

OPPORTUNITIES AND OBSTACLES FOR TELEVISION WEATHERCASTERS TO REPORT ON CLIMATE CHANGE

BY KRIS WILSON

“Global warming is the greatest scam in history.” Those aren’t the inflammatory words of a hyperbolic politician on Capitol Hill, but rather a comment published on the Web by a local TV weathercaster in San Diego. With this Internet post in fall 2007, KUSI-TV’s John Coleman once again pointed out the “schism between most researchers and some television weathercasters on the subject of global change” (Henson 2008).

While Coleman refers to himself as “a mere TV weatherman” in his “Comments on Global Warming” blog (www.kusi.com/weather/colemancorner/11621966.html), recent peer-reviewed research confirms that television weathercasters may be “the most prominent science communicators in our society” (Wilson 2008). Coleman’s assertion was cited frequently by radio and cable TV political commentators like Rush Limbaugh and Glenn Beck and also influenced other television weathercasters’ reporting on the topic.

The question of whether John Coleman is an isolated skeptic or represents a larger community of skeptical TV weathercasters was one of several research motivations for a recent national survey of AMS weathercasters sponsored by the National Environmental Education Foundation (NEEF). NEEF, a nonprofit founded by Congress in 1990 to advance environmental knowledge, sponsored the survey to lead development of online course materials as part of their ongoing outreach to broadcast meteorologists (www.neefusa.org). The survey was vetted by an advisory board of climate experts, including representatives from NOAA, the NWS, UCAR, the Environmental

Protection Agency, the Pew Center for Global Climate Change, and many members of the AMS.

Among the most provocative findings is that John Coleman is not alone—almost a third of those who responded to the survey “agreed” (19%) or “strongly agreed” (10%) with his sentiments that “global warming is a scam,” despite the increasing scientific weight of evidence of a global warming. Almost half of this sample “disagreed” (23%) or “strongly disagreed” (22%), and the remaining 26% responded “neutral” to Coleman’s statement, highlighting the often contentious debate among this group of specialists.

“While some survey respondents seem to have made up their minds about climate change, these data also suggest that a substantial portion of the broadcast meteorology community may be open to learning more about science from trusted sources,” said Sara Espinoza, program manager for weather and environment at NEEF. Espinoza also directs NEEF’s Earth Gauge program, which many TV weathercasters already incorporate into their coverage.

When weathercasters were asked in this survey to identify the “greatest obstacle to reporting on climate change,” their top answer (41%) was “too much scientific uncertainty,” despite the growing consensus of climate scientists evinced by the Intergovernmental Panel on Climate Change (IPCC) and in direct conflict with the AMS Statement on Climate Change. (This statement, in the February 2007 issue of *BAMS*, concludes that “despite the uncertainties noted, there is adequate evidence that the atmosphere, ocean, and land surface are warming . . . and that humans have significantly contributed to this change.”) Heidi Cullen, then The Weather Channel’s in-house climate expert, addressed that matter in a 21 December 2006 blog post when she said “If a TV meteorologist has the AMS Seal of Approval, which is used to confer legitimacy to TV meteorologists, then they have a responsibility to truly educate themselves.” Soon after, two other TV weathercasters, Bob Ryan and John Toohey-Morales, wrote in a guest editorial in *BAMS* that “the [AMS]

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statement should be required reading for all of us who communicate with the public.”

Given the high level of scientific consensus, “Why Are TV Weather Forecasters Climate Skeptics?” was a question for discussion at the October 2008 annual meeting of another leading science reporting organization, the Society of Environmental Journalists.

The short answer is most of them *aren't* skeptics, but there is much more to learn from this survey, part of ongoing longitudinal research on television weathercasters as science communicators.

RESEARCH GOALS AND METHODOLOGY.

This new survey builds on surprising research findings from a larger, random survey of 249 television forecasters (discussed in a 2002 *Science Communication* paper by Wilson), which found that meteorology/science degrees, seals of approval, years of experience, newscast position, and market size had no statistical impact on accurate climate-change knowledge. Ultimately, the only variable that did have such an impact was TV forecasters’ “attitudes and values” about the subject, and those often drive many weathercasters’ approach to the subject today.

The new, shorter, more targeted survey sheds more light on those attitudes while guiding the development of online instructional materials to educate weathercasters about the science of climate change.

The survey was distributed by e-mail to broadcast meteorologists on the AMS listserve (numbering approximately 800) the week of 8 May 2008. There were 121 responses by 7 June, which was more than the expected goal of 100. Direct comparisons between this highly selective sample of AMS members and the larger random mail sample of all TV weathercasters published in 2002 are difficult. Different questions and methodologies were used. General patterns will be noted, but since this sample is selected from only AMS meteorologists, we can't know from these data whether all TV weathercasters share their perspectives or not. Presumably, AMS sealholders are more scientifically trained than the general population of all on-air weathercasters. Ultimately, we surveyed this group because they are the primary targets of the new online instructional course that will count toward AMS professional development credits.

One of the major advantages of this survey over the previous surveys is the ample space for qualitative comments. Most respondents used these comment boxes, providing much more detailed information than any previous research allowed.

Further demographic detail is reported in Table 1. This sample continues to show the “chroma key ceiling” for women in TV weathercasting, while the other demographics reveal a good distribution among key characteristics that measure TV news ranging from newscast position to market size.

RESULTS AND DISCUSSION. The AMS Station Scientist initiative receives strong support among this sample of TV weathercasters. Nearly three-quarters strongly agreed (31%) or agreed (43%) with the statement: “I am comfortable serving in the role as my station’s scientist.” Only 13% disagreed (Q. 23 on Table 2). Here the self-selecting nature of the online survey of AMS members may enhance the findings, since those who are most involved with the AMS are more likely to respond. However, the percentage is very high and suggests that many TV weathercasters are open to doing more than forecasting.

These survey results confirm previous data that show ample opportunities for weathercasters who want to report on science and the environment. Only 11% of this sample said their station has someone covering that beat full-time. That number is almost identical to a new national census of all environment reporters (discussed by Sachsman et al. in a 2008 *Applied Environmental Education and Communication* article) that showed only 10% of TV stations having science/environment specialists.

The most frequent scientific or environmental topic that respondents have covered is climate change, with 75% of this sample saying they’ve already discussed it as part of their duties. The most common way TV weathercasters discuss climate change is speaking before community and school groups. More than 90% of the weathercasters speak before such groups, and nearly two-thirds (65%) say they’ve discussed climate change before these kinds of organizations. Some weathercasters already use PowerPoint to organize their community talks; providing resources in this form that can be adapted by individual weathercasters could be invaluable, and has been incorporated as one of the available resources in the online COMET course module that NEEF has helped develop based on the results of this survey.

The second most common way weathercasters discuss climate change is in “anchor chit-chat.” Half of this sample say they’ve discussed climate change this way, and many of them acknowledge it can be “the most critical, since there is no way of knowing what an anchor will say.” News producers will often precede or follow

TABLE 1. Demographic details of the sample of 121 AMS TV weathercasters.

Chief meteorologist/ primary anchor		Weekend anchor		Morning/noon anchor	
48%		22%		21%	
CBM Seal		AMS Seal		NWA Seal	
45%		63%		25%	
Top 10 Market		Market 11–25		Market 26–50	
17%		16%		17%	
Age: <29		Age: 30–39		Age: 50–59	
19%		37%		18%	
Age: 40–49		Age: >60			
23%		2%			
Male			Female		
88%			12%		

the weather segment with a weather-related or “science” story, and often the weathercaster may be asked to respond spontaneously. Providing reliable, timely, relevant, scientific talking points to respond accurately to what one television meteorologist in this sample described as a “potential ambush by an anchor” is one more way to enhance climate-change communication.

Only one-third of weathercasters say they’ve discussed climate change during their on-air weathercast, primarily because of time constraints; almost half of weathercasters say that “lack of time in the newscast” is an obstacle to reporting on climate change. While weathercasters in this study say the newscast time devoted to weather has increased (three-quarters say to more than 25 minutes a day and two-thirds say to more than 30 minutes), each weather segment is actually quite short (about 3 minutes), meaning there is not much time for information beyond the forecast.

As John Coleman and Heidi Cullen demonstrate, blogging has also become a popular communication tool, and one-third of weathercasters in this sample say they’ve blogged about climate change. One-quarter use station blogs, but another 12% also utilize personal blogs. These are places where individual weathercasters freely express their opinions.

Many weathercasters in this sample expressed their preference for discussing climate change off-air. “We try to stay out of it on-air” said one, saying public response, both positive and negative, can be overwhelming. “We blog about it instead,” said another, “as it allows for more detail and discussion.” The Web, with its links to other sources, also helps

audiences control the information, discover their own resources, and reach their own conclusions, perhaps allowing weathercasters to avoid being considered “too political” or involved in the topic.

While almost two-thirds (61%) agree that it is appropriate to discuss the topic on-air, higher numbers concur about discussing climate change online (73%) and in community speaking events (79%; see Table 2). The mean strength (*n*) of agreement (from 1 = “strongly agree” to 5 = “strongly disagree”) also increases from 2.44 for on-air (about halfway between “agree” and “neutral”) to 2.19 for online and 2.02 for community speaking events, which tied for the highest agreement among all questions in the survey.

Only 19% of this sample said they have produced a story in the field on climate change. Some reasons can be found in responses about the obstacles to reporting on climate change, including lack of time for field reporting (25%) and lack of station support (21%). Weathercasters who seek extra opportunities for reporting often face challenges in getting photographers assigned to their stories, as well as time to get interviews with sources. But, again, weathercasters are finding other ways to report on the topic that don’t require extra commitments from their stations. Many weathercasters also use their regular newspaper columns and radio broadcasts to discuss climate change. Results from these data suggest that weathercasters are using a wide range of approaches to report not just weather, but also other science topics such as climate change, and 21% of them said they had “no obstacles” to doing so.

TABLE 2. The Likert Scale questions are coded with 1 = “Strongly Agree” to 5 = “Strongly Disagree.” The lower the mean number, the higher the agreement.

23. “I am comfortable serving in the role as my station’s scientist.”

Strongly Agree (1)	Agree (2) <i>n</i> = 2.13	Neutral (3)	Disagree (4)	Strongly Disagree (5)
31	43	12	8	5

12. As a TV weathercaster it is appropriate for me to discuss the science of climate change on-air.

Strongly Agree (1)	Agree (2) <i>n</i> = 2.44	Neutral (3)	Disagree (4)	Strongly Disagree (5)
19%	42%	22%	12%	5%

13. As a TV weathercaster it is appropriate for me to discuss the science of climate change online.

Strongly Agree (1)	Agree (2) <i>n</i> = 2.19	Neutral (3)	Disagree (4)	Strongly Disagree (5)
21%	52%	17%	6%	4%

14. As a TV weathercaster it is appropriate for me to discuss the science of climate change in community speaking events.

Strongly Agree (1)	Agree (2) <i>n</i> = 2.02	Neutral (3)	Disagree (4)	Strongly Disagree (5)
29%	50%	15%	3%	4%

The next set of data shows who broadcast meteorologists turn to for “trusted advice about climate change.” Of this sample, 65% say they most frequently use scientific journals for climate-change information. By far, *BAMS* is cited most often by this group (perhaps because the sample is drawn from AMS membership). The previous 2002 survey showed that TV weathercasters are highly educated and that most pursue continuing education, but many in this survey expressed financial concerns about gaining access to peer-reviewed journals for their newsrooms.

Web sites are a close second (60%) as the most common sources of climate-change information used by this group. The examples provided in the dialogue boxes span the gamut from www.icecap.us, a Web site that attributes climate changes to factors beyond increasing greenhouse gases, to sites at NOAA, NCAR, and the IPCC that conform more to the scientific consensus.

Conferences also play an important role in the climate-change education of most TV weathercasters (51%). The most common include the AMS An-

nual Meeting and the AMS Conference on Broadcast Meteorology. The latter provided a 3-hour block of climate-change programming in Denver in June 2008 (after this survey was conducted) and is following that with a full day of climate-change programming at its 2009 conference in Portland. Other meetings commonly mentioned include the Bahamas Hurricane Conference, the National Weather Association Annual Meeting, and regional meetings of various government organizations. More than a third say they also rely on media reports (38%)—including their competition—to inform them about climate change.

For this sample, the AMS and its various publications, conferences, and Web resources collectively ranked as the top choice (22%) when answering the question: “Whom do you turn to for trusted advice about new ideas/information about climate change?” The next most common response (16%) was: “I don’t trust anyone” or “No one.” Some worried that the topic was “too politicized” in general. “I believe everyone involved has a bias,” said one; “The issue

TABLE 3. The Likert Scale questions are coded with 1 = “Strongly Agree” to 5 = “Strongly Disagree.” The lower the mean number, the higher the agreement.

15. As a TV weathercaster, I should be knowledgeable about the basic conclusions of the Intergovernmental Panel on Climate Change (IPCC) assessment.

Strongly Agree (1)	Agree (2) <i>n</i> = 2.02	Neutral (3)	Disagree (4)	Strongly Disagree (5)
28	52	13	5	2

16. Respond to this IPCC conclusion: “Warming of the climate system is unequivocal.”

Strongly Agree (1)	Agree (2)	Neutral (3) <i>n</i> = 2.86	Disagree (4)	Strongly Disagree (5)
17%	28%	21%	20%	14%

17. Respond to this IPCC conclusion: “Most of the warming since 1950 is very likely human-induced.”

Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4) <i>n</i> = 3.44	Strongly Disagree (5)
8%	16%	25%	24%	26%

has become so politicized that I trust very little,” said another.

While healthy skepticism is a hallmark of journalism, these data suggest a deeper cynicism among some on-air forecasters. While some said they trusted the IPCC, others said that organization was “the most political” and discredited its entire body of evidence. While some considered former Vice-President Al Gore as a credible expert, others singled him out for special invectives and disdain, with one of them referring to him as a “snake-oil salesman.” Ranking third in the category (12%) of “whom do you trust” was “Myself.” A wide range of other trusted sources were listed, including other government agencies and other media, as well as several prominent skeptics, but none of these other sources reached a 5% threshold.

The bottom line for several respondents in this sample is something basic from all journalism training: “It’s best not to use one source,” said one, and “I read multiple sources,” said another. Single-source stories are anathema in news reporting and can serve an important function here, too. The design of the new NEEF/COMET online climate course relies extensively on links to other sourced references, allowing weathercasters to navigate a wide range of material, which may help obviate their skepticism of sources.

SKEPTICISM AND SCIENCE. Nowhere is this skepticism more evident than in a series of survey questions about the IPCC (Table 3), even though 80% agree that TV weathercasters should be knowledgeable about the basic conclusions of this international panel of climate experts. The mean for this question (Q. 15) equals the highest agreement in the survey (*n* = 2.02), and only 7% of the sample disagreed with the statement that they should know the conclusions of the IPCC. But followup questions quickly show that many of them don’t agree with those conclusions. For example, Q. 16 asks weathercasters to respond to the IPCC conclusion that “warming of the climate system is unequivocal.” When these results were presented at the AMS Conference on Broadcast Meteorology in June 2008, some in attendance objected to the term “unequivocal” in the survey sentence, but it is the precise term used by the IPCC, and in the following panel session, Kevin Trenberth, head of the Climate Analysis Section for NCAR and one of the IPCC lead authors, pointed out that the term was approved by 113 nations, which he said was “quite remarkable.” Still only 45% of this sample agreed (*n* = 2.86) with this conclusion, and one-third flat-out disagreed.

Asking weathercasters to respond to not only “detection” of the climate-change signal, but also its “attribution” (Q. 17) forces the mean across the

neutral median for the first time ($n = 3.44$). Although both the IPCC synthesis and the AMS Statement on Climate Change note the human fingerprint, half of this sample disagreed with the consensus that “most of the warming since 1950 is very likely human-induced.” Just one-quarter of the sample agreed (16%) or strongly agreed (8%) with the statement. Clearly, many on-air meteorologists continue to question climate science. Lesson plans that address how scientists are attributing climate change to anthropogenic causes may help address those concerns.

“The wide range of opinion on the IPCC conclusions . . . says to me that we need to explain more on how they reached those conclusions; what is the evidence that backs them up, and what is the level of confidence?” said Vickie Johnson, who is using the survey results as the COMET project lead to produce the online course.

Since model-based prediction is a crucial component of climate science, three questions addressing their use followed (Table 4). Almost two-thirds of this sample disagreed that “global climate models are reliable in their projections for a warming of the planet” (Q. 20), with $n = 3.65$ indicating how strongly this group rejects this basic premise of general circulation models. Perhaps because this group works so closely with weather models, which are much more volatile and less reliable than longer-term climate models, they project that same unreliability onto one of the areas all climate models agree on: warming of the planet.

Surprisingly, this sample shows slightly stronger agreement with Q. 21 that “global climate models are reliable in their projections for precipitation and drought” ($n = 3.47$). While 19% agree with the two statements (Q. 20 and Q. 21), fewer respondents strongly disagreed with the second statement, and 9% more were neutral in their assessment of models and precipitation.

Two-thirds of this sample also disagreed with the statement that “global climate models are reliable in their projections for local weather patterns” ($n = 3.72$). This is the strongest disagreement in the survey, which reflects a more accurate understanding of the current weaknesses of global modeling. Local and regional weather remain the most problematic aspect of climate prediction. Weathercasters in this sample clearly make this distinction and can help their audiences understand this dynamic as well by not overplaying isolated weather events as either symptomatic or asymptomatic of a pattern of global climate change.

This is one place where these experts in local weather understand the modeling process.

These data suggest that lesson modules on how climate models work and differ from weather models are likely to pay dividends in creating a clearer understanding and appreciation for climate science. Helping weathercasters make that distinction—and then being able to convey that to their audiences—may also help the lay public understand this important difference in the scale and scope of “weather” vs. “climate.”

The survey then asked weathercasters to comment on the most common questions they get about climate change in public and in their newsrooms. Weathercasters in this sample say there is some overlap in the questions they get from these two constituencies, but there are also some important differences. By far (62%) the number-one question from the public is some version of: “Is it (global warming) real?” or “Do you believe in global warming?” As many weathercasters noted, the framing of these questions asks for a personal opinion response rather than a scientific answer, which can exacerbate the perceived politicization of the subject.

The second most common question (25%) from the audience asks weathercasters to comment on the link between local weather events and global climate change, which is also the number-two question asked from the newsroom (19%). This is not surprising, since “proximity” is a basic news value, but it can be problematic given the difficulty of regional climate predictions. Weathercasters say the third most common question they get about climate change is public skepticism about forecasts, precisely because of the volatility of weather models. Given the often-negative feedback from the audience about a “blown forecast,” the question, “if you can’t get the five-day forecast right, why should I believe anything you say about long-term climate predictions?” is especially pertinent to local weathercasters. Again, pointing out *how* weather and climate models work differently may help ameliorate this concern from the audience.

Weathercasters in this survey report far fewer questions about climate change from their news colleagues. In fact, when asked what their concerns are regarding climate change, the most common responses (collectively 34%) are: “none”; “they never ask”; “they couldn’t care less”; and “nothing, they’re not interested.” Because journalists in the newsroom share interest in local impacts of larger trends and stories—including climate change—this lack of over-

TABLE 4. The Likert Scale questions are coded with 1 = “Strongly Agree” to 5 = “Strongly Disagree.” The lower the mean number, the higher the agreement.

20. Global climate models are reliable in their projections for a warming of the planet.

Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4) <i>n</i> = 3.65	Strongly Disagree (5)
3	16	20	37	25

21. Global climate models are reliable in their projections for precipitation and drought.

Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4) <i>n</i> = 3.47	Strongly Disagree (5)
1%	18%	29%	36%	16%

22. Global climate models are reliable in their projections for local weather patterns.

Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4) <i>n</i> = 3.72	Strongly Disagree (5)
0%	14%	25%	38%	24%

18. Respond to one TV weathercaster’s quote saying: “Global warming is a scam.”

Strongly Agree (1)	Agree (2)	Neutral (3) <i>n</i> = 3.28	Disagree (4)	Strongly Disagree (5)
10%	19%	26%	23%	22%

all interest in the topic is surprising. These results indicate that one of the first challenges many TV weathercasters may face as “station scientists” is to encourage their newsroom colleagues, who have no science training, to see those stories as compelling journalism. The third most common question from newsrooms is about whether weathercasters “believe” in global warming (18%).

NEEF and COMET have employed climate experts to answer these and other common questions to help weathercasters respond to those most frequent inquiries. The list can be accessed at www.earthgauge.net/climate-q-a. The entire list of audience and newsroom questions was also used to frame the lessons in the 2-hour online course module.

CONCLUSIONS. The survey asked respondents to identify resources that would help them to learn about climate change and improve reporting on the subject. One respondent summed it all up: “A website just for broadcast meteorologists that provides the latest research and conclusions without bias, as well as supporting graphics and visuals that we can grab

and use on the air.” The only thing missing in his request is the commonly mentioned access to interviews with credible climate scientists with “cogent sound bites.” Reflecting their trust issues about sources of information, this sample of AMS weathercasters repeatedly expressed their desire to have access to “independent,” “unbiased,” and “reputable” sources of data and information that present “both sides” of the issue.

“The open-ended questions about resources were especially helpful,” said Johnson, who has spent months building the new online climate-change module for COMET/MetEd. “Weathercasters want a really good reference list, especially sources they can go to for up-to-date information . . . so we’ve added that, as well as the graphics for on-air and the PowerPoints that can be adapted to the large amount of public service they perform.” The new climate-change course, “Fitting the Pieces Together,” is available online at www.meted.ucar.edu/bmet_training.php.

Other organizations are also recognizing the potential impact of television meteorologists and are

conducting their own kinds of outreach to extend their education and their impact in their communities.

“We’re not aiming for the true-believers or the die-hard skeptics,” says Bud Ward with the Yale Forum on Climate Change and the Media. “To use a political metaphor, we’re aiming at the independents, who don’t have all the information yet and haven’t made up their minds.” His organization, with a grant from the McCormick Foundation, held its first regional climate-change conference with 25 on-air forecasters from the Midwest in spring 2009. Like the COMET/MetEd project, much of the workshop focused on distinguishing between climate and weather modeling and incorporated climate scientists from trusted agencies. Weathercasters attending were also able to use on-site cameras to conduct interviews with the presenters, which also addresses another of their chief requests from this survey.

In his blog, John Coleman makes many questionable assertions, but one in particular relates to the distinction between climate and weather (or climatology and meteorology). “Global warming is not a religion, it’s not something you believe in, it is science, the science of meteorology,” he says. While he’s absolutely correct that it’s not something to “believe” in, he’s incorrect that climate change is just the science of meteorology. It is the science of climatology, and while the two share many common foundations, the scale and scope of the two are quite different and reflect the need for further education to build on the commonalities while elucidating the distinctions.

“Too many climatologists and meteorologists express condescending attitudes about each other,” said Peter Dykstra, former executive producer of science, technology, and weather at CNN. Cullen concurs and says that a goal of her current venture, Climate Central (www.climatecentral.org), is to “build a healthier community between meteorologists and climatologists,” adding that climatologists have a responsibility to reach out to meteorologists to better explain their expertise.

What is clear from all of this increased attention is the recognition that TV weathercasters do play a role as prominent science communicators in our society. Given their high-profile platform, how weathercasters communicate the science of climate change may have more impact on public discourse than any other means of dissemination, underscoring the importance of trying to improve that communication process. Future research should evaluate the efficacy

of these various outreach efforts to determine which produce the best outcomes, including a best-practice series that showcases examples of TV weathercasters successfully communicating to their audiences the science of climate change.

Kris Wilson worked in TV news for more than 10 years and earned a doctorate in geography specializing in climatology and climate change. His research investigates the nexus of science and media, and he has just returned to the University of Texas at Austin as a senior lecturer in the School of Journalism.

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