**Headline:** Is Earth Close to “The Great Dying”?

By Thom Hartmann

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**[Article Body:]**

You may remember the 2004 disaster movie [*The Day After Tomorrow*](https://www.imdb.com/title/tt0319262/)*,* in which large parts of Europe and the American East Coast suddenly freeze up?

The plot device is that the Great Conveyor Belt—also known as the Atlantic Meridional Overturning Circulation (AMOC)—which brings heat from the south Pacific around the southern tip of Africa and up the east coast of the Americas (we call it the Gulf Stream) into the North Atlantic and Europe shuts down.

The AMOC and the heat it brings to the North Atlantic ocean is the main reason why London (at the [same](https://vividmaps.com/comparing-latitude-of-europe-and-america/) latitude as Calgary) has a relatively temperate climate year-round, instead of being snowbound six months out of the year.

It’s why Europe can grow enough food to feed its 740+ million people; if the AMOC was to stop transporting all that heat to the North Atlantic, the continent could be plunged into famine in a matter of years or decades (the movie was heavily dramatized).

The IPCC has warned of this possibility but had placed the danger zone for the failure of the AMOC in the early 22nd century, well past the lifetimes of most people living today. That proclamation moved it off most of our immediate-attention screens.

Now, however, might be a good time to watch the movie again: a new study published in *Nature Communications* last week titled “[Warning of a Forthcoming Collapse of the Atlantic Meridional Overturning Circulation](https://www.nature.com/articles/s41467-023-39810-w)” reports that global warming forced by all the CO2 and methane in our atmosphere—if we don’t do something immediately—could shut down the AMOC as early as 2025 and almost certainly before 2095.

This adds to a growing body of alarming climate science, like the one published last year in the *Journal of Climate* [titled](https://journals.ametsoc.org/view/journals/clim/35/3/JCLI-D-21-0200.1.xml) “*Sixfold Increase in Historical Northern Hemisphere Concurrent Large Heatwaves Driven by Warming and Changing Atmospheric Circulations*,” which indicates we’re much farther down the path of dangerous climate change than even most scientists realized.

That study essentially predicted this year’s shocking Northern Hemisphere heat waves (with more and worse to come); the lead researcher’s first name is Cassandra, no doubt an unintentional choice in the paper’s authors’ pecking order, but still.

Perhaps most alarming was a paper published eleven months ago in *The Proceedings of the National Academy of Sciences of the United States of America (PNAS)* titled “[*Evidence for Massive Methane Hydrate Destabilization During the Penultimate Interglacial Warming*](https://www.pnas.org/doi/10.1073/pnas.2201871119).”

It brings up the topic of the “Clathrate Gun Hypothesis,”which is the absolute worst case scenario for humanity’s future.

All across the planet there are an [estimated 1.4 trillion tons](https://courses.seas.harvard.edu/climate/eli/Courses/global-change-debates/Sources/Methane-Clathrate-gun-hypothesis/1-Clathrate%20gun%20hypothesis-Wikipedia.pdf) of methane gas frozen into a snowcone-like slurry called clathrates or methane hydrates laying on the sea floor off the various continental shelves.

When they suddenly melt, that’s the “firing of the gun.” An explosion (in the context of geologic time) of atmospheric gas that’s over 70 times as potent a greenhouse gas as CO2. The Clathrate Gun.

The PNAS paper mentioned above concludes that 126,000 years ago there was an event that caused a small amount of these clathrates to warm enough to turn to gas and bubble up out of the seas. The resulting spike in greenhouse gas (methane) led to a major warming event worldwide:

“Our results identify an exceptionally large warming of the equatorial Atlantic intermediate waters and strong evidence of methane release and oxidation almost certainly due to massive methane hydrate destabilization during the early part of the penultimate warm episode (126,000 to 125,000 y ago). This major warming was caused by … a brief episode of meltwater-induced weakening of the Atlantic meridional overturning circulation (AMOC) and amplified by a warm mean climate.”

The researchers warn we may be looking at a similar event in our time:

“Our results highlight climatic feedback processes associated with the penultimate climate warming that can serve as a paleoanalog for modern ongoing warming.”

As glaciers melt and the oceans warm, they note:

“[M]eltwater-induced AMOC weakening significantly amplifies the warming of intermediate waters and, in turn, destabilizes shallow subsurface methane hydrate deposits.”

In other words, the recent extreme warming of our oceans increases the chances the AMOC Great Conveyor Belt will shut down, throwing Europe into an existential crisis and wilding the rest of the world’s weather. And, most ominously, the AMOC shutting down will speed up the melting of more methane clathrates on the sea floors around the world.

The process is driven by warming of the oceans, which absorb more than 90 percent of the additional global warming heat we’re forcing by burning fossil fuels. As the BBC [noted](https://www.bbc.com/future/article/20230720-theres-a-heatwave-in-the-sea-and-scientists-are-worried), the past month and first weeks of July “were hotter than any in recorded history” and:

“This week, sea surface temperatures along the coasts of Southern Spain and North Africa were 2-4C (3.6-7.2F) higher than they would normally be at this time of year, with some spots 5C (9F) above the long-term average.”

Ocean temperatures off the coast of [Florida this week](https://www.nytimes.com/2023/07/26/climate/florida-100-degree-water.html?smid=nytcore-ios-share&referringSource=articleShare) were in the range that Jacuzzi recommends for their hot tubs: [101 degrees](https://www.forbes.com/sites/ariannajohnson/2023/07/26/what-warmer-oceans-mean-for-the-environment-from-dangerous-storms-to-severe-flooding/?sh=36c1d8be3d3b). This has never happened before in human history.

The least likely but most dangerous outcome scenario is that the warming ocean might begin a massive melting of those methane hydrate slurries into gas, producing a “burp” of that greenhouse gas into the atmosphere, further adding to global warming, which would then melt even more of the clathrates.

It would be a deadly “positive feedback system,” with each phase of warming setting up the next and worse one. The Clathrate Gun.

At the end of the Permian, 250 million years ago, this runaway process is apparently what happened when a spike in methane led to such a violent warming of the planet that it killed over 90 percent of all life in the oceans and 70 percent of all life on land, paving the way for the rise of the dinosaurs, as cold-blooded lizards were among the few survivors.

That period is referred to as the Permian Mass Extinction, or, simply, “[The Great Dying](https://www.cbsnews.com/news/great-dying-permian-triassic-extinction-event-warning-humanity/).” It was the most destructive mass extinction event in the history of our planet.

Eight years ago, Leonardo DiCaprio and I put together and co-narrated [a 12-minute video about this exact scenario](https://www.youtube.com/watch?v=2bRrg96UtMc), interviewing some of the world’s top climate scientists.

The “clathrate gun hypothesis” is controversial, but there’s a large body of evidence for it having done the damage at the end of the Permian, as we note in that video.

While it’s the least likely but most dramatic outcome of today’s global warming, it’s worth heeding the warning: by pouring over thirty billion tons of carbon into the atmosphere every year we have stirred a beast that could—if we don’t take serious action soon—spell the doom of human civilization, if not humanity itself.

As the scientists writing in the [*Proceedings of the National Academy of Sciences*](https://www.pnas.org/doi/10.1073/pnas.2201871119) noted:

“The key findings of our study add to a growing body of observational findings strongly supporting the ‘**clathrate gun hypothesis**.’ … Importantly, the interval we have studied is marked by a mean climate state comparable to future projections of transient global climate warming of 1.3 °C to 3.0 °C.” [emphasis mine]

We just this year passed 1.3 degrees Celsius of planetary warming: we are now in the territory of the Clathrate Gun Hypothesis if these researchers are right (although the risks are still small).

This is the first study I’ve seen to make such a claim, and it’s not from crackpots or alarmists; these are solid, credible scientists with a lifetime of learning and work behind them.

And, they argue, if the AMOC weakens or shuts down, all bets are off:

“Simulation studies have suggested warming of intermediate waters has been limited to ∼1.5 °C to 3 °C, and that such warmings were insufficient to significantly affect the stability of shallow subsurface methane hydrates. However, the magnitude of intermediate water warming can be significantly amplified by meltwater-induced weakening of atmospheric and ocean circulation, an amplification not considered in the simulations that examined potential gas hydrate destabilization.”

In other words, if the AMOC fails, the clathrate gun hypothesis becomes significantly more viable.

For much of the past four decades, climate activists have been warning us that we’re approaching tipping points and thresholds that will alter how Americans live, cost us a fortune, and kill millions of humans every year.

Now we’re there. Our “normal” climate is dead; the weather has gone insane, and it is annually killing thousands of Americans and millions of people all around the globe. And the numbers are increasing almost exponentially, year to year.

This is how quickly it has hit us: when I published the first edition of my book warning of climate change, [*The Last Hours of Ancient Sunlight,*](https://www.amazon.com/Last-Hours-Ancient-Sunlight-Revised/dp/1400051576/ref%3Dthomhartmann)in 1996 (it’s been updated twice since then) there was still a vigorous debate here in the United States—funded in large part by the fossil fuel industry and its allies in rightwing media—over whether climate change was even a real thing.

They knew that their product was poisoning our atmosphere, but they were making hundreds of billions of dollars in profits. Nothing was more important to these morbidly rich people than that money.

They and their bought-off politicians began to believe their own lies, or at least some did, and thought this wouldn’t happen until they were all dead anyway, even if it was true.

But then it happened. The climate emergency we were worried about arrived. It is here, now.

Looking at statistical information about major heatwaves—particularly ones that hit multiple continents at the same time—the authors of the *Journal of Climate* paper referenced above [found](https://journals.ametsoc.org/view/journals/clim/35/3/JCLI-D-21-0200.1.xml):

“Such simultaneous heatwaves are 7 times more likely now than 40 years ago. They are also hotter and affect a larger area.”

In the 1980s the Northern Hemisphere averaged around 73 heatwaves during the summer months from May to September. By the 2010s that number had grown to 152 heatwaves per summer.

And those heat waves are also almost 20 percent hotter than they were the year Reagan won the presidency (and denied climate change throughout his 8 fossil-fuel-funded years in office).

One of the most startling understandings of what’s happening has only become apparent in the past decade or so: that the atmospheric Polar Jet Stream is acting weird and thus making our weather extremes more severe.

Over the course of multiple conversations with a few of the world’s top climate scientists I’ve learned that the Polar Jet Stream—the fast-moving river of high-altitude (30,000+ feet) air that circulates around the North Pole—has slowed down, weakened, and is beginning to “drool” down over parts of North America, going as far south as Texas.

This was, in fact, what caused the severe winter weather that shut down Texas’ privatized power grid a few years back, along with causing the “bomb cyclone” freezing storms hitting the Midwest and Northeast every winter, and the extended periods of 100+ degree weather all across America, Europe, Russia, and China this summer.

Historically, the Polar Jet Stream was held in place—mostly in the northern part of the Northern Hemisphere—by the temperature differential between the Arctic and the middle latitudes, where most Americans (outside of northern Alaska) live.

The cold arctic air defined the northernmost margin of the Polar Jet Stream while the warmer middle latitude air defined its southernmost margin. While it pushed weather patterns across North America for much of my life, it rarely dipped below the Mason-Dixon line and, even when it did, generally just brought the hot/cold, or wet/drought weather behind it for only a day or two.

But the Arctic has been warming at least three times faster than the middle latitudes where most of us live, which means the difference in temperature between the Arctic air to the north of the Jet Stream and our air to its south has diminished.

The North Pole/Arctic, once a solid cap of ice where Santa Claus was supposed to live, is now an open sea every summer.

As that temperature differential has declined, so has the strength and velocity of the Jet Stream. Now, instead of whipping across the Northern Hemisphere, it often spills down as far south as Mexico and then stays in place for days at a time.

What would have been a one-day cold-snap or heat wave becomes multiple days, long enough to wreak billions in damage to a state’s residential and energy infrastructure.

What would have been a rainstorm lasting a few hours becomes an unrelenting downpour lasting for days, creating massive flooding.

These changes in the Jet Stream, combined with the warming of our oceans (whose temperatures also drive weather), have also caused what were once routine weather patterns to change.

Regions that were only dry during the summer are now experiencing drought year-round; parts of the country where flooding was occasional but rare are now regularly experiencing massive, days-long storms that tear up houses and flood entire regions.

Flights are bumpier and being canceled with increasing frequency because of weather, as we’re just now sliding into this unknowable new era of severe weather weirding.

This is our new normal, and it’s costing us lives and billions of dollars every year, all to preserve the profits of a fossil fuel industry that knew in the 1960s that their product was poisoning the world and would lead to this outcome.

But don’t think that just because this is the new normal that this “normal” will last. The last time our planet saw CO2 levels at their [current 422](https://www.co2.earth/daily-co2) parts-per-million, sea levels were [60 feet higher](https://www.theguardian.com/science/2019/apr/03/south-pole-tree-fossils-indicate-impact-of-climate-change) and [trees were growing](https://www.theguardian.com/science/2019/apr/03/south-pole-tree-fossils-indicate-impact-of-climate-change) in Antarctica.

In other words, we’re on a path, not at a destination. The planet will catch up with all that CO2, and as it does our weather will continue to become more and more severe until we figure out a way to get CO2 levels back down to the 1950s count of just over 300 ppm.

Meanwhile, we’re pouring more CO2 into the atmosphere right now than at any time in human history, despite efforts among the world’s developed nations to reduce their carbon footprints.

The Russian invasion of Ukraine has been a major kick-in-the-pants to Europe to get off their dependence on fossil fuels and go green, as have high oil and gas prices around the world.

But here in America, Republicans on the Supreme Court (with 6 justices put on the bench with money from fossil-fuel billionaires) [kneecapped](https://hartmannreport.com/p/the-supreme-court-has-lit-our-planet) the Biden administration’s ability to regulate CO2 and promote green energy.

In 2010, five Republicans on the Court legalized political bribery with their *Citizens United* decision. And, of course, Republicans deeply in the pocket of Big Oil, Gas, and Coal continue to deny climate change is even happening. Just last week, Congressman Scott Perry called climate change a massive “grift.”

And now the Heritage Foundation has, according to [*Raw Story*](https://www.rawstory.com/climate-battle-plan/), a plan for the next Republican administration to gut the EPA; end the Department of Energy’s (DOE) Office of Energy Efficiency and Renewable Energy and Office of Clean Energy Demonstrations; end “grid expansion for the benefit of renewable resources or supporting low/carbon generation”; ban EPA workers from using certain types of science; and prevent other states from copying California’s strict environmental standards for greenhouse gasses.

The fossil fuel industry has almost unlimited money to buy politicians, per *Citizens United*. The ten top recipients of fossil fuel money in Congress [last year](https://www.opensecrets.org/industries/summary.php?ind=E01&cycle=2022&recipdetail=M&sortorder=U) were:

Manchin, Joe (D-WV) $724,270
McCarthy, Kevin (R-CA) $396,284
Lankford, James (R-OK) $275,148
Pfluger, August (R-TX) $268,011
Kennedy, John (R-LA) $264,788
Murkowski, Lisa (R-AK) $249,808
Sinema, Kyrsten (D-AZ) $230,160
Fletcher, Lizzie (D-TX) $191,765
Cuellar, Henry (D-TX) $191,450
Scott, Tim (R-SC) $181,291
Scalise, Steve (R-LA) $181,263
Gonzales, Tony (R-TX) $174,461
Rubio, Marco (R-FL) $165,636

Amazing how little it costs to buy a member of Congress to keep your multi-billion-dollar-a-year profits flowing, isn’t it?

Here’s who [opensecrets.org says](https://www.opensecrets.org/industries/summary.php?ind=E01&recipdetail=M&sortorder=U&cycle=All) are the top fossil fuel money recipients through their careers:

Romney, Mitt (R-UT) $8,291,262
Cornyn, John (R-TX) $4,678,062
Cruz, Ted (R-TX) $4,138,421
McConnell, Mitch (R-KY) $2,852,107
McCarthy, Kevin (R-CA) $2,581,832
Hutchison, Kay Bailey (R-TX) $2,332,021
Inhofe, James M (R-OK) $2,320,139
Pearce, Steve (R-NM) $2,236,714
Barton, Joe (R-TX) $2,211,987
Brady, Kevin (R-TX) $2,087,396
Scalise, Steve (R-LA) $1,847,013
Murkowski, Lisa (R-AK) $1,792,602

Americans are dying because these paid-off shills have either failed to act or actively blocked any meaningful change in our nation’s climate policy. They have blood on their hands, with more to come as every year brings more severe floods, storms, and drought.

We can no longer tolerate this morally criminal level of political malpractice, particularly since there is still time to act. And we must move quickly.

If America is to reclaim its position as a leader and role model for the world and stop the disastrous new climate “normal” we’re now entering from becoming radically more severe, we must get our use of fossil fuels under control.

That means ostracizing elected officials in the pocket of the industry, rolling back *Citizens United* so Big Oil and Big Coal can’t continue to bribe members of Congress, and throwing significant subsidies into greening our energy and transportation systems.

The climate emergency is here. We can’t wait any longer for major and dramatic worldwide action.