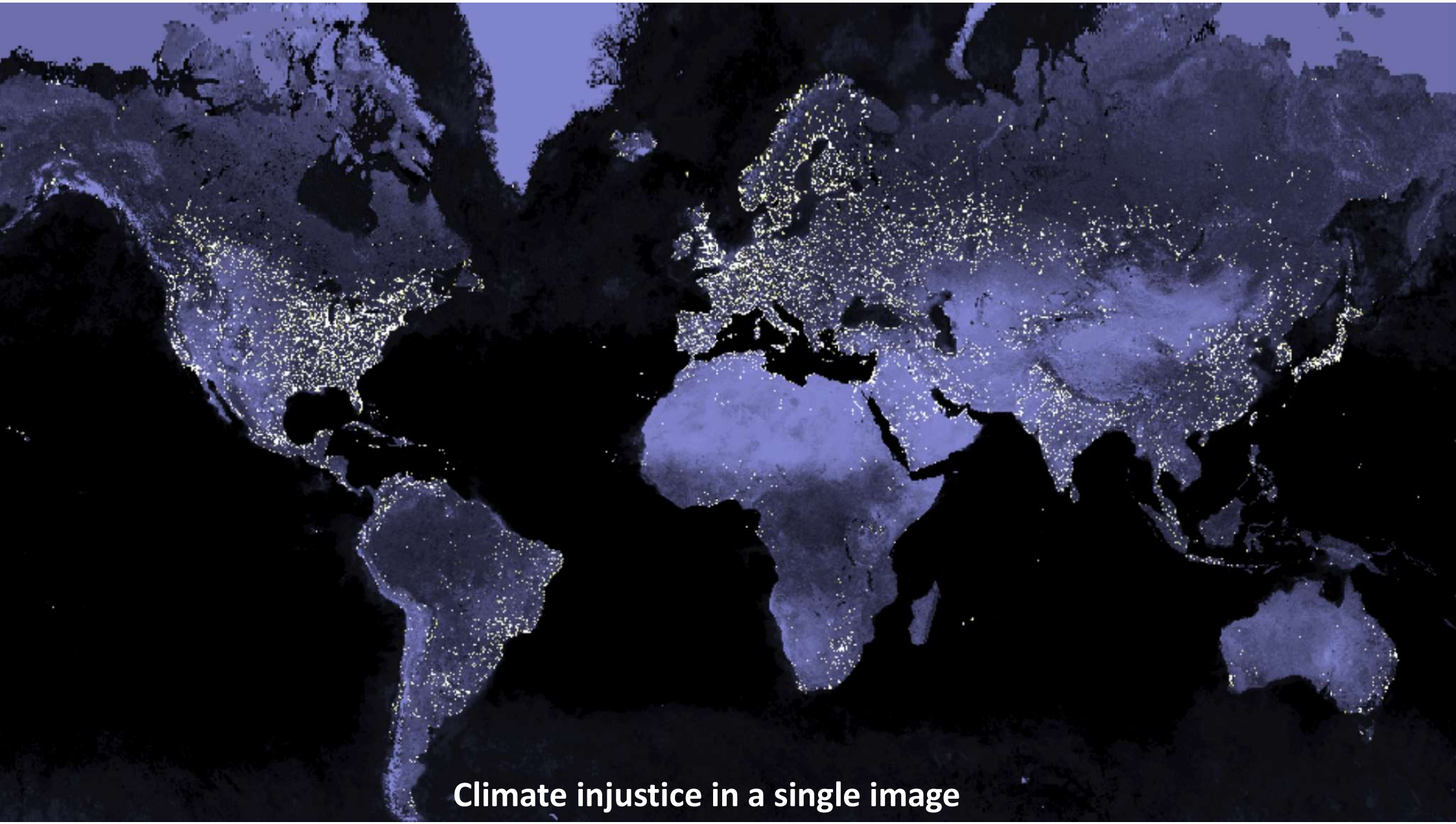
ISC:Glasgow

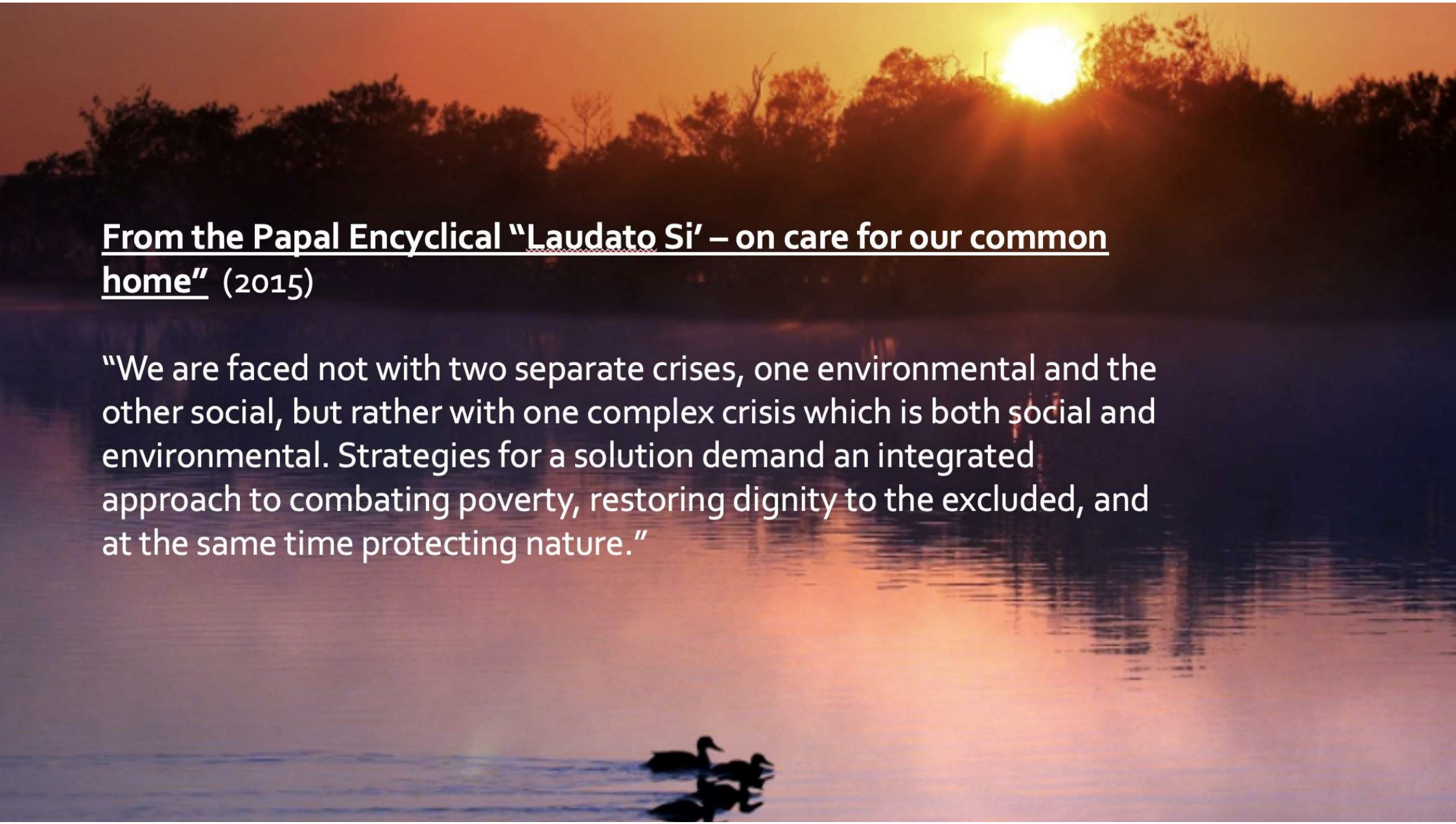
Restoring the integrity of life in Jesus : Climate and Spirit

ISC Glasgow, 14 September 2024

Ania Grobicki
Co-facilitator

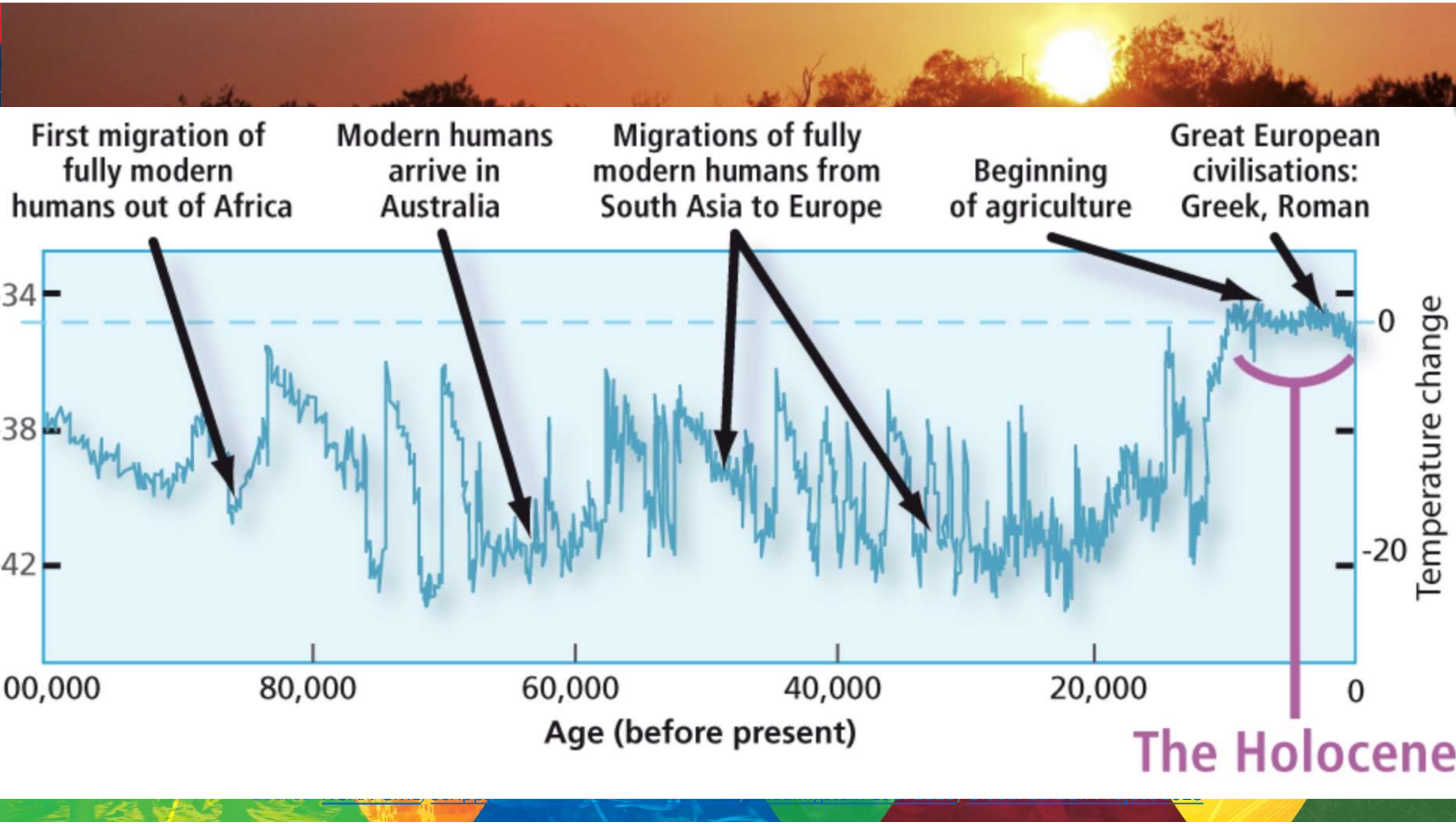

Climate injustice in a single image

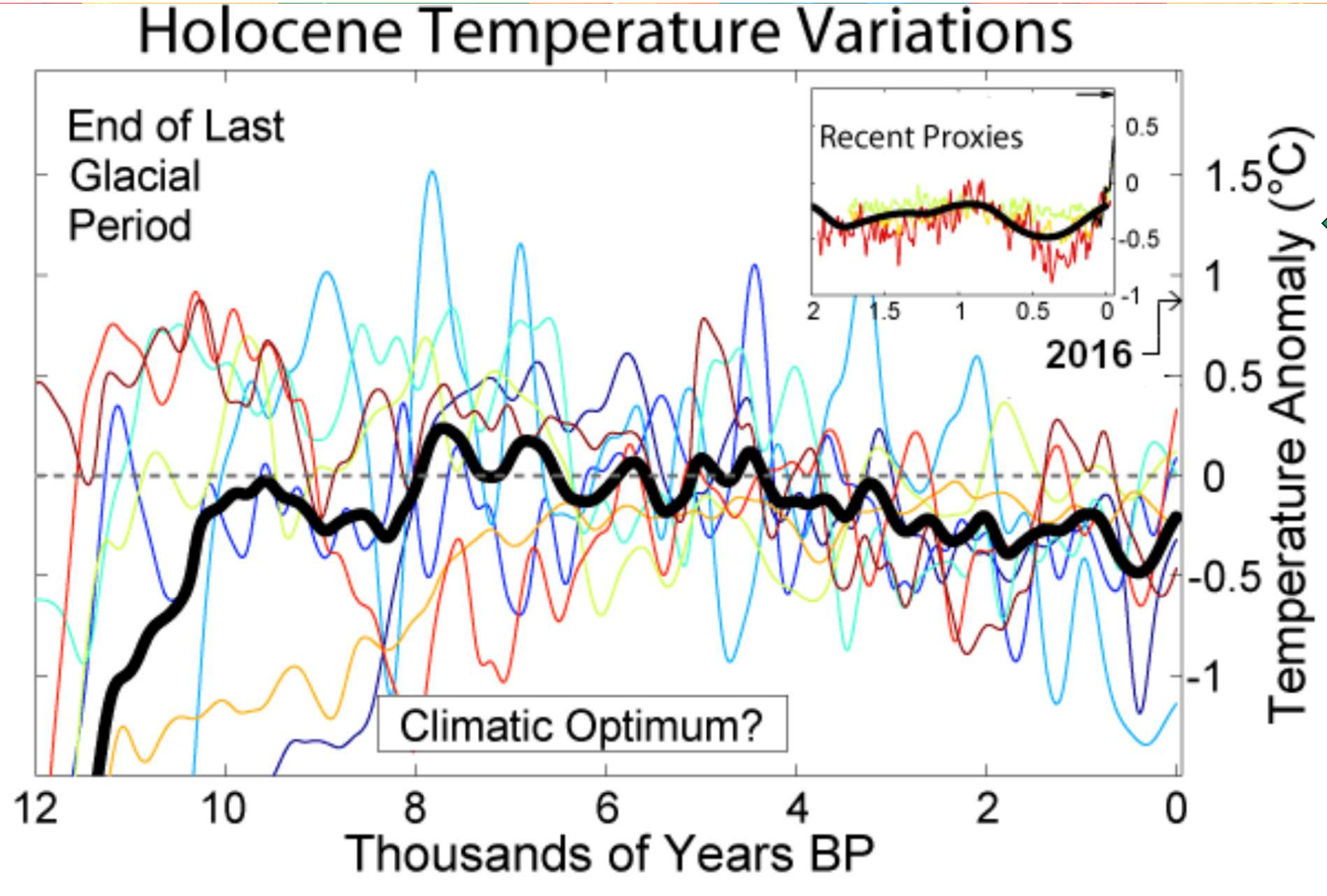
Mike Goldwater/Getty Images



From the Papal Encyclical "Laudato Si' – on care for our common home" (2015)

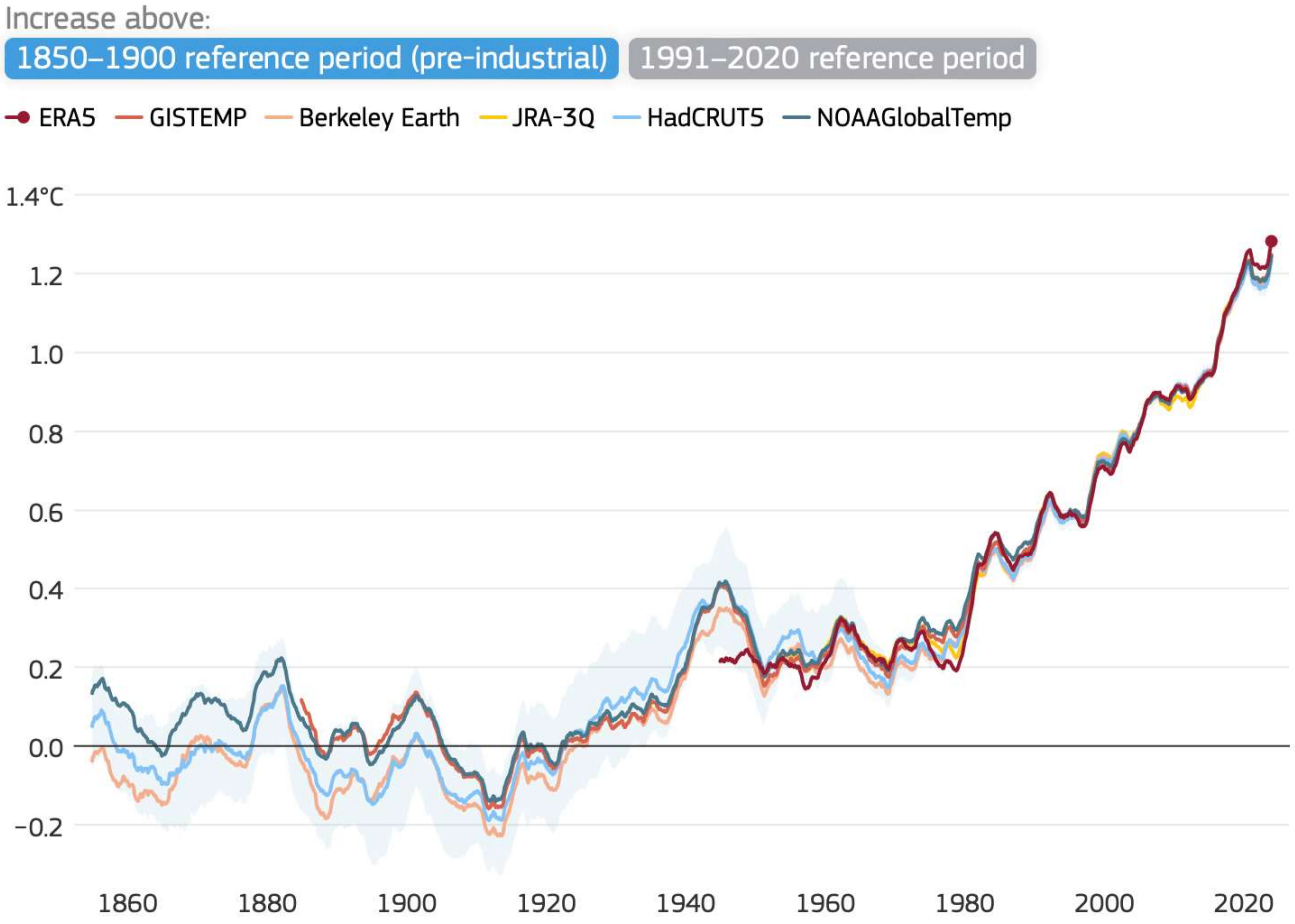
"We are faced not with two separate crises, one environmental and the other social, but rather with one complex crisis which is both social and environmental. Strategies for a solution demand an integrated approach to combating poverty, restoring dignity to the excluded, and at the same time protecting nature."


First migration of fully modern humans out of Africa
Modern humans arrive in Australia
Migrations of fully modern humans from South Asia to Europe
Beginning of agriculture
Great European civilisations: Greek, Roman
34
38
42
0
-20
Temperature change
00,000
80,000
60,000
40,000
20,000
0
Age (before present)
The Holocene



We are now here

Increase in global average temperature



The light blue shaded area shows the min–max range for the HadCRUT5 values.

Data: ERA5 (C3S/ECMWF), JRA-3Q (JMA), GISTEMPv4 (NASA), HadCRUT5 (Met Office Hadley Centre), NOAAGlobalTempv6 (NOAA) and Berkeley Earth • Credit: C3S/ECMWF

Copernicus Climate Change Service
Climate Indicators | 2023

PROGRAMME OF THE EUROPEAN UNION

Copernicus

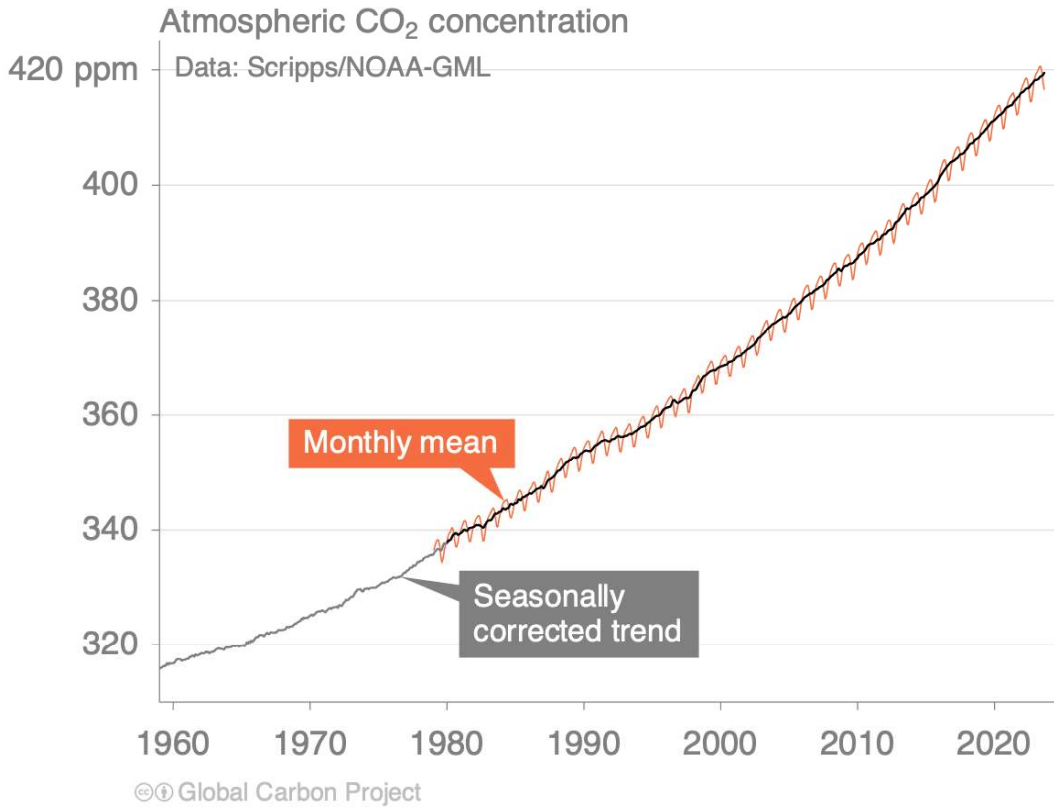
IMPLEMENTED BY ECMWF

GENESIS CHAPTER 3 :

21 The Lord God made garments of skin for Adam and his wife and clothed them.22 And the Lord God said, “The man has now become like one of us, knowing good and evil. He must not be allowed to reach out his hand and take also from the tree of life and eat and live forever.”23 So the Lord God banished him from the Garden of Eden to work the ground from which he had been taken.24 After he drove the man out, he placed on the east side of the Garden of Eden cherubim and a flaming sword flashing back and forth to guard the way to the tree of life.

Atmospheric CO_2 concentration

The global CO_2 concentration increased from ~277 ppm in 1750 to 419.3 ppm in 2023 (up 51%)



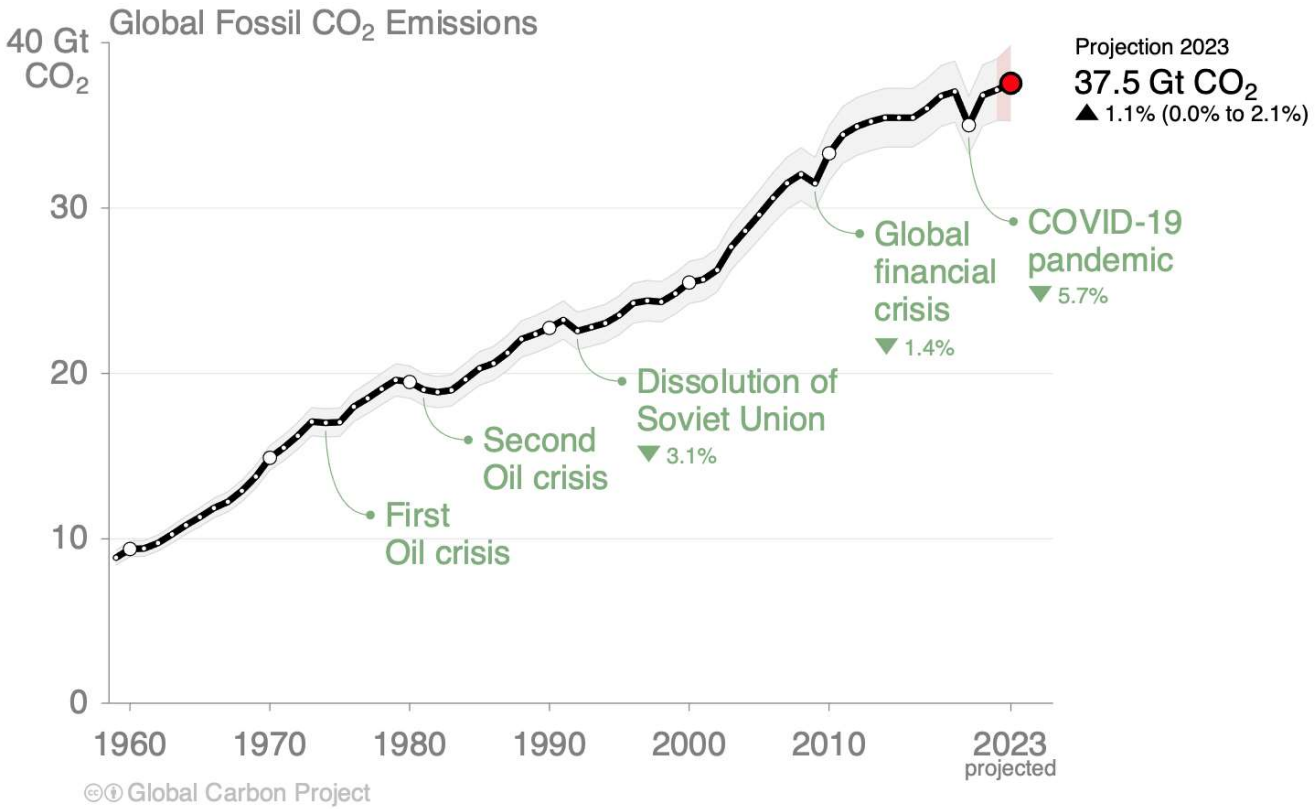
"a flaming sword flashing back and forth"

Globally averaged surface atmospheric CO_2 concentration. Data from: NOAA-GML after 1980; the Scripps Institution of Oceanography before 1980

Source: NOAA-GML; Scripps Institution of Oceanography; Friedlingstein et al 2023; Global Carbon Project 2023

Global fossil CO_2 emissions

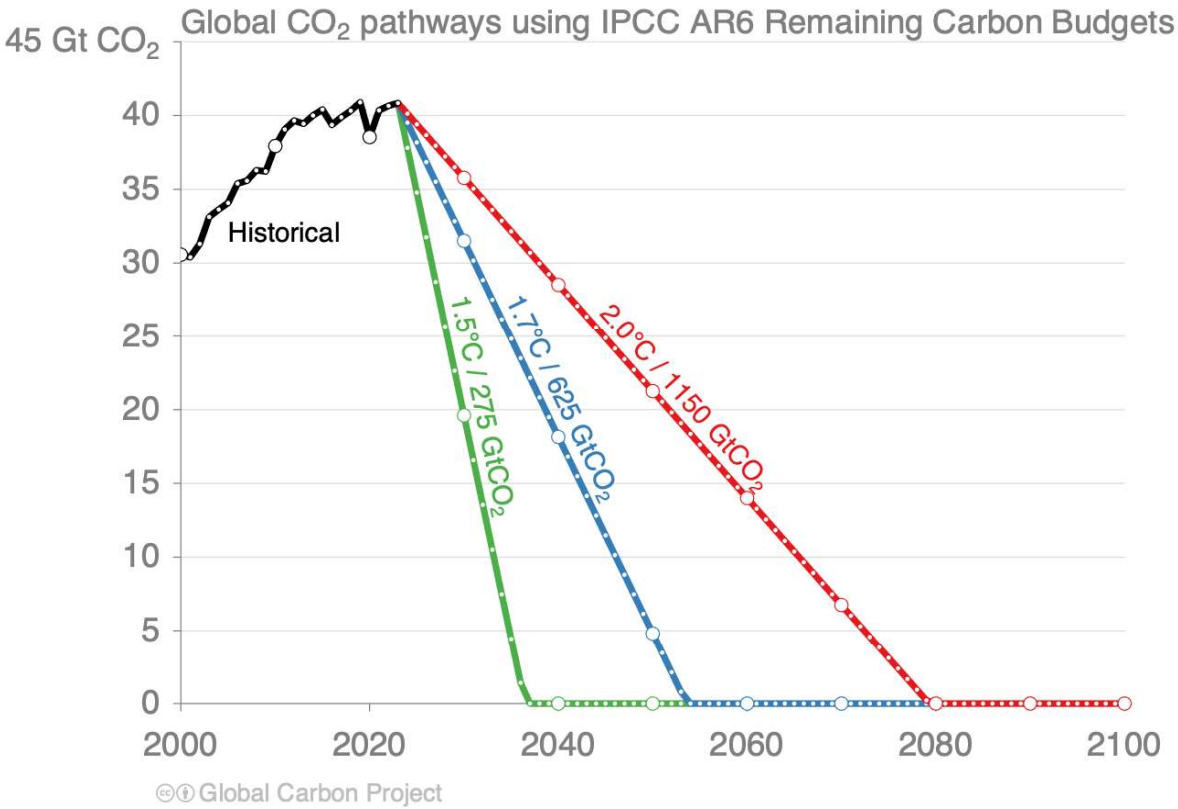
Global fossil CO_2 emissions have risen steadily over the last decades.
Emissions are set to grow again in 2023.



When including cement carbonation, the 2023 estimate is 36.8 ± 2 $GtCO_2$.
The 2023 projection is based on preliminary data and modelling.
Source: Friedlingstein et al 2023; Global Carbon Project 2023

Remaining carbon budget

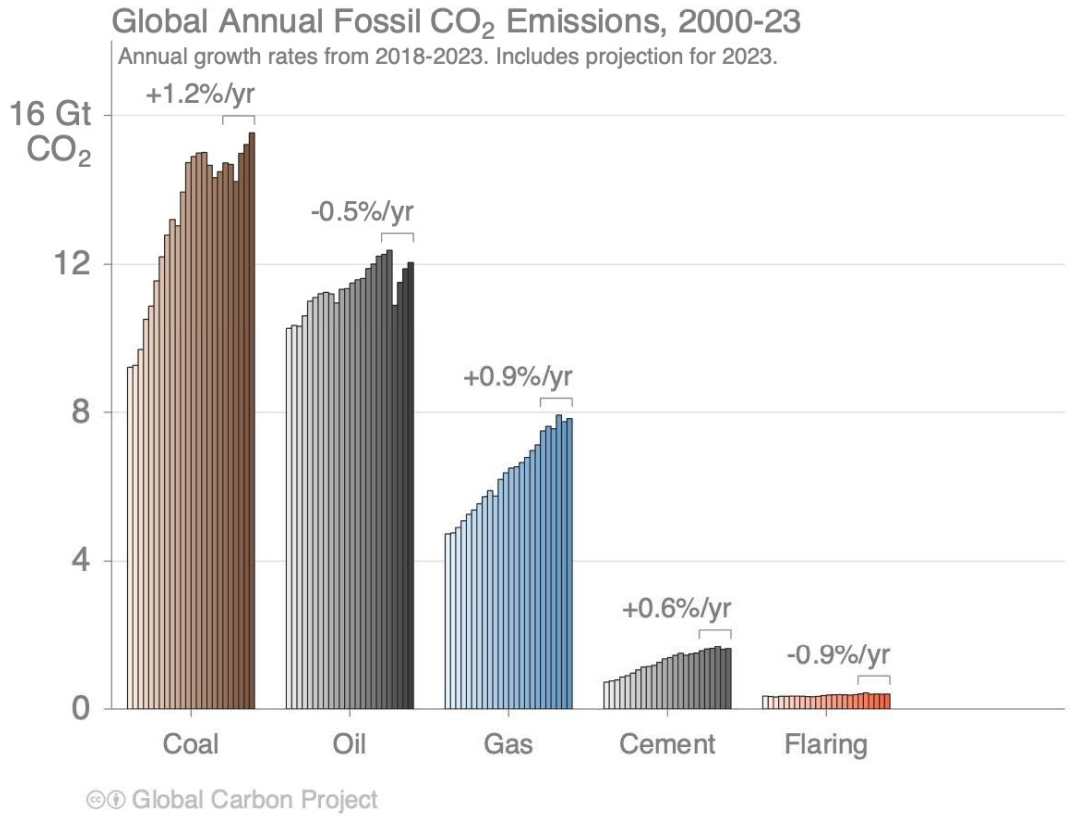
Global CO_2 emissions must reach zero to limit global warming



Source: Friedlingstein et al 2023; Global Carbon Project 2023

Fossil CO_2 emissions by source

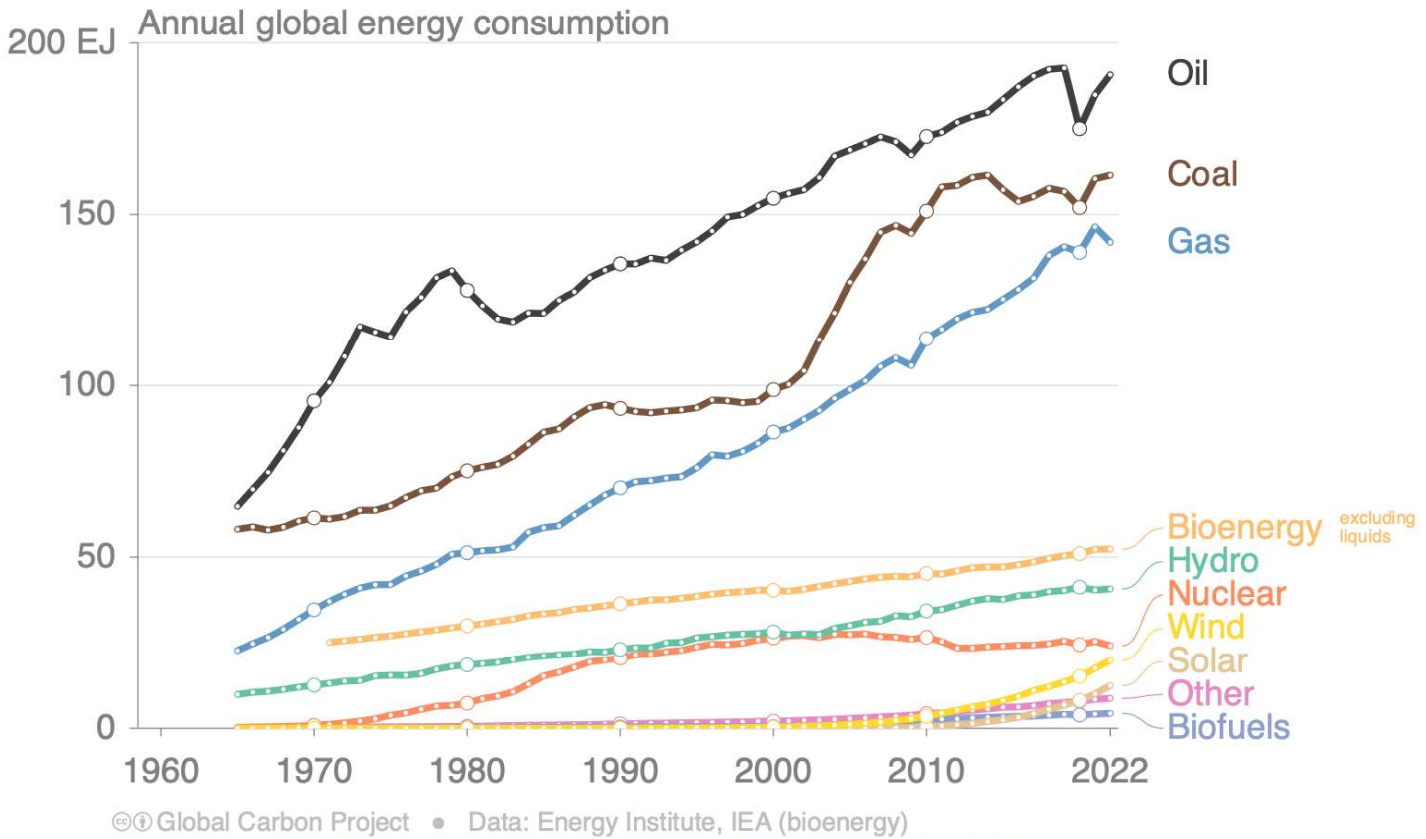
Emissions by category from 2000 to 2023, with growth rates indicated for the more recent period of 2018 to 2023
Coal use has returned to growth, and both coal and oil declined sharply in the pandemic year 2020



Source: Friedlingstein et al 2023; Global Carbon Project 2023

Energy use by source

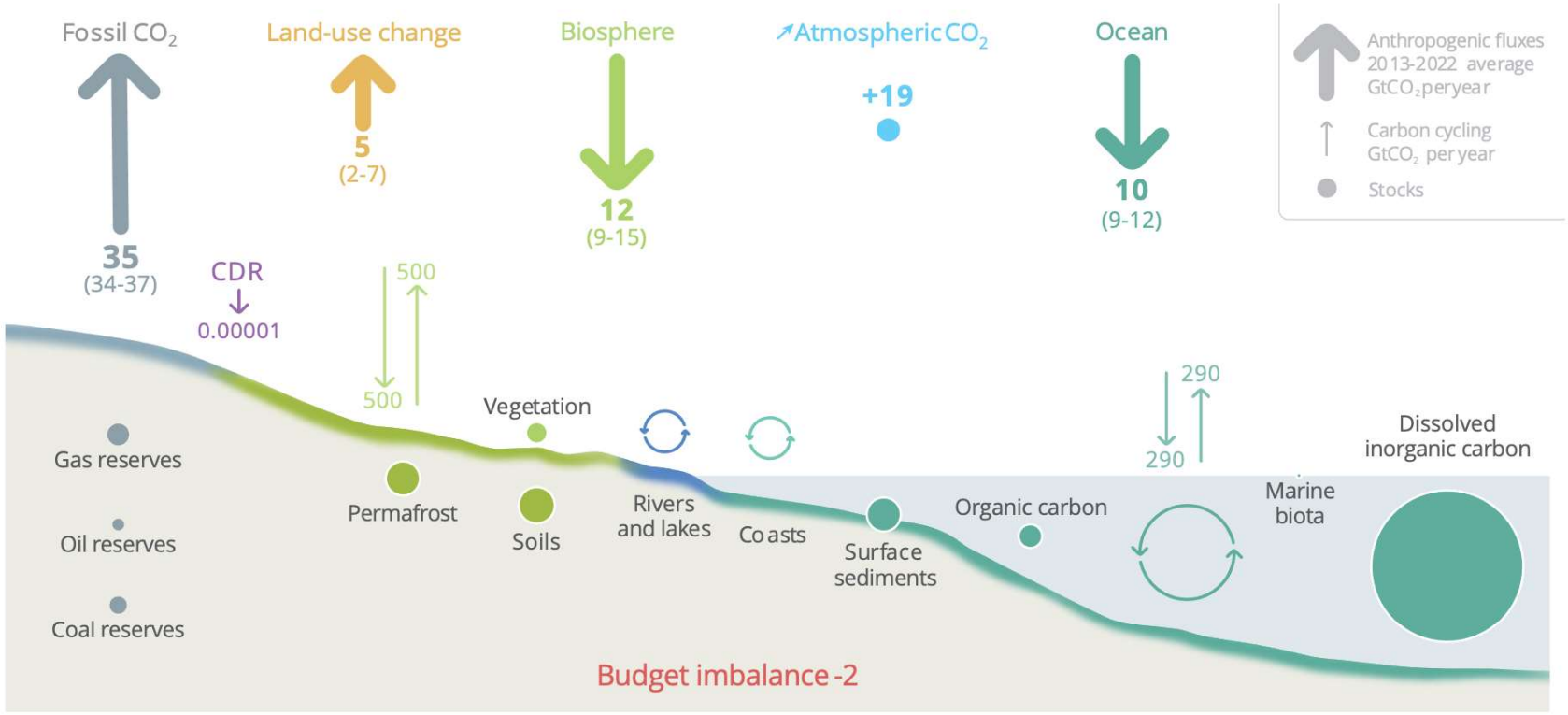
Consumption of natural gas declined in 2022, but oil recovered most of its pandemic-period losses.
Renewable energy continued to grow, but needs to grow even faster to replace fossil energy consumption.



This figure shows "primary energy" using the substitution method
(non-fossil sources are scaled up by an assumed fossil efficiency of approximately 0.38)
Source: Energy Institute 2023; Global Carbon Project 2023

Anthropogenic perturbation of the global carbon cycle

Perturbation of the global carbon cycle caused by anthropogenic activities, global annual average for the decade 2013–2022 ($GtCO_2$/yr)



CDR here refers to Carbon Dioxide Removal besides those associated with land-use that are accounted for in the Land-use change estimate.
The budget imbalance is the difference between the estimated emissions and sinks.
Source: NOAA-GML; Friedlingstein et al 2023; Canadell et al 2021 (IPCC AR6 WG1 Chapter 5); Global Carbon Project 2023

Fate of anthropogenic CO_2 emissions (2013–2022)

Sources = Sinks

Fossil fuel emissions

35.3 $GtCO_2/yr$

88%

Emissions from de-forestation and land use change

12%

4.7 $GtCO_2/yr$

18.9 $GtCO_2/yr$

47%

Remaining carbon accumulates in the atmosphere

31%

12.3 $GtCO_2/yr$

Carbon absorbed by the biosphere

26%

10.4 $GtCO_2/yr$

Carbon absorbed by the oceans

Budget Imbalance:
(the difference between estimated sources & sinks)

4%

-1.6 $GtCO_2/yr$

Source: Friedlingstein et al 2023; Global Carbon Project 2023

Biodiversity and climate change – two sides of the same coin

Positive feedback loop : Strengthens climate change

Biodiversity destruction – deforest-ation and land use change

Sources = Sinks

35.3 $GtCO_2/yr$

88%

12%

4.7 $GtCO_2/yr$

18.9 $GtCO_2/yr$

47%

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26%

10.4 $GtCO_2/yr$

Negative feedback loop : Reduces climate change

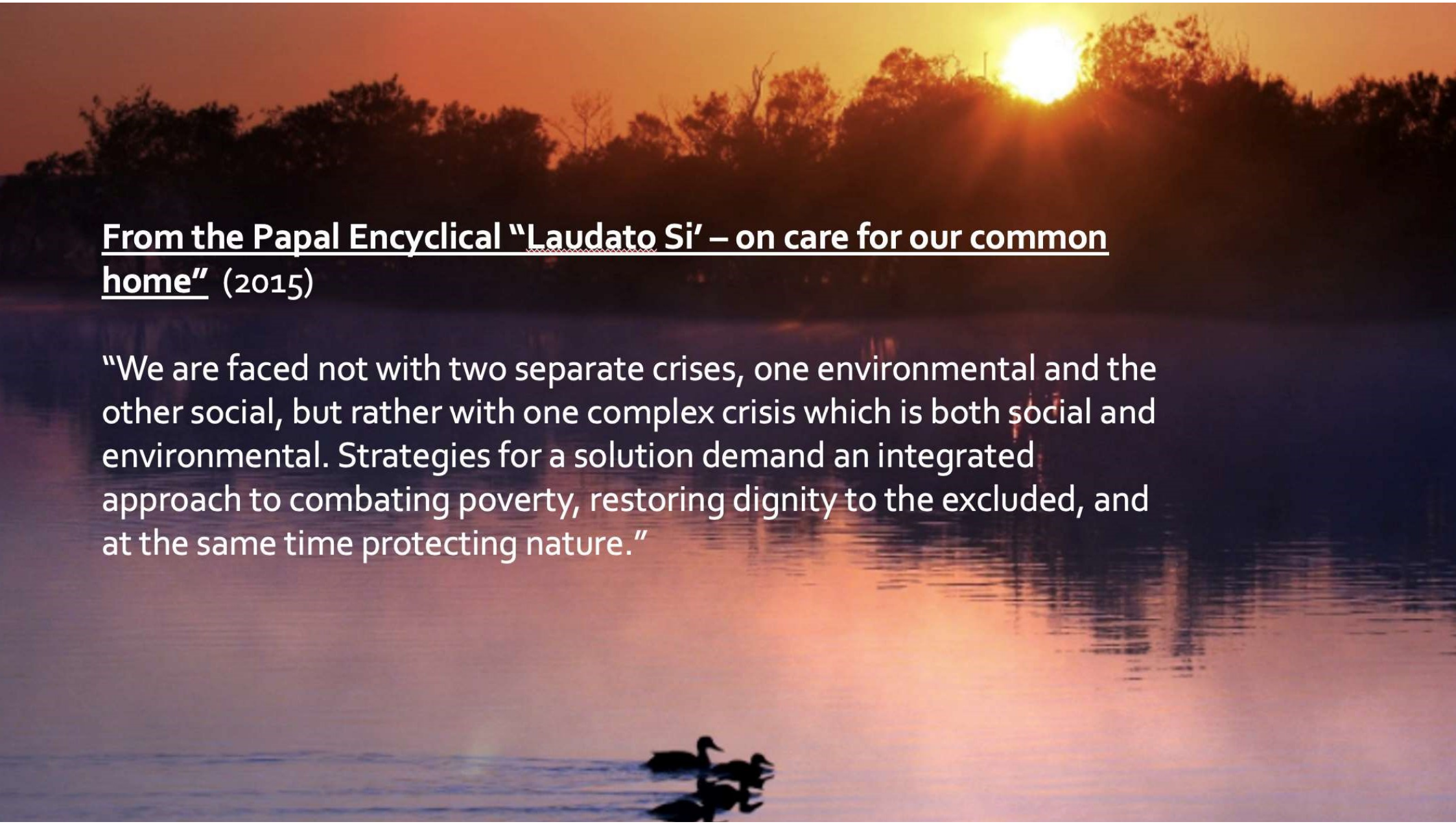
Biodiversity growth – Nature, reforest-ation and ecosystem restoration

Budget Imbalance:
(the difference between estimated sources & sinks)

4%

-1.6 $GtCO_2/yr$

Source: Friedlingstein et al 2023; Global Carbon Project 2023



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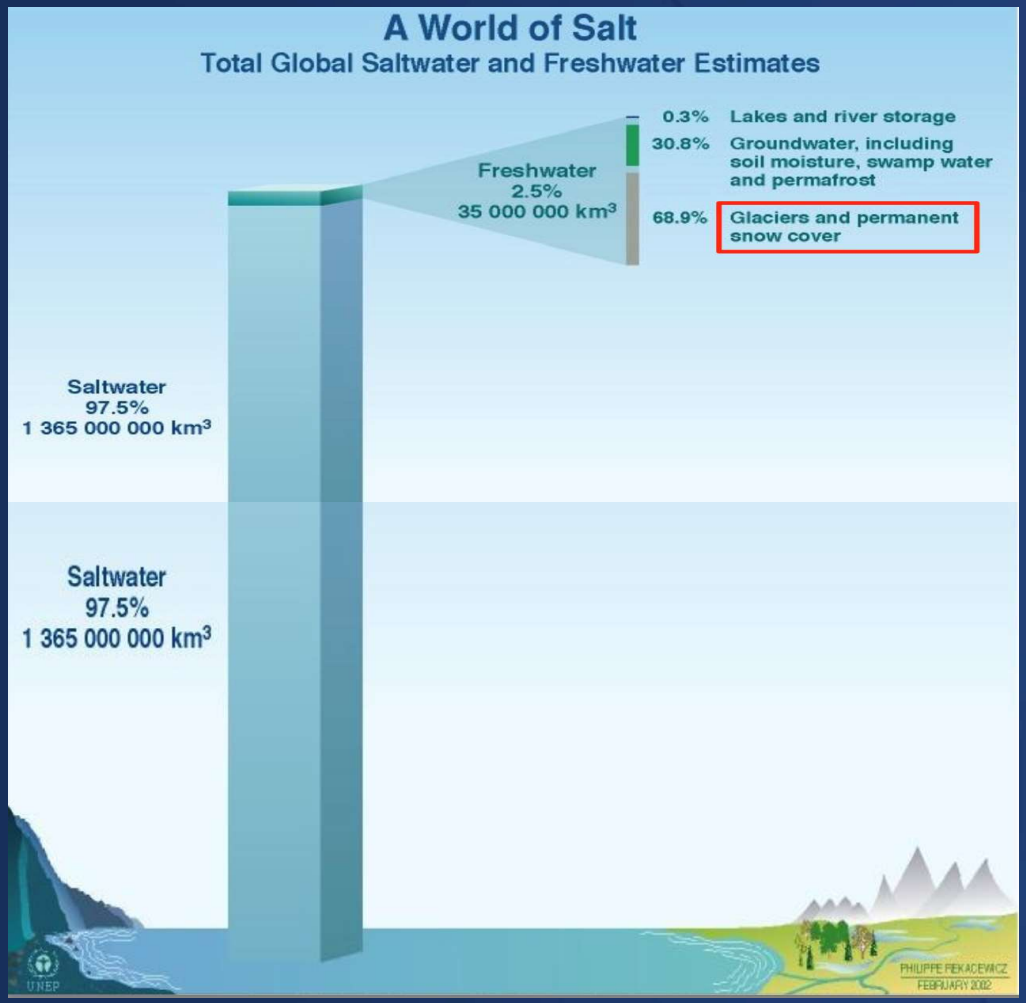
Some thoughts for reflection :

- **Could we use the 4-fold relational framework of Laudato Si' as a compass to help us navigate these difficult realities ? (our relationship with God, with ourselves, with our communities, with creation)**

- **Could we see our socio-economic dependence upon fossil fuels as a "sin", when we see how much our world is suffering from it ? [within the context of the Spiritual Exercises – cf. Week 1]**

Mike Goldwater/Getty Images



Why focus on the water cycle ?

- The amount of total water on Earth in the global water cycle is unchanging

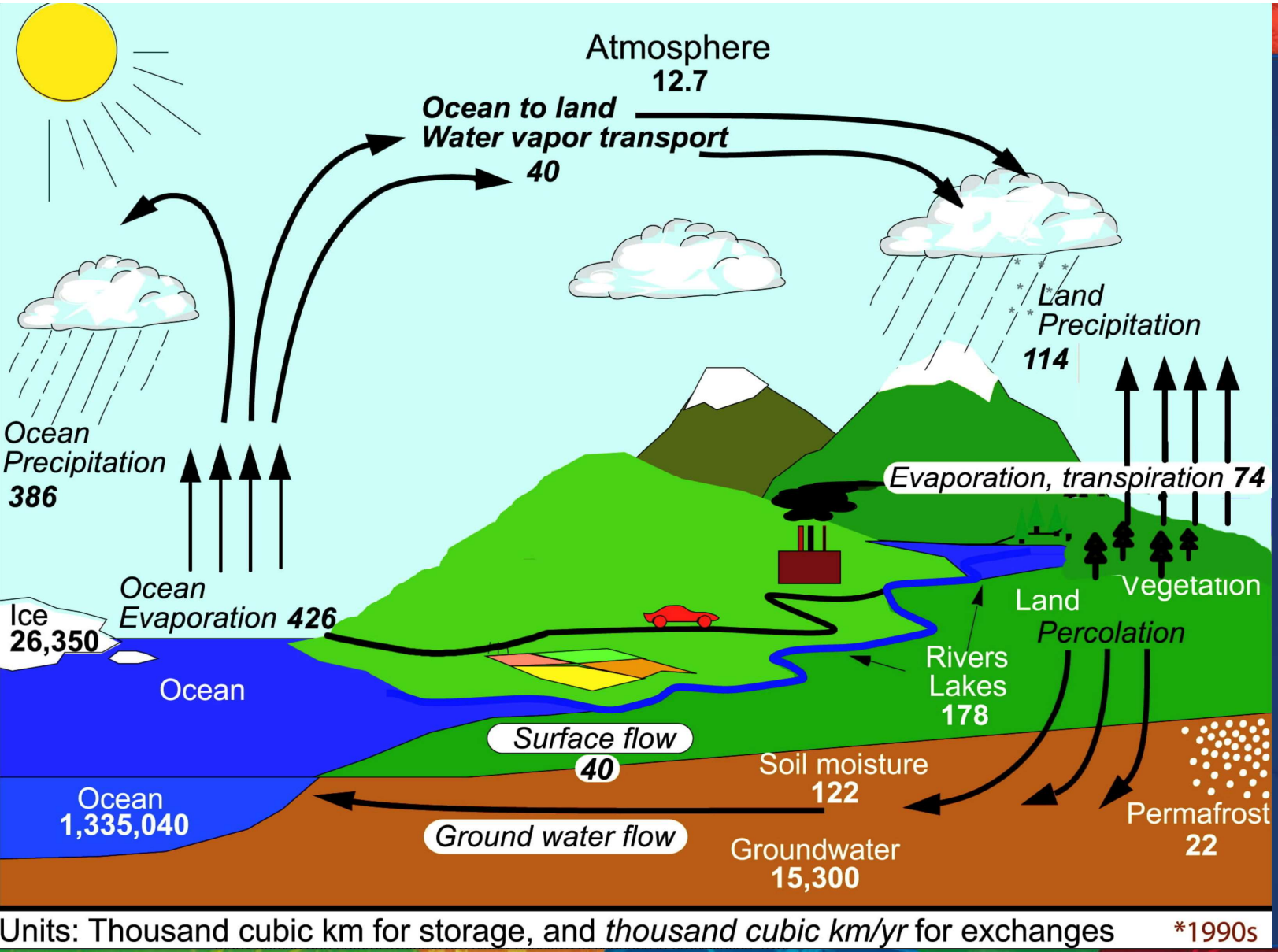
- The amount of freshwater on Earth is shrinking as rivers and lakes dry up, groundwater is drained and glaciers melt (oceans are rising and land is becoming salinized), yet populations and economies are growing

- Climate change is speeding up the global water cycle and its rainfall patterns – hence more floods, droughts and storms

Impacts of climate change on freshwater: extremes and growing scarcity

The rising Clarence River floods the town of Grafton in northern New South Wales, on March 1, 2022.

The Po River in Italy reached historically low levels in 2022.



Source : Royal Meteorological Society

We as humans are now influencing and taking on responsibility for the water cycle – both through climate change and through land use change

The SDG “wedding cake” : Water (SDG 6) is the basis of all life on earth

Source : Stockholm Resilience Centre

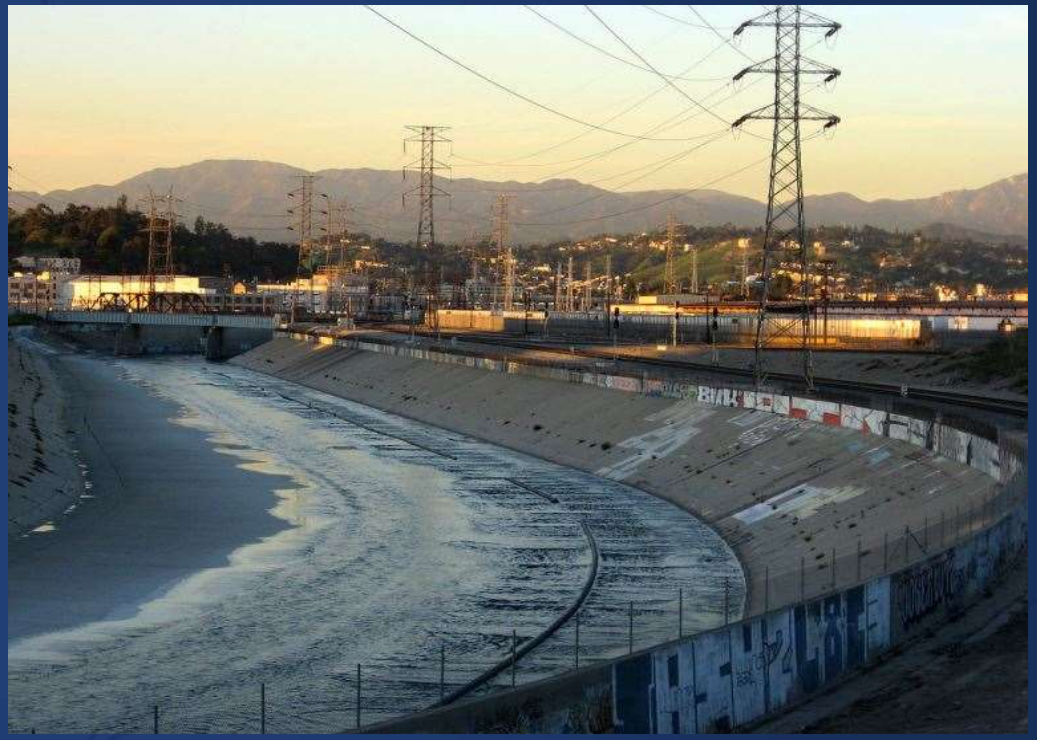
Water Risks I :
How wetlands, rivers and deltas help us cope with disasters

- Rivers and streams meander to create fertile, silted floodplains
- Left intact, along with their network of inland lakes and swamps, they can act as a giant sponge = water security
- During intense rainfall or sudden floods, they can spread and store water over a wide area, reducing damage downstream
- Many rivers have been canalized and straightened, especially near cities, eliminating this natural flood control
- Flood plains have been and are being built upon, increasing run-off and speeding up river flows

Casamance, Senegal

Water Risks II :
Mismanaging wetlands can worsen the impact of disasters

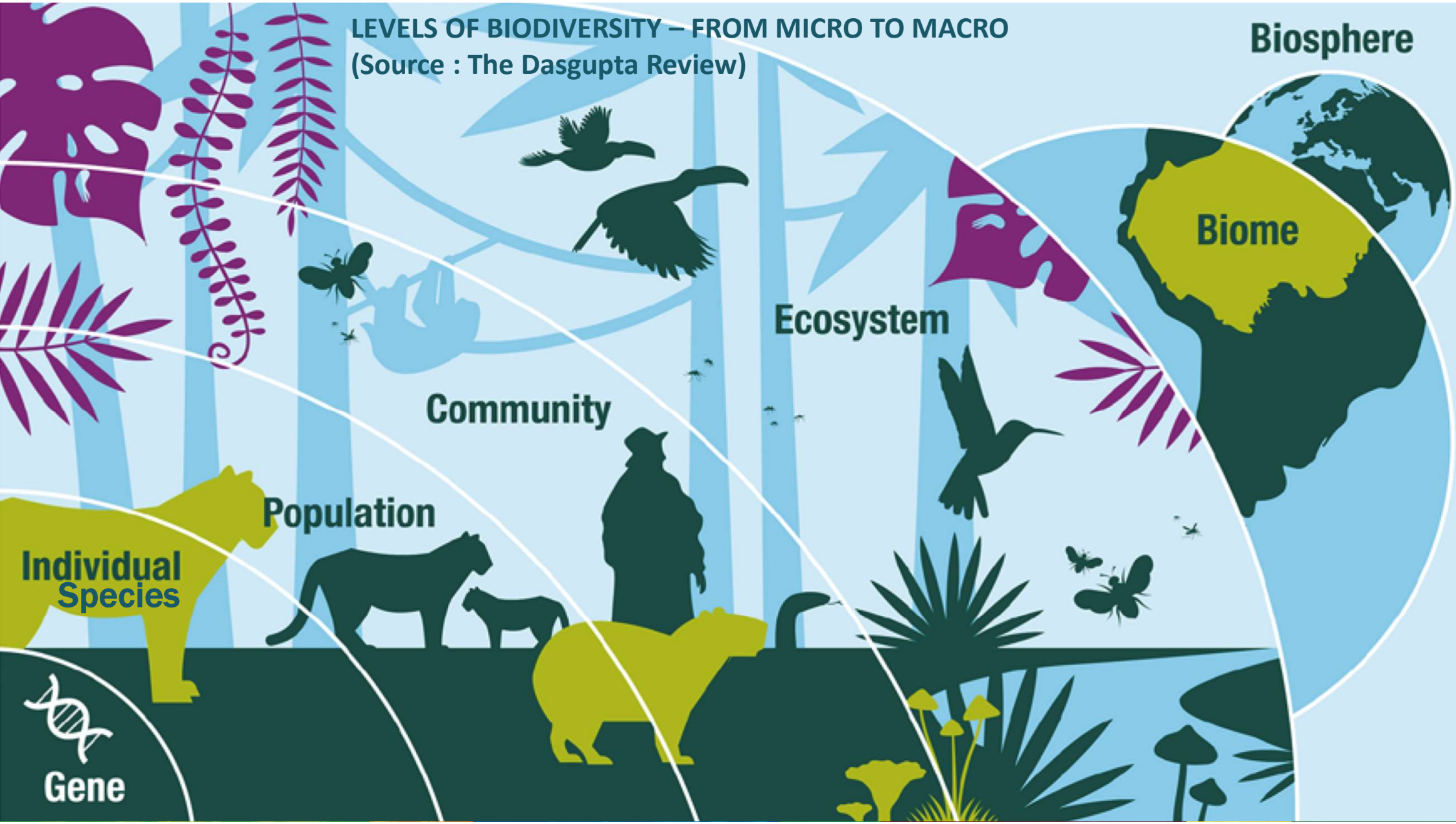
- 64% of all wetlands have disappeared since 1900 due to the growing needs of cities, industry, agriculture
- This removes the “sponge effect” of wetlands which protect us against both floods and drought
- Canalizing rivers can make floods more powerful
- Clearing mangroves and mining coral reefs can expose coastlines to storms
- Burning or draining peatlands releases large quantities of CO2 and loses the sponge effect



Los Angeles River, California, USA
Picture: Wikipedia

Example of a nature-based solution : Restored and new wetlands

- Work with nature by restoring wetlands and creating detention ponds in water catchment areas upstream of communities
- Landscape urban areas with new wetland areas for water run-off and/or final effluent treatment
- AND – invest worldwide in early warning systems and disaster risk insurance

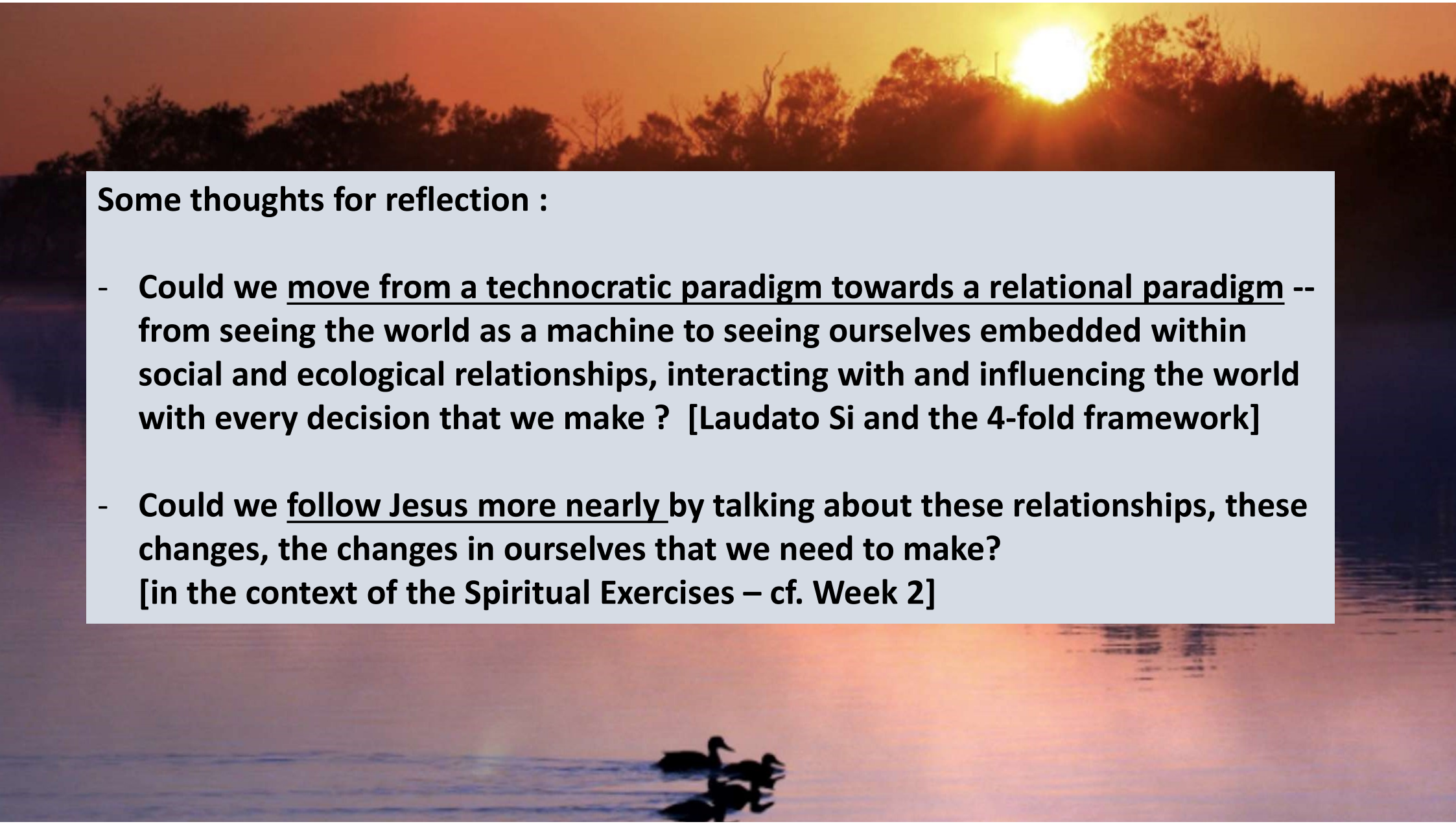

LEVELS OF BIODIVERSITY – FROM MICRO TO MACRO
(Source : The Dasgupta Review)
Biosphere
Biome
Ecosystem
Community
Population
Individual
Species
Gene

https://www.youtube.com/watch?v=WCli0gyNwL0

Source : The Dasgupta Review

Visualise our world – with the carbon cycle, the water cycle and the biosphere all being cared for by humans, managed and kept within the planetary boundaries (image created by AI (Copilot))….

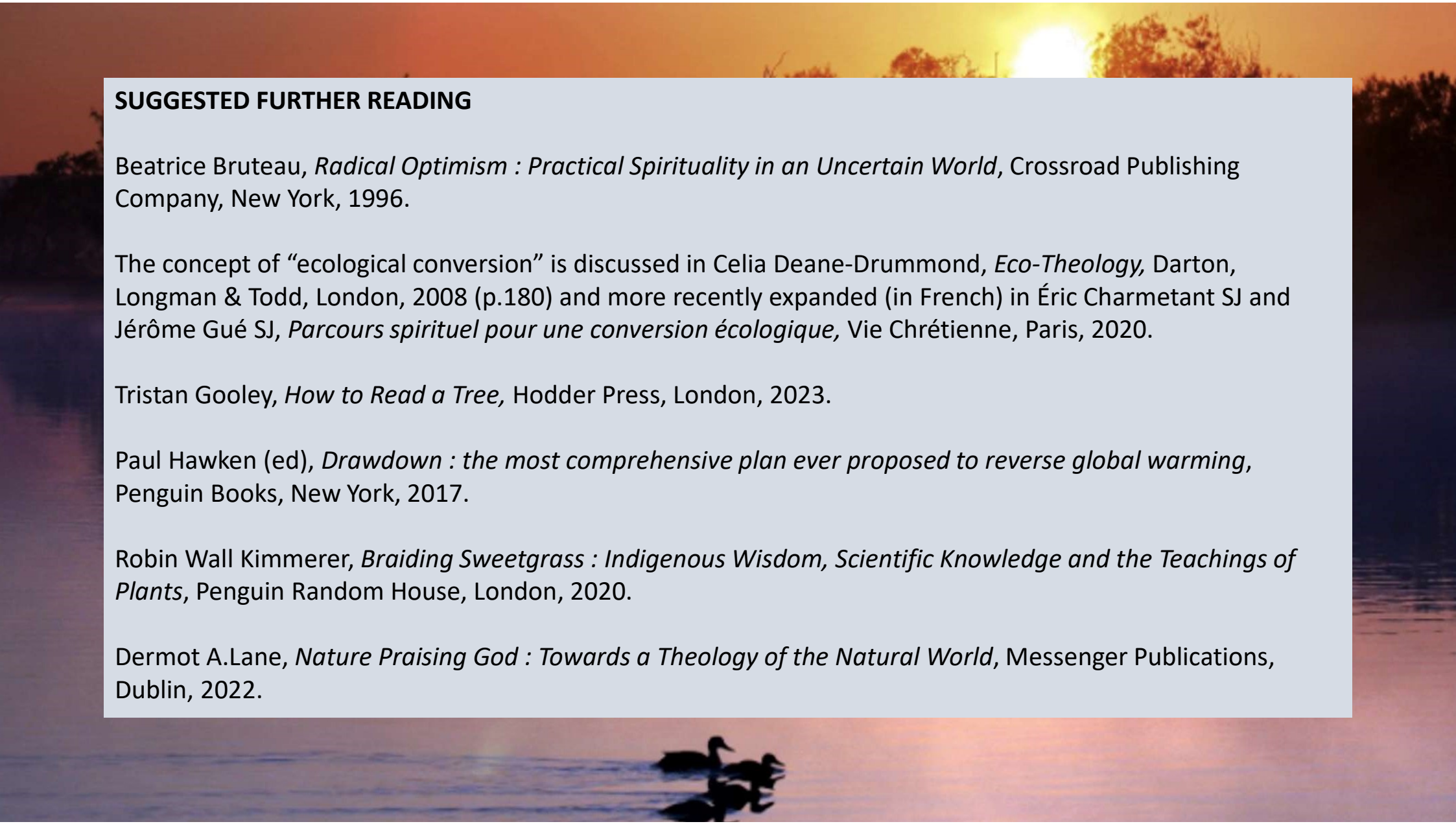
Can you imagine it?



Some thoughts for reflection :

- **Could we <u>move from a technocratic paradigm towards a relational paradigm</u> -- from seeing the world as a machine to seeing ourselves embedded within social and ecological relationships, interacting with and influencing the world with every decision that we make ? [Laudato Si and the 4-fold framework]**

- **Could we <u>follow Jesus more nearly</u> by talking about these relationships, these changes, the changes in ourselves that we need to make?**
  [in the context of the Spiritual Exercises – cf. Week 2]



SUGGESTED FURTHER READING

Beatrice Bruteau, *Radical Optimism : Practical Spirituality in an Uncertain World*, Crossroad Publishing Company, New York, 1996.

The concept of “ecological conversion” is discussed in Celia Deane-Drummond, *Eco-Theology,* Darton, Longman & Todd, London, 2008 (p.180) and more recently expanded (in French) in Éric Charmetant SJ and Jérôme Gué SJ, *Parcours spirituel pour une conversion écologique,* Vie Chrétienne, Paris, 2020.

Tristan Gooley, *How to Read a Tree,* Hodder Press, London, 2023.

Paul Hawken (ed), *Drawdown : the most comprehensive plan ever proposed to reverse global warming*, Penguin Books, New York, 2017.

Robin Wall Kimmerer, *Braiding Sweetgrass : Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*, Penguin Random House, London, 2020.

Dermot A.Lane, *Nature Praising God : Towards a Theology of the Natural World*, Messenger Publications, Dublin, 2022.