

The Good News About Climate Change

Ales and Wild Tails

Center for Biological Diversity

Dr. David Hastings, Eckerd College

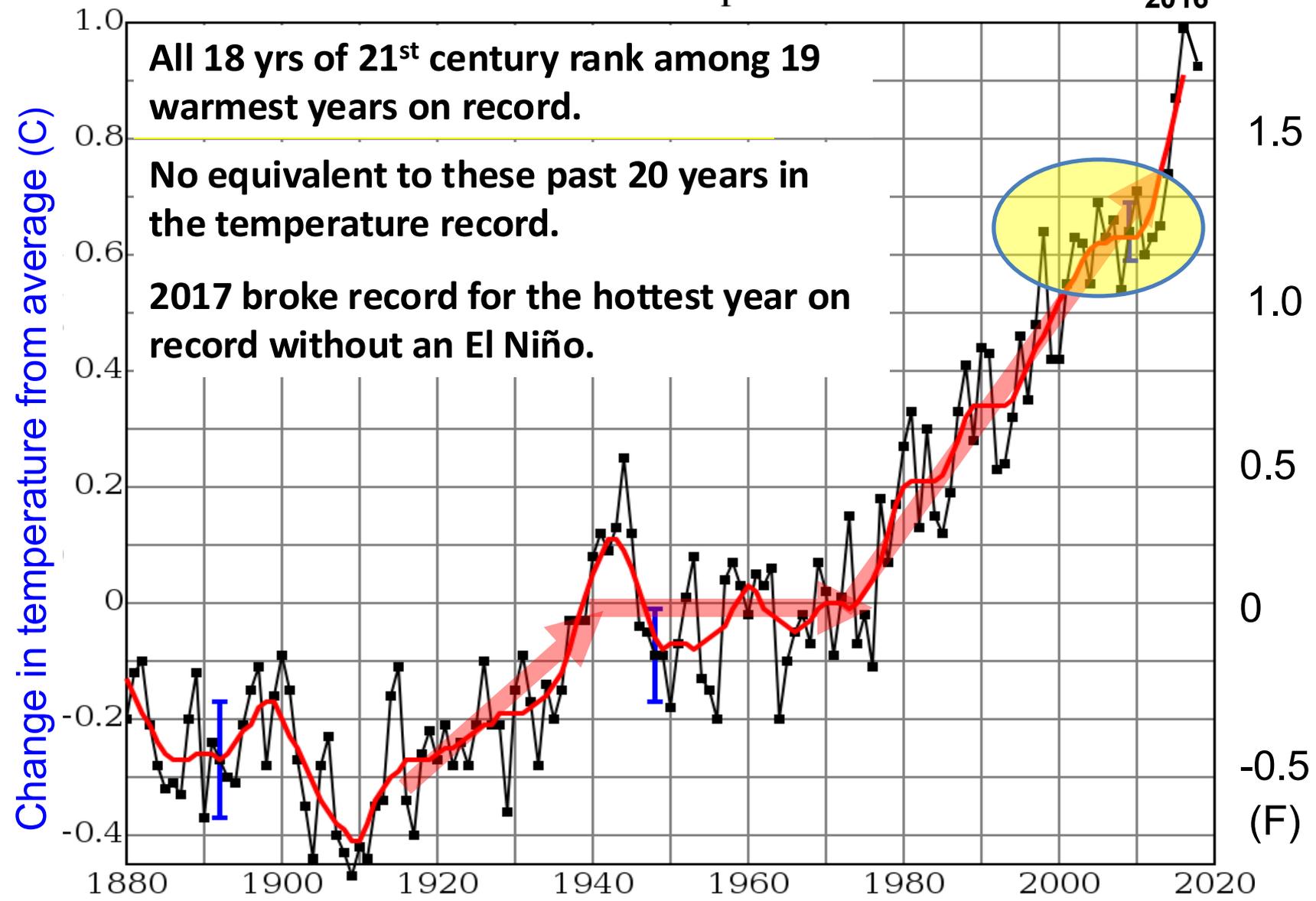
What are 2 things you know
about climate change?

What is one thing you are
uncertain or confused about?



Global Land–Ocean Temperature Index

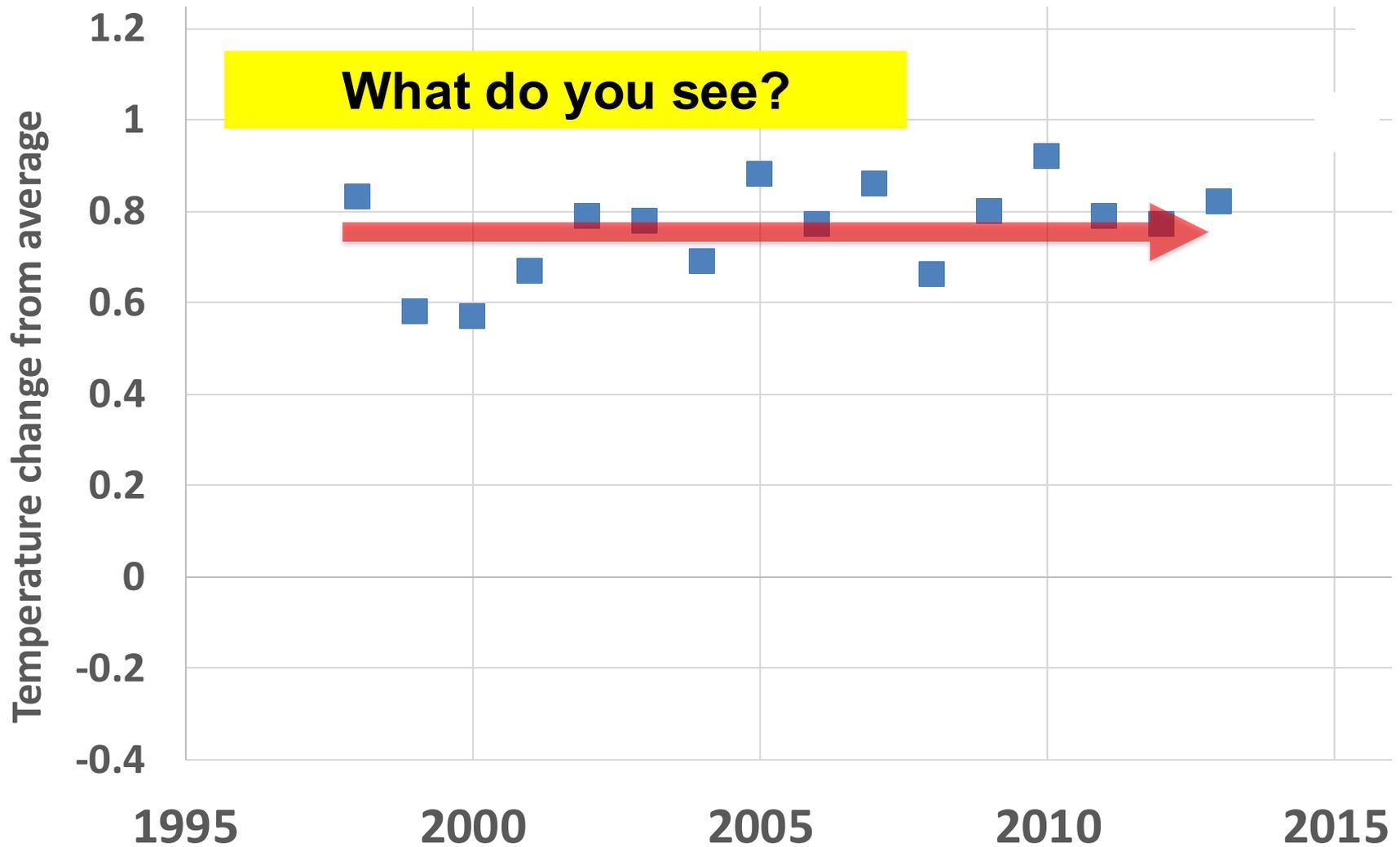
2016



GISTEMP Team, 2017: *GISS Surface Temperature Analysis (GISTEMP)*. NASA Goddard Institute for Space Studies. Dataset accessed 2018-01-03 at <https://data.giss.nasa.gov/gistemp>

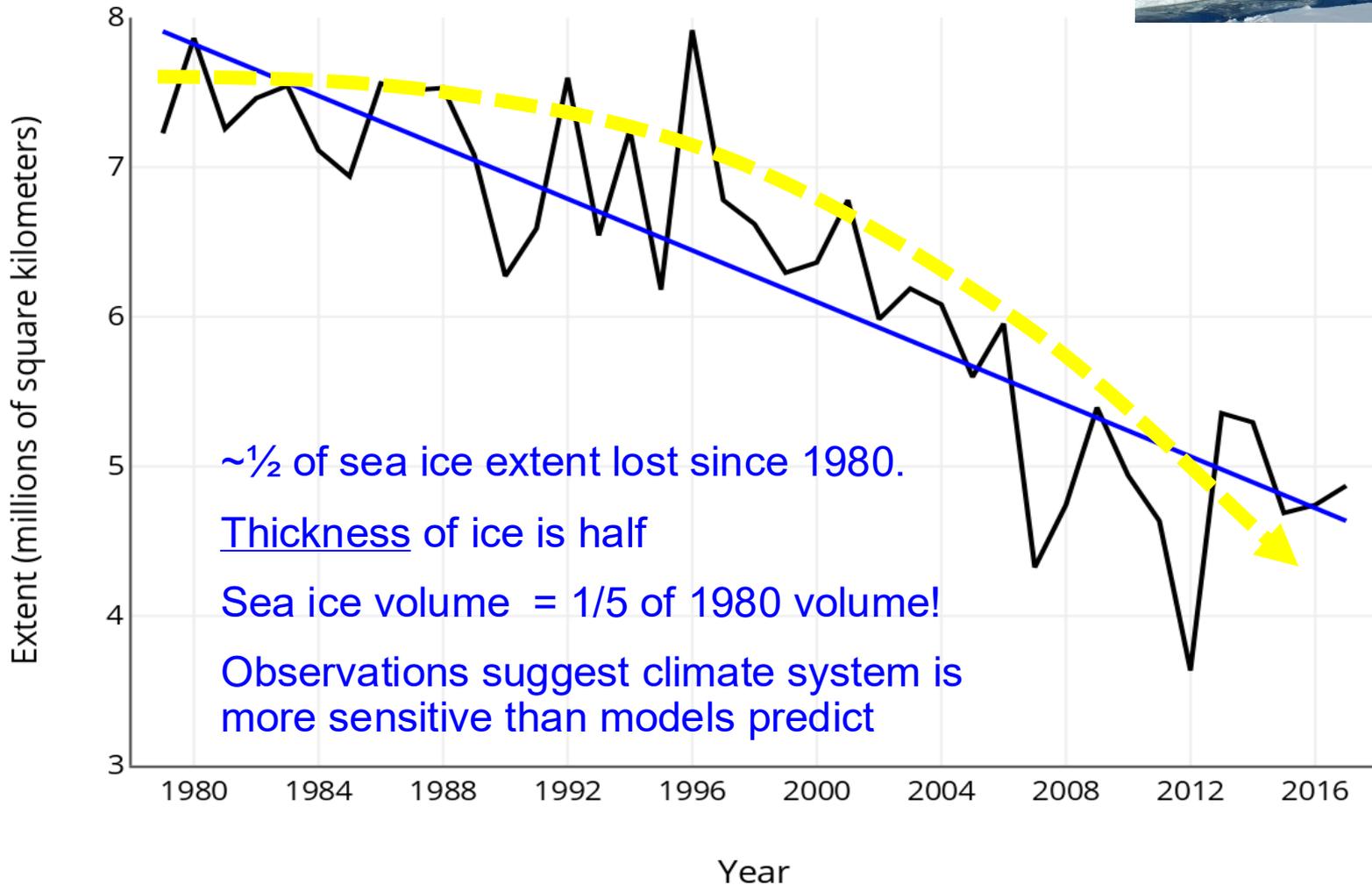
Following the common practice of the [IPCC](http://www.ipcc.org), the zero on this figure is the mean temperature from 1961-1990.

Global Temperature (C): 1998-2013



Arctic ice is melting

Average Monthly Arctic Sea Ice Extent
September 1979 - 2017



National Snow and Ice Data Center

DROWNING

Cities with the 10 highest annual flood costs by 2050



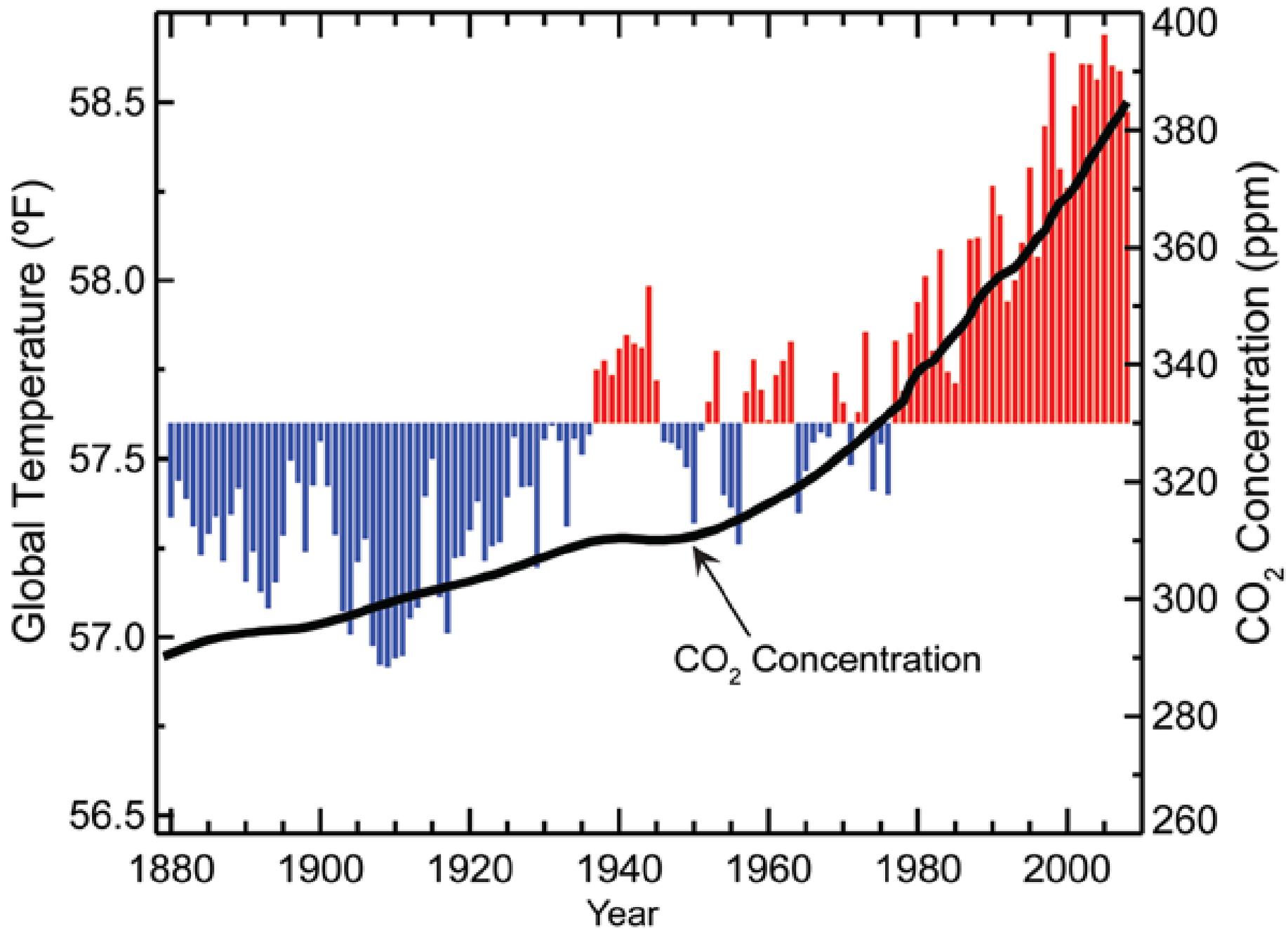
Miami \$2.5 billion

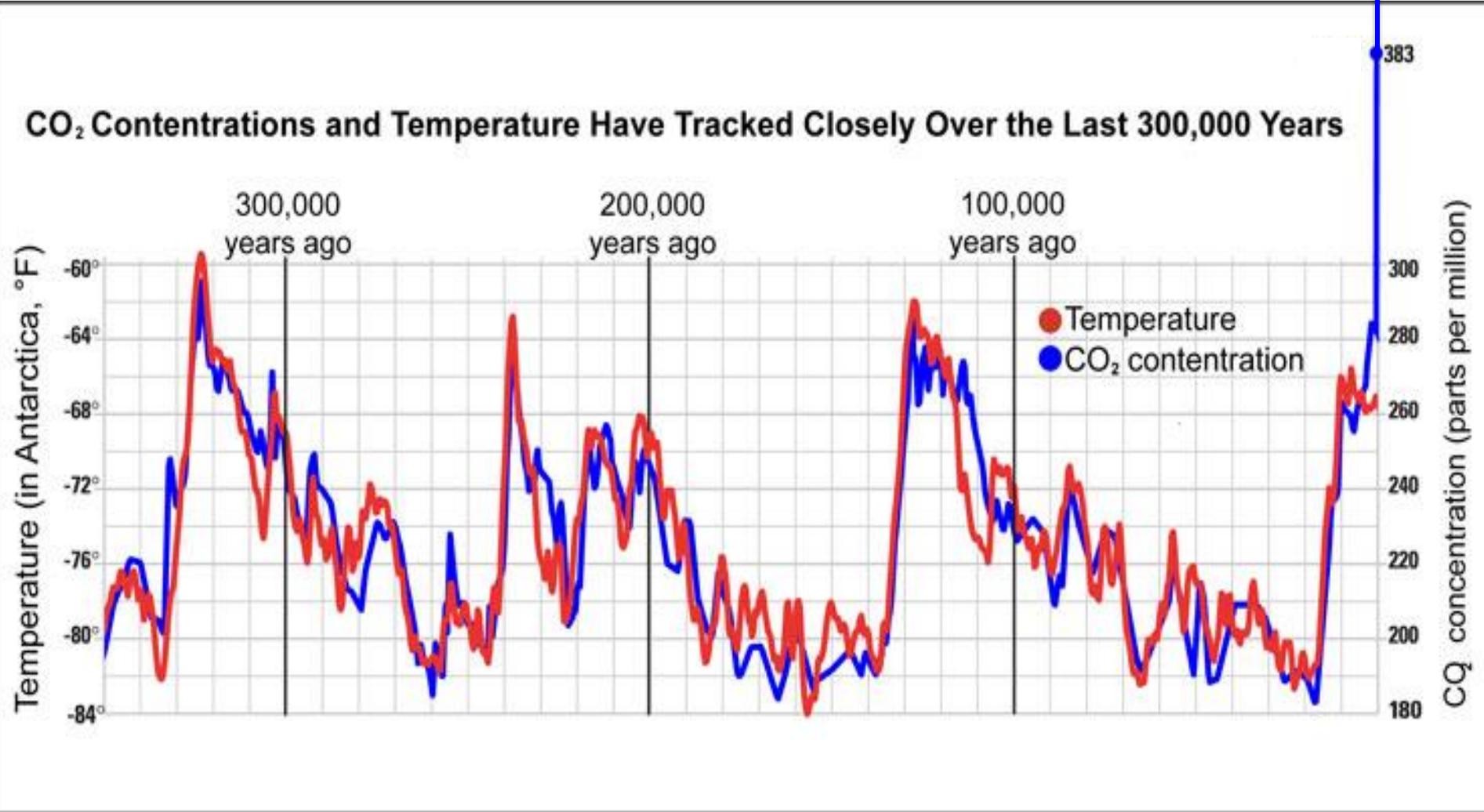
Tampa \$850 million

RUNNERS-UP



Map by Tim McDonnell
Source: Hallegatte et al.





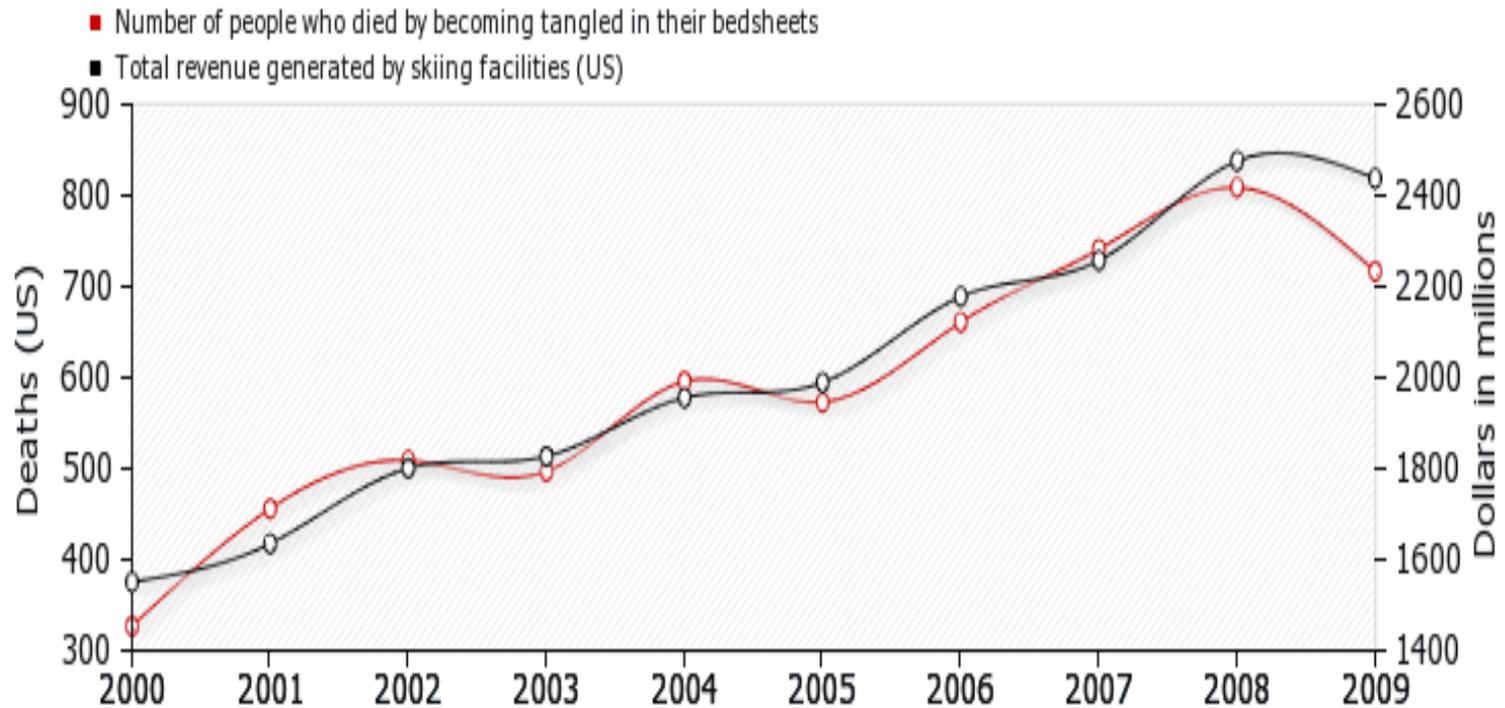
Graph of [CO₂](#), [temperature](#) measured from [Vostok, Antarctica ice core](#)

Petit J.R., et al. (1999). Climate and Atmospheric History of the Past 420,000 years from the Vostok Ice Core, Antarctica, *Nature*, 399: 429-436.

Number of people who died by becoming tangled in their bedsheets

correlates with

Total revenue generated by skiing facilities (US)



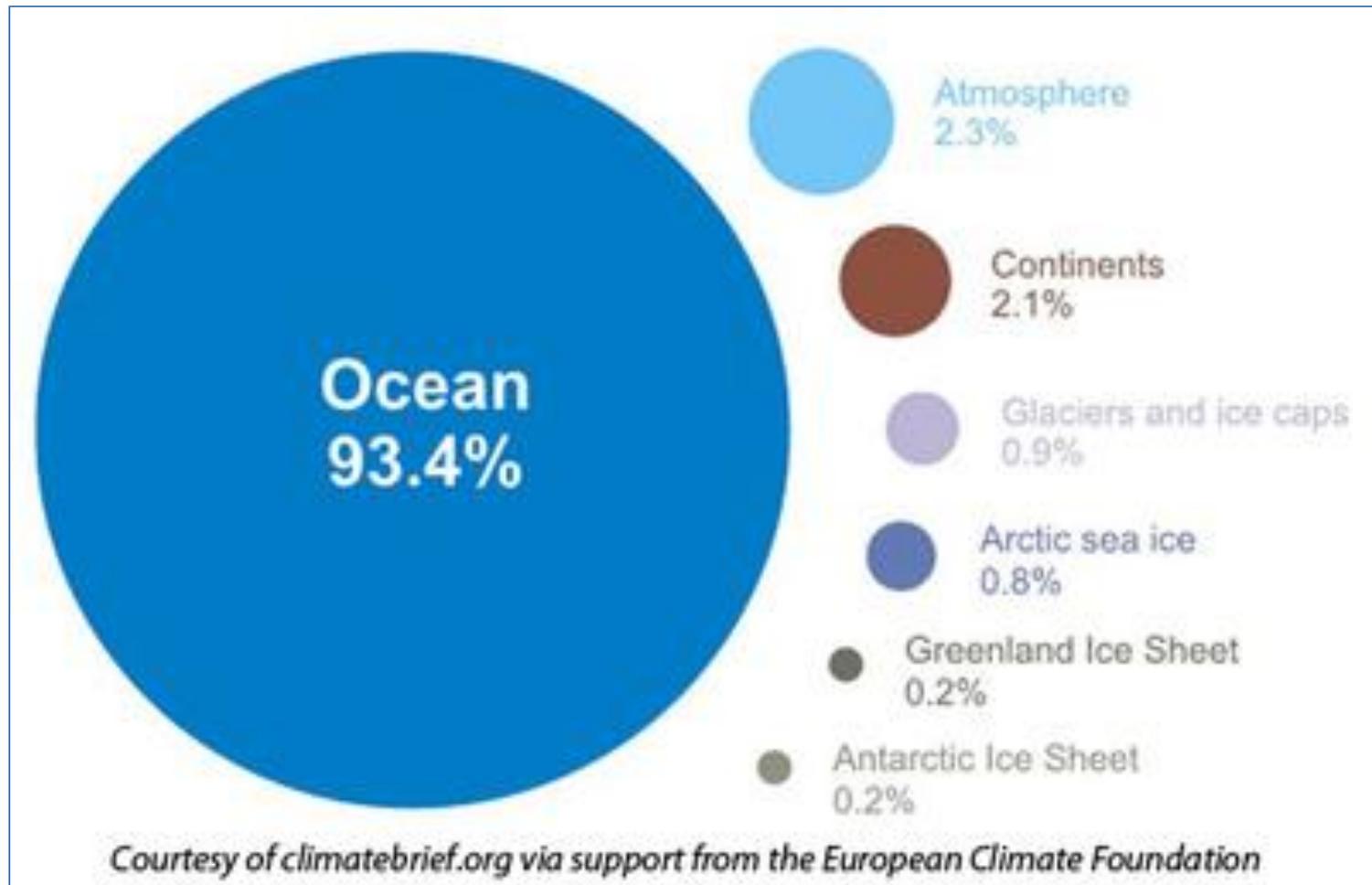
$$r^2 = 0.97$$

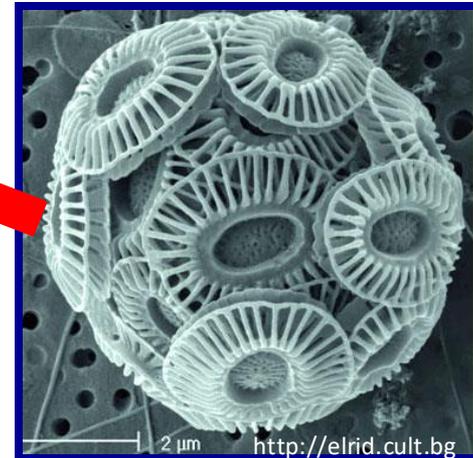


What caused the temperature change?

Attribution

Where is global warming going?





Ocean acidification: biological impacts

Broad agreement that that ocean acidification is occurring and will have large effects on many marine organisms.

Hurricanes and Tropical Storms



Global Climate Change: 101

- **It's happening now**
 - The climate is changing: temperature is rising, oceans are more acidic
- **We are causing it**
 - changes are largely due to human influence not “natural”
- **Scientists agree:**
 - 97% climate scientists agree that climate is changing; due to human activity
 - broad consensus in scientific community
- **We can't wait:**
 - If we don't act now, there will be very serious consequences.
- **We can fix it:**
 - We can do something to reduce CO₂ emissions.
Solar and wind power are cheap, profitable, and are good business. JOBS
US has abundant clean energy: offshore, onshore wind; solar in SE and SW



Slashing costs of wind and solar means that clean energy is more economical than fossil fuels

Clean Energy Approaching Tipping Points

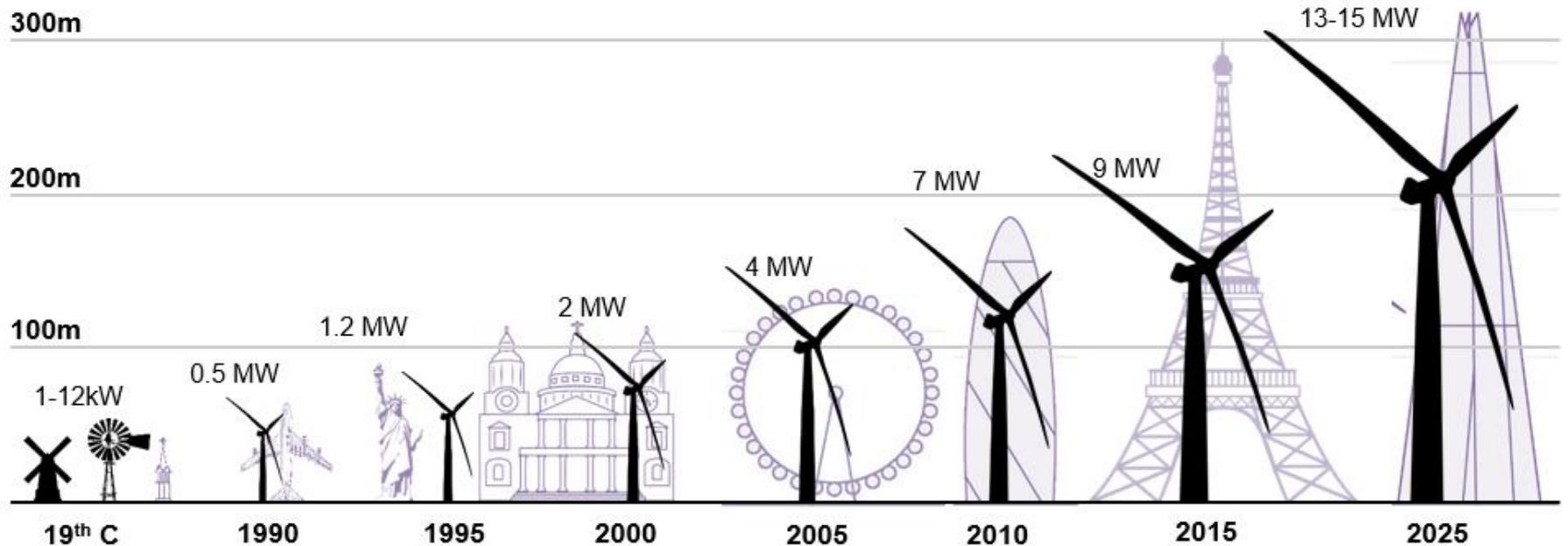
Tipping point 1: new wind and solar are cheaper than anything else; anything you have to retire is replaced by wind and solar ... That tipping point is either here or almost here everywhere in the world.”

Tipping point 2: when it's more costly to operate existing coal/gas plants than wind and solar. That point may arrive within next decade.

Clean energy will reap 86% of the \$10.2 trillion invested in power generation by 2040

The cost on NOT acting is becoming more expensive than the cost of acting.

Evolution of wind turbine heights and output

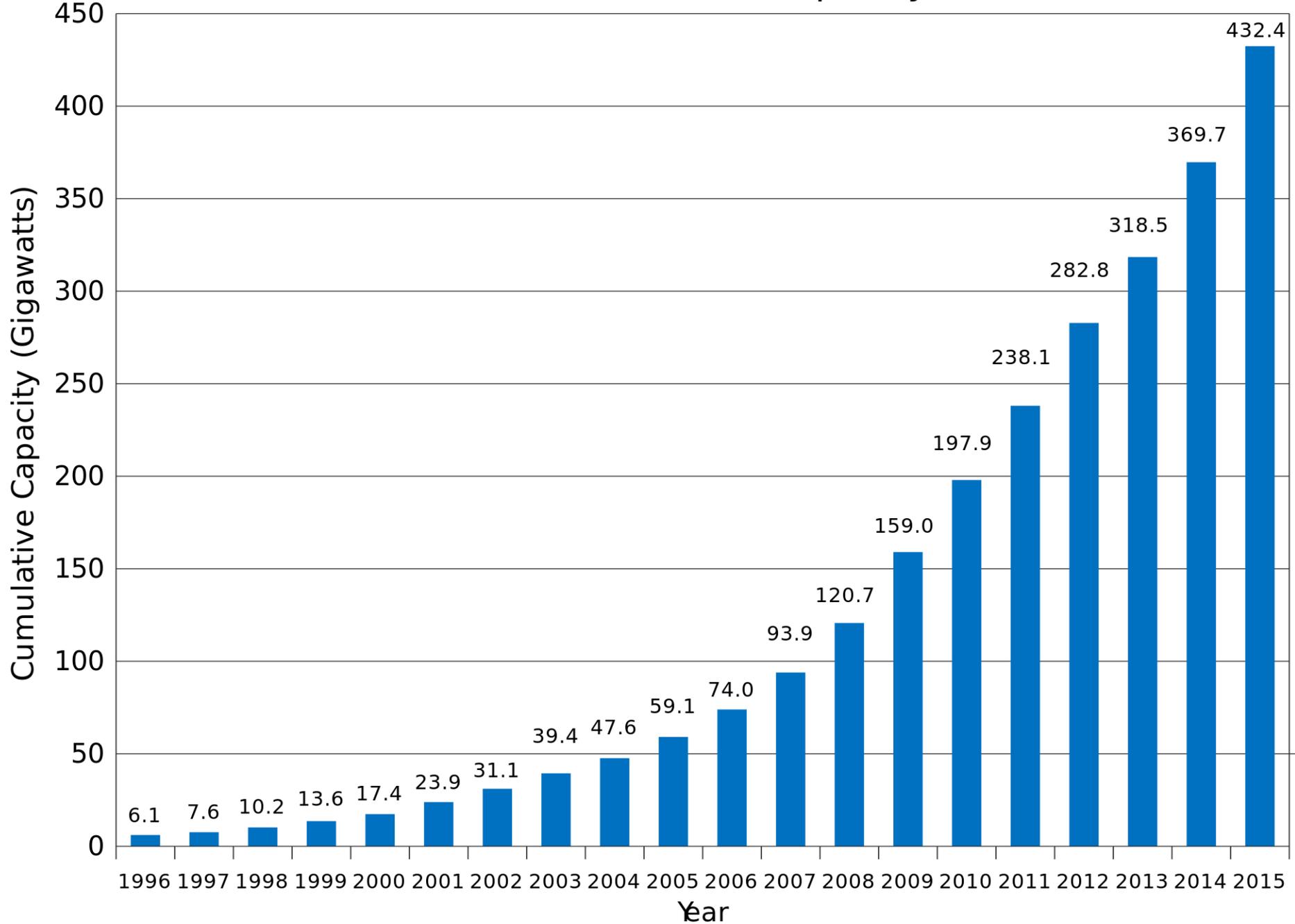


Sources: Various; Bloomberg New Energy Finance

Bloomberg
New Energy Finance

Cost of renewables is plunging faster than anticipated as technologies like gigantic wind turbines arrive on market

Global Wind Power Cumulative Capacity (Data:GWEC)



Good News!

“But the fact is we are seeing progress that is growing exponentially, and that is what gives me the most reason for hope. -Christiana Figueres, former UN climate chief

[Solar industry employs more people](#) than all of the coal industry (374K vs. 160K)

Solar power industry helped create 374,000 jobs in US

Global momentum for the transition to clean energy is unstoppable.

WA

OR

CA

There is a large, international, sophisticated, smart, multi generational, multi-cultural and persistent climate change movement.

367 Mayors in U.S. are taking [Climate Action](#), often surpassing goal of [Paris Agreement](#)

We are at a tipping point where coal and oil are MORE expensive than renewable energy

Personal Choices Make a Difference

- *Low impact:*
 - Upgrade light bulbs
 - Line dry clothes
 - Cold water wash
- *Medium Impact:*
 - Eat plant rich diet/avoid red meat
 - Don't waste food
 - More efficient car
- *High Impact:*
 - **Live car free**
 - **Consume less energy/buy green energy**
 - **Avoid 1 long haul flight**
- **Transformational changes:**
 - **Meet with elected representatives –put a price on carbon**
 - **Volunteer w non-profit/organization**
 - **Talk about climate change!**
 - open a dialogue

Wynes and Nicholas 2017 Environ. Res. Lett

Take Home Message

We can fix it:

- We can reduce CO₂ emissions!
- **Existing** technologies and conservation are making large cuts in polluting gases.
- We need to get the market to incorporate environmental costs, dismantle subsidies that prop up fossil fuels.
- No one technology or approach can do whole job:
 - a variety of strategies will need to be used
- Energy – Carbon – Climate problem is manageable!
- *But it's not going to be easy.*

Thank you!



Clear messaging

- **There is an Urgent Threat:**
 - Strange, severe **weather**
 - Responsibility to protect our **children**
- **There is a Villain:** Oil Companies stranglehold on democracy
 - Oil companies are accountable for slow progress
 - It's a rigged system against clean energy
- **Solutions exist!**
 - Wind and solar are profitable solutions
 - Turbines on farms, solar on our roofs creates local jobs and stronger communities.

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 - 97% of actively publishing climate scientists agree that climate is changing due to humans
- **We can't wait:**
 - If we don't act now, there will be very serious consequences.
- **We can fix it:**
 - We can do something to reduce CO₂ emissions:

We need to get the market to incorporate environmental costs

Establish a price on carbon emissions and other greenhouse gases

Dismantle subsidies that prop up fossil fuels.

Can we do this? Will this fit into our capitalist paradigm?

B.C. Canada, Australia, Europe.