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Forget the *Means*.
Global Warming Widens
the Climate *Extremes*.

95% of world's mountain glaciers are shrinking. They will be gone by 2050.

Mount Baker, Washington State USA

Mount Rainier Ice Cave
in 1925 (gone today)

UW Library Collection

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Black & White Mtn.

Mountain glaciers gone by 2050

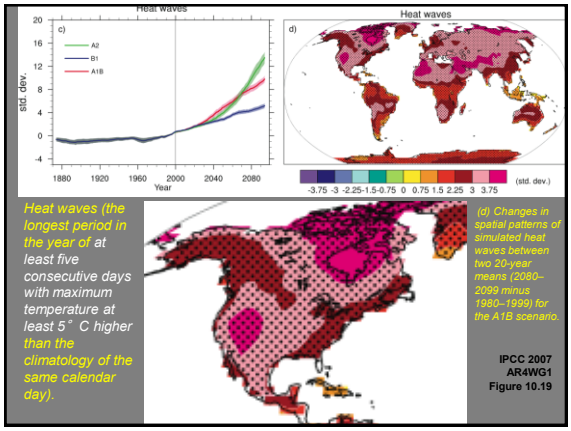
What everyone knows by now…

1. Slowly overheating
   1. due to greenhouse gases like CO
   2. mostly from burning coal and oil.

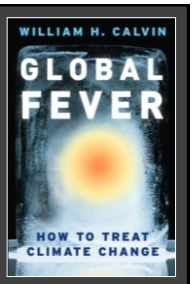
1. But it is the extreme events that do the damage.

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

Salvador Dalí *The Persistence of Memory.* 1931



- The Diagnosis:
  - *Global Fever*
  - ocean acidity buildup
  - and *Complications such as desertification, heavy weather, fires*
- The Treatments
  - Too Little, Too Late, Too Local
  - *Insufficiently Ambitious*



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What everyone knows by now…

1. Slowly overheating
   1. due to greenhouse gases like CO
   2. mostly from burning coal and oil
2. Promises to get much wors
   1. Someday.
3. Unless we reduce emission
   1. clean cars
   2. clean electricity
   3. more efficient use
   4. reformed agriculture and forest

1. But it is the extreme events that do the damage.
2. Tomorrow?
3. Totally inadequate except to speed up a real fix that *removes* CO_2

Climate Briefings

How hot is it?

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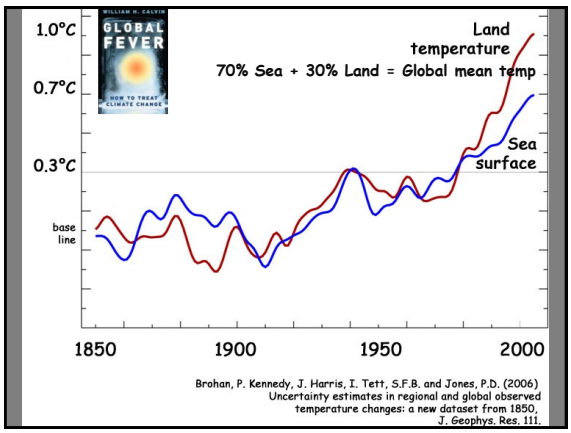
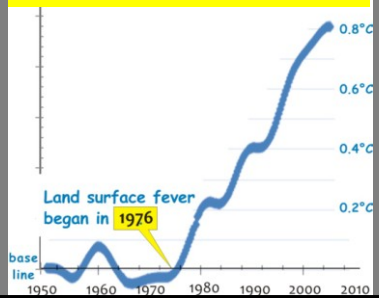
Global-Fever.org



Not just extreme events but abrupt climate shifts



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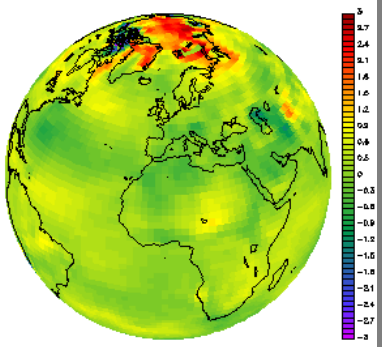
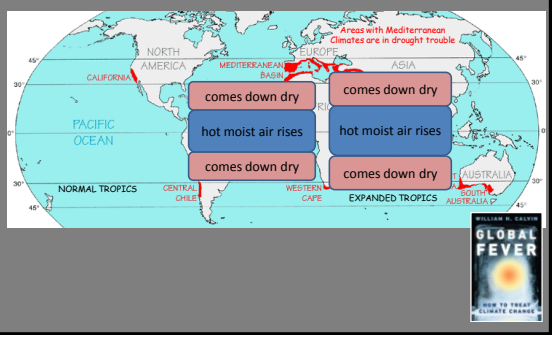
Arctic overheating from 1999 to 2008

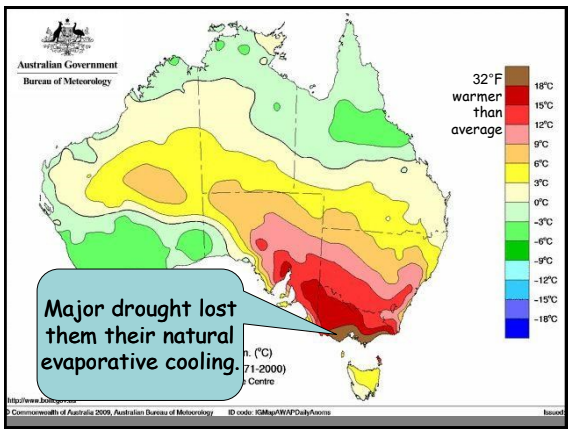


Permafrost researcher *Katey Walter* igniting methane trapped beneath the surface of a frozen pond.

23X as potent as CO_2

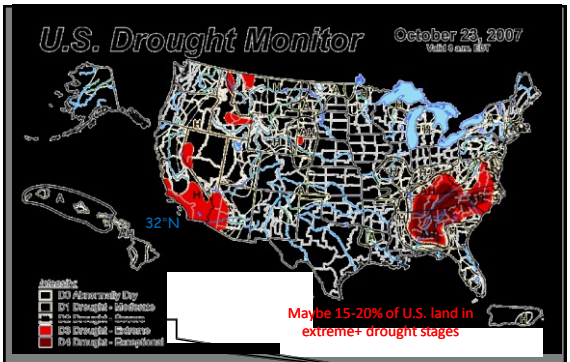
The expansion of the overheated tropics



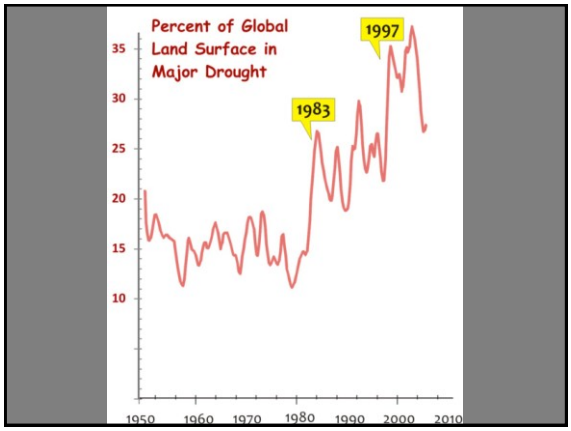


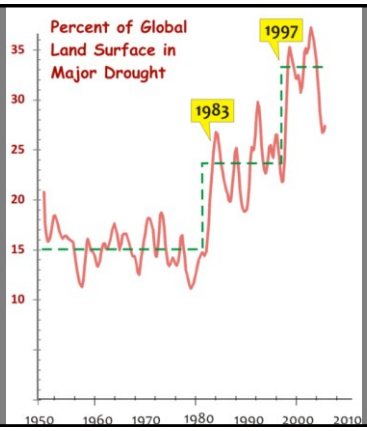
Drought

Dorothea Lange, Dust Bowl 1930s



The two most severe drought stages are plotted next, averaged over all of the global land surface except where ice sheets live.





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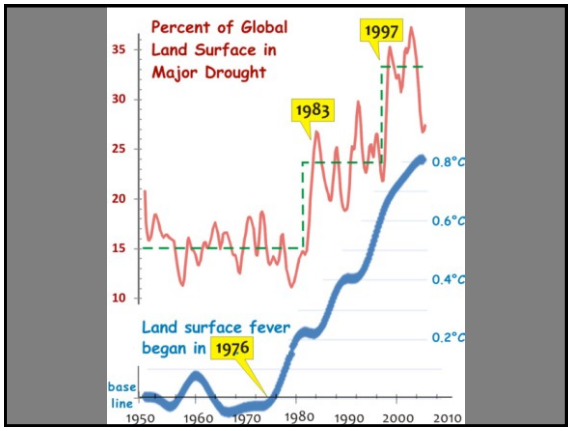

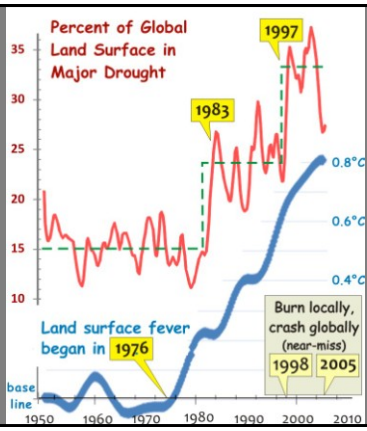

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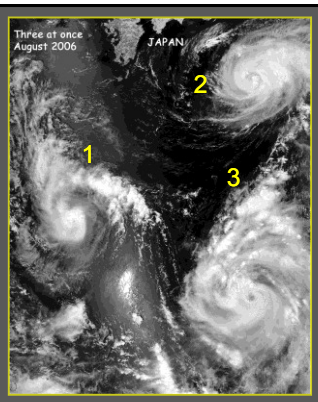
High Winds



Cyclone Nargis hit Burma in May 2008 with winds of 200 to 250 km/h (120 to 150 mph).

Authorities have reported over 22,500 dead, with a further 41,000 people still missing

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Britain's changing coastline
Daily-updated news
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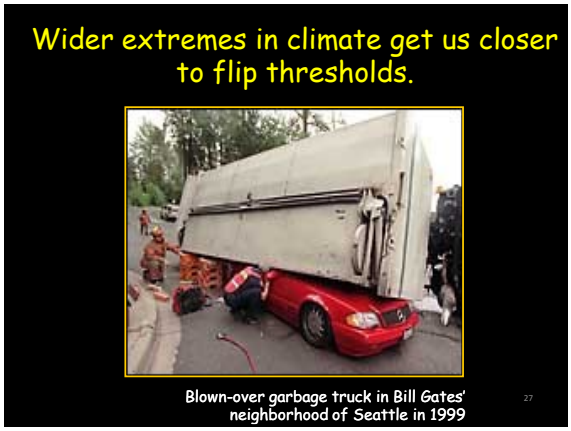
Floodwaters from Hurricane Ike were reportedly as high as eight feet in some areas, causing widespread damage along the coast of Texas.
A single home is left standing among debris from Hurricane Ike September 14, 2008 in Gilchrist, Texas.
David J. Phillip
Boston.com


Wider extremes in climate get us closer to flip thresholds.
Blown-over garbage truck in Bill Gates' neighborhood of Seattle in 1999
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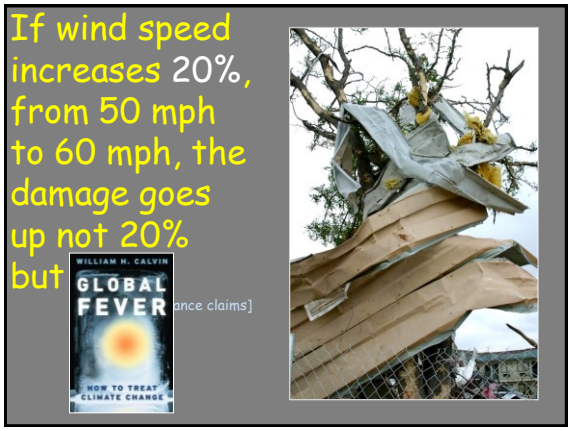
If wind speed increases 20%, from 50 mph to 60 mph, the damage goes up not 20% but
WILLIAM H. CALVIN
GLOBAL FEVER
HOW TO TREAT CLIMATE CHANGE
ance claims]


Wildfires
Science
AAAS
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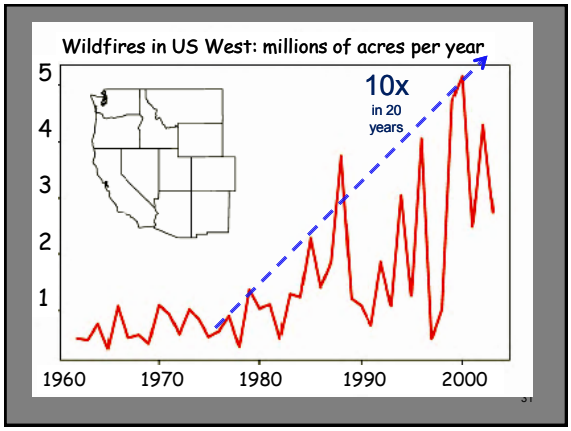
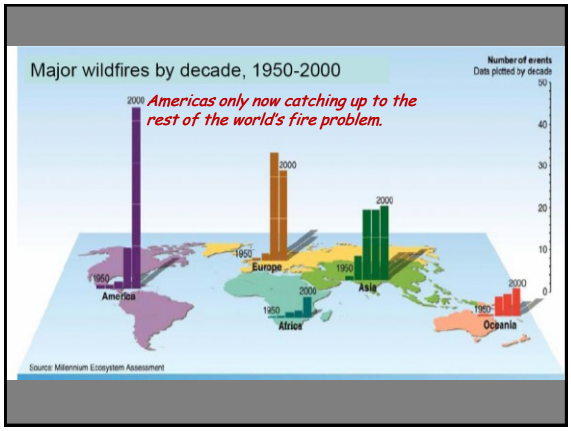
Fire managers predict bad year for blazes
Sat May 10, 2008 2:37pm EDT
David S. Roberts, San Diego County 2007



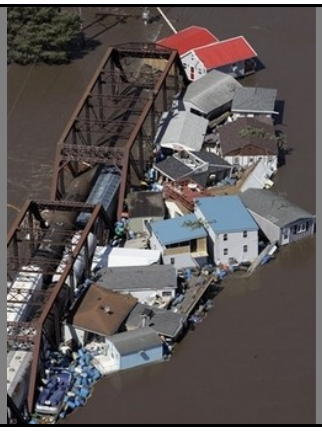


Heavy Weather

The heavens opened
(US government photo)

Logged hillside collapse

Chehalis WA flood 2007



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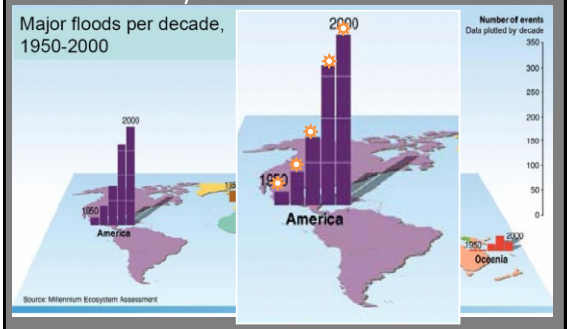
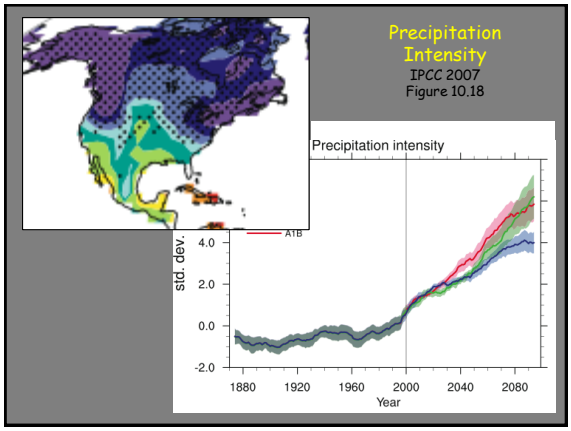
So it is a global climate change,
not merely local trouble that moves around.

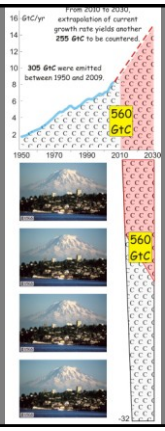


Floods have been increasing for 50 years.



The mess we're in

7. Compensating for current annual emissions, and delayed effects of past ones, requires at least 10 Gt of carbon to be sequestered each year.
8. Drawing down [CO_2] within several decades requires an additional 22 Gt C each year.
9. Sequestering crop residues might total 0.2 Gt C, and global sewage is similar—which suggests growing biomass on land will prove far too small for 32 GtC/yr.



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The mess we're in

10. Only algae has the needed growing space, the ocean surface.
11. The requirement is growing and then sequestering enough algae each year.
12. Emission reductions will allow us to reduce both big threats more quickly.
    a. But without the means to sequester such massive amounts of circulating carbon, *emission reductions merely slow the disease.*

Our climate fix must be big and quick.

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

The End

My books and talks may be found at:

WilliamCalvin.org