

Roth: 400 ppm tipping point?

By [Jim Roth](#), Director and Chair of the Firm's Clean Energy Practice Group. This column was [originally published in The Journal Record](#) on October 3, 2016.



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400 ppm tipping point?

Safe carbon levels in Earth's atmosphere are now a thing of the past, as many scientists conclude we may have just passed the tipping point for our planet's climate, based upon readings from this week's carbon levels.

The lowest carbon levels of an entire year typically occur in the later part of September, yet September 2016 just saw another historic event in climate science with carbon dioxide levels remaining above 400 ppm (parts per million) for the first time in recorded history. In fact, scientists are able to conclude that it's the first time in over 3 million years, considering that the Earth just surpassed the 400 ppm level in

2013. Now we've missed our annual minimum from even dipping below that level, just three years on.

The National Oceanic and Atmospheric Administration first measured the 400 ppm threshold from its monitoring station in Hawaii in 2013, causing worry around the world from scientists and environmentalists who have long held that level as the threshold to avoid irreversible changes to climate, weather, sea levels and ice cover. The same NOAA station at Mauna Loa Observatory just recorded that "Carbon dioxide just hits its annual minimum ...and failed to dip below 400 ppm" on Wednesday.

For years many scientists have suggested that 350 ppm is the upper limit of safe CO₂ levels in the atmosphere, with 400 ppm considered the line not to cross, yet this week's reality suggests that we are continuing to add 2 ppm of CO₂ to the atmosphere every year, with no real change in sight.

And to be clear, it's not all the fault of fossil fuels, although the broader industrialization of planet Earth's more populous countries over the last two centuries has been proven to accelerate us all to the current reality. Other causes, including those that have perhaps forced September to not dip backwards to its annual minimum, come from other sectors of the world's economies (agriculture, deforestation, etc.) and other naturally occurring realities, evident this September.

Why September?

The month of September is usually the month with the lowest levels of carbon in the atmosphere because the effect of massive summer plants growing and absorbing the CO₂ in the Northern Hemisphere in particular. And as the calendar moves on, those plants and trees lose their leaves, decompose and again release the carbon into the atmosphere. And with the greater industrialization of the planet, humans have been adding more and more carbon dioxide than Earth's remaining plants can absorb. Thus, when the natural seasonal effects

happen the absorbed carbon is released into a world that already has carbon levels too high.

To see an amazing visualization of the growing carbon levels, please check out NASA's Global Modeling and Assimilation Office at gfycat.com/InexperiencedFalseGypsamoeth.

Next week I'll share a few ideas for things we can do in our own lives to help slow the harm we are all witnessing.

Jim Roth, a former Oklahoma corporation commissioner, is an attorney with [Phillips Murrah P.C.](#) in Oklahoma City, where his practice focuses on clean, green energy for Oklahoma.