Could climate change lead to a nuclear war?

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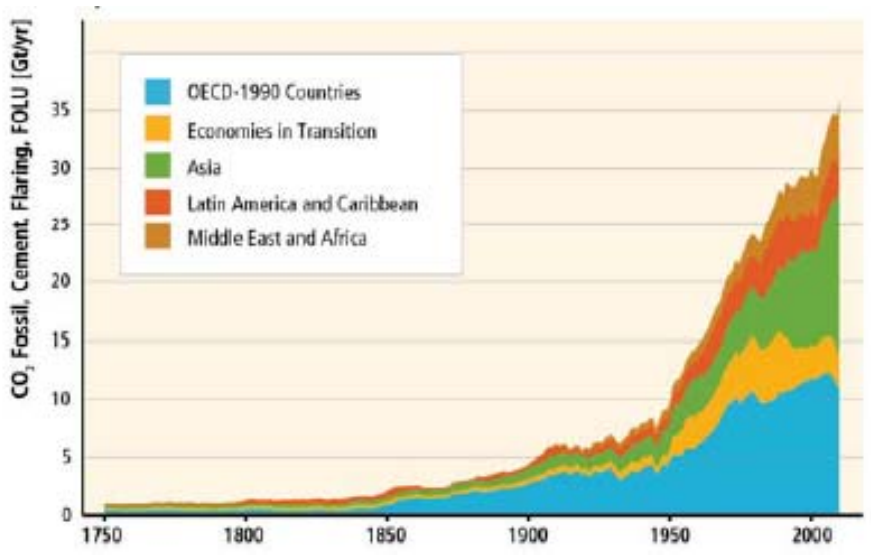
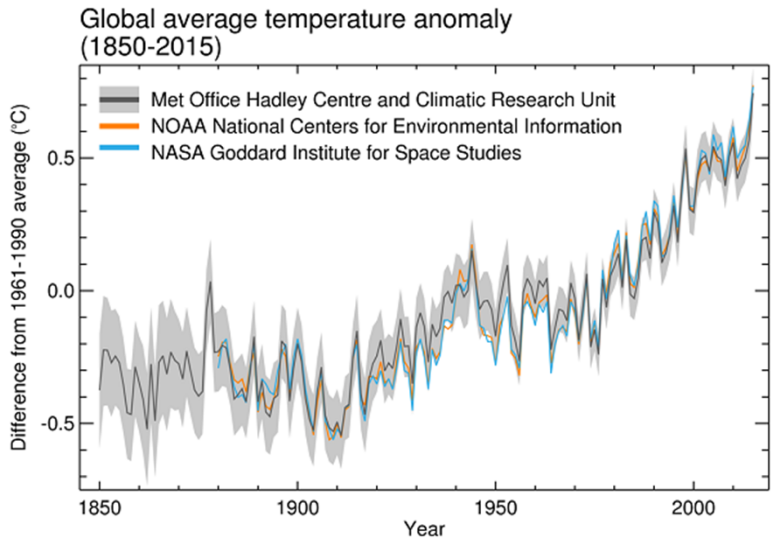
Carbon dioxide emissions have risen considerably over the industrial period…



IPCC (2014)

Carbon dioxide emissions, 1750-2010 – from IPCC (2014b)

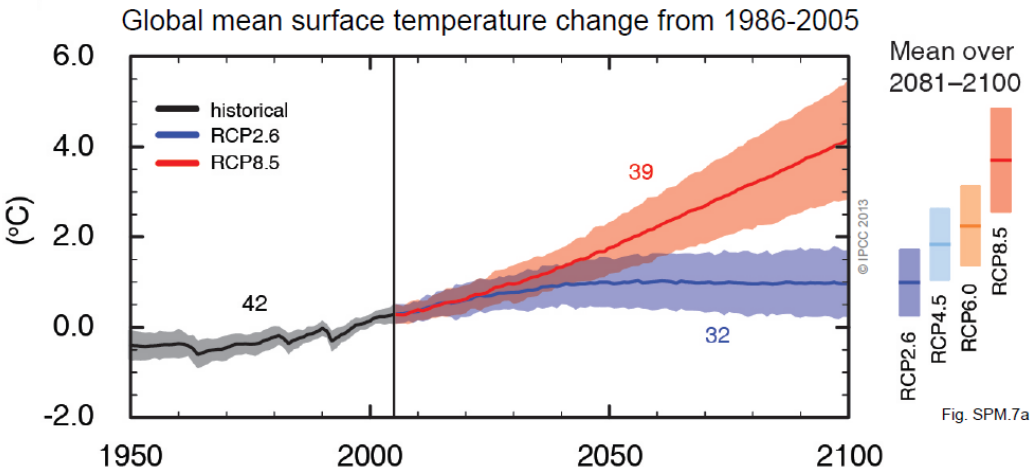
…leading to large increase in global temperatures…



Met Office (2016)

Met Office (2016)

…with much larger temperature increases to come…



IPCC (2013)

IPCC (2013)

More extreme weather with major impacts on:

- Fresh water resources
- Coastal areas
- Food supplies
- Human health
- Human security
- Wildlife

• Higher temperatures leads to more energetic/dramatic/extreme weather

• Fresh water resources - dry areas likely to get drier, wet areas get wetter; hundreds of millions more suffering from 'water stress' over next few decades; Increased storminess likely to increase flood risk

• Coastal areas - Sea-level rise will lead to major increase in flooding risk and loss of land; Huge numbers affected (Currently, half world population lives in coastal areas); Mega-deltas of Asia and Africa, and small island states, will be most affected

• Food supplies - major disruption as crop productivity falls in tropics & sub-tropics and, eventually, everywhere

• Human health – much more malnutrition, disease, 'heat stress'

• Human security – more refugees, increasing risk of war

• Potential for massive loss of plant and animal species – coral reefs, rainforests especially under threat

Houghton (2004); IPCC (2007); IPCC (2014a)

Climate change and conflict

- Climate change multiplies potential for conflict over:
  - Land; fresh water; food stocks; other resources
- Climate change increases pressures to migrate
  - 2008: 20 million displaced by extreme weather
  - 2050: between 50 and 350 million displaced by climatic factors

Whitmee et al (2015) – p1995

Current example: Syria

- Regional drought 2007-2010
  - Lowest rainfall on record
  - Event '2-3 times more likely' due to climate change
- Widespread crop failure; food shortages
- Rural families migrated to towns
- Tensions between social groups increased
- Protests suppressed by government in 2011
- Civil war

Kelley et al (2015)

Future example: Pakistan?

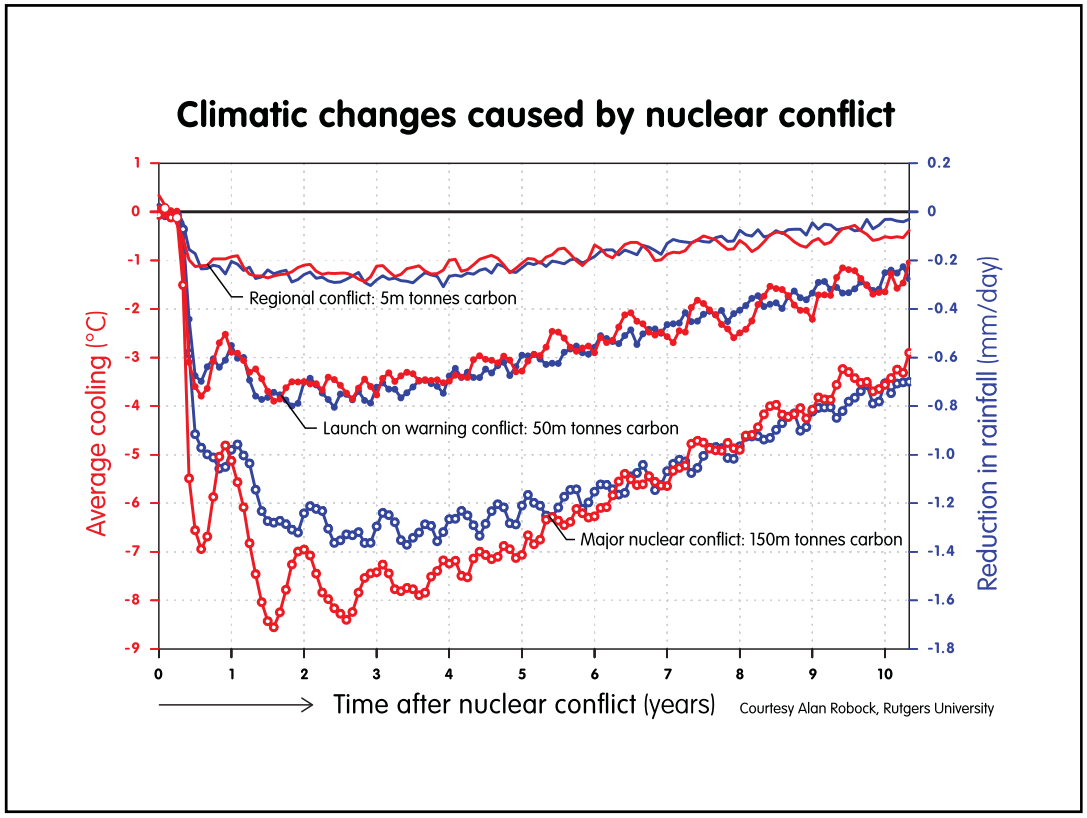
- Currently prone to extreme monsoon rains and extreme heatwaves
  - Severe flooding and heat-related deaths
  - Likely to get worse
- Rapid population growth, agriculture expansion and loss of river water from glaciers
  - Water shortages rapidly increasing
- Existing poverty/ poor governance/ conflicts
- Pakistan/ India tensions
  - both nuclear-armed

Whitmee et al (2015) - p1996

‘Nightmare’ nuclear scenarios

- Pakistan-India
  - Political breakdown leads to extremists gaining control of/ launching nuclear weapons
- Nuclear war can itself cause climate disruption, e.g. ‘nuclear winter’
  - Smoke from explosion of nuclear warheads over cities can cause rapid climate cooling
    - Approx. 100 Pakistani/ Indian warheads
    - 10s of UK Trident warheads
  - Causing crop failures in many regions, then global famine

See, for example, Webber (2013) for analysis of climate disruption scenarios and academic references



- Regional nuclear conflict – e.g. Pakistan-India – could cause emission of 5m tonnes of 'black carbon' within smoke clouds leading to global cooling of approx. 1C
- Launch on warning conflict – e.g. involving all the nuclear weapons on high-alert in US/ Russian arsenals – could cause emissions of 50m tonnes of black carbon, and global cooling of 4C
- Major nuclear conflict – involving all the deployed US/ Russian arsenals – 150m tonnes black carbon, and global cooling of 8C
- Exploding all nuclear warheads on one UK Trident submarine over cities would cause global cooling similar to regional scenario above
- NB these cooling episodes would happen within 1 to 2 years – considerably faster than current climate change due to CO2 emissions – and hence have much more devastating effects than slower changes

Main Sources: Robock (2015); Webber (2013)

Potential solutions

- Peacebuilding
  - Poverty reduction; early warning systems in fragile states; dialogue processes
- Nuclear threat reduction
  - End high-alert status; no first-use
  - Treaties, especially TPNW
- Tackle climate change
  - Green technologies – e.g. renewables, public transport
  - Economic reform – e.g. circular economy, redistribution
  - Behaviour change – e.g. sustainable consumption

Selected sources: Elworthy (2017); ICAN, http://www.icanw.org/ ; Centre for Alternative Technology (ZCB reports)

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