Food Systems and Climate Change: Reflections from Recent IPCC and GSDR Reports

Prof. Jean-Pascal van Ypersele

UCLouvain, Louvain-la-Neuve, Belgium

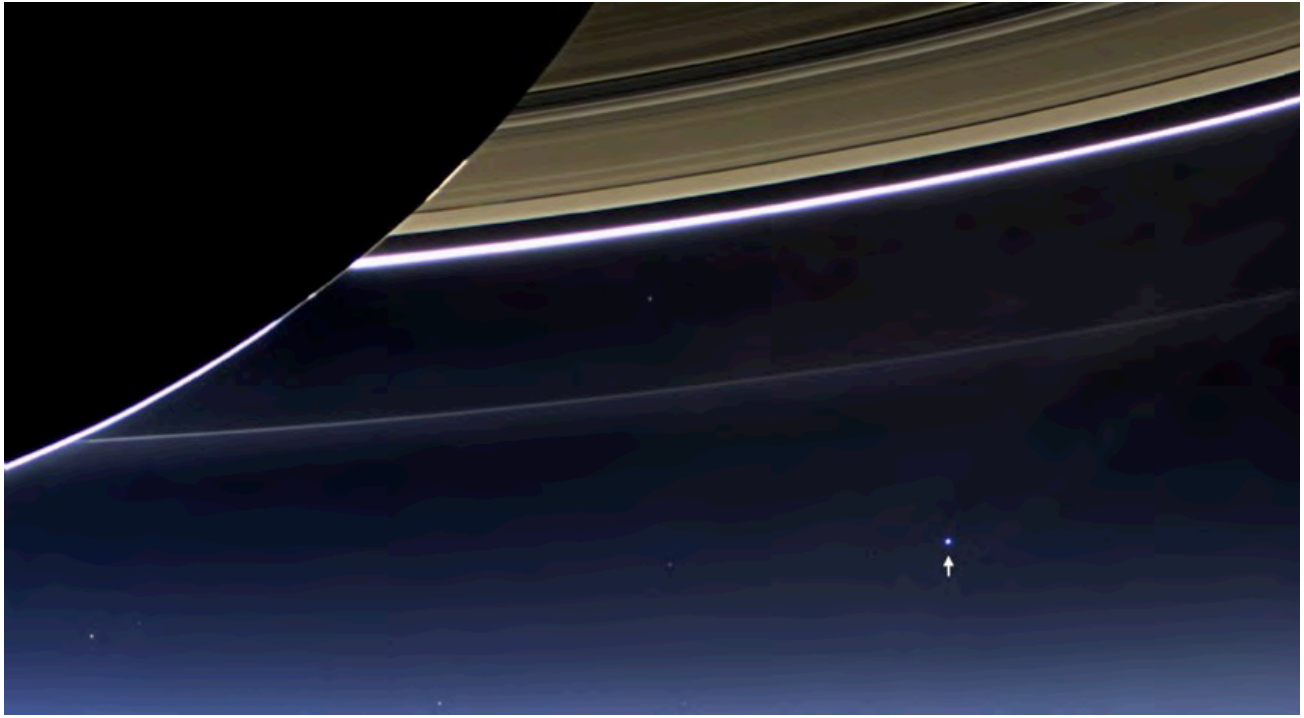
IPCC Vice-Chair from 2008 to 2015

Twitter: @JPvanYpersele

FENS2019, 13th European Nutrition Conference
« Malnutrition in an Obese World », Dublin, Ireland,
16 October 2019 (By video)

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

That small blue dot is the Earth, a seen from Cassini, orbiting Saturn, 1.44 billion km from us, on 19 July 2013

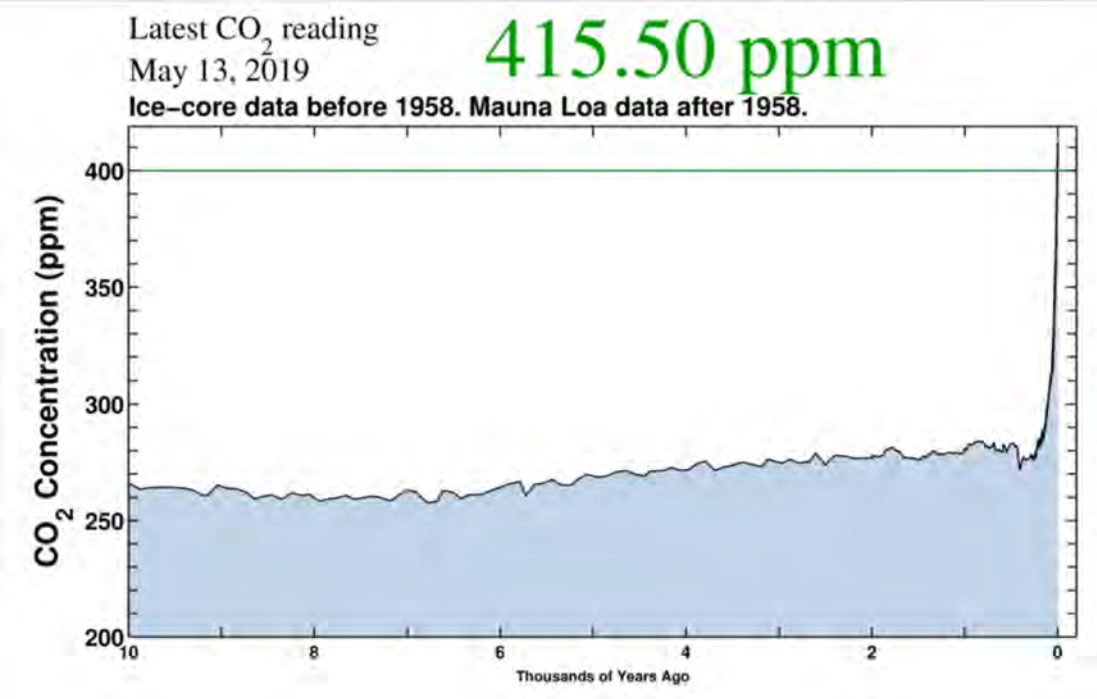


Fact: Because we use the atmosphere as a dustbin for our greenhouse gases, we thicken the thermal insulation layer around the planet

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

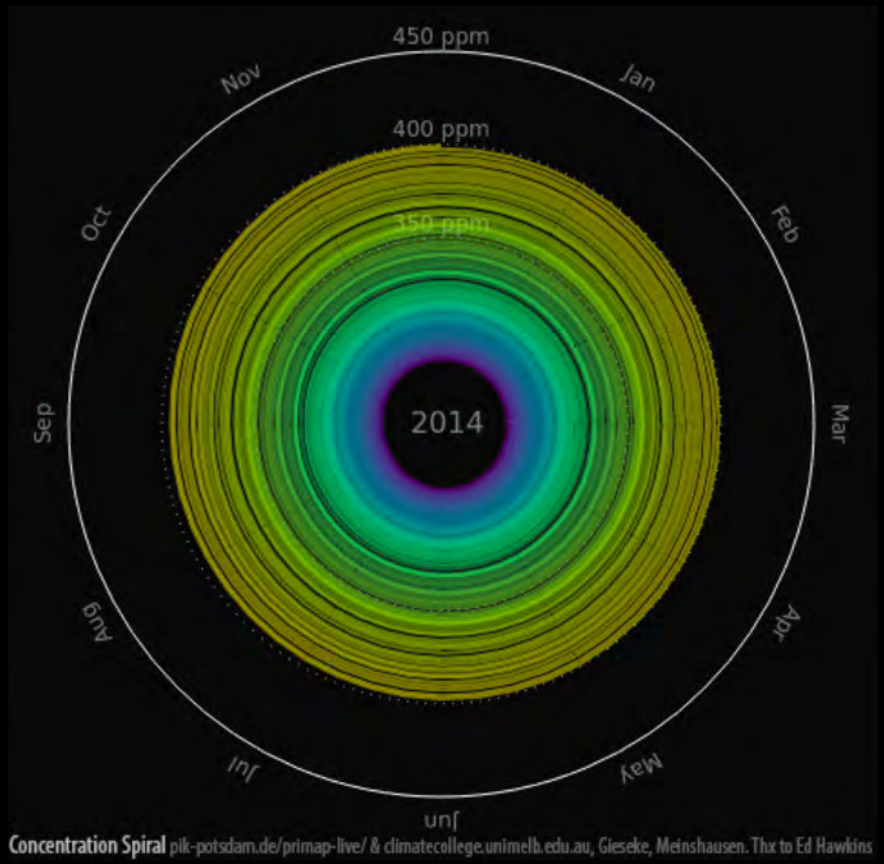
@JPvanYpersele

CO_2 Concentration, 13 May 2019 (Keeling curve)



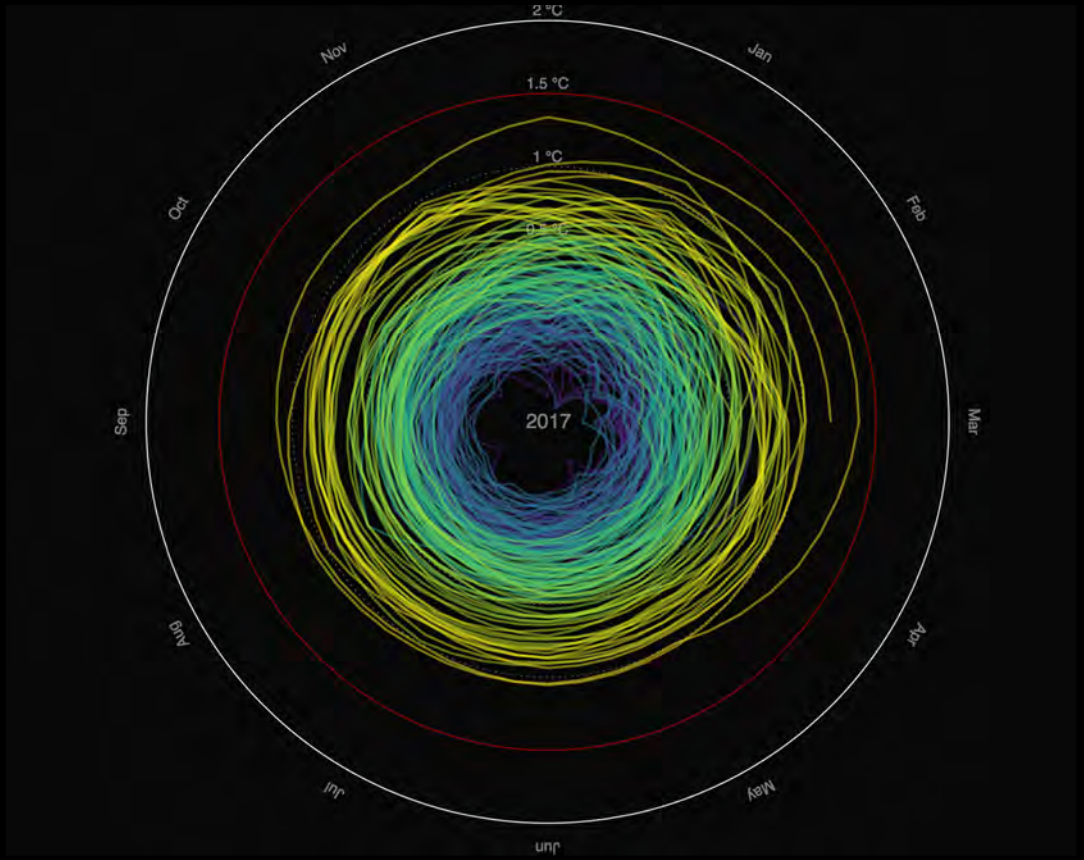
Source: scripps.ucsd.edu/programs/keelingcurve/

CO_2 concentration spiral: the insulation thickens!



CO_2 concentration spiral 1851-2014 (ppm), by Gieseke & Meinshausen,
Available on http://pik-potsdam.de/primap-live

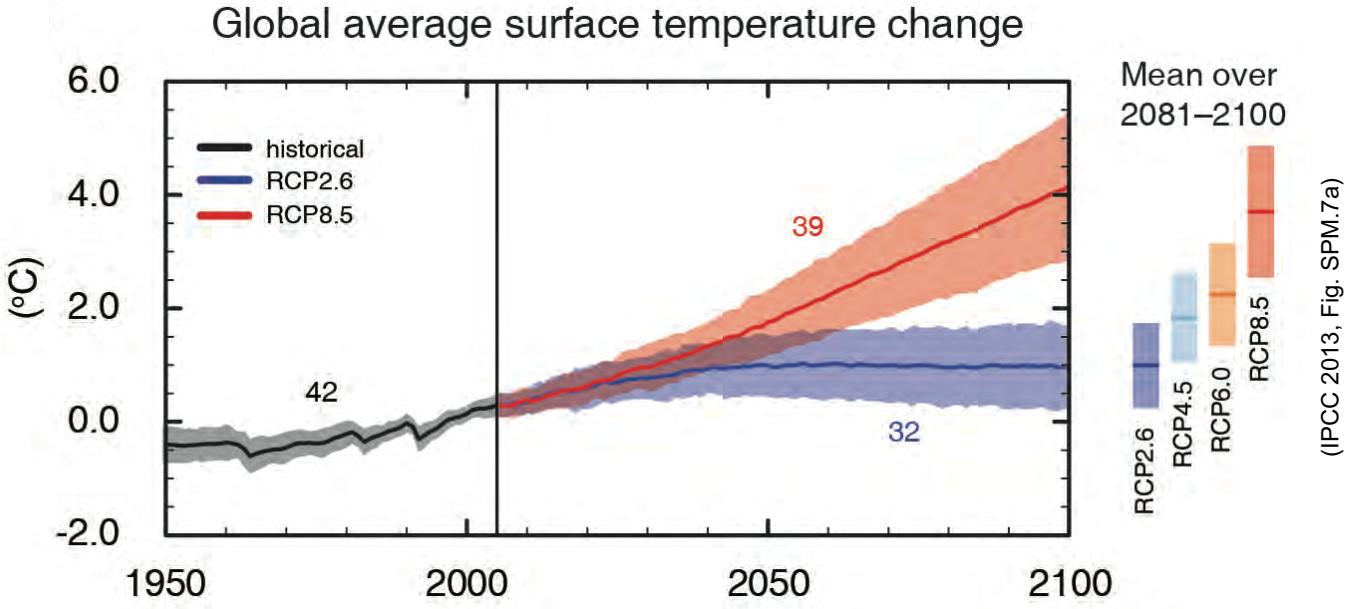
Temperature spiral



Global Mean Temperature in °C relative to 1850 – 1900
Graph: Ed Hawkins (Climate Lab Book) – Data: HadCRUT4 global temperature dataset
Animated version available on http://openclimatedata.net/climate-spirals/temperature

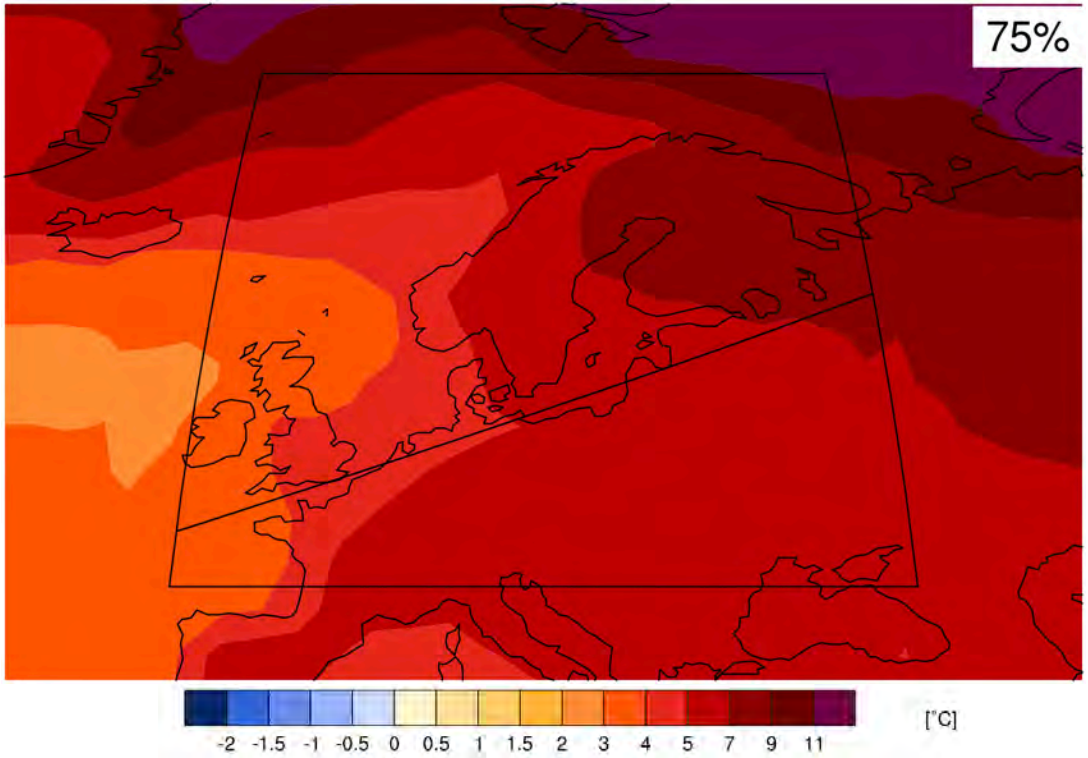
Since 1950, extreme hot days and heavy precipitation have become more common

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



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

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



IPCC WG1 Fifth Assessment Report (Final Draft)

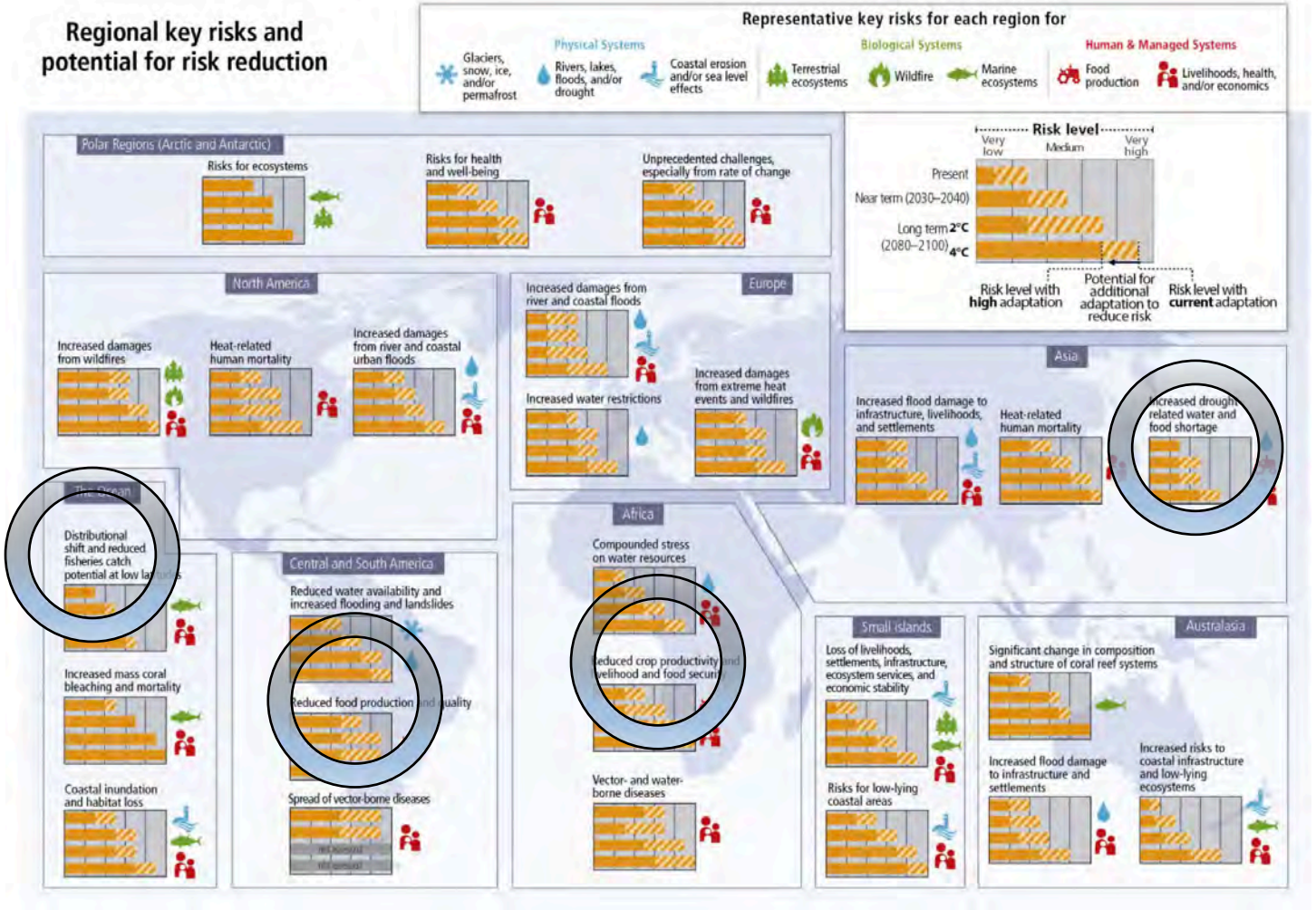
Impacts are already underway

- 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)

AP Photo - Lisa Krantz (http://lisakrantz.com/hurricane-katrina/zspbn1k4cn17phidupe4f9x5t1mzdr)



IPCC, AR5, SPM, Figure SPM.6

WMO UNEP

Why the IPCC ?

Established by WMO and UNEP in 1988

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

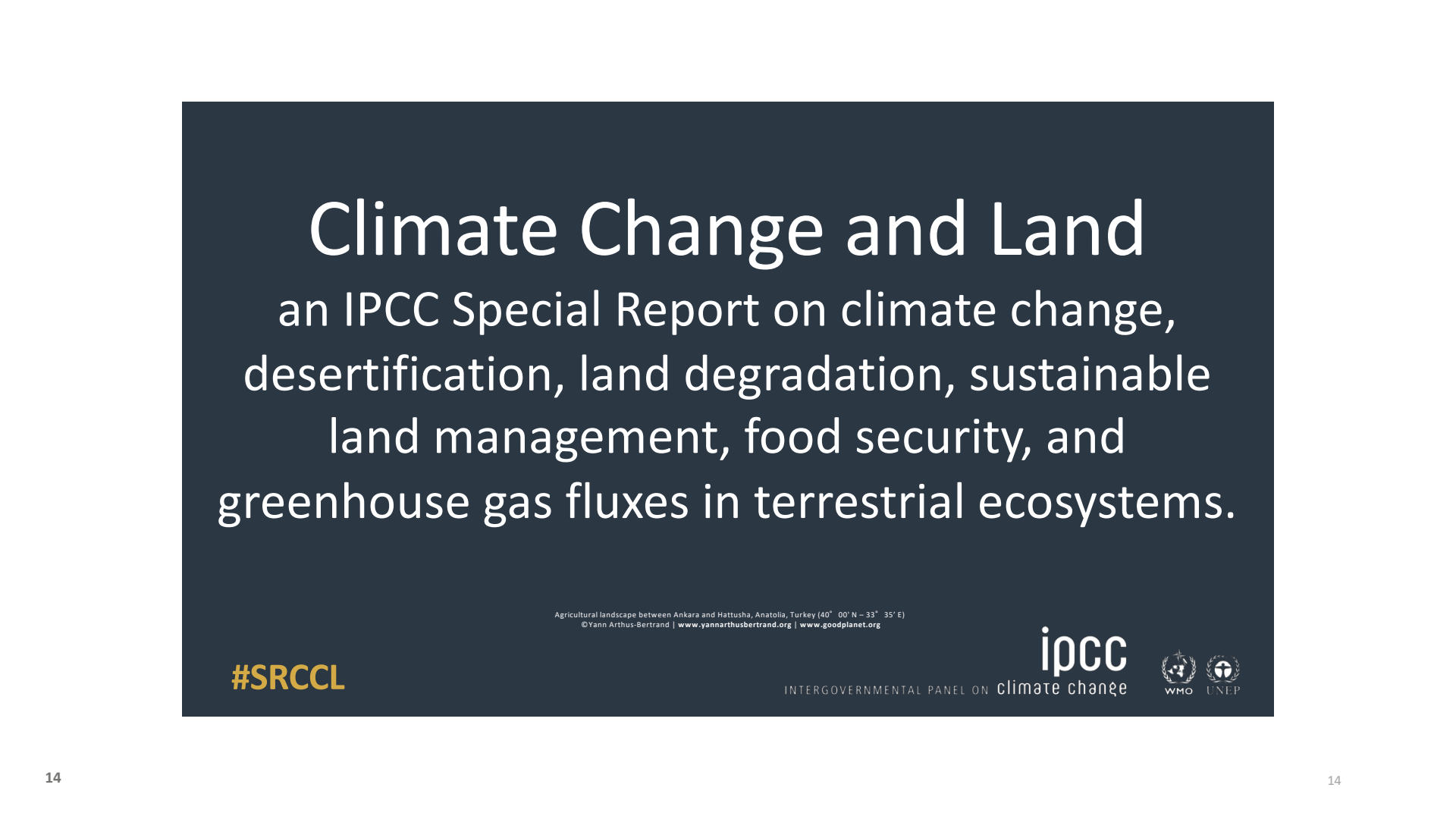
- causes of climate change,
- potential environmental and socio-economic impacts,
- possible response options (adaptation & mitigation).

WMO=World Meteorological Organization

UNEP= United Nations Environment Programme

Climate Change and Land

an IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.



Agricultural landscape between Ankara and Hattusha, Anatolia, Turkey (40° 00' N – 33° 35' E)
©Yann Arthus-Bertrand | **www.yannarthusbertrand.org** | **www.goodplanet.org**

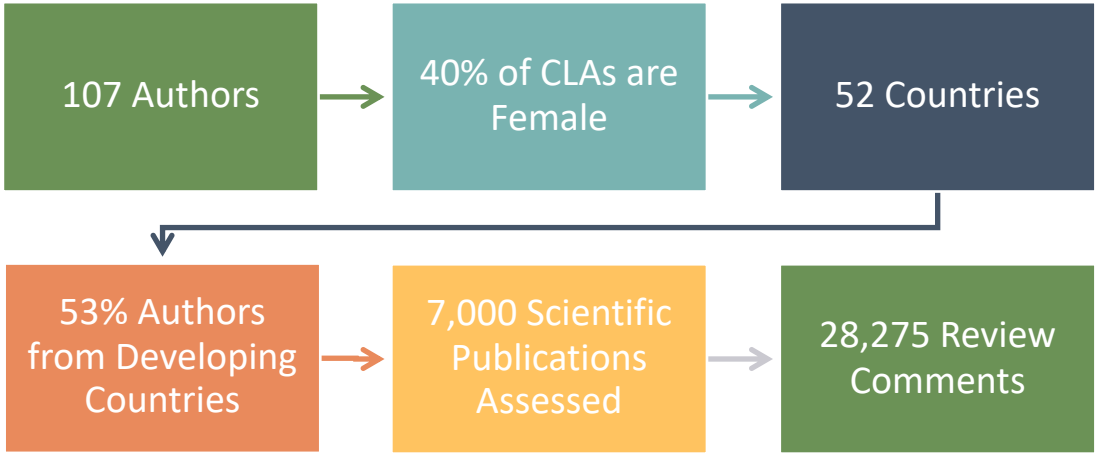
#SRCCL

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

14

SRCCL REPORT BY THE NUMBERS



15

Land is where we live

Land is under growing human pressure

Land is a part of the solution

But land can't do it all

16

“Land is a critical resource – we rely on it for food, water, health and wellbeing – but it is already under growing human pressure. Climate change is adding to these pressures

Climate Change Undermines Food Security

- Despite increasing food production, an estimated 821 million people are undernourished.

- In some regions yields may temporarily benefit from warmer conditions.

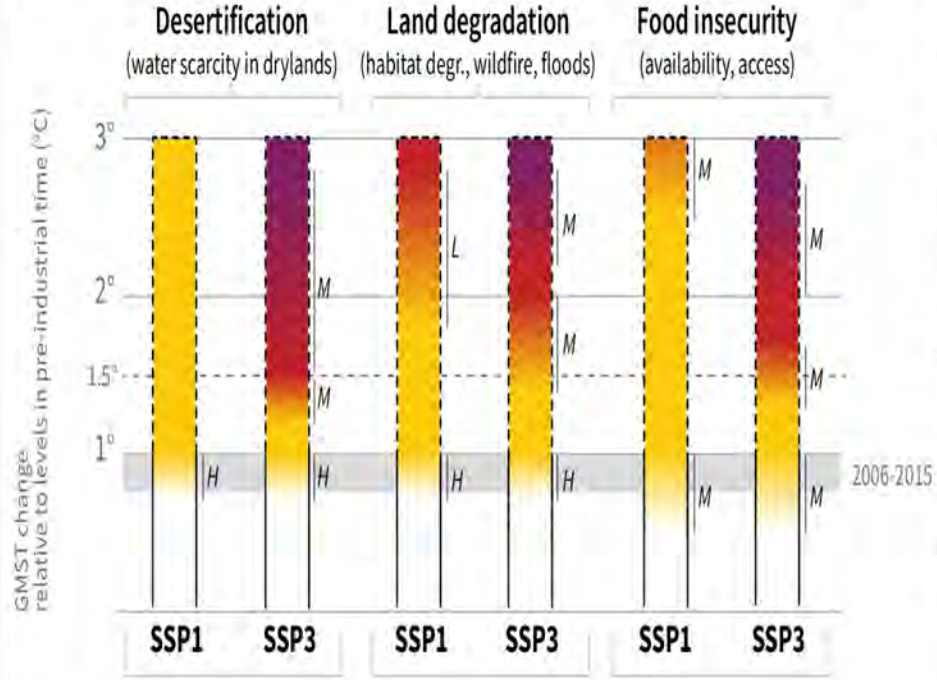
- In the future climate change will cause declined yields, increased prices, reduced nutrient levels and the disruption of supply chains for food.

18

Climate change is making a **challenging situation worse and undermining food security**.

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

B. Different socioeconomic pathways affect levels of climate related risks



Socio-economic choices can reduce or exacerbate climate related risks as well as influence the rate of temperature increase. The **SSP1** pathway illustrates a world with low population growth, high income and reduced inequalities, food produced in low GHG emission systems, effective land use regulation and high adaptive capacity. The **SSP3** pathway has the opposite trends. Risks are lower in SSP1 compared with SSP3 given the same level of GMST increase.

Agriculture, food production, and deforestation are major drivers of climate change.

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Agriculture, Forestry and Other Land Use (AFOLU) activities accounted for Around:

- 13% of CO_2
- 44% of methane (CH_4)
- 82% of nitrous oxide (N_2O)

emissions from human activities globally during 2007-2016, representing **23%** (12.0 +/- 3.0 $GtCO_2e\ yr^{-1}$) **of total net anthropogenic emissions of GHGs**[22]

> Coordinated action to tackle climate change can **simultaneously improve land, food security and nutrition, and help to end hunger.**

The **way we produce our food matters**; dietary choices can help reduce emissions and pressure on land.

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

A move to more balanced diets could help us adapt to and limit climate change

- Some diets require more land and water and lead to higher emissions than others.
- Diets high in grains, nuts and vegetables have a lower carbon footprint than those that are high in meat, and lead to better health outcomes.
- Dietary choices are influenced by local production practices and cultural habits.

25

There are things we can do to both **tackle land degradation** and prevent or adapt to further climate change.

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

> **The land that we are already using could feed the world in a changing climate and provide biomass for renewable energy**, but it would require early, far-reaching action across several fronts.

Better land management also supports **biodiversity conservation**

> **Better land management can play its part** in tackling climate change, but it can't do it all.

Land is where we live

Land is under growing human pressure

Land is a part of the solution

But land can't do it all

30

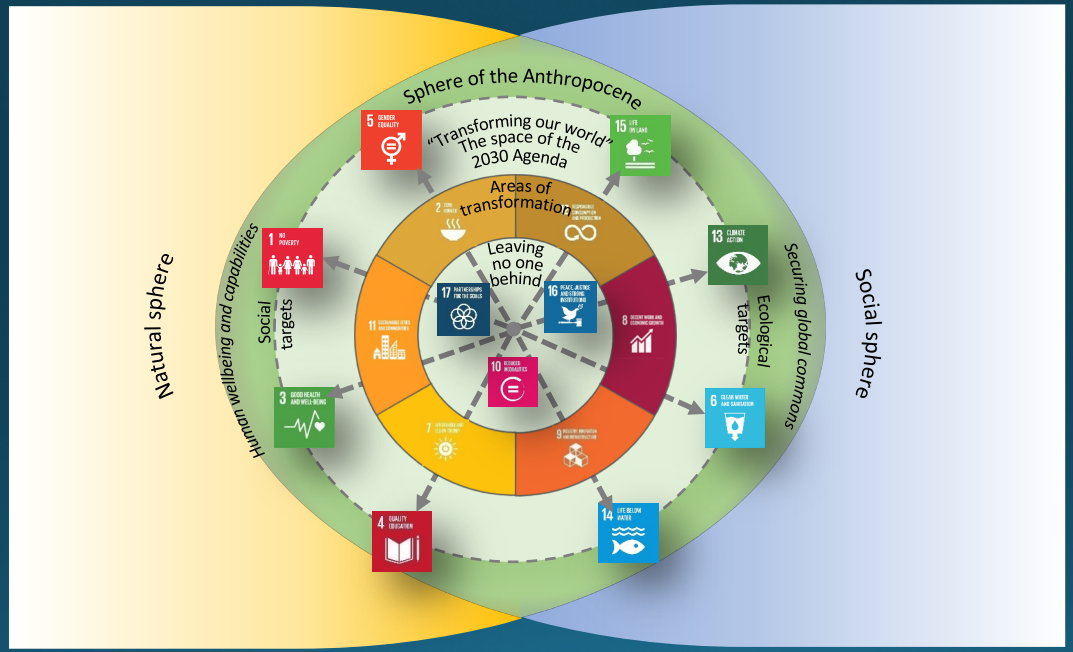
SUSTAINABLE DEVELOPMENT GOALS

The Future is Now – Science for achieving sustainable development

#GSDR2019: Global Sustainable Development Report 2019

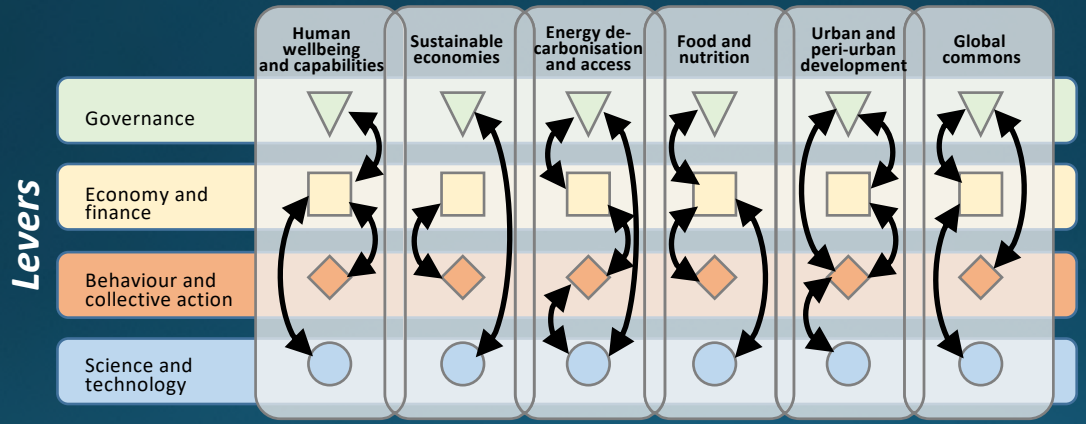
sustainabledevelopment.un.org/gsdr2019

Sustainable Development in the world of the 2030 Agenda



Transforming our world

Entry points for transformation



Innovative pathways to transformation represent context-specific configurations of levers to achieve transformation in each area

Joel Pett, USA Today

This gives me hope:

Well-informed young people speaking truth to power

With @GretaThunberg at COP24

Useful links:

- www.climate.be/vanyp : my slides and other documents
- www.ipcc.ch : IPCC (reports and videos)
- www.skepticalscience.com: excellent responses to contrarians arguments
- sustainabledevelopment.un.org/gsdr2019
  GSDR2019: Global Sustainable Development Report 2019
- **On Twitter: @JPvanYpersele**
  and @IPCC_CH

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