

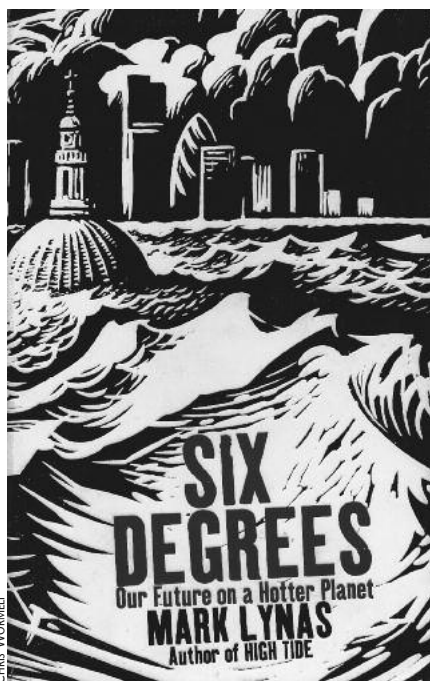
Six Degrees of Danger

We are still a long way from this hellish six-degree world, but if emissions keep rising over the decades to come ... the nightmare ending will be ever more likely.

— Mark Lynas (marklynas.org)

During 2005, Mark Lynas got up every day and cycled from his home in Oxford, UK, to the Radcliffe Science Library, where he systematically worked his way through tens of thousands of research papers on the impacts of global climate change. The IPCC climate scientists had warned the world that if we continued to burn fossil fuels, Earth's temperature would rise by 1.4°C to 5.8°C (2.5°F to 10.4°F) above the 1990 level, and up to 6.4°C (11.5°F) above the pre-industrial level.

But what did it mean? Step by step, Mark assembled the scientists' findings into six spreadsheets, one for each degree of temperature rise.



These formed the basis of his award-winning book *Six Degrees – Our Future on a Hotter Planet*, made into a National Geographic Channel TV film, *Six Degrees Could Change The World*. If you read just one book about the realities climate change will bring if we do not act, this is it.

Up to + 1°C

- Dust-bowl conditions return to much of the US mid-west.
- Permafrost melt causes buildings to sink across Alaska, Canada and Siberia.
- Mountain glaciers around the world continue to melt.
- Forest fires increase, especially in the Mediterranean.
- Droughts, hurricanes, deluges, and extreme weather events increase.

Chance of avoiding a 1°C increase: next to zero.

1–2°C

- European summer heatwaves like that of 2003, which killed 35,000 people, become the norm.
- Past 1.2°C, Greenland tips into an irreversible meltdown, leading to an eventual six-metre rise in sea level.
- The Arctic is ice-free in summer months.
- Himalayan glaciers all but disappear, endangering water supplies to 0.5 billion people.
- A third of all land-based animals and plants face extinction as rapid temperature rise makes their habitats disappear.
- Repeated bleaching makes most coral reefs extinct.

Chance of avoiding a 2°C increase: good as long as global emissions peak by 2015 and fall by 80% by 2050.

2–3°C

- The Amazon rainforest passes a ‘tipping point’ of drought, causing massive fires and an eventual transformation into savannah and desert.
- Tens of millions displaced by spreading deserts in southern Africa and the Mediterranean.
- Farming and food production enter an irreversible decline due to soaring temperatures and droughts in the world’s bread-baskets.
- Super-hurricanes, boosted by warming seas, devastate coastal cities.
- Dissolving CO₂ in the oceans makes them increasingly acidic, dissolving the remaining coral reefs and much of the marine food chain.
- Sea levels continue to rise. The last time the temperature was 3°C warmer, more than 3 million years ago in the Pliocene, sea levels were 25 metres higher.

Chance of avoiding a 3°C increase: good as long as emissions peak by 2020, and fall by 60% by mid-century.

3–4°C

- Streams of refugees flee the world’s coastlines.
- The world’s economy is battered by food shortages and migration.
- China’s agricultural production crashes.
- Africa starves.
- Summer temperatures in southern Britain reach up to 45°C.
- More than half the Earth’s natural species are wiped out, in the worst mass-extinction since the dinosaurs.
- The Arctic permafrost is in a runaway thaw, releasing billions more tonnes of carbon.
- Preventing a further rise in temperature

becomes next to impossible, due to failure of carbon storage in soils and forests.

Chance of avoiding a 4°C increase: reasonable as long as emissions peak by 2030 and stabilize by 2050.

4–5°C

- Rapid melting of Greenland and Antarctica causes sea level to rise by up to two metres.
- Possible collapse of West Antarctic Ice sheet, leading to further sea level rise.
- Rainforests reduced to tiny refuges as deserts spread through the tropics.
- The Arctic is ice-free all year round.
- Possible destabilization of marine methane hydrates.
- Civilization will likely retreat to a few guarded enclaves. A return to survivalism creates a further disaster for biodiversity.

Chance of avoiding a 5°C increase: good if emissions are stabilized in the second half of the century

5–6°C

- Temperatures on Earth are similar to the Cretaceous period, 144 to 65 million years ago.
- Major mass extinction of life on Earth due to rapid and extreme temperature rises.
- Eventually, over centuries, all ice on the planet melts, turning low-lying countries into archipelagos of islands.
- In the oceans, since less oxygen can dissolve in the warm water, conditions become stagnant and anoxic, further driving the mass marine extinctions.
- Super-hurricanes, floods and other extreme weather make normal life impossible.
- Food production only possible in sub-polar refuges; most of humanity is wiped out.