Climate change: Understanding and acting

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Twitter: @JPvanYpersele

Briefing for the Board of Ethias, online,
27 October 2021

Thanks to the Walloon Government (funding the Walloon Platform for IPCC)
to my team at UCLouvain for their support

The Essential Truth About Climate Change in Ten Words

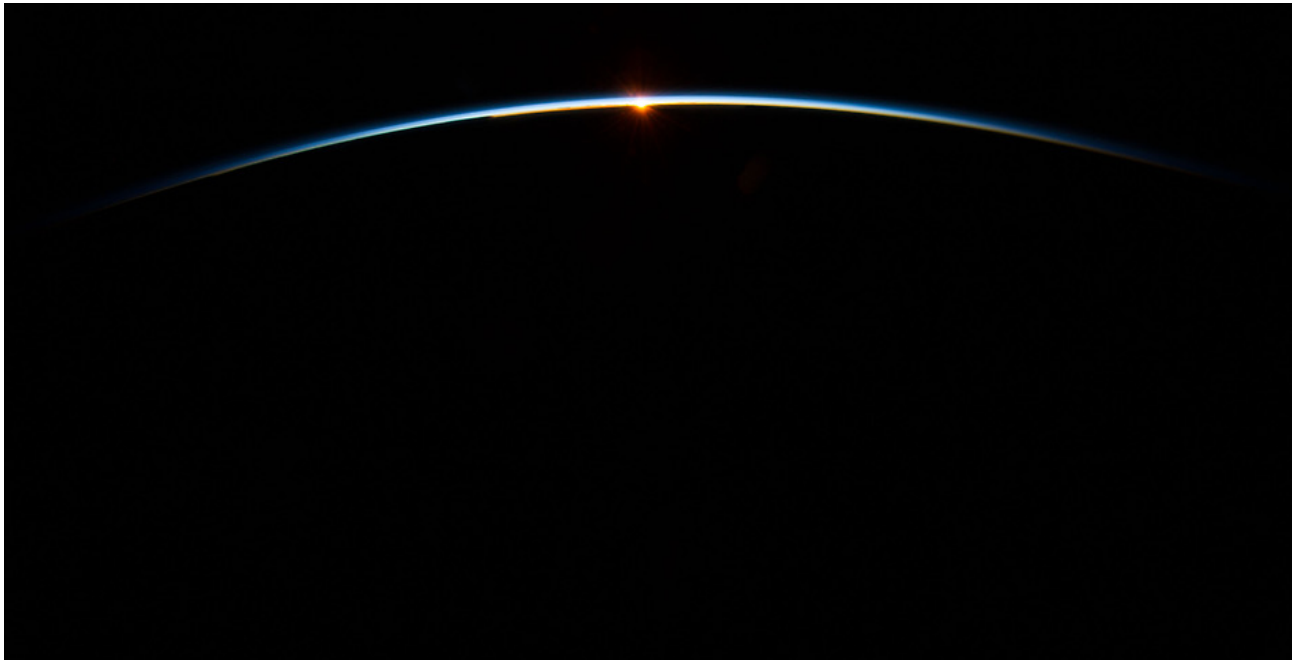
The basic facts of climate change, established over decades of research, can be summarized in five key points:

IT'S REAL	Global warming is happening.
IT'S US	Human activity is the main cause.
EXPERTS AGREE	There's scientific consensus on human-caused global warming.
IT'S BAD	The impacts are serious and affect people.
THERE'S HOPE	We have the technology needed to avoid the worst climate impacts.

Source: @JohnfoCook

Felix Schaad (Tages Anzeiger, Switzerland)

Our atmosphere is thin and fragile (as seen by ISS crew on 31 July 2013)



Source: NASA

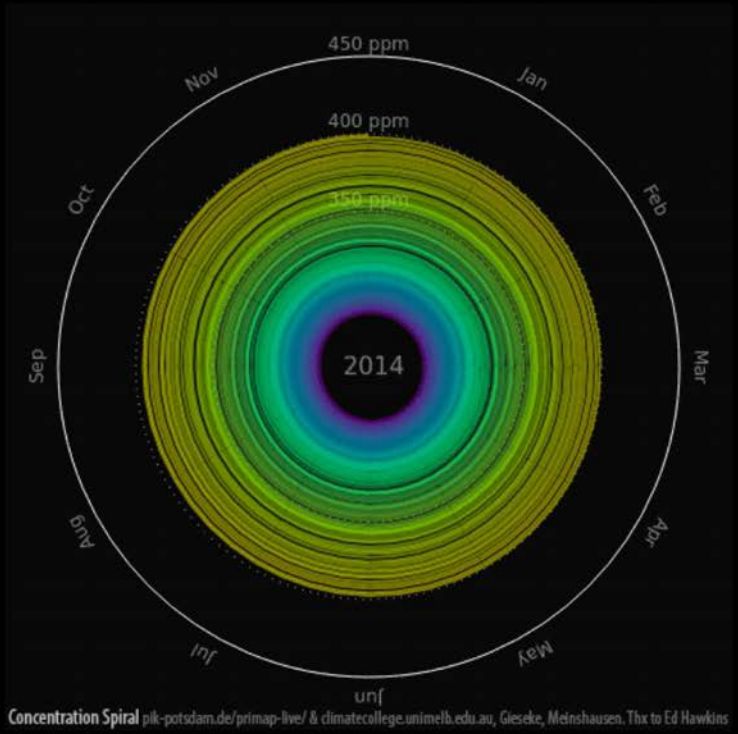
Jean-Pascal van Ypersele
(vanyp@climate.be)

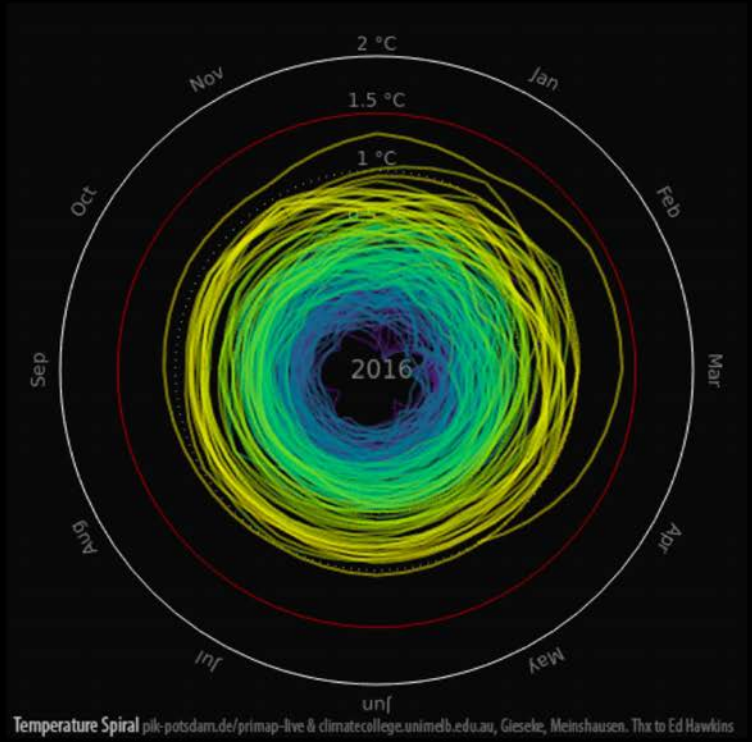
Fact: Because we use the atmosphere as a free dustbin for our greenhouse gases, we thicken the thermal insulation layer around the planet

That is why we must cut emissions
to net ZERO as soon as possible

@JPvanYpersele

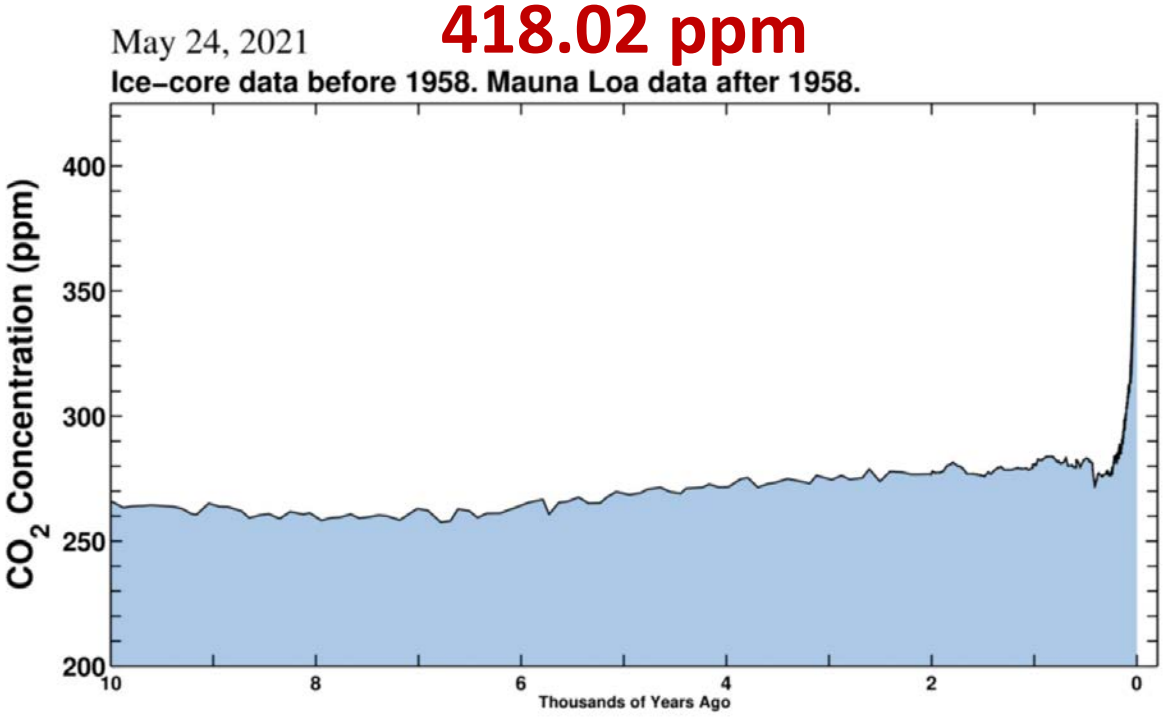
CO_2 Concentration and Temperature spirals





CO_2 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/

CO_2 Concentration 24 May 2021 (Keeling curve + last 10000 years)



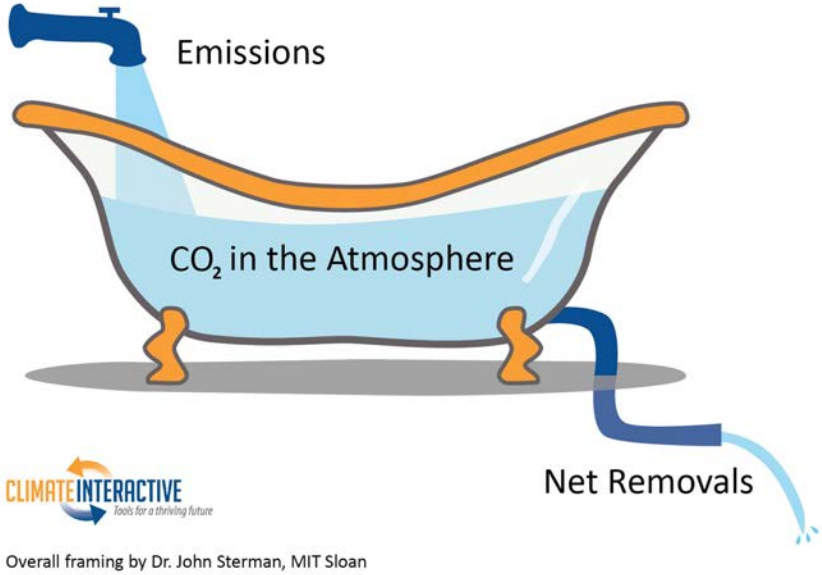
Source: scripps.ucsd.edu/programs/keelingcurve/

Fact: The changing composition of the atmosphere and the resulting climate chenge are due to our usage of fossil fuels, cement, and to deforestation

The science about this is now crystal clear

@JPvanYpersele

The Carbon Bathtub



Source: @CarbonInteractive

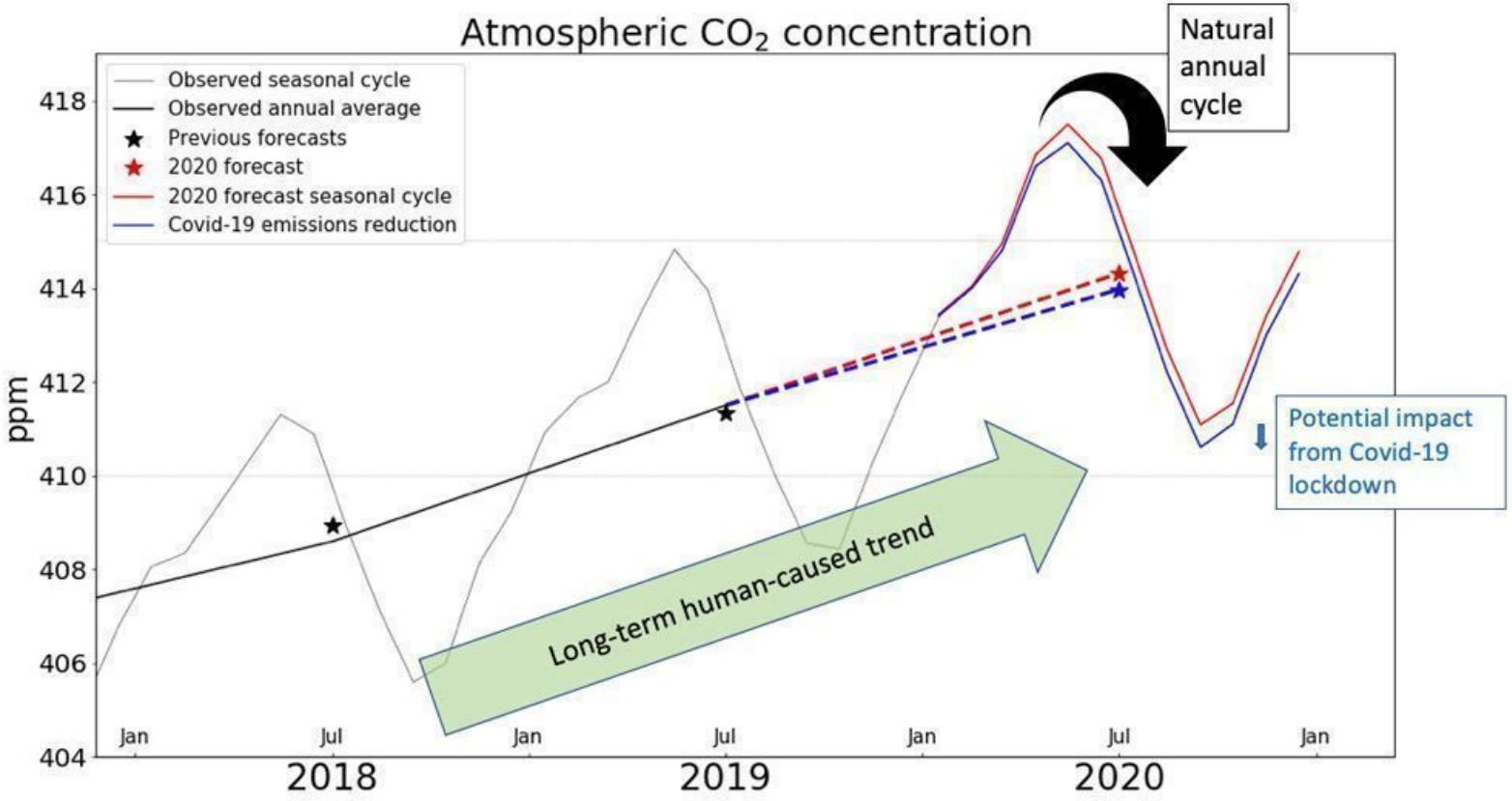
Climatic Change: Are We on the Brink of a Pronounced Global Warming? (Broecker,1975)

Table 1. Reconstruction and prediction of atmospheric CO_2 contents based on fuel consumption data.

Year	Chemical fuel CO_2 ($\times 10^{16}$ g)	Excess atmospheric CO_2* ($\times 10^{16}$ g)	Excess atmospheric CO_2 (%)	Excess atmospheric CO_2 (ppm)	CO_2 content of the atmosphere† (ppm)	Global temperature increase‡ (°C)
1900	3.8	1.9	0.9	2	295	0.02
1910	6.3	3.1	1.4	4	297	.04
1920	9.7	4.8	2.2	6	299	.07
1930	13.6	6.8	3.1	9	302	.09
1940	17.9	8.9	4.1	12	305	.11
1950	23.3	11.6	5.3	16	309	.15
1960	31.2	15.6	7.2	21	314§	.21
1970	44.0	22.0	10.2	29	322§	.29
1980‖	63	31	14	42	335	.42
1990‖	88	44	20	58	351	.58
2000‖	121	60	28	80	373	.80
2010‖	167	83	38	110	403	1.10

*On the assumption that 50 percent of the CO_2 produced by the burning of fuel remains in the atmosphere. †The preindustrial atmospheric partial pressure of CO_2 is assumed to be 293 ppm. ‡Assumes a 0.3°C global temperature increase for each 10 percent rise in the atmospheric CO_2 content. §Value observed on Hawaii for 1960, 314 ppm; value for 1970, 322 ppm (*8*). ‖Post-1972 growth rate taken to be 3 percent per year.

« Covid19 »: a very small effect on CO_2 concentration



Source: @CarbonBrief, mai 2020 @JPvanYpersele

Why the IPCC ?

Established by WMO and UNEP in 1988

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

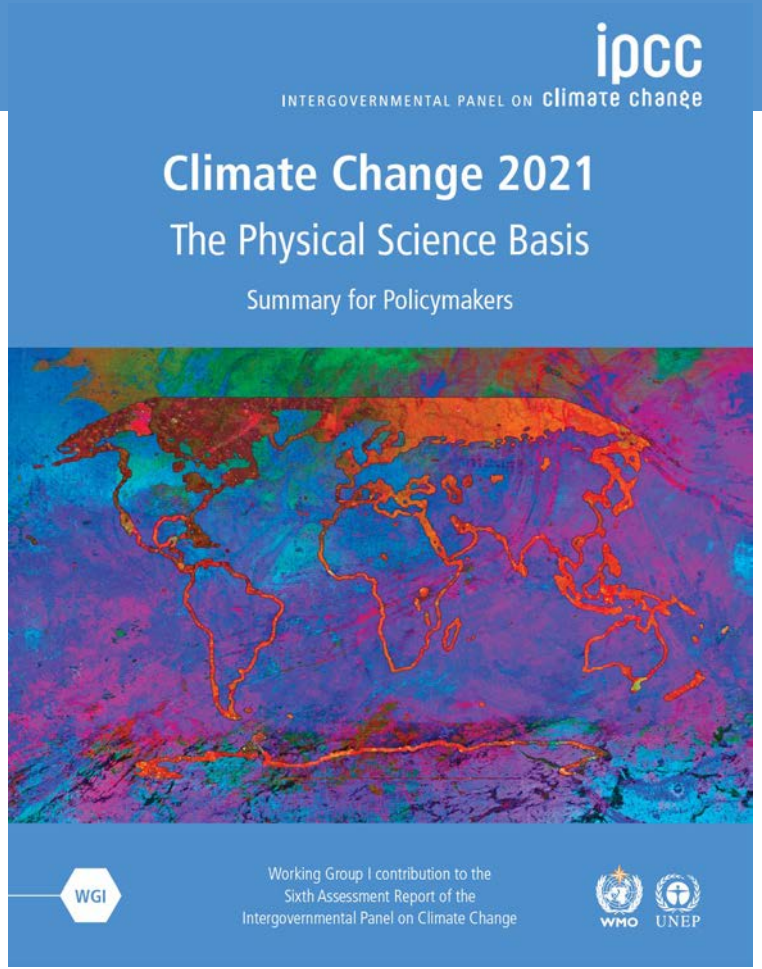
- causes of climate change,
- potential environmental and socio-economic impacts,
- possible response options (adaptation & mitigation).

WMO=World Meteorological Organization

UNEP= United Nations Environment Programme

SIXTH ASSESSMENT REPORT

Working Group I – The Physical Science Basis



BY THE NUMBERS

Author Team

234 authors from **65** countries

28% women, **72%** men

30% new to the **IPCC**

Review Process

14,000 scientific publications assessed

78,000+ review comments

46 countries commented on Final Government Distribution

Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years

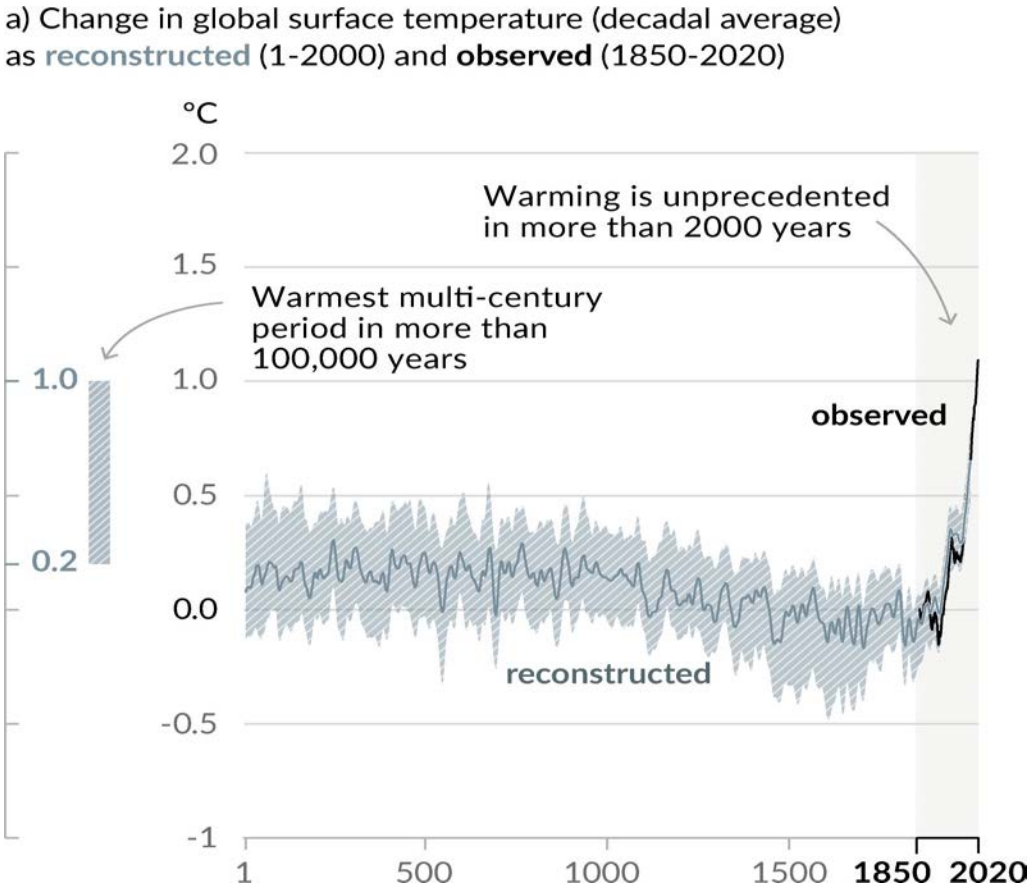


Figure SPM.1

Progression of Understanding: Greater and Greater Certainty in Attribution

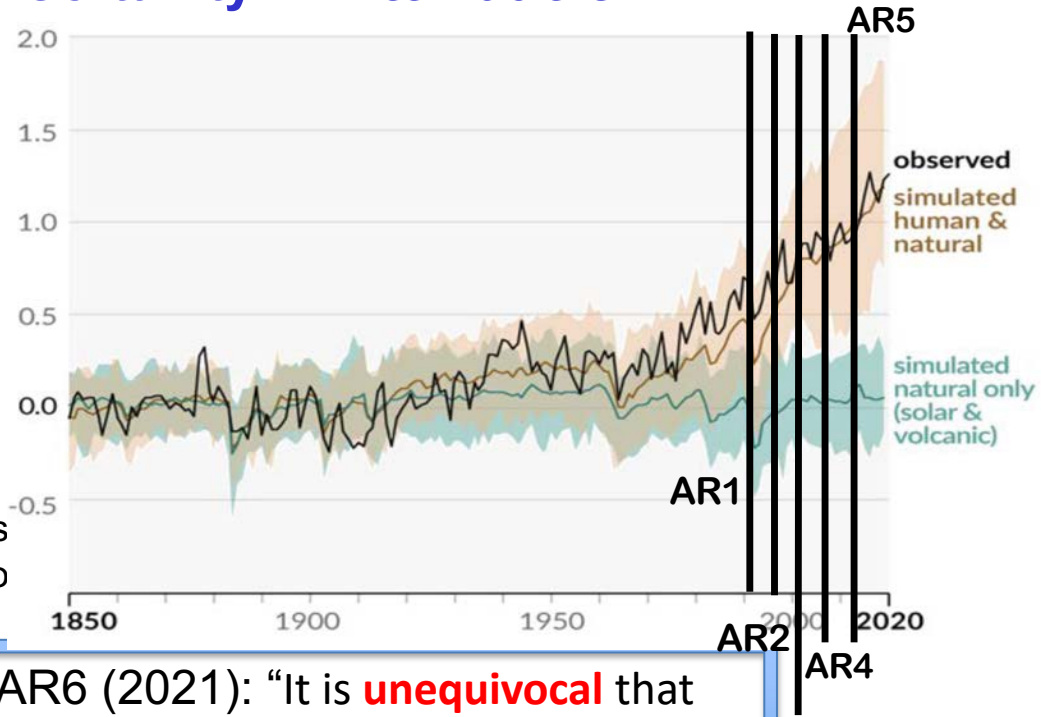
AR1 (1990): “unequivocal detection not likely for a decade”

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”

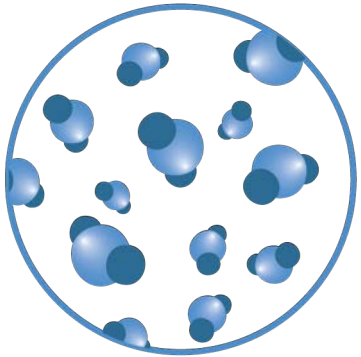
AR5 (2013) «It is **extremely likely** (odds 95 out of 100) that human influence has been the dominant cause… »



AR6 (2021): “It is **unequivocal** that human influence has warmed the atmosphere, ocean, and land.”

IPCC

CO_2
concentration



Highest

in at least

2 million years

Sea level
rise

Fastest rates

in at least

3000 years

Arctic sea ice
area

Lowest level

in at least

1000 years

Glaciers
retreat

Unprecedented

in at least

2000 years

Human-induced climate change is already affecting many weather and climate extremes in every region across the globe

Extreme heat

More frequent

More intense

Heavy rainfall

More frequent

More intense

Drought

Increase in some regions

Fire weather

More frequent

Ocean

Warming

Acidifying

Losing oxygen

Photo Credits from left: 1. Luiz Guimaraes 2. Jonathan Ford 3. Peter Burdon 4. Ben Kuo 5. NOAA

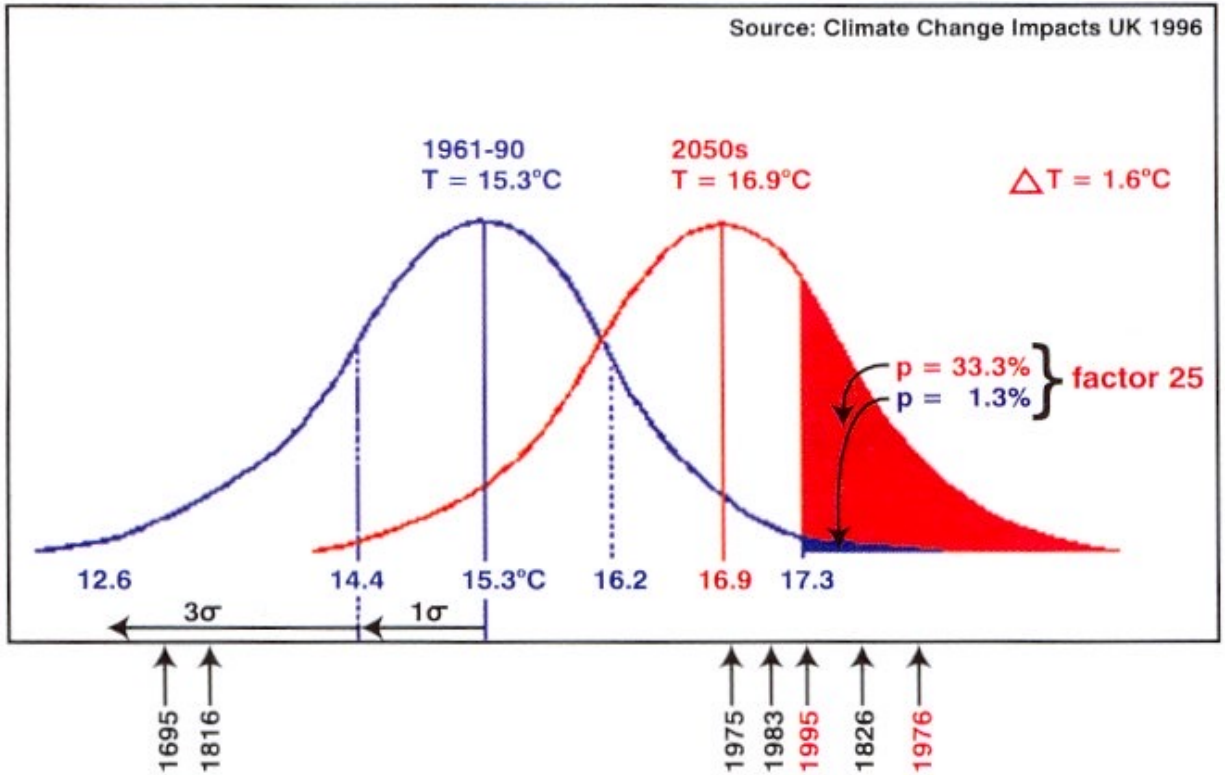
A.3 Human-induced climate change is already affecting many weather and climate extremes in every region across the globe

It is virtually certain that **hot extremes** (including heatwaves) have become more frequent and more intense across most land regions since the 1950s

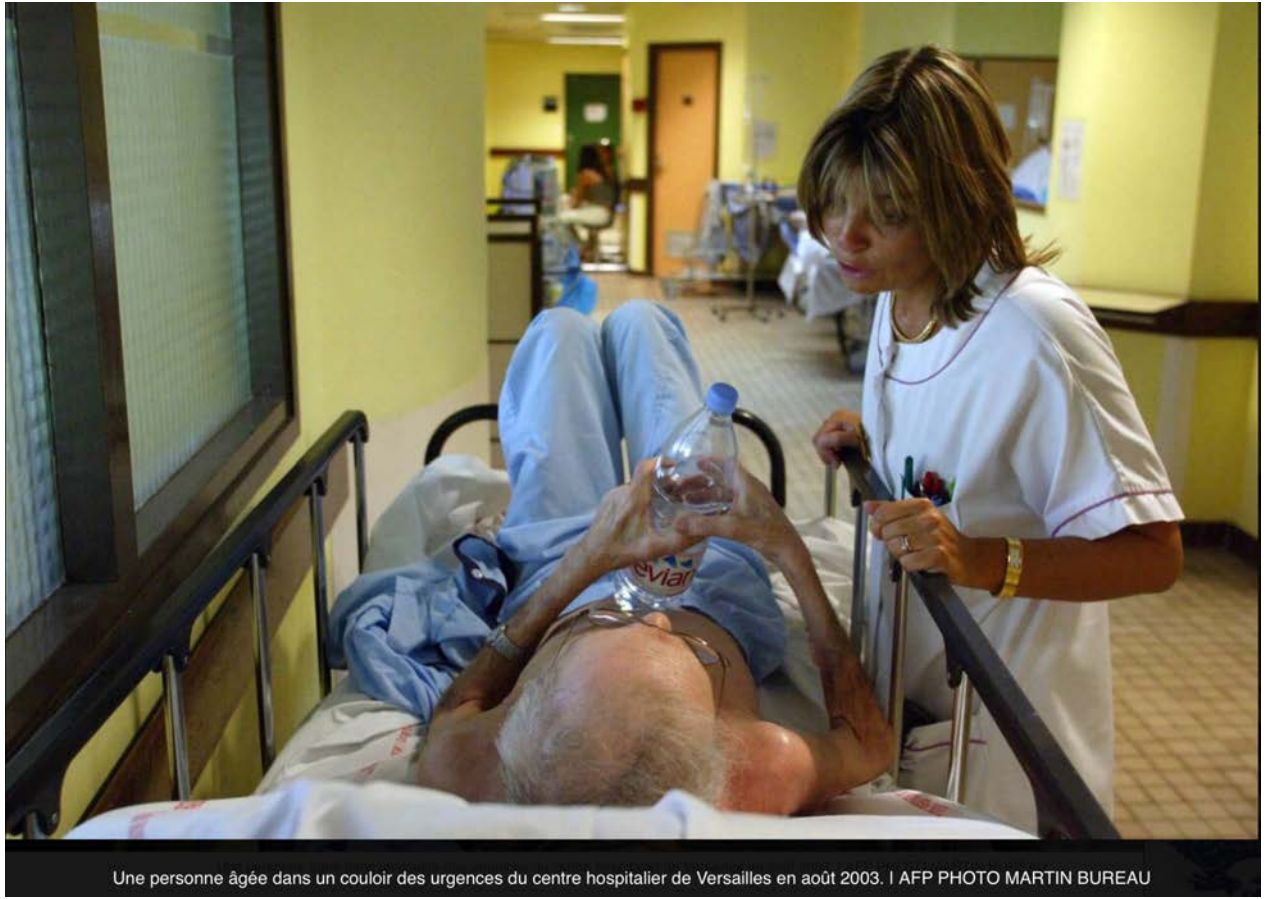
The frequency and intensity of **heavy precipitation** events have increased since the 1950s over most land area (…) (high confidence), and human-induced climate change is likely the main driver.

Increasing Probabilities of Extremes

Example: Summer Temperatures in Central England

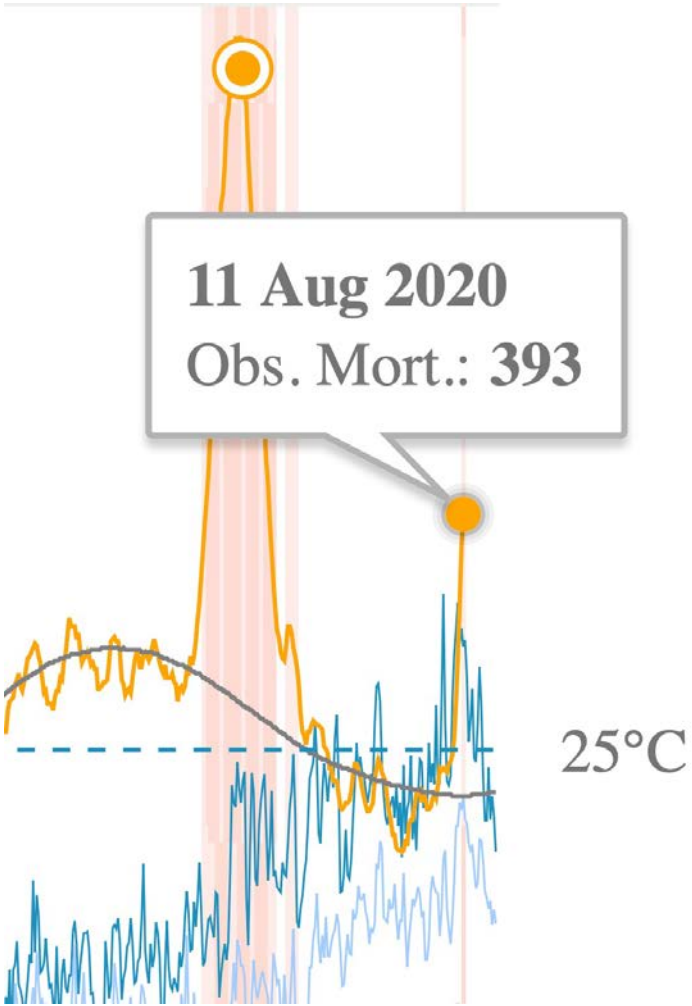


Heat waves kill (Ex: 2003 summer in EU: 70000 deaths)



Une personne âgée dans un couloir des urgences du centre hospitalier de Versailles en août 2003. I AFP PHOTO MARTIN BUREAU

Décès dus à la canicule d'août 2020 en Belgique: plus de 1400 d'après Sciensano



Climate change is already affecting every inhabited region across the globe, with human influence contributing to many observed changes in weather and climate extremes

Figure SPM.3

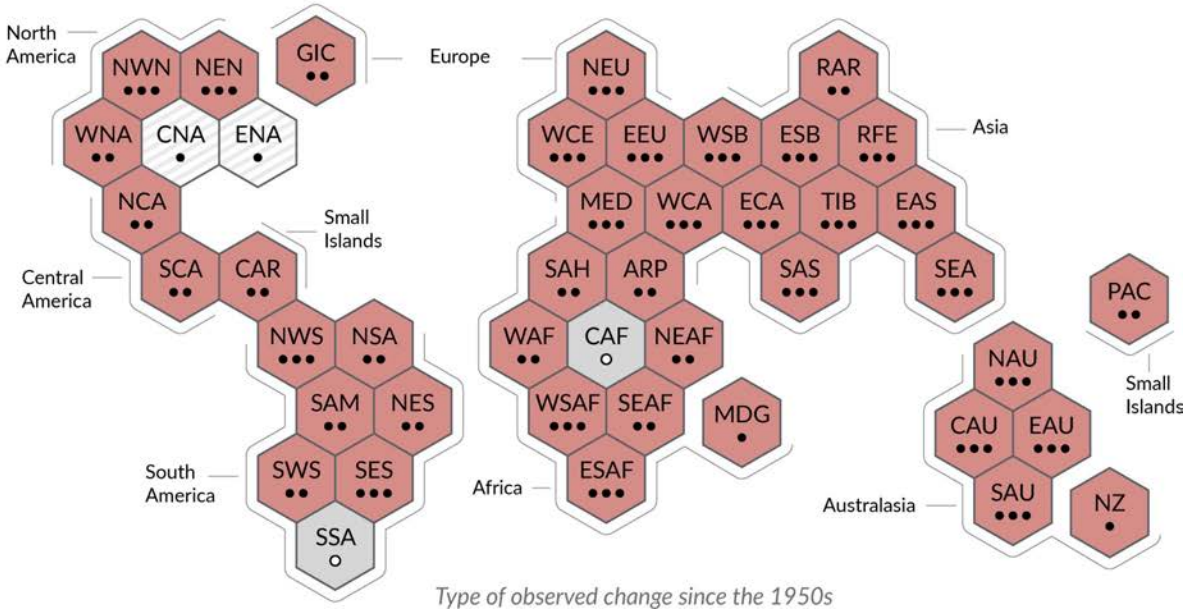
a) Synthesis of assessment of observed change in **hot extremes** and confidence in human contribution to the observed changes in the world's regions

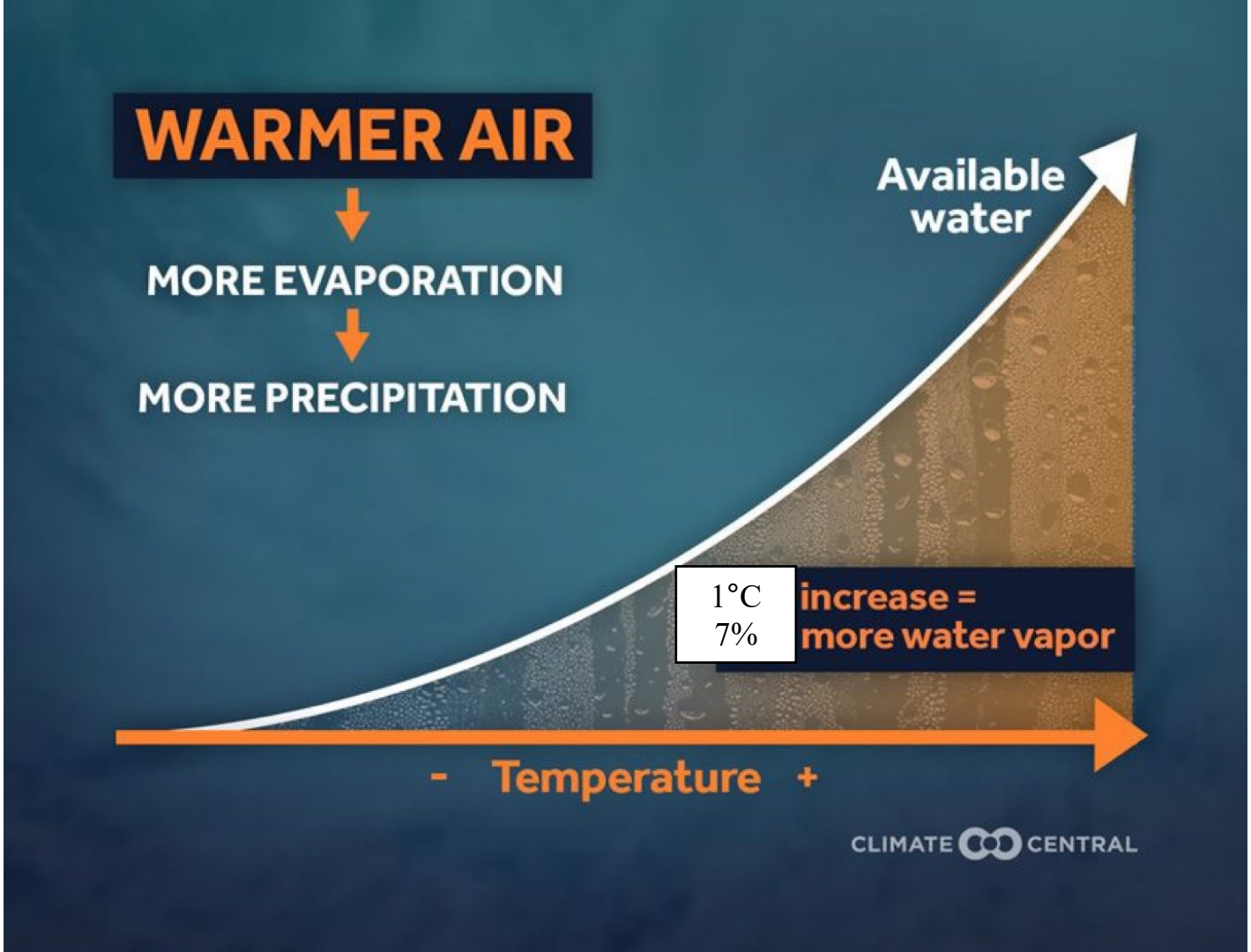
Type of observed change in hot extremes

- Increase (41)
- Decrease (0)
- Low agreement in the type of change (2)
- Limited data and/or literature (2)

Confidence in human contribution to the observed change

- ●●● High
- ●● Medium
- ● Low due to limited agreement
- ○ Low due to limited evidence




WARMER AIR
MORE EVAPORATION
MORE PRECIPITATION
Available water
1°C
7%
increase =
more water vapor
- Temperature +
CLIMATE CENTRAL

Climate change is already affecting every inhabited region across the globe, with human influence contributing to many observed changes in weather and climate extremes

Figure SPM.3

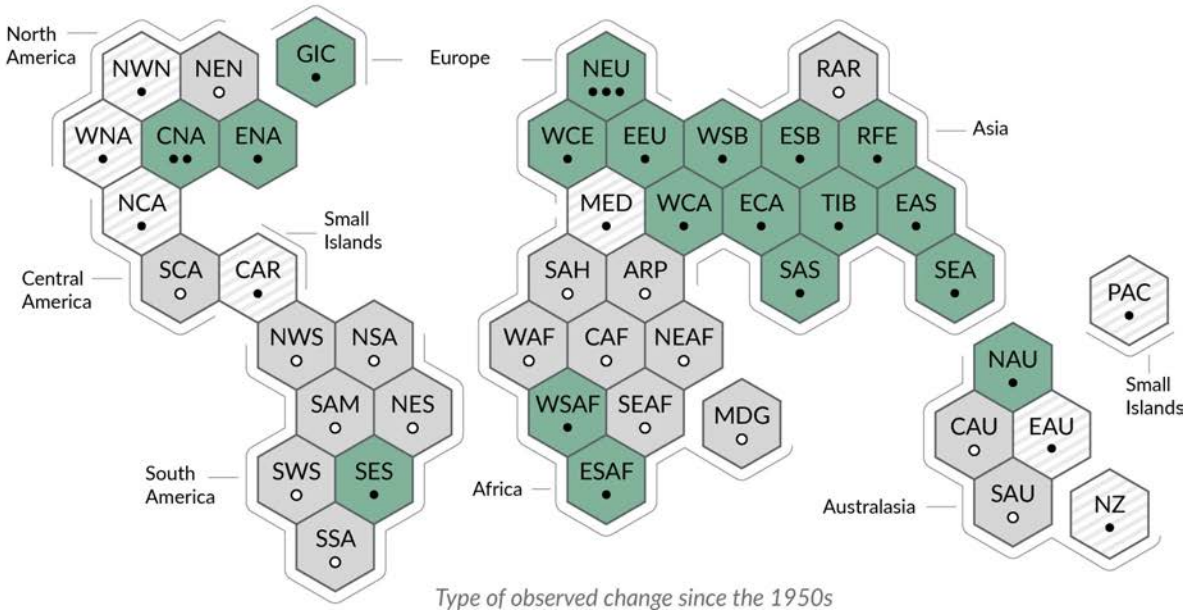
b) Synthesis of assessment of observed change in **heavy precipitation** and confidence in human contribution to the observed changes in the world's regions

Type of observed change
in heavy precipitation

- Increase (19)
- Decrease (0)
- Low agreement in the type of change (8)
- Limited data and/or literature (18)

Confidence in human contribution
to the observed change

- ●●● High
- ●● Medium
- ● Low due to limited agreement
- ○ Low due to limited evidence

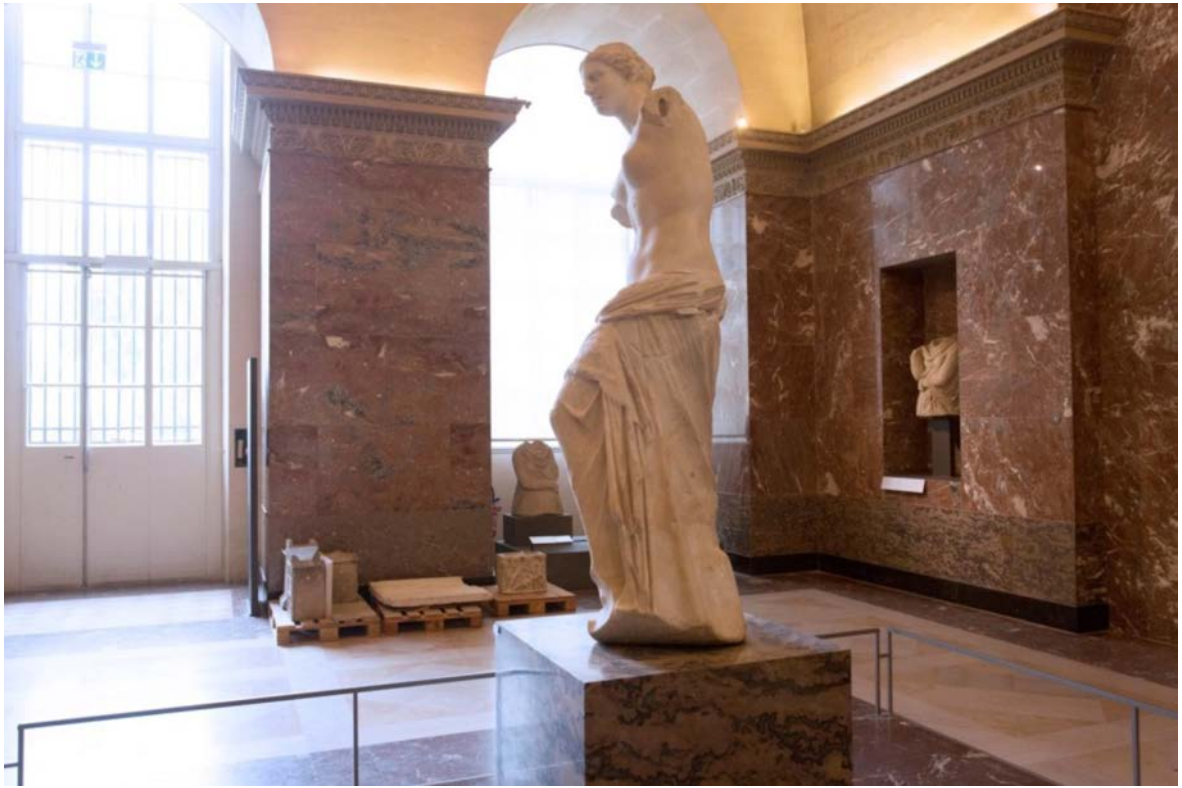


Wallonia Floods, July 2021

Source:
VRT Nieuws

Floods cost

The Louvre and Musée d’Orsay in Paris evacuated their vaults (May 2016)



Geoffroy Van Der Hasselt / Getty Images

Climate change is already affecting every inhabited region across the globe, with human influence contributing to many observed changes in weather and climate extremes

Figure SPM.3

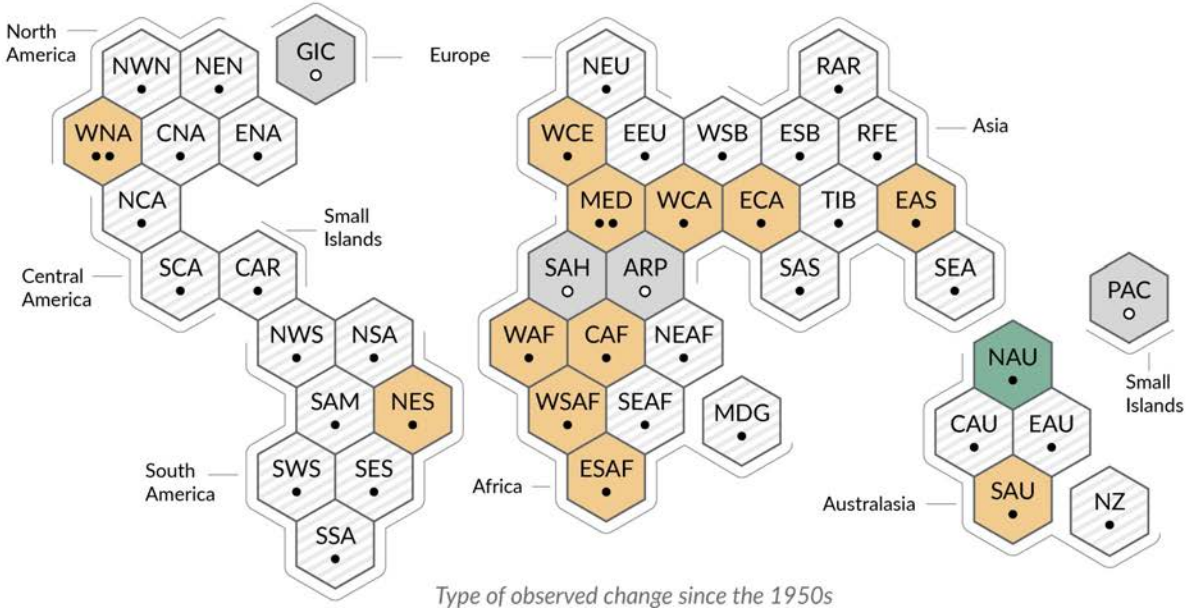
c) Synthesis of assessment of observed change in **agricultural and ecological drought** and confidence in human contribution to the observed changes in the world's regions

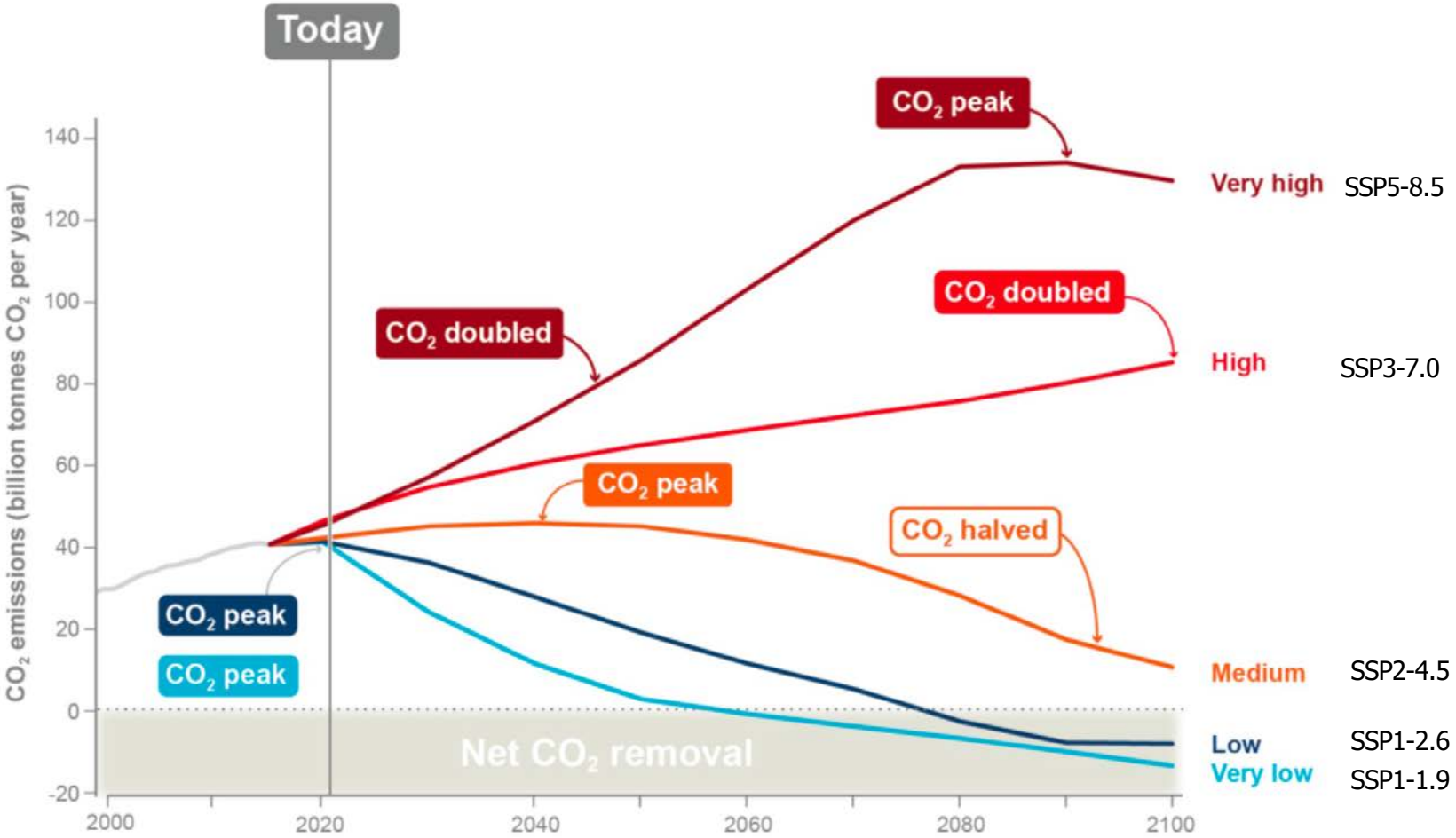
Type of observed change
in agricultural and ecological drought

- Increase (12)
- Decrease (1)
- Low agreement in the type of change (28)
- Limited data and/or literature (4)

Confidence in human contribution
to the observed change

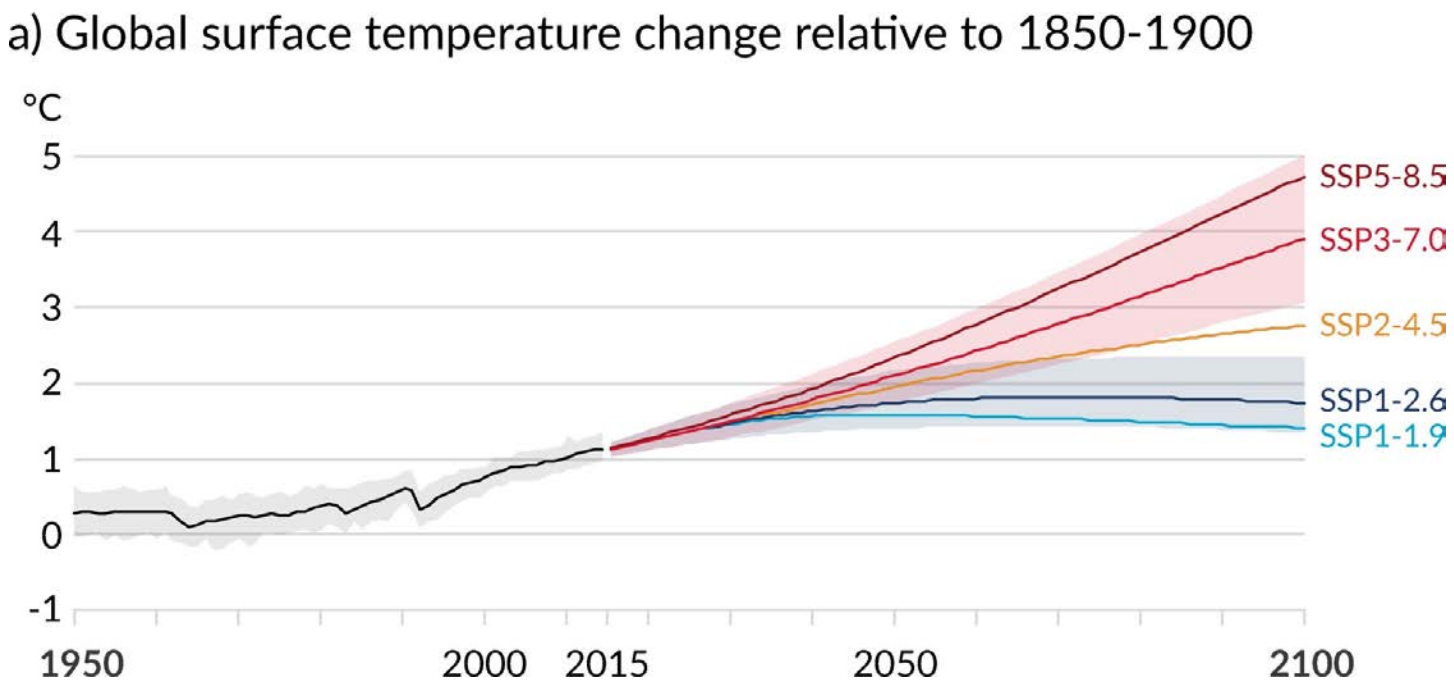
- ●●● High
- ●● Medium
- ● Low due to limited agreement
- ○ Low due to limited evidence




Today
CO_2 peak
Very high
SSP5-8.5
CO_2 doubled
CO_2 doubled
High
SSP3-7.0
CO_2 peak
CO_2 halved
Medium
SSP2-4.5
CO_2 peak
CO_2 peak
Low
SSP1-2.6
Very low
SSP1-1.9
Net CO_2 removal
CO_2 emissions (billion tonnes CO_2 per year)
140
120
100
80
60
40
20
0
-20
2000
2020
2040
2060
2080
2100

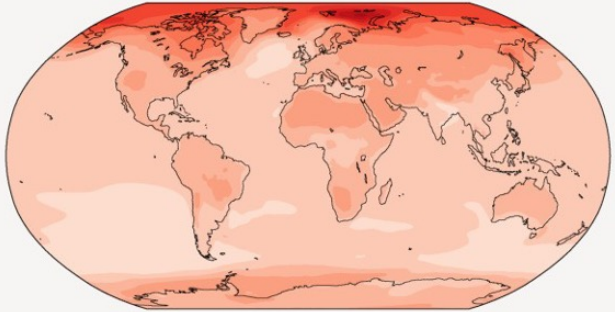
Human activities affect all the major climate system components, with some responding over decades and others over centuries

Figure SPM.8

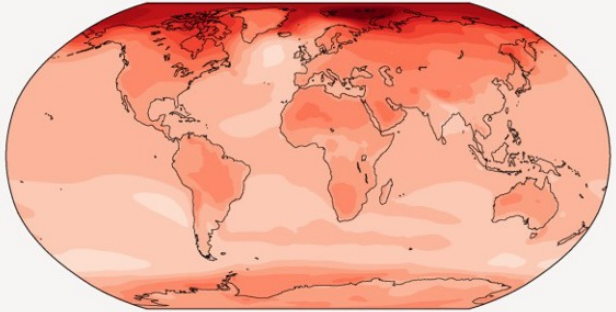


Across warming levels, land areas warm more than oceans, and the Arctic and Antarctica warm more than the tropics

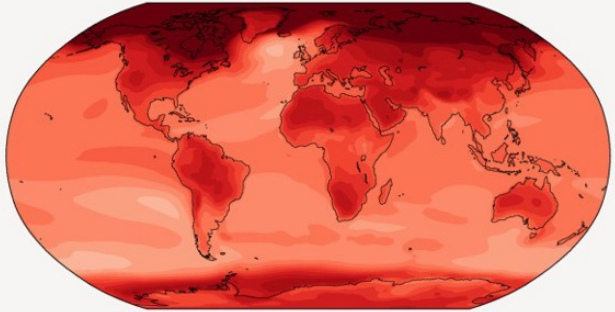
+1.5° C

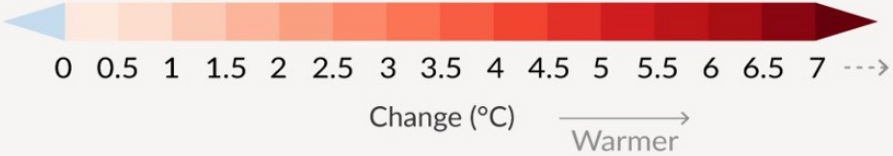


+2° C



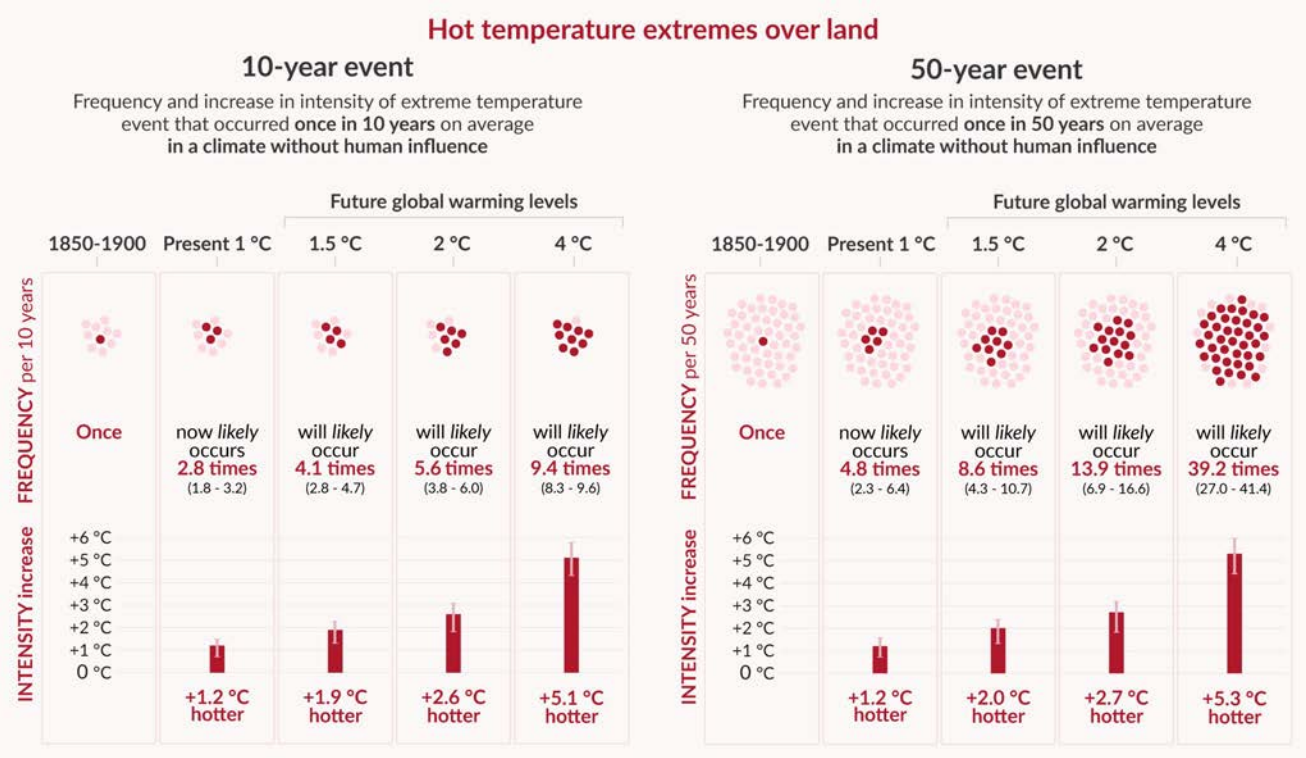
+4° C





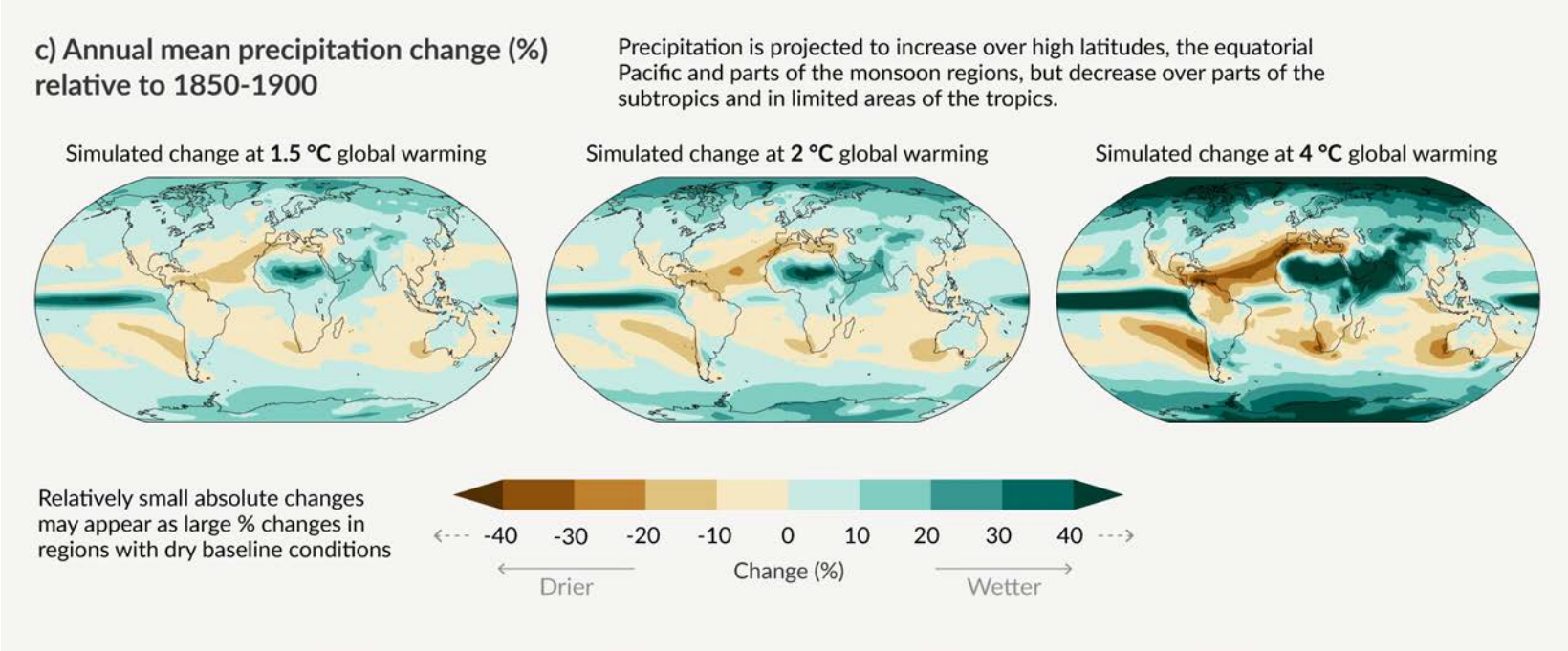
Projected changes in extremes are larger in frequency and intensity with every additional increment of global warming

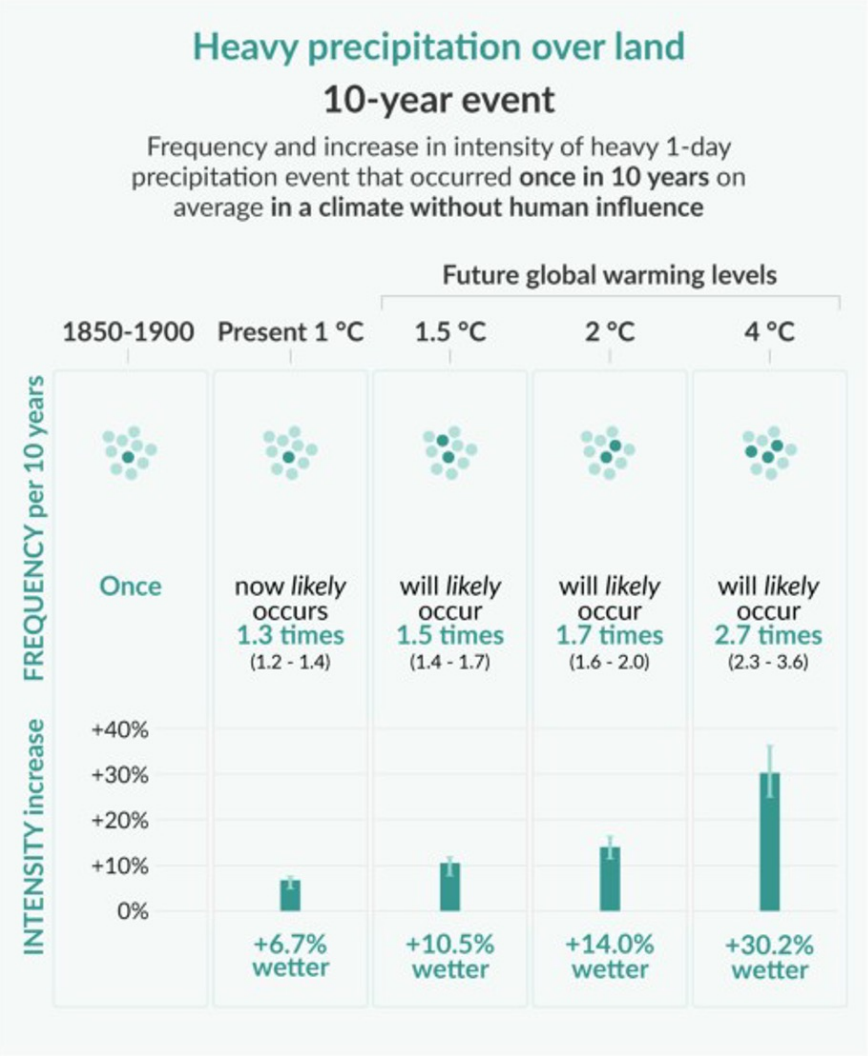
Figure SPM.6



With every increment of global warming, changes get larger in regional mean temperature, precipitation and soil moisture

Figure SPM.5





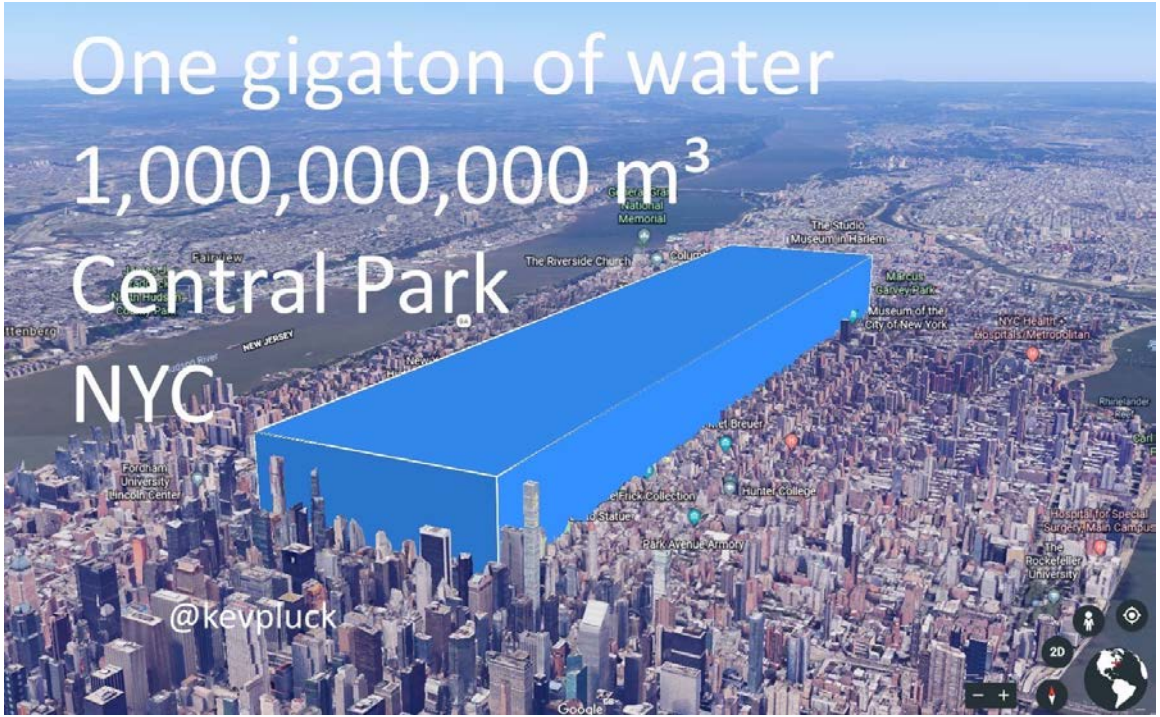
IPCC AR6 WGI SPM
Figure SPM.6

Fact: Average temperature is on its way to exceed the « conservation temperature » for the Greenland and (some of the) Antarctic ice sheet

There is therefore a very high risk that average sea level would increase by several metres over the next century or two

@JPvanYpersele

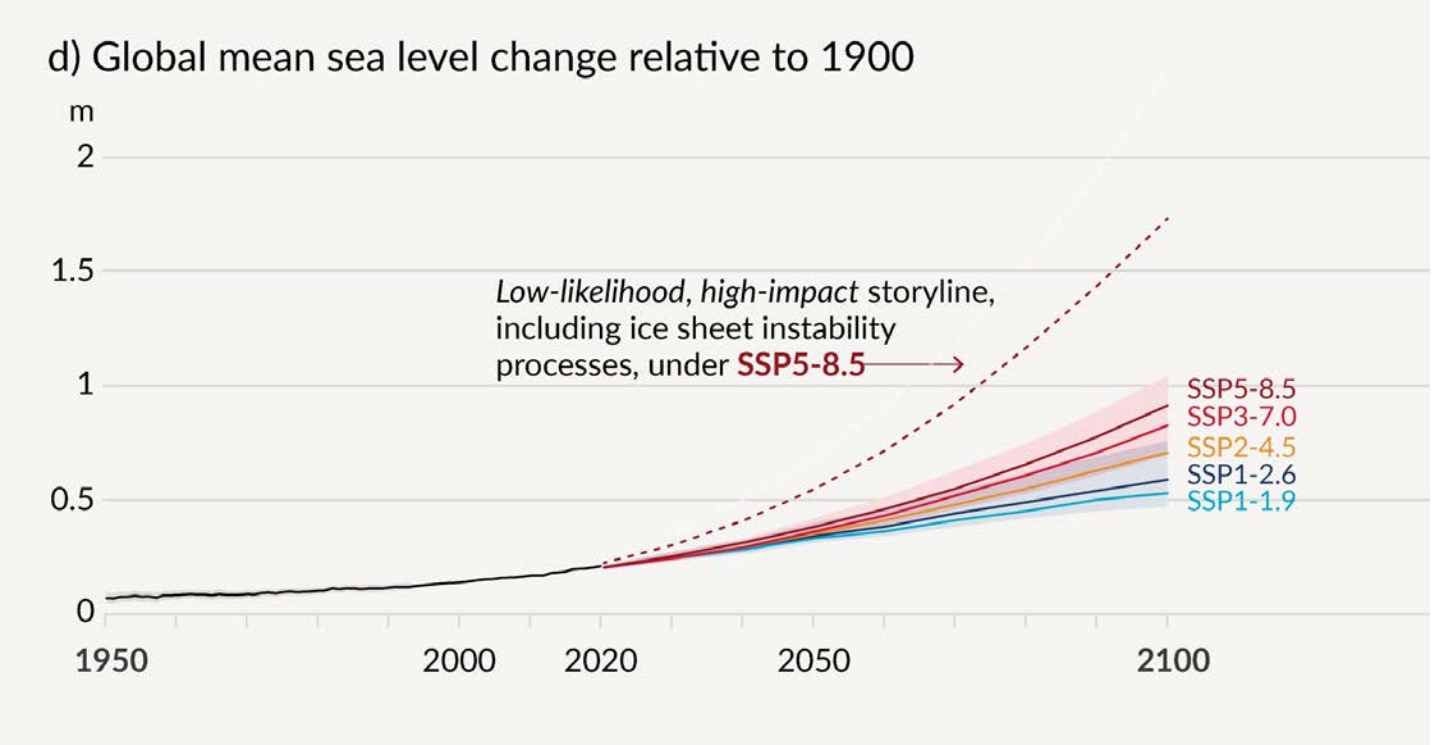
The Antarctic Ice Sheet presently loses 1 Gt of ice every 1.5 day



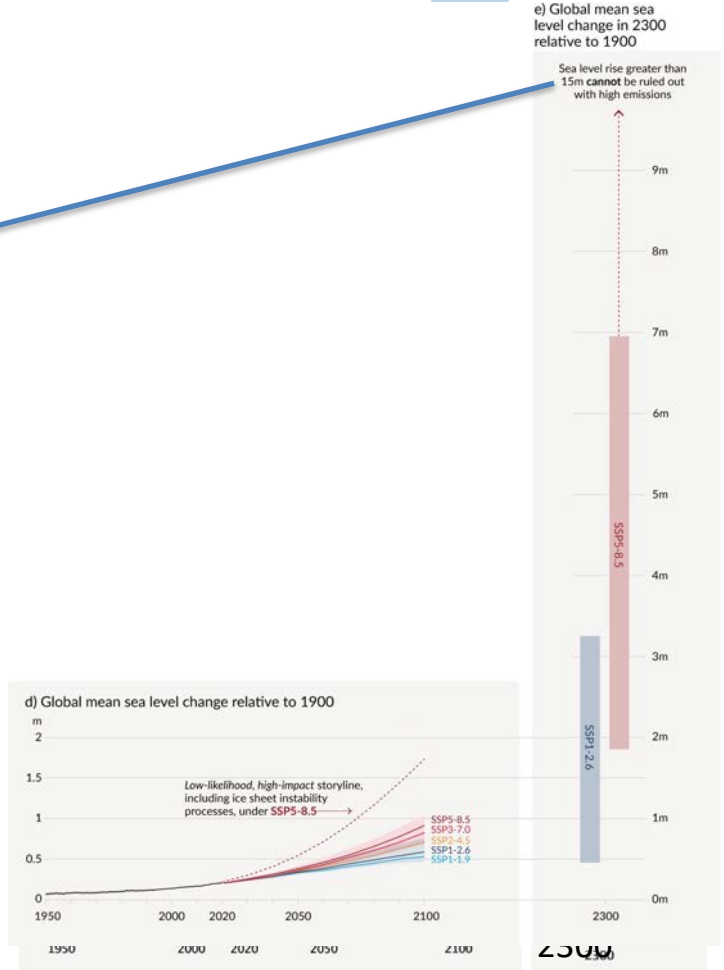
Source: @Kevpluck, June 2018

Human activities affect all the major climate system components, with some responding over decades and others over centuries

Figure SPM.8



« Sea level rise **greater than 15 m** cannot be ruled out with high emissions »



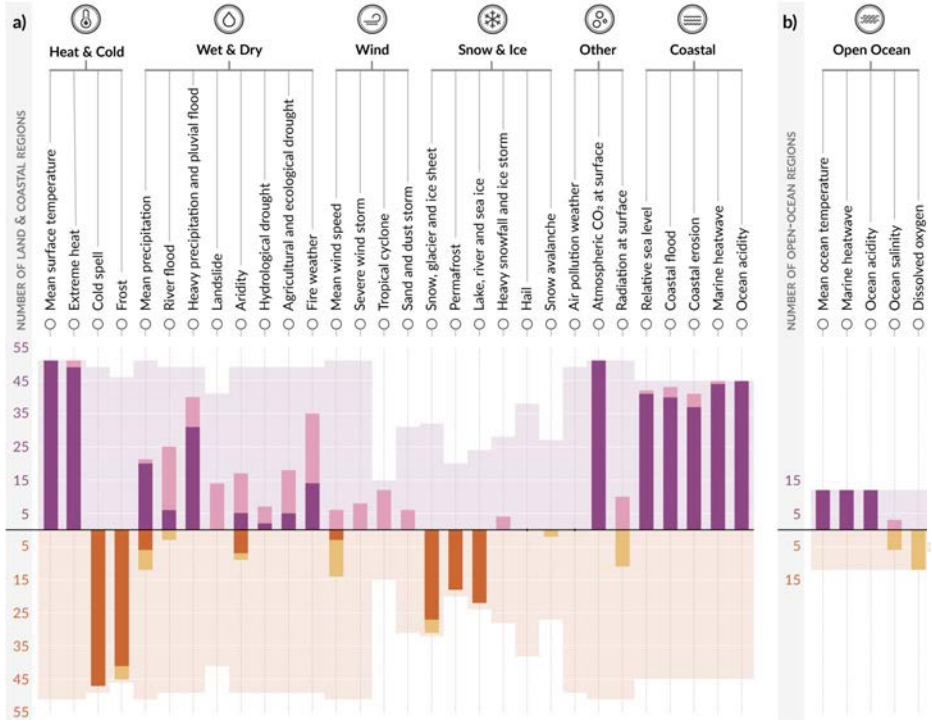
7 m

2 m

Multiple climatic impact-drivers are projected to change in all regions of the world

Figure SPM.9

Number of land & coastal regions (a) and **open-ocean regions** (b) where each **climatic impact-driver** (CID) is projected to increase or decrease with ***high*** *confidence* (dark shade) or ***medium*** *confidence* (light shade)



ASSESSED FUTURE CHANGES

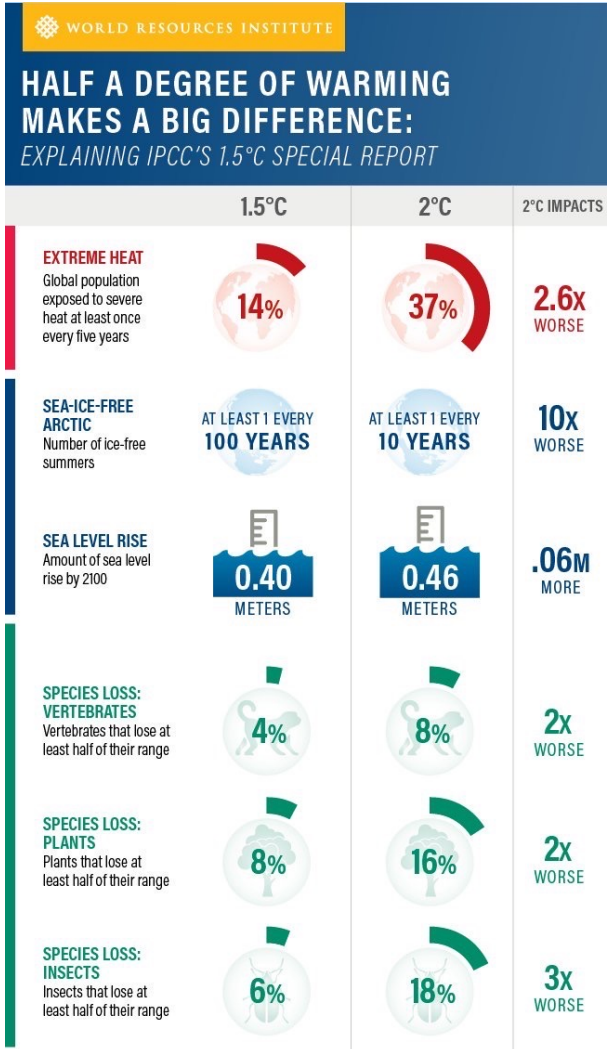
Changes refer to a 20–30 year period centred around 2050 and/or consistent with 2°C global warming compared to a similar period within 1960-2014 or 1850-1900.

BAR CHART LEGEND

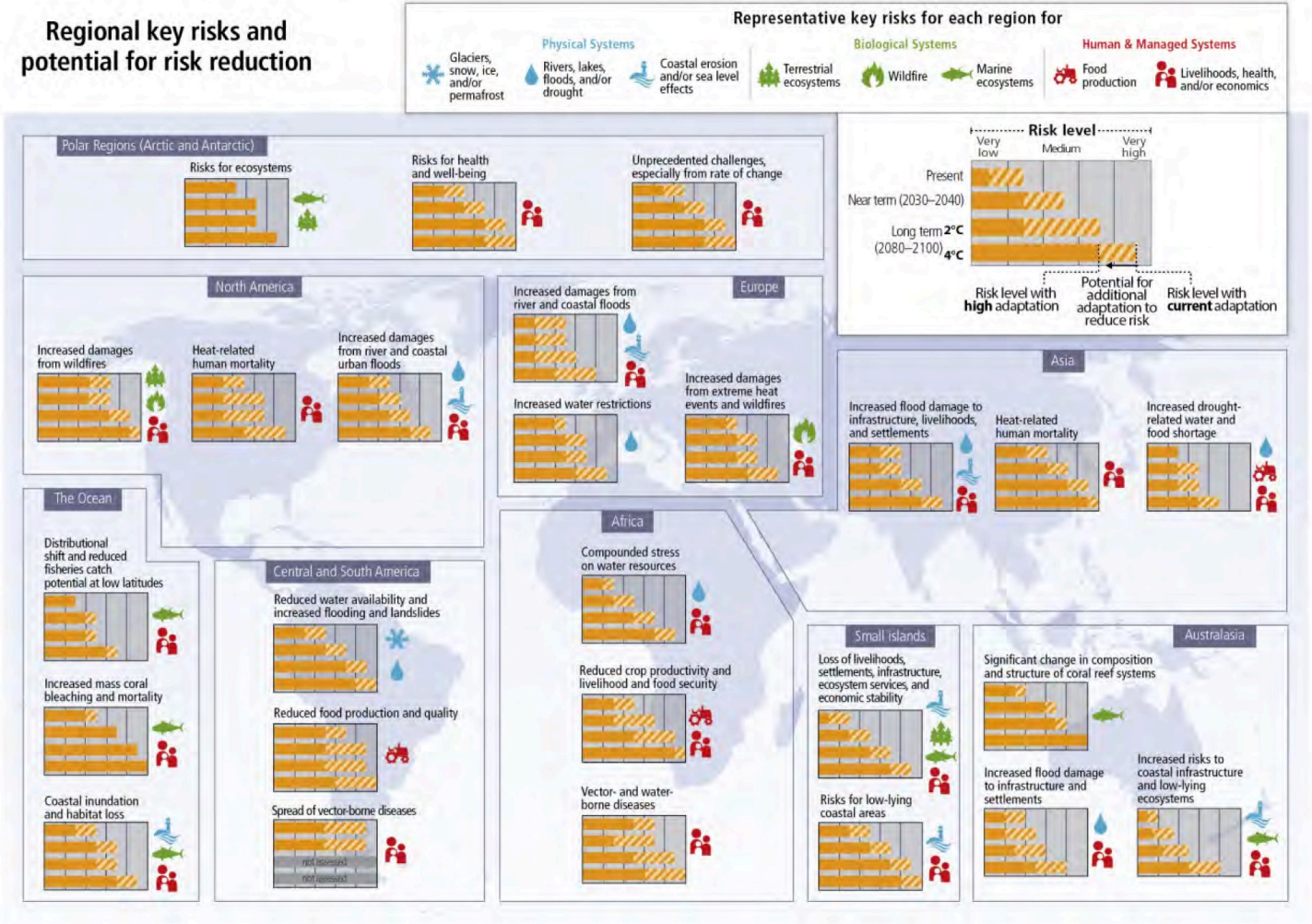
- Regions with ***high*** *confidence* increase
- Regions with ***medium*** *confidence* increase
- Regions with ***high*** *confidence* decrease
- Regions with ***medium*** *confidence* decrease

LIGHTER-SHADED 'ENVELOPE' LEGEND

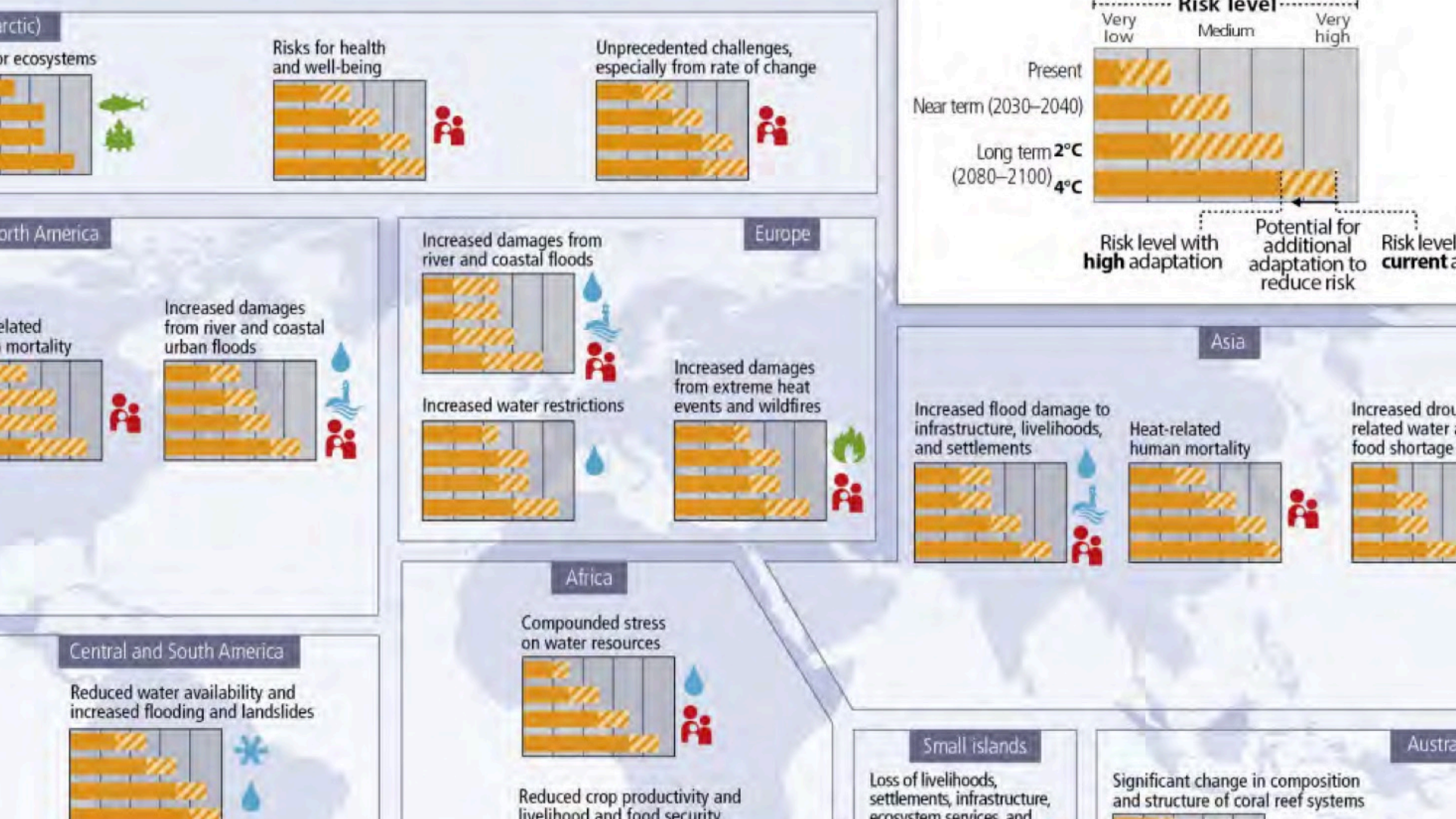
The height of the lighter shaded 'envelope' behind each bar represents the maximum number of regions for which each CID is relevant. The envelope is symmetrical about the x-axis showing the maximum possible number of relevant regions for CID increase (upper part) or decrease (lower part).



Responsibility for content: WRI



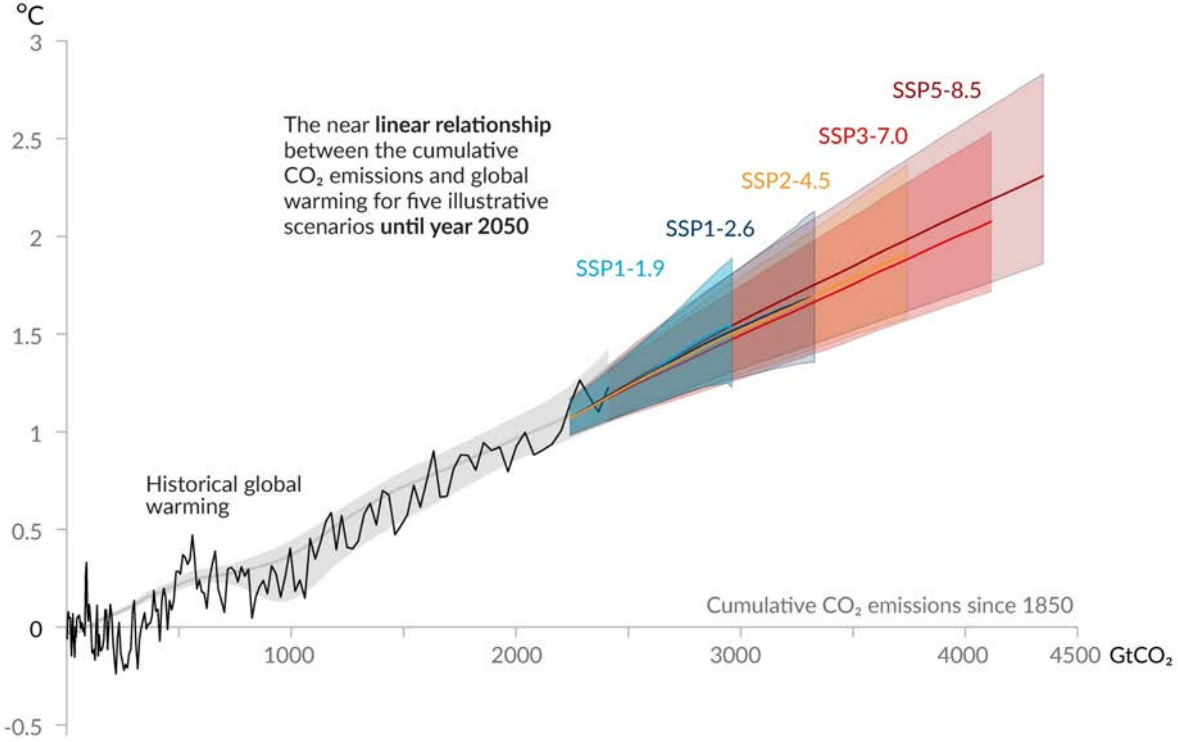
IPCC, AR5, SPM, Figure SPM.8


rctic)
or ecosystems
Risks for health and well-being
Unprecedented challenges, especially from rate of change
orth America
elated mortality
Increased damages from river and coastal urban floods
Europe
Increased damages from river and coastal floods
Increased water restrictions
Increased damages from extreme heat events and wildfires
Risk level
Very low
Medium
Very high
Present
Near term (2030–2040)
Long term (2080–2100)
2°C
4°C
Risk level with high adaptation
Potential for additional adaptation to reduce risk
Risk level current
Asia
Increased flood damage to infrastructure, livelihoods, and settlements
Heat-related human mortality
Increased drou related water food shortage
Central and South America
Reduced water availability and increased flooding and landslides
Africa
Compounded stress on water resources
Reduced crop productivity and livelihood and food security
Small islands
Loss of livelihoods, settlements, infrastructure, ecosystem services, and
Austra
Significant change in composition and structure of coral reef systems

Every tonne of CO_2 emissions adds to global warming

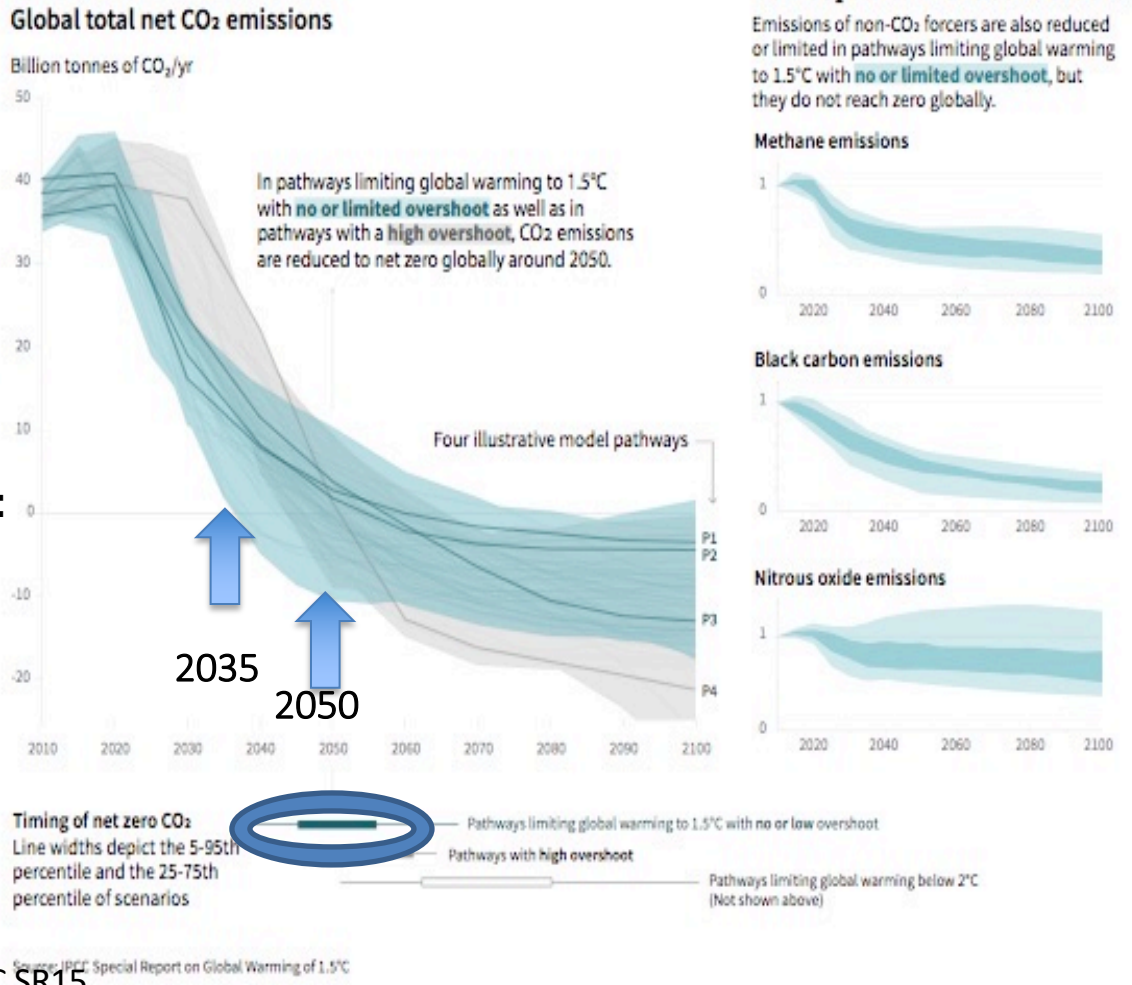
Figure SPM.10

Global surface temperature increase since 1850-1900 (°C) as a function of cumulative CO_2 emissions ($GtCO_2$)



Emission pathways compatible with below 1.5° C warming:

Net ZERO:



Source: IPCC SR15

Trajectoires d'émissions de gaz à effet de serre

- Limiter le réchauffement planétaire à 1.5° C demanderait des changements à une échelle sans précédent

→ **Transitions de systèmes** : énergie, agro-foresterie, villes, industrie, infrastructures

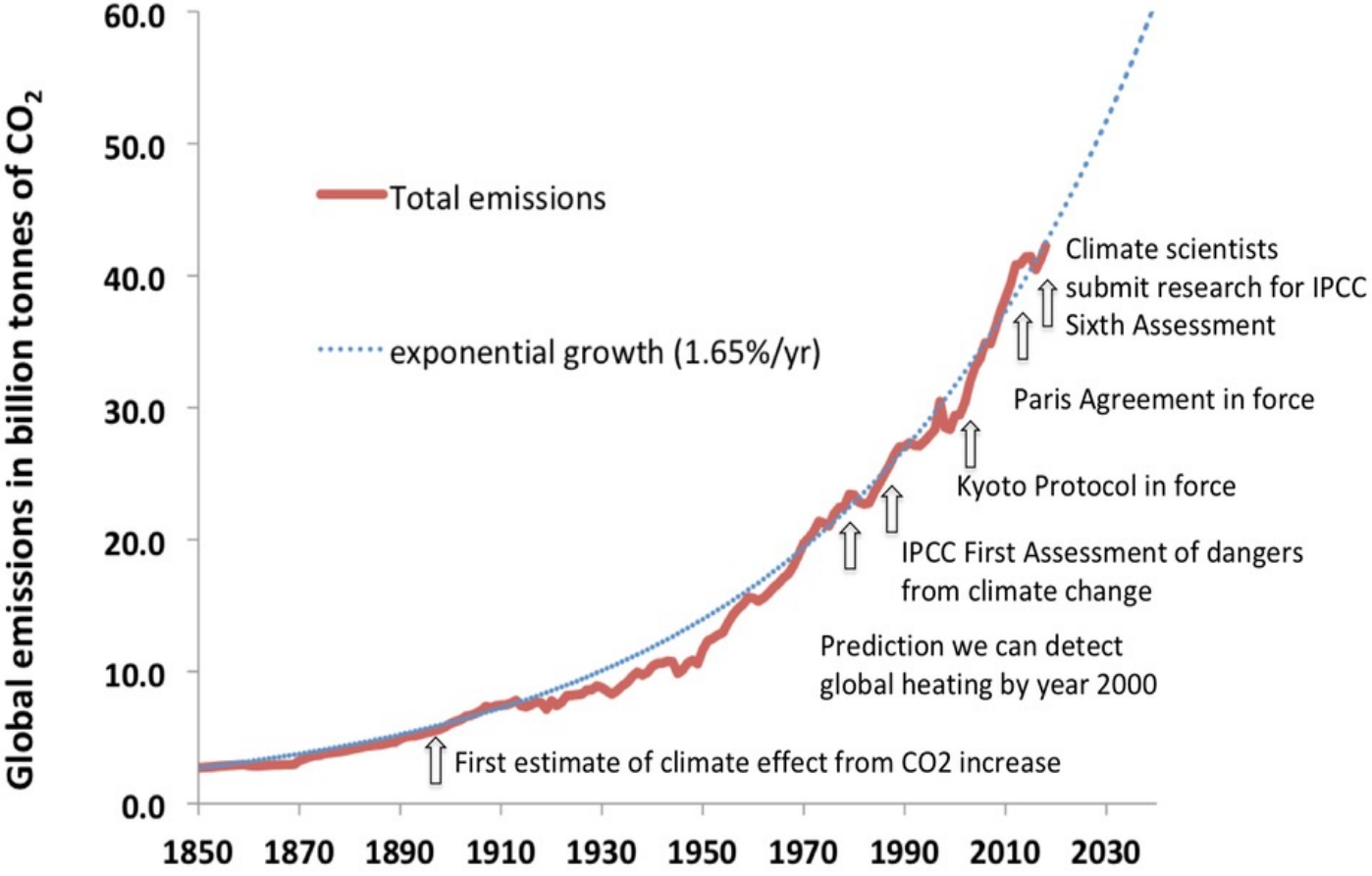
→ Fortes baisses d'émissions dans **tous les secteurs**

→ Large palette de technologies

→ et de changements de comportements

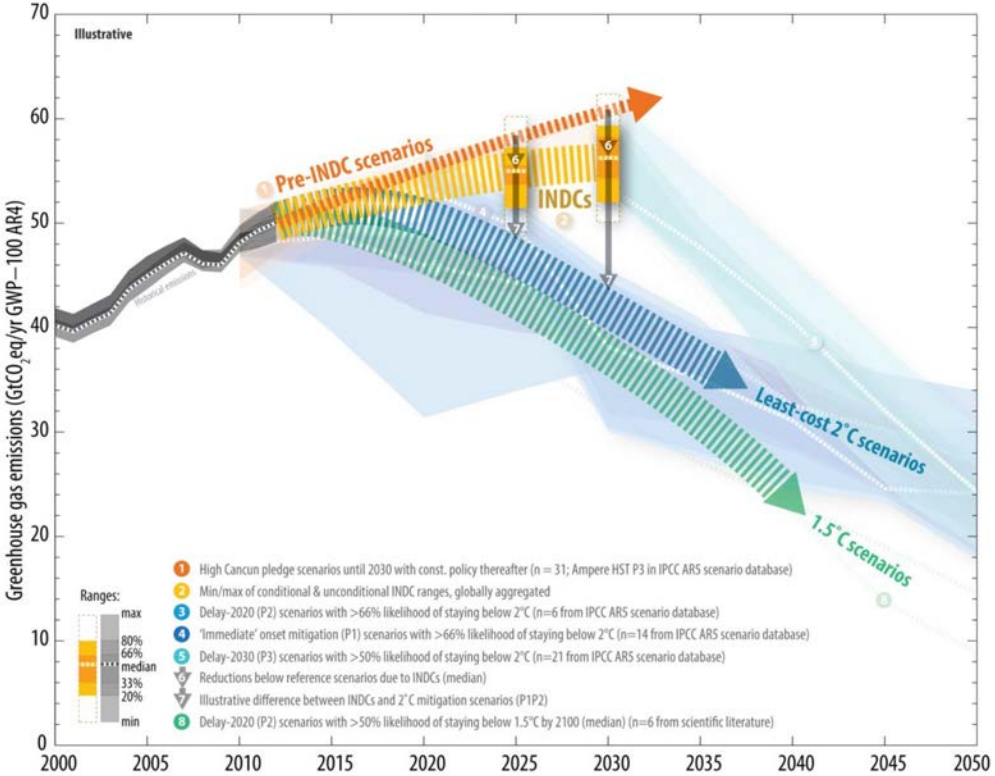
→ Augmentation des **investissements** dans les options bas carbone et l'efficacité énergétique (x5 en 2050)

Peter Essick / Aurora Photos



Source: Wolfgang Knorr, in The Conversation (2019)

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

Fact: It might become much worse, but the future climate is in our hands

@JPvanYpersele

Yes, the planet got destroyed. But for a beautiful moment in time we created value for shareholders

"Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders."

http://www.newyorker.com/humor/issuecartoons/2012/11/26/cartoons_20121119#slide=6

RCP2.6 **RCP8.5**

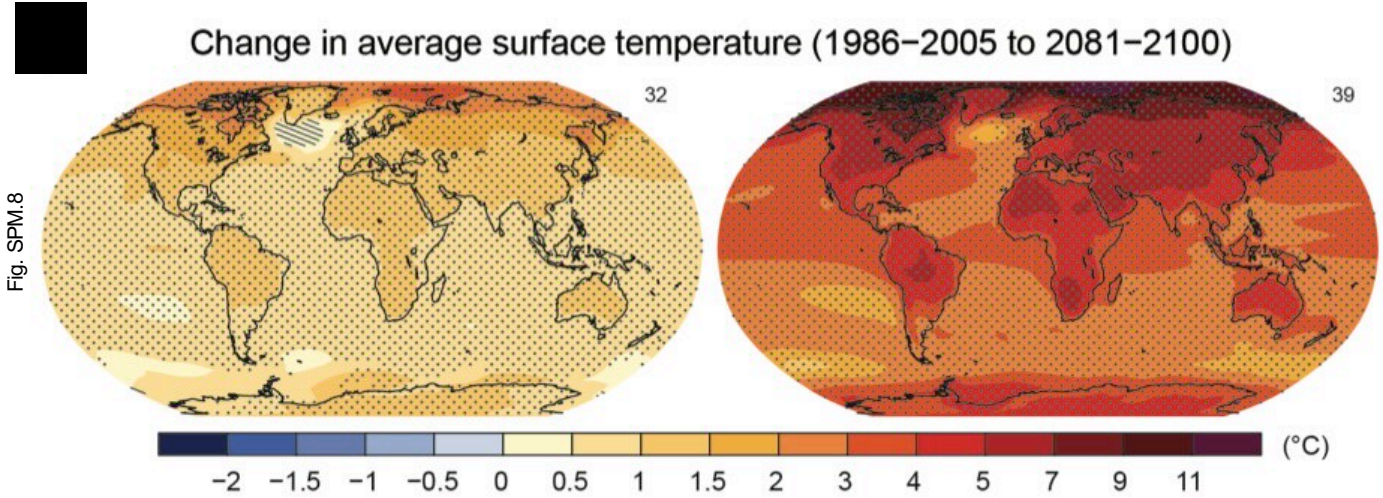
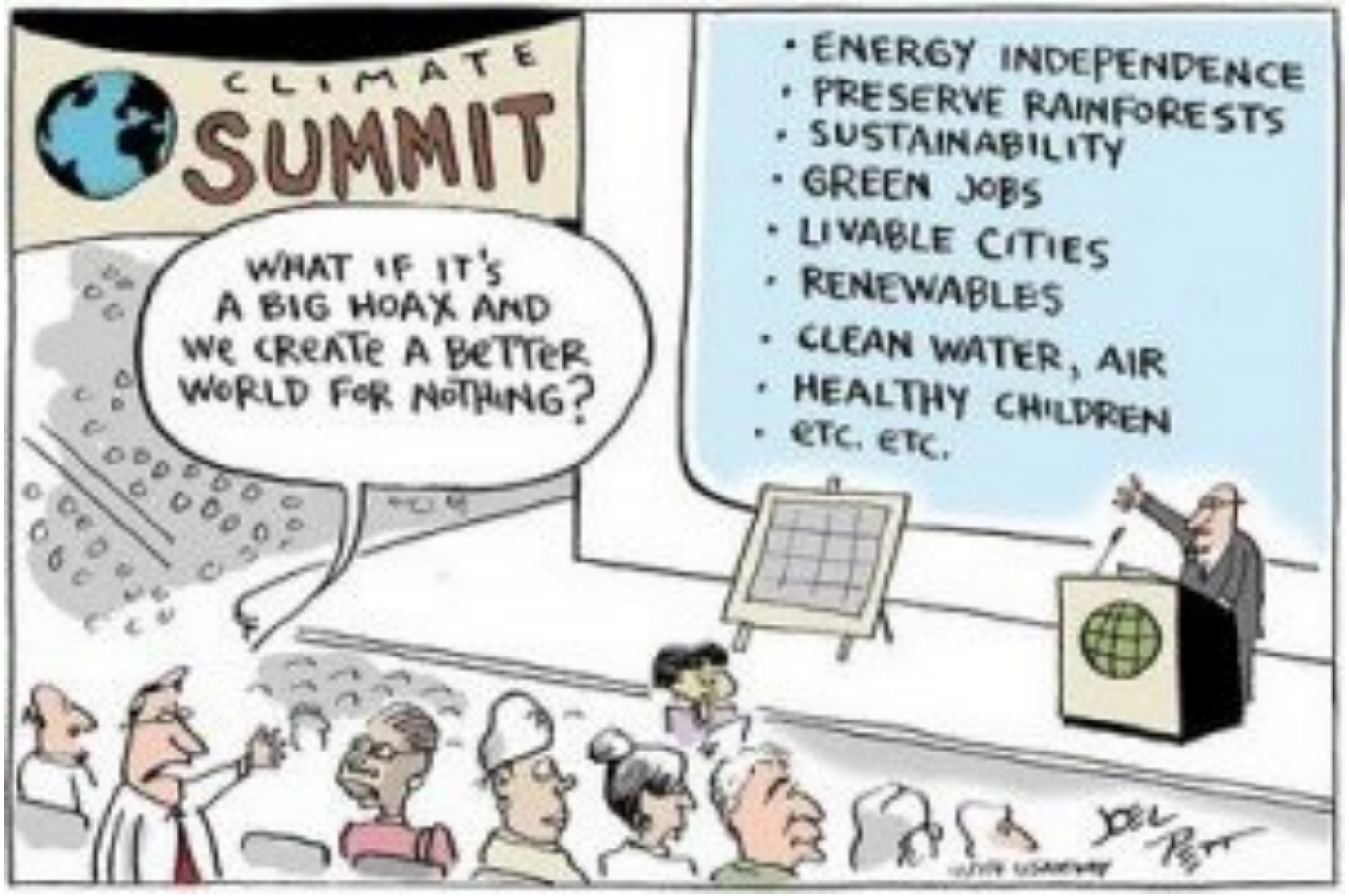


Fig. SPM.8

Humanity has the choice

SUSTAINABLE DEVELOPMENT GOALS



Joel Pett, USA Today


Nations Unies
onférence sur les Changements Climatiques
COP21/CMP11
Paris, France
SECRETAIRE EXECUTIVE CCNUCC
PRESIDENT

The Paris Agreement (COP21, December 2015)

Vision

« …strengthen the **global response to the threat of climate change**, in the context of **sustainable development** and efforts to **eradicate poverty** »

Objectives

a) Holding the increase in the global average temperature:

- *« **to well below 2°C** above pre-industrial levels »*
- *« **pursuing efforts to limit the temperature increase to 1.5°C** above pre-industrial levels,*
  recognizing that this would significantly reduce the risks and impacts of climate change »

b) Adaptation and Mitigation

- *« **Increasing the ability to adapt** to the adverse impacts of climate change and **foster climate resilience** and*
- ***low greenhouse gas emissions development**, in a manner that does not threaten food production»*

c) Finances

- *« Making **finance flows consistent** with a pathway towards low greenhouse gas emissions and climate-resilient development. »*

Climate negotiations since Paris Agreement

Two main issue set the tone

1. Making the Paris Agreement fully operational by agreeing the Katowice Rulebook

- Paris Agreement generally defines principles and mandates for further elaboration and conclusion
- Original plan: conclude the finalisation of the Rulebook at the first Meeting of the Parties to the Paris Agreement (was expected right before 2020)
- Due to the rapid entry into force of Paris Agreement at COP22 in 2016 this had to be revised
- Marrakesh (COP22) decides for conclusion of the rulebook by end of 2018 (COP24)
- COP24 succeeds in reaching agreement on the Katowice Rulebook Paris Agreement
- One very important exception to this: Article 6 market mechanism and the cooperation between Parties to achieve their emission reductions.

Climate negotiations since Paris Agreement

2. Enhancing climate ambition

- Central feature of Paris Agreement: 5 YEAR AMBITION CYCLE

  -> Global Stocktake of Paris Agreement (Art 14 Paris Agreement)

  -> Concept: science based input, technical preparations, political phase to be followed by new NDCs (in 2025, 2030, …)

  -> Invitation to communicate Long term strategies (LEDS)

- GST only starts in 2023 (and every 5 year thereafter): need for similar arrangement prior to this

  -> Solution: Paris Agreement decision to have in 2018 a 'Facilitative Dialogue' (branded as '**Talanoa Dialogue**' by Fiji)

  -> invitation to IPCC to present **Special Report on Global Warming of 1,5°C (reduce global emission with 45% by 2030 compared to 2010)**

- Since then building up on enhancing ambition (UN SG Summit 2019, Greta Thunberg, race to zero initiatives, …)

- At the focus of climate diplomacy and external dimension of EU Green Deal

- Originally Parties expected to present new or updated NDC in 2020

Climate negotiations since Paris Agreement

Preparing for COP26 in Glasgow: UK decided to postpone with 1 year and so only in November 2021

4 Broad workstreams

i) Enhancing national ambition in NDCs and LTS

- EU NDC 'at least 55%' and decision for climate neutral EU
- Other major economies are speeding up China; South Korea, Canada, …
- US President Biden: decided immediately after to rejoin Paris Agreement and decided for Climate Ambition Summit on 22 April

ii) Finalising the rulebook

iii) Upcoming mandates: new Climate Finance goal by 2025, adaptation …

iv) Climate campaigns: energy transition, transport, nature based solutions, climate resilience and adaptation, sustainable finance -> coalitions of the willing to spur transition and gain political momentum

1

"put the world on a path to driving down emissions, until they reach net zero by the middle of this century"

- All countries to set targets to get us to net zero by the middle of the century,
- and to come forward with 2030 emissions reduction targets to take us there.
- Consign coal power to history.
- Signal the end of polluting vehicles.
- Tackle methane emissions.
- Call time on deforestation, by making sustainable production pay.
- Countries to commit to all new cars being zero emission by 2040, or earlier.

01-12 NOV 2021
GLASGOW

COP26

IN PARTNERSHIP WITH ITALY

2

"to protect people and nature"

- Accelerate progress towards the Global Goal for Adaptation.
- Action to avert, minimise and address loss and damage
- Adaptation Action Coalition.
- Risk Informed Early Action Partnership.

01-12 NOV 2021
GLASGOW

3

"mobilising finance to tackle climate change"

IN PARTNERSHIP WITH ITALY

- deliver on the $100 billion, and support developing countries to respond to the climate crisis. It is a matter of trust.
- get private finance flowing, and collaborating with donors and development banks to create investment opportunities in emerging markets.

4

"Working together"

- building consensus among governments, so the negotiations in Glasgow are a success.

- finalise the Paris Rulebook
  - carbon markets.
  - transparent reporting.
  - Common Timeframes.

(Element) of solution n° 1: The survival of humanity and ecosystems must become a much higher political priority

… as if we were all running for our life.

@JPvanYpersele

Solution n° 2: Economic actors must be confronted much more clearly with their responsibilities

Degrowth of climate-unfriendly activities must be accepted, while growth of activities helping climate protection and poverty eradication must be encouraged

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http://www.newyorker.com/humor/issuecartoons/2012/11/26/cartoons_20121119#slide=6

Solution n° 3: The best understood language is the price. Destroying the environment must become more and more expensive. Collected funds must be used to help the decarbonization, and avoid impacting the poor disproportionately

EU Emission Trading System, CO_2 taxes, fines, internal CO_2 price (firms do « as if » CO_2 emission was expensive). NB: Price must match the effect desired!

@JPvanYpersele

Solution n° 4: Transition towards a clean and sustainable economy and energy system must be « just », and other synergies with the SDGs must be seeked

Ex : The Polish energy system cannot be transformed without facilitating the coal miners reconversion

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Solution n° 5: Before looking at how to produce energy cleanly, much more attention must be given to reducing energy demand and efficiency, in all sectors

All production and consumption patterns must be reconsidered, helped by energy audits, etc.

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- **Substantial reductions in emissions to stay under 2° C would require large changes in investment patterns e.g., from 2010 to 2029, in billions US dollars/year:** (mean numbers rounded, IPCC AR5 WGIII Fig SPM 9)
- **energy efficiency: +330**
- **renewables: + 90**
- **power plants w/ CCS: + 40**
- **nuclear: + 40**
- **power plants w/o CCS: - 60**
- **fossil fuel extraction: - 120**

Solution n° 6: Building sector: offers many opportunities in energy saving, economic activity, improving wellbeing…

Solution n° 7: Mobility : much more space and priority to pedestrians, bicycles, and public transport; reduce priority given too long to individual transport in urban planning

Electrify remaining vehicles (with clean electricity). Fly less, only if essential.

@JPvanYpersele

Solution n° 8: Food and agriculture. A possible change with big positive impact: eat less (red) meat and cheese, of better quality! Eat more plant-based food (produced cleanly)

…It is good for health as well!

@JPvanYpersele

Solution n° 9: The Sun gives us in two hours about as much energy as the world uses in *one year*, all forms of energy considered

The cost of solar kWh is crashing, wind power, heat and electricity storage, and smart grids are moving forward

@JPvanYpersele

Trying to practice what I « preach »:

- Energy audit before renovation
- Strong external insulation (wood fiber)
- Super-efficient windows
- Air tightiness + heat recovery ventilation system
- Ground-water heat pump replacing oil furnace
- Solar PV covering all consumption
- No tropical wood
- Small, used electric car

Conclusions

The IPCC AR6 WGI report confirmed that the inhabitability of the Earth is at stake due to climate change

Adaptation is key, and resources need to be much better shared and managed, but adaptation will not be sufficient at all

Stabilizing the temperature as close as possible to no more than 1.5°C above the pre-industrial is essential, and requires to move away quickly from fossil fuels, and to stop deforestation

The challenge is huge: transform the world in a few decades so that the whole world activities are decarbonized, while poverty and hunger are eliminated

Addressing this challenge opens so many opportunities, including opportunities to address in a synergistic manner other societal goals, such as the 17 Sustainable Development Goals.

This gives me hope:

Well-informed young people speaking truth to power

With @GretaThunberg in the Lausanne train station, August 2019

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

Plateforme Wallonne pour le GIEC

Lettre N°13 - avril 2019

'Sauver le climat' : les bases

Suite à l'intense mobilisation des jeunes, les changements climatiques ont fait l'objet de beaucoup d'attention au cours des derniers mois. Elèves 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 !

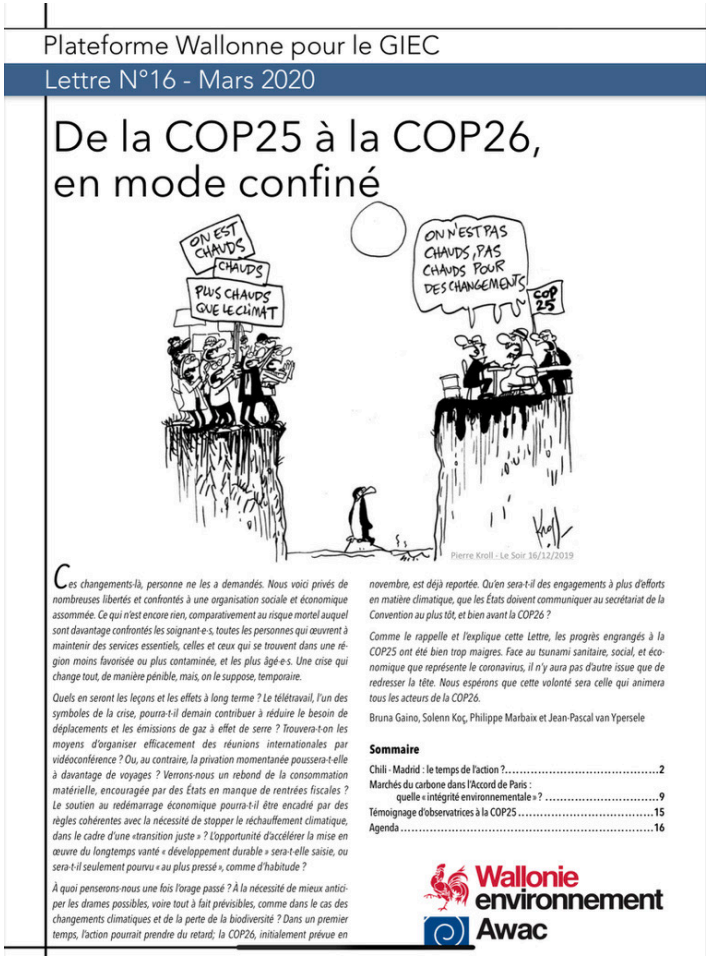
Jean-Pascal van Ypersele, Philippe Marbaix et Bruna Gaino

Sommaire

Wallonie environnement Awac

Disponible gratuitement, 6X/an: www.plateforme-wallonne-giec.be

Une des Lettres de la Plateforme Wallonne pour le GIEC (que j'anime) consacrées aux COPs



Plateforme Wallonne pour le GIEC

Lettre N°16 - Mars 2020

De la COP25 à la COP26, en mode confiné

Pierre Kroll - Le Soir 16/12/2019

Ces changements-là, personne ne les a demandés. Nous voici privés de nombreuses libertés et confrontés à une organisation sociale et économique assommée. Ce qui n'est encore rien, comparativement au risque mortel auquel sont davantage confrontés les soignant·e·s, toutes les personnes qui œuvrent à maintenir des services essentiels, celles et ceux qui se trouvent dans une région moins favorisée ou plus contaminée, et les plus âgé·e·s. Une crise qui change tout, de manière pénible, mais, on le suppose, temporaire.

Quels en seront les leçons et les effets à long terme ? Le télétravail, l'un des symboles de la crise, pourra-t-il demain contribuer à réduire le besoin de déplacements et les émissions de gaz à effet de serre ? Trouvera-t-on les moyens d'organiser efficacement des réunions internationales par vidéoconférence ? Ou, au contraire, la privation momentanée poussera-t-elle à davantage de voyages ? Verrons-nous un rebond de la consommation matérielle, encouragée par des États en manque de rentrées fiscales ? Le soutien au redémarrage économique pourra-t-il être encadré par des règles cohérentes avec la nécessité de stopper le réchauffement climatique, dans le cadre d'une «transition juste » ? L'opportunité d'accélérer la mise en œuvre du longtemps vanté « développement durable » sera-t-elle saisie, ou sera-t-il seulement pourvu « au plus pressé », comme d'habitude ?

À quoi penserons-nous une fois l'orage passé ? À la nécessité de mieux anticiper les drames possibles, voire tout à fait prévisibles, comme dans le cas des changements climatiques et de la perte de la biodiversité ? Dans un premier temps, l'action pourrait prendre du retard; la COP26, initialement prévue en novembre, est déjà reportée. Qu'en sera-t-il des engagements à plus d'efforts en matière climatique, que les États doivent communiquer au secrétariat de la Convention au plus tôt, et bien avant la COP26 ?

Comme le rappelle et l'explique cette Lettre, les progrès engrangés à la COP25 ont été bien trop maigres. Face au tsunami sanitaire, social, et économique que représente le coronavirus, il n'y aura pas d'autre issue que de redresser la tête. Nous espérons que cette volonté sera celle qui animera tous les acteurs de la COP26.

Bruna Gaino, Solenn Koç, Philippe Marbaix et Jean-Pascal van Ypersele

Sommaire

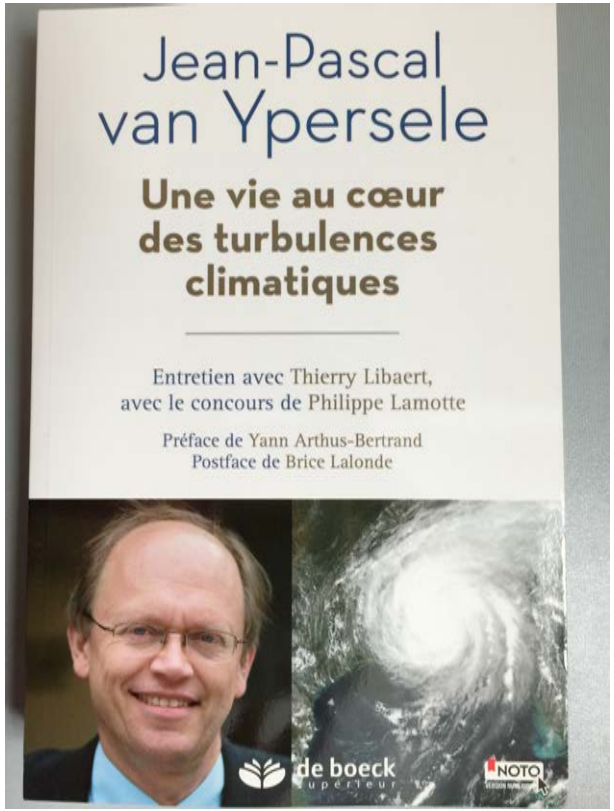
Wallonie environnement Awac

Disponible gratuitement, 6X/an: www.plateforme-wallonne-giec.be

Pour en savoir plus:

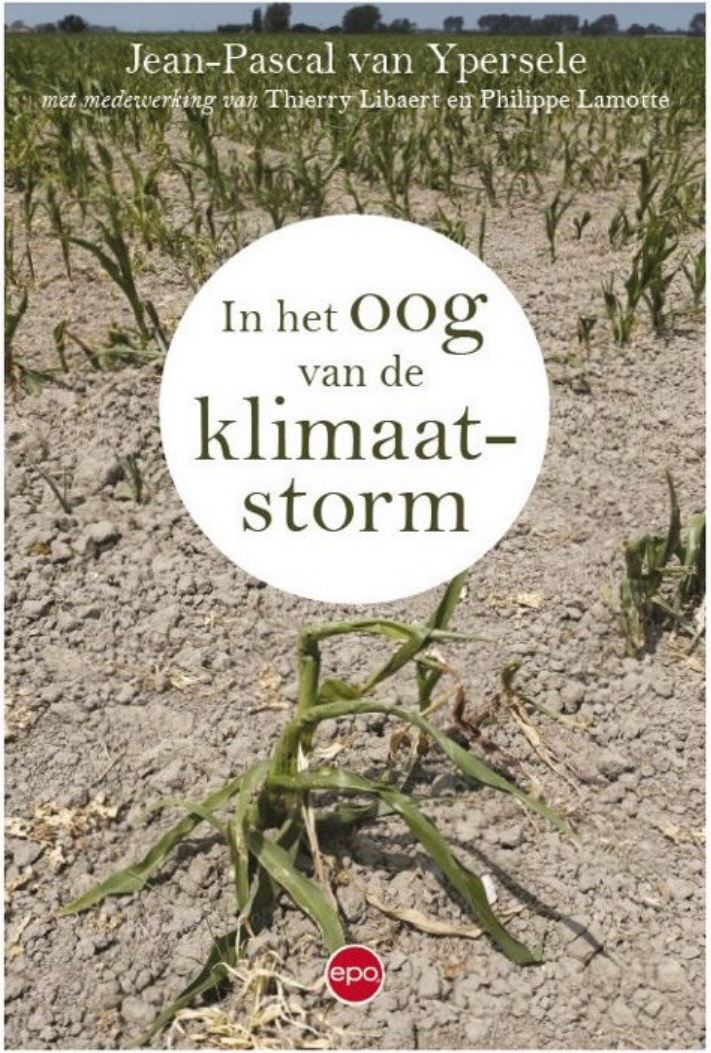
Lisez mon livre, où j'aborde tous ces sujets

Publié chez De Boeck supérieur

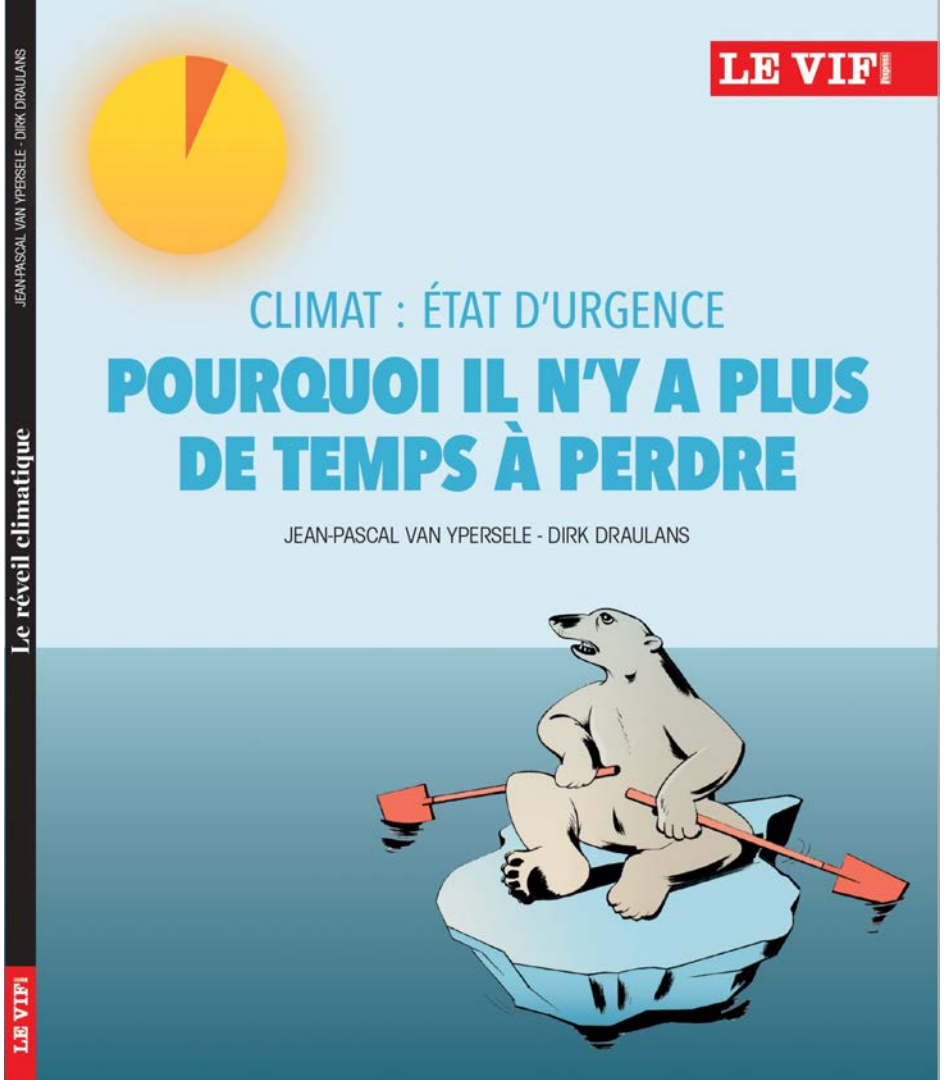


Bij EPO (2018)

Voorwoord:
Jill Peeters



Gratuit sur
www.levif.be/reveil-climatique



Gratis op
www.knack.be/klimaatalarm

DAT POLITICI OVER TWINTIG JAAR NIET KOMEN JANKEN DAT ZE HET NIET WISTEN.

DIRK DRAULANS (1956) is bioloog, doctor in de wetenschappen en was gastonderzoeker aan de University of Oxford. Sinds 1987 is hij journalist bij Knack.

JEAN-PASCAL VAN YPERSELE (1957) is fysicus en klimatoloog. Hij is hoogleraar klimatologie en milieuwetenschappen aan de UCLouvain en was ondervoorzitter van het Intergovernmental Panel on Climate Change (IPCC).

BIJLAGE BIJ KNACK VAN 16 SEPTEMBER 2020. MAG NIET LOS VERKOCHT WORDEN.

HET KLIMAATALARM

HET KLIMAAT ALARM

Dirk Draulans en
Jean-Pascal van Ypersele

Knack

To go further :

- www.climate.be/vanyp : my slides (under « conferences »)
- www.ipcc.ch : IPCC
- www.realclimate.org : answers to the merchants of doubt arguments
- www.skepticalscience.com : same
- www.plateforme-wallonne-giec.be : IPCC-related in French, Newsletter, latest on climate, basic climate science
- **Twitter: @JPvanYpersele & @IPCC_CH**

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