

The Ocean and Climate Ambition: Urgency to Act

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**Opening of the Spanish Pavillion's Ocean Day,
Because the Ocean initiative, COP25, Madrid,
6 December 2019**

Thanks to the Walloon government for supporting www.plateforme-wallonne-giec.be & my team at UCLouvain

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.

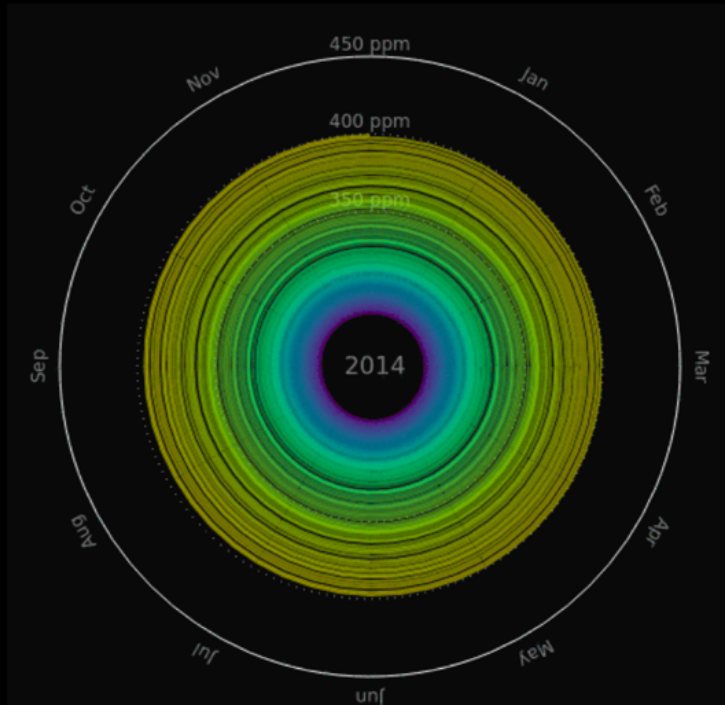
IT'S BAD

The impacts are serious and affect people.

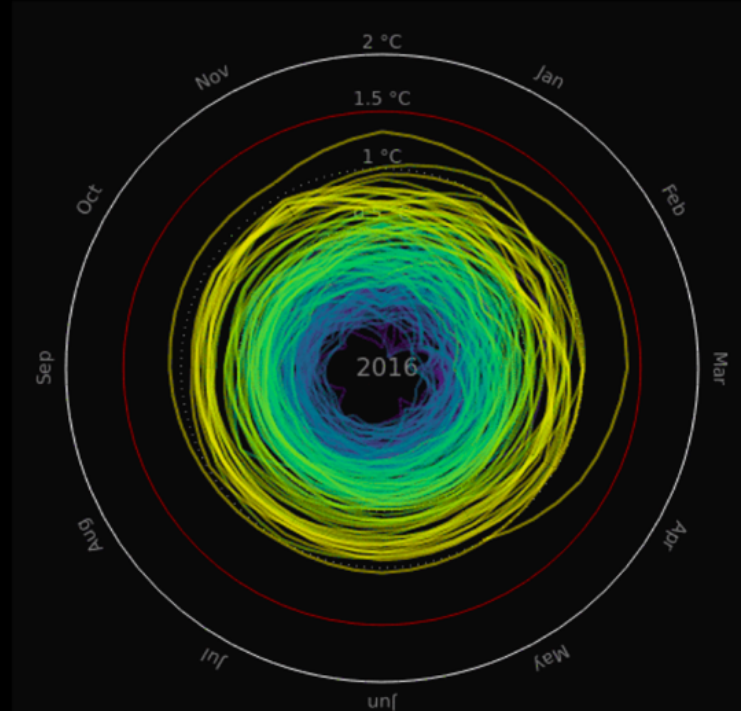
THERE'S HOPE

We have the technology needed to avoid the worst climate impacts.

CO₂ 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

CO₂ 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/>

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INTERGOVERNMENTAL PANEL ON climate change

The Ocean and Cryosphere in a Changing Climate

This Summary for Policymakers was formally approved at the Second Joint Session of Working Groups I and II of the IPCC and accepted by the 51st Session of the IPCC, Principality of Monaco, 24th September 2019

Summary for Policymakers



WG I WG II



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WG I WG II



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Changes in polar regions

- The Greenland and Antarctic ice sheets are losing mass, accelerating global sea level rise. They will continue to melt, committing the planet to **long-term** global sea level rise.
- **Arctic sea ice is declining in every month of the year**, and is getting thinner.
- At global warming of 1.5°C, the Arctic Ocean will **rarely be free of sea ice** in September. At 2°C warming, this will occur **up to one year in three**.

Plateau Glacier (1961) (Alaska)



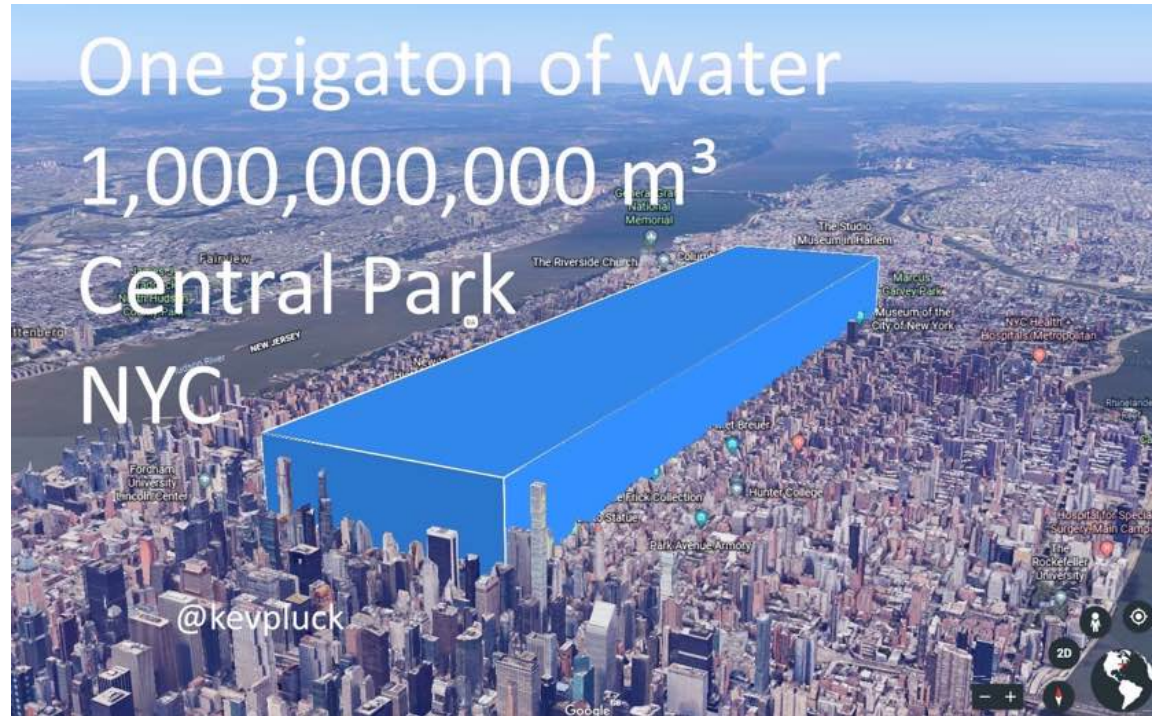
http://www.weather.com/news/science/environment/alaskas-glaciers-capturing-earth-changing-our-eyes-20131125?cm_ven=Email&cm_cat=ENVIRONMENT_us_share

Plateau Glacier (2003) (Alaska)

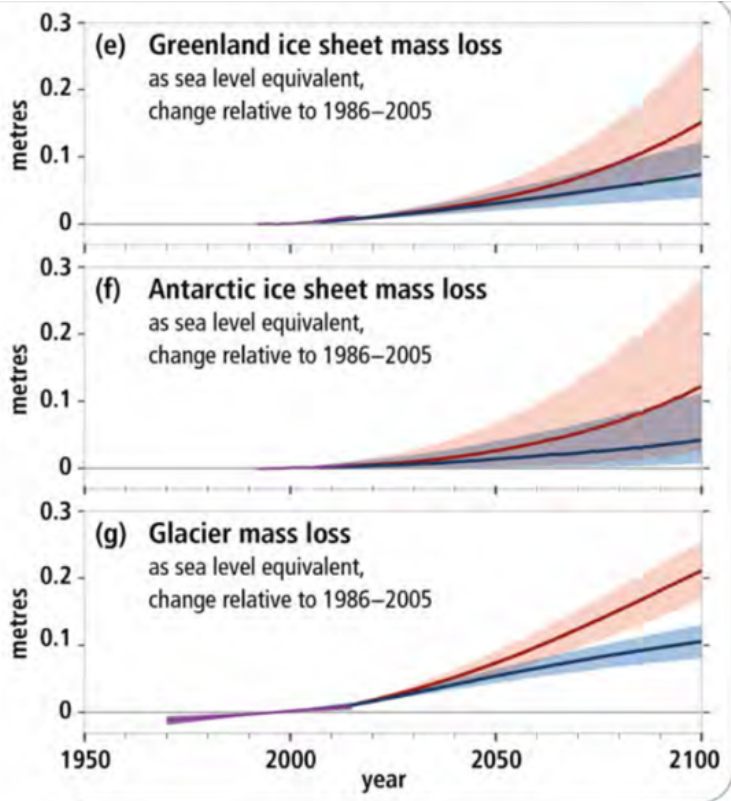


http://www.weather.com/news/science/environment/alaskas-glaciers-capturing-earth-changing-our-eyes-20131125?cm_ven=Email&cm_cat=ENVIRONMENT_us_share

The Greenland and Antartic Ice Sheets presently lose 1 Gt of water every 16 hours

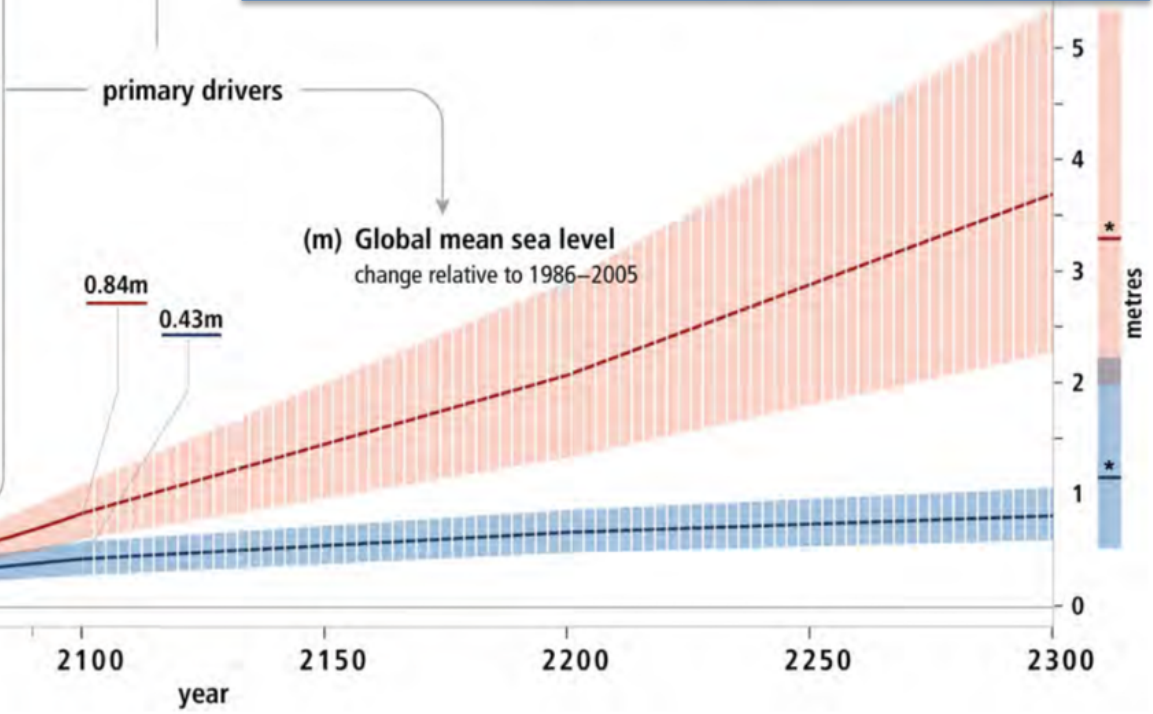


Source of illustration: @Kevpluck, June 2018

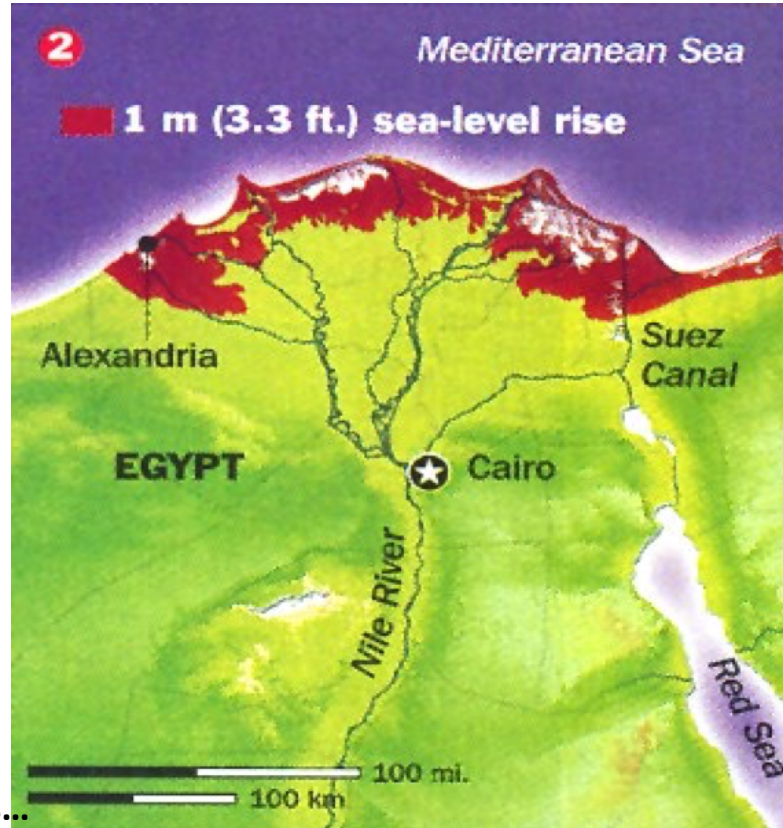


Past and future changes in the ocean and cryosphere
Historical changes (observed and modelled) and projections under RCP2.6 and RCP8.5 for key indicators

- Historical (observed)
- Historical (modelled)
- Projected (RCP2.6)
- Projected (RCP8.5)



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



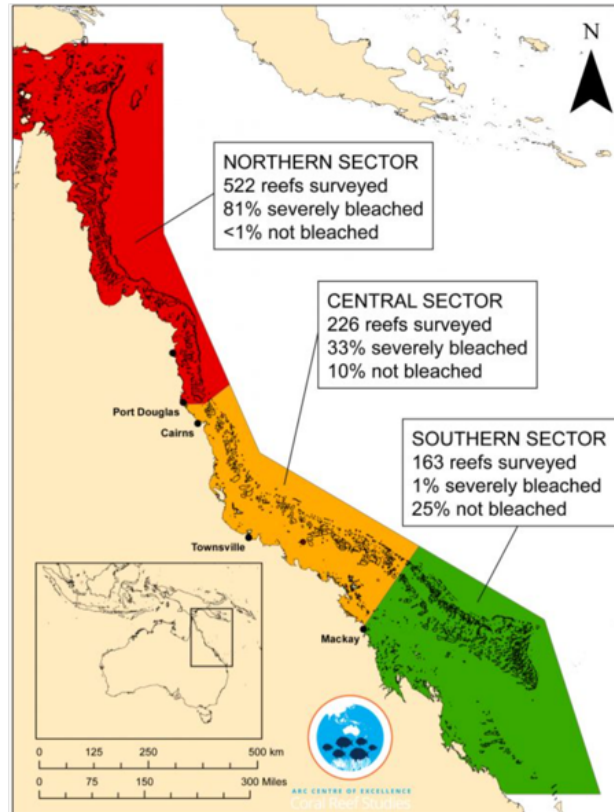
NB: + 1 m is possible
in the next 100 years..

(Time 2001)

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

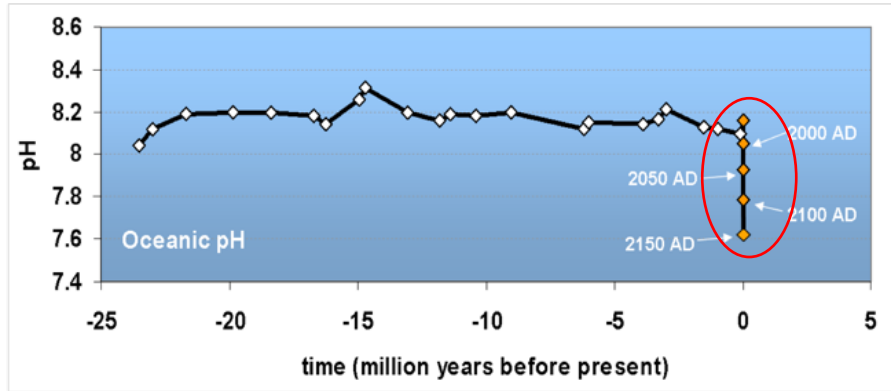
The « Sixth Extinction » has started, and
climate change is one of the causing factors

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



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



Knowledge for action

The IPCC Special Report on the Ocean and Cryosphere in a Changing Climate

- highlights **the urgency** of prioritizing **timely, ambitious and coordinated action** to address **widespread and enduring changes** in the ocean and cryosphere;
- empowers people, communities and governments to tackle the unprecedented transitions in all aspects of society;
- provides evidence of the benefits of combining scientific with local and indigenous knowledge;
- focuses, for the first time, on the importance of education and climate literacy.

The more decisively and earlier we act, the more able we will be to address unavoidable changes, manage risks, improve our lives and achieve sustainability for ecosystems and people around the world – today and in the future.

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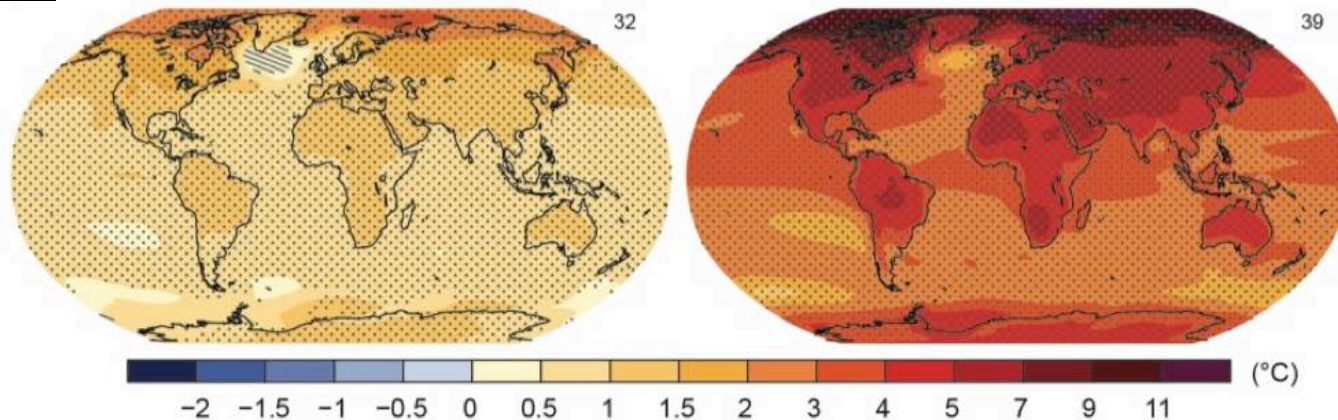


RCP2.6

RCP8.5

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

Fig. SPM.8



Humanity has the choice

Océans et cryosphère

Le rapport spécial sur l'Océan et la cryosphère dans le contexte des changements climatiques a été adopté par l'Assemblée plénière du GIEC le 25 septembre 2019 à Monaco.

Dans cette Lettre, nous présentons d'abord un aperçu des principaux éléments de l'évaluation du GIEC, sous une forme accessible et illustrée d'éléments concrets.

Ensuite, trois scientifiques belges nous font bénéficier de leur expertise en présentant chacun un sujet important lié au rapport - la fonte des glaces du Groenland et de l'Antarctique, leurs mécanismes et leur impact sur le niveau des mers, et la perte d'oxygène des océans, perturbation anthropique moins souvent abordée mais à laquelle les changements climatiques contribuent également.

Nous vous souhaitons une agréable lecture de cette Lettre !

Philippe Mathais, Bruna Galno et Jean-Pascal van Ypersele

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Basé sur le dernier rapport du GIEC (SROCC). Complété par les articles de spécialistes, avec des liens vers des ressources utiles

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

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, latests on SR15, basic climate science
- **Twitter: @JPvanYpersele & @IPCC_CH**