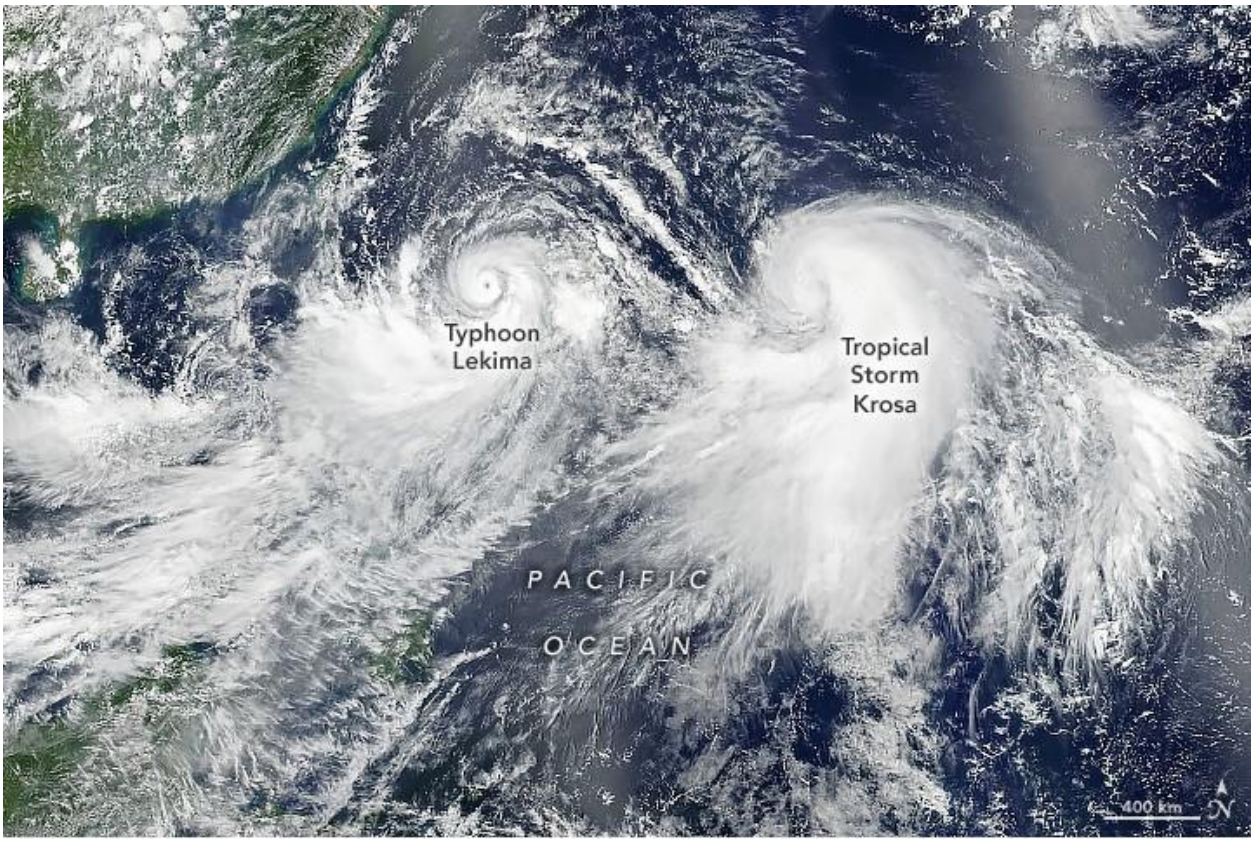
Climate at a Glance: Global Tropical Cyclones



Above: The Visible Infrared Imaging Radiometer Suite (VIIRS) on the Suomi NPP satellite acquired this natural-color image of Typhoon Lekima (left) and Tropical Storm Krosa (right) at about 04:30 Universal Time (1:30 p.m. Japan Standard Time) on August 7, 2019. Annotated image from NASA Earth Observatory.

Key Takeaways:

- Tropical cyclones, also known as typhoons and hurricanes, have occurred for millennia.
- There has been **no increase in the number or intensity of tropical cyclones** since at least 1972 as the planet has modestly warmed, and some data suggests tropical cyclone frequency has actually declined over the past century.
- Even the **U.N. IPCC agrees**, finding it can detect no increase in the frequency or severity of tropical cyclones.

Short Summary:

Devastating tropical cyclones have been common in coastal regions and islands around the world long before the invention of automobiles and coal-fired power plants.[1] Present-day real-world data shows little or no effect of global warming, aka climate change, on tropical cyclone frequency or intensity.

The Intergovernmental Panel on Climate Change's (IPCC) 2018 interim report states there is "only low confidence for the attribution of any detectable changes in tropical cyclone activity to anthropogenic influences."[2] In its AR6 WG1 report, released in August 2021, the IPCC noted,

"Identifying past trends in TC [tropical storm] metrics remains a challenge," a statement that essentially admits scientists have yet to identify a solid measurable upward trend in the data.[3]

The IPCC's findings are well supported by objective tropical storm data. See Figures 1 and 2.[4, 5]

Figure 1: Graph showing global tropical cyclone frequency since 1981

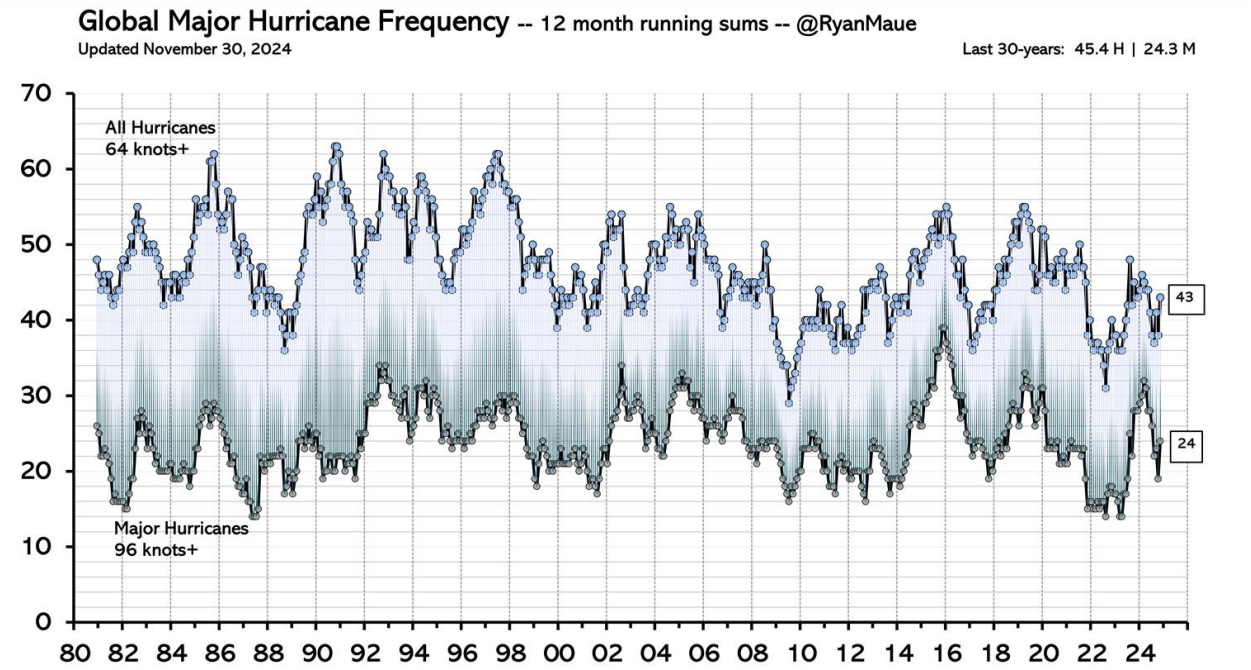


Figure 1. This figure shows that global hurricane and tropical cyclone activity is not increasing. In fact, it demonstrates a downward trend from the peak recorded in 1991. Source: Ryan N. Maue, "Global Tropical Cyclone Activity," Climate Atlas, accessed February 25, 2025, https://climatlas.com/tropical/global_major_freq.png

Additionally, the amount of accumulated energy contained in tropical cyclones, known as Accumulated Cyclone Energy (ACE) has also been measured since 1972, and as shown in Figure 2, there is no obvious increase in ACE. In fact, the value of ACE is lower in 2022 than it was in 1972. This data strongly suggests that tropical cyclones have not become more powerful since the globe began modestly warming in the late 19th century.

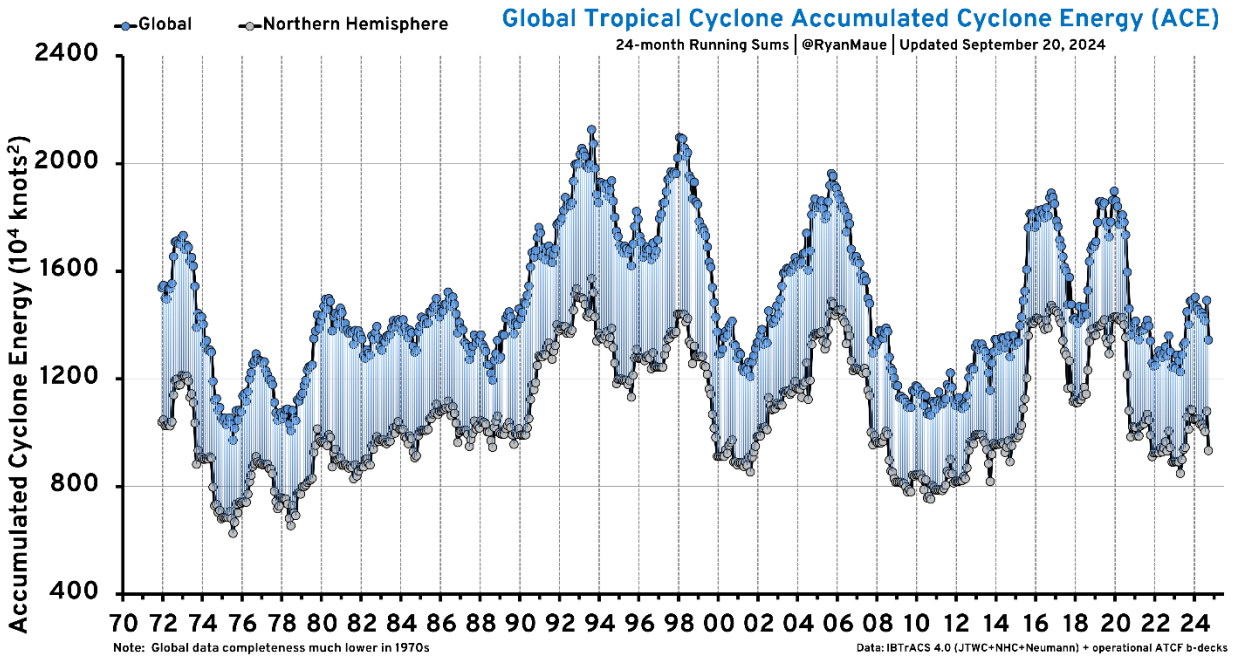


Figure 2. Last 52 years of Global and Northern Hemisphere Accumulated Cyclone Energy: 24 month running sums in different hemispheres. Source: Ryan N. Maue, "Global Tropical Cyclone Activity," Climate Atlas, accessed February 25, 2025, https://climatlas.com/tropical/global_running_ace.png

Multiple other studies suggest that over the past century, the frequency and intensity of tropical cyclones have declined, with one report finding a 13 percent decrease in tropical cyclones between 1850 and 2012.[6, 7, 8]

Research published by the University of Miami, *Global Warming Increases Wind Shear, Reduces Hurricanes*, *Climate Model Shows,* suggests that increases in wind shear have hampered the formation, and power of hurricanes, as well as their ability to maintain cohesion, explaining why tropical cyclone trends have declined.[9]

References:

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