EXTREME EVENTS AND CLIMATE CHANGE

BZE FORUM • 7 February 2011 • David Spratt

EXTREME EVENTS AND CLIMATE CHANGE

"All across the world, in every kind of environment and region known to man, increasingly dangerous weather patterns and devastating storms are abruptly putting an end to the long-running debate over whether or not climate change is real. Not only is it real, it's here, and its effects are giving rise to a frighteningly new global phenomenon: the man-made natural disaster."

Barack Obama, 3 April 2006

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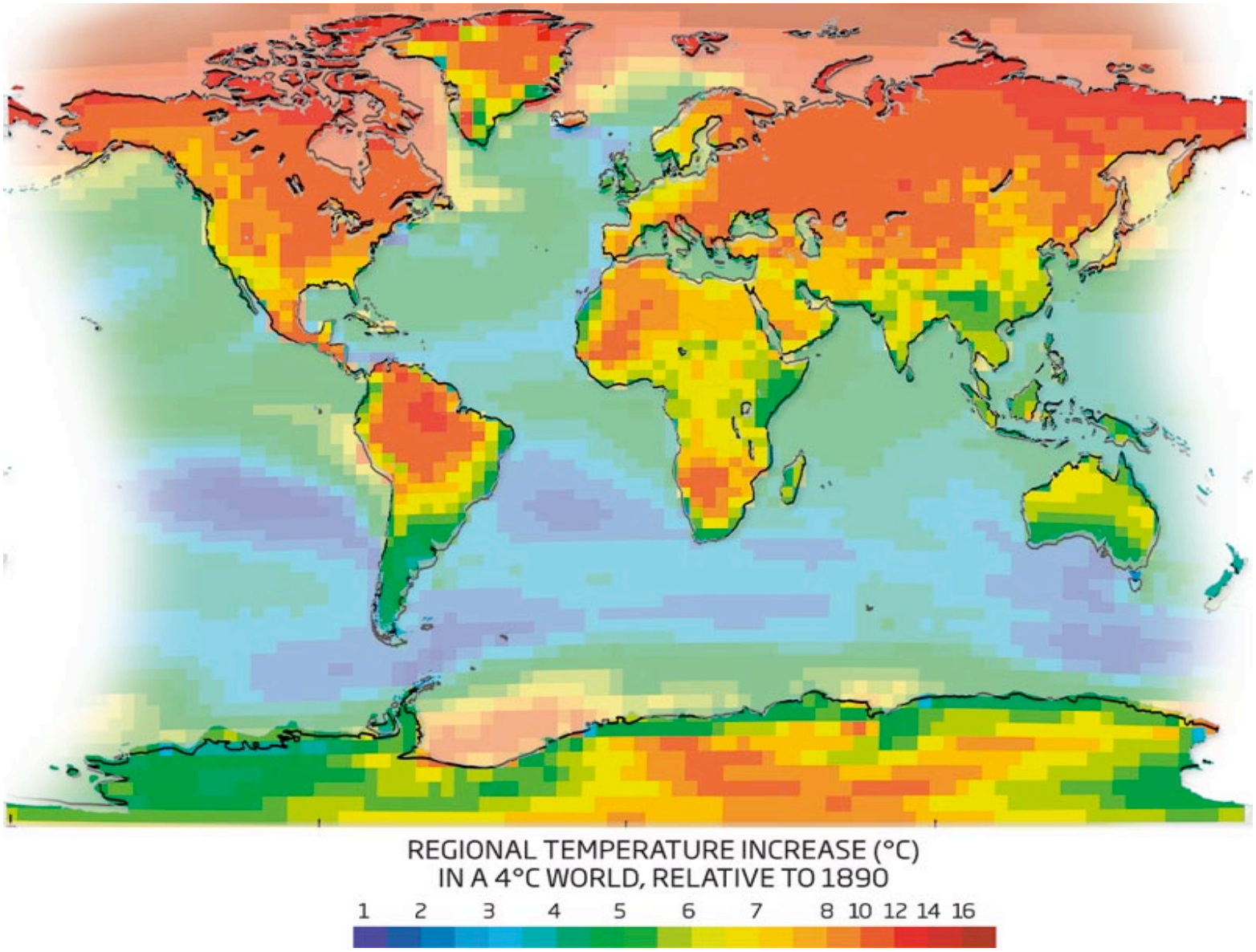

The world at +4 degrees Celsius – temperature

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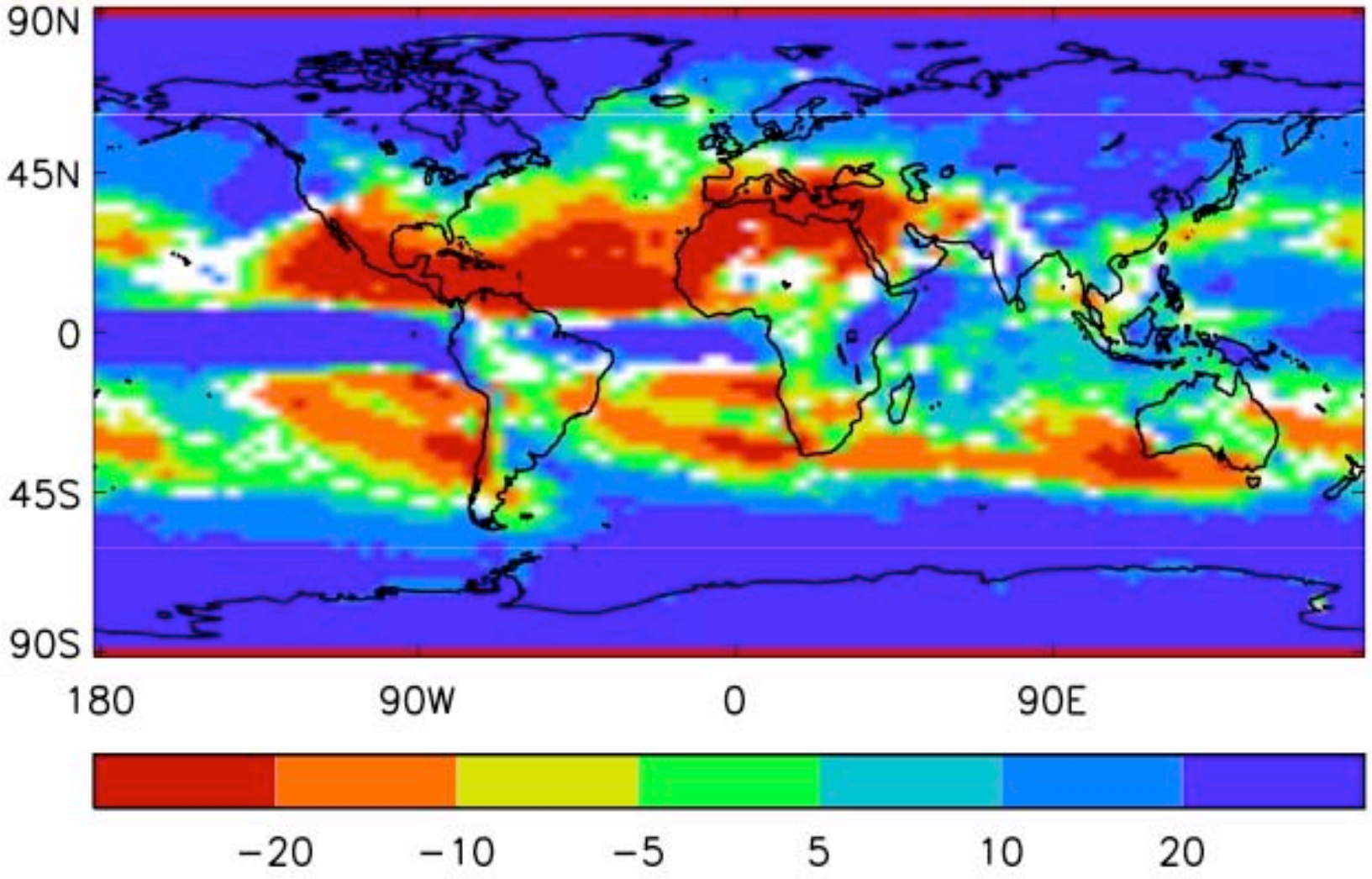

The world at +4 degrees Celsius – precipitation

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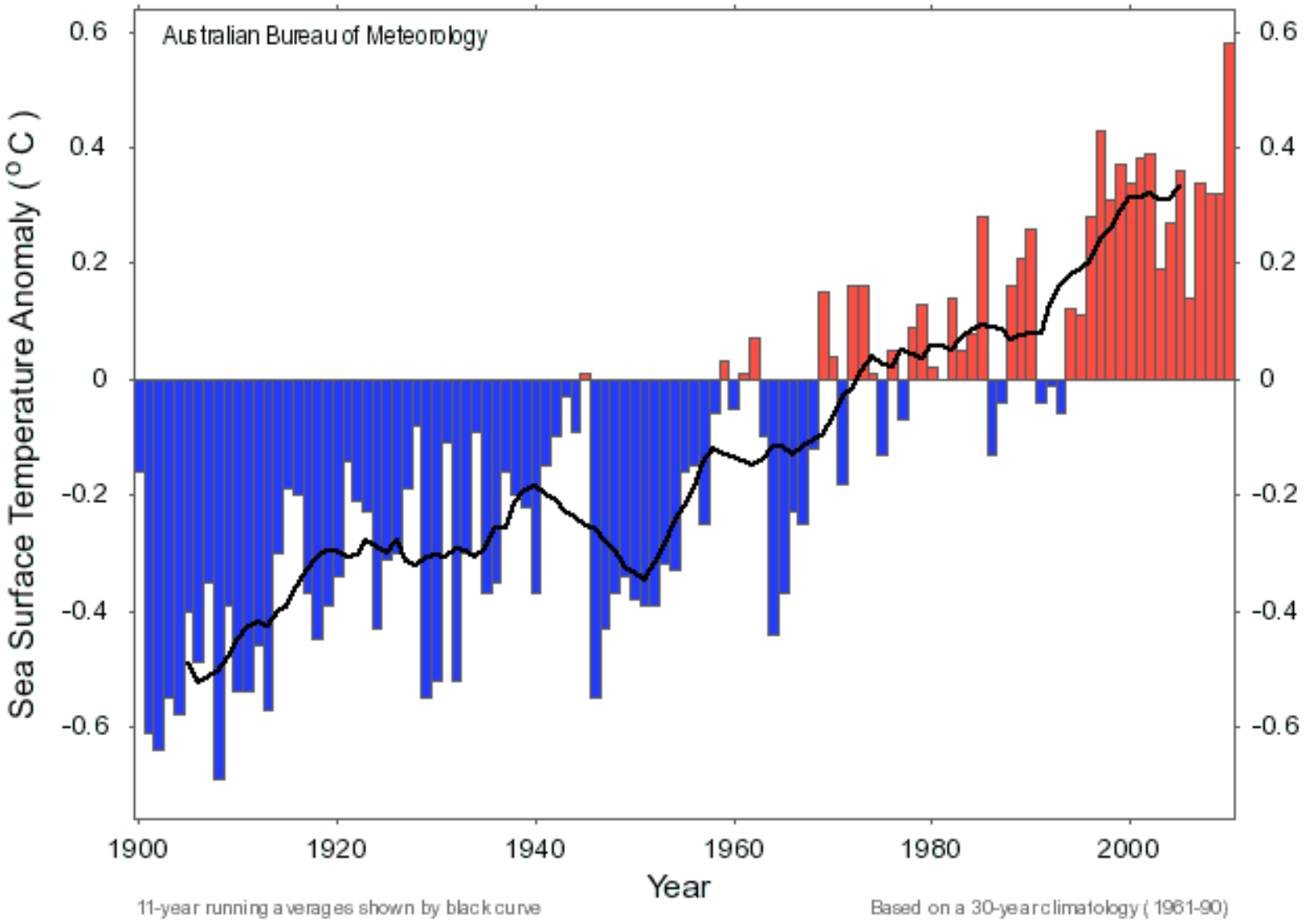

December sea surface temperature anomaly – Australian region

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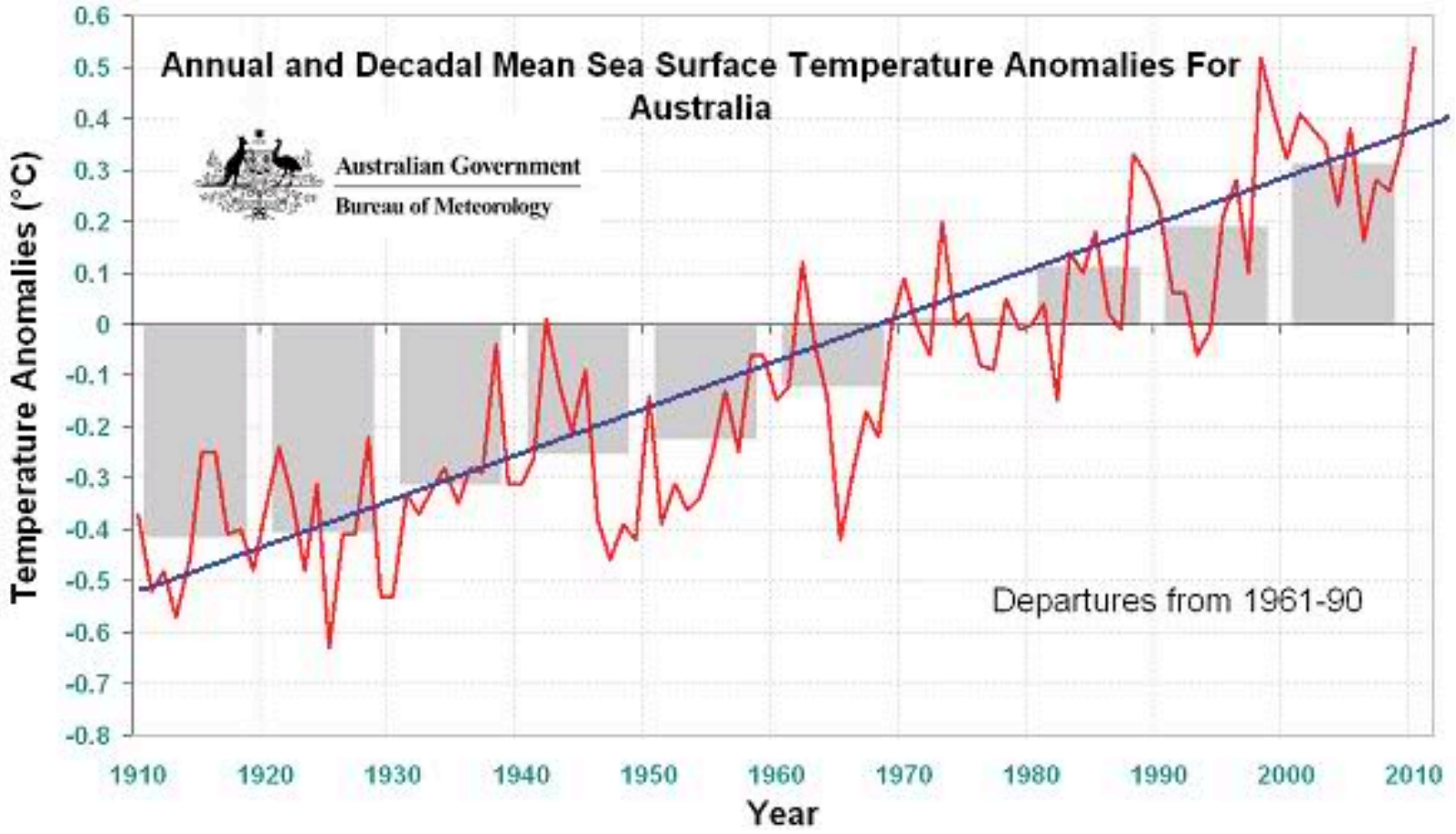

Sea surface temperature – Australian 1910-2010

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"If the question were posed as 'would these events have occurred if atmospheric carbon dioxide had remained at its pre-industrial level of 280 ppm?', an appropriate answer in that case is 'almost certainly not'. That answer, to the public, translates as 'yes', i.e., humans probably bear a responsibility for the extreme event."

James Hansen, NASA climate science chief

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"It's not the right question to ask if this storm or that storm is due to global warming, or is it natural variability. Nowadays, there's always an element of both.... there is a systematic influence on all of these weather events now-a-days because of the fact that there is this extra water vapor lurking around in the atmosphere than there used to be say 30 years ago."
Dr Kevin Trenberth, head of Climate Analysis, NCAR

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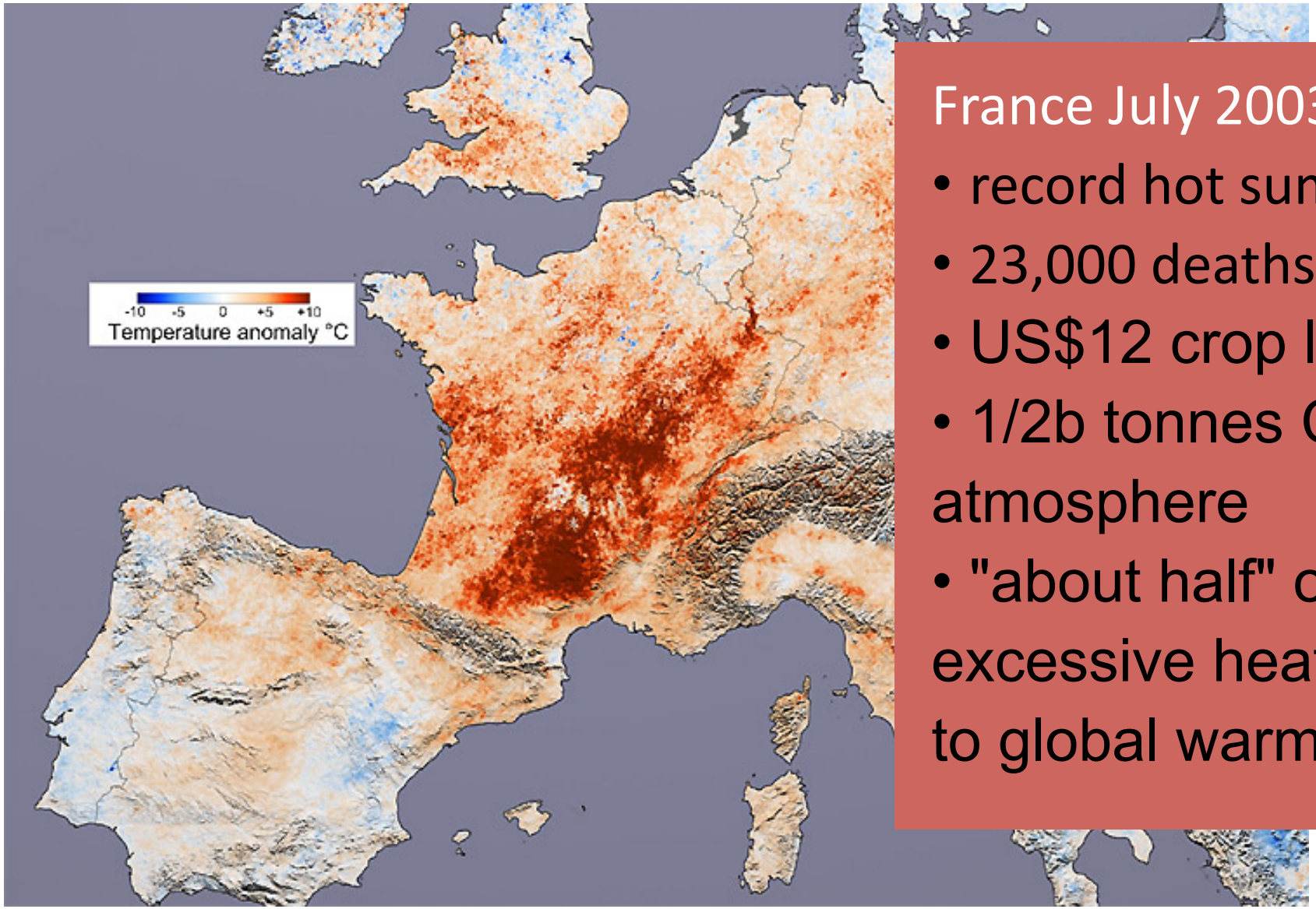

France July 2003

- record hot summer
- 23,000 deaths
- US$12 crop loss
- 1/2b tonnes C into atmosphere
- "about half" of the excessive heat due to global warming

French July 2003 heatwave compared to July 2001

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"What you can say is that there is very strong evidence that global warming exacerbated the fire situation."
Dr Neville Nicols, Monash Uni.

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The “most severe, most catastrophic storm that has ever hit our coast”.

Qld Premier
Anna Bligh

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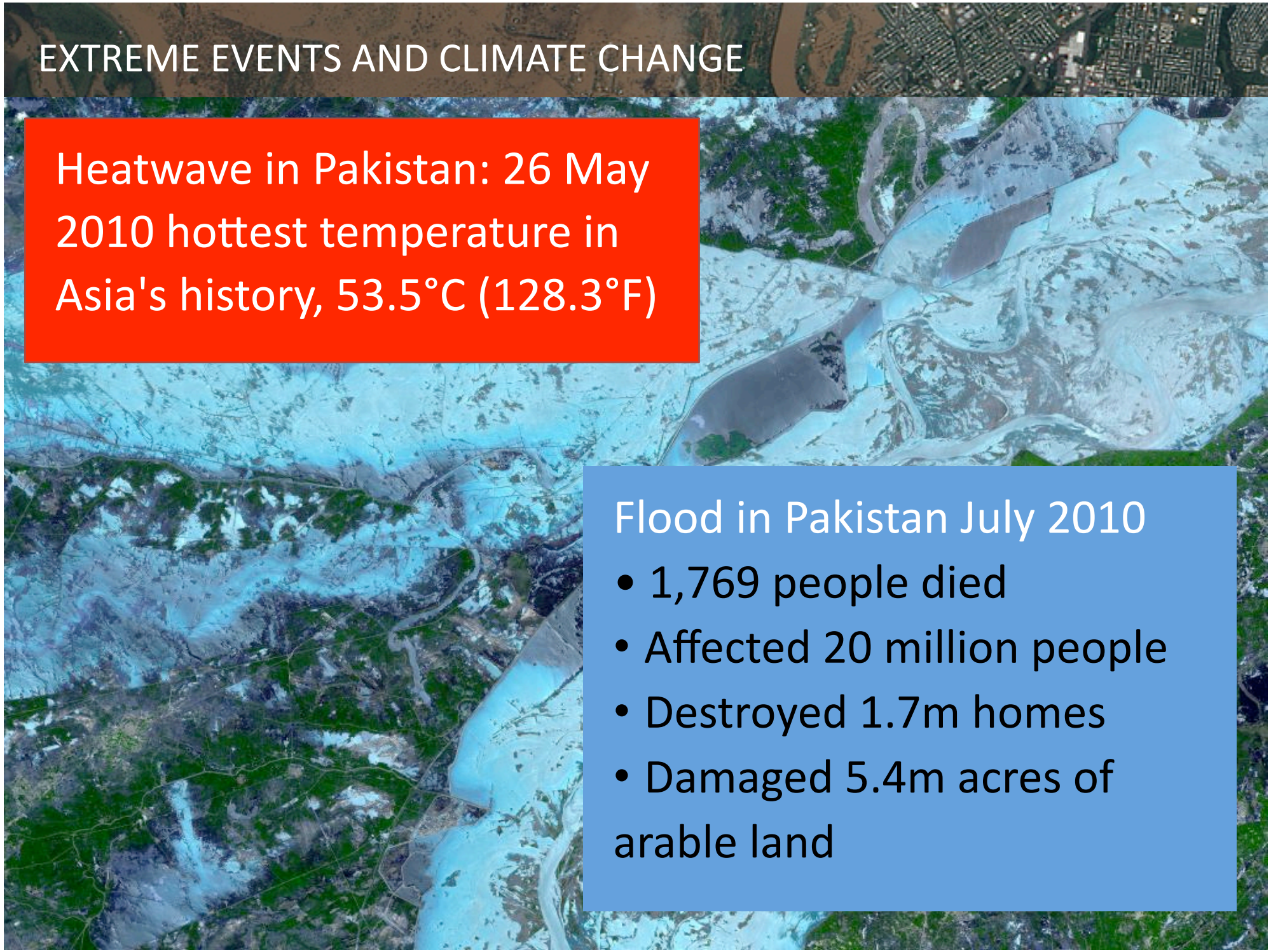

Heatwave in Pakistan: 26 May 2010 hottest temperature in Asia's history, 53.5°C (128.3°F)

Flood in Pakistan July 2010

- 1,769 people died
- Affected 20 million people
- Destroyed 1.7m homes
- Damaged 5.4m acres of arable land

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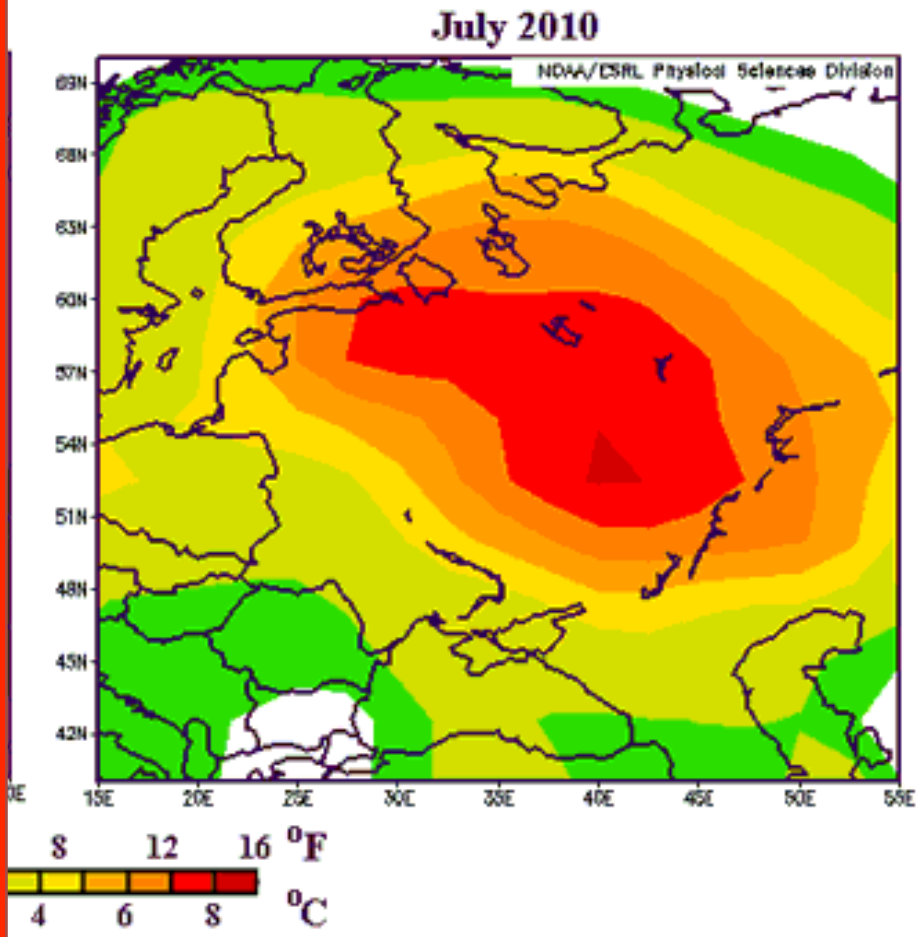
- July average temp in Moscow +2C previous record
- August: 550 fires out of control across Russia's steppes, bogs and forests
- Munich Re: heatwave and + fires + air pollution killed at least 56,000 people

ussian heatwave



erature from average:
3 and Russia July 2010

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"The rapid onset of La Nina meant the Asian monsoon was enhanced and the over 1 degree Celsius anomalies in sea surface temperatures led to the flooding in India and China in July and Pakistan in August. A portion, about 0.5C, of the ocean temperatures around northern Australia, which are more than 1.5C above pre-1970 levels, could be attributed to global warming."

Dr Kevin Trenberth, head of Climate Analysis, NCAR

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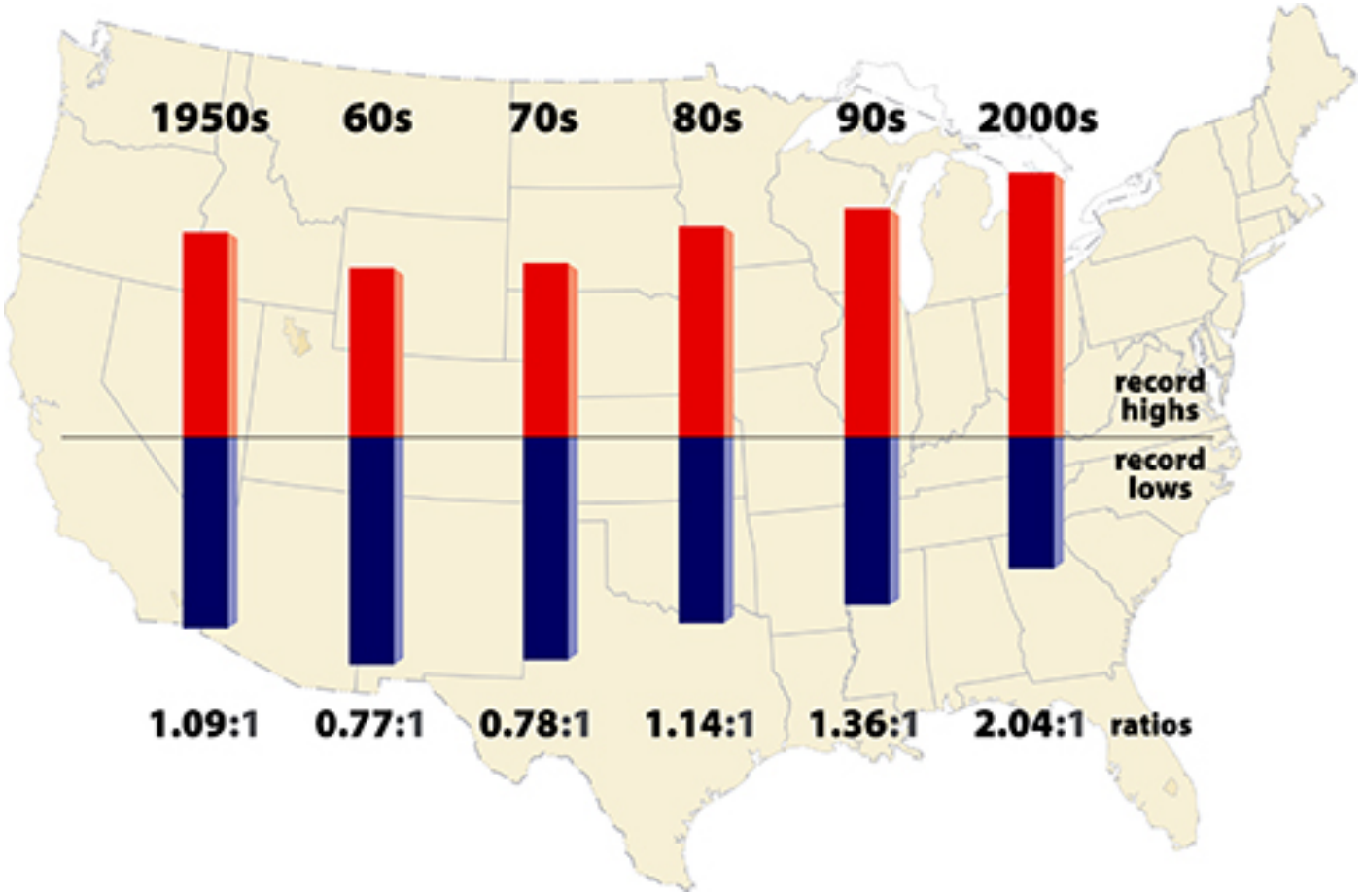

Record high and low temperatures over six decades

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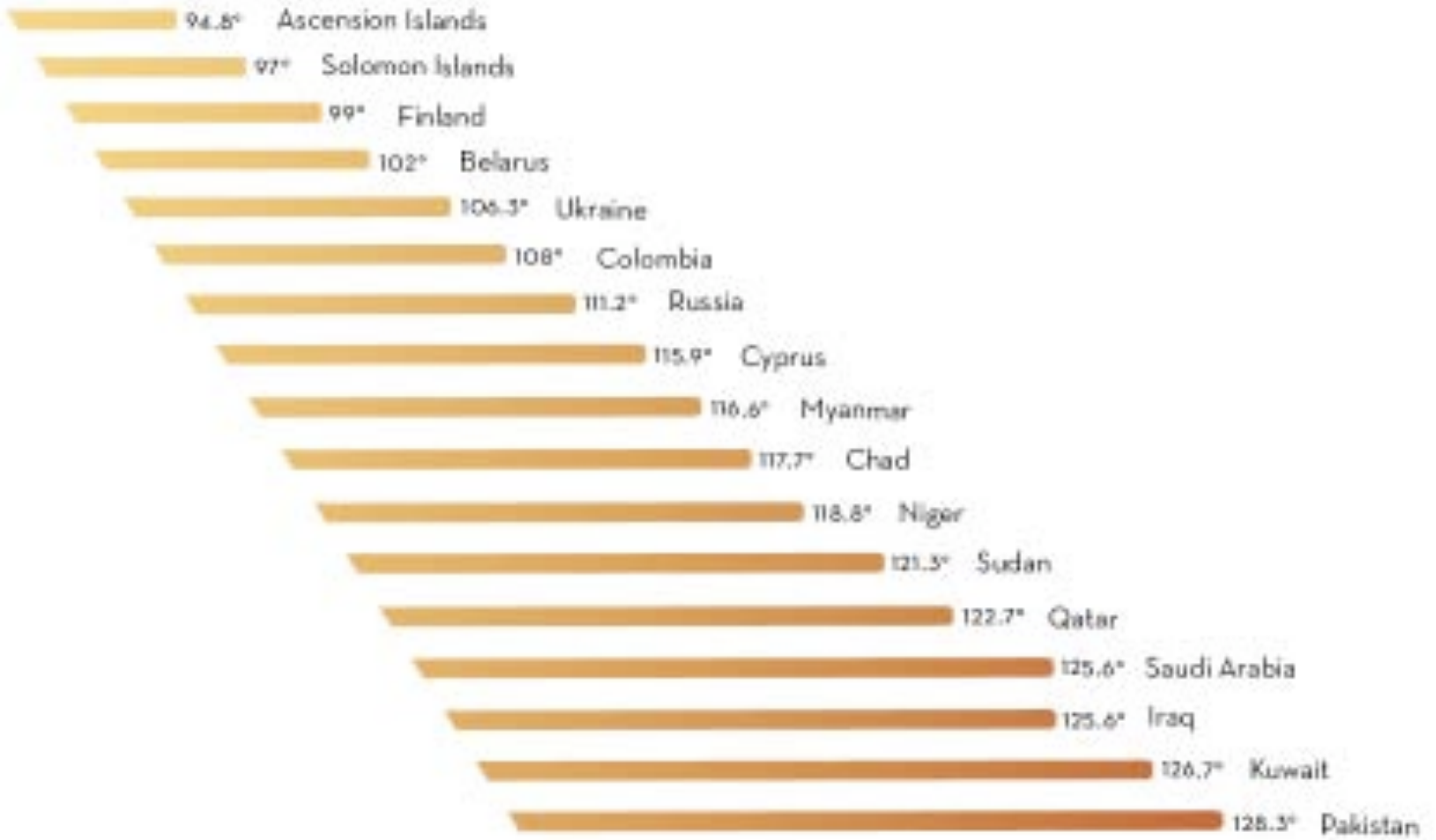

Countries that set new record highs in 2010

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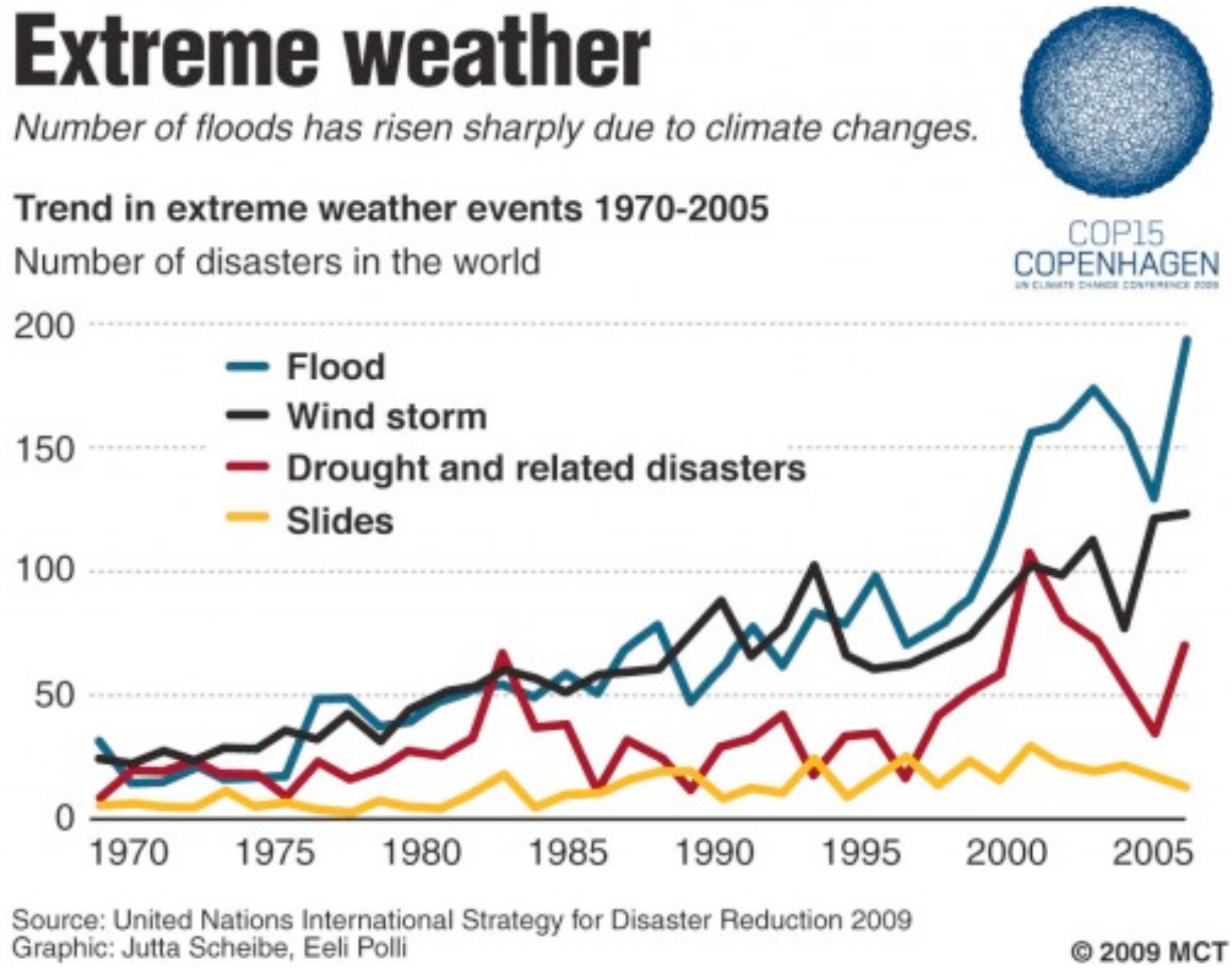

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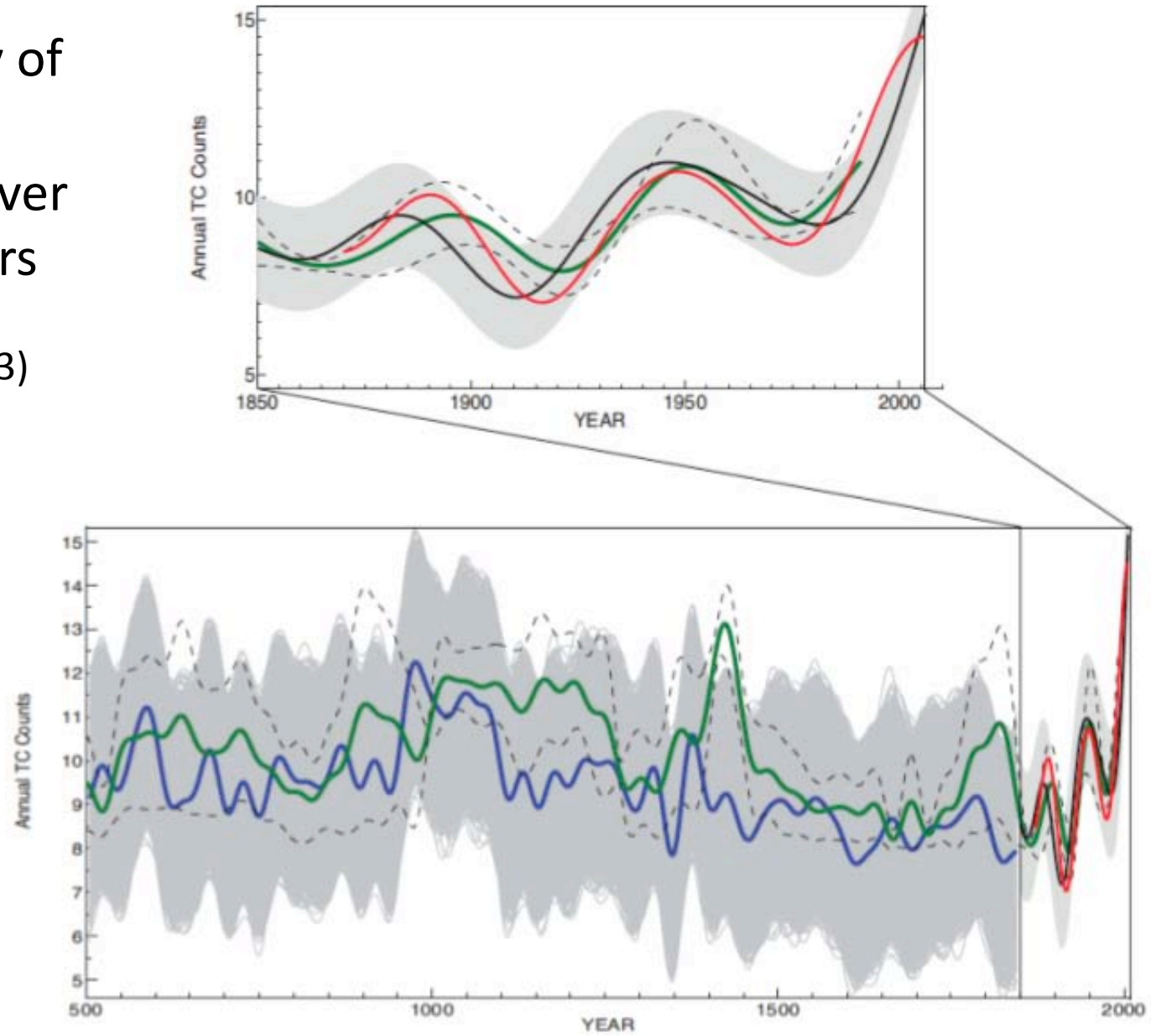
Frequency of Atlantic cyclones over 1500 years

(Nature 460:880-883)



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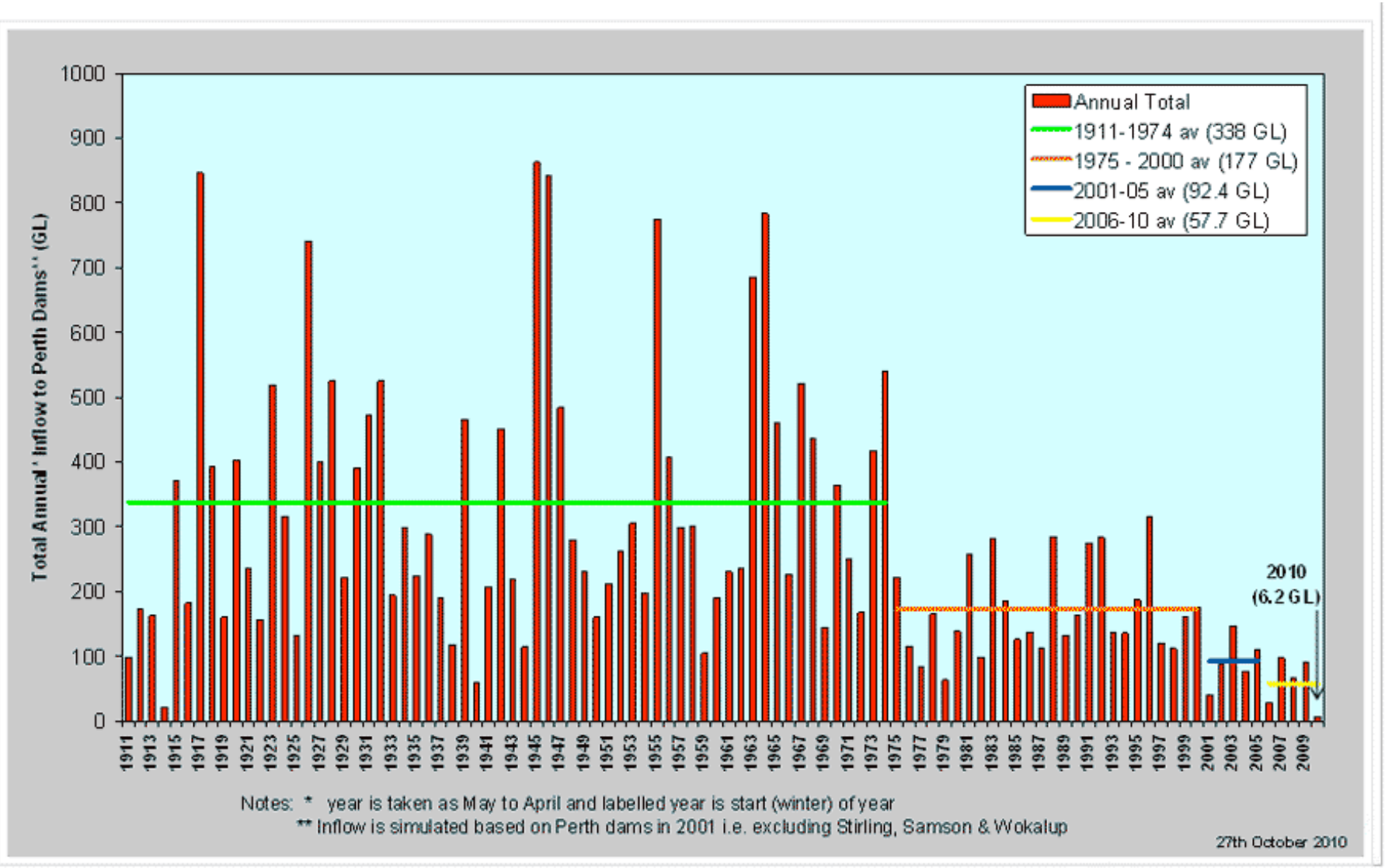

Inflow to dams WA

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"We respond well to an emergency, but global warming is an emergency too."
– "The Age" editorial, 16 January 2011

Now…	Emergency…
Spin, denial, politics as usual	Brutal honesty Urgency perceived
Just another issue	Highest priority, rapid response
Budgetary "restraint"	Allocate resources to solve problem
Partisan politics	Transformative leadership
Slow rate of change	Rapid transition and scaling up
Market-first solutions	Plan, innovate, allocate
Political tradeoffs, culture of compromise	Critical targets and goals not compromised

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EACH DAY HUMBLE SUPPLIES ENOUGH *ENERGY* TO MELT 7 MILLION TONS OF GLACIER!

This giant glacier has remained unmelted for centuries. Yet, the petroleum energy Humble supplies—if converted into heat—could melt it at the rate of 80 tons each second! To meet the nation's growing needs for energy, Humble has applied science to nature's resources to become America's Leading Energy Company. Working wonders with oil through research, Humble provides energy in many forms—to help heat our homes, power our transportation, and to furnish industry with a great variety of versatile chemicals. Stop at a Humble station for new Enco Extra gasoline, and see why the "Happy Motoring" Sign is the World's First Choice!

HUMBLE
OIL & REFINING COMPANY
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