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Climate scientist finds large errors in Al Gore-founded Climate TRACE, a global climate pollution database

Kevin Gurney, a professor from NAU's School of Informatics, Computing, and Cyber Systems, found that the global database co-founded by Gore was underestimating city vehicle greenhouse gas emissions by an average of 70%.

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New research from Northern Arizona University found that a global greenhouse gas emissions database produced by the Climate TRACE consortium, co-founded by former Vice President Al Gore, is underestimating vehicle carbon dioxide emissions in cities by an average of 70%.

Professor Kevin Gurney of NAU's School of Informatics, Computing, and Cyber Systems (SICCS) today published [results](#) in *Environmental Research Letters* analyzing the carbon dioxide (CO₂) emissions from cars and trucks in the recently released Climate TRACE database. He said these findings, combined with a previous study noting similar discrepancies at power plants, raise concerns because accurate and reliable information on greenhouse gas emissions is a critical ingredient for society's response to climate change.



“Given the importance of vehicle CO₂ emissions in cities, we carefully examined the Climate TRACE data which relied on promising new artificial intelligence-based approaches,” Dr. Gurney said. “When combined with our previous study on Climate TRACE power plant CO₂ emissions, our results suggest that the Climate TRACE data significantly underestimates over half of U.S. fossil fuel-based CO₂ emissions in cities”.

Gurney and his team matched the Climate TRACE urban vehicle CO₂ emissions in the United States to a similar “onroad” database, Vulcan, produced by Gurney’s laboratory, which is calibrated to official traffic and energy consumption data.

“While the Vulcan onroad data is not perfect, with uncertainty of about 14%, this is far lower than the differences found when we compared 260 city vehicle CO₂ emissions in the United States to the Climate TRACE database,” said Dr. Bilal Aslam, a SICCS postdoc and co-investigator on the study. “The Climate TRACE CO₂ emissions were, on average, 70% lower than those same emissions in the Vulcan onroad CO₂ emissions database.”

“Individual cities such as Indianapolis and Nashville were lower by more than 90%,” added Dr. Pawlok Dass, a research associate in SICCS and contributor to the study. The study authors suspect the underestimation is present globally and raises concerns about many other aspects of the Climate TRACE database.

The study authors believe that, though artificial intelligence is a promising approach to providing information on many environmental metrics, scientific rigor, transparency, and expert review remain essential to ensuring accuracy and maintaining trust. Accurate assessment of greenhouse gas emissions remains a cornerstone of effective climate policies. “We make a number of recommendations in our study to improve and advance the important work Climate TRACE is doing,” remarked Gurney. “Reliable vehicle CO₂ emissions will make policy choices and money spent to reduce emissions most effective and correctly targeted,”

“We will never estimate emissions with perfect accuracy, but we must ensure that the data shared with policymakers and the public is unbiased and meets best practices and the most rigorous scientific standards available,” Gurney said. “Without this, we mislead decision makers and potentially lose public trust in our ability to tackle climate change.”

Gurney, who specializes in atmospheric science, ecology and public policy, has spent the past two decades developing a standardized system quantifying greenhouse gas emissions in the U.S. His [Vulcan](#) and [Hestia](#) projects, funded by multiple federal agencies, quantifies and visualizes greenhouse gases emitted across the entire country down to individual power plants, neighborhoods and roadways, identifying “hotspots” and enabling better decisions about where to cut emissions most effectively. His estimates have shown excellent performance when compared to direct atmospheric monitoring. [Gurney](#) has authored more than 180 scientific publications with more than 20,000 citations, including a recent U.S. National Academy Report, “Greenhouse Gas Emissions for Decisionmaking.” He has been involved with the United Nations Climate Change Framework Convention and the Kyoto Protocol for more than 25 years and is a lead author for the Intergovernmental Panel on Climate Change (IPCC).