

Climate Reality

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**The Climate
Reality Project®**

NORTHERN NEW MEXICO CHAPTER











~~Wain~~

~~JESUS~~

LOVES

YOU!

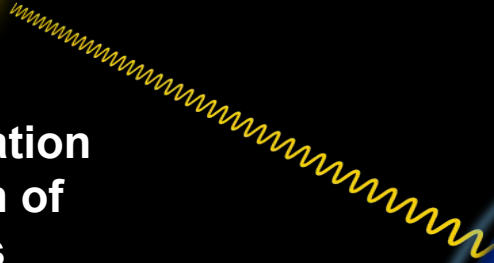
A LOT!!

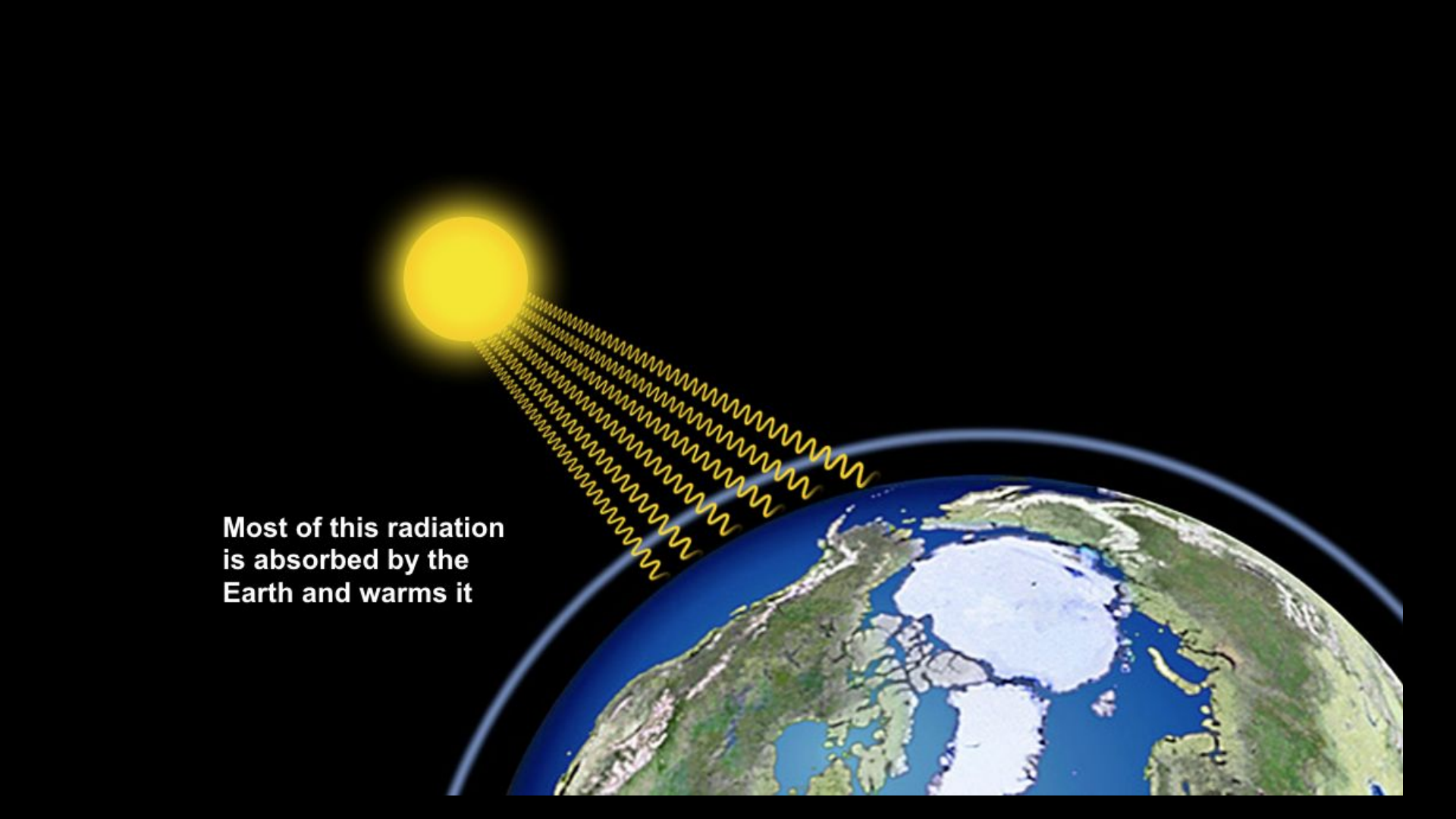
Things to
know #1:
It's not new
Greenhouse Effect was
first described by Joseph
Fourier in 1824



Things to know #2: How it works

**Solar radiation
in the form of
lightwaves
passes through the
atmosphere**

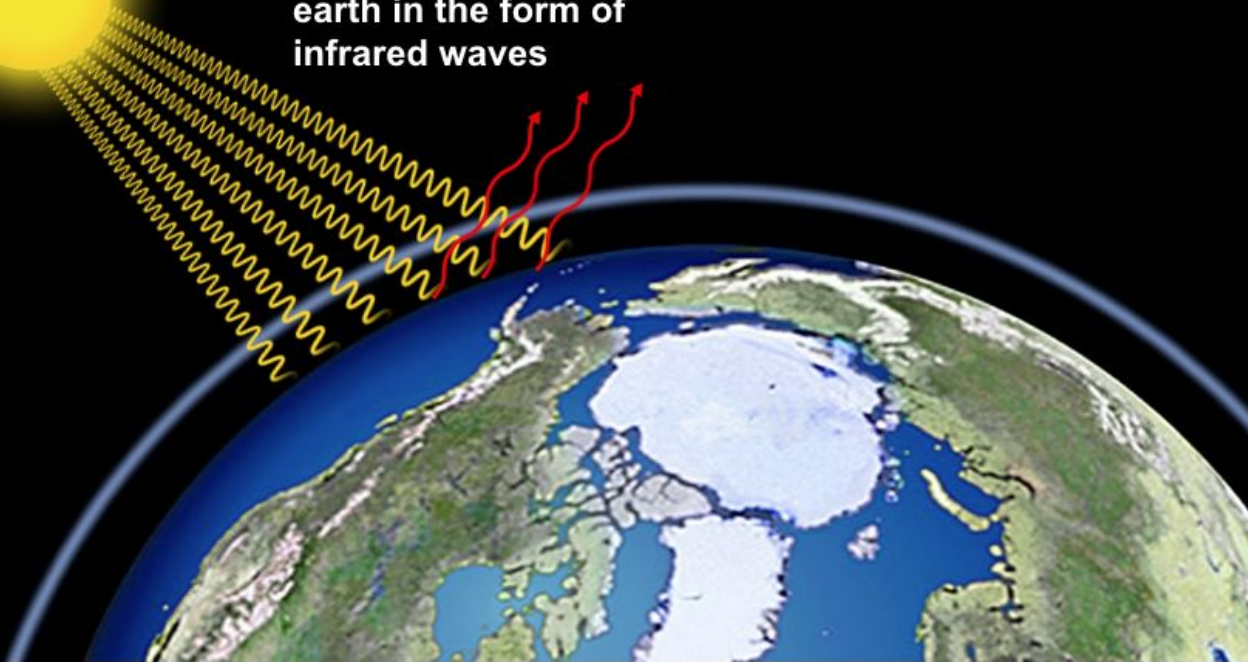


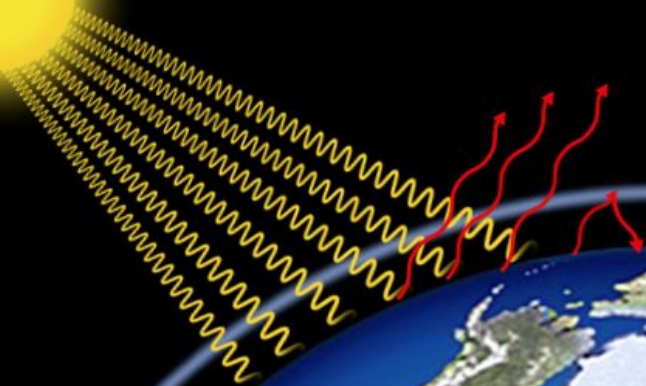
A diagram showing a bright yellow sun in the upper left corner. From the sun, several parallel wavy lines representing electromagnetic radiation extend towards the right. These lines are directed towards the Earth, which is shown as a curved horizon in the lower right. The Earth's surface is depicted with green landmasses, blue oceans, and white ice sheets. The background is a solid black space.

**Most of this radiation
is absorbed by the
Earth and warms it**

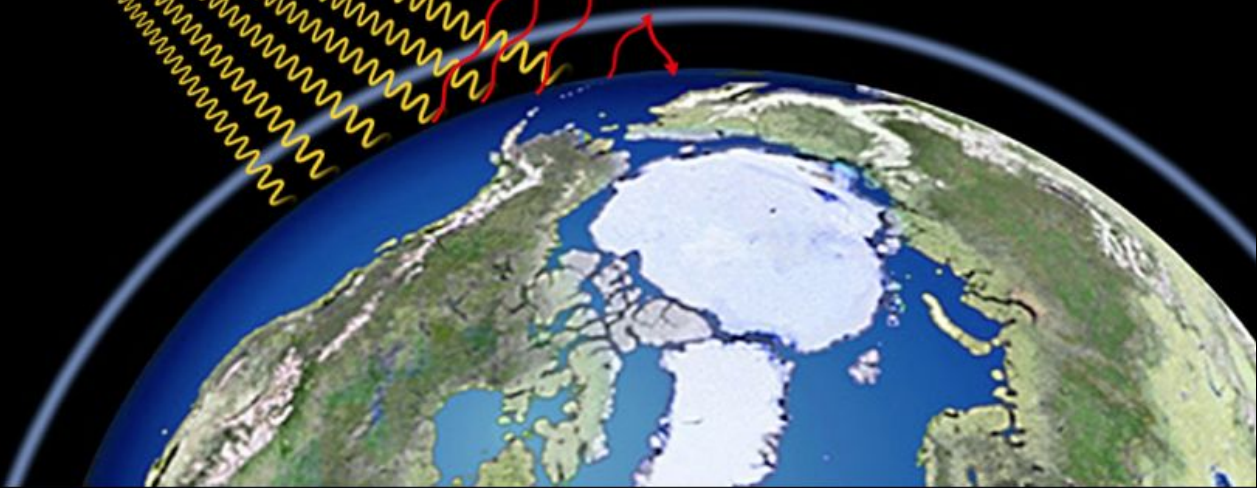


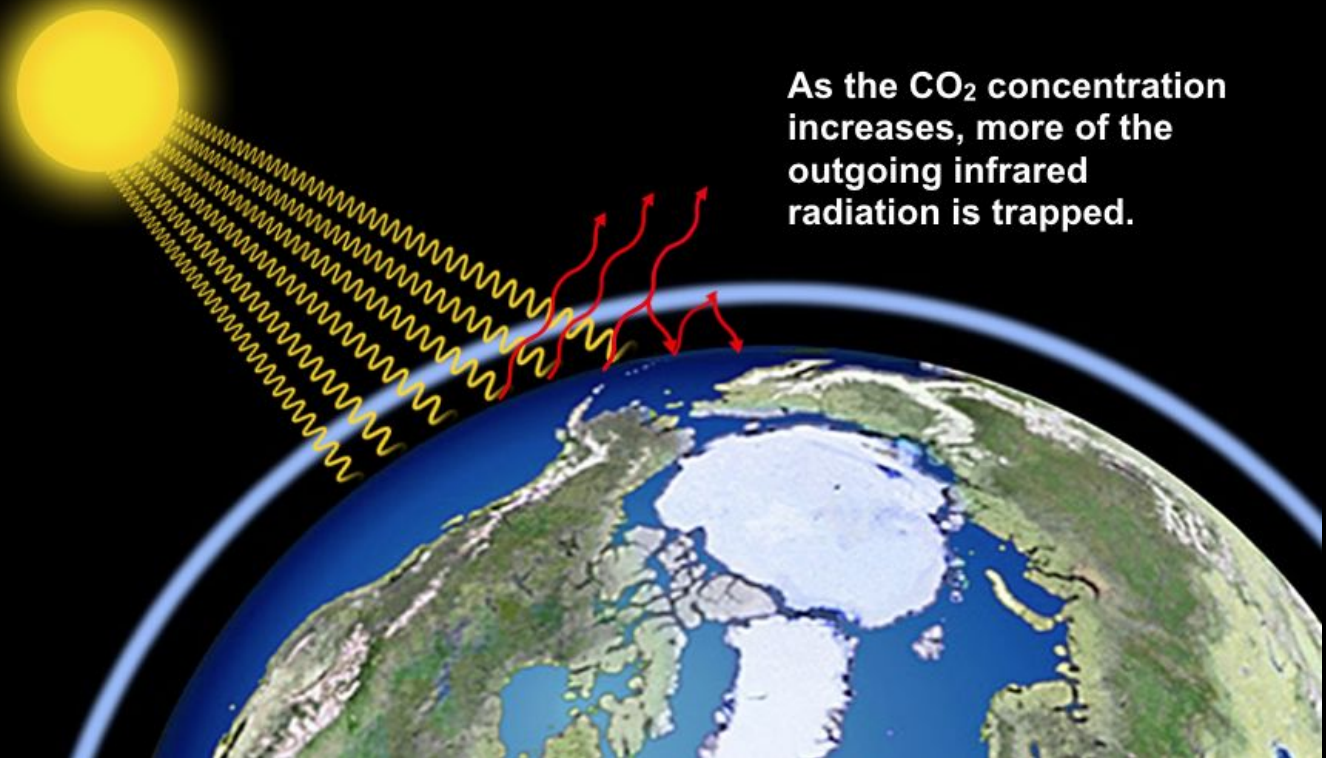
Some energy is radiated
back into space by the
earth in the form of
infrared waves





Some of this outgoing infrared radiation is trapped by the earth's atmosphere and warms it

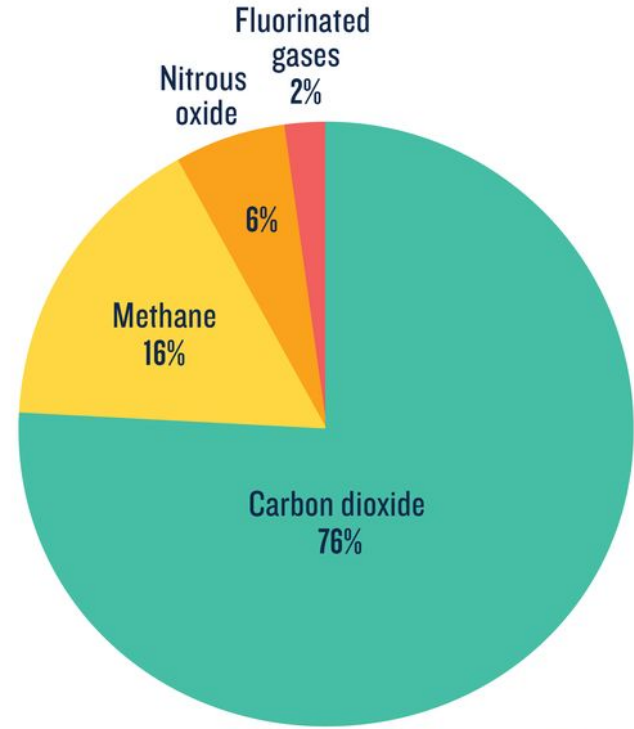




As the CO₂ concentration increases, more of the outgoing infrared radiation is trapped.

Things to know #3:

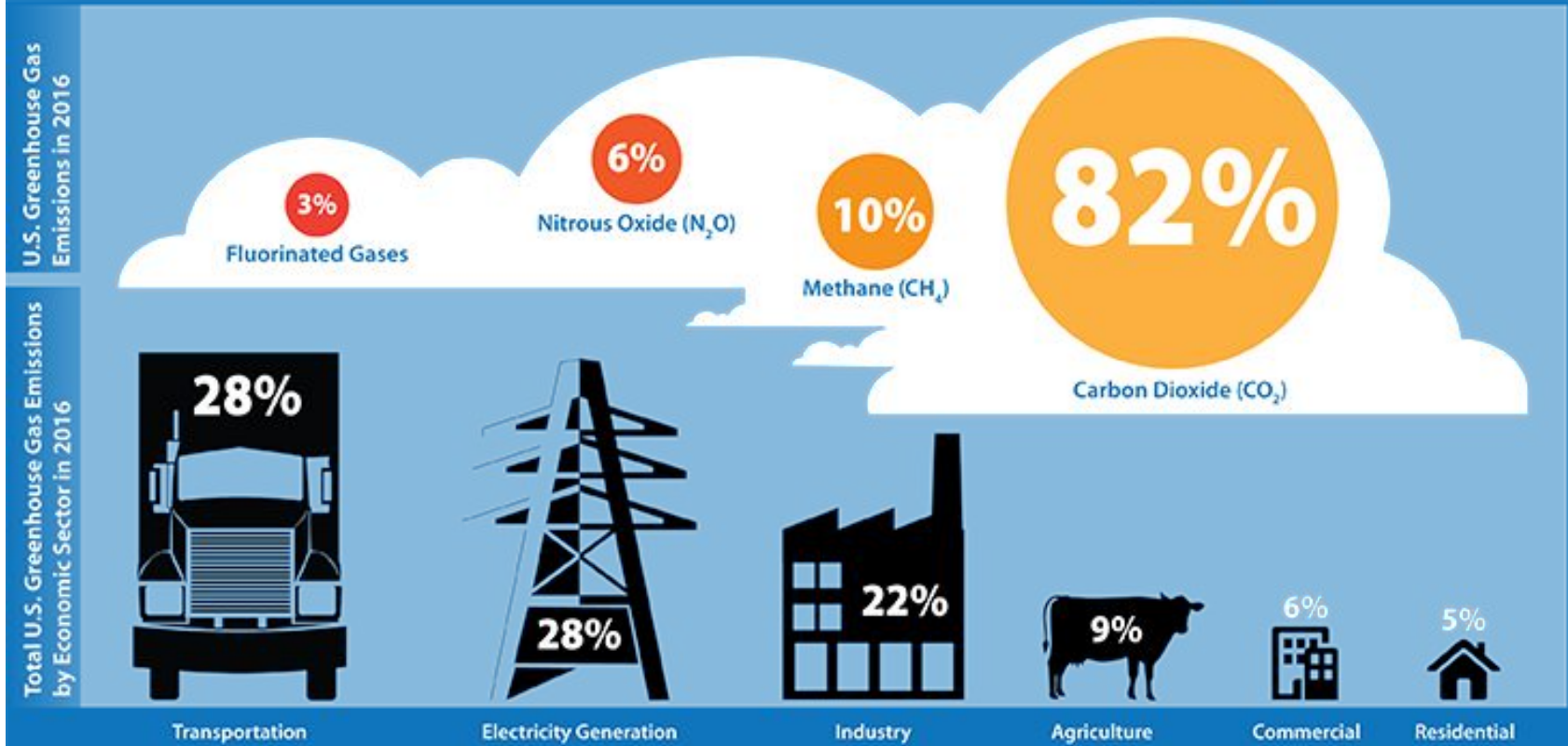
Not Just CO₂



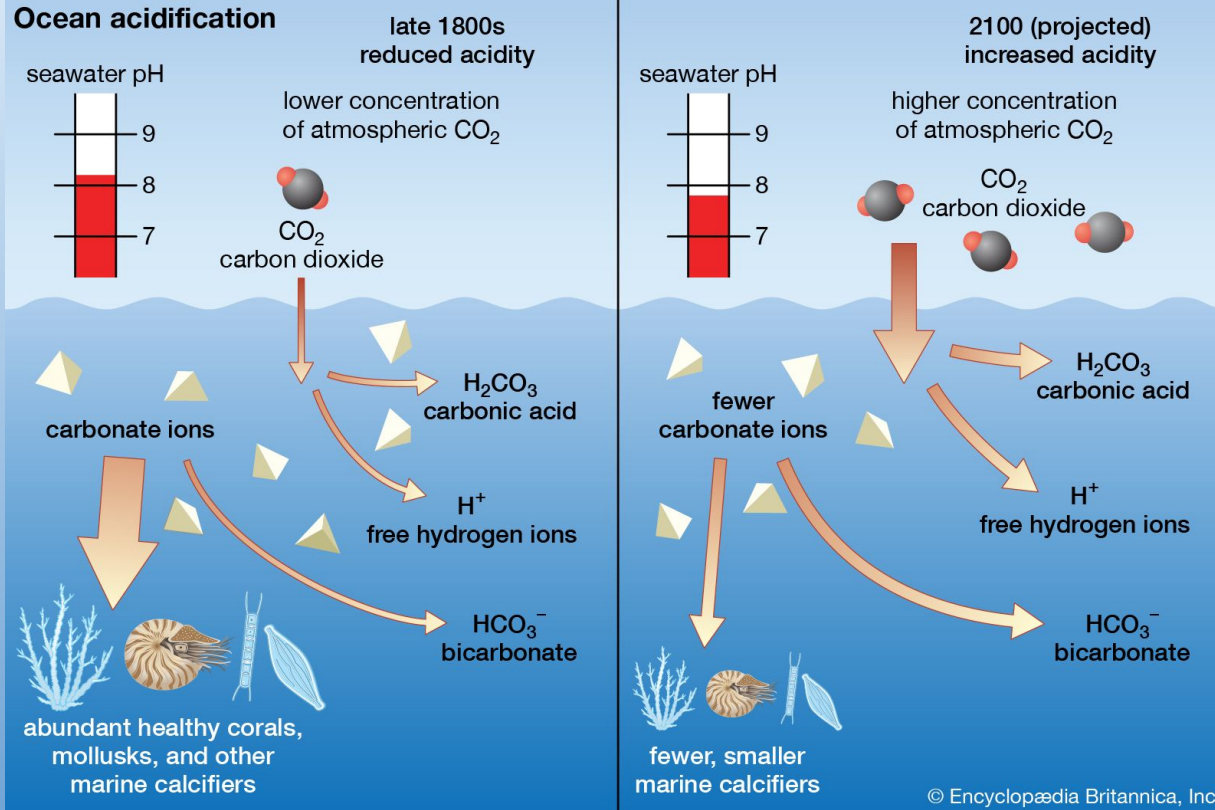
Source: IPCC (2014)

How much each human-caused greenhouse gas contributes to total emissions around the globe.

Things to know #4: Sources of GHG



Things to know #5: Not Just Temperature



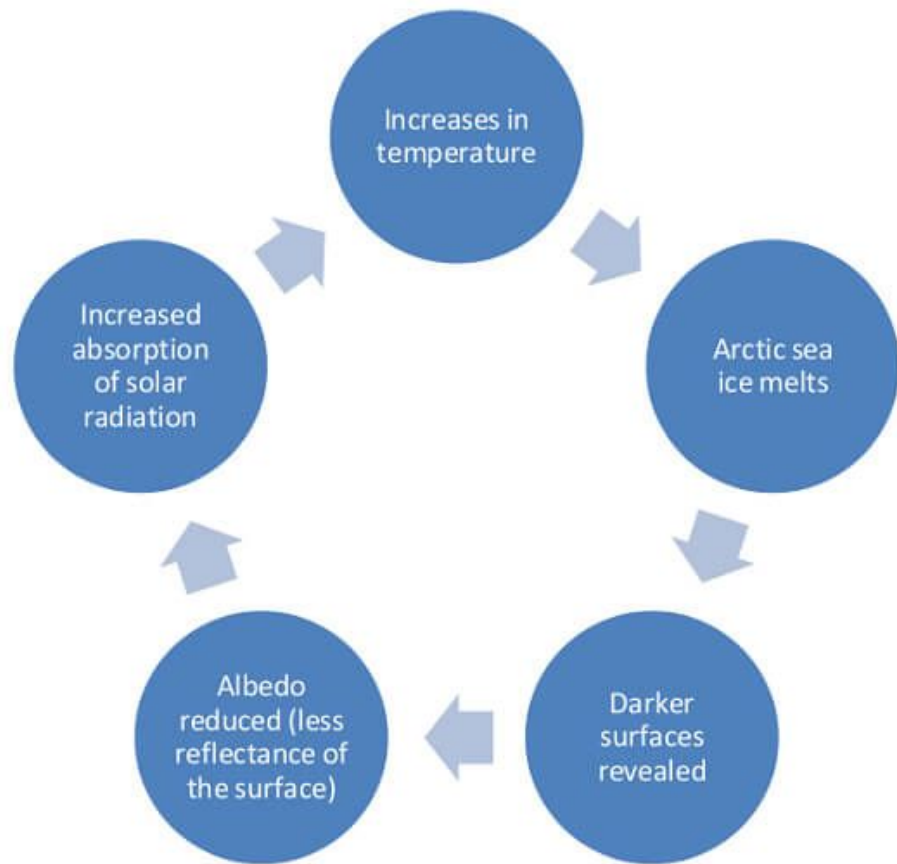
Things to know #6: Feedback Loops

Positive (amplifies):

- Albedo reductions
- Forest die off
- Forest burning
- Methane releases from hydrates, permafrost
- Methane released from decomposition of frozen organic matter
- Water Vapor increase due to warmer air

Negative (decreases impact):

- Cloud Cover Increases
- Increased Plant Growth Lowers CO₂
- Blackbody Radiation



Feedback Loops Run Amok

Between 1.5°C - 2°C above baseline is considered the point when the positive feedback loops start playing a significant role. This can lead to runaway, or abrupt changes.

Worst Case: Permian Extinction

- Spike in CO₂ emissions from volcanic activity and CH₄ from single celled *Methanosarcina* caused rapid temperature rise.
- About 250 million years ago
- Approximately 90% lost of life on land - 95% in the ocean

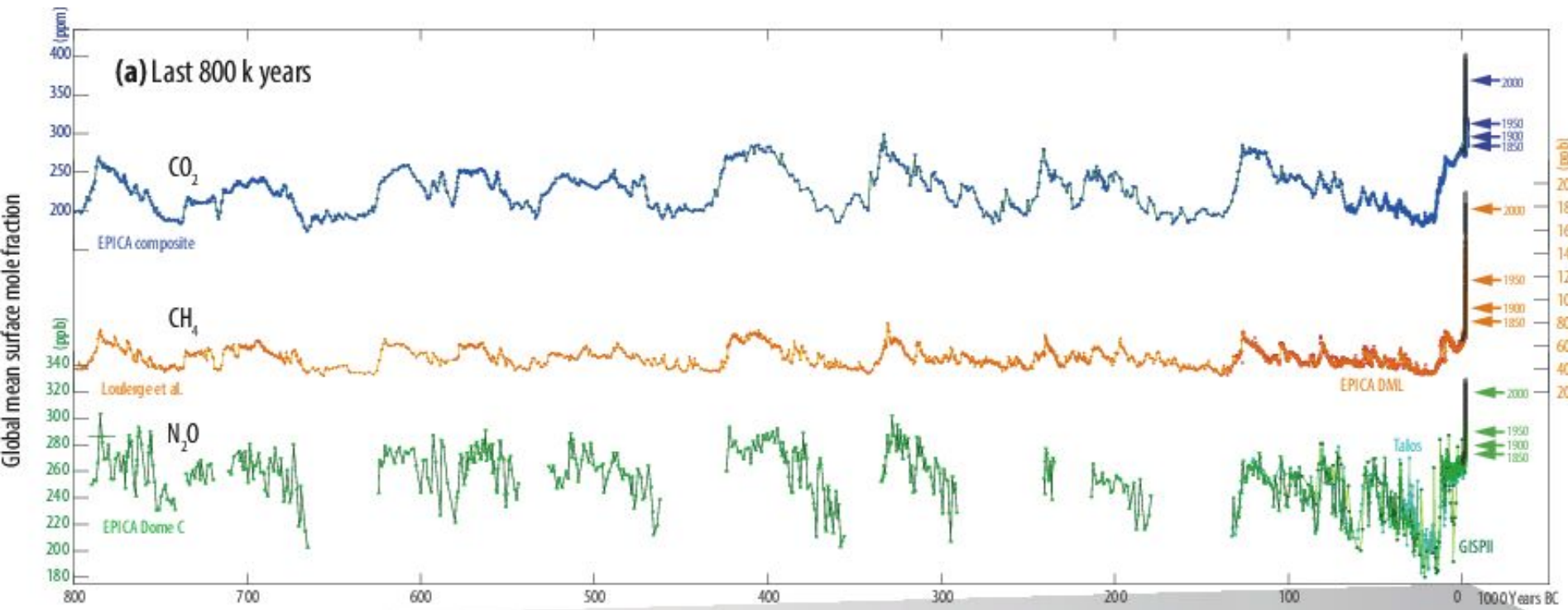
Where are We Currently?

- The planet has warmed to 1°C above pre-industrial temperatures.
- CO₂ hit 415ppm on May 12, 2019 up from pre-1880 level of 280 ppm.
- We still release around 2.57 million pounds of CO₂ every second.
- October 2019 was the hottest October on record.

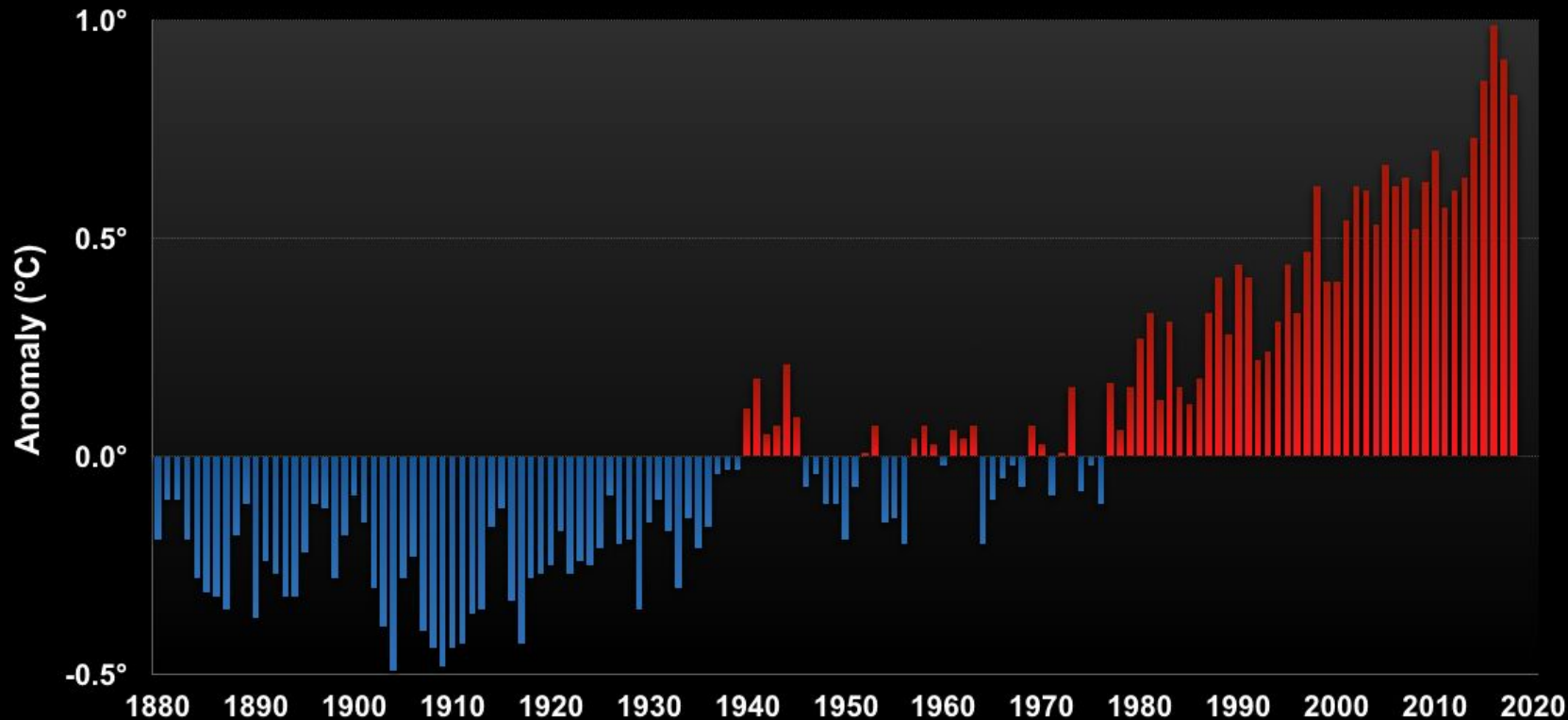
Top 10 warmest years (NOAA) (1880–2018)

Rank	Year	Anomaly °C	Anomaly °F
1	2016	0.94	1.69
2	2015	0.90	1.62
3	2017	0.84	1.51
4	2018	0.77	1.39
5	2014	0.74	1.33
6	2010	0.70	1.26
7	2013	0.66	1.19
8	2005	0.65	1.17
9	2009	0.64	1.15
10	1998	0.63	1.13

GHG Past to Current

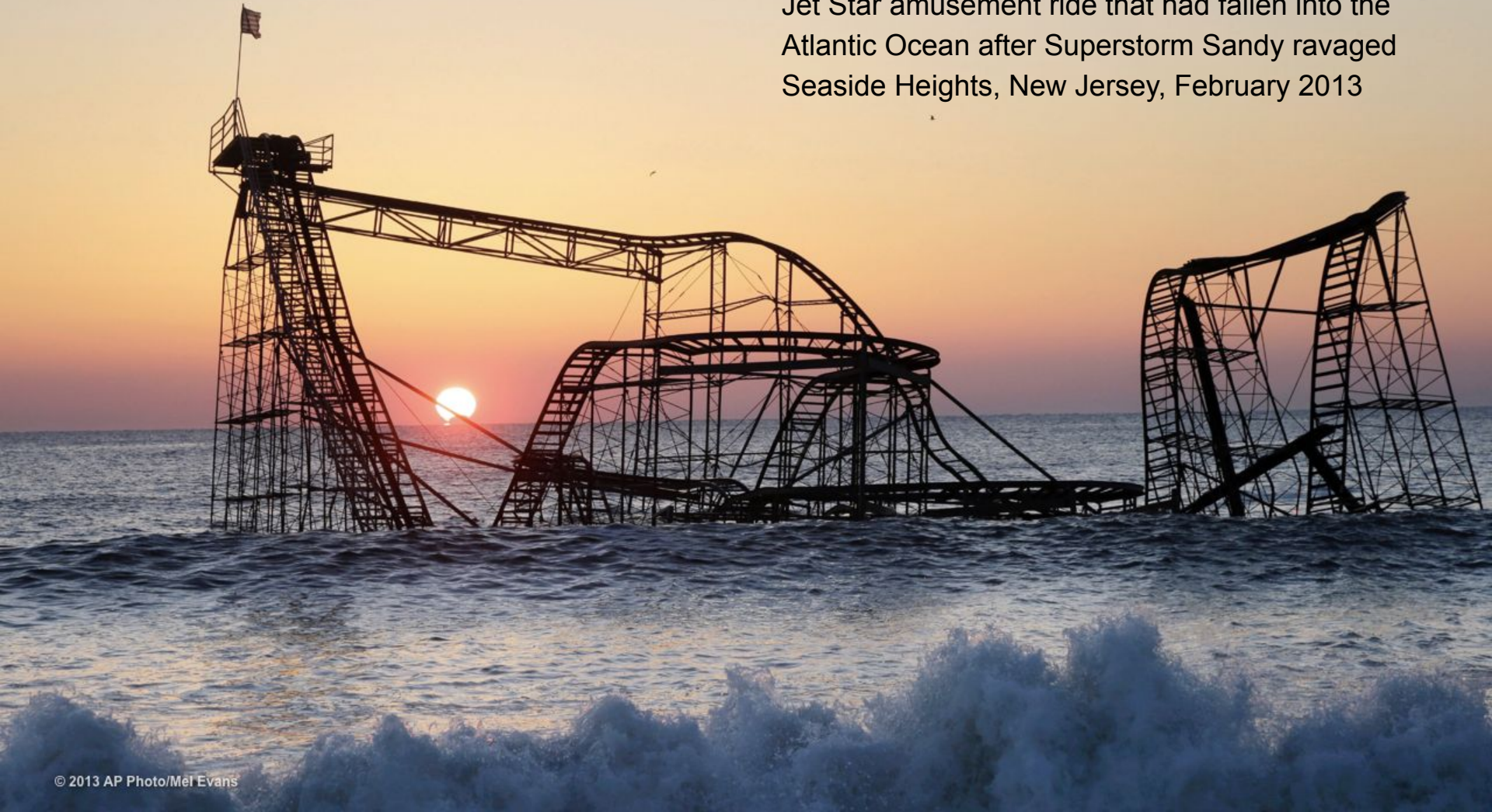


Atmospheric CO₂ and Earth Surface Temp 1880- 2018



Impacts

Jet Star amusement ride that had fallen into the Atlantic Ocean after Superstorm Sandy ravaged Seaside Heights, New Jersey, February 2013



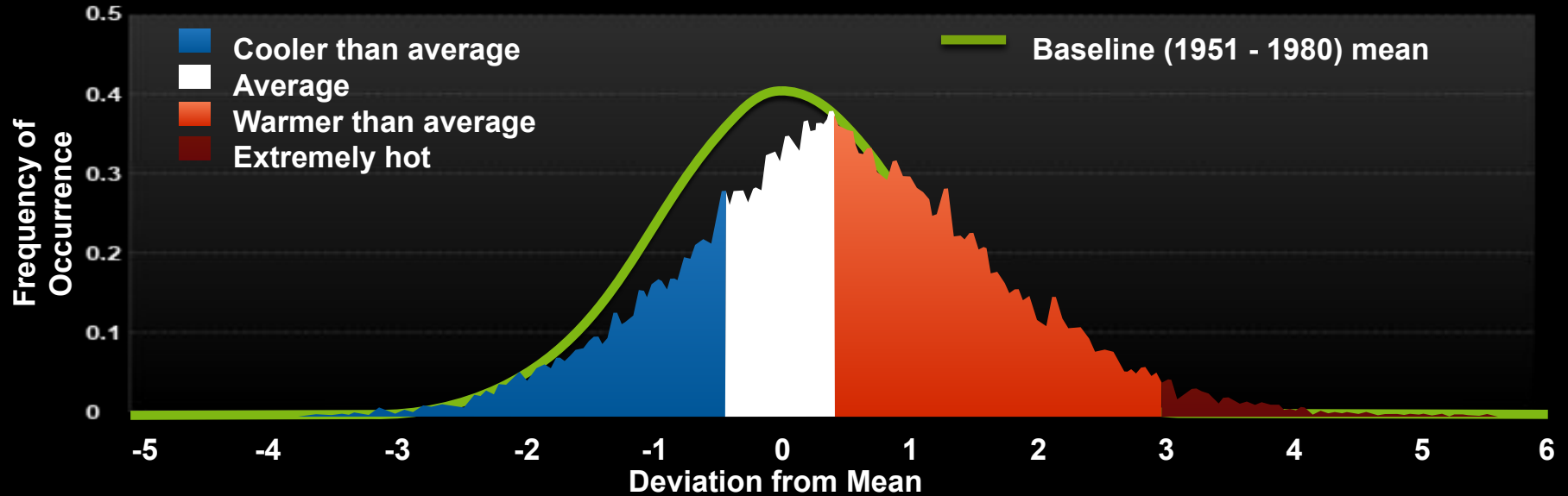
Summer Temperatures Have Shifted

1951 – 1980



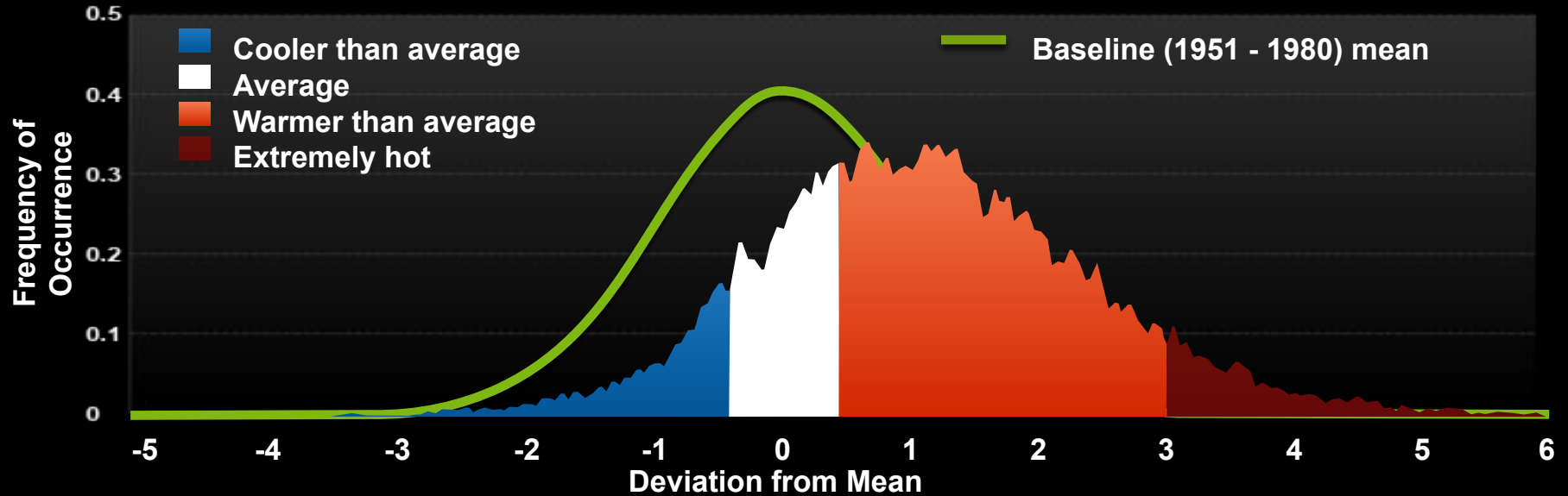
Source: NASA/GISS; Hansen, et al., "Perceptions of Climate Change," Proc. Natl. Acad. Sci. USA 10.1073, August 2012 - Updated 2016

1983 – 1993



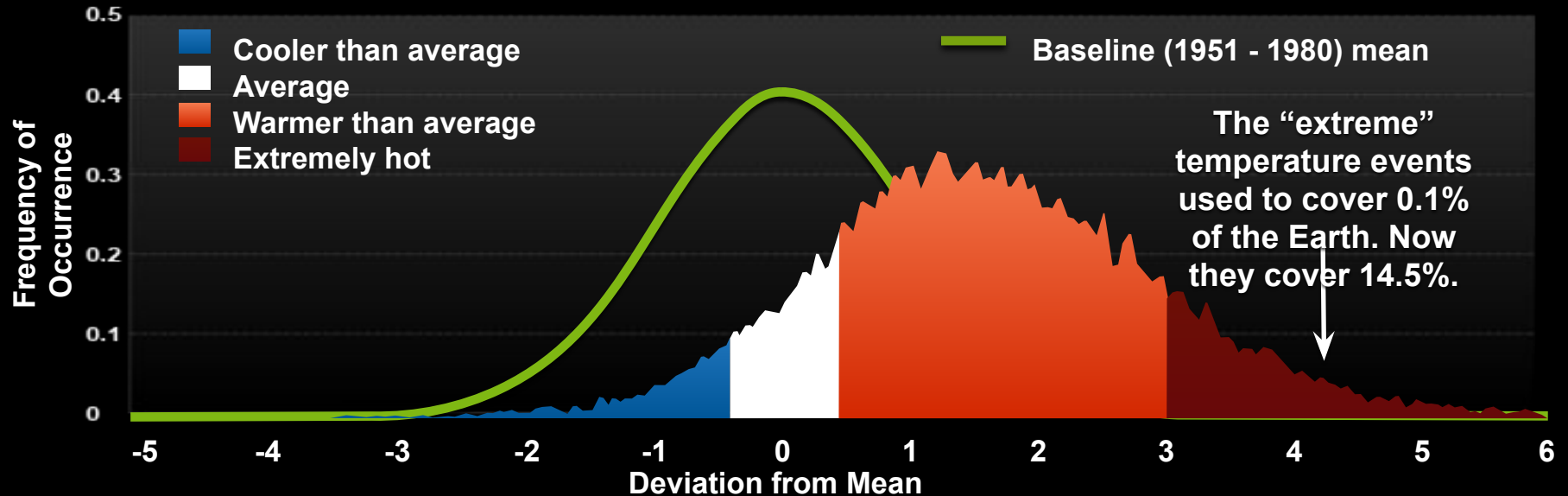
Source: NASA/GISS; Hansen, et al., "Perceptions of Climate Change," Proc. Natl. Acad. Sci. USA 10.1073, August 2012 - Updated 2016

1994 – 2004



Source: NASA/GISS; Hansen, et al., "Perceptions of Climate Change," Proc. Natl. Acad. Sci. USA 10.1073, August 2012 - Updated 2016

2005 – 2015



Source: NASA/GISS; Hansen, et al., "Perceptions of Climate Change," Proc. Natl. Acad. Sci. USA 10.1073, August 2012 - Updated 2016

**Thirty years ago the mosquito
season in Minneapolis was
74 days long, on average.**

Now it averages 108 days each year.

The background of the slide is an underwater view of the ocean surface, showing blue water with light filtering through and some bubbles or ripples near the top.

The world's oceans are
now
30% more acidic,
on average, than they were
before the industrial
revolution.

The temperature at the
North Pole was **50° F**
(**28° C**) **hotter than**
normal
on February 25, 2018.



Bellevue, Nebraska

March 19, 2019

States of emergency were declared in two-thirds of Nebraska's 94 counties and in four tribal areas.



The waterskloof Reservoir, Western Cape, South Africa

February 8, 2018

South Africa's
Western Cape
province faced a
severe drought in
2018.



Schwüblingsen, Germany

August 22, 2018

**2018's droughts
in Europe
resulted in \$3.9
billion in
economic
losses.**



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

Amritsar, India

June 2, 2019



Redding, California

July 27, 2018



The Carr Fire burned over 229,000 acres and destroyed more than 1,000 homes.

**In the United States
12 million people
could lose their homes
due to sea level rise
with a warming of 2° C.**

Source: Climate Central

Impacts on NM

Projected annual temperature change by 2050

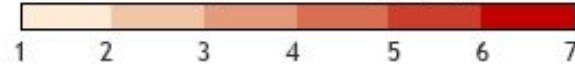
all projections

warmest 20%

coolest 20%



Temperature change (°F)

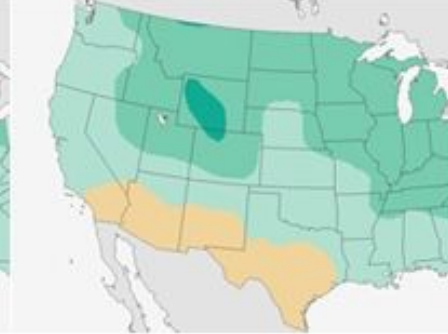


Projected annual precipitation change by 2050

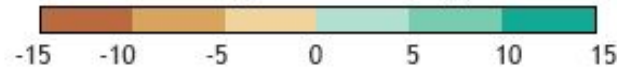
all projections

wettest 20%

driest 20%



Precipitation change (%)

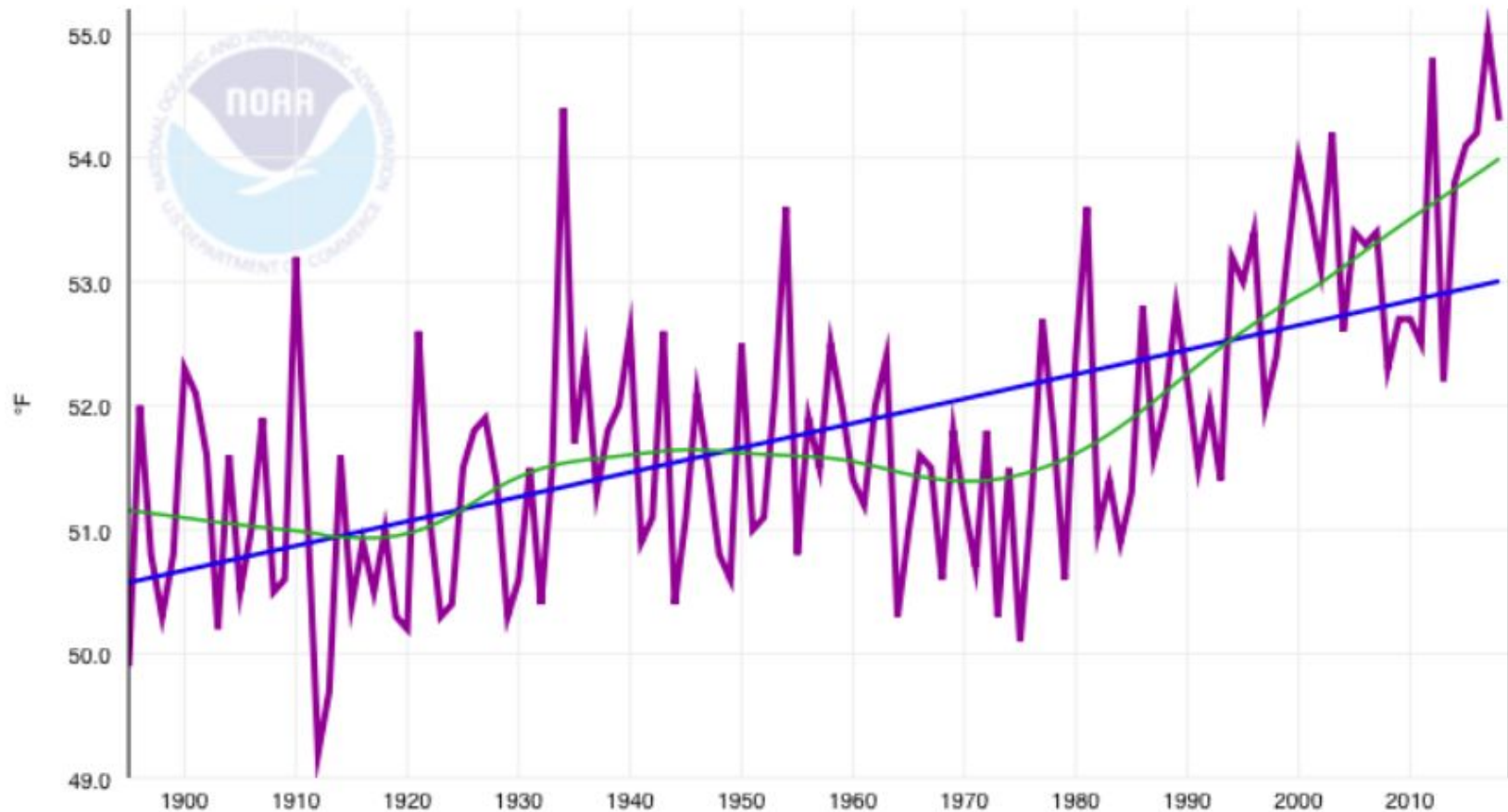


Southwest Climate Region, Average Temperature, January-December

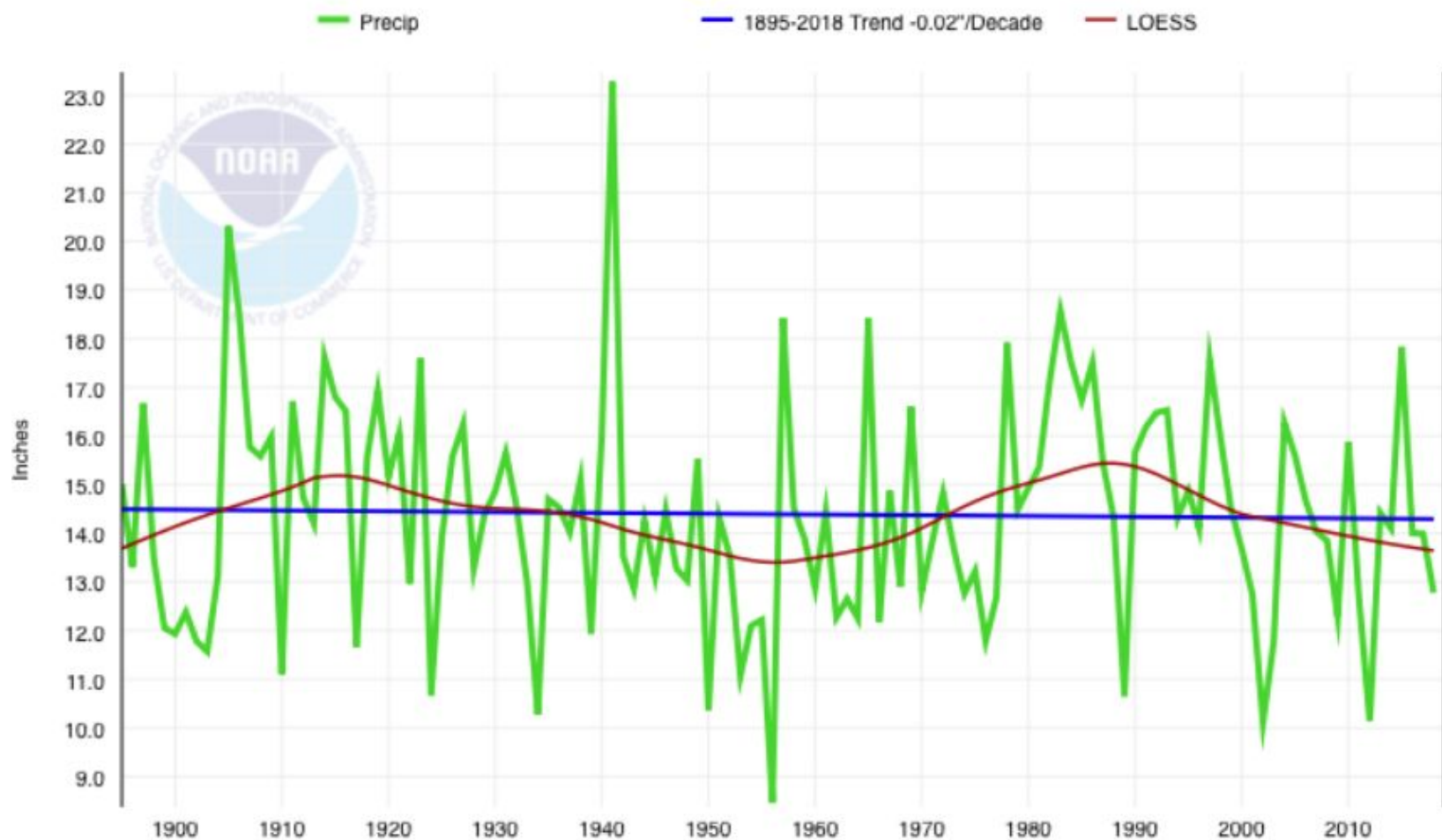
— Avg Temperature

— 1895-2018 Trend +0.2°F/Decade

— LOESS

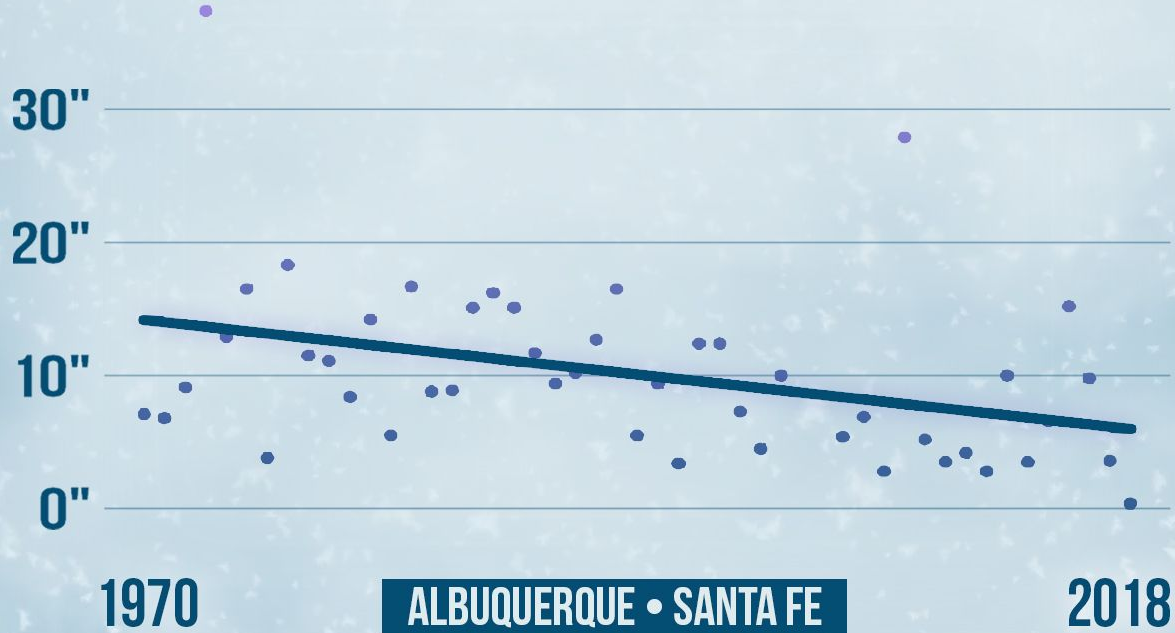


Southwest Climate Region, Precipitation, January-December



SNOWFALL

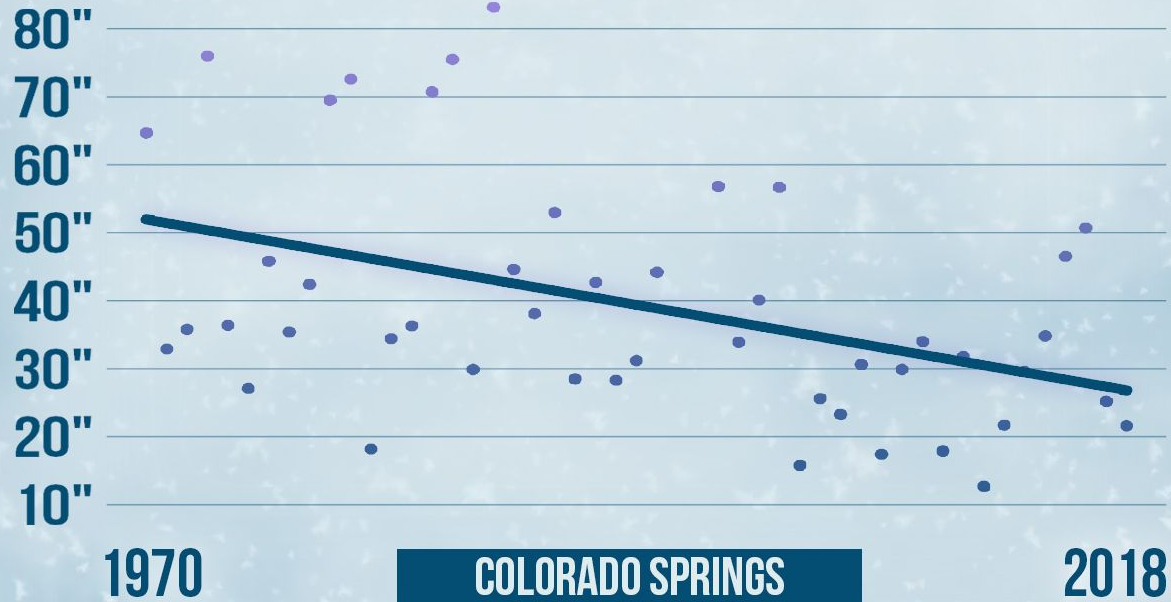
YEARLY SNOW TOTALS



July-June totals
Source: RCC-ACIS.org

SNOWFALL

YEARLY SNOW TOTALS

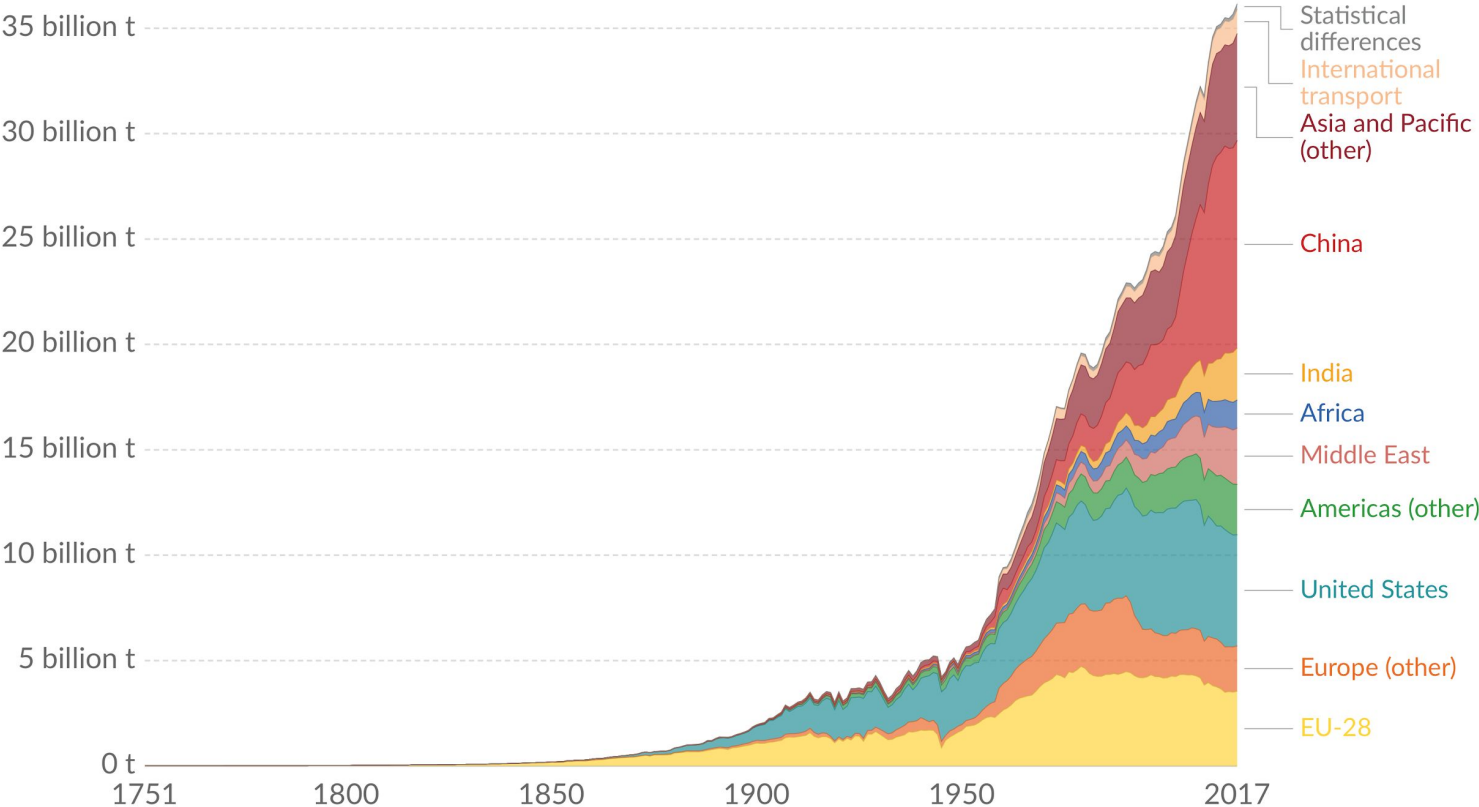


July-June totals
Source: RCC-ACIS.org

What Needs to Happen?

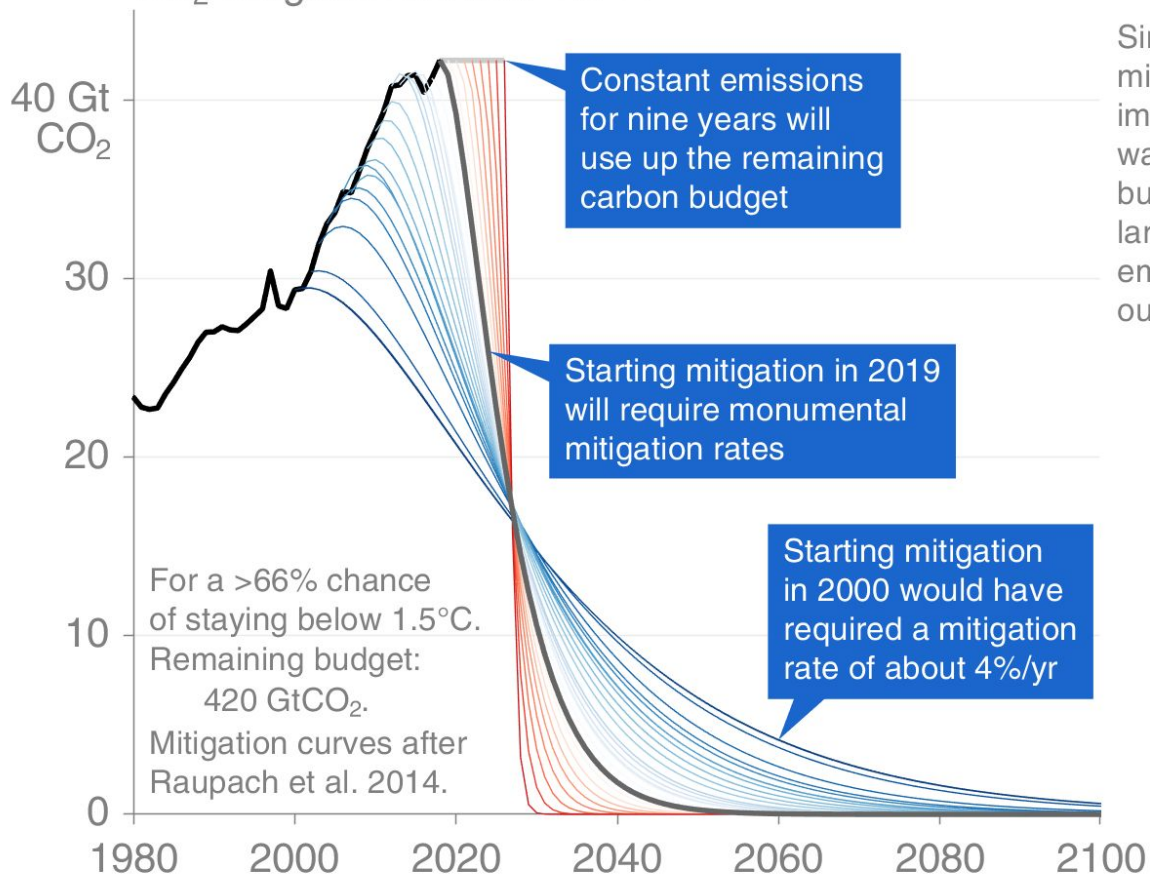
United Nations Intergovernmental Panel on Climate Change (IPCC) says we have until 2030 to reduce CO₂ emissions by 50% from 2010 levels to stay below 1.5°C temperature rise.

Annual total CO2 emissions, by world region



Source: Carbon Dioxide Information Analysis Center (CDIAC); Global Carbon Project (GCP)
Note: "Statistical differences" notes the discrepancy between estimated global emissions and the sum of all national and international transport emissions.
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

CO₂ mitigation curves: 1.5°C



Since such steep mitigation is impossible, the only way to achieve this budget is with very large "negative" emissions: pulling CO₂ out of the atmosphere.

In a statement published on Nov. 5, 2019 in the journal *BioScience* 11,000 scientists from 153 countries wrote Declared A Climate Emergency And Warned Of "Untold Suffering"

In a statement published on Nov. 5, 2019 in the journal *BioScience* 11,000 scientists from 153 countries wrote:

"An immense increase of scale in endeavors to conserve our biosphere is needed to avoid untold suffering due to the climate crisis."

What can you do?

- Food
- Transportation
- Home
- Reduce Consumption
- Donate
- Join Local Groups
- Petition Decision Makers

Personal Actions to Reduce CO₂

Switch Off Vampire Loads

Stop Eating Meat

Fuel-efficient Car

Regional and seasonal food

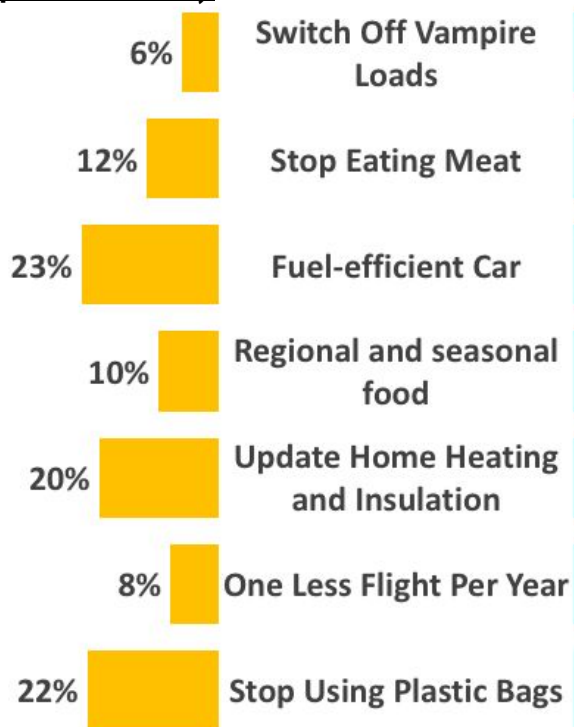
Update Home Heating and Insulation

One Less Flight Per Year

Stop Using Plastic Bags

Personal Actions to Reduce CO₂

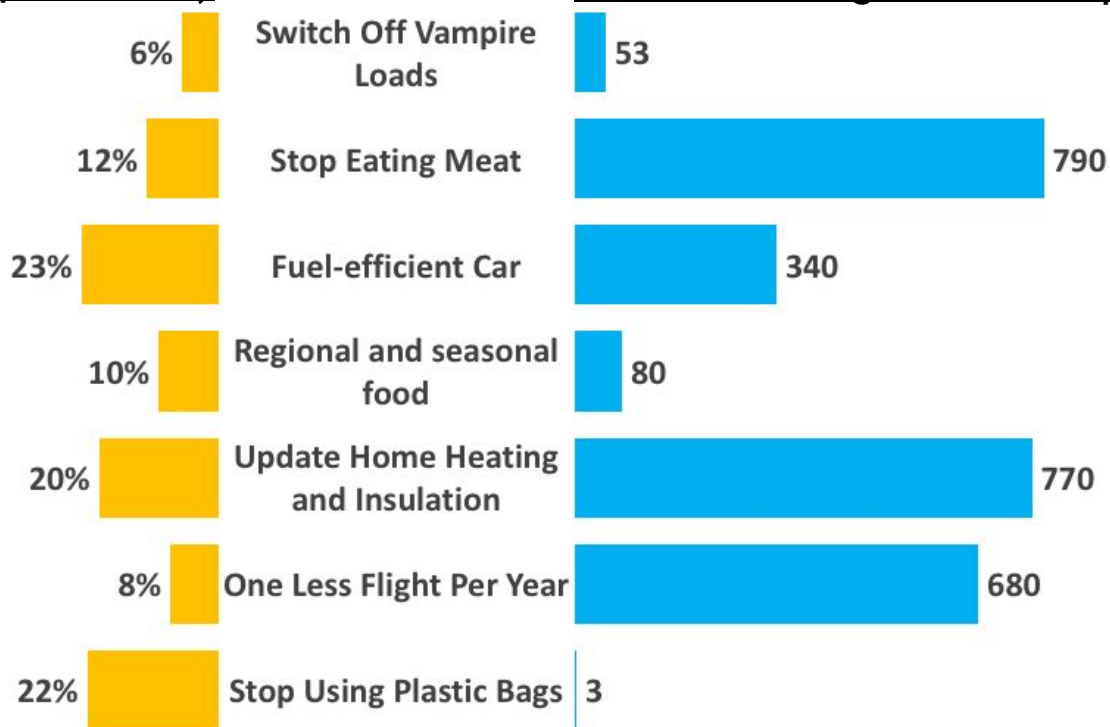
Belief (% of respondents)



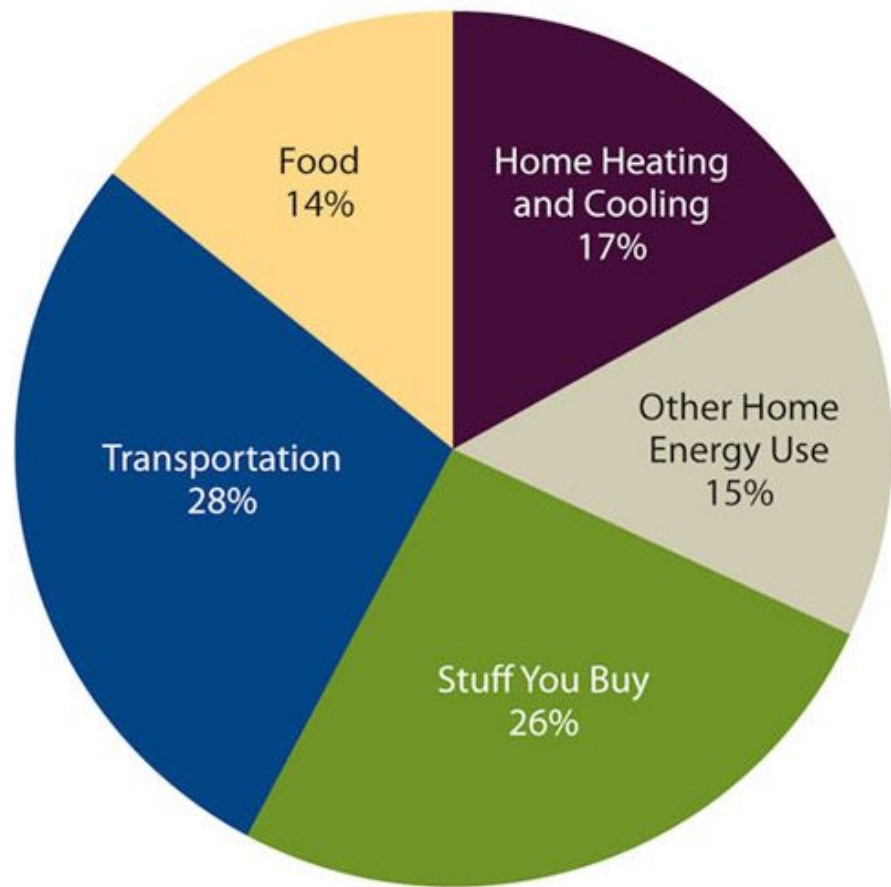
Personal Actions to Reduce CO2

Belief (% of respondents)

Actual CO2 kg reduction per capita



Average American's Carbon Emissions

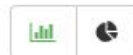


Calculate Your Own Carbon Footprint

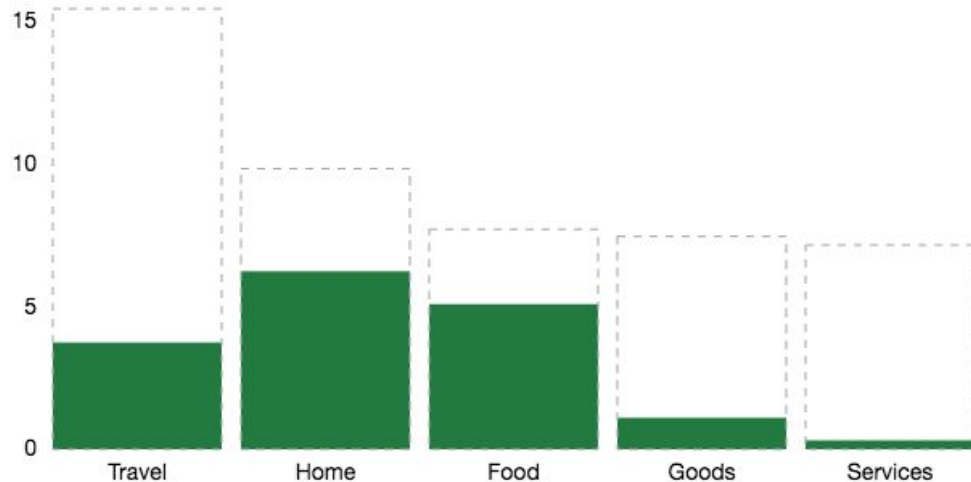
16 tons CO₂/year
Total Footprint




66%
Better than Average



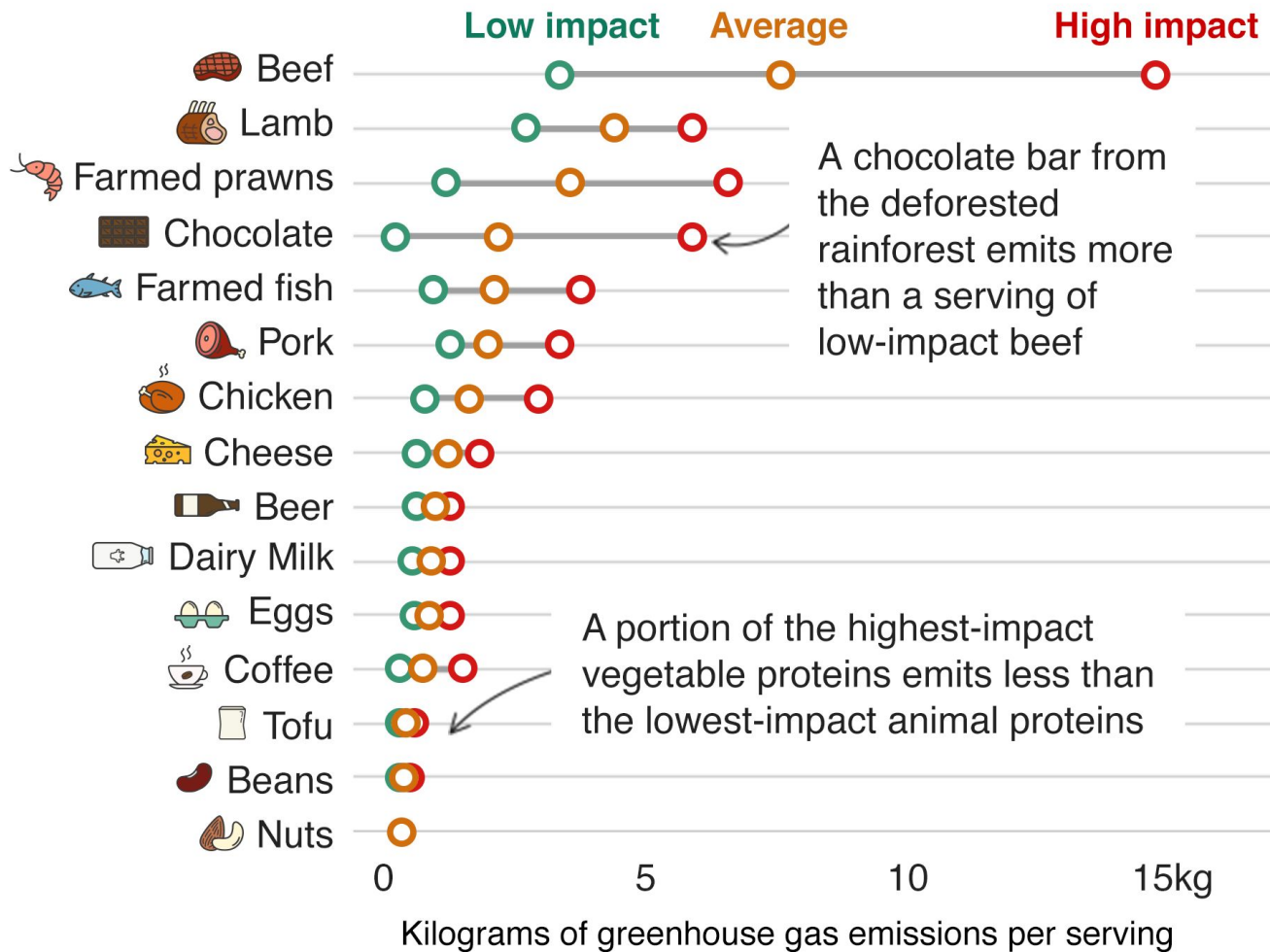
Household tons CO₂/year



 Your household footprint

 Similar households

Food

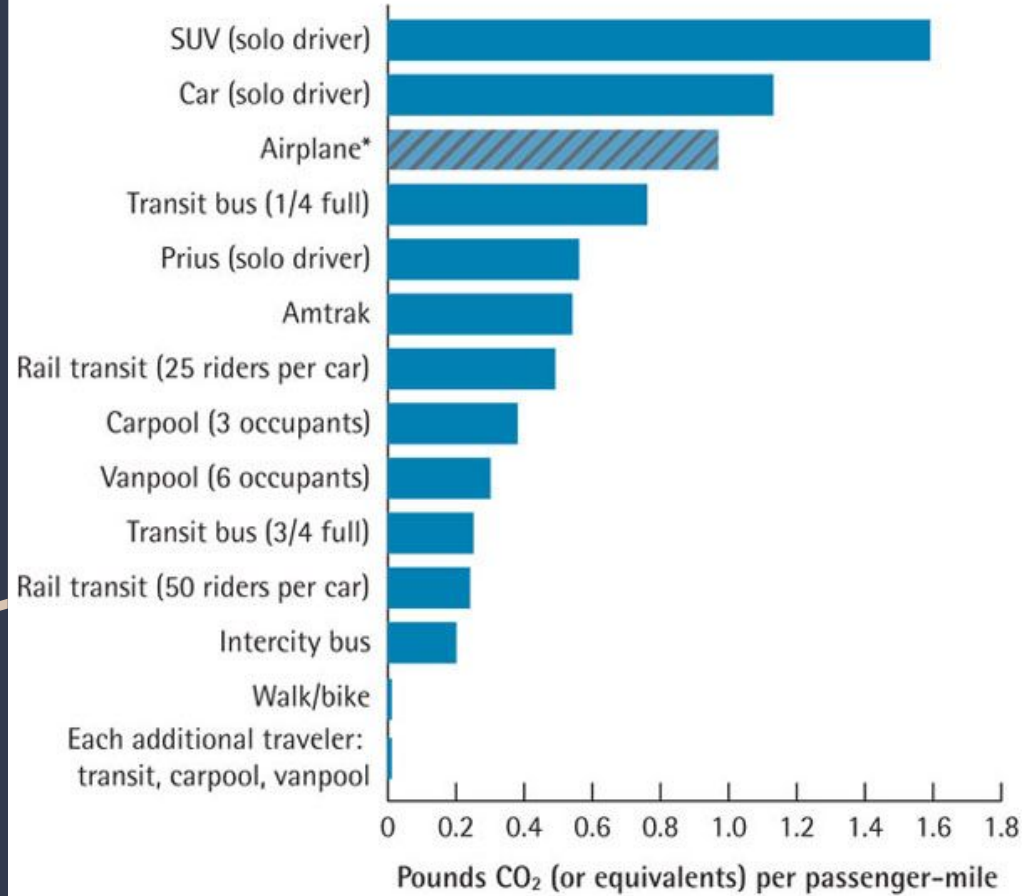


Additional Beef Impact

An estimated 70 percent of deforestation in the Amazon basin can be attributed to cattle ranching. Using these numbers, cattle ranching in the Amazon has resulted in the loss of an area larger than the state of Washington. Brazil is the world's largest exporter of beef.



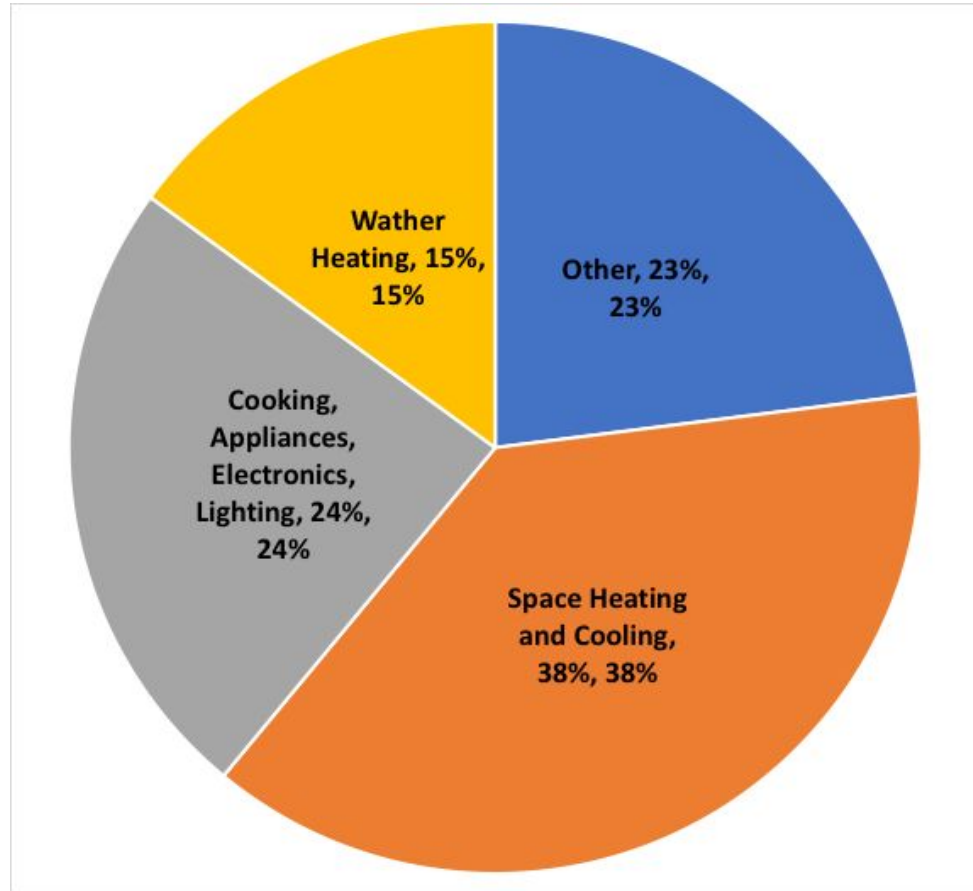
Transportation



**Aircraft emissions are the most variable. Use an online calculator, such as [Atmosfair.com](https://www.atmosfair.com), to estimate the climate impacts of your flight.*

At Home

- Lower/raise thermostat
- Insulate and seal
- Light bulbs
- Replace gas appliances with electric
- High efficiency appliances
- On-demand water heater
- Solar Panels
- Hang dry your clothes
- Use cold water for washing



Total CO2 Emissions from Residential Sector 2016

Consume Less

 REFUSE

 REDUCE

 REUSE

 RECYLCE

 ROT

Big Picture Actions

Lower Fertility Rates

- Education women and girls
- Make family-planning services available to all

Incentivize 'Good' Behaviors

- Carbon Tax
- Cradle to cradle design
- Hold industry responsible for externalized costs

Protecting/Improving Negative Feedback

- Protect/Restore forest
- Improve agricultural practices
- Protect/Restore wetlands
- Carbon Sequestration

Local Groups

- 350.org (Albuquerque)
350newmexico.org
- Citizens Climate Lobby (Santa Fe)
citizensclimatelobby.org
- Sierra Club (Rio Grande Chapter)
riograndesierraclub.org
- Climate Reality (Northern New Mexico) nrmclimatereality.org

Petition Decision Makers

Business owners

Corporations

Legislators

What Keeps You From Acting?

Overwhelmed?

Trust in someone else fixing the issue?

Political ideology?

Resources



Project Drawdown

<https://www.drawdown.org>

See the data yourself NOAA

<https://www.ncdc.noaa.gov/cag/>

Our World in Data - Interactive GHG charts

<https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>

Carbon Footprint Calculator

<https://www.nature.org/en-us/get-involved/how-to-help/consider-your-impact/carbon-calculator/>

Find My Legislator - New Mexico Legislature

https://www.nmlegis.gov/members/find_my_legislator

Story of Stuff

<https://storyofstuff.org/movies/>