



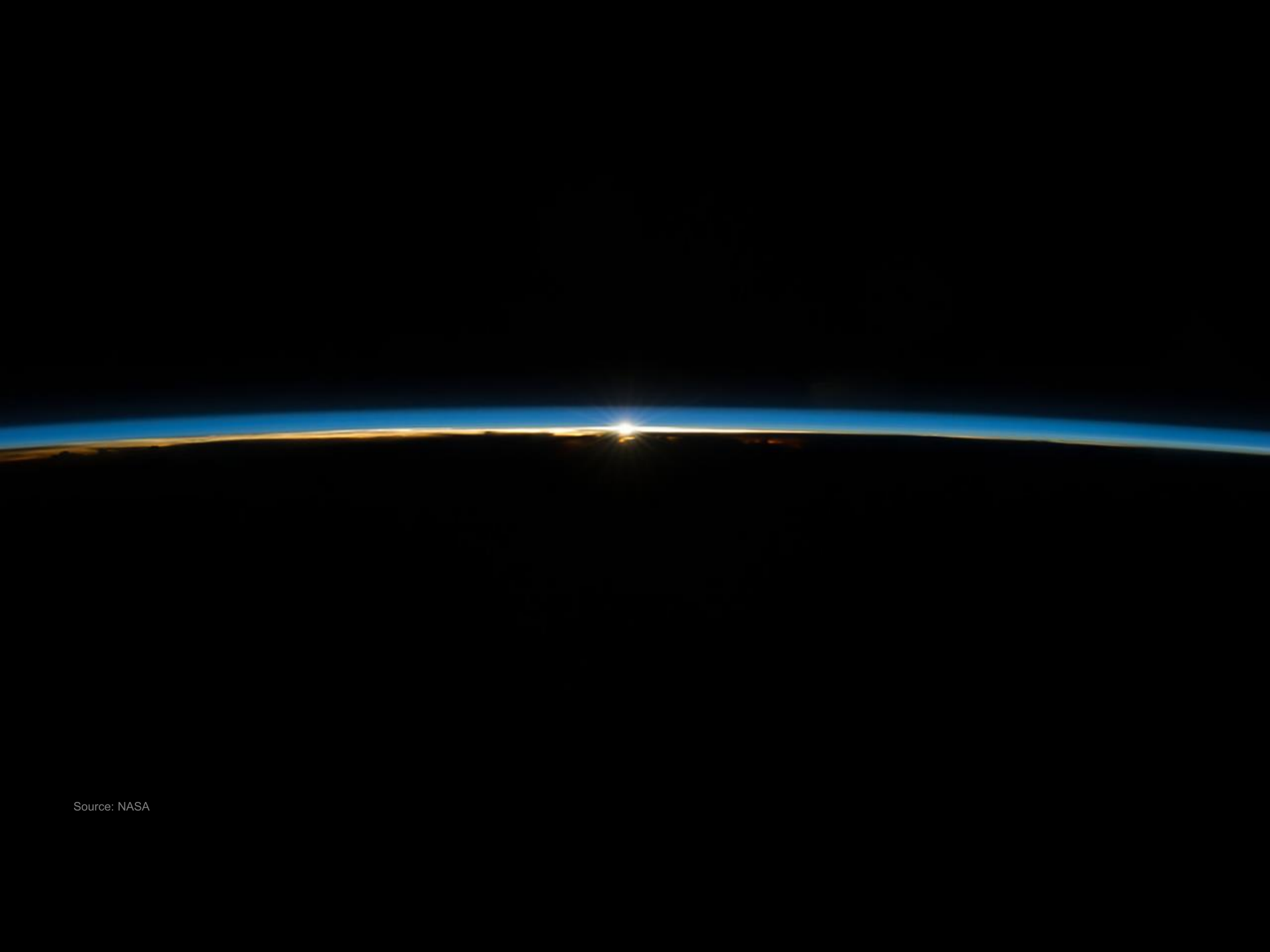
**The Climate
Reality Project[®]**



Source: NASA

1. Must we change?
2. Can we change?
3. Will we change?

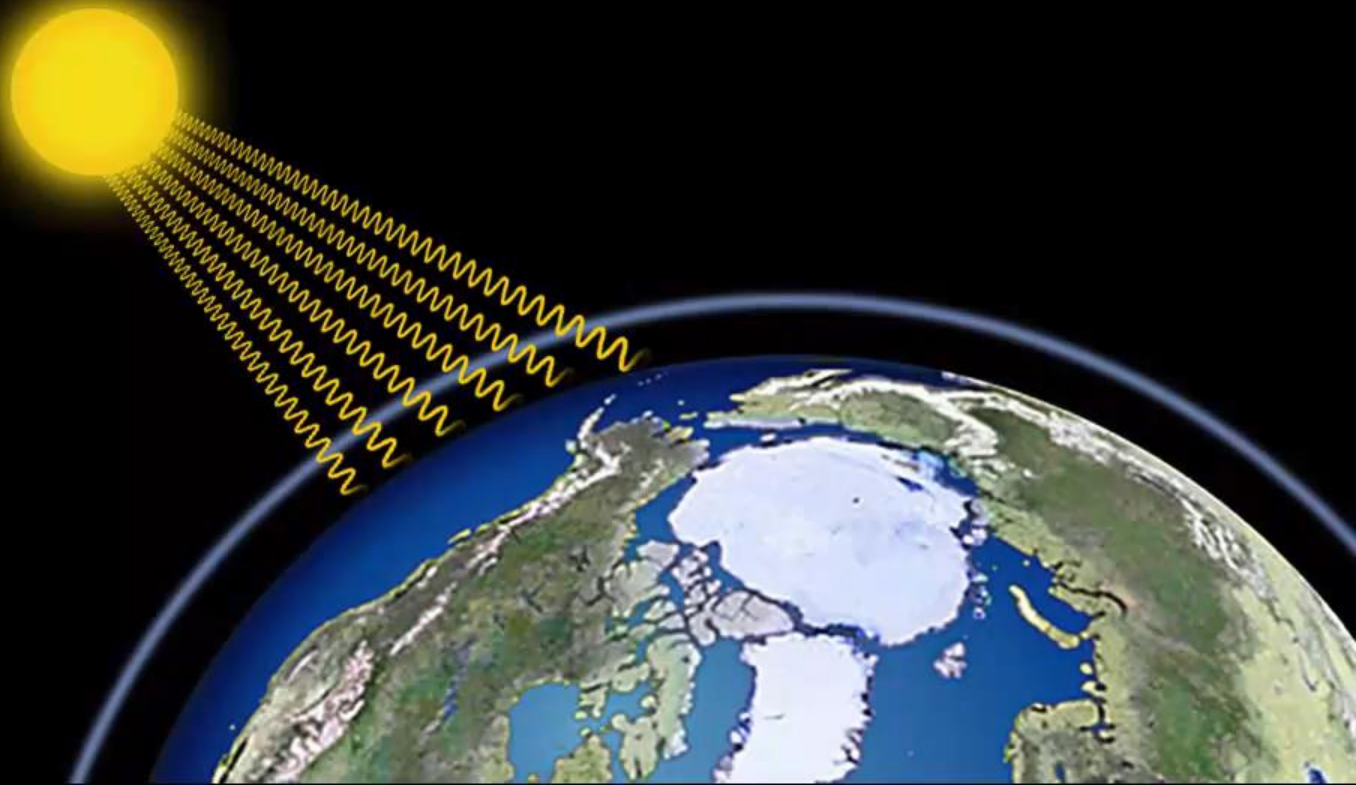
1. Must we change?



Source: NASA



Solar radiation
in the form of lightwaves
passes through the
atmosphere





AIR TRANSPORT

OIL PRODUCTION

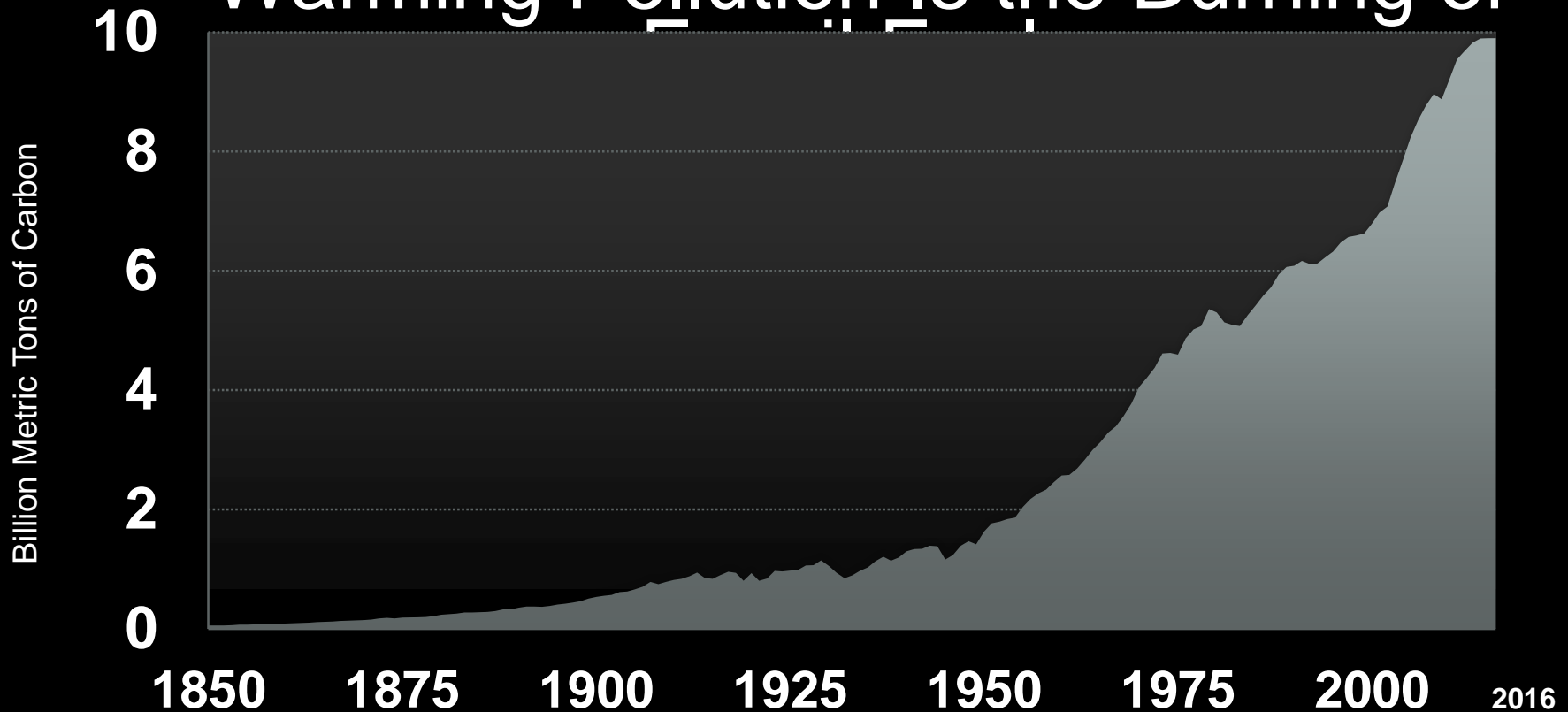
COAL PLANTS

INDUSTRIAL PROCESSES

FERTILIZATION

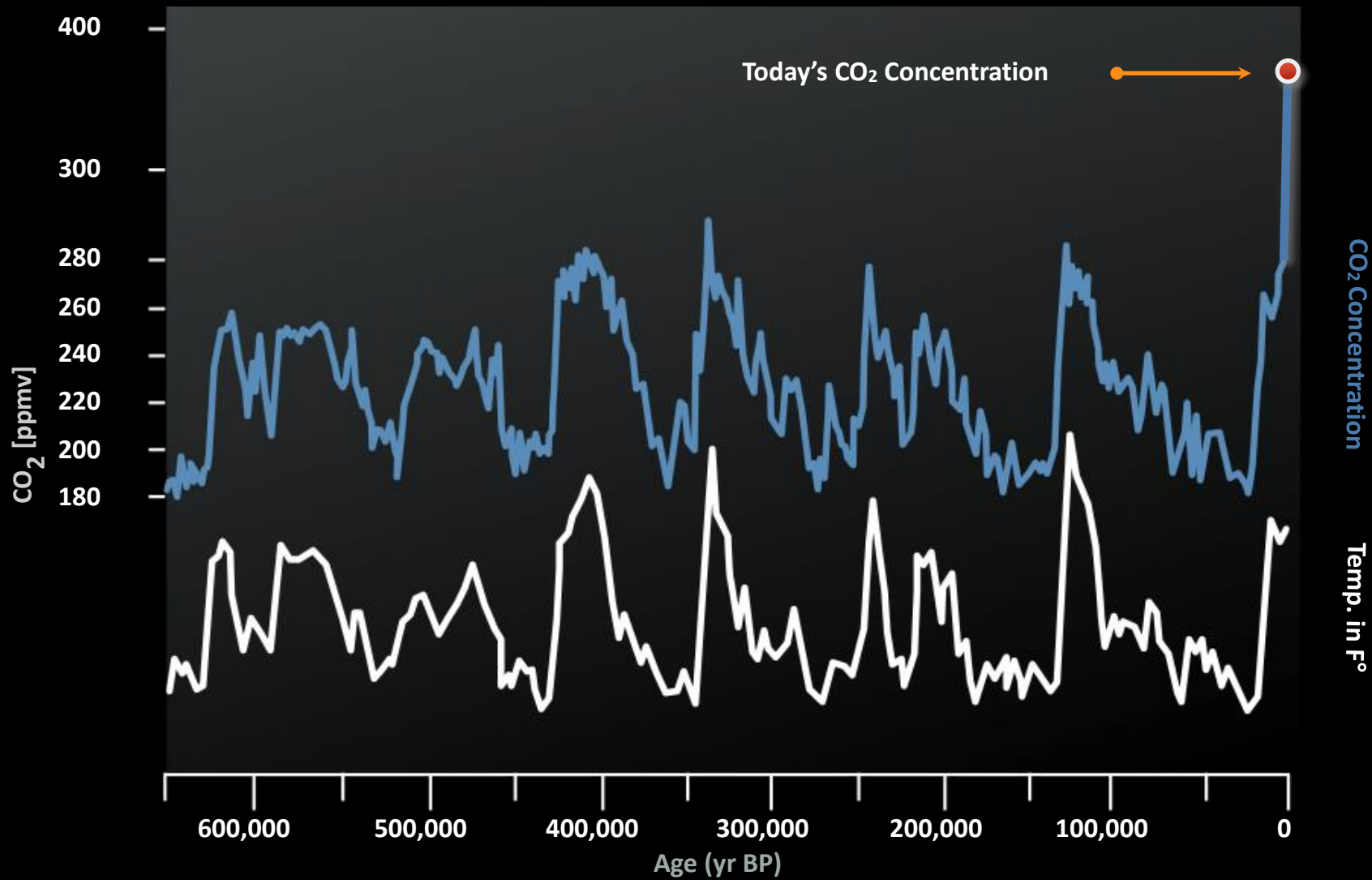
LAND TRANSPORT

The Largest Source of Global Warming Pollution Is the Burning of

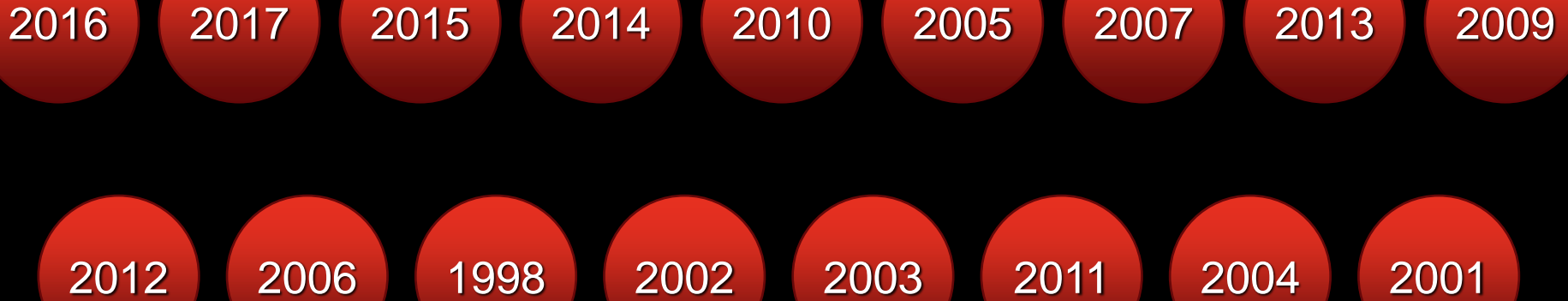


Data: U.S. Department of Energy/CDIAC

CO₂ is being released
into the atmosphere
faster than at any time in
at least the last
66 million years.



The 17 Hottest Years Since the Year 2001

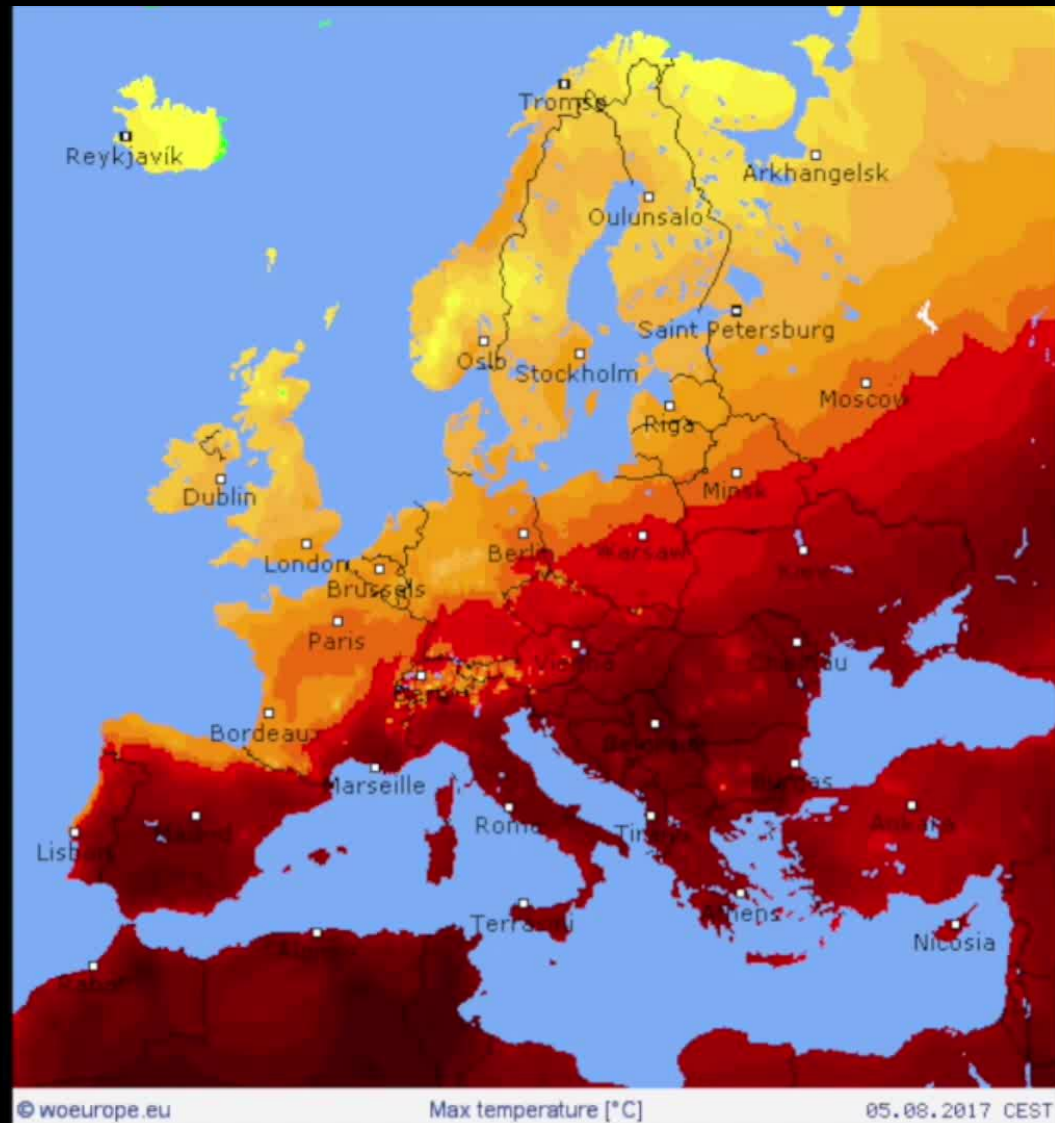


2016	2017	2015	2014	2010	2005	2007	2013	2009
2012	2006	1998	2002	2003	2011	2004	2001	

European Heat

- August 5 – 11, 2017

Much of Europe was placed on “red alert” as temperatures exceeded **111° F** (44° C).



Paris, France

• July 5, 2017



A guard faints
due to the heat.

A wide-angle, high-angle photograph of a very crowded beach. The foreground and middle ground are filled with people sunbathing on the sand. Many blue beach umbrellas are open, creating a pattern of blue dots across the light-colored sand. People are wearing swimwear, and some are lying on towels or blankets. In the background, the ocean is visible, and many people are wading or swimming in the shallow water. The overall scene is one of a busy, popular beach destination.

Sydney, Australia

The temperature in Sydney reached **117° F** (47.3° C) — the city's hottest day in almost 80 years.

Hatay, Turkey

• July 4, 2017

This road melted
in the heat.

© 2017 Erdal Turkoglu/Anadolu Agency/Getty Images



On May 19, 2016
India set a new all-time
high temperature record of

124° F (51° C)

New Delhi, India

• May 19, 2016

The Indian government distributed drinking water as temperatures set new records.

© 2016 Photo by Ajay Aggarwal/Hindustan Times via Getty Images



A photograph showing a man's head and shoulders being doused with water from a plastic bottle. The water is splashing over his face and hair. The background is a dry, outdoor area with some trees and a blue and red checkered cloth hanging in the distance.

Ahmedabad, India

May 21, 2015

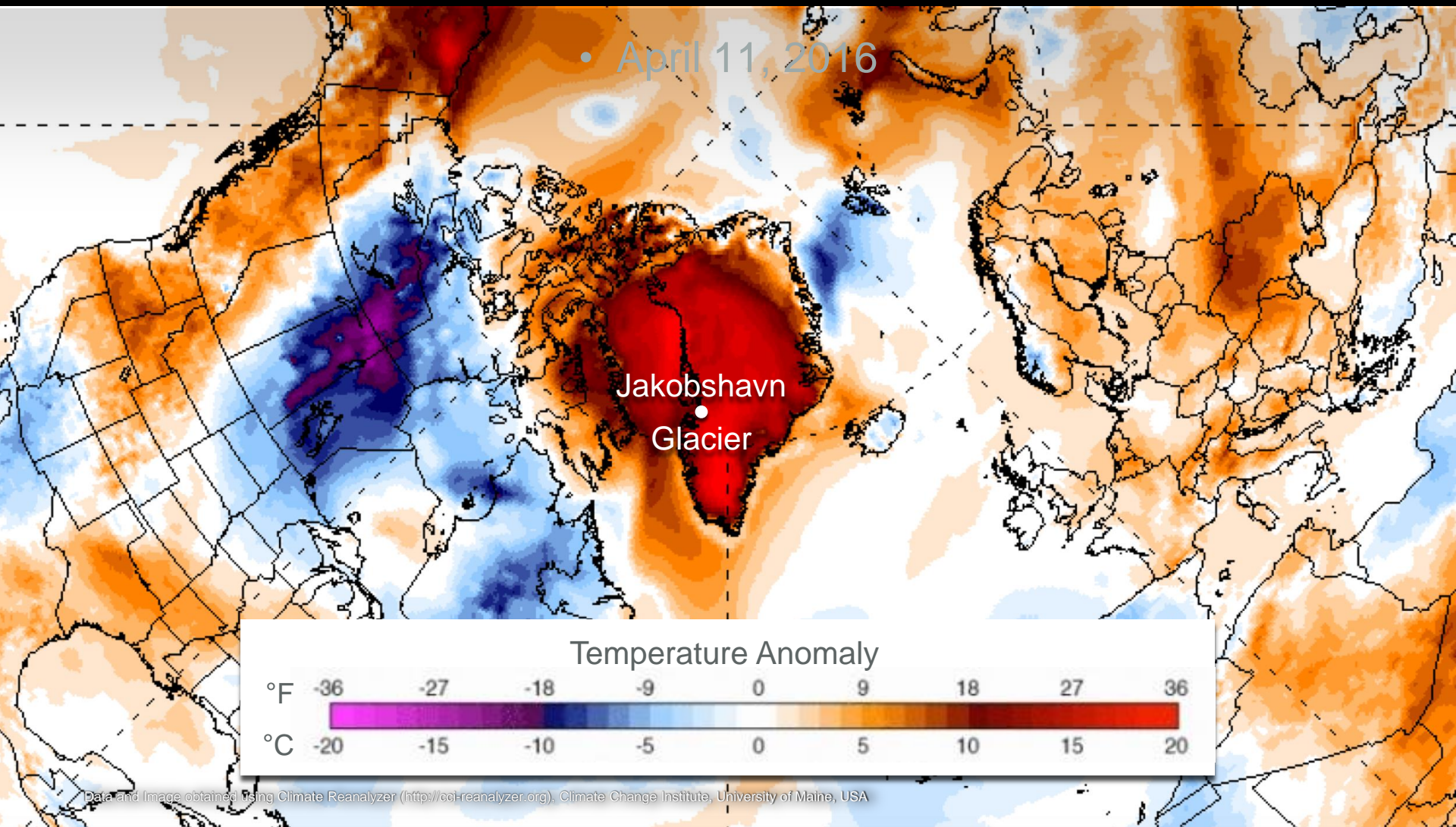
At least 2,330 people
died in the 2015 India
heat wave

© 2015 AP Photo/Ajit Solanki

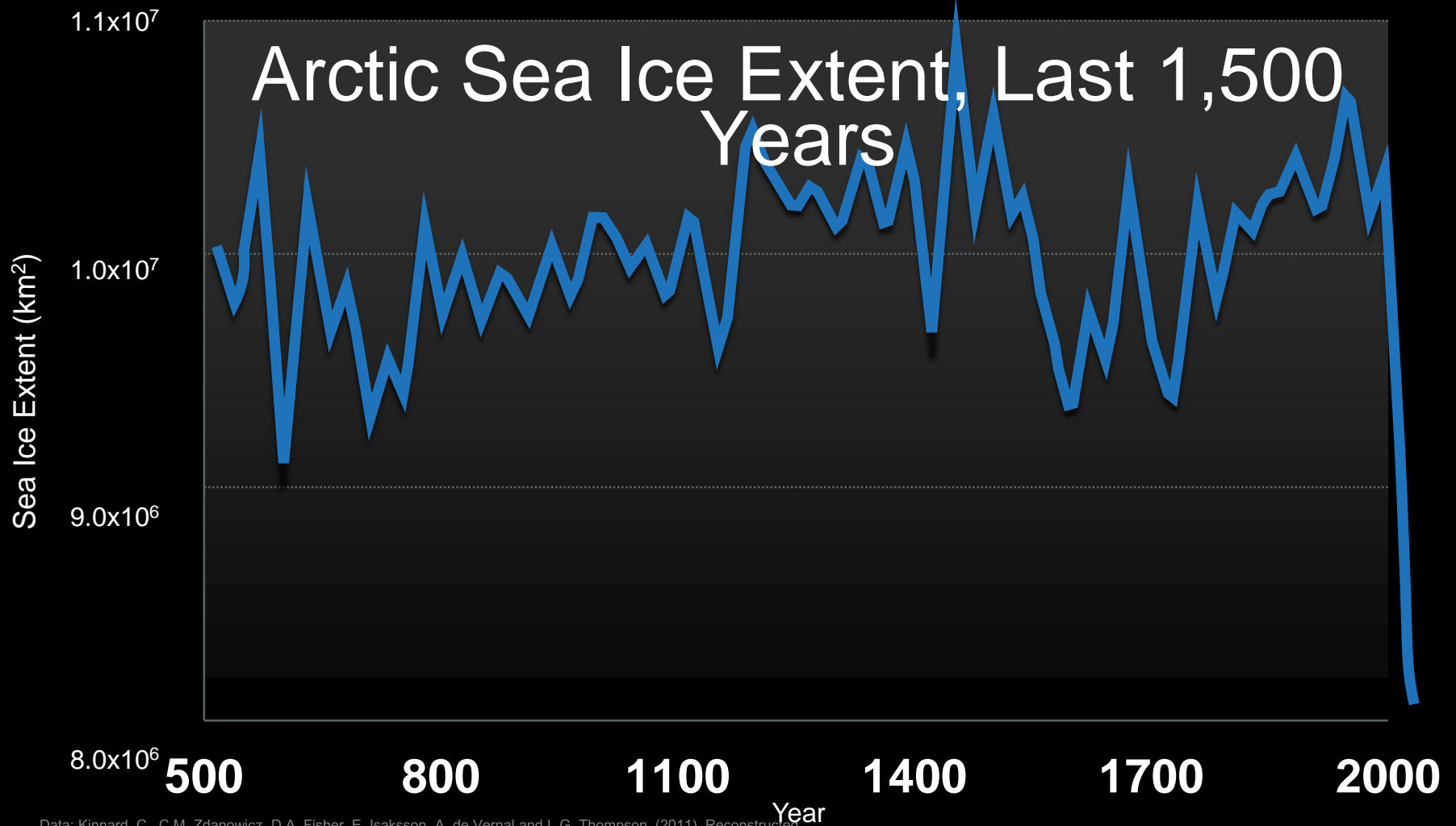


Greenland

• April 11, 2016

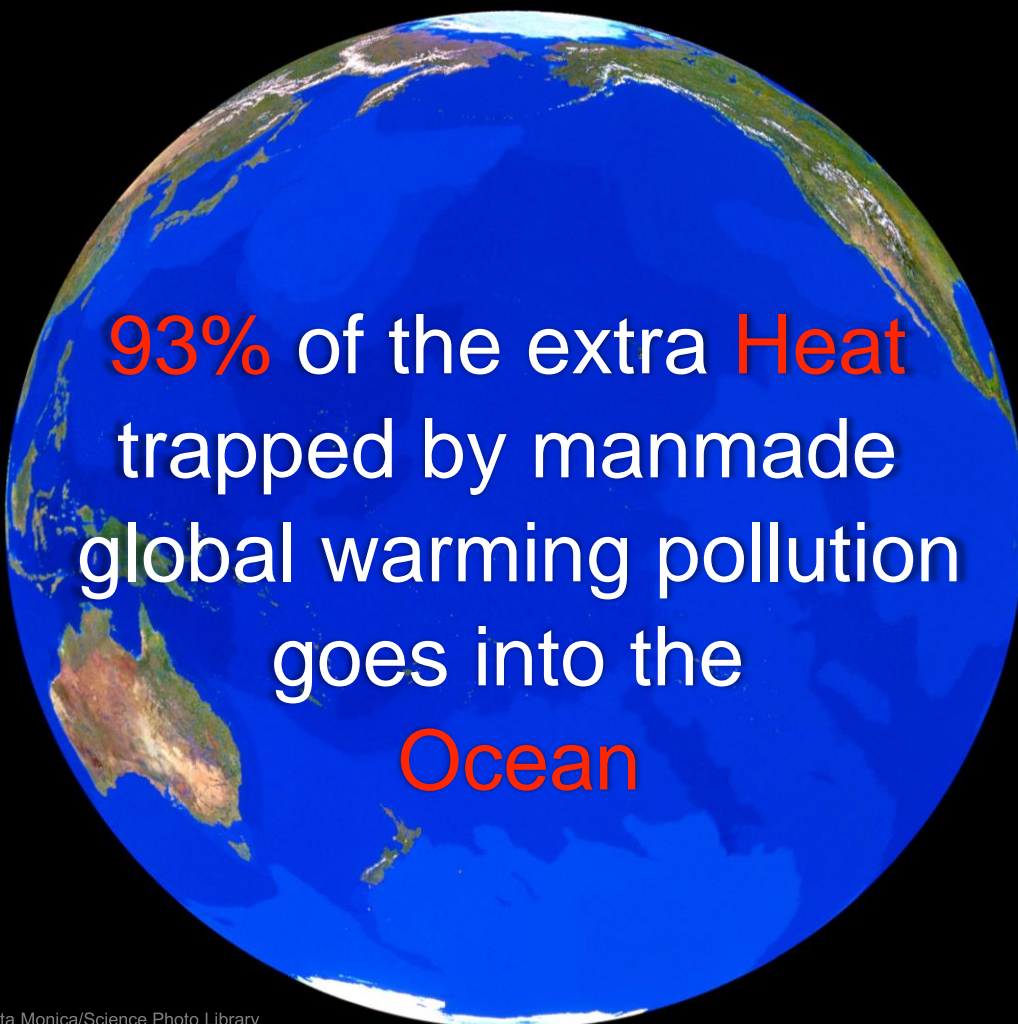


Data and Image obtained using Climate Reanalyzer (<http://cl-reanalyzer.org>). Climate Change Institute, University of Maine, USA



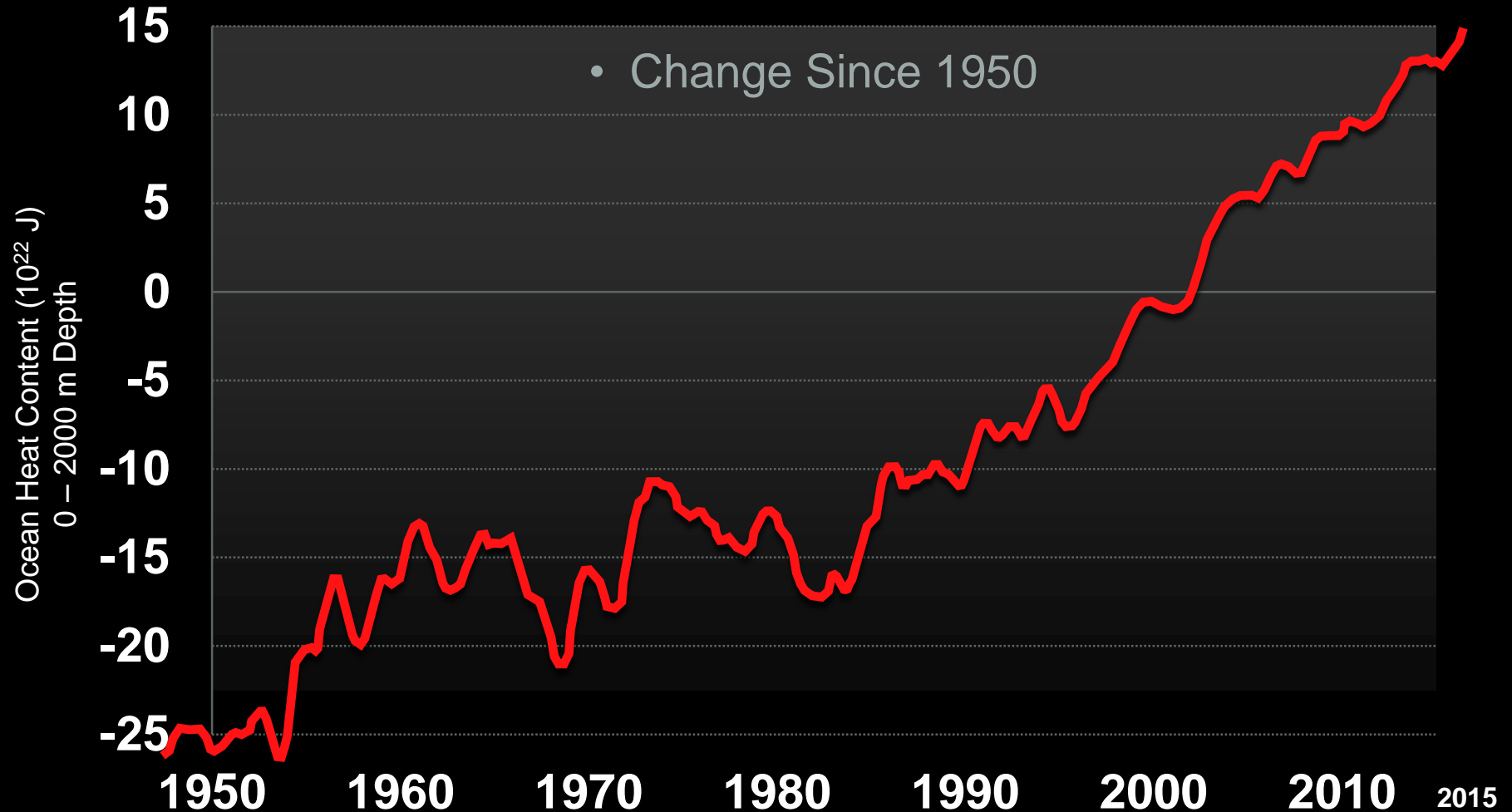
Data: Kinnard, C., C.M. Zdanowicz, D.A. Fisher, E. Isaksson, A. de Vernal and L.G. Thompson. (2011). Reconstructed change in Arctic sea ice over the last 1,450 years. Nature letter, DOI:10.1038/nature10581, Fig. 3

**What happens to our Earth when the
average temperature goes up?**

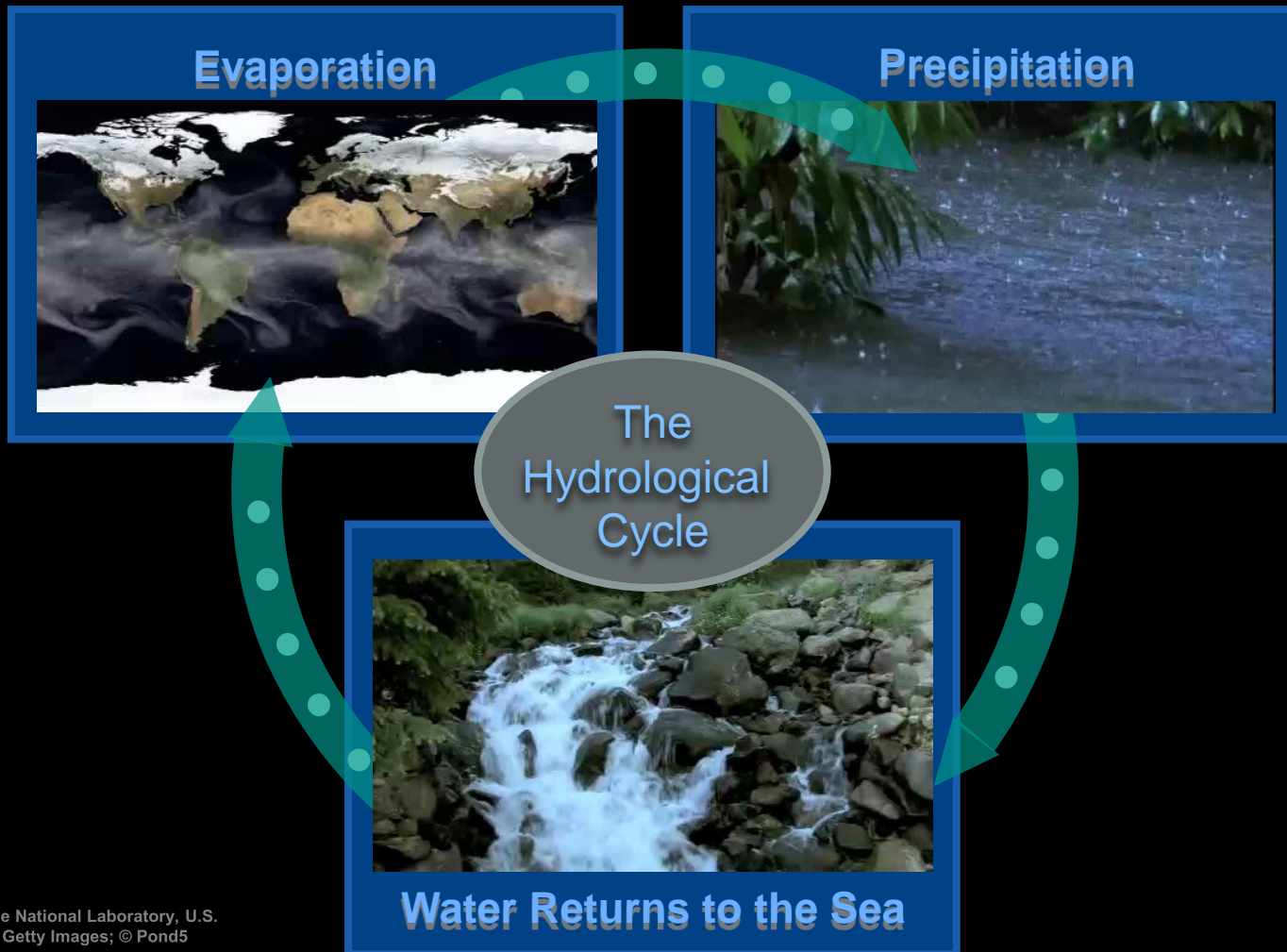


93% of the extra Heat
trapped by manmade
global warming pollution
goes into the
Ocean

Global Ocean Heat Content

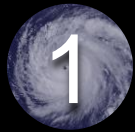


Data: L. Cheng, K. E. Trenberth, et al., "Improved estimates of ocean heat content from 1960 to 2015," *Science Advances*, 10 March 2017



Sources: Oak Ridge National Laboratory, U.S. Dept. of Energy; © Getty Images; © Pond5

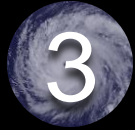
How Does the Climate Crisis Impact Hurricanes?



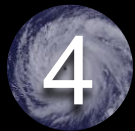
Warmer oceans lead to more intense hurricanes



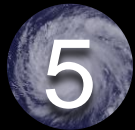
Hurricanes intensify much more rapidly



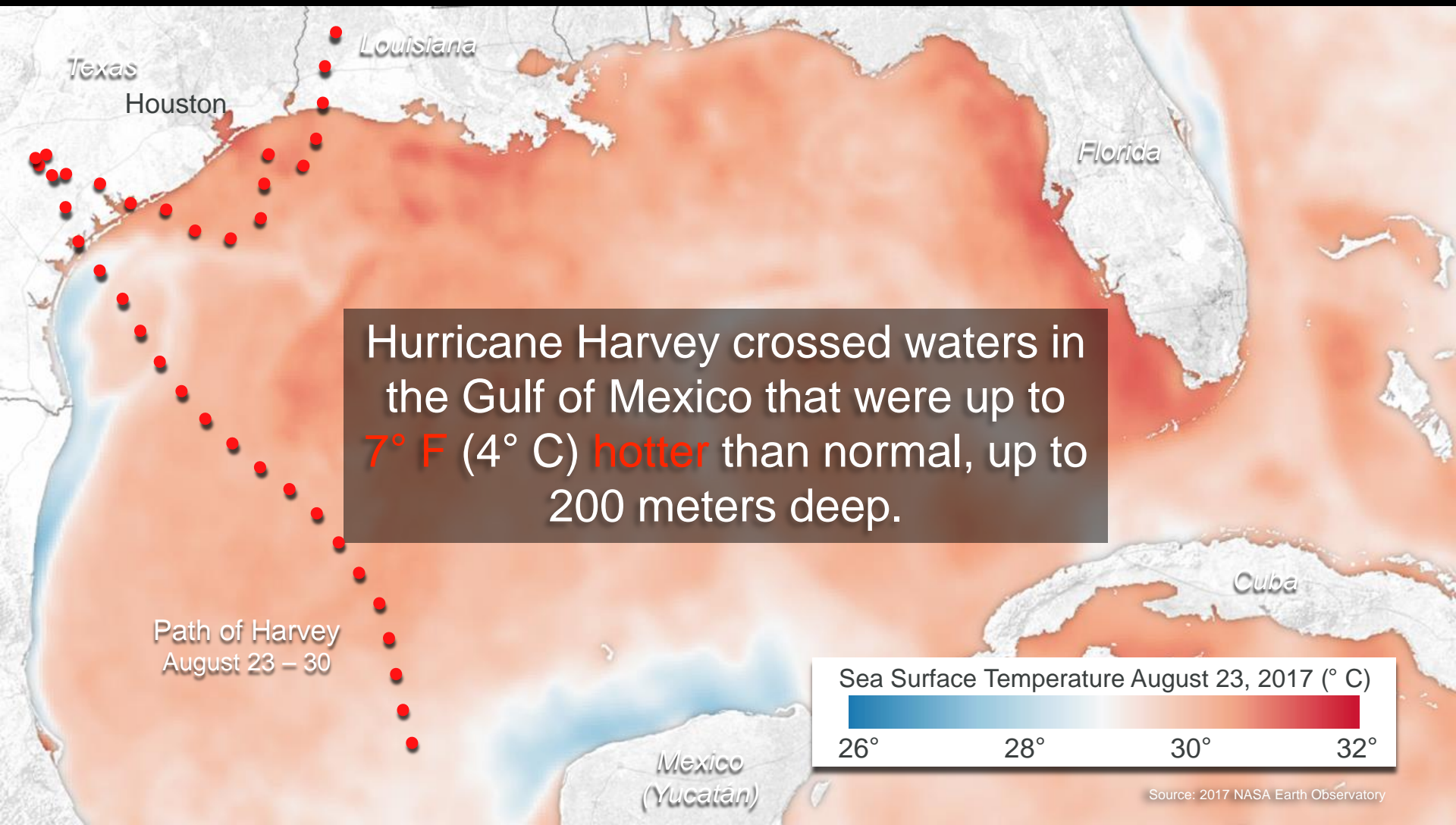
Warmer air holds more moisture, leading to heavier downpours



Storm surge increases due to sea level rise



A “wavier” jet stream can hold storms in place longer



Houston, Texas

• August 27, 2017



Hurricane Irma

- September 10, 2017

Irma remained a Category 5 hurricane for three straight days—a new global record since satellite tracking began.

Source: 2017 NASA Earth Observatory

Havana, Cuba

- September 10, 2017



© 2017 AP Photo/Ramon Espinosa

So the downpours get bigger



© 2010 Sean R. Heavey

Globally, floods and
extreme rainfall events
now occur
four times more often
than in 1980

Mumbai, India

• August 29, 2017



At least 1,400 people have died in flooding across South Asia during the 2017 monsoon.

Agartala, India

• August 11, 2017



Hundreds of thousands of people have been affected by monsoon flooding in 2017.

Chennai, India

- November 17, 2015

The torrential rains in Tamil Nadu affected two million people.



Rishikesh, Uttarakhand State, India

- June 18, 2013



Bogra, Bangladesh

- August 20, 2017



Liuzhou City, China

• July 12, 2017



Rio de Janeiro, Brazil

- December 11, 2013



Dalby, Queensland, Australia

- December 30, 2010



Rising temperatures remove moisture from the
Ocean and also from Land

Chennai, India

- May 17, 2017



Tamil Nadu is experiencing its worst drought in 140 years.

Theewaterskloof Reservoir, Western Cape, South Africa

• May 23, 2017

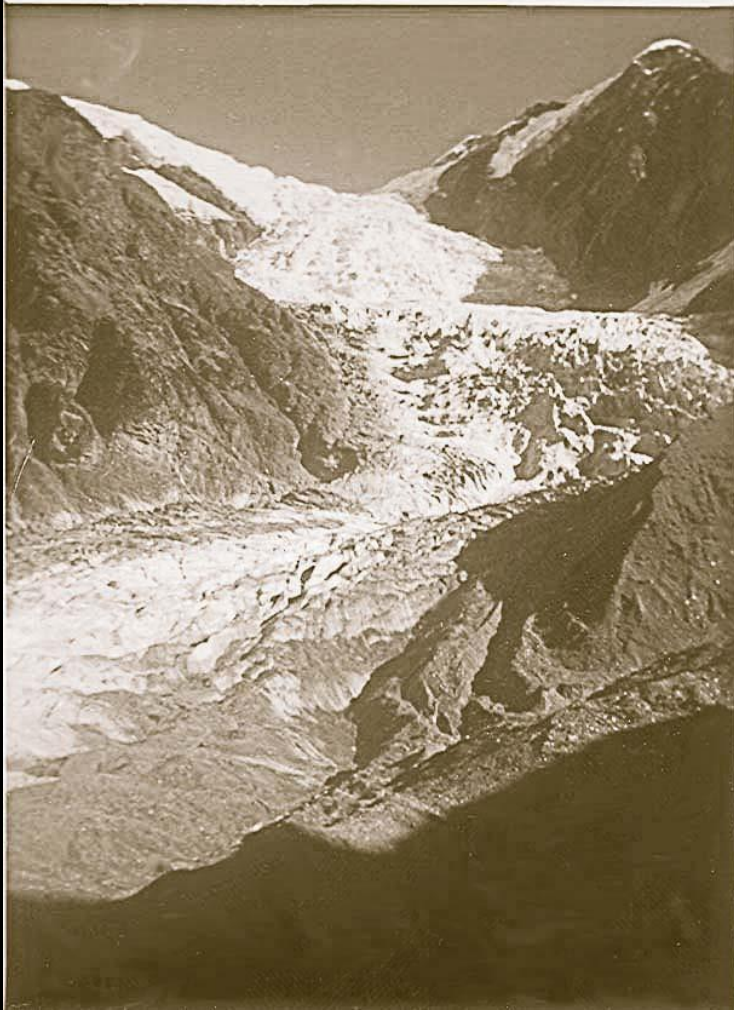
South Africa's Western Cape province faces its worst water shortage in 113 years.

Upsala Glacier, Argentina



Indian glaciers have already started melting....

Pindari Glacier, Himalayas

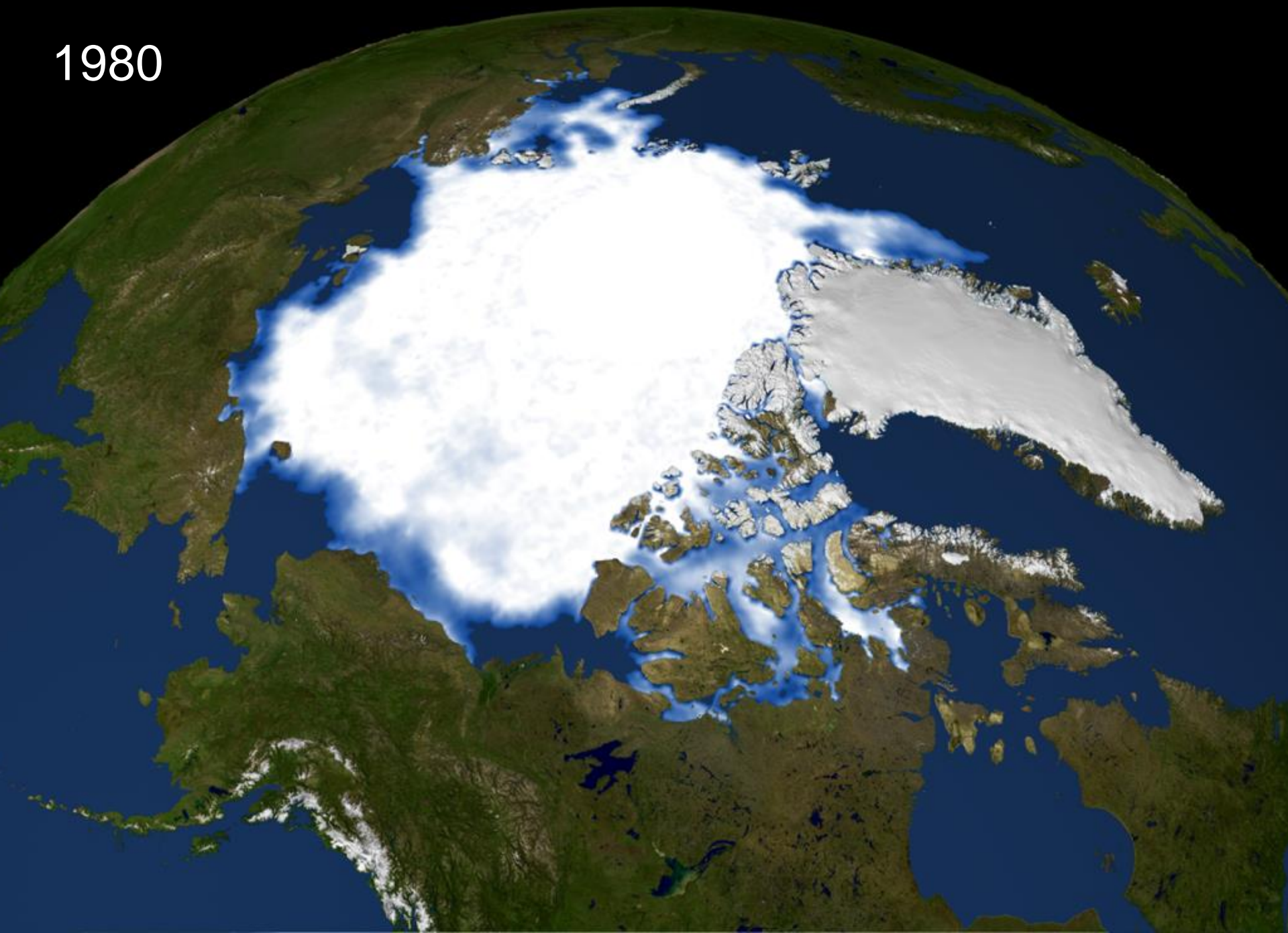


1936

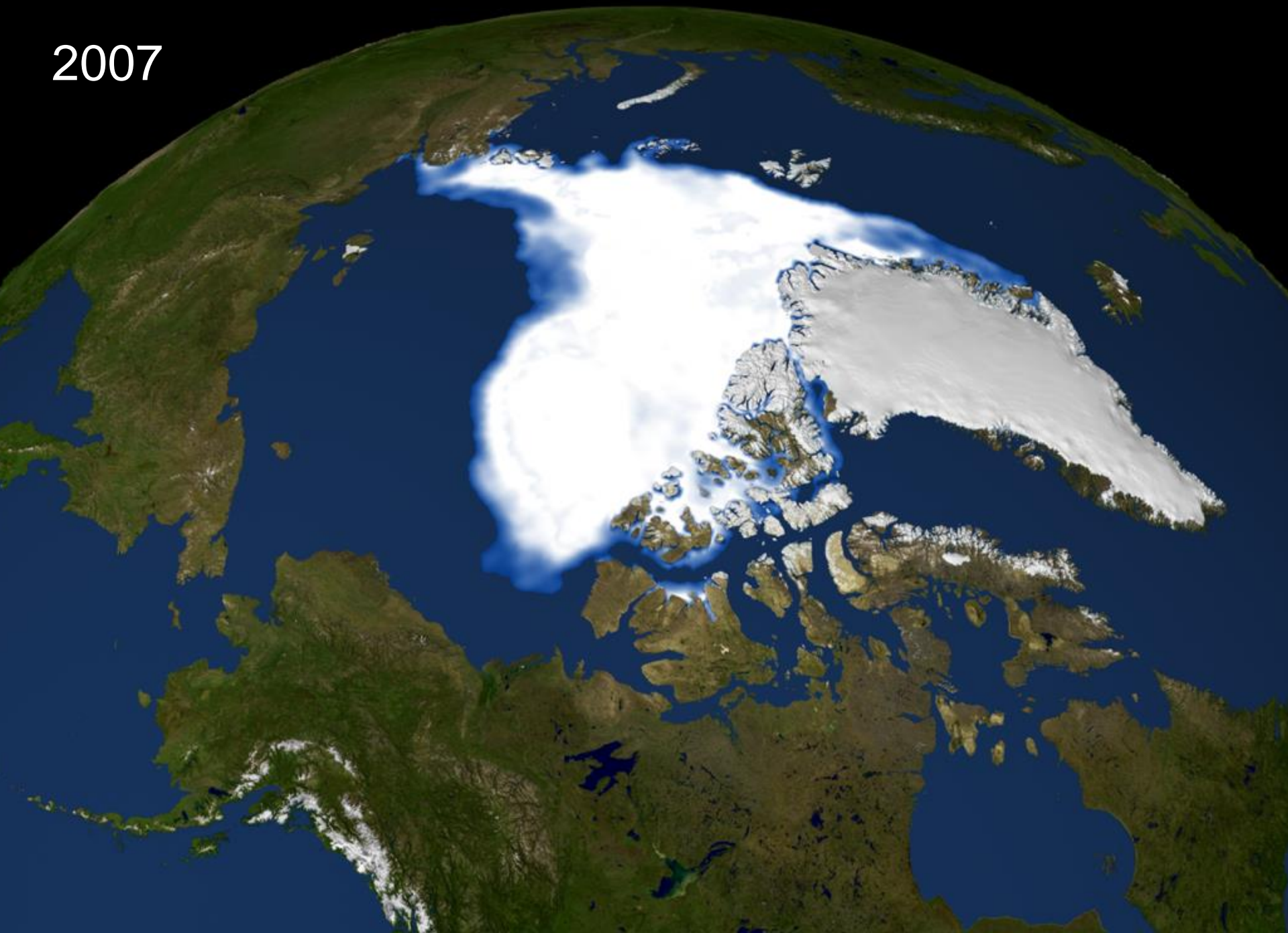


2006

1980



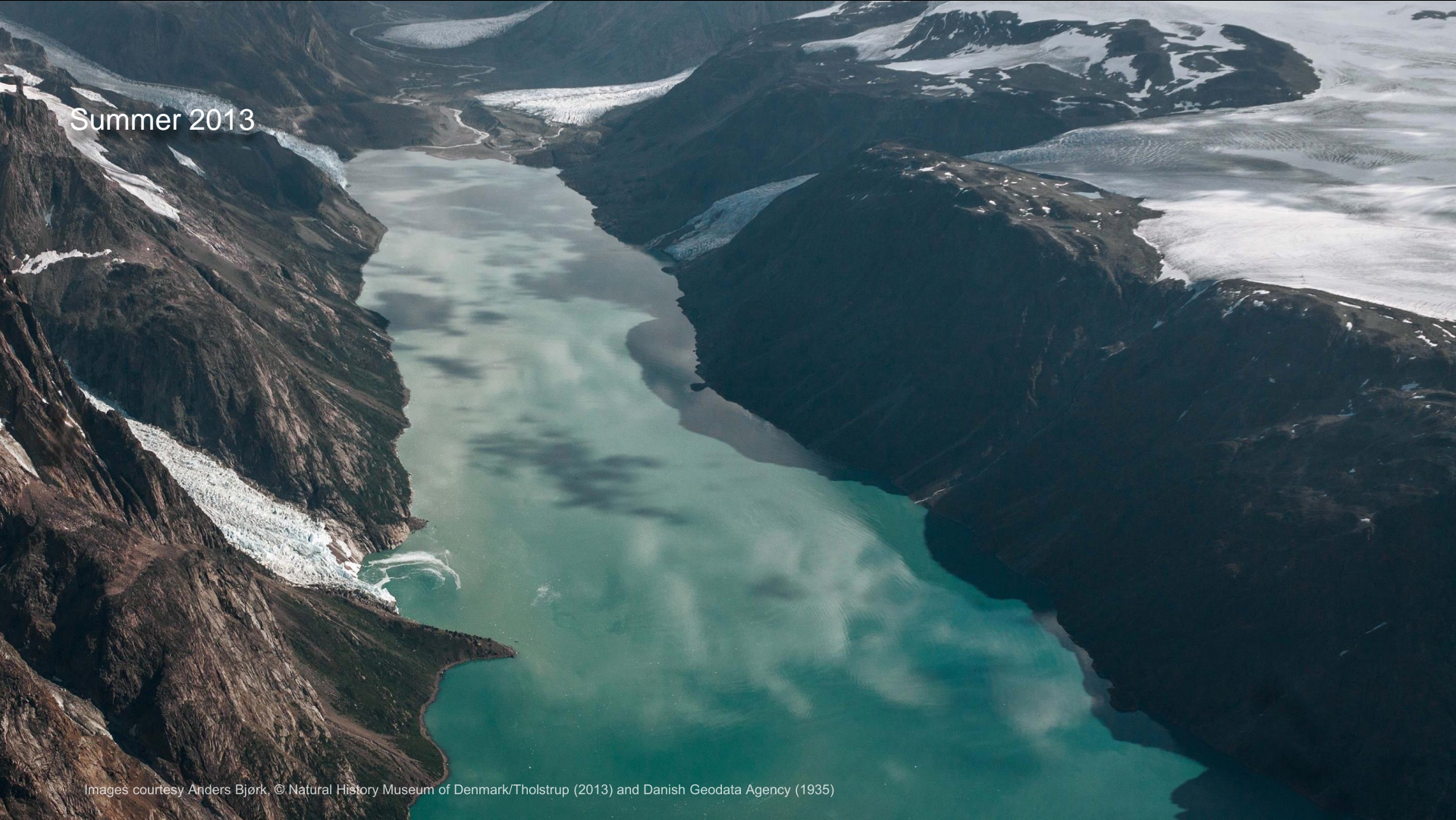
2007



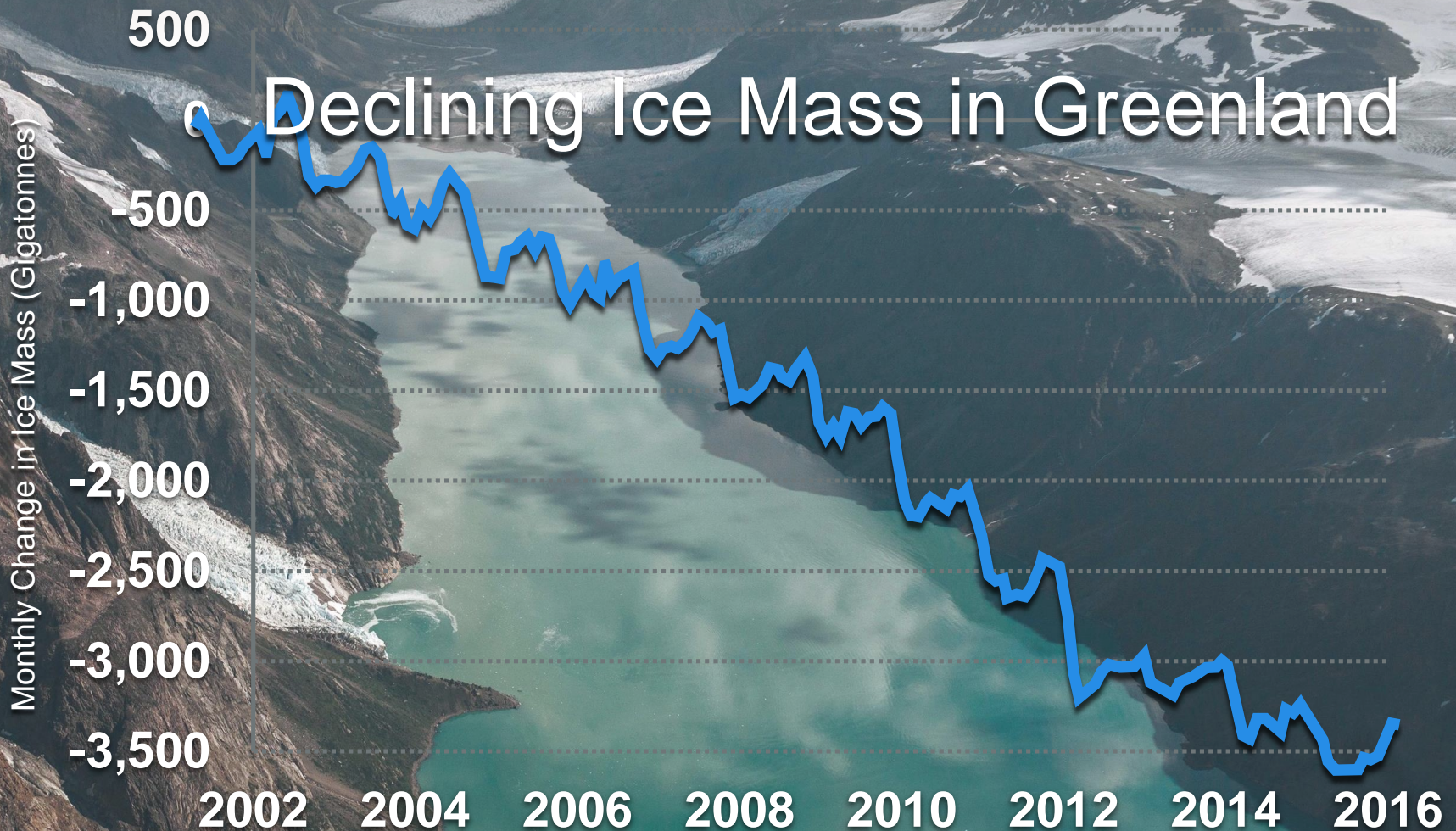
Unnamed Glacier, Southwest Greenland

Summer 2013

Images courtesy Anders Bjørk. © Natural History Museum of Denmark/Tholstrup (2013) and Danish Geodata Agency (1935)

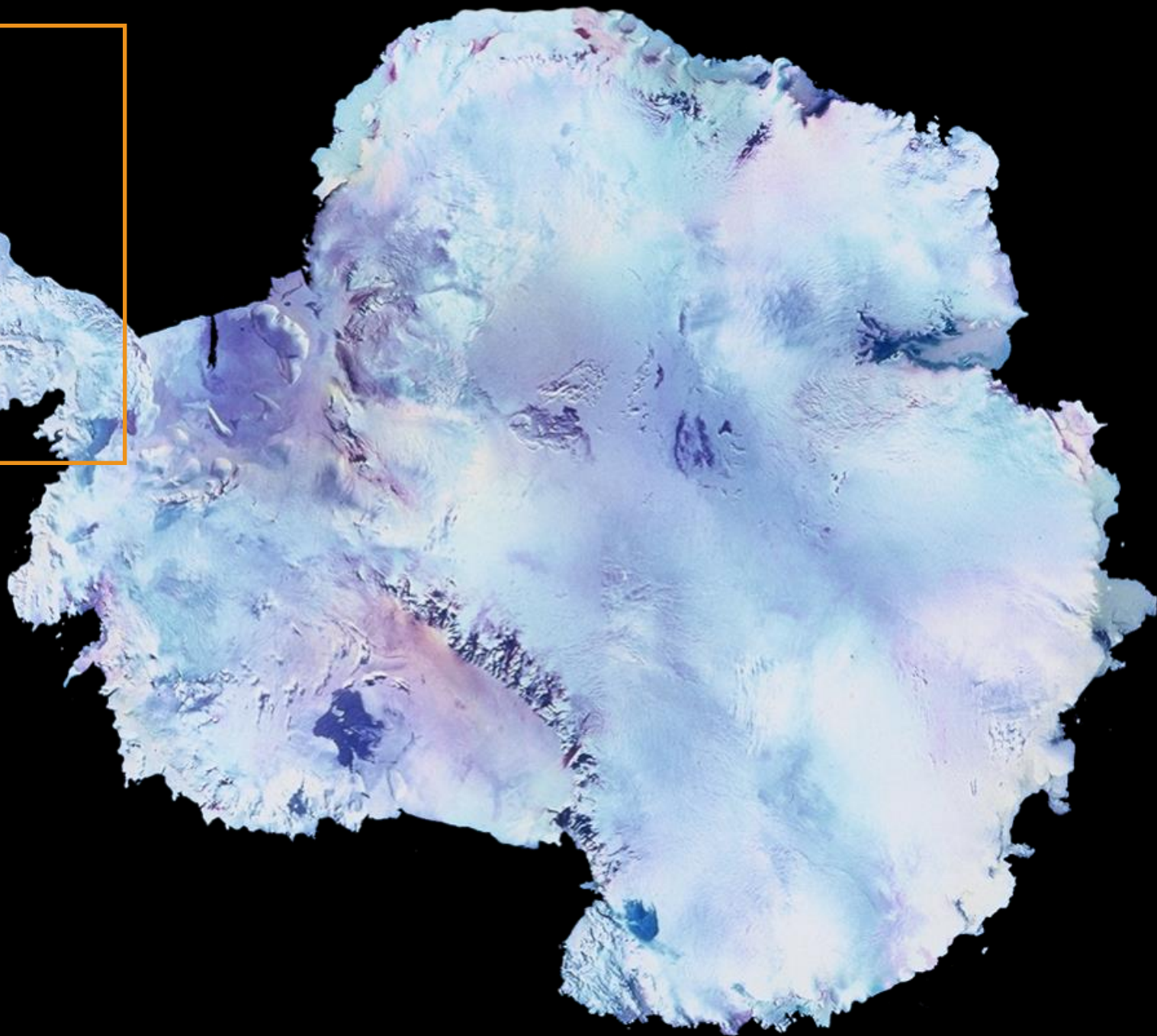


Declining Ice Mass in Greenland



Data: NASA
Images courtesy Anders Bjørk. © Natural History Museum of Denmark/Tholstrup (2013) and Danish Geodata Agency (1935)





We are already seeing the beginning...

**The Sunderbans mangroves have decreased by 20%
in the last 40 years...**



Flooding in Bangladesh

An aerial photograph showing a vast, flooded landscape in Bangladesh. The water is a murky, brownish-grey color, and the land is visible as irregular, dark brown patches. A single person is walking through the water in the center of the frame, carrying a bundle on their back. The overall scene conveys the extent of flooding and its impact on the environment.

Flooding from sea level rise, storm surges and tidal surges are all leading to increased soil salinity in Bangladesh



“Climate Change is a Medical Emergency.”

**Professor Hugh Montgomery, Co-Chair,
The 2015 Lancet Commission on
Health and Climate Change**

June 2015

Tropical Diseases on the Move



Background Map © James Hastings-Trew

*The exact point of origin of many diseases is uncertain



Aedes aegypti, the principal carrier of the Zika virus.

We now risk losing
up to
**50% of all
living species**
in this century



Source: Nicholas Stern, The Economics of Climate Change
Photo: © Dirk Ercken/Shutterstock

Projected Yield Declines For Each 1° C of Warming



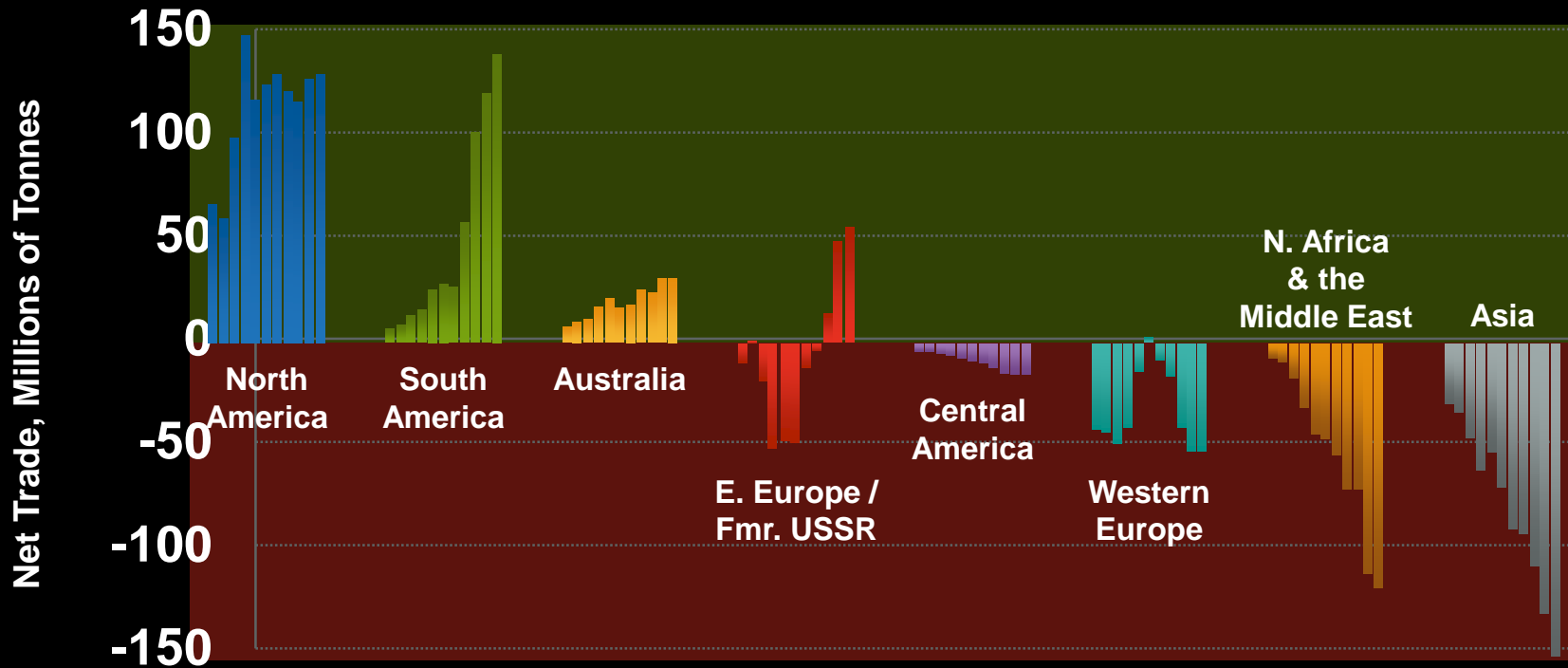
These four crops make up two thirds of human caloric intake.

Data: Chuang Zhao, et al., "Temperature increase reduces global yields of major crops in four independent estimates," *PNAS*, August 29, 2017.

Images: [Corn:] © EggHeadPhoto/Shutterstock; [Wheat:] © AlenKadr/Shutterstock; [Rice:] © ekotamak/Shutterstock; [Soy:] © Jiang HongYan/Shutterstock

Food Surpluses and Deficits

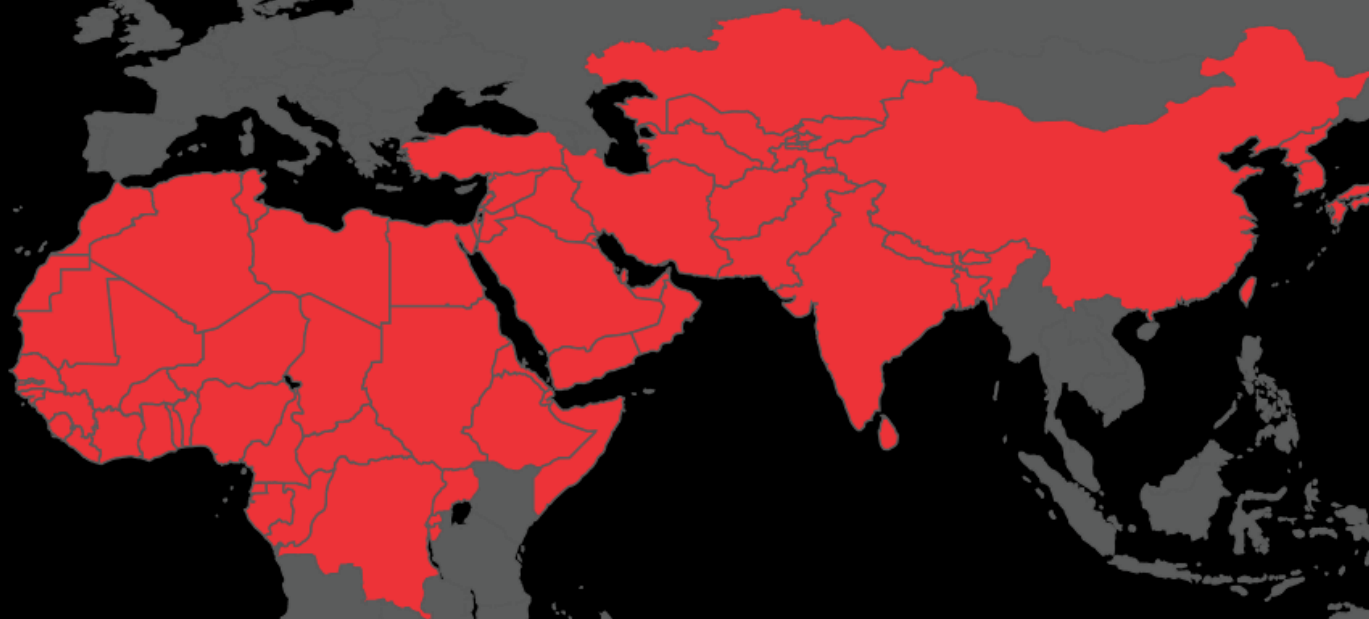
• 1965 – 2012



Water scarcity
already affects
more than 40%
of the world's population

Water Scarcity's Effect on GDP

• 2050

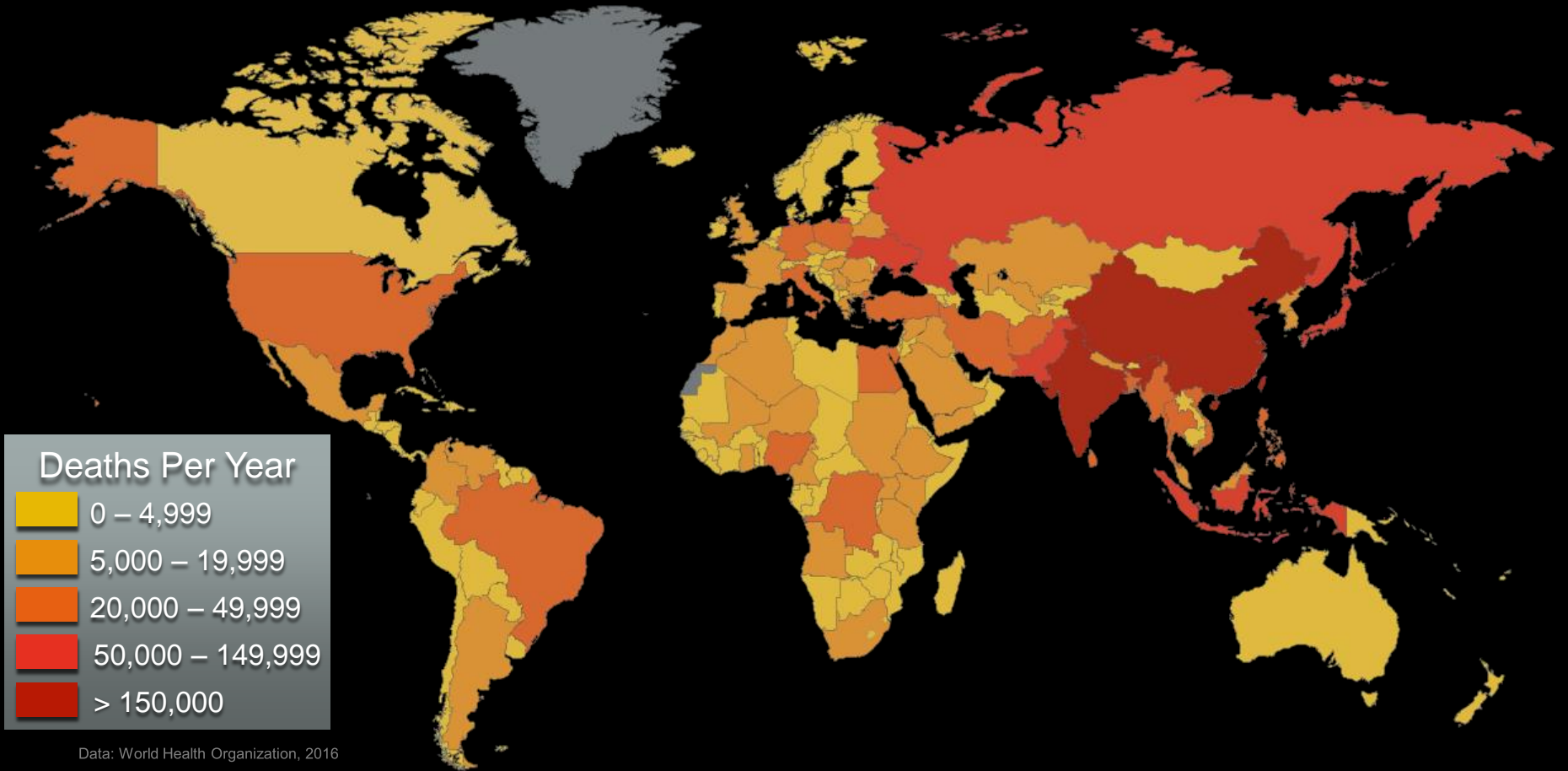


Countries that could lose up to 6% of GDP by 2050 under a business as usual scenario

Source: World Bank, 2016. "High and Dry: Climate Change, Water, and the Economy."

Worldwide,
air pollution kills
7 million people
every year

Deaths Attributable to Ambient Air Pollution

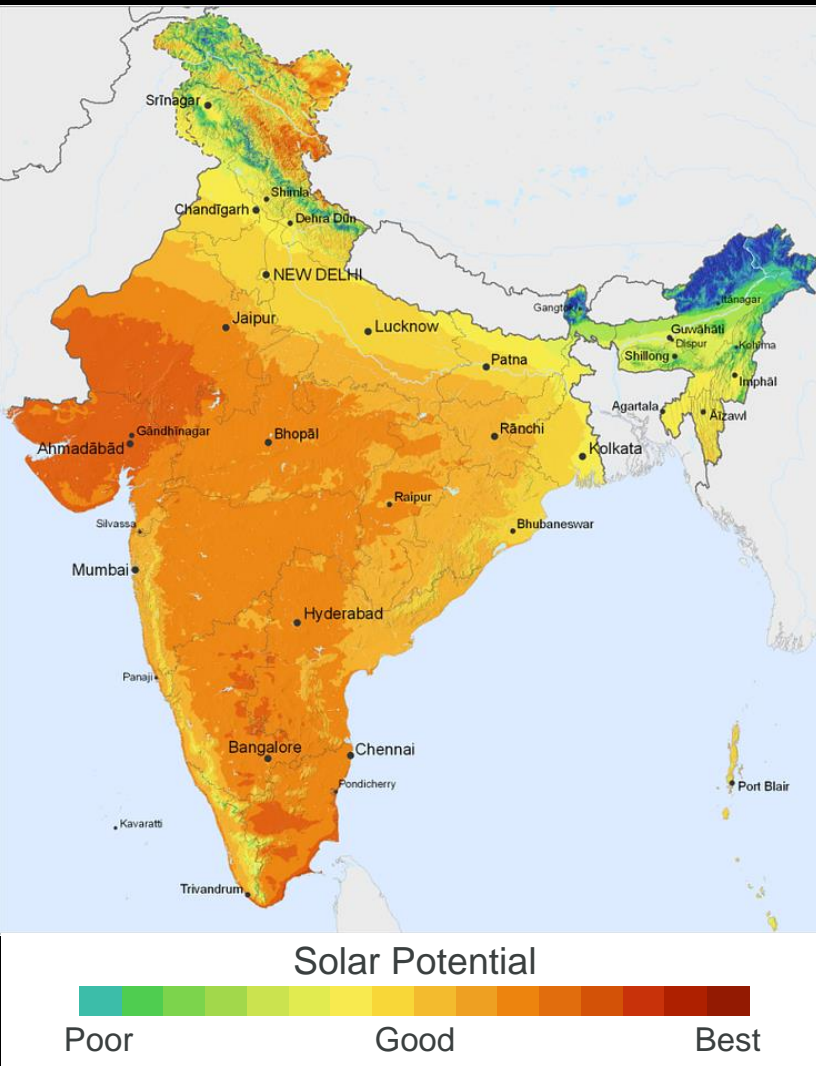


1. Must we change?

YES!

2. Can We change?

**We have
the solutions
at hand...**



Solar power in India is now cheaper than coal

Piyush Goyal,
India's Ex- Minister of State
for Power, Coal and New &
Renewable Energy

GHI Solar Map © 2016 Solargis cc by sa 3.0



Delhi, India

Laws are being changed!


In September 2014, Delhi instituted net metering, allowing individuals to sell solar electricity to the grid.

Low hanging fruit !

India could save \$42 billion each year with enhanced energy efficiency.

Chandrasan Village, Gujarat



A wide-angle photograph of a massive solar farm. The image is dominated by a dense, repeating pattern of blue solar panels stretching towards the horizon. The panels are arranged in long, parallel rows, creating a strong sense of perspective. In the foreground, a dirt path runs alongside the solar array. Two people are walking on this path, their small figures providing a sense of scale to the enormous size of the solar park. The sky is not visible, as the panels fill the upper portion of the frame.

The Indian states of Gujarat, Andhra Pradesh, and Telangana are all investing in large-scale solar energy initiatives.

Renewable Energy in India

Installed Capacity (GW)

62.5

50.0

37.5

25.0

12.5

0.0

62.5

50.0

37.5

25.0

12.5

0.0

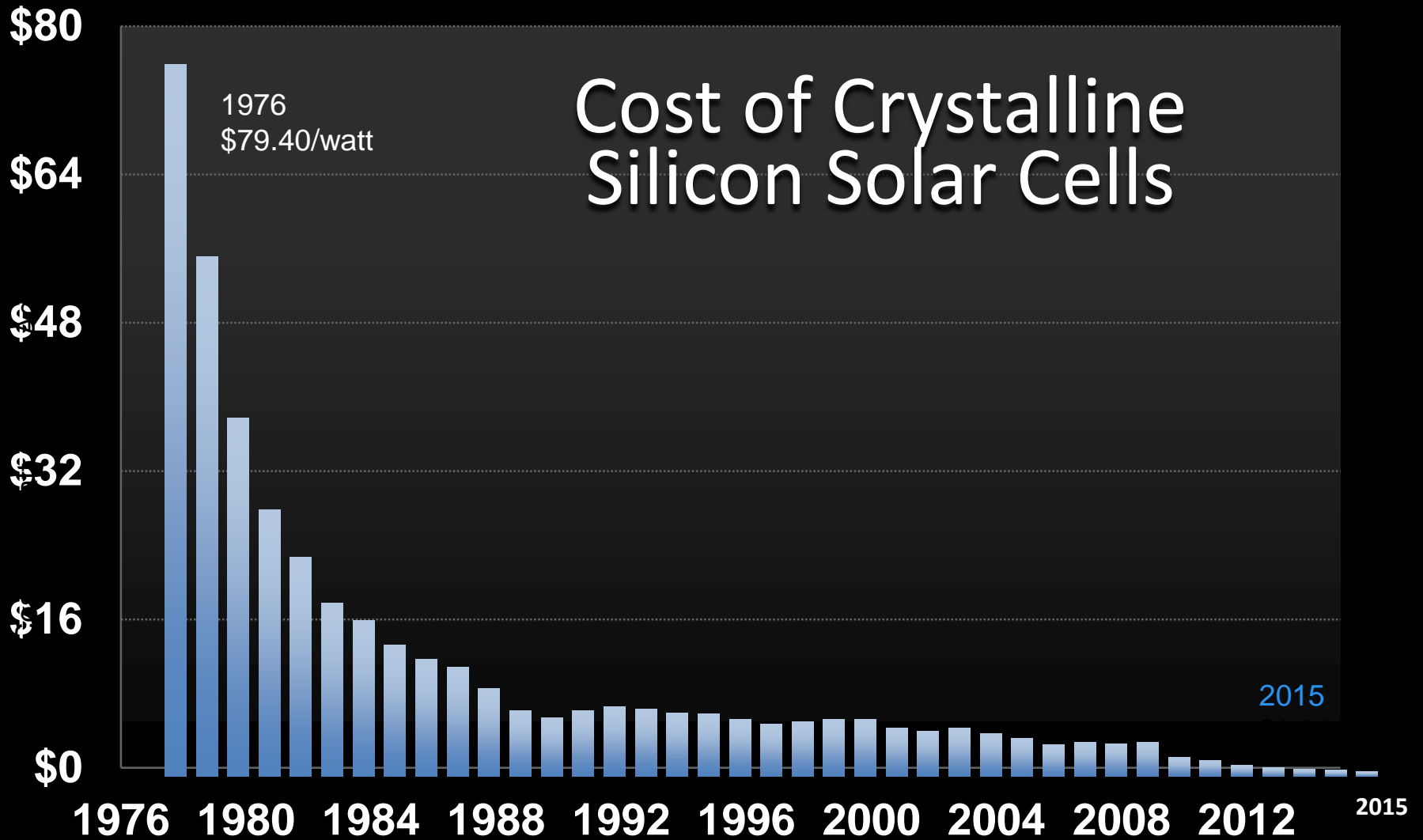
2013

2015

2017

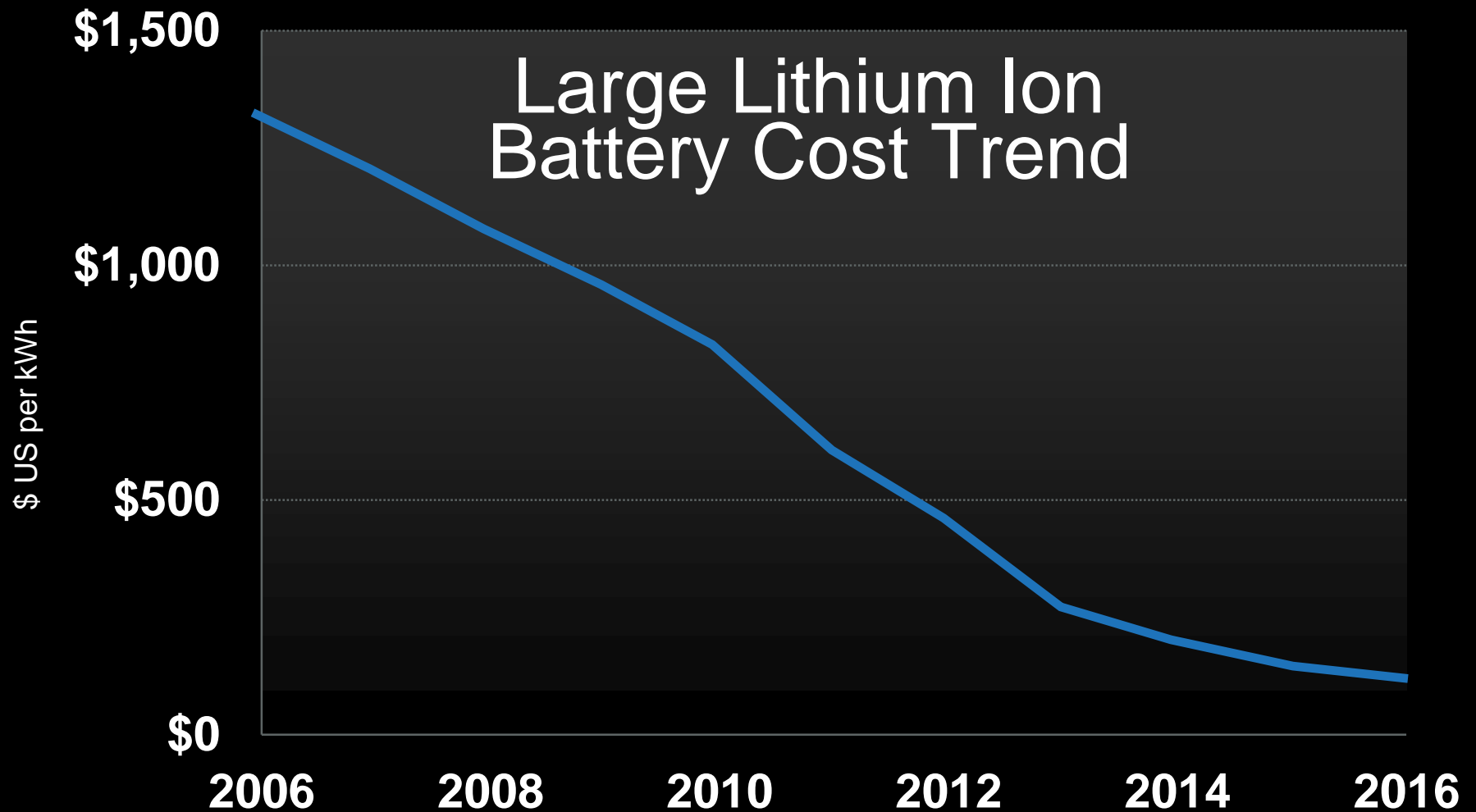
2022

Data: 2017 India's
Ministry of New
and Renewable
Energy (MNRE)



Data: Bloomberg New Energy Finance

Large Lithium Ion Battery Cost Trend



Data: 2014 Citigroup

Suzlon Wind Farm, Ahmedabad



9% of India's
electricity capacity is
in wind energy

Ahmedabad, India





Clean cookstoves use 50% less fuel
and reduce toxic emissions up to
80%

Indiatimes| The Times of India |The Economic Times

THE TIMES OF INDIA

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[News](#) » [Auto](#) » [Miscellaneous](#) » India aiming for all-electric car fleet by 2030, petrol and diesel to be tanked

India aiming for all-electric car fleet by 2030, petrol and diesel to be tanked

PTI | Updated: Apr 30, 2017, 06.26 PM IST



A-

A+


Countries Planning a Fossil Fuel Vehicle Phase-Out:

<u>Country/State</u>	<u>Date of Phase Out</u>
Norway	2025
Netherlands	2025 (passed by Parliament, pending in Senate)
India	2030
China	"In the near future"
Scotland	2032
France	2040
Britain	2040
Germany	Date of phase-out pending. Merkel: "The approach is right."

2. Can We change?

YES!

3. Will we change?

A nighttime photograph of the Eiffel Tower in Paris, France, illuminated with golden lights. The tower stands prominently on the left side of the frame. In the foreground, the Seine River flows, with several boats, including a large white tour boat, visible. The riverbanks are lined with trees and city lights. In the background, the Pont de la Concorde bridge is visible, featuring ornate statues and fountains. The sky is a deep blue with some clouds.

In the 2015 Paris Agreement, India and virtually every nation in the world agreed to work together to achieve net zero greenhouse gas emissions.



Paris, France

Prime Minister Modi and French President François Hollande launched the International Solar Alliance in Paris on November 30, 2015

WE ARE STILL IN

125 Cities

9 States

183 Colleges and Universities

902 Businesses and Investors

All committed to the Paris Climate Agreement





Source: NASA

Facebook: facebook.com/ClimateRealityIndia

Twitter: @tcrpindia

Website: www.climatereality.org.in

THANK YOU FOR YOUR TIME

www.climatereality.org.in



The Climate
Reality Project
INDIA