

Climate Politics: Does the IPCC Have a Future?

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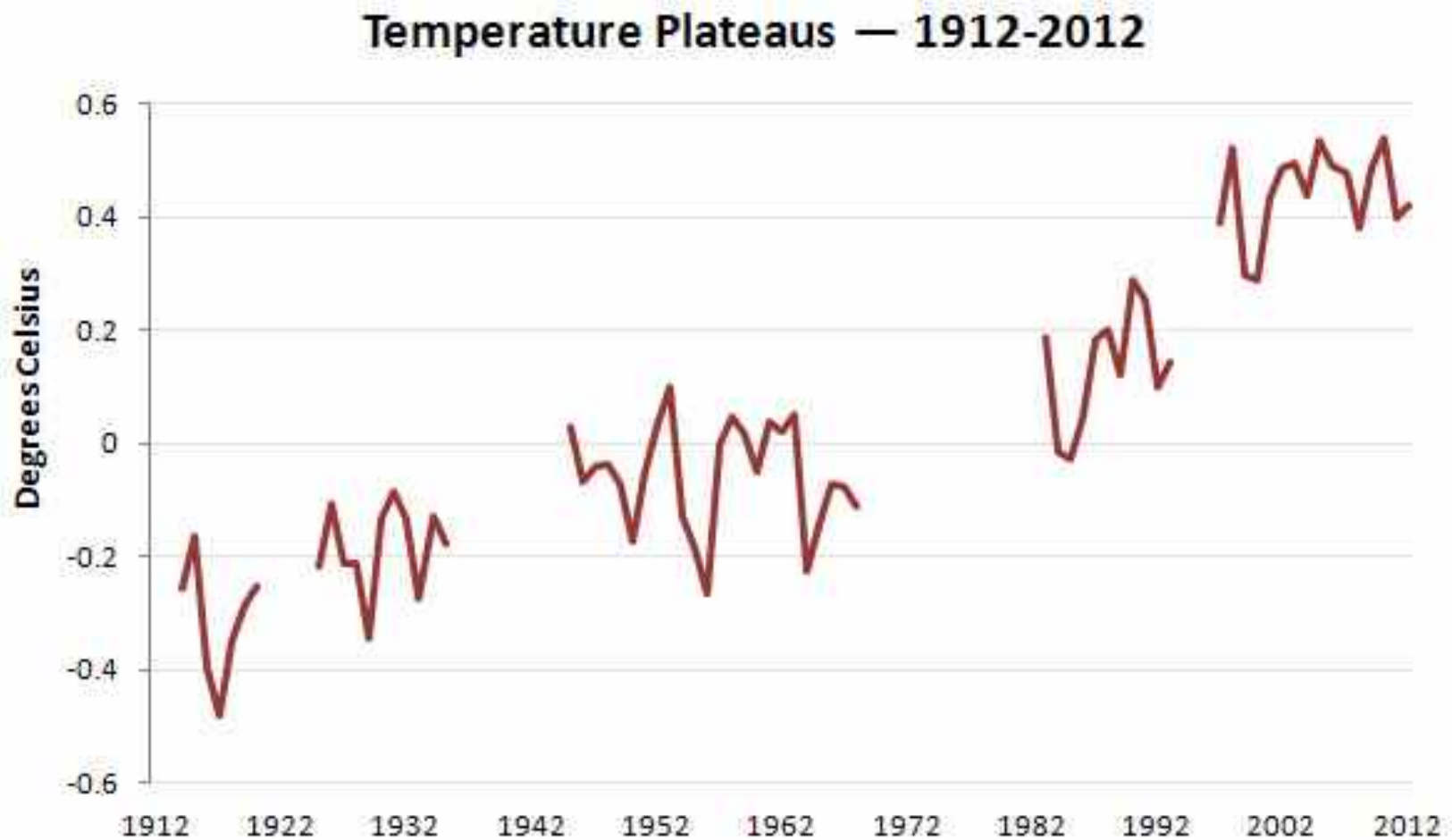
King's College, London, 26 March 2015

**Thanks to the Belgian Federal Science Policy Office (BELSPO)
and the Ministry of Foreign Affairs, and to my team at the
Université catholique de Louvain for their support**

Temperature Change From 1961-1990 Average

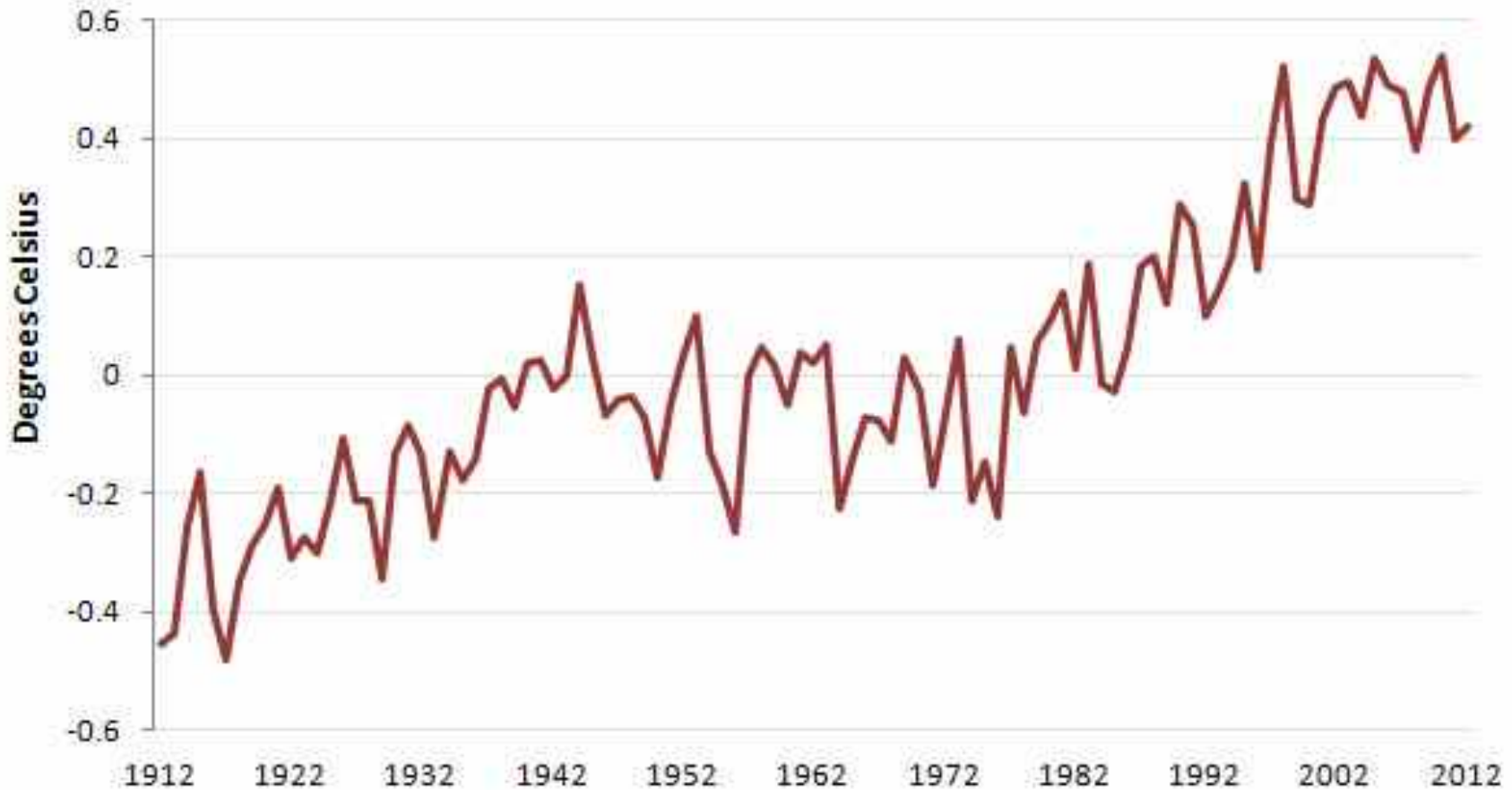


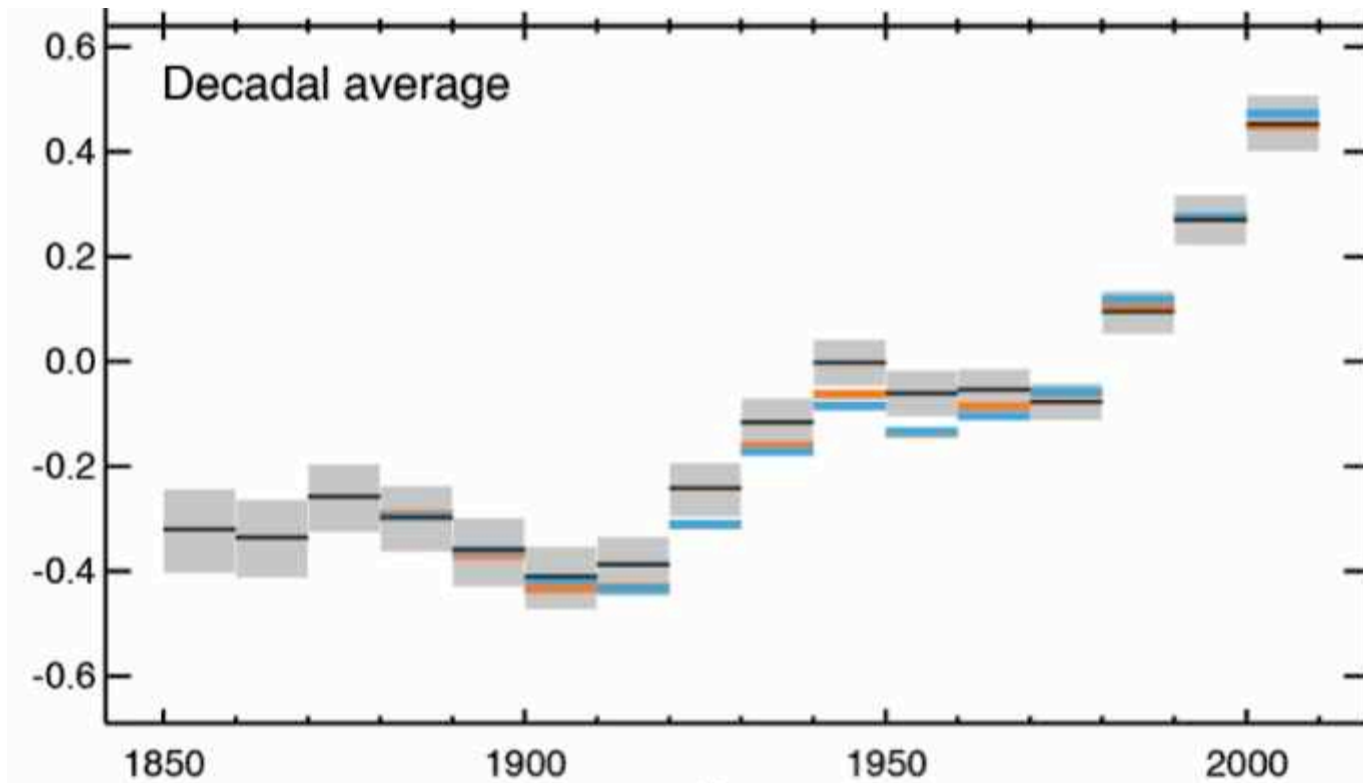
Lying With Statistics, Global Warming Edition



Lying With Statistics, Global Warming Edition

Temperature Change From 1961-1990 Average





(IPCC 2013, Fig. SPM.1a)

Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850.

In the Northern Hemisphere, 1983–2012 was *likely* the warmest 30-year period of the last 1400 years (*medium confidence*).

Key messages from the IPCC WG1 Report (1)

■ Certain:

- Emissions resulting from **human activities are substantially increasing** the atmospheric concentrations of the **greenhouse gases**: CO₂, CH₄, CFC, and N₂O

■ Calculated **with confidence**:

- Under the business as usual scenario, **temperature will increase by about 3°C by 2100** (uncertainty range: **2 to 5°C**), and **sea level will increase by 60 cm** (uncertainty range: **30 to 100 cm**)

Key messages from the IPCC WG1 Report (2)

- With an increase in the mean temperature, **episodes of high temperature** will most likely become **more frequent**
- Rapid changes in climate will change the composition of ecosystems; **some species** will be unable to adapt fast enough and **will become extinct**.
- Long-lived gases (**CO₂**, N₂O and CFCs) **would require immediate reduction** in emissions from human activities **of over 60% to stabilise their concentration at today's levels.**

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Oops...



- ... this was from the IPCC **first** assessment report, published 20 years ago (1990)
- Was anybody really listening?

When does this quote date from?




“It may require only a very small percentage of change in the planet’s balance of energy to modify average temperatures by 2°C. Downward, this is another ice age; upward, a return to an ice-free age. In either case, the effects are global and catastrophic. ”

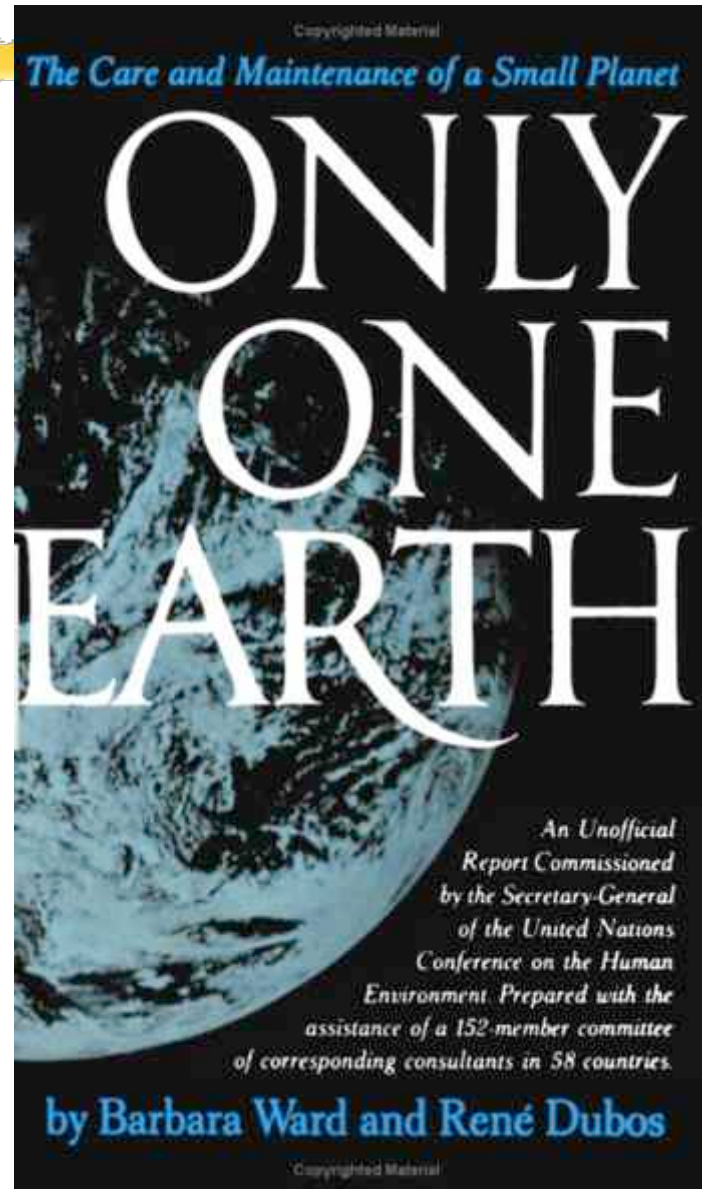
When does this quote date from?




“... The sum of all likely fossil-fuel demands in the early decades of the [21st] century might ... greatly increase the emission of carbon dioxide into the atmosphere and by doing so bring up average surface temperature uncomfortably close to that rise of 2°C which might set in motion the long-term warming up of the planet.”



B. Ward & R. Dubos, 1972



Already 43 years!



- It was well before the establishment of the IPCC, in 1988
- Didn't humanity lose some time?

Why the IPCC ?

Established by WMO and UNEP in 1988

to provide **policy-makers** with an **objective source of information** about

- causes of climate change,
- potential environmental and socio-economic impacts,
- possible response options (adaptation & mitigation).

WMO=World Meteorological Organization

UNEP= United Nations Environment Programme



Mandate of the IPCC

“The General Assembly [...] endorses action of the World Meteorological Organisation and the United Nations Environment Programme in jointly establishing an Intergovernmental Panel on Climate Change to provide **international coordinated scientific assessments** of the magnitude, timing and potential environmental and socio-economic impact of climate change and realistic response strategies [...].”

United Nations General Assembly
43rd session resolution, 6th December 1988


Role of IPCC



"The IPCC does not carry out research nor does it monitor climate related data or other relevant parameters. It bases its assessment mainly on peer reviewed and published scientific/technical literature."

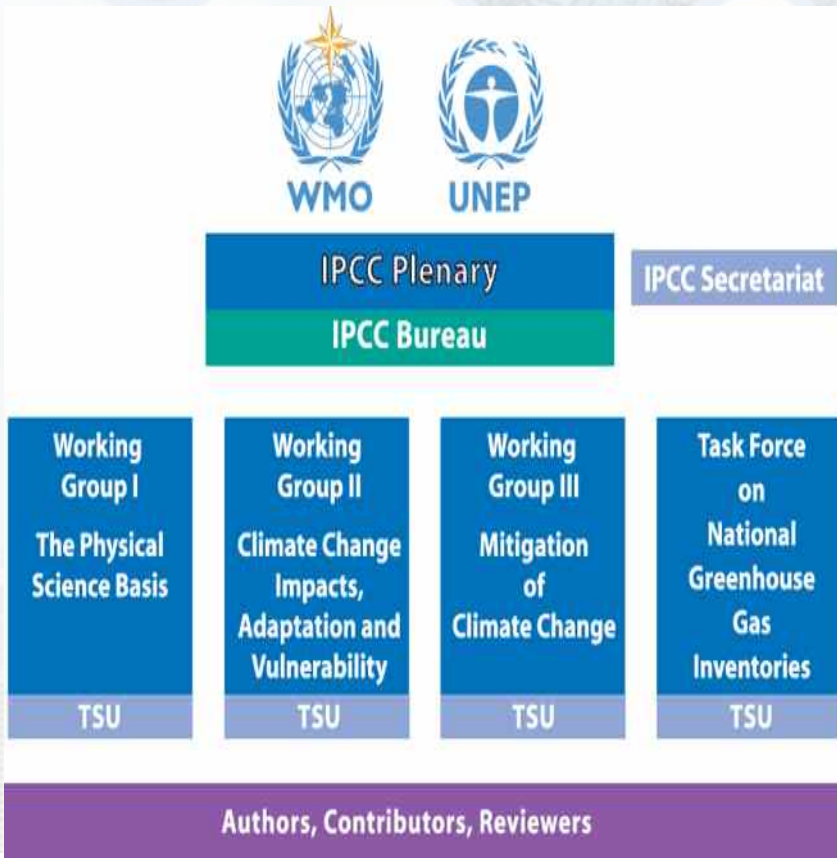
(source: www.ipcc.ch)

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IPCC Reports are
policy-relevant,
NOT
policy-prescriptive

Inter-governmental Panel on Climate Change (IPCC): Organization Structure

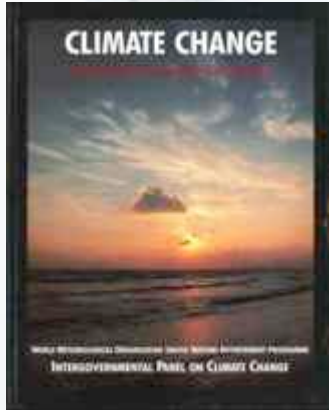


- IPCC plenary comprises of all countries in the world
- IPCC Bureau comprises of 34 elected members; IPCC elects its Bureau every 6-7 years
- 3 Working Groups & a Task Force on National Greenhouse Gas Inventories
- Authors, Contributors, Reviewers, Review Editors

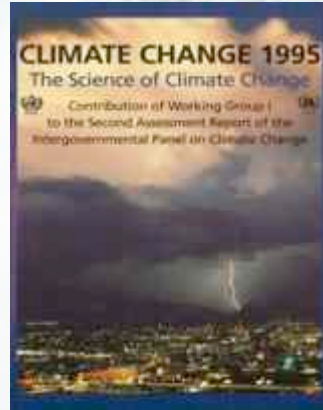
IPCC writing cycle (4 years, 831 Lead authors)

- Plenary decides table of content of reports
- Bureau appoints world-class scientists as authors, based on publication record
- Authors assess all scientific literature
- *Draft* – Expert review (+ Review editors)
- *Draft 2 (+ Draft 1 Summary for Policy Makers (SPM))* – Combined expert/government review
- *Draft 3 (+ Draft 2 SPM)* – Government review of SPM
- Approval Plenary (interaction authors – governments) – *SPM and full report*
- ***NB: the scientists have the last word!***

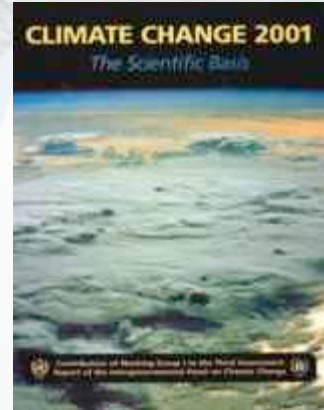
IPCC Assessment Reports



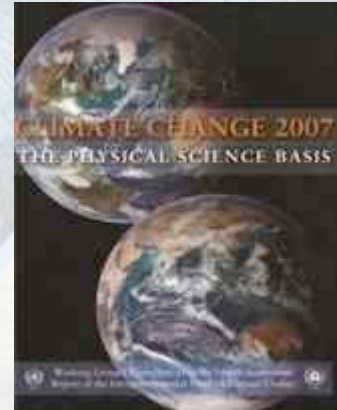
FAR 1990



SAR 1995



TAR 2001



AR4 2007



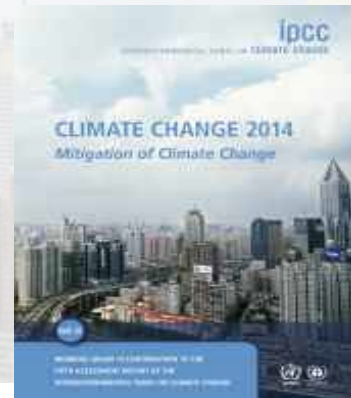
Nobel Peace Prize 2007



AR5 WGI 2013



AR5 WGII 2014

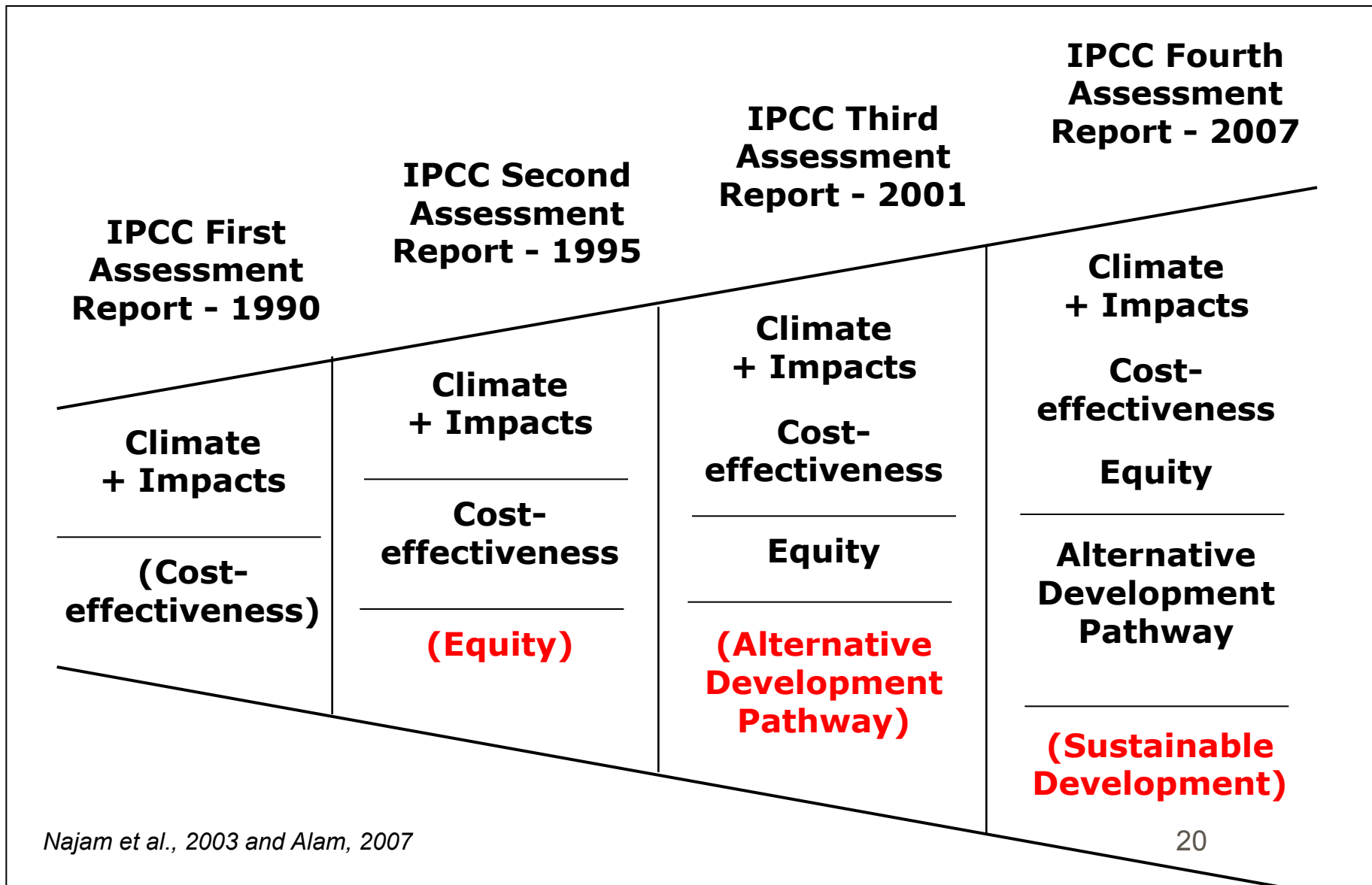


AR5 WGIII 2014



IPCC AR5 Synthesis Report

Background



The IPCC assessments have influenced global action on an unprecedented scale

1. The First Assessment Report (FAR, 1990) had a major impact in defining the content of the **UNFCCC**
2. The Second Assessment Report (SAR, 1996) was largely influential in defining the provisions of the **Kyoto Protocol**
3. The Third Assessment Report (TAR, 2001) focused attention on the **impacts** of climate change and the need for **adaptation**
4. The Fourth Assessment Report (AR4, 2007) informed the decision on the ultimate objective (**2°C**) and is creating a strong basis for a **post Kyoto Protocol** agreement
5. The Fifth Assessment Report (AR5, 2013-14) is informing the **review of the 2°C objective**, and the **preparation of the Paris 2015 agreement**

Strengths of the IPCC

- ✓ **Mobilisation of thousands of multi-disciplinary experts worldwide**
- ✓ **Policy-relevant findings (but not policy-prescriptive)**
- ✓ **Widely used methodological reports**
- ✓ **Assessments relying on peer reviewed literature**
- ✓ **Review process involving experts and Governments**
- ✓ **Media attention and outreach activities**

AR5 is the best ever

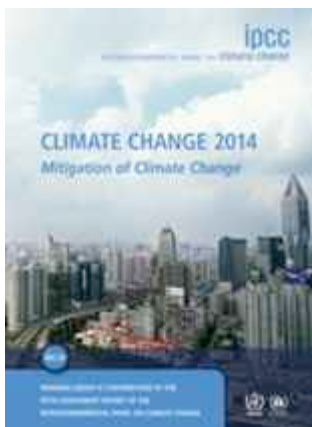
- **Better integration of Mitigation and Adaptation**
- **Improved risk-management approach**
- **Evolving away from the non-mitigation SRES scenarios** (SRES= Special Report on Emission Scenarios, 2000)
- **Special effort to provide regional information when available**
- **Sustainable development & equity aspects**
- **More comprehensive treatment of economic aspects, and of cross-cutting issues**
- **Emerging issues handled (acidification, ...)**
- **Better handling & communication of uncertainties**



What is happening in the climate system?



What are the risks?



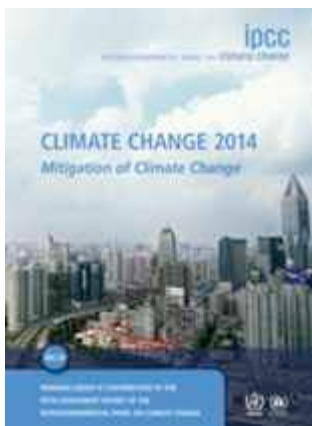
What can be done?



WG I (Physical science basis): 209 lead authors, 2014 pages, 54.677 review comments



WG II (Impacts, Adaptation and Vulnerability): 243 lead authors, 2000 pages, 50.492 review comments



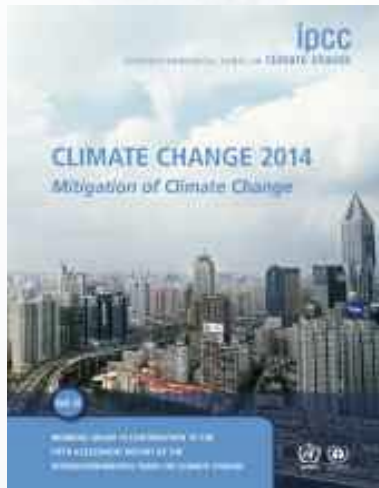
WG III (Mitigation of Climate Change): 235 coordinating and lead authors, 2000 pages, 38.315 review comments



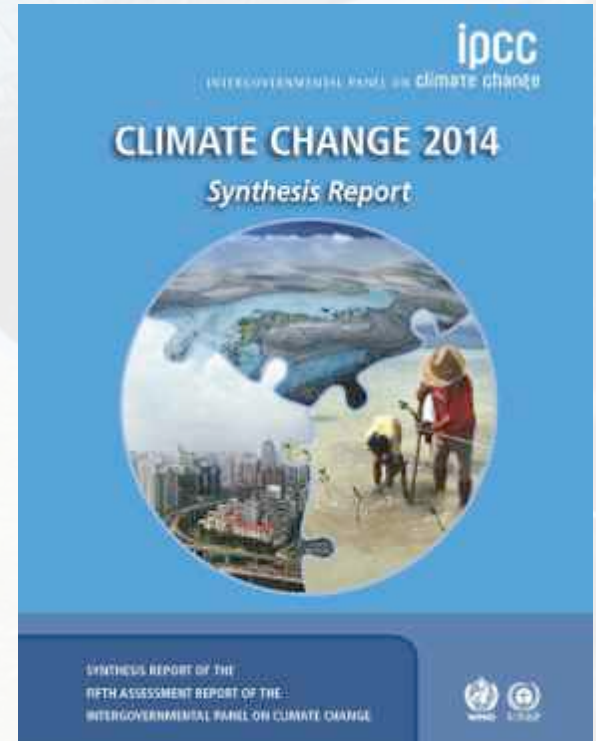
AR5 WGI 2013



AR5 WGII 2014



AR5 WGIII 2014



Key messages from IPCC AR5

- **Human influence on the climate system is clear**
- **Continued emissions of greenhouse gases will increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems**
- **While climate change is a threat to sustainable development, there are many opportunities to integrate mitigation, adaptation, and the pursuit of other societal objectives**
- **Humanity has the means to limit climate change and build a more sustainable and resilient future**

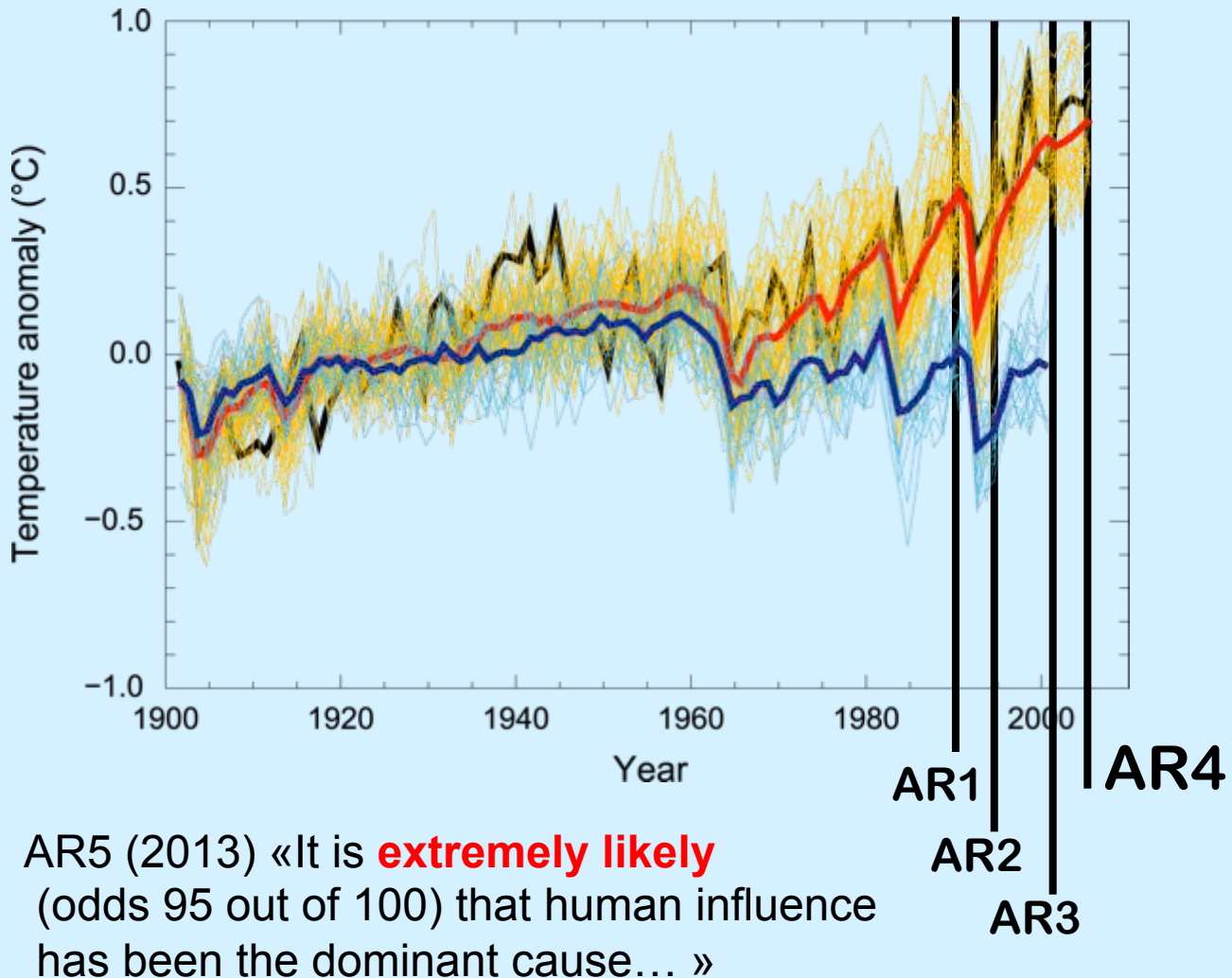
A Progression of Understanding: Greater and Greater Certainty in Attribution

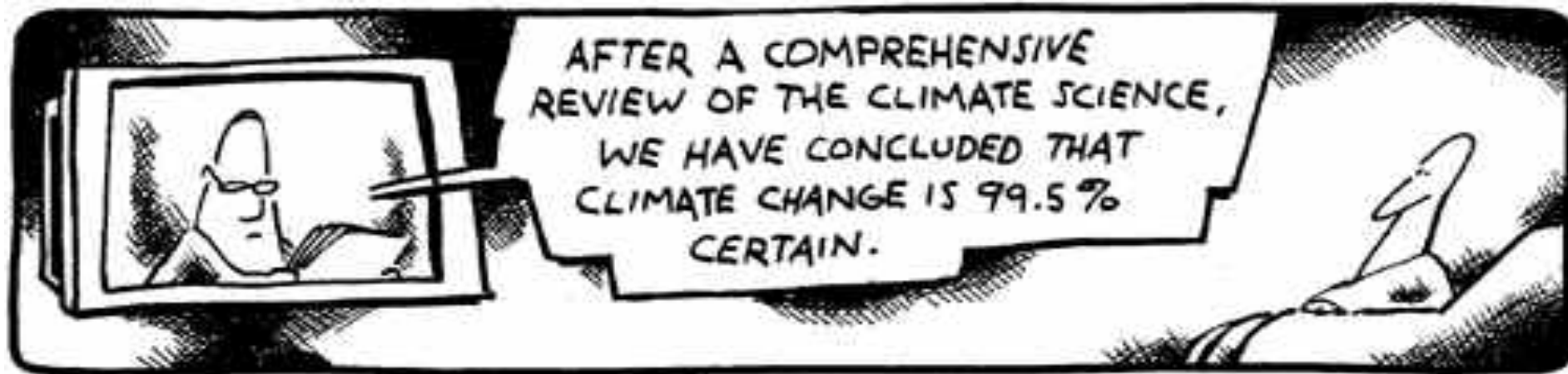
AR1 (1990):
“unequivocal detection
not likely for a decade”

AR2 (1995): “balance
of evidence suggests
discernible human
influence”

AR3 (2001): “most of
the warming of the
past 50 years is **likely**
(odds 2 out of 3) due
to human activities”

AR4 (2007): “most of
the warming is **very
likely** (odds 9 out of 10)
due to greenhouse
gases”





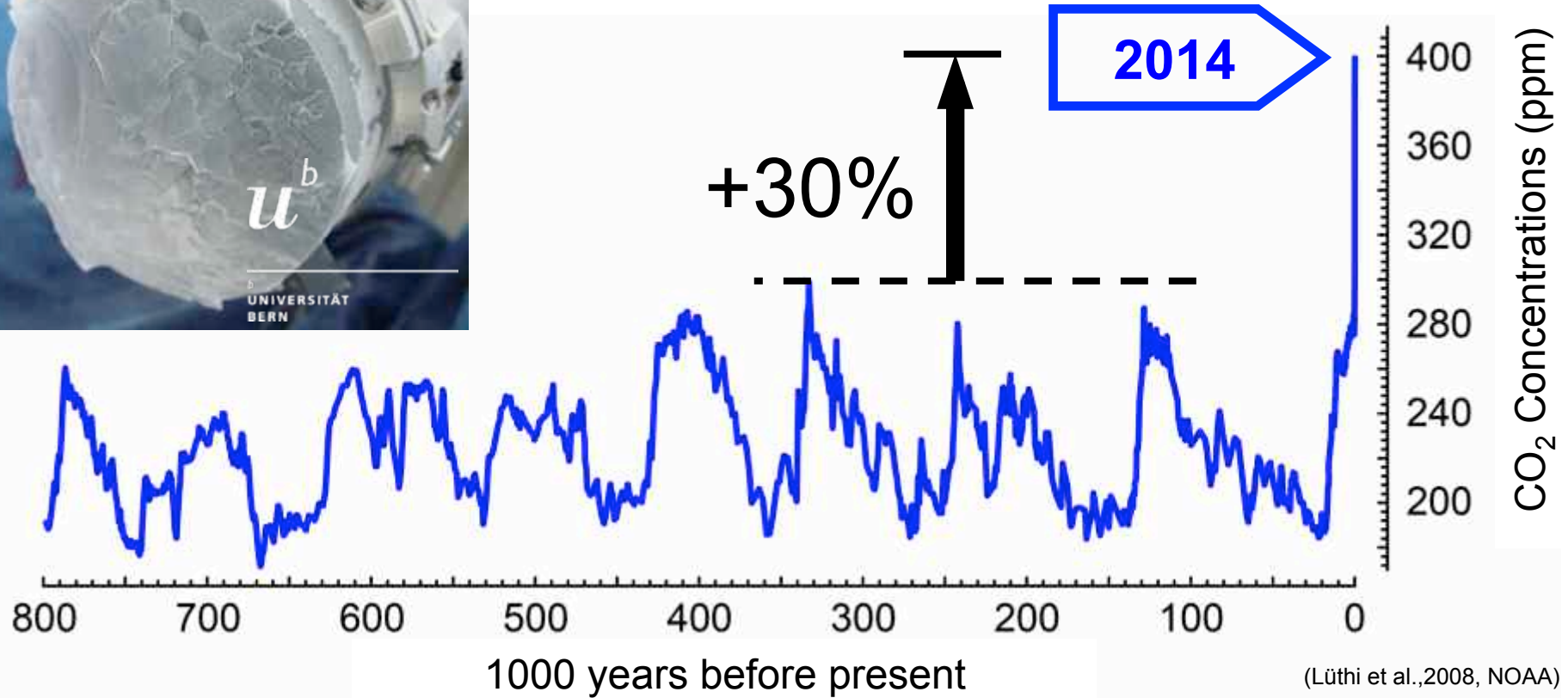
TOLES

© 2010 THE WASHINGTON POST

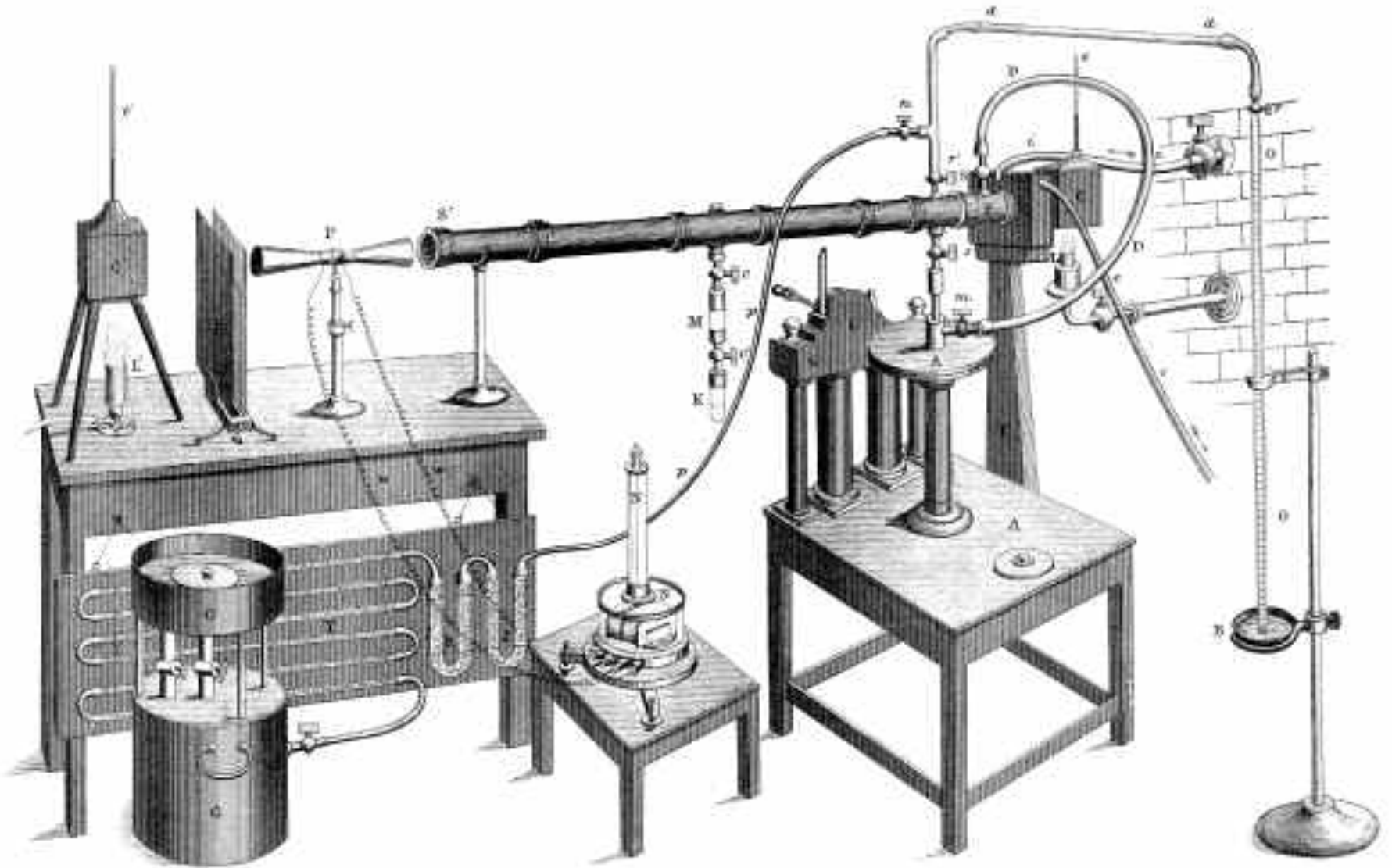
2-22-10

Tom Toles in The Washington Post

Atmospheric concentrations of CO₂



The concentrations of CO₂ have increased to levels unprecedented in at least the last 800,000 years.



Tyndall (1861) mesure l'absorption du rayonnement par les gaz

Plateau Glacier (1961) (Alaska)



http://www.weather.com/news/science/environment/alaskas-glaciers-capturing-earth-changing-our-eyes-20131125?cm_ven=Email&cm_cat=ENVIRONMENT_us_share

Plateau Glacier (2003) (Alaska)



http://www.weather.com/news/science/environment/alaskas-glaciers-capturing-earth-changing-our-eyes-20131125?cm_ven=Email&cm_cat=ENVIRONMENT_us_share

Since 1950, extreme hot days and heavy precipitation have become more common



There is evidence that anthropogenic influences, including increasing atmospheric greenhouse gas concentrations, have changed these extremes

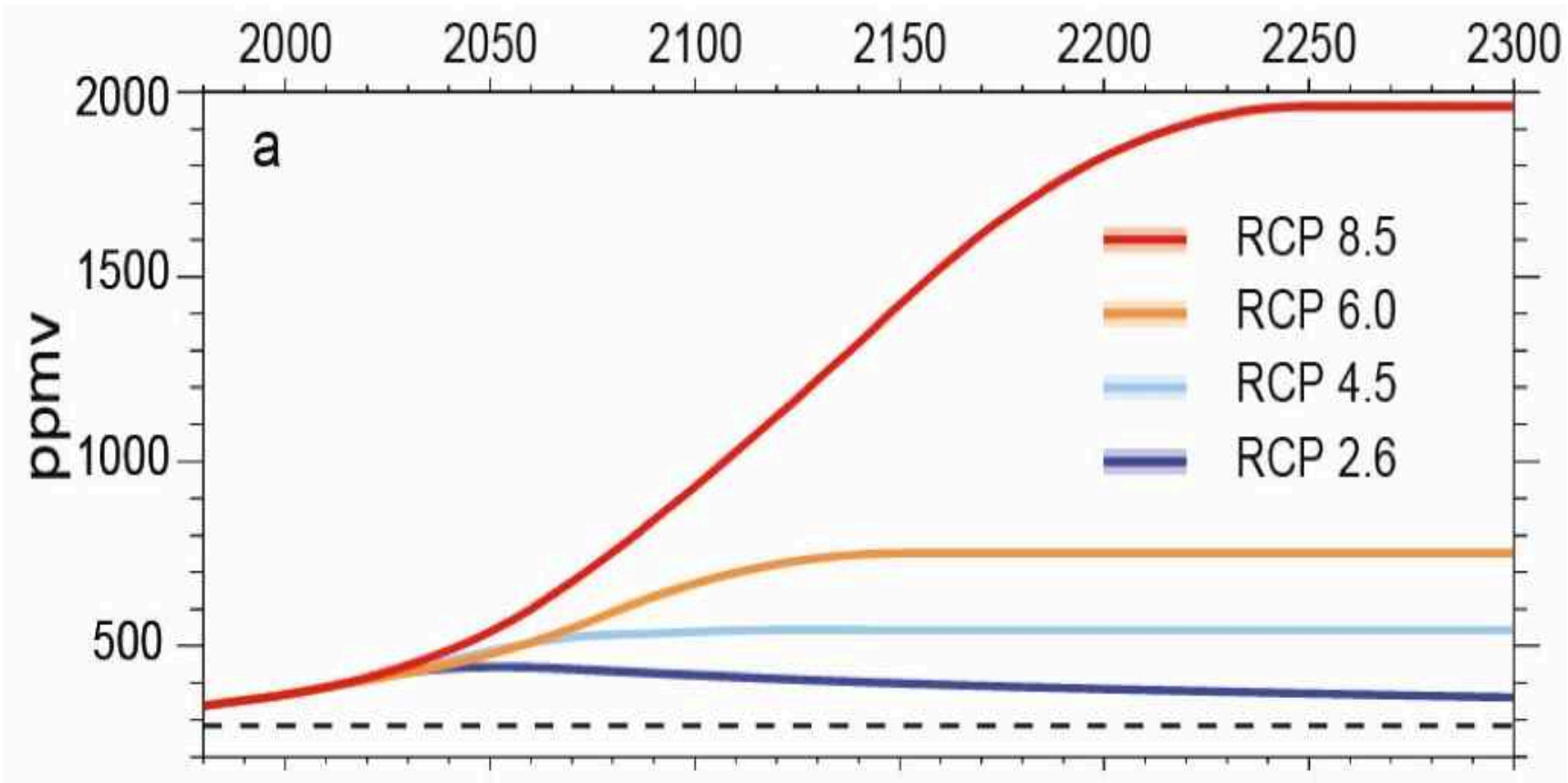
Impacts are already underway

- **Tropics to the poles**
- **On all continents and in the ocean**
- **Affecting rich and poor countries (but the poor are more vulnerable everywhere)**



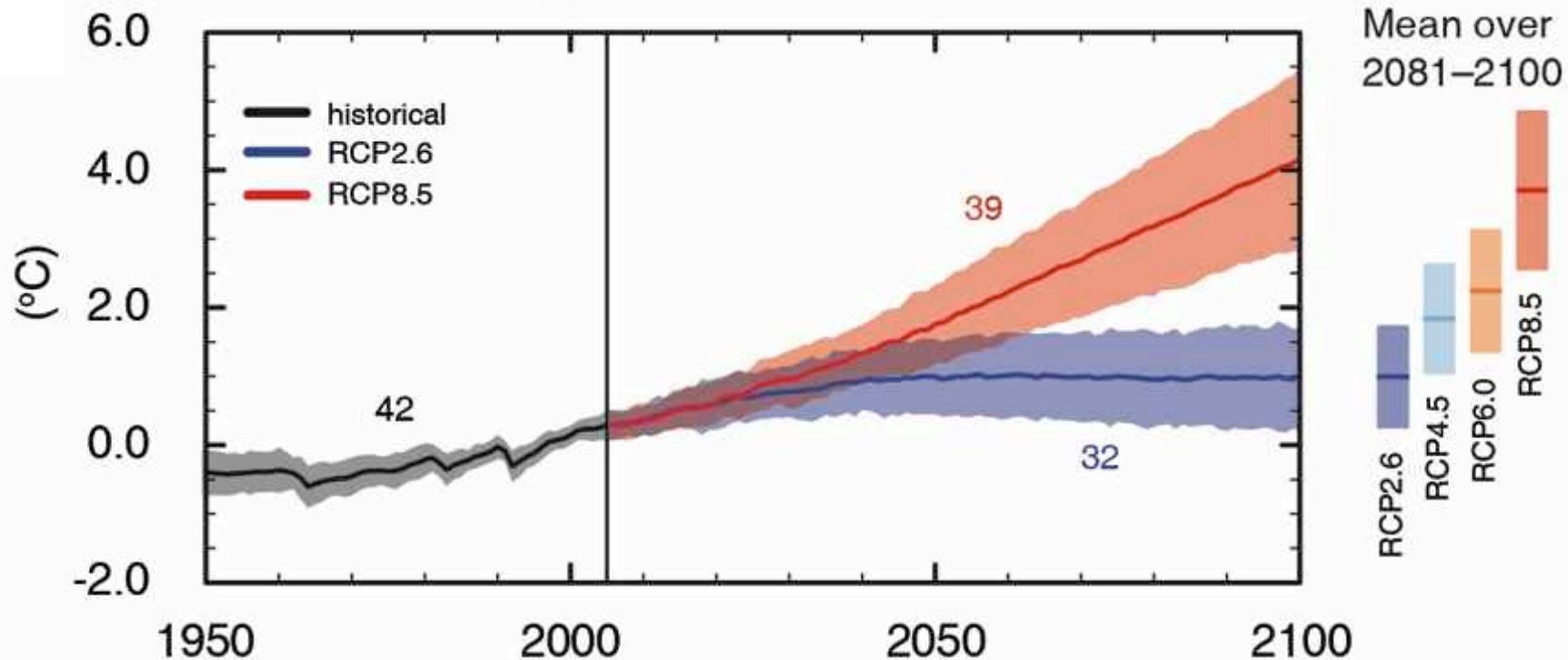
AR5 WGII SPM

RCP Scenarios: Atmospheric CO₂ concentration



Three stabilisation scenarios: RCP 2.6 to 6
One Business-as-usual scenario: RCP 8.5

Global average surface temperature change

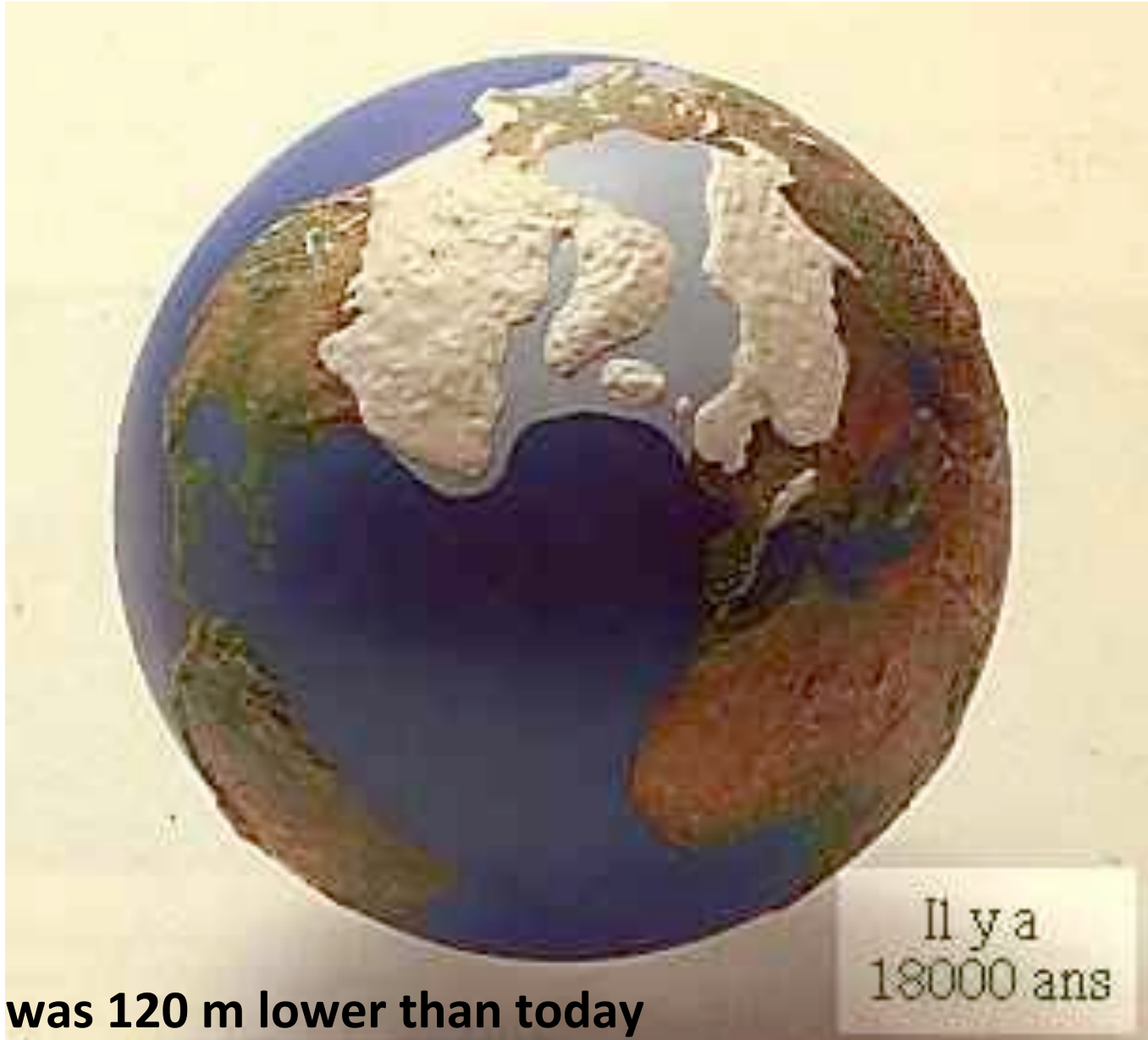


(IPCC 2013, Fig. SPM.7a)

Only the lowest (RCP2.6) scenario maintains the global surface temperature increase above the pre-industrial level to less than 2°C with at least 66% probability

18-20000 years ago (Last Glacial Maximum)

With permission from Dr. S. Joussaume, in « Climat d'hier à demain », CNRS éditions.



Sea level was 120 m lower than today

Today, with +4-5°C globally

With permission from Dr. S. Joussaume, in « Climat d'hier à demain », CNRS éditions.



Potential Impacts of Climate Change



Food and water shortages



Increased displacement of people



Increased poverty



Coastal flooding

AR5 WGII SPM

Risk = Hazard x Vulnerability x Exposure (Katrina flood victim)

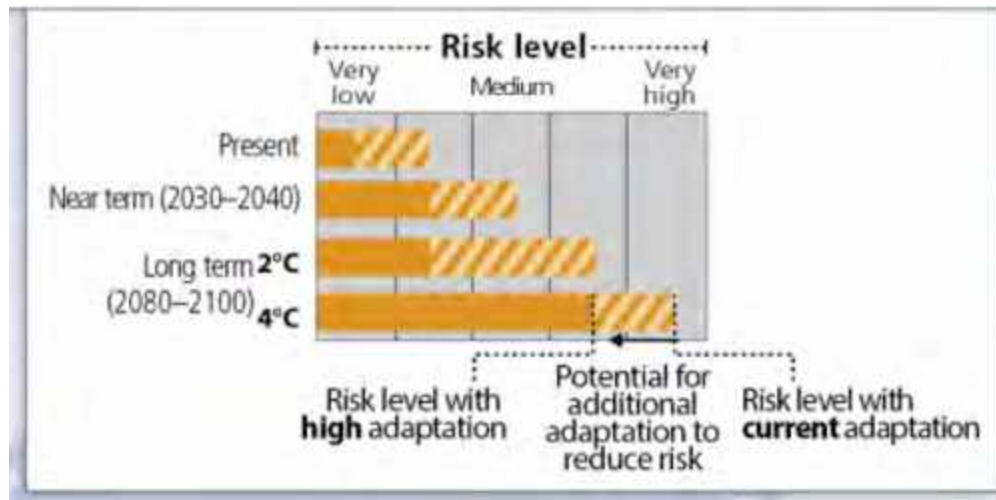




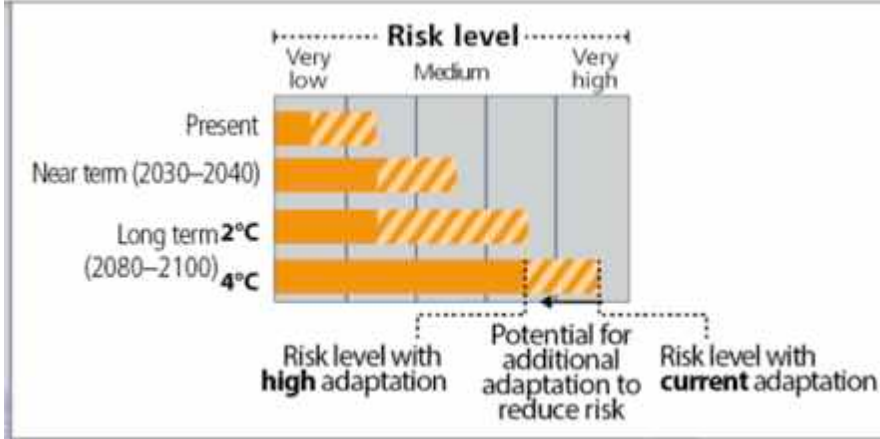
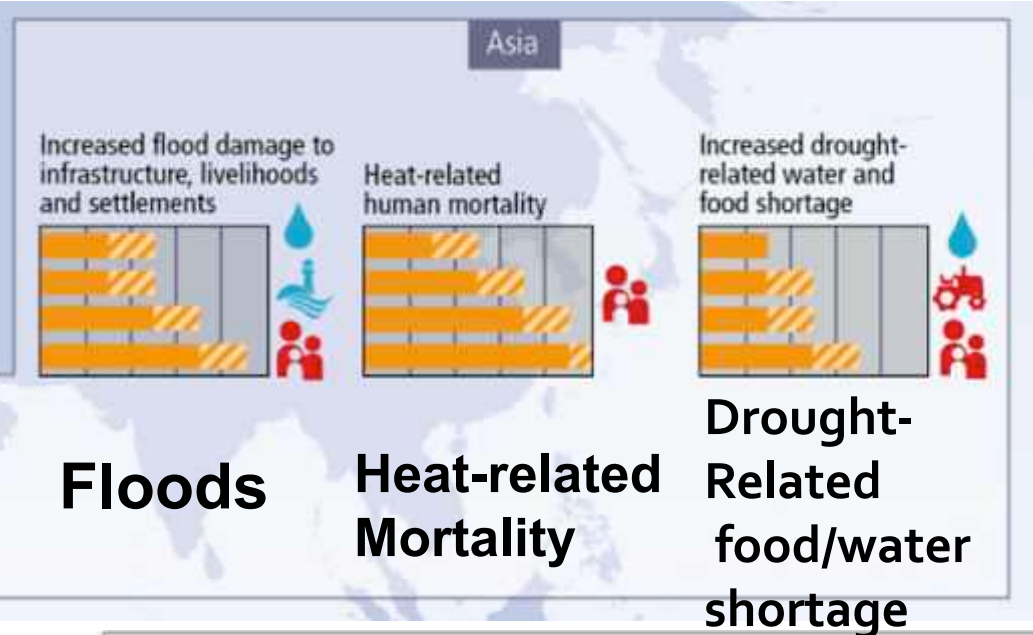
ADAPTATION IS ALREADY OCCURRING

Regional key risks and potential for risk reduction through adaptation

Representative key risks for each region for



Regional key risks and potential for risk reduction: Asia



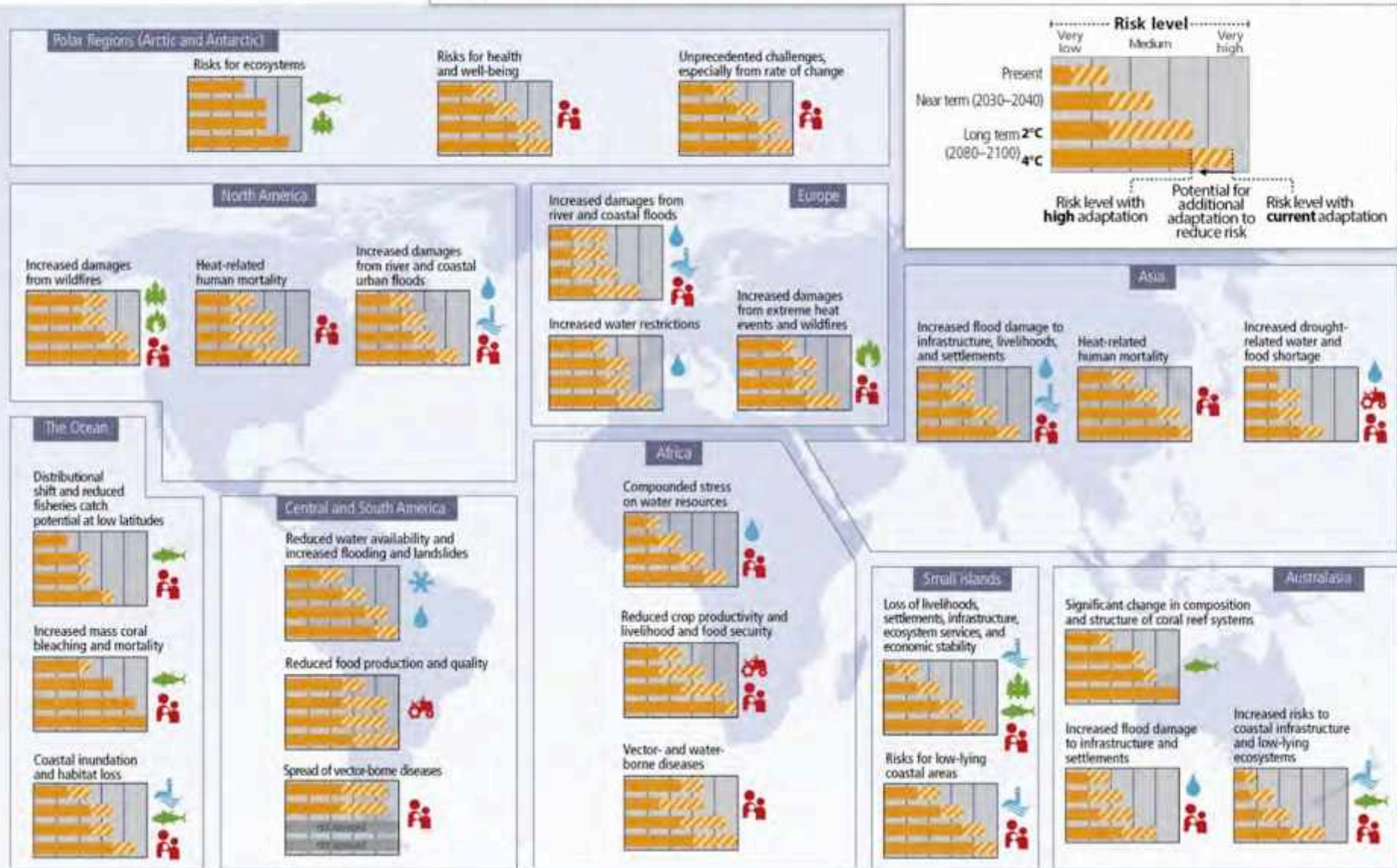
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INTERGOVERNMENTAL PANEL ON climate change



Regional key risks and potential for risk reduction

Representative key risks for each region for



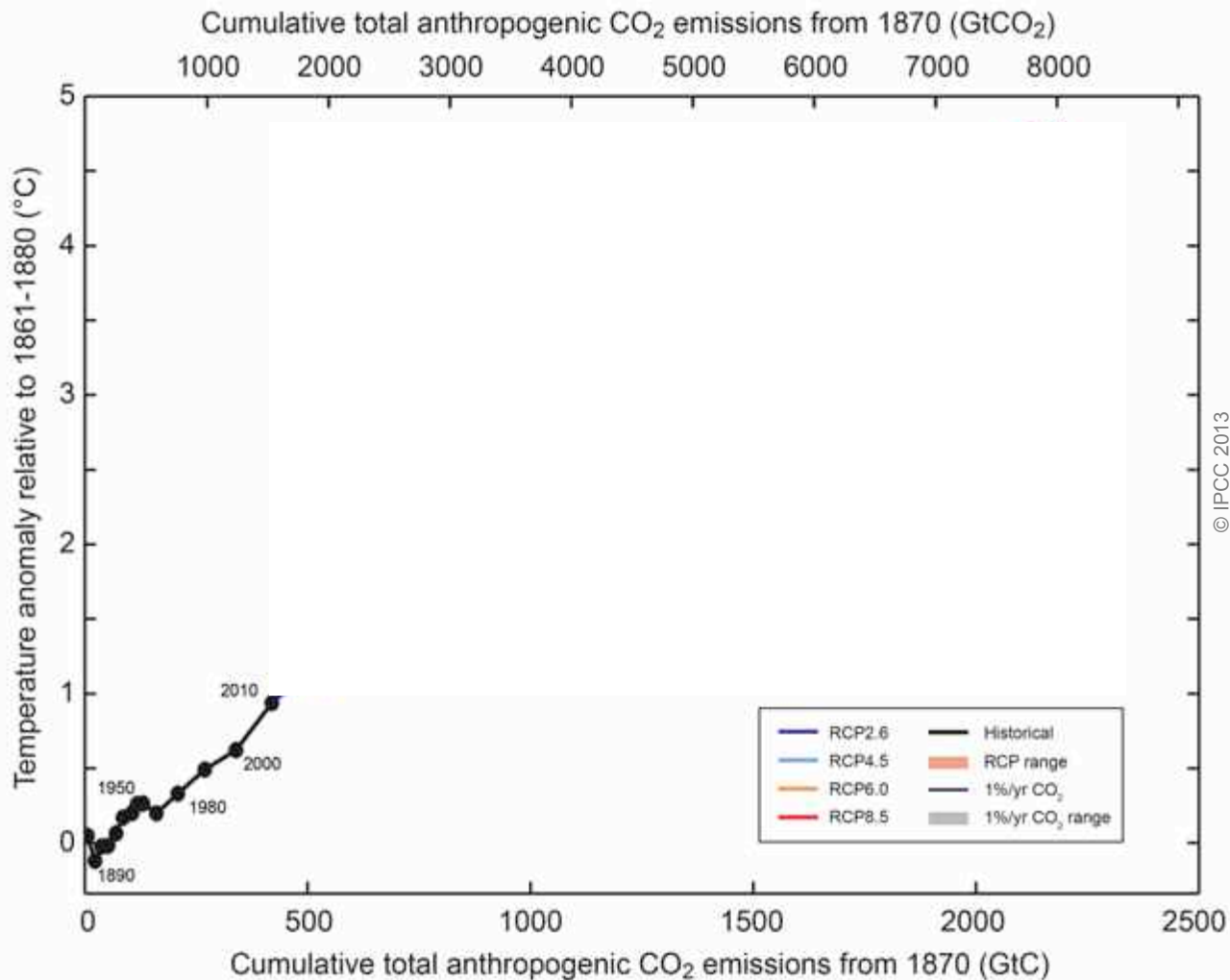
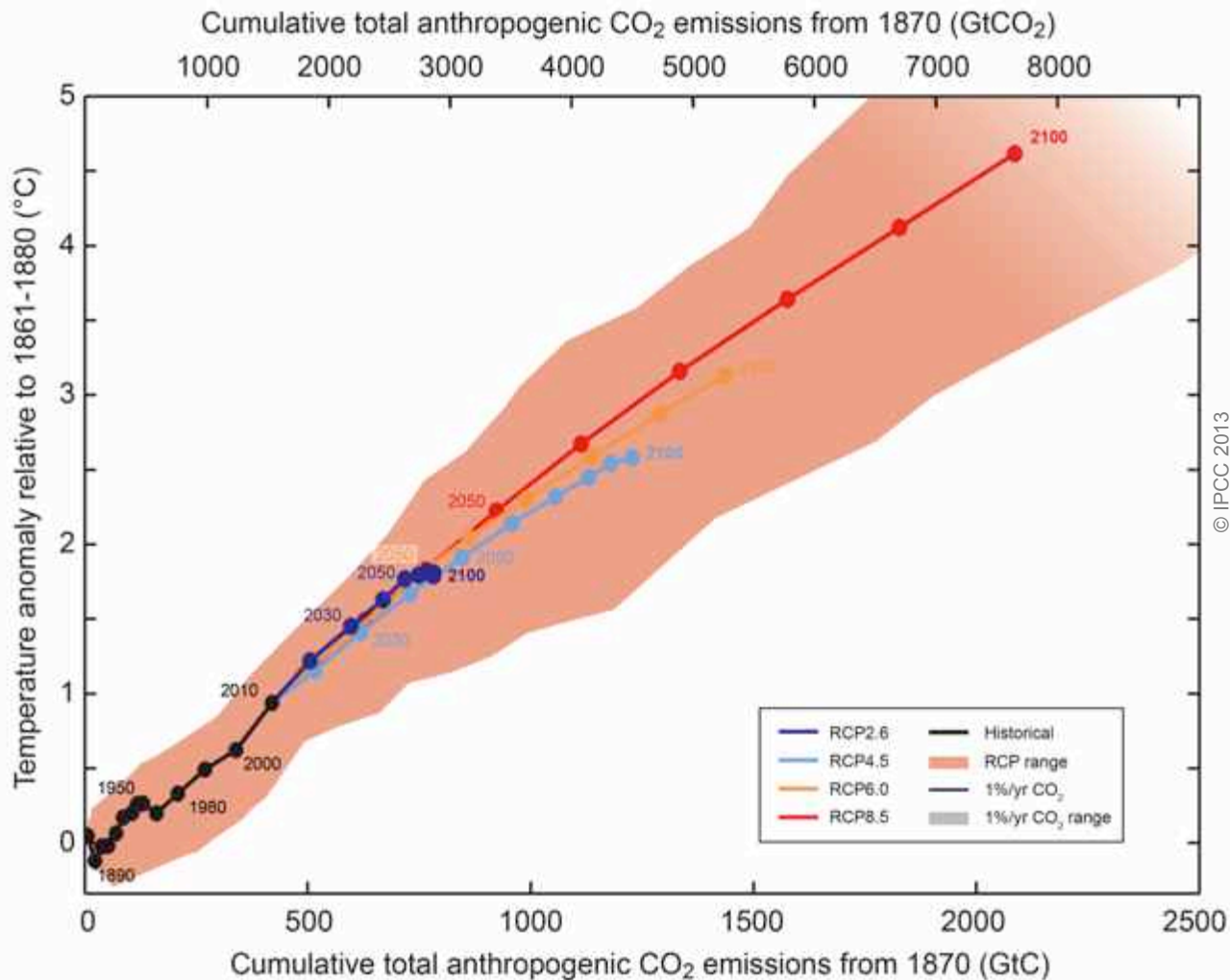


Fig. SPM.10

Cumulative emissions of CO₂ largely determine global mean surface warming by the late 21st century and beyond.



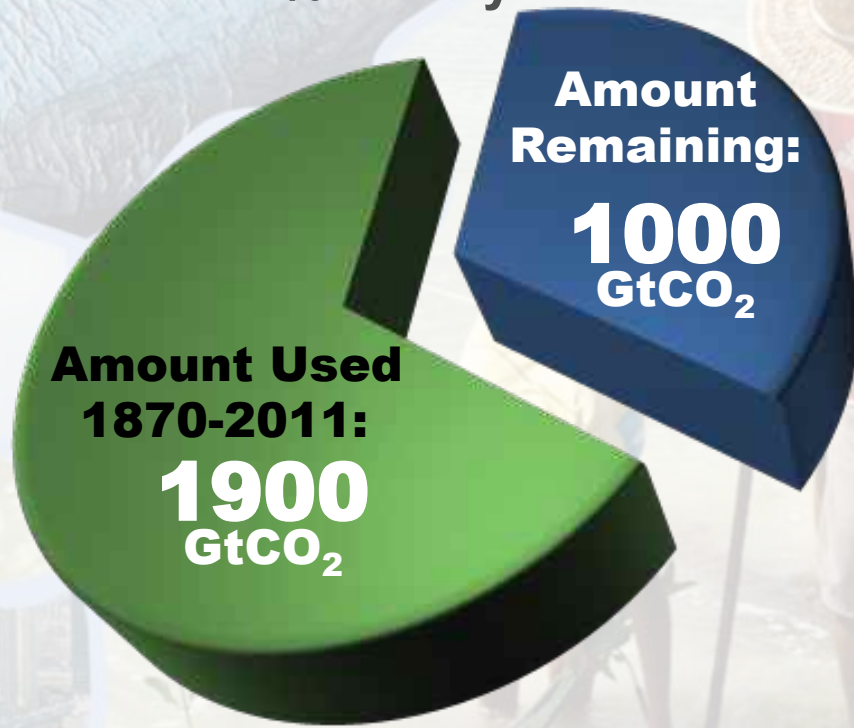
© IPCC 2013

Fig. SPM.10

Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.

The window for action is rapidly closing

65% of the carbon budget compatible with a 2°C goal is already used
NB: this is with a probability greater than 66% to stay below 2°C



NB: Emissions in 2011: 38 GtCO₂/yr

AR5 WGI SPM


Limited room to manoeuver

“The room for manoeuver is very limited to avoid the “severe, pervasive, and irreversible impacts” that the IPCC has warned about in its last Report.”

@JPvanYpersele for The Guardian, 16 March 2015

Can temperature rise still be kept below 1.5 or 2°C (over the 21st century) compared to pre-industrial ?

- **Many scenario studies confirm that it is technically and economically feasible to keep the warming below 2°C, with more than 66% probability (“likely chance”).** This would imply limiting atmospheric concentrations to 450 ppm CO₂-eq by 2100.
- **Such scenarios for an above 66% chance of staying below 2°C imply reducing by 40 to 70% global GHG emissions compared to 2010 by mid-century, and reach zero or negative emissions by 2100.**

An aerial photograph of a city skyline, likely Hong Kong, featuring a dense cluster of skyscrapers and a complex multi-level highway interchange in the foreground. The image has a blue-tinted, slightly hazy atmosphere. The text is overlaid in the center in a white, bold, sans-serif font.

Mitigation options are available in every major sector.

Mitigation Measures



More efficient use of energy



Greater use of low-carbon and no-carbon energy

- Many of these technologies exist today



Improved carbon sinks

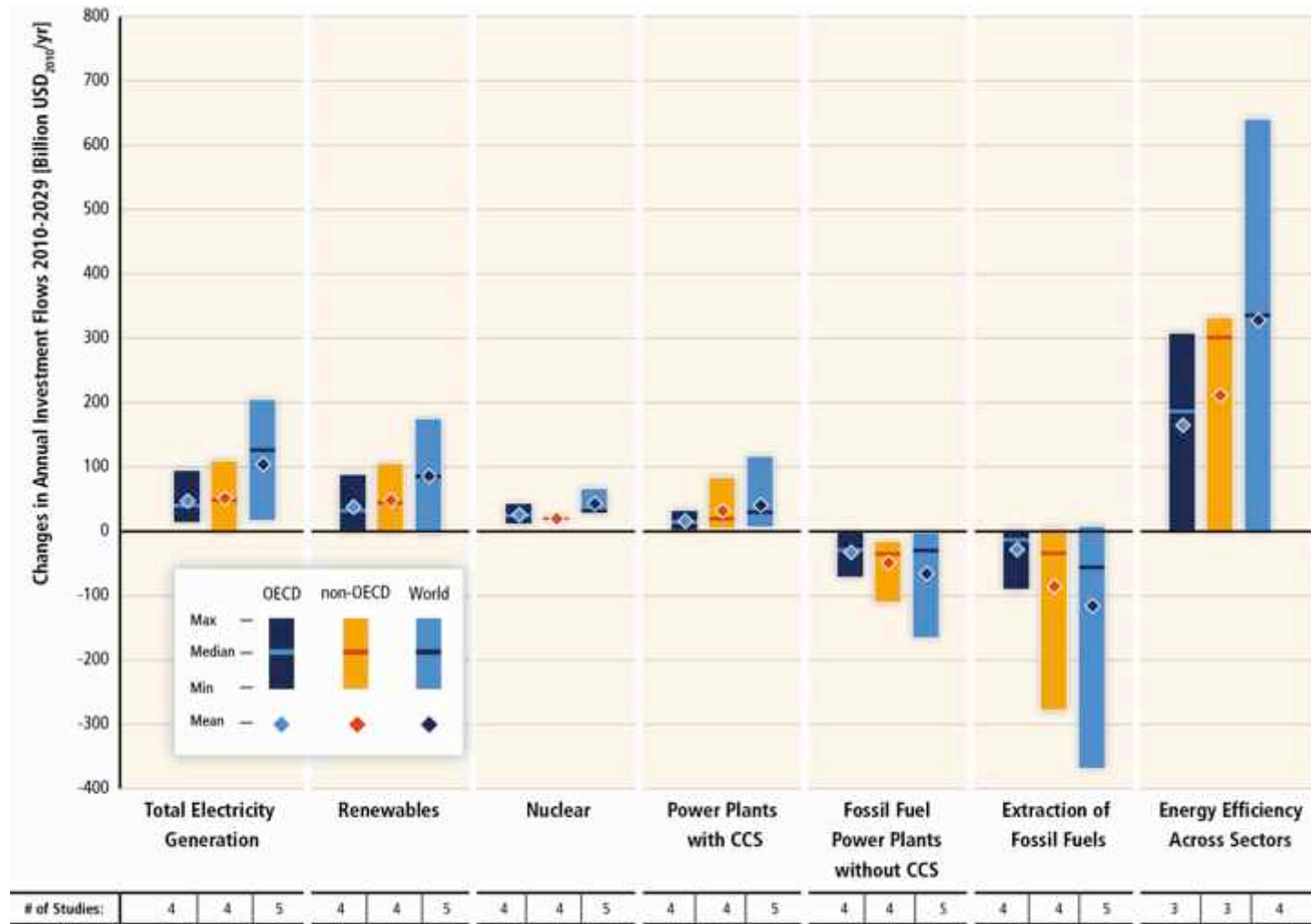
- Reduced deforestation and improved forest management and planting of new forests
- Bio-energy with carbon capture and storage

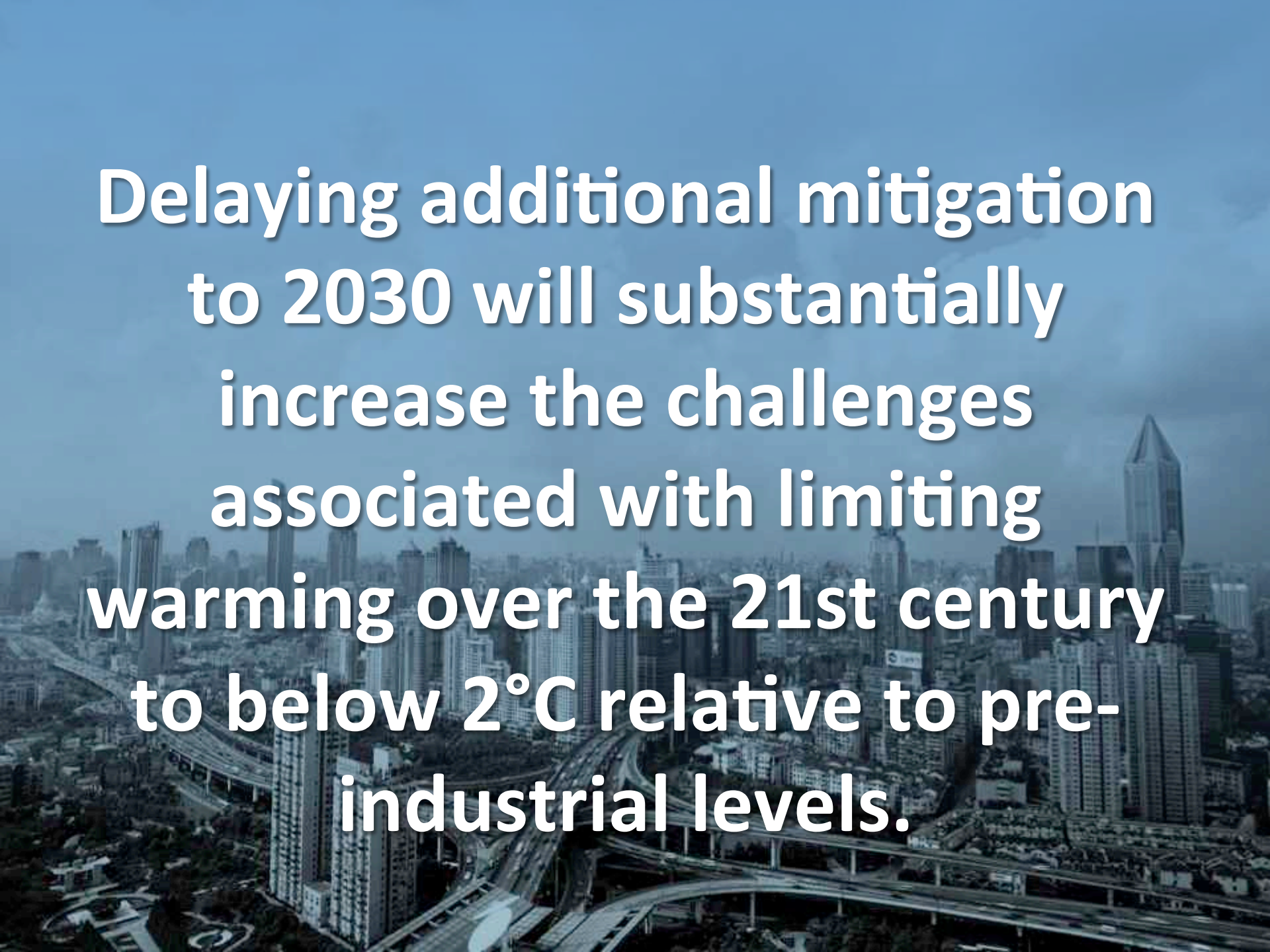


Lifestyle and behavioural changes

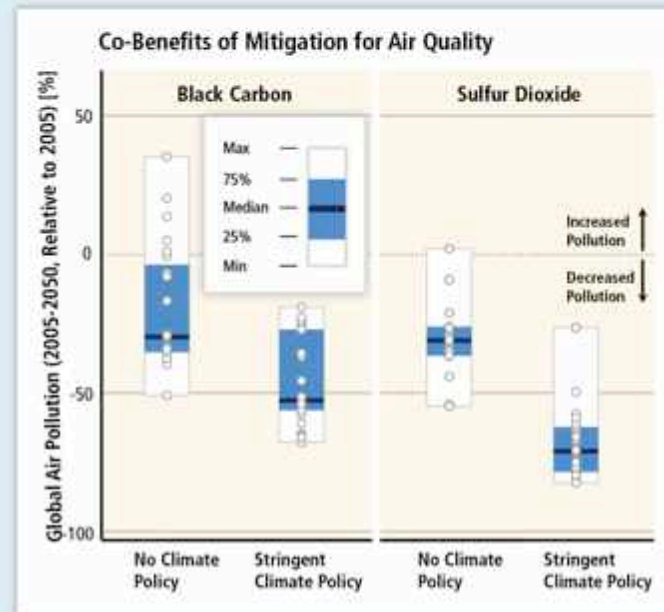
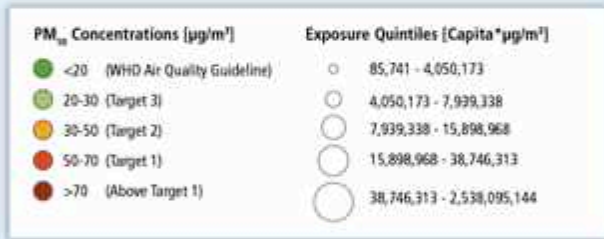
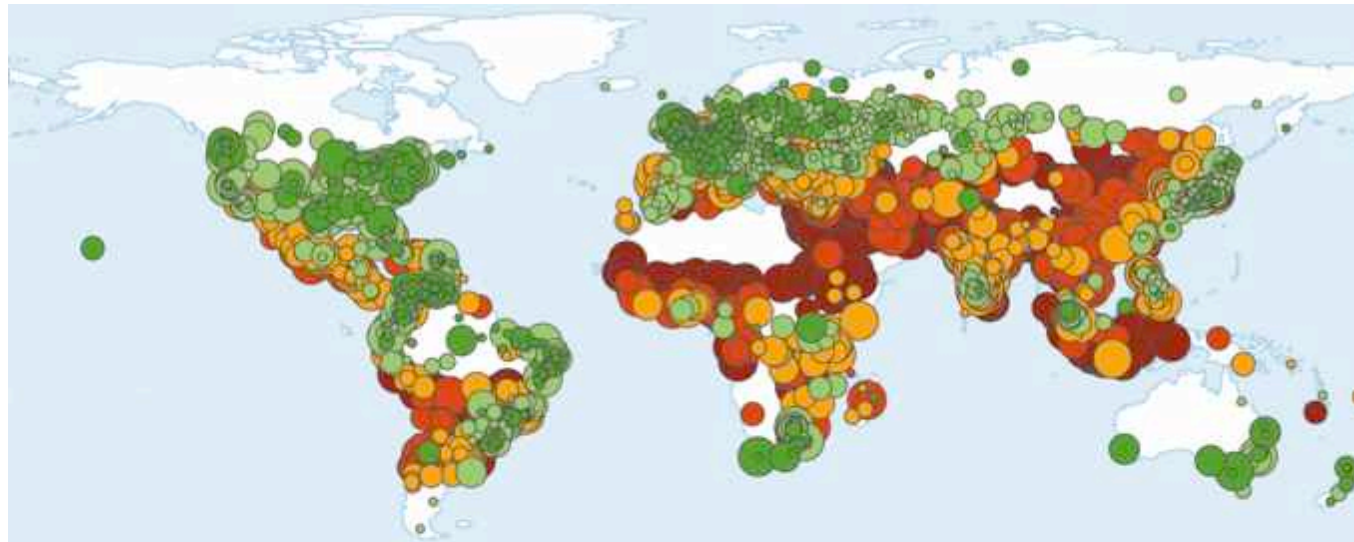
AR5 WGIII SPM

Substantial reductions in emissions would require large changes in investment patterns.



An aerial photograph of a city skyline, likely Hong Kong, featuring a complex highway interchange in the foreground and numerous high-rise buildings in the background. The image is overlaid with a semi-transparent blue filter.

**Delaying additional mitigation
to 2030 will substantially
increase the challenges
associated with limiting
warming over the 21st century
to below 2°C relative to pre-
industrial levels.**



Mitigation can result in large co-benefits for human health and other societal goals.

- **Sustainable development and equity provide a basis for assessing climate policies and highlight the need for addressing the risks of climate change**
- **Issues of equity, justice, and fairness arise with respect to mitigation and adaptation**

Equity is an integral dimension of Sustainable development (*high confidence*)

- Intergenerational equity underlies the concept of sustainability;
- Intra-generational equity is also often considered an intrinsic component of SD.
- In the particular context of international climate policy discussions, several arguments support giving equity an important role:
 - a moral justification that draws upon ethical principles;
 - a legal justification that appeals to existing treaty commitments ...;
 - and an effectiveness justification that argues that a fair arrangement is more likely to be agreed internationally ...

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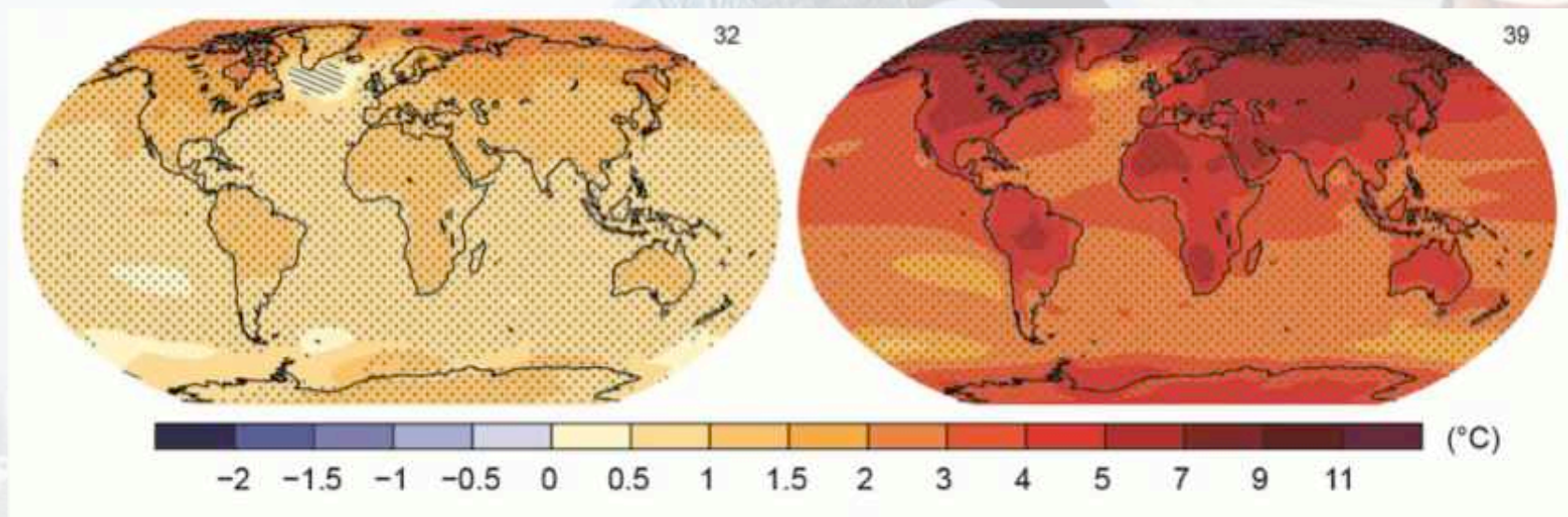
INTERGOVERNMENTAL PANEL ON climate change



The Choices Humanity Makes Will Create Different Outcomes (and affect prospects for effective adaptation)

With substantial mitigation

Without additional mitigation



Change in average surface temperature (1986–2005 to 2081–2100)

AR5 WGI SPM

Conclusion (1):

Science has a lot to offer to understand better this un-named “Party” of UNFCCC, with whom one cannot negotiate:

The Climate System, governed by the laws of Nature

Conclusion (2):

IPCC is eager to continue serving the climate and sustainable development process, with policy relevance, without being policy-prescriptive

A few words about my platform as candidate IPCC Chair

See details at:

www.climate.be/vanyp (« IPCC » page)

“Humanity knows it must stop ignoring the
“inconvenient truth” of climate change.”

@JPvanYpersele for The Guardian, 16 March 2015

Keep the IPCC mandate

“When manoeuvring a vehicle in limited space, one **must be very well informed** about both the surrounding **risks and the available options**.

This is what the IPCC must do, and continue to do, in a scientifically rigorous, but policy-neutral, way: assess the risks, the options and the processes for reaching decisions.”

@JPvanYpersele for The Guardian, 16 March 2015

Inclusiveness & Team Spirit

“But the IPCC must do so in a manner even **more inclusive** than in the past, involving more scientists from developing countries in particular. It must encourage all authors to **work better across disciplinary boundaries**. The next assessment by the IPCC must ensure the best **team spirit**, with a **sense of accountability and ownership** that is shared by all.”

@JPvanYpersele for The Guardian, 16 March 2015

Improve Communication

For the IPCC to be relevant, it must also continue to improve its communication with policymakers and with the public. The IPCC products need to be **more accessible, more readable,...**

... reach out to **different audiences**, seek greater **transparency** in how it works and show more responsiveness on **social media**.

@JPvanYpersele for The Guardian, 16 March 2015

Full Time IPCC Chair needed

“To make sure all of this happens during the next assessment cycle, the IPCC needs a strong **leader, a team builder**, who dedicates herself or himself **full time** as IPCC Chair.”

@JPvanYpersele for The Guardian, 16 March 2015

Useful links:



- www.ipcc.ch : IPCC (reports and videos)
- www.climate.be/vanyp : my slides and candidature to become IPCC Chair
- www.skepticalscience.com: excellent responses to contrarians arguments
- **On Twitter: @JPvanYpersele
and @IPCC_CH**