

## Climatic Consequences of Nuclear Conflict: Nuclear Winter Still a Threat

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A nuclear war between Russia and the United States, using the reduced arsenals of 4000 total nuclear weapons that will result by 2017 in response to the New START treaty, could still produce nuclear winter. A nuclear war between India and Pakistan, with each country using 50 Hiroshima-sized atom bombs as airbursts on urban areas, could produce climate change unprecedented in recorded human history and global-scale ozone depletion. This second scenario, using less than 0.03% of the explosive power of the current global nuclear arsenal, would produce so much smoke from the resulting fires, that it would plunge the Earth to temperatures colder than those of the Little Ice Age of the 16th to 19th centuries, shortening the growing season around the world and threatening the global food supply. Furthermore, there would be massive ozone depletion with enhanced ultraviolet radiation reaching the surface. This surprising conclusion is the result of new research by a team of American and Russian scientists who produced the pioneering work on nuclear winter in the 1980s (available at <http://climate.envsci.rutgers.edu/nuclear/>). Using the NASA GISS ModelE and NCAR WACCM GCMs, we injected different amounts of soot aerosols that would be generated by fires from regional and global nuclear wars into the upper troposphere, and examined the climatic and stratospheric chemistry responses. The soot is lofted into the stratosphere, and the effects of regional and global nuclear war would last for more than a decade, much longer than previously thought. Nuclear proliferation continues, with nine nuclear states now, and more working to develop or acquire nuclear weapons. The continued environmental threat of the use of even a small number of nuclear weapons must be considered in nuclear policy deliberations in Russia, the U.S., and the rest of the world.

GISS Global Average Temperature Anomaly  
+ 5 Tg smoke in 2011

