

Draft UN report warns of rising seas, storm surges, melting permafrost

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Waves hit a sea wall in Taizhou, China. The same oceans that nourished human evolution are poised to unleash misery on a global scale unless the carbon pollution is brought to heel

The same oceans that nourished human evolution are poised to unleash

misery on a global scale unless the carbon pollution destabilising Earth's marine environment is brought to heel, warns a draft UN report obtained by AFP.

Destructive changes already set in motion—some irreversible—could see a steady decline in fish stocks, a hundred-fold or more increase in the damages caused by superstorms, and hundreds of millions of people displaced by rising seas, according to the Intergovernmental Panel on Climate Change (IPCC) "special report" on oceans and Earth's frozen zones, known as the cryosphere.

As the [21st century](#) unfolds, melting glaciers will first give too much and then too little to billions who depend on them for fresh water, it finds.

Without deep cuts to manmade emissions, at least 30 percent of the northern hemisphere's surface permafrost could melt by century's end, unleashing billions of tonnes of carbon and accelerating [global warming](#) even more.

The 900-page scientific assessment is the fourth such tome from the UN in less than a year, with others focused on a 1.5-Celsius (2.6-Fahrenheit) cap on global warming, the state of biodiversity, and how to manage forests and the global food system.

All four conclude that humanity must overhaul the way it produces and consumes almost everything to avoid the worst ravages of [climate change](#) and environmental degradation.

Governments meet in Monaco next month to vet the new report's official summary. While the underlying science—drawn from thousands of peer-reviewed studies—cannot be modified, diplomats with scientists at their elbow will tussle over how to frame the findings, and what to leave in or out.

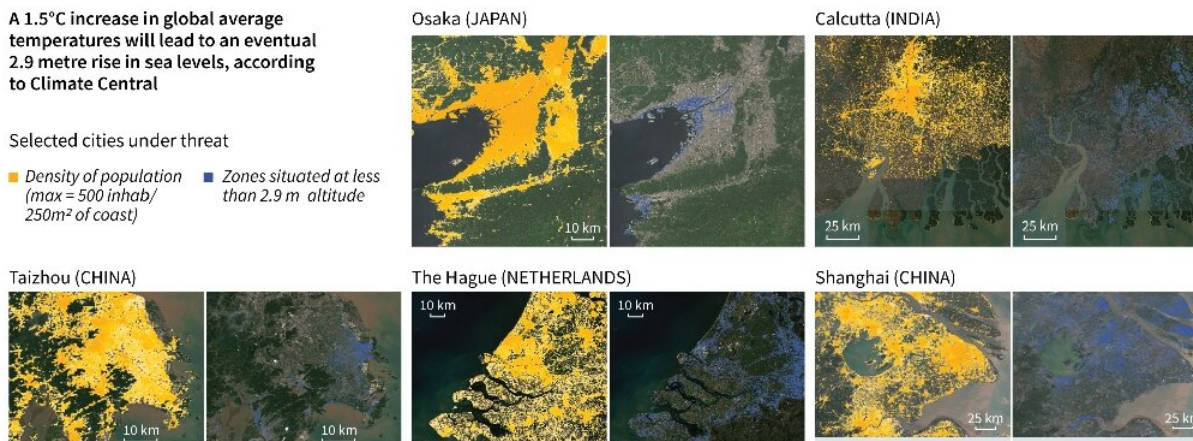
The final advice to policymakers will be released on September 25, too late to be considered by [world leaders](#) gathering two days earlier for a summit convened by UN Secretary-General Antonio Guterres to extract stronger national commitments in confronting the climate crisis.

Major coastal cities threatened by rising sea levels

A 1.5°C increase in global average temperatures will lead to an eventual 2.9 metre rise in sea levels, according to Climate Central

Selected cities under threat

■ Density of population (max = 500 inhab/250m² of coast) ■ Zones situated at less than 2.9 m altitude



Sources: Climate central, USGS (SRTM), Copernicus

The altitudes used are estimates based on satellite images

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Map of population density and the risk of submersion in five major coastal cities.

Guterres may be disappointed by what the world's major greenhouse gas emitters put on the table, according to experts tracking climate politics in China, the United States, the European Union and India.

The Big Four—accounting for nearly 60 percent of global fossil fuel-based emissions—all face devastating ocean- and ice-related impacts, but none seem prepared just yet to announce more ambitious goals for purging carbon from their economies.

'Irreversible' change

Donald Trump—a no-show at the G7 climate segment this week—wants the US to exit the Paris Agreement and has taken a chainsaw to predecessor Barack Obama's climate policies.

India is rapidly developing solar power, but continues to build up coal-fired capacity at the same time.

The European Union is inching toward a mid-century "net zero" emissions goal, but several member states are dragging their feet.

Long seen as a leader on climate, China—which emits nearly as much CO₂ as the US, EU and India combined—is also sending mixed signals.

"The eyes of Beijing are gradually moving away from environmental issues, and climate change in particular," noted Greenpeace International analyst Li Shuo, a longtime observer of China's climate policy.



Sled dogs wading through standing water on the sea ice during an expedition in North Western Greenland

A resurgence of domestic coal-fired power and a relaxing of air pollution regulations, he said, point to a preoccupation with China's slowing economy and its trade war with the US.

And yet, all of these nations face many of the threats outlined in the IPCC report.

Shanghai, Ningbo, Taizhou and another half-dozen major coastal cities in China, for example, are highly vulnerable to [future sea level rise](#), which is projected to add a metre by 2100 compared to the late 20th century global watermark, if CO2 emissions continue unabated. Mumbai and other coastal Indian cities are in harm's way as well.

Even in the United States, where billions are being spent to protect New York, Miami and other exposed cities, such efforts could easily be overwhelmed, say experts.

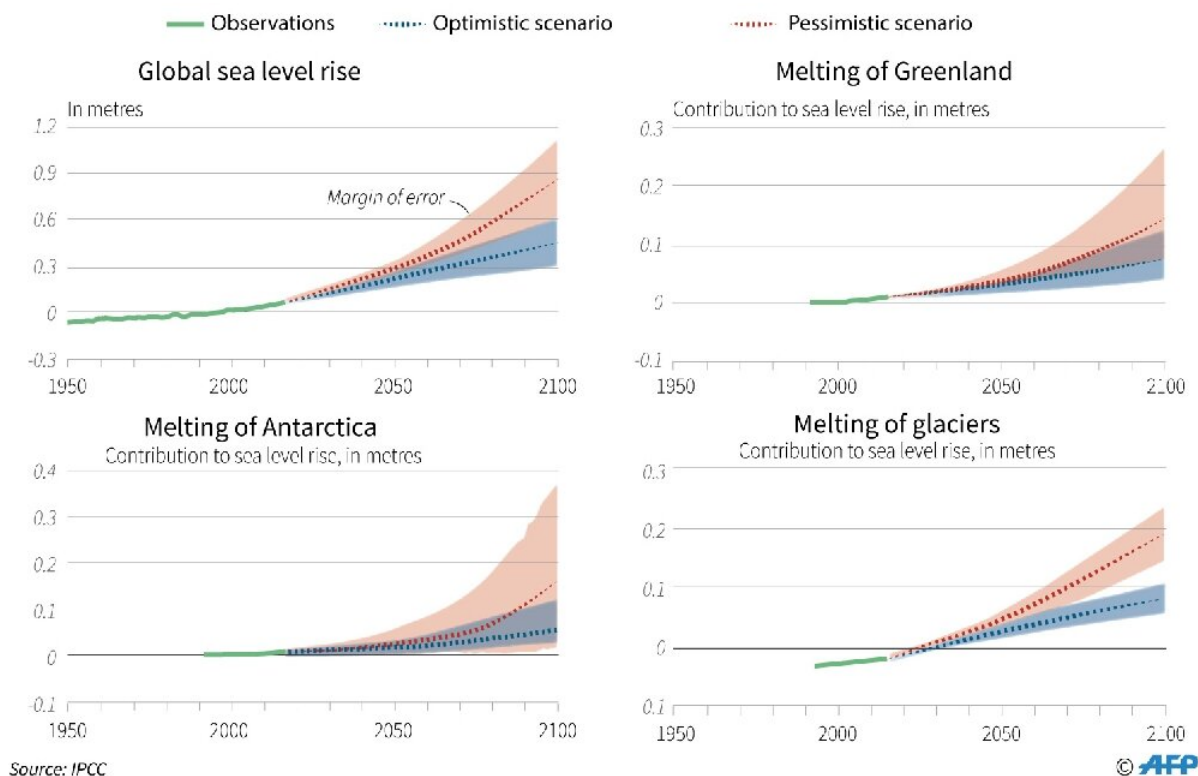
"There is a pervasive thread in the US right now promoted by techno-optimists who think we can engineer our way out of this problem," said Michael Mann, director of the Earth System Science Center at Pennsylvania State University.

"But the US is not ready for a metre of sea level rise by 2100," he told AFP.

"Just look at what happened in the wake of superstorm Sandy, Katrina, in Houston, or Puerto Rico."

Rising sea levels

Even in the most optimistic scenario, rising sea levels could eventually displace 280 million people



Sea level rise forecasts to 2100, with contributions from different areas

1,000-fold flood damage increase

By 2050, many low-lying megacities and small island nations will experience "extreme sea level events" every year, even under the most optimistic emissions reduction scenarios, the report concludes.

By 2100, "annual flood damages are expected to increase by two to three orders of magnitude," or 100 to 1,000 fold, the draft summary for policymakers says.

Even if the world manages to cap global warming at two degrees Celsius, the global ocean waterline will rise enough to displace more than a quarter of a billion people.

The report indicated this could happen as soon as 2100, though some experts think it is more likely to happen on a longer timescale.

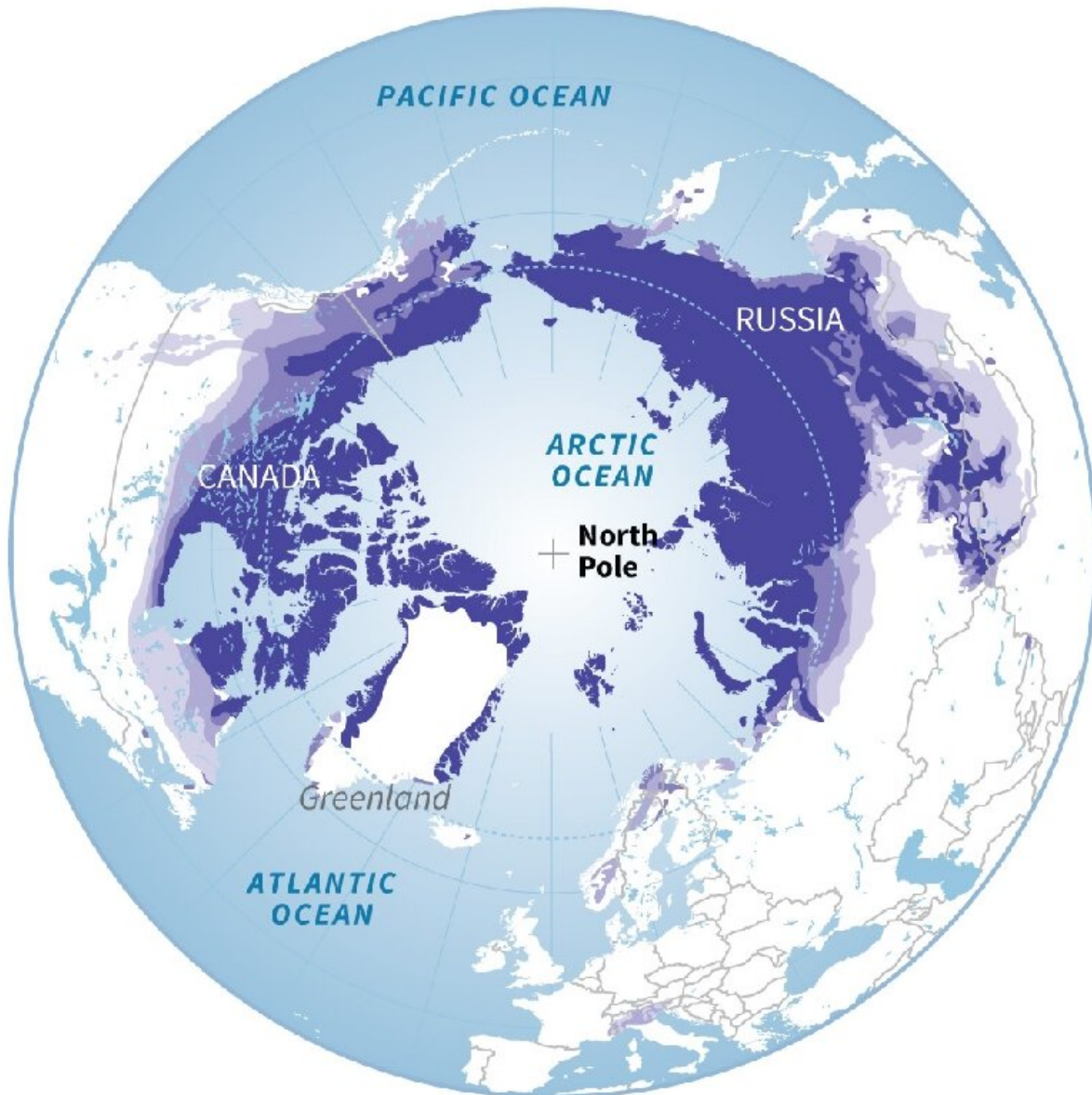
"Even if the number is 100 or 50 million by 2100, that's still a major disruption and a lot of human misery," said Ben Strauss, CEO and chief scientist of Climate Central, a US based research group.

"When you consider the political instability that has been triggered by relatively small levels of migration today, I shudder to think of the future world when tens of millions of people are moving because the ocean is eating their land."

Earth's average surface temperature has gone up 1C since the late 19th century, and is on track—at current rates of CO₂ emissions—to warm another two or three degrees by century's end.

Permafrost zones

In the northern hemisphere



Zones

Continuous cover
 Discontinuous
 Sporadic
 Isolated

Source: Woods Hole Research Center

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Map showing permafrost zones in the northern hemisphere

The Paris Agreement calls for capping global warming at "well below" 2C.

Sea level rise will accelerate rapidly moving into the 22nd century, and "could exceed rates of several centimetres per year"—about 100 times more than today, according to the report.

"If we warm the planet by 2C, by 2100 we will only be at the beginning of a runaway train ride of sea level rise," said Strauss, whose research informs the report's conclusions.

Marine heatwaves

Oceans not only absorb a quarter of the CO₂ we emit, they have also soaked up more than 90 percent of the additional heat generated by greenhouse gas emissions since 1970.

Without this marine sponge, in other words, global warming would already have made Earth's surface intolerably hot for our species.

But these obliging gestures come at a cost: acidification is disrupting the ocean's basic food chain, and marine heatwaves—which have become twice as frequent since the 1980s—are creating vast oxygen-depleted dead zones.

In the Tasman Sea, for example, a 2015-16 heatwave lasted for 251 days, causing disease outbreaks and a die-off of farmed shellfish.

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