

Climate Science vs. Fossil Fuel Fiction

An Infographic from the Union of Concerned Scientists

www.ucsusa.org/fossilfuelfiction

Climate Science Source Material March 2015

The risk is clear. It has been for decades.

- "...we can state with 99% confidence that current temperatures represent a real warming trend."—*Dr. James Hansen; Director of NASA Goddard Institute for Space Studies, 1988 Senate Testimony*
 - Hansen, J.E. 1988. Energy policy implications of global warming. United States House of Representatives, 100th Cong. Hearing before a subcommittee of the Committee on Energy and Commerce. Online at <http://www.skepticalscience.com/pics/ClimateChangeHearing1988.pdf>, accessed February 26, 2015.
- Image:
 - Shabecoff, Philip. Global warming has begun, expert tells senate. *New York Times*, June 24. Online at <http://www.nytimes.com/1988/06/24/us/global-warming-has-begun-expert-tells-senate.html>, accessed February 26, 2015.

Global warming is happening.

- The global average temperature has increased 1.5 degrees Fahrenheit since 1880. (IPCC AR5)
 - Intergovernmental Panel on Climate Change (IPCC). 2013. Summary for policymakers. In *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by T.F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley. Cambridge, UK, and New York, NY, Cambridge University Press. Online at http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf, accessed February 26, 2015.

Fossil fuels are the primary cause.

- 1880 Atmospheric CO₂ Concentration: 280ppm
 - From, E., and C.D. Keeling. 1986. Reassessment of late 19th century atmospheric carbon dioxide variations in the air of western Europe and the British Isles based on an unpublished analysis of contemporary air masses by GS Callendar. *Tellus* 38(2): 87–105. Online at <http://onlinelibrary.wiley.com/doi/10.1111/j.1600-0889.1986.tb00092.x/pdf>, accessed February 26, 2015.
- 2014 Atmospheric Concentration: 399ppm
 - From NOAA at ftp://aftp.cmdl.noaa.gov/products/trends/co2/co2_annmean_mlo.txt and sources cited here <http://co2now.org/>, accessed January 30, 2015.

The consequences are serious.

- Global average sea level rise today and in 2050. NOAA/National Climate Assessment 2014.
 - Data:
 - Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville. 2014. Appendix 3: Climate science supplement. In *Climate change impacts in the United States: Third National Climate Assessment*, edited by J.M. Melillo, T.c. Richmond, and G.W. Yohe. Washington, DC: U.S. Global Research Program; doi:10.7930/JOKS6PHH. Online at http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_Appendix_3_Climate_Science_Supplement_LowRes.pdf?download=1, accessed February 26, 2015.
 - Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville. 2014. Our changing climate. In *Climate change impacts in the United States: Third National Climate Assessment*, edited by J.M. Melillo, T.c. Richmond, and G.W. Yohe. Washington, DC: U.S. Global Research Program; doi:10.7930/JOKS6PHH. Online at <http://nca2014.globalchange.gov/report>, accessed February 26, 2015.
 - Parris, A., P. Bromirski, V. Burkett, D. Cayan, M. Culver, J. Hall, R. Horton, K. Knutti, R. Moss, J. Obeysekera, A. Sallenger, and J. Weiss. 2012. Global sea level rise scenarios for the National Climate Assessment. NOAA Tech Memo OAR CPO-1. Washington, DC: National Oceanic and Atmospheric Administration. Online at http://scenarios.globalchange.gov/sites/default/files/NOAA_SLR_r3_0.pdf, accessed February 26, 2015.
 - Image:

- Union of Concerned Scientists (UCS). 2014. *Science connections: Sea level rise and global warming*. Online at <http://www.ucsusa.org/sealevelrise>, accessed February 26, 2015.

Continued use of fossil fuels magnifies the risk.

- Projected temperature increase 2070-2099 (continued increase in CO₂ emissions scenario)
 - Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville. 2014. Appendix 3: Climate science supplement. In *Climate change impacts in the United States: Third National Climate Assessment*, edited by J.M. Melillo, T.c. Richmond, and G.W. Yohe. Washington, DC: U.S. Global Research Program; doi:10.7930/J0KS6PHH. Online at http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_Appendix_3_Climate_Science_Supplement_LowRes.pdf?download=1, accessed February 26, 2015.
 - Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville. 2014. Our changing climate. In *Climate change impacts in the United States: Third National Climate Assessment*, edited by J.M. Melillo, T.c. Richmond, and G.W. Yohe. Washington, DC: U.S. Global Research Program; doi:10.7930/J0KS6PHH. Online at <http://nca2014.globalchange.gov/report>, accessed February 26, 2015.
- The “continued increase in CO₂ emissions” scenario pictured is characterized in the National Climate Assessment glossary and was originally developed by the IPCC SRES, which describes the A2 scenario as reflecting the following:
 - Relatively slow demographic transition and relatively slow convergence in regional fertility patterns.
 - Relatively slow convergence in inter-regional GDP per capita differences.
 - Relatively slow end-use and supply-side energy efficiency improvements (compared to other storylines).
 - Delayed development of renewable energy.
 - No barriers to the use of nuclear energy.