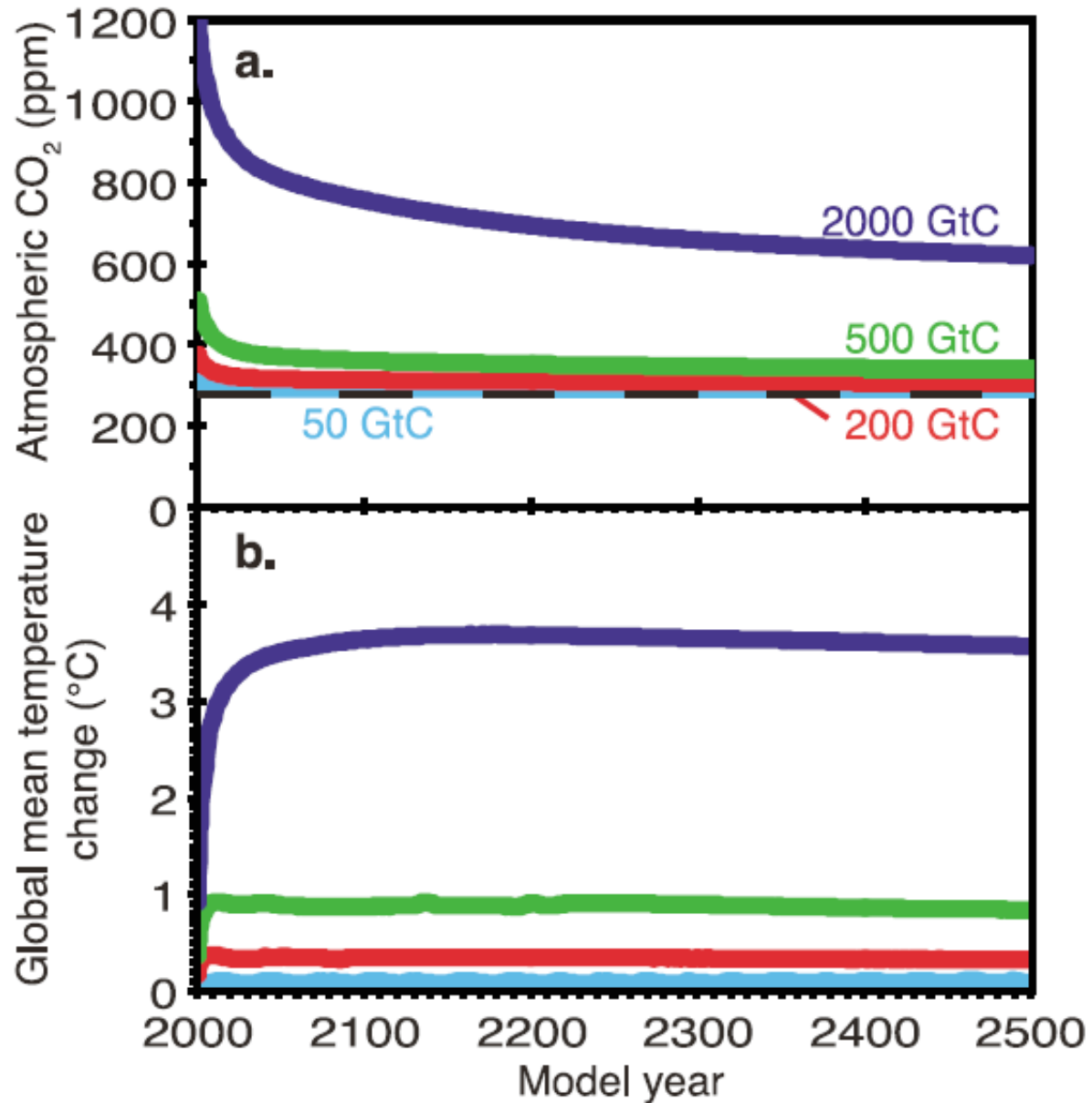
# Global agriculture



# Climate change and conflict




# Permanent climate change



# Communication

- The IPCC
- Expertise in climate science



THE NEO CONS  
WERE BEHIND  
9/11!




DIANA WAS KILLED  
BY PRINCE PHILIP!



THE MOON  
LANDING  
NEVER  
HAPPENED!

ELVIS  
LIVES!



HAN-MADE  
CLIMATE  
CHANGE IS A  
HOAX!



SERIOUSLY?  
W... W...

# IPCC procedures

- Hundreds of top scientists
- Comprehensive assessment
- Multi-stage, broad-based, monitored review
- Plenary approval line-by-line, by governments



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



UNEP

# Errors in the 2007 IPCC report

- WGII – Himalayan glaciers
- WGII – Netherlands sea level

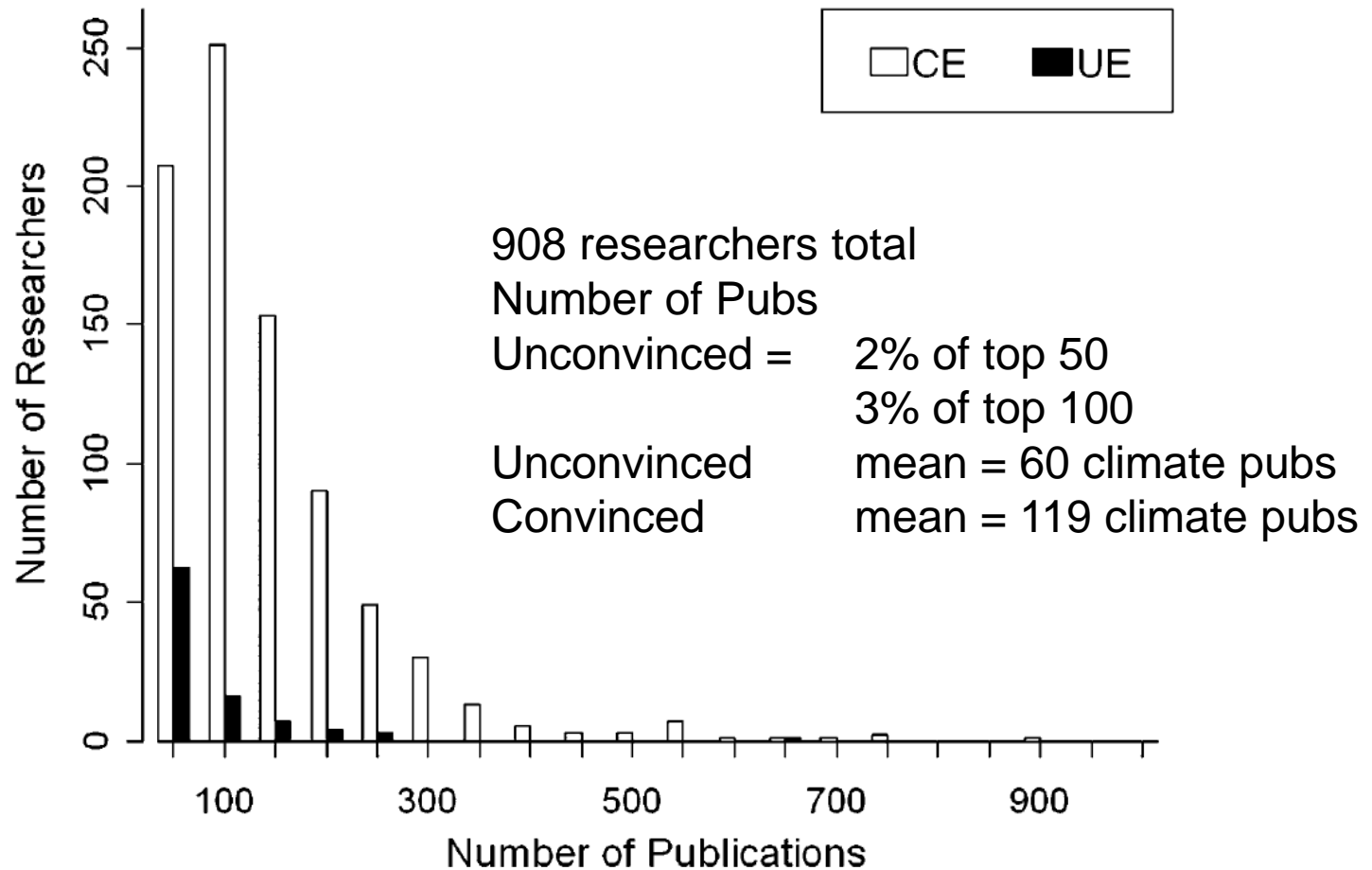
AR4, WGII, ch 10, p. 493. Glaciers in the Himalaya are receding faster than in any other part of the world (see Table 10.9) and, if the present rate continues, the likelihood of them disappearing by the year 2035 and perhaps sooner is very high if the Earth keeps warming at the current rate.

AR4, WGII, ch 12, p. 547. The Netherlands is an example of a country highly susceptible to both sea-level rise and river flooding because 55% of its territory is below sea level where 60% of its population lives and 65% of its Gross National Product (GNP) is produced.

# Climategate

- No problems with any of the science.
- None.

# Expertise in climate science



# Are the researchers in it for the money?

“Is it any wonder that those who benefit the most from continuing to do nothing emphasize the controversy among scientists and the need for continued research?”

# Values

- Present versus future
- Aggregate good versus distributional equity
- Easy versus difficult to monetize
- Human versus non-human stakeholders
- Sensitivity to low-probability, high consequence events (risk aversion)

# The velocity of climate change

- Solutions take time
  - Science
  - Development
  - Scaling-up / industrialization
  - Scaling up / policy landscape
  - Scaling up / global challenges
  - Avoiding early retirement costs

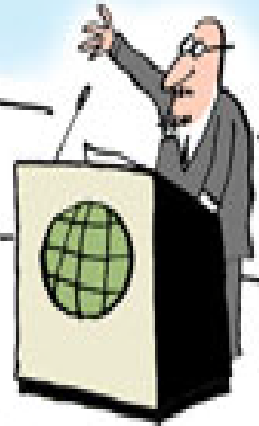
Energy sources, efficiency, and adaptation change the world incrementally and quantitatively.



# CLIMATE SUMMIT

WHAT IF IT'S A BIG HOAX AND WE CREATE A BETTER WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.



YEL  
Pitt  
11/19 USA TODAY

# The velocity of climate change

- Climate changes persist many centuries
- Climate changes alter risk profiles
  - 100% certainty is a hopeless target
- Developing solutions takes time
- Artificial controversy
  - Costs time and opportunity
  - Lets risks and damages accumulate
  - Postpones co-benefits
  - Jeopardizes leadership opportunities