

The Devastating Blows of Rapid Climate Change: How Will We Survive?

Climate change is happening now, hundreds of times faster than natural changes in the past. It has consequences that will dramatically damage us in our lifetimes, and become **far, far** worse for our children and grandchildren than is generally known.

Actions much greater in scale than are currently planned must be undertaken **now**. The UN's Intergovernmental Panel on Climate Change (IPCC), reflecting the conclusions of thousands of scientists around the world, said bluntly in October of 2018 that unless global GHG emissions are cut by 40% to 45% by 2030 – *just 10 years away* – we will not be able to limit global heating to 1.5° Celsius above pre-industrial norms, and will face devastating consequences.

Instead of decreasing, global GHG emissions are still rising. The 1.5°C target will be exceeded by between 2030 and 2052. **According to the IPCC, current nationally stated commitments to cut GHGs, if achieved, will result in a 3.2° increase in global temperatures by 2100, and higher beyond that.** If we do not meet those reduction targets, the 2100 *average global* temperature increase will be more than 4° above pre-industrial levels. Temperatures in northern latitudes will be much higher. Because North Americans produce a very disproportionate share of global GHG emissions, GHG emissions in North America must decrease to almost zero.

A Litany of Disasters: An average rapid global warming of 3.2° by 2100 will have the following devastating and inter-connected impacts. Each of us will be affected as temperatures move rapidly higher.

1. *Every* natural ecosystem will be at risk of collapse, and many will have collapsed.
2. There will be a much higher frequency of droughts and precipitation deficits, and lasting for longer periods. This will affect food production; food prices will be much higher than today, where food is available.
3. Extreme heat events will become normal, and will last longer. Costs to cool buildings will more than double. The mid-latitudes (including southern Canada, much of the USA, the Mediterranean, central Europe) will experience an average rise of at least 4° Celsius (7.2° Fahrenheit).
4. Heat-related morbidity and deaths will multiply, and be especially deadly in low latitude countries. Conflicts and economic dislocations will become widespread.
5. The loss of livestock and declines in livestock health will affect prices and human diets everywhere. Prices will escalate.
6. The number of wildfires will multiply and be more widespread. Controlling them will become more difficult, and drain public finances. The devastating fires in Australia, at the beginning of its summer season, is a current example.
7. Rising temperatures and dryness in parts of the USA will make much of its southern regions unlivable by 2100. Canada and northern states in the USA will experience a massive flow of climate refugees that will strain our ability and desire to accommodate them.
8. Heating and habitat loss will decimate plant, insect and other animal populations. Rates of extinction will accelerate beyond already extreme rates.
9. Arctic ice will continue to melt, at a more rapid rate than is happening now, and will not stop. Sea levels will continue to rise (6 metres once all of Greenland becomes ice-free), to the point that coastal cities will become at least partially flooded, and today's coastal marshes will be lost.
10. More than a trillion dollars of oceanside real estate value will be lost.
11. By 2100, all or almost all ocean beaches will have disappeared.



12. Less arctic ice means more heat from the sun will be absorbed into the oceans, creating a feedback loop that will melt more ice.
13. Permafrost is thawing *now*, emitting millions of tons of methane, a greenhouse gas 20 to 25 times more powerful as a GHG than carbon dioxide. The permafrost will thaw faster, and may never freeze again. A feedback loop is already occurring that will accelerate global heating. *If this is not stopped, there is no hope.*
14. Boreal forests will be degraded, and some will be lost.
15. Climate changes will be too fast for plant life to adapt or move northward fast enough. Massive die-offs of vegetation will occur and plant diversity will be reduced.
16. Vector-borne diseases will migrate with climate changes.
17. The ocean is becoming more acidic, and will experience oxygen loss. Coral reefs will face total die-off. Populations of fish dependent on them will, in turn, be threatened. Food production from fishing and aquaculture will drop. Land animals will become a greater source of food in many regions; extinction rates of land animals will increase.
18. Armed conflicts will increase as famine and human-caused disasters spread. North America will likely not be without some strife. Military costs and emergency aid to other countries will increase.
19. National, regional and local economies will be strained as more financial resources are allocated towards adaptation and mitigation of climate events and trends. Employment dislocation and poverty rates will increase (with artificial intelligence systems as an additional factor), constraining the ability of governments to keep up with its social costs.
20. Enforcement of laws to limit crimes of desperation will be more difficult.

Failure to Respond: Politically-driven tax cuts to offset increased household costs of climate change will cripple the ability of governments to keep up with change. Delays in moving to net-zero carbon energy production will make necessary actions more difficult to undertake. Political and monetary pressure from fossil fuel industries will make a rapid transition to energy based on non-fossil fuels very difficult, and perhaps dangerous (How far will fossil fuel energy producers go to protect their industries?). Adequacy of action is and will be constrained by denials of the existence or severity of the scientific evidence.



What have we done to their future?

March 2021

* Per sources identified in the book "The Uninhabitable Earth: Life After Warming", by David Wallace-Wells.