

James Hansen Spells Out Climate Danger of the ‘Hyper-Anthropocene’ Age

by Joe Romm

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James Hansen in the 1980's

James Hansen and 16 leading climate experts have written a must-read discussion paper on what humanity risks if it can't keep total global warming below 2°C (3.6°F). The greatest risk they identify is “that multi-meter sea level rise would become practically unavoidable.”

This is warning everyone should heed — not just because Hansen's co-authors include some of the world's top sea-level rise experts, such as Eric Rignot and Isabella Velicogna, but also given Hansen's prescience on climate change dating back more than three decades.

In 1981, Hansen led a team of NASA scientists in a seminal article in *Science*, “Climate Impact of Increasing Atmospheric Carbon Dioxide.”

They warned: “Potential effects on climate in the 21st century include the creation of drought-prone regions in North America and central Asia as part of a shifting of climatic zones, erosion of the West Antarctic ice sheet with a consequent worldwide rise in sea level, and opening of the fabled Northwest Passage.”

Wow. A 35-year-old peer-reviewed climate warning that is 100 percent dead on. Is there anyone else on the planet who can has been right for so long about climate change?

Hansen and co-authors deftly dismiss those ill-informed Pollyannas who use Orwellian terms like “good Anthropocene.” They explain that we are far past “the era in which humans have contributed to global climate change,” which probably began a thousand years ago, and are now in “a fundamentally different phase, a Hyper-Anthropocene ... initiated by explosive 20th century growth of fossil fuel use.”

The “Hyper-Anthropocene” is a very good term to describe the unprecedented acceleration in global warming that humanity has set in motion with the explosive growth of fossil fuels and carbon pollution, as the recent science makes clear:

The fact that *warming as high as 2°C should be avoided at all costs* is not news to people who pay attention to climate science, though it may be news to people who only follow the popular media. Indeed, 70 leading climate experts made that point crystal clear in a May report to the world's leading governments that received embarrassingly little coverage from the mainstream media.

As an important aside, Hansen and his 16 co-authors continue to be criticized for publicizing this paper prior to peer review. While I probably would have framed the paper's launch somewhat differently — as an expert opinion and discussion piece coming from one or more major scientific institutions — I think this particular criticism is overblown.

The mainstream media has generally failed to explain to the public the dire nature of our climate situation, repeatedly hitting the snooze alarm even as the world's scientists shout “Wake Up” louder and louder in every peer-reviewed forum you can imagine. Hansen himself has tried every traditional way possible to inform the media and alert the public for 35 years. If this new piece is what it takes to get any non-Trump, non-Kardashian, coverage in our current media environment, I'm not certain how much criticism scientists deserve for playing by a set of rules they did not make, rules made by the very people nit-picking at them.

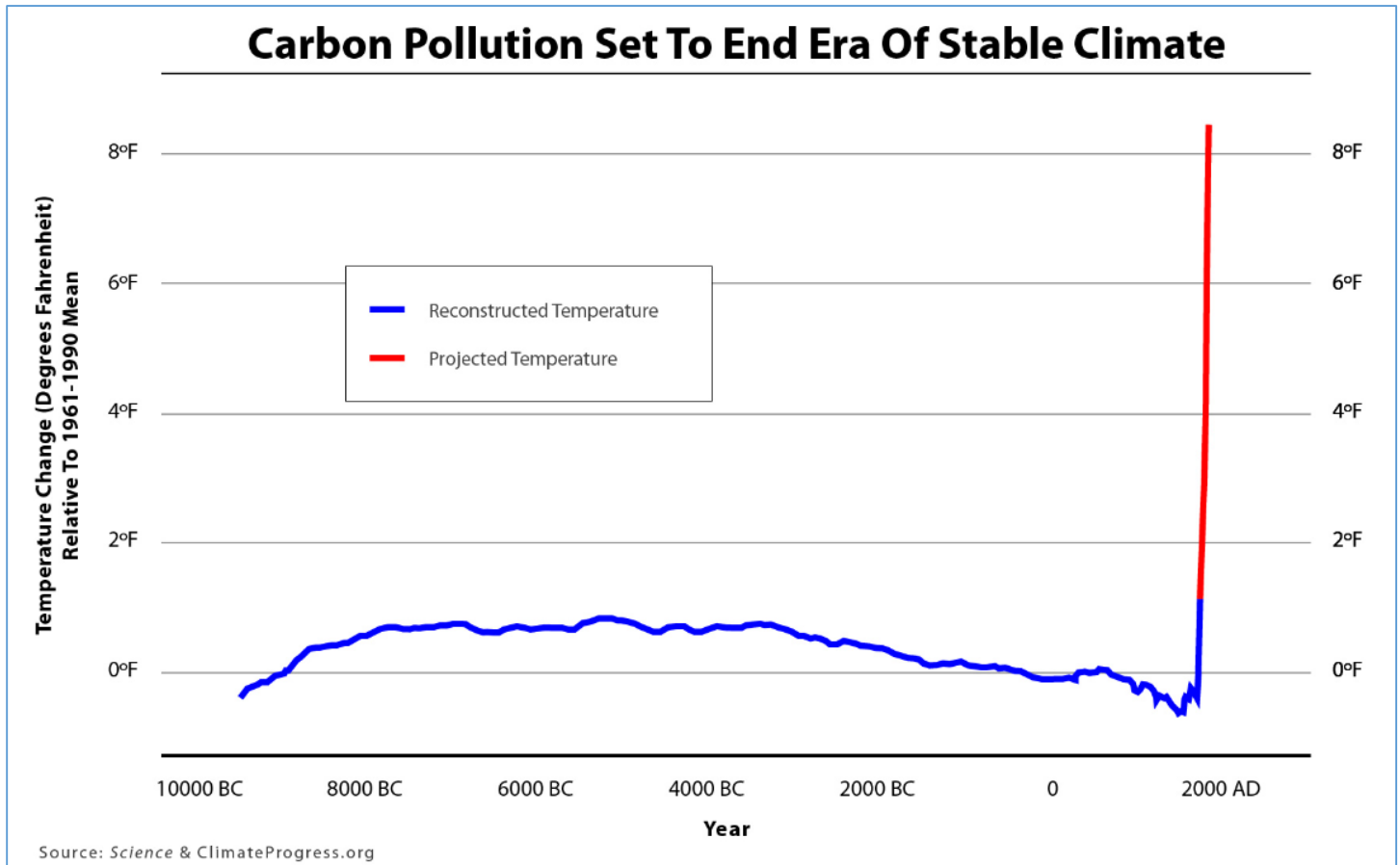
The fact that *2°C total warming locks us in to sea level rise of 10 feet or more* has been obvious for a while now. Heck, the National Science Foundation (NSF) issued a news release back in March 2012 on paleoclimate research with the large-type headline, “Global Sea Level Likely to Rise as Much as 70 Feet in Future Generations.” The lead author of that study explained, “The natural state of the Earth with present carbon dioxide levels is one with sea levels about 70 feet higher than now.”

And a 2009 paper in *Science* showed that the last time CO2 levels were this high, it was 5° to 10°F warmer and seas were 75 to 120 feet higher.

What has changed is our understanding of just how fast sea levels could rise. In 2014 and 2015, a number of major studies revealed that large parts of the Antarctic and Greenland ice sheets are unstable and headed toward irreversible collapse — and some parts may have already passed the point of no return. Another 2015 study found

that global sea level rise since 1990 has been speeding up even faster than we knew.

The key question is how fast sea levels rise this century and beyond. Coastal planners — and governments — need to know what the plausible worst-case is.



Temperature change over past 11,300 years (in blue, via Science, 2013) plus projected warming this century on humanity's current emissions path (in red, via recent literature).

The Intergovernmental Panel on Climate Change, in its 2013 Fifth Assessment Report (AR5) reviewing the scientific literature, threw up their hands. They have no idea how quickly the ice sheets can melt and contribute to sea level rise — so they assume it is very little and plead ignorance: “The basis for higher projections of global mean sea level rise in the 21st century has been considered and it has been concluded that there is currently insufficient evidence to evaluate the probability of specific levels above the assessed likely range.”

And so the IPCC's sea level rise range for 2100 is instantly obsolete and useless for governments and planners. A study that integrated expert opinion from 2013 on ice sheet melt with the IPCC findings concluded, “seas will likely rise around 80 cm” [31 inches] by 2100, and that “the worst case [only a 5% chance] is an increase of 180

cm [6 feet].” Since that expert opinion predated all of the bombshell findings of the last 18 months, the authors of that study noted, “We acknowledge that this may have changed since its publication. For example, it is quite possible that the recent series of studies of the Amundsen Sea Sector and West Antarctic ice sheet collapse will alter expert opinion.” Precisely.

The main contribution Hansen et al. makes is to warn that “sea level rise of several meters in 50, 100 or 200 years,” which means as early as this century but in any case, sooner than expected. They also warn that even with the less than 1°C of warming we already have, ice sheet melt appears to be putting sea level rise on an exponential growth path that would bring 10 feet of sea level rise sooner, rather than later — even if we stabilize at 2°C total warming.

Why does this matter? The authors explain, “The economic and social cost of losing functionality of all coastal cities is practically incalculable.” Heck, even the New York Times reported last year on the news of the accelerating collapse of the West Antarctic ice sheet that “The heat-trapping gases could destabilize other parts of Antarctica as well as the Greenland ice sheet, potentially causing enough sea-level rise that many of the world’s coastal cities would eventually have to be abandoned.”

Team Hansen just carries the analysis to its next logical phase and exposes the dangers of the IPCC’s willful underestimation of the problem: “Our analysis paints a different picture than IPCC (2013) for how this Hyper-Anthropocene phase is likely to proceed if GHG emissions grow at a rate that continues to pump energy at a high rate into the ocean. We conclude that multi-meter sea level rise would become practically unavoidable.”

And what happens in the Hyper-Anthropocene?

Social disruption and economic consequences of such large sea level rise could be devastating. It is not difficult to imagine that conflicts arising from forced migrations and economic collapse might make the planet ungovernable, threatening the fabric of civilization.

That is especially true when you throw in the other part of Hansen’s prediction from 1981 that has come true — “the

creation of drought-prone regions in North America and central Asia as part of a shifting of climatic zones.” Indeed, if this comprehensive new paper has one failing, it is in not discussing the myriad studies and evidence that warming-driven Dust-Bowlification threatens one third of the habited and arable landmass of the planet.

I also think Hansen is pushing the speculative possibility of 10 feet of sea level rise this century harder than he needs to. Yes, there are many experts who consider that a real possibility now, so it would be imprudent to ignore the warning. But the fact is, on our current emissions path, we now appear to be headed toward the ballpark of 4-6 feet of sea level rise in 2100 — with seas rising up to one foot per decade after that — which should be more than enough of a “beyond adaptation” catastrophe to warrant strongest of action ASAP.

The world needs to understand the plausible worst-case scenario for climate change this century and beyond — something that the media and the IPCC have utterly failed to deliver. And the world needs to understand the “business as usual” set of multiple catastrophic dangers of 4°C if we don’t reverse course now. And the world needs to understand the dangers of even 2°C warming.

Kudos to James Hansen et al for figuring out a way to draw attention to these crucial issues.

http://thinkprogress.org/climate/2015/07/27/3684564/james-hansen-climate-danger-hyper-anthropocene/?utm_source=newsletter&utm_medium=email&utm_campaign=cptop3