Updates on the Sun-Climate Connection: March 28, 2025

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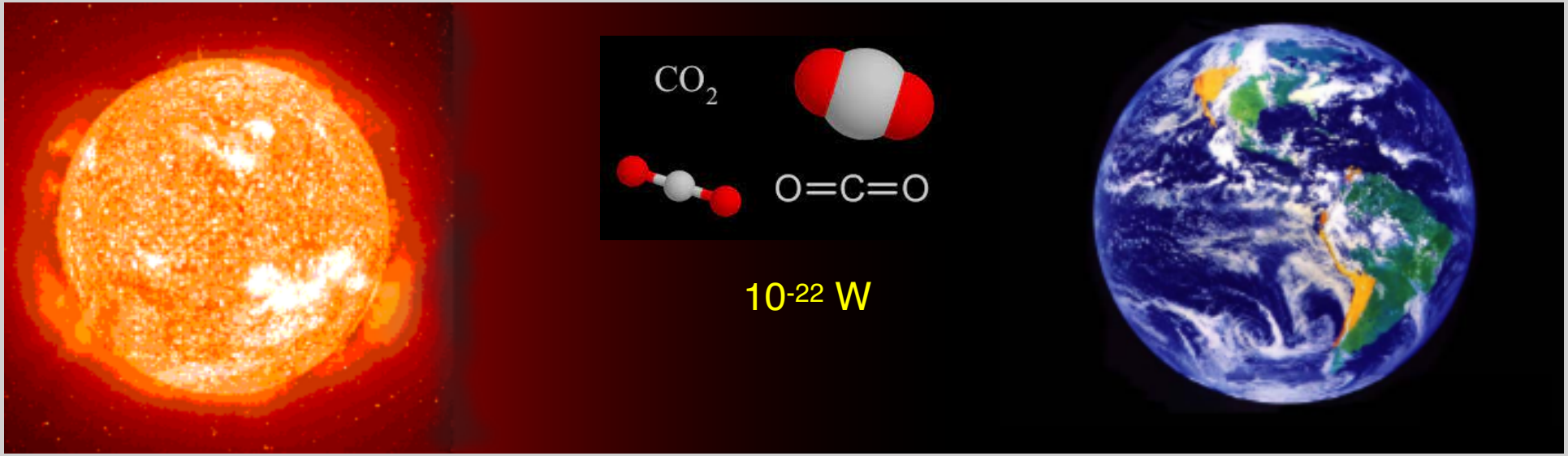
March 28, 2025
Heartland Institute Podcast

The weather-climate system is powered by solar energy



Power: 4×10^{26} W (Earth is 2 billion times weaker) 2×10^{17} W (mainly converted solar power!)
radiogenic heat = 2×10^{13} W[a]

(world most powerful laser: 5-10 x 10^{15} W; 100 petawatts pulse coming*)

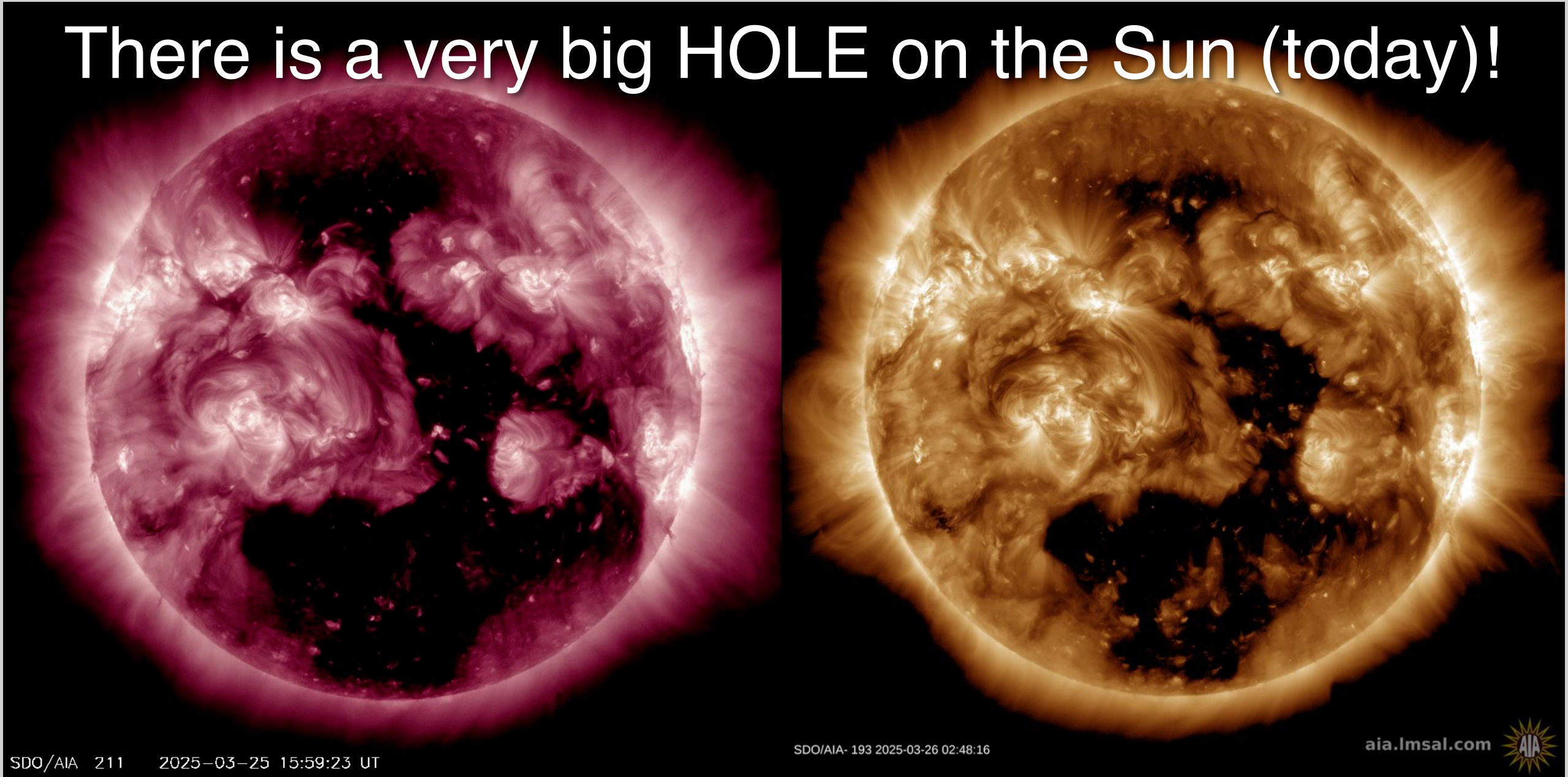
Adapted from Jurg Beer 2007's presentation with improvements by Willie Soon

*Ruxin Li, Shanghai Superintense Ultrafast Laser Facility (January 24, 2018 Science Magazine News)

[a]KamLAND Collaboration et al. (2011) Nature Geoscience, vol. 4, 647-651; Alimonti et al. (2009) Nuclear Instruments and Methods in Physics A, vol. 600, 568-593

Want to see/witness the power of the Sun?

There is a very big HOLE on the Sun (today)!

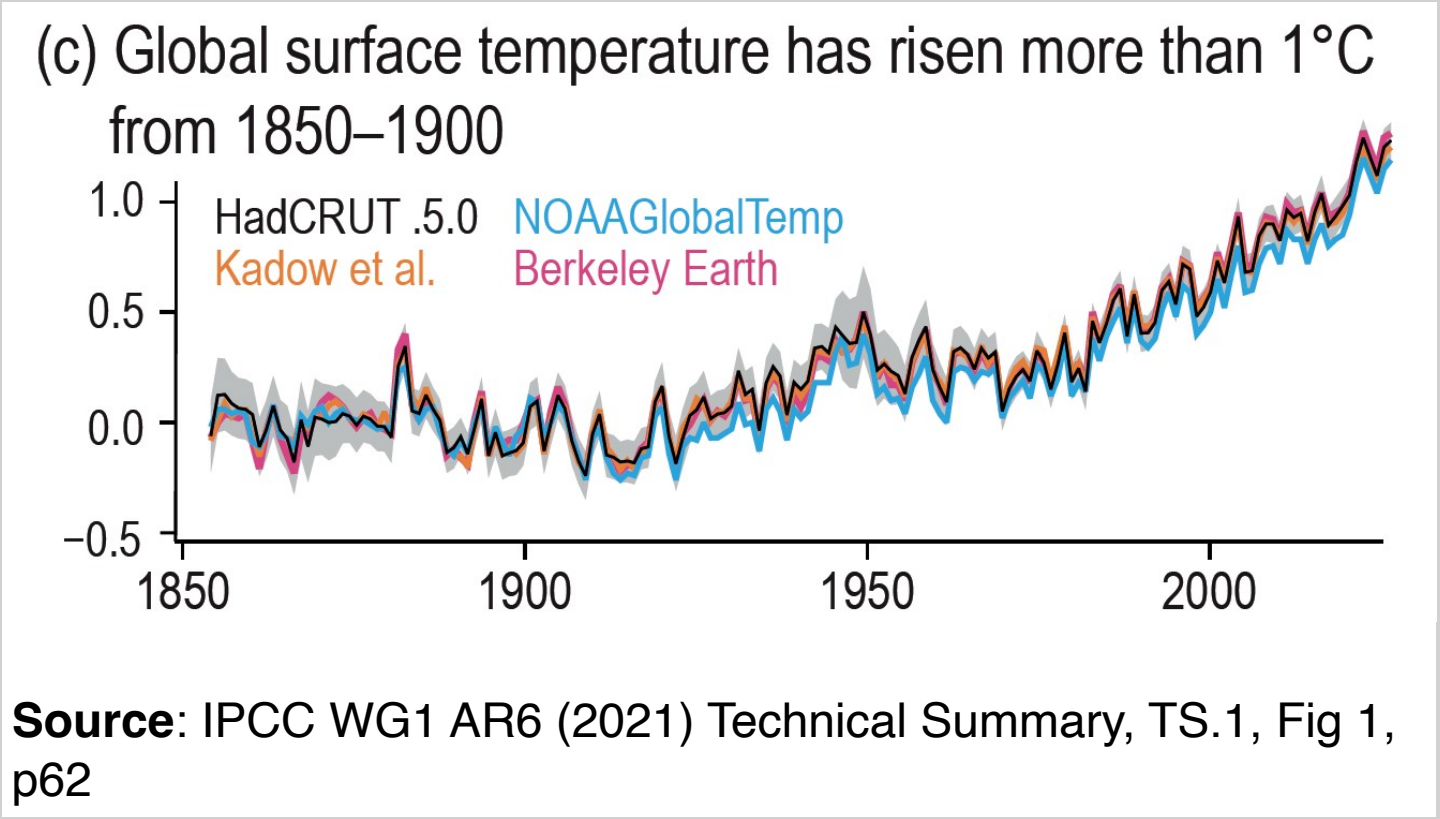


Want to see/witness the power of the Sun?

Want to see/witness the power of the Sun?

Dunedin, New Zeland, March 27,

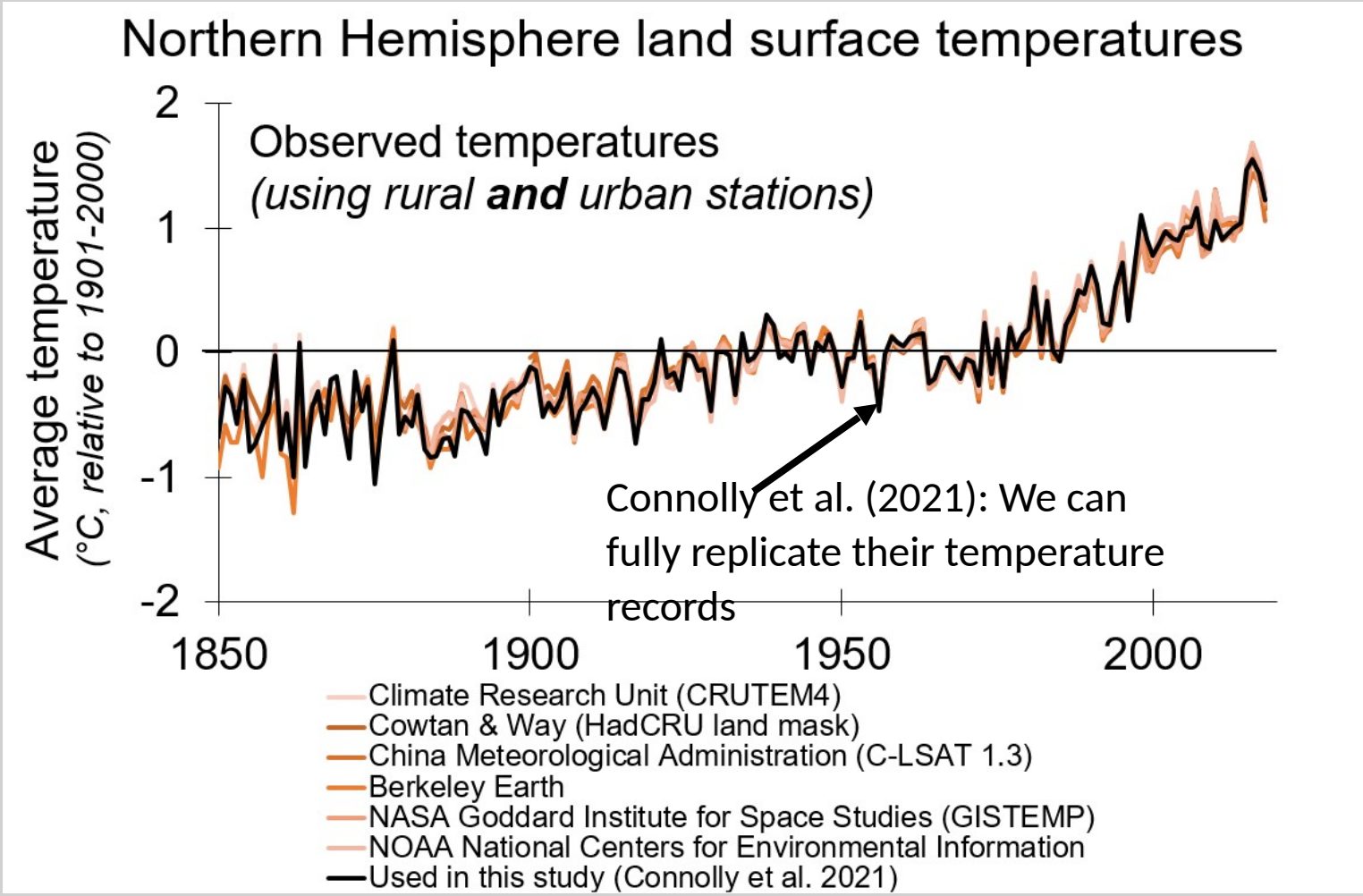
The IPCC's approach: Detection



Source: IPCC WG1 AR6 (2021) Technical Summary, TS.1, Fig 1, p62

IPCC's "Detection" of global warming

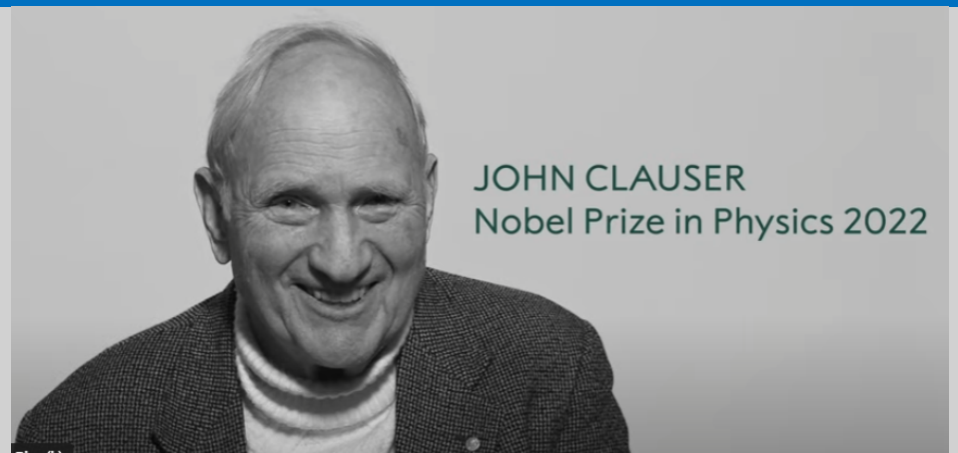
- IPCC compiled several "**global surface temperature anomaly**" time series (1850-2020)
- All of them show an almost continuous "global warming" of 1°C since the 19th century



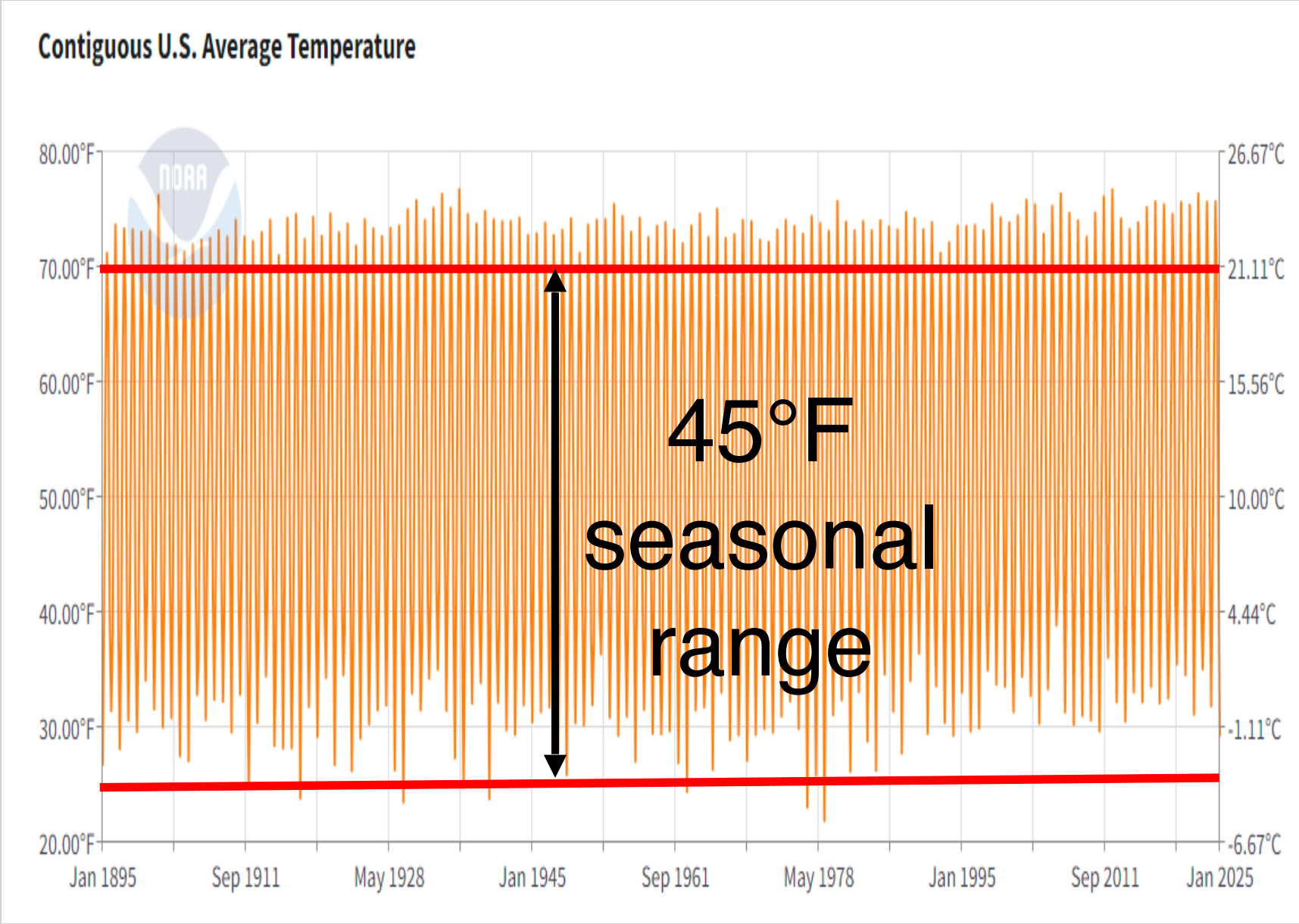
- Nonetheless, by averaging together all the available records for each year, you can generate graphs like the above!
- The warming shown by these time series is called “global warming”

“The IPCC is one of the worst sources of dangerous misinformation.”

– John F. Clauser, 2022 Nobel Laureate in Physics (Conference on Quantum Information 2023)

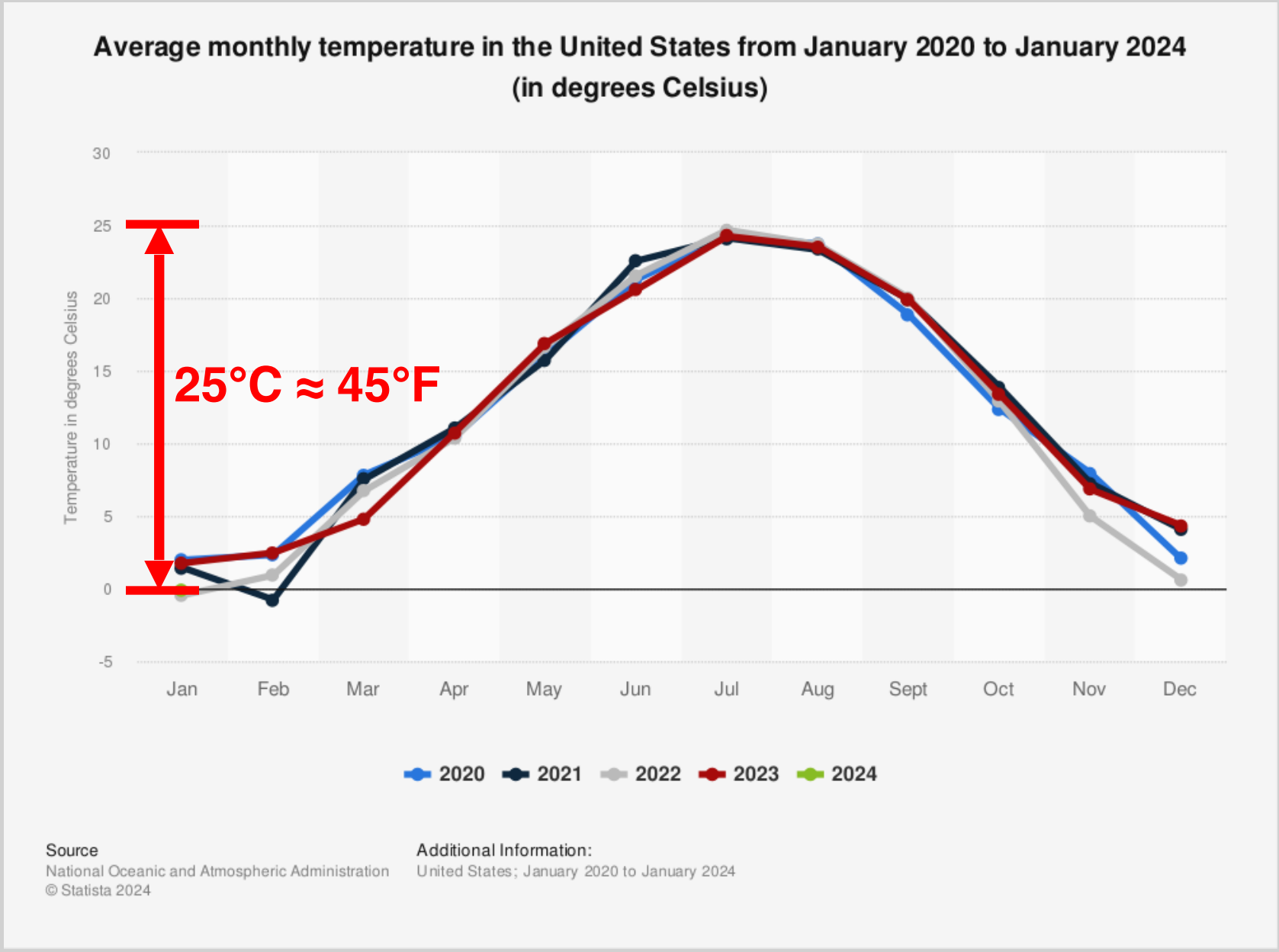


100% confident that it is impossible to find CO_2 in USA Records



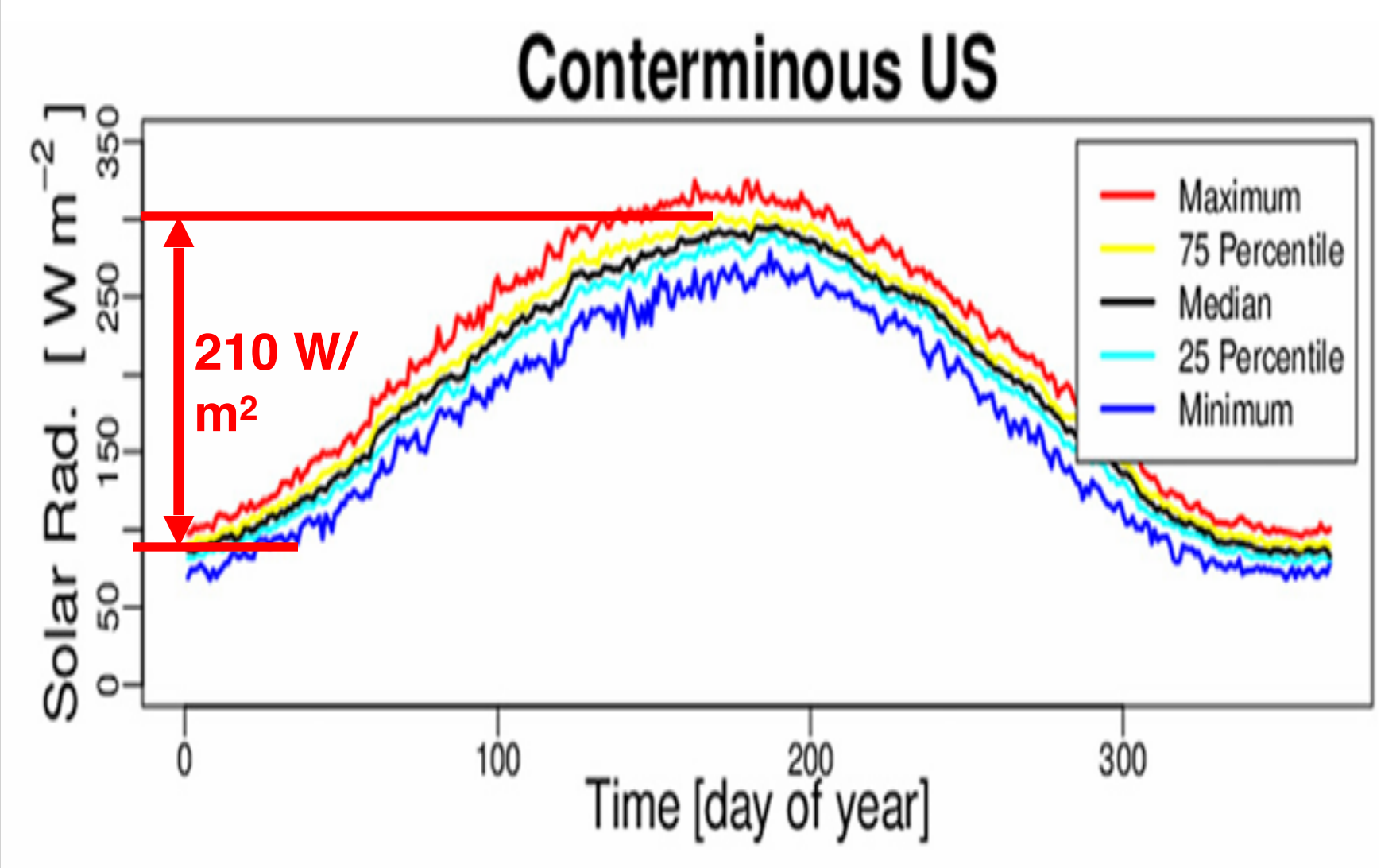
Source: NOAA; https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/national/time-series/110/tavg/1/0/1895-2025

The Seasonal Solar Radiation and Seasonal US temperatures



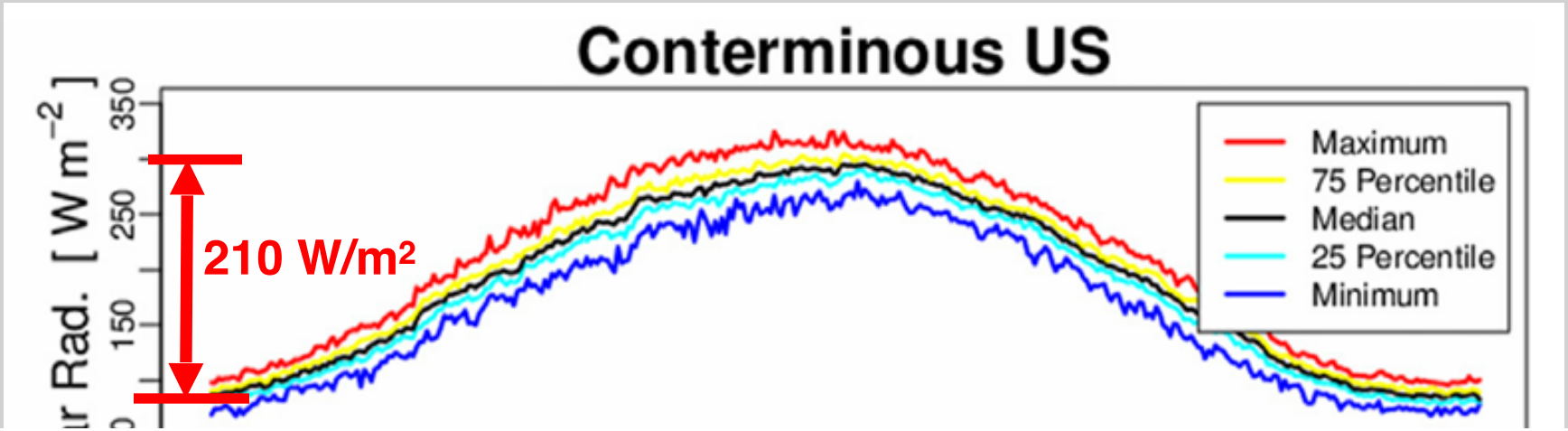
https://www.statista.com/statistics/513644/monthly-average-temperature-in-the-us-celsius/

The Seasonal Solar Radiation and Seasonal US temperatures

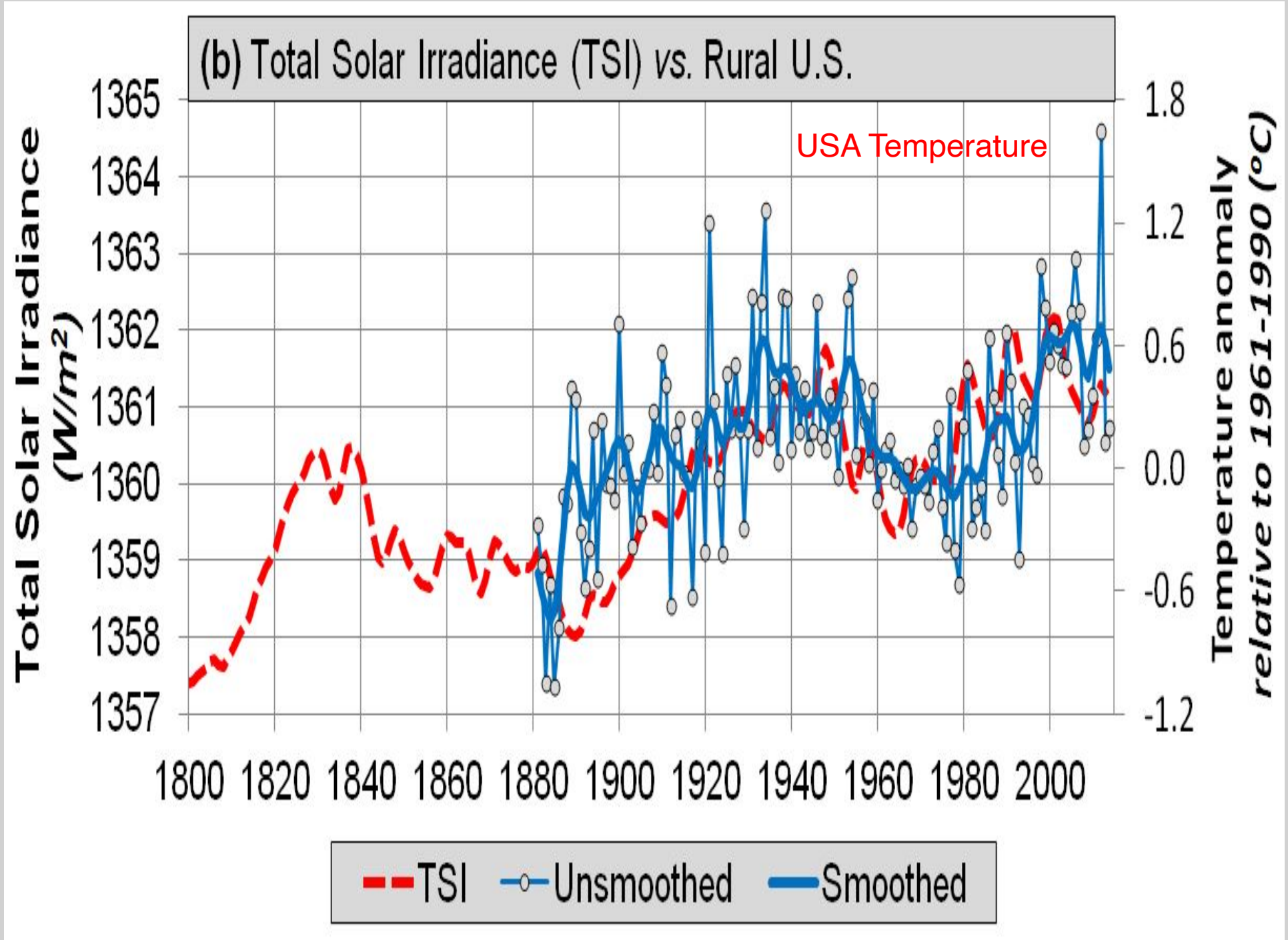


https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2023.1076830/full

The Seasonal Solar Radiation and Seasonal US temperatures

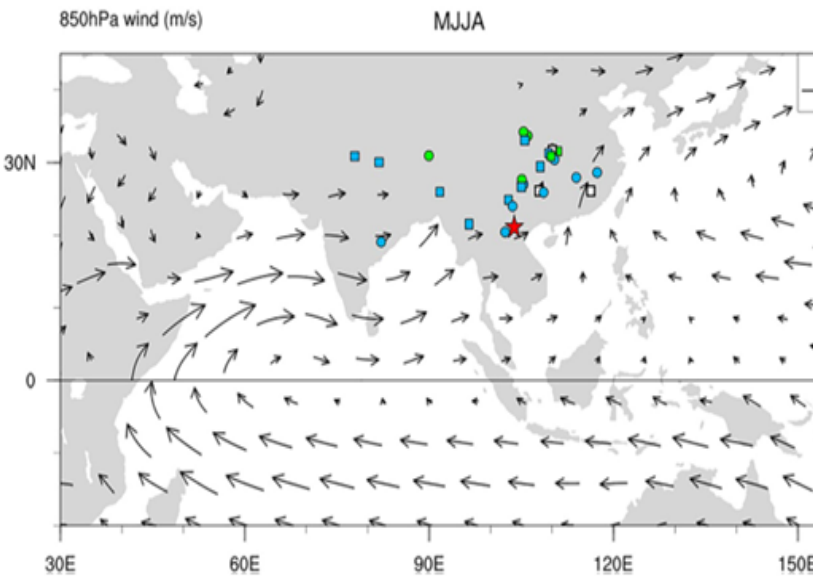


Implying 0.5 °C ≈ 0.9°F for doubling of CO_2


(b) Total Solar Irradiance (TSI) vs. Rural U.S.
USA Temperature
Total Solar Irradiance (W/m²)
Temperature anomaly relative to 1961-1990 (°C)
1365
1364
1363
1362
1361
1360
1359
1358
1357
1.8
1.2
0.6
0.0
-0.6
-1.2
1800 1820 1840 1860 1880 1900 1920 1940 1960 1980 2000
TSI
Unsmoothed
Smoothed

1. New paper on Sun-Climate Connection

Paper 1: Chiang, Chen et al. (2025)



npj | climate and atmospheric science

Article

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March 15, 2025

https://doi.org/10.1038/s41612-025-00971-8

Speleothem evidence of solar modulation on the south Asia monsoon intensity

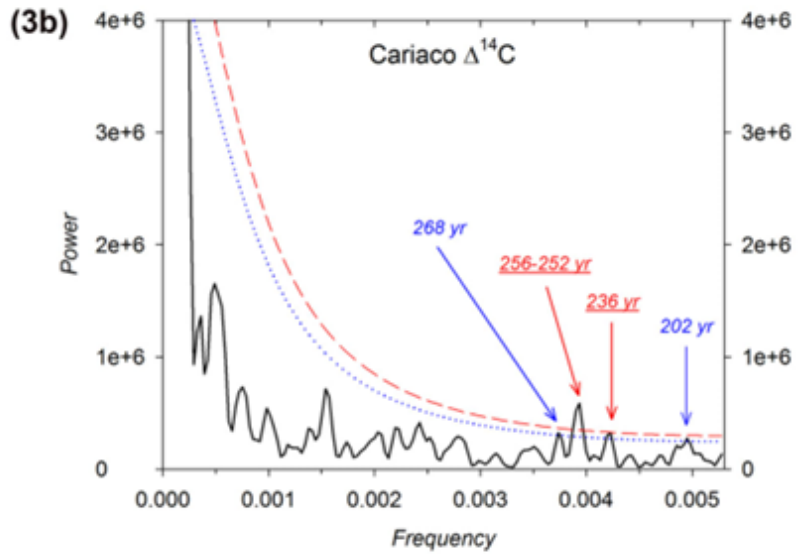
Check for updates

Hong-Wei Chiang[1,6], Yue-Gau Chen[1,6], Shih-Yu Lee[1] ✉, Dung Chi Nguyen[2] ✉, Chuan-Chou Shen[3,4], Yin Lin[5] & Lam Dinh Doan[2]

The influence of solar variation on climate has long been debated. Here, we utilize a decadal-resolved speleothem $\delta^{18}O$ record from Vietnam, spanning 32.5 to 27.5 kyr BP, as a proxy for regional precipitation levels. Our results show a general coherence between Total Solar Irradiance (TSI) and regional precipitation, supporting a positive climate response consistent with conventional monsoon theory. Spectral analysis on studied datasets reveals an approximately 180-year periodicity coinciding with the de Vries cycle of solar activity. Further comparing our record with 35 other speleothem records, we demonstrate the importance of sufficient age control points in capturing solar-related periodicities. Model simulation shows that TSI could enhance monsoonal circulation and regional precipitation. Also highlighted are the implications of chronology control for detecting climate events in proxy records. The new findings underscore the significance of relatively minor radiative forcing in regional climate dynamics over monsoonal Asia on decadal to centennial timescales.

Paper 1: Chiang, Chen et al. (2025)

All these oscillations are solar-related signals



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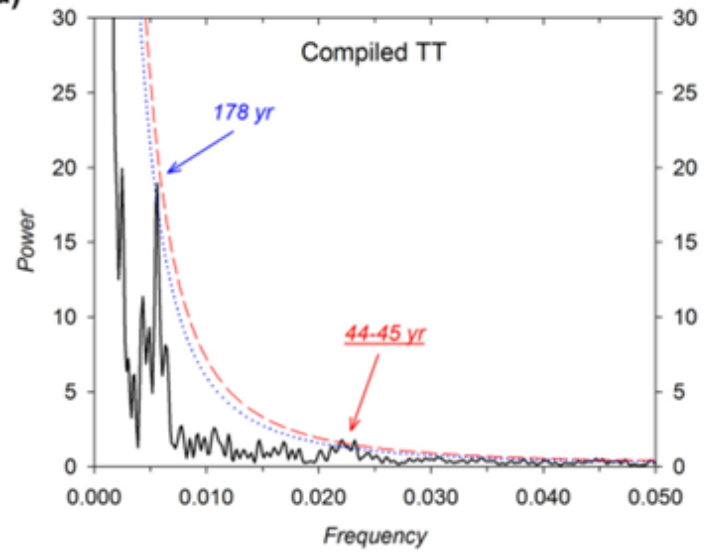

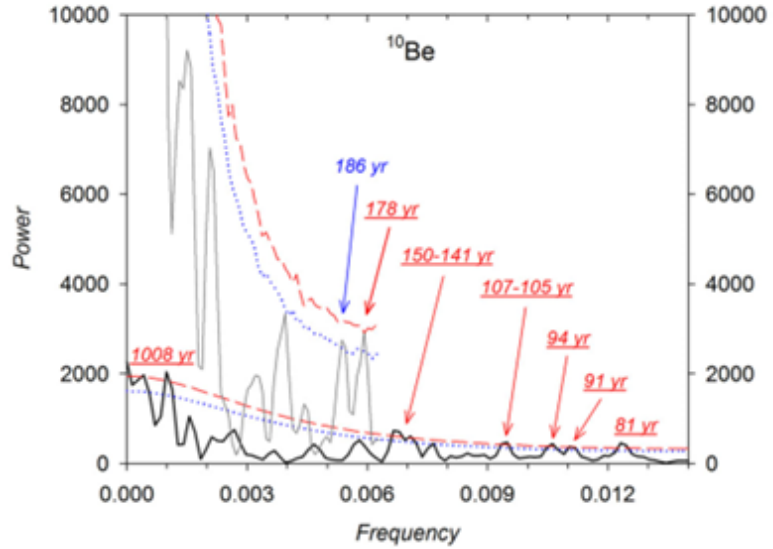

Fig. 3 | Spectral analysis of the TT $\delta^{18}O$ and cosmogenic nuclides record. Results of power spectral analysis for (**a**) the compiled TT $\delta^{18}O$ time series and (**b**) Cariaco $\Delta^{14}C$[51] and GISP2 ^{10}Be[27] records. Black (gray) line was calculated from ^{10}Be data in 3000–8000 year BP (11,000–18,000 year BP). The cyclicities above the 95% (dashed) and 90% (dotted) confidence line are shown in red and blue.

Paper 2: Wang, Zhang et al. (2023)

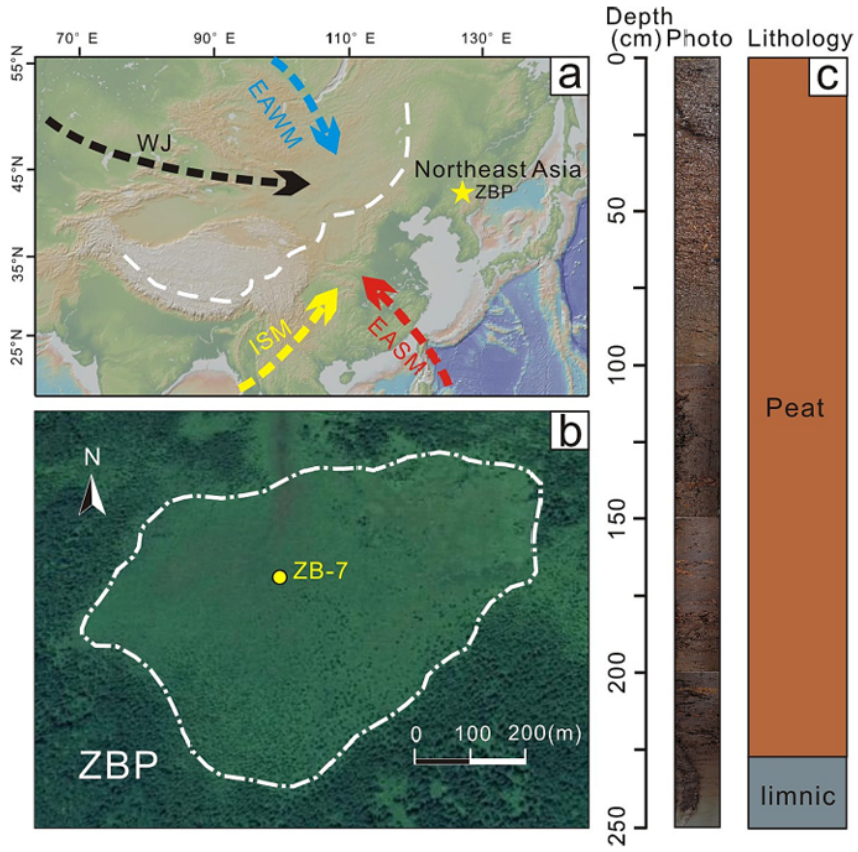

Fig. 1. (a) Map showing the location of the Zhibian peatland (WJ = Westerly Jet; EAWM = East Asian winter monsoon; EASM = East Asian s Indian summer monsoon; ZBP = Zhibian peatland. The base map was generated using GeoMapApp 3.6.10, http://www.geomapapp.org); (b and the location of core ZB-7; (c) Photo and lithology of core ZB-7.

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Solar and ENSO activity affecting Late Holocene carbon accumulation rates in peatlands from Northeast Asia: Evidence from periodic signal analysis

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Amplitude modulation

ABSTRACT

Peatlands are well developed in large areas of Northeast Asia, where changes in Late Holocene carbon accumulation rate (CAR) have played an important role in influencing the regional carbon cycle. However, the driving mechanisms and periodic signals of these important peatlands have rarely been investigated. The Zhibian peatland is a subalpine peatland, which has a continuous CAR record covering the entire Late Holocene. This peatland is located in Northeast Asia, its carbon dynamics were directly influenced by the East Asian summer monsoon. This peatland recorded direct interactions between the CAR dynamics, solar and El Niño–Southern Oscillation (ENSO) activity. Thus, we selected this peatland as a representative peatland for Northeast Asia. We used spectrum analyses and wavelet analyses to study the periodic signals of CAR dynamics, total solar irradiance (TSI), mean annual precipitation (Pann) and ENSO activity during the Late Holocene. The correlation relationships between the above parameters were investigated to explore the driving mechanisms for CAR dynamics in Northeast Asia peatlands. Our analyses indicate that CAR dynamics show 88a, 210a and 1000a periodicity over the Late Holocene. The potential driving factors, such as the Pann, ENSO and TSI, also indicate similar periodic signals. These relationships further indicate that the Pann, ENSO and TSI played an important role in controlling the CAR variations of Northeast Asia peatlands. Wavelet analyses results suggest that the CAR, Pann and TSI negatively corresponded with the ENSO variations. From the relationship model between these parameters, we concluded that strong solar activity resulted in fewer ENSO events and more precipitation in Northeast Asia. Wet conditions contributed to higher CAR, and vice versa.

Paper 2: Wang, Zhang et al. (2023)

All these oscillations are solar-related signals …

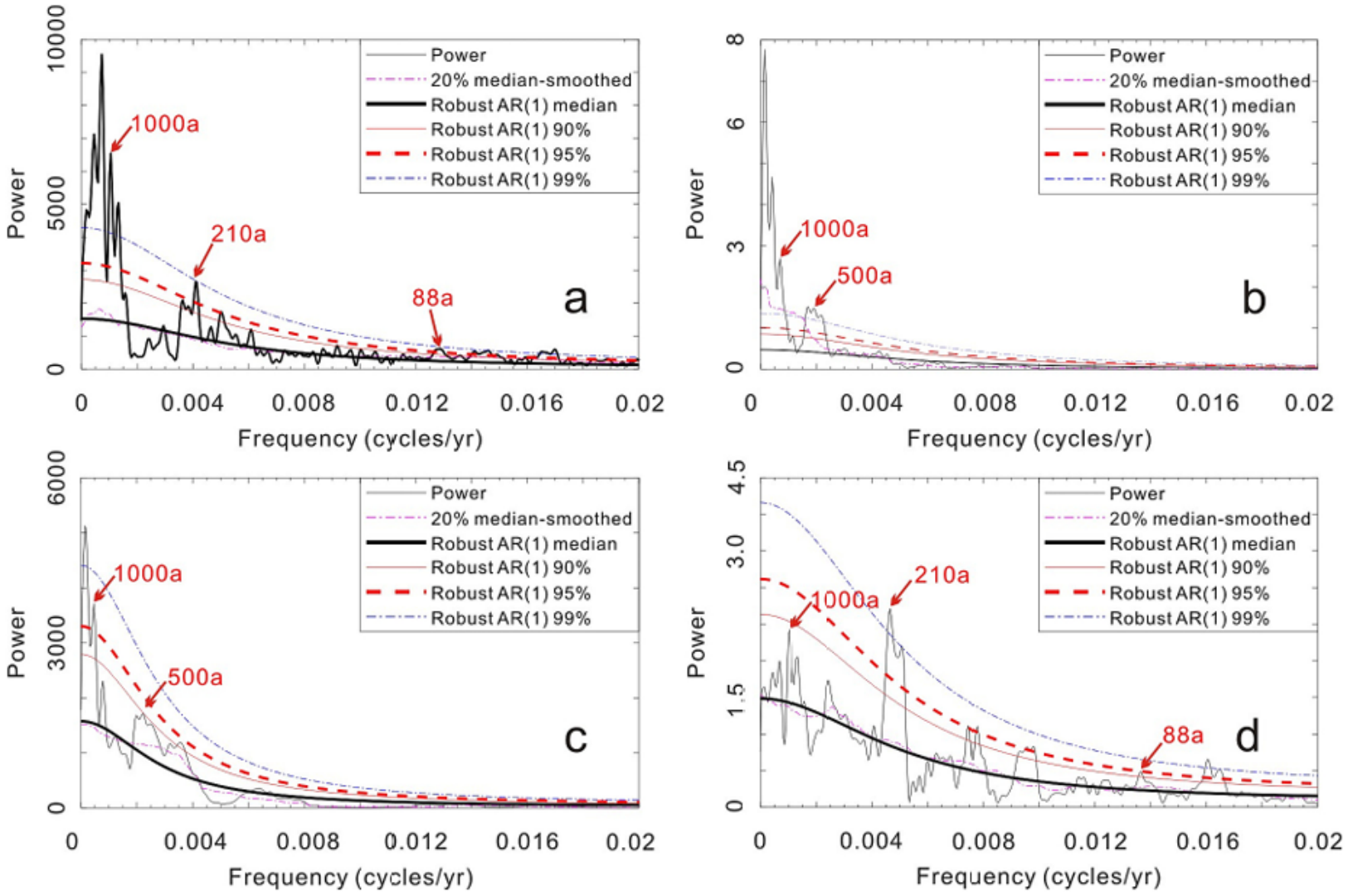


Fig. 4. (a) Power spectrum analyses results of the CAR in the Zhibian peatland (this study); (b) The reconstructed Pann from Sihailongwan Lake (Stebich et al., 2015); (c) The ENSO variance (Moy et al., 2002); (d) The TSI record (Steinhilber et al., 2009).

2. New paper on Social Cost of Carbon

Article | Open access | Published: 15 February 2025

Extended crop yield meta-analysis data do not support upward SCC revision

Ross McKitrick

Scientific Reports **15**, Article number: 5575 (2025) | Cite this article

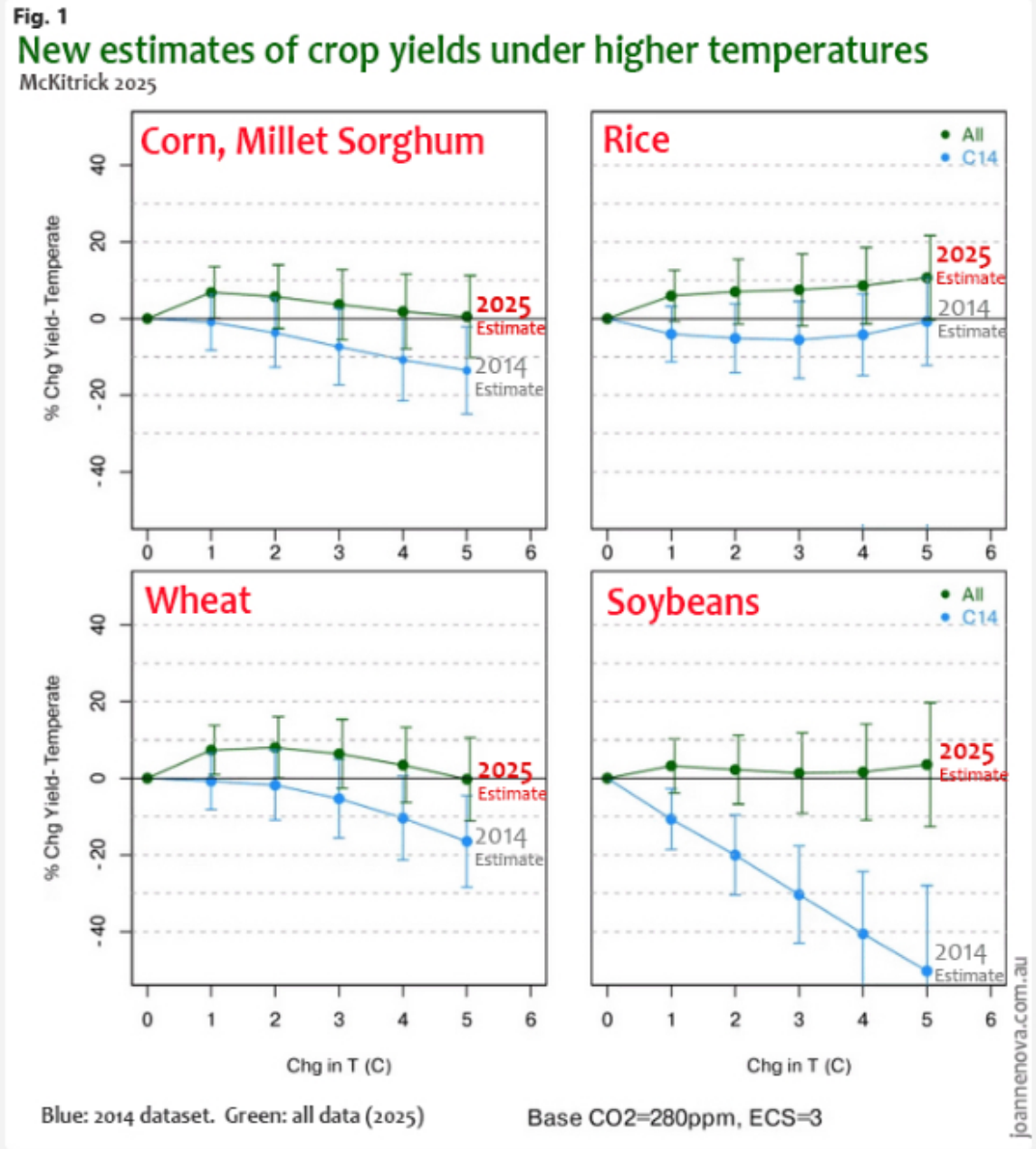
Abstract

The Biden Administration raised its Social Cost of Carbon (SCC) estimate about fivefold based in part on global crop yield decline projections estimated on a meta-analysis data base first published in 2014. The data set contains 1722 records but half were missing at least one variable (usually the change in CO_2) so only 862 were available for multivariate regression modeling. By re-examining the underlying sources I was able to recover 360 records and increase the sample size to 1222. Reanalysis on the larger data set yields very different results. While the original smaller data set implies yield declines of all crop types even at low levels of warming, on the full data set global average yield changes are zero or positive even out to 5 °C warming.

Recent estimates of the Social Cost of Carbon (SCC) from the US Environmental Protection Agency (EPA)[1] are about 5 times higher than previously[2]. Part of the increase is due to an upward revision of the estimated agricultural damages from climate warming. The EPA used two damage modules, denoted DSCIM and GIVE, and in the latter, of the new 2030 SCC value ($220 under 2% discounting), $103, or nearly half, is attributed to projected agricultural damages ([1] pp. 78–81). The GIVE agricultural damage function is based on[3] (Moore et al. 2017, herein "M17") which presents a reanalysis of a database first presented in[4] (Challinor et al. 2014, herein denoted "C14"), which itself was a meta-analysis of crop model studies simulating yield changes for agricultural crops under various climate warming scenarios. The underlying models were parameterized based on results from field studies, and the authors selected them to be, as much as possible, globally representative.

Discussion

In a climate change scenario relevant to policymaking temperature changes in response to CO_2 increases, and precipitation changes in response to temperature changes. Consequently the analysis needs to be done using multivariate modeling, which unfortunately disqualified half the C14 dataset. On that version of the dataset I replicated the regression results of C14 and generated regression results and yield change simulations approximately matching those in M17. But after rebuilding and extending the dataset I find different and much more optimistic results, namely that net crop yield changes are zero or positive even out to 5 °C for all crop types, even soybean.



McKitrick (2025). "Extended crop yield meta-analysis data do not support upward SCC revision". Sci Rep 15, 5575. Edits were made to the heading by me.

- Original dataset in blue ("C14") shows reduction in yields with even modest global warming
- Updated dataset in green ("All") shows increases in yields with global warming of up to 5°C