

Climate & Nuclear Weapons

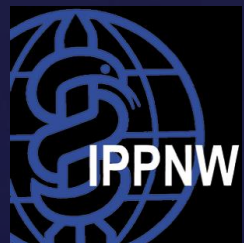
& A. Nidecker, MD, Prof. of Radiology Basel President
of Basel Peace Office / Board PSR IPPNW Switzerland

& For the hybrid event organized by the Kasakh
Embassy London, Nursultan Nazarbayev Foundation,
PNND and Youth Fusion on the "Int. Day of Nuclear
Tests" Sept 9th 2021.



Climate & Nuclear Weapons

- ❧ EXISTING CLIMATE THREATS: need urgent political action including Carbonfree Living and new technologies but in particular human behavioural changes
- ❧ NUCLEAR ENERGY : neither short nor long term solution for existing climate threats NOW
- ❧ NUCLEAR WEAPONS / WAR : potentially big problem for Climate even by a limited regional nuclear war with 50 – 100 small Hiroshima type nuclear bombs



Climatic and Health effects of a (limited) regional Nuclear War

- Meteorological models proposed in 2007 by Robock et al. U of Colorado (USA): massive effects, even with a "limited" nuclear war with a number of small "Hiroshima" type nuclear bombs: Besides fires and infrastructure damage

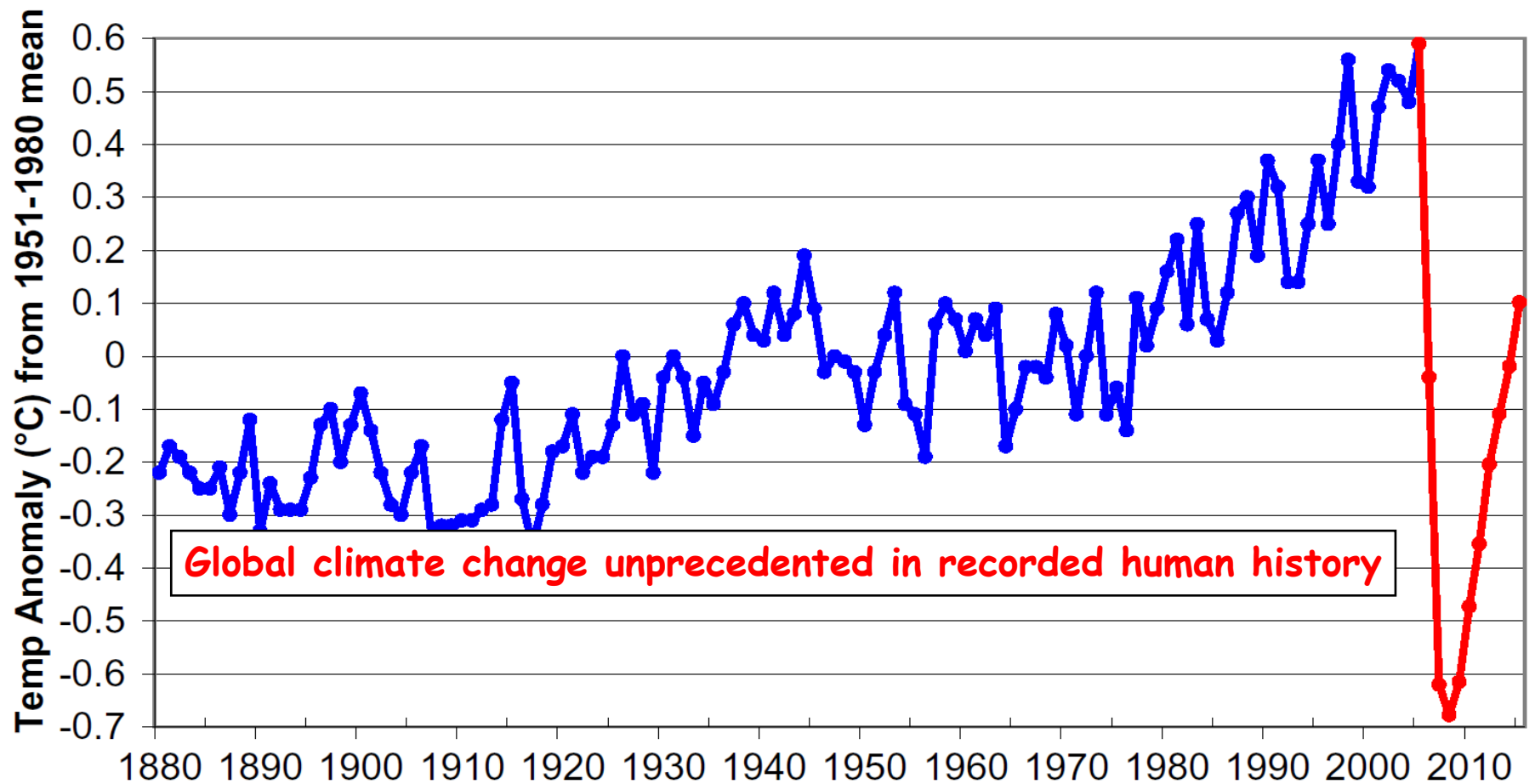
Dust and smoke reaching the atmosphere and
Due to absorption of sunlight less light on earth surface

- Massive, rapid terrestrial temp. drop : cause shortening effect on agricultural growing time
- Stratospheric Ozone depletion damages agricultural products sensitive to UV B
- Radioactive / toxic contamination further decrease productive agricultural surface



GISS Global Average Temperature Anomaly

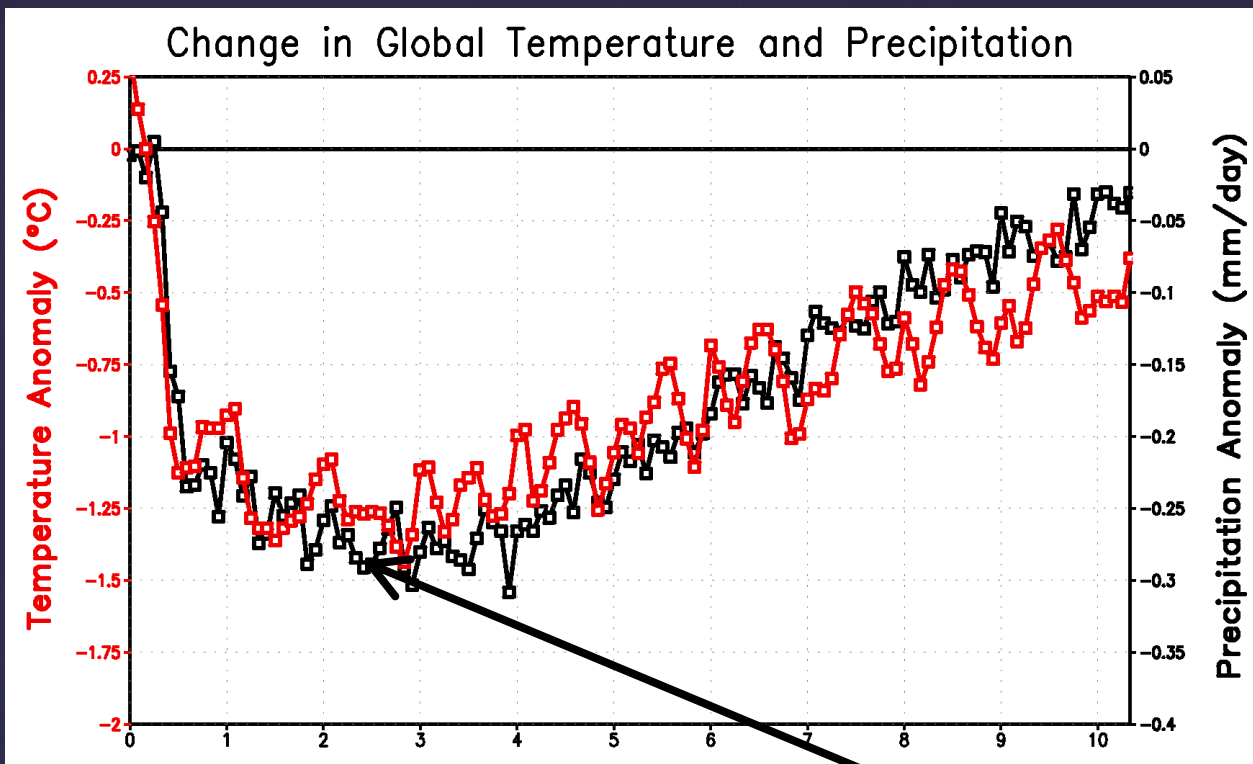
+ 5 Tg smoke in 2006



Graph courtesy of Alan Robock

Robock A et al.: Climatic consequences of regional nuclear conflicts
(2007) *Atm. Chem Phys*, 7, 2003 – 12



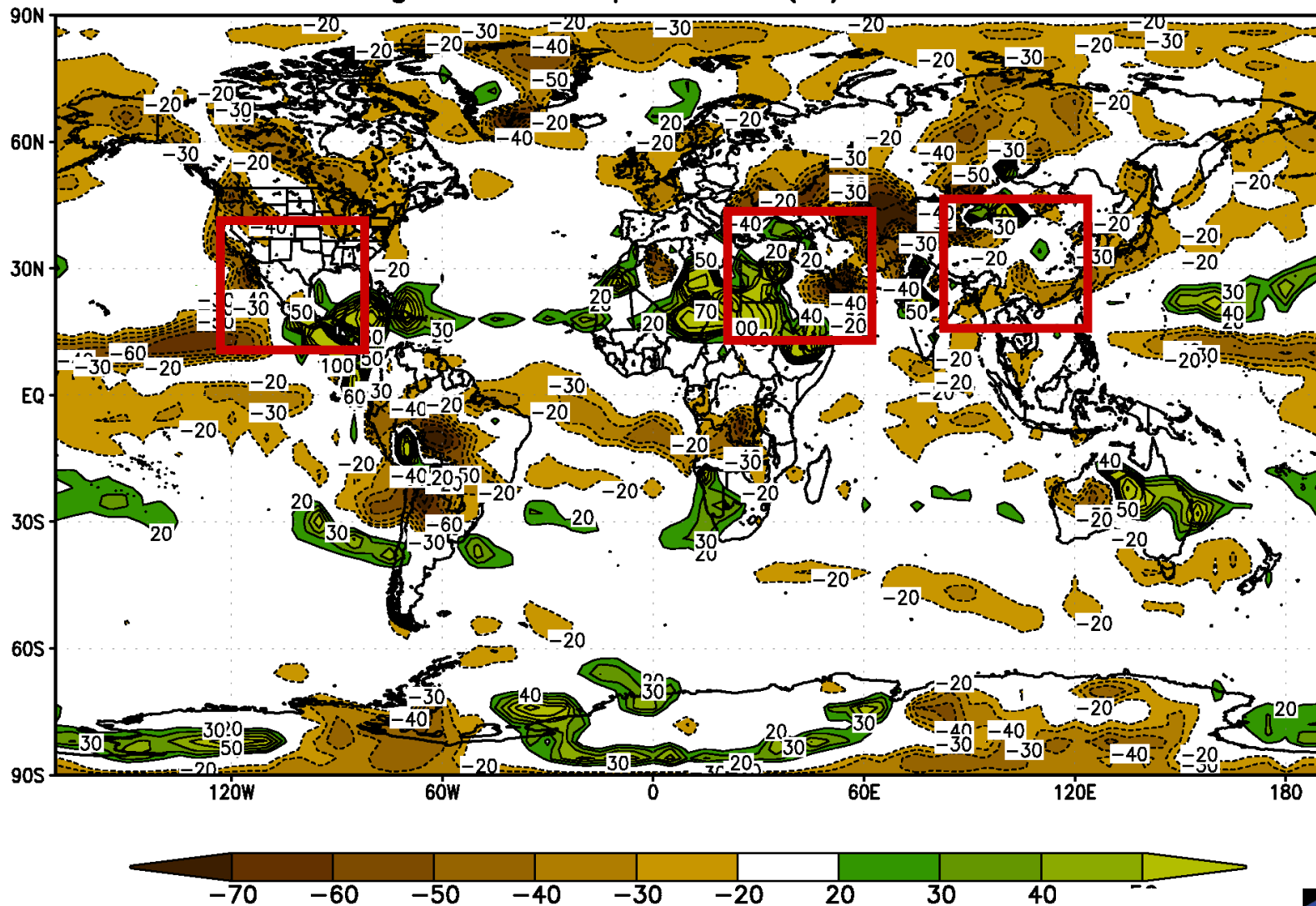


Graph shows, how both the temperature and precipitation changes – due to dust and smoke contamination of the atmosphere – cause a decrease of precipitation and average cooling effect on the Earth surface of -1.25°C of up to 10 years

Graph courtesy Alan Robock



Change in Precipitation (%) JJA Year 1



Change of global precipitation in %

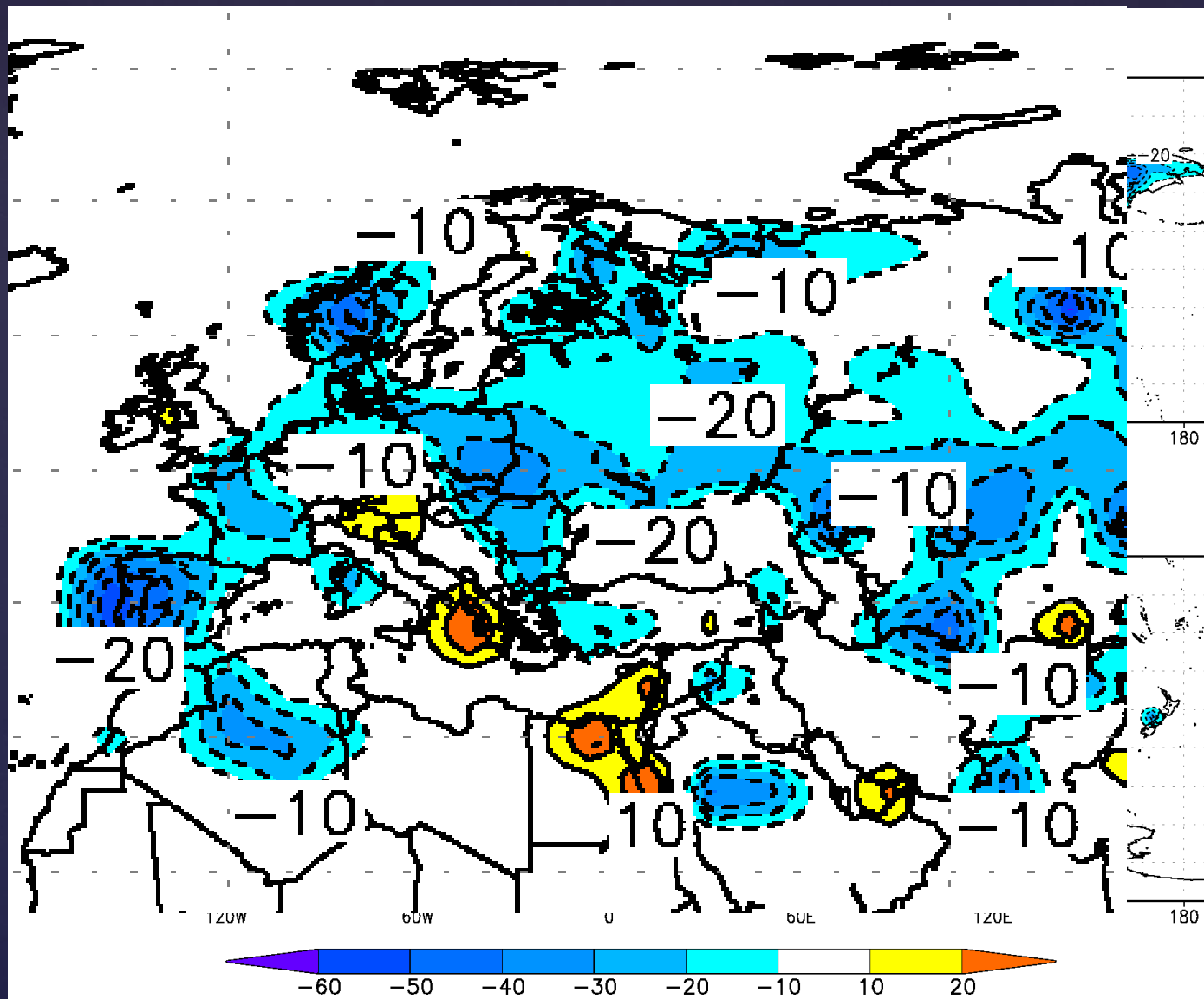
Chart courtesy of Alan Robock



Subacute effects of nuclear war :

- ❖ US Natl. Acad of Sciences study 1986 on indirect effects of nuclear war: lary mechanism for human fatalities: not blast, burns, ionizing radiation but famine i.e. "nuclear famine"!
- ❖ Situation 2020: World Hunger Index: 690 Mio people chronically malnourished, with baseline consumption of 1750 calories or less/d with 144 Mio children growth delayed, 47 Mio children acutely malnourished and 5.3 Mio died of malnourishment in 2018;
- ❖ Even a 10% decline in their food consumption would put the entire group at risk.





Change in Growing Season Year 1 in Northern and Southern Hemisphere

Chart courtesy of Alan Robock



Risks of nuclear escalation in 2021 and beyond

Due to:

- ⌘ Modernisation of arsenals of 9 Nuclear Weapon States (NWS) with some 13500 Nuclear weapons;
- ⌘ Lack of Dialogue among major NWS / horizontal Proliferation;
- ⌘ Except for START, no International Security Treaties.

Increasing global challenges as

- ⌘ Climate change, Loss of arable Land, decreasing Water reserves and quality, Migration, Poverty, Pandemics may increase international tensions and risk of war incl. limited Nuclear Escalation: S Asia, Korea, Middle East, S China Sea, Donbas...

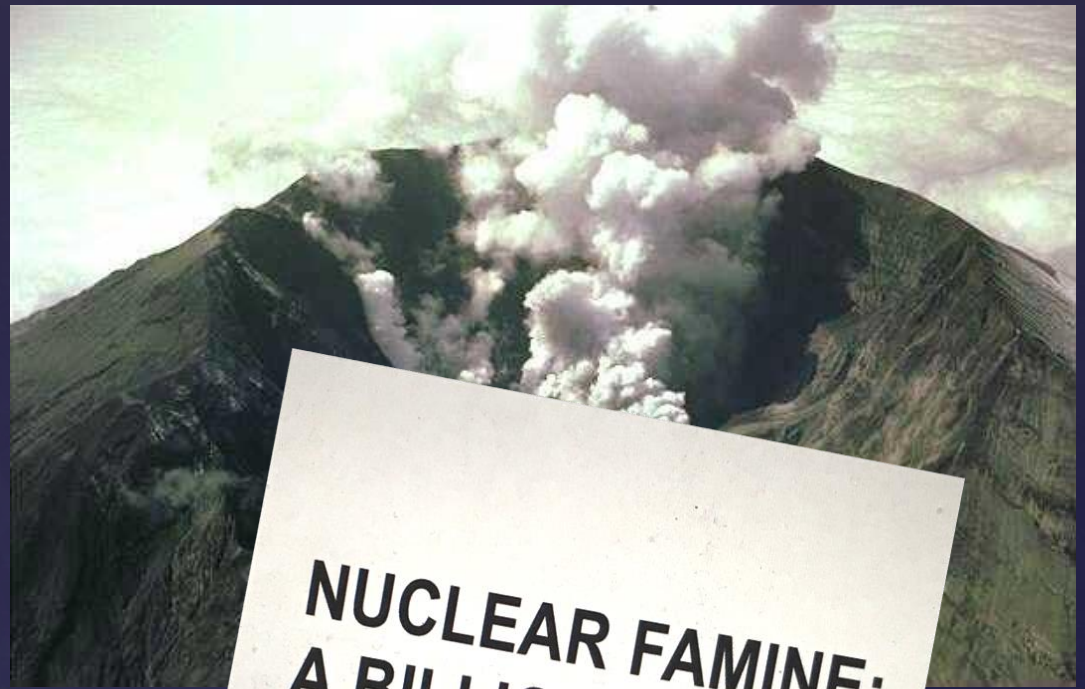


Ex 2: Tambora Volcano Eruption in Indonesia

- April 1815 for 3 consecutive days Tegen; (Note: likely typo for 'Tegen' or 'Tegen' in original)
- 175 km³ volcanic ashes equals 50 km³ solid Magma
- Over 100000 deaths globally
- - 0.7 ° Celsius temp drop with dramatic shortening of growing season

Subsequently 1816 the “year without summer with:

- 4 serious summer frosts in US & Canada
- snowstorms in New England
- famine in Germany, Ireland, France, India, Switzerland



NUCLEAR FAMINE: A BILLION PEOPLE AT RISK

Global Impacts of Limited Nuclear War on Agriculture,
Food Supplies, and Human Nutrition

Ira Helfand, MD
International Physicians for the Prevention of Nuclear War
Physicians for Social Responsibility

Conclusions :

1. The bombardment of Hiroshima and Nagasaki in 1945 killed over 100 thousand people immediately. Many more died from cancers after yrs.
2. Hotspots exist between Nuclear Powers
3. Even a regional nuclear war can have, besides the known effects from nuclear bombs, significant climatic influences and lead subsequently to major famine for millions of people.



Ex 1: 1st Gulfwar between
Irak and Iran: burning
Oilfields in Kuwait



Large Volume of dusts and ashes in the air
with massive effect on Climate in Kuwait, Saudi
Arabia and other Gulfstates. Temperatures
were during some months up to 10 Degree
Celsius deeper than in other years



Climate Change Impact

Temp. variation
Precipitation
Water runoff
Droughts
Extreme events
Soil erosion
Desertification
Sea level rise

Human Dynamics



Possible Societal Impacts

Weak Institutions
Lack of legitimacy
Social Instability
Environmental Conflicts
Crime, Urban violence
Terrorism
Civil unrest
Armed conflicts

From: J Scheffran, A Battaglini: Climate and conflicts: the security risks of global warming
Reg Environ Change (2011) 11 (Suppl 1): 27-39



2021 Existing / emerging global Hotspots:

- ⌘ Kashmir (India vs. Pakistan)
- ⌘ Donbas (Russia vs. Ukraine)
- ⌘ Himalayas (India vs. China)
- ⌘ South China Sea (China vs US)
- ⌘ Korea (North vs South Korea)
- ⌘ Middle East (Iran/ Syria vs. Israel)

