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# Climate change is often hidden in the way we are shown temperature data

Shifting climate baselines conceal warming that occurred in the past; our new 'normals' differ strongly from normals decades ago

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An early-morning rower glides through the Potomac River on July 20, 2019. (J.David Ake/AP)  
By **David Policansky**

November 29, 2020 at 9:43 a.m. PST

When I was a child ...

“The snow got knee-deep several times a winter.”

“I could walk across the bay in winter.”

“It got so hot you could fry an egg on the sidewalk.”

How many weather stories begin that way?

There are several reasons people tell such stories. One is that when you're a child, it doesn't take that much snow to reach your knees. Another is that people's memories of weather events are notoriously bad, in part because they remember mainly the extremes, even if they are rare, and the much commoner periods with “normal” weather fade from memory. And another is that weather and climate patterns change over time. Because of those changes in climate, each generation grows up experiencing different climate averages than the previous generation did. Yet one of the ways climate information is presented makes those changes harder to notice.

Twenty-five years ago, Daniel Pauly, a fishery biologist with interests far too diverse to be categorized as belonging to any single discipline, wrote a seminal and much-cited paper, only one page long, titled “[Anecdotes and the Shifting Baseline Syndrome in Fisheries](#).” In it, Pauly argued that because we don’t have solid data on the abundances of fishes, especially much before the time of his paper, we have to rely on anecdotes. He cites an anecdote from a colleague’s grandfather, who was bothered by bluefin tuna getting into his mackerel nets off Denmark in the 1920s. There was no market for bluefin tuna in those days and they damaged the nets. Today there are no bluefin tuna there anymore.

Pauly coined the term “shifting baseline syndrome” to explain how young fishery biologists entering the profession in the 1920s expected bluefin tuna to be around, but their children, and especially their grandchildren, never saw bluefin tuna in their waters, and thus they entered the profession with a new baseline, one that had gradually shifted. Pauly contrasted the fishery situation with that of climate statistics, where good, detailed climate information is available for more than 100 years for many places throughout the world and for much longer in some places.

Here is a personal example of the shifting baseline syndrome.

When I first lived in Washington nearly 40 years ago, I ice-skated outdoors quite often, including on pools on the Mall and on the C&O Canal. I’m too old and out of practice to ice-skate anymore, but even if I wanted to, the opportunities are fewer than they were.



A rare instance of a frozen Potomac River on Jan. 25, 2014. (Craig Hudson for The Washington Post)

If I had grandchildren living in D.C., their baseline for winter wouldn't include outdoor ice-skating. Unlike me, they wouldn't miss it, because they'd never experienced it. Their baseline would have shifted.

An institutionalized example of the shifting baseline syndrome, with potentially larger consequences, is the way the National Oceanic and Atmospheric Administration (NOAA) reports climate averages; [it uses "30-year normals."](#) Every decade, the normals are updated. For the past 10 years, our "normal" period has been from 1981 through 2010. It will be updated to 1991 through 2020 next year.

[This past July in Washington was miserably hot](#); the average temperature was 83.9 degrees, 4.1 degrees above normal. The only two Julys hotter were in 2011 and 2012. So the new normal period, for 1991-2020, will contain three Julys that were hotter than occurred in any previous "normal" period. The baseline temperature for July will have shifted upward, maybe by a full degree. So if July 2021 is equally miserably hot, and the new normal for July has gone up by a degree, then it will be "only" 3.1 degrees above normal.

If temperatures continue to warm, by the time your grandchildren (or great-grandchildren) are old enough to buy houses, the normal July temperature could be so high that this past July would not be considered unusually hot.

Both winters and summers have warmed in Washington, since official climate data has been recorded, beginning in 1871. But the warming has been most noticeable in the past 40 years or so. And by shifting the baseline every 10 years, NOAA is making these warming trends harder to notice.

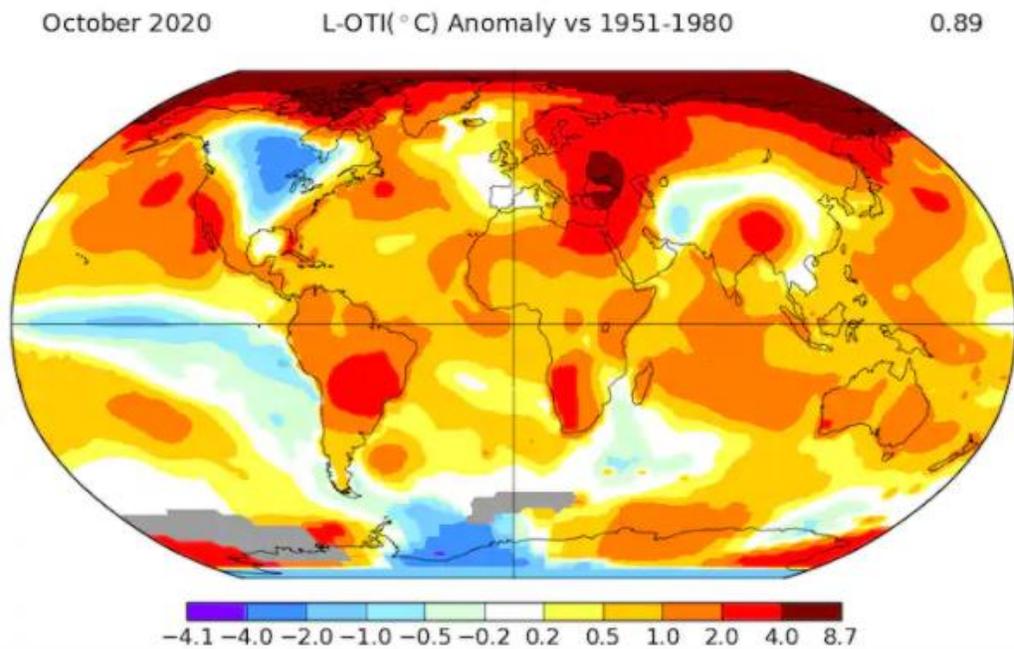
Climatologists of course know what's going on, but despite the occasional recent winter cold snap, the steadily rising "normal" temperatures make it harder for most of us to notice the change. This is not just an obscure data problem of interest only to climate nerds. It is in fact an institutionalized shifting of the baseline that makes real climate trends more obscure for most of us.

The shifting of the baseline was not intended to obscure climate change, which was not a major concern for most people 100 years ago. There are many good reasons for using 30-year climate "normals" and for updating them every decade.

According to NOAA, the 30-year "normals" were mandated by the International (now World) Meteorological Organization almost 100 years ago. The first "normal" period was 1901-1930. Many countries use the 30-year normals.

If climate averages weren't updated, insurance companies, builders, farmers and others would be using climate data that was out of date. It's important to know what the climate was like 100 years ago for many reasons, but not for today's builders, farmers and insurers. But even though it's not intentional, in a warming climate, the shifting baseline causes a problem that should be addressed.

So what should be done? The answer, it seems to me, needs to be based on a conversation among climatologists, policymakers and others. But as a start, I suggest that we use two climate “normals.”

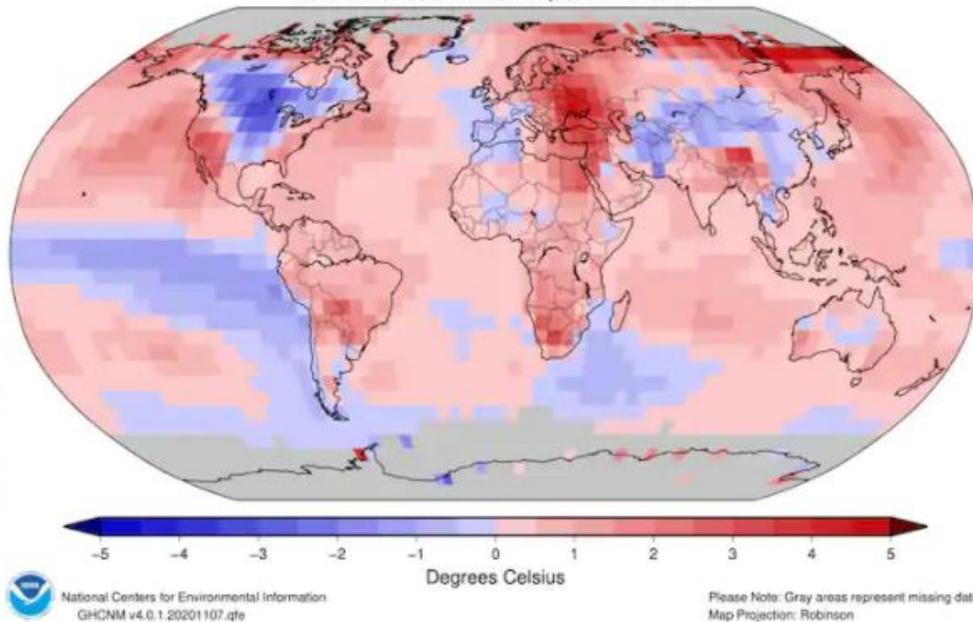


Temperature difference from normal in October relative to 1951-1980 baseline. (NASA)

One “normal” could be based say on the period 1951-1980, which covers some cold and warm periods but also is recent enough that many current weather stations existed in their present locations then. It also is mostly before the effects of human-caused climate warming were clear. That could be used as a reference baseline, one that does not shift, so that people could clearly see how the current weather they experience has — or has not — changed.

Land & Ocean Temperature Departure from Average Oct 2020  
(with respect to a 1981–2010 base period)

Data Source: NOAA GlobalTemp v5.0.0–20201108



Temperature difference from normal in October compared to 1981-2010 baseline. Using an earlier baseline, more of the map would be red. (NOAA)

The second would be the current 30-year “normals” that are updated regularly. They would both be presented, thus providing a clear picture of how one of the baselines is shifting. Doing this would heighten people’s awareness of climate change, would allow people to see whether and how urban sites are changing differently from rural sites, and would provide useful and accessible information for policymakers.

*David Policansky is a retired scientist who worked in the Division on Earth and Life Studies at the National Academy of Sciences.*

Link: <https://www.washingtonpost.com/weather/2020/11/29/climate-normals-hide-global-warming/>