September 2024

CliSciPol

Climate Science and Policy for Nonscientists

One picture is worth a thousand words.

There is a new Science Topic on the CLISCIPOL website: Carbon Facts. The post discusses the history of CO2 from three billion years ago, tracing the massive changes that have occurred in the amount of atmospheric CO2 and discussing the significance of these changes up to the present day. (See CLISCIPOL Science Topic: Carbon Facts)

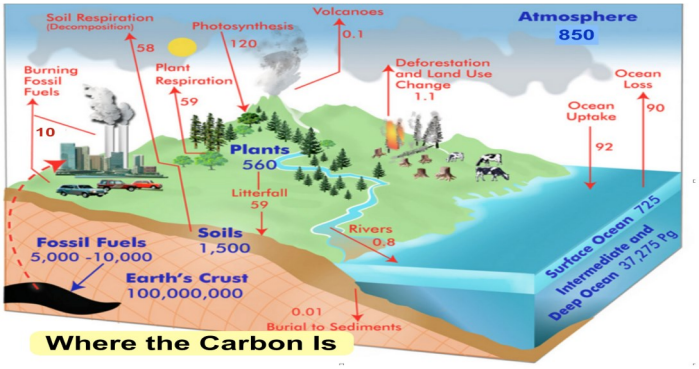
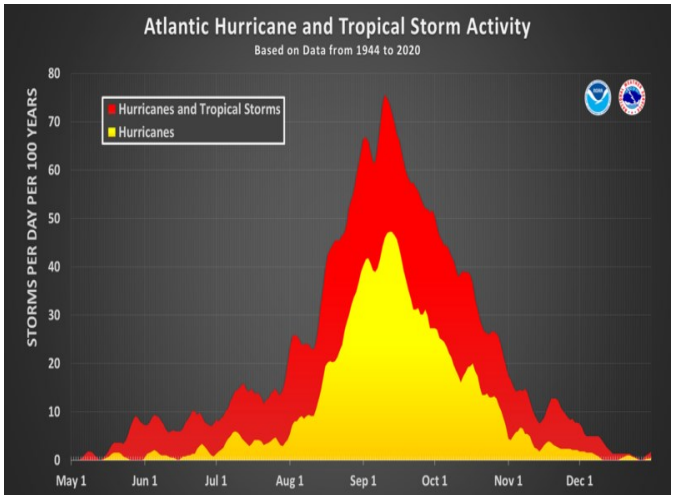


Figure 3. Depiction of the global carbon budget in Gt of carbon. Values in blue are stocks of carbon while values in red are annual flows. Note that the ocean contains nearly 50 times as much carbon as the atmosphere does, and the ocean and atmosphere are in constant flux.[17]



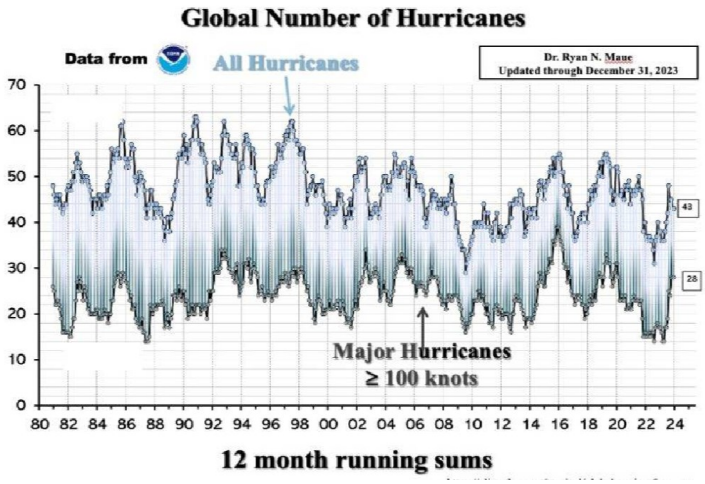
Hurricanes

The Atlantic hurricane season lasts 6 months from June to November with peak activity between mid-August and mid-September. As of September 15 about 60% of the season has passed. Hurricanes have Maximum Sustained Winds exceeding 73 mph. A tropical storm has MSW of 39-73 mph. Back in April and May scientists issued their predictions for the 2024 season.

For example, NOAA (the US National Oceanographic and Atmospheric Administration) predicted that the Atlantic season would have "above normal activity" with 17-25 named storms, 8-13 hurricanes, and 4-7 major hurricanes (Cat 3-5). Professor Michael Mann (Univ. of Pa) predicted 27-39 named storms. But not only has hurricane activity to date been slightly below normal, but from August 13 to September 8, which usually is a period of peak activity, not a single named storm formed.

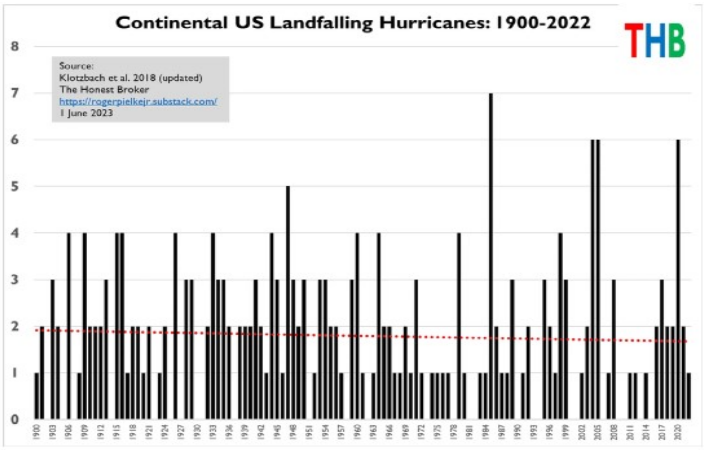
ATLANTIC BASIN HURRICANE INFORMATION

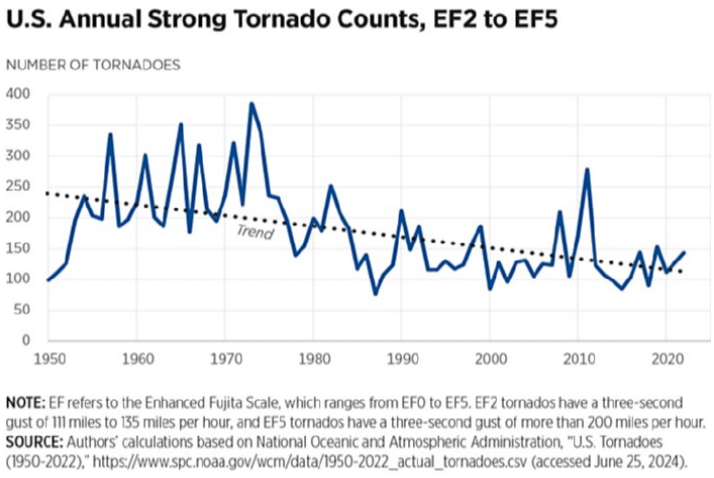
	NAMED STORMS	HURRICANES	MAJOR HURRICANES
Peak Sustained Wind Speed (mph)	>39	>74	>Hurrics110
Average Number Per Season	14	7	3
NOAA Prediction	17-25	8-13	4-7
Actual to 09-15-24	7	4	1



Numbers of hurricanes and of major hurricanes per year show significant variability since 1980 with perhaps a slight downward trend. The year-to-year variability is attributed, in part, to the El Nino/La Nina Cycle. The IPCC has found: (1) low confidence in trends in the frequency of all-category hurricanes, (2) the total global frequency of hurricane formation will decrease or remain unchanged with increased warming, and (3) there is no trend in frequency of US landfalls. [IPCC AR6 WGI ps.9, 71, 1585 (2021)]

US landfalling hurricanes since 1900 have declined very slightly, averaging about 2 per year, but with significant variability. The peak year was 1985 with 7 strikes, and there have been 3 years with 6 strikes and one with 5. So far this year there have already been 3 strikes, so 2024 is above average in this respect: (1) Beryl hit Texas at Cat.1 level although it had earlier peaked at Cat.5, (2) Debby hit Florida at Cat.1, and (3) Francine hit Louisiana at Cat. 2.





US strong tornadoes (EF2-5) have been declining since 1950. Unfortunately hurricanes and tornadoes are tremendously destructive, and they are an unavoidable fact of life. There is no increase in frequency that can be attributed to rising CO2 emissions or to rising temperatures.

Lightning

Lightning is a dangerous aspect of weather that does not receive much attention in the media. But a recent article proclaimed, "Climate Change's Latest Deadly Threat: Lightning Strikes." The article is, unfortunately, a typical example of climate alarmism. It states without any supporting data that climate change is "making stormy weather and lightning more common." It cites a single projection that a 1 C rise in temperature can (not will) lead to a 12% increase in lightning strikes

IPCC AR6 (2021) FINDINGS ON LIGHTNING

The IPCC treats lightning with "Severe convective storms, (tornadoes, hail, rainfall, wind, lightning." (e.g. AR6 p. 1532)

"Observational trends in tornadoes, hail, and lightning are not robustly detected due to insufficient coverage of the long-term observations." (AR6 p.1595)

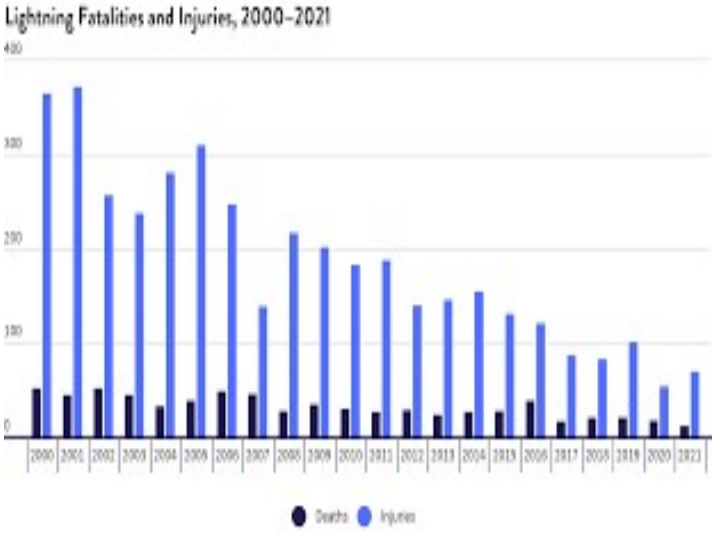
"It is difficult to directly simulate tornadoes, hail storms, and lightning, so modelling studies of these changes are limited." (AR6 p. 1596)

"Projections of smaller-scale hazard phenomena such as…lightning are currently not directly available partly due to the inability of climate models to simulate such phenomena." (AR6 p.1828)

"Insufficient observational record length for lightning numbers does not allow an assessment of trends." (AR6 p. 1824)

The IPCC in its latest Assessment Report 6 (2021) found no trend in the numbers or the intensity of lightning strikes and no reliable models that might project increases in such numbers or intensity.

While there is insufficient data from which to find any trend in the frequency of lightning strikes or their intensity, there is actual data showing a large decrease in US deaths due to lightning 1940-2014.



And there is actual data showing a large decrease in US lightning injuries 2000-2021 and a continued decrease in US lightning deaths over the same period.

Worldwide since 1920 there has been a massive decrease both in deaths and in death risk from climate-related events.

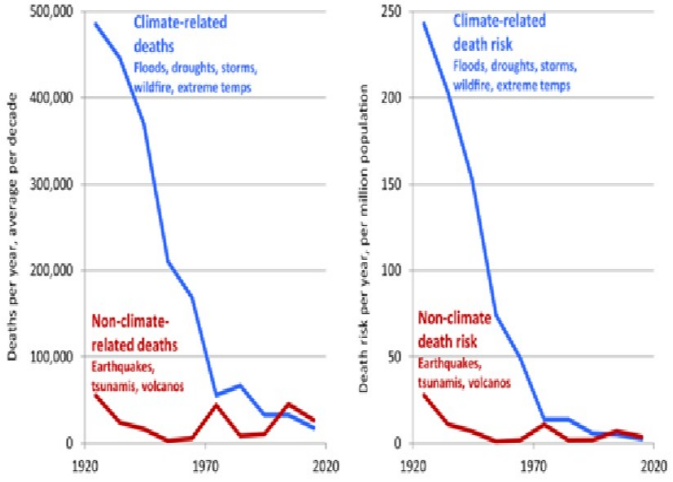
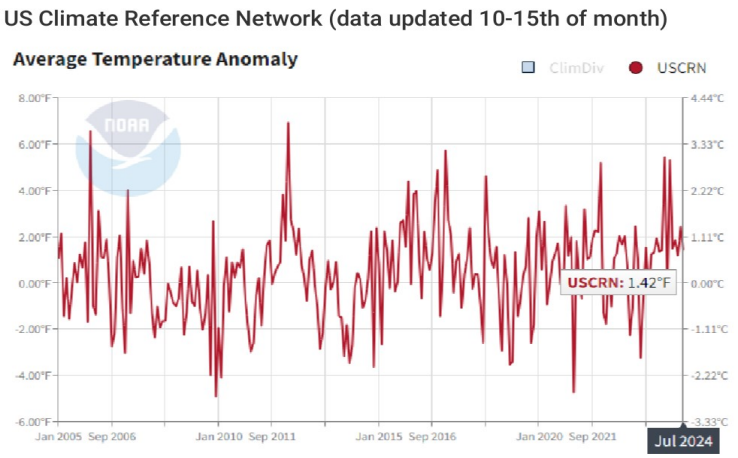


Figure 1: Climate and non-climate-related deaths and death risks from disasters 1920–2018, averaged over decades. Data comes from EM-DAT (2019), using floods, droughts, storms, wildfire, and extreme temperatures for climate-related deaths, and earthquakes, tsunamis, and volcanos for non-climate-related deaths. Source: Lomborg (2020).



The 2023-4 Temperature Spike

The media has frequently reported that, for the world, 2023-4 have been the hottest years "on record," which means since the preindustrial period, 1850-1900. But the US's most accurate dataset (NOAA's Climate Reference Network) shows that this is not true of the US. The recent spike in the US was not as high as the 2006 or the 2012 spike, and, as of July 2024, the US was back in the usual temperature range of the last 20 years

The 2023-24 temperature spike can not be attributed to rising greenhouse gases, because there has been no corresponding spike in such gases. NASA's Gavom Schmidt has commented that the spike came "out of the blue, revealing an unprecedented knowledge gap perhaps for the first time since about 40 years ago. We don't have a quantitative explanation for even half of it. That is pretty humbling."

Tidbits

A McKinsey survey has found that 46% of US EV owners want to switch back to traditional gas-powered cars.

Efforts to prevent extinctions have traditionally focused on one species at a time, but habitat destruction is one of the most important causes of extinctions. (See CLISCIPOL Science Topic: Extinctions) A new study has focused on identifying areas around the world with the greatest biodiversity. It concluded that by protecting such key areas, covering 1.2% of earth's surface, a majority of extinctions could be prevented.

Experts who manage our electricity grids are nearly unanimous that premature retirements of 24/7 dispatchable electricity generation (e.g. nuclear, natural gas, coal generation) mean more frequent and severe blackouts are threatened.

The Chinese government announced on August 15 that it will restrict exports of antimony, a critical mineral that dominates the production of weapons globally and is essential for producing equipment like munitions, night vision goggles, and bullets. The American mining company trying to permit an antimony mine in Idaho is still bogged down in red tape after 8 years. S&P Global recently reported that the "average mine lead time continues to trend upward, reaching 17.9 years for mines coming online in 2020-23 compared with 12.7 years for mines that started up 15 years ago."

A new study in the prestigious journal Science examined 1,500 "climate" policies adopted around the world and found that only 63 of them, or 4%, actually produced any emissions reductions.

The world's use of coal rose by 2.6% in 2023 to reach an all-time high, driven by strong coal-use growth in China and India, the two countries that use the most coal. China emits about twice the amount of CO2 as the US.

Work Cited

Intergovernmental Panel on Climate Change Assessment Report 6, Working Group I, The Physical Science Basis (2021) (AR6 WGI)