Improving public understanding of climate change by supporting weathercasters

To the Editor — Effectively communicating the risks of climate change is essential for advancing the adaptation and mitigation measures required for human and planetary health. Building and supporting trusted communicators can be an important means to reach that end.

Broadcast meteorologists are well suited given their training, access to the public, and status as local and trusted sources of scientific information. As a profession, meteorologists have been working to keep the public out of harmful weather events since the 1800s. Concerned by the substantial loss of life on land and at sea, a network of mostly volunteers leveraged the power of the telegraph to collect weather observations and communicate the first storm warnings. Since that time, the broader weather–climate community has worked to build predictive tools on timescales ranging from minutes — for a tornado warning, to millennia — for the long-term impacts of climate change. Today, in the United States, the weather forecast is consistently one of the most watched segments on local TV news, and more Americans get their news from local TV than from newspapers, national network TV or cable TV.

In 1997, recognizing the potential of TV weathercasters to educate their viewers, US President William Clinton invited more than 100 broadcast meteorologists to the White House to discuss climate change[1]. This event led to a broader discussion in the broadcast meteorology community about the scope of their responsibilities in communicating risk and keeping the public out of harm's way. In 2007, building on the recently established 'station scientist' role proposed by the American Meteorological Society, TV meteorologists Bob Ryan (WRC-TV, Washington, DC) and John Morales (WTVJ-TV, Miami) published a commentary in the *Bulletin of the American Meteorological Society* calling for weathercasters to educate their viewers about climate change[2]. Public polling from that period showed that, while most Americans accepted the reality of climate change, they tended to see it as a distant and abstract risk that lacked personal relevance. Broadcast meteorologists are uniquely positioned to educate the public about the personal relevance of climate change by, when relevant, reporting on

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Box 1 | The Climate Matters programme

A one-year field experiment conducted in 2010 with the TV station WLTX (Columbia, South Carolina) tested the premise that weathercasters are well positioned to educate audiences about the local relevance of global climate change. With technical support from climate and social scientists at George Mason University and Climate Central, WLTX chief meteorologist Jim Gandy produced and aired 13 Climate Matters stories over one year that illustrated the current impacts and future risks of climate change in Columbia. The test was successful: surveys of news viewers showed that, in comparison with viewers of other local channels, WLTX viewers developed a more science-based understanding of the relevance of climate change[5]. Moreover, based on their important business metrics, WLTX management was pleased with the programming; they continue to participate today.

With these results as proof of principle, we set out to scale-up Climate Matters nationally to foster local climate reporting by supporting TV weathercasters as a community of practice[7]. Our objective was to reduce the barriers to climate reporting identified in our 2010 weathercaster survey: time to research and produce stories; access to appropriate data and visuals/graphics; knowledge about the topic; and access to trusted scientific information[3]. We soon identified another barrier that required attention: tensions and conflict in the weathercaster community that resulted from their diverging views about climate change[8].

We collaborated with organizations that weathercasters trust as information sources, including the National Oceanic

and Atmospheric Administration, the National Aeronautics and Space Administration, the American Meteorological Society and the National Weather Association. Over time, as Climate Matters grew to include other local journalists beyond the weather beat, additional organizations joined the collaboration (for example, Climate Communication, the Society of Environmental Journalists, the National Association of Hispanic Journalists, the Radio Television Digital News Association and the Local Media Association).

In 2012, we offered Climate Matters to opinion-leading weathercasters in ten additional media markets. Engaging opinion leaders as early participants heightened the interest of other weathercasters to try the practice themselves. In 2013, Climate Matters was offered to all interested weathercasters, leading to rapid expansion into many media markets[6].

We now produce Climate Matters materials for every US media market, in English and Spanish; approximately half of America's weathercasters, who broadcast in 94% of US media markets, now participate. Since 2012, the number of on-air climate stories has increased more than 100-fold, reaching 5,672 TV stories (and a total of 15,521 TV, print and social media stories) in 2021.

Most importantly, impact evaluation studies conducted in vitro (in Chicago and Miami) and in vivo (nationwide) found that climate reporting by TV weathercasters has improved public understanding of climate change as a locally relevant problem in communities across America[11,12].

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current local weather conditions in the context of current local climate change impacts and future risks, thereby bridging the weather–climate divide.

However, a 2010 national survey of TV weathercasters revealed both the potential and challenges of the proposal by Ryan and Morales: only about half of US

weathercasters thought global warming was happening (54%) — although nearly all of them expressed interest in educating their viewers about the local impacts — while 25% thought it wasn't happening and 21% weren't sure[3]. Related research at that time found that only a small number of weathercasters were taking steps to educate

the public about climate change — mostly in community and school presentations — and just a handful were doing so on air[4].

Realizing a need to bring the weather and climate communities into better alignment, and enable interested weathercasters to educate their viewers about the personal relevance of climate change, in 2010 we developed an approach to support weathercasters as trusted local climate educators (Box 1)[5]. The approach rested on a few key design decisions, including: user-inspired research; pilot testing to ensure efficacy; designing for and supporting weathercasters as a community of practice; and focusing initially on community opinion leaders[6,7]. In addition, we hosted conflict mediation sessions with opinion-leading weathercasters to address conflict among members of their community that was identified as a potential barrier to the success of our approach[8]. Now in its tenth year, this approach has proved effective at increasing weathercasters' knowledge and climate reporting, and in reducing climate scepticism and conflict within their community[9,10]. The approach has also proved effective at educating the public about climate change[5,11,12].

More work needs to be done to support the broadcast meteorology community — and local journalists more broadly — in their efforts to report on climate change. The local news industry is under great economic pressures that threaten its viability of local climate reporting. Fostering the further growth of science-based climate reporting — which should be considered essential to enhancing public understanding of risks and response options — will require efforts that compensate for the long-term downsizing in the local news industry. Moreover, as communities become increasingly aware of their growing risks, and as solutions become increasingly accessible, strengthening reporting resources on solutions and actions that can be taken to increase resilience and/or mitigate carbon emissions is becoming increasingly important.

In conclusion, the approach we developed is consistent with the newly emerging practice of convergence research identified in 2016 as a priority by the US National Science Foundation. We contend it can be productively applied in many other communities of practice — for example, local health departments, fire departments, transportation agencies, municipal planners — to rapidly update their knowledge and professional practices, and to enhance their capacity to respond effectively to our changing climate[7]. ❒

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Author contributions

All authors contributed to the development and operation of Climate Matters at various times over the past decade. E.M. and H.C. led the writing of the manuscript, drawing from the expertise and previous contributions of all authors. All authors reviewed, revised and approved the final version.

Competing interests

The authors declare no competing interests.