

## Climate at a Glance: El Niño and Global Warming

### Bullet-Point Summary:

- El Niño events in the Pacific Ocean are [natural patterns that have been going on for millions of years](#).
- El Niño events in the 21<sup>st</sup> century have had some very **strong warming spikes**.
- If you remove the effect warming El Niño events in the climate record, the amount of warming since 2000, you find **almost half of the global warming in the 21<sup>st</sup> century is due to El Niño events**.

### Short Summary:

[According to NOAA](#): “El Niño is a naturally occurring climate pattern associated with warming of the ocean surface temperatures in the central and eastern tropical Pacific Ocean, which can significantly influence weather patterns, ocean conditions, and marine fisheries worldwide.”

A major uncertainty in figuring out how much of recent warming has been human-caused is knowing how much nature has caused. The [IPCC is quite sure](#) that nature is responsible for less than half of the warming since the mid-1900s, but some climate scientists, politicians, activists, and various green energy pundits go even further, behaving as if warming is 100% human-caused. But real-world data shows that natural El Niño events add to global warming, and it [strongly effects climate](#) over time.

If we look at the warming over the 19-year period 2000-2018, we see the [record El Nino event during 2014-16](#) which caused increased sea surface temperature in the Pacific Ocean, which in turn increased air temperature globally as seen in Figure 1:

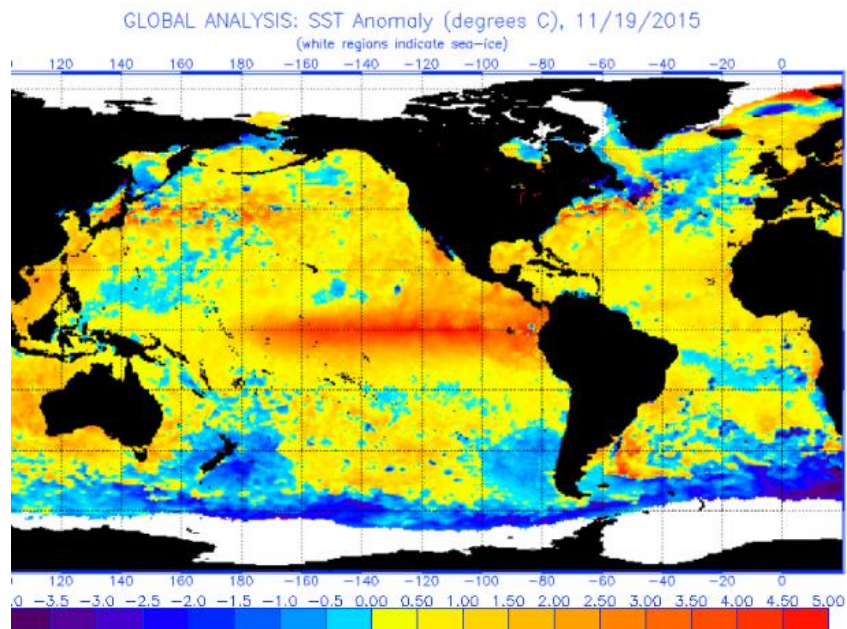


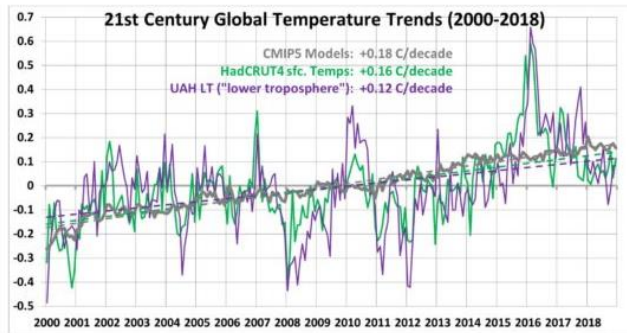
Figure1: Satellite imagery showing a strong El Niño event in the Pacific Ocean in November 2015. Source: NOAA <https://www.ospo.noaa.gov/Products/ocean/sst/anomaly/2015.html>

That event created a “warm spike” in the global temperature record in 2015 and 2016, and caused increased global warming trends.

Climate Scientist Dr. Roy Spencer of the University of Alabama, Huntsville, performed a calculation to remove the effect of the 2015/2016 El Niño event as seen in Figure 2 below.

### **With El Niño warming:**

Even with the record warm 2015-16 El Niño, observed warming has not kept pace with climate model projections.



### **With El Niño warming removed:**

Restricting analysis to the period with no trend in El Niño/La Niña activity (15.5 years) leads to a larger discrepancy between models and observations.

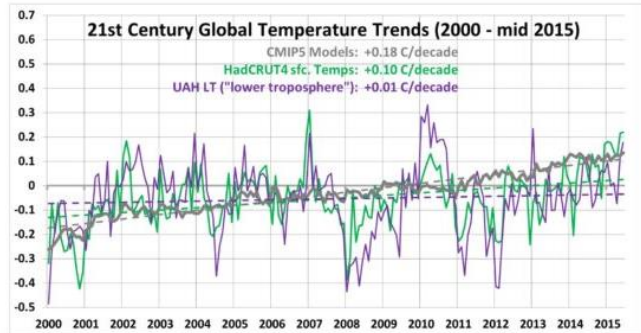


Figure 2: comparison of warming trends for models, surface temperature, and satellite derived atmospheric temperature. Original data on the left, data with El Niño events removed on the right.

### **The result:**

- The observed trend in HadCRUT4 surface temperatures is nearly cut in half compared to the CMIP5 climate model average warming over the same period, and the UAH tropospheric temperature trend is almost zero.
- The observed rate of warming — when we ignore the natural fluctuations in the climate system is only about one-half of that projected by climate models at this point in the 21st Century.

### **Further reading:**

1. Dr. Roy Spencer, online publication, 2019. <http://www.drroyspencer.com/2019/05/half-of-21st-century-warming-due-to-el-nino/>
2. IPCC AR5 report on climate, 2015, IPCC Website: <https://www.ipcc.ch/assessment-report/ar5/>
3. NOAA NESDIS sea surface temperature satellite imagery: <https://www.ospo.noaa.gov/Products/ocean/sst/anomaly/2015.html>
4. Understanding El Niño, NOAA Website, 2016: <https://www.noaa.gov/understanding-el-nino>
5. El Niño's Grip on Climate, Nature, 2012 <https://www.nature.com/scitable/knowledge/library/el-nino-s-grip-on-climate-25816069/>