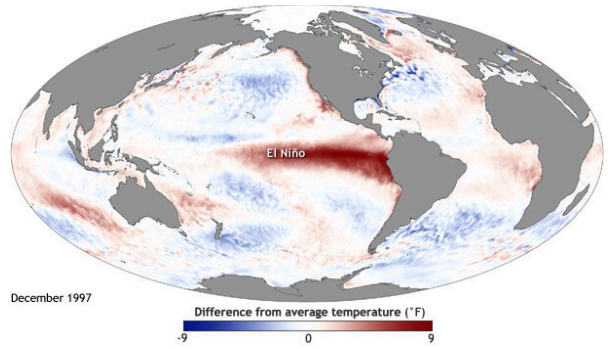
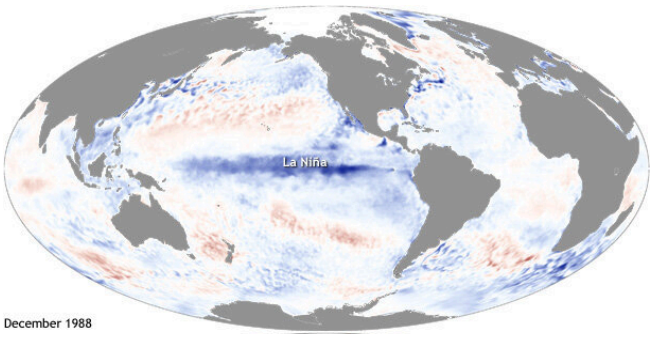
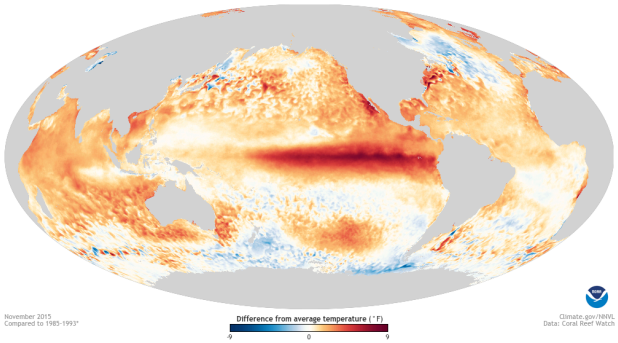
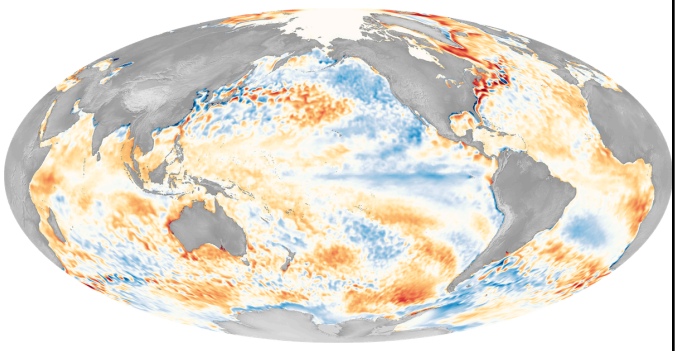
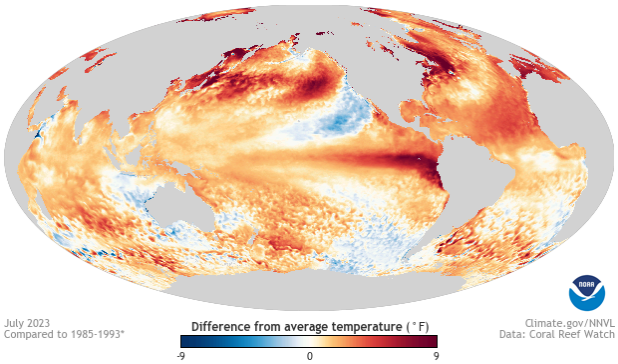
Keeping an Eye on La Niña

A quick Refresher: **El Niño-La Niña** is a 2-7 year **natural cycle** in the Pacific off of South America which affects global temperatures and can have huge impacts on weather - e.g., El Niños (like last year's which is winding down now) tend to disrupt hurricanes with high winds up in the Troposphere. La Niñas (like the one starting now), especially in the presence of warm oceans, can result in more hurricanes. The last "Super El Niño" was in 2015 (it was the warmest on record). The "Super El Niño" before that was in 1997-1998, which had a strong La Niña phase:

El Niño Phases (1997, 2015, 2023)	La Niña Phases (1998, 2017, 2024)
	
	
	La Niña 2024 ?? Much more on how this cycle comes to be can be found in **CSSG-2.15 - El Niño & La Niña and Current Global Warming.**

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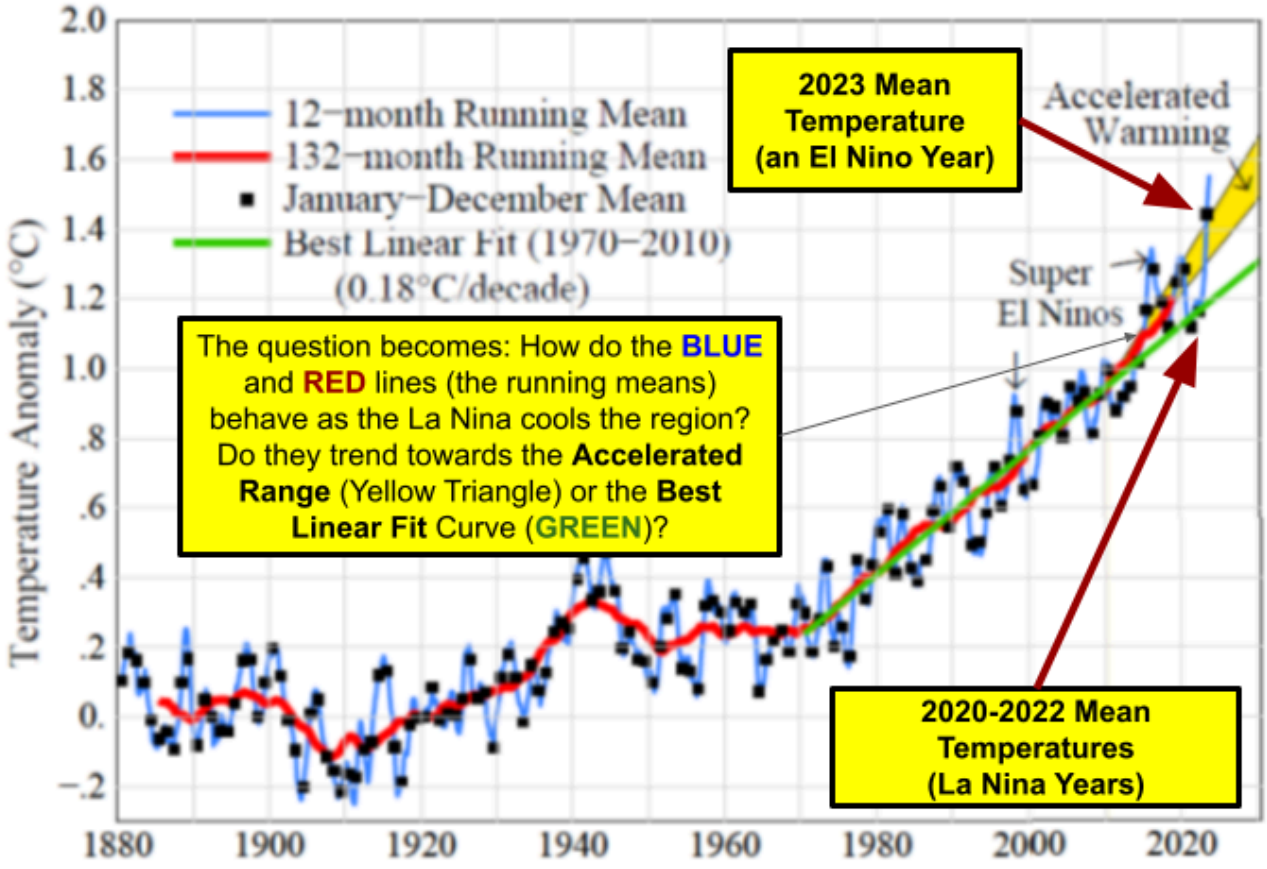
Now, why is “Keeping an eye on La Niña” of interest this year? Since the El Niño Southern Oscillation (ENSO) (the El Niño - La Niña cycle) is a natural cycle, **the net impact over several years should zero out**. So, ultimately, additional warming will become obvious on its own.

First of all, the El Niño phase, which is ending now, was not quite as strong as the “Super El Niños" in 1998 and 2016, above. Even so, **2023 set the all-time surface temperature record for the planet.** There has been some discussion (a LOT of discussion) on how fast the planet is warming.

Maybe the 2023 record was mostly the result of the warm part of the ENSO cycle. If so, once La Niña kicks in (and that is starting now), will the planet settle back into the **steady warming** we’ve seen before 2010? But, if the planet doesn’t cool back down much, then we may be confirming we are in **accelerated heating**, which some predict.

Let’s look at the temperature chart:

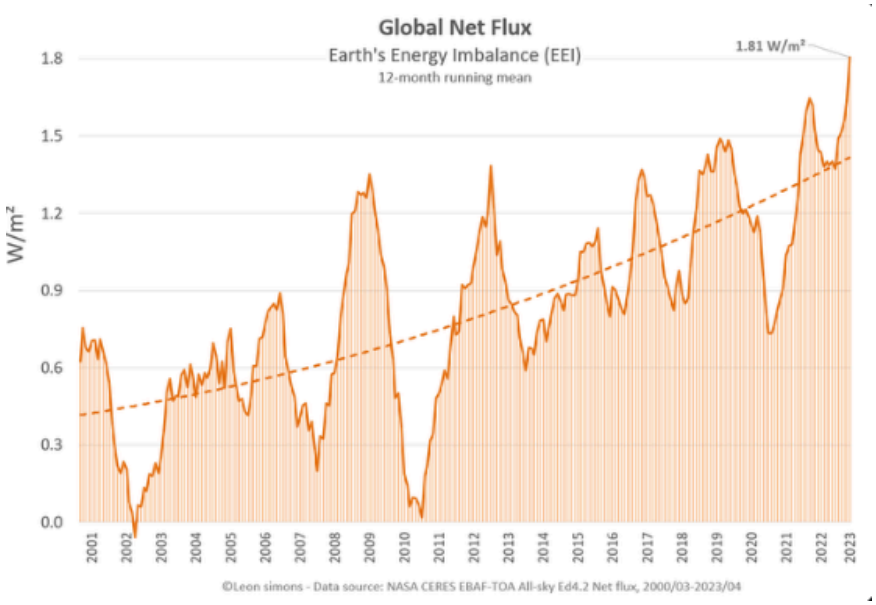


Updated 6/26/24 https://www.columbia.edu/~mhs119/Temperature/
https://www.columbia.edu/~jeh1/mailings/2024/MayEmail.2024.05.16.pdf

And looking a bit closer:

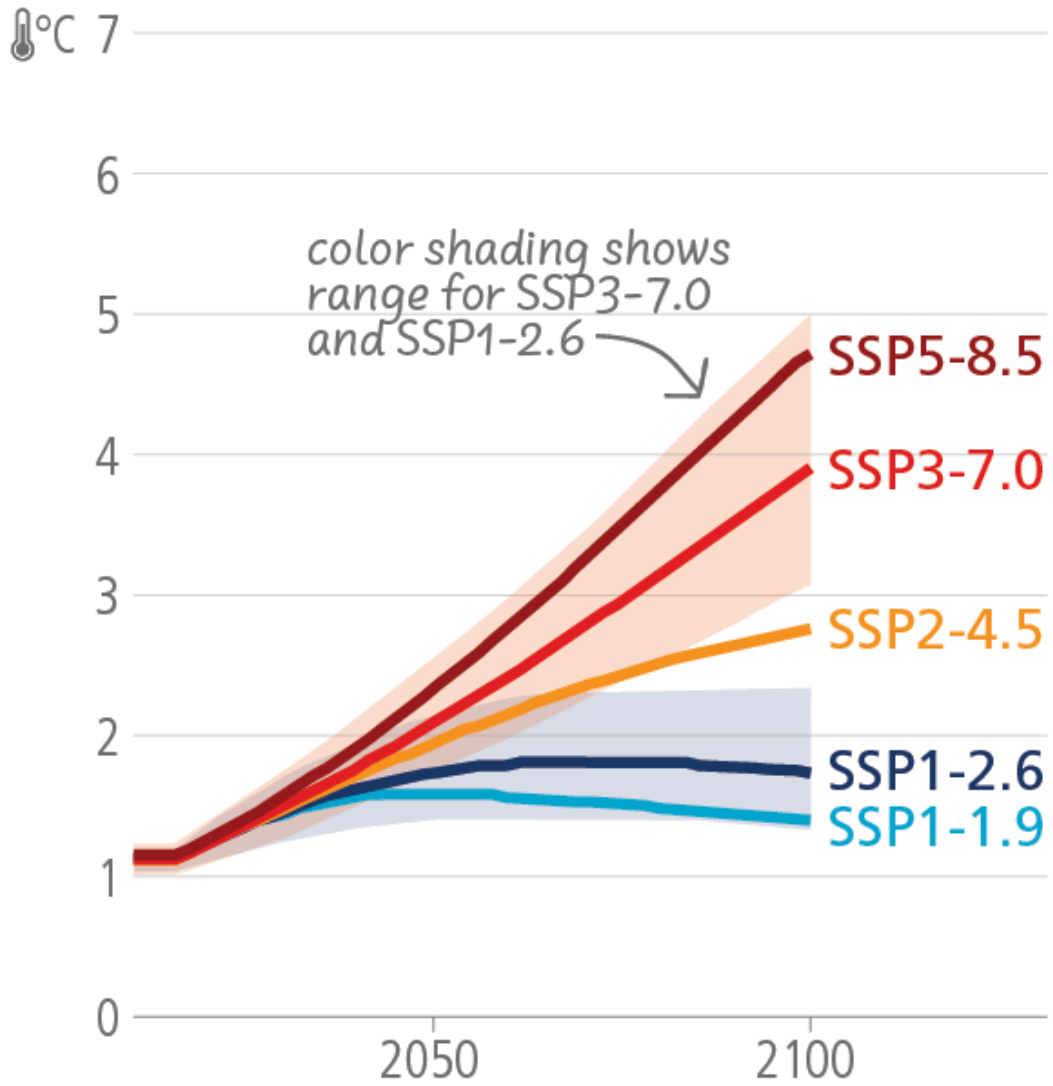
This is consistent with the Earth's Energy Imbalance (W/m^2)

It is increasing ⇒ Accelerated Warming



We first discussed this in **CSSG-2.1 Global Warming and Earth's Energy Imbalance**

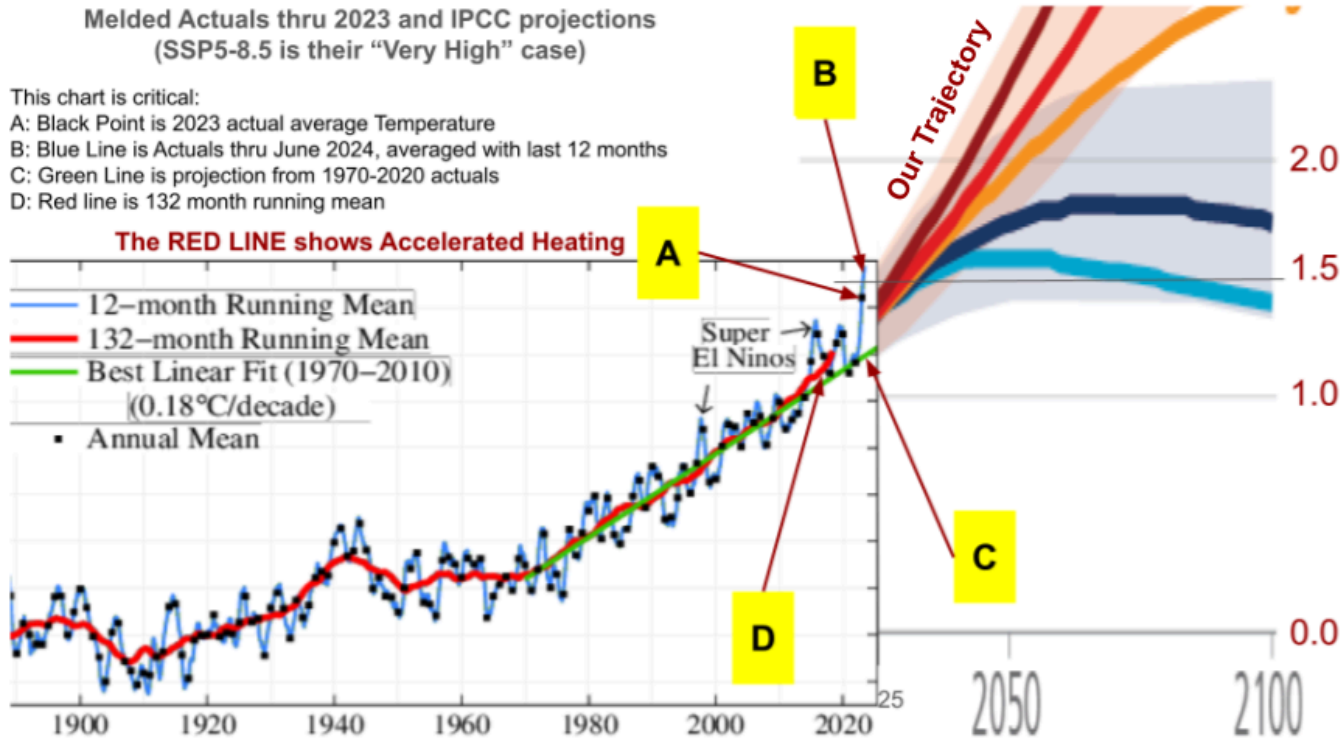
In early 2023, the Intergovernmental Panel on /Climate Change (IPCC) issued its Synthesis of all work so far. The most striking chart (to me) was this one, which revealed that scientists actually discuss the possibility of warming the Earth by almost 5 ^{0}C by the end of the century. Now, it must be said that the SSP5-8.5 case is described as the "Very High" emissions scenario, which basically says we keep going and increasing as in the past. Hopefully, we can do better.



https://www.ipcc.ch/report/ar6/syr/downloads/figures/IPCC_AR6_SYR_CSB_2_Figure_1.png

When you put the **ACTUAL TEMPERATURES** chart from above with the **IPCC POSSIBLE TEMPERATURE TRAJECTORIES** chart, it doesn't look good at all.

Below is a **direct confirmation** that the planet is heating and that it is heating faster even than IPCC had projected. The long-term trajectory (D) is diverging from the past (C). **NOTE THE PROXIMITY of A&B TO 1.5 ^{0}C.**



CONCLUSION

We can expect the **Blue Line** (which is up-to-date as of June 26, 2024) to curve over as La Niña emerges and helps cool the planet a bit over the summer and fall of this year (2024). As the months unfold into the next year, the 132-month Running Mean (the **RED Line**) - which tells us more about the longer term CLIMATE change - will be telling its story more clearly.

That's why folks are "Keeping an Eye on La Niña".

Some Resources

https://sealevel.jpl.nasa.gov/internal_resources/774/

https://sealevel.jpl.nasa.gov/data/el-nino-la-nina-watch-and-pdo/el-nino-2023/

https://apple.news/AeLgfgtzVQiq4K-YBYiOb3w

https://apple.news/Ay7xHnXNwR56NawWu8T6BOw

https://apple.news/AAe8NsYilRoW4im4bVsuQew

https://youtu.be/wMMRKu4xPHU?si=h-T8zjwoln0m7Xti

Approximate "Cheat Sheet":

1 meter → 3 feet **1 degree Celsius (^{0}C)** → 2 degree Fahrenheit (^{0}F)
ppm = parts per million **CO_2** = Carbon Dioxide
1 tonne = 1000 kilograms = 2205 pounds **1 gigatonne (1 Gt)** = 1 billion tonnes
1 trillion tonnes (1Tt) = 1000 gigatons

GOOD NEWS CORNER

BUSINESS

New method of generating solar power could have a lasting impact: 'Agrivoltaic solar arrays will win the rural solar war'

This would enable farmers to make money, preserve farmland, protect flora and fauna, and prevent pollution.

by Katherine Hammer / July 19, 2024

https://apple.news/Ao4-msPp3RyCGhG_RZCSPkw

Factory in Finland replaces component of lithium batteries with new material from trees: 'Abundantly available'

The project is exciting with its potential to address a wide range of environmental concerns.

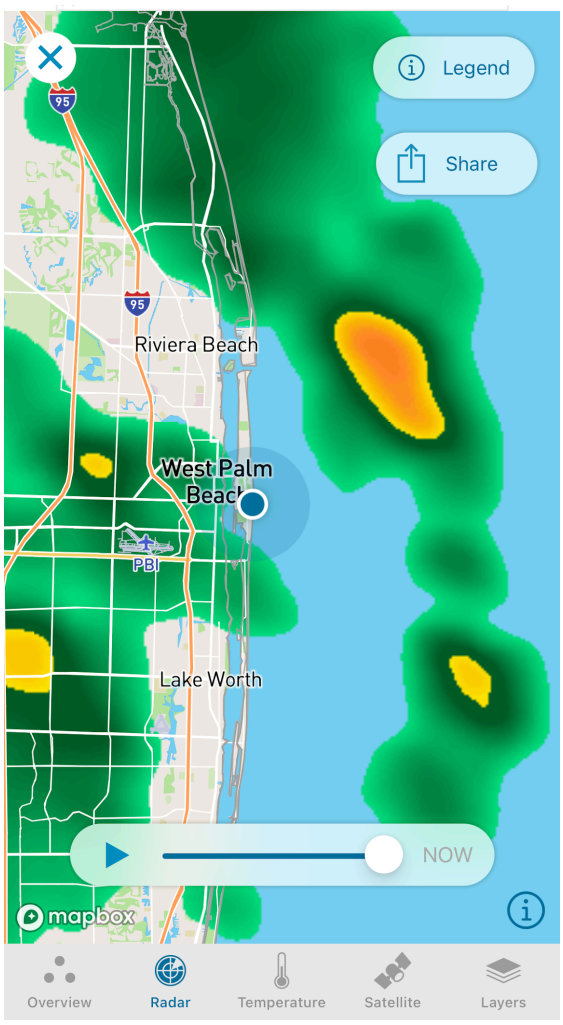
by Katherine Hammer / July 19, 2024

https://apple.news/AwjKeI9DLSg2Jp8bULJ-EGA

Our Natural World - This is Us

Saturniidae Moth Caterpillar - no animator can come close to nature

Thunderstorm off of Palm Beach July 19, 2024 with the storm on radar (the big yellow blob)



Sands of the Sahara this last week