



Dawn from Space

Fragile edge of our planet

Thin blue line

Mysterious rhythm

Our next breath

Heart struck with wonder

Mind dizzy with awe

-- Astronaut Douglas Wheelock @Astro_Wheels

World Environment Day 5.6.2020

Climate Change and Biodiversity

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Climate variability and change

Greenhouse effect

Joseph Fourier (1834)
John Tyndall (1861)
Svante Arrhenius (1896)
Nils Gustaf Ekholm (1901)

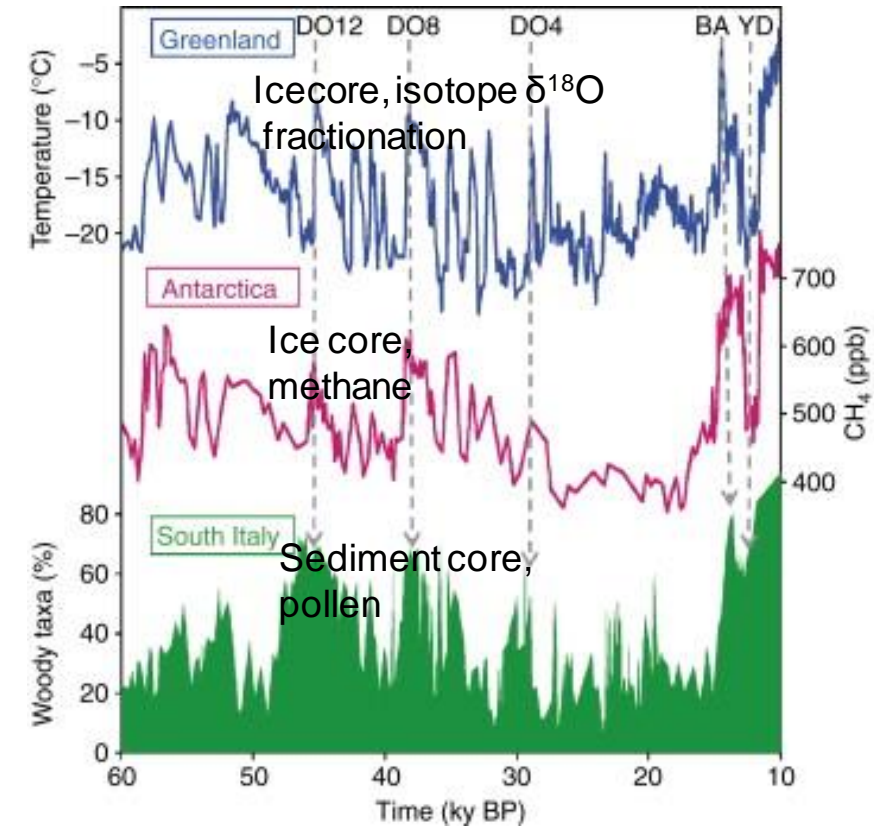
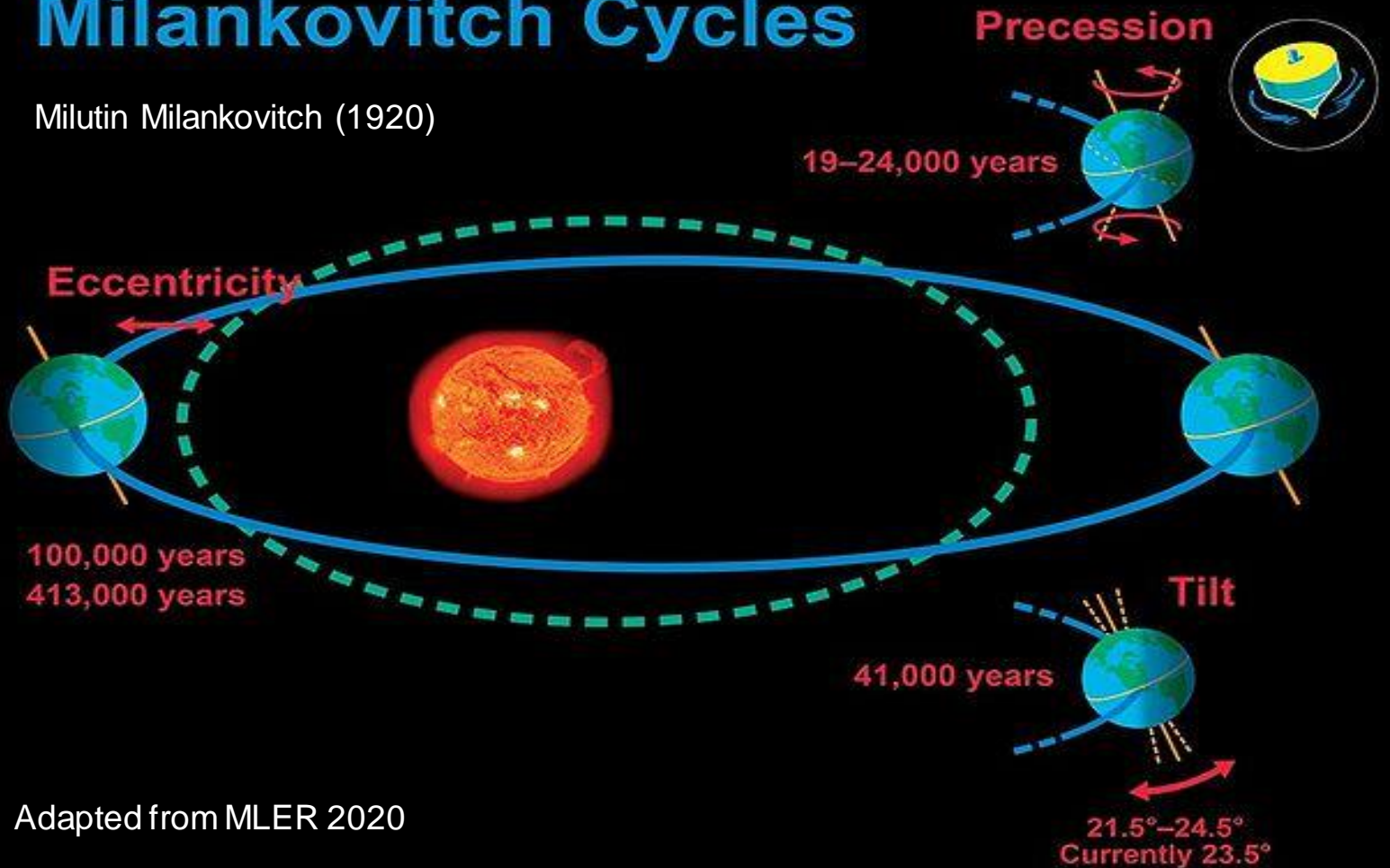
Greenhouse gases
water vapor, H₂O
carbon dioxide, CO₂
methane, CH₄
nitrous oxide, N₂O

Climate proxies

Indicators of past climate variations

Milankovitch Cycles

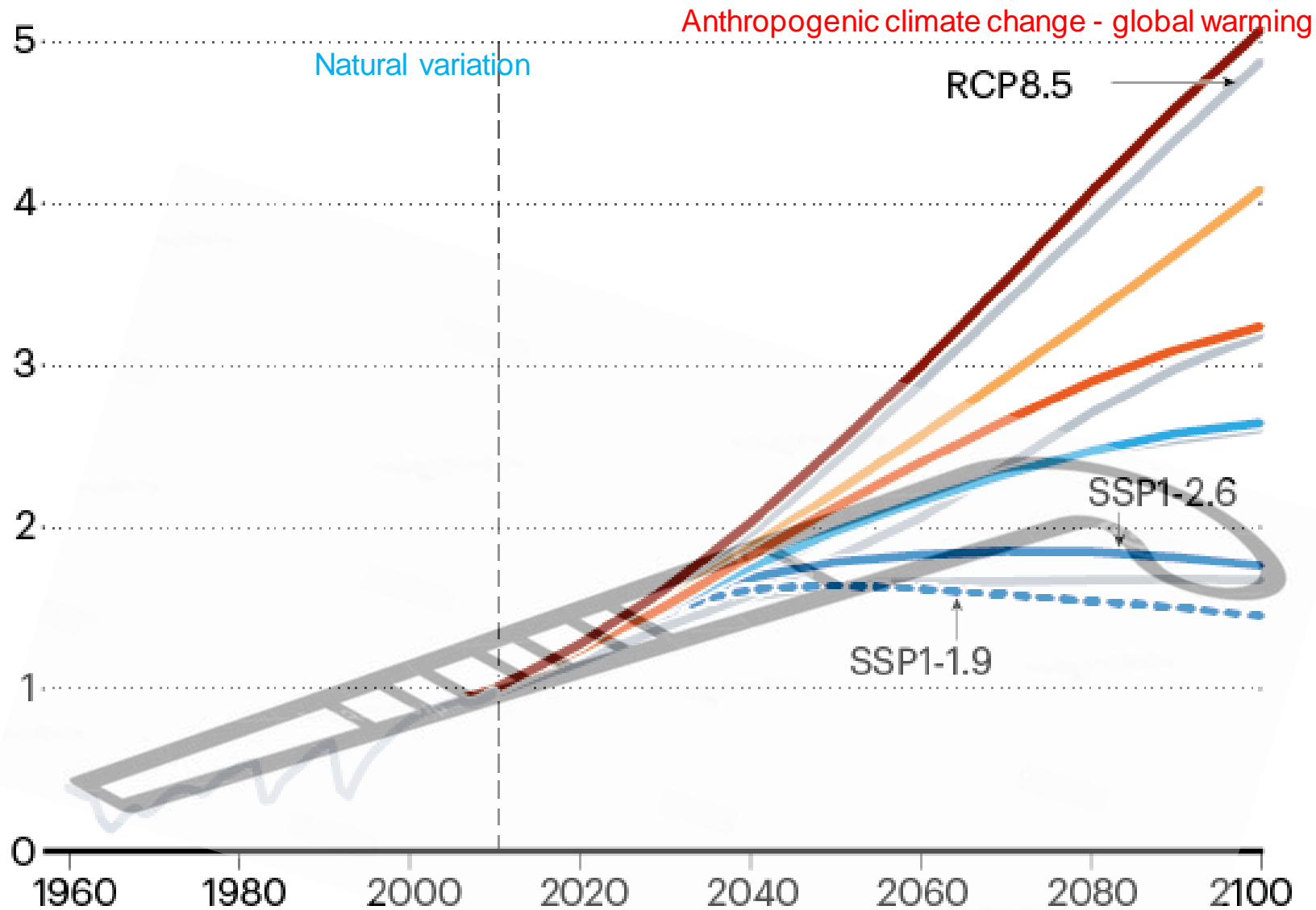
Milutin Milankovitch (1920)



Blunier and Brook (2001), Watts et al. (1996), Ganopolski (2008)

Field hockey stick curve

Temperature Increase (°C)



RCP 8.5

Representative Concentration Pathway where radiative forcing will be 8.5 watts per squaremeter at 2100

SSP1

Shared Socioeconomic Pathways, level 1 Sustainability

Intergovernmental Panel on Climate Change IPCC , 6th assessment in 2021-2022.

The IPCC was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP)

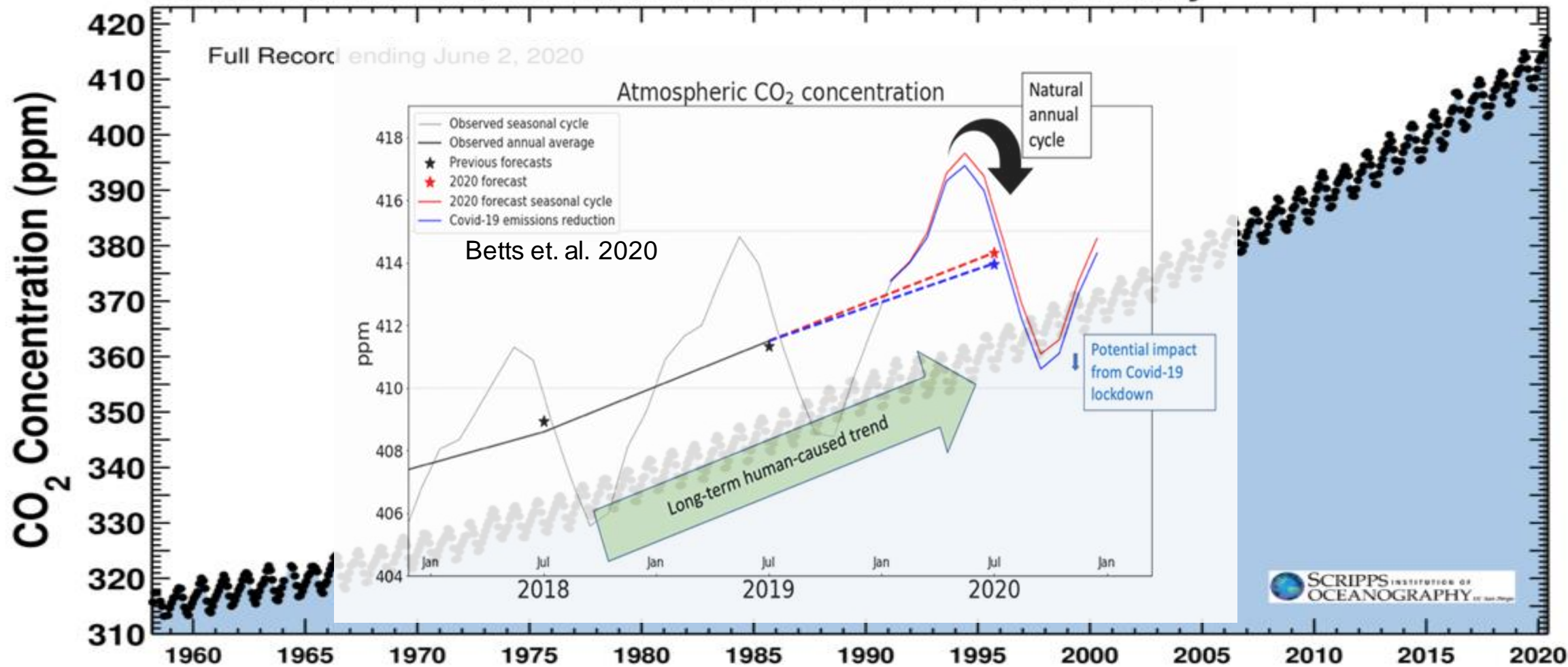
Slightly modified from O'Neill et al. 2016, Riahi et al. 2017

Impact on COVID19 lockdown

- Atmospheric carbon dioxide concentration is increasing
- Additional CO2 is accumulating in the atmosphere

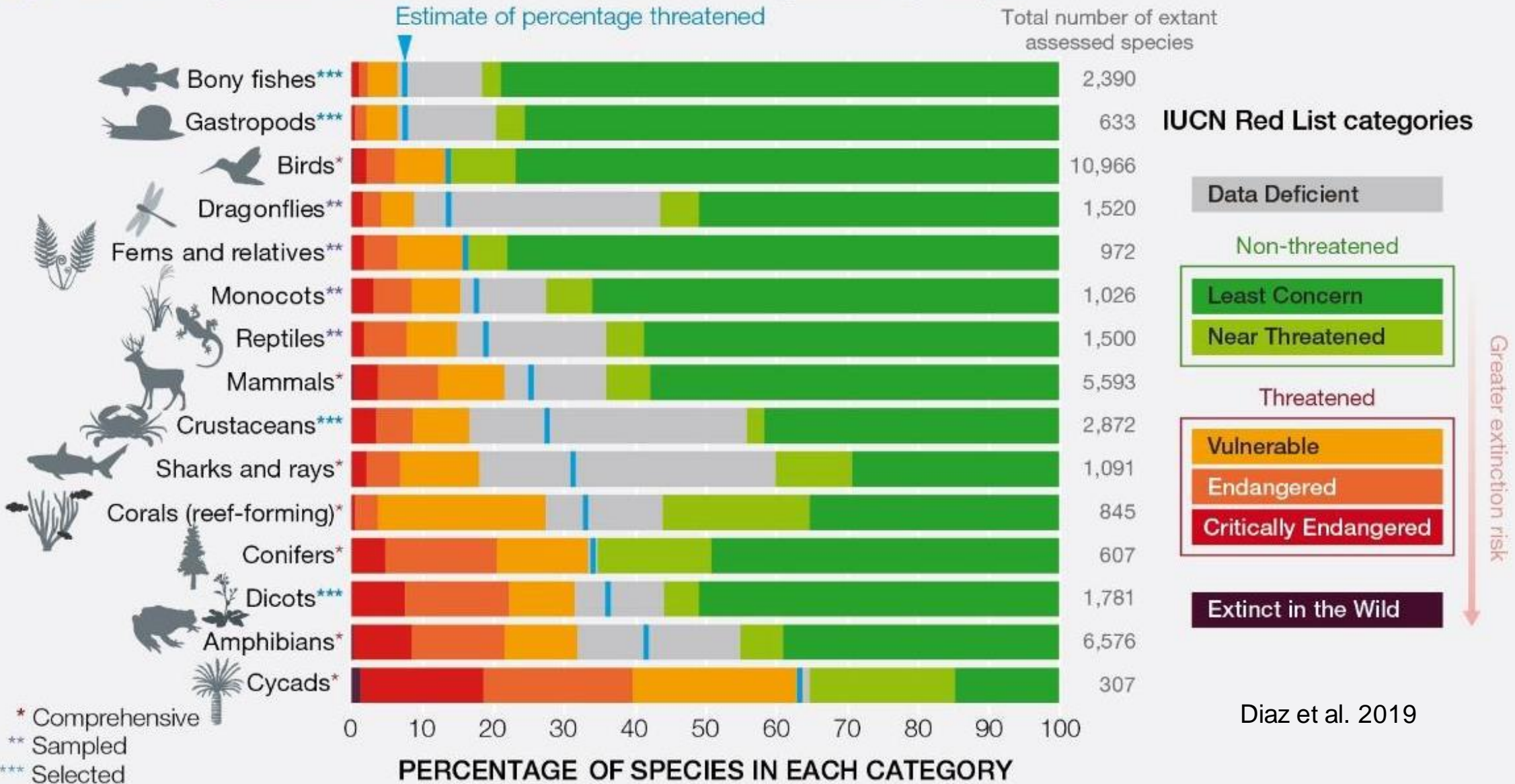
June 02, 2020

Carbon dioxide concentration at Mauna Loa Observatory

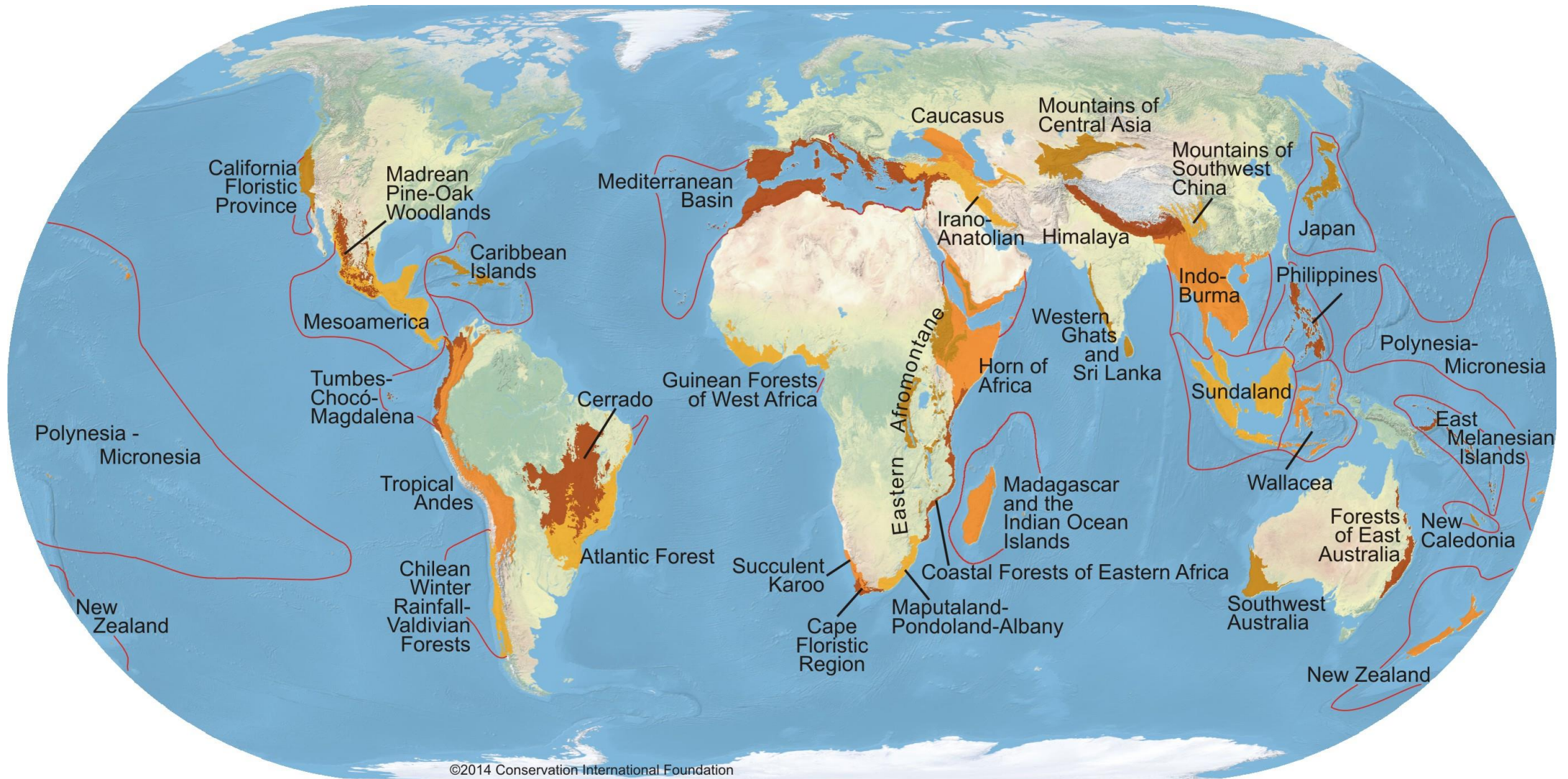


Changes in Biodiversity

A Current global extinction risk in different species groups



Biodiversity hotspots



Conservation International (conservation.org) defines 35 biodiversity hotspots — extraordinary places that harbor vast numbers of plant and animal species found nowhere else. All are heavily threatened by habitat loss and degradation, making their conservation crucial to protecting nature for the benefit of all life on Earth.