

The Responsibility of Scientists

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<https://www.sgr.org.uk/projects/nuclear-weapons-threat-main-outputs>

2025 judged to be most dangerous in humanity's history

The Doomsday Clock was invented in 1947 for the *Bulletin of the Atomic Scientists* as a powerful symbol of the likelihood of a human-made global catastrophe caused by nuclear weapons. Nowadays including environmental and technological threats.

For many Cold War years clock set to several minutes before midnight.

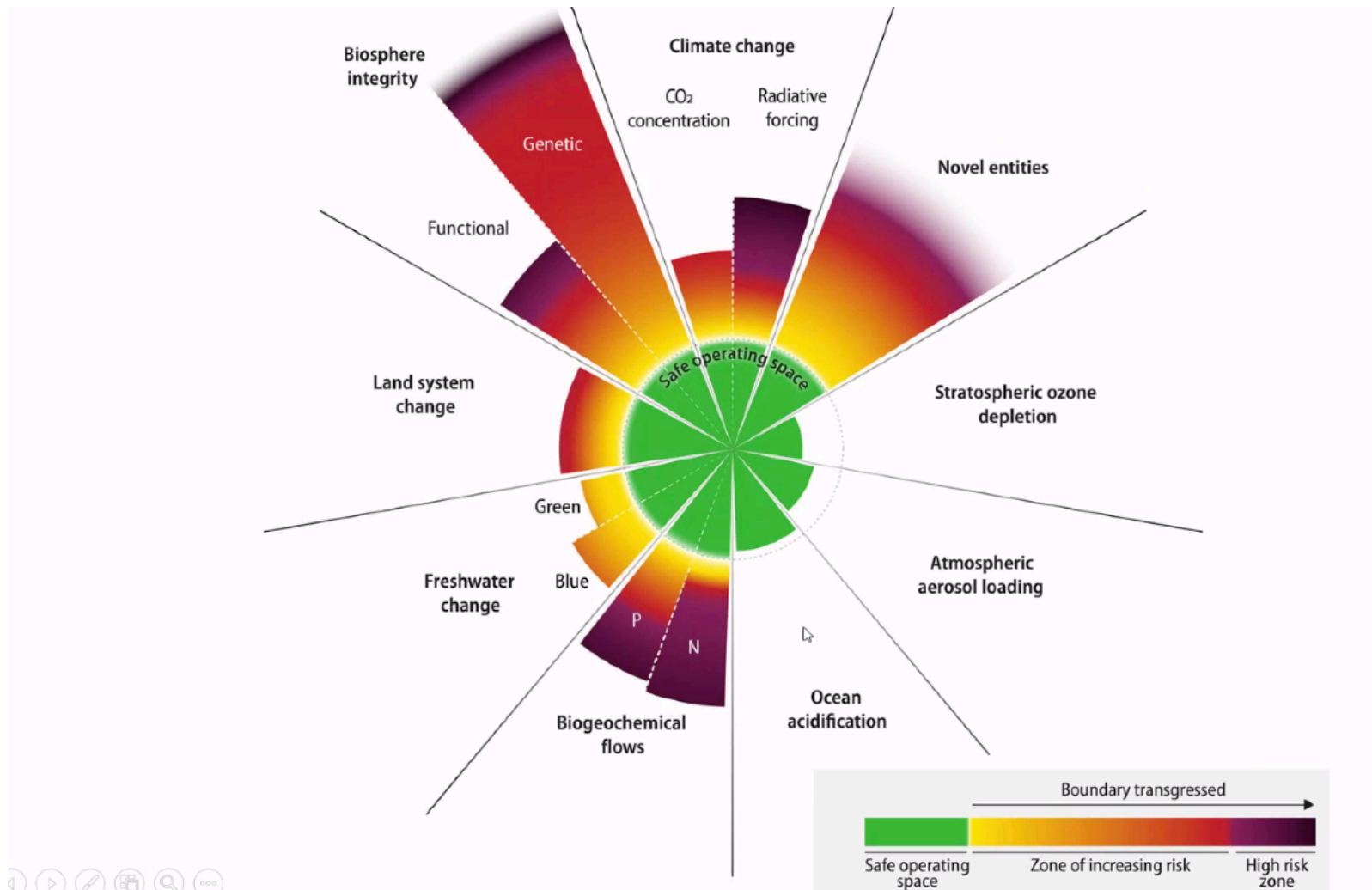
**IT IS 90 SECONDS
TO MIDNIGHT**

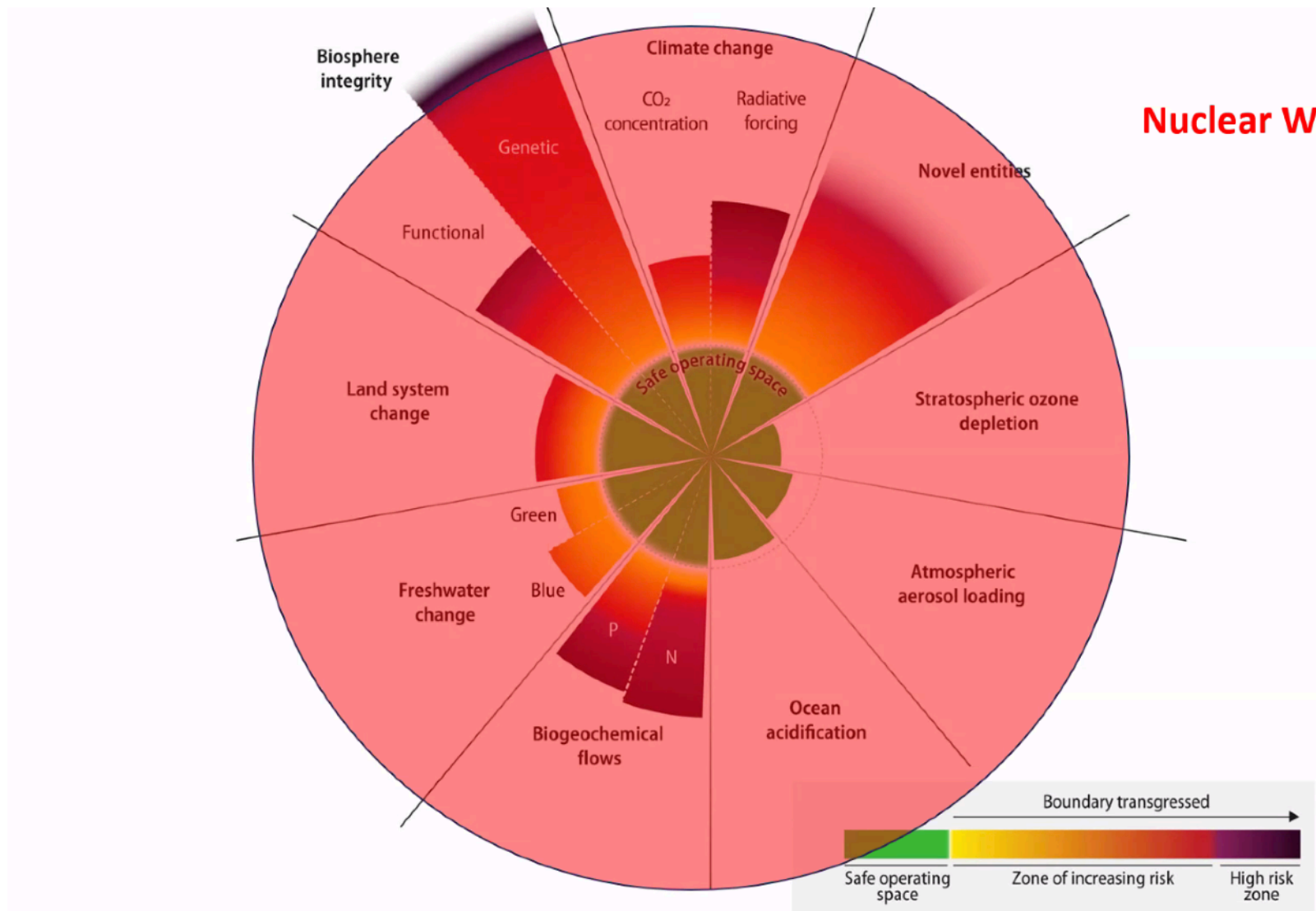


89 seconds to midnight

Reasons ...

- ❑ a new heightened risk of nuclear war;
- ❑ a growing climate emergency;
- ❑ Breaching six of nine planetary survival boundaries
- ❑ political systems riven with dangerous and deliberate misinformation;

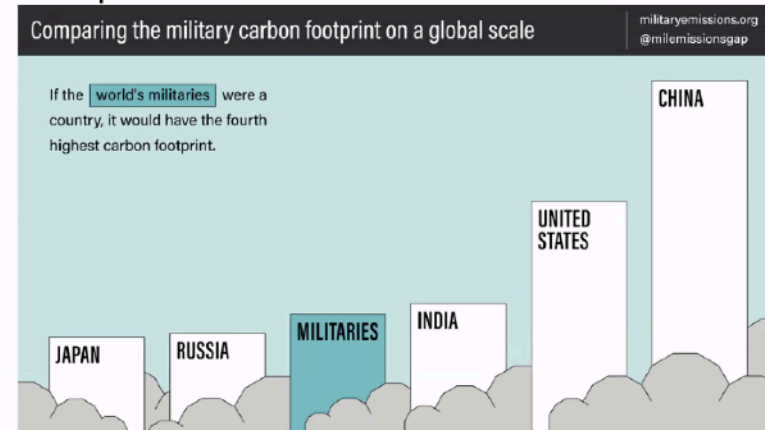




Nuclear Wa

Global estimate: military carbon footprint

- Global total (best estimate): **2,750 MtCO₂e/ 5.5%**
- **Larger than Russia's** total carbon footprint
- Uncertainty range
 - 1,600 to 3,500 million tonnes of carbon dioxide equivalent
 - 3.3% to 7.0% of global GHG emissions
- **Significant obstacle to reducing emissions**



Nuclear deterrence – a delusion

❑ **Proposition:** Nuclear deterrence has been keeping us 'safe for over 70 years' or 'works every day to keep us 'safe'; 'nuclear umbrella'

❑ **Rebuttals:**

- Extensive uncompensated impacts from testing and uranium mining
- 20 or more serious nuclear near misses over 70 years: equipment failure, false alarms, most dangerous during military exercises / conflicts. Nuclear threat makes crises *more* risky
- We've been lucky – so far
- NW are no 'umbrella' – an unstoppable mega death threat
- Ukraine war & Gaza bombardment taking place under this threat

The extreme impacts of nuclear weapon use

Designed to be extremely destructive when detonated

☐ One weapon:

- 81,000 killed, over 200,000 injured – some fatally, burns / fires / fallout
- Destruction equivalent to months of artillery shelling in a few seconds
- Medical facilities overwhelmed. Humanitarian assistance impossible
- Equivalent to 6 months of Ukraine war, Gaza casualty rate – but in minutes

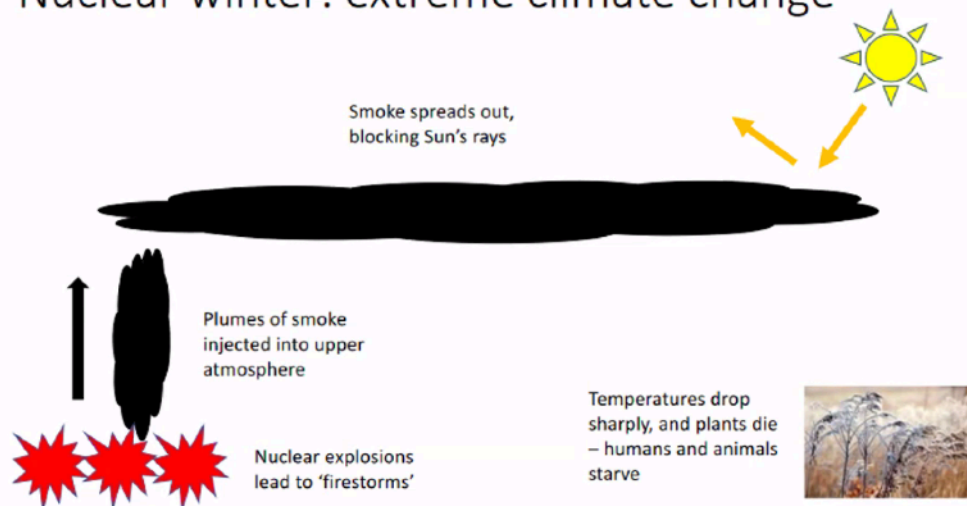
☐ Regional nuclear war:

- 100 Hiroshima size weapons - hundreds of millions killed, injured.
- Terrible long-term impacts – 10 year nuclear winter. 2bn+ at risk.

☐ Global nuclear war:

- 2000 – 4000 warheads - mainly USA & Russia
- Hundreds of millions to over a billion killed and injured
- Radioactive fallout over large areas - especially from nuclear reactors
- Even worse long term nuclear winter, ozone destruction, ecocide
- 'civilisation' at risk

Nuclear winter: extreme climate change

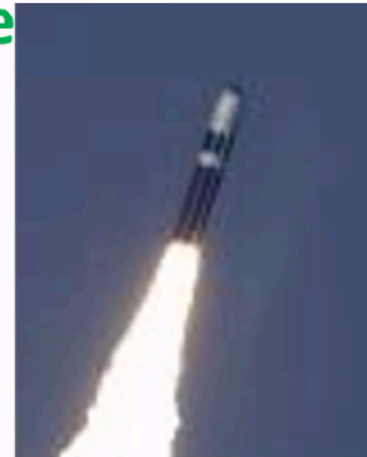


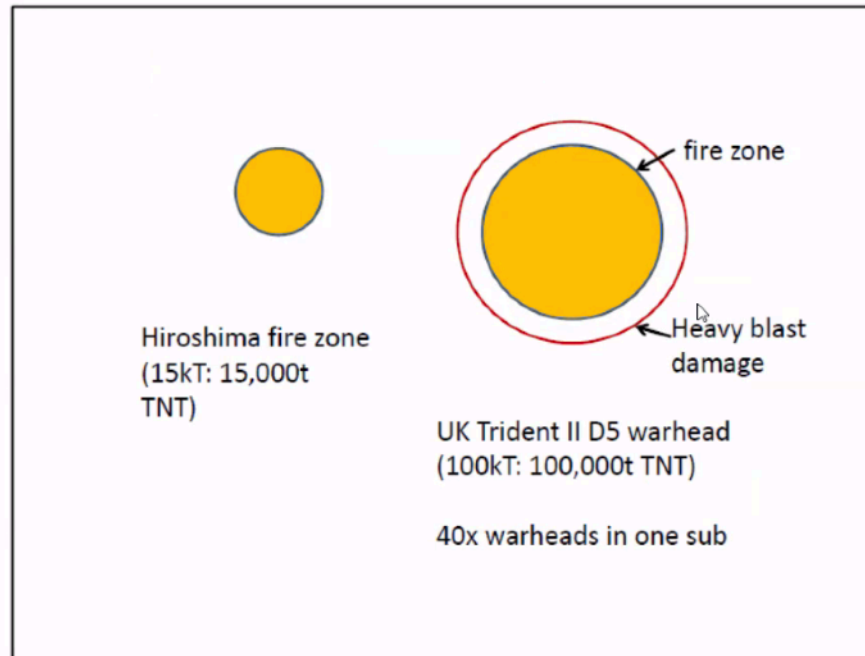
- Extreme cooling (rather than heating from carbon emissions)
- Change would be faster and larger than that due to carbon emissions
- Robust evidence for impacts – derived using modern climate models – published in academic journals

Image credit: Alicja via Pixabay

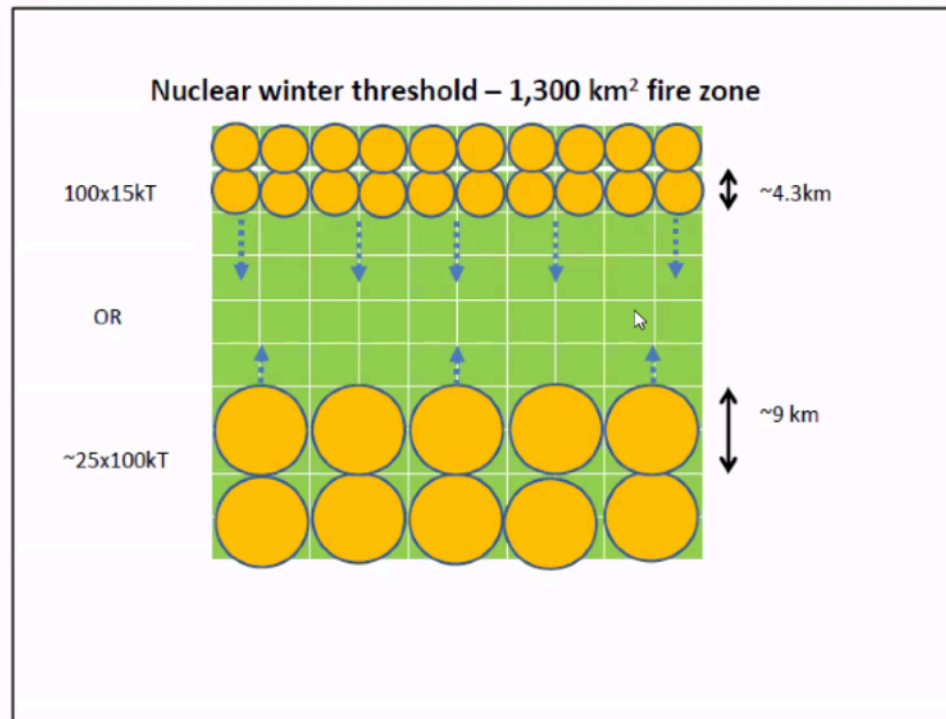
Impacts of UK nuclear weapons use

- ❑ One UK submarine carries at least 40 Trident warheads
- ❑ At least 4 million fatalities and 10 million casualties across 10 or more cities
- ❑ Only 25 warheads would create a 1,300 km² fire zone (100x Hiroshima) and 5 million tonnes 'black carbon' leading to catastrophic climate cooling
- ❑ Total explosive power huge - greater than 6 years of bombing during World War II !



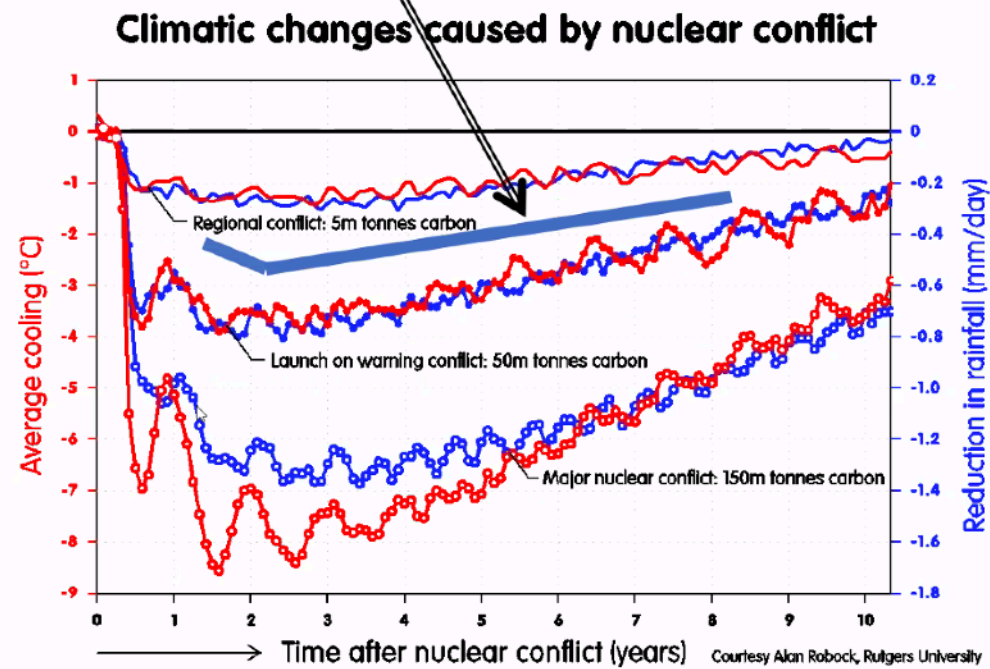


Trident warhead fire zone: approx. 4 times larger in area; scales to the power of 0.8.
Blast zone scales to the power of $2/3$ (volume effect).
5psi blast zone: ~1km for Hiroshima; ~3km for Trident



Schematic of 100 Hiroshima fire zone area - equivalent to ~25 Trident D5 warheads. Postol suggests a possibly 4x larger Trident fire zone than using thermal intensity scaling – scaling to Hiroshima compensates for this.

One Trident salvo !



The Core Problem: deeply corrupt decision-making

Similar cycle applies to
climate inaction via fossil-
fuel subsidies / profit taking

From 2023 ICAN report: *Wasted: 2022
nuclear weapon spending*

