

## ESSAY REVIEW

### **THE Most Important Book about Climate Change**

**Unsettled: What Climate Science Tells Us, What It Doesn't, and Why It Matters** by Steven E. Koonin. BenBella Books, 2021. 320 pp. (hardcover). ISBN 978-1950665792.

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If you want to know the facts about global warming and climate change, if you want to reach your own informed opinion about what should be done about it, this is the book to read. All relevant facts are presented clearly, very much including the historical records together with scrupulous citing of primary sources, among which the official published reports, international and national, feature prominently.

The author's credentials for this work could hardly be more impressive. Steven Koonin has been a successful physicist, including pioneering work on the use of high-performance computers in simulation and modeling. He gained some insights from the administrative role of Vice President and Provost at Caltech; another highly relevant experience as Chief Scientist for the oil company BP, focusing on renewable energy possibilities; and he was an Undersecretary for Science in the Department of Energy in the Obama Administration, focusing on energy technologies and climate science. He understands the viewpoints of scientists, of government, and of industry; in other words, he knows whereof he speaks.

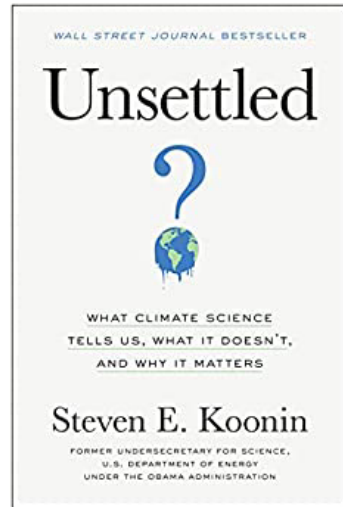
Throughout the book, Koonin takes deliberate, explicit care to write dispassionately and factually. At the outset, he acknowledges that the

path to convincing any wide audience calls for arousing emotion, so that scientists are inevitably in a dilemma: whether simply to describe the facts and hope for appropriate attention to them, or whether to find emotionally impressive ways of spinning and hyping the facts. Koonin takes the first course quite effectively. For example, “the science doesn’t support what’s portrayed in most popular discussions” might also have been expressed as, say, “We are being massively misled about so-called climate science, by media, pundits, and official climate scientists.” Thus the

book’s careful, factually based wording may easily seem incongruous as it describes unwarranted and unscrupulous mis-stating of facts, spinning, and hyping, which seem to be an integral part of official “consensual” “climate science,” to which the book refers as “The Science” to contrast with actual evidence-based science.

Still, it emerges inescapably that essentially everything that the media, the pundits, the official experts, and politicians everywhere disseminate is simply untrue. Koonin (2014) had summarized his discussion already seven years ago in a 2000-word piece in the *Wall Street Journal* without bringing any change to the pervasive, continual, public misleading by official sources, the media, NGOs, activist groups, self-interested “climate scientists,” and of course politicians. The official assessment reports are not transparent, and sometimes even wrong about what the science actually says (p. 100): Summaries in the reports, and government and media and press releases, continue to disseminate assertions that do not accurately reflect the data in the reports themselves (p. 4). Koonin points out that all this misleading “serve[s] the interests of diverse players including environmental activists, the media, politicians, scientists, and scientific institutions” (p. 12).

Unsurprisingly, therefore, predictions made by official experts have quite frequently turned out to be wrong (p. 9).



Koonin's thesis in a nutshell: Yes, human activities influence climate. Yes, the globe has warmed recently. However, to the present time the effects of human influences have been negligible by comparison to natural forces. All the hysterically hyped prophecies, the concept of an "existential crisis," are based on invalid models. Many informed scientists agree with Koonin's thesis but will not do so publicly (p. 5).

The computer models of "The Science" are demonstrably inadequate (Chapter 4, "Many muddled models"). They are unable to replicate over any appreciable length of historical time the actual facts about temperature, carbon dioxide, or anything else. Koonin enables us to understand why, by explaining the host of variables involved, our ignorance about the many relevant natural forces and variables, and the fact that there is considerable variation in weather and climate between different regions of the world. Furthermore, modeling *changes* calls for having an accurate initial baseline, and we do not have sufficiently detailed local and regional data to establish such a starting point. So current models involve "tuning" of parameters to make a better fit with actual data; which in other contexts might be described as inserting fudge factors to hide inadequacies. Results from the various models differ dramatically both from one another and from observations. But you wouldn't know that unless you read deep into the United National Intergovernmental Panel on Climate Change (IPCC) reports (p. 86).

The globe warmed from 1910 to 1940 at about the same rate as in the late 20<sup>th</sup> century; but the computer models calculate a rate only half of what was actually observed (pp. 88–89). Models in 2014 were no better than in 1979 at calculating climate sensitivity; and "the models are even worse at describing changes in regional climate than they are at describing changes in global quantities" (p. 145).

The very concept is a fairy tale, of some average global temperature or of a global warming that would impact all parts of the world in anything like a similar fashion; how very differently warming has taken place since 1986—there was even *cooling* in some regions—is illustrated in figure 1.5 (p. 37).

There can be no substitute for reading the whole book. Here are just some of the noteworthy points, all of them described in the book in detail and with scrupulous citing of sources:

“[T]he science is unsettled enough that *any* unusual weather can be ‘attributed’ to human influences” (p. 178).

“[T]he increasing concentration of carbon dioxide has been a significant factor in [agricultural crop] yield improvements” (p. 173).

“[H]eat waves in the US are now *no more common* [italics in original] than they were in 1900 . . . the warmest temperatures in the US have not risen in the past 50 years. When I tell people this, most are incredulous. . . . and some get downright hostile (p. 1).”

“Observations extending back over a century indicate that most types of extreme weather events don’t show *any* significant change—and some such events have actually become less common or severe” (p. 97).

“[T]he science says that most extreme weather events show no long-term trends that can be attributed to human influences on the climate” (p. 99); “temperature extremes in the contiguous US have become less common and somewhat milder since the late nineteenth century,” but official reports claim the very opposite, that temperature records in the US are becoming more frequent (p. 107).

“The coldest temperatures . . . [are] rising more rapidly than the warmest temperatures—the climate is getting milder as the globe is getting warmer” (p. 36).

As to hurricanes, “the assessment reports . . . present summary ‘spin’ inconsistent with their own findings” (p. 112). An apparent increase in the number of annual tornadoes is most likely owing to steadily increasing ability to observe weak tornadoes that would have failed to be recorded in the many decades before weather radar came into wide use (p. 122 ff.); “if anything, US tornadoes have become more benign as the globe has warmed over the past seventy-five years” (p. 126). Humans have had no detectable impact on hurricanes over the past century.

Human influences currently amount to only 1% of the energy that flows through the climate system (p. 58); “Water vapor . . . accounts for more than 90 percent of the atmosphere’s ability to intercept heat” (pp. 50–51).

Overall and on average, there has been no increase in flooding in the U.S. in the past century; but some regions have seen more flooding while others have seen less (fig. 7.7, pp. 137–138). “There is not very much changing very quickly with precipitation, either globally or in the US” (p. 147).

So too with droughts, for the globe as a whole: “*low confidence* in a global-scale trend in drought or dryness since the middle of the 20<sup>th</sup> century” (p. 138); indeed, “*high confidence* for droughts during the last millennium of greater magnitude and longer duration than . . . since the beginning of the 20<sup>th</sup> century in many regions” (p. 140).

The oceans are the climate’s long-term memory holding more than 90 % of the climate’s heat (p. 38).

“[W]e don’t know how much of the rise in global sea levels is due to human-caused warming and how much is a product of long-term natural cycles” (p. 165). Over the past 400,000 years, sea levels have varied over a range of more than 150 meters (fig. 8.1). The summaries in official reports are as misleading about sea-level changes (p. 157 ff.) as they are about extreme weather events.

Greenland’s ice sheet isn’t shrinking any more rapidly today than it was eighty years ago.

The net economic impact of human-induced climate change will be minimal through at least the end of this century. “The consensus on the minimum overall economic impact of rising temperatures is well known to experts [to which] a prominent environmental policy maker [responded]: ‘Yes, it’s unfortunate that the impact numbers are so small’” (p. 180).

National policies can also be counterproductive as to controlling emissions by going electric: The US imposed tariffs that increased the cost of solar panels, and the EU imposed substantial import duties on energy-efficient lightbulbs (p. 234).

That official statements, and the summaries of official reports, misrepresent the detailed data in those reports “might be due to incompetence, but I suspect otherwise” (p. 109). The UN framework convention had hijacked the very term “climate change” by *defining* it as

“a change of climate which is attributed directly or indirectly to human activity” (p. 35).

Many other devices have also been deployed to prevent questioning of that. For instance, figure 1.1, showing the familiar “hockey-stick” of rapid increase in temperature from about the 1960s, illustrates how misleading an impression a graph can deliver by choosing the scale used: the graph shows “temperature anomaly,” *deviation* from average, in tenths of degree; yet the *total global warming from 1850 to 2010* is barely 1 °C, and there were two periods of actual *cooling* (~1880–1910 and ~1940s–1970s).

An article (Ghebreyesus, 2020) by the Director-General of the World Health Organization attributes to climate change “deaths [that in reality are] due to ambient and household air pollution . . . Such brazen misinformation by the WHO’s leadership is particularly upsetting for its potential to diminish confidence in the organization’s vital public health mission” (p. 171).

Chapter 9 discusses in detail three “Apocalypses that ain’t,” namely (p. 167 ff.):

That “‘climate-related deaths’ [are] a menace” [is] an assertion “based on speculation, strained assumptions, and incorrect use of data.”

That there is impending “a future agricultural ‘disaster’ . . . is belied by the evidence and requires acrobatic distortion to even detect.”

“[P]urportedly ‘enormous’ economic costs . . . turn out, even based on the data presented, to be minimal, if not too small to measure”.

Chapter 11 gives Koonin’s ideas for “fixing the broken science.” He recalls that since a workshop in 2014, he had been “tracking the misrepresentation of climate science by the media and politicians . . . and . . . was freshly irked by the misleading presentation of hurricane data in the 2014 National Climate assessment . . . described in Chapter 6.”

Koonin’s chief proposition is the need for a “Red Team exercise” whereby “a group of scientists would be charged with rigorously questioning one of the assessment reports, trying to identify and

evaluate its weak spots . . . a qualified adversarial group would be asked ‘What’s wrong with this argument?’” And, of course, the ‘Blue Team’ (presumably the report’s authors) would have the opportunity to rebut the Red Team’s findings. “Red Team exercises are commonly used to inform high-consequence decisions such as testing national intelligence findings or validating complex engineering projects . . . ; they’re also common in cybersecurity” (pp. 197–198).

Much of Chapter 11 describes many evasions and political distractions that illustrate the mainstream’s unwillingness to engage in meaningful substantive discourse; the book cites a number of typical invalid mainstream polemical devices:

Referring to a dissenting scientist as “denier” or “alarmist.”

Claiming a 97% consensus among scientists.

Confusing weather with climate.

Omitting numbers.

Quoting alarming quantities without context.

Finally, in typically even-handed fashion, Koonin recommends two blogs “that seriously and consistently cover recent climate science”: [realclimate.org](http://realclimate.org) for the mainstream, [judithcurry.com](http://judithcurry.com) for the “non-consensus point of view.”

Chapter 12 explains why the concept of a carbon-free environment is a chimera, unattainable in practice; and data are cited to illustrate that much of the political discourse about restraining carbon emissions is simply silly in light of the actual facts. The following Chapter 13 points out further that changes in the mode of energy generation entail or require changes in many other things as well: sources and distribution of fuel, consumer behavior, shifts in costs and prices of *everything*. Carbon-generating modes of energy generation would have to be phased out *slowly* as the more desired forms are introduced: There can be no significant change in short order: “energy supply facilities such as power plants or refineries require large up-front investments and last for decades (over which those investments are gradually paid off)” (p.

228). Changes also impinge on the interests of “many different players: industry, consumers, governments, and NGOs. For example, there are often yearslong disputes over the routing of pipelines and the siting of power plants” (p. 229).

Chapter 14 discusses alternatives to the attempted control of carbon emissions: geoengineering or adaptation. “I soon discovered that any mention of geoengineering to governments or NGOs was met with tight-lipped silence, if not actual hostility. The focus was on reducing emissions, and any distraction from that goal, especially one that could allow the world to continue to use fossil fuels, was not to be contemplated” (pp. 238–239).

Geoengineering could include changing the reflectivity of the Earth to cut down on sunshine and capturing carbon dioxide and disposing of it. Adaptation, which Koonin seems to regard as the most feasible approach, has the advantages (pp. 245–246) that

it can be effective whether climate change is natural or human-influenced: “Humans have been successfully adapting to changes in climate for millennia . . . without the foggiest notion of what . . . might be causing them. . . Societies have thrived in environments ranging from the Arctic to the tropics.

it would be realistic, proportional to need.

it would be local, and “naturally tailored to the different needs and priorities of different populations and locations. This also makes it more politically feasible.”

It’s clear that media, politicians, and often the assessment reports themselves in their executive summaries, misrepresent blatantly what the science says about climate and catastrophe. Chapter 10, “Who broke ‘The Science’ and why,” discusses “The perfect storm of interests that leads to a fervent belief in a consensus that isn’t” (p. 183).

In just a few places, Koonin does allow himself some righteous wrath:

“I have no problem with activism, and the efforts of NGOs have made the world better in countless ways. But distorting science to further a cause is inexcusable, particularly with the complicity of



those scientists who serve on their advisory boards” (p. 194).

“I’ve been dismayed . . . by the willingness of some climate scientists—abetted by the media and politicians—to misrepresent what the science says, and then by the many other scientists who are silently complicit in those misrepresentations” (p. 249).

“I think we should begin by restoring integrity to the way science informs society’s decisions on climate and energy” (p. 255).

“As a scientist, I’m disappointed that so many individuals and organizations in the scientific community are demonstrably misrepresenting the science in an effort to persuade rather than inform” (p. 196).

## LESSONS BEYOND CLIMATE CHANGE

Koonin has begun to learn what the fate is of even the most judicious and well-informed critic of an official consensus: questioning of his credentials, personal attacks, criticism by former friends and colleagues (pp. 14–16).

I say only “begun” to learn because nowhere does the book show awareness that it is far from uncommon for official sources to publicly disseminate mis-information on important matters (Bauer 2012, 2021); this is not restricted to global warming and climate science.

Active researchers, specialist experts in particular fields, tend to be fully occupied with exploring and seeking to expand what is known and understood in their particular field. In the normal course of events, scientists assume that they can rely on what the consensus is in other fields of science. Individual scientists, particularly the most original ones, occasionally come up against the fact that the system is not working how it should and as they thought it did: Few active researchers have not experienced incompetent or unfair peer review, without drawing the extrapolated conclusion that the system of peer review is in and of itself no guarantee of objective reliability.

An awareness of the inadequacies, weaknesses, and dysfunctions throughout the scientific community as a whole is common not among active researchers in The Sciences but among outsiders who take an interest in scientific activity and its relationship to the wider

society: historians, philosophers, sociologists, political scientists, what nowadays has matured into the discipline of Science & Technology Studies (STS); as well as “anomalists,” people who take an interest in topics that mainstream science ignores. Every student of any science, and all active researchers, should be required to read Bernard Barber’s (1956) discussion of “Resistance by scientists to scientific discovery”.

*Unsettled* is a marvelously substantive, fact-respecting work—rather to my surprise, as I had been anything but a Koonin fan three decades ago when he had been prominent among the physicists who had pooh-poohed the report by Fleischmann and Pons of finding nuclear processes at ordinary temperatures in electrochemical cells (“cold fusion”). Physicists everywhere were unable to reproduce the reported findings—ignoring that non-experts doing a few months of electrolysis might not be properly replicating the work of long-experienced, expert, electrochemical specialists. There remain scientists all over the world who have achieved results analogous to or comparable with the Fleischmann-Pons claims (Goodstein, 1994); the phenomenon is apparently highly sensitive to the state of the solid electrode, and the need to get it occupied to by deuterium to greater than or equal to ~85% of the number of palladium atoms in the solid lattice of the electrode; and the overvoltage applied is also critical—theory suggests that can mimic something like  $10^{27}$  atmospheres of pressure (Bauer, 1990). Koonin, like all of us, can be spot-on right on some matters but mistaken on others.

In calling for a “Red Team” exercise on climate-change calculations and projections, Koonin acknowledges that “Of course, both the UN’s IPCC and the US government claim that their respective assessment reports are authoritative because they are already subject to rigorous peer-review before publication” (p. 198). Exactly. As I have been arguing for some time, proponents of a mainstream consensus simply refuse to engage with critics, which is why a Science Court is needed, with the authority to *force* substantive, public engagement on issues of public importance (Bauer, 2017, 2021).

The publishers are to be congratulated for the brave publication of a book that demolishes the conventional wisdom about global warming and climate-change dogma; but there is one highly annoying feature: All figures are black-and-white, making it in some cases impossible to

decipher differences between different shades of gray among half-a-dozen areas or lines.

This book should be read by every journalist, pundit, and environmental activist, and by all politicians, policymakers, as well as their staffs.

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