# Good Reasoning on Global Warming*

*David R. Henderson*

*Steven E. Koonin:*
*Unsettled: What Climate Science Tells Us, What It Doesn't, and Why It Matters*
*BenBella Books, Dallas, 2021, p. 306*
*ISBN: 978-1950665792*

## Introduction

We are told almost daily that the earth will suffer from global warming. Why do we need to be told? Because most of us aren't scientists spending hours poring over scientific papers. That information must come from others. But what do those others know? And what if the information we are receiving is incomplete, or severely misleading?

One question that particularly matters for an economic publication is: Will global warming badly hurt economic growth?

In his book *Unsettled*, *physicist Steven E. Koonin* addresses all these issues. Koonin has strong credentials. He was vice-president of Caltech in California and later was undersecretary for science in President Obama's Department of Energy. According to Koonin, many climate scientists and many members of the media have gone beyond what the science can tell us when they predict catastrophe unless we quickly and drastically cut our emissions of carbon dioxide.

His book is full of important, factual information and insights. One of his main messages is that there is much more uncertainty about where the climate is headed than many climate scientists and even a higher percentage of people in the media are willing to admit. And the good news is that the long-term economic effect of even substantial global warming will be small.

* The papers in this issue contain the views of the authors which are not necessarily the same as the official views of the Magyar Nemzeti Bank.

*David R. Henderson is an Emeritus Professor of economics at the Naval Postgraduate School and a Research Fellow with Stanford University's Hoover Institution. Email: davidrhenderson1950@gmail.com*

Among the scientific sources Koonin uses to make his case are the very reports by the United Nations' Intergovernmental Panel on Climate Change (IPCC) that reporters draw on. The difference is that Koonin spells out what the reports actually say, whereas reporters tend to draw selectively from the reports in ways that – according to Koonin – mislead the reader. It would probably come as a surprise to most people, for example, that the oceans are still rising slowly, that forest fires have not become more common, and that hurricanes are not more frequent than they were 100 years ago. Koonin, who agrees that the earth has warmed and will likely warm further, considers the various options for slowing global warming. He shows how hard it would be, especially in developing countries, to reach net zero emissions by 2050 or even by 2075. So he considers various alternative ways of slowing global warming and also the idea of adapting to global warming.

## Our Knowledge of Warming

Probably the most important chapter for teaching us about global warming is Chapter 1, "What We Know About Warming." Koonin writes, "The world's oceans are both the most important and the most problematic piece of the earth's climate system." The reason is that they "hold more than 90 per cent of the earth's heat and are its long-term memory." The problem is that it's even harder to get data that are precise and comprehensive enough to detect climate change. Nevertheless, Koonin seems to accept the idea that global temperatures have risen by about 1 degree Celsius since 1880. His scepticism is less about the change in temperature and more about the causes. He agrees that it could be caused by humans, but reminds the reader that "there are powerful natural forces driving the climate as well." What are these forces? He doesn't specify, but does note that temperatures from 127,000 to about 100,000 years ago were 2 to 3 degrees Celsius higher than today. It's hard to attribute that to humans.

## Modelling Climate

In Chapter 4, entitled "*Many Muddled Models*," Koonin explains in detail how climate models are formulated. Modellers start by "covering the earth's atmosphere with a three-dimensional grid." The models typically have between ten and twenty grid boxes that are stacked on top of a surface grid of squares. Each square is typically 100 km by 100 km. The modellers then use laws of physics to calculate how air, water, and energy move to neighbouring grid boxes over very short periods, often as little as ten minutes. Once the modellers input the data, they let the model run on a powerful computer. Koonin states that the smaller the grid squares, the longer the computer takes to run. A computer simulation that would take two

months to run if it had 100 km grid squares would take more than one hundred years to run if the grid size were dropped to 10 km.

How do the various simulations perform? Koonin writes, "[M]odel results differ dramatically both from each other and from observations." Unfortunately, he notes, you wouldn't know – unless you read the IPCC reports very carefully – that what they present is an average of models that differ substantially from each other. Moreover, notes Koonin, the models generally "fail to reproduce the strong warming observed from 1910 to 1940." They show a warming rate for that period that is only about half of the warming observed.

Interestingly, the IPCC admits the uncertainty, as Koonin shows with this quote from one of its reports:

> It remains difficult to quantify the contribution to this warming from internal variability[1], natural forcing ["forcing" is the term used for "influence"] and anthropogenic [human-caused] forcing, due to forcing and response uncertainties and incomplete observation coverage. (*IPCC AR5 WGI 2013*: *887*)[2]

One of the big sources of uncertainty is clouds. The amount of cloud cover matters a lot for global warming. Clouds "reflect sunlight or intercept heat in varying amounts." But because clouds change on a much smaller scale than the usual 100 km square grid and we have limited historical information on cloud cover, climate modellers must make assumptions. The results of their models are only as good as their assumptions.

## Temperatures, Hurricanes, Fires, Rainfall, Floods, and Sea Levels

We often hear that global warming is responsible for greater and more frequent floods, and more drought. But Koonin quotes the IPCC report itself noting that climatologists have "low confidence" about whether floods will be greater and more frequent, or smaller and less frequent. Also, the IPCC report states that climatologists have "low confidence in a global-scale observed trend in drought or dryness (lack of rainfall) since the middle of the 20th century." Translation: the IPCC isn't even sure about what has happened in the recent past let alone what will happen in the next few decades.

---

[1] Internal variability is due to movements within nature that are independent of humans.
[2] *Climate Change 2013 The Physical Science Basis*. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

What about the record high temperatures we so often hear about? Koonin points out that the measures used to make this claim are actually not the number of days with record high temperatures but are instead the *ratio* of the number of days with record high temperatures to the number of days with record low temperatures. Because the number of days with record low temperatures has fallen, that ratio has increased. But the executive summary of the *Climate Science Special Report* (CSSR), a report produced by the U.S. government, obfuscates this point, stating "Record warm daily temperatures are occurring more often." Koonin caught the error and, digging further, found that the National Academies of Science, Engineering, and Medicine had also noted the error. The National Academies' review panel bluntly wrote:

> Further, it is difficult to understand how a statement that includes increases in extreme warmth can be associated with a high confidence or extremely likely statement, given that most of the graphics in this chapter show a decrease in extreme warmth in the historical record.

The U.S. government's *National Climate Assessment* (NCA) of 2014 stated that "The intensity, frequency, and duration of North Atlantic hurricanes, as well as the frequency of the strongest (Category 4 and 5) hurricanes, have all increased since the early 1980s." When Koonin looked at the accompanying graph, he noted that the data began in 1970. It showed that starting about 1980, the North Atlantic Power Dissipation Index (PDI), a measure of hurricane activity, had shown an upward trend. He wondered what the data looked like before 1970. He found that there had been a *downward* trend in the North Atlantic PSI between 1949 and 1970, with no trend between 1949 and 2015. Searching the NCA more thoroughly, he found the following admission, buried in the text of Appendix 3:

> There has been no significant trend in the global number of tropical cyclones nor has any trend been identified in the number of US landfalling hurricanes.

We often hear that the increased number of fires in recent years is due to global warming. Has there been an upward trend globally? Koonin says no. He has a graph showing a *downward* trend, between 2003 and 2015, in the area burned by fires monthly.

What about rainfall and floods? Interestingly, climate activist *Mark Carney* gave a speech in 2015, while he was the governor of the Bank of England, in which he stated, shortly after England's very wet winter of 2014, that "[F]orecasts suggest we can expect at least a further 10 per cent increase in rainfall during future winters." What actually happened? In the six winters after 2014, writes Koonin, rainfall averaged 39 per cent *less* than in 2014.

One of people's biggest worries is that global warming will cause glaciers to melt and, therefore, increase the global average sea level. The CSSR mentioned earlier added to this worry by pointing out that the average had increased much more quickly after 1993 than before, rising by 7 centimetres in the later period. Koonin wondered if one could find other recent 25-year periods in which sea levels also rose quickly. He found one, the period from 1935 to 1960, when the average rose by 6 centimetres. Koonin argues that one should look at the whole period and not "cherry pick" the periods in which sea levels rose particularly quickly. Koonin notes that he sent his criticism to the lead author of the CSSR report, Don Wuebbles of the University of Illinois, and to Robert Kopp of Rutgers University, the main author of the CSSR's chapter on sea level rise. Both, he writes, agreed with his criticism, though claimed that they would have pointed this out in their report, but that it was too late.

What I, as an economist and not a climate scientist, found interesting is how little the sea will likely rise this century. Koonin quotes an IPCC finding that even in the most extreme case of global warming, the average sea level will be between 0.61 and 1.10 metres higher by 2100. If the Netherlands' experience in the last few centuries is any guide, that shouldn't be difficult to deal with, especially if economic growth continues, giving us more disposable wealth to make adjustments.

## Global Warming and the Economy

That brings me to the economy. Koonin points out the IPCC's prediction that a global temperature increase of up to 3 degrees Celsius by 2100 will cause world gross domestic product to be 3 per cent lower in 2100 than if we avoid that temperature increase. If world economic output increases by 2 per cent annually for the rest of the century, global warming of 3 degrees Celsius will cause GDP to increase annually by approximately 1.95 per cent instead. (Koonin's calculation is slightly wrong. The correct calculation is available from the author of this review.) So instead of world output in 2100 being 387.5 per cent higher than it is now, it would be "only" 368.8 per cent higher.

## Global Warming Exaggeration

Why does one get such a different impression about many of these issues from following the mainstream media? One reason is that some climate activists and some of the most prominent high-level, well-informed scientists are often willing to exaggerate. Koonin quotes a famous statement in 1989 from the late *Stephen Schneider*, a climate researcher at Stanford University:

> On the one hand, as scientists we are ethically bound to the scientific method, in effect promising to tell the truth, the whole truth, and nothing but — which means that we must include all the doubts, the caveats, the ifs, ands, and buts. On the other hand, we are not just scientists but human beings as well. And like most people we'd like to see the world a better place, which in this context translates into our working to reduce the risk of potentially disastrous climatic change. To do that we need to get some broad based support, to capture the public's imagination. That, of course, entails getting loads of media coverage. So we have to offer up scary scenarios, make simplified, dramatic statements, and make little mention of any doubts we might have. This 'double ethical bind' we frequently find ourselves in cannot be solved by any formula. Each of us has to decide what the right balance is between being effective and being honest. I hope that means being both.

Other climate activists have been even blunter about their willingness to portray scary scenarios. Koonin quotes former politician *Timothy Wirth*, who was the lead U.S. negotiator at the 1997 Kyoto Climate Conference:

> We've got to ride this global warming issue. Even if the theory of global warming is wrong, we will be doing the right thing in terms of economic and environmental policy.

Koonin quotes Wirth to show a bias but, unfortunately, does not directly question Wirth's reasoning. If the theory of global warming is wrong, it would seem strange that following it would lead to good economic and environmental policies. To take an extreme case, if global warming were completely unconnected to carbon usage—and I'm not claiming that it is—it would be hard to argue for a tax on carbon.

But aren't scientific organisations with thousands of members likely to make more-measured statements without exaggeration? Yes, if they consult those members. But Koonin points out an important instance where a major scientific organisation didn't do so. He quotes a 2019 report by the American Association for the Advancement of Science (AAAS) that climate change is an "urgent problem" and that "Americans are already feeling its effects." Koonin notes that he is a member of the AAAS and that the statement "was never submitted for comment, let alone endorsement, by the organisation's 120,000 members."

## Conclusion

Koonin's book tells us as much about the transmission of information in our society as about the basic science of global warming. If we want to know the truth, we will need to look beyond the pronouncements of politicians, the mainstream media, and scientists trying – like Stephen Schneider – to be "effective". *Unsettled* is a good place to start.