

Mental health risk and resilience among climate scientists

Awareness of the threats to mental health posed by climate change leads to questions about the potential impacts on climate scientists because they are immersed in depressing information and may face apathy, denial and even hostility from others. But they also have sources of resilience.

Susan Clayton

Acknowledgement that the climate is changing is increasingly paired with awareness that it will affect human well-being. A growing body of research not only describes the implications for physical health¹ but also documents, with varying levels of certainty, a range of potential impacts on mental health². Severe weather events such as hurricanes, droughts and wildfires — all projected to become more frequent as the climate changes — are clearly associated with threats to mental health such as post-traumatic stress disorder, anxiety, and depression. The slower but more profound changes in the environment that result from rising temperatures, changing patterns of precipitation, and higher sea levels will also have negative impacts on human well-being. Negative emotions are frequently reported in response to climate change^{3,4}. It is likely that some people will experience levels of fear and anxiety that impair mental health.

Some populations are particularly likely to be affected by climate changes. Indigenous communities, for example, are vulnerable both because they are often located in geographically threatened areas (such as ocean coasts), and also because their cultures tend to be intimately connected with the land and natural processes⁵. Thus environmental changes are likely to be more salient to them, and the changing climate threatens their cultural identities and traditions. The same might be said, for different reasons, about climate scientists. A number of articles in the popular press have suggested that this group of professionals faces particularly high mental health risks, using terms like ‘climate trauma’ and ‘pre-traumatic stress disorder’ to describe their responses to studying climate change⁶. What is the reasoning behind these anecdotes?

Reasons for distress

The way in which climate scientists and conservation practitioners respond to climate change is likely to differ in several ways from that of the general public. They are typically more knowledgeable about, and attentive to, the evidence for a changing

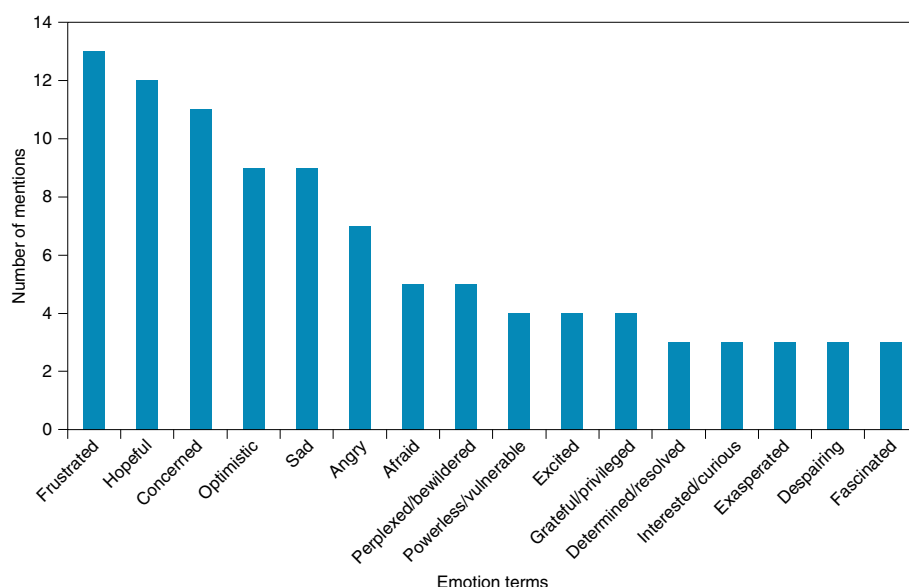


Fig. 1 | Frequency counts for the emotion terms mentioned by more than two people in letters from climate scientists. The letters were retrieved from <http://www.isthisshowyoufeel.com/this-is-how-scientists-feel.html>. Note that some similar terms were combined, for example, determined/resolved.

environment. Many are confronted with it, through research results or through personal experience, on an almost daily basis. Such an awareness of climate change is certainly a prerequisite for an emotional response. According to a model proposed by Bradley and colleagues³, experience of environmental degradation predicts perceptions of risk, which in turn predicts distress. Bradley et al. found that psychological adaptation, which included paying more attention to climate change, accepting it as a threat, and taking a problem-solving attitude towards climate change, strengthened the relationship between risk perception and distress.

On average, climate scientists are also likely to have more pro-environmental values than the average citizen. Risks are more distressing to the extent that they threaten something that is valued. For example, shortly after the offshore drilling rig Deepwater Horizon exploded in the Gulf of Mexico, local residents

who were more attached to the community reported more negative affect⁷. Similarly, with regard to climate change, people with a pro-environmental orientation have been found to report more distress⁴. Climate scientists may also experience threats to their personal identity and sense of self: they may feel helpless to stop the increase in CO₂ emissions, and climate change may undermine their sense of occupational identity. Linking occupation to mental health, IPCC contributor Camille Parmesan has described herself as being ‘professionally depressed’⁶.

Sources of resilience

Although climate scientists may be particularly susceptible to negative mental health impacts of climate change due to their involvement with the topic, they may also benefit from several protective factors that are less available to the layperson. Perhaps most important is the sense of community.

The perception that one is working with others towards a shared goal can provide a source of support and validation. Climate scientist Michael Mann, for example, reported being cheered by contact with other concerned people⁶. In Bradley and colleagues' model³, seeking social support reduced the strength of the relationship between risk perceptions and distress. Follow-up research among people affected by the Deepwater Horizon disaster showed that — in contrast to the effects found immediately afterwards⁷ — attachment to community served to protect mental health in surveys six months and a year after the explosion⁸.

Working with others to address a problem can also enable a sense of empowerment and meaning. According to one theoretical model⁹ community activism can lead to empowerment. For instance, in a sample of Black and Latino college students, political activism was able to mitigate the negative effects of discrimination on mental health¹⁰. More generally, community participation has been found to predict (more strongly than be predicted by) a feeling of personal empowerment¹¹.

Although climate scientists may not see themselves as community activists, they share some characteristics: through their research and their work, they are trying to disrupt the status quo in terms of the ways in which societies utilize natural resources and relate to nature. Their chosen professions allow them to publically affirm their shared goals and values (such as scientific inquiry and a healthy environment), thus providing the basis for a strong social identity⁹. The experience of collective action that comes from working as part of a group can lead to the development of new social relationships and sources of social support, the experience of positive emotions, and increases in self-esteem and empowerment¹².

An earlier study¹³ distinguished between two types of emotional coping in response to climate change: what is described therein as unrealistic hope, grounded in denial; and constructive hope, based on perceived efficacy, positive reappraisal, and trust that others will take action. In a sample of teenagers and young adults in Sweden, constructive hope predicted pro-environmental behaviour and denial inhibited it, even when controlling for pro-environmental values¹³. Climate scientists may be able to draw on their knowledge and their social connections to build constructive hope.

Evidence

As described above, there are good arguments on both sides: climate scientists may face increased mental health risk, but they may also have greater protection from those risks. What evidence do we have? I found almost no empirical articles concerning the mental health of climate scientists. One previous study¹⁴ reported that those working in the field of climate change seem 'anecdotally' to be more at risk for distress. Statistics from an online survey of conservationists¹⁵ were consistent with this suspicion: 77% of respondents had a high level of concern about environmental degradation, 35% said they experienced 'constant worry' and 49% reported persistent worry about the future state of the environment. Describing a specific event of environmental harm, respondents used words such as: 'angry', 'enraged', 'regret', 'anxiety' and 'hopeless'. A follow-up set of interviews with environmental educators and conservation graduate students about emotional experiences of climate change suggested that it did trigger severe emotional distress.

Providing additional anecdotal evidence, science communicator Joe Duggan asked climate scientists how they felt about climate change (<http://www.isthisshowyoufeel.com/this-is-how-scientists-feel.html>). Although this is clearly not a representative sample, the 43 responses posted online provide an interesting perspective. Many climate scientists reported strong negative responses such as 'despairing', 'afraid', 'overwhelmed' and 'outraged', but these were not the most common reactions. When I coded the 43 letters for explicit mention of emotion terms, the most frequently listed were frustration and sadness, but also included hope and optimism (see Fig. 1). Other positive responses included 'determined', 'fascinated', 'excited' and 'privileged' [by the opportunity to work professionally in such an important and rapidly-changing field]. Among this largely self-selected sample, many respondents found sources of positive emotion. Similarly, some respondents to another survey and accompanying interviews referred to negative environmental events as "motivational."¹⁵

Maintaining resilience

Overall, despite frequent articles on this topic in the popular press, there is little hard evidence of the extent to which climate scientists feel debilitating depression or anxiety. Available

information suggests at the very least that it is not inevitable. Climate scientists, like others, can develop resilience in the face of environmental threats, and may even have an advantage regarding some of the correlates of resilience, such as being informed, prepared, and socially connected. They may, however, confront cultural norms that, for example, discourage emotion and encourage intellectualizing. Research is needed to examine not only the degree of anxiety felt by climate scientists, but also ways in which their mental health might be affected by the combination of uncertainty, frustration and worry, along with professional interest, involvement and social support, that they encounter. Finally, research should explore strategies to help them productively cope with these emotions. Their continued motivation and empowerment is important for all of us. □

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Competing interests

The author has no competing interests.