

# A REVIEW OF JAMES HANSEN'S PROVOCATIVE BOOK... 'STORMS OF MY GRANDCHILDREN'

REVIEWED BY DOUG MEYER

*Could a water-vapor runaway greenhouse effect happen here on Earth? The physics says no, the orbit is too far from the sun, but the physics can't model clouds either. Score: physics 0, James Hansen 0. Here we are, three years after our pre-eminent climate scientist's brazen conjecture that Earth would ultimately lose its oceans if humans dig up and burn all the fossil fuels, and still we can't rule it out. He's a wise man that Dr. Hansen, knowing both that the science won't soon be able to provide any reliable answers to the question, and that he could very well be right. He says it's a dead certainty that the planet's methane hydrates will decompose if we burn all the fossil fuels and then asks us to infer that higher climate sensitivity resulting from perhaps unprecedented climate forcing implies an eventual water-vapor runaway. You do the math. Either way, whether it's a dead planet or just one devoid of all higher forms of life for a few hundred thousand years, I'm satisfied with the pure indictment of our species that Hansen's book delivers. Is it hot enough for ya? –Doug Meyer*

In the endless battle between the human mind and the human animal, it looks like the animal is winning. James Hansen has written an expose of the science and politics of global warming that should undermine any remaining faith one might have in a good outcome for civilization. We get the sense of global schizophrenia as he reviews the pathetic response to global warming so far. And yet, though the science of the mind is impressive in its reach, it too is maddening. After all the research and reports have been digested, the precautionary principle is still the basis for its advocacy. The forces involved simply dwarf and defy human time scales, comprehension, computation, and efficacy. Thus the animal escapes.

"Storms of My Grandchildren" is also a self-critique by the man who has been at the very center of humanity's awakening to global warming. What happens to this man, and his science, when the discoveries appear antithetical to the "progress" of human society? The message gets distorted, that's what happens, and the blame

lies on both the sending and receiving ends, as the author suggests. This is James Hansen's masterful attempt to wipe the slate clean and try, one last time, to share the burden of his understanding with all of us.

But that knowledge emerged only after a journey spanning 65 million years of Earth history, and numerous extended stopovers of millennia, centuries, and sometimes just decades along the way.

That's the good news. These results did NOT magically appear from a climate model! But it's also the bad news. Apparently, the lessons of paleoclimate don't translate well into today's dysfunctional political scene. Imagine that. So something really big is gonna give. Someday. We're not sure exactly when.

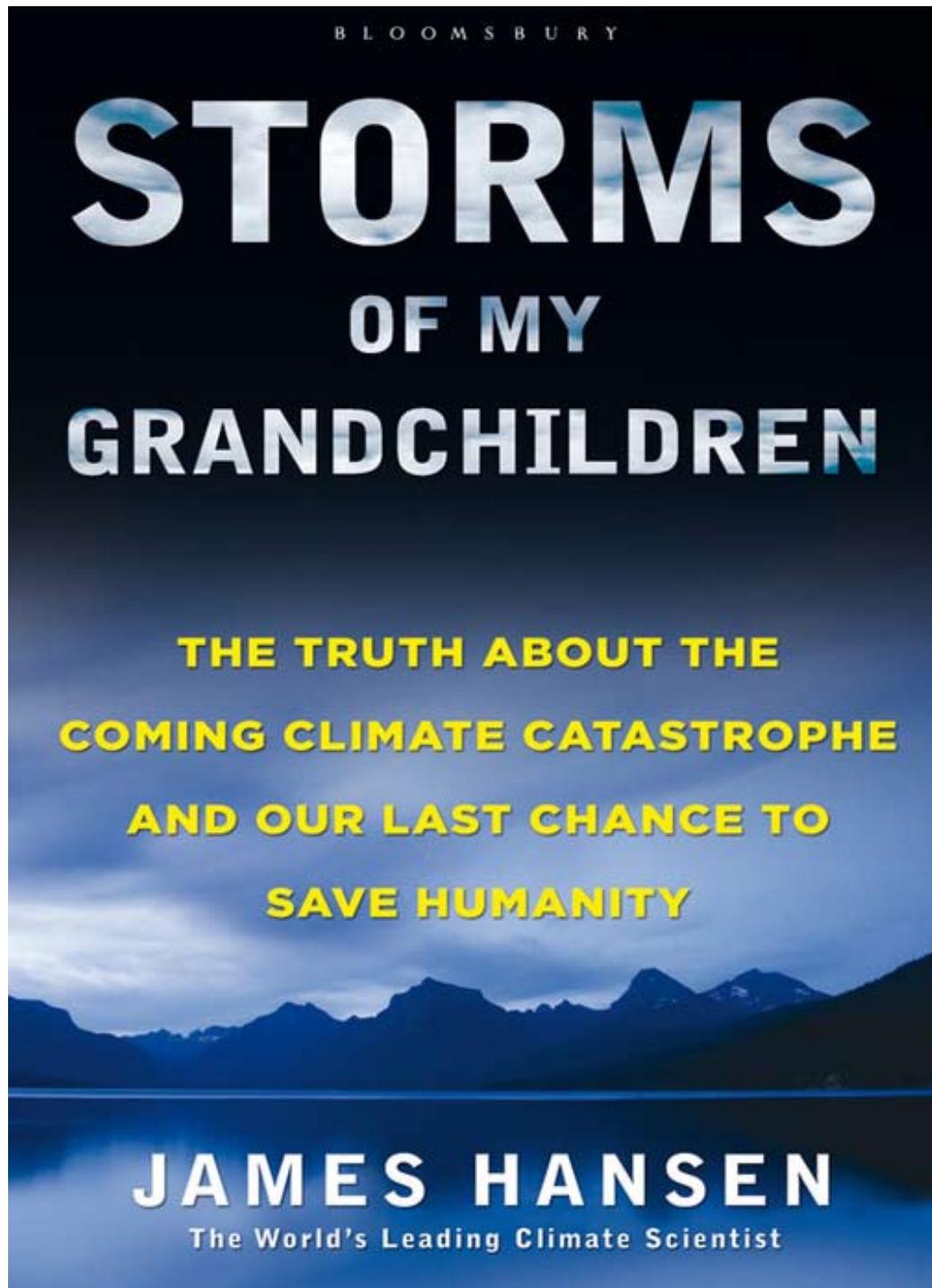
## Ice sheets

In the event of "continued growth of atmospheric carbon dioxide" then "within several decades", the Arctic's floating sea ice will be gone by the end of each summer. This would make it "difficult to imagine how the Greenland ice sheet could survive", according to Hansen. OK, but stay with me here, the momentum and time frames are essential to understand.

This is the "urgent" message of the book, again, from a paleoclimate perspective. Only in the last few years has the science revealed that the Greenland and West Antarctic ice sheets can disintegrate in less than a century, rather than millennia, as previously thought. Not quite the bombshell you were expecting? I agree, so let's look closer.

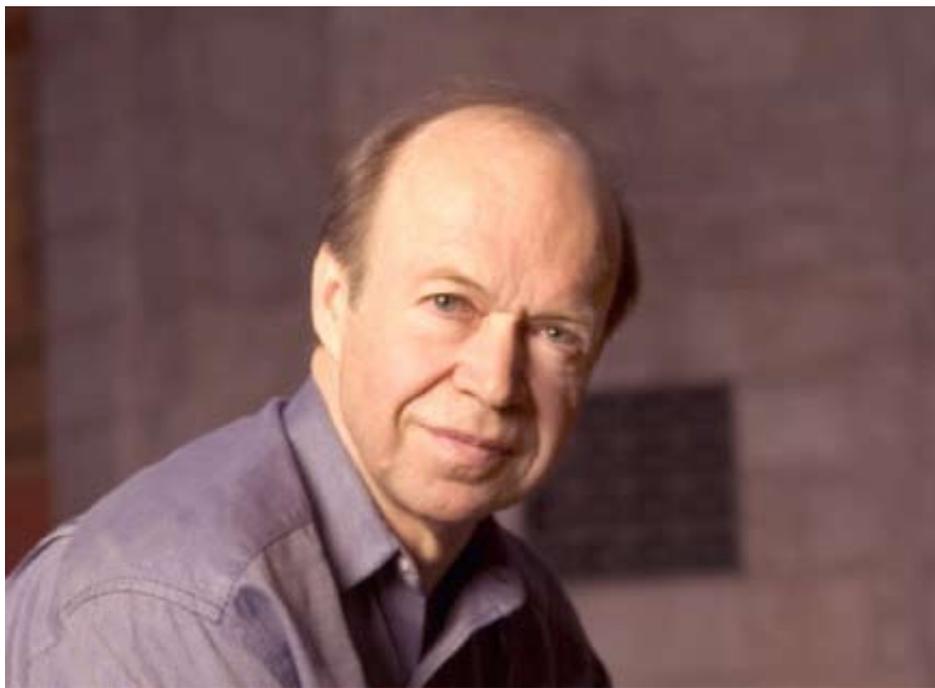
Hansen notes that the 2007 IPCC estimate of about half a meter of sea level rise this century results from treating continental-scale ice sheets as "giant rigid ice cubes that melt only slowly". This ignores ice shelves, (where ice sheets' colossal buttressing tongues meet the sea), melt water lubrication of the ice sheet base, and rapid, large-scale glacial flow to the sea from deep within the interior.

So, how much and how fast? Hansen refers to a period during Earth's recovery from the last ice age when, "there was no discernable lag between the time of maximum solar forcing of the ice sheet



and the maximum rate of melt” and that sea level “increased 4 to 5 meters per century for several consecutive centuries--an average rate of 1 meter every 20 or 25 years.” He also cites a study of the Last Interglacial that “presented evidence that a 2- to 3-meter sea level rise probably occurred in a period of 50 years or less”. Temperatures during the Last Interglacial averaged only 1 degree Celsius above today, a warming that every single IPCC scenario shows we’ll exceed in the next few decades.

Collapse of the West Antarctic ice sheet would raise sea level a few meters, enough to eventually displace hundreds of millions of people world wide. Greenland, perhaps equally vulnerable, has even more ice. So, when will the ongoing “softening up” of ice sheets reach a point of no return, where the “dynamical process of collapse takes over”? Hansen acknowledges that science today can’t answer that question. Even so, he goes ahead with this estimate: “Although ice sheet inertia may prevent a large sea level rise before the second half of the century, continued growth of greenhouse gases in the near term will make that result practically inevitable, out of our children’s and grandchildren’s control.”



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### Time out. Greenwash alert.

Note that “in the near term” and “within several decades” are mostly within the timeframe of the effects of ocean thermal inertia, meaning that much of Earth’s average surface air temperature rise in that time is already committed to occur.

Also, the phrases “continued growth of greenhouse gases” and “continued growth of atmospheric carbon dioxide” are tricky. Hansen is NOT talking emissions here. Because of the limited ability of the carbon cycle to absorb long-lasting CO<sub>2</sub>, a global 50% cut in CO<sub>2</sub> emissions would still result in increasing CO<sub>2</sub> in the atmosphere. So, in the near term, there’s no question that we’ll see “continued growth of atmospheric carbon dioxide”.

Now we can re-read Dr. Hansen’s words and make some stronger inferences: The loss of Arctic summer sea ice by mid-century is certain, along with the warming feedback that comes with it. And the substantial collapse of both the West Antarctic and Greenland ice sheets in the next hundred years will raise global sea level several meters. This will occur even in the unlikely event that the world

cuts emissions 50% in the near (but yet unspecified) future. The much larger East Antarctic ice sheet would presumably require substantially longer to disintegrate.

### Storms

We all know what happens when warm and cold air masses collide. Hansen tells us that as the ice sheets slowly tumble into the sea, the high latitude oceans will be cooled by the effect of melting icebergs. Meanwhile, the tropics will be getting warmer, and warmer air holds more moisture. Combine higher sea levels and

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bigger storms and what have you got? Hansen cites the ‘93 Superstorm, which at one point stretched from Central America to Nova Scotia, as a smaller cousin to the kinds of storms the world can expect by century’s end. He adds “It is not necessary to put the entire island of Manhattan under water to make the city dysfunctional and, given prospects for continuing sea level rise, unsuitable for redevelopment.” As the sea keeps slowly rising, hundreds of millions of coastal residents around the world may not be welcomed with open arms by their inland neighbors. A collapse of global governance looms.

### After ice

If humanity burns the remaining fossil fuels this century as expected, all of the Earth’s ice would be committed to eventually slide into the ocean, perhaps requiring a couple more centuries after this one to reach the ice-free state, with sea levels 75 meters above to-

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