

# A new measure of global warming from carbon emissions

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Damon Matthews, a professor in Concordia University's Department of Geography, Planning and the Environment has found a direct relationship between carbon dioxide emissions and global warming. Matthews, together with colleagues from Victoria and the U.K., used a combination of global climate models and historical climate data to show that there is a simple linear relationship between total cumulative emissions and global temperature change.

Until now, it has been difficult to estimate how much climate will warm in response to a given carbon [dioxide emissions](#) scenario because of the complex interactions between human emissions, carbon sinks, atmospheric concentrations and temperature change. Matthews and colleagues show that despite these uncertainties, each emission of carbon dioxide results in the same global temperature increase, regardless of when or over what period of time the emission occurs.

These findings mean that we can now say: if you emit that tonne of carbon dioxide, it will lead to 0.000000000015 degrees of global temperature change. If we want to restrict global warming to no more than 2 degrees, we must restrict total carbon emissions - from now until forever - to little more than half a trillion tonnes of carbon, or about as much again as we have emitted since the beginning of the industrial revolution.

"Most people understand that carbon dioxide emissions lead to global warming," says Matthews, "but it is much harder to grasp the

complexities of what goes on in between these two end points. Our findings allow people to make a robust estimate of their contribution to [global warming](#) based simply on total carbon dioxide emissions."

In light of this study and other recent research, Matthews and a group of international climate scientists have written an open letter calling on participants of December's Conference of the Parties to the U.N. Framework Convention on Climate Change to acknowledge the need to limit cumulative emissions of [carbon dioxide](#) so as to avoid dangerous climate change.

Source: Concordia University

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