

# **Climate Change and Peace**

**Jean-Pascal van Ypersele**

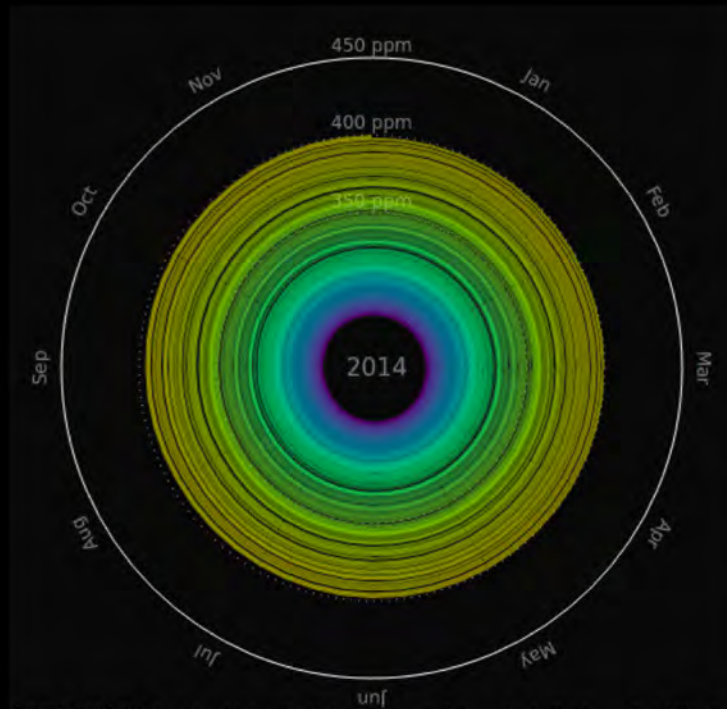
**Université catholique de Louvain (UCLouvain),  
Former IPCC Vice-Chair**

**Twitter: @JPvanYpersele**

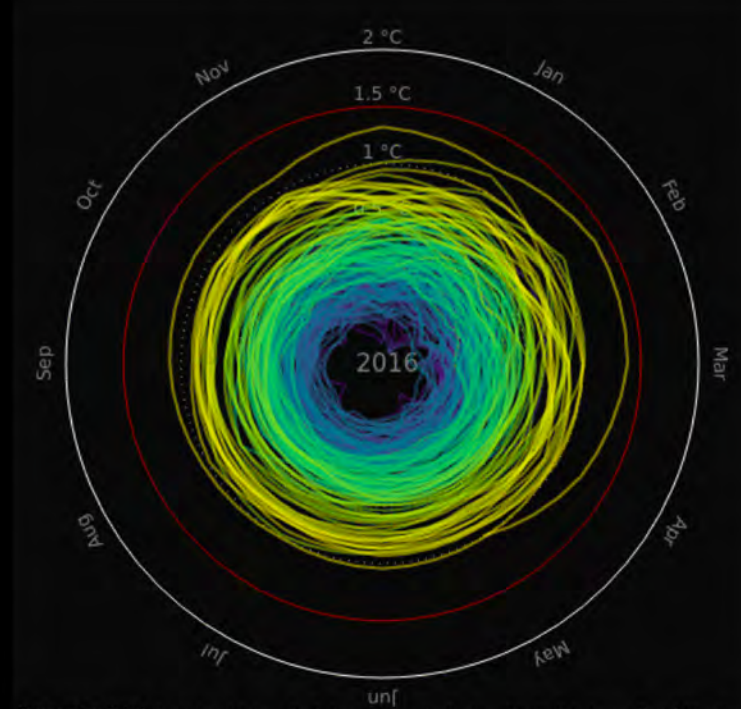
**Hautes études de sécurité et de défense, organisées par  
l'Institut royal supérieur de défense avec le soutien de  
l'Institut royal des relations internationales – Egmont,  
École royale militaire, Bruxelles, 12 October 2019**

**Thanks to the Walloon government for supporting  
[www.plateforme-wallonne-giec.be](http://www.plateforme-wallonne-giec.be) & my team at UCLouvain**

## CO<sub>2</sub> Concentration and Temperature spirals



Concentration Spiral pik-potsdam.de/primap-live/ & climatecollege.unimelb.edu.au, Gieseke, Meinshausen. Thx to Ed Hawkins



Temperature Spiral pik-potsdam.de/primap-live & climatecollege.unimelb.edu.au, Gieseke, Meinshausen. Thx to Ed Hawkins

CO<sub>2</sub> Concentration since 1850 and Global Mean Temperature in °C relative to 1850 – 1900  
Graph: Ed Hawkins (Climate Lab Book) – Data: HadCRUT4 global temperature dataset  
Animation available on <http://openclimatedata.net/climate-spirals/concentration-temperature/>

# “Climate Change War” Is Not a Metaphor

The U.S. military is preparing for conflict, retired Navy Rear Adm. David Titley says in an interview

*On our current path, climate change could pose an irreversible, **existential risk to civilization as we know it**—but we can still fix it if we decide to work together.*

# 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





**What is happening in the climate system?**

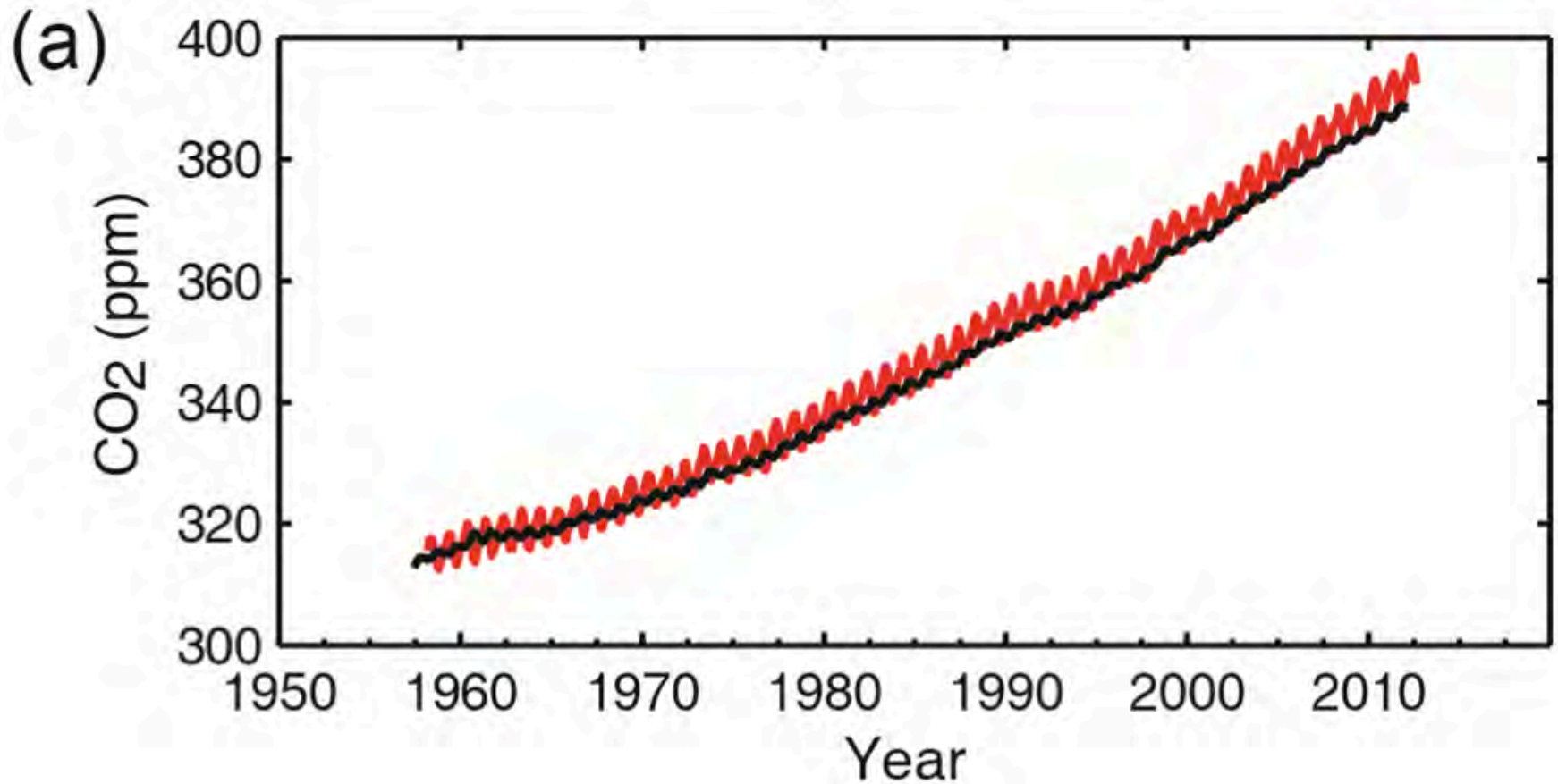
**What are the risks?**

**What can be done?**

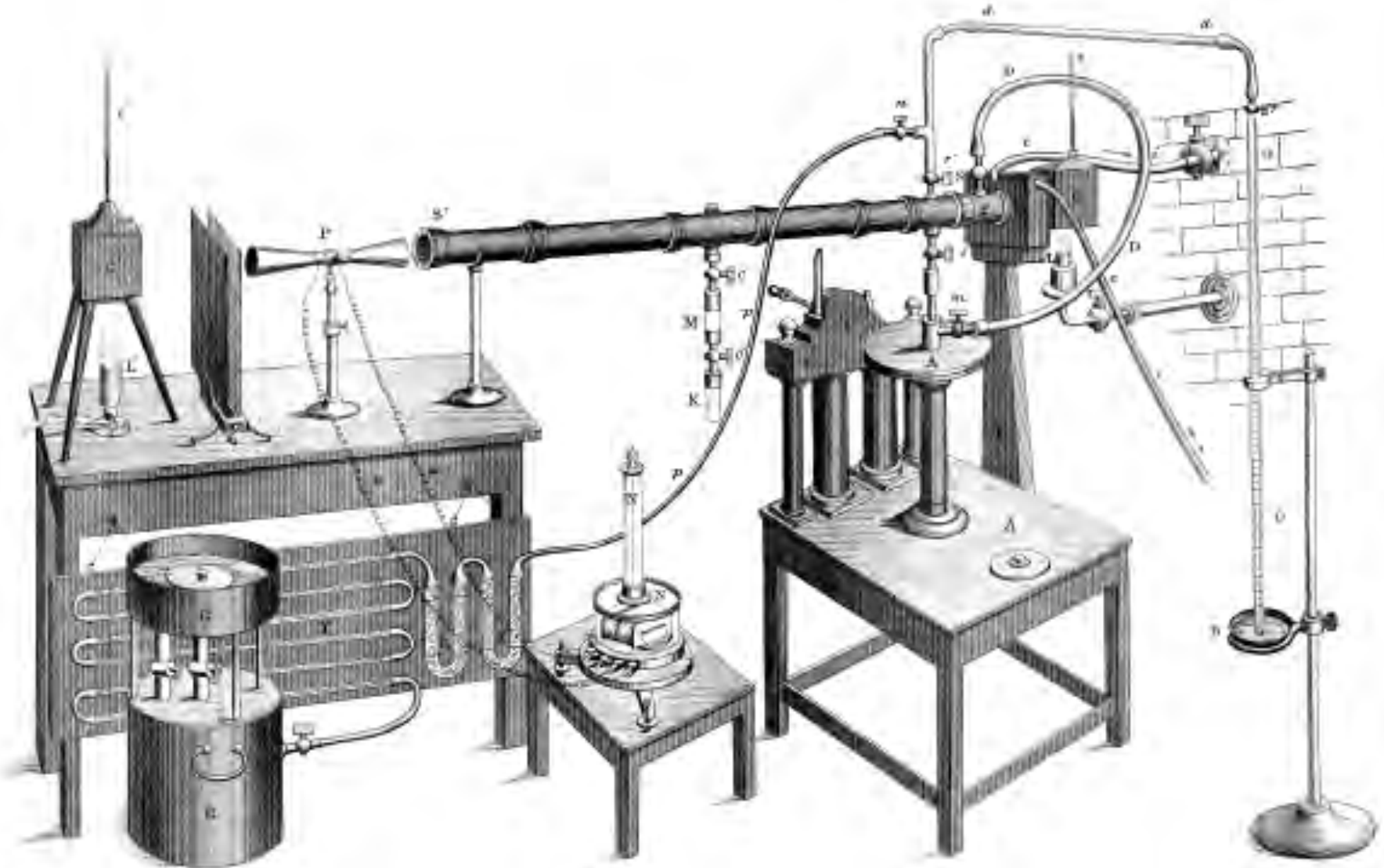


# What is happening in the climate system?

# Atmospheric CO<sub>2</sub> concentration







**Tyndall (1861) measures gas absorption of radiation as a function of wavelength**

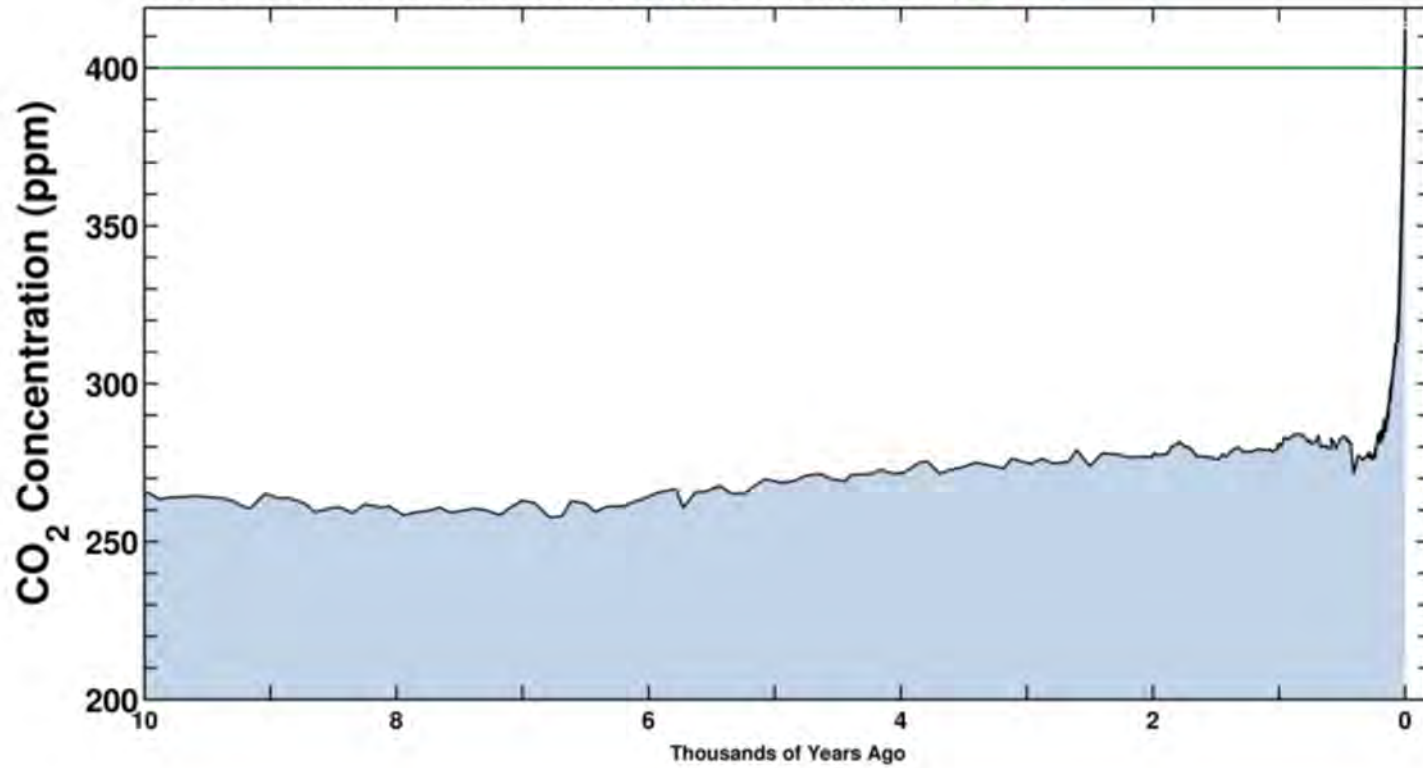


# CO<sub>2</sub> Concentration, 13 May 2019 (Keeling curve)

Latest CO<sub>2</sub> reading  
May 13, 2019

415.50 ppm

Ice-core data before 1958. Mauna Loa data after 1958.



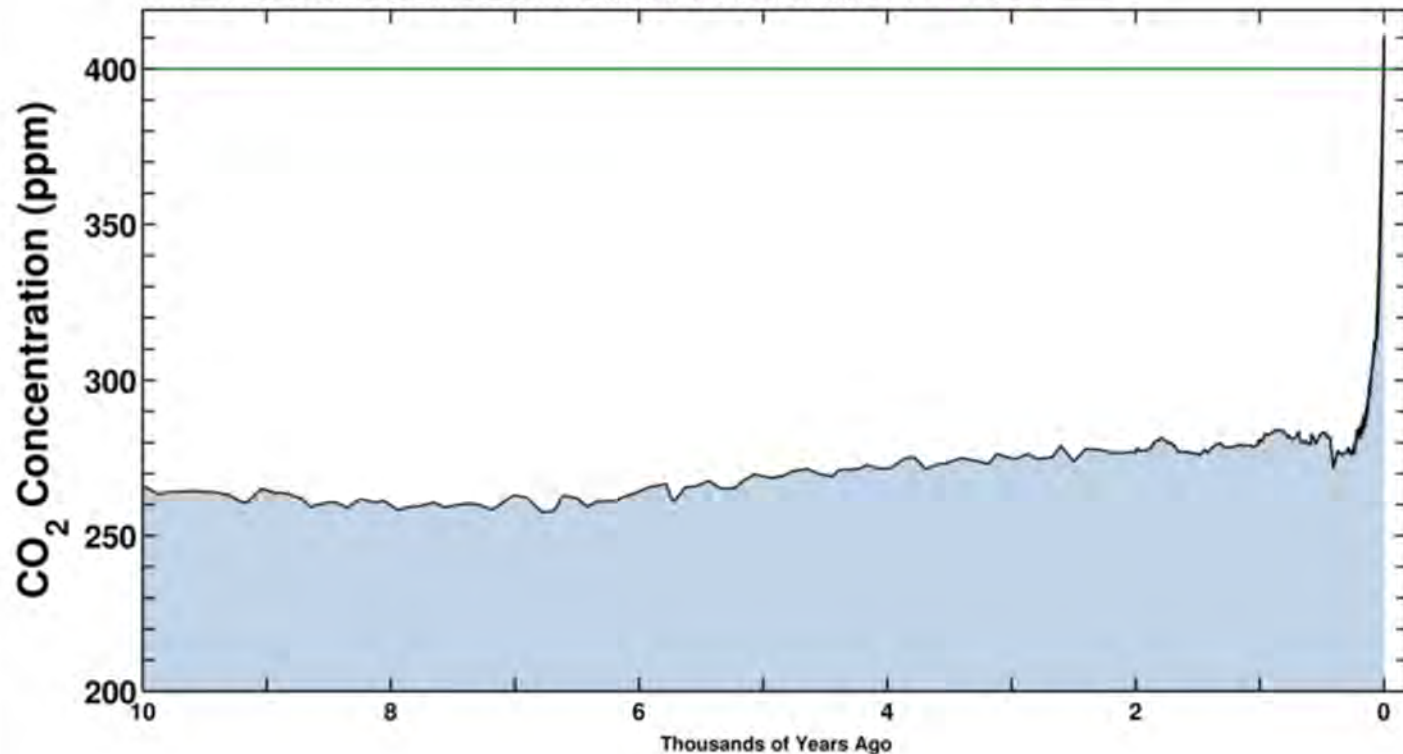
Source: [scripps.ucsd.edu/programs/keelingcurve/](https://scripps.ucsd.edu/programs/keelingcurve/)

# CO<sub>2</sub> Concentration, 28 May 2018 (Keeling curve)

Latest CO<sub>2</sub> reading  
May 28, 2018

411.98 ppm

Ice-core data before 1958. Mauna Loa data after 1958.



Source: [scripps.ucsd.edu/programs/keelingcurve/](https://scripps.ucsd.edu/programs/keelingcurve/)

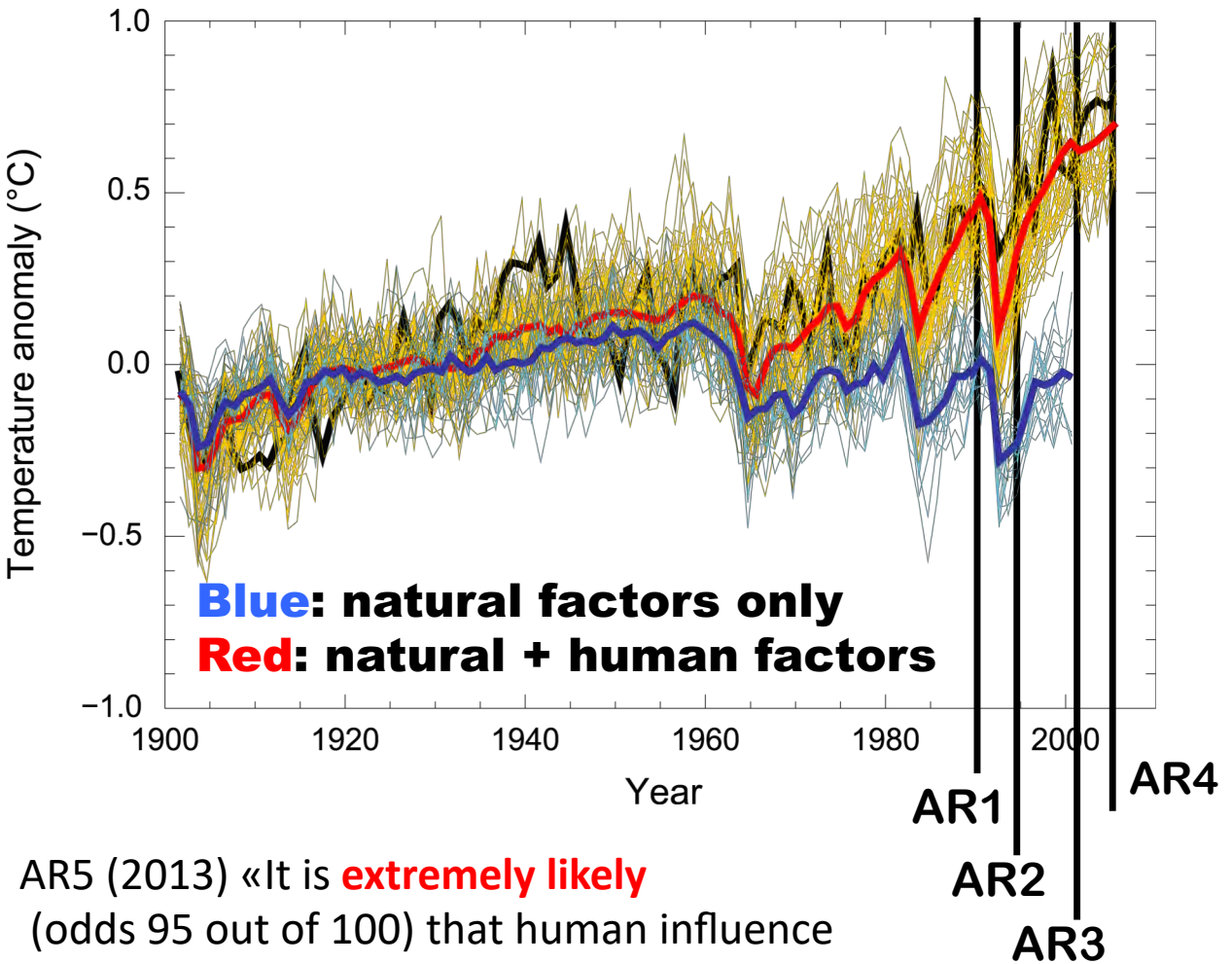
# A Progression of Understanding: Greater and Greater Certainty in Attribution

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

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

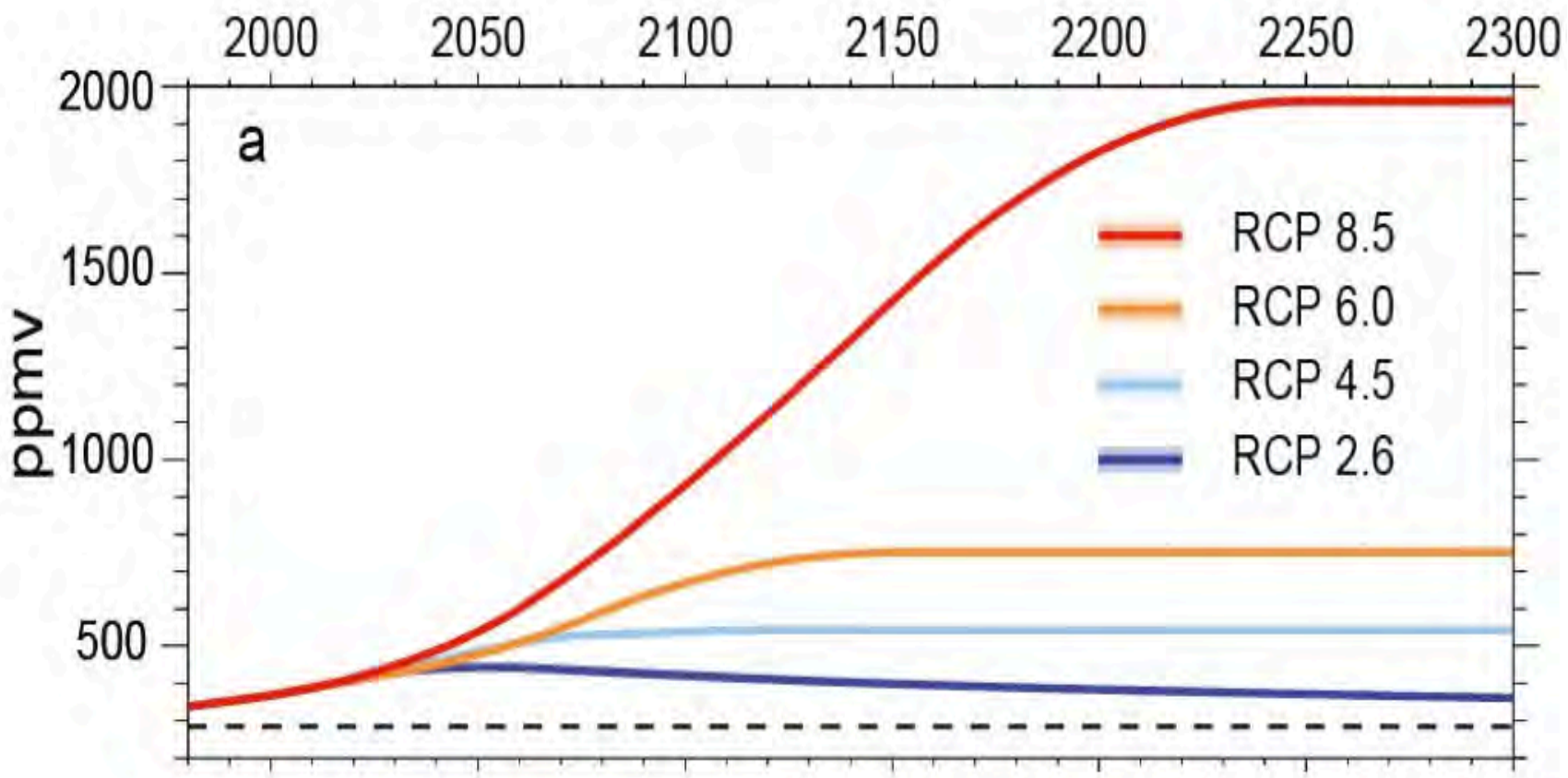
AR3 (2001): “most of  
the warming of the  
past 50 years is **likely**  
(odds 2 out of 3) due  
to human activities”

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



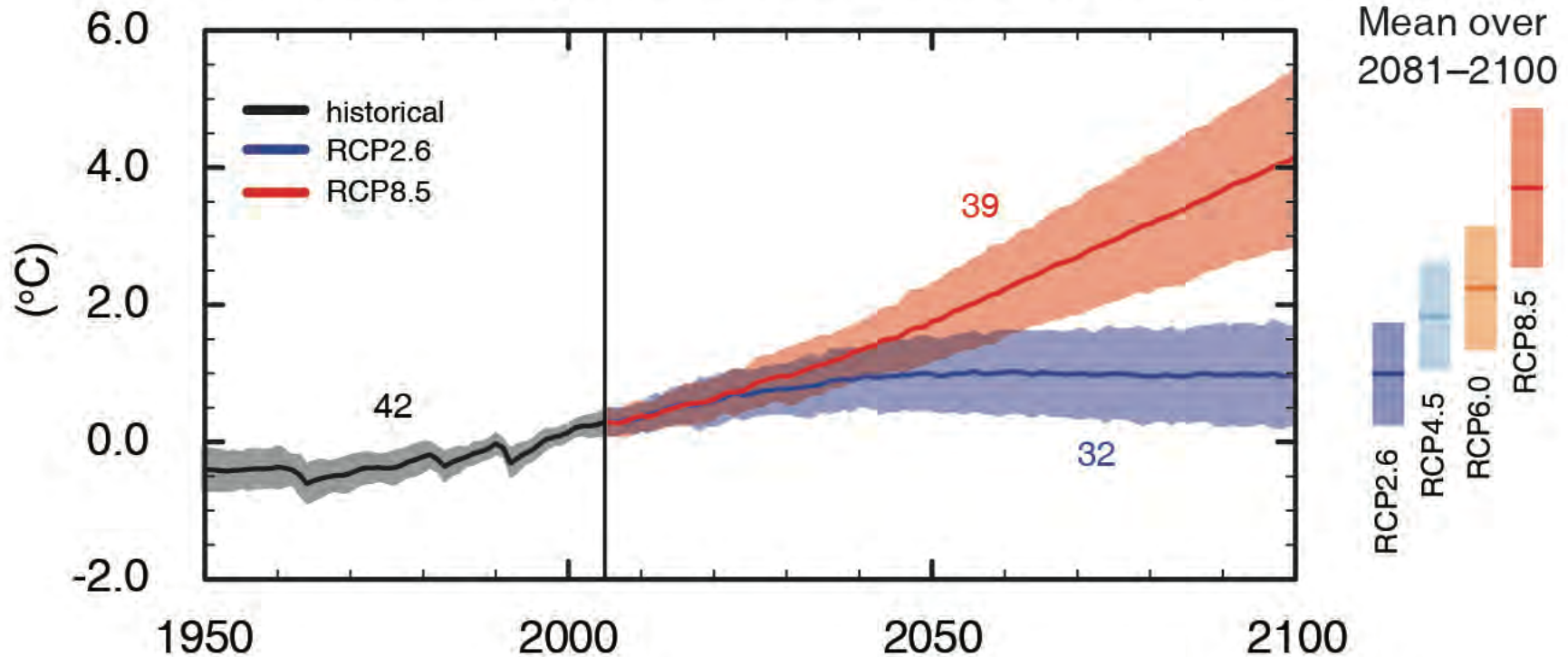
AR5 (2013) «It is **extremely likely**  
(odds 95 out of 100) that human influence  
has been the dominant cause... »

# RCP Scenarios: Atmospheric CO<sub>2</sub> concentration



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

## Global average surface temperature change

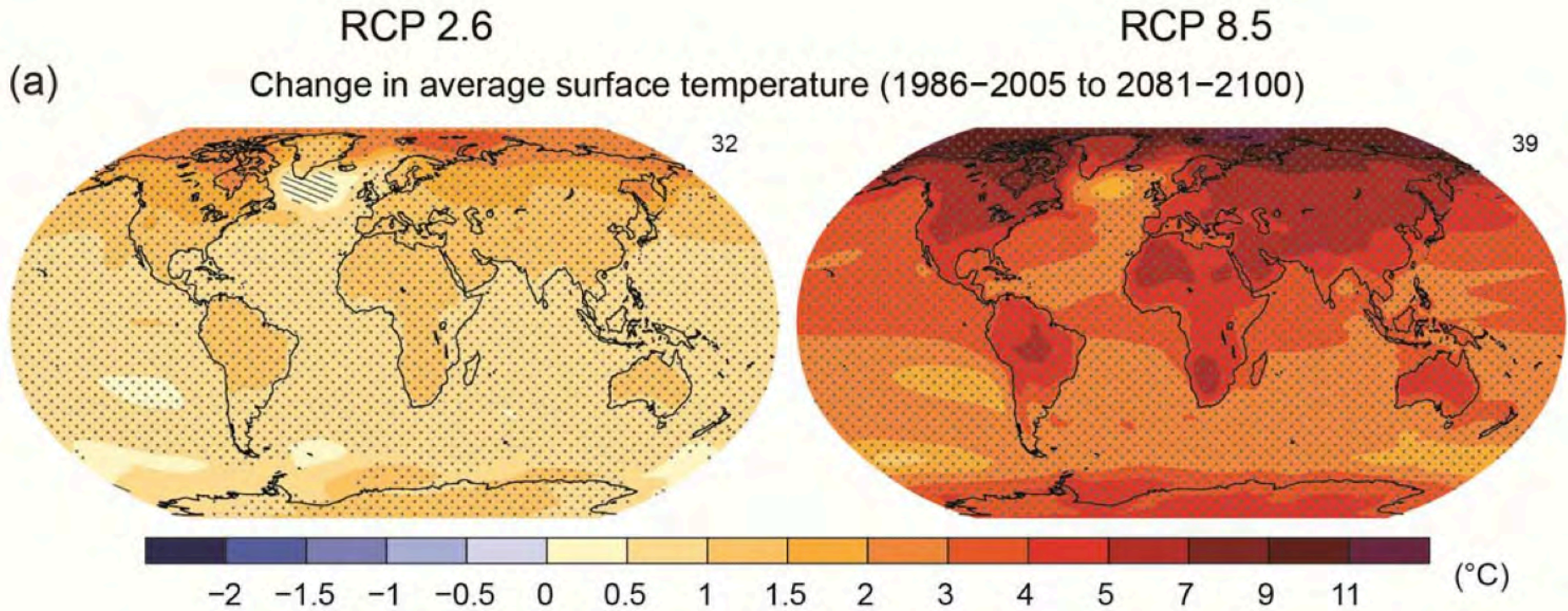


(IPCC 2013, Fig. SPM.7a)

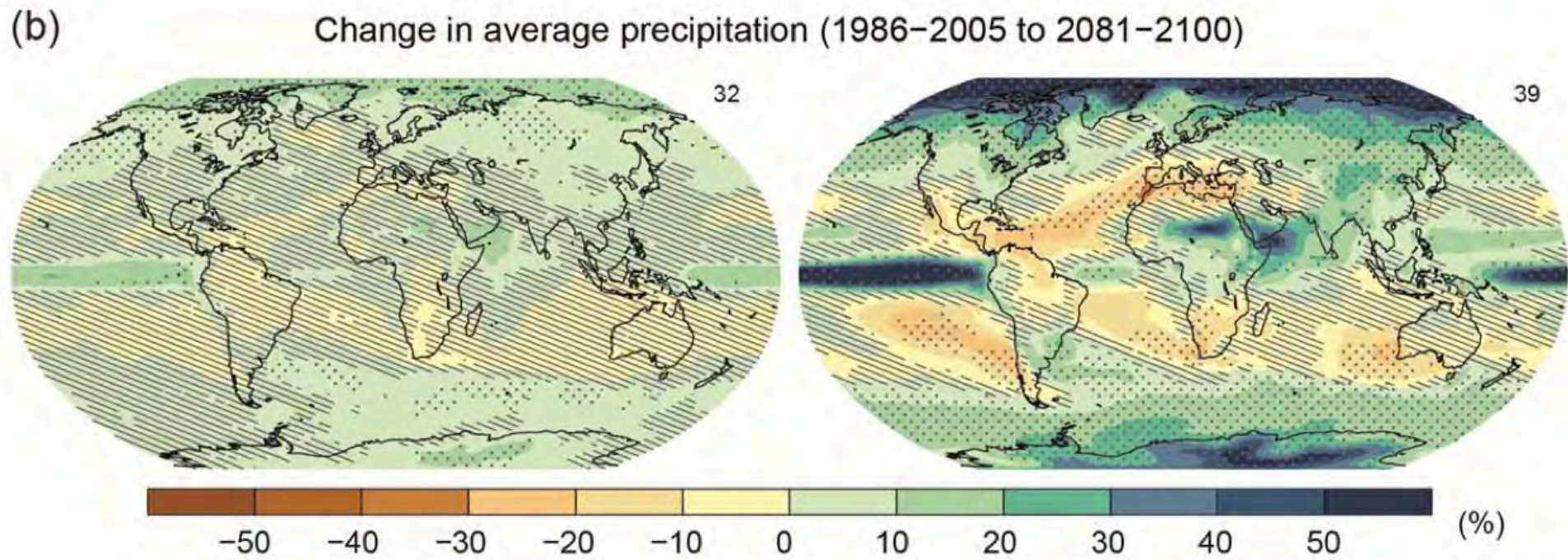
Only the lowest (RCP2.6) scenario maintains the global surface temperature increase above the pre-industrial level to less than 2°C with at least 66% probability



# Surface temperature projections

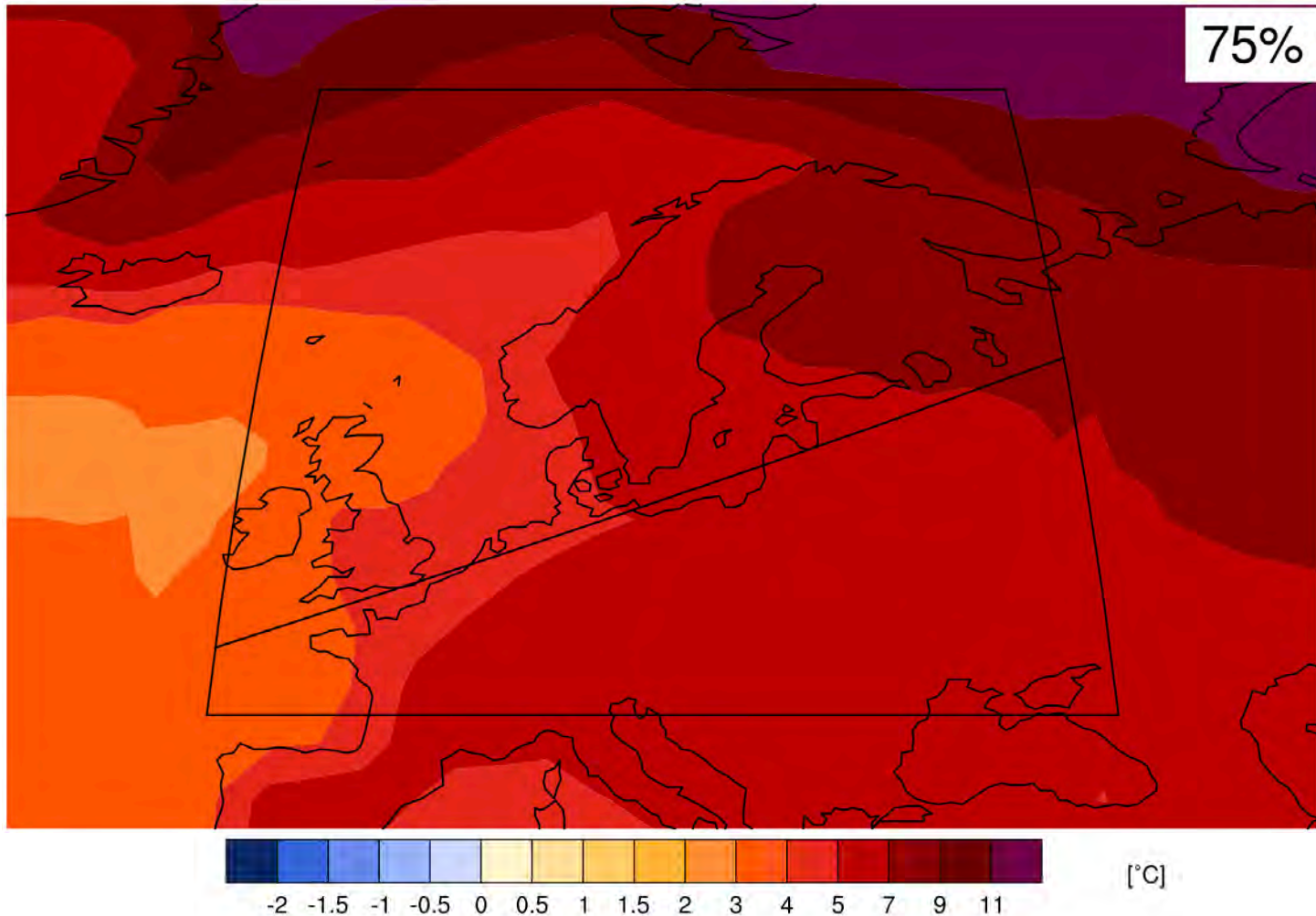


# Precipitation projections





# North Europe - Map of temperature changes: 2081–2100 with respect to 1986–2005 in the RCP8.5 scenario (annual)



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



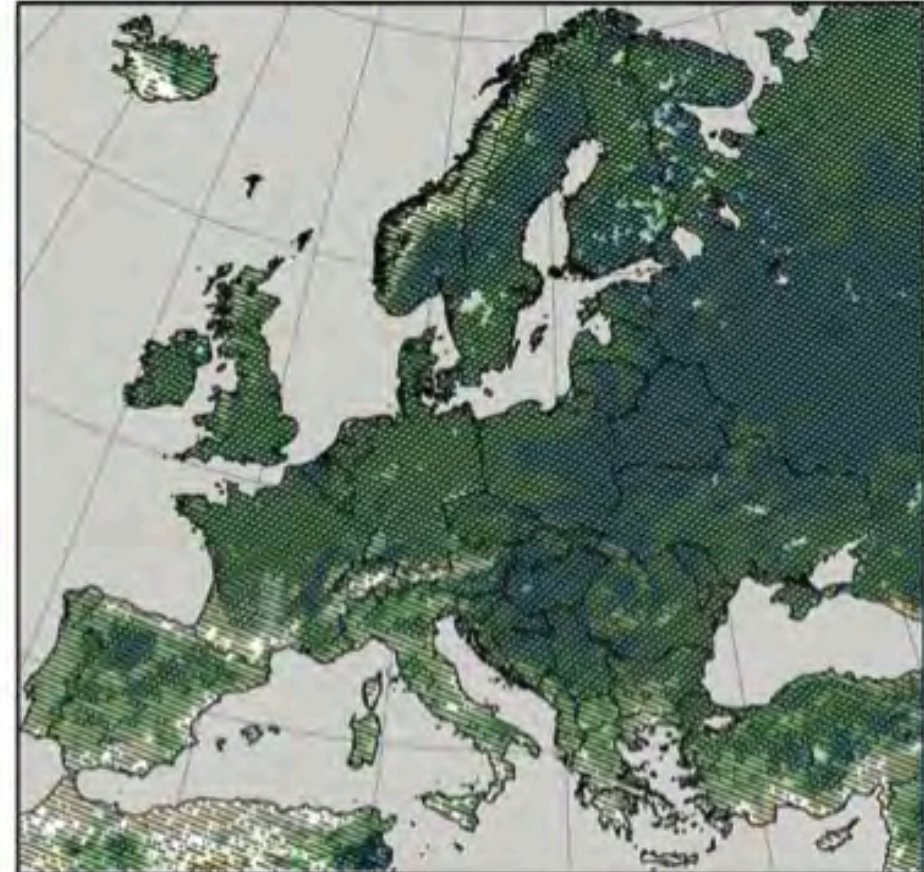
There is evidence that anthropogenic influences, including increasing atmospheric **greenhouse gas concentrations**, have changed these extremes



# DJF seasonal changes in heavy precipitation (%), 2071-2100 compared to 1971-2000

RCP4.5

RCP8.5



Seasonal changes in heavy precipitation in percent



/// Significant change

\\\\ Robust change



**Extreme precipitation can affect public infrastructure...**



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

# 18-20000 years ago (Last Glacial Maximum)

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



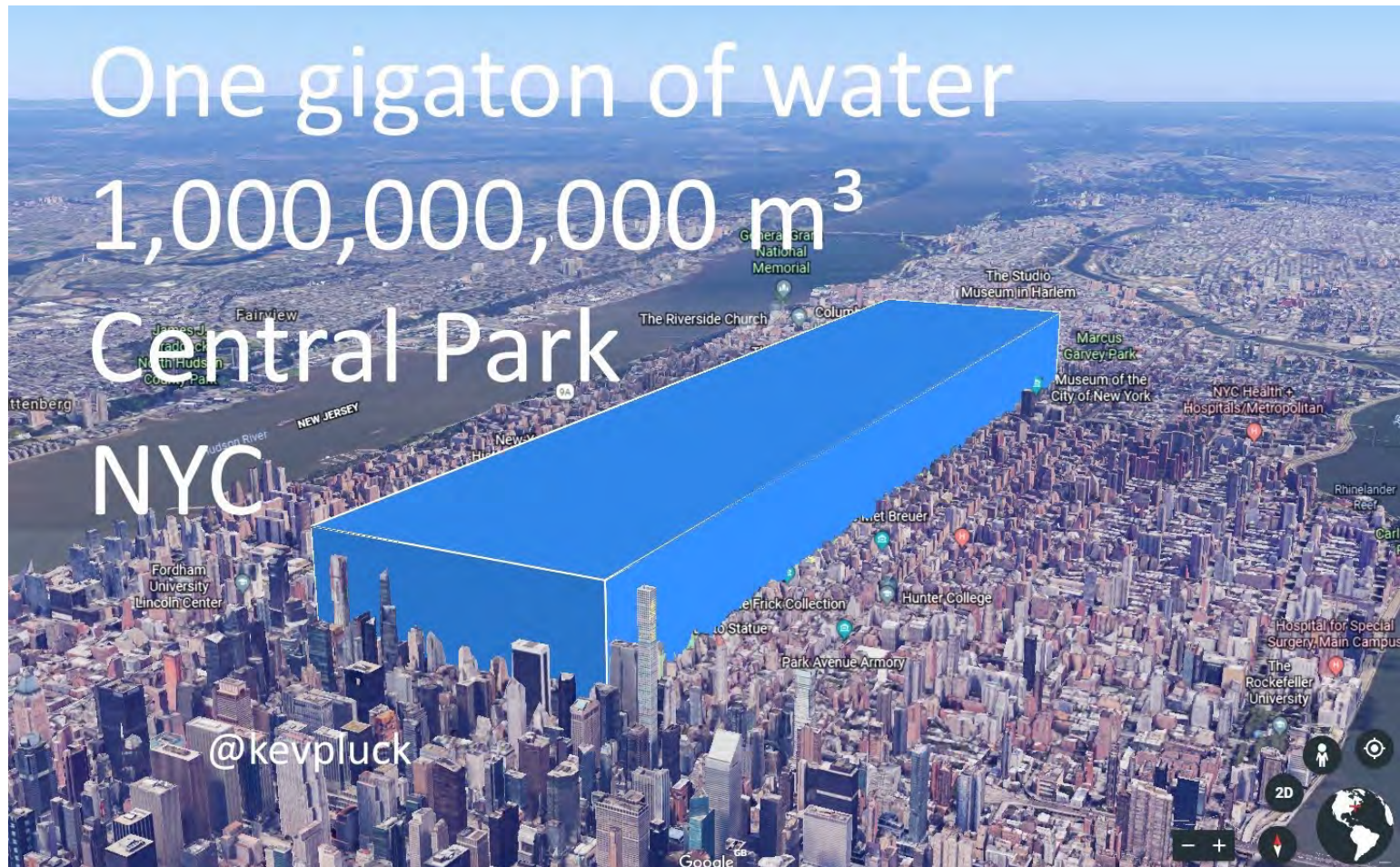


# Today, with +4-5° C globally

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



# The Antarctic Ice Sheet presently loses 1 Gt of water every 1.5 day



Source: @Kevpluck, June 2018

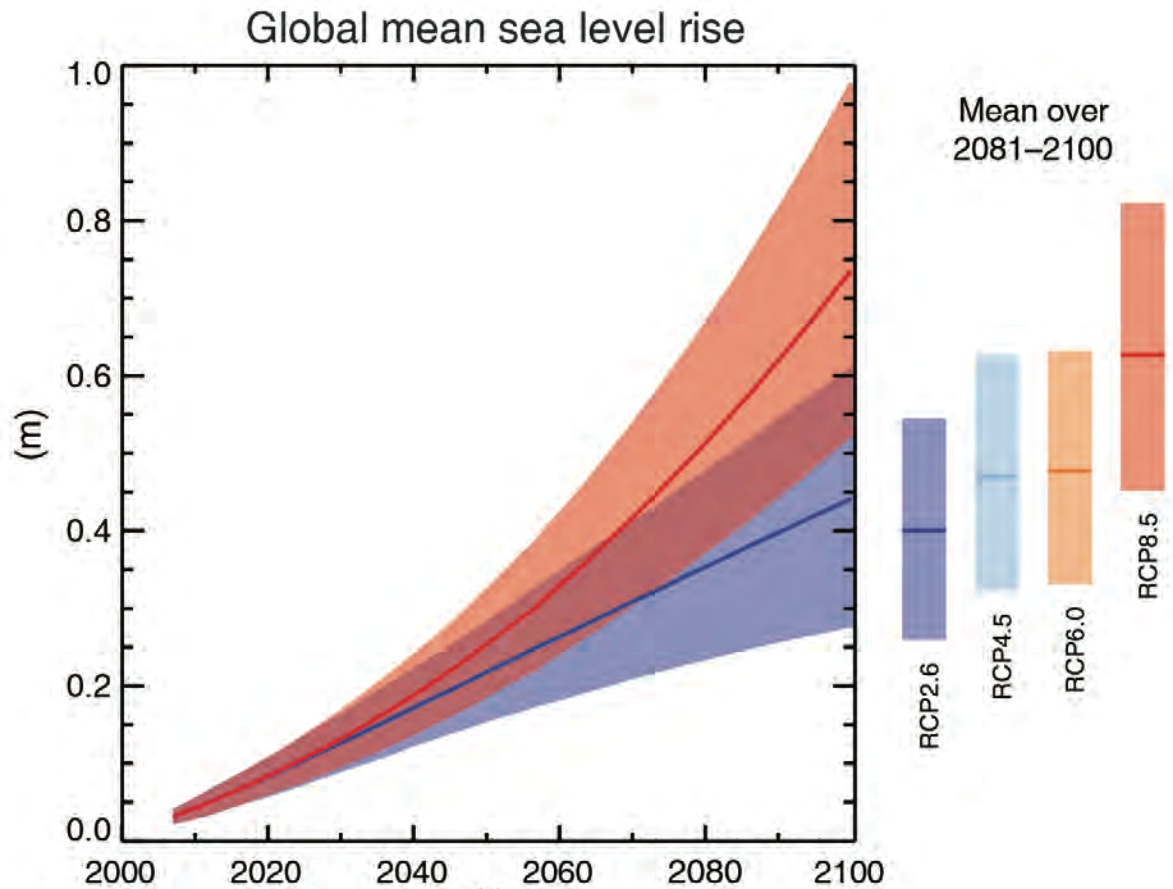


Fig. SPM.9

RCP2.6 (2081-2100), *likely* range: 26 to 55 cm

RCP8.5 (in 2100), *likely* range: 52 to 98 cm

**(Reference level: 1986-2005)**





## What are the risks?

# 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

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







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# ADAPTATION IS

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# ALREADY OCCURRING



# Effects on the Nile Delta, where more than 10 million people live less than 1 m above sea level



NB: + 1 m is possible  
in the next 100 years...

(Time 2001)

**With 8 metre sea-level rise: 3700 km<sup>2</sup> below sea-level in Belgium  
(very possible in year 3000)  
(NB: flooded area depends on protection)**

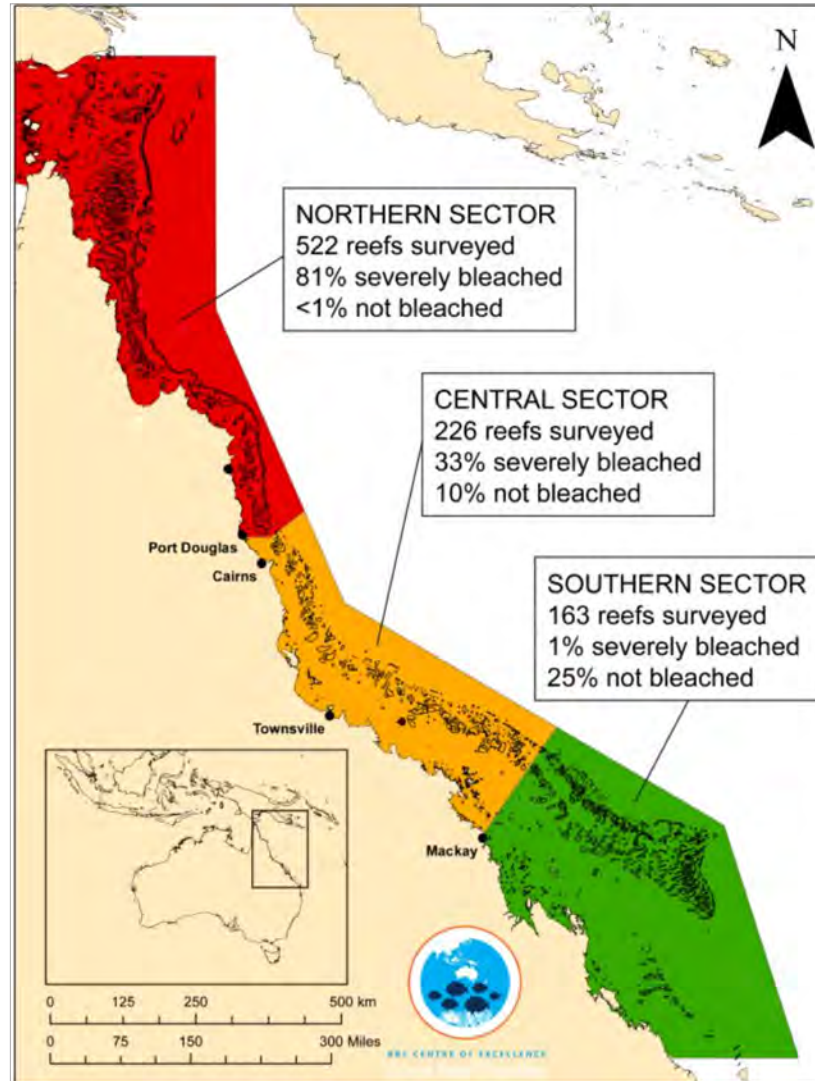


Source: J.P. van Ypersele et P. Marbaix (2004) See [www.climate.be/impacts](http://www.climate.be/impacts)

# **Ecosystems suffer more and more, while our wellbeing depends on their good state**

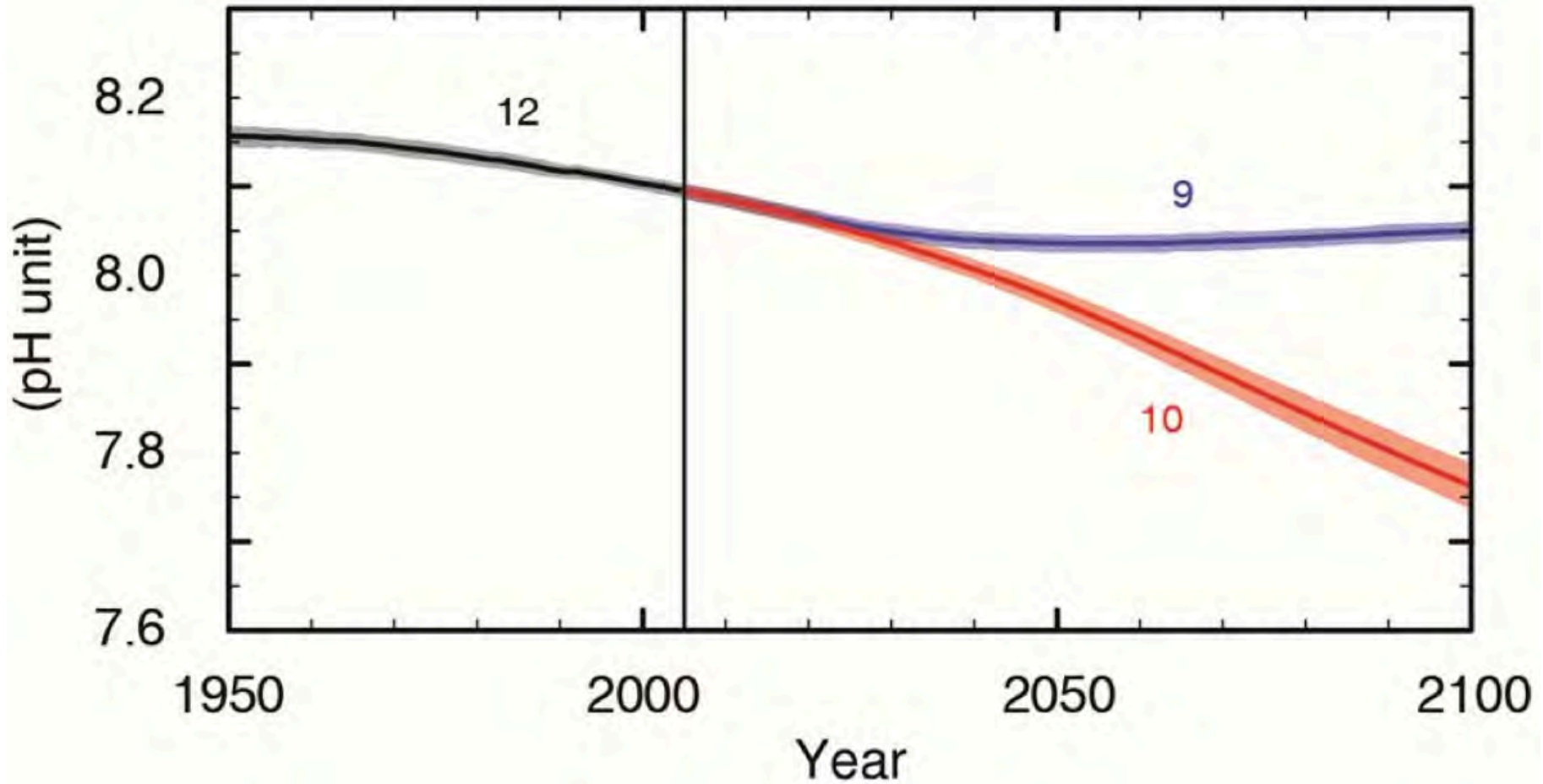
The « Sixth Extinction » has started, and  
climate change is one of the causing factors

# 2016: Only 7% of the Great Barrier Reef has avoided coral bleaching



# Global ocean surface pH (projections)

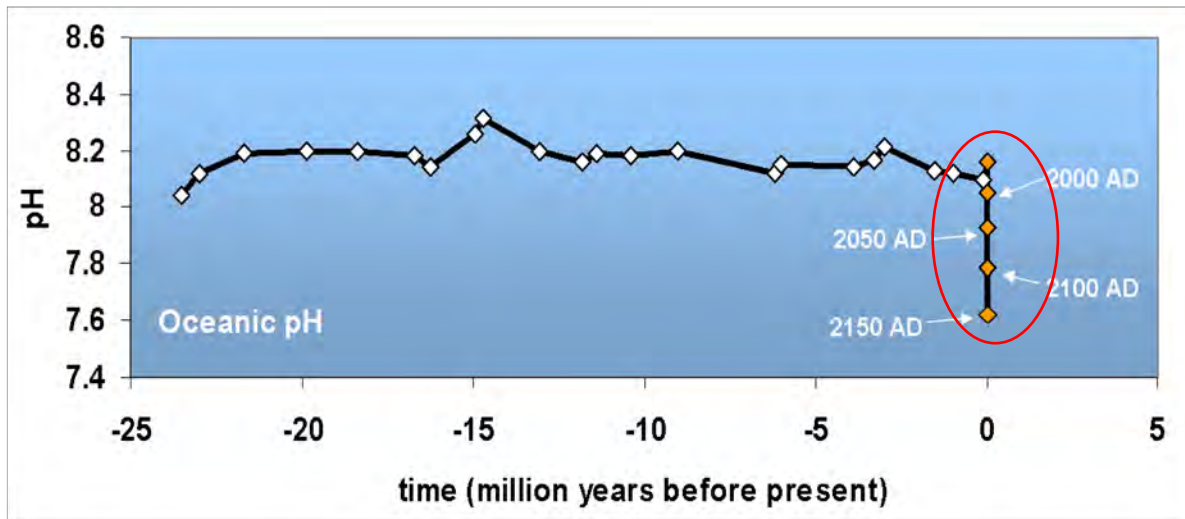
**Ocean Acidification, for RCP 8.5 (orange) & RCP2.6 (blue)**





# Oceans are Acidifying Fast...

Changes in pH over the last 25 million years



“Today is a rare event in the history of the World”

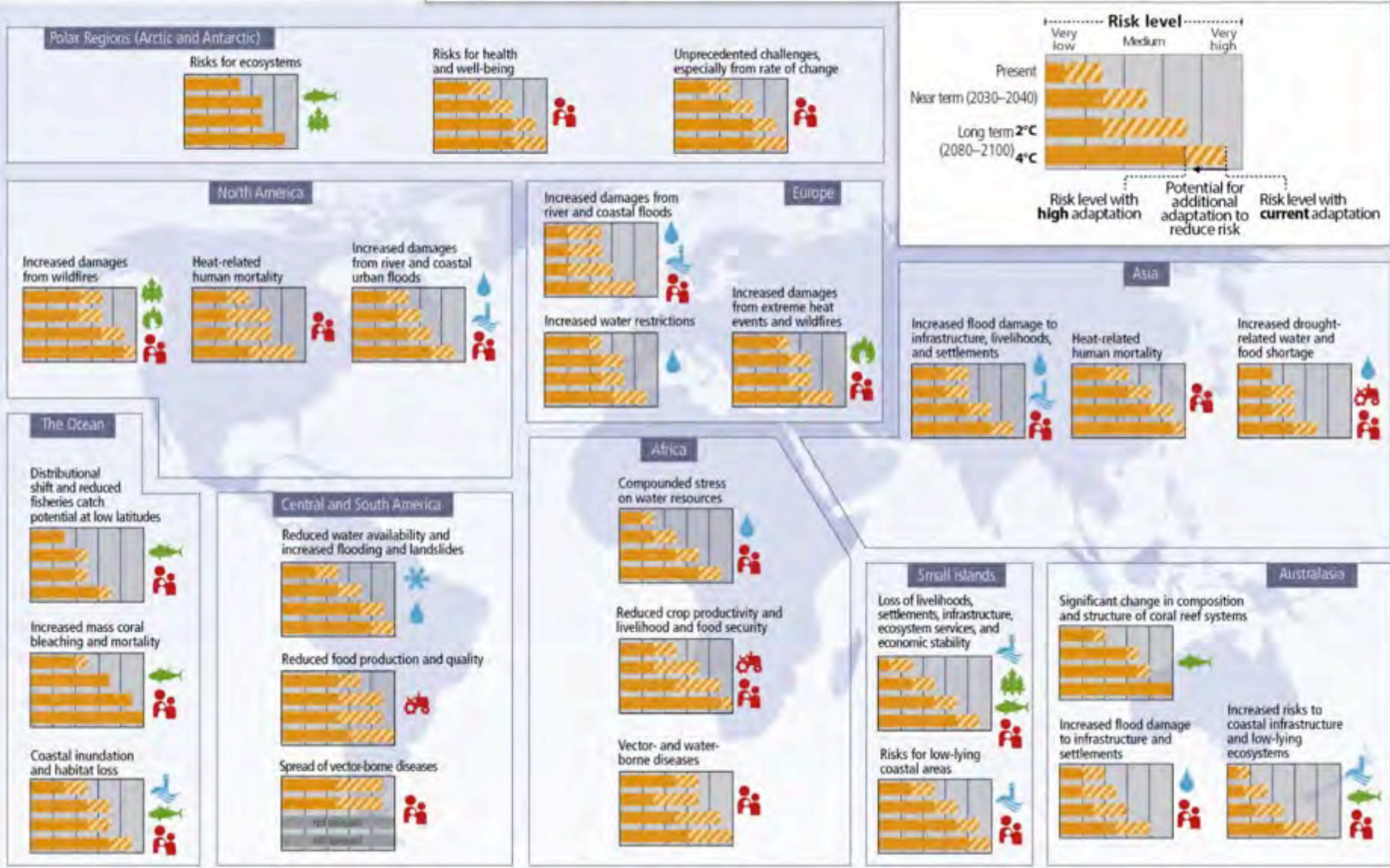
- It is happening now, at a **speed and to a level** not experienced by marine organisms for about 60 million years
- Mass extinctions linked to previous ocean acidification events
- Takes 10,000' s of years to recover

Turley et al. 2006

Slide courtesy of Carol Turley, PML

# Regional key risks and potential for risk reduction

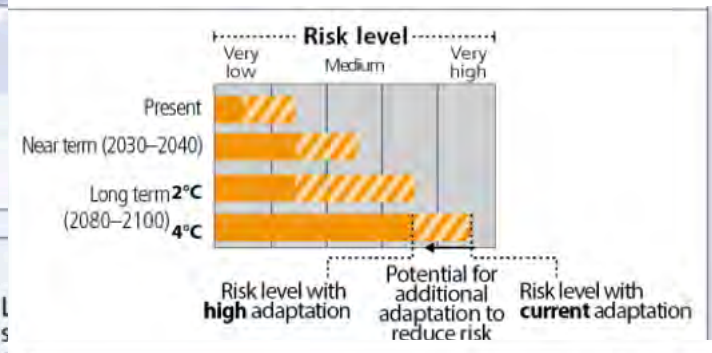
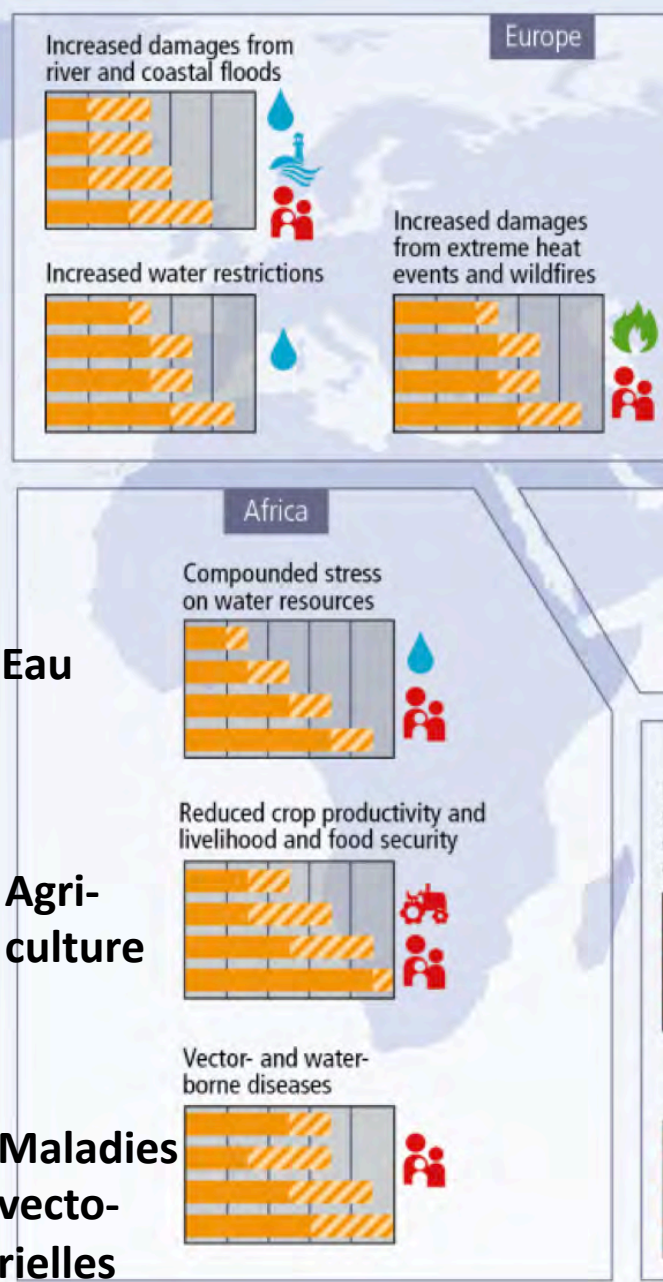
## Representative key risks for each region for



IPCC, AR5, SPM, Figure SPM.8





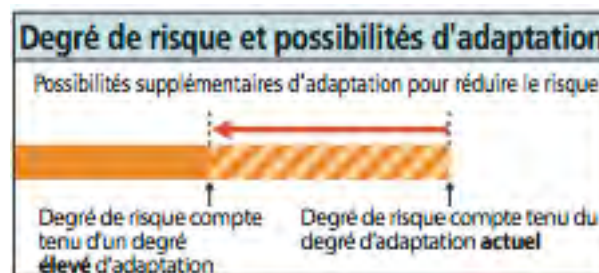
# Risques clés à l'échelle régionale et potentiel de réduction du risque par l'adaptation: Afrique




# Risque majeur pour l'Afrique: eau

Aggravation des pressions exercées sur les ressources hydriques déjà lourdement sollicitées par la surexploitation et la dégradation, et qui feront face à l'avenir à une demande accrue. Stress dû à la sécheresse exacerbé dans les régions africaines déjà exposées à ce fléau (*degré de confiance élevé*).


Facteurs climatiques	Échéancier	Risques et possibilités d'adaptation		
		Très faibles	Modérés	Très élevés
 	Moment présent	[Barre à 25% remplie]		
	Court terme (2030–2040)	[Barre à 50% remplie]		
	Long terme 2°C (2080–2100) 4°C	[Barre à 75% remplie]		



Facteurs déterminants des incidences liées au climat										
										
Tendance au réchauffement	Température extrême	Tendance à l'assèchement	Précipitations extrêmes	Précipitations	Enneigement	Cyclones destructeurs	Niveau de la mer	Acidification des océans	Fertilisation par le dioxyde de carbone	

# Risque majeur pour l'Afrique: agriculture

Baisse de la productivité des cultures due à la chaleur et à la sécheresse — dont les conséquences sur les moyens de subsistance et la sécurité alimentaire des pays, des régions et des ménages pourraient être graves — ainsi qu'aux dommages causés par les ravageurs, les maladies et les inondations sur l'infrastructure des systèmes alimentaires (*degré de confiance élevé*)

Facteurs climatiques	Échéancier	Risques et possibilités d'adaptation		
		Très faibles	Modérés	Très élevés
	Moment présent	[Bar chart showing moderate risk]		
	Court terme (2030–2040)	[Bar chart showing moderate risk]		
	Long terme 2°C (2080–2100) 4°C	[Bar chart showing high risk]		












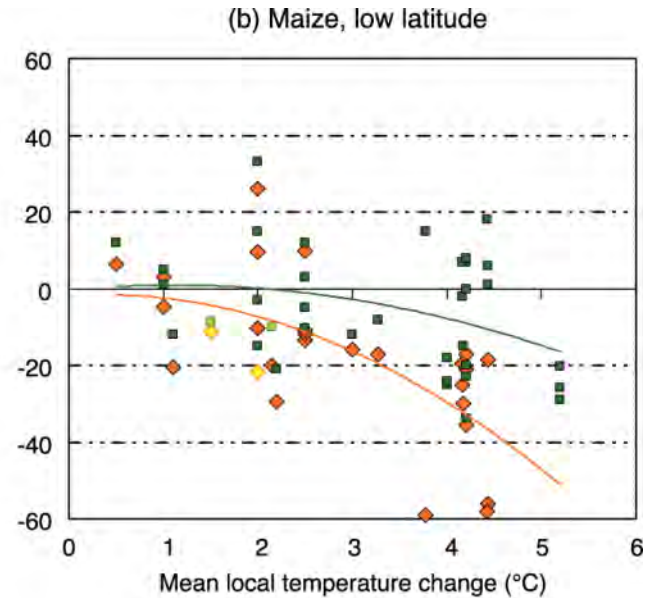
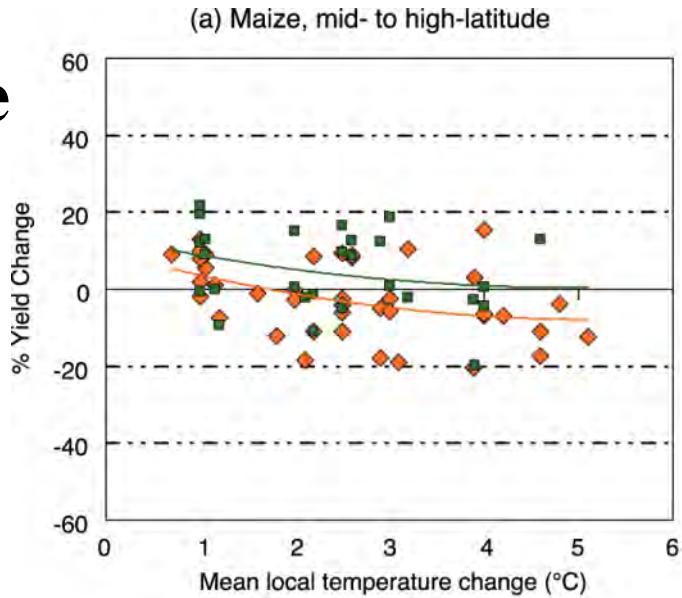
Facteurs déterminants des incidences liées au climat									
									
Tendance au réchauffement	Température extrême	Tendance à l'assèchement	Précipitations extrêmes	Précipitations	Enneigement	Cyclones destructeurs	Niveau de la mer	Acidification des océans	Fertilisation par le dioxyde de carbone

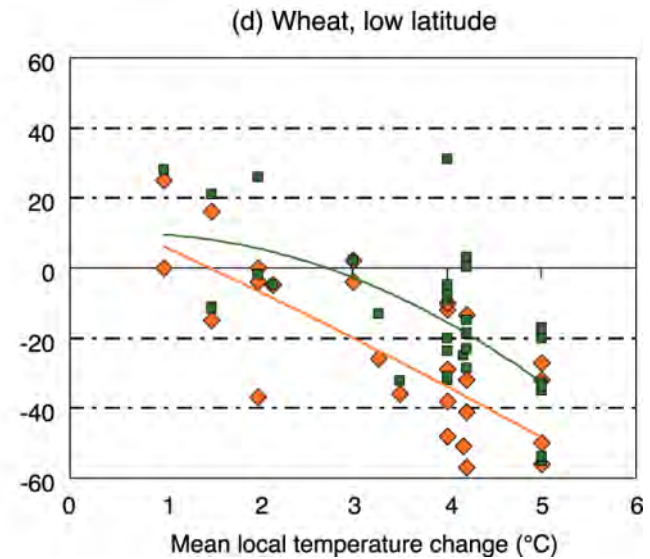
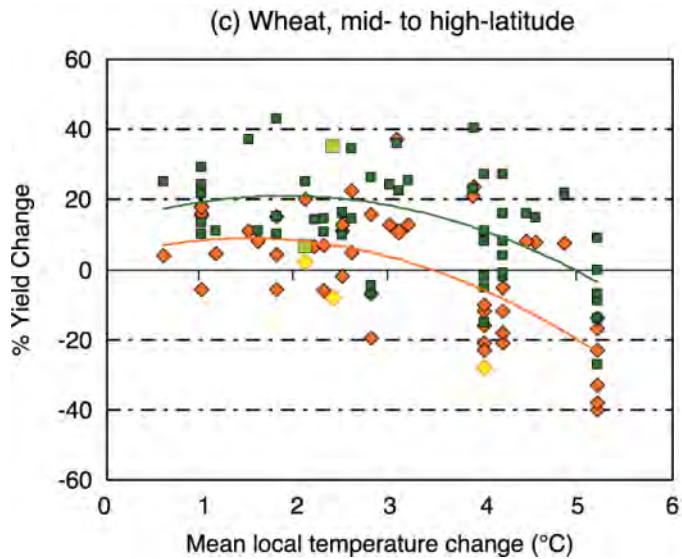


Figure TS.7. Sensitivity of cereal yield to climate change

**Maize**




**Wheat**



# Risque majeur pour l'Afrique: santé

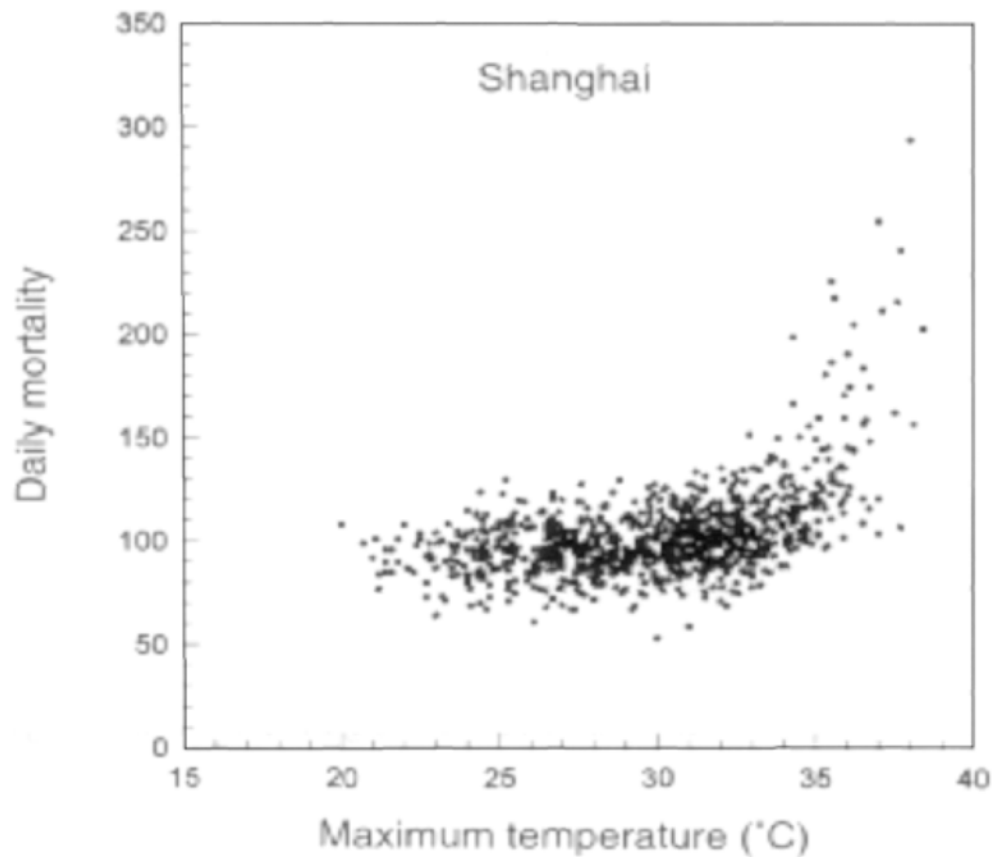
Variations de l'incidence et de l'extension géographique des maladies à transmission vectorielle ou d'origine hydrique dues à l'évolution des températures et des précipitations moyennes et de leur variabilité, en particulier aux limites de leurs aires de répartition (*degré de confiance moyen*)

Facteurs climatiques	Échéancier	Risques et possibilités d'adaptation		
		Très faibles	Modérés	Très élevés
	Moment présent	[Bar chart showing moderate risk]		
	Court terme (2030–2040)	[Bar chart showing moderate risk]		
	Long terme 2°C (2080–2100) 4°C	[Bar chart showing high risk]		





# Relationship between maximum temperature and mortality in Shanghai, China, 1980-89



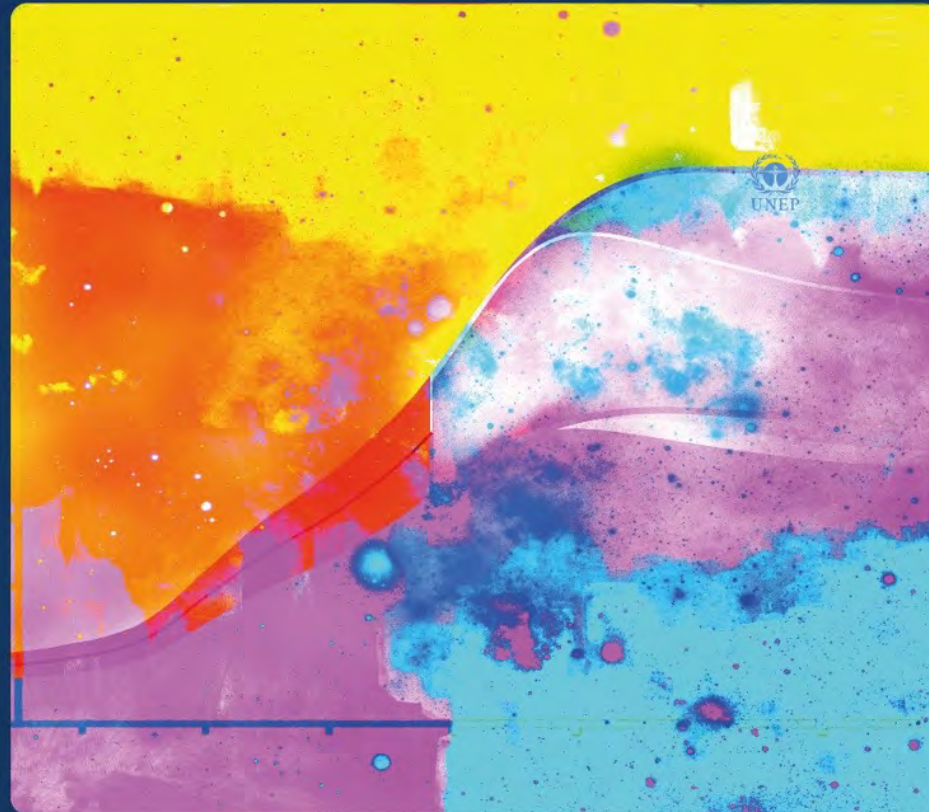
Référence : CLIMATE CHANGE AND HUMAN HEALTH, 1996

Jean-Pascal van Ypersele  
(vanyp@climate.be)

# The SR15






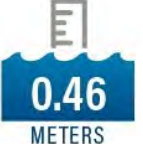






# Global Warming of 1.5°C

An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

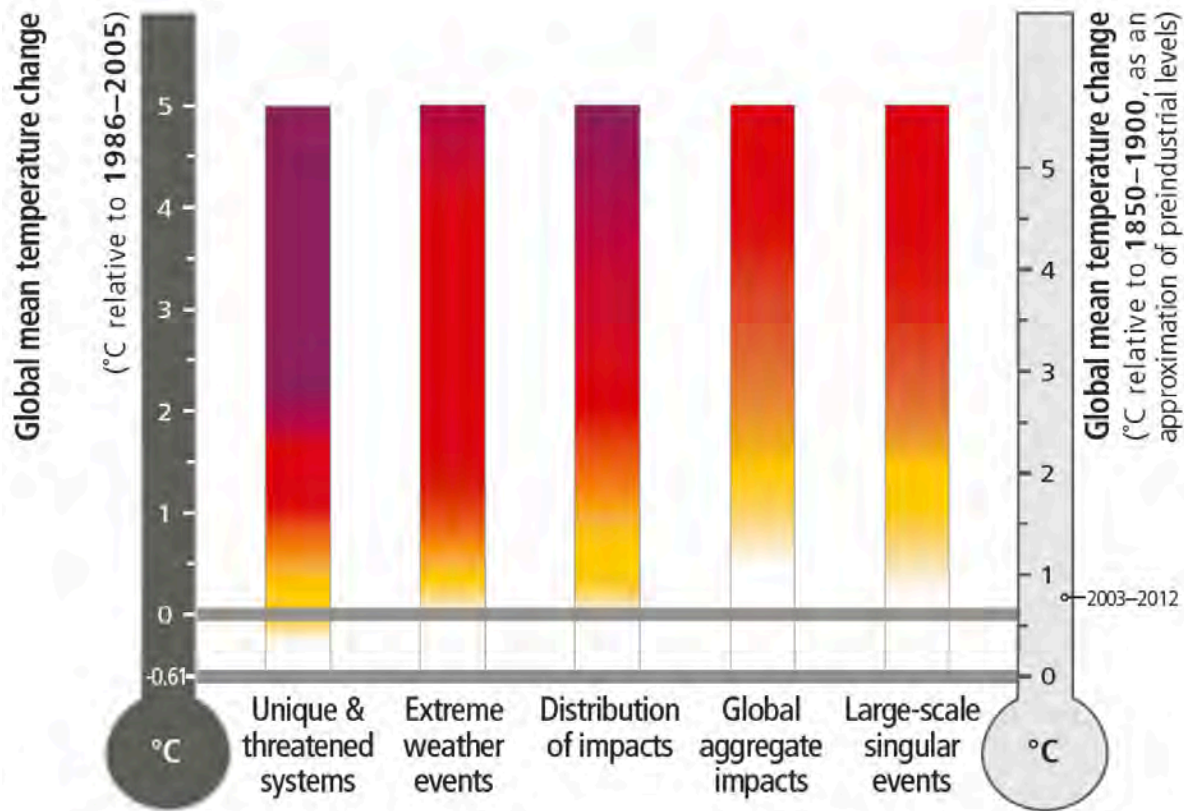


# HALF A DEGREE OF WARMING MAKES A BIG DIFFERENCE:

EXPLAINING IPCC'S 1.5°C SPECIAL REPORT

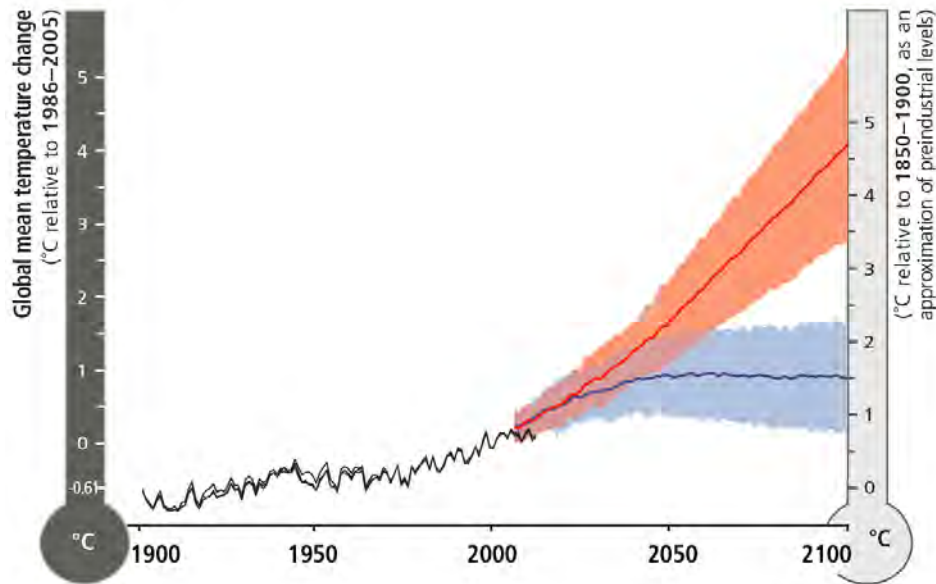
	1.5°C	2°C	2°C IMPACTS
<b>EXTREME HEAT</b> Global population exposed to severe heat at least once every five years	 <p>14%</p>	 <p>37%</p>	<p><b>2.6x</b> WORSE</p>
<b>SEA-ICE-FREE ARCTIC</b> Number of ice-free summers	<p>AT LEAST 1 EVERY <b>100 YEARS</b></p> 	<p>AT LEAST 1 EVERY <b>10 YEARS</b></p> 	<p><b>10x</b> WORSE</p>
<b>SEA LEVEL RISE</b> Amount of sea level rise by 2100	 <p><b>0.40</b> METERS</p>	 <p><b>0.46</b> METERS</p>	<p><b>.06M</b> MORE</p>
<b>SPECIES LOSS: VERTEBRATES</b> Vertebrates that lose at least half of their range	 <p>4%</p>	 <p>8%</p>	<p><b>2x</b> WORSE</p>
<b>SPECIES LOSS: PLANTS</b> Plants that lose at least half of their range	 <p>8%</p>	 <p>16%</p>	<p><b>2x</b> WORSE</p>
<b>SPECIES LOSS: INSECTS</b> Insects that lose at least half of their range	 <p>6%</p>	 <p>18%</p>	<p><b>3x</b> WORSE</p>

Responsibility for content: WRI

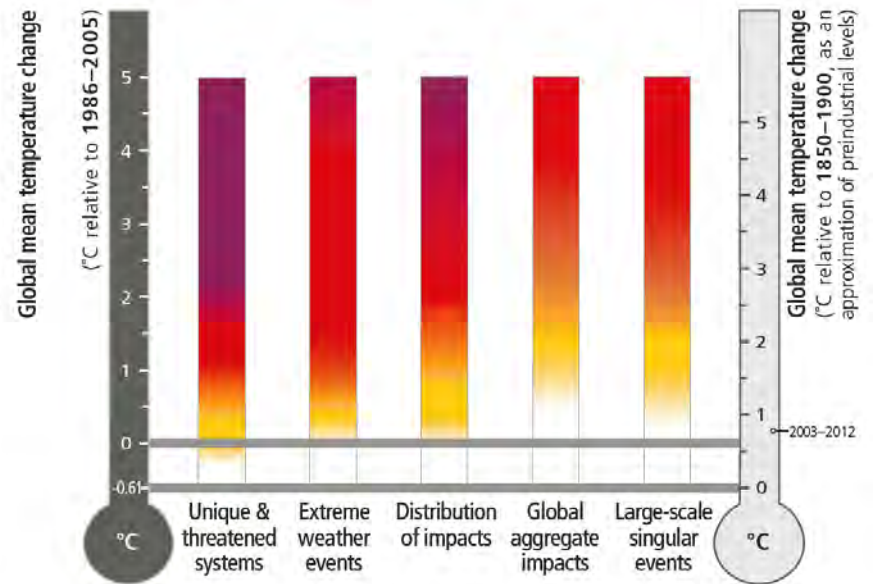


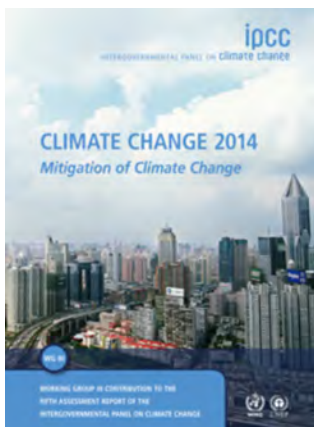
AR5, WGII, Box SPM.1 Figure 1





- Observed
- RCP8.5 (a high-emission scenario)
- Overlap
- RCP2.6 (a low-emission mitigation scenario)





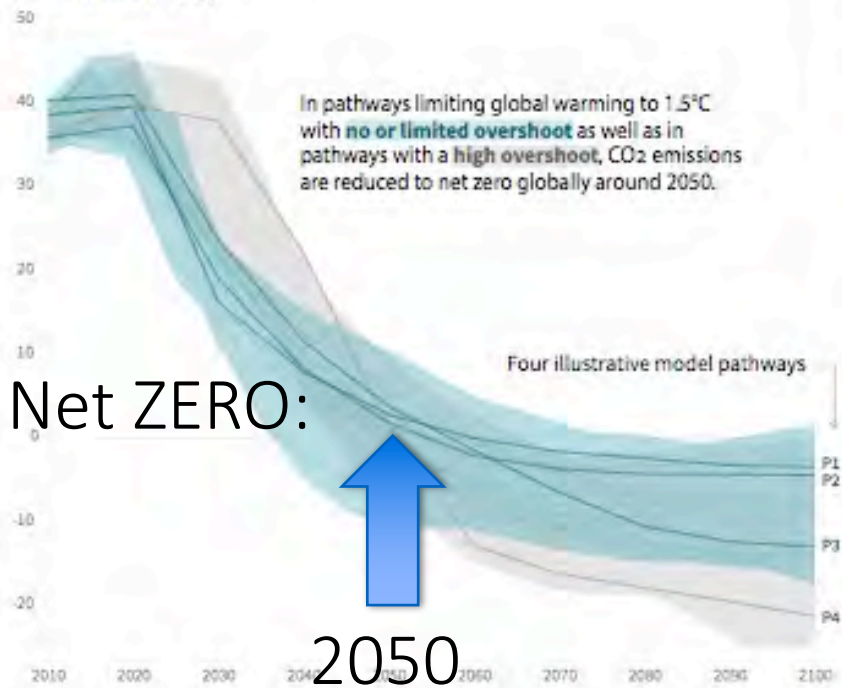
# What can be done?

## Global emissions pathway characteristics

General characteristics of the evolution of anthropogenic net emissions of CO<sub>2</sub>, and total emissions of methane, black carbon, and nitrous oxide in model pathways that limit global warming to 1.5°C with no or limited overshoot. Net emissions are defined as anthropogenic emissions reduced by anthropogenic removals. Reductions in net emissions can be achieved through different portfolios of mitigation measures illustrated in Figure SPM3B.

### Global total net CO<sub>2</sub> emissions

Billion tonnes of CO<sub>2</sub>/yr



#### Timing of net zero CO<sub>2</sub>

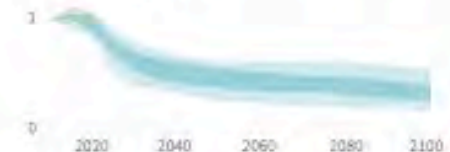
Line widths depict the 5-95th percentile and the 25-75th percentile of scenarios



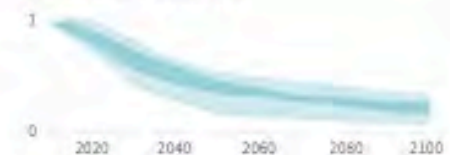
### Non-CO<sub>2</sub> emissions relative to 2010

Emissions of non-CO<sub>2</sub> forcers are also reduced or limited in pathways limiting global warming to 1.5°C with no or limited overshoot, but they do not reach zero globally.

#### Methane emissions



#### Black carbon emissions



#### Nitrous oxide emissions



# Greenhouse gas emissions pathways

- To limit warming to 1.5° C, CO<sub>2</sub> emissions fall by about 45% by 2030 (from 2010 levels)
  - Compared to 20% for 2° C
- To limit warming to 1.5° C, CO<sub>2</sub> emissions would need to reach 'net zero' around 2050
  - Compared to around 2075 for 2° C
- Reducing non-CO<sub>2</sub> emissions would have direct and immediate health benefits

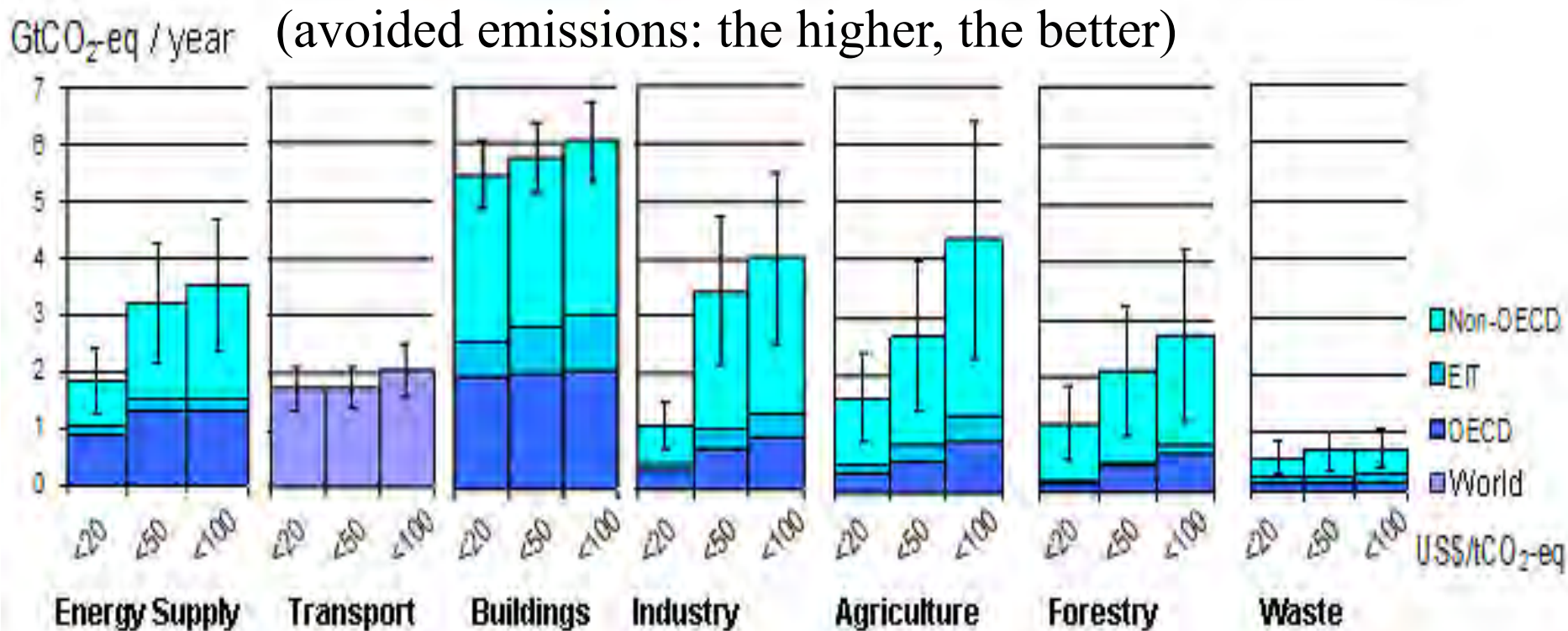


# Greenhouse gas emissions pathways

- Limiting warming to 1.5° C would require changes on an unprecedented scale
  - Deep emissions cuts in all sectors
  - A range of technologies
  - Behavioural changes
  - Increase investment in low carbon options

- **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 CO<sub>2</sub>-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.**

# All sectors and regions have the potential to contribute by 2030



IPCC AR4 (2007)

Note: estimates do not include non-technical options, such as lifestyle changes.



# Conférence sur les Changements Climatiques

## Nations Unies

COP21/CMP11

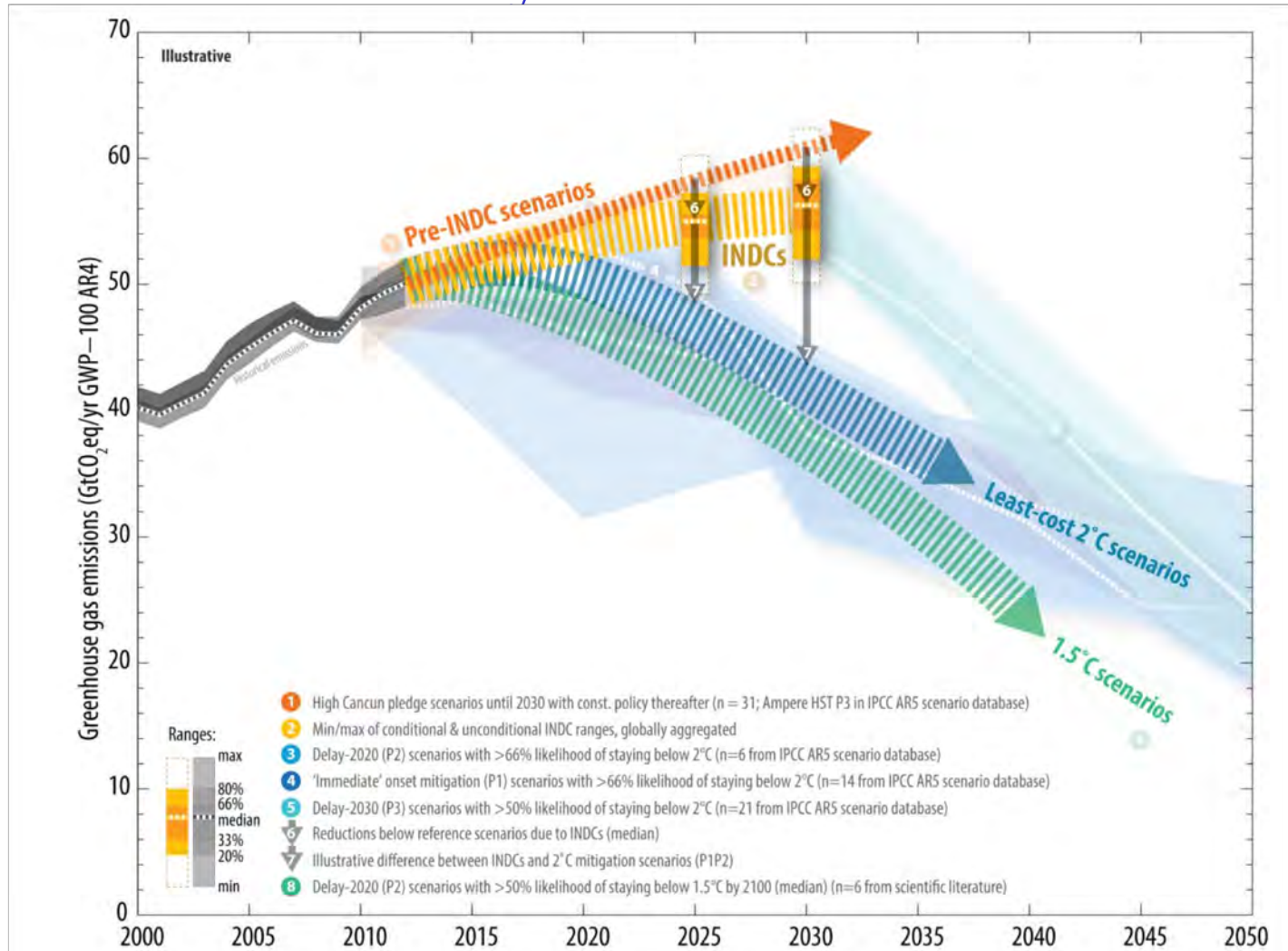
### Paris, France



SECRETAIRE EXECUTIVE CCNUCC

PRESIDENT

# Comparison of global emission levels in 2025 and 2030 resulting from the implementation of the intended nationally determined contributions



UNFCCC, Aggregate effect of the intended nationally determined contributions: an update

<http://unfccc.int/resource/docs/2016/cop22/eng/02.pdf>

# **Geopolitics, conflicts and peace**



## Climate change and conflicts: summary (IPCC AR5 WGII)

- Climate change [and climate variability] can indirectly increase risks of violent conflicts in the form of civil war and inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks (medium confidence)
- Violent conflict increases vulnerability to climate change  
Large-scale conflicts harms assets that facilitate adaptation, including infrastructure, institutions, natural resources, social capital and livelihood opportunities

## Does climate change cause violent conflicts?

- Some factors that increase risks from violent conflicts and civil wars are sensitive to climate change
  - For example [...] factors like low per capita income, economic contraction, and inconsistent state institutions are associated with the incidence of civil wars, and also seem to be sensitive to climate change.
- Climate-change policies, particularly those associated with changing rights to resources, can also increase risks from violent conflict.
- While statistical studies document a relationship between climate variability and conflict, there remains much disagreement about whether climate change directly causes violent conflicts

# Will climate change cause war between countries?

- Climate change has the potential to increase rivalry between countries over shared resources
  - For example, (...) rivalry over changing access to the resources in the Arctic and in transboundary river basins.
- Climate changes represent a challenge to the effectiveness of the diverse institutions that already exist to manage relations over these resources.
- However, there is high scientific agreement that this increased rivalry is **unlikely** to lead **directly** to **warfare between states**.
  - The evidence to date shows that the nature of resources such as transboundary water and a range of conflict resolution institutions have been able to resolve rivalries in ways that avoid violent conflict.



## Climate change - conflict: insights from the past ?

- Some studies show that the Little Ice Age in the mid-17th century was associated with more cases of political upheaval and warfare than in any other period, but (...) findings from historical antecedents are not directly transferable to the contemporary globalized world.
- collectively the research **does not conclude** that there is a **strong positive relationship** between warming and armed conflict
- There is some agreement that either increased rainfall or decreased **rainfall** in **resource-dependent economies** **enhances the risk of localized violent conflict**, particularly in pastoral societies in Africa (...)  
**Institutions** able to peacefully manage conflict are highlighted as the critical factor in mediating such risks

# Violent Conflict and Vulnerability to Climate Change

- development studies and political science show that violent conflict undermines capacity to cope with changes
- conflict creates poverty and constrains livelihoods that, in turn, increases vulnerability to the impacts of climate change; violent conflict is a major cause of hunger and famines.
- armed conflict can decrease the capacity of governments to function effectively as well as the capacity for collective action, which also impedes adaptation

# State Integrity and Geopolitical Rivalry

- Examples

- sea-level rise and other changes compromise human security, in particular in countries made up entirely of low-lying atolls
- Productive ocean fisheries are already directly affected by climate change (...) the movement of fish stocks has been suggested to increase transboundary rivalry
- The **impacts of climate-induced water variability on transboundary water basins** generates geopolitical concerns (...) particularly where challenges stemming from rising consumption and growing populations are already present.
- Uncertainty and high likelihood of differential geographic impacts of **geoengineering** are anticipated sources of tension or conflict between states. These include regional effects of solar radiation management on reduced precipitation in specific areas in Asia or in the Sahel with negative food production implications

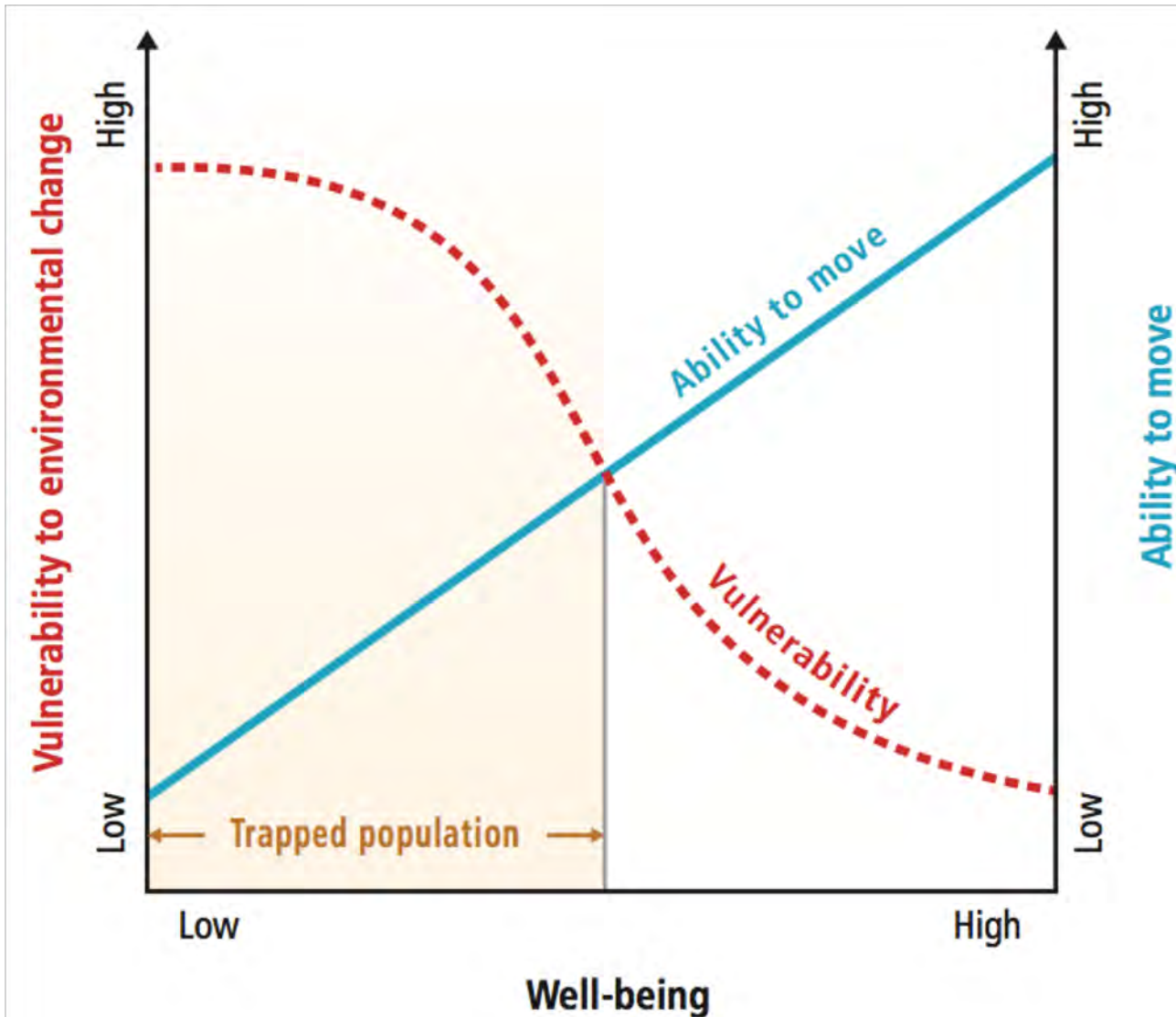


# Geopolitical Dimensions of Climate Change Impacts in the Arctic

- The Arctic has been warming at about twice the global rate since 1980, resulting in unprecedented loss in sea ice
- These changes have implications for land-based infrastructure, shipping, resource extraction, coastal communities, and transport
- There is medium evidence that changes will create or revive terrestrial and maritime boundary disputes among Arctic countries. There is little evidence the changing Arctic will become a site for violent conflict between states
- At present, political institutions are providing forums for managing resource competition, new transportation practices, and boundary disputes, but anticipated increased stresses will test these institutions in the future

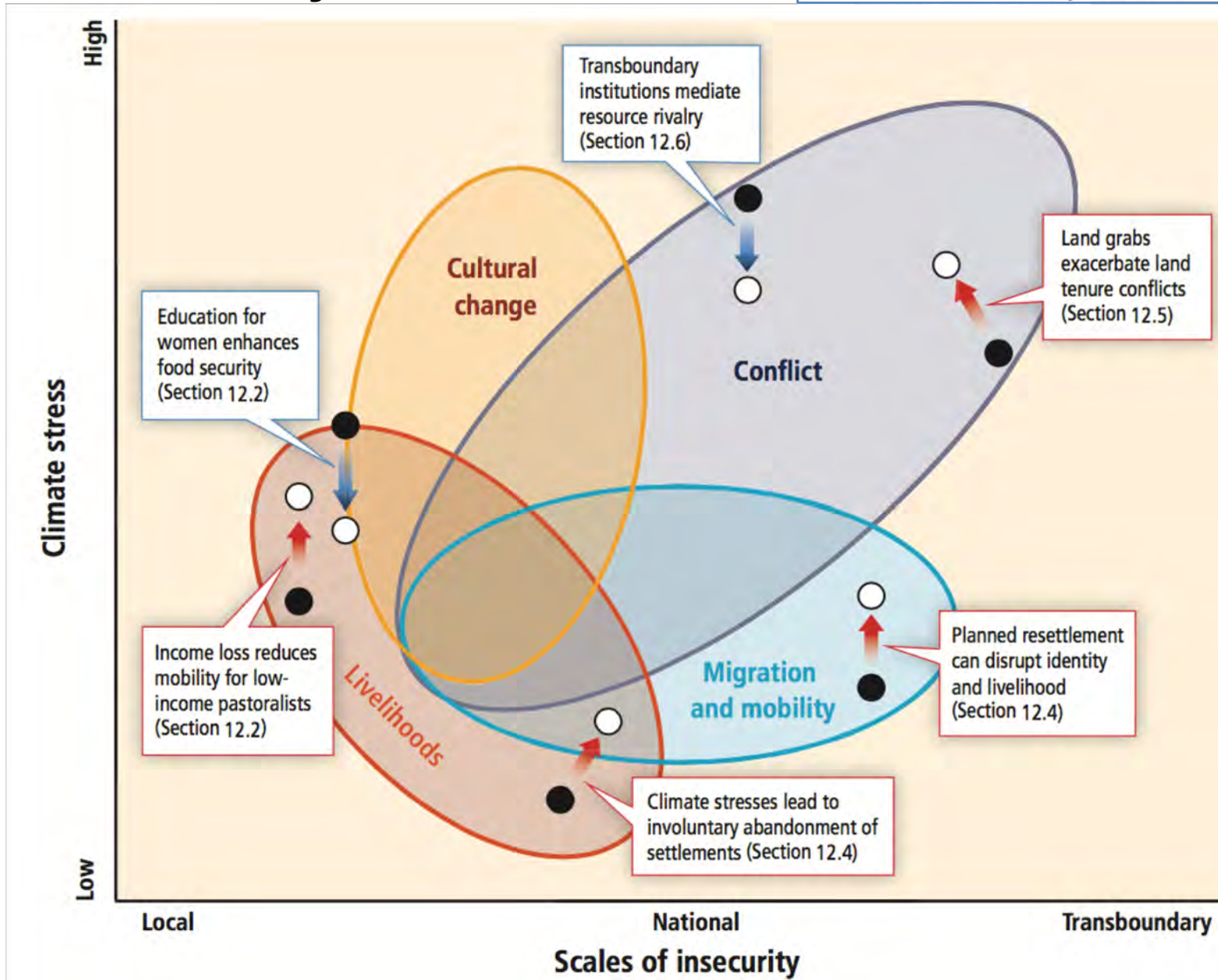
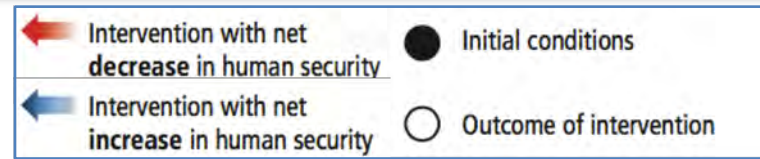
# Climate change and migrations

- populations most exposed and vulnerable to the impacts of climate change may have least ability to migrate



AR5 WGII  
Fig 12.1

# Climate change and human security



AR5 WGII  
Fig 12.3



## Climate change may undermine peace and security

Climate change exacerbates existing pressures on security as well as bringing new challenges, and the potential for violent conflict could increase. The operational responsibilities of the defence sector could also expand in the event of large-scale climate-driven disasters.

### Reducing the Carbon 'Footprint'

In many nations, defence forces are the largest single consumer of fossil fuel. Reducing fuel consumption would in turn reduce greenhouse gas (GHG) emissions.



**More Efficient Vehicles**  
Light-duty vehicles could be 40–70% more fuel efficient by 2035 than now.



**Alternative Fuels**  
New aircraft typically offer 20–30% improvement in efficiency. Shifting from kerosene to biofuels offers +30% cuts in direct GHG emissions.



**Operational Efficiencies**  
Aviation carbon dioxide (CO<sub>2</sub>) emissions can be reduced through more efficient planning of operations, including routes, altitudes and speeds.

### Security-Related Climate Change Impacts



**Increase in Drought and Inland Flooding**  
Food and freshwater insecurity, pandemic/epidemic disease outbreaks, loss of food production and arable lands, population displacement, livelihood insecurity.



**Rising and Extreme Temperatures**  
Lower agricultural output, spread of disease, food insecurity, less renewable water resources, more heat-related illness, change in large-scale fish catch potential.



**Geopolitical Concerns**  
Uneven distribution of impacts among countries depending on geographic setting and other factors affecting national and human security. Climate-related security threats greatest in countries with weak or failing governments and/or with existing conflict.



**Declining Snow and Ice Cover**  
Access to offshore resources in newly ice-free areas, freshwater insecurity, changes in geography and new openings for traffic.

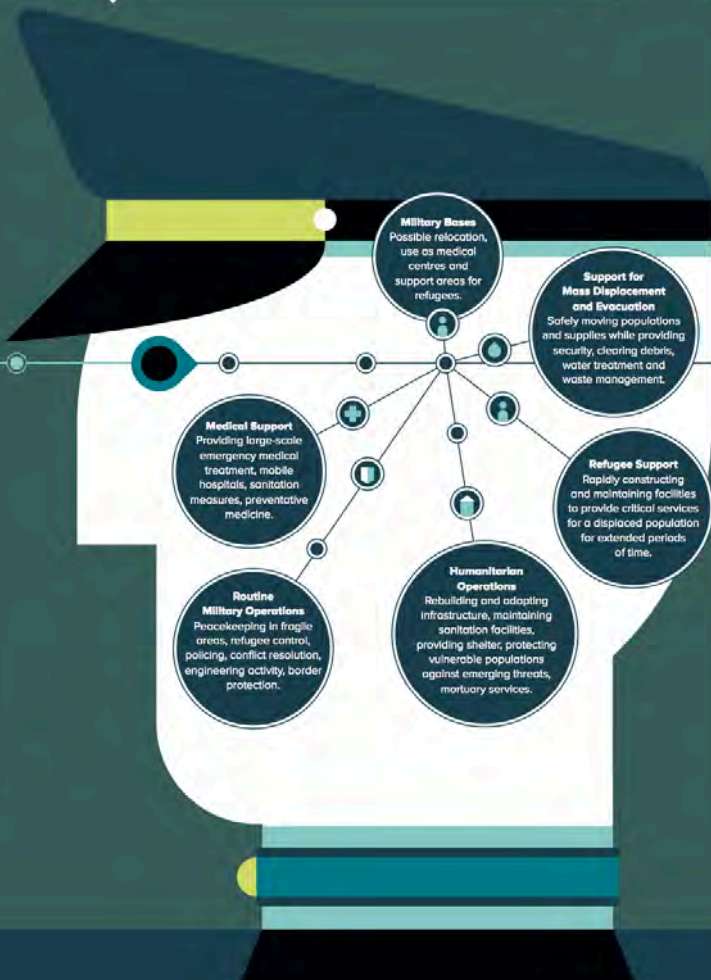


**Sea-Level Rise and Storm Surges**  
Increased vulnerability in the Low Elevation Coastal Zones, damage to infrastructure, changing territorial limits and integrity, population displacement, disease spread, loss of arable land, change in coastal resources.



**Extreme Weather**  
Destruction of critical infrastructure, population displacement, pandemic/epidemic disease outbreaks, humanitarian disaster.

### Responding to Climate Change Impacts



### Resilience Strategies



**Flexible Response**  
Even with adaptation measures, changes in climate can have unexpected, adverse effects on military operations. Flexibility in planning and response will be essential in meeting long-term defence and security responsibilities.



**Reducing Risk**  
Action with an emphasis on disaster risk reduction can increase climate resilience while helping improve human livelihoods.



**Planning for Displacement**  
Millions of people could depend on adaptation measures to reduce displacement caused by coastal flooding and land loss.



**Anticipating Climate Risk**  
Anticipating climate risks can help planners reduce impacts. Numerous facilities may need to be relocated and/or strengthened, notably to secure naval bases against flooding and sea-level rise.



**Adjustments in Security Analysis**  
Nations will need to update strategic security planning to take into account risks and impacts of climate change.



**Scenarios for Lack of Resources**  
Reduction of fresh, clean water resources could require increased peacekeeping in areas prone to conflict over extreme scarcity, as well as logistical adaptation for troop supplies.



# Climate change may undermine peace and security

Climate change exacerbates existing pressures on security as well as bringing new challenges, and the potential for violent conflict could increase. The operational responsibilities of the defence sector could also expand in the event of large-scale climate-driven disasters.

→ Key Findings from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5)

For more information please visit [www.cisl.cam.ac.uk/lpcc](http://www.cisl.cam.ac.uk/lpcc)

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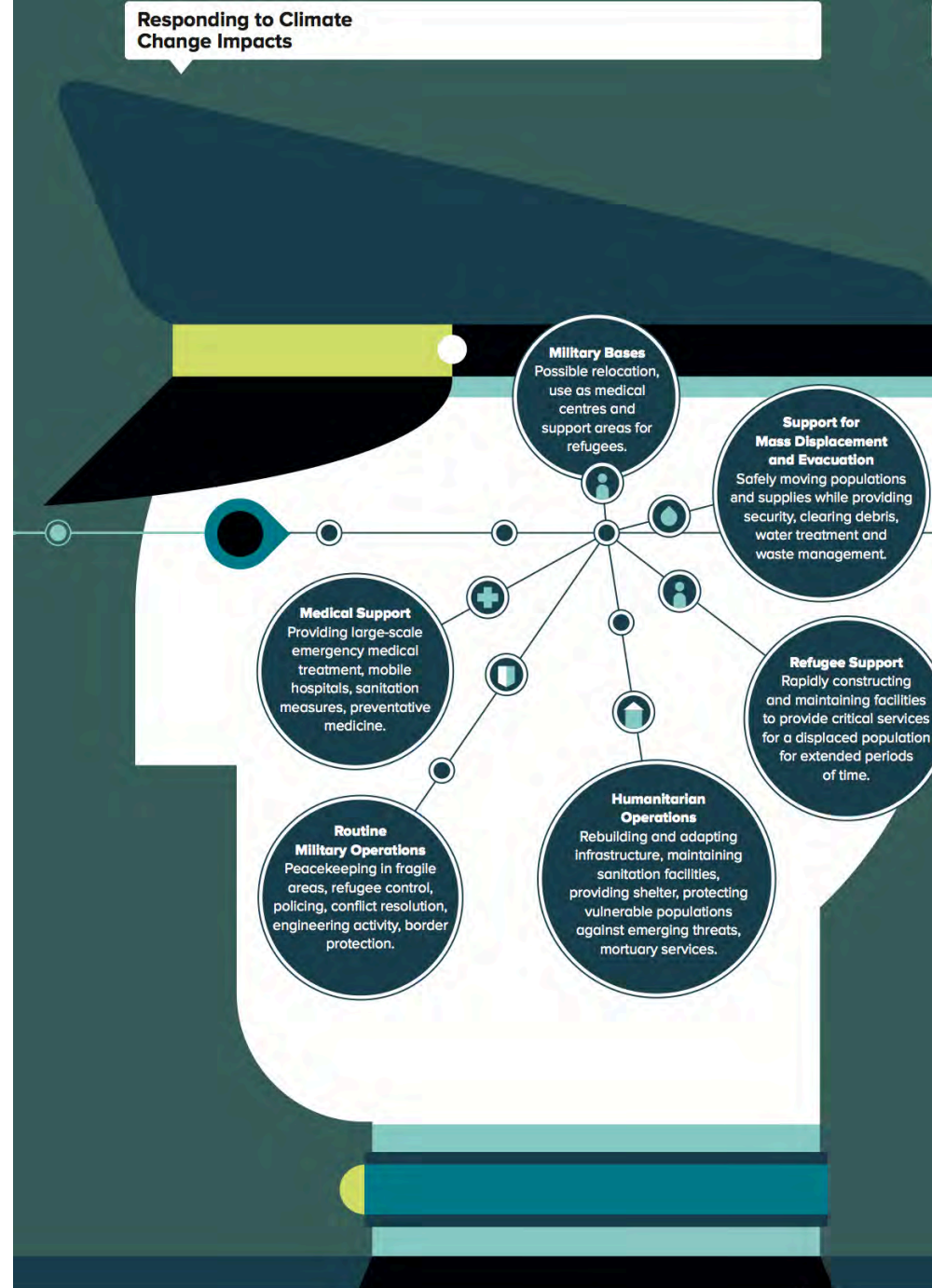
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# Resilience

**Many adaptations to climate change that involve the military can result in significant co-benefits, such as alleviating poverty and enhancing development, especially in developing countries:**

- **Flood preparedness**
- **Relocating military installations and bases**
- **Preparing for water insecurity**
- **Increasing resilience**

# Mitigation Potential

The **global military complex is an energy-intensive industry** and in many nations, defence forces are the largest single consumer of fossil fuels.

- **More efficient vehicles**
- **Alternative fuels**
- **Operational improvements**
- **NB: Note risk of unintended consequences of mitigation and adaptation**

# “Climate Change War” Is Not a Metaphor

Climate change worsens the divide between haves and have-nots, **hitting the poor the hardest**. It can also drive up food prices and spawn megadisasters, creating refugees and taxing the resiliency of governments.

When a threat like that comes along, it's impossible to ignore. Especially if your job is national security.



# Conclusion

**Climate change has the potential to increase the risk of conflict and insecurity** because factors such as poverty and economic hardship, associated with a higher risk of violent conflict, are especially sensitive to climate change.

Although many climate risks warrant further investigation and there is a need for more comprehensive evidence across multiple locations and over long durations, **it is likely that climate change over the 21st century will lead to new challenges to states and will increasingly shape national security policies.**

# 'Sauver le climat' : les bases

Écrit pour les jeunes (et moins jeunes), avec des liens vers des ressources utiles



Université Saint-Louis & social sciences  
Initiatives against climate change

*Suite à l'intense mobilisation des jeunes, les changements climatiques ont fait l'objet de beaucoup d'attention au cours des derniers mois. Éléves du secondaire, étudiants, professeurs, parents et grand-parents sont descendus dans la rue pour montrer leur désarroi face à la lenteur de l'action vis-à-vis des changements climatiques.*

*Nous nous réjouissons de cette mobilisation, car notre rôle nous met encore plus fréquemment que l'ensemble de la population en position de témoin des risques que font courir les changements climatiques, ainsi que de l'ampleur des efforts nécessaires pour mettre en œuvre les objectifs que se sont fixés les membres des Nations Unies à Paris en 2015 (COP21).*

*Une démarche essentielle en faveur de ces jeunes est de les aider à se former, à appréhender les principaux éléments de la problématique du climat, et plus largement, de l'influence de nos activités sur notre environnement et sur le futur de l'humanité. L'éducation est un des instruments essentiels pour évoluer vers une société plus durable et plus juste.*

*Pour y contribuer, nous présentons ici une brève synthèse de la problématique et une sélection de références commentées. Nous espérons que cette Lettre aidera enseignants et élèves à disposer d'une base d'information solide et ainsi à prendre leur part dans la solution à ce problème planétaire : agir à leur niveau et favoriser l'action dans leur entourage et au niveau sociétal.*

*Plusieurs témoignages d'élèves ou de professeurs sont également présentés.*

*Nous vous souhaitons une bonne lecture !*

Jean-Pascal van Ypersele, Philippe Marbaix et Bruna Gaino

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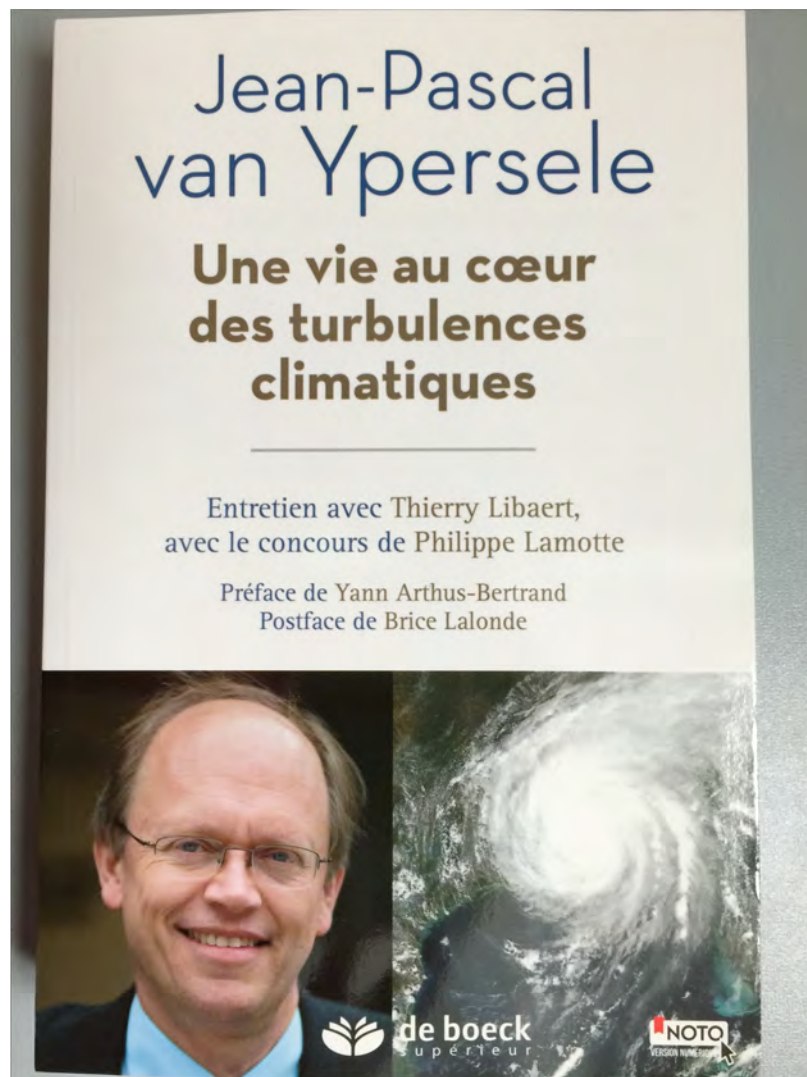


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Lalonde**





**Bij EPO (2018)**

**Voorwoord:  
Jill Peeters**





# To go further :



- [www.climate.be/vanyp](http://www.climate.be/vanyp) : my slides (under « conferences »)
- [www.ipcc.ch](http://www.ipcc.ch) : IPCC
- [www.cisl.cam.ca.uk/ipcc](http://www.cisl.cam.ca.uk/ipcc) : AR5 summary sheet on security
- [www.realclimate.org](http://www.realclimate.org) : answers to the merchants of doubt arguments
- [www.skepticalscience.com](http://www.skepticalscience.com) : same
- [www.plateforme-wallonne-giec.be](http://www.plateforme-wallonne-giec.be) : IPCC-related in French, Newsletter, latest on SR15, COP24, basic climate change
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