

## *The real reason some scientists downplay the risks of climate change*

*Climate deniers often accuse scientists of exaggerating the threats associated with the climate crisis, but if anything they're often too conservative*

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*Sea ice on the ocean surrounding Antarctica. Photograph: Ted Scambos/AP*

Although the results of climate research have been consistent for decades, climate scientists have struggled to convey the gravity of the situation to laypeople outside their field. If anything, the wider public only recently seems to have awakened to the threat of the climate crisis. Why?

In our new book, *Discerning Experts: The Practices of Scientific Assessment for Environmental Policy*, we attempted to illuminate how scientists make the judgments they do. In particular, we wanted to know how scientists respond to the pressures, sometimes subtle, sometimes overt, that arise when they know that their conclusions will be disseminated by the

research community – in short, how scientists are affected when they know the world is watching.

We explored these questions with respect to assessments of acid rain, ozone depletion and sea level rise predictions from the west Antarctic ice sheet.

While climate skeptics and deniers often accuse scientists of exaggerating the threats associated with the climate crisis, the available evidence suggests the opposite. By and large, scientists have either been right in their assessments, or have been unduly conservative. We noticed a clear pattern of

underestimation of certain key climate indicators, and therefore underestimation of the threat of climate disruption. When new observations of the climate system have provided more or better data, or permitted us to re-evaluate earlier conclusions, the findings for ice extent, sea level rise and ocean temperature have generally been worse than previously thought.

One of the factors that appears to contribute to this trend of underestimation is the perceived need for consensus, or what we call “univocality”: the felt need to speak in a single voice.

Many scientists worry that if they publicly air their disagreement, government officials will conflate their differences of opinion with ignorance and use this as justification for inaction.

Others worry that even if policy-makers want to act, they will find it difficult to do so if scientists fail to send an unambiguous message. Therefore, scientists actively seek to find their common ground, and to focus on those areas of agreement. In some cases, where there are irreconcilable differences of opinion, scientists may say nothing, giving the erroneous impression that nothing is known.

How does the pressure for univocality lead to underestimation? Consider a case in which most scientists think that the correct answer to a question is in the range one to 10, but some believe that it could be as high as 100. In this case, everyone will agree that it is at least one to 10, but not everyone will agree that it could be as high as 100. Therefore, the area of agreement is one to 10, and this will be reported as the consensus view. Wherever there is a range of possible outcomes that includes a long, high-end tail of probability, the area of overlap will lie at or near the low end.

We are not suggesting that every example of underestimation is caused by the factors we observed in our work, nor that the demand for consensus always leads to underestimation. But we found that this pattern

occurred in all of the cases that we studied. We also found that the institutional aspects of assessment, including who the authors are and how they are chosen, how the substance is divided into chapters, and guidance emphasizing consensus, also generally tilt in favor of scientific conservatism.

Knowing this, what do we do?

To scientists, we suggest that you should not view consensus as a goal. Consensus is an emergent property, something that may come forth as the result of scientific work, discussion and debate. When that occurs, it is important to articulate the consensus as clearly and specifically as possible. But where there are substantive differences of opinion, they should be acknowledged and the reasons for them explained. Scientific communities should also be open to experimenting with alternative models for making and expressing group judgments, and to learning more about how policy makers actually interpret the findings that result. Such approaches may contribute to assessments being more useful tools as we face the reality of adapting to the climate crisis and the disruptions that will occur.

For political leaders and business people, we think it is important for you to know that it is extremely unlikely that scientists are exaggerating the threat of the climate crisis. It is far more likely that things are worse than scientists have said. We have already seen that the impacts of increased greenhouse gases in the atmosphere are unfolding more rapidly than scientists predicted. There is a high likelihood that they will continue to do so, and that the IPCC estimates – that emissions must be rapidly reduced, if not entirely eliminated, by 2050 – may well be optimistic. The fact that this conclusion is hard to swallow does not make it untrue.

And for ordinary citizens, it is important to recognize that scientists have done their job. It is now up to us to force our leaders to act upon what we know, before it is too late.

Dale Jamieson, Michael Oppenheimer and Naomi Oreskes are authors of *Discerning Experts: The Practices of Scientific Assessment for Environmental Policy*. This piece is largely excerpted from that book

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