

Turning a Blind Eye Towards Armageddon: US leaders reject the nuclear winter studies

by Steven Starr

Scientists warn of the existential danger of nuclear war

Ten years ago, the world's leading climatologists chose to reinvestigate the long-term environmental impacts of nuclear war. The peer-reviewed studies they produced are considered to be the most authoritative type of scientific research, which is subjected to criticism by the international scientific community before its final publication in scholarly journals. No serious errors were found in their studies.

Working at the Laboratory for Atmospheric and Space Physics at the University of Colorado, the Department of Environmental Sciences at Rutgers, and the Department of Atmospheric and Oceanic Sciences at UCLA, these scientists used state-of-the-art computer modeling to evaluate the consequences of a range of possible nuclear conflicts. They began with a hypothetical war in Southeast Asia, in which a total of 100 Hiroshima-size atomic bombs were exploded in the cities of India Pakistan. In order to give you a clear idea of what an atomic bomb can do, please consider these images of Hiroshima, before and after the bomb, which had an explosive power of 15,000 tons of TNT.

The detonation of such an atomic bomb will instantly ignite fires over a surface area of 3 to 5 square miles. The scientists calculated that the blast, fire, and radiation from a war fought with 100 atomic bombs could produce as many fatalities as World War II. However, the long-term environmental effects of the war could significantly disrupt the global weather for at least a decade, which would likely result in a vast global famine.

The scientists [predicted](#) that nuclear firestorms in the burning cities would cause [3 to 4 million tons of black carbon smoke to quickly rise above cloud level into the stratosphere](#), where it could not be rained out. The smoke would circle the Earth in less than 2 weeks and would form a global stratospheric smoke layer that would remain for more than a decade. The smoke would absorb warming sunlight, which would heat the smoke to temperatures near the boiling point of water, producing [ozone losses of 20% to 50% over populated areas](#). This would almost double the amount of UV-B reaching the some regions, and it would create UV-B indices unprecedented in human history. In North America and central Europe, the time required to get a painful sunburn at mid-day in June could decrease to as little as six minutes for fair-skinned individuals.

As the smoke layer blocked warming sunlight from reaching the Earth's surface, it would produce [the coldest average surface temperatures in the last 1000 years](#) Medical experts have predicted that the shortening of growing seasons and corresponding decreases in agricultural production could cause up [to 2 billion people to perish from famine](#).

The climatologists also investigated the effects of a nuclear war fought with the vastly more powerful modern thermonuclear weapons possessed by the US, Russia, China, France, and England. Some of the thermonuclear weapons constructed during 1950s and 1960s were 1000 times more powerful than an atomic bomb.

During the last 30 years, the average size of thermonuclear or "strategic" nuclear weapons has decreased. Yet today, each of the approximately 3540 strategic weapons deployed by the US and Russia is 7 to 80 times more powerful than the atomic bombs modeled in the India-Pakistan study. The smallest strategic nuclear weapon has an explosive power of 100,000 tons of TNT, compared to an atomic bomb with an average explosive power of 15,000 tons of TNT.

Strategic nuclear weapons produce much larger nuclear firestorms than do atomic bombs. For example, [a standard Russian 800 kiloton warhead, on an average day, will ignite fires covering a surface area of 90 to 152 square miles](#)].

A war fought with hundreds or thousands of US and Russian strategic nuclear weapons would ignite immense nuclear firestorms covering land surface areas of many thousands or tens of thousands of square miles. The scientists [calculated](#) that these fires would produce up [to 180 million tons of black carbon soot and smoke, which would form a dense, global stratospheric smoke layer](#). The smoke would remain in the stratosphere for ten to twenty years, and it would block as much as 70% of sunlight from reaching the surface of the Northern Hemisphere and 35% from the Southern Hemisphere. [So much sunlight would be blocked by the smoke that the noonday sun would resemble a full moon at midnight](#).

Under such conditions, it would only require a matter of days or weeks for daily minimum temperatures to fall below freezing in the largest agricultural areas of the Northern Hemisphere. [Freezing temperatures would occur every day for a period of between one to three years. Average surface temperatures would become colder than those experienced 18,000 years ago at the height of the last Ice Age](#), and the prolonged cold would cause average rainfall to decrease by up to 90%. Growing seasons would be completely eliminated for more than a decade; [it would be too cold and dark to grow food crops, which would doom the majority of the human population](#).

A brief history of nuclear winter

The profound cold and the dark following nuclear war became known as [nuclear winter](#) and it was first predicted in 1983 by a group of NASA scientists. During the mid-1980s, a large body of research was done by such groups as the Scientific Committee on Problems of the Environment (SCOPE), the World Meteorological Organization, and the U.S. National Research Council of the U.S. National Academy of Sciences; their work essentially supported the initial findings of the 1983 studies.

The idea of nuclear winter, published and supported by prominent scientists, generated extensive public alarm and put political pressure on the US and the Soviet Union to reverse a runaway nuclear arms race which, by 1986, had created a global nuclear arsenal of more than 65,000 nuclear weapons. Unfortunately, this created a backlash among many powerful military and industrial interests, who undertook an extensive media campaign to brand nuclear winter as “bad science” and the scientists who discovered it as “irresponsible.”

Critics used various uncertainties in the studies and the first climate models (which are primitive by today’s standards) as a basis to criticize and reject the concept of nuclear winter. In 1986, the Council on Foreign Relations published an article by scientists from the National Center for Atmospheric Research, who predicted drops in global cooling about half as large as those first predicted by the 1983 studies and described this as a ‘nuclear autumn.’ The nuclear autumn studies were later shown to be deeply flawed, but it didn’t matter.

Nuclear winter was subject to criticism and damning articles in the Wall Street Journal and Time Magazine. In 1987, the National Review called nuclear winter a “fraud.” In 2000, Discover Magazine published an article which described nuclear winter as one of “The Twenty Greatest Scientific Blunders in History.” The endless smear campaign was successful; the general public, and even most anti-nuclear activists, were left with the idea that nuclear winter had been discredited.

The rejection of nuclear winter by today’s US military and political leaders

Yet the scientists did not give up. In 2006, they returned to their labs to perform the research I have previously described. Their new research not only upheld the previous findings, it found that the earlier studies actually underestimated the environmental effects of nuclear war.

After the initial series of studies were published in 2007 and 2008, the scientist from Rutgers, Dr. Robock, and Dr. Toon of the University of Colorado, made a series of requests to meet with members of the Obama administration. The scientists offered to brief the White House about their findings, which they assumed would have a great impact upon nuclear weapons policy. Their offers were met with indifference.

Finally, after a number of years of trying, I have been told that Drs. Robock and Toon were allowed an audience with John Holdren, the Senior Advisor to President Barack Obama on Science and Technology. Dr. Robock also has met with Rose Gottemoeller, the Under Secretary of State for Arms Control and International Security. Dr. Robock has the impression that neither Holdren nor Gottemoeller think the nuclear winter research is correct.

But it is not only Holdren and Gottemoeller who reject the nuclear winter research. According to sources cited by Greg Mello of the Los Alamos Study Group, the [US Nuclear Weapons Council](#) – the group that determines the size and composition of US nuclear weapons, as well as the policies for their use – has stated that *“the predictions of nuclear winter were disproved years ago.”*

The members of the US Nuclear Weapons Council include:

- The Under Secretary of Defense for Acquisition, Technology, and Logistics
- The Vice Chairman of the Joint Chiefs of Staff
- The Under Secretary for Nuclear Security of the Department of Energy
- The Under Secretary of Defense for Policy
- The Commander of the United States Strategic Command

It may be that General John Hyten, the Head of the Strategic Command, who is in charge of the US nuclear triad, and General Paul Selva, the Vice Chairman of the Joint Chiefs of Staff, the second highest ranking officer in the US, have never seen or heard of the 21st century nuclear winter studies. Perhaps when they hear a question about “nuclear winter”, they only remember the smear campaigns done against the early studies. Or maybe they just choose not to accept the new scientific research on nuclear winter, despite the fact that it has withstood the criticism of the global scientific community.

Regardless, the rejection of nuclear winter research by the top military and political leaders of the United States raises some profoundly important questions: *Do they fully understand the consequences of nuclear war? Do they realize that the launch-ready nuclear weapons they control constitute a self-destruct mechanism for the human race?*

Renewed Cold War and the possibility of war with Russia and China

Meanwhile, US political leaders generally support the ongoing US confrontation with nuclear-armed Russia and China. Mainstream corporate media, including the editorial boards of the New York Times and Washington Post, engage in [anti-Russian, anti-Putin rhetoric that surpasses the hate speech of the McCarthy era](#). The US has renewed the Cold War with Russia,

with no debate or protest, and has subsequently engaged in proxy wars with Russia in Ukraine and Syria, as well as threatening military action against China in the South China Sea.

Hillary Clinton, who appears likely to become the next president of the United States, has repeatedly called for a US-imposed “no-fly zone” over Syria, where Russian planes are now flying in support of the Syrian Armed Forces. Marine General Joseph Dunford, Chairman of the Joint Chiefs of Staff, told Congress in September that should the US attempt to set up such a no-fly zone, it surely [result in war with Russia](#).

Apparently there is now some debate about this, however, Russia has responded by moving its latest air defense systems to Syria, and it stated it [would shoot down any US or NATO planes that attempted to attack the Syrian Armed Forces](#).

Russia has also sent its only aircraft carrier, along with all of its Northern fleet and much of the Baltic fleet to the Mediterranean, in [its largest surface deployment of naval vessels since the end of the Cold War](#). In response to what NATO leaders describe as Russia’s “dangerous and aggressive actions”, [NATO has built up a “rapid-response force” of 40,000 troops](#) on the Russian border, in the Baltic States and Poland. This force includes hundreds of tanks, armored vehicles, and heavy artillery. NATO troops stationed in Estonia are within artillery range of St. Petersburg, the second largest city of Russia.

[The US has deployed its Aegis Ashore Ballistic Missile Defense \(BMD\) system in Romania](#) and is constructing another such BMD system in Poland. The [Mark 41 launch system](#) used in the Aegis Ashore systems can be used to launch a variety of missiles, including long-range nuclear-armed cruise missiles.

In other words, the US has built and is building launch sites for nuclear missiles on the Russian border. This fact has been widely reported on Russian TV and has infuriated the Russian public. In June, Russian President Putin specifically warned that [Russia would be forced to retaliate against this threat](#).

While Russian officials maintain that its actions are normal and routine, Russia now appears to be preparing for war. On October 5, [Russia conducted a nation-wide civil defense drill that included 40 million of its people being directed to fallout shelters](#). Reuters reported that on October 7, Russia had [moved its Iskander nuclear-capable missiles to Kaliningrad, which borders Poland](#).

While the US ignores the danger of nuclear war, Russian scholar [Stephen Cohen reports that the danger of war with the US is the leading news story in Russia](#). Cohen states:

*“Just as there is no discussion of the most existential question of our time, in the American political class – the possibility of war with Russia – it is the **only** thing*

being discussed in the Russian political class . . . These are two different political universes. In Russia, all the discussion in the newspapers, and there is plenty of free discussion on talk show TV, which echoes what the Kremlin is thinking, online, in the elite newspapers, and in the popular broadcasts, the number 1, 2, 3, and 4 topics of the day are the possibility of war with the United States.”

Cohen goes on to say:

*“I conclude from this that the leadership of Russia actually believes now, in reaction to what the United States and NATO have said and done over the last two years, and particularly in reaction to the breakdown of the proposed cooperation in Syria, and the rhetoric coming out of Washington, that **war is a real possibility**. I can’t remember when, since the Cuban Missile Crisis, that the Moscow leadership came to this conclusion in its collective head.”*

My own personal assessment of the state of the nuclear danger today is that it is profound. The United States is sleepwalking towards nuclear war. Our leaders have turned a blind eye to the scientifically predicted consequences of nuclear war, and appear to be intent in making “Russia back down”. This is a recipe for unlimited human disaster.

It is still not too late to seek dialogue, diplomacy, and détente with Russia and China, and to create a global dialogue about the existential dangers of nuclear war. We must return to the understanding that nuclear war cannot be won, and must not be fought. This can be achieved if we listen to the warnings from the scientific community about the omnicidal consequences of nuclear war.

Peer-reviewed scientific studies of the consequences of nuclear war

A. Robock, L. Oman, G. Stenchikov, (2007). "[Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences](#)", Journal of Geophysical Research – Atmospheres, Vol. 112

O. B. Toon, R. Turco, A. Robock, C. Bardeen, L. Oman, G. Stenchikov, (2007). "[Atmospheric effects and societal consequences of regional scale nuclear conflicts and acts of individual nuclear terrorism](#)", Atmospheric Chemistry and Physics, Vol. 7

M. Mills, O. B. Toon, R. Turco, D. Kinnison, R. Garcia. (2008). "[Massive global ozone loss predicted following regional nuclear conflict](#)", Proceedings of the National Academy of Sciences (USA), vol. 105

M. Mills, O.B. Toon, J. Lee-Taylor, A. Robock. (2014). "[Multidecadal global cooling and unprecedented ozone loss following a regional nuclear conflict](#)". American Geophysical Union, DOI: 10.1002/2013EF000205

A. Robock, L. Oman, G. Stenchikov, O.B. Toon, C. Bardeen, R Turco. (2007). "[Climatic consequences of regional nuclear conflicts](#)". Atmospheric Chemistry and Physics, Vol. 7

Peer-reviewed scientific studies of the consequences of nuclear war

A. Robock, L. Oman, G. Stenchikov, (2007). "[Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences](#)", Journal of Geophysical Research – Atmospheres, Vol. 112

O. B. Toon, R. Turco, A. Robock, C. Bardeen, L. Oman, G. Stenchikov, (2007). "[Atmospheric effects and societal consequences of regional scale nuclear conflicts and acts of individual nuclear terrorism](#)", Atmospheric Chemistry and Physics, Vol. 7

M. Mills, O. B. Toon, R. Turco, D. Kinnison, R. Garcia. (2008). "[Massive global ozone loss predicted following regional nuclear conflict](#)", Proceedings of the National Academy of Sciences (USA), vol. 105

M. Mills, O.B. Toon, J. Lee-Taylor, A. Robock. (2014). "[Multidecadal global cooling and unprecedented ozone loss following a regional nuclear conflict](#)". American Geophysical Union, DOI: 10.1002/2013EF000205

A. Robock, L. Oman, G. Stenchikov, O.B. Toon, C. Bardeen, R Turco. (2007). "[Climatic consequences of regional nuclear conflicts](#)". Atmospheric Chemistry and Physics, Vol. 7



Cloudless sky

obscured by 150 million tons of smoke in the stratosphere
after a US-Russian nuclear war

adapted from *Scientific American*, (2010) "Local Nuclear War, Global Suffering", Robock & Toon