Climate Action Tai Tokerau Conference

7 September 2023

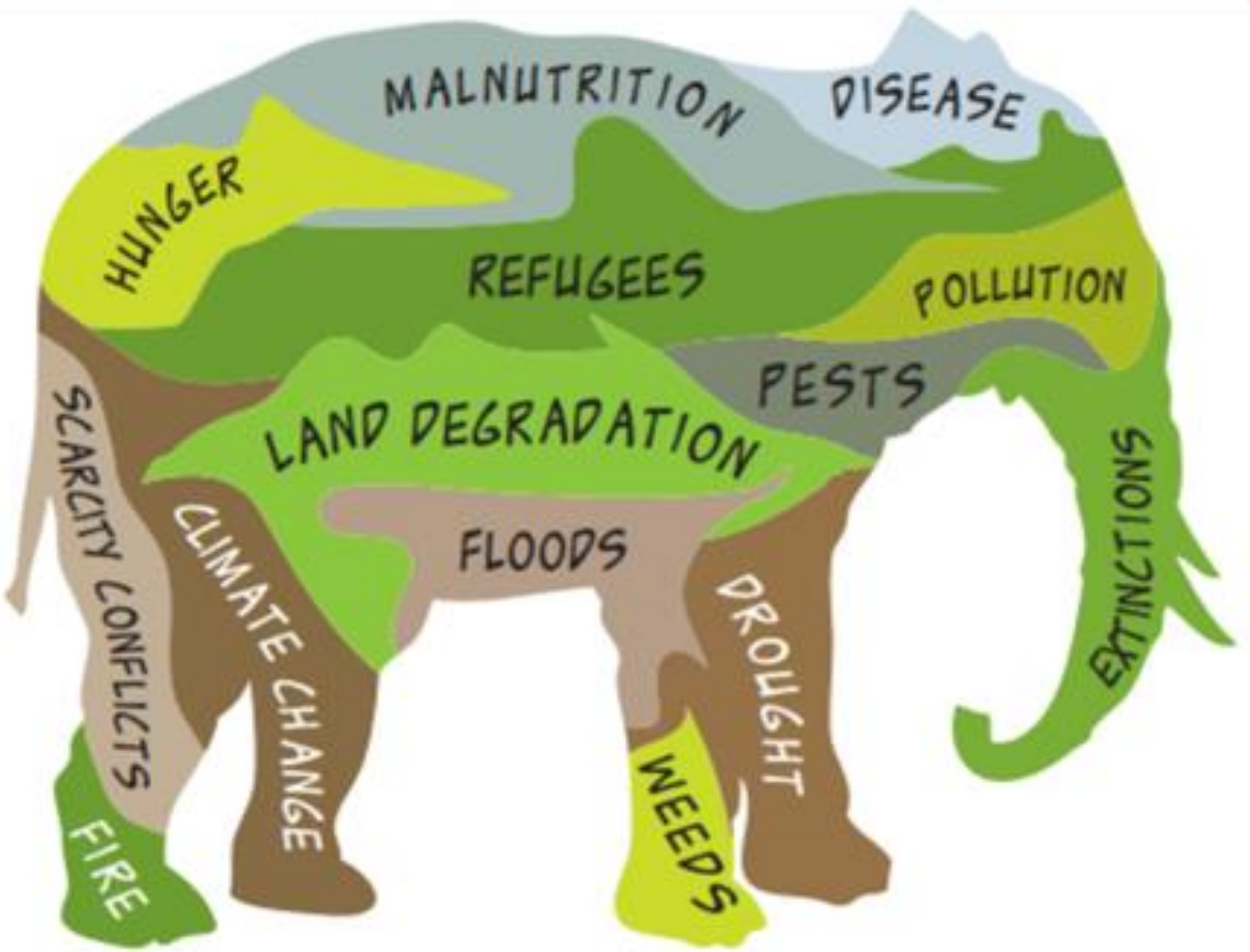
Nine ways to heal the climate

Peter Bruce-Iri

1. Beyond CO^2 – more options for mitigation

2. How plants cool (and the re-radiation of heat)

3. Climate action and solutions in Te Tai Tokerau



The metacrisis – they are all connected

+ income inequality, poverty, consumerism…

1. Stop burning fossil fuels

Nine ways to heal the climate

How's that working for us?

S **Legacy Sustainability addresses just this:**

Atmosphere

The envelope of gases surrounding earth

R **Regenerative Sustainability addresses all earth systems**

Hydrosphere

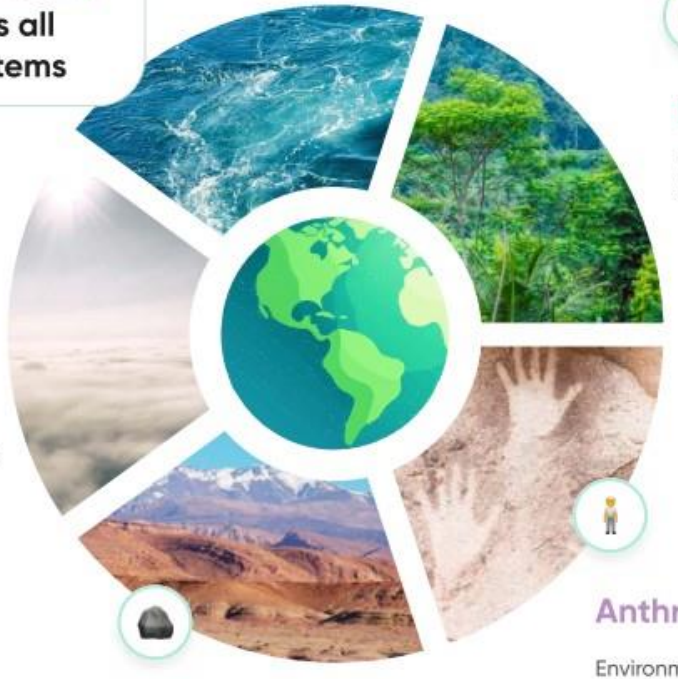
All the water on earth

Biosphere

Earth's regions occupied by living organisms

Atmosphere

The envelope of gases surrounding earth



Anthroposphere

Environments modified for human habitat, human activities, culture and technology

Lithosphere

Soil and earth

From *Race to Regeneration*

Going against the scientific consensus?

MARGARINE

BUTTER

Image credit: https://www.powerofpositivity.com/differences-butter-margarine/

Image credit: UltraTech Cement website

Wider world views

“... the proposal seems designed from a western point of view and doesn’t recognise the cultural value that Māori place on land, in addition to economic value. There is also concern that the measures seem more directed at large economically strong farming operations, not those over-represented in the classes of land where Whenua Māori is located.”

Dr Charlotte Severne (Māori Trustee) from her 24 November press release about levies for agricultural emissions.

Nine ways to heal the climate and support biodiversity

1. Stop burning fossil fuels

2. Regenerate food systems

3. Regenerate landscapes

4. Regenerate oceans

5. Repair the hydrological cycle

6. Cool our cities

7. Detoxify the planet

8. Circular production and green industry

9. Reducing consumption

1. Stop burning fossil fuels

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“kai and wai”

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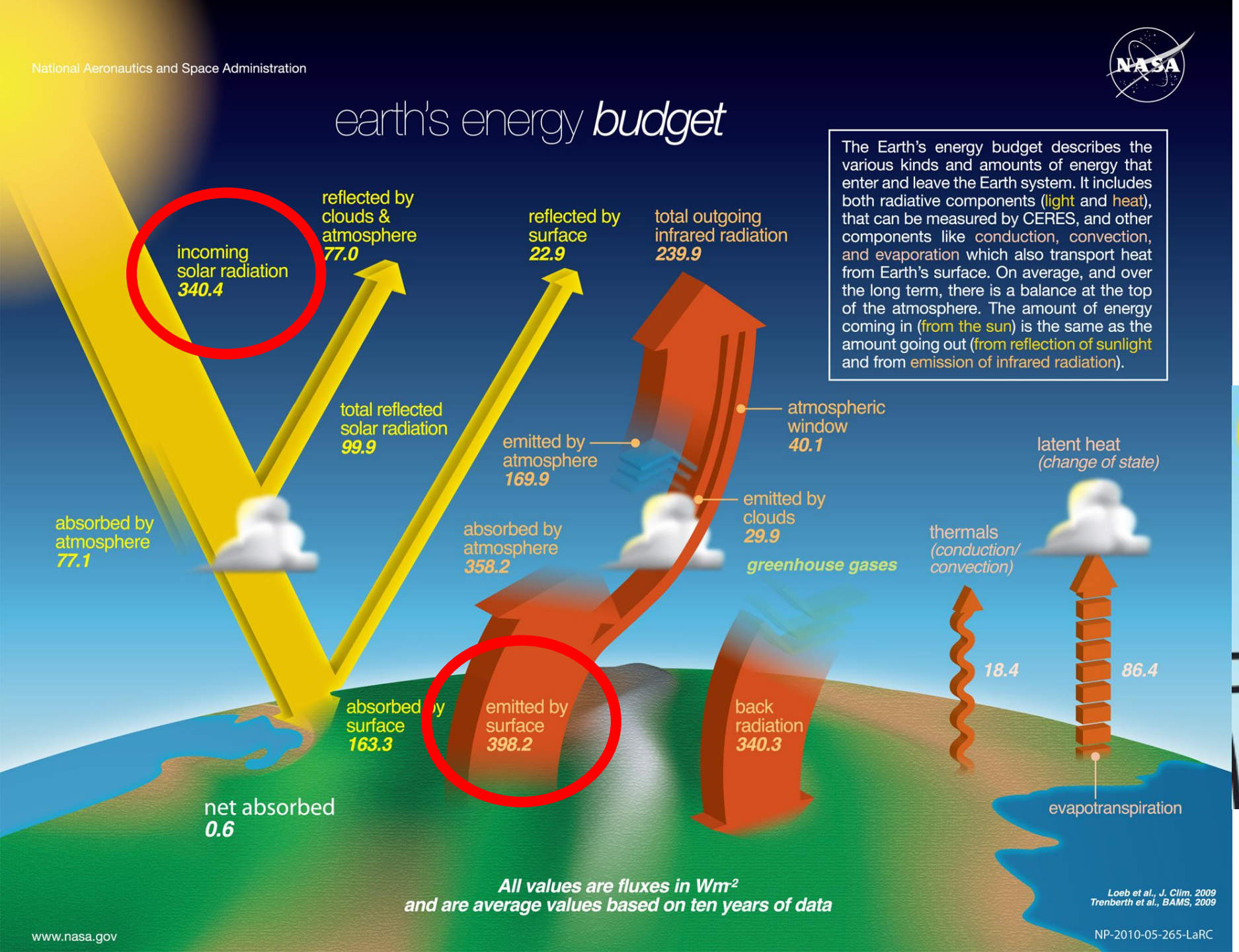
Some science

COAL CONSUMPTION AFFECTING CLIMATE.

The furnaces of the world are now burning about 2,000,000,000 tons of coal a year. When this is burned, uniting with oxygen, it adds about 7,000,000,000 tons of carbon dioxide to the atmosphere yearly. This tends to make the air a more effective blanket for the earth and to raise its temperature. The effect may be considerable in a few centuries.

RODNEY AND OTAMATEA TIMES, WAITEMATA AND KAIPARA GAZETTE, 14 AUGUST 1912, PAGE 7

PAPERS PAST



Incoming: 340.4

Reradiated: 398.2

(watts per m2 on average)

clouds do the heavy lifting

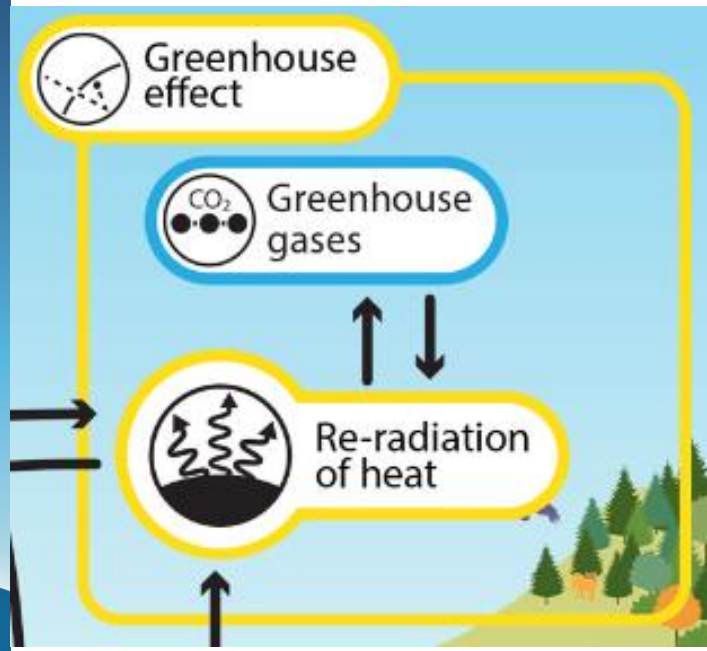


Image credits: Nasa (left) and [Berkeley University]

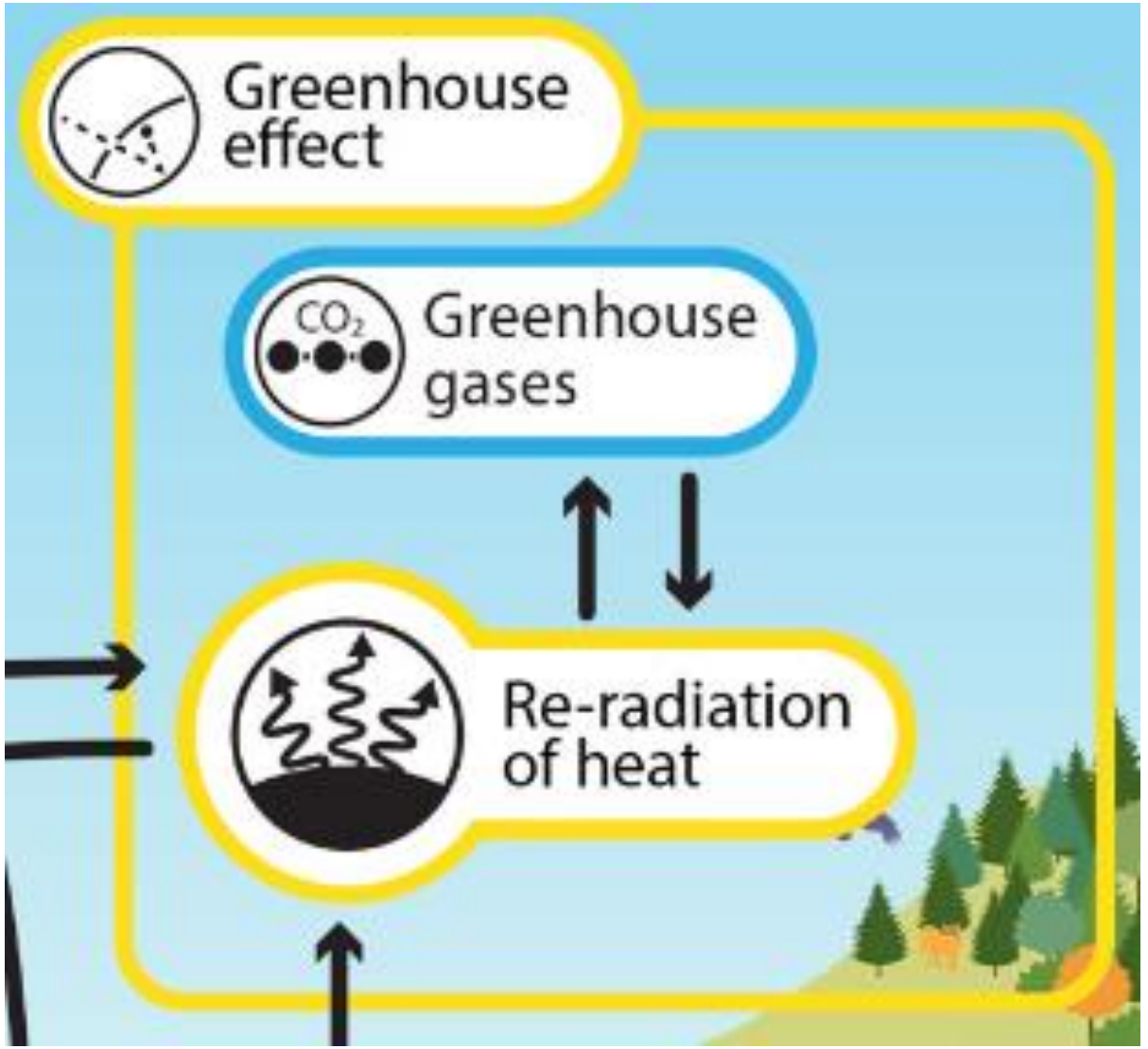


Image credit: Berkeley University

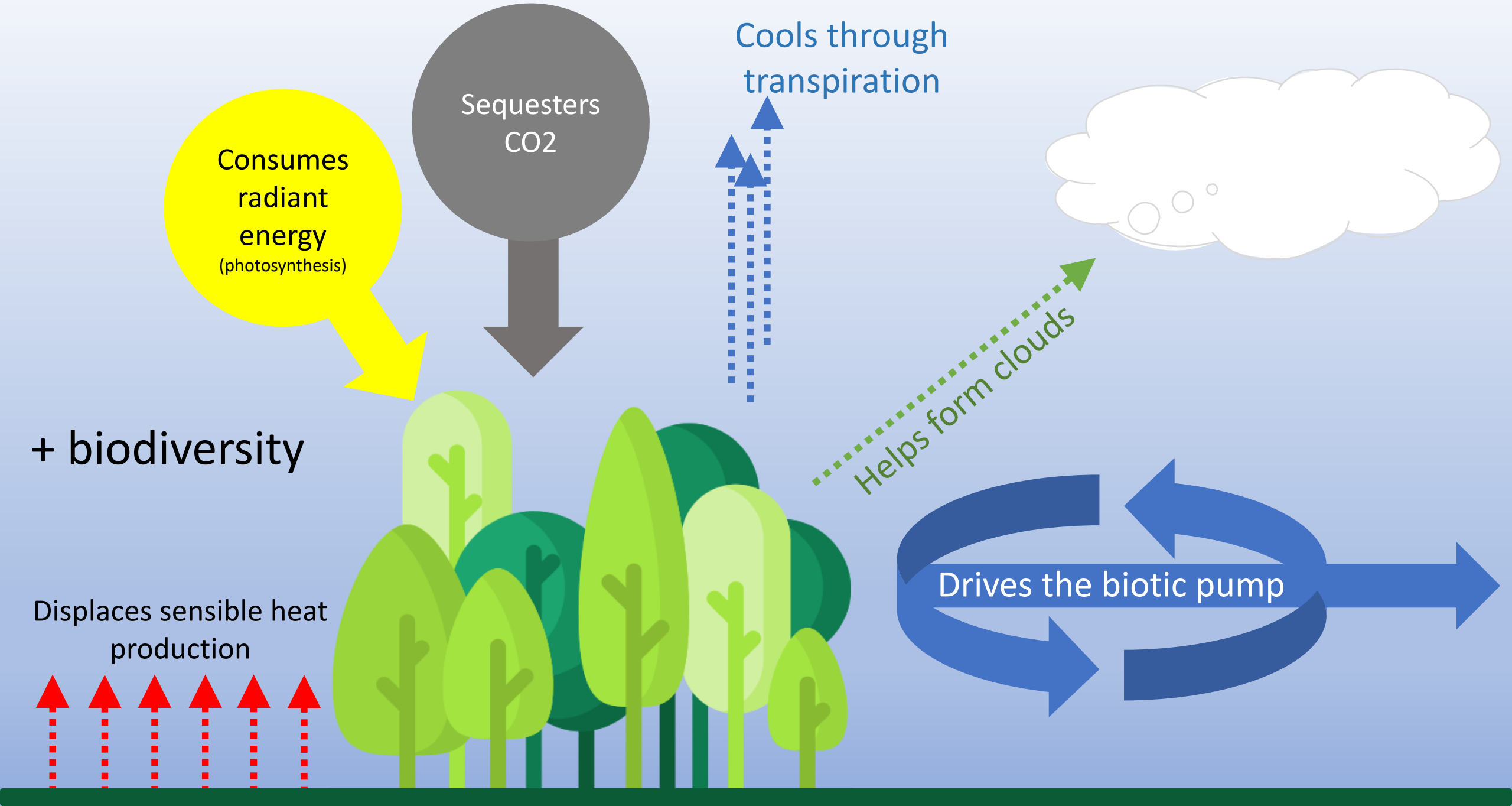
More greenhouse gasses – like adding another blanket

More re-radiated energy – like more people in the bed

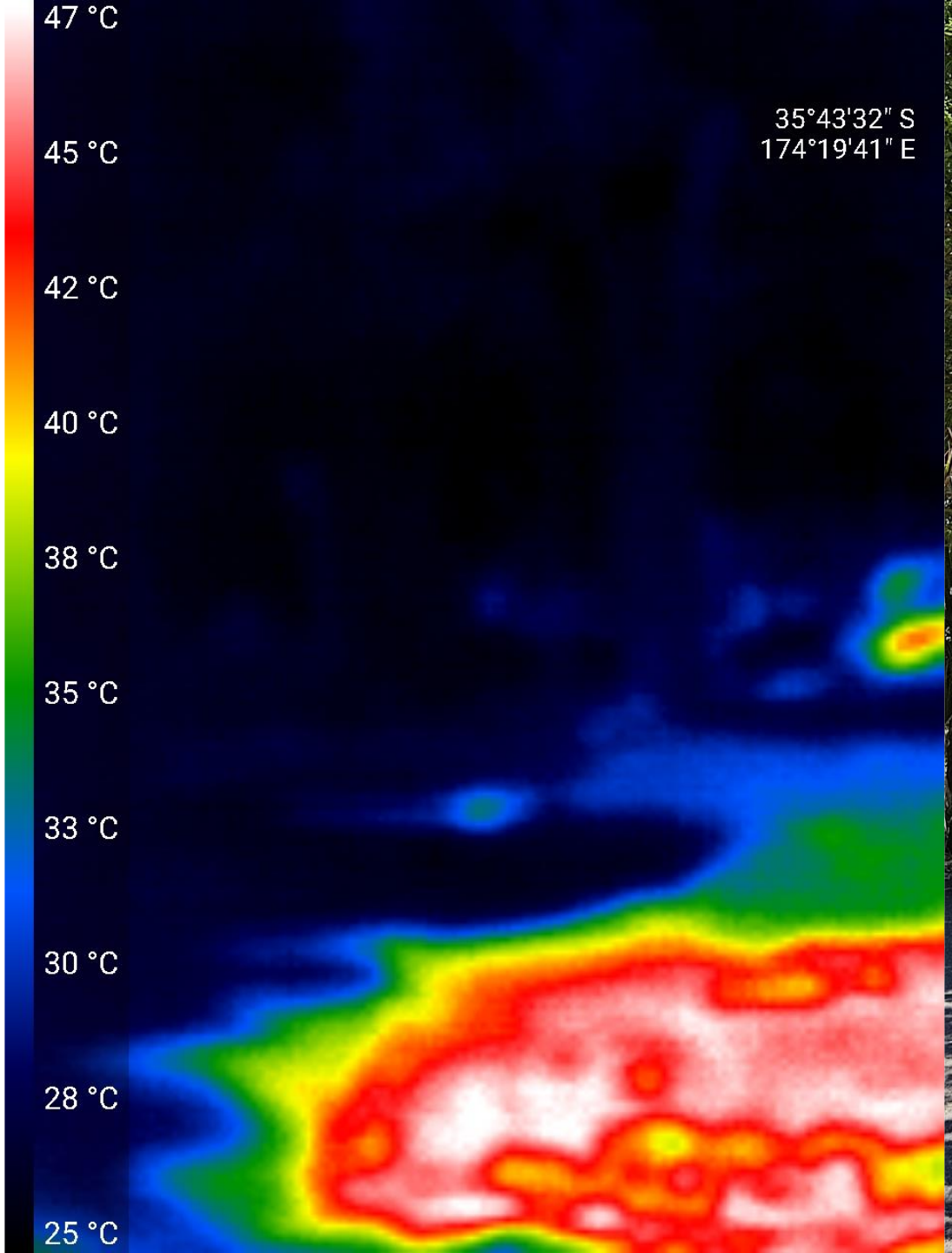
image credit: Dail Motion

Sequester
CO2

+ biodiversity


Sequesters CO2
Cools through transpiration
Consumes radiant energy (photosynthesis)
Helps form clouds
+ biodiversity
Drives the biotic pump
Displaces sensible heat production

Infrared photography reveals the temperature differences between vegetated and bare or constructed surfaces.



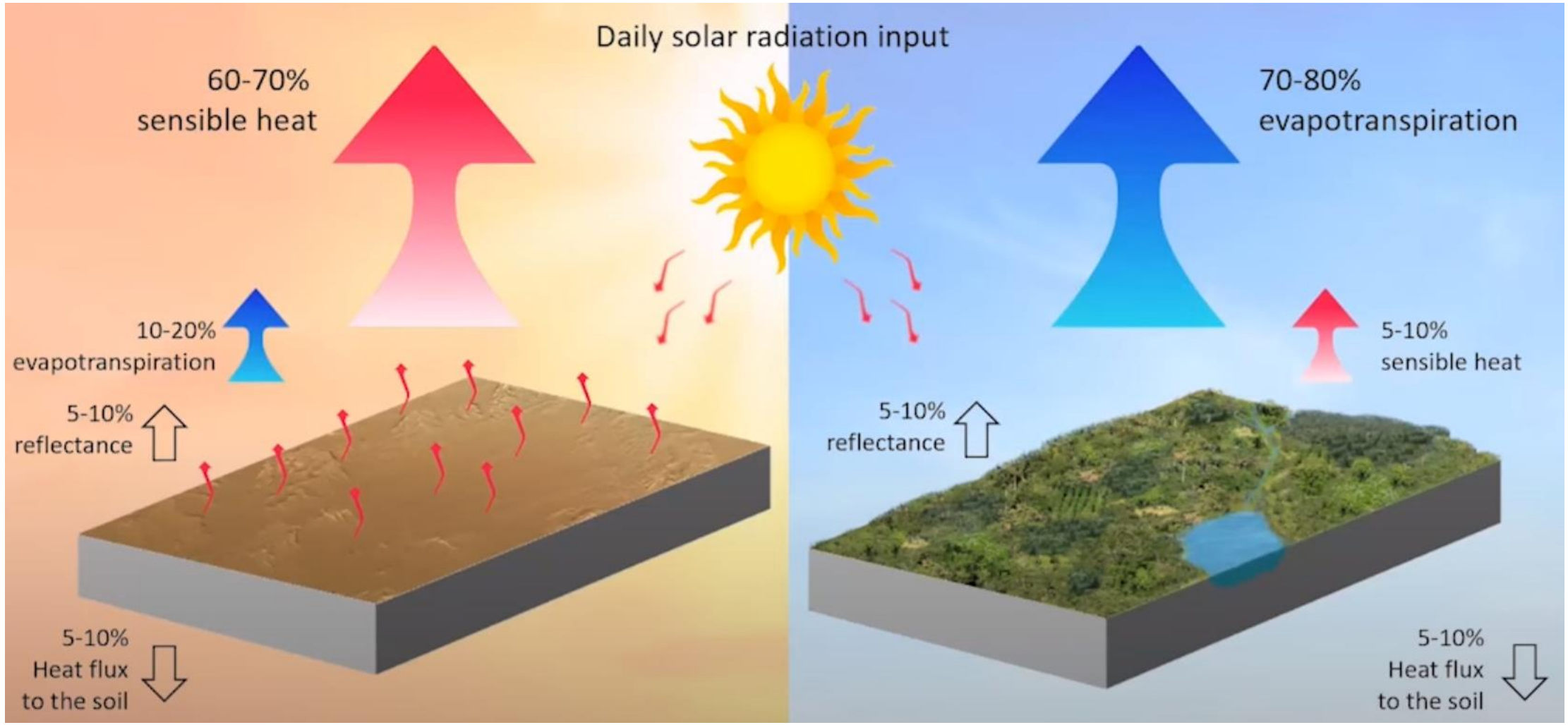
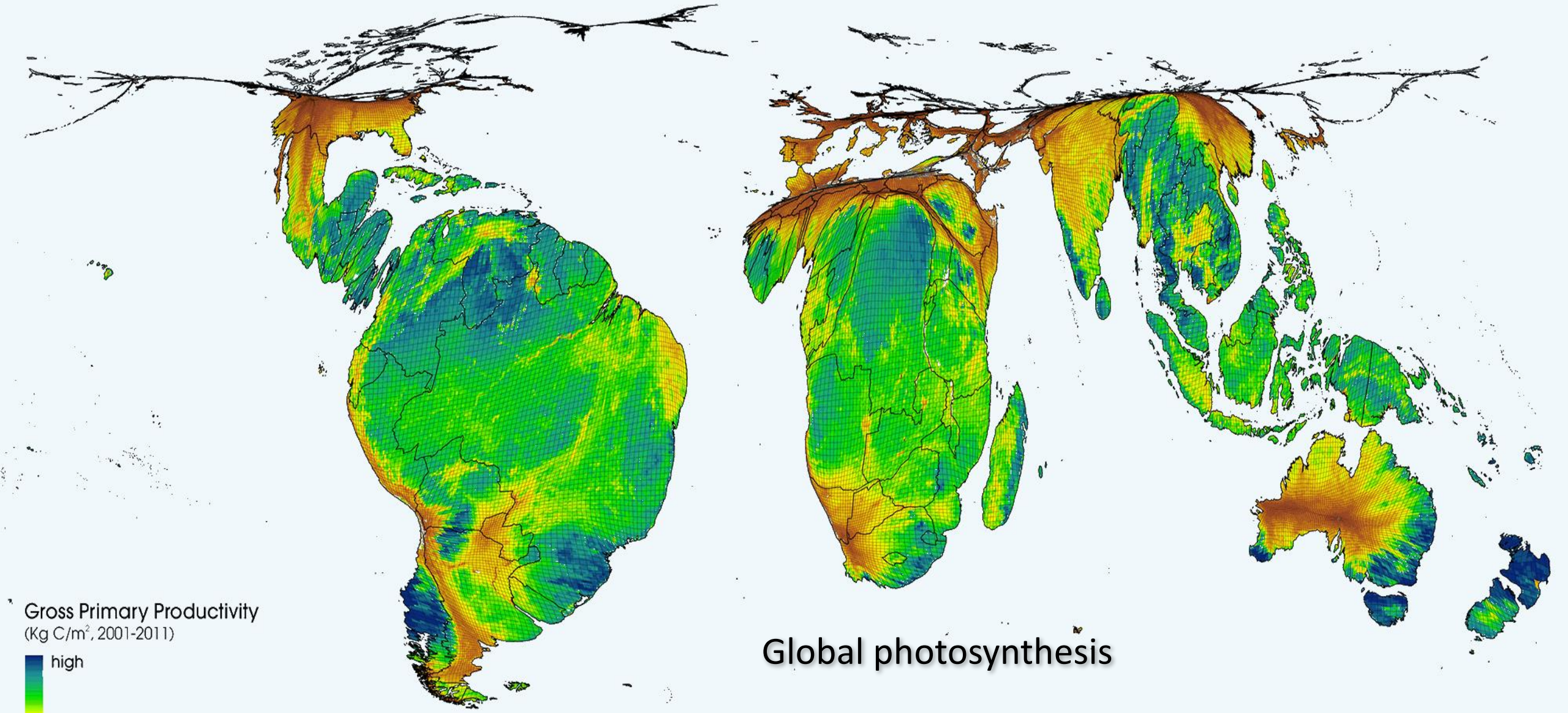


Image credit: Ties van der Hoeven (The WeatherMakers)

January Photosynthesis and biomass production on land throughout the year



Global photosynthesis

Global GPP - Data 2000-2010- source Yadvinder Mahli Univ. Oxford

4. Regenerate oceans

Every second breath (at least) comes from the sea!

Problem: The sea surface microlayer (SML) has been degraded by pollutants allowing much more water to evaporate

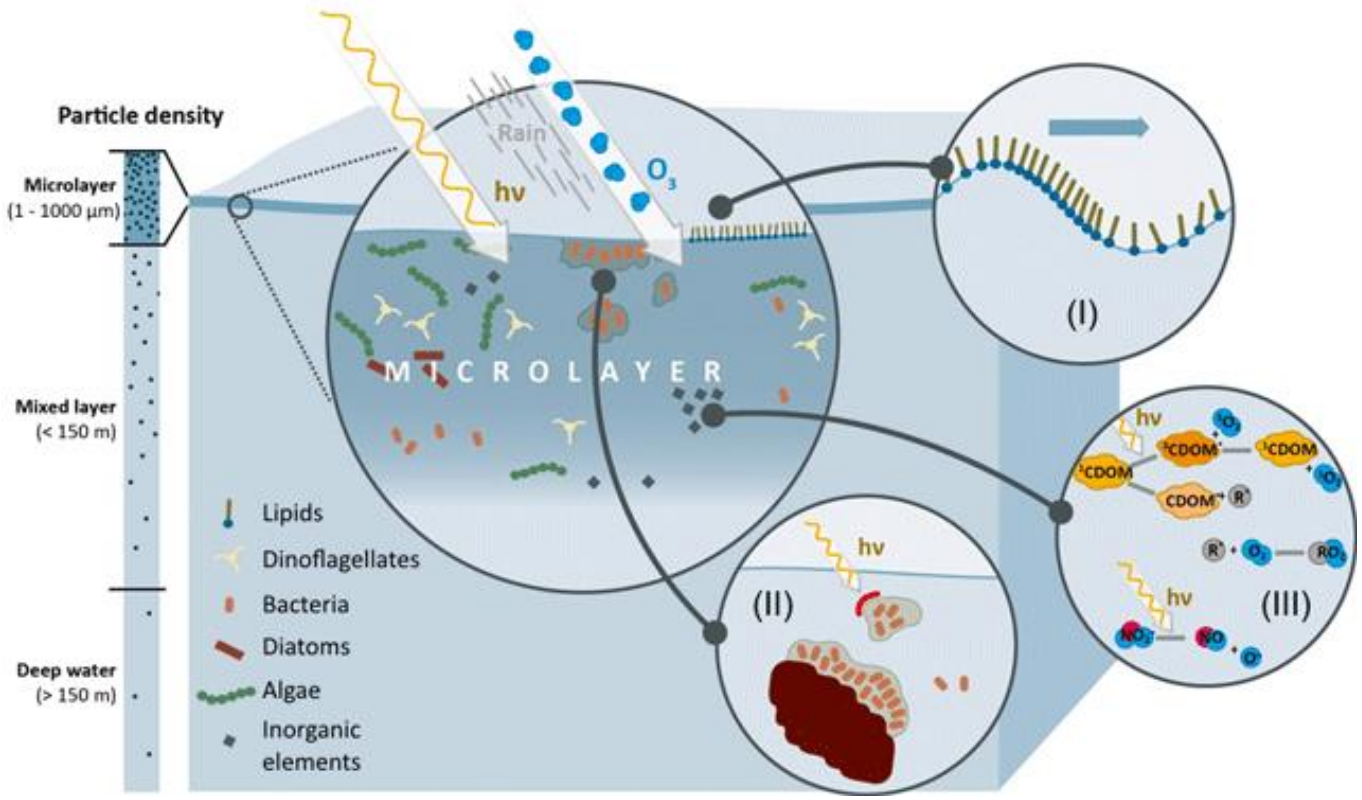


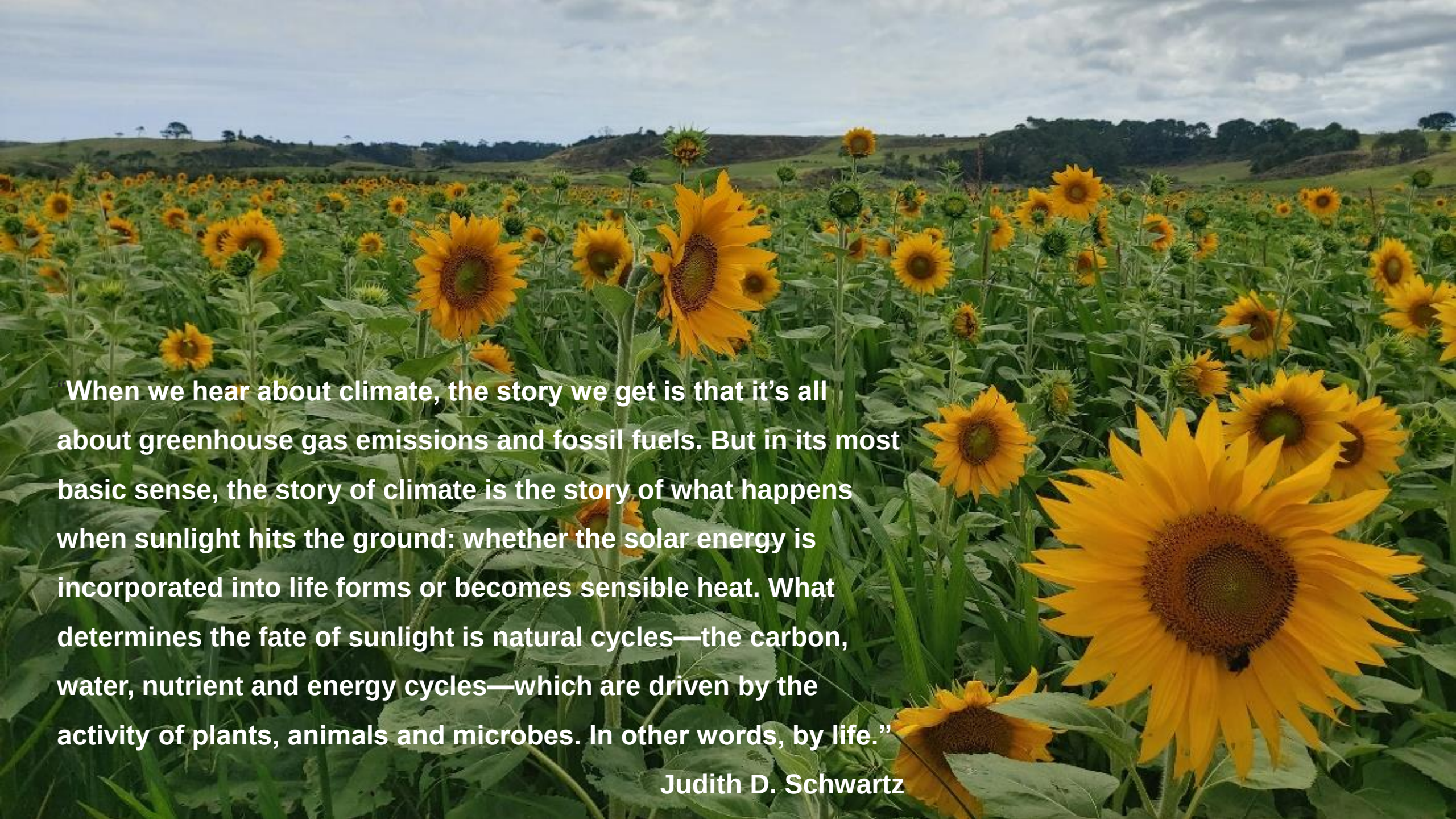
Image credit: Oliver Wurl; Werner Ekau; William M. Landing; Christopher J. Zappa - [1] doi:10.1525/elementa.228

Solutions:

- Stopping fossil fuel pollution (black carbon).
- Improving sewerage treatment.
- Reducing the use of biocides and forever chemicals.
- Using climate friendly sunscreen.
- Getting plastic out of the ocean.

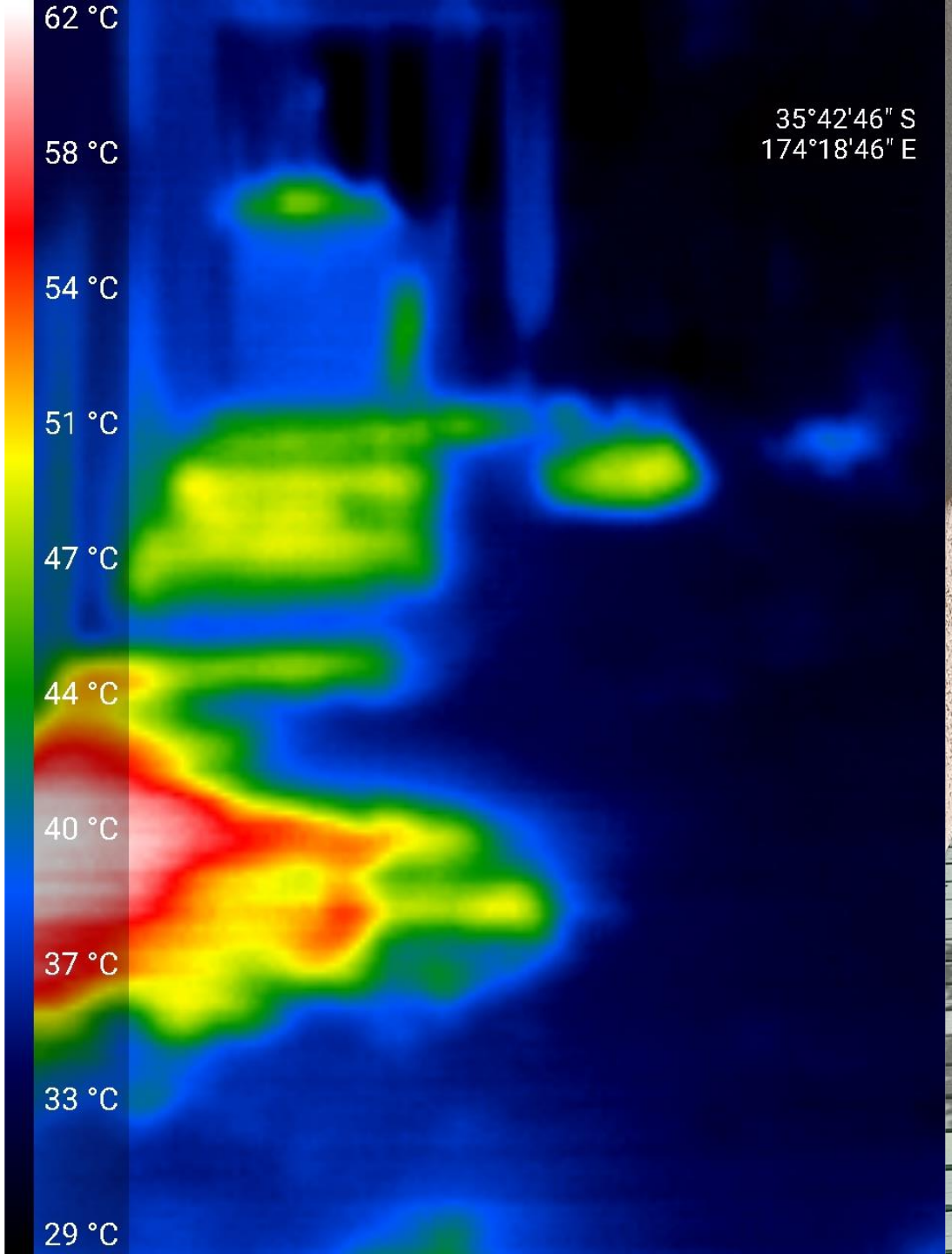
2. Regenerative food systems


Regenerative agriculture


“When we hear about climate, the story we get is that it’s all about greenhouse gas emissions and fossil fuels. But in its most basic sense, the story of climate is the story of what happens when sunlight hits the ground: whether the solar energy is incorporated into life forms or becomes sensible heat. What determines the fate of sunlight is natural cycles—the carbon, water, nutrient and energy cycles—which are driven by the activity of plants, animals and microbes. In other words, by life.”
Judith D. Schwartz

6. Cool our cities

Cool houses, cool cities

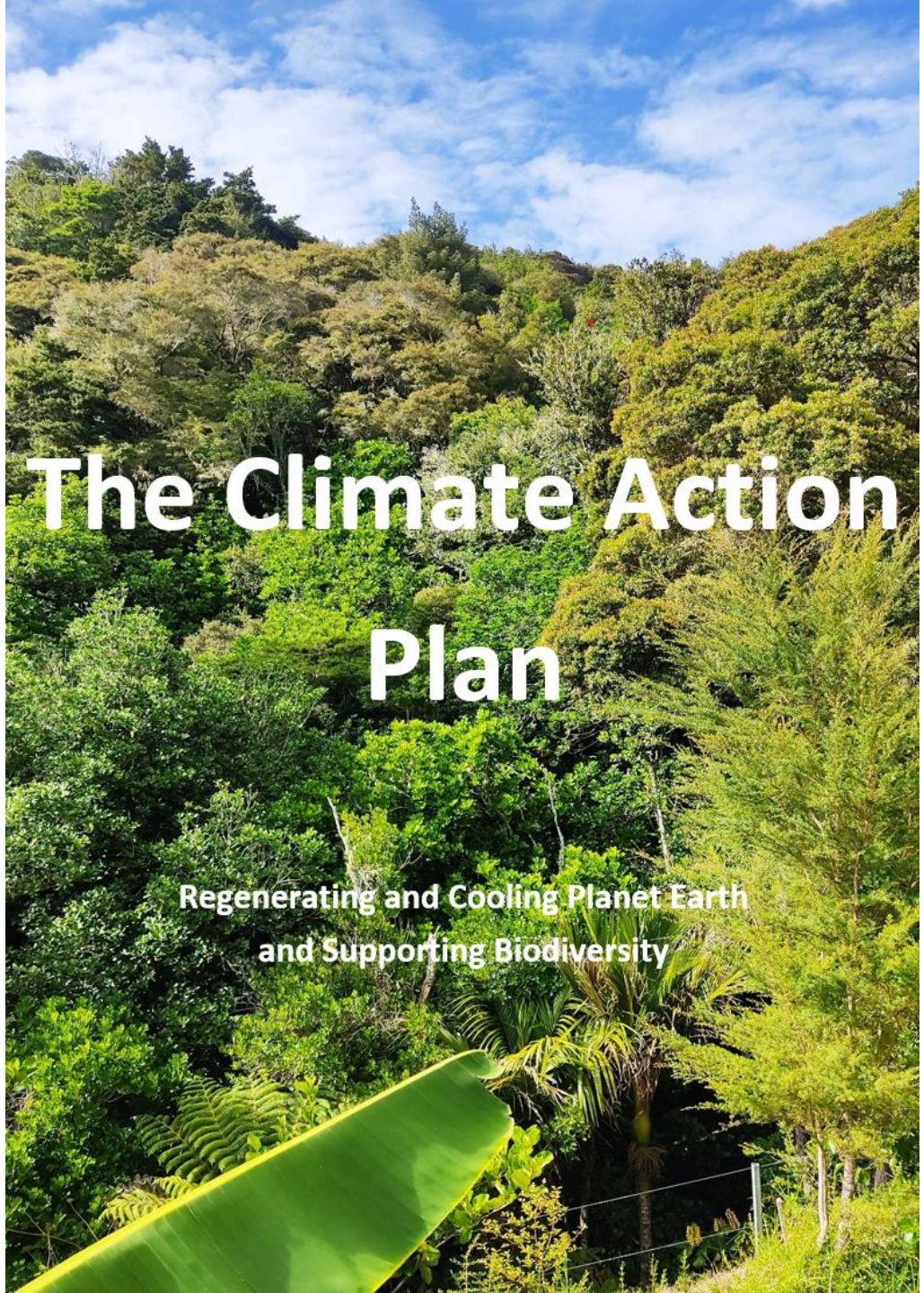



Cool walls

HOW PLANTS COOL AND HEAL THE CLIMATE

FINDING SOLUTIONS CLOSE TO HOME

Peter Bruce-Iri



https://northlandclimatechange.org/resources/

Nine ways to heal the climate and support biodiversity

1. Stop burning fossil fuels

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3. Regenerate landscapes

4. Regenerate oceans

5. Repair the hydrological cycle

6. Cool our cities

7. Detoxify the planet and go circular

8. Circular production and green industry

9. Reversing climate tipping points