Ocean acidification

Prof. Petteri Taalas

Secretary General

World Meteorological Organization

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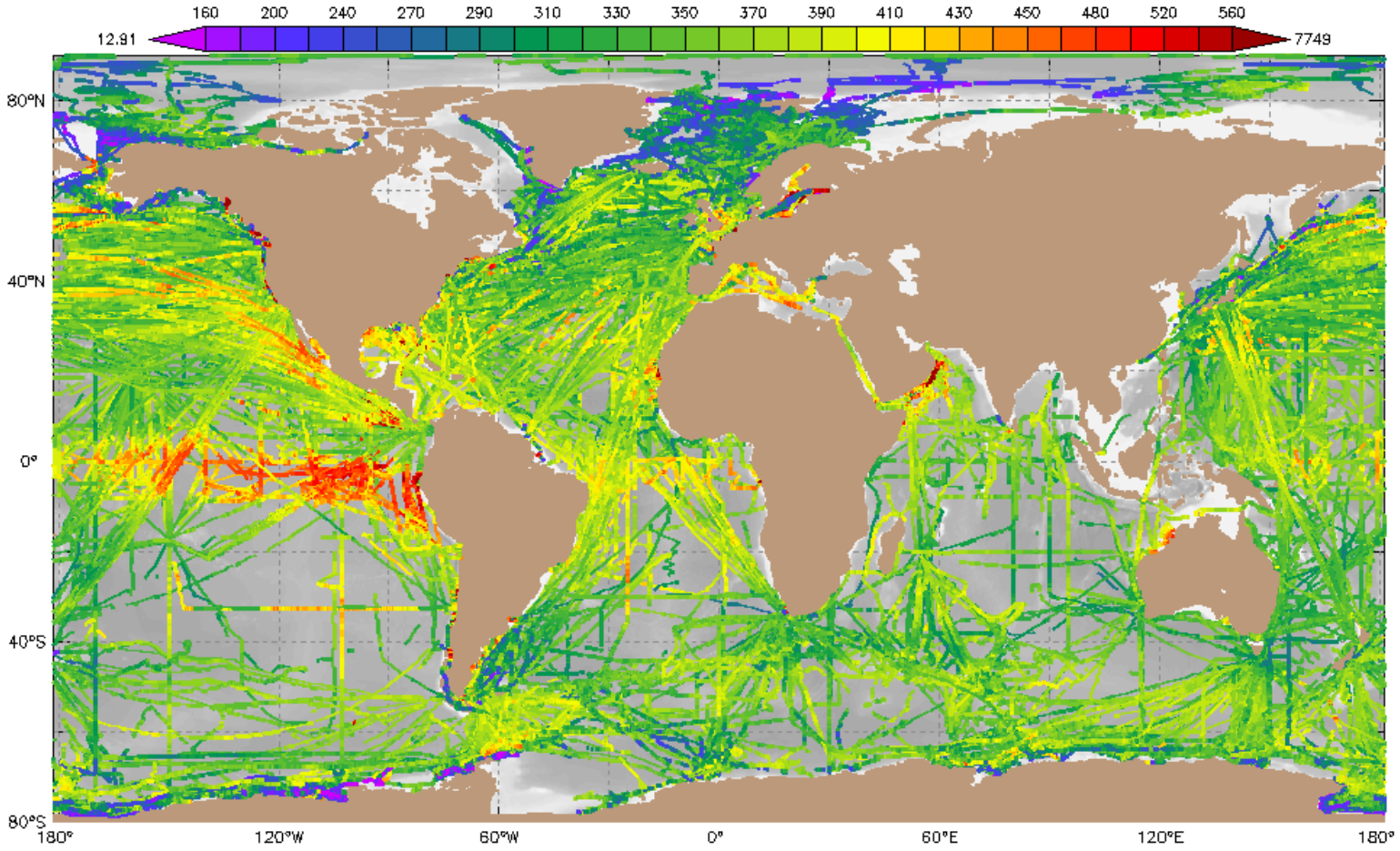
Ocean Acidification



Ocean acidification is a global problem that threatens marine organisms, ecosystems, services and resources and that has potentially considerable ecological and socio-economic consequences (food security, livelihood of fishing communities)

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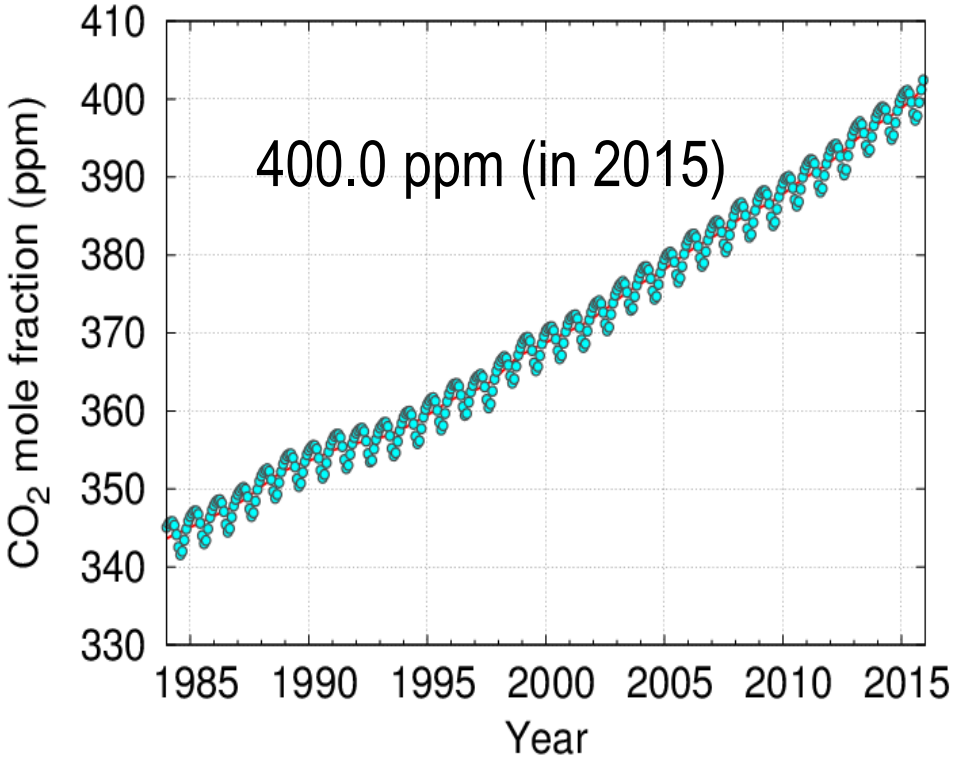
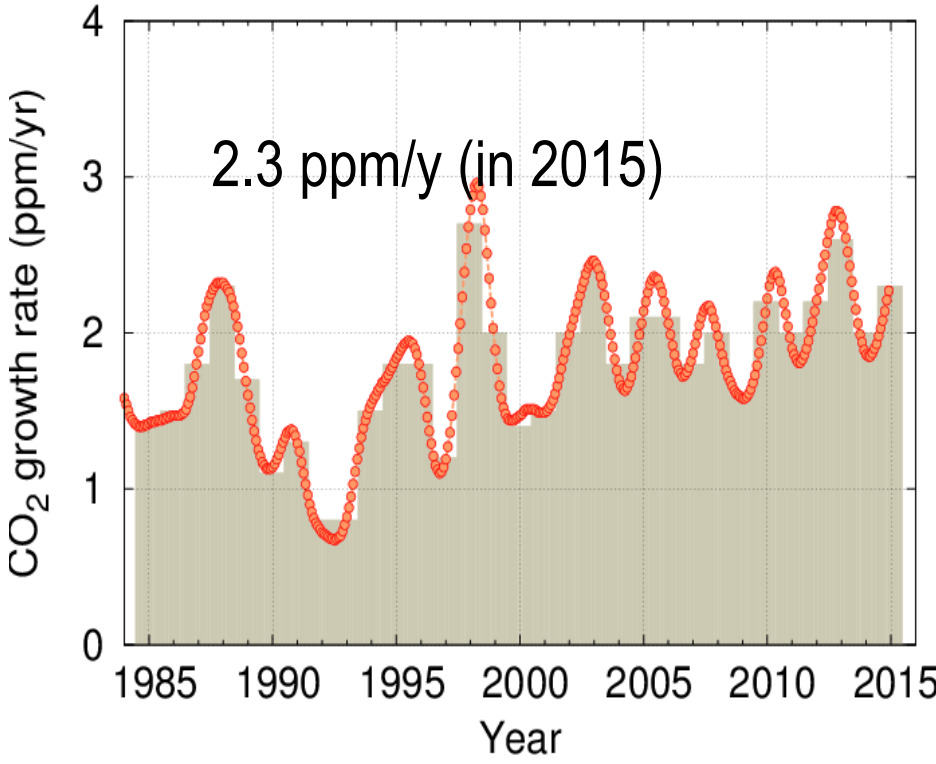
DATA SET: SOCAT v4 Data Collection
VARIABLE: fCO2 recommended (µatm)
01-Jan-1957 00:00 to 31-Dec-2016 00:00

Changes of CO_2 in the atmosphere





Long-term mitigation of ocean acidification depends on the reduction of CO2 emissions in the atmosphere; thus, climate change mitigation efforts such as ratification and effective implementation of the Paris Agreement will be instrumental. Geoengineering techniques that discuss solar radiation management do not take into consideration that continued increase in atmospheric CO2 will increase ocean acidification.

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CO_2 budget 2006-2015

34.1 $GtCO_2$/yr

91%

9%

3.5 $GtCO_2$/yr

Sources = Sinks

16.4 $GtCO_2$/yr

44%

31%

11.6 $GtCO_2$/yr

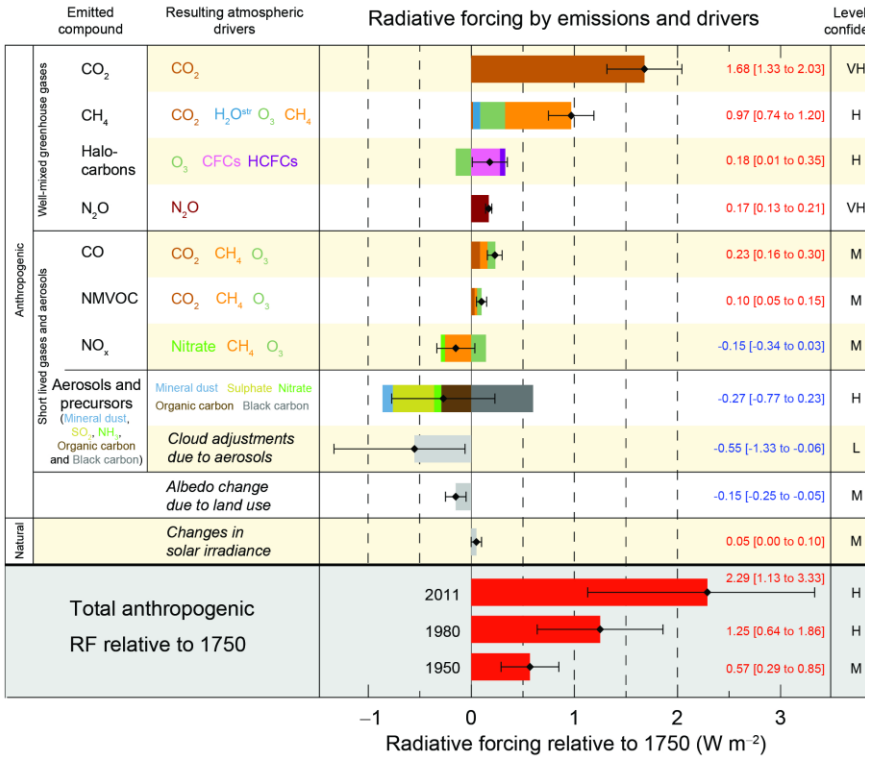
26%

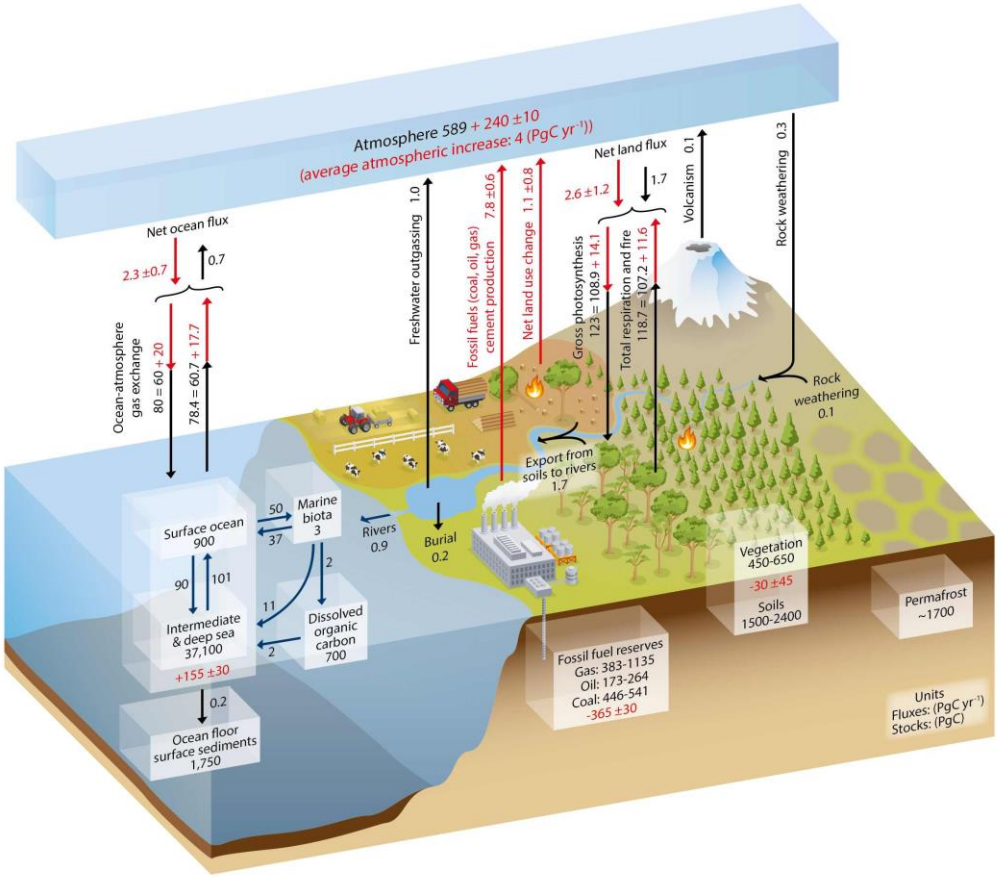
9.7 $GtCO_2$/yr

Source: CDIAC; NOAA-ESRL; Houghton et al 2012; Giglio et al 2013; Le Quéré et al 2016; Global Carbon Budget 2016

Paris Agreement – limit the warming below 2C

Fundamental problem – it is what you **HAVE** in the atmosphere, not what you **PUT** in the atmosphere, that controls the temperature





Calculations are for year in 2011

Human (9GtC in) – ocean (2.3GtC out) – biosphere(2.6GtC out)

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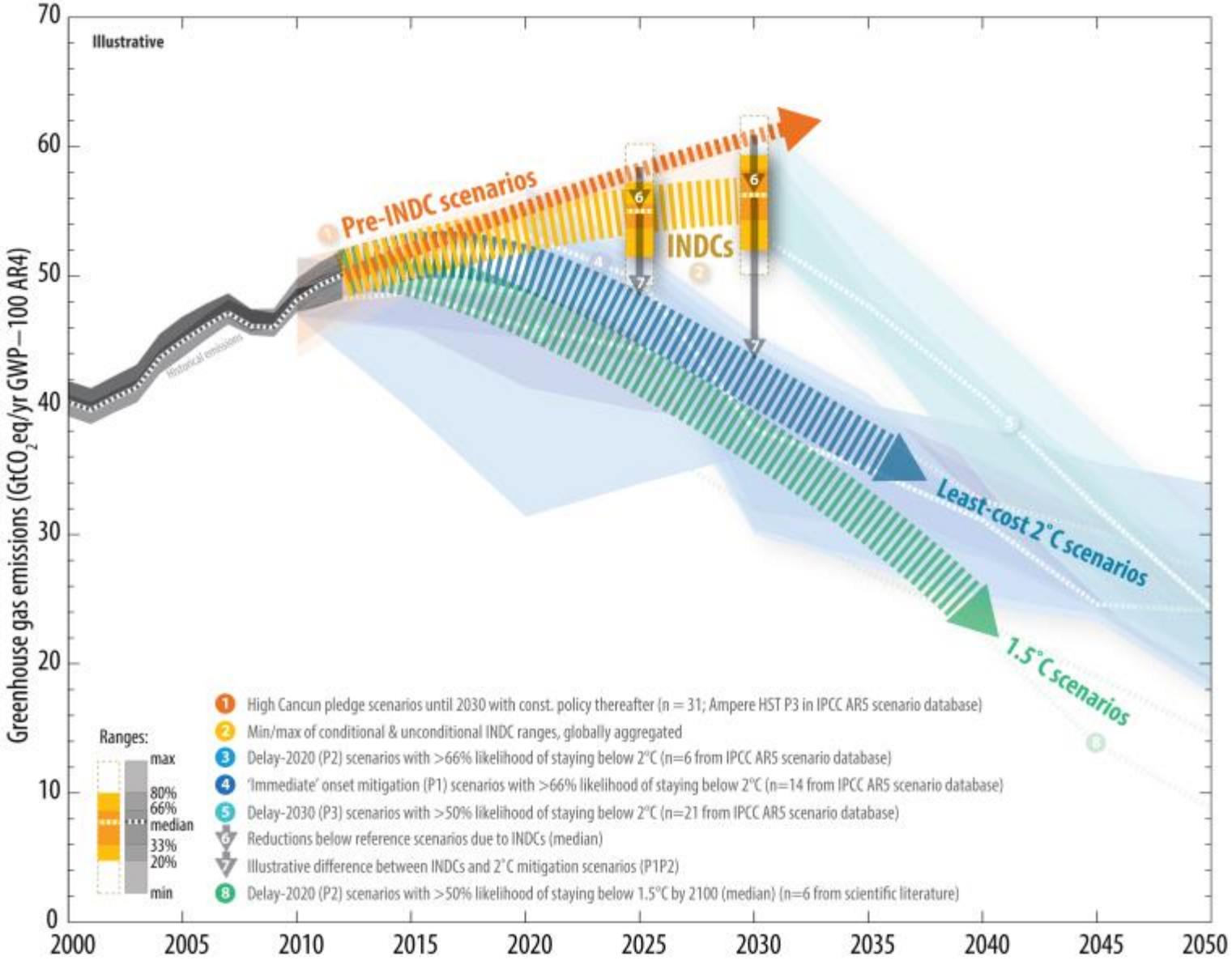
Comparison of global emission levels in 2025 and 2030 resulting from the implementation of the INDCs



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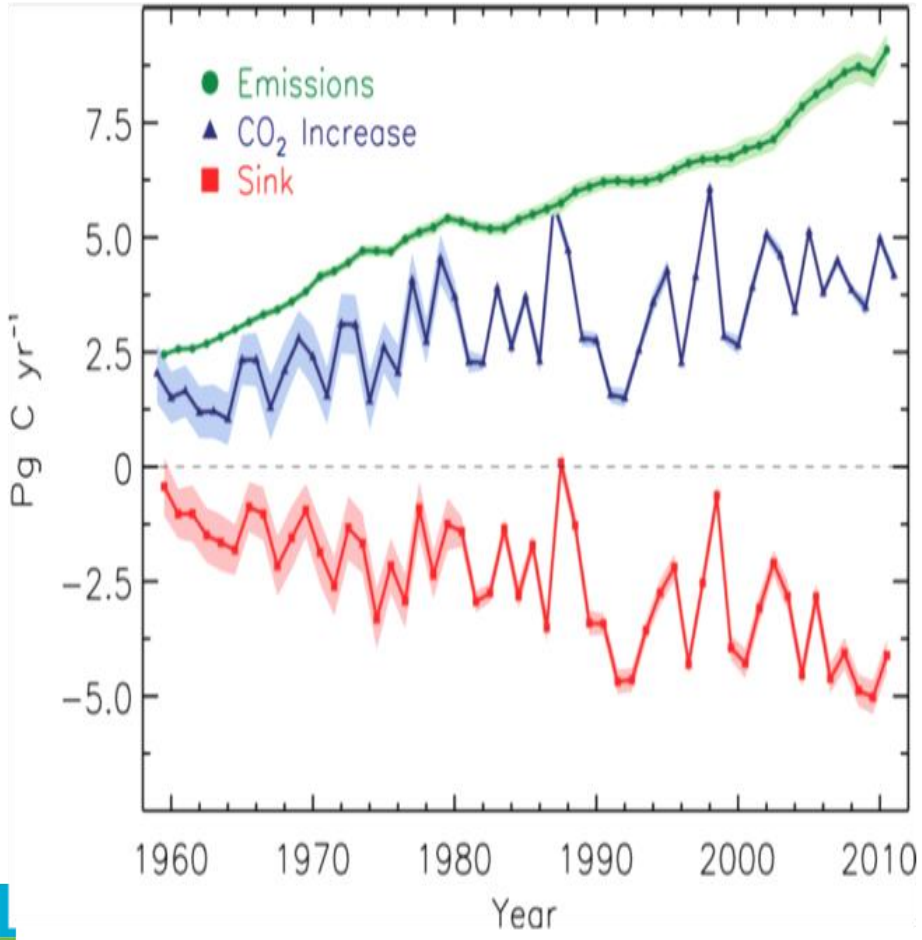
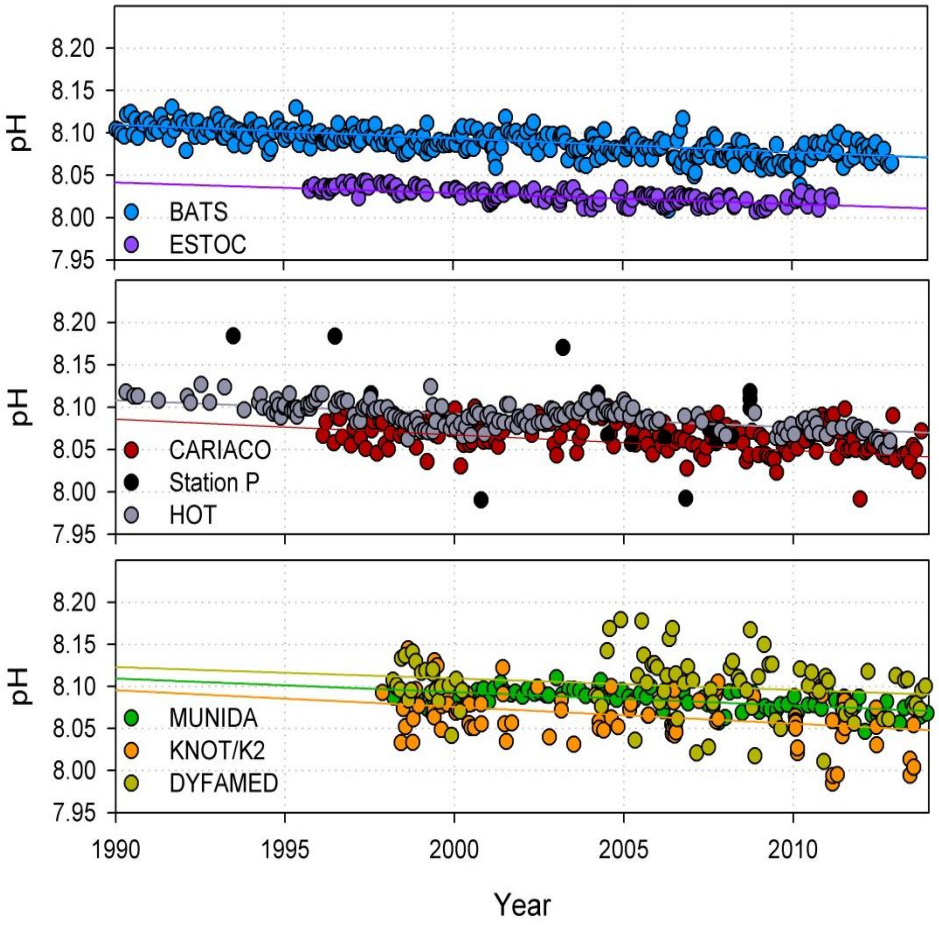
Atmospheric emissions and ocean CO_2





Ocean acidification is related to the fact that oceans currently absorb one fourth of the CO2 released into the atmosphere from anthropogenic activities, but this may change in the future.

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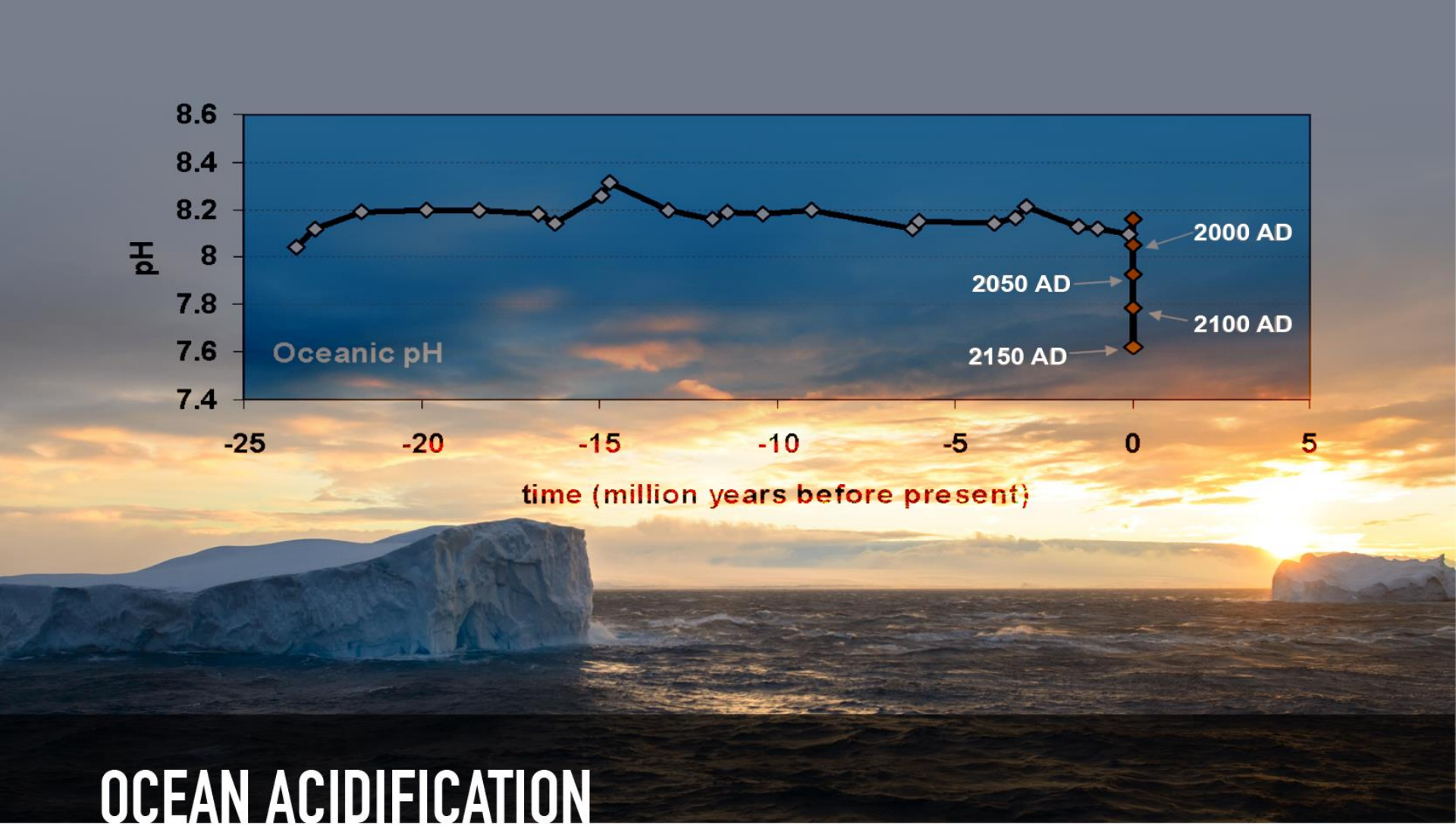
IAEA

Ocean Acidification International Coordination Centre
OA-ICC

SCOR



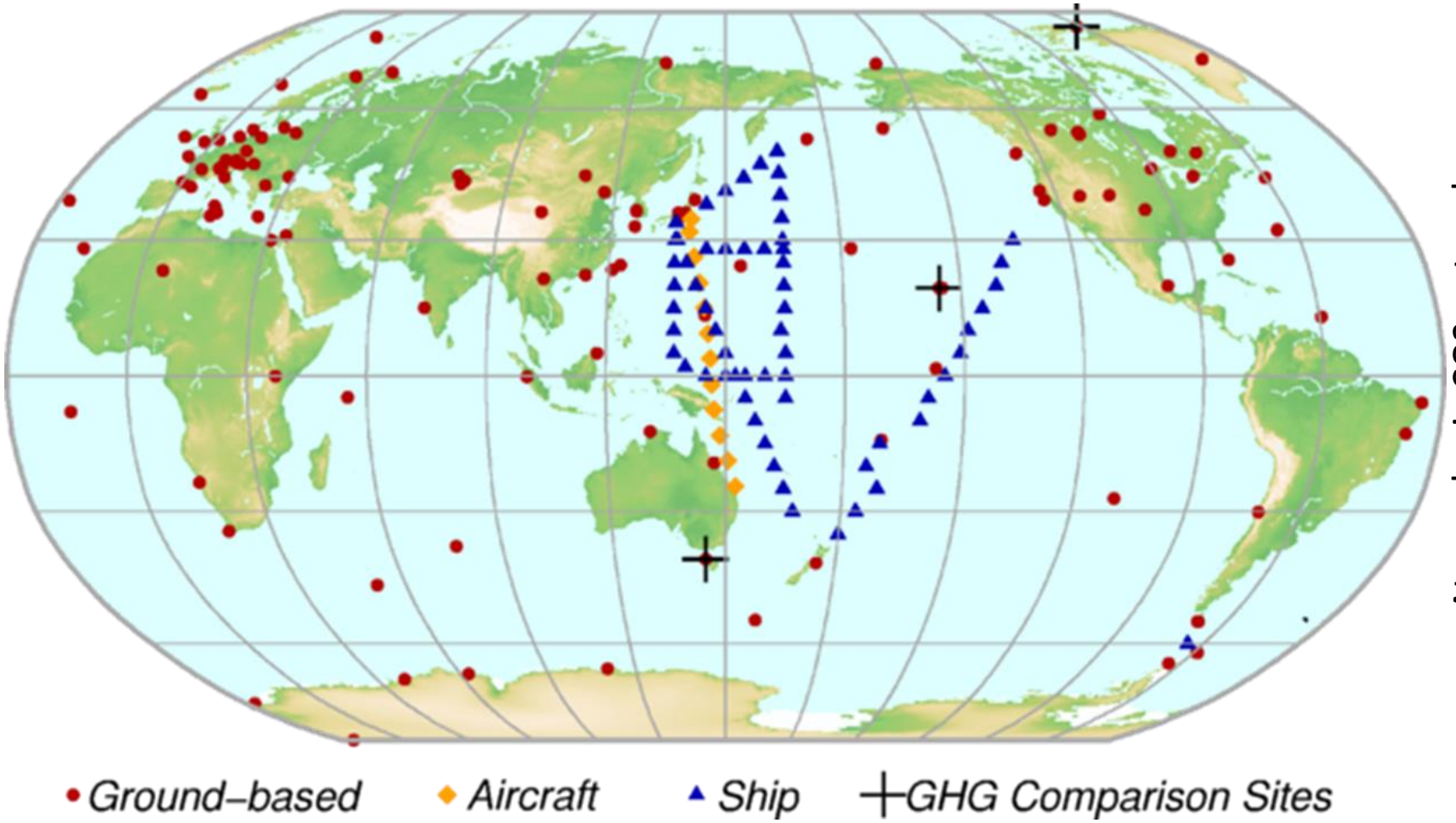
OCEAN ACIDIFICATION

Current levels of acidification unmatched in last 25 million years.

Direct evidence of human impact on climate and oceans.

Courtesy of NASA, Avoiding Dangerous Climate Change (Turley et al 2006)

How /why do we know it?



Atmospheric CO2 network

Ocean acidification (as well as warming and deoxygenation) and climate change need to be observed, studied in **an integrated manner** and include cooperation between all relevant organizations/bodies.

Global ocean acidification monitoring is too large a challenge to be achieved without the **engagement of all contributing sectors** (e.g. maritime, fisheries)

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Spectrum of solutions

Mitigation of CO_2/ emission reduction

CO_2 emission reductions (energy efficiency, renewable energy, etc.) (21)

Increase of CO_2 removal by other means

Coastal carbon sinks/blue carbon (19)

Terrestrial carbon sinks (1)

Carbon capture and sequestration (8)

Adaptation/reducing impact of the other stressors

Adaptation to more acidic ocean conditions (14)

Support by observations and research (35)

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Thank you

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