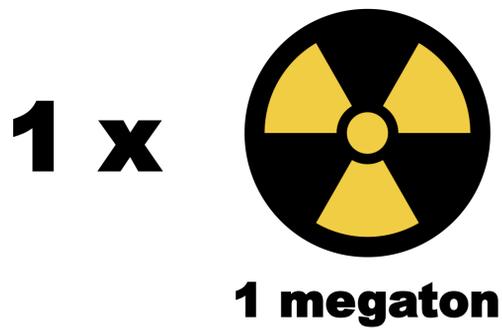
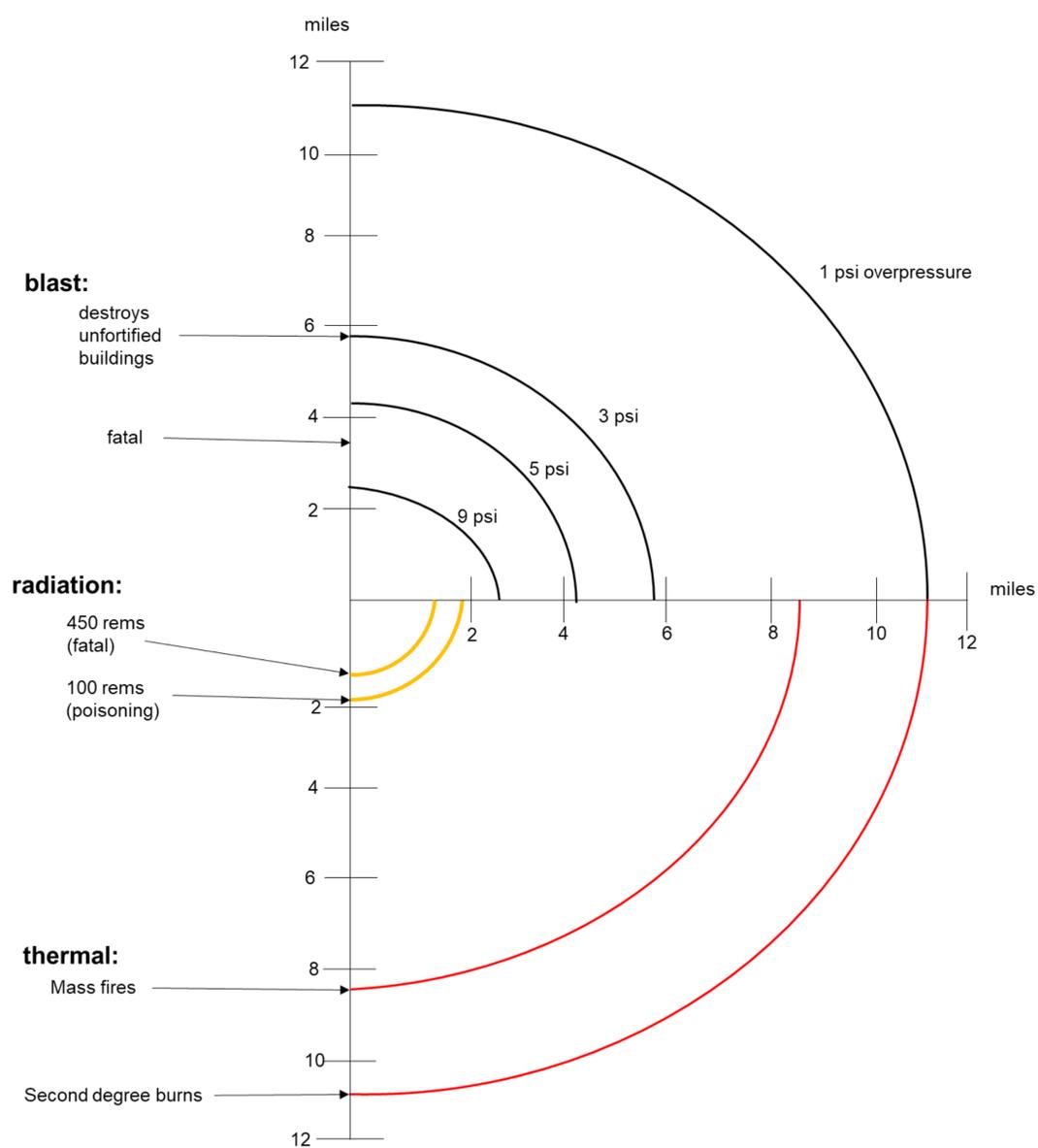


# Blast, Burn, Irradiate:

One (medium) nuclear weapon



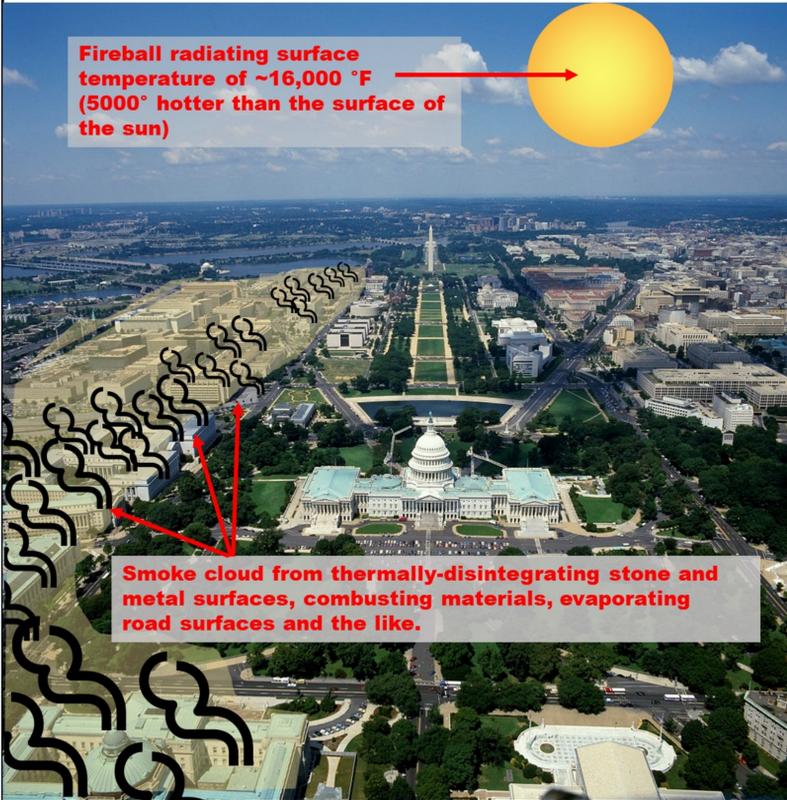
**=**



Adapted from: Barash, Dr. David P. *The Arms Race and Nuclear War*. Belmont: Wadsworth Publishing Company, 1987. p 72.

# A (MEDIUM) NUCLEAR BLAST OVER D.C.

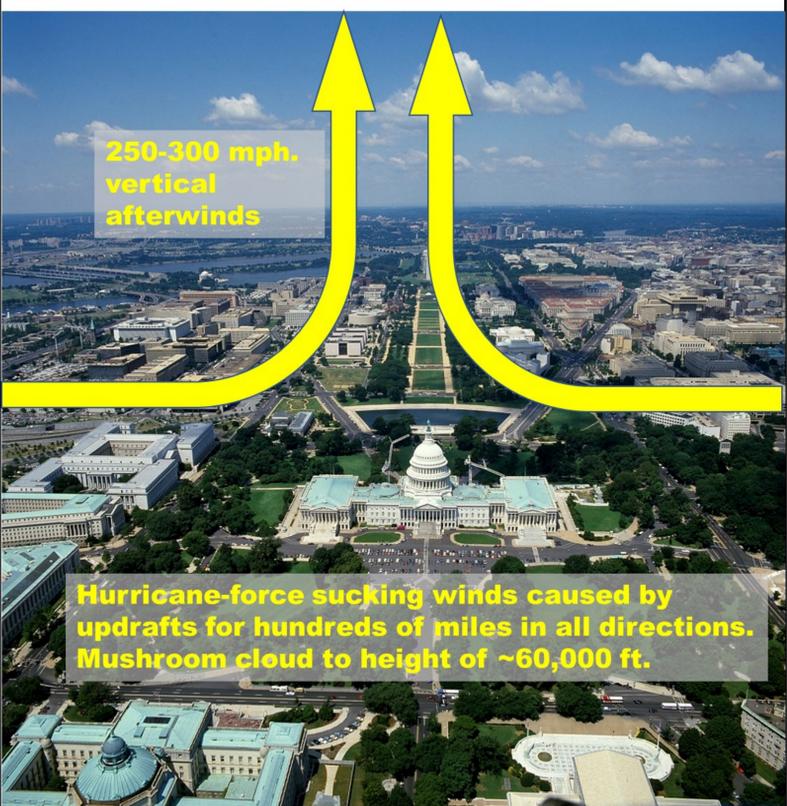
< 1 second after airburst of .8 megaton weapon over Washington D.C. -- not shown is the blinding flash and radiation which would accompany such a blast.



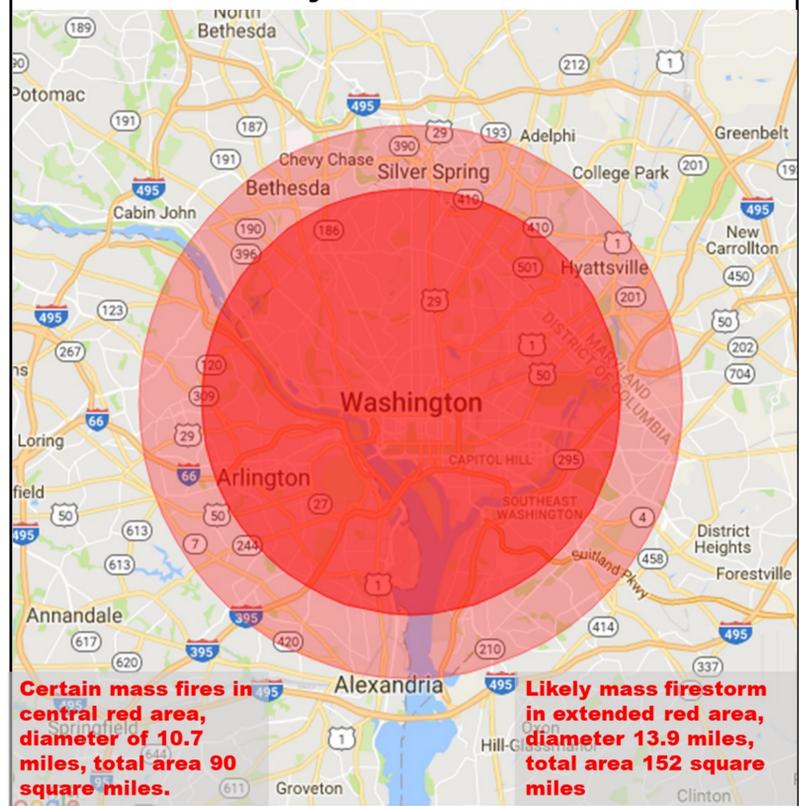
~ 30-40 seconds after .8 megaton nuclear blast over Washington. Nuclear fireball too large for frame of picture.



~ two minutes after blast of .8 megaton weapon over Washington. Not shown are fireball, smoke, debris, etc.



**Nuclear Firestorm over Washington D.C. for a single .8 megaton airburst on an average, clear day. Minimal survivability in the central zone.**



Adapted from Eden, Lynn, Theodor Postol, and Steven Starr. "What would happen if an 800-kiloton nuclear warhead detonated above midtown Manhattan?" *Bulletin of the Atomic Scientists*, February 25, 2015. <http://thebulletin.org/what-would-happen-if-800-kiloton-nuclear-warhead-detonated-above-midtown-manhattan8023>.

Effects of nuclear explosions, Barash, Dr. David P. *The Arms Race and Nuclear War*. Belmont: Wadsworth Publishing Company, 1987. Map from Steven Starr, Nuclear Age Peace Foundation, NuclearDarkness.org. Other images from Wikimedia commons.

# Nuclear Fallout:

**Deadly, invisible radiation carried downwind causing sickness, cancer, birth defects and permanent genetic damage, lasting up to 100 years.**

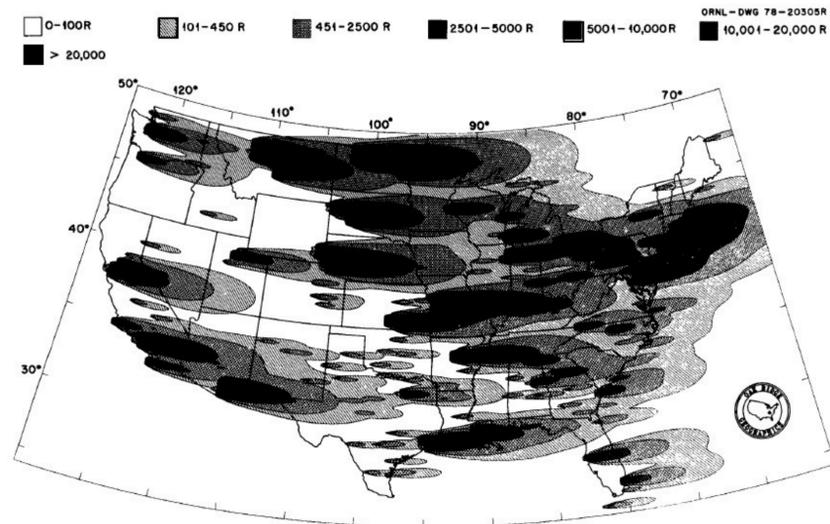
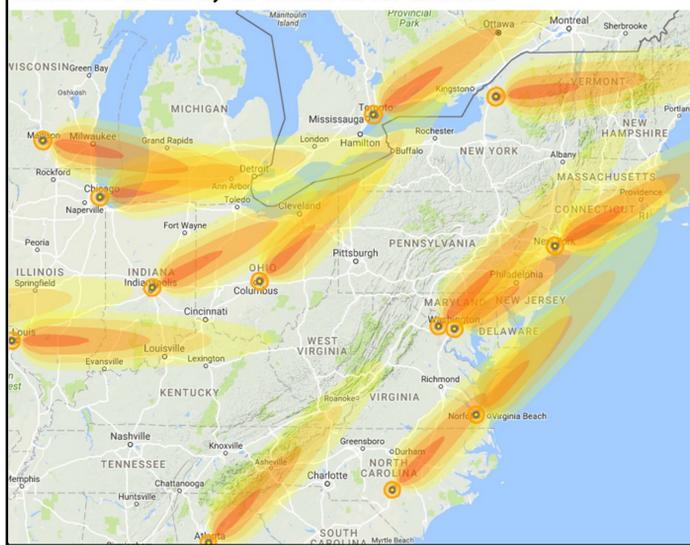
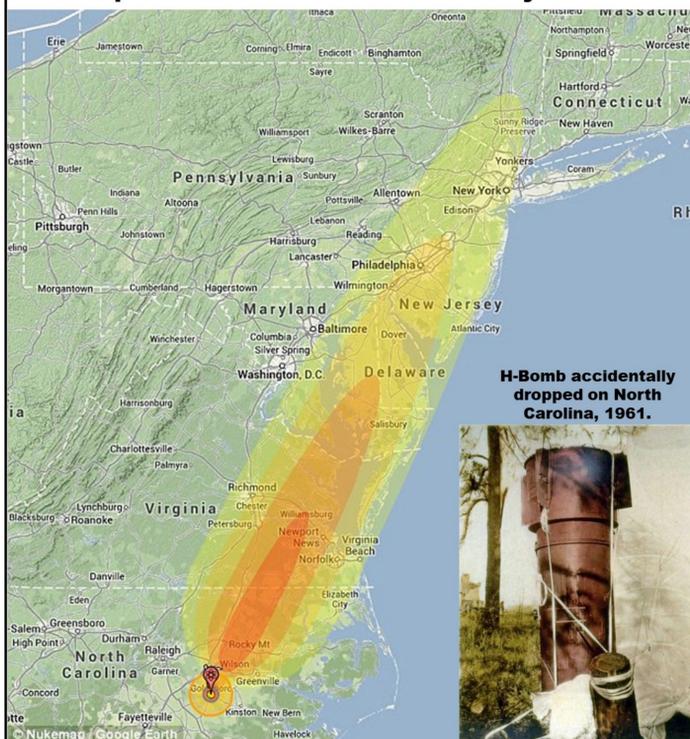


Fig. 3.7. Accumulated 14-day fallout dose patterns from a hypothetical attack on the United States.

**Sample radioactive fallout patterns after simulated nuclear exchange in Eastern US with 5 megaton Chinese ICBM's, 18 hours after blasts.**



**Simulated fallout of nuclear blast from actual 1961 incident where an aircraft accidentally dropped two bombs with combined power of 8 megatons in Eastern North Carolina. Fallout would have caused serious problems as far as New York City.**



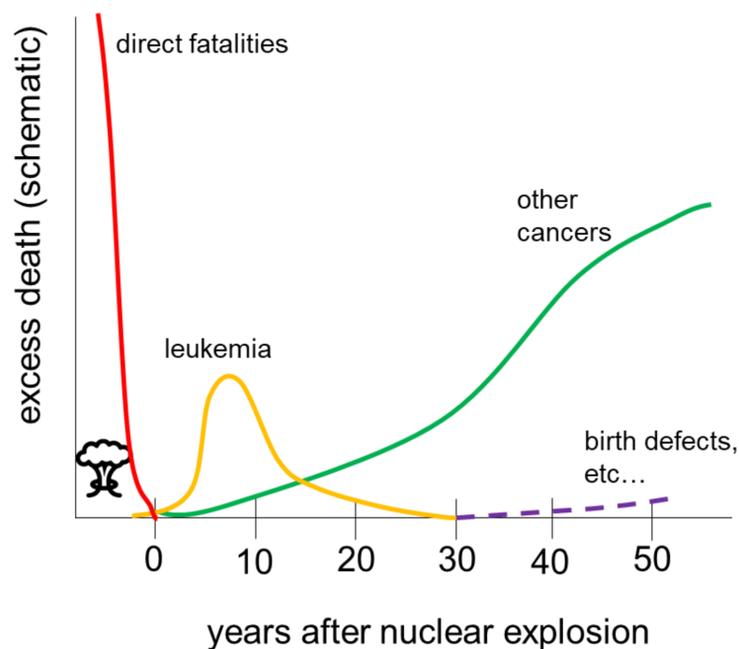
**Sources: Oak Ridge National Laboratory Study, 1979, cited in Barash, Dr. David P. *The Arms Race and Nuclear War*. Belmont: Wadsworth Publishing Company, 1987. P 94. Nukemap online tool created 2012 by Dr. Alex Wallerstein, a project of the College of Arts and Letters at the Stevens Institute of Technology, Hoboken, New Jersey.**

**Pilkington, Ed. "US nearly detonated atomic bomb over North Carolina – secret document." *The Guardian* (London), September 20, 2013. Accessed June 26, 2017. <https://www.theguardian.com/world/2013/sep/20/usaf-atomic-bomb-north-carolina-1961>.**



# Nuclear Radiation

## Long-term mortalities from single nuclear blast



Radioactive Isotope	Half Life	Targeted Organ
I-131 (Iodine)*	8.3 days	Thyroid
Rn-222 (Radon) Pu-239 (Plutonium) Kr-85 (Krypton)*	3.8 days 24,000 years 10 years	Lung, (Rn-222 tends to spread over the whole body)
Co-60 (Cobalt) Pu-239 (Plutonium)	5.3 years 24,000 years	Liver
U-235 (Uranium) U-238 (Uranium) Pb-210 (Lead) Ru-106 (Ruthenium)*	700,000,000 years 4,500,000,000 years 22.3 years 1 year	Kidney
Cs-137 (Cesium)* K-42 (Potassium)* C-14 (carbon) T-3 (Tritium) S-35 (Sulfur)	30 years 12 hours 5730 years 12.2 years 87 days	Skin, muscle
Pu-239 (Plutonium) Sr-90 (Strontium) Ra-226 (Radium)	24,000 years 28.8 years 1620 years	Bone
Po-210	138 days	Spleen (high toxicity)
Pu-239 (Plutonium)	24,000 years	Gonads
K-42*, Co-60*, Kr-85*, I-131*, Cs-137*, Pu-239	12 hours - 24,000 years	Ovaries

### Lethal Radiation Doses

TIME AFTER EXPOSURE	800 r (lethal dose)	700 r (median lethal dose)	200 r (moderate dose)
FIRST WEEK	Nausea and vomiting after 2 hours	No definite symptoms	No definite symptoms
	Diarrhoea, vomiting inflammation of throat	No definite symptoms	No definite symptoms
SECOND WEEK	Fever, rapid emaciation leading to death (100 per cent)	No definite symptoms	No definite symptoms
THIRD WEEK	Loss of hair begins Loss of appetite General malaise Fever and pallor leading to rapid emaciation and death for 50 per cent of the population	Loss of hair begins Loss of appetite Sore throat Faller and diarrhoea	Recovery begins (no deaths in absence of complications)

### Comparative Radiation Effects on the Body

Chest X-ray	0.1 mSv
Average background exposure in one year	3 mSv
Abdominal X-ray	4 mSv
Living on the Colorado Plateau for one year	4.5 mSv
Typical yearly dose for a uranium miner	5-10 mSv
Full-body CT scan	10 mSv
Lowest dose for any statistical risk of cancer	50 mSv
Mild radiation sickness (headache, risk of infection)	0.5-1 Sv
Light radiation poisoning (mild to moderate nausea, fatigue, 10% risk of death after 30 days)	1-2 Sv
Severe radiation poisoning (vomiting, hair loss, permanent sterility, 35% risk of death after 30 days)	2-3 Sv
Severe radiation poisoning (bleeding in mouth and under skin, 50% risk of death after 30 days)	3-4 Sv
Acute radiation poisoning (60% fatality risk after 30 days)	4-6 Sv
Acute radiation poisoning (bone marrow destroyed, nearly 100% fatality after 14 days)	6-10 Sv
Acute radiation poisoning (symptoms appear within 30 minutes, massive diarrhea, internal bleeding, delirium, coma)	10-50 Sv
Coma in seconds or minutes, death within hours	50-80 Sv
Instant death*	>80 Sv

**The Medical Implications of Nuclear War**, Institute of Medicine. National Academy of Sciences, National Academy Press, Washington D.C. 1986.

Barash, Dr. David P. **The Arms Race and Nuclear War**. Belmont: Wadsworth Publishing Company, 1987. pp 63-108.

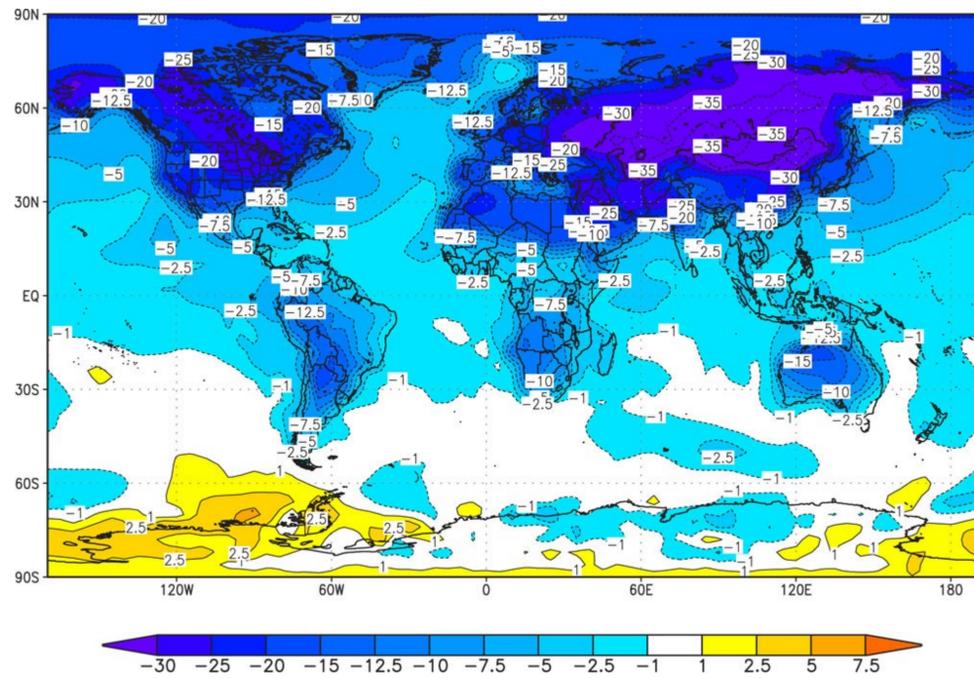
Universal Review, Page 14, <https://universe-review.ca/F14-nucleus08.htm>



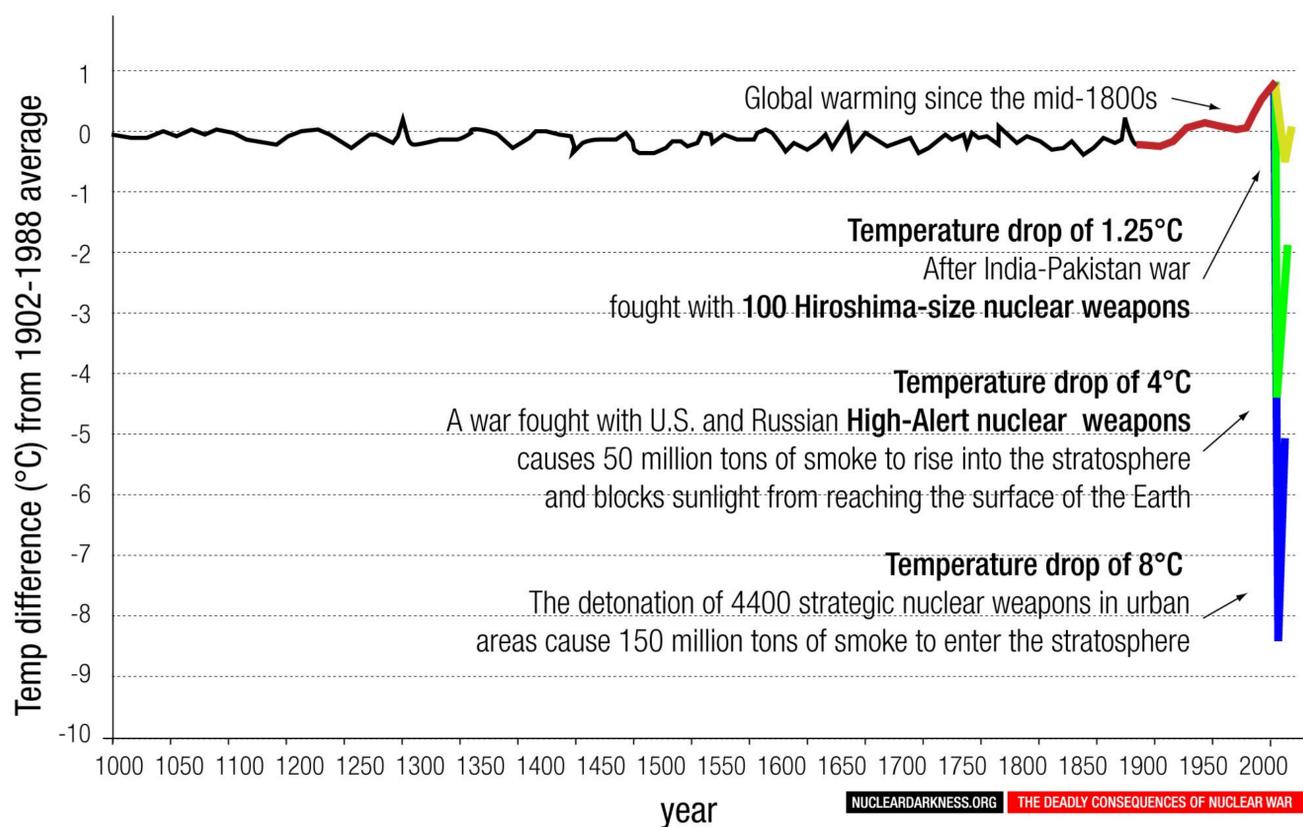
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# Nuclear Winter:

**Atmospheric effect of nuclear blast, blocking up to 70% of sunlight and triggering a global ice age**



Surface Air Temperature (degree C) changes following a full-scale nuclear war averaged for June, July, and August of the year following the conflict.



Sources: Barash, Dr. David P. *The Arms Race and Nuclear War*. Belmont: Wadsworth Publishing Company, 1987. pp 97-107.

Steven Starr, NuclearDarkness.org

Alan Robock, Luke Oman, and Georgiy L. Stenchikov, Nuclear winter revisited with a modern climate model and current nuclear arsenals (2007). *Journal of Geophysical Research*, vol. 112, D13107, doi:10.1029/2006JD008235.



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# ELECTROMAGNETIC PULSE:

An inconvenient side effect of nuclear explosions producing wide-scale, mass-spectrum radiation.

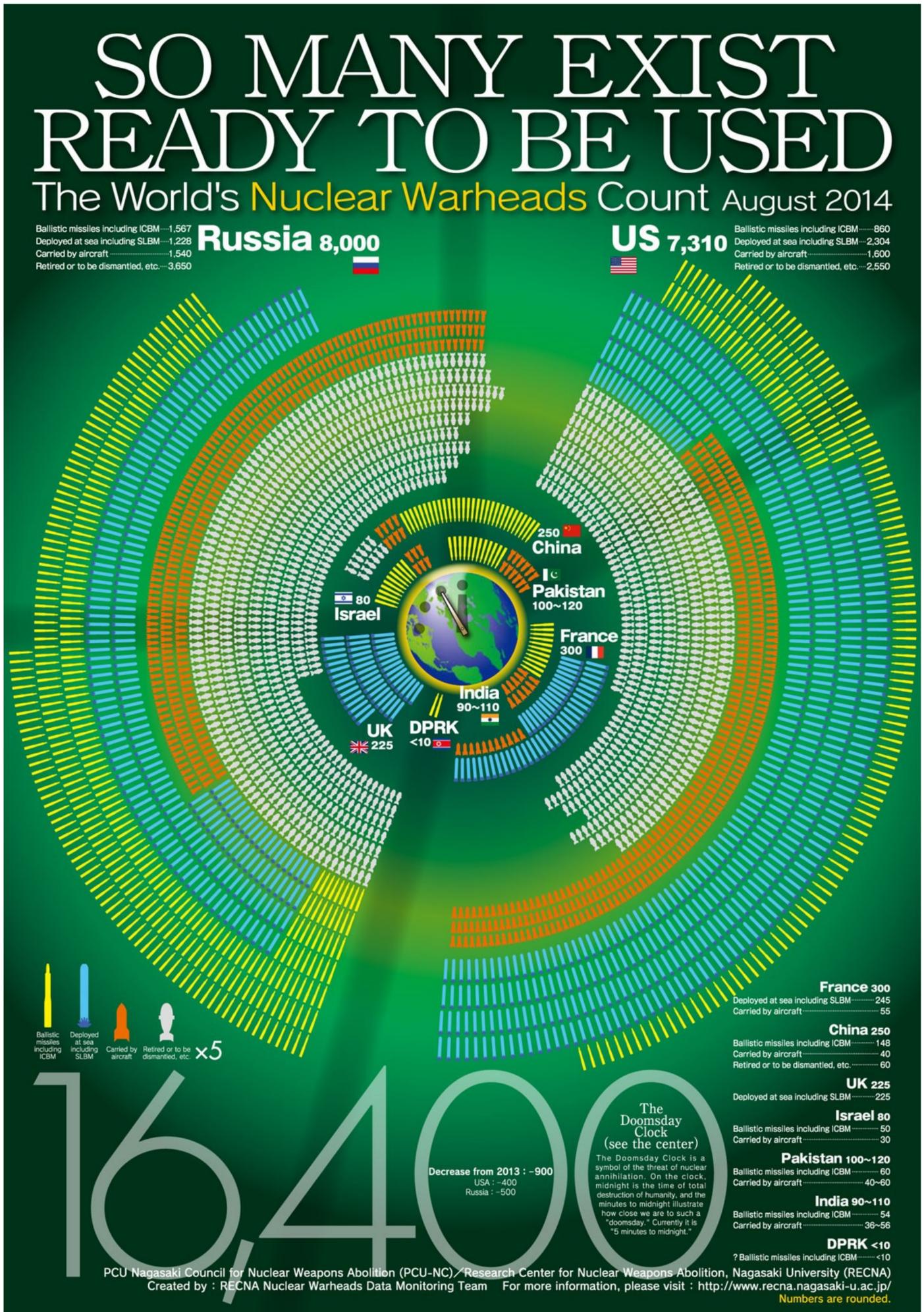
1 x  @ 200 mi. alt.  
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Area effected by 1 megaton nuclear burst over Omaha, Nebraska, at 200 mi. altitude. Electrical surges between 25,000-50,000 V/m. No unshielded (civilian) electronics, power infrastructure, cellphone or internet server would likely survive intact. Cars with electronic components, airplane navigation systems, computers, electronic cameras, televisions, videogame systems, ATM's and surveillance systems would all fall into these categories. Say goodbye to your cat videos and selfie collection! Say goodbye to the modern economy... (Adapted from: Barash, Dr. David P. *The Arms Race and Nuclear War*. Belmont: Wadsworth Publishing Company, 1987. pp 78-81. Images from Wikimedia commons)

# Nuclear proliferation:

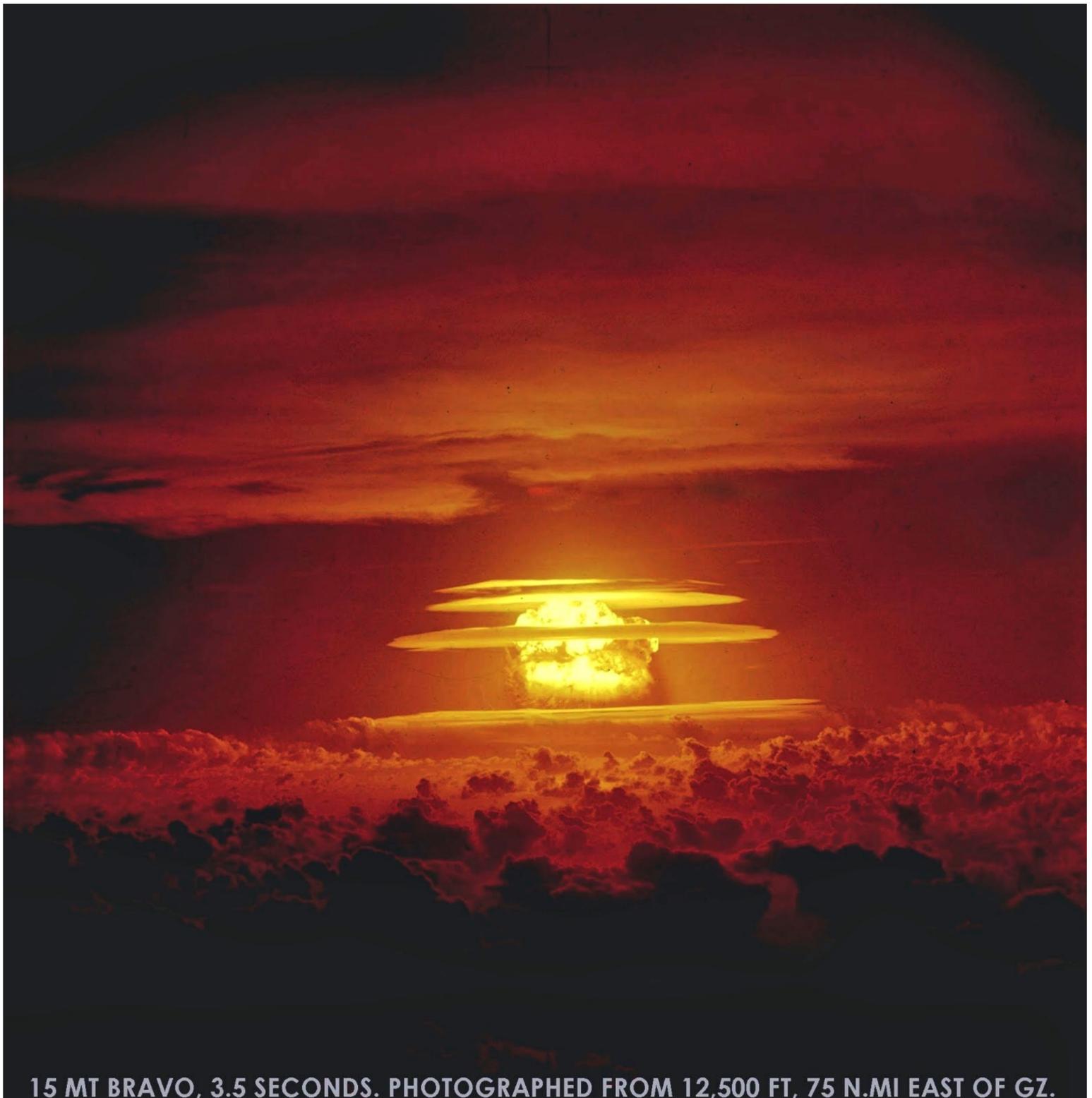
Enough nukes exist to destroy the earth between 5 and 50 times over, depending on who's counting.



From PCU-Nagasaki Council for Nuclear Weapons Abolition, Nagasaki University  
<http://www.recna-nagasaki-u.ac.jp/>

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# Further Considerations



15 MT BRAVO, 3.5 SECONDS. PHOTOGRAPHED FROM 12,500 FT, 75 N.MI EAST OF GZ.

**Atmospheric venting to outer space due to air acceleration effect of nuclear blast: thinning of Earth's atmosphere with every detonation.**

**Possibility of atmospheric ignition in an all-out nuclear war: nothing would live on earth again.**

**Neutron bombs: designed to kill by irradiation, a horrible, prolonged death. Mass produced.**

**Dirty bombs: no expertise necessary to produce. Could hide in a suitcase.**

**Nuclear power plants: nuclear targets for terrorism?**

Find out more for yourself — join us in researching, understanding and advocating against nuclear war and nuclear weapons.

These posters designed using opensource and original resources by EK Knappenberger, 6/2017, for the Nuclear Literacy Project of the Charlottesville Center for Peace & Justice, PO Box 2012, Charlottesville, Virginia, 22902. Join CCPJ for monthly meetings, community events, educational actions and more — [CharlottesvillePeace.org](http://CharlottesvillePeace.org).



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