

An update on the IPCC report

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- * Background
- * Timetable
- * Highlights



Responding to climate change:
Sustaining health and wellbeing
PHSS, University of Otago, Wellington
February 2014

Working Group 2, AR5, Bled July 2013

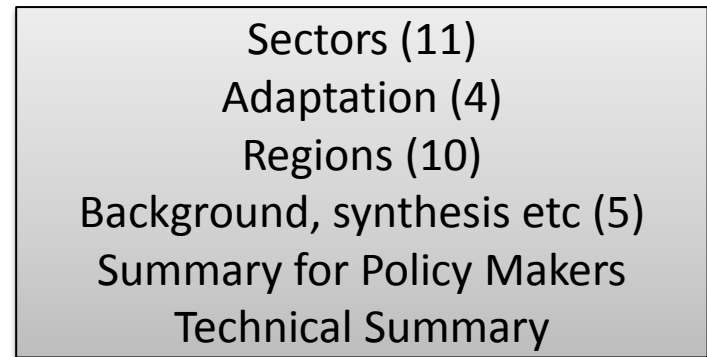
- Who are the members of the IPCC?
- What is the purpose of the IPCC?
- Who writes its reports?
- How do IPCC reports differ from the usual scientific publications?

Outputs from the 5th Assessment Report

WG1 – Climate Change 2013, The Physical Science Basis

<http://www.ipcc.ch/report/ar5/wg1/#.Uut51WSSw5g>

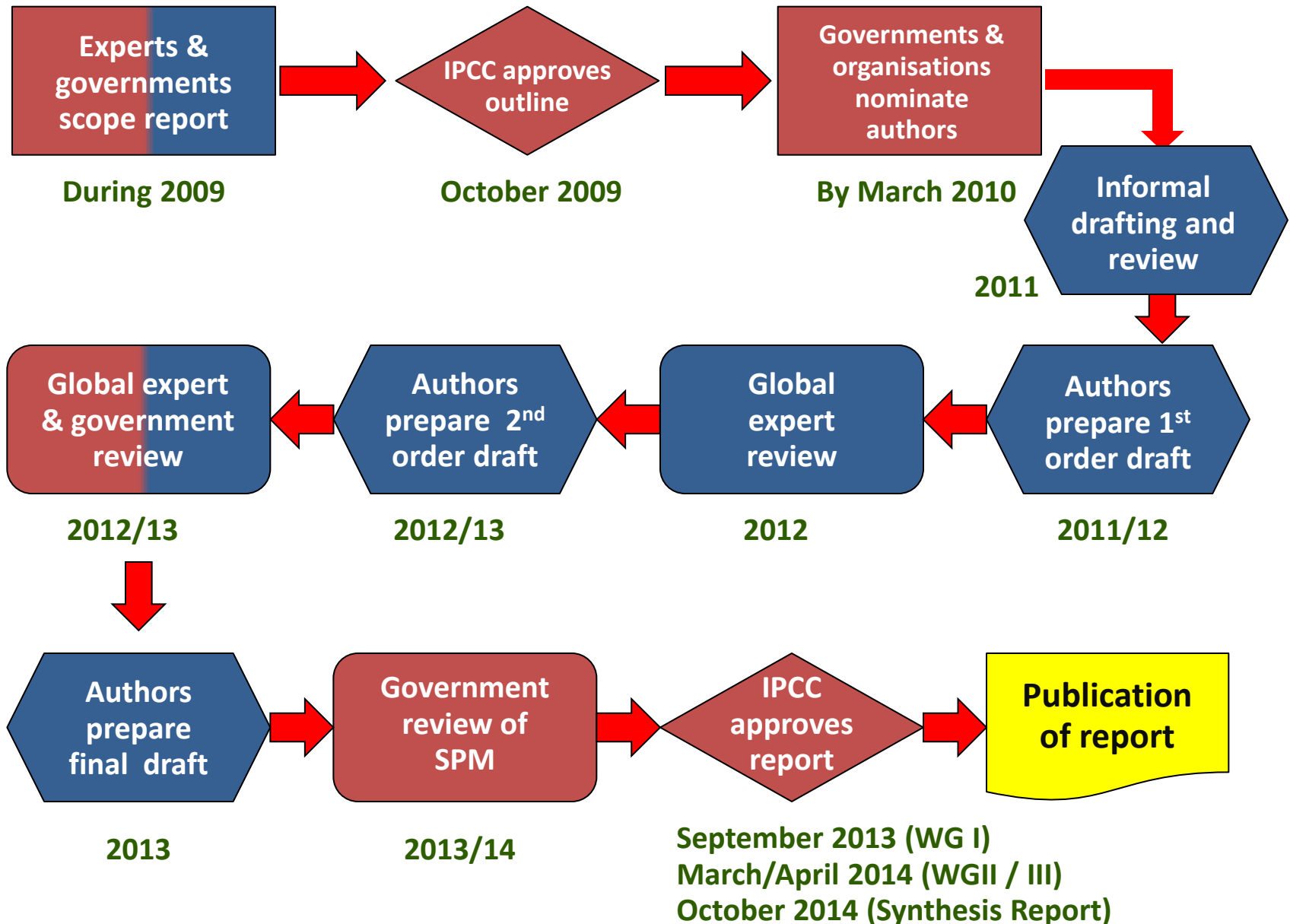
WG2 – Impacts, adaptation and vulnerability



WG3 – Mitigation of climate change

Climate Change 2014: Synthesis Report

TIMELINE 5TH ASSESSMENT REPORT (AR5)

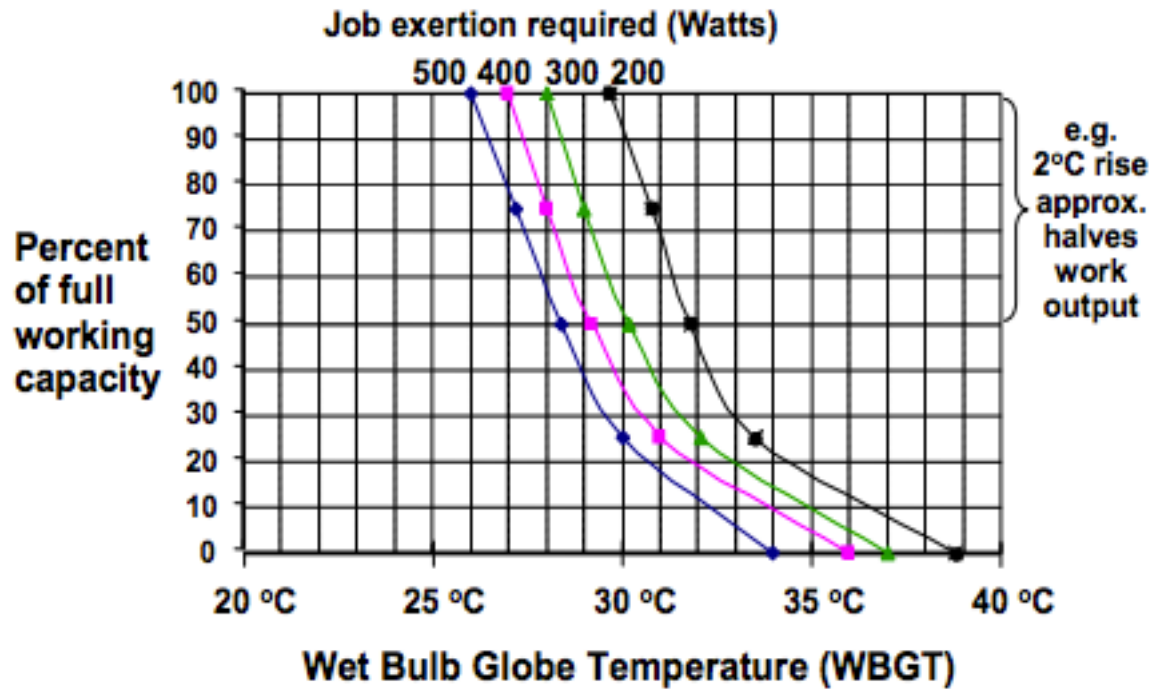


What is new in AR5?

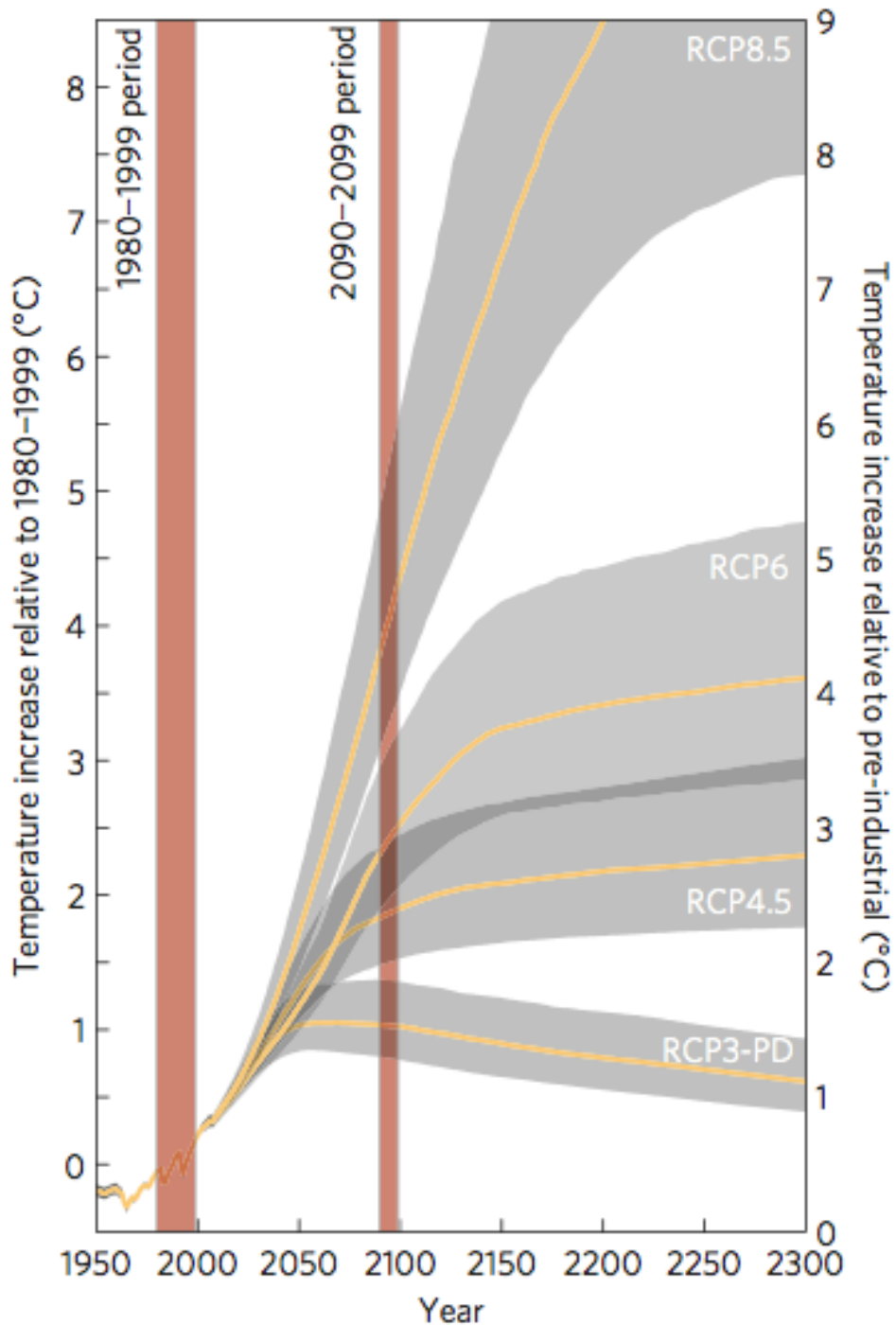
- Heat receives more attention
- High end scenarios (4 degrees plus) explored
- Balance of gains and losses clarified
- Speed of change - important in own right
- Attribution advances
- Co-benefits included



Australian Open Tennis Championship, Melbourne, January 2014



ISO Standard for Heat Stress in the Workplace (1989)



High end warming – assumes no restriction on use of fossil fuels, climate does not stabilize below about +12 degrees warming

Temperature projections for four concentration pathways, median (yellow) and uncertainty bound (gray), 2010 – 2300.

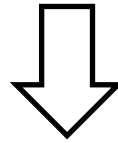
“The dose makes the poison”

Not exactly. It is
the dose RATE
that makes
exposures
(physical and
chemical) more
or less
hazardous

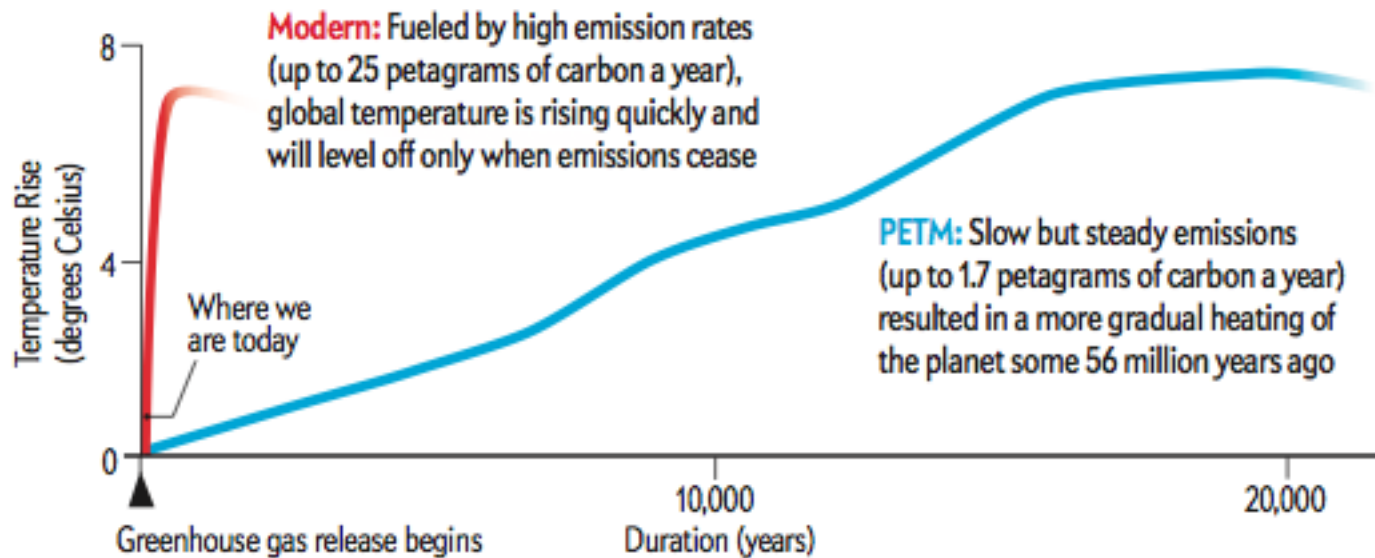
Paracelsus, 1493-1541



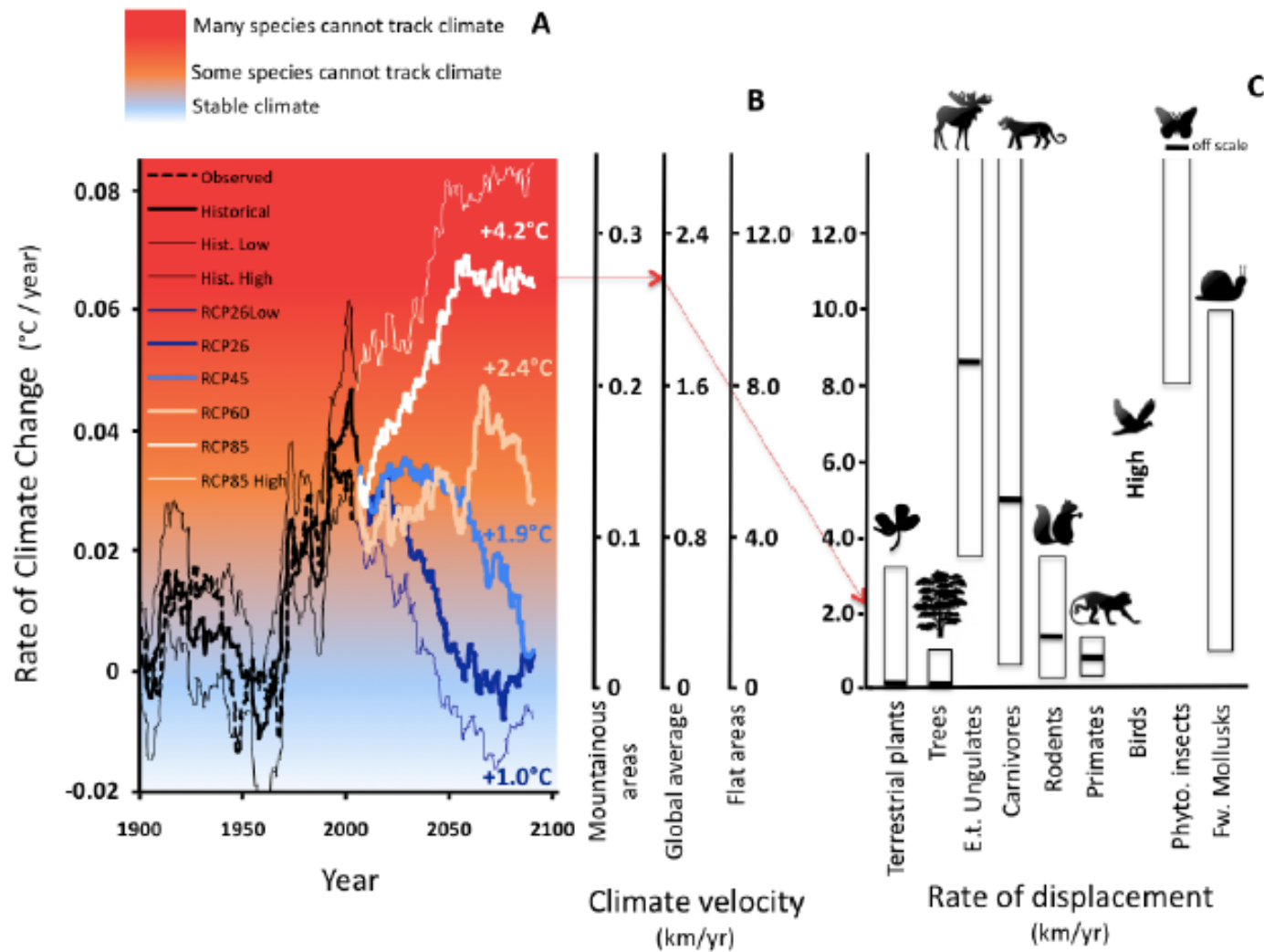
Rate of change over the next 100 years a hundred times greater than experienced previously (RCP 8.5). Even the RCP2.6 scenario warms ten times faster than the PETM.




Global temperature is rising much more quickly today than it did during the PETM



Palaeo-Eocene Thermal Maximum:
caused by volcanoes, methane
releases, peat fires



Introducing the idea of climate velocity – a critical test of the limits of adaptation to global heating.
Summary for Policy Makers Fig 3 (SOD)



Rapid change compromises adaptation
Black Saturday fires, Victoria 2009

McArthur Forest Fire Danger Index exceeded 100 for the first time.
Failure of Civil Defence
172 deaths

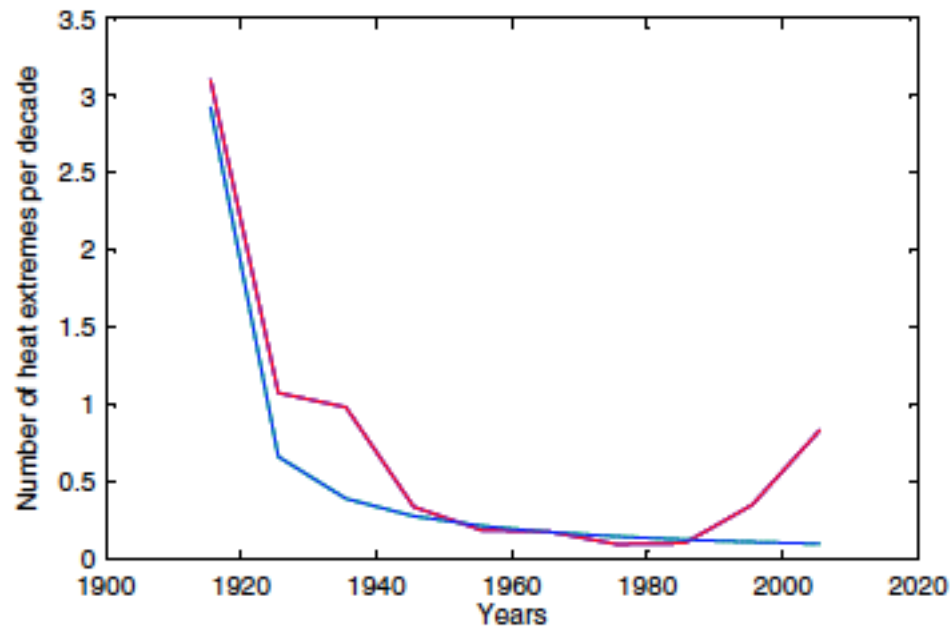
Detection of change is the process of demonstrating that climate or a system affected by climate has changed in some defined statistical sense

Seasonal distribution of mortality has changed

Attribution is the process of evaluating the relative contributions of causal agents

The seasonal balance of deaths changed as a result of climate change

A theoretical approach to quantifying the effect of long-term climate trends on the expected number of extreme events



Five times more extreme heat events in Moscow in late 2000s than expected under stationary climate

Fig. 4. Expected number of unprecedented July heat extremes in Moscow for the past 10 decades. Red is the expectation based on Monte Carlo simulations using the observed climate trend shown in Fig. 1E. Blue is the number expected in a stationary climate ($1/n$ law). Warming in the 1920s and 1930s and again in the past two decades increases the expectation of extremes during those decades.

Russia 2010:

1 month heat wave with fires

Approx 11,000 excess deaths

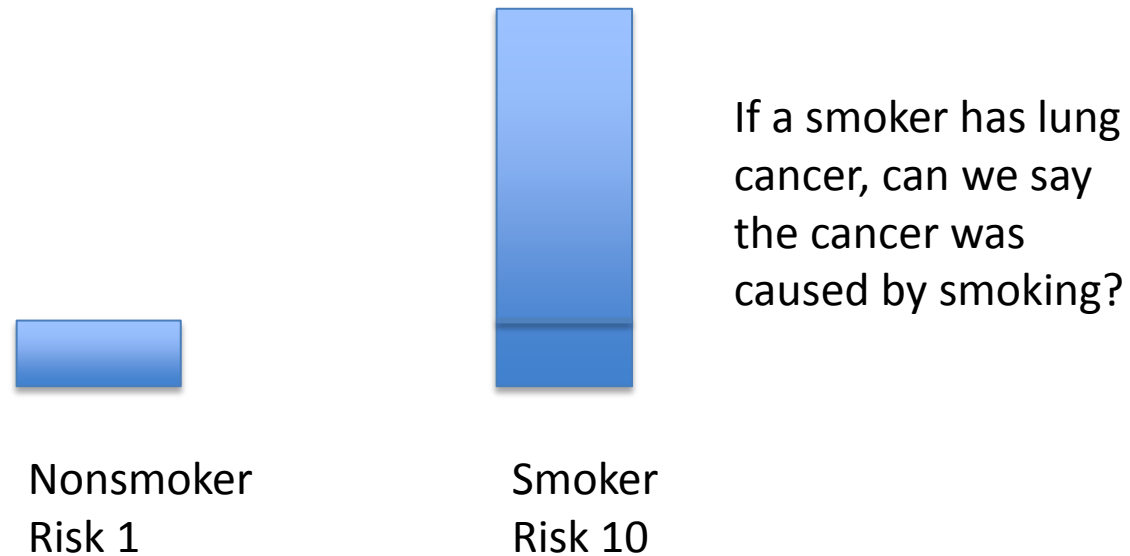
Question: If the risk of such an event is raised 5-fold under climate change, what is the probability that this particular heat wave was due to climate change?

Answer:
80%



Smoking and lung cancer

The risk of lung cancer is raised 10-fold if smoking is present



If a person has lung cancer, and smokes, what is the chance that the cancer was caused by smoking?

90%

Attribution by probabilities - We can't tell whether a particular individual developed lung cancer due to smoking, but it is highly likely (90%) that a lung cancer death among a smoker is caused by cigarettes

Russia 2010:

1 month heat wave and fires
Approx 11,000 excess deaths

Question: If the risk of such an event is raised 5-fold under climate change, what is the probability that this particular heat wave was due to climate change?

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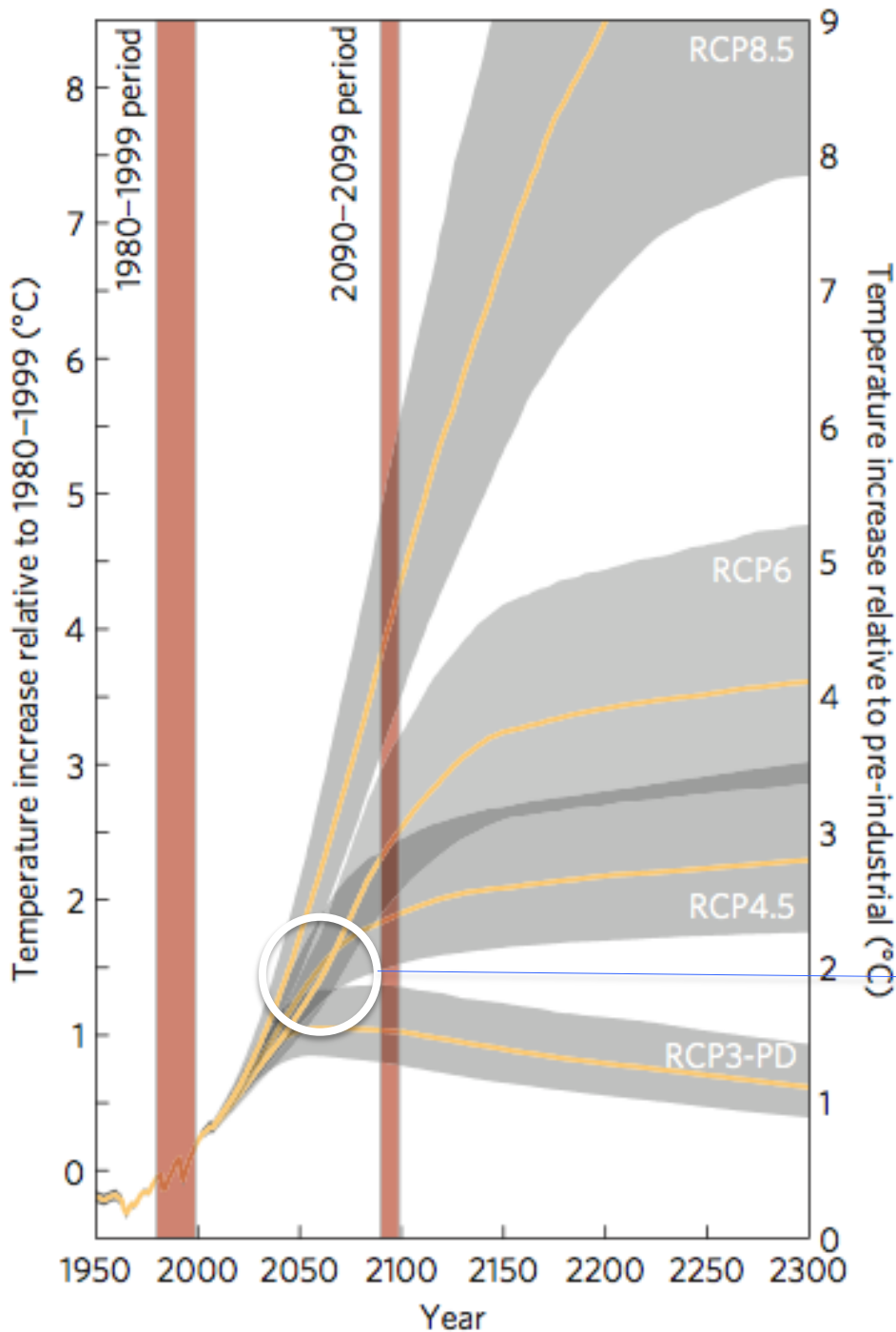
Attribution by probabilities: it is more likely than not that the Moscow heat wave and fires (and the deaths that followed) were caused by climate change



Co-benefits

The positive effects that a policy or measure aimed at one objective might have on other objectives, irrespective of the net effect on overall social welfare.

Examples include benefits in other sectors, such as health, urban development, transport, and agriculture, of climate mitigation and adaption efforts. Another term used is “ancillary benefits”

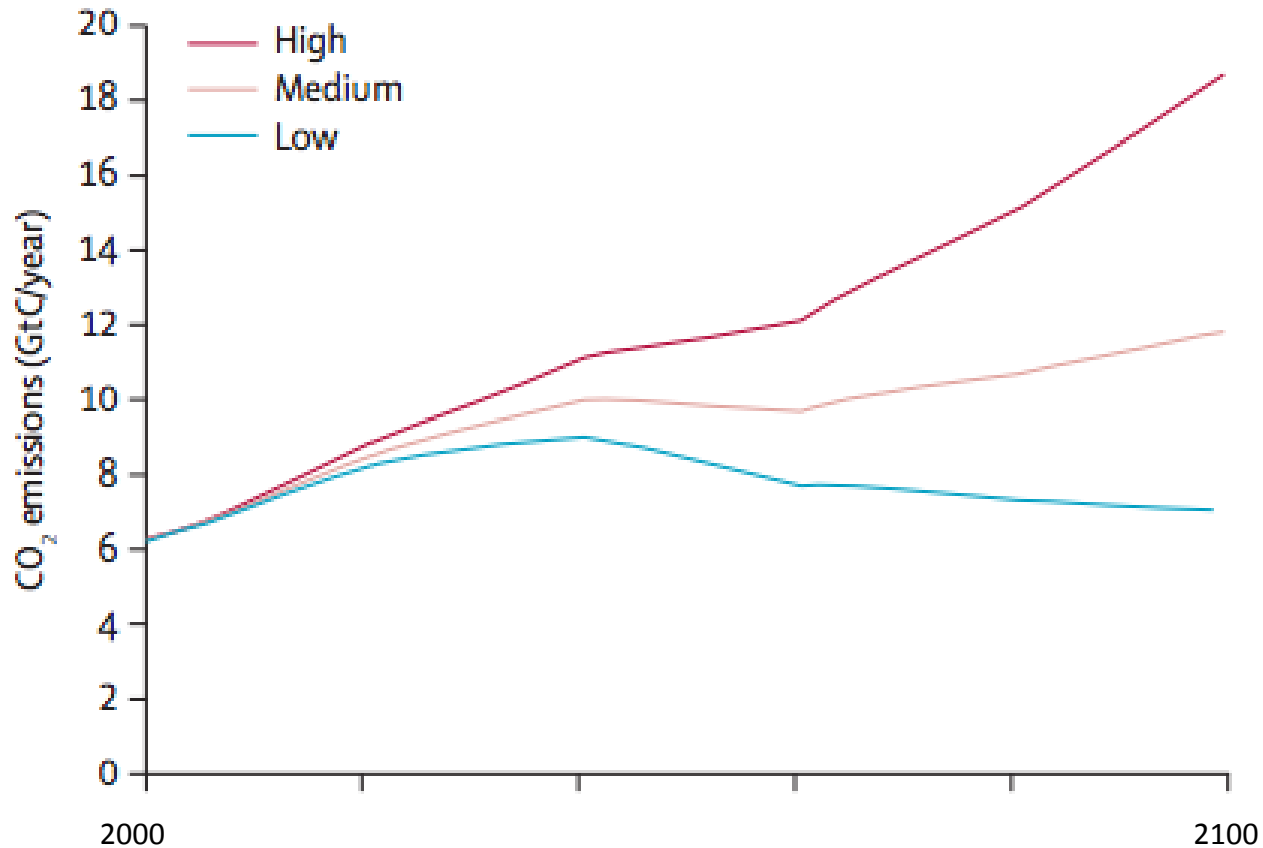


Temperature projections for four concentration pathways, median (yellow) and uncertainty bound (gray), 2010 – 2300.

Political appeal of co-benefits: no discernible impact of lowered emissions until around 2050

Nature Climate Change 2012;2:248

Population growth and global greenhouse emissions – high, medium and low UN population projections, applying the B2 emissions scenario, 2000-2100.



Reproductive health services and climate change

- Several hundred million women have restricted access to reproductive health services and wish to limit their families
- Satisfying unmet demand for contraception would reduce fertility by about 0.5 births per woman (world-wide), **equivalent to shifting from the UN medium growth projection to the low growth future**
- Such a shift would lower CO₂ emissions by about 40% by 2100, and bring large health gains

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