

# Climate change and journalistic norms: A case-study of US mass-media coverage

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## Abstract

The Intergovernmental Panel on Climate Change – comprised of top climate scientists from around the globe – has reached consensus that human activities have contributed significantly to global climate change. However, over time, the United States has refused to join concerted international efforts – such as the Kyoto Protocol – to curb human activities contributing to climate change. US newspaper and television media constitute key influences among a set of complex dynamics shaping information dissemination in this politicized environment. Mass-media coverage of climate change is not simply a random amalgam of newspaper articles and television segments; rather, it is a social relationship between scientists, policy actors and the public that is mediated by such news packages. This paper demonstrates that consistent adherence to interacting journalistic norms has contributed to impediments in the coverage of anthropogenic climate change science. Through analysis of US newspaper and television coverage of human contributions to climate change from 1988 through 2004, this paper finds that adherence to first-order journalistic norms – personalization, dramatization, and novelty – significantly influence the employment of second-order norms – authority-order and balance – and that this has led to informationally deficient mass-media coverage of this crucial issue. By critically scrutinizing US print and television media as a ‘public arena,’ we improve understanding of how journalistic activities have shaped interactions at the interface with climate science, policy and the public.

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## 1. Introduction

On March 28, 2001, two weeks after US President George W. Bush publicly proclaimed his opposition to the Kyoto Protocol and reversed a campaign pledge to seek major reductions in US power plant carbon dioxide emissions, White House spokesperson Ari Fleischer further clarified Bush’s position: “The president has been unequivocal. He does not support the Kyoto treaty. It exempts

developing nations from around the world, and it is not in the United States’ economic best interest. The president has always opposed the treaty. It is a question of what we can do based on sound science and a balanced approach as a nation to take action against global warming” (Fleischer, 2000). This was not only a surreptitious swipe at the findings of climate scientists and the ongoing international policy processes (such as the agreed upon 1995 Berlin Mandate), but it was also the spectacular culmination of a complex discursive process involving the mass-media in the United States. This process is facilitated by the interlocking normative orders to which the mass-media must pay heed.

Media scholar W. Lance Bennett asserts that political news content is influenced by three normative orders: (1) “norms about the proper role of the press in politics,” and

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society (i.e. *political norms*); (2) “the normative constraints of the business side of news organizations” (i.e. *economic norms*); and (3) “norms about the journalism profession” like objectivity, fairness, accuracy, balance (*journalistic norms*) Bennett (1996, 375, *emphasis added*). While these normative orders consistently intersect, here we specifically place our critical gaze on how interacting *journalistic norms* shape news coverage of anthropogenic climate change.<sup>2</sup>

Climate change is one of the most serious environmental risks of the twenty-first century.<sup>3</sup> Nevertheless, the prospect of such concerted action by the United States is dim. President Bush’s ties to carbon-based industry are commonly cited reasons for the US’s persistent unwillingness to follow such a reduction program. However, a more subtle factor that helps explain US inaction also exists: journalists’ faithful adherence to their professional norms. Paradoxically, such professional, well-intentioned behavior can actually decrease the possibility of precise, proper, and pressing climate-change coverage. By operating in accordance with widely accepted journalistic norms, influential mass-media newspaper and television sources in the United States have misrepresented the top climate scientific perspective, and thus have perpetrated an informational bias regarding anthropogenic climate change.<sup>4</sup> This informational bias is undergirded by the first-order journalistic norms of personalization, dramatization, and novelty as well as the second-order norms of authority-order and balance.

In the case of anthropogenic climate change, there is a remarkably high level of scientific consensus. The most reputable climate scientists from around the globe – participants in the IPCC – have consistently asserted that anthropogenic climate change is a serious problem that must be addressed immediately (Houghton et al., 1992; Carter et al., 1995; Houghton et al., 1996; Watson et al., 1997; Nakicenovic and Swart, 2000; Houghton et al., 2001). Specifically, the IPCC’s Second Assessment Report stated that there has been a “discernible human influence” on the

global climate (Houghton et al., 1996).<sup>5</sup> Additionally, a study by Naomi Oreskes found that in recent years, “all major scientific bodies in the United States whose members’ expertise bears directly on the matter have issued similar statements” to those of the IPCC (Oreskes, 2004, p. 1686). Nevertheless, the United States has resolutely refused to ratify the Kyoto Protocol and has sidestepped concerted action to reduce activities that play a role in global warming. As such, political discourse in the United States has swerved appreciably from well-established international climate scientific discourse.<sup>6</sup>

This discrepancy has manifold political and economic roots, including the historically steady flow of campaign contributions from the carbon-based industries to Capitol Hill; the tireless work of auto-industry lobbyists; and more recently, the Bush administration’s overtly friendly relationship with the oil industry. Although adherence to journalistic norms is not the only factor here, it is a bedrock – and heretofore under-investigated – factor in this complex situation.

This paper explains how journalistic norms have shaped mass-media coverage of human contributions to climate change. We posit that in order to examine impediments in climate science communication via the media, research must critically scrutinize the firmly entrenched journalistic norms that profoundly shape the selection and composition of news. To do this, we examine the quantity and quality of anthropogenic climate change coverage in the US mass media – daily print and television – from 1988 to 2004 and analyze salient features of this coverage over time. We focus on the US because it is the top emitter of greenhouse gases (GHGs) globally, producing approximately 25% of GHGs worldwide with 5% of the world’s population (McCarthy et al., 2001; U.S. Census Bureau, 2006). Thus, climate policy and public understanding in the US, as well as news coverage of climate change are vital.<sup>7</sup> Interrogating the interactive processes of news production, we examine how journalistic norms influence news coverage of climate science. We also explore how this news coverage feeds back into complex, non-linear relations at the interface with climate science, policy and the public. We consider the importance of journalistic norms in the context of Hilgartner and Bosk (1988, p. 58) ‘Public Arenas Model.’ These authors identify the mass-media as one of the key “public arenas in which social problems are framed and grow”. Since the public (of which policy actors are a part) learns most of

<sup>2</sup> This use of journalistic ‘norms’ relates to what has been treated in journalism studies in the past as journalism ‘values’ (Galtung and Ruge, 1965). The taxonomy introduced by Galtung and Ruge – particularly ‘personalization’ – overlaps with that which is introduced by Bennett (2002). These interacting norms and values have emerged in numerous analyses of media effects and in the US literature they are often referred to similarly (e.g. Gans, 1979; Wilkins, 1993; Harcup and O’Neill, 2001; Boykoff, 2006).

<sup>3</sup> In this paper, we use the terms ‘global warming’ and ‘climate change’ interchangeably due to their transposable use in popular and policy discourse. However, it should be noted that strictly speaking these two terms are scientifically distinct. ‘Global warming’ refers to a more specific facet of climate change: the climate characteristic of temperature. Even more specifically, it refers to increases in temperature over time. ‘Climate change,’ a broader term, also accounts for changes in other climate characteristics, such as rainfall, ice extent and sea levels.

<sup>4</sup> By ‘bias’ we do not mean ideological bias – the debate over whether the mass-media have a liberal or conservative slant – but rather informational bias, or distortion of accuracy. The term “informationally deficient coverage” indicates an analytical category, not an ideology-based contention nor a normative claim pointing toward an objective, omniscient truth.

<sup>5</sup> It should be noted that while the IPCC has conclusively made the link between human activities and climate change, there are a number of related issues about which climate scientists are less certain. Also, while the IPCC supports taking action, there is intense debate over what exactly should be done, how it should be done and who should be doing it.

<sup>6</sup> For this study, a discourse is an identifiable web of words, phrases, assumptions, and reference points that individuals and groups of people use in order to organize and understand the world.

<sup>7</sup> While our focus here is on the mass-media coverage in the United States, research in other country contexts is useful.

what it knows about science from the mass-media (Nelkin, 1987; Wilson, 1995), scrutinizing the media's portrayal of climate change – and exploring how and why information about climate change is translated into news – is imperative.

## 2. Climate change, the mass-media and journalistic norms

The mass-media are key actors in the identification and interpretation of environmental issues (Schoenfeld et al., 1979; Spector and Kitsuse, 1977). Scientific findings constitute a specialized mode of knowledge that is almost always packaged in professional language. Scientists generally employ a lexicon of caution and speak in a language of probability, which usually does not translate smoothly into the crisp, unequivocal commentary that is valued in the press. In other words, the very language scientists employ plays into scientific uncertainty as a salient theme in media coverage (Weingart et al., 2000; Zehr, 2000). Therefore, scientific findings usually require translation into more colloquial terms in order for it to be comprehensible.

### 2.1. First-order journalistic norms

These news-production conditions intersect in important ways with *first-order journalistic norms*: personalization, dramatization, and novelty. We dub these 'first-order' journalistic norms, because these factors are significant and baseline influences on both the selection of what is news and the content of news stories.

Personalization – “the tendency to downplay the big social, economic, or political picture in favor of the human trials tragedies, and triumphs that sit at the surface of events” (Bennett, 2002, p. 45) – is a fundamental journalistic norm. Viewed through the personalization lens, the intersection of science and politics becomes a competition between personalities struggling for power and acting strategically in order to improve their prestige and socio-political leverage. The personalized, human-interest story conforms to the idea that news should be about individuals and personalities rather than group dynamics or social processes (Gans, 1979). Instead of concentrating on power, context, and process, the media tend to personalize social issues, focusing on the individual claims-makers who are locked in political battle. In other words, the macro is foregone in favor of the micro; structural or institutional analyses are skipped over in favor of personalized stories that stress the trials and tribulations of individuals. Only seldom are these personalized stories linked to deeper social analysis.

Another first-order journalistic norm that is crucial to understanding news output on climate change is dramatization, whereby “news dramas emphasize crisis over continuity, the present over the past or future, conflicts” and “downplay complex policy information, the workings of government institutions, and the bases of power behind the central characters” (Bennett, 2002, p. 46). Hilgartner and Bosk write that, “Drama is the source of energy that gives

social problems life and sustains their growth” (Bennett, 2002, p. 62). Dramatized news tends to eschew significant and more comprehensive analysis of the enduring problems, in favor of covering the spectacular machinations that sit at the surface of events (Wilkins and Patterson, 1987). The aforementioned scientific language of uncertainty and probability does not help the issue of global warming conform to this dramatization norm; it can similarly make the ‘global warming story’ less tantalizing for journalists (Ungar, 2000). Moreover, the journalistic valuation of drama can serve to trivialize news content, as it also can lead to the blocking out of news that does not hold an immediate sense of excitement or controversy. However, this norm does not necessarily lead to reduced coverage. Ereaut and Segnit have posited that presenting news in this dramatized form is most common, and ‘sensationalized’ or ‘alarmist’ reporting “might even become secretly thrilling – effectively a form of ‘climate porn’ rather than a constructive message” (Ereaut and Segnit (2006, p. 14).

Dramatization intersects with another norm of contemporary journalism: the predilection for novelty (Wilkins and Patterson, 1991, 1987; Gans, 1979). Pointing to the relationship between dramatization and novelty in the mass-media, Hilgartner and Bosk assert that “saturation of the public arenas with redundant claims and symbols can dedramatize a problem” (Hilgartner and Bosk, 1988, p. 71). Because of the perceived need for a ‘news peg,’ certain stories are deemed suitable and others are not (Wilkins, 1993; Wilkins and Patterson, 1987). As Stocking and Leonard put it: “It ain’t news unless it’s new,” and this leads to an “issue-of-the-month syndrome” that “allows persistent, and growing, environmental problems to slide out of sight if there is nothing ‘new’ to report” (Stocking and Leonard (1990, p. 40). Gans asserts there is a “repetition taboo” whereby journalists reject stories that have already been reported in favor of news that is fresh, original, and new (Gans, 1979, p. 169). In print and on the screen, this translates into a preference for coverage of crises, rather than chronic social problems that have already been discussed on the mass-media terrain. Therefore, when it comes to climate-change coverage, Wilson notes, “The underlying causes and long-term consequences are often overlooked in the day-to-day grind to find a new angle by deadline” (Wilson (2000, p. 207).

### 2.2. Second-order journalistic norms

In combination, through influences on the selection of news and the content therein, these three first-order norms initiate and inform a set of second-order journalistic norms: authority-order, and balance (Fig. 1). Together, we argue that in the case of anthropogenic climate change, these norms and influences have contributed to informational bias. This informational bias leads to ‘episodic framing’ of news – rather than ‘thematic framing’ whereby stories are situated in a larger, thematic context – and this has been

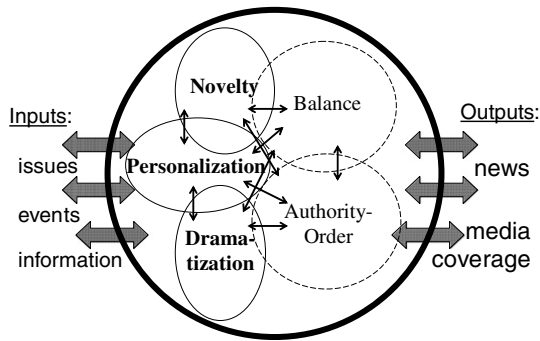


Fig. 1. Interacting Journalistic Norms. This figure depicts the public arena of mass-media production, where journalistic norms interact. These complex and dynamic factors take place between and within (as well as feed back into) a larger context of political, social, cultural and economic norms and pressures.

shown to lead to shallower understandings of political and social issues (Iyengar, 1991).

Authority-order bias is a second-order journalistic norm where journalists tend to primarily, and sometimes solely, consult authority figures – government officials, business leaders, and others – who reassure the public that order, safety, and security will soon be restored (Bennett, 2002, pp. 48–49). This two-pronged journalistic norm highlights “the desirability of social order” and “the need for national leadership in maintaining that order” (Gans, 1979, p. 52). Research has shown that through media coverage of climate change, there is often significant acceptance of political and expert voices by the public (McManus, 2000). Moreover, the complex issue of public trust in authority figures may feed back into and influence climate policy decision-making (Lorenzoni and Pidgeon, 2006; Pidgeon and Gregory, 2004). The sometimes explicit but often tacit drive to restore order can then serve to defuse or amplify concern about threatening social issues, even if such effects are not warranted.<sup>8</sup> Since environmental issues such as global warming often appear in the news because of a threatening crisis, this penchant for authoritative – often governmental – sources is not a trivial matter (Miller and Riechert, 2000). However, effects of this journalistic norm become less straightforward when there is overt contestation and ‘dueling’ authorities clash. This is the case with the George W. Bush administration and the IPCC regarding anthropogenic climate change. This leads both back to first-order norms of personalization and dramatization, and to the final second-order norm of balance.

Balance is often seen as a synecdoche for objectivity, especially since 1996 when the Society of Professional Journalists removed the term ‘objectivity’ from its ethics code (Cunningham, 2003). With balanced reporting, journalists

“present the views of legitimate spokespersons of the conflicting sides in any significant dispute, and provide both sides with roughly equal attention” (Entman, 1989, p. 30). In coverage of climate science, balance can serve as a crutch for reporters when they lack the requisite scientific background or knowledge, or are facing formidable time constraints (Dunwoody and Peters, 1992). With coverage of climate change, the proclivity to personalize news dovetails in an important way with the notion of balance in that it leads to the scenario of the dueling scientists. These opposing scientists, who receive ‘roughly equal attention,’ create the appearance of a hot scientific debate between the upper echelons of the science community, which elides the fact that on one ‘side’ there are thousands of the world’s most reputable climate-change scientists who vigorously engage the process of peer review, while on the other side there are only a few dozen naysayers who generally have not had their skeptical assertions published in peer-reviewed publications. The result of ‘balanced’ reporting, then, is an aura of scientific uncertainty. This scientific uncertainty is, in turn, a powerful political tool.

Boykoff and Boykoff (2004) quantitatively explored how the balance norm has been applied to anthropogenic climate change. This study found that, over a 15-year period, a majority (52.7%) of prestige-press articles featured balanced accounts that gave “roughly equal attention” to the views that humans were contributing to global warming and that exclusively natural fluctuations could explain the earth’s temperature increase. Coverage was divergent from the IPCC discourse in a statistically significant way from 1990 through 2002. In other words, through ‘balance,’ US newspaper coverage perpetrated an informational bias.

Through these entrenched first-order norms influencing second-order journalistic norms and feedbacks therein, US mass-media have misrepresented the top climate scientific perspective regarding anthropogenic climate change. Moreover, the mass-media have allowed a small group of climate-change contrarians or ‘climate skeptics’ to emerge from conservative think tanks (McCright and Dunlap, 2000, 2003) to proliferate and amplify their “denial discourse” that “global warming is not scientifically provable or that it is not a serious issue” (Adger et al., 2001, p. 707).

### 3. Methodology

Content analysis, according to Kerlinger (1973, p. 525) is “a method of observation” that allows researchers to gain leverage on communication-related phenomena. This study constitutes descriptive content analysis that focuses on a specific message pool that US media outlets generated over a 17-year period (Neuendorf, 2002, pp. 53–54). In this content analysis, we examined television segments and newspaper articles about global warming and climate change that appeared between 1988 and 2004. Analysis began in 1988 because of five important events that year, which sensitized US policy actors and the public to the issue of global warming: (1) Testifying in front of the US Congress, NASA

<sup>8</sup> It must be pointed out that events and issues are often inherently dominated by authority figures working for order. Thus, our attention here is to examine media representations of those traits, and is not to suggest that the appearance of elite figures on news stories is the sole result of journalist adherence to the ‘authority-order’ norm.

scientist James Hansen declared anthropogenic global warming to be a critical problem in need of immediate action (Ungar, 1992); (2) the Prime Minister of the United Kingdom, Margaret Thatcher, asserted publicly that with climate change, “we may have unwittingly begun a massive experiment with the system of the planet itself” (Leggett, 2001, p. x); (3) North America experienced a major heat wave and concomitant drought thus sensitizing many people to climate science research; (4) the United Nations Environment Program and World Meteorological Organization (WMO) created the IPCC; and (5) The WMO held an international conference called ‘Our Changing Atmosphere’ in Toronto (Pearce, 1989). We chose the end of 2004 as the closure for sampling as it was the last full calendar year for study. The articles and segments were compiled through searches with the keywords ‘global warming’ and ‘climate change’.

We examined a combination of television and daily print media because research has shown that people get most of their news from these mass-media sources (NSF, 2004; Project for Excellence in Journalism, 2006). Within daily print media, we selected four major US newspapers – the *New York Times*, the *Los Angeles Times*, the *Washington Post*, and the *Wall Street Journal* – because they are considered the most influential newspapers in the country (Project for Excellence in Journalism, 2006). Each of these newspapers has an average daily circulation of over 750,000 and are called ‘first-tier’ or ‘prestige-press’ newspapers (McChesney, 2000). Moreover, beyond directly reaching their readers, they also influence news coverage of other, ‘second tier,’ or smaller newspapers across the country, because: (a) reporters, editors, and publishers frequently consult these newspapers for decisional cues on what is ‘news,’ and (b) stories from these newspapers are often printed verbatim in regional, state, and local newspapers. We accessed these newspaper articles through the databases *LexisNexis Academic*, the *National Newspaper Index* and *ABI/Inform*.<sup>9</sup> These selection procedures produced 4887 news articles. Of these articles, approximately 39% appeared in the *New York Times*, 28% in the *Washington Post*, 25% in the *Los Angeles Times*, and 8% in the *Wall Street Journal*. Our sample contained 18.4% of the population, which was every sixth article as they appeared chronologically.

Within television news, we selected three network evening newscasts – *ABC World News Tonight*, *CBS Evening News* and *NBC Nightly News* – because these news programs garner significantly more viewers than any other sources in television news and are regarded as most representative of current television news coverage (Project for Excellence in Journalism, 2006). We accessed and compiled the segments through the Vanderbilt University Television News Archive. 293 news segments were broadcast from

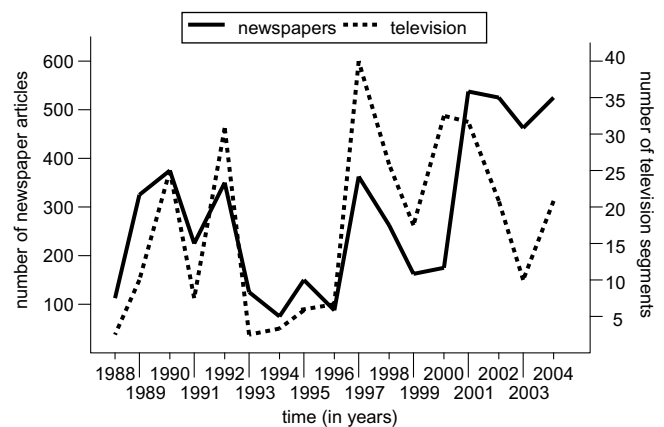


Fig. 2. United States newspaper and television news coverage of climate change.

1988 to 2004, and 36% were from *ABC World News Tonight*, 33% from *CBS Evening News*, and 31% from *NBC Nightly News*. For television segments, the sample accounted for 54% of the population. This sample was compiled through selection of every other news clip, arranged chronologically.

Both of these data sets were random samples, and therefore the sample was larger in years where news coverage was also greater. The sample was assembled by systematically opting in from a random starting point in January 1988. Fig. 2 shows the distribution of the news articles and segments by year, from 1988 through 2004.

In order to examine how journalistic norms have shaped mass-media coverage of anthropogenic climate change in the United States, we coded news stories according to whether they exhibited evidence of the five journalistic norms under consideration. Systematic, replicable content analysis of empirical data therefore focuses on the effects of the bedrock journalistic norms under study (Riffe et al., 1998, pp. 20–25). As with all content analysis, we summarized the message set rather than reporting it in all its detail (Neuendorf, 2002).<sup>10</sup>

#### 4. Contending models for understanding climate change coverage

Fig. 2 exhibits the total population of newspaper articles and television news segments with a central focus on the issue of climate change. This figure indicates rises and declines in the amount of newspaper and television news coverage. The five time spans in which the issue of global warming received the most coverage were 1990, 1992, 1997, 2001–2002, and 2004. A number of studies have charted the rise and fall of media attention for global climate change

<sup>10</sup> The content analysis measure underwent reliability pilot testing regarding the presence as well as salience of these journalistic norms. This pre-testing also accounted for spuriousness. A randomly selected set of newspaper articles from across the 17-year period were independently analyzed and achieved an inter-coder reliability rate of 96%. This standard meets accepted criteria for inter-coder reliability (Rubin and Babbie, 2000, pp. 192–194).

<sup>9</sup> In alignment with previous work (e.g. Antilla, 2005; Boykoff and Boykoff, 2004), stories from the Sports, Style, Fashion, and Real Estate sections or letters to the editor were excluded, since climate change is generally a tangential or epiphenomenal dimension from these sections.

issues (e.g. Ungar, 1992; Mazur and Lee, 1993) and some scholars have examined environmental policy through this lens (e.g. Roberts, 2004). In an attempt to theorize the rise and fall of media coverage and public concern for ecological issues, Downs posits that public attention to environmental issues moves through five sequential stages: (1) the “pre-problem stage”; (2) the “alarmed discovery and euphoric enthusiasm” stage; (3) the gradual-realization-of-the-cost stage; (4) the gradual-decline-of-intense-public-interest stage; and (5) the “post-problem stage” in which the formerly ‘hot’ issue “moves into a prolonged limbo – a twilight realm of lesser attention or spasmodic reoccurrences of interest” (Downs, 1972, pp. 39–41). Scholars have analyzed media coverage of climate change in light of Anthony Downs’s “Issue-Attention Cycle” for ecological issues, periodizing media coverage of global warming into distinct phases (e.g. McComas and Shanahan, 1999; Trumbo, 1996). Yet, the Downs model does not help to explain the variations in the quantity of US newspaper and television coverage of anthropogenic climate change over time. Looking at global warming coverage in the US media as depicted in Fig. 2, how would the Downsian model explain the increase in coverage in 1997, 2001–2002, or 2004? Would it be correct to characterize coverage in those years as “spasmodic”?

We contend that the Downs model is inadequate primarily because it does not pay enough attention to the crucial role played by the mass media, and more specifically to the journalistic norms that undergird news production. Although the model argues that ecological issues will naturally follow an up-and-down path because of qualities inherent to the issues themselves, this is clearly not the case, as global warming has gradually become a more serious threat over time. The persistence of environmental problems on the social docket is affected more by the way these problems are constructed in the newspaper and television news media than by a natural history framework, and the way problems are constructed in the media is rooted in the use of mass-media norms.

Therefore, we opt instead to use a “Public Arenas Model” to consider the increases and decreases in media attention to climate change. This model “stresses the ‘arenas’ where social problem definitions evolve, examining the effect of those arenas on both the evolution of social problems and the actors who make claims about them” (Hilgartner and Bosk, 1988, p. 55). Our analysis focuses on one such ‘arena’ – the US mass media – and zeroes in on the journalistic norms that affect climate-change coverage in the competitive process that all social problems experience on the road to becoming news. This coheres with Hilgartner and Bosk’s proposition to focus analytical attention on “the institutional arenas that serve as ‘environments’ where social problems compete for attention and grow” as well as “the ‘principles of selection,’ or institutional, political, and cultural factors that influence the probability of survival of competing problem formulations” (Hilgartner and Bosk, 1988, p. 56).

The US mass-media play an important role in agenda setting: the process of highlighting certain issues or problems as the most salient of the day (Murdock et al., 2003; Petts et al., 2001; Iyengar and Kinder, 1987). When an issue finds its way to the top of the press’s agenda, it – in the words of Hilgartner and Bosk – has reached “celebrity status” as a social problem (1988, p. 57). Ungar argues that in order to make it to the top of the mass media’s agenda, thereby reaching this status, environmental problems must “piggyback on dramatic real-world events” (1992, p. 483). In other words, there is no ‘natural’ cycle of issue attention, as Downs’s work suggests, but rather, unpredictable, real-world dynamics thrust social and environmental issues into the purview of policy makers and the public. As such, environmental issues that climb to the top of the mass media’s agenda – like anthropogenic climate change – may not do so for scientific reasons, or those of ‘alarmed discovery’ (Downs, 1972). Real-world issues, events, and dynamics must interact with journalistic norms in order to successfully translate into media coverage (Fig. 1).

## 5. Increases in coverage: where climate science meets politics

Fig. 2 displays notable increases in global-warming coverage in 1990, 1992, 1997, 2001–2002, and 2004 in US newspaper and television news media. Even though scientists had warned for years that emissions of carbon dioxide and other greenhouse gases would lead to changes in the Earth’s climate, this did not capture large-scale media attention in the US until 1988. As mentioned before, this sharp increase in coverage occurred for five major reasons. These can be further understood through the primary type or effect of each contribution: (1) *ecological/meteorological* – North America experienced a drought in the summer of 1988, as well as expansive fires in Yellowstone National Park, (2) *political* – Margaret Thatcher issued a warning regarding potential impacts due to climate change and Dr. James Hansen of NASA’s Goddard Institute for Space Studies forcefully warned Congress that global warming was a reality, and (3) *scientific* – the UN and WMO formed the IPCC, and the WMO held its conference in Canada. Viewed in this way, ecological, political and scientific factors interact to raise attention to this issue, and these dynamic processes are thus seen as negotiated social spaces or ‘public arenas,’ rather than spaces of informational deficit (Wynne, 1994; Irwin and Wynne, 1996). When Hansen testified to a congressional committee that, “it was 99% certain” that the global warming had begun (Shabecoff, 1988, A1), his testimony was bolstered by the fact that it occurred on one of the hottest days of the year, in a warm Senate chamber. According to Ungar, “What rendered 1988 so extraordinary was *concatenating* physical impacts *felt* by the person in the street” (1992, p. 490, emphasis in original).

The unprecedented weather may help explain how this issue initially captured media attention, but political and electoral considerations were also important. 1988 was a presidential election year filled with campaign rhetoric.

When on the campaign trail that year, presidential candidate George H.W. Bush stated that global warming was a serious problem. He later vowed the administration would deal resolutely with climate change, promising to “fight the greenhouse effect with the White House effect” (Peterson, 1989, A1). With the drought occurring and even political conservatives like Margaret Thatcher pointing to the problem’s seriousness, to do otherwise would have been politically unwise. The novelty of the weather scare combined with the drama of Thatcher’s and Bush’s statements, and the personalization of Hansen, a highly regarded scientist, meant that this story conformed to the journalistic norms and informational predilections of the newspaper and television news media.<sup>11</sup>

### 5.1. 1990

Similarly, the increase in coverage in 1990 can be attributed to a combination of circumstances that was far from purely scientific in nature. Indeed, that year there was a slew of scientific reports issued on climate change. In August 1990, the IPCC released its First Assessment Report, and in November 1990 at the World Climate Conference an IPCC technical report was reviewed and more than 700 scientists released the Scientists’ Declaration. However, the scientific assertions were not the entire story, and in themselves did not garner such an increase. Rather, late in the year, a coherent and cohesive group emerged to challenge the claims that were made in these reports (Mc-Cright and Dunlap, 2000, 2003). This group is what eventually became known as climate contrarians, climate ‘skeptics’ or the ‘carbon club.’ S. Fred Singer, Robert Balling, Sallie Baliunas, Richard Lindzen, Patrick Michaels and others began to speak out consistently and vociferously against the findings of the IPCC. For example, when an IPCC assessment associated sulfur dioxide emissions with climate change effects, carbon club assertions made their way into the media almost immediately. In a *Washington Post* article – “Primary Ingredient of Acid Rain May Counteract Greenhouse Effect” – contrarians grabbed print space to assert their claims. Discussing the relative role of sulfur dioxide, the article stated:

If the role of sulfur cooling proves to be large, and this is still far from certain, some researchers say it could be necessary to continue burning fossil fuels in order to produce sulfur dioxide to fight the carbon dioxide-driven warming. “I would not be surprised if somebody suggested concentrating fossil fuel power plants on the eastern margins of continents, which would put a lot of sulfates into the atmosphere, which would rain out over the oceans, which have a tremendous capacity to absorb acidity,” [Patrick] Michaels

said. “This plan would make sense because the prevailing winds blow from east to west” (Booth, 1990, A10).

Contentious, novel comments such as this one fed the journalistic norms of drama and novelty, as well as the norm of balance.

Furthermore, in the early 1990s, as prominent scientists and politicians from both sides of the issue emerged, the first-order norm of personalization played an important role in the increase in the amount of climate change news coverage. The emergent personalities who warned of the seriousness of the problem (e.g. James Hansen, Stephen Schneider) and those who said these warnings were unfounded (e.g. S. Fred Singer, Patrick Michaels) played into the norm of personalization. In television news, this was illustrated through a March 1990, *NBC Nightly News* report, where Tom Brokaw stated, “for all the alarm about global warming, there’s a major new study questioning whether it is happening... certain to trigger *even more debate* over whether temperatures in fact are on the rise on planet Earth” (Brokaw, 1990, emphasis added). Another example appeared in an April 1990 *ABC World News Tonight* segment that emphasized “scientists [are] still debating whether it’s even happening” and featured portions from such a debate that had just taken place on *ABC’s This Week With David Brinkley* between Patrick Michaels and Michael Oppenheimer (Delasky, 1990).

The personalization norm drew upon prominent individuals, including White House Chief of Staff John Sununu. A *Washington Post* article entitled “Environmentalists Try to Cut Sununu Down to Size” began with the following:

John H. Sununu has made so many environmental headlines lately that his critics named a newsletter after him yesterday. Called “Sununews” and illustrated with a caricature of him wielding a chainsaw, the newsletter issued by the National Wildlife Federation promises to publish “each time Mr. Sununu pulls out his chief-of-staff chainsaw and cuts down progress toward strong environmental policy.” In a more serious tone, the federation and seven other environmental groups sent a letter to President Bush complaining that Sununu intervened in three actions that led to “policy statements by your administration, which not only adversely affected the environment but also broke pledges you have made to the American public” (Weisskopf, 1990, A21).

*ABC World News Tonight* also brought attention to this ‘Sununu effect’ – pitting environmental concerns opposite economic ones – in discussing how Sununu does not want to “go too far, with scientific data he doesn’t trust” (Compton, 1990). The segment also quoted Sununu, who characterized the unfolding science on anthropogenic climate change in stating, “there’s a little tendency by some of the faceless bureaucrats in the environmental side to try and create a policy in this country that cuts off our use of coal,

<sup>11</sup> Also, coverage of global warming may well have been piggybacking off the public interest generated by the controversy over chlorofluorocarbons (CFCs) and the stratospheric ozone issue.

oil and natural gas” (Compton, 1990). The *CBS Evening News* also followed this thread in a segment covering a President George H.W. Bush speech in which he stated the intention to “continue efforts to improve our understanding of climate change [and] to seek hard data...” (Andrews, 1990) This call for more research, effectively deemphasizing a potential call for swift action to reign in anthropogenic emissions, emerged as a political mantra for the status quo. The report personalized this position – rather than examining the larger political economic terrain that led to such a stance – by stating that, “environmentalists blame that on White House Chief of Staff John Sununu” (Andrews, 1990). This also threatened to distract media consumers from deep analysis of climate science and policy, thus potentially affecting public pressure as well as international policy action. Such personalized battles dominated and contributed to increased coverage in this year.

## 5.2. 1992

Another jump in US newspaper and television news media coverage occurred in 1992. In this year, coverage continued to increase substantially leading up to and during the Rio Summit. Within this media attention arose the question – rooted in personalization and dramatization – of whether or not US president George Bush would attend the summit. A *Washington Post* article reported:

Yesterday, after a White House meeting with U.N. Secretary General Boutros Boutros-Ghali, Bush called the treaty a “historic step” and announced his plans to go to Rio for an unspecified period of time. The announcement ended what officials acknowledge was an artful game of diplomatic “chicken.” Bush was under pressure by world leaders to lend the luster of his office to the most ambitious environmental conference ever held. He refused to agree to attend, however, until the US position on global warming prevailed, saying April 21, “I’m not going to go to the Rio conference and make a bad deal or be a party to a bad deal” (Weisskopf, 1992a, A3).

Such personalized, dramatized controversy regarding Bush’s attendance was common. Also, more generally, the ‘Earth Summit’ fulfilled the journalistic ‘hook’ of novelty as President Bush dubbed the treaty a “historic step” (Weisskopf, 1992a, A3). By doing so, coverage increased substantially in this year as well.

The personalization of the climate-change narrative deflects attention from the roots of the problem, favoring the strategic moves of individuals over the political contexts in which they operate. For example, the 1992 *Washington Post* front-page story “Bush Was Aloof in Warming Debate” described the conscious political maneuvering of Sununu again, as he continued to highlight scientific uncertainty and the need for more research on climate change. Although President Bush had vowed to employ “the White House effect” to combat the greenhouse effect,

the article describes his calculated decisions to remain “aloof.” From this vacuum of presidential silence rose Sununu, who:

[F]ollowed his personal belief that global warming projections were alarmist and overruled the recommendations of the administration’s own environmental officials. Stressing his engineering credentials, Sununu commissioned government-supported scientists to develop a simplified climate model that he ran on his office computer. His strong arguments – even in the face of contrary scientific evidence – that excess heat from the burning of carbon fuels would be absorbed by oceans earned him the nickname “plankton man” from the president (Weisskopf, 1992b, A1).

This focus on Sununu’s personality and credentials was part of a larger trend rooted in the first-order norm of personalization. Such personalization then fed into the second-order journalistic norm of authority-order bias, as the media relied on such statements from the Bush administration’s bully pulpit.

The most prominent and heavily covered event in this year was the June United Nations (UN) Conference on Environment and Development in Rio de Janeiro, Brazil (or Earth Summit). The subject of climate change was central to this summit meeting, with the unveiling of the UN Framework Convention on Climate Change (FCCC) (UNFCCC, 1992). Leading up to this much-heralded event in which 115 heads of state and over 7000 delegates took part, journalistic norms strongly shaped anthropogenic climate change coverage in the US mass-media. A segment during the *NBC Nightly News* sought to outline the salient themes surrounding the science and politics of anthropogenic global warming. In the process, the segment illustrated the ongoing influence and interactions of many journalistic norms like dramatization and balance. Reporter Robert Bozell stated, “All sorts of precise scientific observations – including studies of ancient glaciers – reveal that most of the Earth is getting warmer. The big question is whether the temperature change is due to natural trends *or* is the result of the greenhouse effect, a warming of the Earth from increased carbon dioxide in the atmosphere...from the burning of gasoline, coal and other fossil fuels” (Bozell, 1992, *emphasis added*).

Dramatic events involving international personalities favor episodic (rather than thematic) framing. This also fuels increased coverage of, in this case, the climate change issue. Moreover, an important byproduct of the personalized coverage of dueling scientists is that media coverage of climate change appears to be a chaotic arena of uncertainty where intense controversy rises and falls without any clear origins or consequences. This uncertainty reverberates throughout press accounts, such as when the *Washington Post* referred to “the usual fickleness of science” (Weisskopf, 1992b, A1).



### 5.3. 1997

In 1997, there was another increase in coverage in the US newspaper and television news media. This can, in large part, be accounted for by an important international event: the third Conference of Parties (COP3), better known as the Kyoto Climate Summit. Coverage of the lead-up to the event – which included a 95-0 US Senate resolution against US participation in the Kyoto Treaty,<sup>12</sup> as well as a massive, oil-industry-funded \$13 million TV ad campaign that further maligned the treaty – provided an opportunity for the media to cover calculated political posturing and bravado (Gelbspan, 1998). Nebraska Senator Charles Hagel asserted, “There is no way, if the President signs this [treaty] that the vote in the United States Senate will be even close. We will kill this bill” (Bennet, 1997b, A1). Meanwhile, as the Kyoto Summit approached, President Bill Clinton expressed renewed interest, despite the fact that he had rarely spoken about climate change and the Kyoto Protocol in the later years of his presidency, and even then only in vague terms. For example, in a *New York Times* article, James Bennet covered a Clinton trip to the Costa Rican rainforests where he spoke about environmental stewardship and climate change:

While calling for reduction of greenhouse gases, Mr. Clinton stopped short of an explicit declaration that pollution was causing the global climate to change for the worse. “There is some doubt about what increased greenhouse gas emissions are doing to the climate,” Mr. Clinton said, “but no one doubts that they’re changing the climate, and no one doubts that the potential consequences can be very profound and severe” (Bennet, 1997a: A6).

When the personalization, dramatization (through sharp political contention), authority-order bias norms took effect, the newspaper and television media had news.

Other accounts in 1997 adhered to the personalization, novelty and dramatization norms. For instance, a *New York Times* story described the worries of Teunaia Abeta, a 73-year-old resident of Kiribati, an island that could be engulfed by climate change-induced rising tides. Abeta, who was described as a man “who wore only his colorful lava-lava, a skirtlike garment, as he sat on the raised platform of his home fingering a home-rolled cigarette,” was the attention-grabbing segue into a discussion of Pacific islands that could be affected by global climate change (Kristof, 1997, F9). Another account from the same news-

paper focused on Gary Hirshberg, the President of Stonyfield Farm, whose use of technologies that were not reliant on carbon-based sources “gripped President Clinton’s attentions,” because this showed the possibility of beginning “the transition to an economy that relies far less on carbon fuels” and that this “essentially painless” process “can begin today” (Cushman, 1997, F8).

### 5.4. 2001–2002

Another noticeable jump in US media coverage of global warming took place in 2001–2002. Again, this increase in coverage occurred more because of politics than because of natural science. In addition to new evidence (rising ocean temperatures) and the IPCC Third Assessment Report that provided strong evidence that global warming had anthropogenic origins (McFarling, 2001), as well as the occurrence of climate talks in Bonn, Germany and the simultaneous G-8 Summit in Genoa, Italy, 2001 was the year President George W. Bush repudiated the Kyoto Protocol, vowing not to “do anything that harms our economy” (Gerstenzang, 2001, A1). The sheer novelty and authority of the newly elected US president taking an unequivocal stance against the Kyoto Protocol made the event newsworthy. The president’s decision not to seek reductions in carbon dioxide emissions was met with sharp criticism from leaders and groups around the globe, including German Chancellor Gerhard Schroeder who said, “It is important that the US accept its responsibility for the world climate. They are the biggest economy in the world and the heaviest energy consumers” (Williams, 2001, A1). However, in turn, some skeptical scientists countered these critiques. *New York Times* turned to prominent climate-change skeptic S. Fred Singer, “a retired physicist and longtime critic of research indicating a warming trend with a human cause, said he hoped Mr. Bush would kill the treaty outright. “The Kyoto Protocol is like a vampire,” Dr. Singer said. “You need to drive a stake through its heart. Otherwise it’ll keep coming back and causing problems” (Revkin, 2001, A7).

This international quarrel conformed to the first-order journalistic norms of dramatization and personalization, which also led to the selection of what was news; in other words, increased coverage in the US press that year.<sup>13</sup> Amid this swirl of US newspaper and television news media coverage, headlines such as, “In President’s Words: ‘A Leadership Role on the Issue of Climate Change’,” and “Bush, EU Clash Over Climate Policy: Europeans Plan to Pursue Kyoto Curbs Despite US Stance” communicated confusion and emphasized controversy, while conforming to journalistic norms (*New York Times*, 2001, A12; Milbank and Richburg, 2001, A1).

<sup>12</sup> The Senate was concerned with the Kyoto Protocol’s multi-phase approach (delineated in the Berlin Mandate from COP1 in 1995), which proposed dealing with developed countries in the first phase of the scheduled reductions. The emissions reductions of developing nations would be taken up in phase two, which some developed countries – including the US – viewed as the unjust exemption of many countries that might, in the future, become major fossil-fuel polluters. The US Senate wanted immediate participation from developing countries.

<sup>13</sup> This research is in line with the work of Wilkins, who found in his analysis of US newspaper articles about the greenhouse effect from 1987 to 1990 that “the majority of stories were pegged to a political event; scientific discovery received much less emphasis in every year but 1987” (1993, p. 78). This trend has continued through the present time.

Heavy coverage in 2002 can be attributed in large part to political fallout related to President Bush's denunciation of the Kyoto accord. In February, with political pressure mounting, the Bush administration released an alternative plan to the Kyoto Protocol. This led to a spate of personalized coverage that keyed on President Bush and his desire to carry out more research without disrupting the status quo. Typical of this personalization, the *Washington Post* quoted Bush, who in a speech at the Commerce Department's National Oceanic and Atmospheric Administration said, "As president of the United States, charged with safeguarding the welfare of the American people and American workers, I will not commit our nation to an unsound international treaty that will throw millions of our citizens out of work" (Pianin, 2002, A9). The *New York Times* later looked back on the unveiling of this plan by focusing on Bush's legacy: "In February, [President Bush] reaffirmed the country's commitment to pursue the goal of a climate treaty his father signed in 1992: to stabilize greenhouse gas concentrations at a level that will prevent dangerous interference with the climate" (Revkin, 2002, F1). The personalized pressure on the president continued in summer, when Japan ratified the Kyoto Treaty, the Environmental Protection Agency released a report that highlighted the role of humans in climate change, and a number of state leaders from around the US urged Bush to take action to curb global warming.

President Bush gained more attention in December when he refused to engage in long-term solutions to global warming if these solutions might hurt the economy. Through multiple journalistic norms such as authority-order bias, media attention for such moves continued. In an article titled, "Group Meets on Global Warming; Bush Officials Say Uncertainties Remain on Cause, Effects," the *Washington Post* reported, "President Bush has called for a decade of research before the government commits to anything more than voluntary measures to stem carbon dioxide and other greenhouse gas emissions from industry and vehicles that have been closely tied to global warming" (Pianin, 2002, A9). Such a personalized focus on Bush's resoluteness or obstinacy – depending on how one looked at it – was a standard feature of press coverage of global warming.

The personalization norms also came to the fore in April when the Bush administration teamed up with fossil-fuel industry lobbyists to oust the head of the IPCC, Dr. Robert T. Watson, in favor of Indian economist and engineer Dr. Rajendra J. Pachauri. Watson was too aggressive in his demands that the US cut back on emissions, reported the *New York Times*, although some sources thought "Mr. Bush might end up regretting the choice, noting that Dr. Pachauri has repeatedly criticized the president for not acting more aggressively to cut emissions from the United States, which is the largest source of heat-trapping gases" (Revkin, 2002, F1). Deepening the personalization of the issue, the *Wall Street Journal* reported that Exxon Mobil Corporation fought hard against Watson, dubbing him "a

minion of former Vice President Al Gore" (Fialka, 2002: C18). Responding to the allegation that he was handpicked by Gore for the IPCC post, Watson responded, "I would swear on a beautiful big stack of Bibles that that is incorrect" (Fialka, 2002: C18).

Finally, there was a bump in coverage in 2002 during the United Nations World Summit on Sustainable Development in Johannesburg, South Africa. During this time a *New York Times* account described a full-page advertisement in the *International Herald Tribune* that featured the headline "Put a Face on Global Warming and Forest Destruction," and beneath it was a picture of President Bush (Swarns, 2001, F1). For environmental activists in South Africa, President Bush had become a synecdoche for environmental disregard in the name of economic profit.

### 5.5. 2004

In 2004, the final year of this study, there was another increase in television and newspaper coverage of climate change. The most salient news-grabbing event of this year was the November Russian ratification of the Kyoto Protocol, which met the conditions for the treaty to enter into force 90 days later. Preceding this event, heavily politicized moves from the increasingly isolated Bush Administration earned press coverage along with other concatenating events in the 'public arena.' For instance, on 20 May, *CBS Evening News* carried a piece, which drew on the intermingling of entertainment and ongoing climate science-policy struggles, in discussing a recently released film *The Day After Tomorrow*. Anchorperson Dan Rather began the segment by stating, "in a never-ending debate over global warming, the latest battle lines run from Washington to Hollywood...a sci-fi flick is the catalyst for a fight over science facts" (Bowen, 2004a). Employing journalistic norms such as dramatization and personalization, the piece then cut between movie clips, recent statements by President George W. Bush, comments by Robert F. Kennedy, Jr. and a portion of a 2003 speech by Oklahoma Senator James Inhofe on the Senate floor, when he said, "could it be that man-made global warming is the greatest hoax ever perpetrated on the American people? It sure sounds like it" (Bowen, 2004a). Such focus on micro-level battles and debates came at the expense of providing larger context of climate scientific consensus regarding anthropogenic climate change: another output of the journalistic norm of balance.

As another example, *CBS Evening News* framed the anthropogenic climate change issue as one of many debated during the campaign push. Adhering dutifully to journalistic norms such as personalization, authority-order bias, and balance, reporter Jerry Bowen plainly stated, "President Bush insists scientists can't definitively link man-made carbon dioxide emissions to a warming planet" (Bowen, 2004b). Following this statement came a quote from climate contrarian Sherwood Idso that, "it is just coincidental that the industrial revolution has come along at the same time and is

putting all this extra CO<sub>2</sub> into the air” (Bowen, 2004b). Leaning on the journalistic norm of balance, Bowen juxtaposed these positions by stating: “But the President’s own panel on climate change issued [a] report this year acknowledging the human impact on warming, a view shared by the majority of the world’s scientists” (Bowen, 2004b). This news coverage – shaped and influenced by interacting public arenas and journalistic norms – poorly served translation of science on anthropogenic climate change.

Reporting in the *Wall Street Journal* also demonstrated continued trends of reliance on journalistic norms at the expense of accuracy in covering the climate science consensus on anthropogenic global warming. Subtle wording and tone seemed to diminish this consensus. For example, a piece covered the work of groups to encourage the US Senate to “approve legislation to regulate carbon dioxide and other man-made gases *thought* to be causing global warming” (Fialka, 2004, A2). Another article discussed “reductions in greenhouse-gas emissions *blamed* for global warming” (Regalado, 2004, B9). These word choices served to perpetuate the aforementioned appearance of a chaotic arena of uncertainty where controversy rises and falls without an accounting for the accumulation of scientific research that comprises that consensus.

## 6. The slow years of climate-change coverage

During periods of reduced climate-change coverage, there was still a steady stream of global warming-related journal articles and IPCC reports emerging, as well as ongoing political posturing. Most prominent among these reports is the IPCC Second Assessment Report (SAR), released in late 1995. Also completed were accompanying documents from three working groups, investigating the science of climate change, and impacts, adaptations, mitigation, economic, political and social dimensions of global warming. The SAR offered clearly stated positions on climate change: “Future unexpected, large and rapid climate system changes (as have occurred in the past) are by their nature difficult to predict. This implies that future climate changes may also involve ‘surprises’” and, “The balance of evidence suggests a discernible human influence on the global climate” (Houghton et al., 1996). Also, in 2000 the IPCC published a Special Report on Emissions Scenarios (SRES). The 40 scenarios that were developed provided images of alternative futures based on varying levels of fossil-fuel intensive behaviors as well as levels of socio-economic equality. While these undertakings were meant to assist in the discussions of understanding of possible future developments through complex climate interactions, this report earned little television or newspaper coverage. The assertions made in these documents, though, were shrouded in the probabilistic language of science, and therefore were less tantalizing to journalists in need of creating dramatic, fresh news. Moreover, the issuance of these reports had seemed to become regular and was therefore losing its novelty appeal.

Moreover, the active formulations of non-problematicity by conservative think tanks served to cast doubt on the role of human activities contributing to climate change (Freudenberg, 2000; McCright and Dunlap, 2003). McCright and Dunlap argue that the “1994 Republican takeover of Congress, along with the concomitant rightward shift in the national political culture” served to diffuse policy-maker and public perception of the problems stemming from climate change (2003, p. 366). Furthermore, in 1995 a group representing carbon-based industry interests undertook a \$13 million campaign, named the ‘Global Climate Information Project.’ This effort sought to undercut the consensus regarding anthropogenic climate change as well as calls for concerted international action like the FCCC. The endeavor adopted the slogan ‘It’s not global and it won’t work’ (Johansen, 2002).

In the political arena, there also was action, but again, this action did not convert into increased coverage after 1992 (Williams and Frey, 1997). For example, in 1995 at the first Conference of Parties (COP1) in Berlin, Germany, participating countries agreed to the terms of the ‘Berlin Mandate.’ This mandate set the table for what was to become the terms of the Kyoto Protocol. It distinguished between ‘luxury’ emissions in industrialized countries and ‘survival’ emissions in developing countries (see Agarwal et al., 1999), and through this distinction it codified the role of the Global North (later to become the 34 countries of Annex I in the Kyoto Protocol) in leading with commitments on emissions reductions targets (UNFCCC, 1995). These events garnered little coverage though in the US newspaper and television media. These scientific findings and political actions during the ‘slow’ years of global-warming coverage demonstrated that if the first-order journalistic norms of dramatization, personalization, and novelty are not met, the chances for extensive, in-depth coverage of this environmental problem are diminished.

As overall coverage of global warming underwent a decrease in the mid-1990s, the balancing of dueling scientists became a common feature of the newspaper and television news media terrain in the United States. While international conferences, new scientific reports, and political promises might fuse into an amorphous swirl of cautious language that is unable to meet journalistic demands for freshness and novelty, the ever-present dueling scientists could be relied upon for a dramatic dose of disagreement. This ‘dueling-scientists’ phenomenon propagated through the media serves to distort unfolding science and policy discourse. It also “breeds confusion within the general public regarding what is widely accepted knowledge and what is a highly speculative claim, and the difference between scientific and value judgments” (McCright and Dunlap, 2003, p. 366).

In fact, were it not for this scientific ‘controversy,’ coverage would have likely been even less (Mazur and Lee, 1993). These dueling scientists deflected attention away from the IPCC’s consensus on the anthropogenic contributions to global warming, thereby allowing politicians to demand

more research before having to tinker with the status-quo reliance on fossil fuels. In a sense, these ‘golden years’ of the dueling scientists, he said/she said phenomenon also constitute what for Hilgartner and Bosk might view as the transformation of climate change as a “celebrity” issue to a lesser problem unable to compete in the marketplace of social problems, but nevertheless still alive because of “small communities of professionals, activists, and interest groups” who “work to keep these problems alive on the margins of public debate” (1988, p. 57).

To reiterate, we assert that in order to understand long-term patterns in media coverage of environmental issues, we must look elsewhere than the inherent characteristics of the issues themselves. Rather, one needs to also carefully assess the relational networks, or ‘arenas’ in which these issues emerge and evolve, and more specifically one needs to explore the role of first-order and second-order mass-media norms that affect what news is considered ‘fit to print.’

## 7. Conclusion

Over time, the US news media have evolved into a powerful actor in the production, exchange, and dissemination of ideas within and between the science, policy and public spheres. From its origins as an unabashedly partisan press, the US mass-media have transformed into a large-scale commercialized news apparatus, and, after engaging the process of professionalization, have grafted on traditions of objectivity and adversarial neutrality (Starr, 2004). With these professional traditions has come the emergence and development of journalistic norms. However, the explicit principles of journalism – such as objectivity and its recent lexical replacements, fairness, balance, accuracy, truth, and comprehensiveness – have proven to be more of a lofty ideal than a consistent, quotidian practice. Moreover, the professional, pragmatic norms and rules have combined to affect news content, as we have seen with US mass-media coverage of anthropogenic climate change.

In the end, we concentrate our attention on the professionalized journalistic behaviors – held together with the glue of norms – that construct meaning, and shape climate change news. In order to understand the level and texture of global-warming coverage in the US mass-media, one must slice straight through to the core of quotidian journalistic practice and interrogate the norms that guide media production. Cultural factors like first- and second-order journalistic norms go a long way in explaining why climate change, as an environmental issue, has struggled to attain fair and accurate attention from US newspaper and television news media. To reiterate, though, we do not contend that mass-media norms constitute the single reason global warming has been constructed as an issue shrouded in uncertainty; while mass-media coverage has been a key strand in a complex web of influences, interpreting the importance of newspaper and television news media as singular or linear in terms of causality would be an oversimpli-

fication. Many other important political, social, and economic factors contribute to this phenomenon.

The rhythms and rituals of journalism do not simply cohere into a static structural factor; rather, they are built and buttressed by the everyday practitioners of journalism: reporters and editors who are enmeshed in political and professional discourses and normative orders. Therefore, journalistic norms not only interlock into important structures but they also embed themselves in the minds of journalists operating within these structures of interaction. Since these norms are formed collectively, they are not eradicated from the minds of journalism workers without great difficulty, in part because, as with many social customs and routines, global-warming news production has many tacit facets and unarticulated assumptions. Thus, by employing the norms of professional journalism, the mass-media can adversely affect interactions between science, policy, and the public. Adherence to the norms of dramatization, personalization, novelty, balance, and authority-order is part of a process that eventuates in informationally biased coverage of global warming. This informational bias has helped to create space for the US government to defray responsibility and delay action regarding climate change.

Findings in this case-study analysis of US news coverage of anthropogenic climate change supplement more general studies of media and environment as well as undertakings in other country contexts. For instance, related analyses of media coverage at the science-practice interface have been undertaken in the United Kingdom (see Carvalho and Burgess, 2005; Carvalho, 2005; Smith, 2005; Anderson, 1997), Australia (see Hay and Israel, 2001; McManus, 2000), New Zealand (see Bell, 1994) France (see Brossard et al., 2000), and Germany (see Weingart et al., 2000). By focusing critical attention on the role of journalistic norms in the US, the findings in this paper complement studies examining journalistic norms and behaviors beyond the US context and support the call by in Burgess, 1990 to examine production and consumption of meaning via the media (1990). In combination, this work provides more supple conceptual tools for further cross-national analyses of relationships between media coverage of climate change and climate science, policy and the public. Moreover, analyses of contestation at this interface of climate science, policy and the public – mediated by news reporting – can also help to examine wider struggles of environmental politics and society.

While the IPCC – and the scientific community more generally (Oreskes, 2004) – has forcefully asserted that anthropogenic activities have had a ‘discernible’ effect on the global climate (Houghton et al., 1996), such assertions have translated poorly into the public arena of cooperative international policy. Most notably, the United States has adamantly refused to join over 140 nations in ratifying the Kyoto Protocol to curb human contributions to global warming.

As previously mentioned, a number of important factors combine to account for this foot-dragging. However, one underconsidered factor – the very norms that guide journal-

istic decision-making – plays a crucial role in the failure of the central messages in the generally-agreed-upon scientific discourse to transmit successfully into US-backed international policy to combat global warming. This is not random; rather, the translation is systemic and occurs not only because of complex macro-political and economic reasons rooted in power relations, but also, in part, because of the micro-processes that undergird journalism. Rather than relying on external constrictions – such as overt censorship and editorial spiking of stories – the mass-media depend on internal constructions, disciplinary practices that produce the patterned communicative geography of the public sphere.

In short, media coverage of climate change matters. News media play a key role in shaping the variegated, politicized terrain where people may be galvanized into action, or mired in a swirl of contradictory phraseology, and resigned to passivity (Bord et al., 2000). This influences perceptions (Baron, 2006) as well as ongoing dynamic interactions with climate policy and the public (Krosnick et al., 2006; Leiserowitz, 2006). This paper aims to serve as a foundation for continued interrogation of US media coverage of climate change, as it examines the role of US mass-media coverage in the selection, production, and maintenance of climate-change discourse since 1988.<sup>14</sup> This dovetails with the recommendations of scholars like Hay and Israel who suggest that geographers (and we would add scientists), “must now understand how and why journalists and their associated institutions construct events in particular ways” (2001, p. 122). Answers to calls such as these should, on a normative note, help global citizens cogently, coherently, and appropriately deal with one of the most pressing problems of the 21 century.

## References

- Adger, W.N., Benjaminsen, T., Brown, K., Svarstad, H., 2001. Advancing a political ecology of global environmental discourses. *Development and Change* 32, 681–715.
- Agarwal, A., Sunita, N., Sharma, A. (Eds.), 1999. *Global Environmental Negotiations I* New Delhi. Centre for Science and Environment.
- Anderson, A., 1997. *Media, Culture and Environment*. Rutgers Univ. Press, New Brunswick, NJ.
- Andrews, W., 1990. Environment, Global Warming, Bush. *CBS Evening News*. 5 February.
- Antilla, Liisa, 2005. Climate of scepticism: US newspaper coverage of the science of climate change. *Global Environmental Change* 15, 338–352.
- Baron, J., 2006. Thinking about global warming. *Climatic Change* 77, 137–150.
- Bell, A., 1994. Climate of opinion: public and media discourse on the global environment. *Discourse & Society* 5 (1), 33–64.
- Bennet, J., 1997a. Clinton Urges Action on Global Warming. *New York Times*. 9 May, p. A6.
- Bennet, J., 1997b. Warm Globe, Hot Politics. *New York Times*. 11 December, p. A1.
- Bennett, W.L., 1996. An introduction to journalism norms and representations of politics. *Political Communication* 13, 373–384.
- Bennett, W.L., 2002. *News: the Politics of Illusion*, fifth ed. Longman, New York.
- Booth, W., 1990. Primary ingredient of acid rain may counteract greenhouse effect. *Washington Post* 17 (September), A10.
- Bord, R.J., O'Connor, R.E., Fisher, A., 2000. In what sense does the public need to understand global climate change? *Public Understanding of Science* 9, 205–218.
- Bowen, J., 2004a. Global Warming: Movie Debate. *CBS Evening News*. 20 May.
- Bowen, J., 2004b. What Does it Mean to You? (global warming). *CBS Evening News*. 27 October.
- Boykoff, J., 2006. Framing dissent: mass-media coverage of the global justice movement. *New Political Science* 28 (2), 201–228.
- Boykoff, M.T., Boykoff, J.M., 2004. Balance as bias: global warming and the U.S. prestige press. *Global Environmental Change* 15 (2), 125–136.
- Bozell, B., 1992. Environment: Global Warming. *NBC Nightly News*. 9 March.
- Brokaw, T., 1990. Atmosphere, Global Warming. *NBC Nightly News*. 29 March.
- Brossard, D., Shanahan, J., McComas, K., 2000. Is mass media coverage of global warming culturally bound? A comparison of French and American coverage of global climate change. In: *Proceedings of Climate Change Communication Conference*, vol. B2, University of Waterloo, Ont., pp. 9–10.
- Burgess, J., 1990. The production and consumption of environmental meanings in the mass media: a research agenda for the 1990s. *Transactions of the Institute for British Geography* 15, 139–161.
- Carter, T.R., Parry, M.L., et al., 1995. *IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations*. IPCC, London, UK.
- Carvalho, A., 2005. Representing the politics of the greenhouse effect: discursive strategies in the British media. *Critical Discourse Studies* 2 (1), 1–29.
- Carvalho, A., Burgess, J., 2005. Cultural circuits of climate change in U.K. broadsheet newspapers, 1985–2003. *Society for Risk Analysis* 25 (6), 1457–1469.
- Compton, A., 1990. Environment, Global Warming, Bush. *ABC World News Tonight*. 5 February.
- Cunningham, B., 2003. Re-thinking objectivity. *Columbia Journalism Review* 42 (2), 24–32.
- Cushman, J.H., 1997. How Fast to Cut Back? Two Views; Turning Green puts some in the Black Now. *New York Times*. 1 December, F8.
- Delasky, C., 1990. Environment, Earth Day. *ABC World News Tonight*. April 15.
- Downs, A., 1972. Up and down with ecology – the ‘Issue-Attention Cycle’. *The Public Interest* 28, 38–50.
- Dunwoody, S., Peters, H.P., 1992. Mass media coverage of technological and environmental risks: a survey of research in the United States and Germany. *Public Understanding of Science* 1, 199–230.
- Entman, R.W., 1989. *Democracy Without Citizens: Media and the Decay of American Politics*. Oxford University Press, New York and Oxford.
- Ereaut, G., Segnit, N., 2006. *Warm Words*. Institute for Public Policy Research, London.
- Fialka, J.J., 2002. U.S. backs Indian to head climate panel after Exxon Mobil opposes American. *The Wall Street Journal* 4 (April), C18.
- Fialka, J.J., 2004. Religious leaders urge Senate to act on climate. *The Wall Street Journal* 19 (May), A2.
- Fleischer, A., 2000. Press briefing, The James S. Brady Briefing Room, 28(March).
- Freudenberg, W.R., 2000. Social Construction and Social Constrictions: Toward Analyzing the Social Construction of ‘the Naturalized’ and well as ‘the Natural’. In: Spaargaren, G., Mol, A.P.J., Buttel, F.H.

<sup>14</sup> Extrapolating from media coverage to audience effects though comes with inherent challenges and limitations, and thus warrants caution. We concur with the acknowledgement by Krosnick et al. that, “Documenting the impact of real world news media content on people’s beliefs and attitudes is typically difficult to do with a great deal of refinement, because it is practically impossible to assess precisely what media content a particular person has been exposed to, necessitating relatively crude analysis” (2006, p. 33). Nonetheless, we consider this contribution provides further foundational tools for future work in this area.

- (Eds.), *Environment and global modernity*. Sage, London, pp. 103–119.
- Galtung, J., Ruge, M., 1965. The structure of foreign news: The presentation of the Congo, Cuba and Cyprus crises in four foreign newspapers. *Journal of International Peace Research* 1, 64–90.
- Gans, H., 1979. *Deciding What's News*. Pantheon, New York.
- Gelbspan, R., 1998. *The Heat Is On*. Perseus Books, Cambridge, MA.
- Gerstenzang, J., 2001. Bush Defends his Stance on the Environment. *Los Angeles Times*, 30 March, p. A1.
- Harcup, T., O'Neill, D., 2001. What is news? Galtung and Ruge revisited. *Journalism Studies* 2 (2), 261–280.
- Hay, I., Israel, M., 2001. Newsmaking geography: communicating geography through the media. *Applied Geography* 21, 107–125.
- Hilgartner, S., Bosk, C.L., 1988. The rise and fall of social problems: a Public Arenas Model. *American Journal of Sociology* 94, 53–78.
- Houghton, J.T., Callander, B.A., et al., 1992. *Climate Change 1992: The Supplementary Report to the IPCC Scientific Assessment*. IPCC, Cambridge, UK.
- Houghton, J.T., Meira Filho, L.G., Callander, B.A., Harris, N., Kattenberg, A., Maskell, K., 1996. *Climate Change 1995: The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge.
- Houghton, J.T., Ding, Y., Griggs, D.J., Noguer, M., van der Linden, P.J., Dai, X., Maskell, K., Johnson, C.A., 2001. *Climate Change 2001: The Scientific Basis – Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge.
- Irwin, A., Wynne, B. (Eds.), 1996. *Misunderstanding Science? The Public Reconstruction of Science and Technology*. Cambridge University Press, Cambridge, UK.
- Iyengar, S., 1991. *Is Anyone Responsible?* University of Chicago Press, Chicago.
- Iyengar, S., Kinder, D.R., 1987. *News that Matters: Television and American Opinion*. The University of Chicago Press, Chicago and London.
- Johansen, B.E., 2002. *The Global Warming Desk Reference*. Greenwood Press, Westport, Conn.
- Kerlinger, F.N., 1973. *Foundations of Behavioral Research*, second ed. Holt, Reinhart, and Winston, New York.
- Kristof, N.D., 1997. Around the Globe, Big Worries and Small Signs of Progress; Island Nations fear Sea could Swamp them. *New York Times*, 1 December, p. F9.
- Krosnick, J.A., Holbrook, A.L., Lowe, L., Visser, P.S., 2006. The origins and consequences of democratic citizens' policy agendas: A study of popular concern about global warming. *Climatic Change* 77, 7–43.
- Leggett, J., 2001. *The Carbon War: Global Warming and the End of the Oil Era*. Routledge, New York.
- Leiserowitz, A., 2006. Climate change risk perception and policy preferences: the role of affect, imagery, and values. *Climatic Change* 77, 45–72.
- Lorenzoni, I., Pidgeon, N.F., 2006. Public views on climate change: European and USA perspectives. *Climatic Change* 77, 73–95.
- Mazur, A., Lee, J., 1993. Sounding the global alarm: environmental issues in the US national news. *Social Studies of Science* 23, 681–720.
- McCarthy, J.J., Canziani, O.F., Leary, N.A., Dokken, D.J., White, K.S., 2001. *Climate change 2001: Impacts, adaptation and vulnerability – Contribution of working group II to the Intergovernmental Panel on Climate Change Third Assessment Report*. Cambridge University Press, Cambridge.
- McChesney, R.W., 2000. *Rich Media, Poor Democracy*. The New Press, New York.
- McComas, K., Shanahan, J., 1999. Telling stories about global climate change. *Communication Research* 26 (1), 30–57.
- McCright, A.M., Dunlap, R.E., 2000. Challenging global warming as a social problem: an analysis of the conservative movement's counterclaims. *Social Problems* 47 (4), 499–522.
- McCright, A.M., Dunlap, R.E., 2003. Defeating Kyoto: the conservative movement's impact on U.S. climate change policy. *Social Problems* 50 (3), 348–373.
- McFarling, U.L., 2001. Studies Point to the Human Role in Global Warming. *Los Angeles Times*, 13 April, p. A1.
- McManus, P., 2000. Beyond Kyoto? Media representation of an environmental issue. *Australian Geographical Studies* 38 (3), 306–319.
- Milbank, D., Richburg, K., 2001. Bush, EU Clash over Climate Policy: Europeans Plan to Pursue Kyoto Curbs Despite U.S. Stance. *Washington Post*, 15 June, p. A1.
- Miller, M.M., Riechert, B.P., 2000. Interest group strategies and journalistic norms: news framing of environmental issues. In: Allan, S., Adam, B., Carter, C. (Eds.), *Environmental Risks and the Media*. Routledge, New York, pp. 45–54.
- Murdock, G., Petts, J., Horlick-Jones, T., 2003. In: Pidgeon, N., Kaspersen, R.E., Slovic, P. (Eds.), *The Social Amplification of Risk*. Cambridge University Press, Cambridge, pp. 159–174.
- Nakicenovic, N., Swart, R., 2000. *Summary for Policymakers: Emissions Scenarios*. IPCC, Cambridge, UK.
- Nelkin, D., 1987. *Selling Science: How the Press Covers Science and Technology*. W.H. Freeman, New York.
- Neuendorf, K.A., 2002. *The Content Analysis Guidebook*. Sage Publications, London.
- New York Times*, 2001. In President's words: 'a leadership role on the issue of climate change'. *New York Times* (12 June, p. A12).
- NSF Science and Engineering Indicators 2004: 2004. <<http://www.nsf.gov/statistics/seind04/c7/c7s1.htm>> (accessed 14.09.2006).
- Oreskes, N., 2004. Beyond the ivory tower: the scientific consensus on climate change. *Science* 306 (5702), 1686. 3 December.
- Pearce, F., 1989. *Turning up the Heat: Our Perilous Future in the Global Greenhouse*. Bodley Head, London.
- Peterson, C., 1989. Experts, OMB Spar on Global Warming: 'Greenhouse Effect' may be Accelerating, Scientists Tell Hearing. *Washington Post*, 9 May, A1.
- Petts, J., Horlick-Jones, T., Murdock, G., 2001. *Social amplification of risk: The media and the public*. Health and Safety Executive Contract Research Report 329. HSE Books, Sudbury.
- Pianin, E., 2002. Bush Unveils Global Warming Plan: President's Approach Focuses on New Technology, Incentives for Industry. *Washington Post*, 15 February, A9.
- Pidgeon, N.F., Gregory, R., 2004. Judgment, decision-making and public policy. In: Koehler, D., Harvey, N. (Eds.), *Handbook of Judgment and Decision-making*. Blackwell, Oxford, pp. 604–623.
- Project for Excellence in Journalism *The State of the News Media 2006*. 2006. <<http://www.stateofthenewsmedia.org/2006/index.asp>> (accessed 14.09.2006).
- Regalado, A., 2004. States to sue power companies over gases linked to warming. *The Wall Street Journal* 21 (July), B9.
- Revkin, A., 2001. Bush's Shift Could Doom Air Pact, Some Say. *New York Times*, 17 March, A7.
- Revkin, A., 2002. Can Global Warming be Studied too Much? *New York Times*, 3 December, F1.
- Riffe, D., Lacy, S., Rico, F.G., 1998. *Analyzing Media Messages*. Lawrence Erlbaum Associates, Mahwah, NJ and London.
- Roberts, J., 2004. *Environmental Policy*. Routledge, London.
- Rubin, A., Babbie, E., 2000. *Research Methods for Social Work*, fourth ed. Wadsworth.
- Schoenfeld, A.C., Meier, R.F., Griffin, R.J., 1979. Constructing a social problem: the press and the environment. *Social Problems* 27 (1), 38–61.
- Shabecoff, P., 1988. Global warming has begun, expert tells Senate. *New York Times*, 24 June, p. A1.
- Smith, J., 2005. Dangerous news: media decision making about climate change risk. *Risk Analysis* 25, 1471.
- Spector, M., Kitsuse, J., 1977. *Constructing Social Problems*. Cummings, Menlo Park, CA.
- Starr, P., 2004. *The Creation of the Media: Political Origins of Modern Communications*. Basic Books, New York, NY.
- Stocking, H., Leonard, J.P., 1990. The greening of the media. *Columbia Journalism Review*, 37–44.
- Swarns, R.L., 2001. U.S. is not the Only Nation Resisting a Strong Pact at the Summit Meeting on Global Warming. *New York Times*, 30 August, p. A4.

- Trumbo, C., 1996. Constructing climate change: claims and frames in U.S. news coverage of an environmental issue. *Public Understanding of Science* 5, 269–283.
- United Nations Framework Convention on Climate Change (UNFCCC). 1992. Rio de Janeiro, Brazil.
- United Nations Framework Convention on Climate Change (UNFCCC). 1995. Report of the conference of parties on its first session, held at Berlin from 28 March to 7 April 1995. Berlin, Germany.
- Ungar, S., 1992. The rise and (relative) decline of global warming as a social problem. *The Sociological Quarterly* 33, 483–501.
- Ungar, S., 2000. Knowledge, ignorance and the popular culture: climate change versus the ozone hole. *Public Understanding of Science* 9, 297–312.
- U.S. Census Bureau, Population Division. 2006. U.S. and world population clocks. <<http://www.census.gov/main/www/popclock.html>> (accessed 09.09.2006).
- Watson, R.T., Zinyowera, M.C., et al., 1997. *The Regional Impacts of Climate Change: An Assessment of Vulnerability*. IPCC, Cambridge, UK.
- Weingart, P., Engels, A., Pansegrau, P., 2000. Risks of communication: discourses on climate change in science, politics, and the mass media. *Public Understanding of Science* 9, 261–283.
- Weisskopf, M., 1990. Environmentalists Try to cut Sununu Down to Size. *Washington Post*. 22 February, p. A21.
- Weisskopf, M., 1992a. Bush to attend Rio 'Earth Summit' in June: Decision follows U.S.-won Concessions in Draft Language on Limiting Pollution. *Washington Post*. 13 May, p. A3.
- Weisskopf, M., 1992b. Bush was Aloof in Warming Debate. *Washington Post*. 31 October, p. A1.
- Wilkins, L., 1993. Between facts and values: print media coverage of the greenhouse effect, 1987–1990. *Public Understanding of Science* 2, 71–84.
- Wilkins, L., Patterson, P., 1987. Risk analysis and the construction of news. *Journal of Communication* 37 (3), 80–92.
- Wilkins, L., Patterson, P., 1991. *Risky Business: Communicating Issues of Science, Risk and Public Policy*. Greenwood Press, Westport, CT.
- Williams, C.J., 2001. Germany Seeks to Sway U.S. to Uphold Emissions Goals. *Los Angeles Times*. 28 March, p. A1.
- Williams, J., Frey, R.S., 1997. The changing status of global warming as a social problem: competing factors in two public arenas. *Research in Community Sociology* 7, 279–299.
- Wilson, K.M., 1995. Mass media as sources of global warming knowledge. *Mass Communication Review* 22 (1&2), 75–89.
- Wilson, K.M., 2000. Communicating climate change through the media: predictions, politics, and perceptions of risks. In: Allan, S., Adam, B., Carter, C. (Eds.), *Environmental Risks and the Media*. Routledge, New York, pp. 201–217.
- Wynne, B., 1994. Scientific knowledge and the global environment. In: Benton, T., Redclift, M. (Eds.), *Social Theory and the Global Environment*. Routledge, London, pp. 169–189.
- Zehr, S.C., 2000. Public representations of scientific uncertainty about global climate change. *Public Understanding of Science* 9, 85–103.