

THE CLIMATE CATASTROPHE



AND THE MĀLAMA HONUA WORLDWIDE VOYAGE OF THE HŌKŪLE`A

How Can We Take Care of the Earth?

**A DEEPER LOOK INTO THE SCIENCE, PHILOSOPHY, AND POLITICS
OF CLIMATE CHANGE**

A Presentation by

TIMOTHY J FREEMAN

Assistant Professor of Philosophy

University of Hawai'i at Hilo





“She is more than a voyaging canoe—she represents the common desire shared by the people of Hawaii, the Pacific, and the World to protect our most cherished values and places from disappearing.”

Polynesian Voyaging Society

<http://www.hokulea.com/voyages/our-story/>

Hōkūle‘a © Herb Kāne

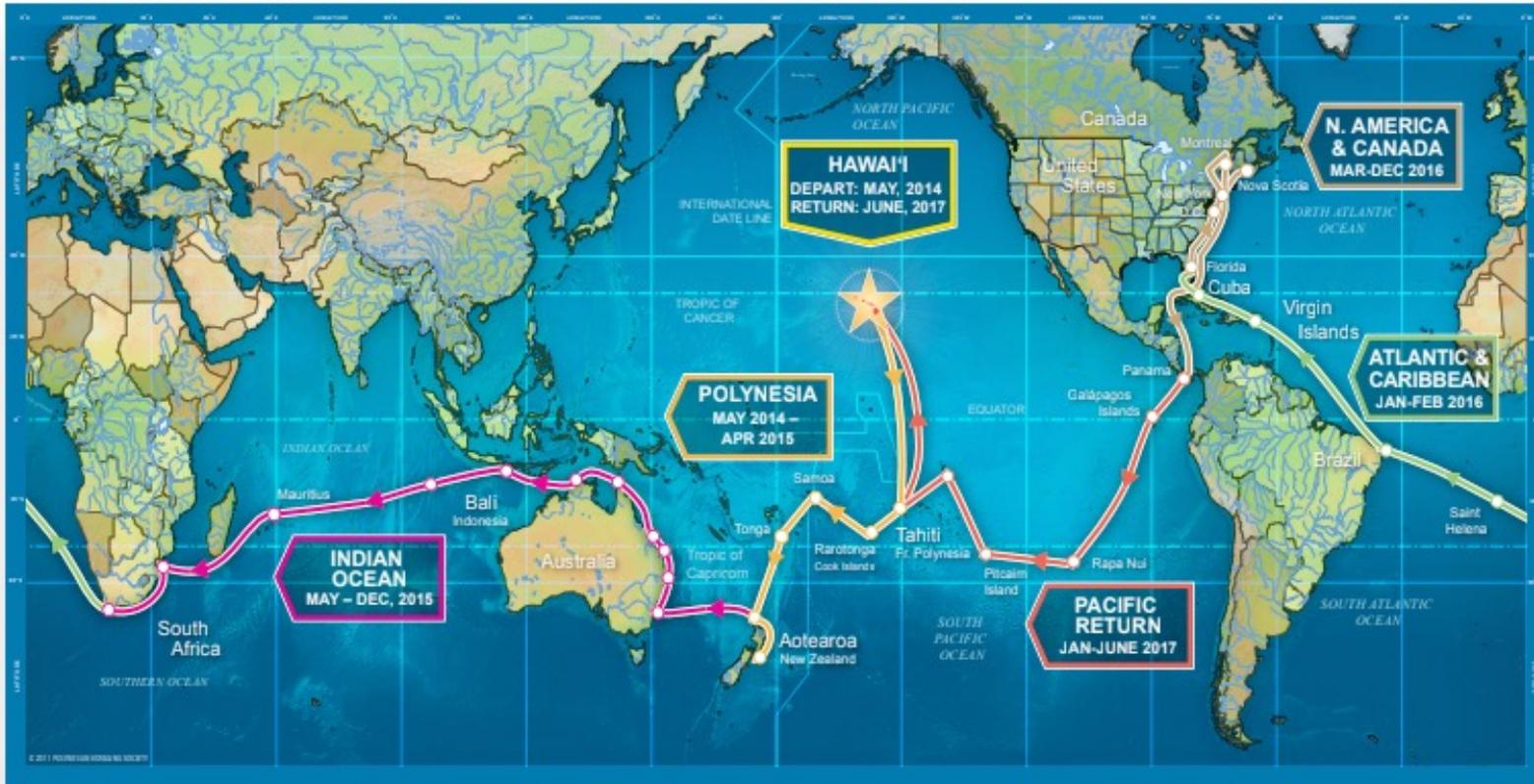


© Herb Kawainui Kāne



MĀLAMA HONUA WORLDWIDE VOYAGE

- SPONSORED BY HAWAIIAN AIRLINES -



The Hawaiian name for this voyage, *Mālama Honua*, means “to care for our Earth.” Living on an island chain teaches us that our natural world is a gift with limits and that we must carefully steward this gift if we are to survive together. As we work to protect cultural and environmental resources for our children’s future, our Pacific voyaging traditions teach us to venture beyond the horizon to connect and learn with others. The Worldwide Voyage is a means by which we now engage all of Island Earth—bridging traditional and new technologies to live sustainably, while sharing, learning, creating global relationships, and discovering the wonders of this precious place we all call home.

Polynesian Voyaging Society

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<http://www.hokulea.com/worldwide-voyage/>





this
precious
place
we
call
home



© 2016 POLYNESIAN VOYAGING SOCIETY
PHOTO: 'ŌIWI TV • PHOTOGRAPHER: NĀ'ĀLEHU ANTHONY



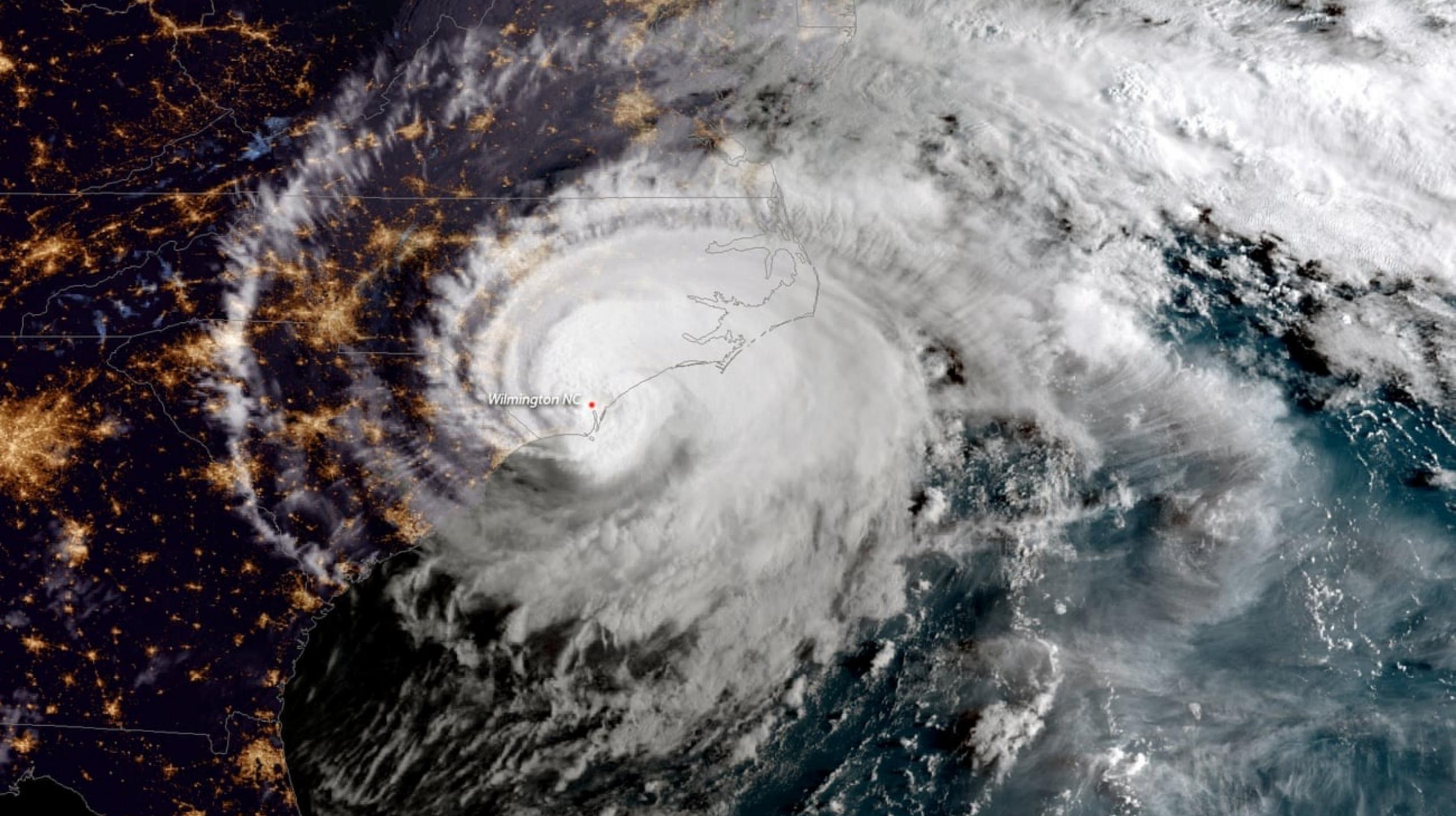
HŌKŪLE'A IMAGE © POLYNESIAN VOYAGING SOCIETY
PHOTO © 'ŌIWI TV • PHOTOGRAPHER: SAM KAPOI





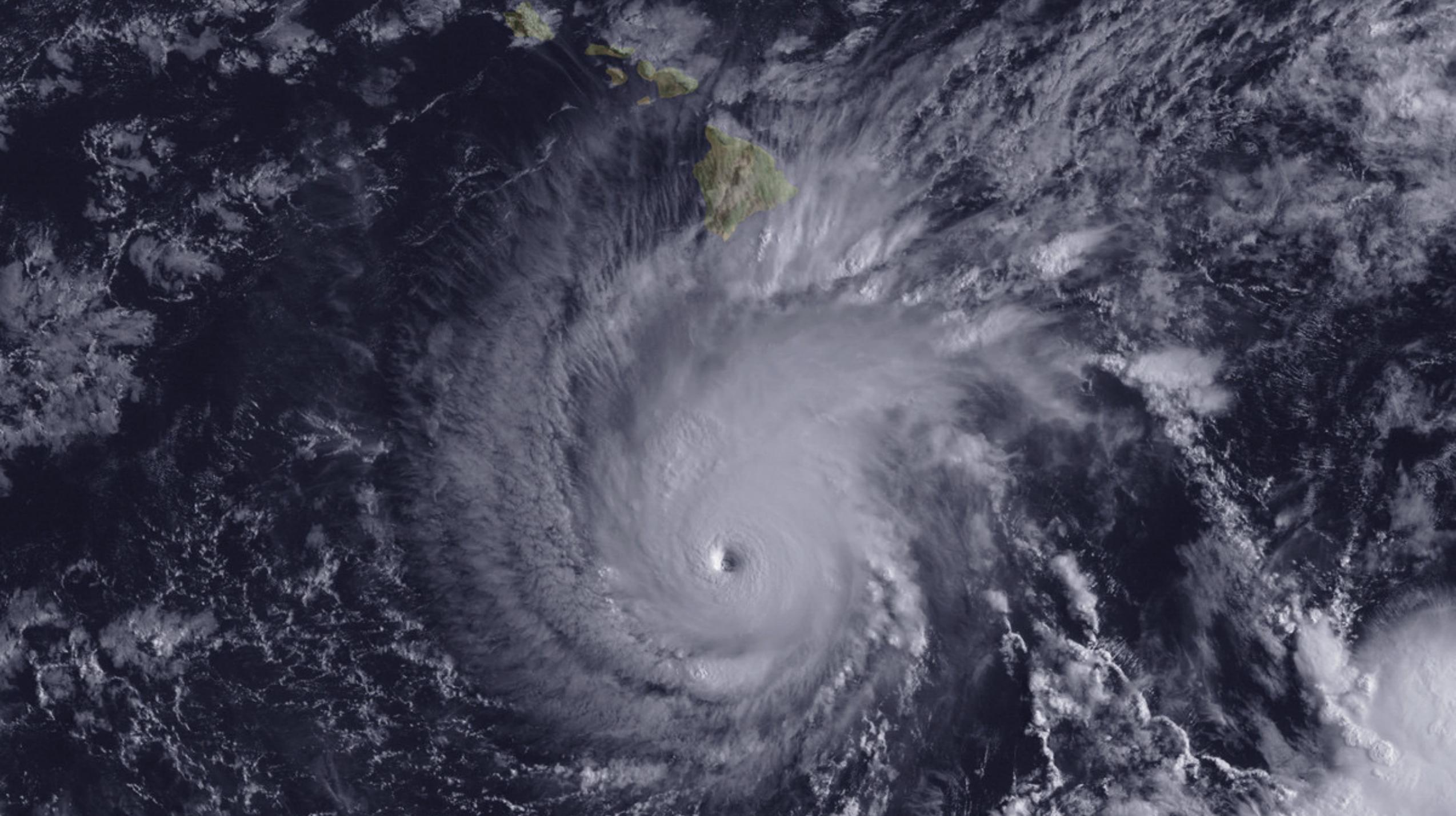






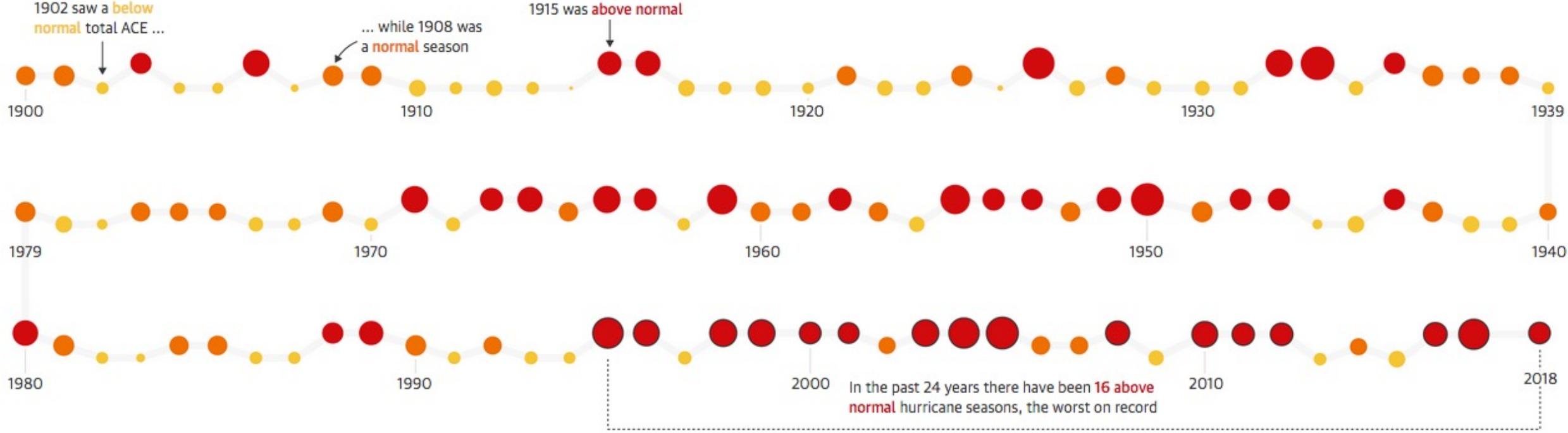
Wilmington NC







Hurricanes are getting stronger and lasting longer

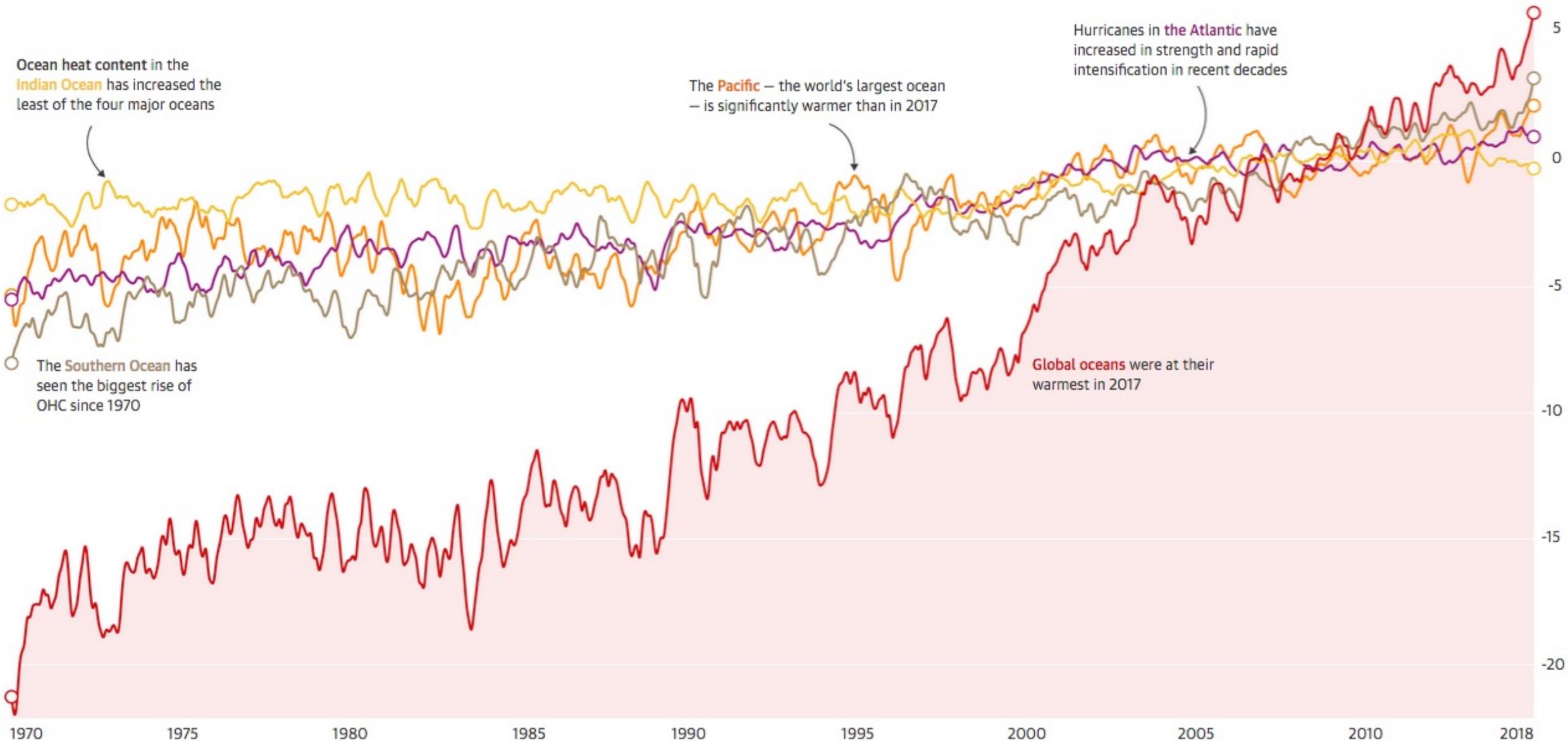


Source: Earth System Research Laboratory

Hurricane seasons from 1900-2018

The data shows that Hurricanes are getting stronger and lasting longer.

Ocean energy is rapidly increasing

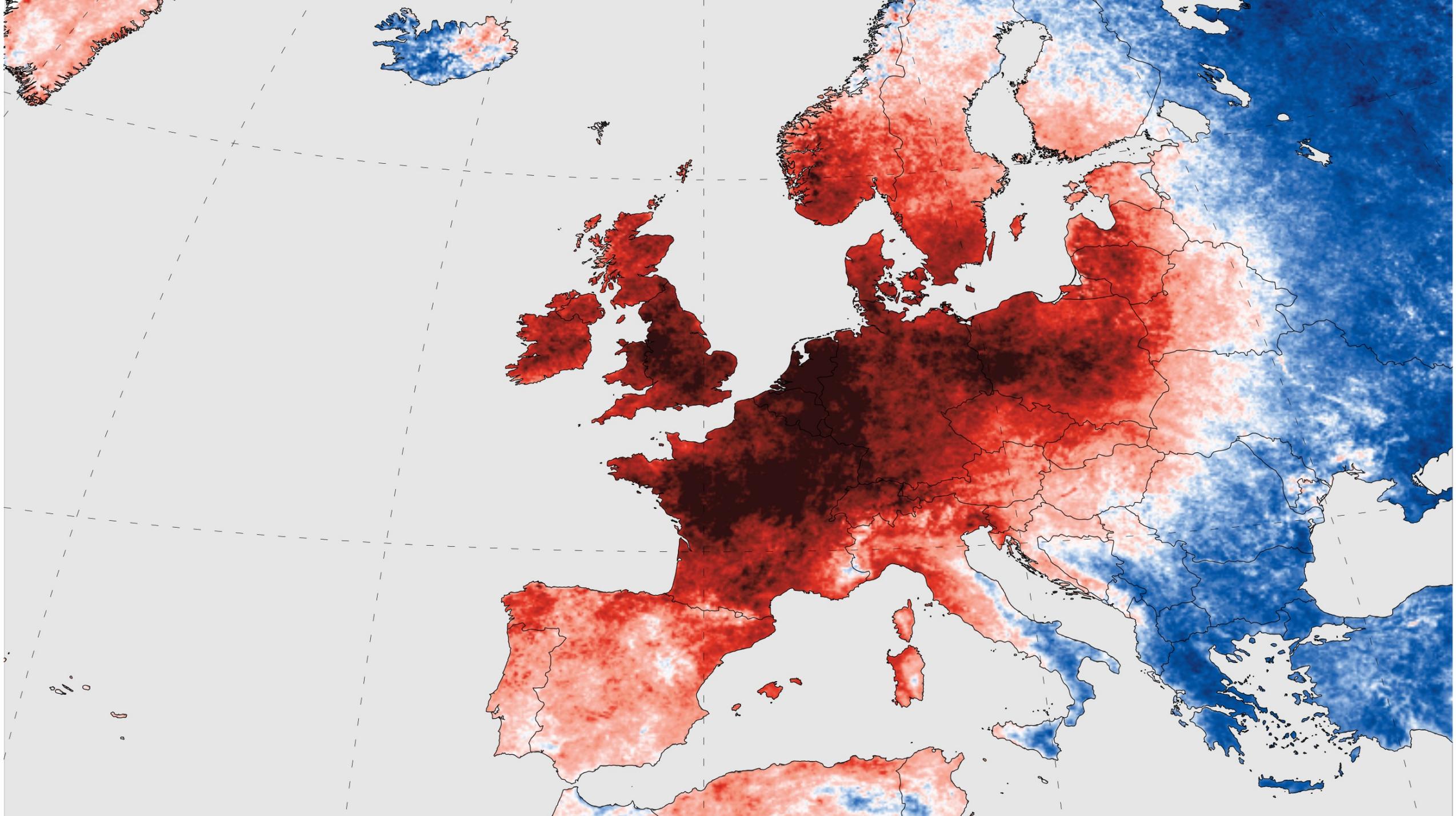


Source: Institute of Atmospheric Physics, Chinese Academy of Sciences. Notes: Ocean Heat Content is based on anomaly (10^{22} Joules)









A close-up photograph of a person's legs and feet standing on parched, cracked earth. The person is wearing a vibrant, multi-colored patterned skirt. The ground is brown and deeply fissured, indicating severe drought. The overall scene conveys the impact of climate change on food security.

THIS IS
CLIMATE CHANGE

FAMINE

"A brilliant work that opens the new frontiers of world politics."
—HIDEKI MATSUZAKI, author of *Power of Storm*

CHRISTIAN PARENTI



TROPIC OF CHAOS

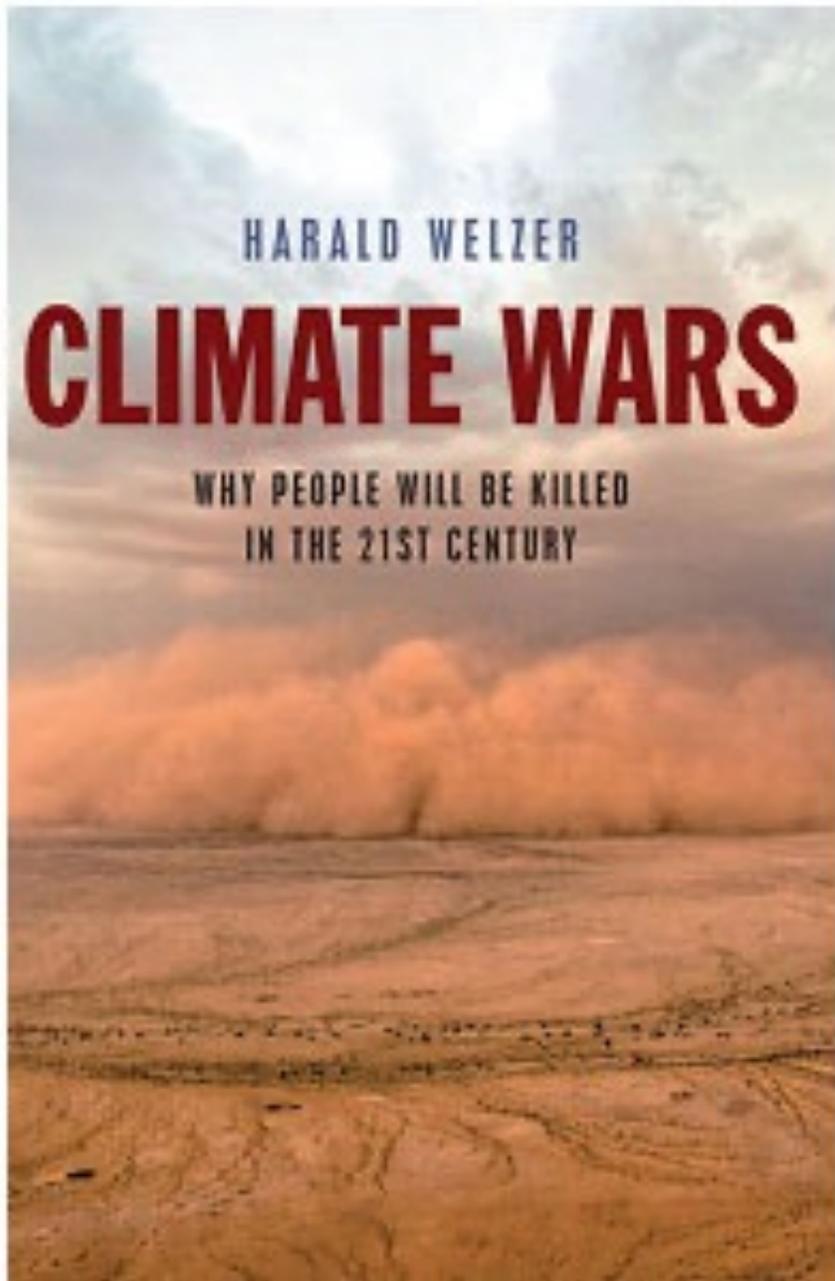
CLIMATE CHANGE and
the NEW GEOGRAPHY of VIOLENCE



HARALD WELZER

CLIMATE WARS

WHY PEOPLE WILL BE KILLED
IN THE 21ST CENTURY



Power in a Warming World

The New Global Politics of Climate Change
and the Remaking of Environmental Inequality



David Ciptet
J. Timmons Roberts
Mizan R. Khan

Major Climate Report Describes a Strong Risk of Crisis as Early as 2040

INCHEON, South Korea — A landmark report from the United Nations' scientific panel on climate change paints a far more dire picture of the immediate consequences of climate change than previously thought and says that avoiding the damage requires transforming the world economy at a speed and scale that has “no documented historic precedent.”

[The report](#), issued on Monday by the Intergovernmental Panel on Climate Change, a group of scientists convened by the United Nations to guide world leaders, describes a world of worsening food shortages and wildfires, and a mass die-off of coral reefs as soon as 2040 — a period well within the lifetime of much of the global population.

The report “is quite a shock, and quite concerning,” said Bill Hare, an author of previous I.P.C.C. reports and a physicist with Climate Analytics, a nonprofit organization. “We were not aware of this just a few years ago.” The report was the first to be commissioned by world leaders under the Paris agreement, [the 2015 pact by nations to fight global warming](#).

The image shows the cover of an IPCC special report. At the top right is the IPCC logo, which includes the text 'ipcc' in a stylized font and 'INTERGOVERNMENTAL PANEL ON climate change' below it. The main title 'Global Warming of 1.5°C' is prominently displayed in large white letters. Below the title is a subtitle: 'An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty'. The central part of the cover features a colorful, abstract graphic with a wavy, layered structure in shades of yellow, orange, red, pink, and blue. At the bottom, there are three circular icons labeled 'WG I', 'WG II', and 'WG III', and the logos for 'WMO' and 'UNEP'.

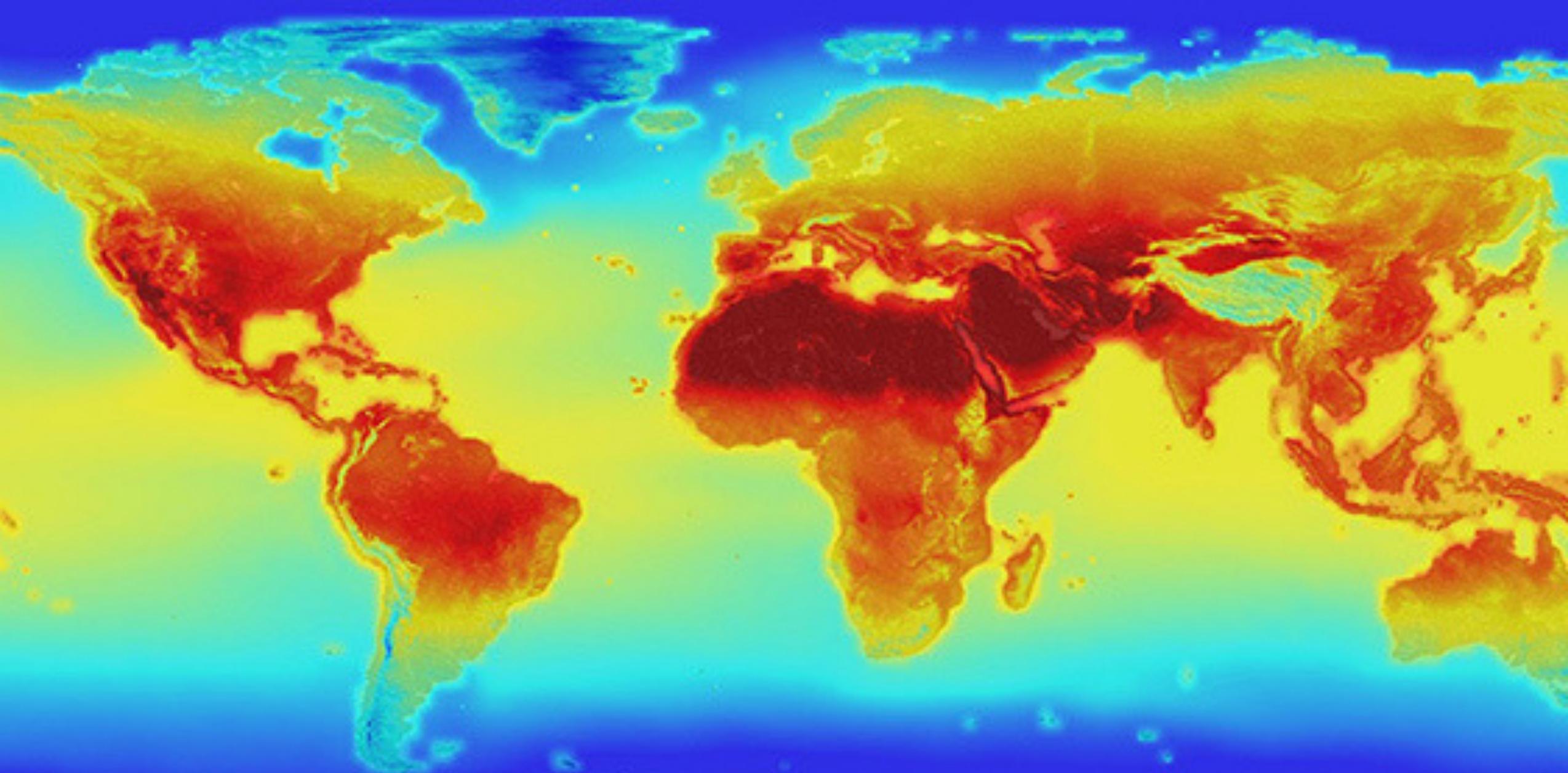
ipcc
INTERGOVERNMENTAL PANEL ON climate change

Global Warming of 1.5°C

An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty

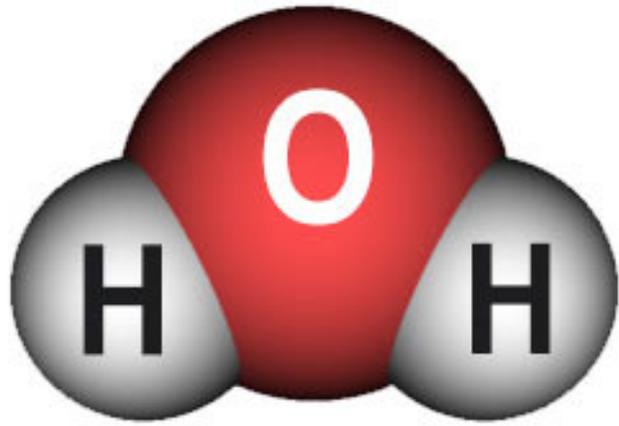
WG I WG II WG III

WMO UNEP



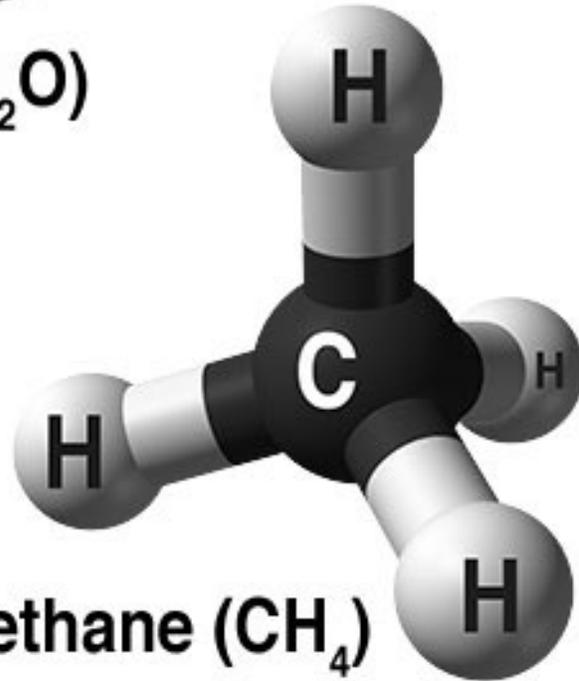
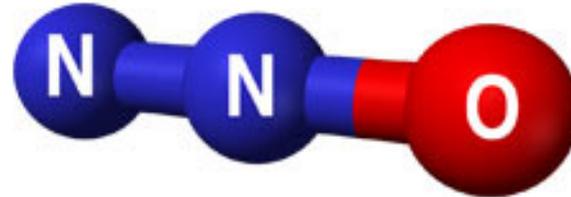
THE SCIENCE OF CLIMATE CHANGE



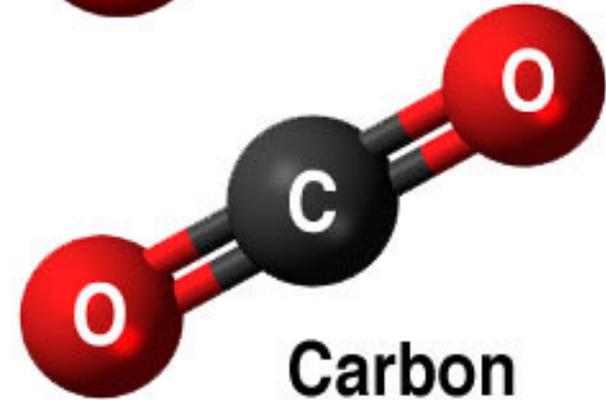


Water vapor (H_2O)

Nitrous oxide (N_2O)



Methane (CH_4)



Carbon dioxide (CO_2)

The Greenhouse Effect



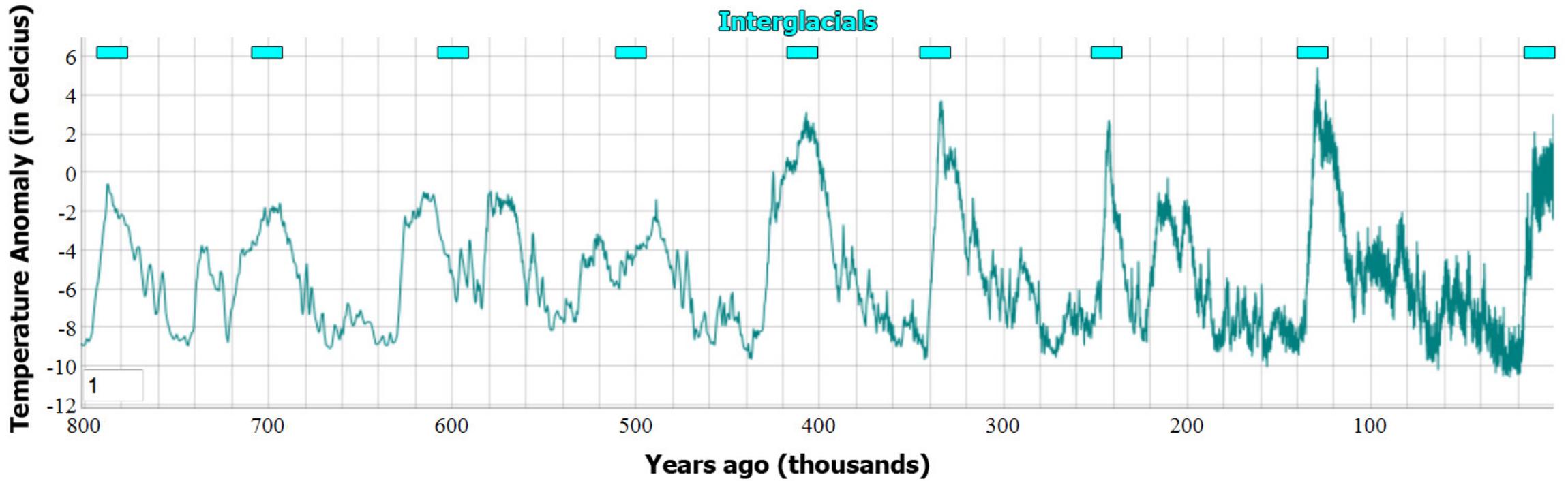
Some energy is reflected back out to space

Earth's surface is heated by the sun and radiates the heat back out towards space

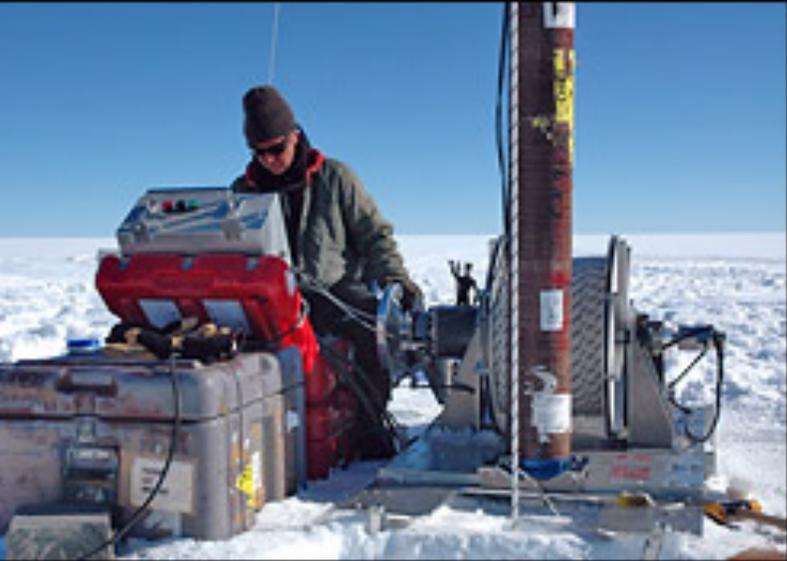
Greenhouse gases in the atmosphere trap some of the heat

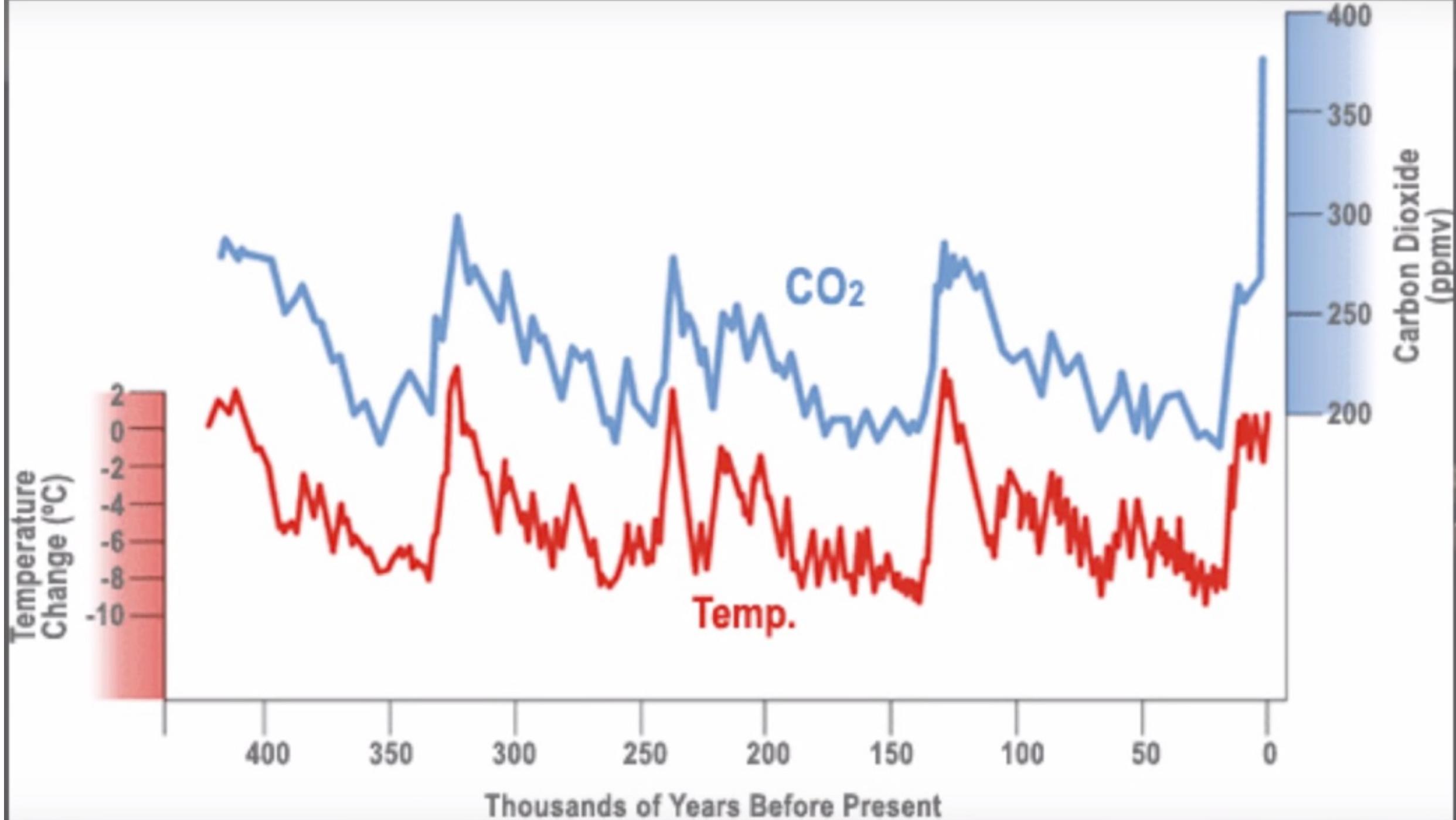
Solar energy from the sun passes through the atmosphere





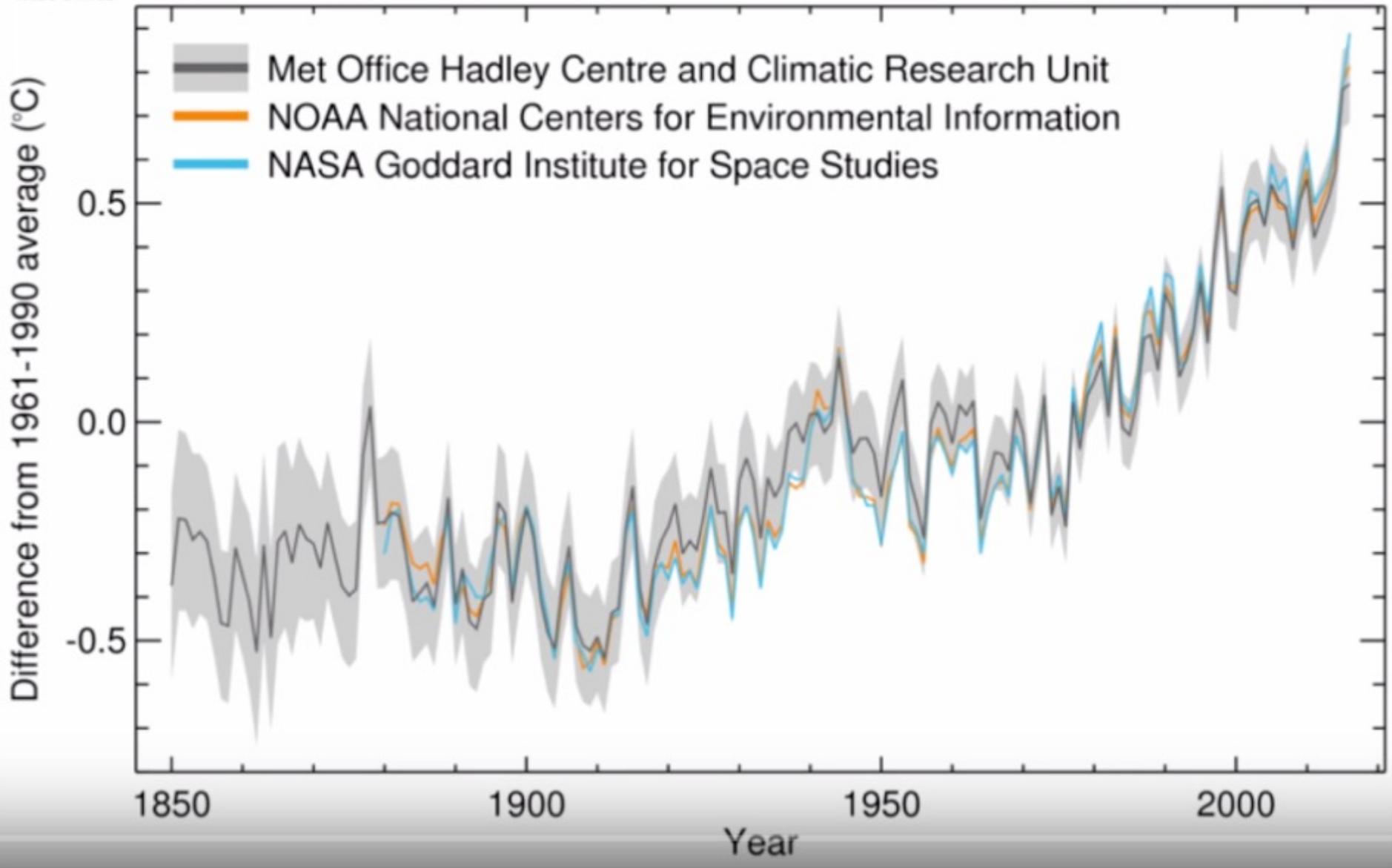
Oscillation of Global Temperature over 800,000 Years



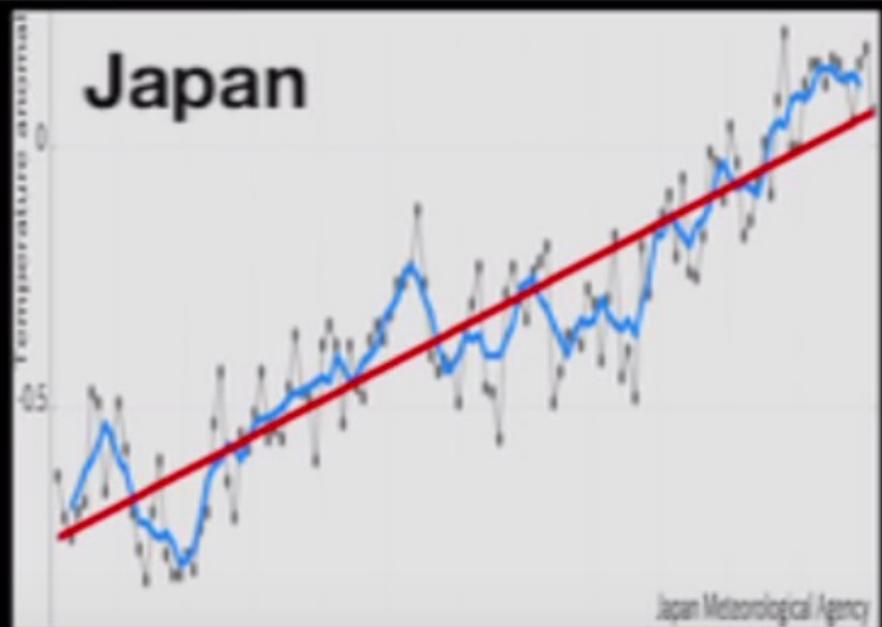
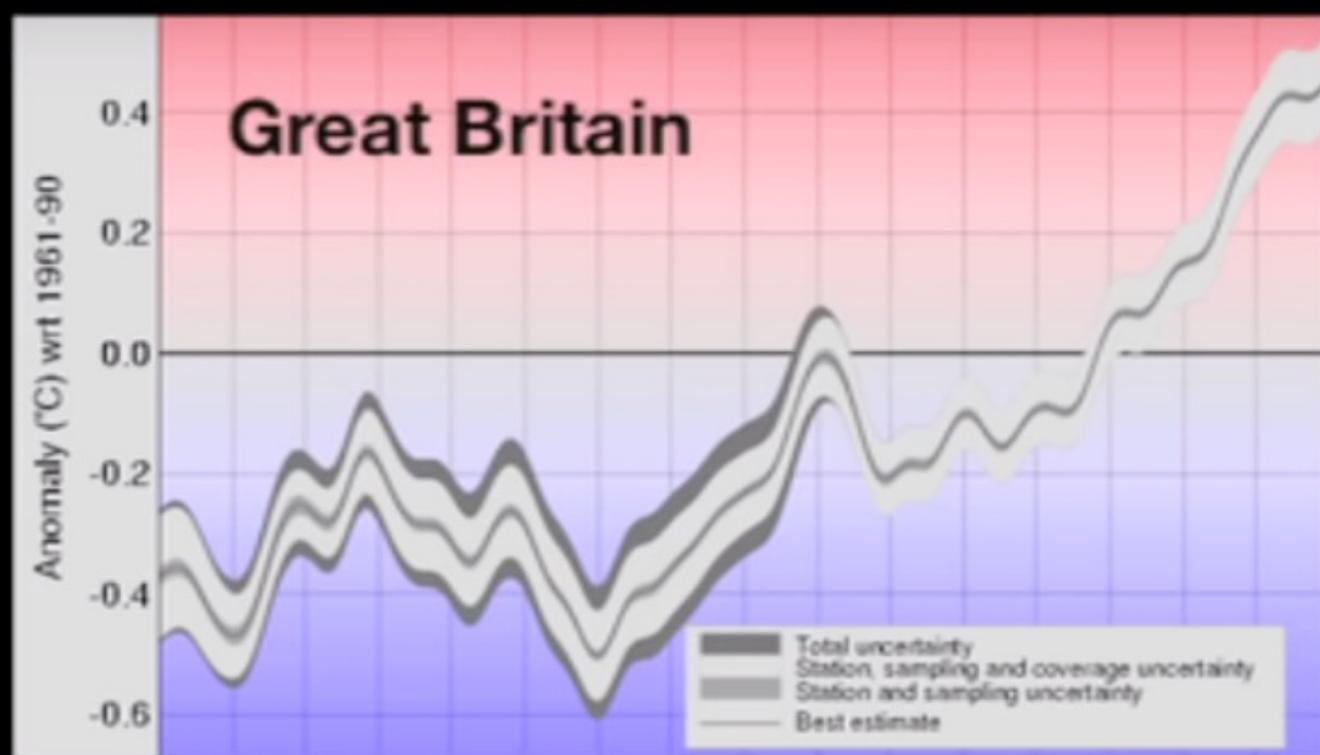
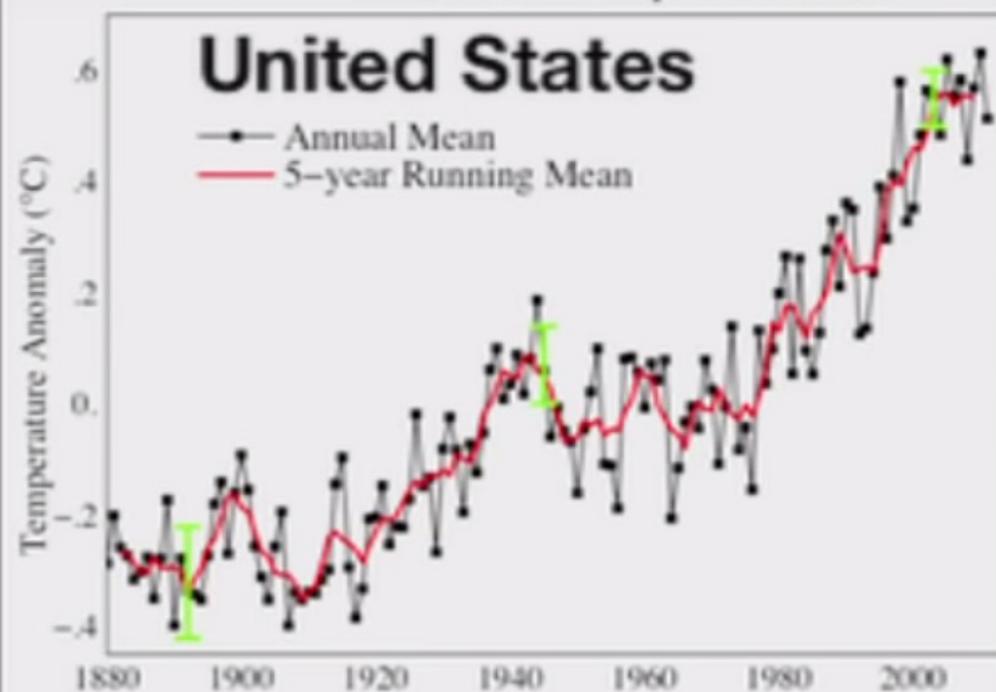




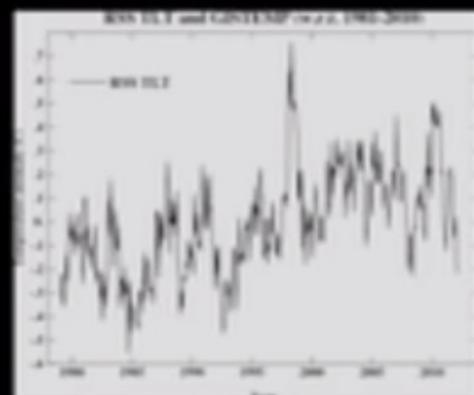
Global average temperature anomaly 1850 - 2016



Global Land-Ocean Temperature Index



Satellite Data Since 1979





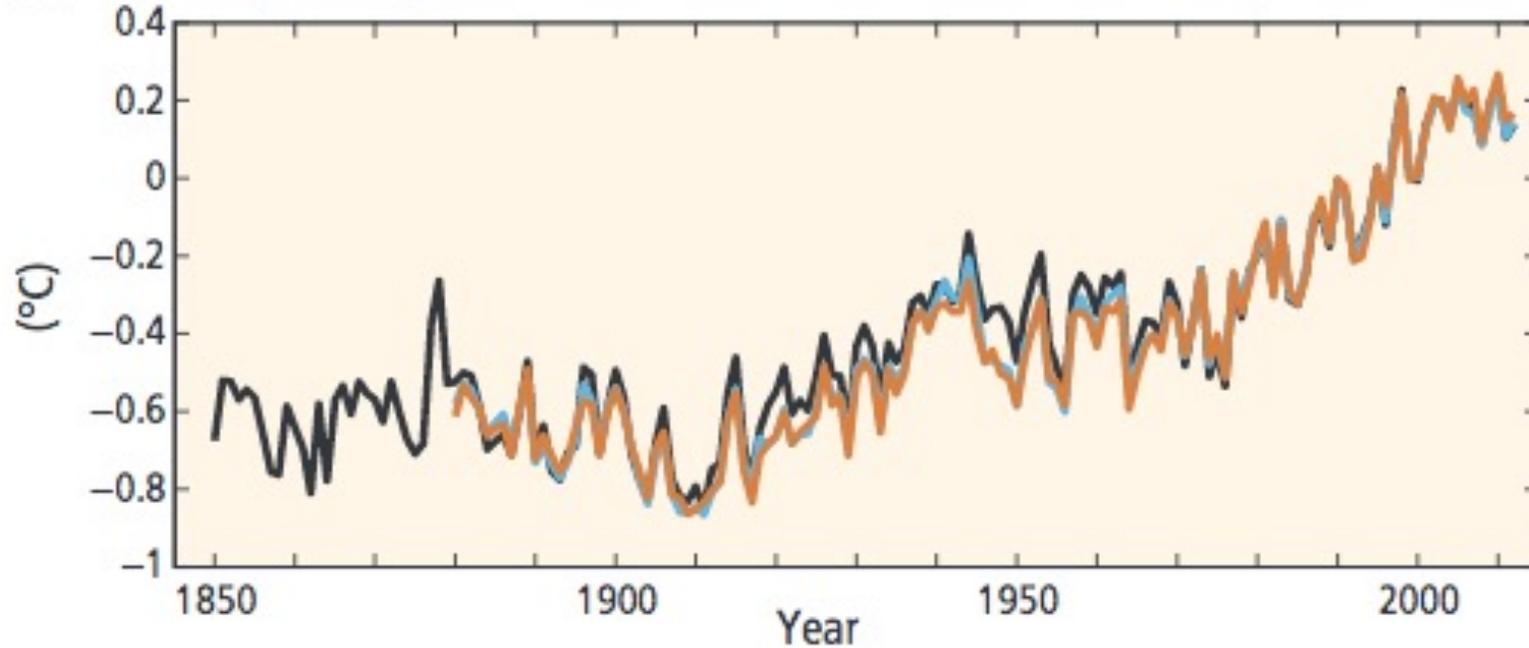
Global Climate Report - September 2018

With global records dating back to 1880, the September 2018 global temperature across the world's land and ocean surfaces was 0.78°C (1.40°F) above the 20th century average of 15.0°C (59.0°F)—tying with 2017 as the fourth highest September temperature in the 139-year record. The ten warmest September global land and ocean surface temperatures have occurred since 2003, with the last five years (2014–2018) comprising the five warmest Septembers on record. September 2015 is the record warmest September at $+0.93^{\circ}\text{C}$ ($+1.67^{\circ}\text{F}$). September 2018 also marks the 42nd consecutive September and the 405th consecutive month with temperatures, at least nominally, above the 20th century average.

NOAA National Centers for Environmental Information, State of the Climate: Global Climate Report for September 2018, published online October 2018, retrieved on November 15, 2018 from <https://www.ncdc.noaa.gov/sotc/global/201809>.



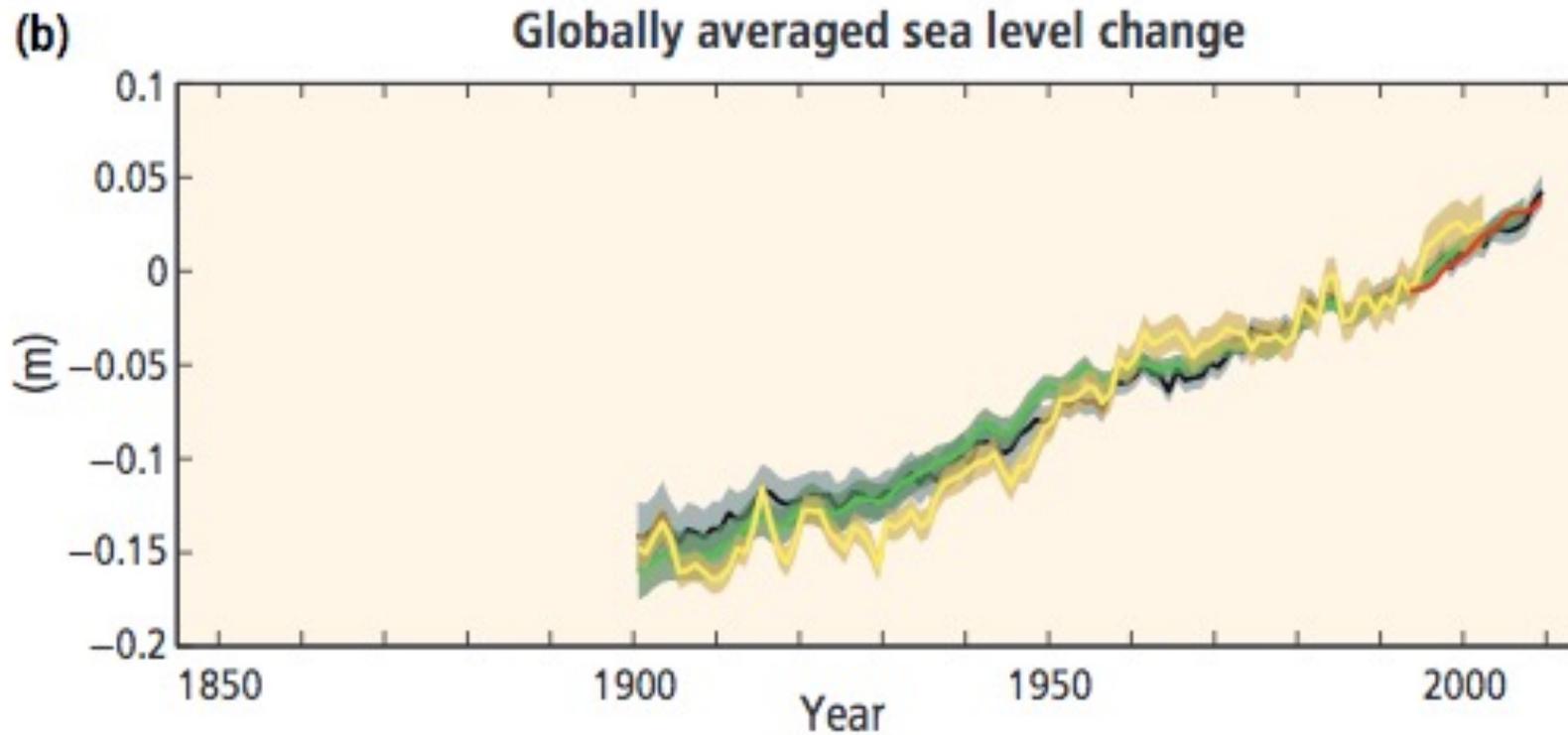
(a) Globally averaged combined land and ocean surface temperature anomaly



Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen. {1.1}

The 2014 Synthesis Report
The Intergovernmental Panel on Climate Change

IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp



Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen. {1.1}

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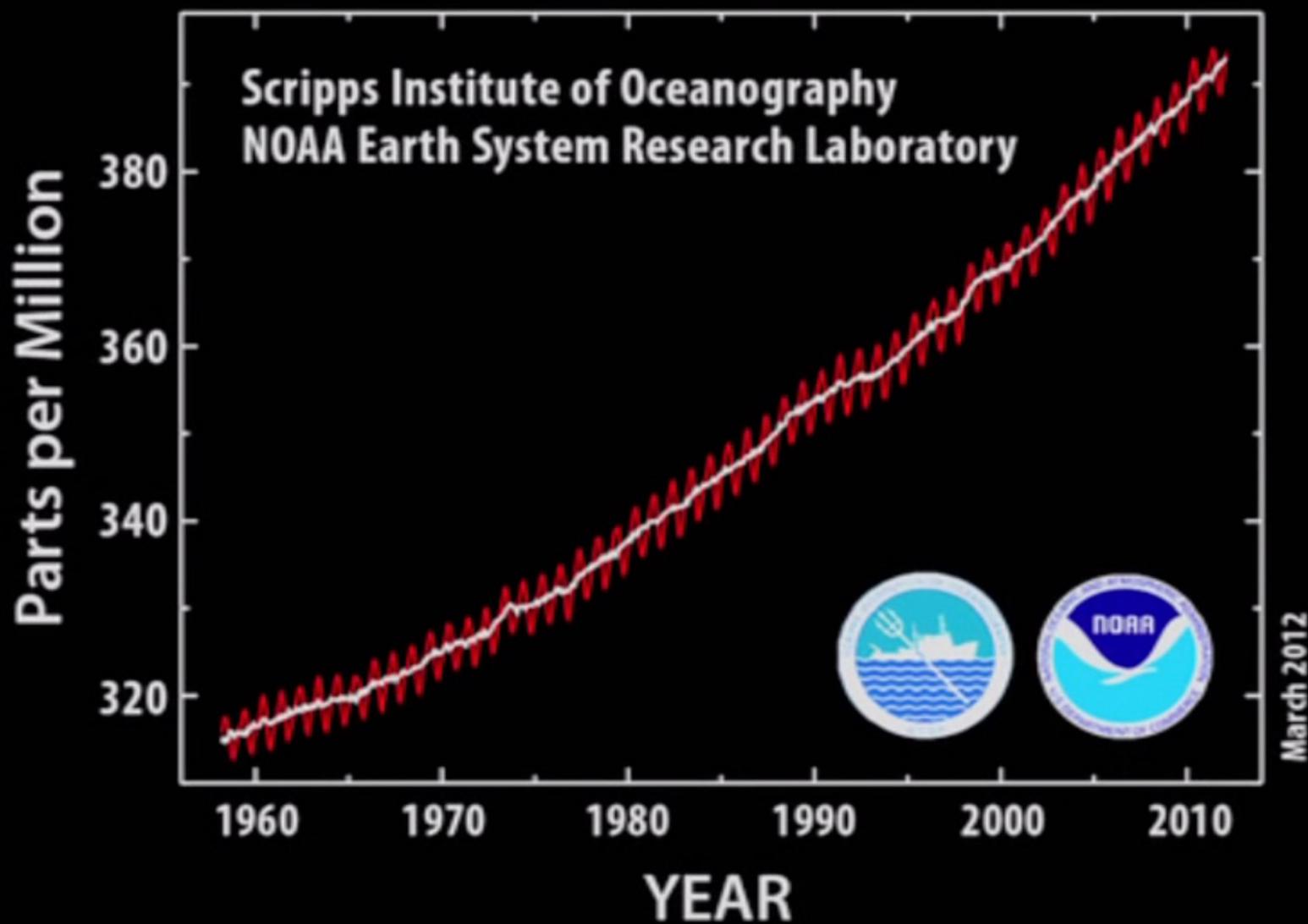
1896

Svante
Arrhenius

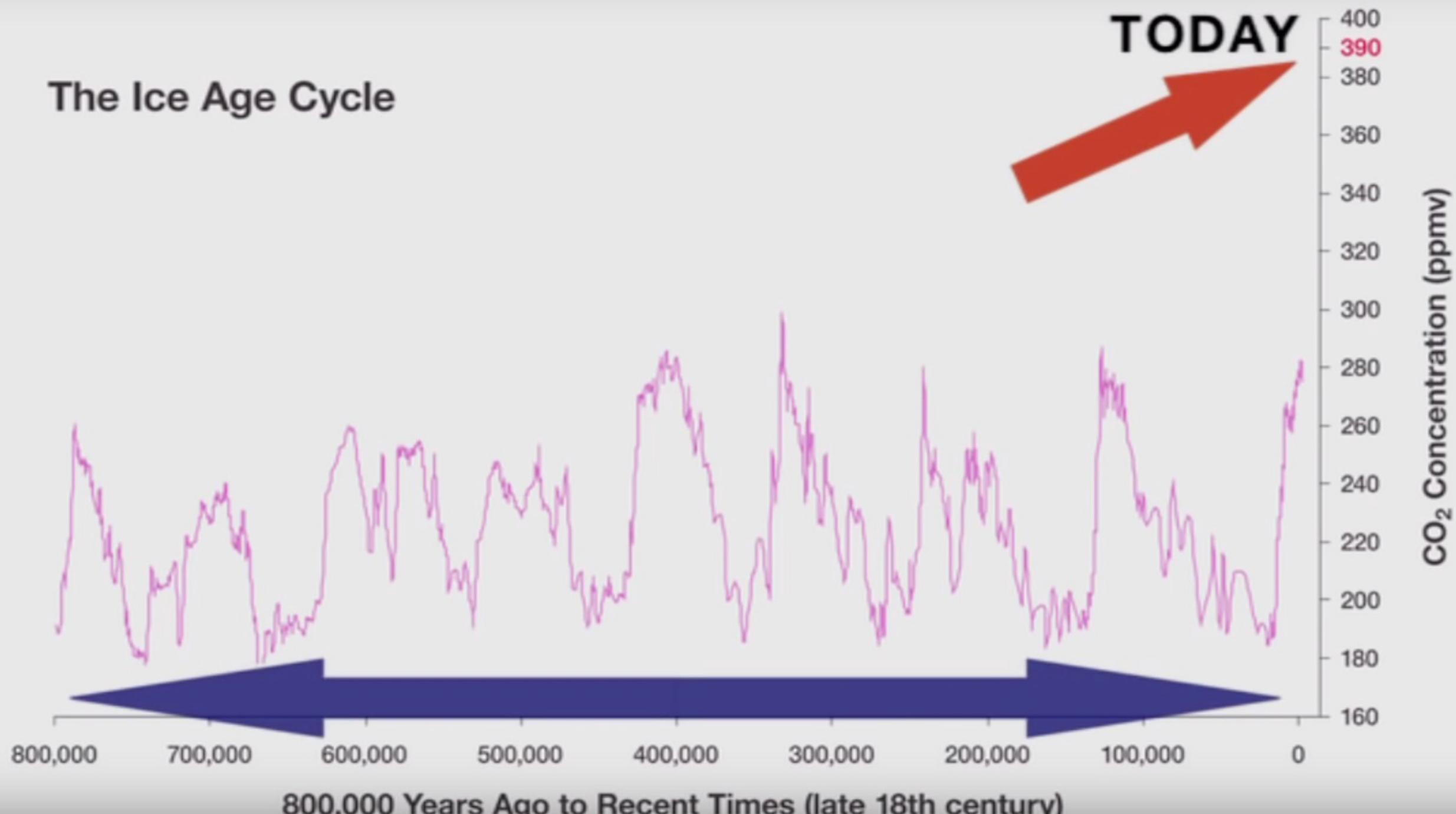




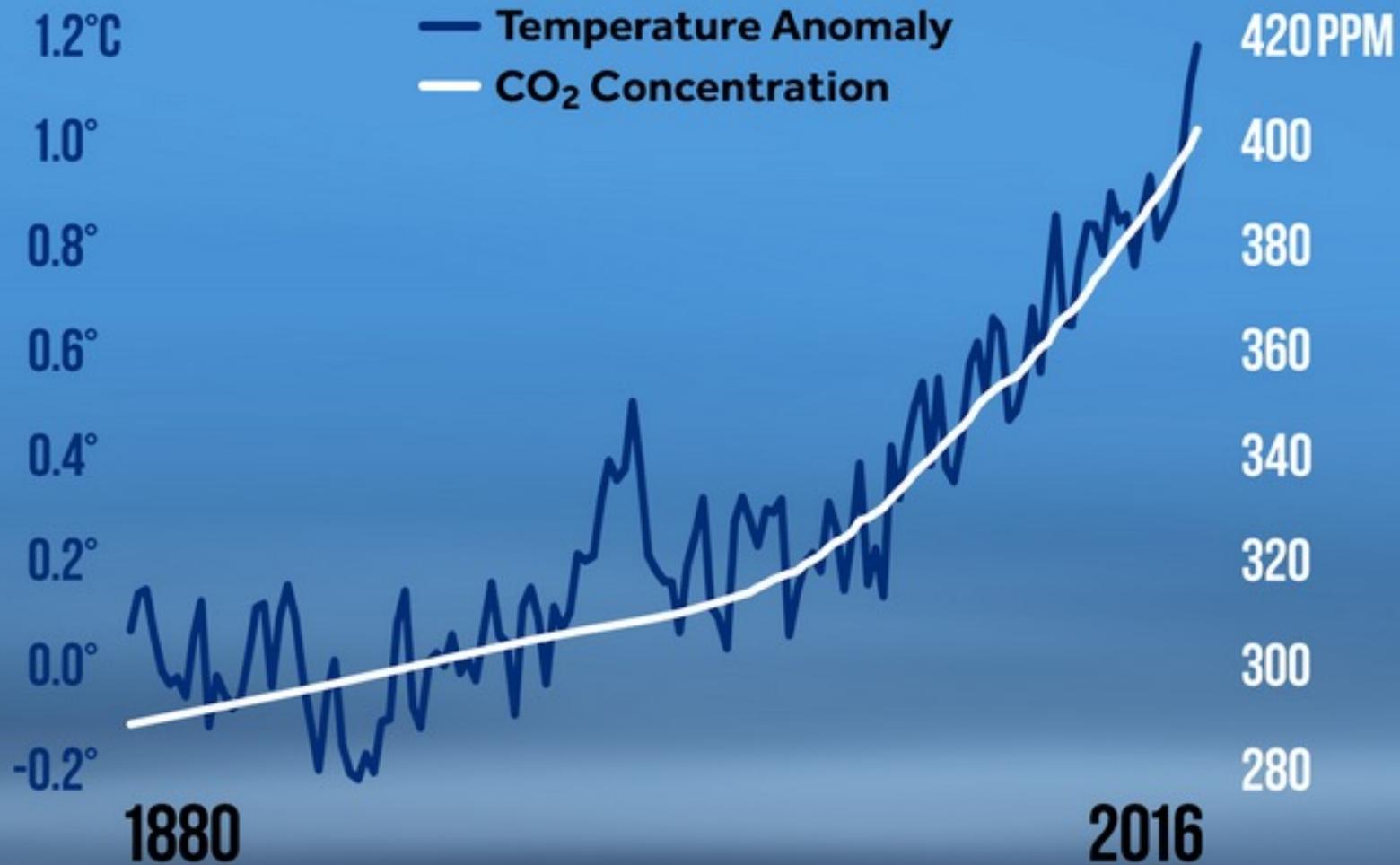
Atmospheric CO₂ at Mauna Loa Observatory



The Ice Age Cycle

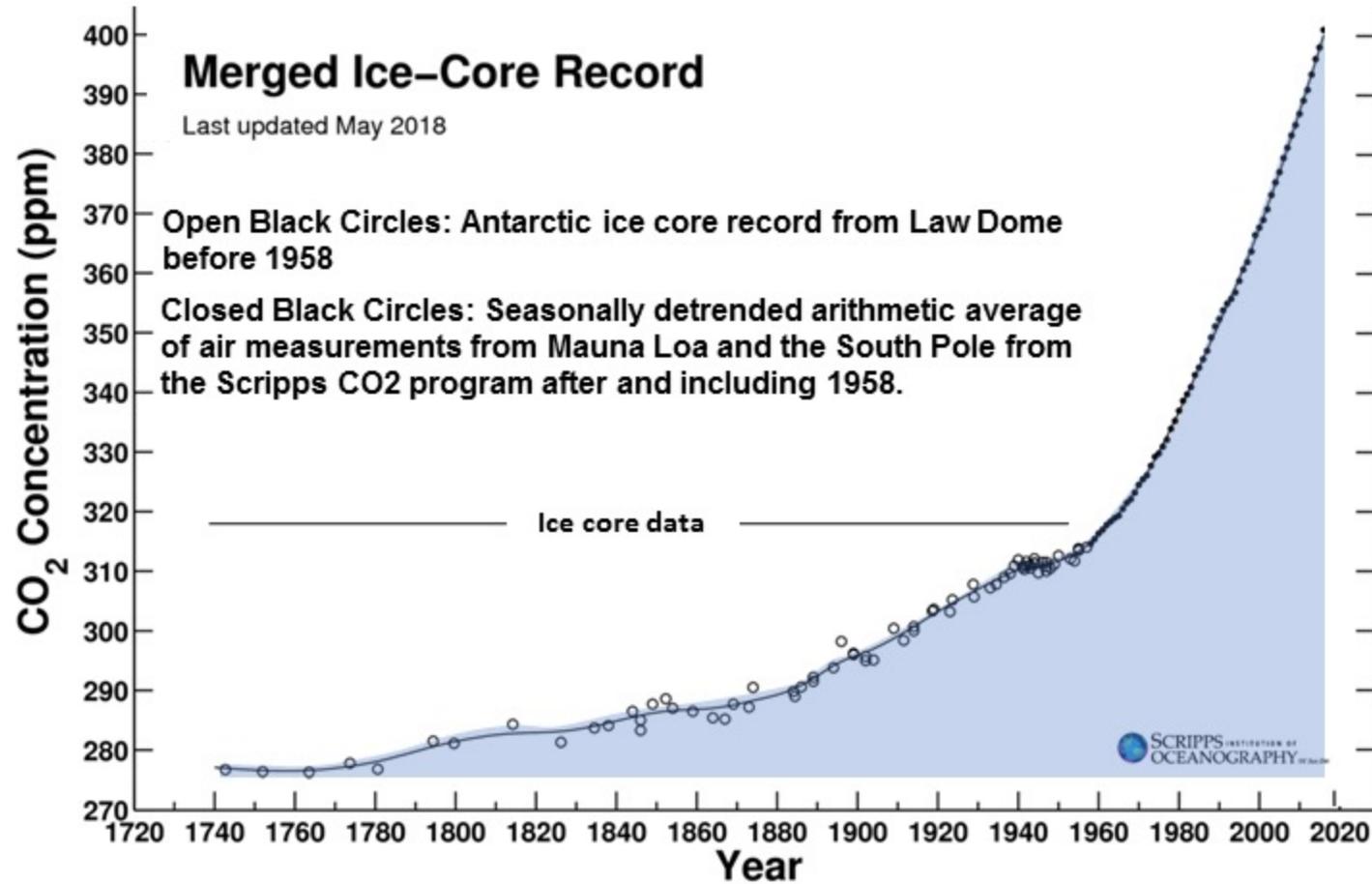


Global Temperature and Carbon Dioxide

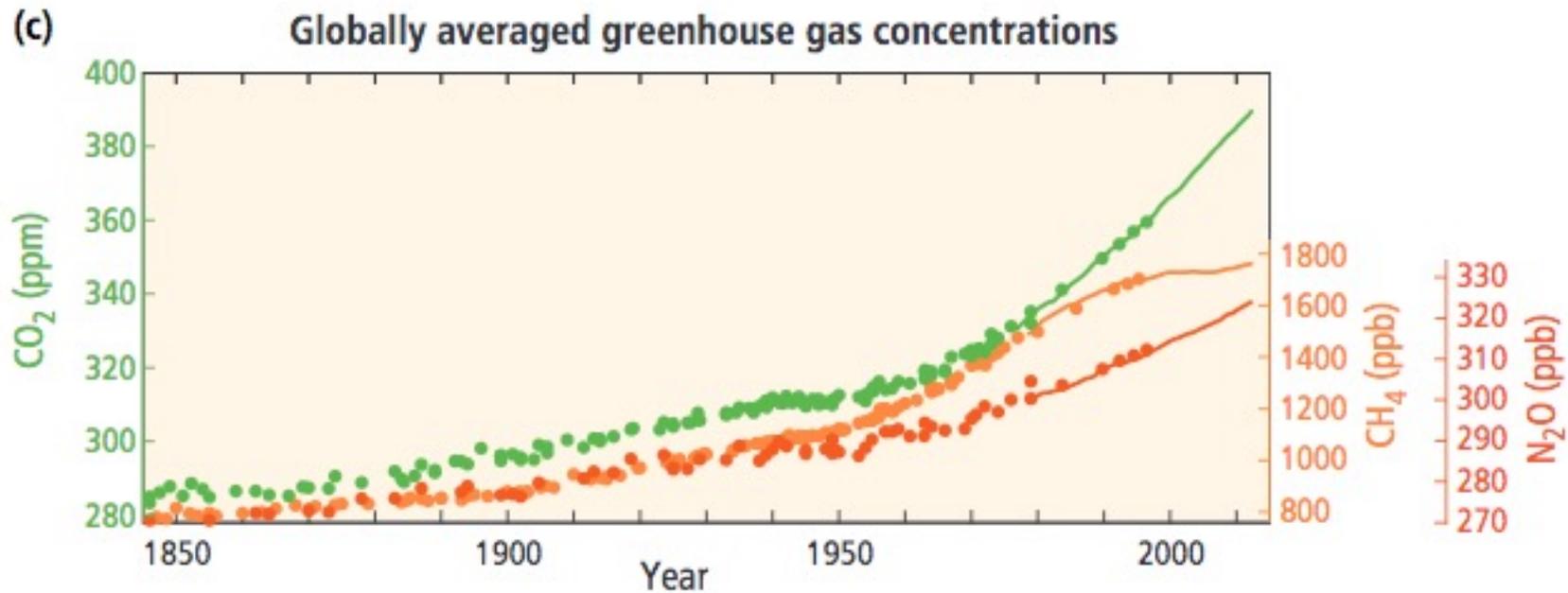


Global temperature data averaged and adjusted to early industrial baseline (1881-1910).
Source: NASA GISS, NOAA NCEI, ESRL

Atmospheric CO₂: merged ice core data and direct CO₂ measurements (Mauna Loa) from 1740 to April 2018



Merged ice-core record of the time trend of the concentration of CO₂, in ppm, in air extracted from an Antarctic ice core combined with the trend based on direct atmospheric measurements.



Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are *extremely likely* to have been the dominant cause of the observed warming since the mid-20th century. {1.2, 1.3.1}

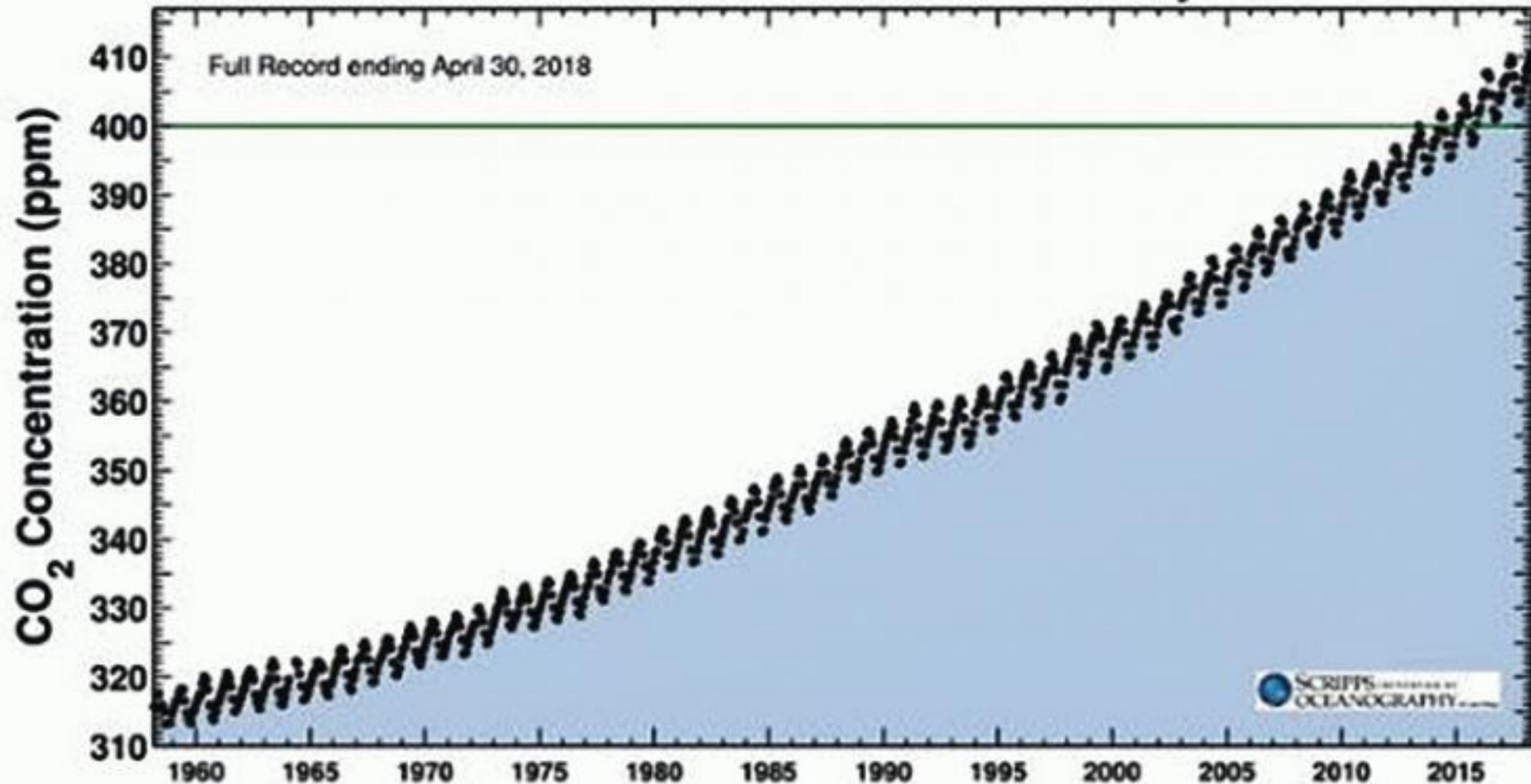
The 2014 Synthesis Report

The Intergovernmental Panel on Climate Change

Latest CO₂ reading
April 29, 2018

411.24 ppm

Carbon dioxide concentration at Mauna Loa Observatory



LIVE

3:42 pm ET

U.S. SENATE

SEN. JAMES INHOFE
R-Oklahoma

C-SPAN2
c-span.org

H

JET

ARCTIC AIR

-25°

-15°

-20°

**HEAVY
SNOW**

15°

0°

**BITING
WINDS**

0°

**POLAR
VORTEX**

15°

20°

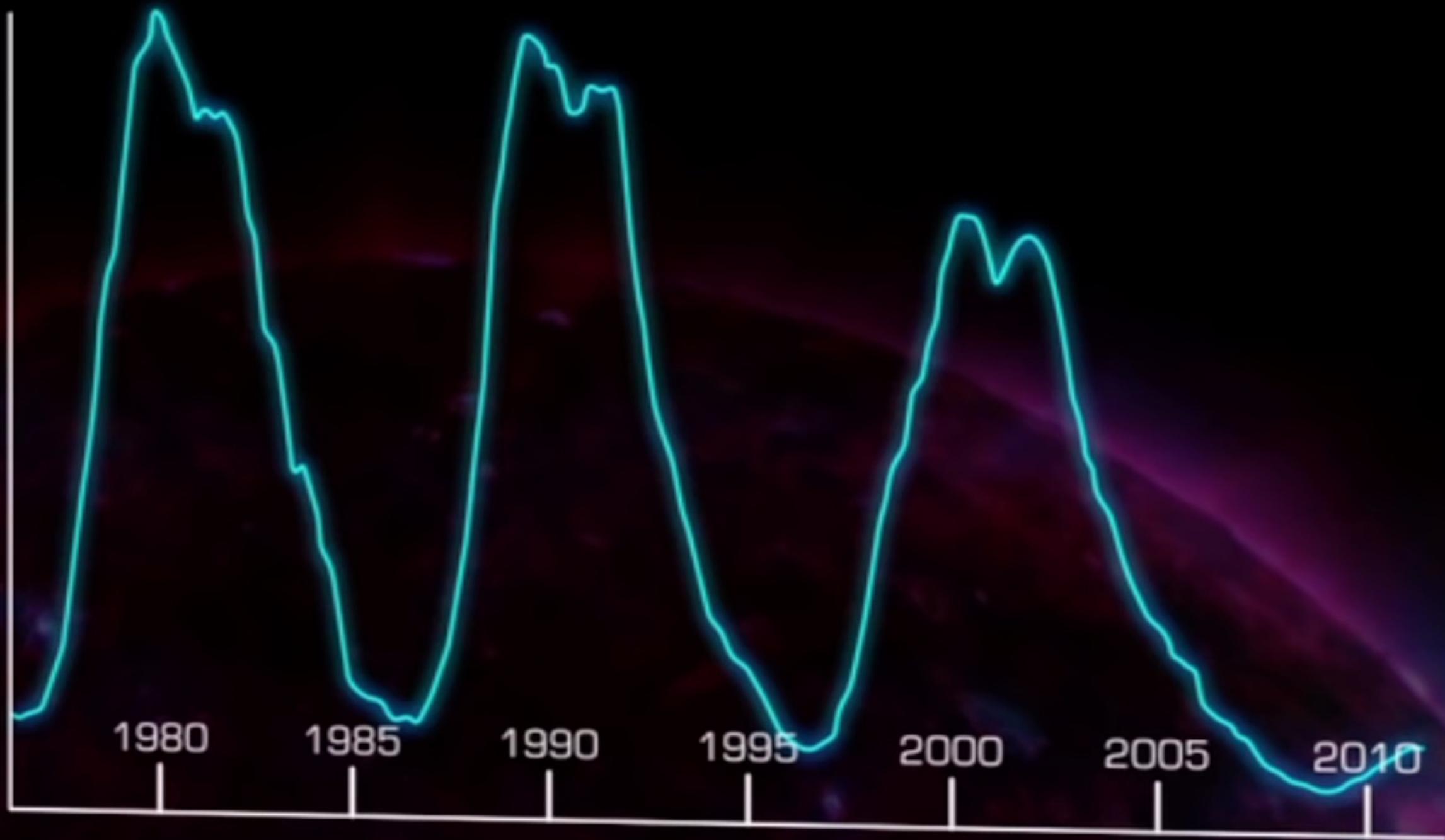
20°

JET

SHOWERS
& FURFS

DRY & WA

Solar Activity





Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems. {1}

The 2014 Synthesis Report
The Intergovernmental Panel on Climate Change

CLIMATE SCIENCE VS FOSSIL FUEL FICTION



NATIONAL ACADEMY
OF SCIENCES

ipcc
INTERGOVERNMENTAL PANEL ON
climate change



U.S. Global Change Research Program
**National Climate
Assessment**

Leading Scientific Authorities on Climate Change
DOCUMENTING THE REALITY
OF GLOBAL WARMING



Shell



ExxonMobil

Peabody
ENERGY

ConocoPhillips

ALEC American
Legislative
Exchange
Council

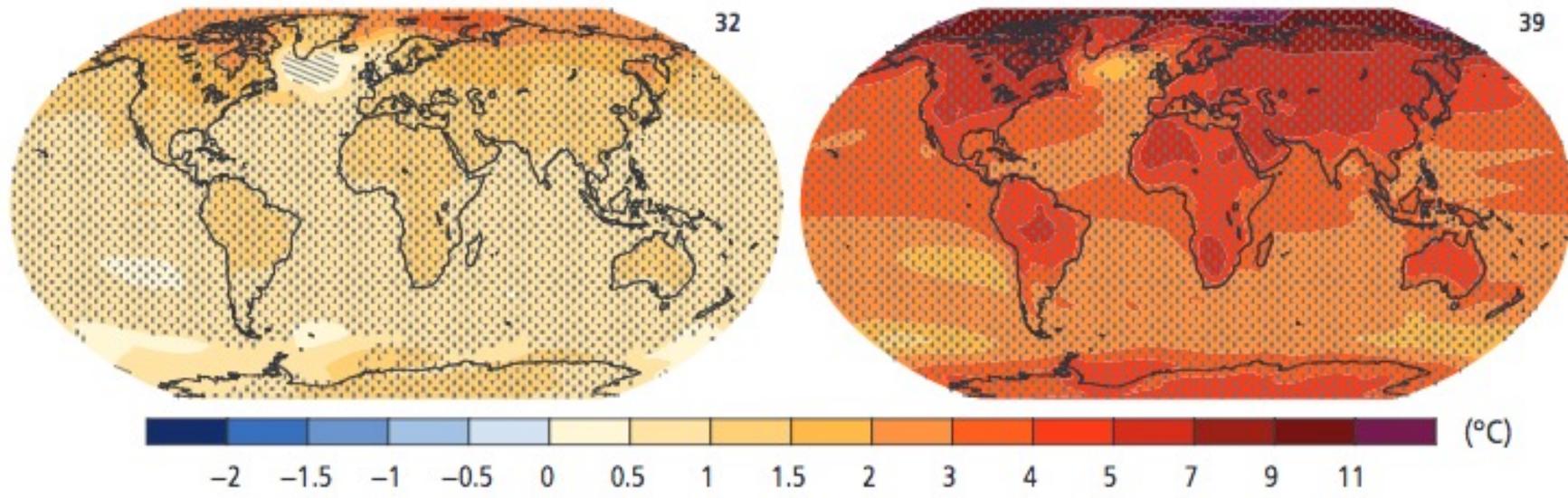
energy **API**
AMERICAN PETROLEUM INSTITUTE

Fossil Fuel Companies and Their Lobbying Groups
DECEIVING THE PUBLIC
FOR NEARLY 30 YEARS—AND COUNTING



(a)

Change in average surface temperature (1986–2005 to 2081–2100)



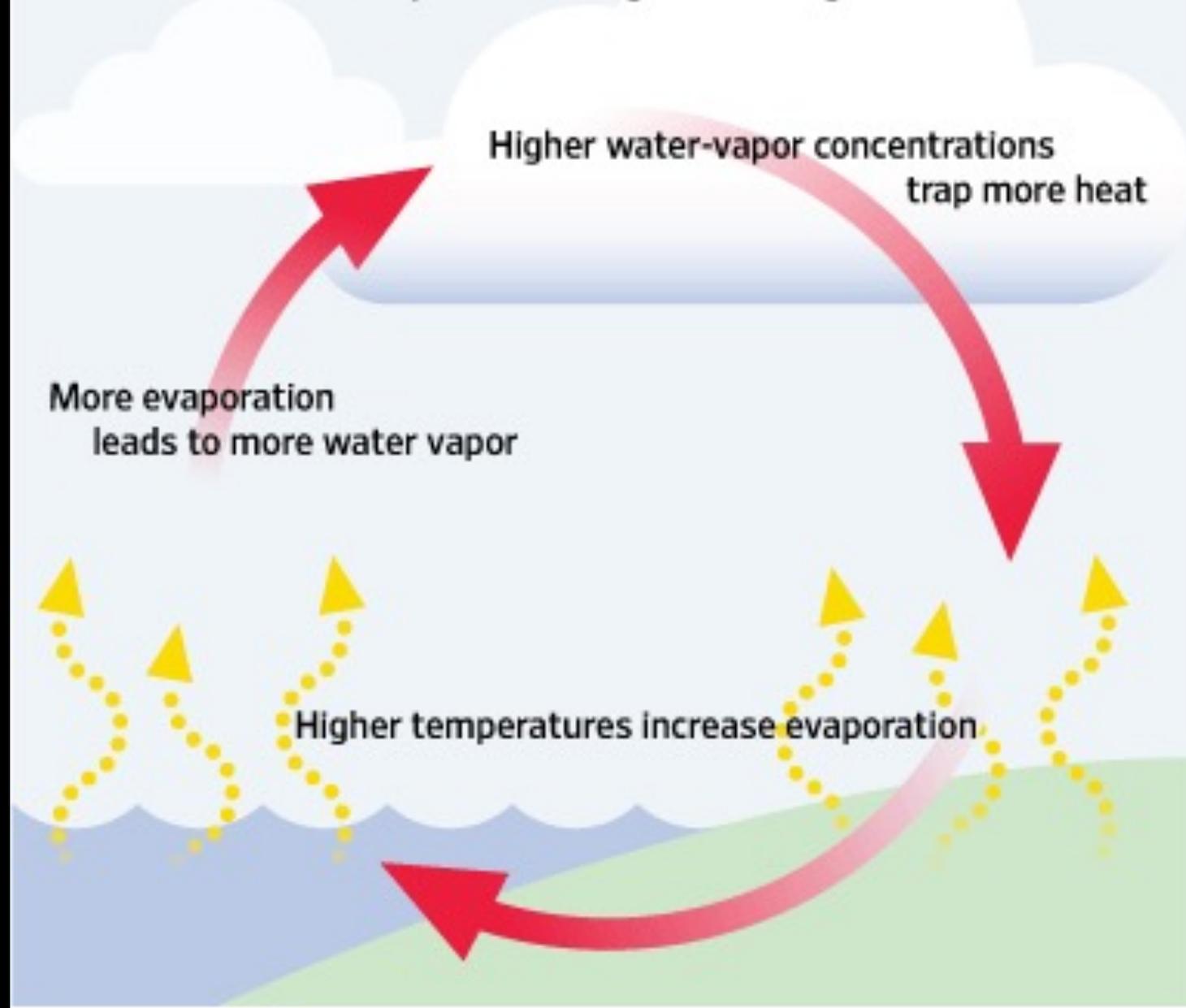
Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks. {2}

The 2014 Synthesis Report

The Intergovernmental Panel on Climate Change

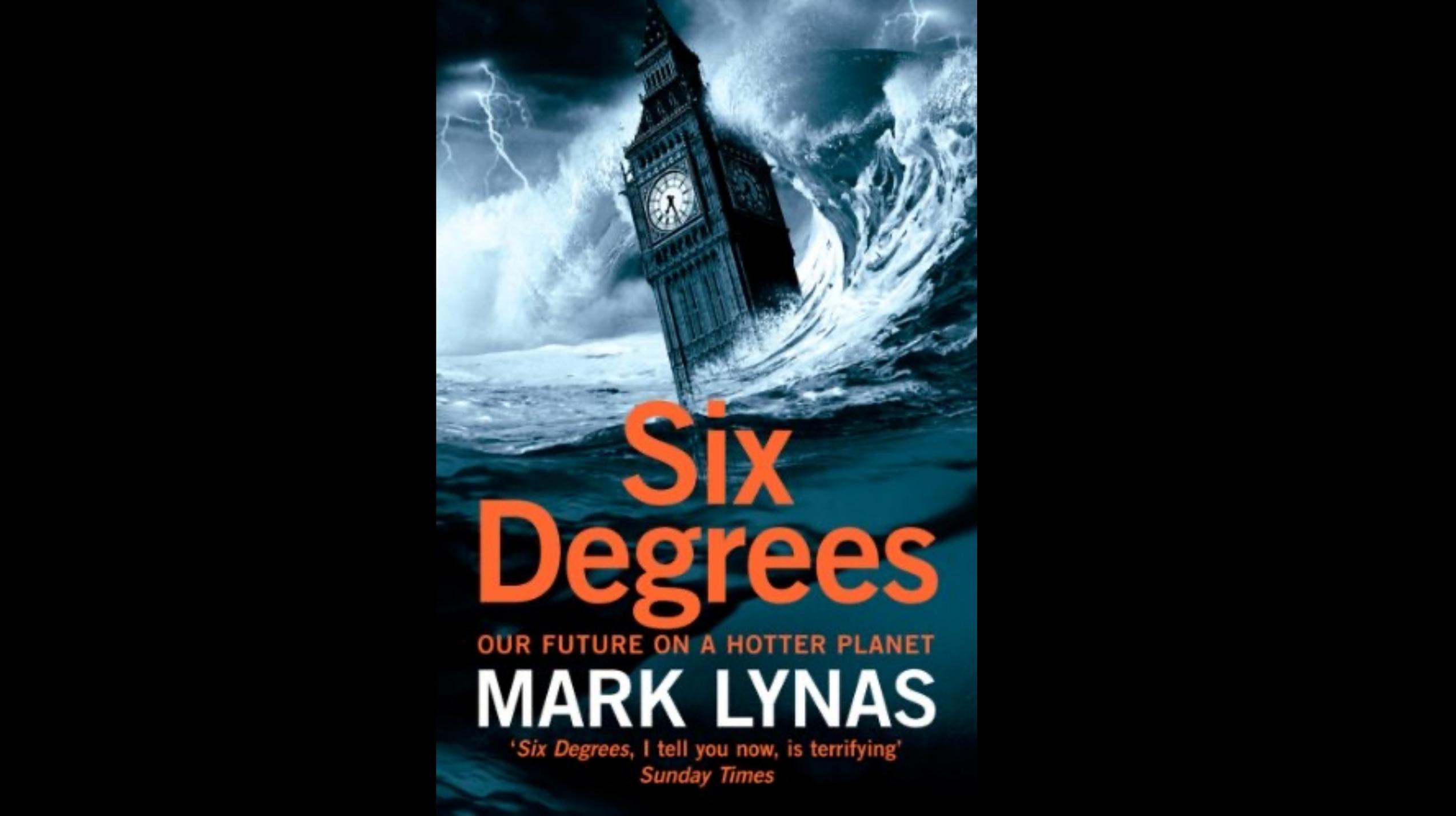
The Cycle of Water Vapor

A look at how water vapor acts as a greenhouse gas





1.5 DEGREES



Six Degrees

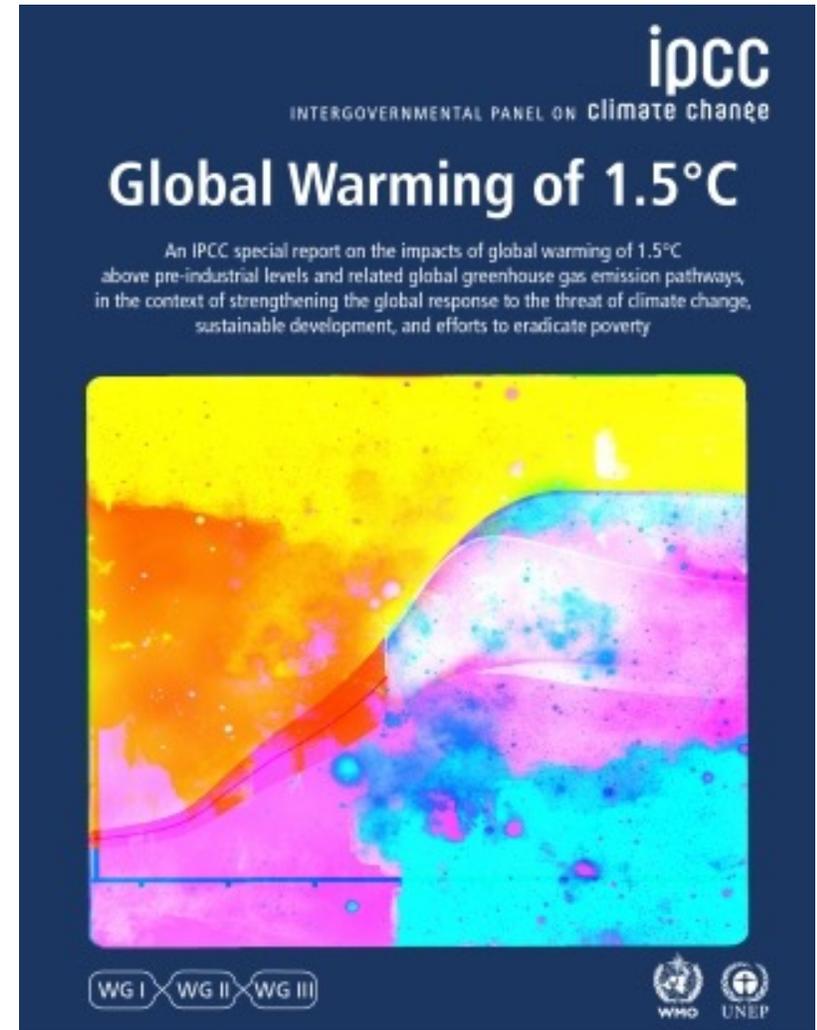
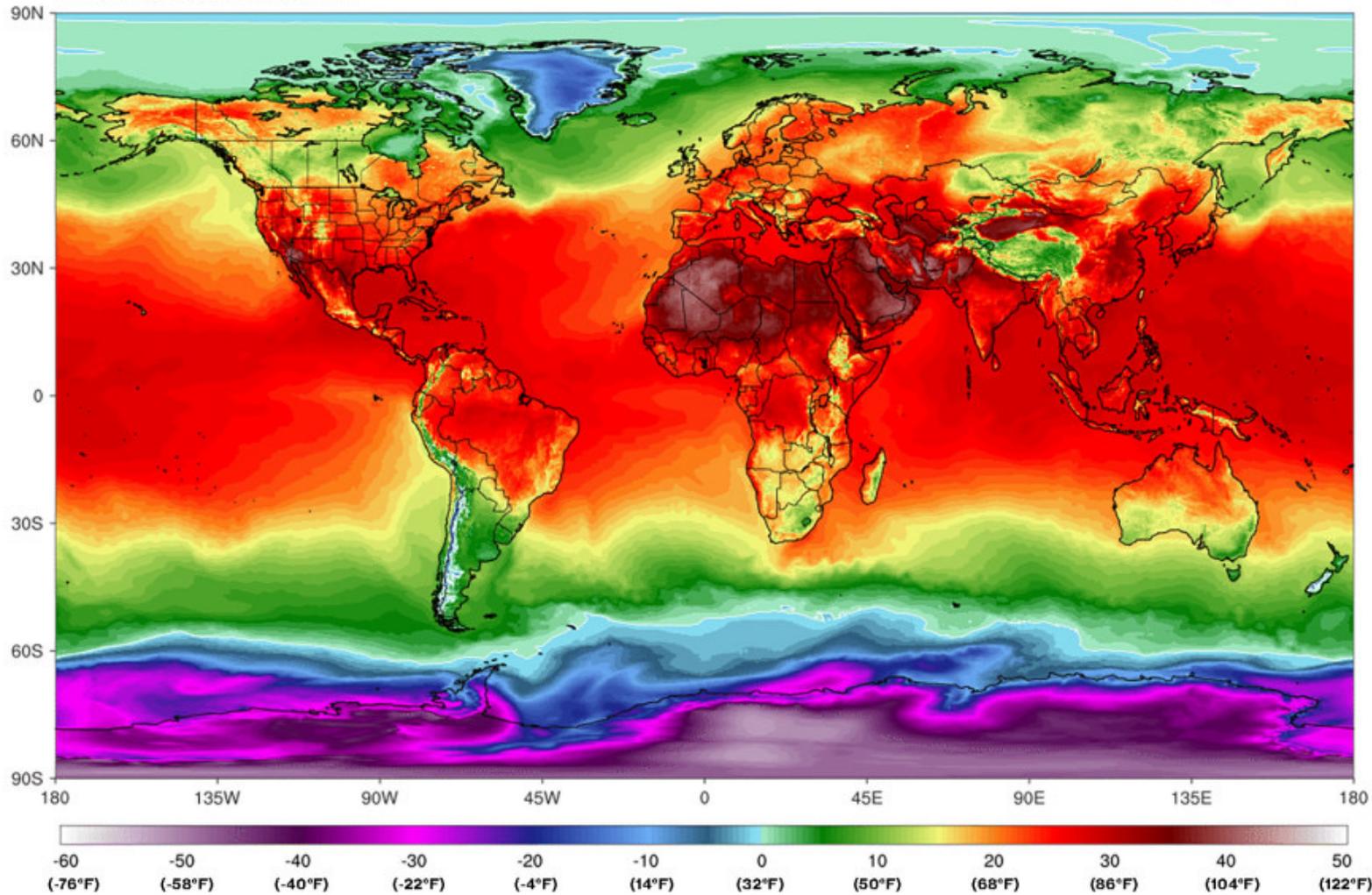
OUR FUTURE ON A HOTTER PLANET

MARK LYNAS

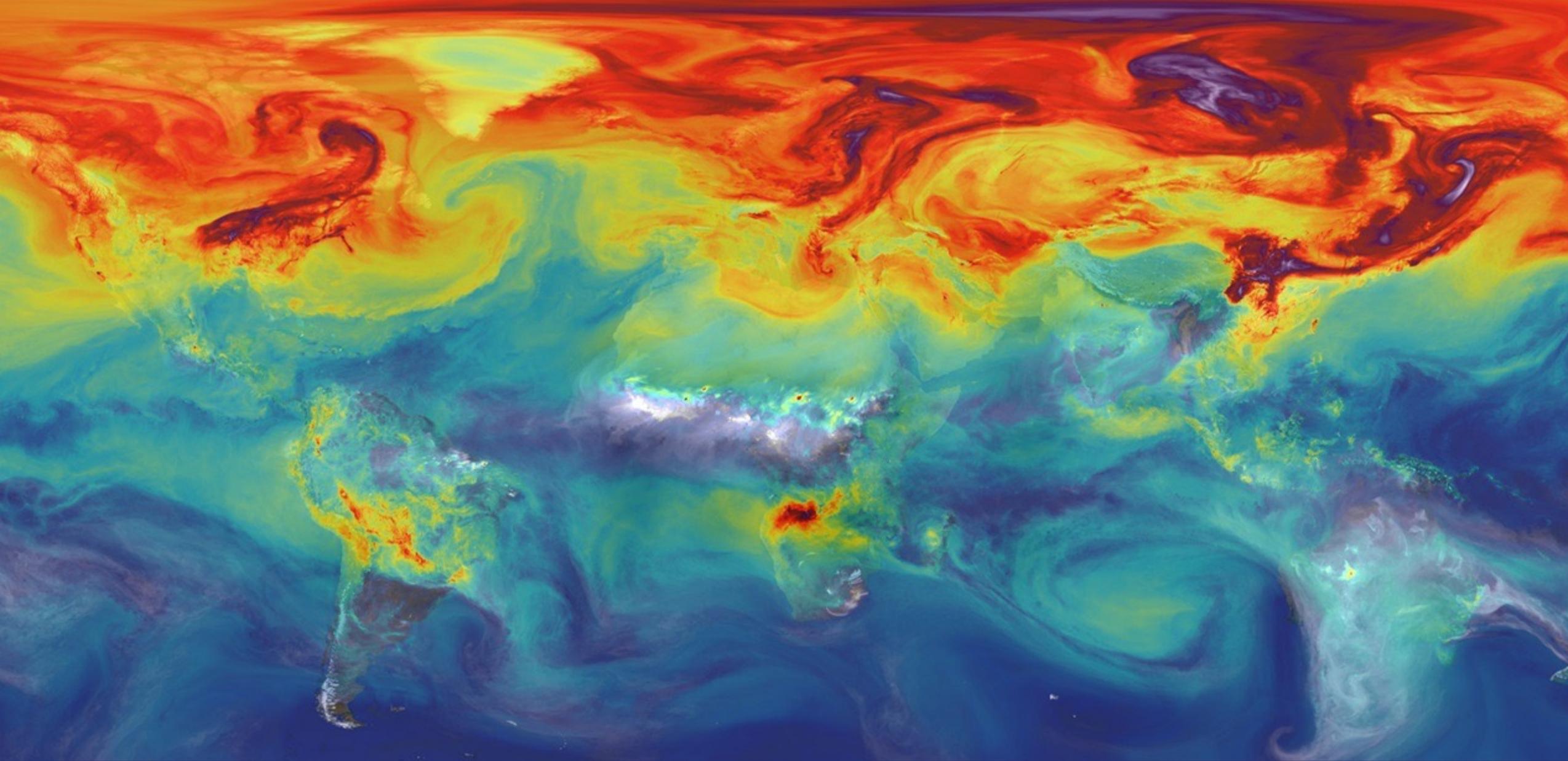
'Six Degrees, I tell you now, is terrifying'
Sunday Times







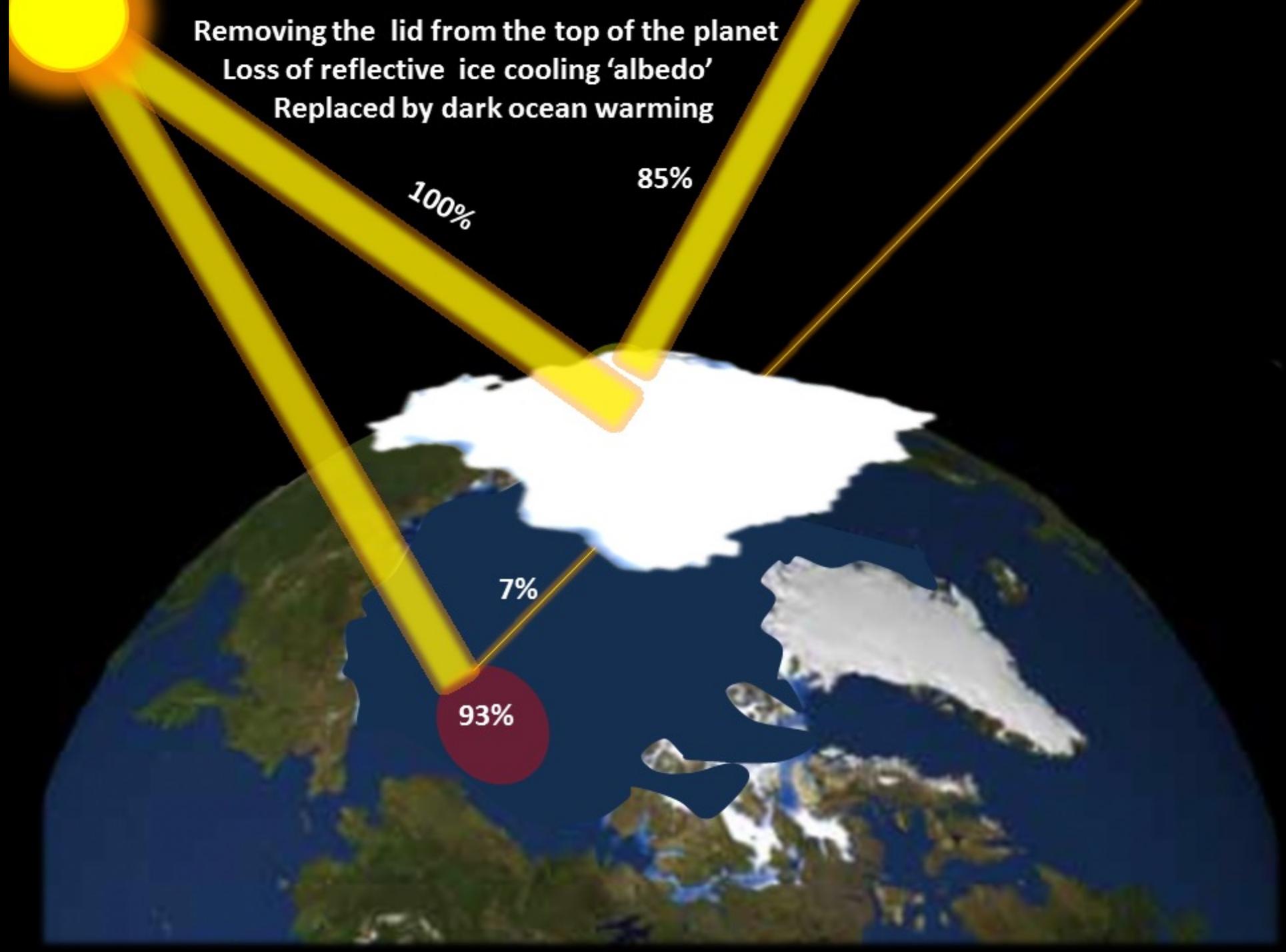
“Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.”



Global Temperature Anomalies

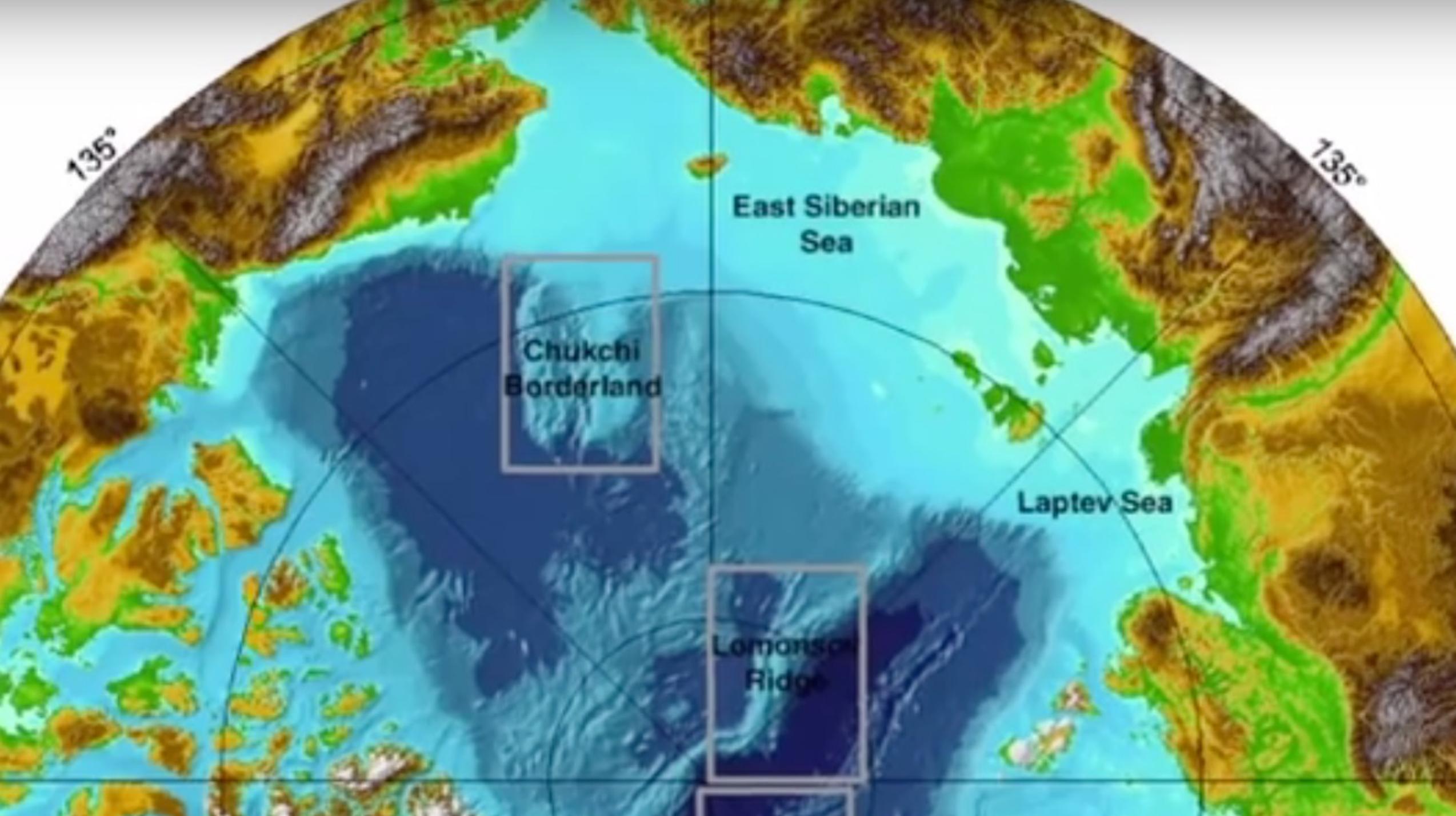


Removing the lid from the top of the planet
Loss of reflective ice cooling 'albedo'
Replaced by dark ocean warming









East Siberian
Sea

Chukchi
Borderland

Laptev Sea

Lomonosov
Ridge

Climate Collapse & Human Extinction 2030







Philosophy of



Climate Change



The Historical Roots of Our Ecologic Crisis

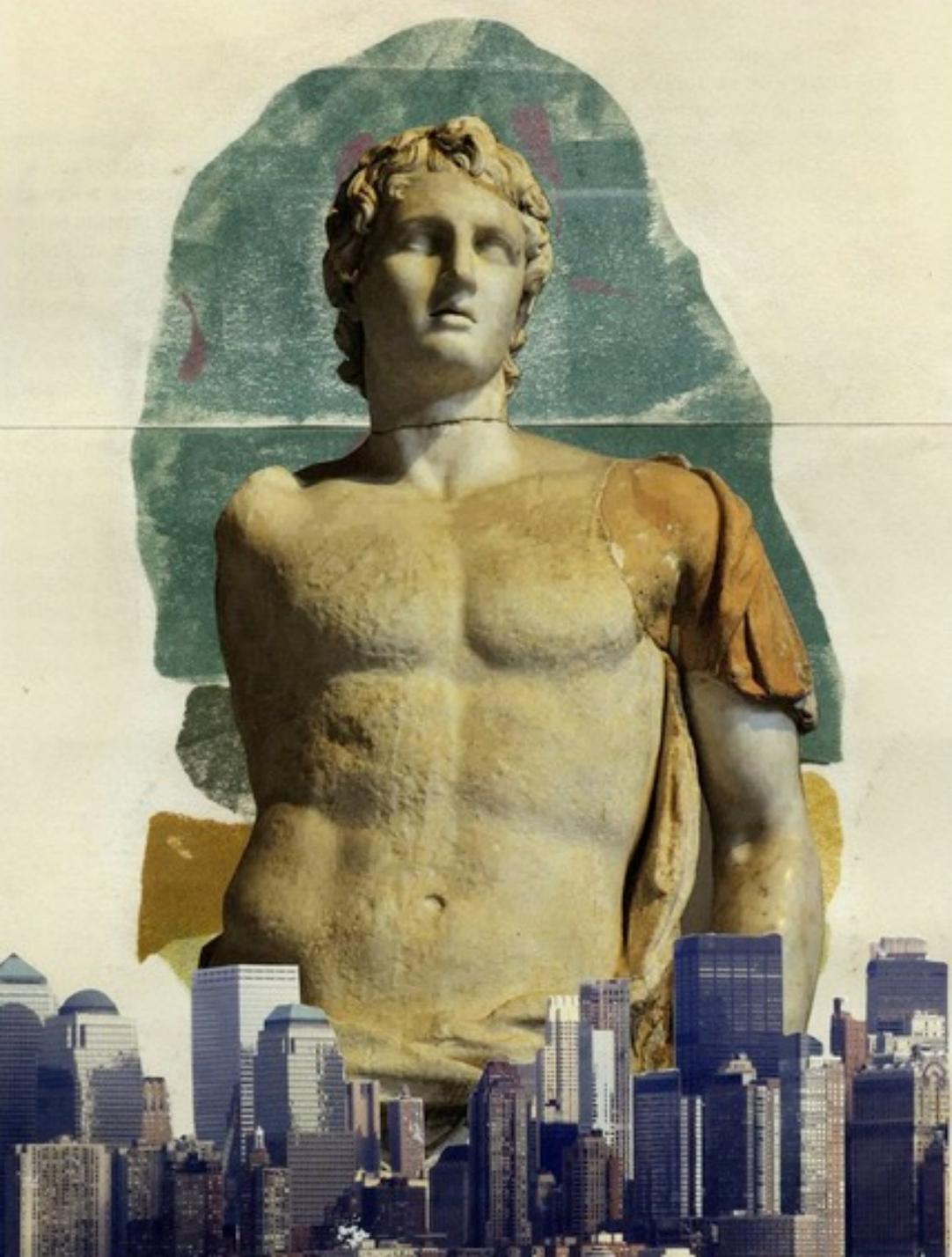
Lynn White, Jr.

A conversation with Aldous Huxley not infrequently put one at the receiving end of an unforgettable monologue. About a year before his lamented death he was discoursing on a favorite topic: Man's unnatural treatment of nature and its sad results. To illustrate his point he told how, during the previous summer, he had returned to a little valley in England where he had spent many happy months as a child. Once it had been composed of delightful grassy glades; now it was becoming overgrown with unsightly brush because the rabbits that formerly kept such growth under control had largely succumbed to a disease, myxomatosis, that was deliberately introduced by the local farmers to reduce the rabbits' destruction of crops. Being something of a Philistine, I could be silent no longer, even in the interests of great rhetoric. I interrupted to point out that the rabbit itself had been brought as a domestic animal to England in 1176, presumably to improve the protein diet of the peasantry.

helped to exterminate the monster mammals of the Pleistocene from much of the globe is plausible, if not proved. For 6 millennia at least, the banks of the lower Nile have been a human artifact rather than the swampy African jungle which nature, apart from man, would have made it. The Aswan Dam, flooding 5000 square miles, is only the latest stage in a long process. In many regions terracing or irrigation, overgrazing, the cutting of forests by Romans to build ships to fight Carthaginians or by Crusaders to solve the logistics problems of their expeditions, have profoundly changed some ecologies. Observation that the French landscape falls into two basic types, the open fields of the north and the *bocage* of the south and west, inspired Marc Bloch to undertake his classic study of medieval agricultural methods. Quite unintentionally, changes in human ways often affect nonhuman nature. It has been noted, for example, that the advent of the automobile eliminated

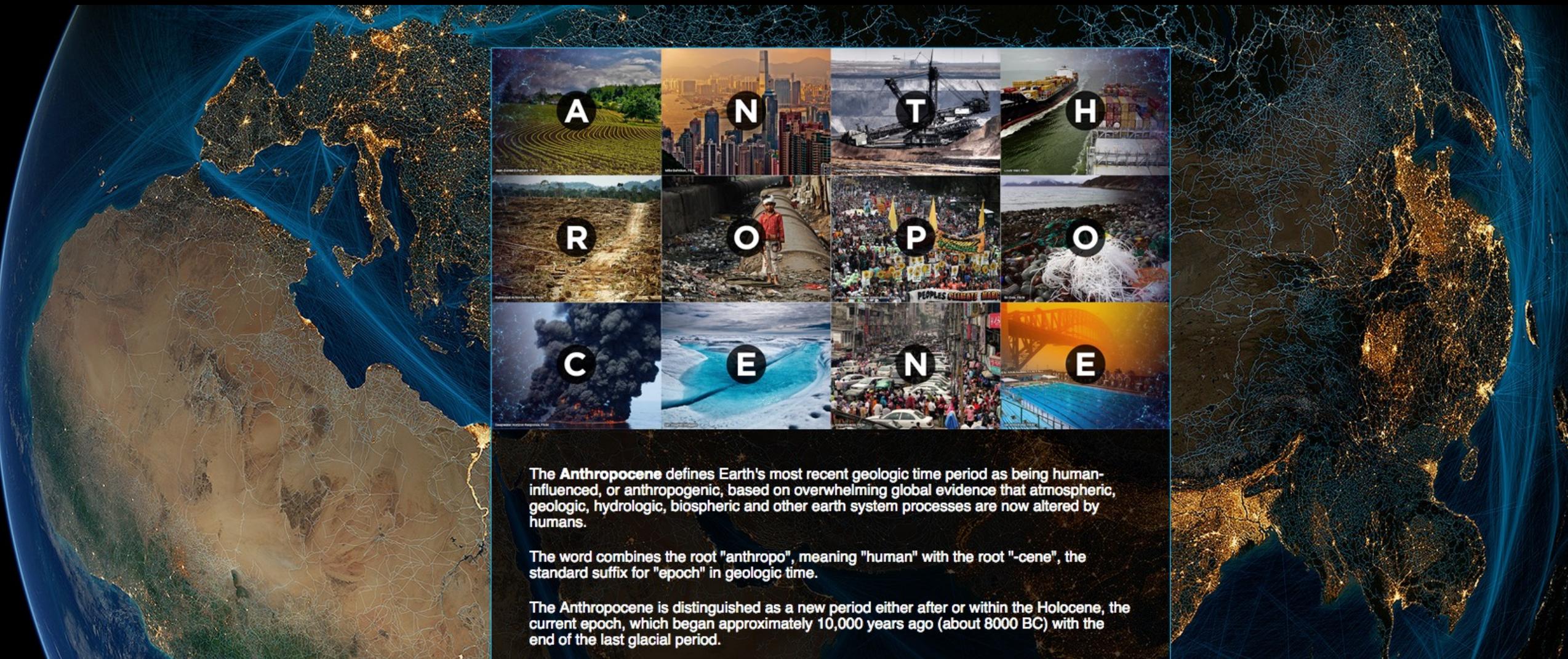
nating in our own time in the reclamation of the Zuider Zee. What, if any, species of animals, birds, fish, shore life, or plants have died out in the process? In their epic combat with Neptune have the Netherlanders overlooked ecological values in such a way that the quality of human life in the Netherlands has suffered? I cannot discover that the questions have ever been asked, much less answered.

People, then, have often been a dynamic element in their own environment, but in the present state of historical scholarship we usually do not know exactly when, where, or with what effects man-induced changes came. As we enter the last third of the 20th century, however, concern for the problem of ecologic backlash is mounting feverishly. Natural science, conceived as the effort to understand the nature of things, had flourished in several eras and among several peoples. Similarly there had been an age-old accumulation of technological skills, sometimes growing rapidly, sometimes slowly. But it was not until about four generations ago that Western Europe and North America arranged a marriage between science and technology, a union of the theoretical and the empirical approaches to our natural environment. The emergence in widespread practice of the Baconian creed that scientific knowledge means technological power over nature can scarcely be dated before about 1850, save in the chemical industries, where it is anticipated in the 18th century. Its acceptance as a normal pattern of action may mark the greatest event in human his-



ANTHROPOCENTRISM

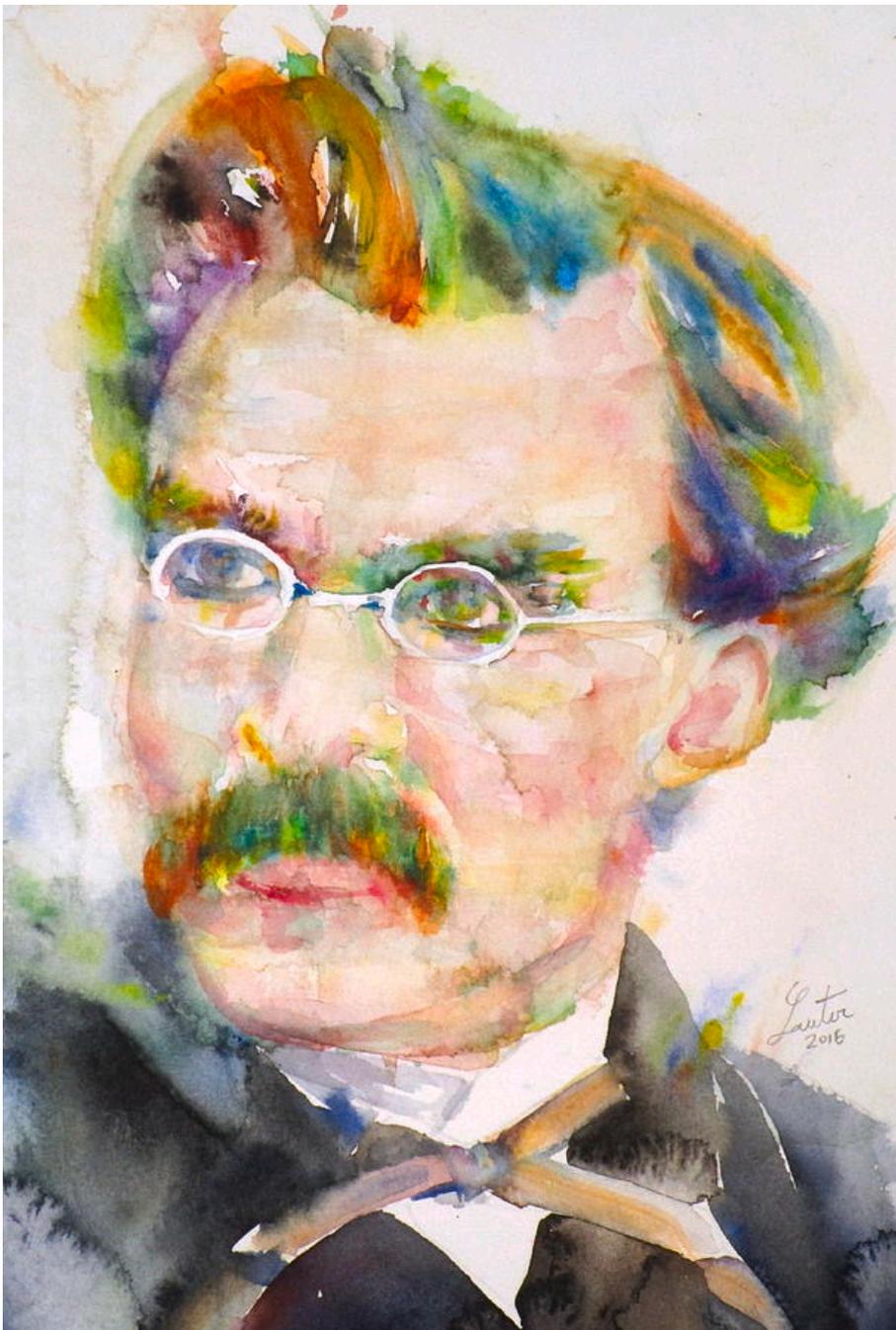
From Greek Ancient Greek: ἄνθρωπος, *ánthrōpos*, "human being"; and Ancient Greek: κέντρον, *kéntron*, "center") is the belief that human beings are the most important entity in the universe.



The **Anthropocene** defines Earth's most recent geologic time period as being human-influenced, or anthropogenic, based on overwhelming global evidence that atmospheric, geologic, hydrologic, biospheric and other earth system processes are now altered by humans.

The word combines the root "anthropo", meaning "human" with the root "-cene", the standard suffix for "epoch" in geologic time.

The Anthropocene is distinguished as a new period either after or within the Holocene, the current epoch, which began approximately 10,000 years ago (about 8000 BC) with the end of the last glacial period.



“If we could communicate with the gnat, we would learn that he likewise flies through the air with the same solemnity, that he feels the flying center of the universe within himself.”

Nietzsche,
“On Truth and Lies in a Nonmoral Sense,”
1873



It is the same with the human as with the tree. The more it aspires to the height and the light, the more its roots strive earthward, downward, into the dark, the depths...

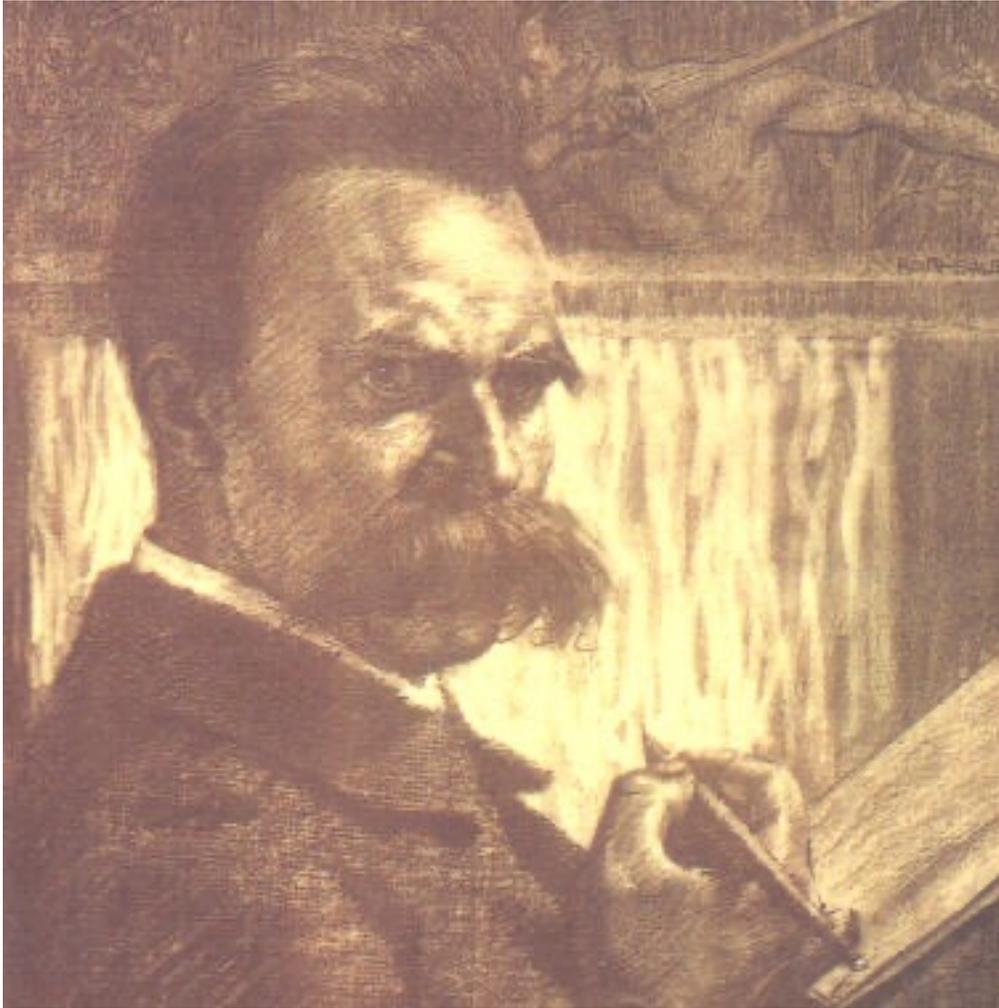
Nietzsche, *Thus Spoke Zarathustra*, 1885



I beseech you, my brothers, *remain loyal to the earth*, and do not believe those who speak to you of otherworldly hopes! Poison-mixers are they, whether they know it or not. Despisers of life are they, decaying and poisoned themselves, of whom the earth is weary: so let them go.

"Once the sin against God was the greatest sin; but God died, and these sinners died with him. To sin against the earth is now the most dreadful thing."

Nietzsche, *Thus Spoke Zarathustra*, 1885



The “kingdom of heaven” is a state of the heart—not something that is to come “above the earth” or “after death.”

The “kingdom of God” is nothing that one expects; it has no yesterday and no day after tomorrow, it will not come in “a thousand years”—it is an experience of the heart; it is everywhere, it is nowhere.

Nietzsche, *The Antichrist*. 1888



I go back, I tell the *genuine* history of Christianity. The very word “Christianity” is a misunderstanding: in truth, there was only *one* Christian, and he died on the cross.

It is false to the point of nonsense to find the mark of the Christian in a “faith,” for instance, in the faith in redemption through Christ: only Christian *practice*, a life such as he *lived* who died on the cross, is Christian.

Such a life is still possible today, for certain people even necessary: genuine, original Christianity will be possible at all times. Not a faith, but a doing; above all, a *not* doing of many things, another state of *being*.

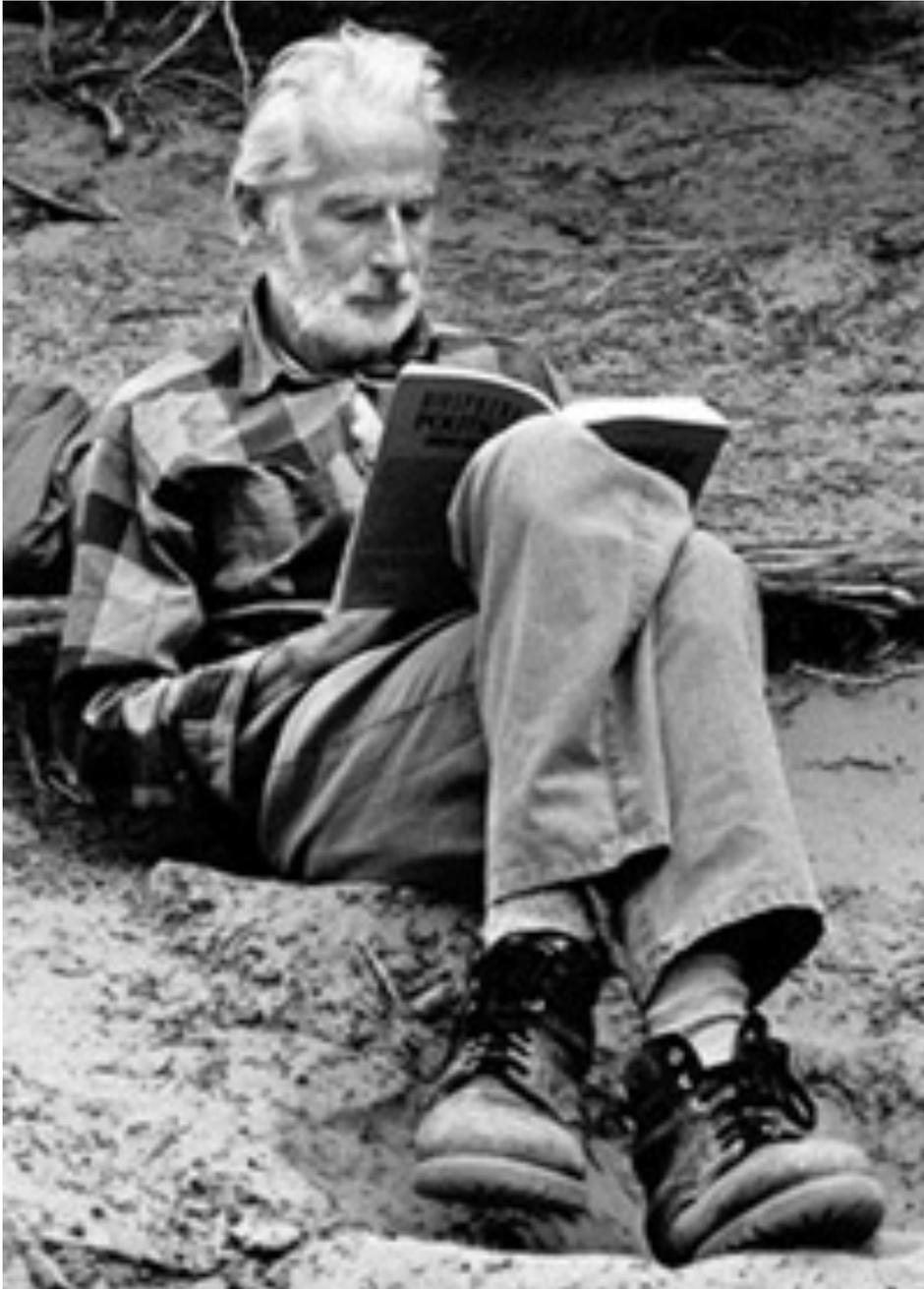
Nietzsche, *The Antichrist*. 1888



THE LAND ETHIC

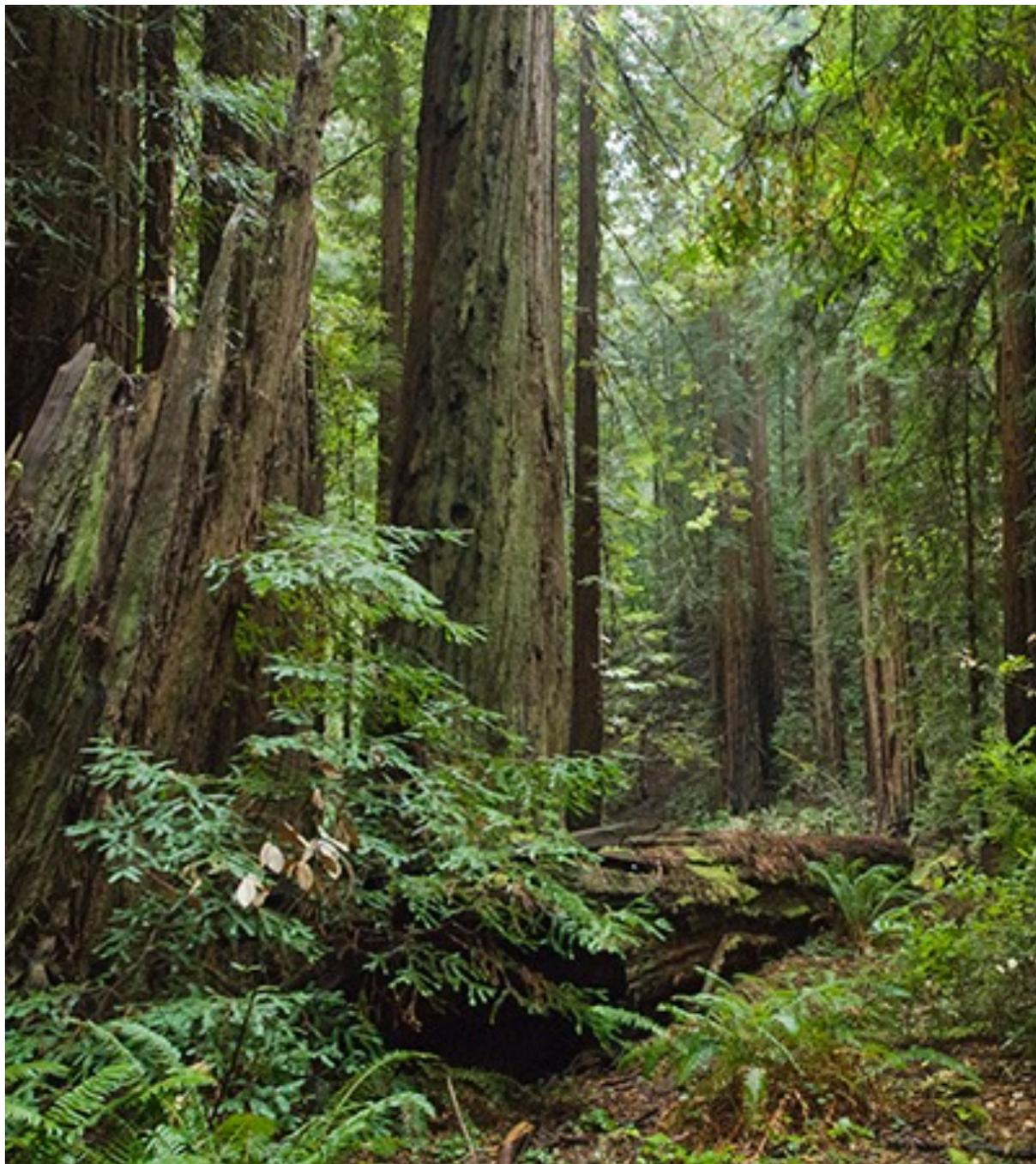
“A land ethic changes the role of *Homo sapiens* from conqueror of the land-community to plain member and citizen of it.”

Aldo Leopold,
A Sand County Almanac, 1949.

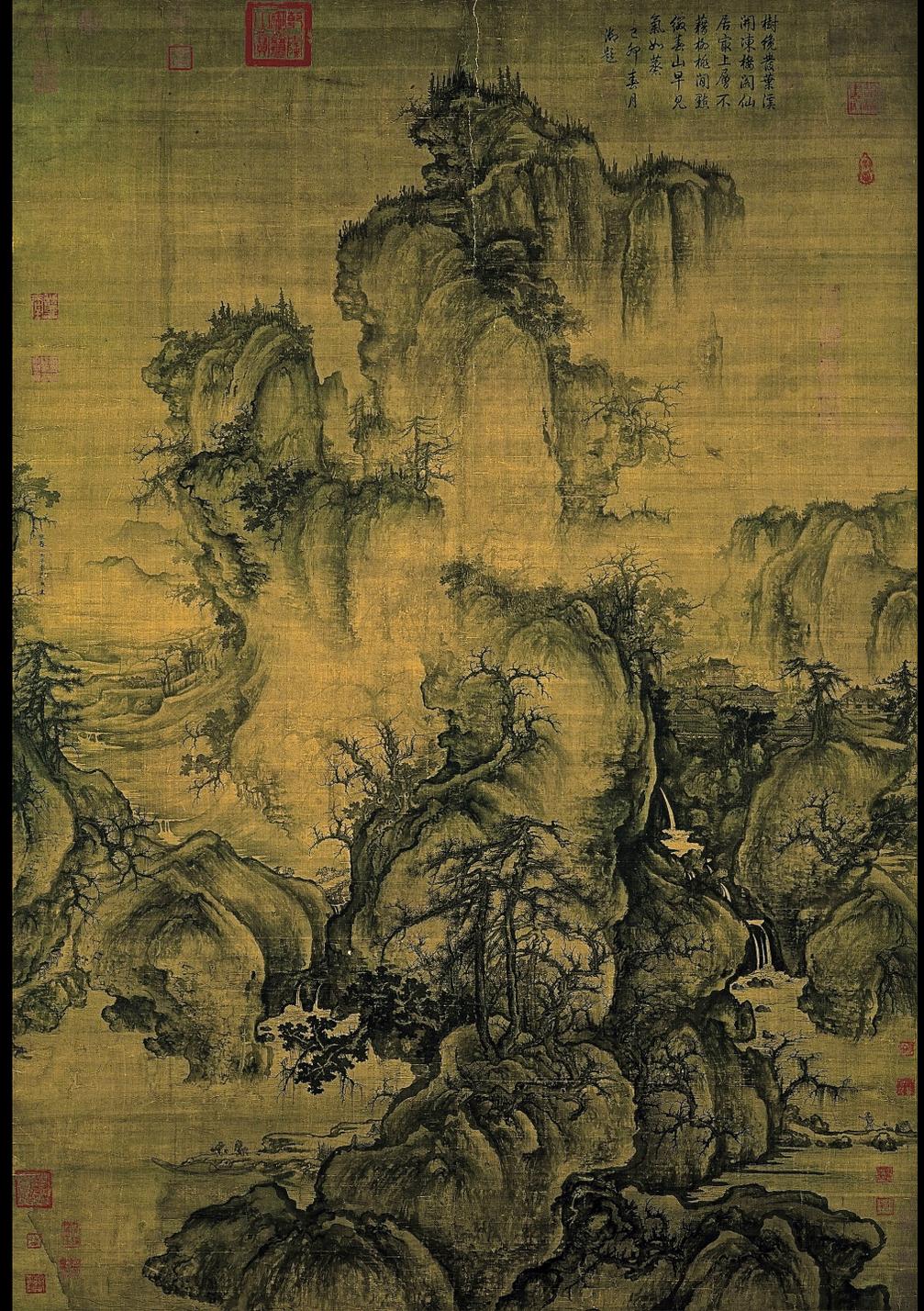


DEEP ECOLOGY

In 1972, Arne Naess coined the term “deep ecology”, which he contrasted with “shallow ecology”: to him, “present human interference with the nonhuman world is excessive, and the situation is rapidly worsening” and all the answers that had been found at the time were superficial and anthropocentric. They addressed the symptoms rather than the causes, and aimed to perpetuate the human race’s domination of the earth.



樹後蒼葉漢
開凍格因仙
居云上層不
藉松栢間豈
嶺表山早見
氣如蒸
己卯五月
恽





Thich Nhat Hanh with Martin Luther King, Jr., 1966

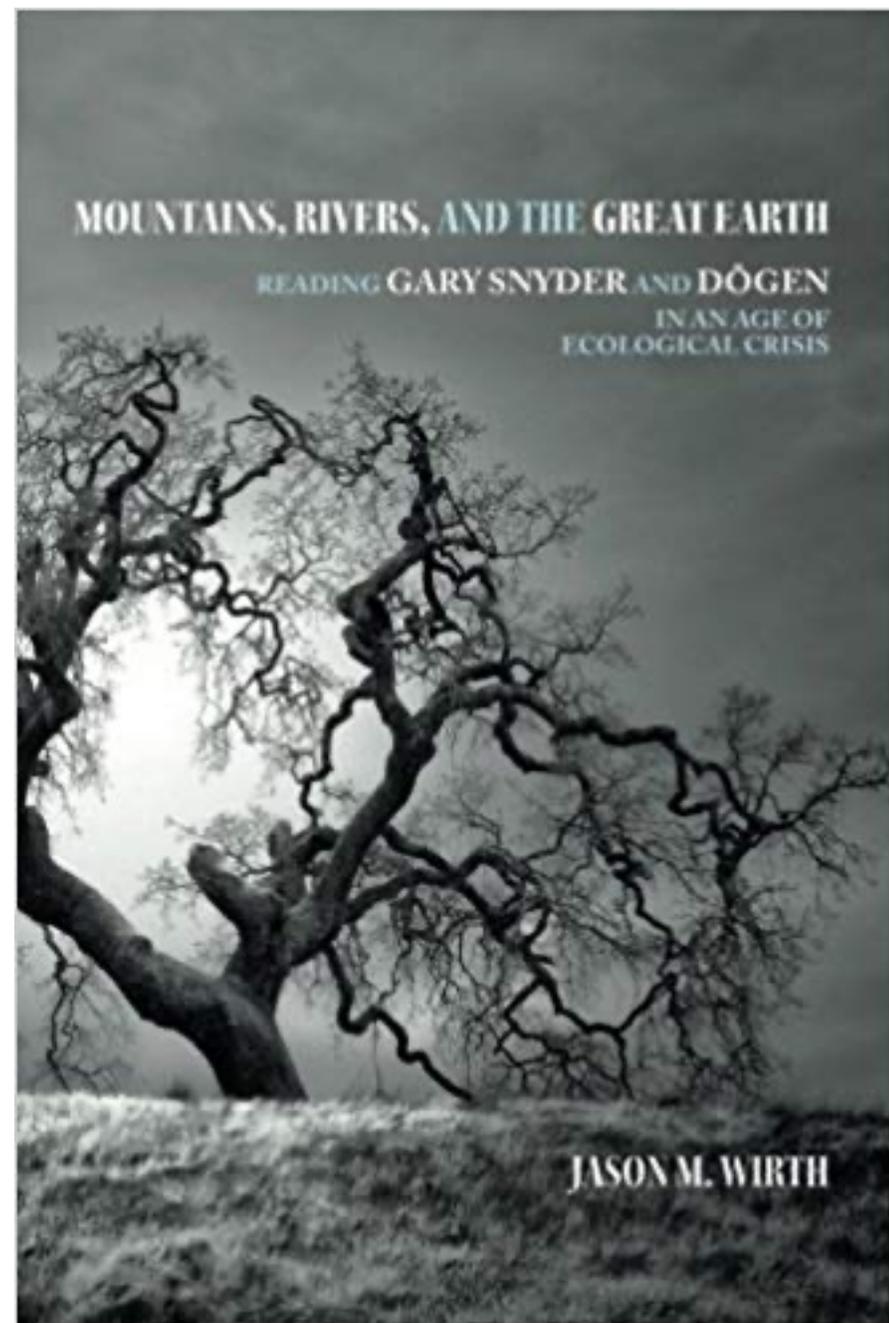
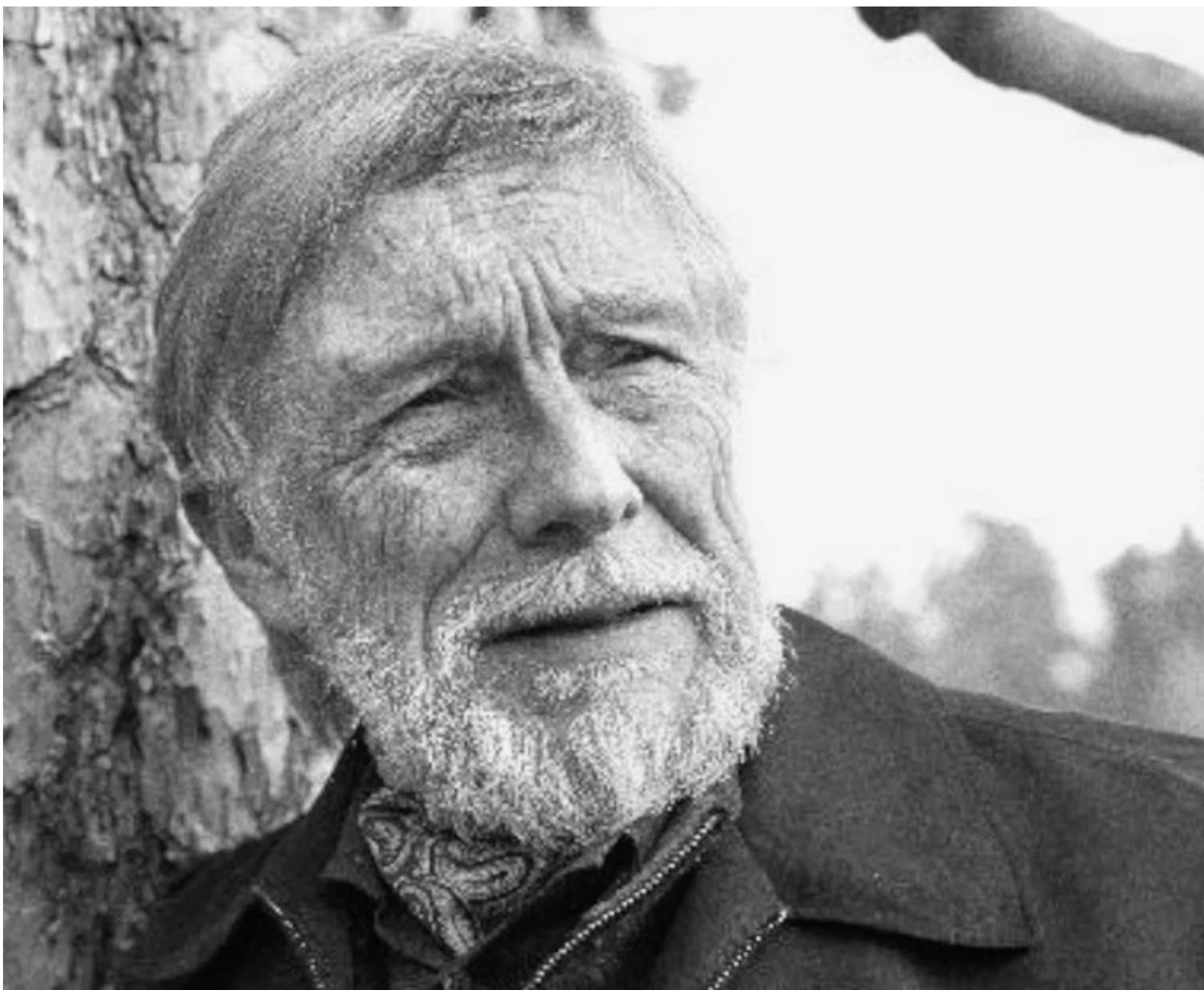
The Sun My Heart

Thich Nhat Hanh

One of the most important Zen masters today is the Vietnamese monk Thich Nhat Hanh (1926–). "The Sun My Heart" is a phrase Nhat Hanh has used in numerous writings to suggest the basic Buddhist teaching of interdependence. This teaching, which begins with the Buddha's teaching of *pratītyasamutpāda*, restated again in

the Mahāyāna teaching of emptiness (*Śūnyatā*), is described by Nhat Hanh as "interbeing." Showing once again the influence of Daoism in Zen, Nhat Hanh draws many examples of "interbeing" in images from the natural world. Perhaps the most well-known example is when Nhat Hanh holds up a blank piece of paper and asks if one can see the cloud in the paper:

"If you are a poet, you will see clearly that there is a cloud floating in this sheet of paper. Without a cloud, there will be no rain; without rain, the trees cannot grow, and without trees, we cannot make paper. The cloud is essential for the paper to exist. If the cloud is not here, the sheet of paper cannot be here either. So we can say that the cloud and the paper *inter-are*. 'Interbeing' is a word that is not in the dictionary yet, but if we combine the prefix 'inter' with the verb 'to be,' we have a new verb, inter-be. Without a cloud, we cannot have paper, so we can say that the cloud and the sheet of paper inter-are."¹







ENCYCLICAL LETTER
LAUDATO SI'
OF THE HOLY FATHER
FRANCIS
ON CARE FOR OUR COMMON HOME

1. “LAUDATO SI’, mi’ Signore” – “Praise be to you, my Lord”. In the words of this beautiful canticle, Saint Francis of Assisi reminds us that our common home is like a sister with whom we share our life and a beautiful mother who opens her arms to embrace us. “Praise be to you, my Lord, through our Sister, Mother Earth, who sustains and governs us, and who produces various fruit with coloured flowers and herbs”.¹

2. This sister now cries out to us because of the harm we have inflicted on her by our irresponsible use and abuse of the goods with which God has endowed her. We have come to see ourselves as her lords and masters, entitled to plunder her at will. The violence present in our hearts, wounded by sin, is also reflected in the symptoms of sickness evident in the soil, in the water, in the air and in all forms of life. This is why the earth herself, burdened and laid waste, is among the most abandoned and maltreated of our poor; she “groans in travail” (*Rom* 8:22). We have forgotten that we ourselves are dust of the earth (cf. *Gen* 2:7); our very bodies are made up

¹ *Canticle of the Creatures*, in *Francis of Assisi: Early Documents*, vol. 1, New York-London-Manila, 1999, 113-114.



**CLIMATE DEAL
WITHDRAWAL**



“When nature is viewed solely as a source of profit and gain, this has serious consequences for society.”

AUTHOR OF NO LOGO AND THE SHOCK DOCTRINE

NAOMI KLEIN

THIS CHANGES EVERYTHING
CAPITALISM vs
THE CLIMATE

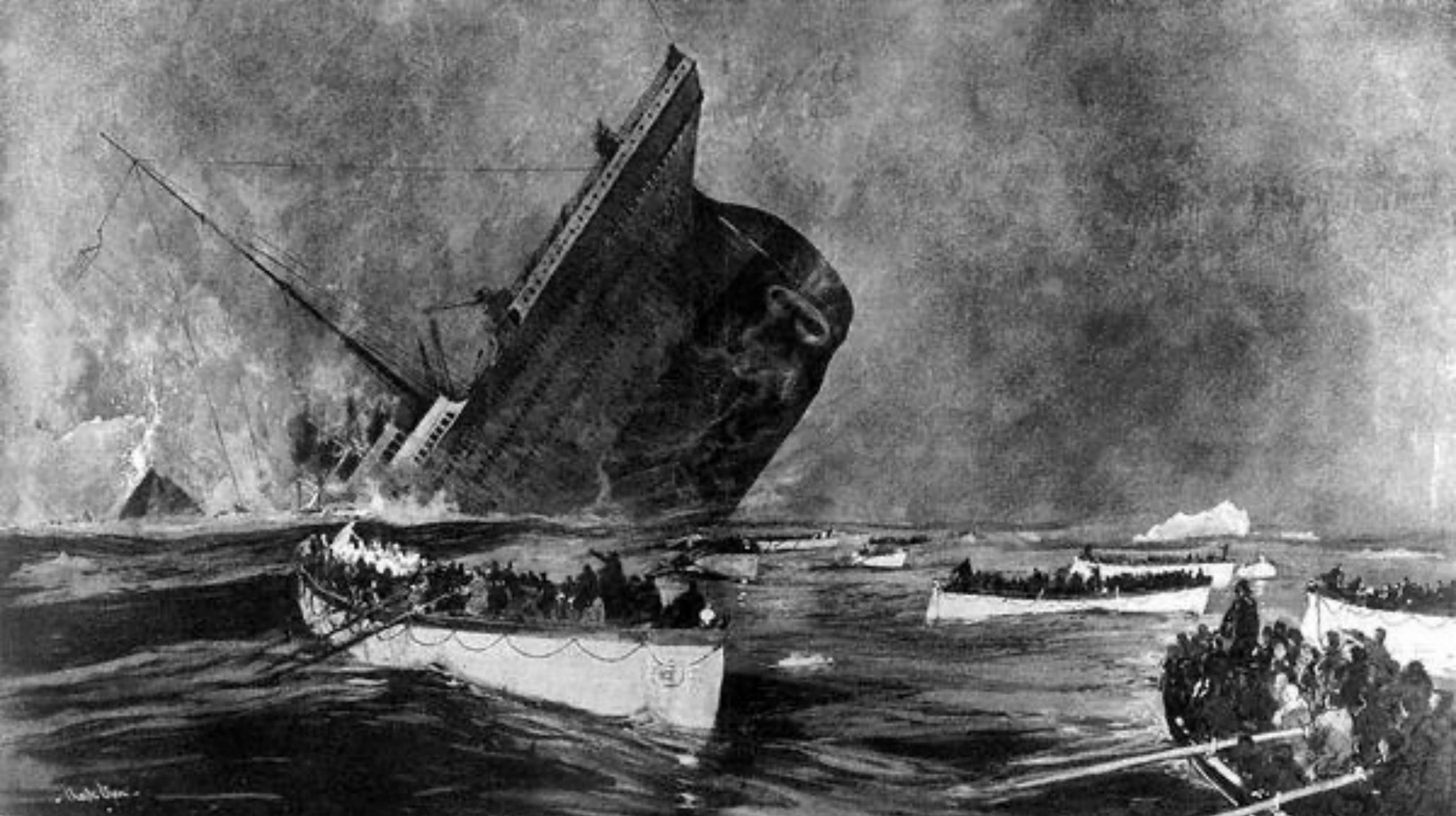
NAOMI
KLEIN
THIS
CHANGES
EVERY
THING
CAPITALISM vs
THE CLIMATE

THIS CHANGES EVERY THING



“Anthropogenic climate change is really *Amerigenic* climate change.”

“There is no other society worldwide with such excessive consumption, waste, and greed for energy. Although the US American population constitutes less than five percent of the world population, it has produced more than a third of the cumulative greenhouse gas emissions of our species.”





“Our society is run by insane people for insane objectives. I think we're being run by maniacs for maniacal ends.”

John Lennon

**BBC interview At The National Theatre,
London, June 1968**

