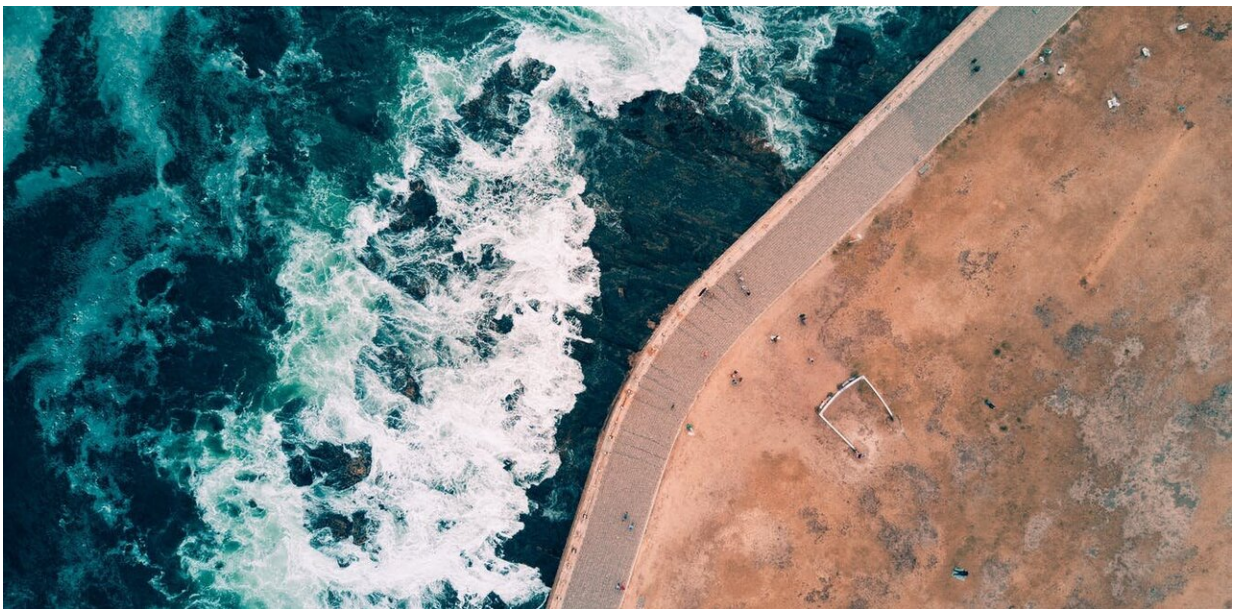


# Nobel prize-winning economics of climate change is misleading and dangerous—here's why

September 9 2020, by Steve Keen

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Credit: [John O'Nolan/Unsplash](#), [FAL](#)

While climate scientists [warn that](#) climate change could be [catastrophic](#), economists such as 2018 Nobel prize winner William Nordhaus assert that it will be nowhere near as damaging. In a [2018 paper](#) published after he was awarded the prize, Nordhaus claimed that 3°C of warming would reduce global GDP by just 2.1%, compared to what it would be in the total absence of climate change. Even a 6°C increase in global

temperature, he claimed, would reduce GDP by just 8.5%.

If you find reassurance in those mild estimates of damage, be warned. In a [newly published paper](#), I have demonstrated that the data on which these estimates are based relies upon seriously flawed assumptions.

Nordhaus's celebrated work, which, according to the [Nobel committee](#), has "brought us considerably closer to answering the question of how we can achieve sustained and sustainable global economic growth," gives governments a reason to give [climate change](#) a low priority.

His estimates imply that the costs of addressing [climate](#) change exceed the benefits until global warming reaches 4°C, and that a [mild carbon tax](#) will be sufficient to stabilize temperatures at this level at an overall cost of less than 4% of GDP in 120 year's time. Unfortunately, these numbers are based on empirical estimates that are not merely wrong, but irrelevant.

Nordhaus (and about 20 like-minded economists) used [two main methods](#) to derive sanguine estimates of the economic consequences of climate change: the "enumerative method" and the "statistical method." But my research shows neither stand up to scrutiny.

## The 'enumerative method'

In the enumerative method, to quote neoclassical climate change economist [Richard Tol](#), "estimates of the 'physical effects' of climate change are obtained one by one from natural science papers ... and added up."

This sounds reasonable, until you realize that the way this method has been deployed ignores industries that account for 87% of GDP, on the [assumption](#) that they "are undertaken in carefully controlled

environments that will not be directly affected by climate change."



It's surely obvious that industries such as transport will be affected by the climate crisis. Credit: [Rodrigo Abreu/Unsplash](#)

Nordhaus's [list of industries](#) that he assumed would be unaffected includes all manufacturing, underground mining, transportation, communication, finance, insurance and non-coastal real estate, retail and wholesale trade, and government services. It is everything that is not directly exposed to the elements: effectively, everything that happens indoors or underground. Two decades after Nordhaus [first made this assumption in 1991](#), the economics section of the [IPCC Report](#) repeated it: "Economic activities such as agriculture, forestry, fisheries, and

mining are exposed to the weather and thus vulnerable to climate change. Other [economic activities](#), such as manufacturing and services, largely take place in controlled environments and are not really exposed to climate change."

This is mistaking the weather for the climate. Climate change will affect all industries. It could turn fertile regions into deserts, force farms—and the cities they support—to move faster than topsoil can develop, create storms that can blow down those "carefully controlled environments," and firestorms that burn them to the ground.

It could force us to eliminate the use of fossil fuels before we have sufficient renewable energy in place. The output of those "carefully controlled environments" will fall in concert with the decline in available energy. The assumption that anything done indoors will be unaffected by climate change is absurd. And if this is wrong, then so are the conclusions based upon it.

The same applies to the "statistical method." As I explained in a previous article, this method assumes that the relationship between temperature and GDP today could be used to predict what will happen as the whole planet's climate changes. But while temperature isn't a particularly important factor in economic output today, climate change will do much more than simply raise individual countries' temperature by a few degrees—the disruption it will cause is enormous.

## **The damage function**

Nonetheless, these optimistic estimates were used to calibrate Nordhaus's so-called "damage function," a simple equation that predicts a small and smooth fall in GDP from a given rise in temperature. But climate change will not be a smooth process: there will be tipping points.

Nordhaus justified using a smooth equation by incorrectly [claiming](#) that [climate scientists](#), including [Tim Lenton](#) from the University of Exeter, had concluded that there were "no critical tipping elements with a time horizon less than 300 years until global temperatures have increased by at least 3°C." In fact, Lenton and his colleagues identified Arctic summer sea ice as a critical tipping point that was likely to be triggered in the next decade or two by changes of between [0.5°C and 2°C](#): "We conclude that the greatest (and clearest) threat is to the Arctic with summer sea-ice loss likely to occur long before (and potentially contribute to) GIS [Greenland ice sheet] melt."

The reason these mistakes are so significant is that, despite the flawed assumptions on which it is based, this work has been taken seriously by politicians, as Nordhaus's Nobel prize recognizes. To these policymakers, a prediction of future levels of GDP is far easier to understand than unfamiliar concepts like the viability of the ecosystem. They have been misled by comforting numbers that bear no relation to what climate change will, in fact, do to our economies.

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Provided by The Conversation

Citation: Nobel prize-winning economics of climate change is misleading and dangerous—here's why (2020, September 9) retrieved 25 June 2024 from <https://phys.org/news/2020-09-nobel-prize-winning-economics-climate-dangeroushere.html>

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