

IS THERE A CLIMATE CRISIS? REVIEWING THE EVIDENCE



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OVERVIEW:

1. ***Slow* warming is occurring**
 - but not as fast as climate model forecasts
2. **The cause is partly from more CO₂**
 - but we don't really know by how much
3. **Most media reports and predictions are exaggerated or wrong**
4. **There is no convincing evidence of more severe weather**
5. **The cost of renewables remain high, and physics prevents widespread displacement of fossil fuels with wind/solar**
6. **Increasing CO₂ has benefits which are seldom mentioned**

Bottom line: There is no climate “crisis” or “emergency.”



WHAT AM I FAIRLY CONFIDENT OF?

1. The climate system has warmed in recent decades, with 2010-2019 the warmest decade in the instrumental record (last ~150 yrs).
2. At least “some” of this warming is due to increasing carbon dioxide (CO₂) from fossil fuel burning.
=> the direct warming effect of 2XCO₂ is only about 1 deg. C
3. Warming *should* continue into the future.



But none of this is necessarily cause for alarm.

WHAT IS UNCERTAIN?

Natural causes of climate change are largely **not** understood.
Climate can change without **any** forcing (it's a chaotic system).



**Retreating Alaska
glacier reveals
medieval forest**

⇒ Climate models are
tuned to not produce
natural climate change
(i.e. they assume the climate
system is naturally in a state
of energy balance)

WHAT ELSE IS UNCERTAIN? THE FUTURE *STRENGTH* OF ANTHROPOGENIC WARMING.

How does the climate system **RESPOND** to the small “direct” warming influence of extra CO₂? These responses are called **FEEDBACKS** (e.g. cloud & water vapor changes with warming)

Feedbacks cause **MOST** of the warming in climate models, amplifying 1 deg. C of direct warming to 3-4 deg. C in response to “2XCO₂” (e.g. from 280 ppm in 1850 to 560 ppm in ~2100).

I believe that only 1.5 – 2 deg. C warming will be the response to 2XCO₂, but it could be less.



ANY TEMPERATURE CHANGE IS CAUSED BY ENERGY IMBALANCE:

**EXAMPLE: THE INTERIOR OF THE SUN PRODUCES *LESS ENERGY*
PER KG OF MASS THAN DOES THE HUMAN BODY**

**...yet the core of the sun is 27,000,000 deg. F
versus the Human body 98.6 deg. F.**

How can this be?

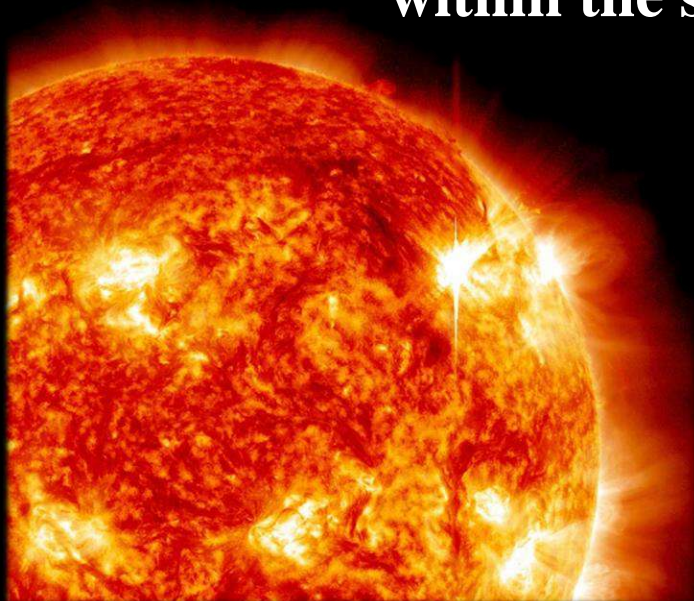
**Because the rate of energy LOSS
within the sun is VERY SLOW, leading to extreme warming.**

AGAIN:

**TEMPERATURE IS NOT DETERMINED BY
THE RATE OF ENERGY GAIN ALONE!!**

(e.g. absorbed sunlight)

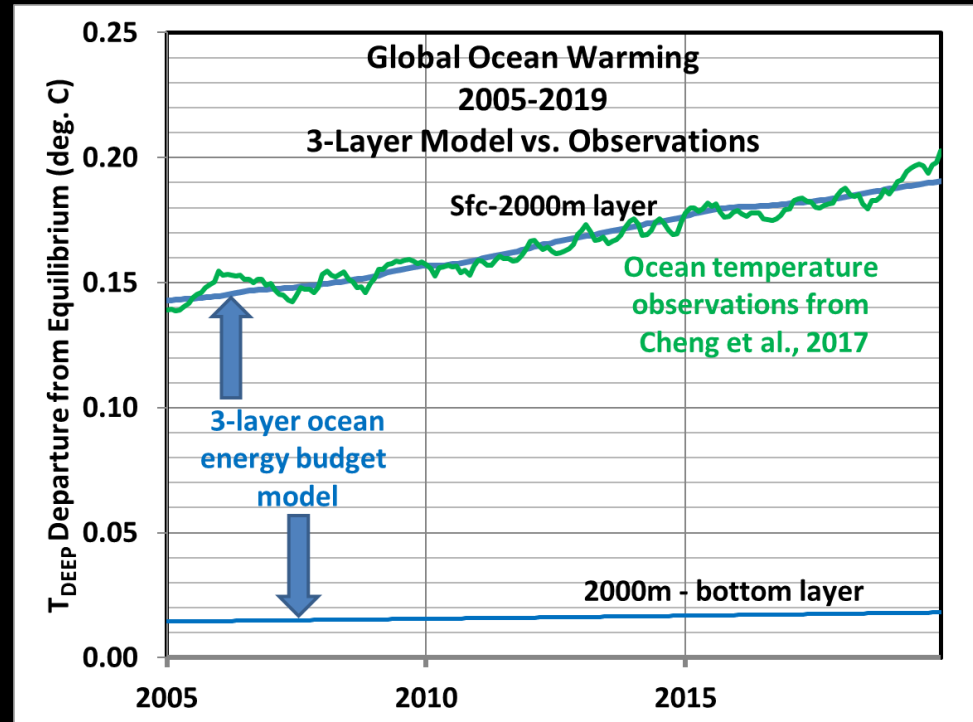
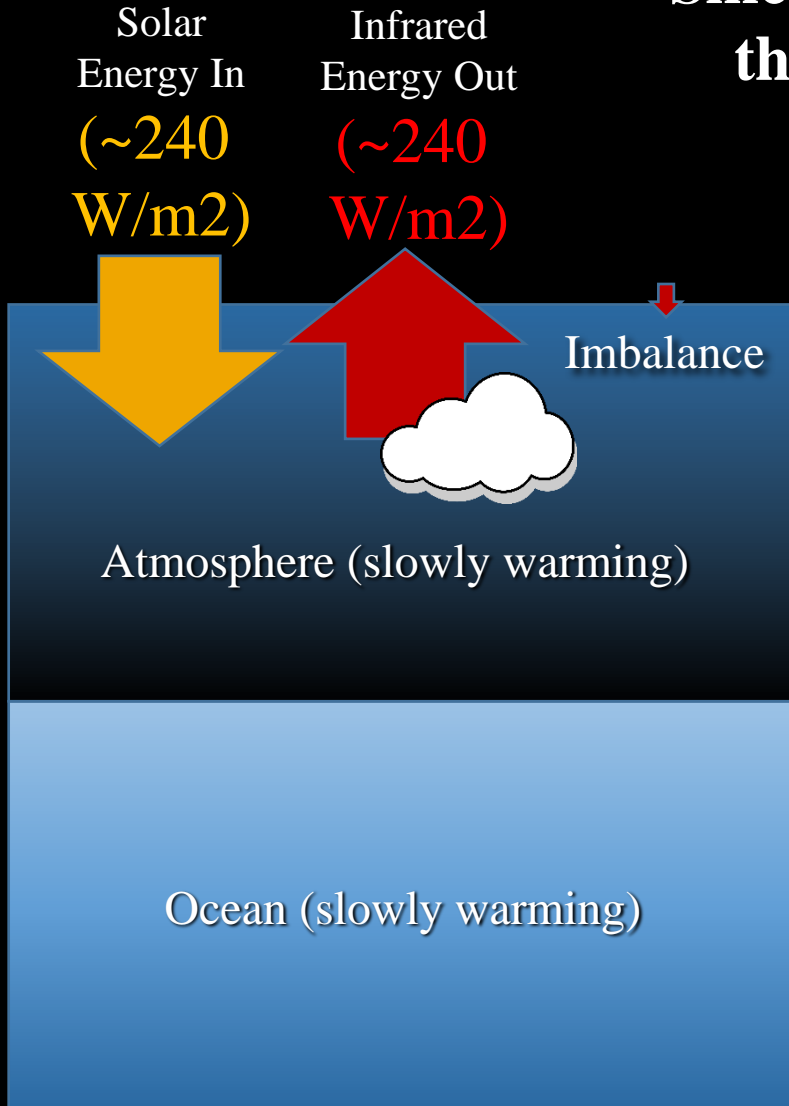
***IT IS DUE TO IMBALANCE BETWEEN
ENERGY GAIN VS. LOSS***



HOW LARGE IS THE GLOBAL ENERGY IMBALANCE?

6

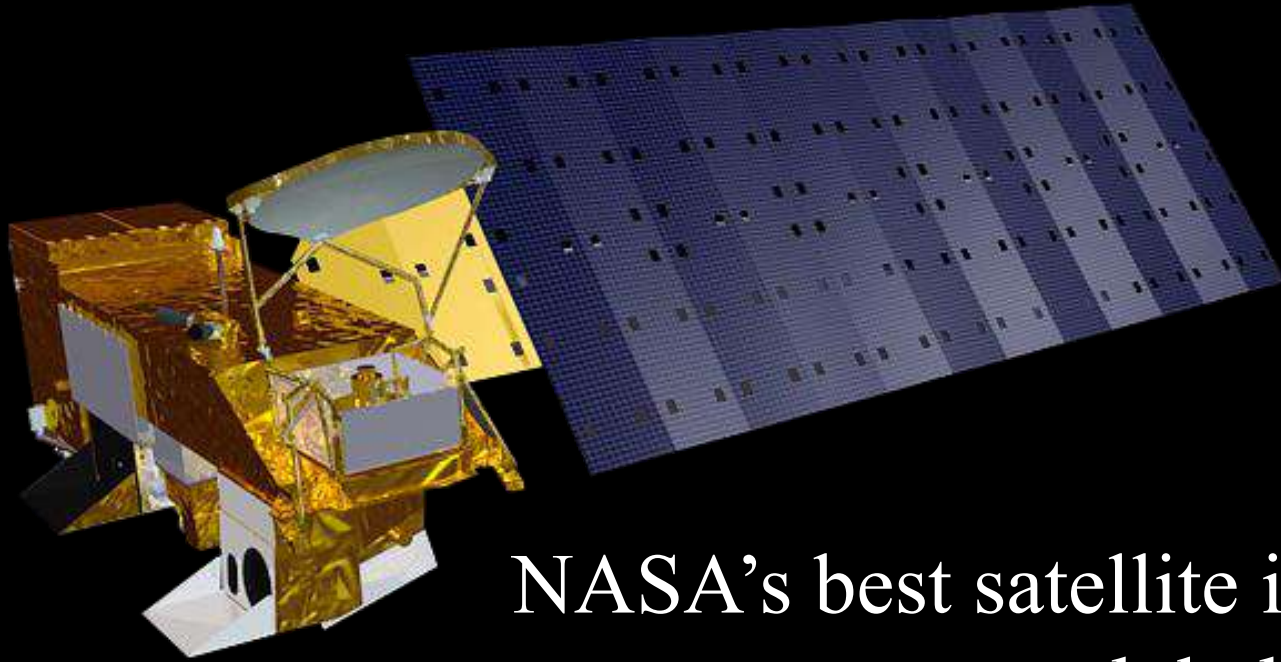
Since 2005, only about 0.8 Watts per sq. meter imbalance;
this is only 1 part in 300 of **natural** energy flows.



We do not know **natural** energy flows to this accuracy,
thus climate change **could be** mostly natural,
and we would not know it!



EVEN OUR BEST SATELLITE OBSERVATIONS AREN'T ACCURATE TO $\sim 1 \text{ W/m}^2$...



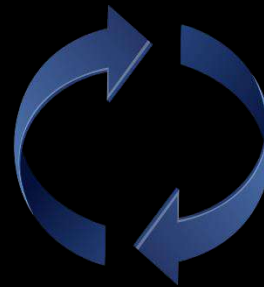
NASA's best satellite instruments cannot measure global energy flows to the level of accuracy required to attribute global warming to humans.



CLIMATE MODELS THAT SUPPOSEDLY “PROVE” HUMANS ARE RESPONSIBLE USE CIRCULAR REASONING

- => Models are first “adjusted” to produce NO warming/cooling.
- => Then CO₂ is added, and warming occurs.
- => It is then concluded recent warming is due to increasing CO₂.

*... so, the modelers merely
conclude what they assumed
at the outset.*



THERE ARE NO “FINGERPRINTS” OF HUMAN-CAUSED WARMING

Any source of warming will look about the same:

Land will warm faster than the oceans.

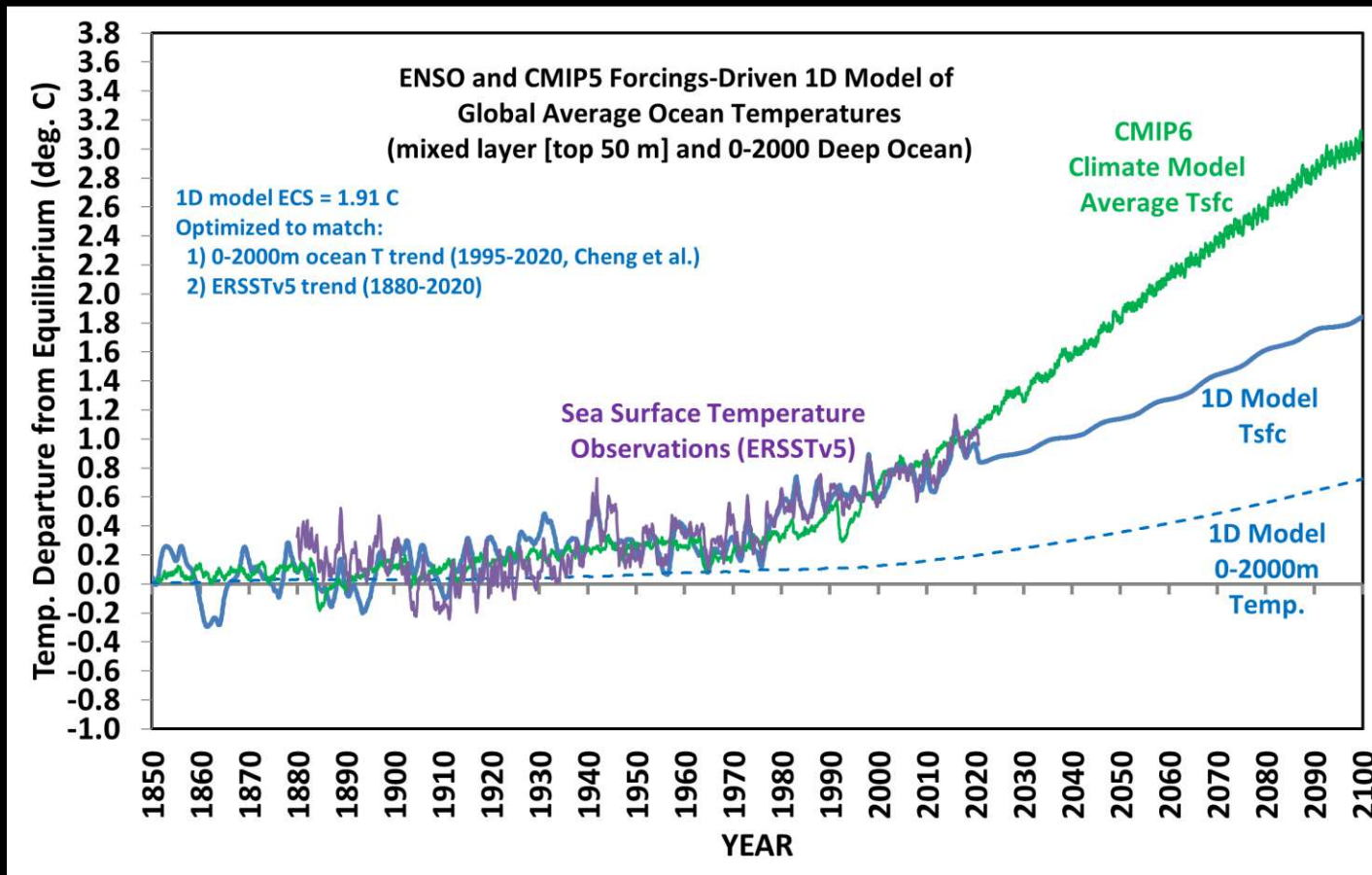
**Warming will be largest at northern latitudes,
least at southern latitudes (due to land/ocean distribution).**

**(Stratospheric *cooling* probably is a fingerprint of increasing CO₂,
but cooling is not warming [stratosphere is simpler physics].)**

NEVERTHELESS, LET'S ASSUME ALL WARMING HAS BEEN DUE TO HUMANS...

10

In our (UAH) 1D ocean model, a 2XCO₂ climate sensitivity of **only ~2 deg C** explains ocean warming (surface and deep ocean) since the 1800s. This is only 50% of CMIP6 models.



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OTHER PUBLISHED STUDIES (BOTH OBSERVATIONAL AND THEORETICAL)

SUGGEST CLIMATE SENSITIVITY COULD BE ONLY 25%-50% OF CMIP6 CLIMATE MODEL PROJECTIONS

11

Selected examples:

2001: Lindzen, R.S., M.-D. Chou and A.Y. Hou: Does the Earth have an adaptive infrared iris? *Bull. Am. Meteor. Soc.*

2008: Spencer, R.W., and W.D. Braswell: Potential biases in cloud feedback diagnosis: A simple model demonstration, *J. Climate*.

2009: Lindzen, R.S. and Y.-S. Choi: On the determination of climate feedbacks from ERBE data. *Geophys. Res. Lett.*

2010: Bates, J.R.: Climate stability and sensitivity in some simple conceptual models. *Climate Dynamics*.

2010: Spencer, R. W., and W. D. Braswell: On the diagnosis of radiative feedback in the presence of unknown radiative forcing. *J. Geophys. Res.*

2011: Lindzen, R.S. and Y.-S. Choi: On the observational determination of climate sensitivity and its implications. *Asia-Pacific J. Atmos. Sci.*

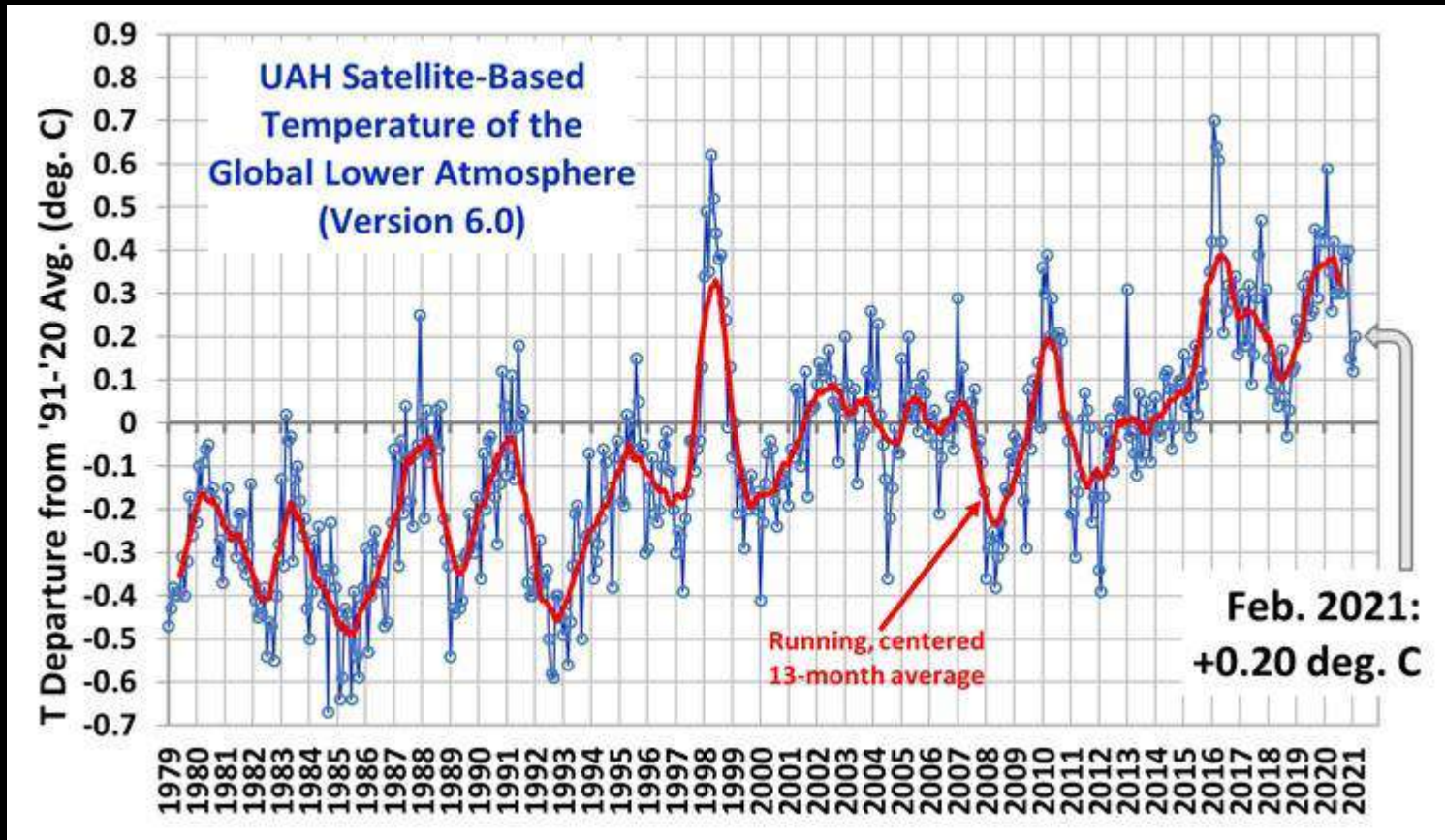
2011: Spencer, R.W., and W. D. Braswell: On the misdiagnosis of surface temperature feedbacks from variations in Earth's radiant energy balance. *Remote Sens.*

2016: Bates, J. R.: Estimating climate sensitivity using two-zone energy balance models. *Earth and Space Science*.

2018: Lewis, N. and J. Curry: The impact of recent forcing and ocean heat uptake data on estimates of climate sensitivity. *Journal of Climate*.



OUR UAH SATELLITE-BASED GLOBAL TROPOSPHERIC TEMPERATURES SHOW A WARMING RATE ONLY ABOUT 50% OF CMIP6 CLIMATE MODELS



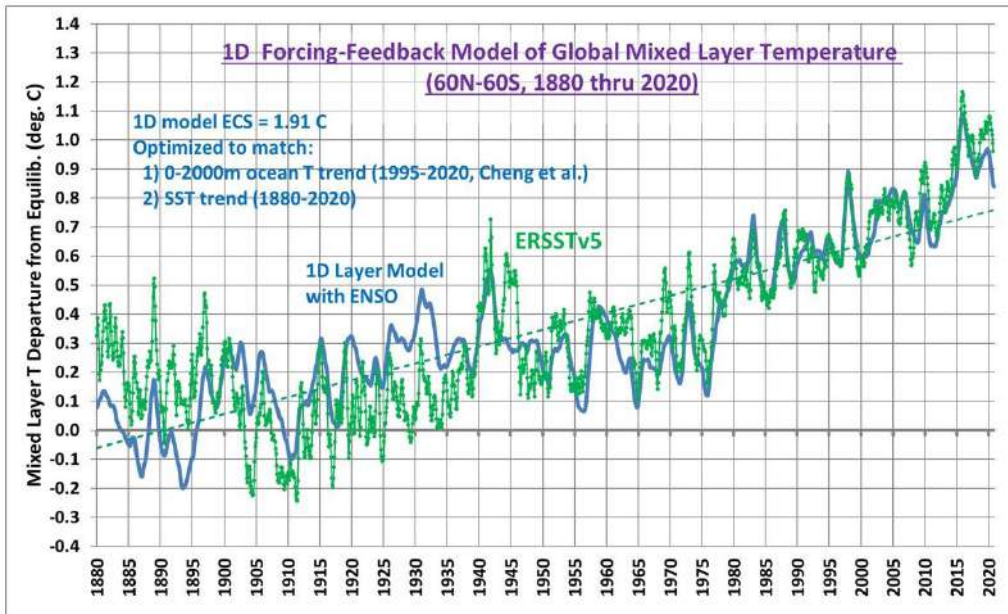
The Satellite Advantage: (1) Global coverage;
(2) The troposphere is where most feedbacks occur, thus exerting strong controls on surface warming/cooling.



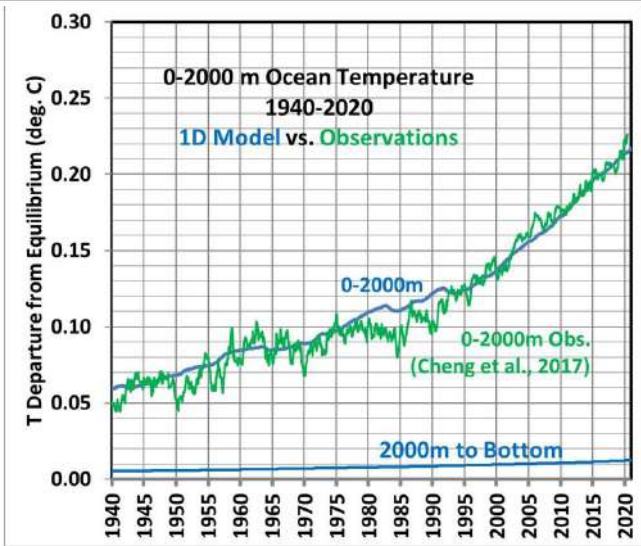
OUR UAH 1D OCEAN TEMPERATURE MODEL

MATCHES GLOBAL SST AND DEEP-OCEAN TEMPERATURE TRENDS

WITH ONLY 1.9 DEG. C CLIMATE SENSITIVITY



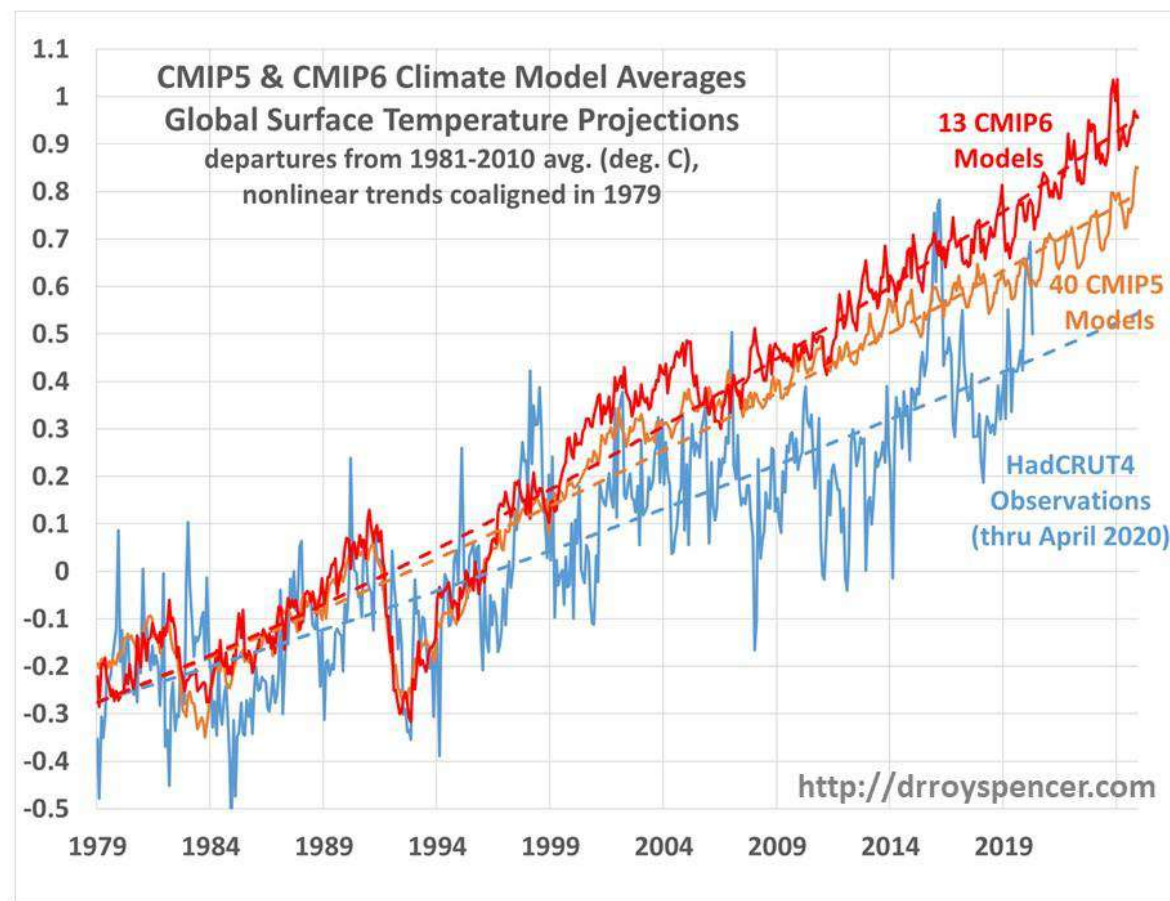
Global SST



Global Deep-Ocean Temperatures



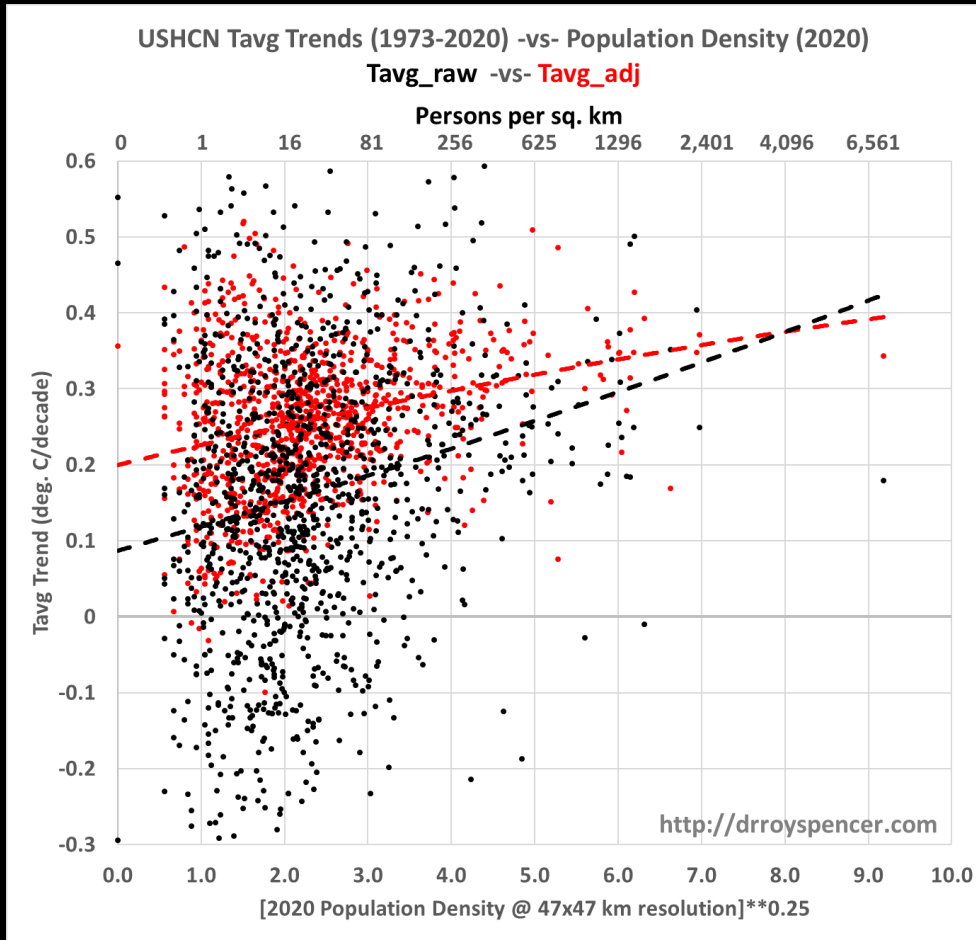
GLOBAL SURFACE TEMPERATURES ARE DIVERGING FROM CLIMATE MODEL PROJECTIONS IN LAST ~20 YEARS



...BUT JUST HOW GOOD

ARE OUR GLOBAL SURFACE TEMPERATURE TREND ESTIMATES?

I believe spurious warming still exists in the official “homogenized” surface temperature records, related to the Urban Heat Island (UHI).

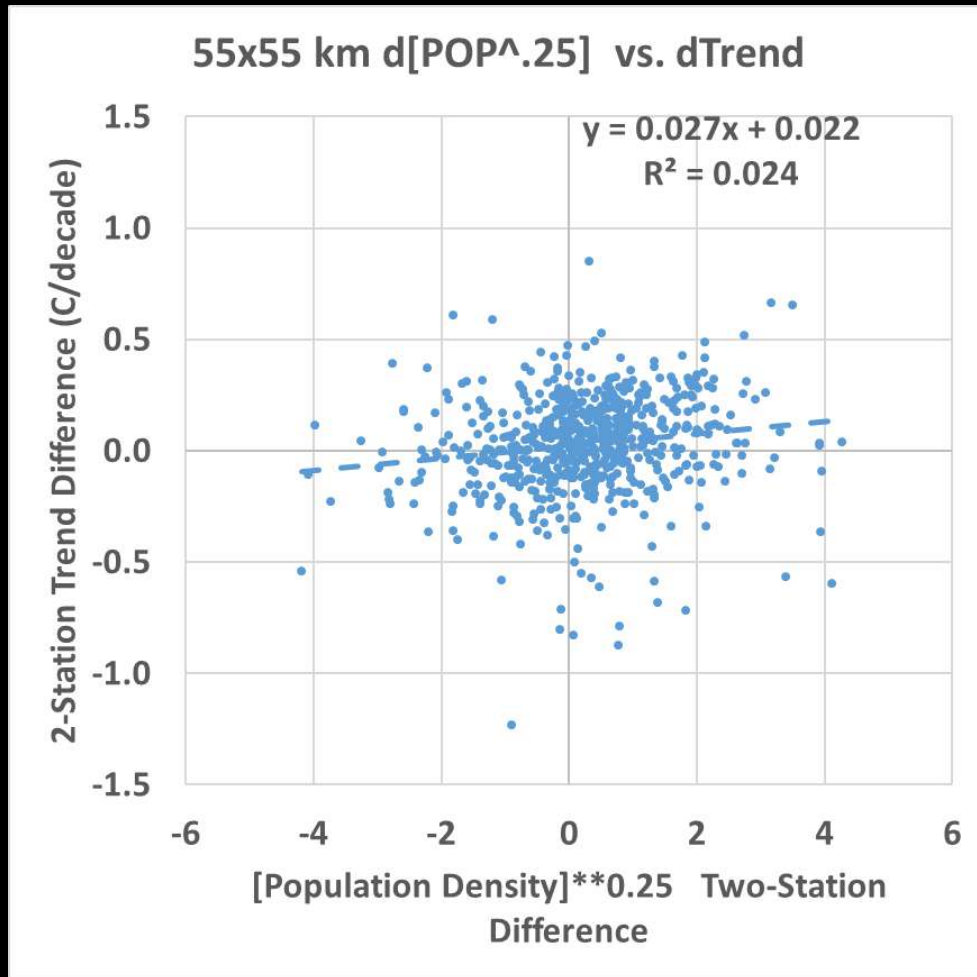


EXAMPLE: USHCN Temperature trends are correlated with population density (both raw and adjusted [homogenized] data).

But *WHY* should warming trends be higher in more urbanized environments?



SIMILAR RESULTS ARE FOUND IN A (MOSTLY-) INDEPENDENT SET OF HOURLY OBSERVATION WEATHER STATIONS (MOSTLY AIRPORTS)



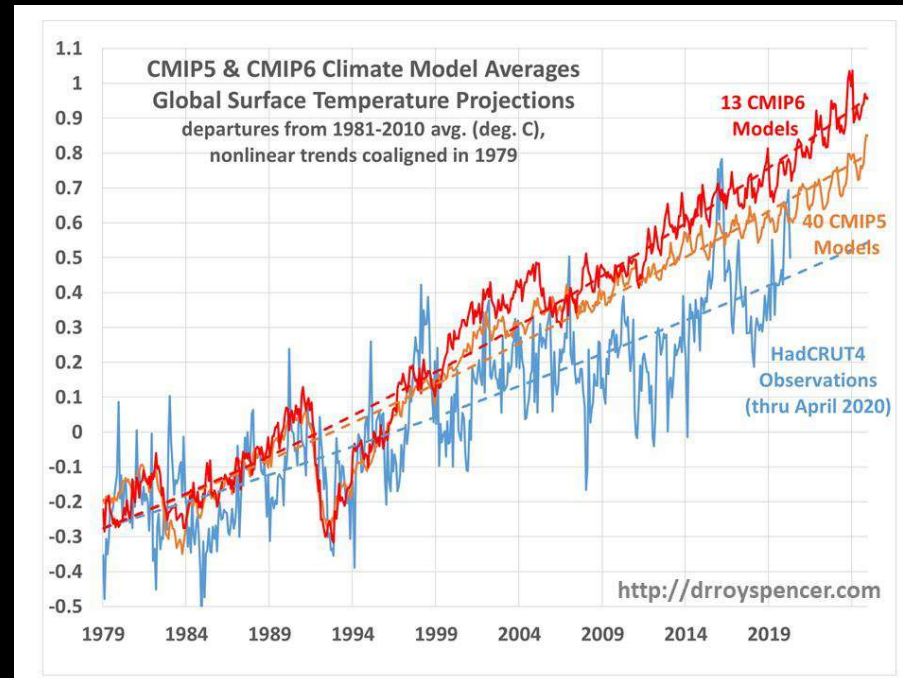
EXAMPLE: 1973-2020 station Tsfc trends from 628 closely-spaced U.S. station pairs show trend differences are correlated with population density differences.

ADJUSTMENT for this effect reduces the station-average warming from +0.27 C/decade to +0.17 C/decade.

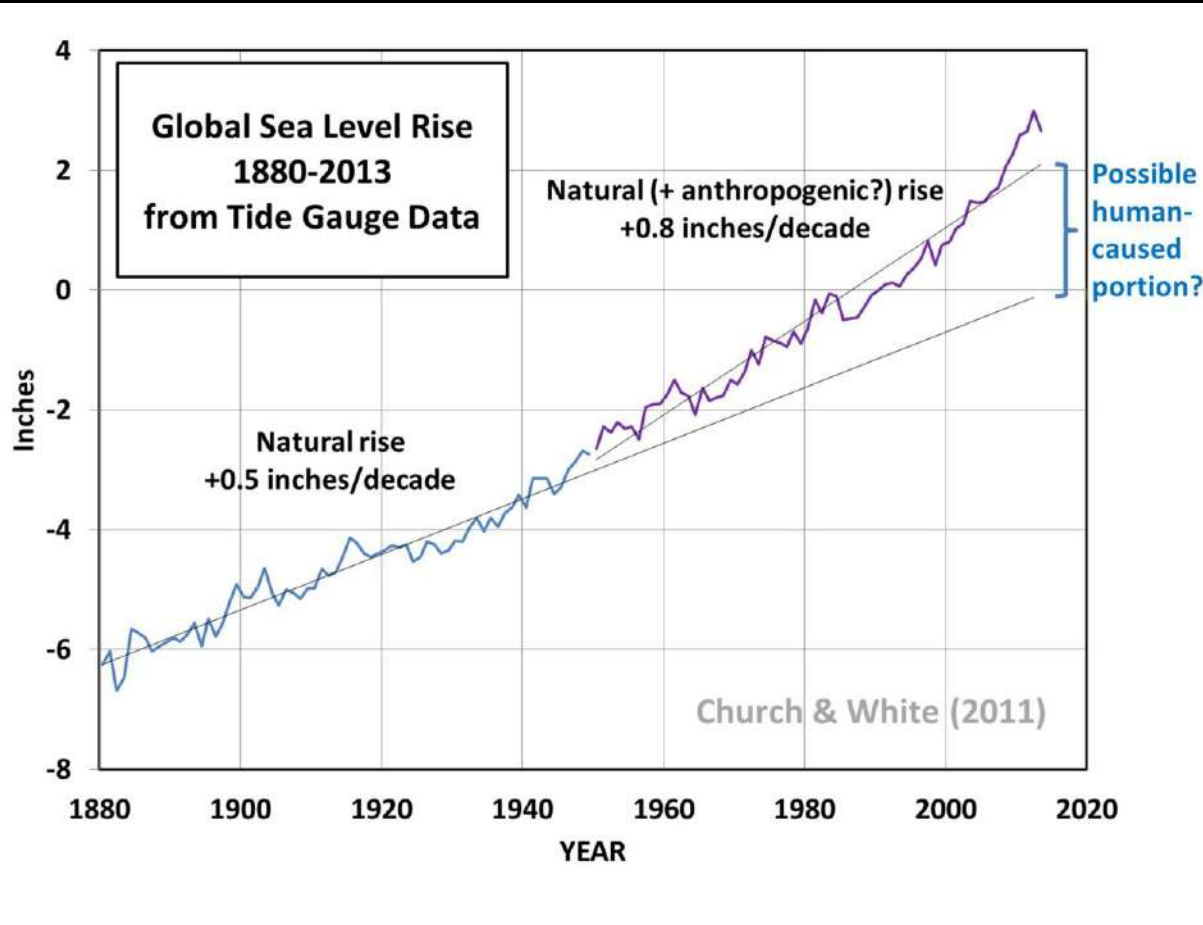


CONCLUSIONS FROM THIS PRELIMINARY TSFC DATA ANALYSIS

- 1) Official estimates of land surface warming appear to be biased too high, probably due to increasing UHI effects (but maybe only in prosperous areas?)
- 2) The lesser the observed global warming rate, the lower the climate sensitivity, and the less the climate change “problem”.



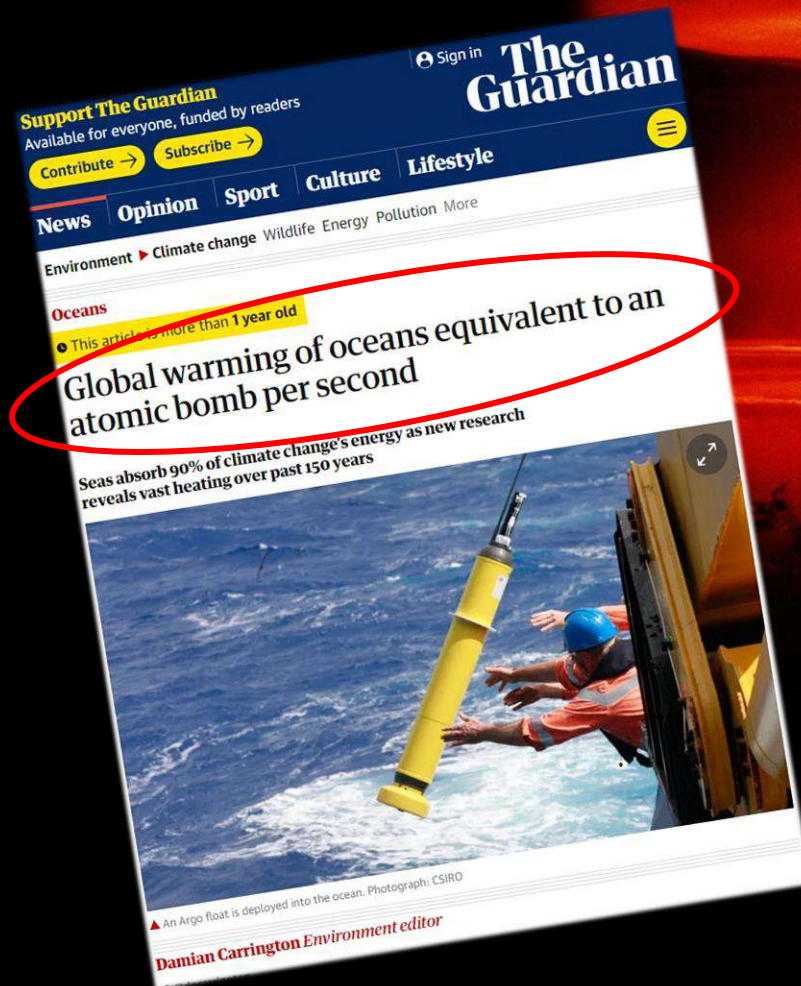
SEA LEVEL RISE HAS BEEN HAPPENING SINCE BEFORE HUMANS COULD BE BLAMED



ASSUMING recent acceleration of sea level rise is (1) real and (2) human-caused, the human contribution is only ~ 8 mm per decade.



DECEPTION: THE ALARMIST LANGUAGE OF “CLIMATE CRISIS”



But Guess What...?

The sun puts the energy equivalent of
300 atomic bombs
into the ocean every second.

WHAT PEOPLE HEAR: EXAGGERATIONS OR FALSEHOODS

20

POPULAR CLAIMS

1. Hottest year (decade) ever!
2. Wildfires are increasing!
3. Storms are worsening!
4. Crops are failing!
5. Humans are suffering!
6. We only have 10 years left!

THE EMPIRICAL REALITY

By 1/100th of a degree! Did you actually feel it?

Global wildfires have not increased!
(regional increases usually result from forest mismanagement.)

Storm intensity has not changed!
(storm financial losses increase with wealth & more infrastructure.)

No! Global crop yields (bushels/acre) continue to break records!

Cold kills more people than heat. No “climate deaths.”
Poverty, not weather, is the greatest threat to human flourishing.

We’ve only had 10 years left for the past 50 years or more!



CROP YIELDS CONTINUE TO BREAK RECORDS

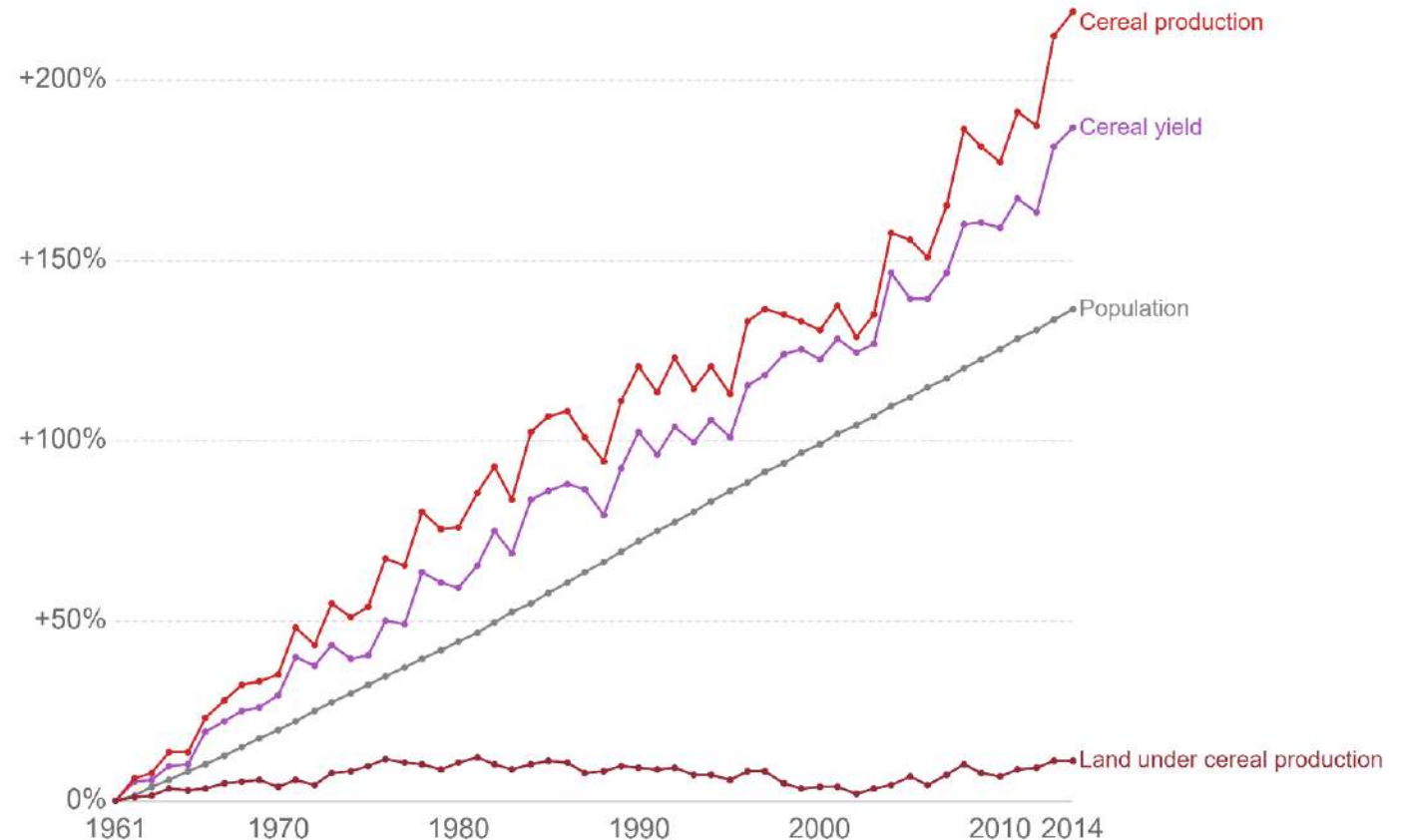
**More CO₂ in the atmosphere
has led to an increase of
\$3.5 trillion in agricultural
productivity from 1961- 2011.
Source: Dr. Craig Idso.**



Change in cereal production, yield and land use, World

Population and cereal production, yield and land use figures are indexed to the year 1961 (i.e. 1961 = 0).

Our World
in Data

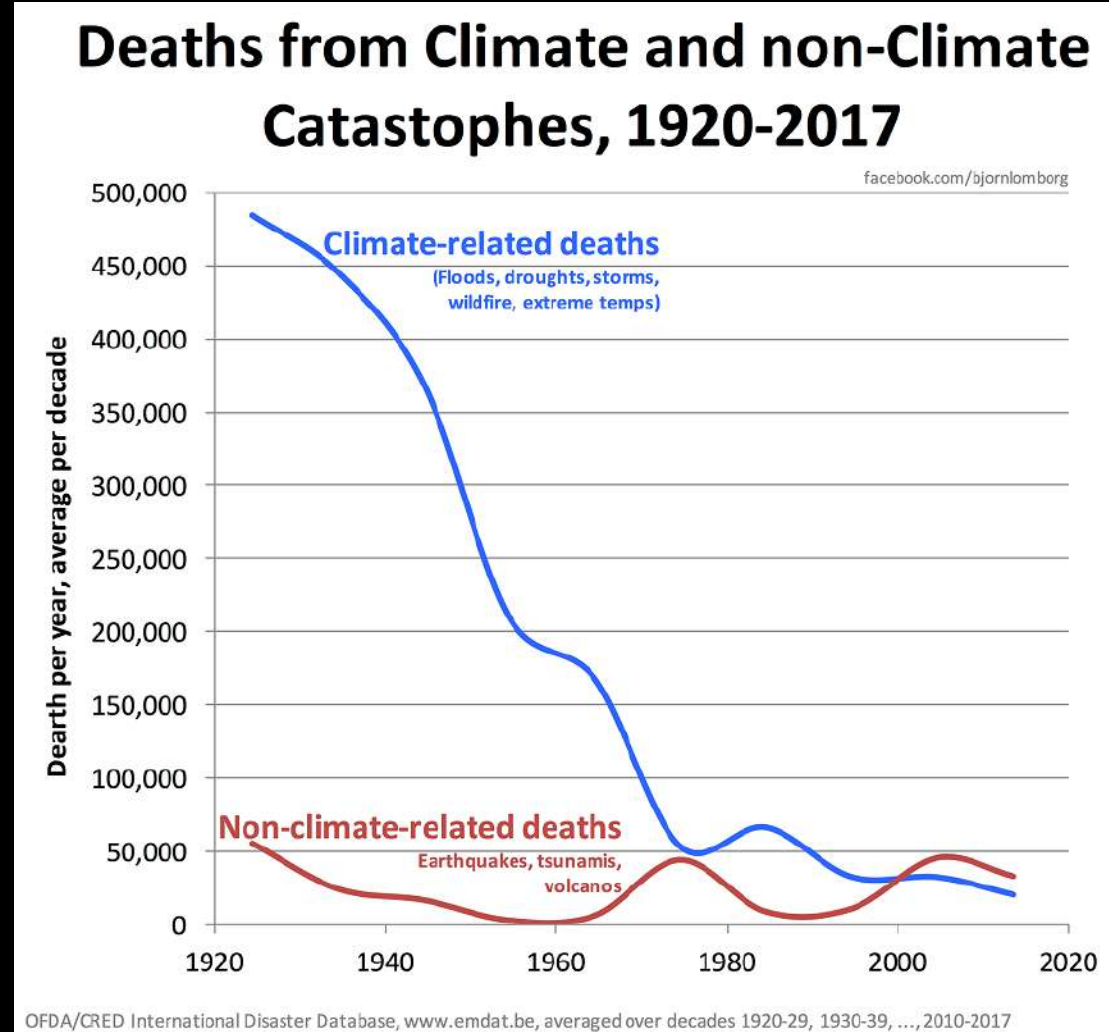


Source: OWID based on World Bank; and UN FAO

OurWorldInData.org/crop-yields • CC BY

THE TRUTH: WEATHER-RELATED MORTALITY IS DOWN 95% IN LAST 100 YEARS

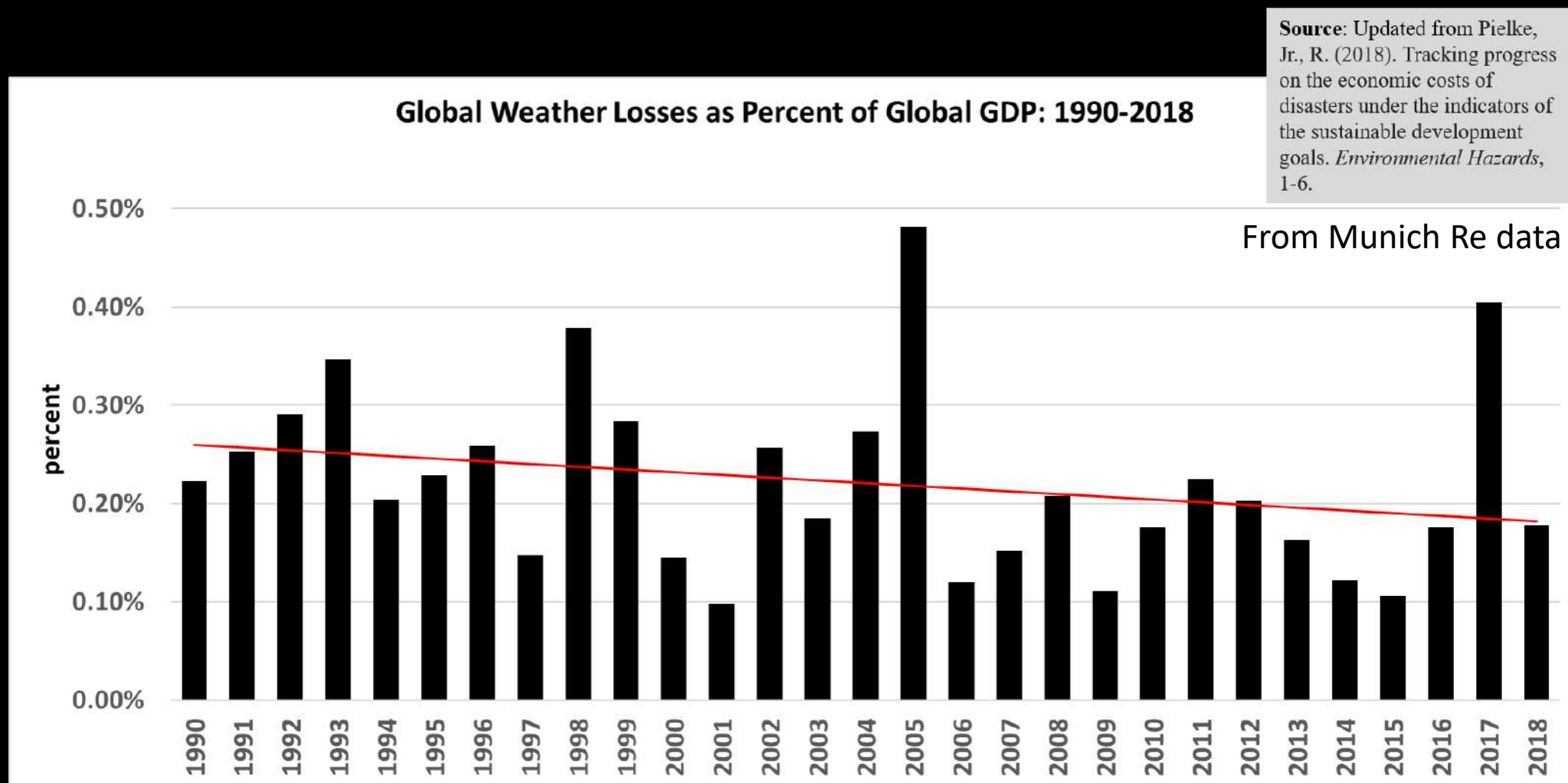
22



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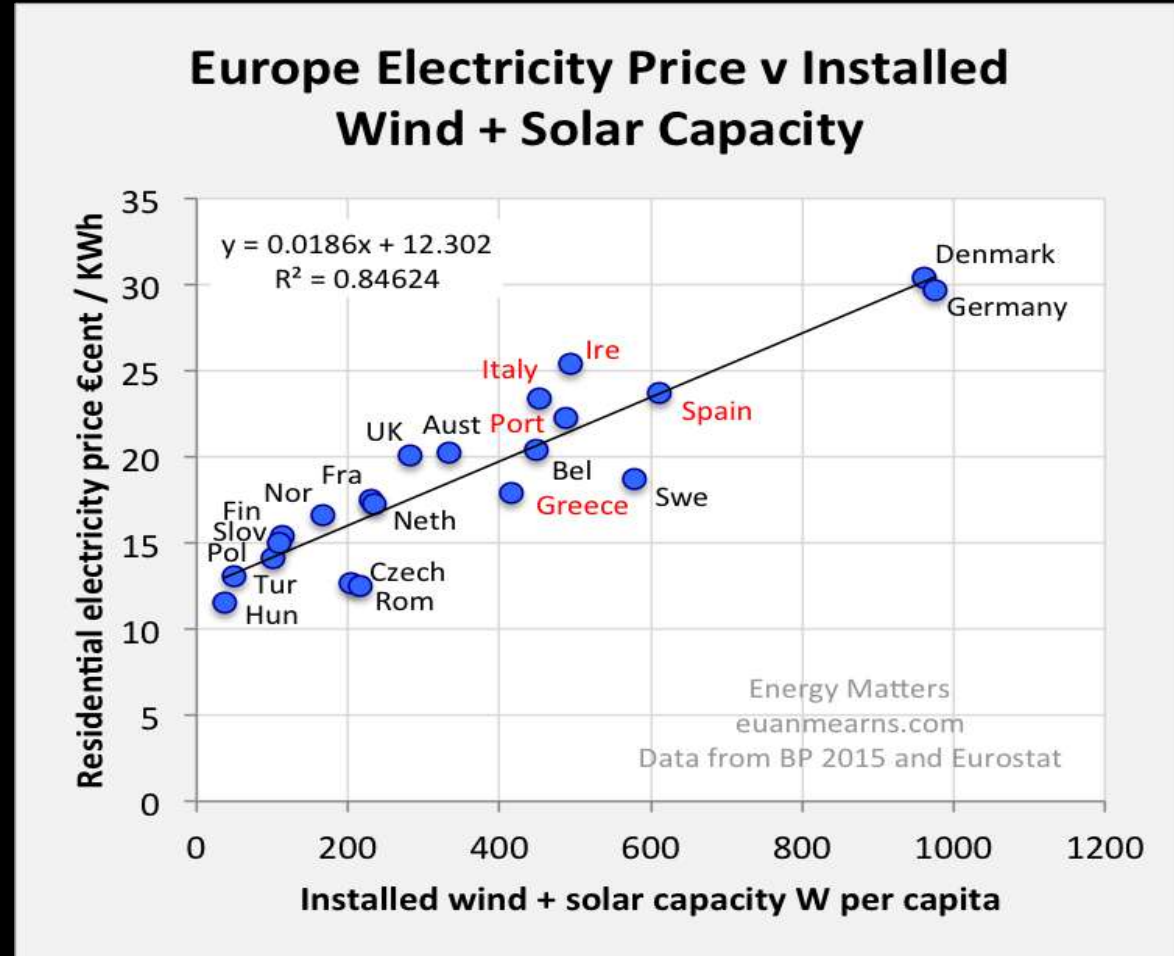


MORE TRUTH: *DOWNWARD* TREND IN WEATHER DISASTER LOSSES RELATIVE TO GDP



THE “SOLUTIONS” FOR CLIMATE CHANGE ARE EXPENSIVE, DESTROY PROSPERITY, & HURT THE POOR

The price of electricity in Europe goes up in proportion to how much solar + wind energy is used.



BUT THE “PROFITS/PROPHETS OF DOOM” WILL CONTINUE...

The climate change / sustainability / social responsibility narratives are strong and profitable, coming from:

1. The **CLIMATE MODELERS: CMIP6 models now produce 3.7 – 4.0 deg. C warming from 2XCO2!**
 2. The education system;
 3. The news media;
 4. The entertainment industry;
 5. Political leaders and government agencies;
 6. Government grants, programs, and mandates;
 7. Rent-seekers (those who want access to political power);
 8. An increasing number of activist corporations;
- And an increasingly frightened and guilt-ridden public.



FOR A CLIMATE “EMERGENCY” TO EXIST AND REQUIRE A CHANGE IN ENERGY POLICY:

- 1. Climate change & warming must be well beyond what humanity is already used to.**
- 2. The cause must be greenhouse gas (GHG) emissions.**
- 3. The “cure” (e.g. solar and wind energy) cannot cause more harm than simple adaptation.**
- 4. The benefits (positive externalities) of extra CO₂ must also be taken into account.**

CONCLUSION:

There is no CLIMATE crisis...

**...but there will be a HUMANITARIAN crisis if we
allow the “warmmongers” to get their way.**



THE END



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