

Climatic Effects of Nuclear Conflict

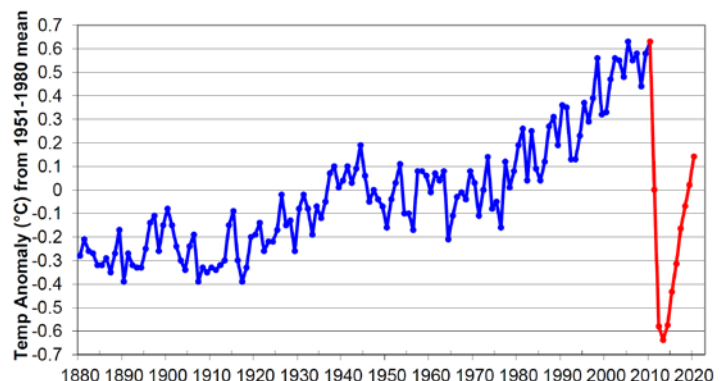
Nuclear winter is a term that describes the climatic effects of nuclear war. In the 1980's, work conducted jointly by Western and Soviet scientists showed that for a full-scale nuclear war between the United States and the Soviet Union the climatic consequences, and indirect effects of the collapse of society, would be so severe that the ensuing nuclear winter would produce famine for billions of people far from the target zones. This realization led to the end of arms race and the end of the Cold War. Since that time, the number of nuclear weapons in the world has now decreased to 1/3 of the peak number of more than 70,000 in the 1980's, and is planned to be only 6% of that level by 2017.

There are several wrong impressions that people have about nuclear winter. One is that there was a flaw in the theory – that the large climatic effects were disproved. Another is that the problem, even if it existed, has been solved by the end of the nuclear arms race. But these are both wrong.

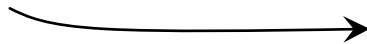
What's New. Based on new work published since 2007 by some of the pioneers of nuclear winter research, we now can say several new things about this topic.

- **Nuclear arsenals with 50 nuclear weapons**, such as currently possessed by India and Pakistan and 6 other nations, threaten more fatalities than in previous wars to any nation attacked. With global delivery systems any such nation is as dangerous as any of the superpowers.
- **A nuclear war between any two countries using 50 Hiroshima-sized atom bombs**, such as India and Pakistan, **could produce climate change unprecedented in recorded human history.** This is less than 0.05% of the explosive power of the current global arsenal. (See graph below.)
- **Nuclear arsenals with 50 nuclear weapons can produce a global pall of smoke leading to global ozone depletion.** The smoke, once in the stratosphere, heats the air, which speeds up reactions that destroy ozone, and also lofts reactive chemicals by altering the winds.
- **A nuclear war between the United States and Russia today, or even after reductions planned for 2017 under the New START treaty, could produce nuclear winter**, with temperatures plunging below freezing in the summer in major agricultural regions, threatening the food supply for most of the planet.
- **The climatic effects of the smoke from burning cities and industrial areas would last for several years, much longer than we previously thought.** New climate model simulations, which have the capability of including the entire atmosphere and oceans, show that the smoke would be lofted by solar heating to the upper stratosphere, where it would remain for years.
- **The spread of nuclear weapons to newly emerging states threatens not only the people of those countries, but the entire planet.**

GISS Global Average Temperature Anomaly
 + 5 Tg smoke in 2011



Global climate change following a war between India and Pakistan, using less than 0.05% of the explosive power of the current global arsenal.



For more information, visit
<http://climate.envsci.rutgers.edu/nuclear>