



Climate Change - Ten Times Faster than Predicted

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It takes 196,000 pounds of plants to produce a gallon of gasoline. It takes 40 acres of plants, roots, stalks and leaves, to go 20 miles in the average car. This is how much ancient plant matter had to be buried millions of years ago to produce one gallon of gas. It is just incredible how much buried sunshine, how many fossilized photons it takes to make up a little bit of oil. Dr. Jeff Dukes published the paper from which these numbers are taken back in 2003 in the journal *Climatic Change*. This ancient solar energy is normally emitted back into the environment over tens, or even hundreds of millions of years. Mankind is literally releasing this carbon millions of times faster than it is naturally released.

Since 1983 Dr. James Hansen has been the Director of the NASA Goddard Institute for Space Studies (GISS). GISS is the United States' foremost climate modeling agency. Hansen, who National Public Radio suggests is "almost universally regarded as the preeminent climate scientist of our time", says that mankind is causing the carbon dioxide concentration in our atmosphere to increase 10,000 times faster than at any time in the last 65 million years – since the giant asteroid struck the Yucatan Peninsula and the dinosaurs went extinct.

Dr. Dennis Darby from Old Dominion University says, in a paper published in 2008 in *Paleoceanography*, that Arctic sea ice has not been absent in the Arctic in the summer season in 14 million years. Dr. Wieslaw Maslowski is an Arctic sea ice scientist at the U.S. Naval Postgraduate School. He is the scientist in charge of the U.S. Navy's Polar Ice Prediction System (PIPS). Maslowski has been predicting, since 2003, that the Arctic will see ice free conditions in summer between 2011 and 2016. Carbon dioxide levels in our atmosphere today are as high as they have been in 15 million years says Dr. Aradhna Tripathi of UCLA and Cambridge University, in a paper published in the journal *Science* in 2009.

These proclamations, amazingly, go on and on, but one of the biggest, and almost completely unknown beyond the world of science, is that our CO2 emissions today are worse than the worst-case scenario developed by the Intergovernmental Panel on Climate Change (IPCC). This was first revealed in the scholarly community in the Proceedings of the National Academy of Science in March of 2007 by a team of seven international scientists led by senior scientist Dr. Michael Raupach at the Australian National Science Program (CSIRO: The Commonwealth Scientific and Industrial Research Organization), and then again in 2009 at the University of Copenhagen before the United Nations Climate Talks in a mega-report by the International Alliance of Research Universities (an alliance of ten of the world's top research universities including Berkeley, Oxford, Cambridge and Yale).

I recently talked with one of the scientists that I interviewed in Greenland in 2007. I had found a previously forgotten quote that appeared to be from him (in my old notes from my trip) and I wanted to confirm. The quote was "*Climate change is proceeding ten times faster than we (the climate scientists) had predicted*". The scientist that made this quote is Dr. Konrad Steffen, Director of the Cooperative

Institute for Research in Environmental Sciences (CIRES) at the University of Colorado, Boulder. When he returned my email he said he was sitting in the same hotel where I had interviewed him (the Hvide Faulk in Ilulissat, Greenland). He had just completed a month-long field session at Camp Swiss, up on the ice sheet. Dr. Steffen founded Camp Swiss in 1990. This is one of those very important ice stations in Greenland that keeps us in touch with climate change in a region where it is likely changing faster than almost anywhere else on the planet. His email confirmed that he remembered me and our interview, and that indeed, he had made this quote and that climate change was in his opinion progressing ten times faster than predicted.

For nearly two decades I have been analyzing academic papers on climate science that talk about climate changes that are one, two or even three orders of magnitude faster than have occurred in millions of years. (One order of magnitude is ten times faster, two is 100 times faster, three is 1,000 times, etc.) I have become jaded as to the significance of the concept of “*Ten times faster*”, so I resort to analogy to understand the true meaning. Understanding that climate change is progressing ten times faster than predicted takes on an entirely different light when put into perspective. “*Ten times faster*” becomes a chillingly profound statement. How much faster is ten times faster? What if the average human life happened ten times faster than normal?

If our human lives evolved ten times faster than normal, our average life expectancy of 77.7 years (77 years and 9 months) would be condensed down to 7 years and 9 ¼ months. In this abbreviated world - this ten times faster world - we would graduate from high school at the age of 21 months, become middle-aged at 5 years and retire at 6 years and 6 months. . . Another analogy? If the speed limit on our highways were ten times faster, we would be traveling at the speed of sound.

The IPCC, which represents six years of work by a super-consensus of over 2,500 climate scientists from 130 countries, is the basis for the predictions of climate change that are understood by the world today. Predictions made by this many specialists in any field have an extremely high likelihood of being significantly conservative. Think what it would be like getting 2,500 politicians to agree on a global political platform... The platform that is eventually agreed upon is the most basic, simple and fundamental knowledge in the field. This is what the IPCC represents. The predictions of the IPCC are basically what Dr. Steffen says are being eclipsed at a rate that is ten times faster than previously understood.

References:

Fossil Plants:

[Dukes, Burning buried sunshine, Climatic change, 2003.](#)

http://globalecology.stanford.edu/DGE/Dukes/Dukes_ClimChange1.pdf

Conrad Steffen, Director of Cires:

<http://cires.colorado.edu/>

James Hansen Director of NASA GISS

Hansen, Bjercknes Lecture, American Geophysical Union, December 2008.

Hansen et. al., Target Atmospheric CO2 Where should humanity aim?, Open Atmospheric Science Journal, August 2008.

http://www.columbia.edu/~jeh1/2008/AGUBjercknes_20081217.ppt

James Hansen and Mark Bowen on Censored Science, NPR interview. Fresh Air, WHYY, January 2008.

<http://www.npr.org/templates/story/story.php?storyId=17926941>

American Geophysical Union (AGU) Fall Meeting Attendance 2008

<http://www.agu.org/meetings/>

Arctic Sea Ice 14 Million Years:

Darby, Arctic perennial ice cover over the last 14 million years, Paleoceanography, February 2008.

Perovich and Richter-Menge, Loss of Sea Ice in the Arctic, Annual Review of Marine Science, October 2008.

<http://arjournals.annualreviews.org/doi/abs/10.1146/annurev.marine.010908.163805?cookieSet=1&journalCode=m>
arine

CO₂ concentration is as high any time in 15 million years:

Tripati, et. al., Coupling of CO₂ and Ice Sheet Stability Over Major Climate Transitions of the Last 20 million years, *Science Express* October 8, 2009.

CO₂ emissions are worse than the worst-case scenario developed by the IPCC:

Synthesis Report, Climate Change, Global Risks, Challenges and Decisions, Climate Change Congress, International Alliance of Research Universities, University of Copenhagen, March 2009.

Raupach, et. al., *Global and regional drivers of accelerating CO₂ emissions, PNAS, April 2007.*

<http://www.pnas.org/content/104/24/10288.full.pdf+html>

World economy in the 20th century, International Monetary Fund, World Economic Outlook, 2000

International Energy Agency Data http://cdiac.ornl.gov/ftp/ndp030/global.1751_2006.ems

IPCC Special Report on Emissions Scenarios

http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/emission/014.htm