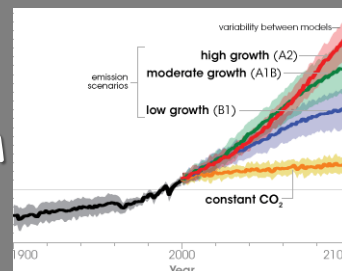
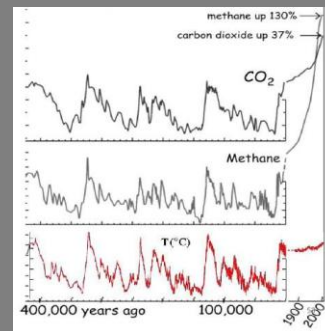


The global warming story is usually told via our high-tech triumphs

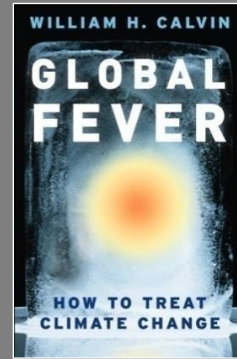
- *CO₂ levels*
- *temperature*
- *forecast models*

But I think this framing of the problem is a serious mistake.



Why is this a tactical mistake?

- People love to complain about the accuracy of **weather** forecasts and assume that **climate** forecasts deserve similar witticisms.
- The problem has been framed as “warming,” but the numbers seem small.
- But heat waves are going to be the least of our problems. This is **fever** and its fatal **complications**.
- It’s something we must *cure*, not just live with.



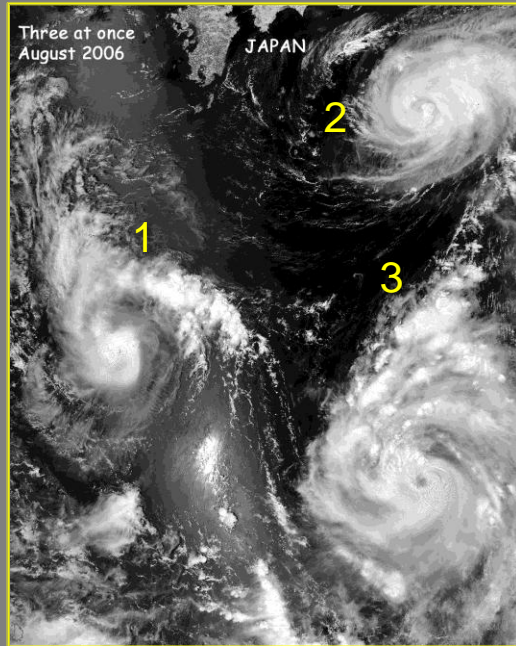
113 mph gusts in northern Utah
More high winds are
predicted for
global warming.

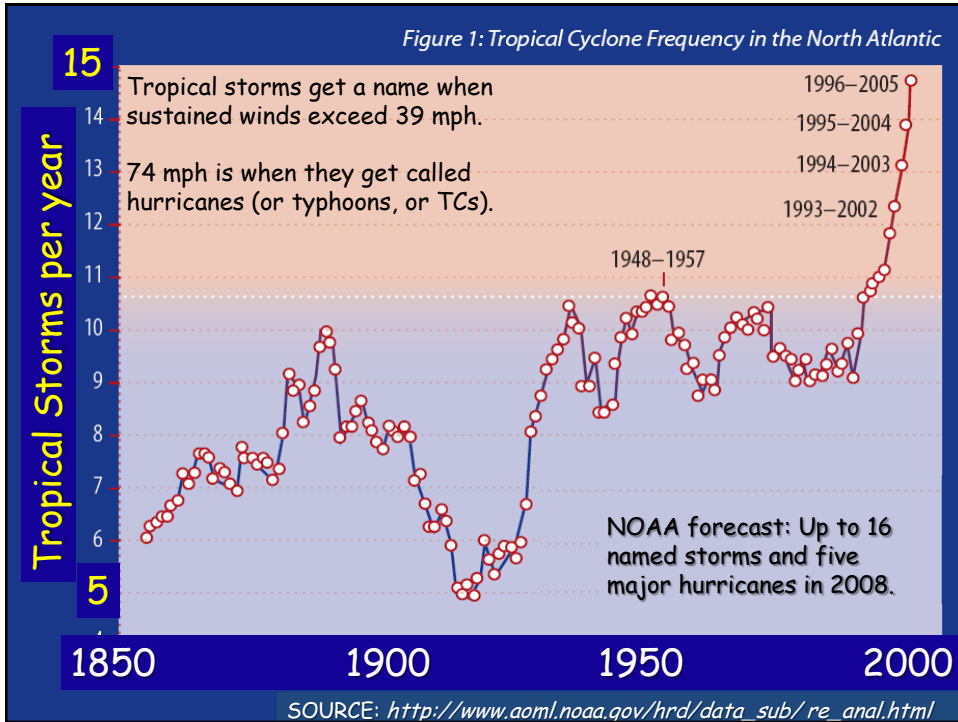
Utah I-15 wind 4/23/99 Credit: Marta Storwick/Standard-Examiner via Associated Press



Blown-over garbage truck, near Bill Gates' house in 1999

High Winds





If wind speed increases 20%, from 50 mph to 60 mph, the damage goes up not 20% but 500%.

[6X insurance claims]

Something blown loose from one building may hit another building if it doesn't hit the ground first, giving a cascade of damage.

Nonlinearity



Heavy Weather

The heavens opened
(US government photo)



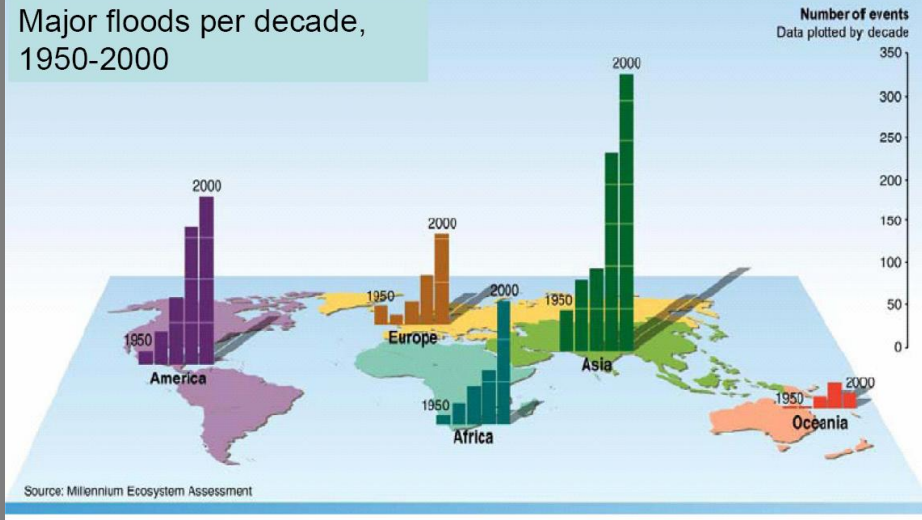
Logged hillside collapse

Chehalis WA flood 2007



So it is a global climate change,
not merely local trouble that moves around.

Major floods per decade,
1950-2000



Floods have been increasing for 50 years.

More Fires



J. M. W. Turner (1835), Burning of the Houses of Parliament

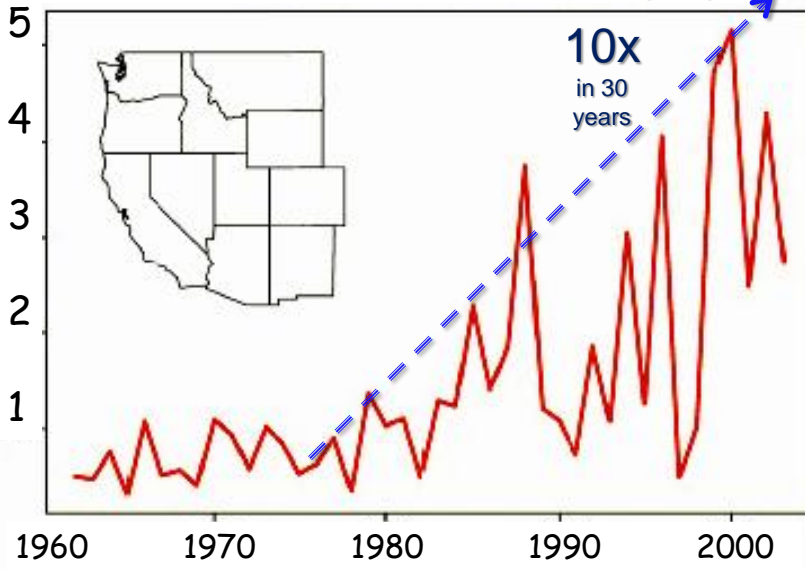
Fire managers predict bad year for blazes

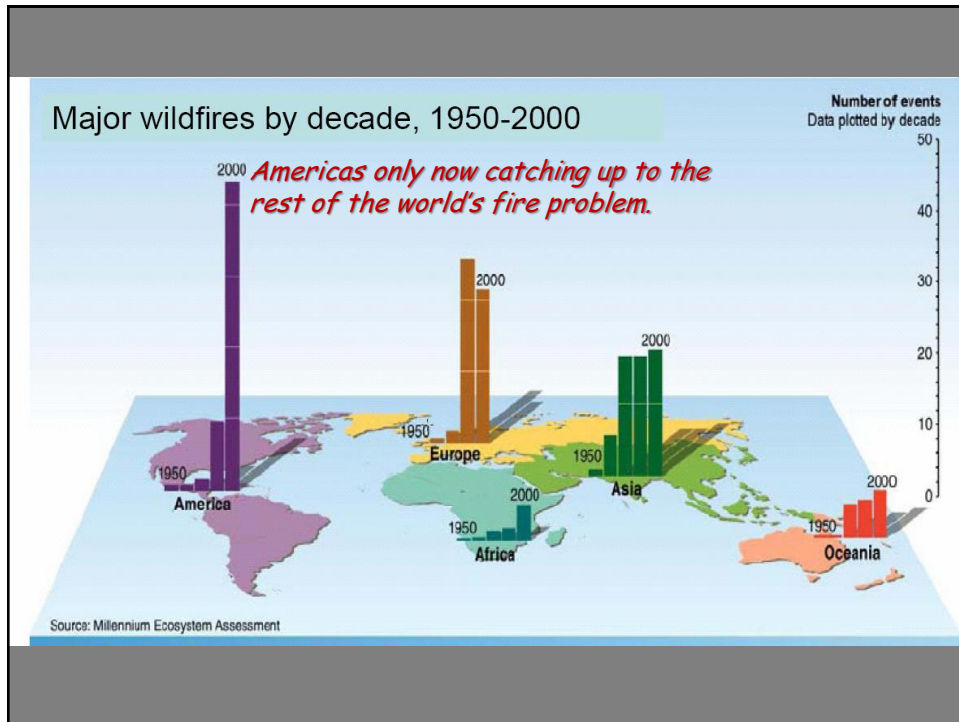
Sat May 10, 2008 2:37pm EDT



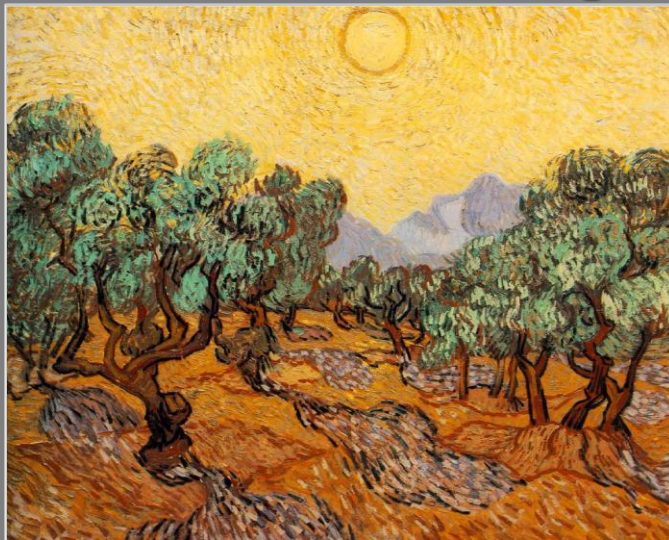
David S. Roberts, San Diego County 2007

Wildfires in US West: millions of acres per year

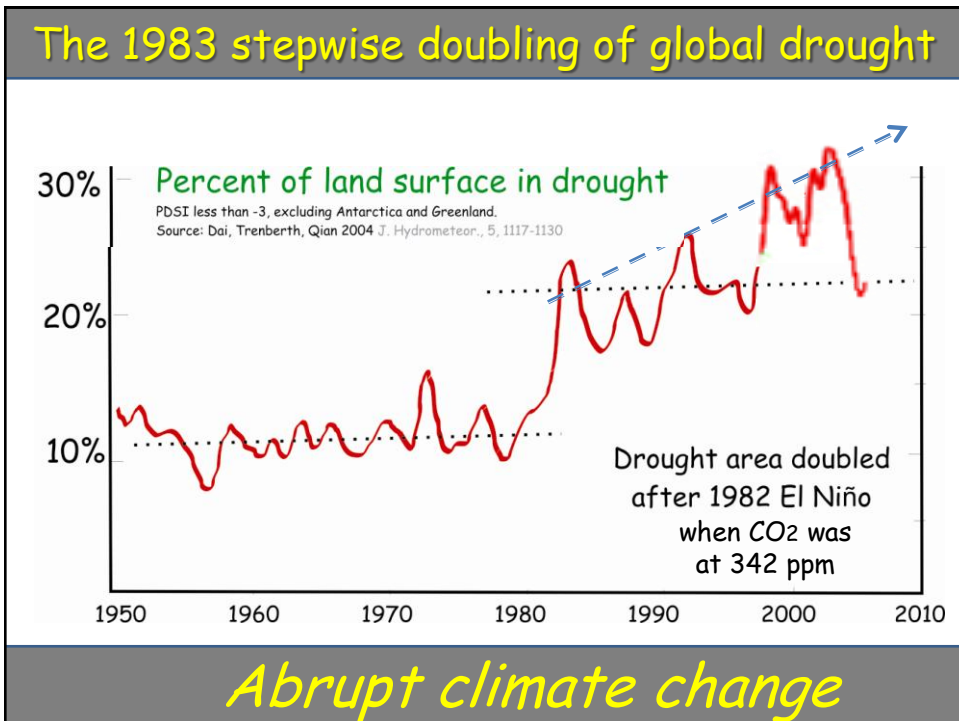
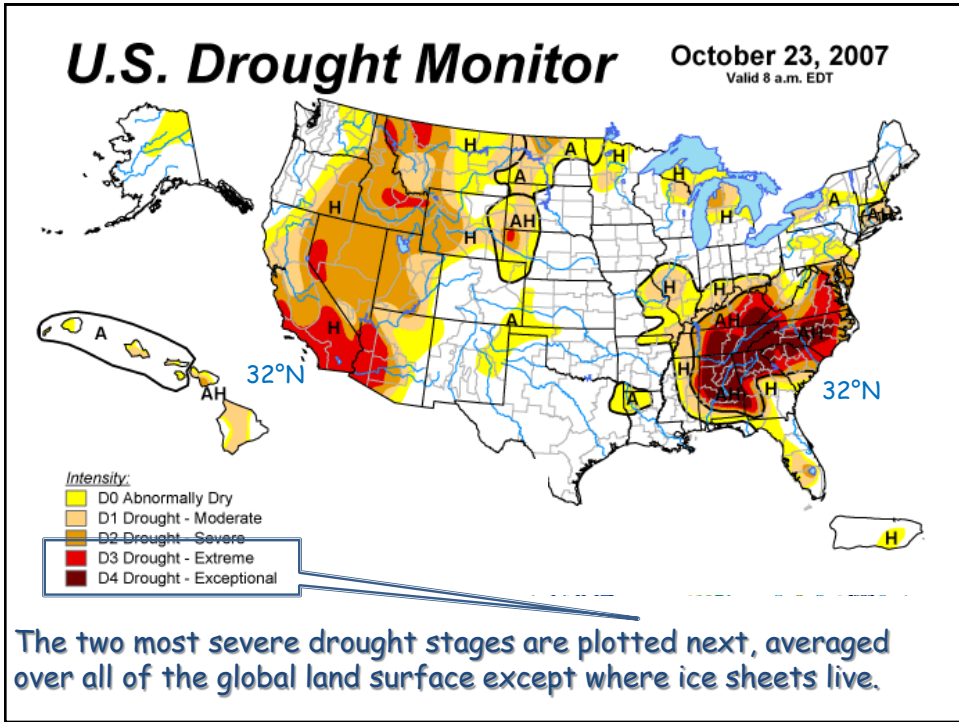




Drought



Vincent van Gogh, Olive Trees with Yellow Sky and Sun, 1889

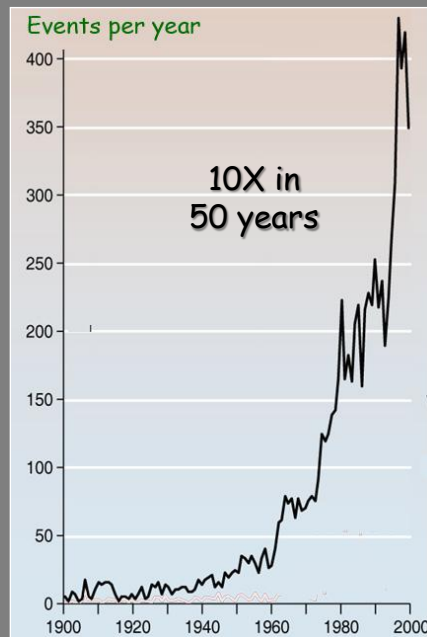


A half-century of global climate change

1. High winds (up 40%)
2. Heavy weather floods (up 10x)
3. Wildfires (up 10x)
4. Drought (abrupt doubling in 1983)
5. Ice melting (Arctic sea ice down 40%, Greenland melt area up 67%)

Those who aren't alarmed yet haven't been paying attention.

(Some try to re-frame the issues so narrowly as to avoid mentioning those 5.)



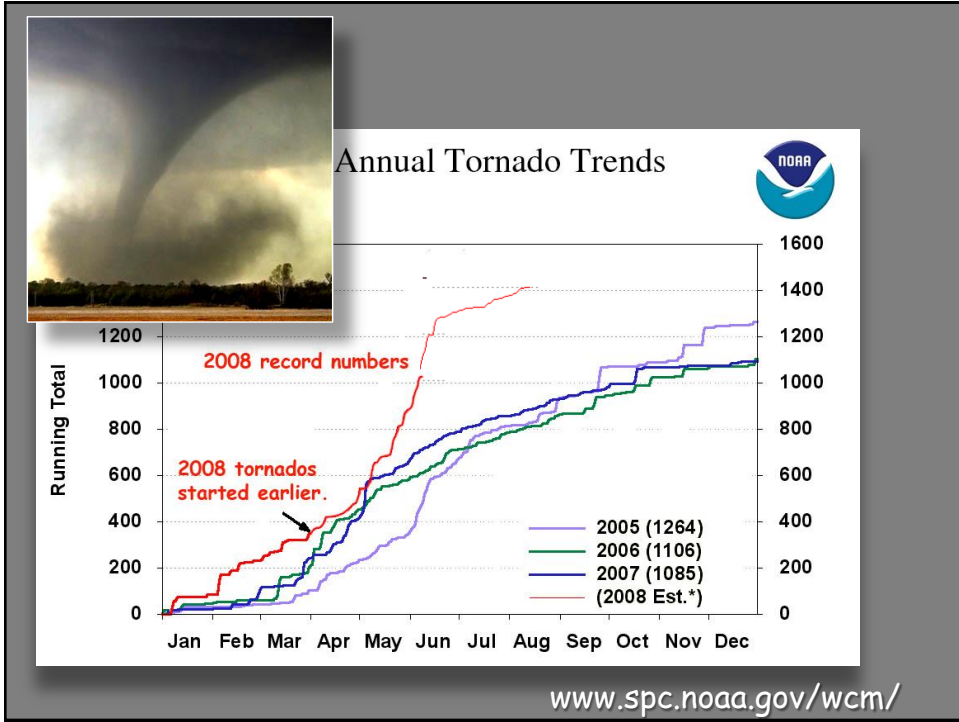
"All disasters" includes

- Drought*
- Earthquake
- Heat waves*
- Famine*
- Flood*
- Infestations*
- Land slides*
- Volcanic eruptions
- Storm surge*
- Wild fires*
- High winds*

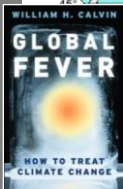
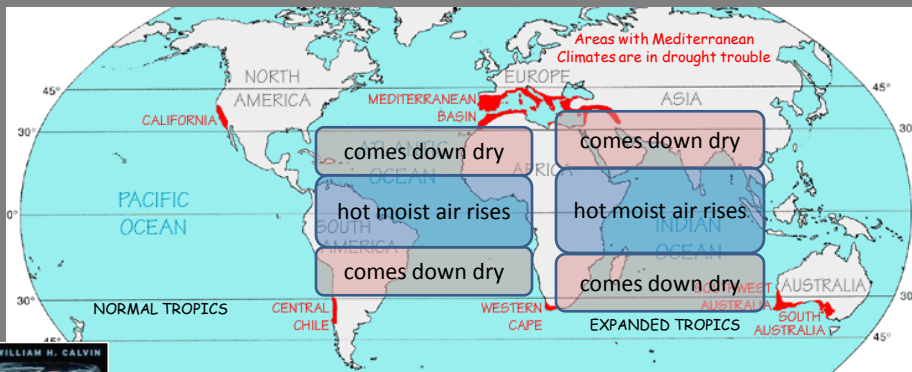
* increased by global fever

But the index does not include tornados.

http://en.wikipedia.org/wiki/Image:Trends_in_natural_disasters.jpg



The expansion of the overheated tropics

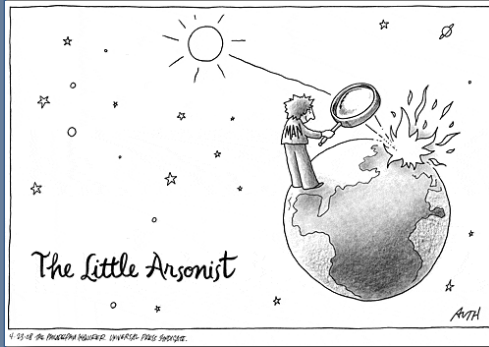


Alarmed yet?

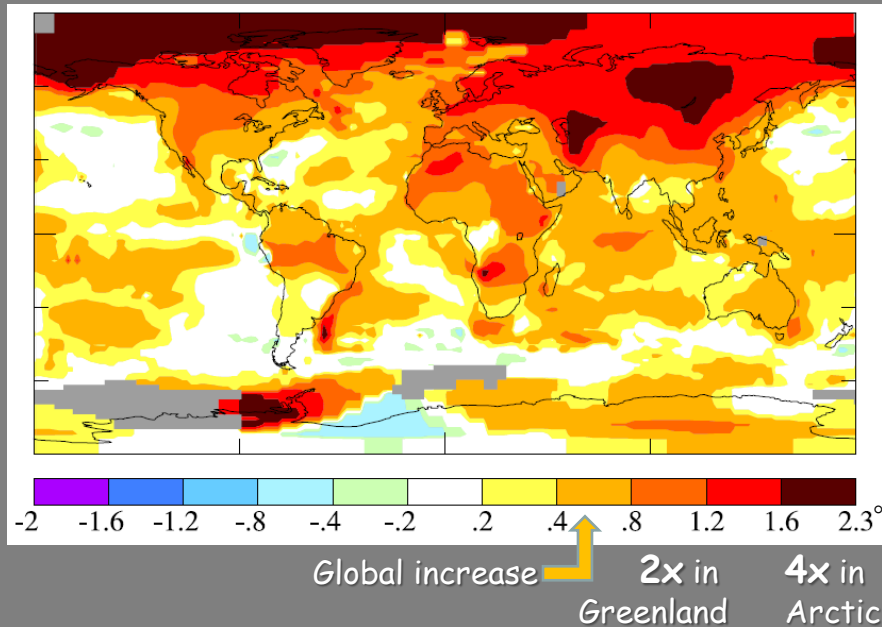
Climate Briefings

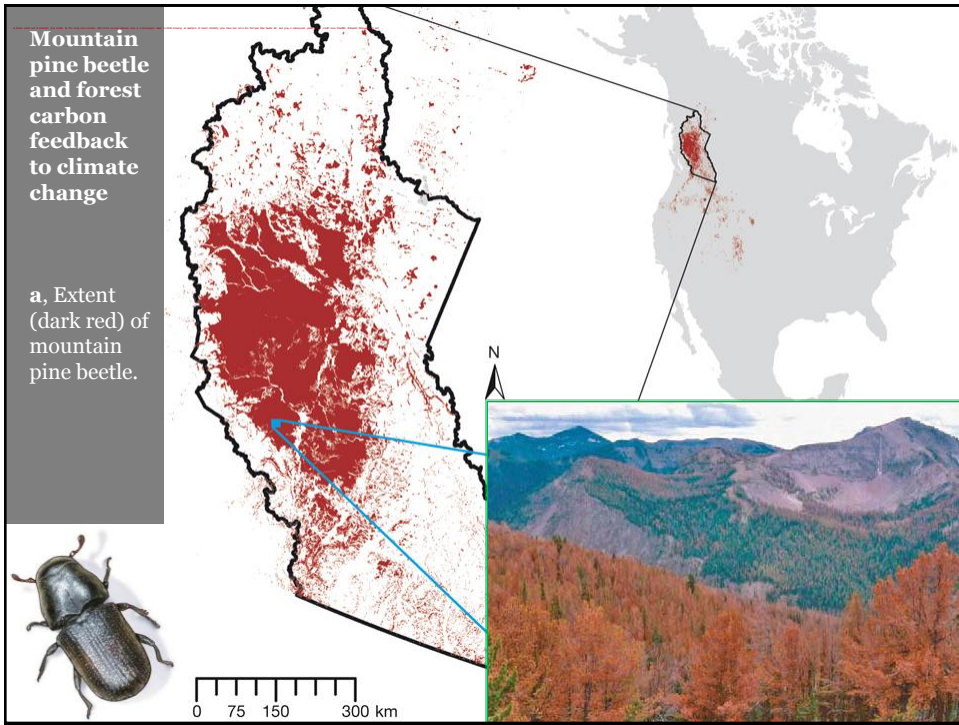
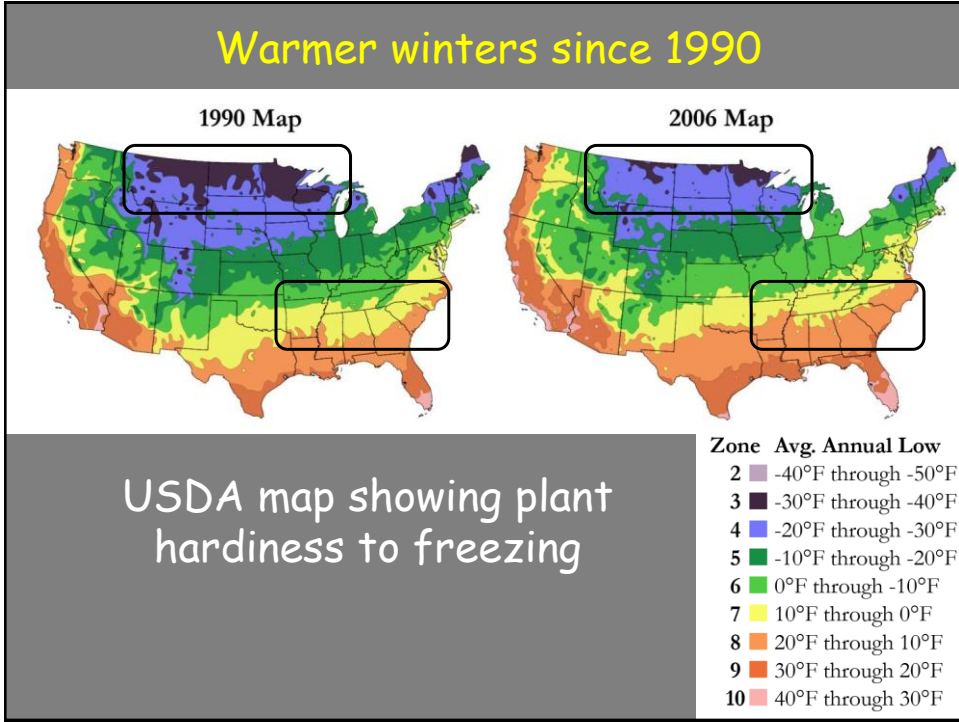
How hot is it?

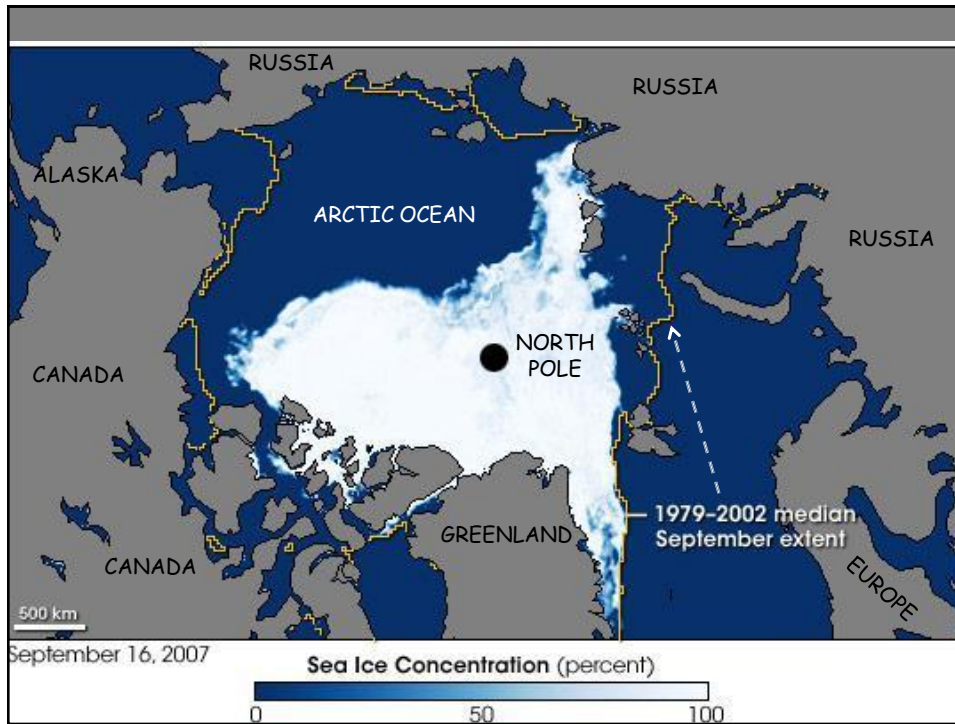
William H. Calvin
University of Washington
Global-Fever.org



2001-2007 Mean Surface Temperature Increase (°C)
Base Period = 1951-80, Global mean rise = 0.54°C



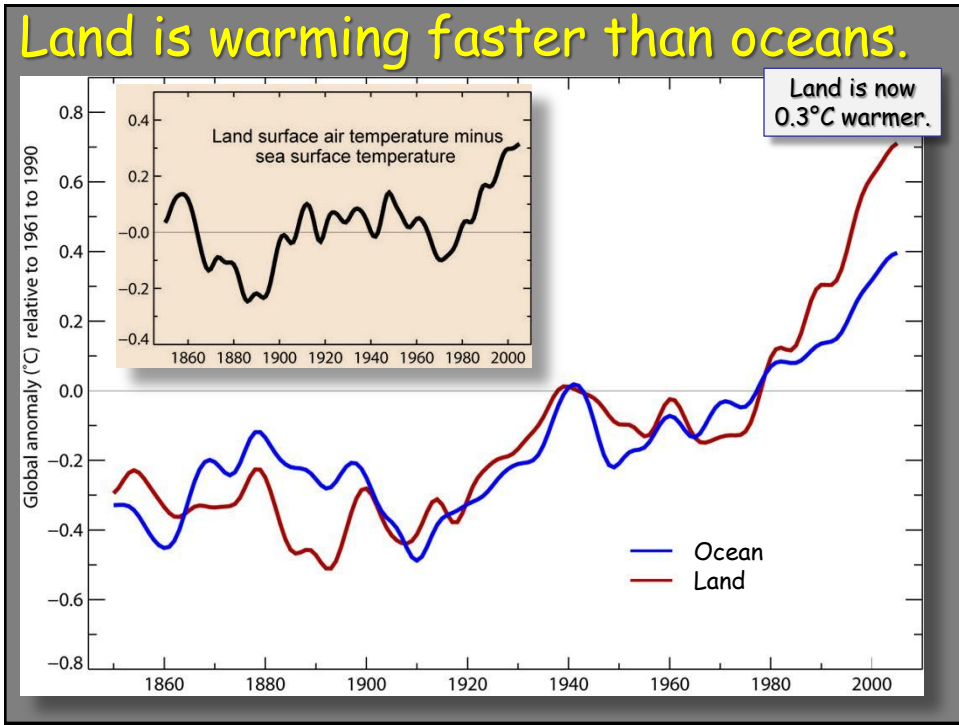




Fresh snow reflects 90% back to space.
After surface melt, only 70% reflects.

Therefore the snow absorbs 3x
as much heat the next day.

The same thing happens with dust and soot.

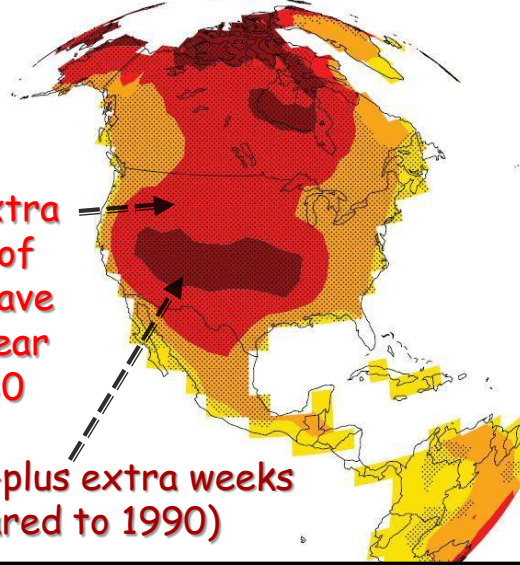


The damage
is done by
the
extremes,
not the
means.

IPCC A1B Heat Waves 2030-1990

Two extra
weeks of
heat wave
each year
by 2030

Three-plus extra weeks
(compared to 1990)

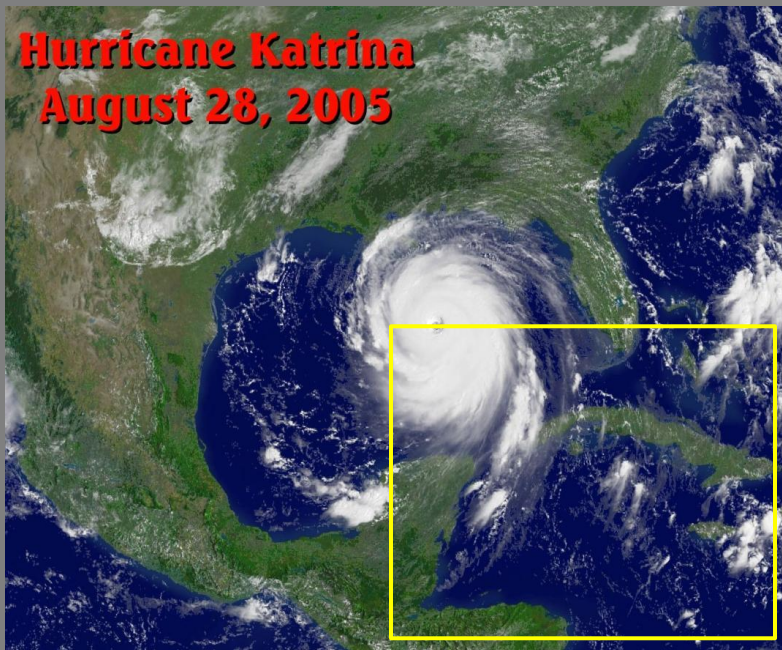


The 2003 heat wave in Europe
killed 35,000 people.

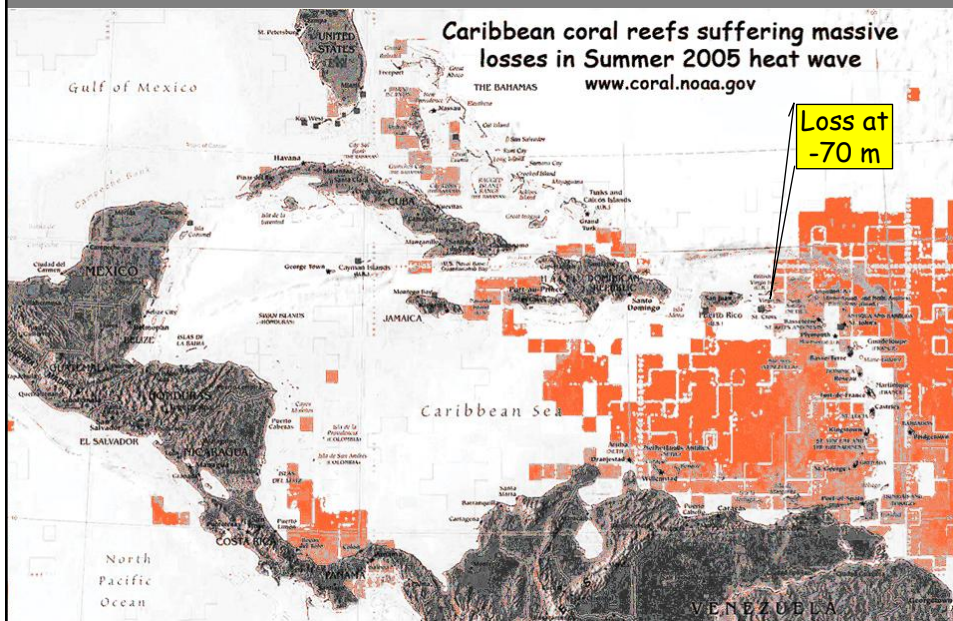


Salvador Dalí *The Persistence of Memory*. 1931

Heat waves are already killing coral.



Caribbean 2005 coral disaster

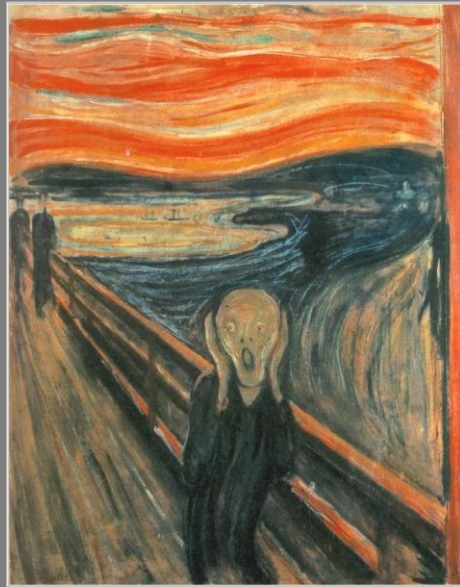


Since NOAA's last report in 2005, the Caribbean region has lost at least **50 percent of its corals**, largely because **sea temperatures have risen**, said Timothy Keeney, NOAA's deputy assistant secretary for oceans and atmosphere, and **25 percent of all marine species need coral reefs** to live and grow, while **40 percent of the fish caught commercially** use reefs to breed.

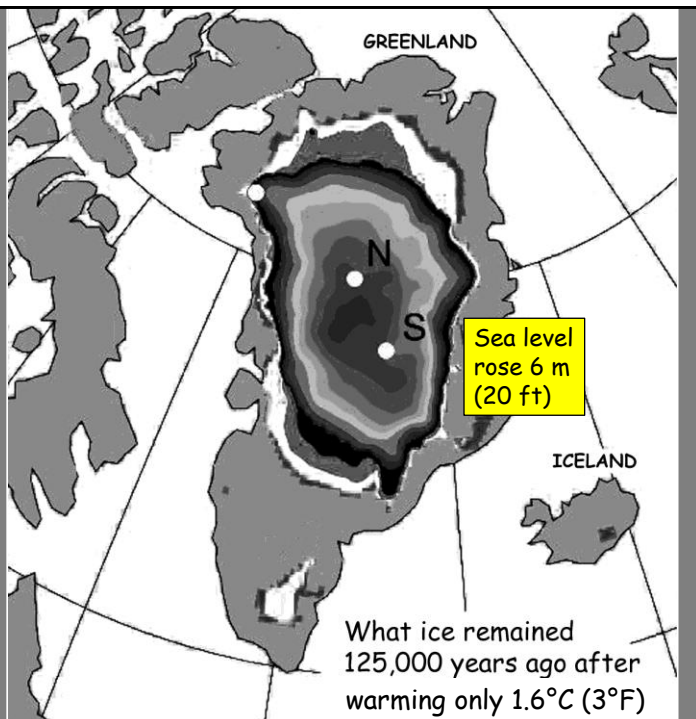
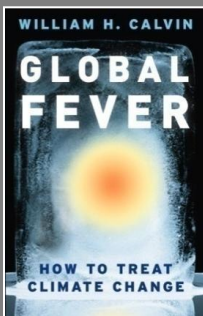


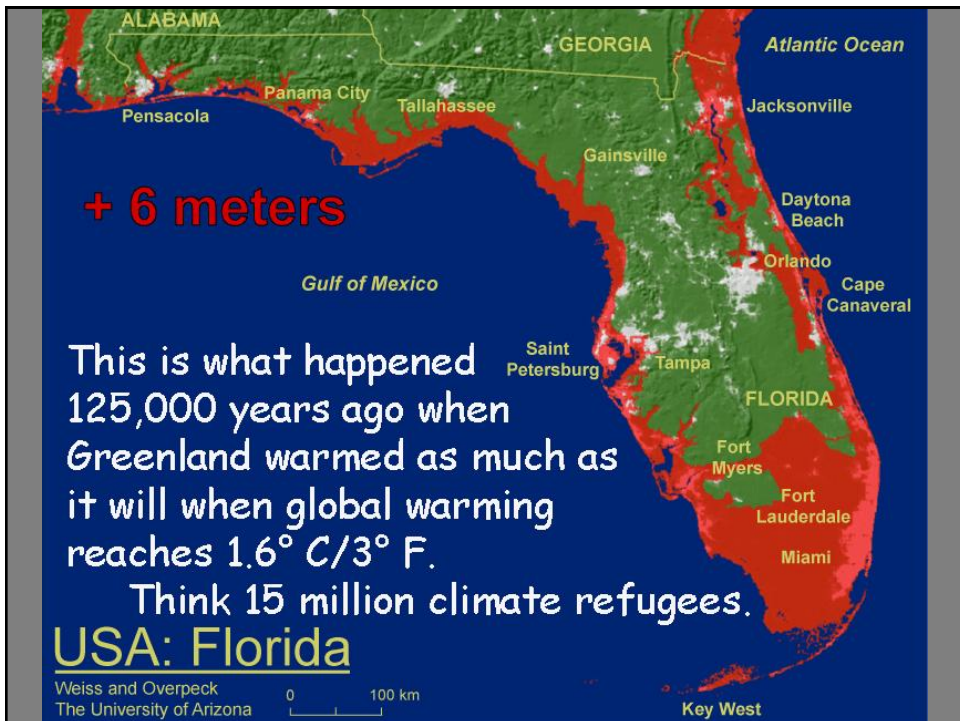
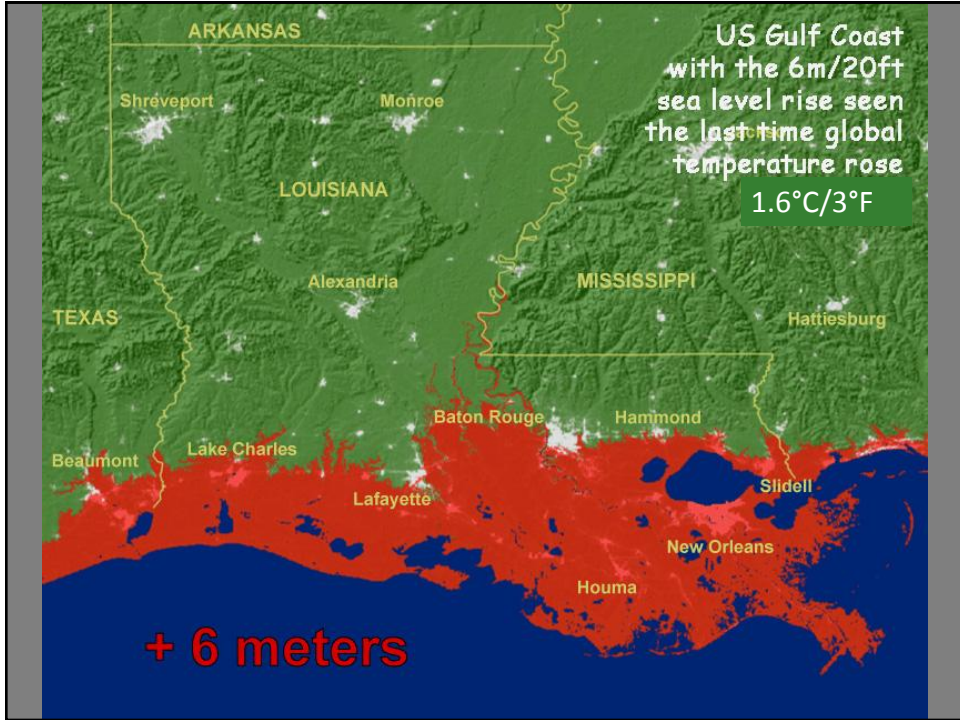
(NOAA press release, July 2008)

Sea Level Rise Refugees



Edvard Munch, *The Scream*





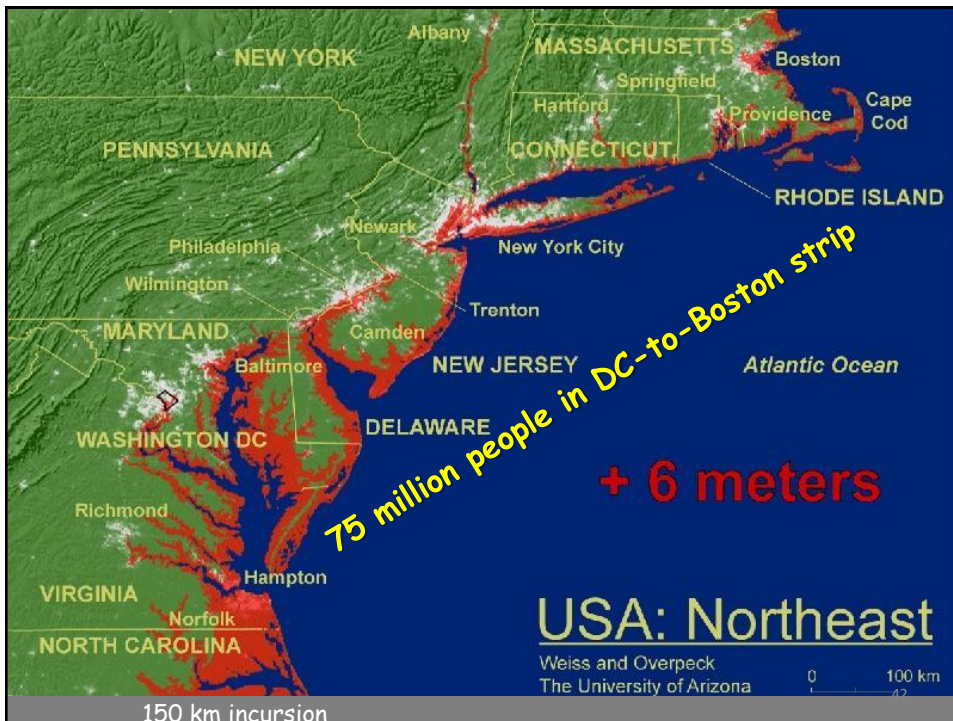
East and Gulf Coasts have very shallow slopes, so a 20 ft rise goes far inland.



Jamestown VA

Photograph by George Steinmetz

Colonial Landscape
National Geographic, May 2007
© 2007 National Geographic Society. All rights reserved.



White House

Capitol Hill

Are they alarmed yet?

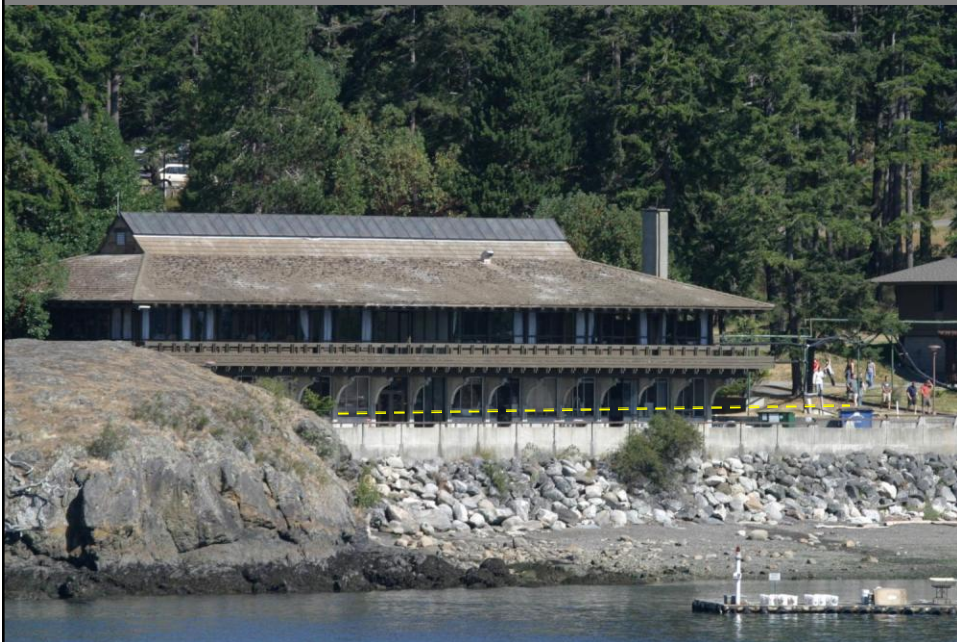
For Washington DC, dikes might suffice.

But for 12,000 miles of coastline along the gently-sloping East and Gulf Coasts...?

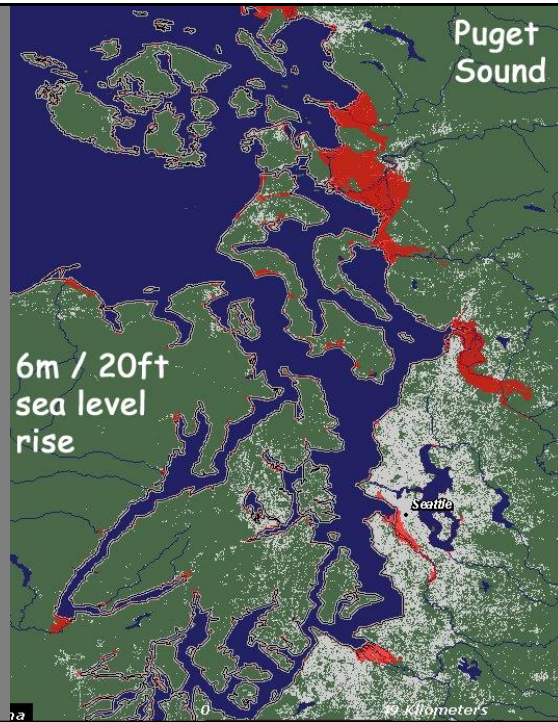
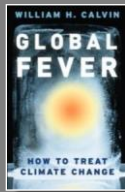
6 m (20 ft) rise in sea level

43

6 m (20 ft) sea level rise at UW's Friday Harbor Lab

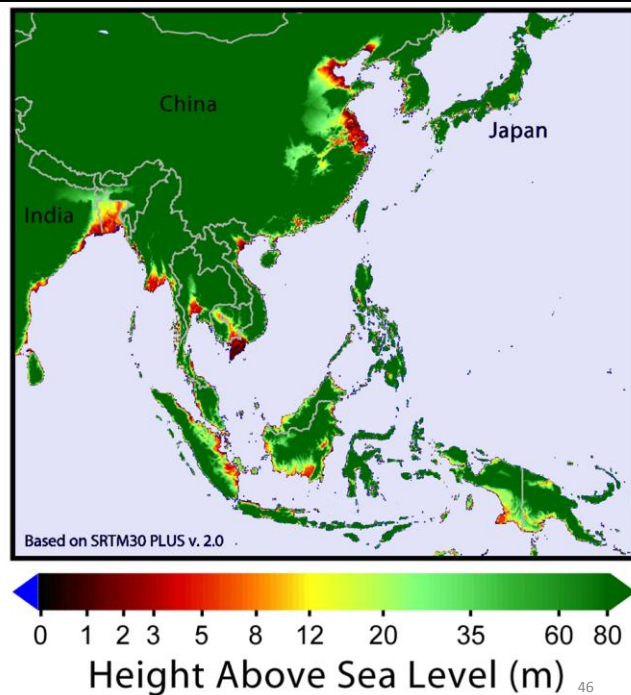


At least, not very many people live in the low-lying areas of Washington State.



Many river deltas in Asia will be inundated.

70 million climate refugees, just from Bangladesh.





Any major downsizing usually involves

1. Famine
2. Pestilence
3. War
4. Genocide

Albrecht Dürer
The Revelation of St John: The Four Riders of the Apocalypse,
 1497-98, Woodcut, 39 x 28 cm,
 Staatliche Kunsthalle, Karlsruhe

Majority hits on minorities

Anti-Immigrant Violence in Johannesburg



A mob of South Africans marching on Sunday through a squatter settlement near Johannesburg, from Zimbabwe, have been attacked.

By **BARRY BEARAK**
 Published: May 19, 2008

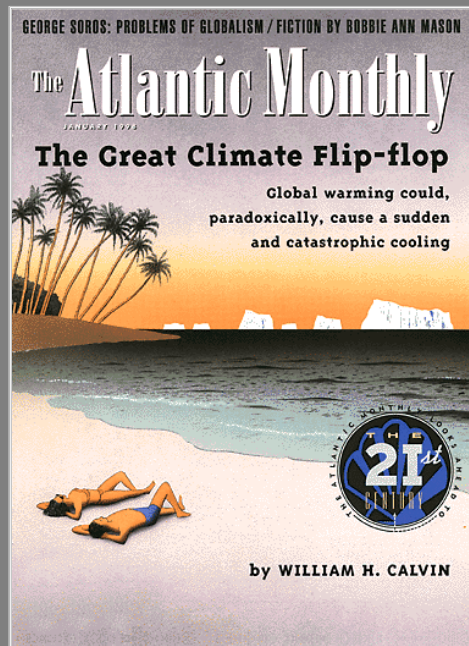
A bad time to be any kind of a minority.



Francisco de Goya
El Tris de Mayo 1808

That's the kind of world we must avoid.

Abrupt
Changes in
Climate



The people who study the abrupt climate shifts of the past have an aphorism:

Climate is like a drunk:

Left alone, it sits.

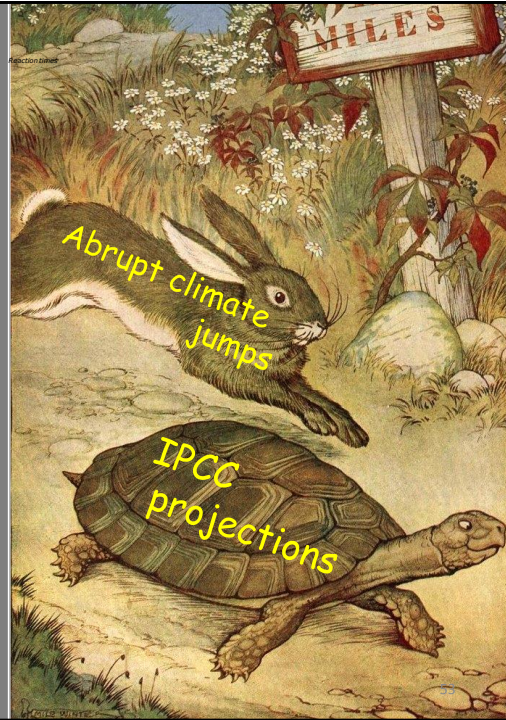
Forced to move, it staggers.

The Tortoise and the Hare is a fable attributed to Aesop. The hare soon left the tortoise far behind and decided to take a nap midway through the course. The tortoise, crawling slowly but steadily, won the race.

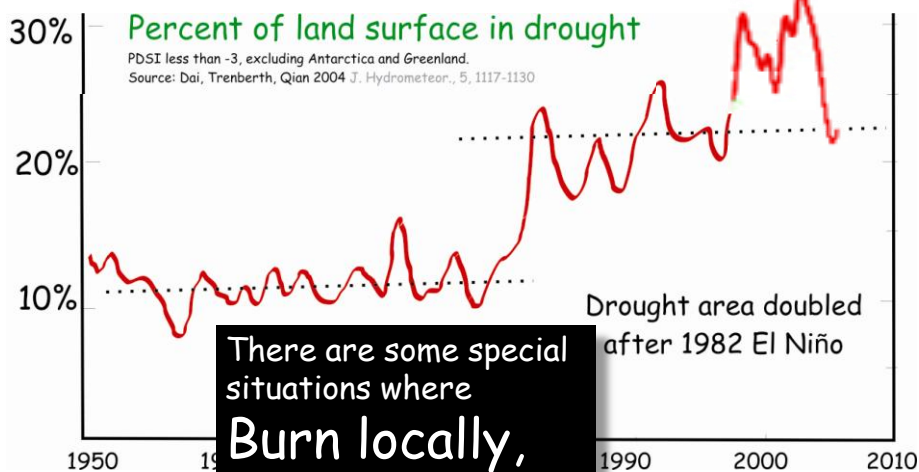
Think of our race finish line, however, as the drop off for a fast descent into Hell. The hare jumps and naps, but the tortoise's progress is slow and sure.

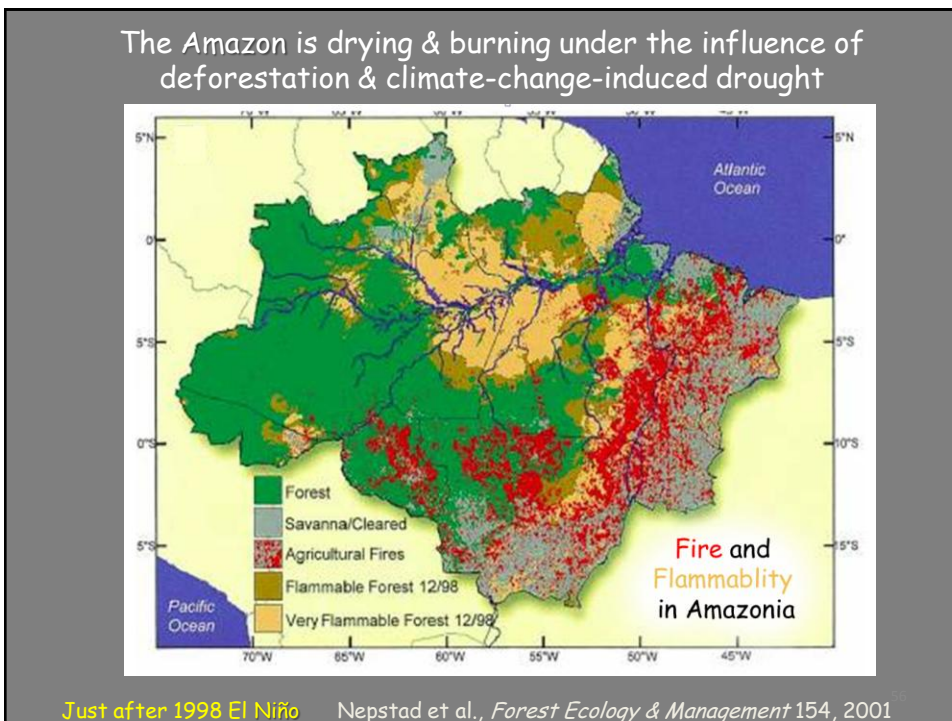
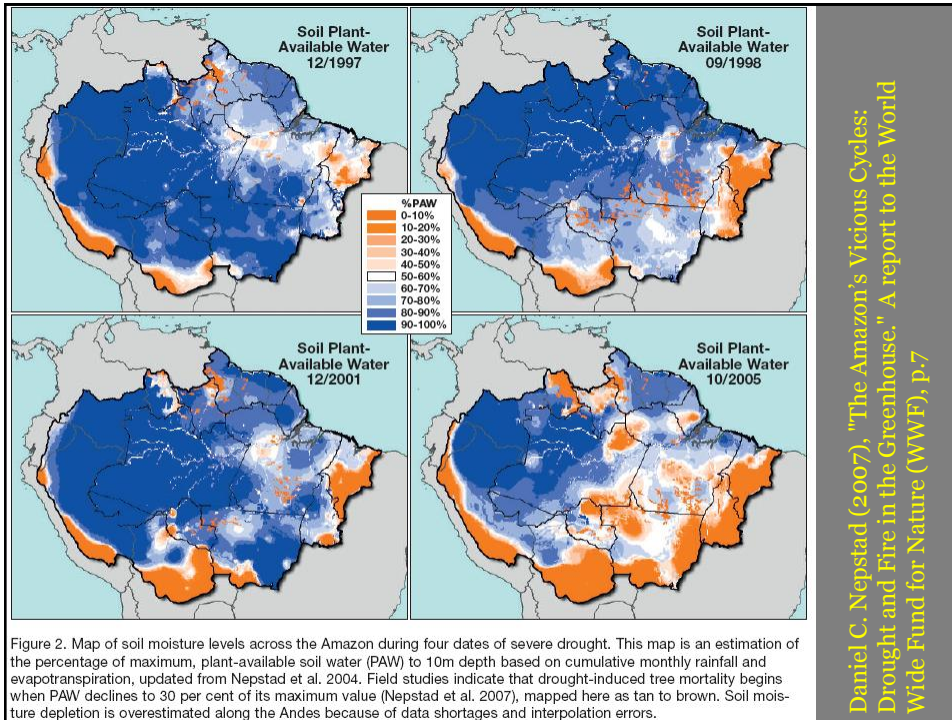


- The IPCC reports treat climate as if it moved in a stately manner like a tortoise.
- They all assume that the Hare conveniently takes a long nap.
- *That is not a safe assumption.*

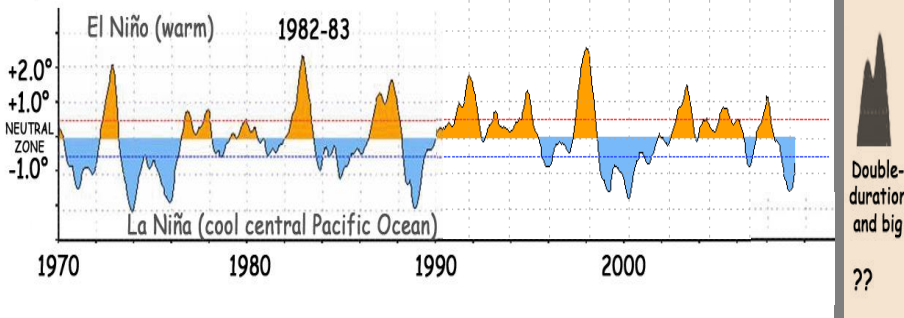


The 1983 stepwise increase in global drought

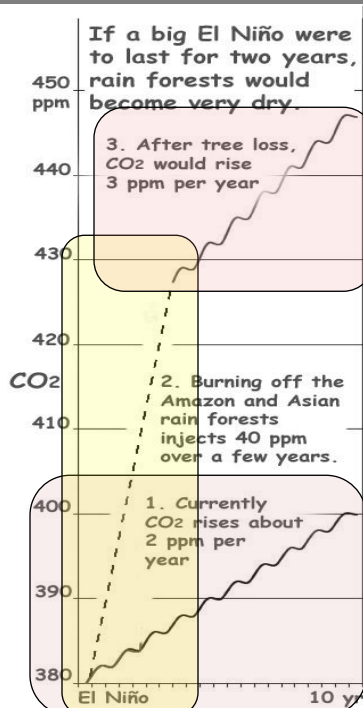




How to rearrange atmospheric circulation in only a few months All it takes is a big El Niño.



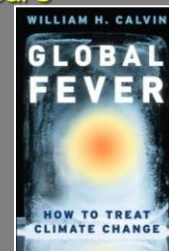
If a big one lasted two years instead of one....



Burn locally, crash globally

On top of that, a 50% increase in the rate of CO₂ growth thereafter, due to loss of carbon sinks.

50% increase in excess CO₂ within a few years

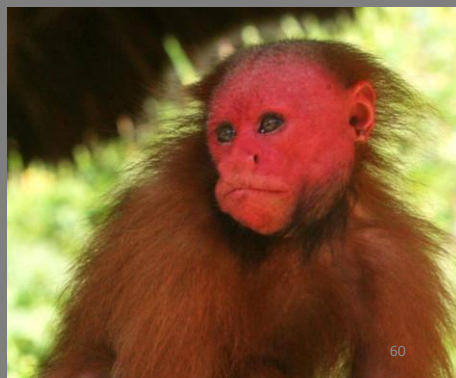


We could
lose our
maneuvering
room and go
into a
tailspin.



Matt Collins in *Scientific American* 2008

The Big Burn also causes
a mass extinction event:
*about half of all Amazon
species will go extinct.*

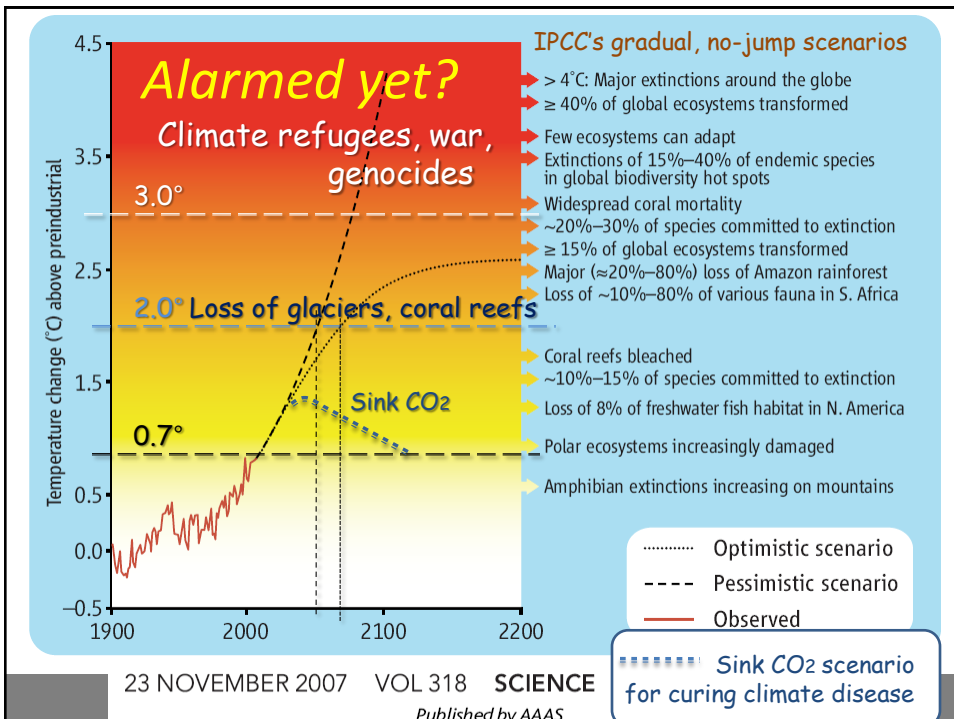


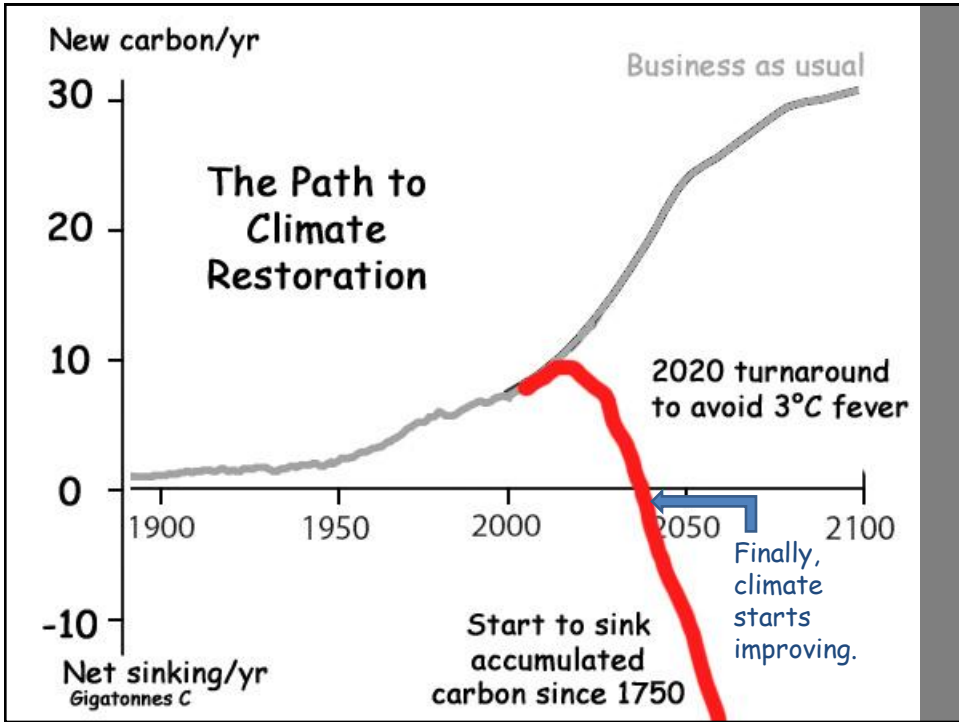
Three of the six species of apes live in SE Asia forests.

Here, orangutan and siamang.



Alarmed yet?





The Climate Optimist

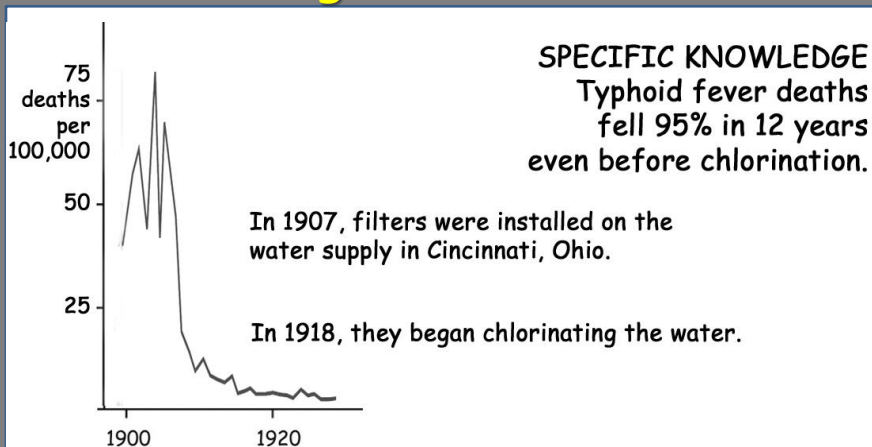


J. M. W. Turner
Norham Castle

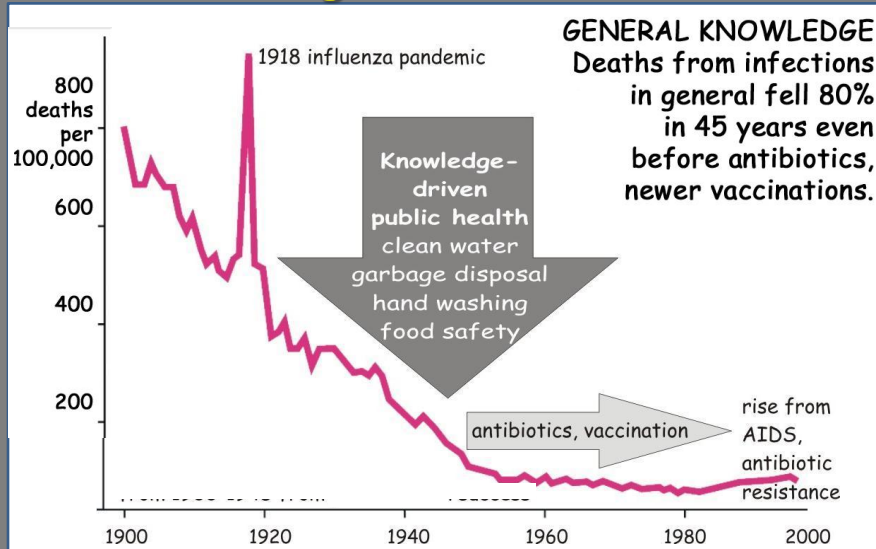
Thanks to science, we have good abilities to look ahead — and backpaddle furiously.



Infections used to be the leading cause of death.

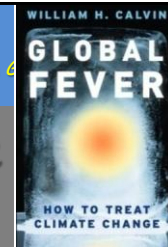


Infections used to be the leading cause of death.



The climate optimist

pp.274-5 in 4

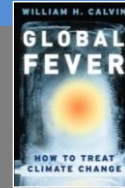


In the 1960s and 1970s, we

1. discovered the *genetic code*, *continental drift*, and *chaos theory*,
2. put *communication satellites* in geosynchronous orbits,
3. *went to the moon*,
4. *did heart transplants*,
5. *invented the Internet, personal computers, email and spreadsheets.*

The climate optimist

pp.274-5 in *Global Fever*



- Much can happen in only twenty years.
- With our current scientific momentum, the *Third Industrial Revolution* has likely started — but now it needs to be *fast and focused*.

69

The Great Use-it-or-lose-it Intelligence Test

The public interest requires doing today those things that men of intelligence and goodwill would wish, five or ten years hence, had been done.

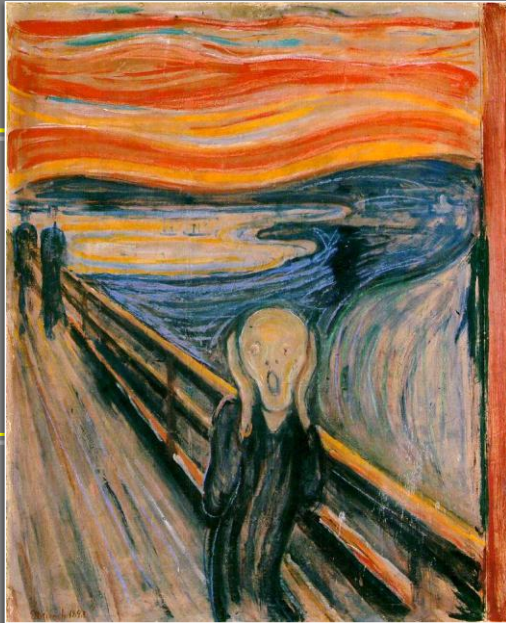
- Edmund Burke

70

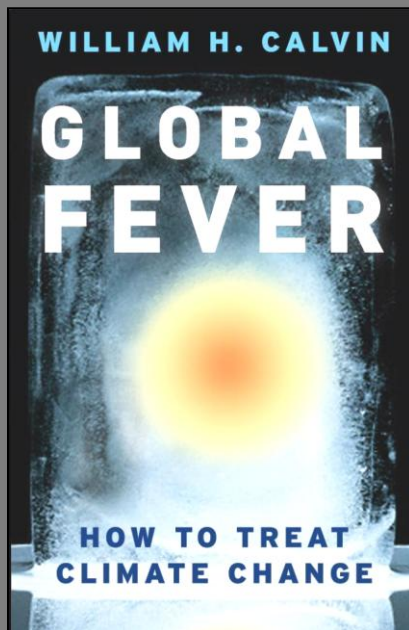
The End

My books and talks
may be found at:

WilliamCalvin.org



Edvard Munch, *The Scream*



Can read chapter
files at

Global-Fever.org