

A real-time Global Warming Index

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Video Abstract

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Abstract

The Paris Agreement, signed on the run-up to the hottest 3-year period on record, is humankind's best bet at fighting climate change. The Agreement set a goal of holding the global average temperature to below 2°C above preindustrial levels. But while setting that mark was a promising start to halting global warming, it has appeared to invite more questions than it has answered: How much climate change is actually caused by human activity? How much of it is simply due to natural changes in our planet? To resolve that confusion, an international team of researchers set out to decouple natural from human-induced causes of global warming. Every factor contributing to climate change, natural or otherwise, leaves a distinct fingerprint across the planet's entire historical temperature record. Increases in greenhouse gases in the atmosphere, for example, cause the planet to warm up. Whereas volcanic eruptions, which spew sunlight-blocking ash and other material into the air, tend to cool it down. In identifying these multiple fingerprints, the team was able to take inventory of all the factors related to human activity and all those chalked up to natural events. The result was the Global Warming Index—a real-time value representing the rise in temperature between pre-industrial times and now caused entirely by humans. Accessible on the web at www.globalwarmingindex.org, that value currently sits above 1.02°C. While that's well within the target established by the Paris Agreement, the rate at which the index has been climbing in recent years is less reassuring. Over the past 5 years, the index has increased from 0.16°C per decade to a more alarming 0.2°C per decade, due to increased emissions of heat-trapping greenhouse gases. One limitation of the index is that it does tend to vary with the temperature dataset used to calculate it. Even so, the index value of 1.02°C could likely represent the current best-case scenario. Those variations aside, the Global Warming Index stands to be a powerful tool. Robust and updated in real time, the index could grant unprecedented access to information whose absence has confounded policymakers and concerned citizens alike.