



# Climate Archives and the New Geography of Risk

*Peter Frankopan*



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## **Climate Archives and the New Geography of Risk**

*By Peter Frankopan*

### **SYNOPSIS**

*New scientific tools – from DNA analysis to climate archives – are transforming how history is written and used. By reconstructing past environments and crises, we are able to gain vital insights for navigating an ongoing climate reorganisation that will have a profound impact on water availability, food provision, disease environments, and more. With the likelihood of extreme weather events and anomalies rising, understanding and benchmarking risk and vulnerability have rarely been more important. Learning from past examples provides some valuable lessons.*

### **COMMENTARY**

When I came to the S. Rajaratnam School of International Studies (RSIS) in October 2025, I spoke about climate change from a historical perspective, and the significance and risks it poses for the present and future. As I told the audience, some of the most interesting and exciting developments in historical studies are emerging from a set of disciplines that historians would rarely have thought about a few decades ago. Advances (and reductions in cost) in geo-scanning, DNA sampling, and computational modelling are allowing us to reconstruct past environments, migrations, and interactions with a level of precision that would once have seemed unimaginable. All of this helps reshape not only how we understand the past but also how we anticipate the challenges of the future.

As it happens, a great many of the new materials that historians can now make use of relate to environmental sciences and to what are now usually called “climate archives” – materials from ice cores, fossilised pollen, lake sediments or calcium carbonate deposits that allow us to reconstruct the past and gain new insights into things like changes in crop planting patterns, levels of smelting and metal working in urban settlements, and (of course) the extent, nature and duration of droughts, floods and major disruptive events such as tsunamis or volcanic eruptions.

For the lover of history, that makes for a series of exciting and revolutionary approaches to the past. For those involved in policy planning, national security, risk management or investment decisions, it provides a data set of extraordinary value for identifying and benchmarking vulnerabilities – and a vast range of examples from the past that can show how some societies navigated sudden periods of extreme pressure, and how some did not.

Those lessons are particularly important at a time of not only geopolitical change but also of climate change. As I have also written for RSIS, we are living through a major reconfiguration of global affairs, to the point that the world feels more uncertain to many than it has for decades. That presents a set of challenges that are tricky enough in themselves. However, responses will be made more complicated by the extraordinary set of environmental revolutions that are taking place at the moment.

To some extent, it matters little exactly what is driving these shifts: for sure, a good deal of the explanation for the rapid heating of the world's sea surface and land temperatures is anthropogenic, with the burning of fossil fuels in particular, in greater volumes to provide cheap and abundant energy, resulting in greenhouse gases accumulating in the atmosphere; but there are also complex natural factors at work, such as the complex set of ocean-atmosphere cycles, changes in cloud cover, and feedback loops involving ice melt and ocean circulation that are also partly responsible for the current warming patterns.

The prognosis for where these trends will lead in the coming decades is certainly worrying: research increasingly points to a significant weakening of the Atlantic Meridional Overturning Circulation – the great ocean conveyor belt that helps move warm tropical water north and cold water south – with studies released this year indicating that both the pace and extent of that weakening may be sharper than previously anticipated. By the end of this century, if not before, this could mean major shifts in rainfall patterns across Africa and South America, cooler conditions in northern Europe, rising sea levels along parts of the North American east coast, and growing instability in marine ecosystems that underpin global food systems.

Even in the short term, though, we are already seeing weather events that are not so much unusual as eye-watering. In March 2026, average temperatures across much of the western United States were more than 6°C above average. The following month, parts of Central Canada were 15°C colder than normal, while South Asia recorded extraordinarily high levels of heat in northern and central India, where temperatures exceeded 45°C. Weather anomalies affected southern China, Bangladesh and Nigeria, all of which saw levels of rainfall that were not only exceptional but resulted in devastating flooding.

In addition to these warnings, early indicators suggest that the coming months are likely to be extremely challenging. Many meteorologists fear that this year will see a “mega” or “super” El Niño event: these usually occur every few years as part of the El Niño-Southern Oscillation (ENSO) natural climate cycle in the Pacific Ocean. El Niño phases are fuelled by rising sea surface temperatures in the central and eastern

Pacific, which weaken or even reverse wind patterns. This, in turn, results in warm water spreading eastwards and shifting the position of the jet stream.

As a result, atmospheric circulation is altered, redistributing heat and moisture in ways that reshape rainfall patterns – suppressing precipitation in parts of Southeast Asia and Australia while increasing it elsewhere. Strong El Niño events also produce sharp spikes in global temperatures, more intense and prolonged heatwaves across parts of Europe, North America and North Africa, severe drought in regions already prone to dryness, heavier rainfall and flooding in parts of the Americas, and heightened wildfire risk.

All this will put further strain on food, water, and energy systems already under pressure from the Gulf crisis. This should be a matter of concern – and of careful forward planning – for all government ministries, because shocks not only can but usually do produce knock-on effects. We are living in an age of great uncertainty and elevated risk, driven by the interdependencies of the global economy. There is no better time, in other words, to heed the lessons of history.

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*Peter Frankopan is Professor of Global History at the University of Oxford. His books include *The Silk Roads: A New History of the World* and, most recently, *The Earth Transformed: An Untold History*. Both have been major global bestsellers. As President of the Royal Society for Asian Affairs, Professor Frankopan has been described as the first great historian of the 21st century. In October 2025, he delivered the S. T. Lee Distinguished Annual Lecture for RSIS in Singapore.*

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