

We Speak for the Trees: Media Reporting on the Environment

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Key Words

communication, cultural politics, discourse, governance, news

Abstract

This review article surveys the role of the media in communicating environmental issues. Media representations—from news to entertainment—provide critical links between formal environmental science and politics and the realities of how people experience and interact with their environments. People abundantly turn to media—such as television, newspapers, magazines, radio, and Internet—to help make sense of the many complexities relating to environmental science and governance that (un)consciously shape our lives. I examine how multiscale factors have shaped media coverage in complex, dynamic, and nonlinear ways. These inquiries are situated in historical context as well as in larger processes of cultural politics and environmental change. Discussions here also touch on how media portrayals influence ongoing public understanding and engagement. Connections between media information and behaviors are not straightforward, as coverage does not determine engagement. Nonetheless, this article explores how media reports influence the spectrum of possibilities for different forms of environmental governance.

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1. INTRODUCTION

On June 13, 2005, a headline on the front page of the *USA Today* proclaimed, “The debate is over: globe is warming.” Article author Dan Vergano wrote (1):

Don’t look now, but the ground has shifted on global warming. After decades of debate over whether the planet is heating and, if so, whose fault it is, divergent groups are joining hands with little fanfare to deal with a problem they say people can no longer avoid.

Two days later, an editorial from the same newspaper went with the lede, “Yes the globe is warming, even if Bush denies it” (2).

This particular set of reports was deemed significant for three primary reasons. First, this was because of the influence of the source. In recent years, *USA Today* has been the most widely circulated daily newspaper in the United States (3). Along with other top newspaper and television outlets, this newspaper—through a range of format, content, and distribution strategies—has contributed to discourses shaping ongoing climate governance in the United States as well as internationally (4). Second, this stance was said to more accurately articulate the consensus

view in climate science that humans contribute to climate change, most prominently embodied by the past decade of reports from the United Nations-sponsored Intergovernmental Panel on Climate Change (IPCC).¹ Third, the reporting shined a light onto ongoing contentious climate politics at the U.S. federal level, where President George W. Bush’s administration was viewed as having a climate science and policy stance at odds with many supporting science and governance bodies, e.g., the U.S. National Academy of Sciences. Vergano’s lucid piece went on to win the 2006 David Perlman Award for Excellence in Journalism from the American Geophysical Union, and many scientists and policy actors—who over time had felt that their research findings, comments and statements have often been misrepresented by a range of mass media outlets—felt this marked a watershed moment toward more accurate environment and science reporting (6).

But did this mark the new beginning for improved media coverage of climate change? Did this signal a significant change in associated spaces where media represent environmental issues more broadly? Was this an illustration of the steady march of progress toward better science, media, and governance interactions? To address these kinds of questions, this article starts by assessing continued coverage of

¹In recent decades, scientific understanding of attribution to climate change has evolved. In the last decade, reports and findings have signaled a broad scientific consensus—despite lingering uncertainties regarding the extent of attribution—that humans have been contributing to modern climate change. For instance, the recently released IPCC Summary for policymakers in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* states, “Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations” (5, p. 8). This IPCC statement is the product of over 2500 of the planet’s top climate scientists’ reviews and assessments of physical science research on climate change. Fielding over 30,000 comments on drafts of the document from experts and governments, this multistage peer-review and consensus process represents a clear view of the state of scientific understanding of climate change.

IPCC:

Intergovernmental Panel on Climate Change

Mass media:

publishers, editors, journalists, and others who produce, interpret and disseminate information, largely through newspapers, magazines, television, radio, and the Internet

climate change in the pages of that same newspaper. In 2008, there appeared a piece in *USA Today* by Rice called, “Climate Now Shifting on a Continental Scale. Study: Migration Patterns Adjust, Plants Bloom Early.” The news “hook” was research findings from *Nature*, documenting shifts in a range of physical and biological shifts in response to changes in the climate. Rice reported on new findings that collated shifts, from penguin population declines to early European arrivals of migratory birds to melting glaciers around the world. However, the article then stated the following (7):

It was a real challenge to separate the influence of human-caused temperature increases from natural climate variations or other confounding factors, such as land-use changes or pollution,” says study coauthor David Karoly, a climate scientist at the University of Melbourne in Victoria, Australia. Scientists reported in the study, however, that “these temperature increases at continental scales cannot be explained by natural climate variations alone.” But Pat Michaels, a senior fellow in environmental studies at the Cato Institute in Washington, D.C., says the research “is a retrospective study, with very little to say prospectively, given the unevenness of global warming.” Michaels says that there has been no warming since 1997 and that a recent study, also published in *Nature*, found that global warming isn’t likely to get started again for at least another 10 years. “I think the problem with this study is not in matching the past with the changes but in projecting the future.”

To the frustration of some of the scientists involved in the *Nature* study (8), Rice conflated a number of distinct scientific issues when assembling the article. In so doing, he called a number of distinct facets of climate science into question thereby raising the spectre of doubt over well-established findings in climate science. Therefore, this piece enabled the well-known contrarian Pat Michaels to fundamentally call into question whether the climate is changing at all.

These brief examples illuminate some of the communication challenges facing the production of media representations of the environment. In this article, I work through perennial difficulties in traversing the dynamic terrain of media reporting and the environment. While the article addresses consumption of media messages to some extent, it focuses on production of interacting texts and images. In so doing, I explore how some aspects of these processes have improved, while others continue to face ongoing institutional, political, economic, and cultural challenges. First, the review situates mass media in a wider cultural politics of the environment. This context setting facilitates how environmental science and governance find meaning in our everyday lives, and how mass media, in particular, respond to the Lorax-like call to “speak for the trees.” Second, the article traces a brief history of the developments of these spaces, and their interactions over time. Third, it argues that the overarching quandary facing contemporary media coverage of the environment is that many distinct issues and challenges are conflated and confused, thereby skewing public understanding, governance, and policy action. Fourth, the text unpacks and interrogates a range of factors at multiple scales that contribute to the practices that produce media representations. These include external factors (such as political economic challenges associated with corporate media consolidation) as well as internal influences (such as contributions from the deployment of journalistic norms). Fifth, the article connects these factors shaping production with their dissemination and interpretation of environmental news in the public sphere, as well as our private lives. Here, it also briefly surveys two models that map media and policy attention/engagement. Finally, how these elements may shape future media coverage of ongoing environmental issues is assessed. These contested spaces between media and environmental politics are outlined to help make sense of how media representations frame truth claims, how larger political contexts influence such framing processes, and how particularly amplified voices

in these spaces shape ongoing interpretations of environmental issues. In other words, this review seeks to appraise the Lorax-like role of media as a key interpreter and actor at the interface of humans and the environment.

2. MASS MEDIA, CULTURAL POLITICS, AND THE ENVIRONMENT

*He snapped, I'm the Lorax who speaks for the trees,
which you seem to be chopping as fast as you please.*

Dr. Seuss

Contemporary environmental challenges permeate the very material and discursive fabric of our lives, weaving through economics, politics, culture, and society. Through time, mass media coverage has proven to be a key contributor—among a number of factors—that has stitched spaces of environmental science, governance, and daily life together. Mass media have given voice to the environment itself by articulating environmental change in particular ways, via claims makers or authorized definers. More formal spaces of science, policy, and politics operating on multiple scales often find meaning in people's everyday lives and livelihoods through mass media—albeit in messy, nonlinear and diffuse ways. I thus adopt a more expansive view of science in society where scientific understanding is part of, rather than separate from, public uptake. As such, mass media have thereby influenced a range of processes, from formal environmental policy to informal notions of public understanding. Media representations are convergences of competing knowledges, framing environmental issues for policy, politics, and the public and drawing attention to how to make sense of, as well as value, the changing world. Emanating out from these processes, public perceptions, attitudes, intentions, and behaviors, in turn, often link back through mass media into ongoing formulations of environmental governance.

Most broadly, mass media range from entertainment to news media, spanning television, films, books, flyers, newspapers, magazines, radio, and the Internet. In the past decade, there

has been a significant expansion from consumption of traditional mass media—broadcast television, newspapers, radio—into consumption of new media, such as the Internet and mobile phone communications. This movement has signaled substantive changes in how people access and interact with information, who has access, and who are the authorized definers or claims makers. Essentially, in tandem with technological advances, these communications are seen to be a fundamental shift from one-to-many (often one-way) communications to many-to-many more interactive webs of communications. Together, these media are constituted by a diverse and dynamic set of institutions, processes, and practices that together serve as mediating forces between communities, such as science, policy, and public citizens. Members of the communications industry and profession—publishers, editors, journalists, and others—produce, interpret, and communicate images, information, and imaginaries for varied forms of consumption. Studies show that television is respondents' primary source of information, followed by the Internet, then newspapers and radio (9).

Workings of mass media—processes and their effects—are usefully situated in a wider cultural politics of the environment, and changes therein. By cultural politics, I mean processes involving how meaning is constructed and negotiated across space and place. This involves not only the representations and messages that gain traction in discourses, but also those that are absent from them or silenced (10, 11). Moreover, assessments of discourses are tethered to material realities and social practices (12). Harvey has commented, “struggles over representation are as fundamental to the activities of place construction as bricks and mortar” (13). Examining these features as manifestations of an ongoing process facilitates the consideration of questions regarding how power flows through the capillaries of our shared social, cultural, and political body, constructing knowledge, norms, conventions, and (un)truths (14). Such dynamic interactions form nexuses of power-knowledge that shape how we come to

understand things as the truth and, in turn, contribute to managing the conditions and tactics of life (15). However, rather than brash imposition of law or direct disciplinary techniques, these more subtle factors permeate and contribute to what becomes permissible and normal in everyday discourses, practices, and institutional processes (16). Effectively, these influences shape how we view environmental problems as well as potential solutions.

Furthermore, the discursive and material elements comprising a cultural politics of environmental change are inextricably shaped by ongoing environmental processes themselves. This has been described as the dialectic of nature and culture (17). Nature is not a backdrop upon which heterogeneous human actors contest and battle for epistemological and material successes. Rather, meaning is constructed, maintained, and contested through intertwined sociopolitical and biophysical processes (18). In other words, the changing environment—and humans' interaction in these spaces—provides the material for the media to cover. Meaning is constructed and manifested through the ontological conditions of nature and the contingent social and political processes involved in interpretations of this nature (19). Approaching these spaces of cultural politics of the environment in this way helps to interrogate “how social and political framings are woven into both the formulation of scientific explanations of environmental problems, and the solutions proposed to reduce them” (20). These framings are inherent to cognition and effectively contextualize as well as fix interpretive categories to help explain and describe complex environmental processes (21). Moreover, these serve to assemble and privilege certain interpretations and understandings over others (22).

So although cultural politics of the environment lurk in a multitude of spaces (our neighborhoods, county councils, workplaces, schools, and town centers), a prominent link between these spaces again is mass media. This community serves a vital role in communication processes between science, policy, and the public. Representations of climate change via

mass media shape many people's perceptions and considerations for action. Media communications thus unfold within a larger political context that then feeds back into ongoing media coverage and considerations. From regulatory frameworks (bounding political opportunities and constraints) and institutional pressures (influencing political and journalistic norms) to individual decision making about what becomes news, these interactions are dynamic and contested spaces of meaning making and maintenance. Thus, it can be argued that mass media outlets—and the many people and processes comprising them—effectively speak for the trees as they give voice to environmental problem formulations in various ways and also then frame the ways in which they are discussed and governed. These articulations may take on varied roles over time, from watchdog to lapdog to guarddog.

3. A BRIEF HISTORY

In this section, these mass media processes are placed in greater historical context. In so doing, there is further exploration of those who make various claims about the environment by way of mass media. Clearly science and politics have influenced media coverage of the environment over time. But conversely, media representations have also shaped ongoing scientific and political considerations, decisions, and activities. In other words, mass media influence who has a say and how. Along with many spatial factors also shaping how mass media grapple with various environmental issues, the temporal dimension regarding these unfolding processes of representation and therefore knowledge production and destruction are important. Over time, there has been a great struggle to represent and thereby influence the ways in which institutions and individual grapple with various environmental challenges.

An expansive history of media begins with the art of rhetoric in ancient Greece and weaves through the centuries of the Roman Empire, the European Middle Ages, and the Renaissance. Over these formative periods,

a wide range of activities and modes of communication—performance art, plays, poetry, debate—drew on narratives, arguments, allusions, and reports to communicate various themes, information, issues, and events (23). These seeds of media then sprouted over the centuries that followed. However, such growth was limited by a number of competing factors, such as strong state control over the public sphere, legacies of colonialism, low literacy rates, and technological capacity challenges (24). However, it was through conditions during the French Revolution and the first Industrial Revolution in the late 1700s that provided opportunities for media communications—newspapers in particular—to emerge with widespread force (25). The thirst for mass political communication, coupled with newfound technological and economic capacity, as well as freedom to participate in democratic processes, enabled the proliferation of and development of newspapers into the 1800s. In the mid-1800s, media communications expanded their reach and influence tremendously, where mass circulation print presses were set up in urban centers, and daily newspaper production quadrupled in 40 years: Circulation grew from 0.34 papers per household in 1870 to 1.21 papers per household in 1910 (24). Thus, during this time, mass media outlets formed increasingly significant and powerful social, political, economic, and cultural institutions (25). Moreover, rapid expansion of modern media communications in the nineteenth and twentieth centuries set the stage for the impressive deployment of information via countless channels and outlets now dubbed the “fourth estate” in contemporary society. Nonetheless, it was not until the 1920s that scholars actually began to speak of such activities as media, as we do today (23).

Many books, essays, media reports, and texts throughout the last century considered environmental issues, thus provoking attention and movements of environmental politics. For instance, Aldo Leopold’s *Sand County Almanac* prompted many to consider environmental stewardship through his discussion of the “land

ethic” (26). In media studies, research from the “Chicago School” (27), the “Frankfurt School” (28), and luminaries such as Lazarsfeld & Merton (29) and Walter Lippman (30) shaped thinking in politics and cultural studies as they related to modern media communications. Intersections between mass media and the environment gained greater prominence in the 1960s and 1970s, as practitioners and researchers gained more insights into connections between human activities and environmental responses (31, 32). For instance, Rachel Carson’s book *Silent Spring* raised public awareness on the environmental risk from pesticide exposure and examined how chemical industry interests influenced the lack of environmental policy action (33). Carson’s analysis (focused on the disappearance of spring bird songs from fatal toxic exposure) significantly shaped investigative environmental reporting and the profession of science journalism from then up to the present (34).

Over the past three decades, scholars have examined how these representations have fed back into ongoing formulations and considerations of environmental problems, issues, and themes. For example, an investigation by Liverman & Sherman (35) examined portrayals of natural hazards in novels and films and was set in an edited volume examining intersections between media and culture across a number of environmental issues (36). Furthermore, Nelkin (37) wrote an influential book on the reasons behind the increase of media coverage of science and technology. Following on from this work, Burgess (38) put forward a foundational and conceptual work regarding the production and consumption of environmental meaning via the media, and she commented on the emerging need to examine aspects of the intersections between mass media, science, environmental politics, and public citizens. Since the early 1990s, a sharp increase in research has explored the influence of mass media on cultural politics and environmental change (e.g., 39–45). Many studies have examined specific environmental issues. For instance, Wilson (46) and other researchers have recognized the key role

that television weathercasters play in the communication of a range of science and environment issues. Other examples include agricultural biotechnology and genetically modified food (47–49), climate change (50–54), earthquakes (55), energy (56), hazardous waste (57), nanotechnology (58–59), nuclear power (60–61), environment and public health (e.g., global bird flu) (62), the autism vaccines controversy (63), natural hazards and disasters (35, 64), and stratospheric ozone depletion (65). The majority of these studies examined print media coverage, whereas others sought to examine television news (64, 66–69) and radio news coverage (70). Additionally, most of these assessments have focused on North American (71), U.K. (72–74), EU (75–76), and Australia/New Zealand (77–79) contexts.

It is useful to further consider the example of climate change to appraise the burgeoning media coverage of associated science and governance issues, assess studies that have considered media and climate change interactions, and consider issues of who are the claims makers of environmental problems in the mass media. Media coverage of climate change first emerged on a mass scale in the 1930s. A staff report in the *New York Times* commented, “The earth must be inevitably changing its aspect and its climate. How the change is slowly taking place and what the result will be has been considered. . .” (80). Media coverage of human contributions to climate change continued to sporadically appear through the subsequent five decades. But, as international and domestic climate policy began to take shape in the mid-1980s, the three media-science-policy spheres collided when media coverage of climate change science and policy increased dramatically; therefore, many climate science and governance issues flowed into public view (69, 81). A number of high-profile interventions turned spectacles generated substantial attention and became emblems for newfound public concern on the issue (82). During this period and into the 1990s, climate scientists were widely quoted and called upon in the media as authorized speakers on behalf of the climate. Street has commented, “Representation,

whatever the principles or ethical values informing it, does not reflect the world so much as organize knowledge about it” (83). In addition, carbon-based business, industry interests, and environmental nongovernmental organizations (ENGOs) have grappled for their particular discursive and material actions to address climate challenges. Many struggles to represent climate change in the 1980s and 1990s were thus also dominated by businesses interests and ENGOs (84). In the process of understanding changes in the climate, many entities, organizations, interests, and individuals battled to shape awareness, engagement, and possible action. Among business interests, over time those enmeshed in carbon-based energy production became particularly interested in these challenges. The variously embattled efforts to define the climate question and frame the problems, predicaments, and possible solutions have expanded tremendously to a variety of actors in subsequent years.

Moving from the 1990s into the new millennium, the amount of media coverage of climate change continued to rise. This reached a high-water mark in 2006 and into 2007. **Figure 1** shows the ebbs and flows of news articles on climate change or global warming from January 2004 through February 2009 in 50 newspapers across 20 countries. Owing to sampling, the relative trends across the various regions are more useful than absolute numbers in the figure. Nonetheless, the high-water mark of coverage of climate change in late 2006 and early 2007 can be attributed to a series of key and interrelated events. The year 2006 marked the global release of the Al Gore film *An Inconvenient Truth*. Moreover, the much anticipated, discussed, and criticized “Stern Review on the Economics of Climate Change” was released on October 30, 2006. Intense media coverage of the Stern Review then fed into media attention on the Twelfth Conference of Parties (COP12) meeting in Nairobi, Kenya, that began approximately a week later. Following on in 2007 were greatly fluctuating oil and gasoline prices, as well as the releases of the highly influential IPCC Fourth Assessment Reports (5).

ENGO:
environmental
nongovernmental
organization

COP: Conference of
Parties

However, the figure also reveals a discernible leveling off or decrease in the amount of coverage from later 2007 through 2008 and into 2009. This trend could be attributed to a number of intersecting influences. Among them, first, media attention on the global economic recession may have displaced the news slot for climate change reporting; second, issues formerly discussed explicitly as climate change or global warming became increasingly treated as energy issues, sustainability considerations, and other associated themes (e.g., carbon trading); third, upon the 2007 release of various Working Group reports for the IPCC Fourth Assessment Report, fewer fundamental issues were subsequently deemed as controversial as in previous assessments (e.g., human contributions to climate change). With aforementioned sampling limitations in mind, this figure also indicates that there has remained a relatively low number of stories on climate change or global warming in the regions of South America and Africa. This points to a critical regional information gap in reporting on these issues, and it relates to capacity issues and support for reporters in these regions and countries (developing and poorer regions/countries).

Frankly, it is often those who are most at risk from environmental impacts, who also are those who typically have access to the least information about it through mass media. This shortcoming is detrimental to efforts to build resilient communities with improved capacity to adapt to changes in the climate, address climate impacts, and mitigate greenhouse gas (GHG) emissions. Amid these larger trends, it is important to note that, to the extent that policy actors and negotiators think of mass media attention to climate change as a proxy for public attention to climate change (and pressure for action), a diminished amount of coverage might be seen as detrimental to putting forward substantive agreements, such as the post-2012 regime negotiated in the run up to COP15 in Copenhagen, and, more generally, to the future of significant international policy action on climate change.

Beyond the quantity of news coverage on climate change and global warming, it is critically important to consider the content of coverage and, more specifically, the “framing” of the climate challenge through media representational practices. From the eighteenth century English-led Industrial Revolution and “dark satanic mills,” progress was often defined by carbon-based technological advancements and driven by the engines of coal, oil, and natural gas. Meanwhile, beginning in the late 1800s, scientists such as Svante Arrhenius, G.S. Callendar, Gilbert Plass, and others began making links between GHG emissions from energy production and increases in atmospheric temperature as well as other climate changes (85, 86). As scientific work coalesced on basic points that the climate was changing and that humans played a part in such changes, early actors responded to these findings. In terms of business, some adapted and changed practices, whereas others called such research into question. Meanwhile, many ENGOs sought to raise public awareness and policy actor concern regarding the negative externalities of environmental damage and risk. On this dynamic battlefield of competing knowledge(s) and representations, predominantly U.S.-based think tanks influenced by conservative ideologies—and often funded by carbon-based industry actors—amplified uncertainties regarding various aspects of climate science, de-emphasized the human contribution to climate change, and called attention to the costs of action, such as switching to renewable energy sources. These messages were repeated in multifarious ways, from subtle scientific certainty argumentation methods (87) to more deliberate politics of manipulation (88, 89) and to overtly deceptive disinformation campaigns and initiatives (90, 91). These, in turn, have been found to inspire and catalyze (92) as well as dampen social movements for change (93). Research by McCright & Dunlap (88, 94) has focused on the opposition movement dubbed contrarians, denialists, inactivists, or skeptics.

In the past decade, questions raised across this spectrum throughout mass media sources

have largely moved away from “is the climate changing?” and “do humans play a role in climate change?” to more textured considerations of governance and economics. For instance, many articles have addressed questions regarding how to effectively govern the mitigation of GHG emissions from sources contributing to climate change, and how to construct and maintain initiatives to help vulnerable communities adapt to already unfolding climate impacts. Mass media articles on economic and political costs and benefits have played a key part in framing considerations for policy action as well as public understanding and engagement. However, journalist Pooley—the former managing editor of *Fortune* magazine and national editor of *Time* magazine—argued in a 2009 paper that, although news on climate change is increasingly focused on economics and policy action, representations have fallen short in three key ways (95): First, reporting on the issues has remained fragmented. Environmental journalists cover environmental aspects of the challenge, politics reporters emphasize the political edge, and economics writers focus on the economics. As a result, the picture remains a fragmented one, whereas important environmental issues like these must be treated more coherently. Second (and related), journalists have failed to make climate economics and policy stories understandable and meaningful to readers. The costs of particular policy actions are highlighted, while the benefits underreported; conversely the costs of inaction are largely omitted. Third, Pooley argues that the consensus on climate governance has been misrepresented and confused, thereby fueling misplaced debates on various policy actions.

While media representations of climate governance—and critiques therein—have gained traction in recent years, others argue that the discussions have remained encased in the logic of neoliberal late capitalism (96). In the academic literature, critiques have emerged regarding the dangers of emergent “carbon capitalism” associated with commodifying the atmosphere, and the fixation with market mechanisms as primary tools to answer climate

questions, among others (97, 98). Moreover, these movements are deemed problematic to the extent that these activities “render the messy materiality of life legible as discrete entities, individuated and abstracted from the complex social and ecological integuments” (99) and, in so doing, reduce the need for decarbonization to a matter of simple (neo-liberal) political economics. In other words, such reformist economic measures are (to invoke the hackneyed hymn), “like rearranging the deck chairs on the sinking Titanic.” However, these critiques have remained largely absent in mainstream mass media representations to date. Nonetheless, within these frames, business groups, ideologically driven think tanks, and ENGOs have continued to vigorously debate and discuss associated features and consequences in the landscapes of mass media. Examples abound: As businesses have touted “carbon neutrality” in their practices, and some ENGOs have praised such activities as a first awareness-raising step toward ongoing decarbonization of industrial practices; meanwhile, other ENGOs have fiercely critiqued these claims as “greenwashing” business-as-usual actions.

At the same time, the boundaries between who constitute authorized speakers (and who do not) as well as who are legitimate claims makers are consistently being interrogated and challenged (100, 101). Leiserowitz has written that these arenas of claims making and framing are “exercises in power . . . Those with the power to define the terms of the debate strongly determine the outcomes” (102). Media coverage of the environment has increasingly expanded from drawing on scientists, business, and ENGO actors for quotes and comments into spaces such as those of popular culture. This is more prevalent in contemporary entertainment media; such developments have implications on the changing architecture of the cultural politics of environmental change. Although endangered polar bears or wild moose may have previously represented issues on the environment, human celebrities have increasingly been seen as the new charismatic

megafauna, populating discourses on possibilities for environmental governance and everyday action. In the past five years or so there has been a clear surge in the coverage of celebrities connected to climate change in various media outlets (103). In the aforementioned neoliberal spaces carved out by increasingly marketized, privatized, and individualized ways of addressing environmental question(s), U2 frontman Bono elegantly described many complex, intertwined, and contradictory forces when he commented in an interview with *Vogue*, “celebrity is a bit silly, but it’s currency of a kind” (104). These celebrity effects raise questions as to whether such activities represent democratic movements by and for the people and the public realm, or rather plutocratic, unique, and extraordinary elite behaviors of distraction. However, as these questions relate to environmental governance and everyday practices, they are arguably as important now as ever before.

In the new millennium, actors making claims about environmental issues have continued to expand, and the negotiations involved in who are authorized definers of environmental issues has intensified. For instance, a key study examined how ENGOs have drawn on expertise and engaged in debates around the issue of environmental waste in the United Kingdom. Researchers found that, while ENGOs still rely on the authority of science, the more contemporary spaces of environmental science and governance have opened up to greater ENGO access as legitimate claims makers themselves. The authors make the point that across other environmental issues, “many challenges are not strategic but contextual . . . expertise built around one boundary does not automatically transfer to another” (101). As mass media frame and represent environmental issues increasingly through these extended networks, questions remain as to how these representations will shape the contemporary cultural politics of the environment, where formal environmental science and policy are entangled with everyday life. Mass media representations of environmental actors, action, predicaments, and progress remain key influences that shape

discourses and bound considerations of essentially who speaks for the trees in ongoing questions of environmental governance. It remains important to examine how media representations and symbols are negotiated through relations of dominance, subordination, inequalities of access, and resources, thereby influencing a “scope of politics” (105) or a spectrum of possibilities for environmental governance.

4. THE GREAT ENVIRONMENTAL GESTALT SWINDLE

Mass media are important interpreters of environmental science and policy information: The public frequently learns about the environment from news and entertainment media. In this context, central, fundamental, and immediate challenges that continue to face mass media in portraying environmental issues are those of fairness, accuracy, and precision in representation. In this high stakes milieu of environmental reporting, journalists and editors, as well as scientists and policy actors, need to be intensely scrupulous. Although media interventions seek to enhance understanding of complex and dynamic human-environment interactions, vague and decontextualized reporting instead can enhance bewilderment. Nonetheless, all too often, media reports conflate the vast and varied terrain from environmental science to governance, from consensus to debate, as unified issues. To the extent that mass media fuse all these issues into environmental gestalt, the collective public is not well served.

Disagreement and dissent certainly have value in reshaping understanding. However, when these are not effectively placed in context with the larger currents of scientific views from convergence to contention, public understanding of these issues suffers. Seminal research by Corbett & Durfee (106) examined coverage of climate change with a focus on uncertainty. Through an experimental design of three newspaper story treatments, i.e., controversy, context, and control (neither context nor controversy), they found that greater contextualization within climate science stories

helps to mitigate against controversy stirred up through uncertainty. So reader perceptions, and by extension public understanding, can be affected by the sometime subtle characteristics of context.

Context helps sort out marginalized views from counterclaims worthy of consideration on various aspects of environmental challenges. *New York Times* journalist Revkin (107) refers to reporting without context “whiplash journalism.” He has written that, “the media seem either to overplay a sense of imminent calamity or to ignore the issue altogether because it is not black and white or on a time scale that feels like news. This approach leaves society like a ship at anchor swinging cyclically with the tide and not going anywhere. What is lost in the swings of media coverage is a century of study and evidence . . .” (107). As a result, it becomes more (rather than less) challenging for citizens and policy actors to make sense of these issues, influencing their everyday lives and livelihoods. Moreover, such treatments through the media contribute to ongoing illusory, misleading, and counterproductive debates within the public and policy communities.

There are facets of science and environment where agreement is strong and convergent agreement dominates, whereas in others contentious disagreement garners worthwhile debate and discussion. Such conflation breeds manipulation and further confusion. Granted, media reporting helps address, analyze, and discuss these issues but does not answer them. Media coverage needs to better portray the contours of the varied aspects of environmental change, as better reporting has critical implications for understanding, meaning, and potential public engagement. Clearly, the role of the journalist is not that of a parrot. Choices about how to represent various aspects of environmental science and policy through the media depend on available information, interpretation, and context. Nonetheless, all aspects of environmental issues should not be treated equally. There are facets of environmental change where consensus is strong and convergent agreement dominates, and in others, contentious

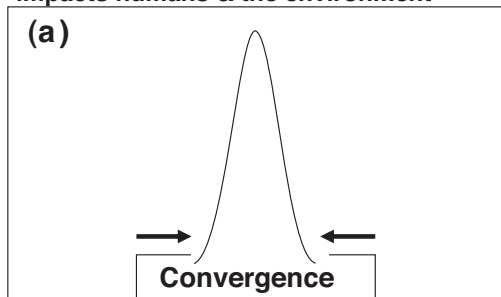
disagreement garners worthwhile debate and discussion (**Figure 2**).

First, consider panel (*a*), high mercury exposure adversely impacts humans and the environment. The convergent/divergent arrows introduce a temporal dimension that influences such levels of agreement. Through increasing scientific information, there has been rising convergent agreement over time that various uses of mercury can be damaging to human health and the environment. Panel (*b*), genetic engineering of crops can solve food production crises, and panel (*c*), nanotechnology is the key to clean energy production in the 21st century, represent both environmental science and governance questions that have a range of perspectives, views, and opinions. Therefore, the schematic represents divergent agreement on these particular points, though some particular cases may have arguably more points of view staked out than others. Last, consider panel (*d*), humans contribute to climate change. Over the past two decades, IPCC endeavors have enhanced understanding of global climate change through careful interpretation of emerging climate research via peer-reviewed and consensus-driven processes (108). In this particular aspect of climate change, IPCC statements have become clear and consistent with those from numerous national science academies and other scientific organizations in stating the humans play a role in climate change.

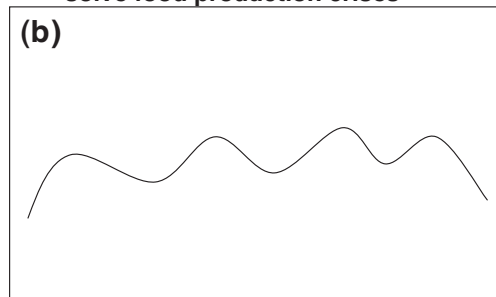
Considering panel *c* in more detail, with increasing confidence, the IPCC has reached consensus that climate change is an issue that has human (anthropogenic) influences.² A steady flow of IPCC reports since 1995 have represented critical discourse moments (53) that has thereby solidified a storyline of consensus regarding anthropogenic climate change. Consequently, over the past dozen years, this managerial discourse has tethered institutional

²In other related climate science issues, such as the rate of temperature change or the extent of connections between hurricane frequency and intensity and climate change, there is no clear consensus at present. Moreover, political questions such as who is responsible and what should be done about it remain highly debated issues.

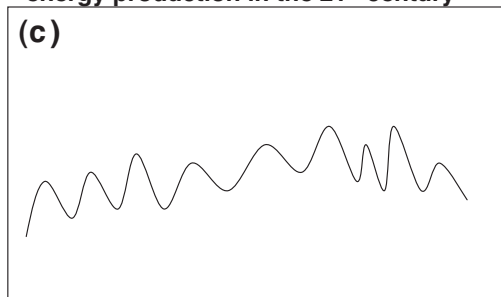
High mercury exposure adversely impacts humans & the environment



Genetic engineering of crops can solve food production crises



Nanotechnology is the key to clean energy production in the 21st century



Humans contribute to climate change

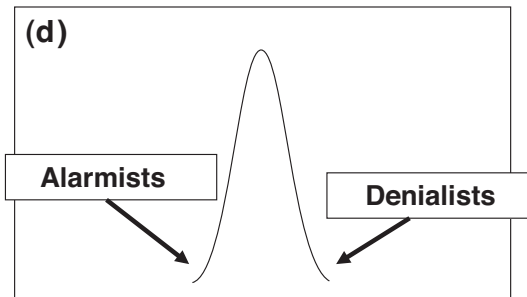


Figure 2

Media representations and convergence/divergence of views in environmental science and governance. This schematic is adapted from a *Nature Climate Reports* commentary by Boykoff (156) and comments by Revkin at the 2006 Society of Environmental Journalists. The bell curves illustrate the relative strength of agreement or disagreement on selected examples for environmental issues. The strength of convergence on particular issues can be interpreted through statements such as those from expert panels like the Intergovernmental Panel on Climate Change (IPCC) in panel (d). The IPCC has stated that the “observed increase in globally averaged temperatures since the mid-twentieth century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations” where “very likely” has been established by the panel to signify “greater than 90% probability.” Here probability and strength of convergence are treated similarly.

activities and actors to storylines that surround human contributions to climate change and has reproduced itself (or has sought to do so) through policy-relevant research statements and decisions. Although it can be challenging to appropriately characterize and delineate general views in a broadly construed scientific community, the collaboration of top climate scientists from around the world through the IPCC presents a unique opportunity to do so. Climate change is a rather unique environmental issue in this sense, in that such a topic is widely deemed legitimate across these spaces of science and governance. Adger & Benjaminsen (109) have explored different climate change discursive regimes and have described a

“managerial discourse” as one that draws primary authority from scientific findings, focuses on macroscale solutions, and bases actions on external policy interventions. This work thus concentrates on the IPCC as a group that effectively articulates a managerial discourse that interacts with national and international policy discourses. While acknowledging that this scientific consensus is not a singular translation of “the truth,” this policy-relevant information has been a critical input to implementation of national and international climate policy.

When mass media report on this particular issue, research has found that attention has been paid particularly to more extreme viewpoints rather than those in convergent

agreement (see **Figure 2d**, alarmists and denialists, and the text below for more precise reasons). Previous research has empirically found, as recently as 2006, that U.K. tabloid newspapers have significantly diverged from this consensus position in representing this distinct issue (see sidebar for more on U.K. Tabloid News Coverage of Climate Change). It was found that minority views—in this case alarmist and denialist discourses—earned much more amplified attention in media reports (110). As a result, when the process of framing—whereby meanings are constructed and reinforced—confuses rather than clarifies scientific understanding of anthropogenic climate change via the media, this can create spaces for policy actors to defray responsibility and delay action regarding climate change. In addition to concerns about the claims-making influence of the aforementioned denialists, or contrarians in the preceding section, others have raised concern about alarmist movements that push climate change discourse in the media beyond the parameters of what science can currently claim. This has been characterized in various ways such as alarmism, catastrophism (111), and climate fundamentalism (112).

Taylor & Buttel posited that the organizational arrangements that define what are environmental problems (such as anthropogenic climate change) can be seen as “particularly vulnerable to deconstruction” (113). Others have pointed out that as scientific understanding improves, rather than settling questions, it often unearths new and more questions to be answered. Moreover, greater scientific understanding actually can contribute to more complicated policy decision making by offering up a greater supply of knowledge from which to develop and argue varying interpretations of that science (114). In other words, any time that the biophysical is captured and categorized at the science–practice interface, it undergoes varying degrees of politicized interpretation, as influenced by power and scale via temporal and spatial contexts (115). Thus, in the discourse assembled by the IPCC, a certain way of viewing things is privileged, and a particular storyline

U.K. TABLOID NEWS COVERAGE OF CLIMATE CHANGE

In the United Kingdom, daily circulation figures for tabloid newspapers are as much as 10 times higher than broadsheet sources. Moreover, readership patterns correlate with socioeconomic status; the majority of readers of tabloids are in working class demographics. With a growing need to engage wider constituencies in awareness and potential behavioral change, it has been important to examine how these influential sources represent climate change for a heretofore understudied segment of U.K. citizenry. Through Critical Discourse Analysis, investigations of framing and semistructured interviews, this project examined claims and framing of climate change in four daily working class UK newspapers from 2000–2006, i.e., *The Sun* (and *News of the World*), the *Daily Mail* (and *Mail on Sunday*), the *Daily Express* (and *Sunday Express*), and the *Mirror* (and *Sunday Mirror*). Data showed that news articles on climate change were predominantly framed through weather events, charismatic megafauna, and the movements of political actors and rhetoric, whereas few stories focused on climate justice and risk. In addition, headlines with tones of fear, misery, and doom were most prevalent. These analyses then enable discussions of how these representations may have influenced ongoing climate science and governance as well as contemporary cultural politics (see References 110 and 155).

has gained salience (116). In the case of anthropogenic climate change, the stakes within and between carbon-based industry and society are high. Therefore, the science–practice interface becomes a particularly strategic discursive battlefield. When media representations such as these conflate distinct issues into a great environmental gestalt, it effectively misinforms the broadly construed public about the texture and nuance involved in complex contemporary environmental challenges.

5. MULTISCALE FACTORS SHAPING MEDIA REPORTING ON THE ENVIRONMENT

Amid possible immediate improvements to the fairness, accuracy, and precision of media reporting on environmental issues, many political, economic, cultural, and institutional

challenges remain in terms of capturing and categorizing environmental issues through media representations. In what follows—focused primarily on the production of such portrayals—various reasons for persistent trends and challenges are addressed. In so doing, a range of issues are discussed, such as how environmental stories come to be reported and what factors influence media capabilities in covering environmental stories. I focus on political economic and cultural factors as well as individual journalistic pressures that shape the contemporary landscapes of science-media-governance. Moreover, I focus on interacting journalistic norms that contribute to media coverage of the environment. Ultimately, the dynamism and contestation of knowledge production in the public arena are explored to make sense of how varying media representational practices may contribute—amid a complex web of factors—to divergent scientific, policy, and public priorities.

Interactions between media representational practices and the environment are complex, dynamic, and messy. It is clear that environmental issues shape media reporting; however, it is also true that journalism shapes ongoing conceptions of environmental problems and associated politics, policy decisions, and activities. The aforementioned notions of framing are again important here. Forsyth has stated, “assessments of frames should not just be limited to those that are labeled as important at present, but also seek to consider alternative framings that may not currently be considered important in political debates” (20). Various actors—both individuals and collective—seek to access and utilize mass media sources in order to shape perceptions of environmental issues contingent on their perspectives and interests (117). Through journalistic norms and values, certain events become news stories, thereby shaping public perception (118, 119). Asymmetrical influences also feed back into these social relationships and further shape emergent frames of news, knowledge, and discourse.

For example, in the area of media coverage of stem cell research, Nisbet et al. have

defined frames as “central organizing idea(s) or storyline(s) to a controversy that provides meaning to an unfolding series of events, suggesting what the controversy is about and the essence of the issue” (120). Focusing on media interactions in the issue of nanotechnology, Anderson et al. point out that it is often a process of “intense negotiation between journalists and their editors . . . (to) help render ‘an infinity of noticeable details’ into meaningful categories” (58). The emphases on controversy and negotiation demonstrate the intensely politicized spaces these media-politics interactions occupy in the process of framing. Such considerations thus provide a window into principles and assumptions underlying framing of representations of environmental issues and politics. According to Forsyth, examinations of particular framings provide an opportunity to question “how, when, and by whom such terms were developed as a substitute for reality” (20).

Although journalists have consistently viewed their role as one of information dissemination rather than education, in fact the distinction between these roles becomes blurred in practice. As media representations, by their very nature, inherently frame various environmental issues, such practices also then contribute—among a host of factors—to setting agendas for considerations within environmental issues and cultural politics. Willman, a veteran correspondent and field producer with CNN, *CBS News*, and National Public Radio, has commented, “in terms of agenda-setting . . . the media don’t tell people what to think, but they tell them what to think *about*” (quoted in Reference 4). This statement is reminiscent of that by Cohen in reference to media coverage of foreign policy (121).

A 2008 book by Ward, *Communicating on Climate Change: An Essential Resource for Journalists, Scientists and Editors* (122), represents the six workshops—organized by Ward and Socci and attended by eminent scientists, journalists, and editors—to address these vexing challenges of media framing, along with many associated cultural, social, institutional, and political economic factors. For instance, media

professionals, such as editors and journalists, operate within an often competitive landscape. Path dependence through histories of professional journalism, journalistic norms and values, as well as power relations shape the production of news stories (24). Therefore, constructions of meaning and discourse, negotiated in the spaces of cultural politics, are shaped by structural factors as well as by authorized definers in these landscapes. These processes take place simultaneously at multiple scales. Large-scale social, political, and economic factors influence everyday individual journalistic decisions, such as how to focus or frame a story with limited time to press as well as limited word counts or segment timings.

In terms of political economics, modern multinational media organizations, dominated by developed-country interests, have continued to consolidate and/or close. The news industry has faced tremendous challenges since the economic downturn in late 2007. In difficult economic times, new examples—particularly in the newspaper industry—become evident nearly every day. Billionaire Warren Buffett (who has a stake in the *Washington Post* among a number of media organizations) has offered a gloomy view of the future of newspapers, stemming from the economic downturn. In discussing shrinking circulation and diminished advertising revenues, a 23% fall from 2007 through 2008 in the United States (123), Buffett commented that newspapers “were essential to advertisers only as long as they were essential to readers . . . [and] I don’t see anything on the horizon that causes that erosion to end.” Other examples include the following (123, 124):

- From 1989 to 2006, the number of newspapers featuring weekly science sections shrank by nearly two-thirds.
- In recent years, only 7% of the members of the National Association of Science Writers have been employed as full-time science writers.
- Nearly one newspaper journalist in five has been laid off since 2001 in the United States.

Moreover, in December 2008, the international cable news network CNN cut its entire science, technology, and environment news staff, signaling a reduction in capacity of television news to cover these stories. The dominance of corporate media structures and organizations mean that efficiency and profit are overarching factors driving the production of news content. Economic developments, and cutbacks therein, have proven to have a detrimental effect on training for news professionals in covering varied news beats, such as science and the environment (125, 126). Additionally, deadlines and space considerations continue to constrain journalists as they can limit the ability of journalists to both comprehend and communicate complex environmental science (31). Moreover, editorial preferences and publisher pressures can affect news reporting (32). Editorial decisions are frequently made on the amount of exposure and placement (front page or buried deep in the newspaper), as well as on the use of headlines and photographs. Economic considerations have limited funding for investigative journalism (127). In this milieu, science communication scholars such as Wilkes argue that editors “prefer to hire reporters who have covered a wide variety of ‘beats’, especially when the job is covering science or another specialised area” (128). In terms of quantity of coverage in developing countries, Harbison et al. (70) posit that lack of journalist training for specialized environmental reporting has decreased the number of climate change stories in these countries (see the comments above and **Figure 1**). Conversely, when the issue itself pushes coverage beyond specialist reporters in the science pages and into political, business, and general assignment reporters, the issue can gain increased coverage and attention. Nisbet & Huges (49) assert that in coverage of plant biotechnology, such spillage has helped to explain an increase in stories on the issue. Nonetheless, a lack of journalist training has hampered accurate communications of environmental issues through such constraints (72).

These issues intersect with processes, such as journalistic norms and values, to further

shape news content (129). These include objectivity, fairness, and accuracy. Much as storylines are fueled within science and policy, the mass media play an important role, particularly as an interpreter, translator, and disseminator of information. As Weingart et al. put it, “the media . . . tend to translate hypotheses into certainties” (31). Boykoff & Boykoff (69) have outlined and examined these journalistic norms (personalization, dramatization, novelty, authority-order bias, and balance), and they shape both what becomes news and how that news is portrayed.

This inclination to personalize stories means coverage focuses on charismatic humanoids, struggling in the negotiated spaces of cultural politics and the environment. The gaze is on the individual claims makers and sensationalized stories, thus often subsuming deeper structural or institutional analyses. This connects to dramatization, whereby coverage of dramatic events tends to downplay more comprehensive analysis of the enduring problems in favor of covering the surface-level movements (130). These norms intersect with the journalistic attraction to novelty (131). Commonly, journalists mention the need for a novel “news hook” in order to translate an event into a story.³ In tandem, journalistic valuations of drama, personalities, and novelty can serve to trivialize news content, as it also can lead to the blocking out of news items that do not hold an immediate sense of excitement or controversy. However, this norm does not necessarily lead to reduced coverage. In their report entitled “Warm words: How are we telling the climate story and can we tell it better?,” Ereaud & Segnit (112) have posited that presenting news in this dramatized form is most common.

An example of a dramatic, personalized, and novel event that generated tremendous news coverage is Hurricane Katrina. Despite scientific uncertainty that remains regarding links

between hurricane intensity and frequency and climate change, this event spurred a wave of coverage. While scientific understanding of links between hurricane intensity and climate change is improving, media coverage of this evolution has focused on conflict and debate (132). In the United States, Eilperin reported in *The Washington Post*, “Katrina’s destructiveness has given a sharp new edge to the ongoing debate over whether the United States should do more to curb greenhouse gas emissions linked to global warming” (133). Considerations of links to implementation of international climate policy in the public domain were fueled in this case by comments made by prominent political actors. For instance, Jurgen Trittin, —Minister of the Environment in Germany, commented, “The American president has closed his eyes to the economic and human damage that natural catastrophes such as Katrina—in other words, disasters caused by a lack of climate protection measures—can visit on his country” (134).

These three norms inform authority-order bias, where journalists rely on official sources (131). In some cases, these authorities step in to restore order, and at other times, they serve to increase political concern. Freudenburg (135) discusses embedded power and leveraged legitimacy enabling privileged constructions of nonproblematicity in environmental issues. For example, in the case of agricultural biotechnology, Priest & Gillespie (136) examined divergent framings of risk, from short-term and concentrated to long-term and diffuse. They found that framing depended chiefly on perspective (from that of a philosopher to that of an ecologist) as well as a firm reliance on expert community views (136). Finally, these norms intersect with the journalistic norm of balance, an activity that often appears to fulfill pursuits of objectivity (137). 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” (138). In coverage of complex issues, such as stem cell research, disaster risks, or genetic engineering, balance can

³These new things are actually novel ways of portraying or depicting already existing things, in the context of ongoing storylines and historicized or preexisting norms and pressures. Hence, it is the perceived need.

provide a validity check for reporters who are on deadline and do not have time nor the scientific understanding to verify the legitimacy of various claims about the issue (139). Although effective in some cases of political debates over environmental alternatives for action, the employment of this norm in covering issues, such as anthropogenic climate change, can serve to perpetrate informational biases in news reporting (82). Overall, adherence to these norms contributes to episodic framing of news, which means framing that fails to place stories into sufficient context (140). This episodic framing can then skew media coverage, thereby influencing the ongoing dynamic and contested spaces of environmental politics in the public sphere.

6. INTERPRETATION OF ENVIRONMENTAL NEWS IN THE PUBLIC SPHERE

Once news texts or segments are produced and enter into the public sphere, these encoded messages—television/radio broadcasts, printed newspapers/magazines, and Internet communications—then compete in public arenas for attention. Considerations of the increases and decreases in media attention to environmental issues have predominantly been examined through two key theoretical models: Downs' Issue-Attention Cycle (141) and Hilgartner & Bosk's Public Arenas Model (142). These models have sought to organize and make sense of the "institutional, political, and cultural factors that influence the probability of survival of competing problem formulations" (142) within the mass media as well as environmental politics, policy, and practices.

Many attempts to theorize the rise and fall of media coverage and public attention to ecological issues have relied on Downs' Issue-Attention Cycle. For instance, in mapping the environmental policy-making process, Roberts relied on this model to "provide an explanation of the waxing and waning of issues within the policy environment" (143). In terms of agenda setting through the media, Newell

has leaned on this model as an "all-embracing explanation for the nature of media coverage of global warming," despite acknowledgment that the model fails to "accurately depict the complexity and challenging nature of the climate change problem" (144). In describing the Issue-Attention Cycle as it relates to issues in ecology, Downs reasoned that attention to environmental issues moves through five sequential stages. First is the "preproblem stage," when an ecological problem exists but has not yet captured public attention. Downs posits that expert communities are aware of the risks, but this has not yet been disseminated more widely. The second phase is that of "alarmed discovery and euphoric enthusiasm," whereby dramatic events make the public both aware of the problem and alarmed about it. Third, there is the "gradual-realization-of-the-cost stage," wherein key actors acknowledge the sacrifices and costs incurred in dealing with the problem. Fourth, there is the "gradual-decline-of-intense-public-interest stage" wherein, according to Downs, actors become discouraged at the prospect of appropriately dealing with the issue, and crises are normalized through suppression and in some cases boredom. Finally, fifth is the catchall "postproblem stage," when the formerly hot issue "moves into a prolonged limbo—a twilight realm of lesser attention or spasmodic reoccurrences of interest." In this stage, Downs covers all possibilities when he states that the issue "once elevated to national prominence may sporadically recapture public interest" (141). This cycle is argued to be "rooted both in the nature" of the problem and in the "way major communication media interact with the public" (141).

This framework is useful perhaps in considering the intrinsic qualities of the issues themselves that influence these ebbs and flows of coverage. Yet, the Downs model fails to adequately account for influences from the contested terrain of environmental politics upon which and from which alarm and costs are determined and contested. For example, it does not capture implications from political economic drivers

as well as cultural pressures or social mores (exhibited through regional or national political differences). It also does not account for the nonlinear factors that shape dynamic interactions in environmental politics via the mass media (145). Logan & Molotch (146) describe the “easy news” and the “hard news” to report upon (“if it bleeds, it leads”) and the difficulty reporters face when raising issues that might threaten their advertisers or owners’ news. Dunlap (147) argues that environmental issues have not conformed to Downs’ Issue-Attention Cycle because the problems have worsened, new problems have arisen, and, most importantly, professionalized social movement organizations have been built to keep them alive. Critics have also made the point that cycles may have both sped up in recent years, as well as become less apparent (148). Moreover, cross-cultural research has found evidence that, although the Downs model appears to hold in some contexts, it does not hold in others (76). In sum, this model provides helpful, yet only partial, and overly linear explanations and interpretations of the messiness of the multiple internal as well as external factors shaping environmental policy, politics, and practice. Therefore, the entrenched use of this Downs model has enabled only limited understanding of how these media representations are constructed and how these shape (and are shaped by) ongoing environmental politics.

A second model, the 1988 Public Arenas Model by Hilgartner & Bosk, helps provide these additional considerations. It “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” (142). This approach seeks to examine both internal and external factors—as well as dynamic and nonlinear influences—that shape media influences on environmental policy, politics, and practices. This helps move analyses beyond static representations to more accurate analytical lenses for understanding current trends, strengths, and weaknesses in media coverage

of environmental issues. In this Public Arenas Model, there is an accounting of dynamic and competitive processes to define and frame environmental problems. Moreover, this accounts for the institutional arenas where these problems compete for attention and are negotiated. In other words, there is acknowledgment of the attention economy (65) that brackets the quantity and quality of media coverage of environmental issues at a given time. Furthermore, this model helps to account for considerations that not all audiences interpret things equally. At a minimum, the public is a dynamic and heterogeneous community. Connections between media information and potential behavioral change are not straightforward: Coverage does not determine engagement but shapes their possibilities (149). For example, some find great inspiration from the messages in Al Gore’s climate change feature film *An Inconvenient Truth*, whereas for others, it is the subject of great political ire. Perhaps due to his framing as a former U.S. Democratic leader, varied responses may form along political party affiliation. Furthermore, one can argue that the many actors in this theater of discursive and material structuration—from climate scientists to business industry interests and ENGO activists—are ultimately all members of this public citizenry, so varied responses to media messaging thereby feeds back into ongoing environmental science and policy formulations.

This section has sought to briefly provide further connectivity between the production and consumption of media coverage of the environment. Research, such as studies described above, has found that mass media representations powerfully shape translations regarding environmental issues. However, interpretations in the public arena comprise critical components of these processes. In discussing mass media influence, Bennett has commented, “Few things are as much a part of our lives as the news . . . it has become a sort of instant historical record of the pace, progress, problems, and hopes of society” (150).

7. ONGOING MEDIA TREATMENT OF ENVIRONMENTAL ISSUES

The turn into the twenty-first century has marked a pivotal time for environmental issues, both in terms of threats and opportunities. For instance, in 2009, negotiations have rapidly unfolded to address mitigation of GHGs and the associated issues of climate change. Stakes have been high as leaders have sought an agreement to follow the 1997 Kyoto Protocol, which expires in 2012.⁴ Meanwhile, political economic forces have contributed to tremendous pressures on and within the news industry, where these issues have become more, not less, challenging to cover. Nonetheless, media representations of Anthropocene geopolitics (11) remain critical to public perceptions of environmental concerns into the twenty-first century. Furthermore, these interacting media portrayals continue to have multifarious implications on ongoing interactions between science, governance, and public understanding/engagement.

As noted above, there is empirical evidence to suggest that there have been short-term improvements in media representations of environmental issues, such as more accurate coverage of anthropogenic climate change. However, over the long-term scale, many institutional challenges persist for enhanced media reporting on the environment. The dynamic cultural politics are politicized and contested arenas where agents of definition battle for recognition and discursive traction; and it is here where the implications for climate governance and action remain open considerations. The approaches taken herein align with Foucault's view that "individuals are the vehicles

of power, not its points of application" (14). In so doing, this contribution has sought to begin necessary unpacking and interrogation on how meanings are made and maintained as well as on what historical and biophysical contingencies shape our perceived opportunities and alternatives for climate action. Rutherford points out that these processes thereby "contribute to 'regimes' of truth, which circumscribe how the world is apprehended . . ." (152).

Thus, media interpretations of environmental change are not the truth translated. Demeritt noted this when he wrote that, "the notion of a purely scientific realm of objective facts as distinct from a political one of contestable values is idealized by nearly all participants in debates . . . even as it is habitually breached in ordinary practice" (153). Seen in this way, media coverage of the environment is not just a collection of news articles and clips produced by journalists and producers; rather, media coverage signifies key frames derived through complex and nonlinear relationships between scientists, policy actors, and the public that is often mediated by journalists' news stories. Nisbet et al. have pointed out in research on media coverage of stem cell research that, "the events that take place in the policy sphere and the groups that compete in the political system are not only mirrored (or covered) in the media but also shaped by the media" (120). Through time, both internal (e.g., journalistic norms) and external (e.g., political economics) factors shaping media representations have dynamically refigured the terms of ongoing interactions in the arena of environmental politics. These have then also influenced ongoing considerations as well as challenges in environmental governance and policy action (97).

The parameters bounding this review can be placed further into context in a number of ways, thus considering them within a wider landscape. For instance, to consider the various facets of these complex processes of media reporting on the environment, it could be useful to consider the "circuits of communication" model, developed by Carvalho & Burgess (81). This model illustrates three moments or circuits through

⁴This can be evidenced partly by the climate change lobby explosion in Washington, DC, since 2005. In 2009, the Center for Public Integrity (151) documented that there has been a 300% increase in climate change lobbyists (numbering up to 2,340 in Washington, DC, in 2009) over the past five years, amounting to approximately \$90 million in expenditures. This indicates that there is a lot to concretely be gained and lost now on critical environmental issues.

which communications pass over time (81). Media communications first originate and second disseminate into the public sphere before the third phase when they enter the private sphere of individual engagement. Stories and reports are assembled, compete for attention, are taken up to varying degrees in our personal lives, and feed back again through ongoing interactions over time. These feedbacks shape news framing in subsequent moments and inform ongoing environmental science, policy, and practice interactions. Although this article has largely focused on the production of media representations in the public sphere, there is a rich literature (beyond the scope of this article) that addresses facets of individual understanding and engagement with media and environmental issues (154).

Overall, the process of media framing involves an inevitable series of choices to cover certain events within a larger current of dynamic activities. Resulting stories compete for attention and thus permeate ongoing

interactions between science, policy, media, and the public in varied ways. Furthermore, these interactions feed back on ongoing media representations. Developments such as the 2009 inauguration of Barack Obama, the forty-fourth U.S. President, and his early actions to address various environmental issues may draw further attention to environmental concerns, often via media reports on them. More media coverage, however, of the environment—and fair, precise, and accurate coverage at that—will clearly not be the solution. Improved reporting through greater specificity and contextualization through combined efforts of journalists, editors, and scientists will certainly help to more effectively engage the public and widen the spectrum of possibility for appropriate action. As outlined above, many political, economic, technological, institutional, and cultural factors will continue to pose challenges, as well as opportunities, for media reporting on the environment as we move further into the twenty-first century.

SUMMARY POINTS

1. Mass media serve a vital role in communication processes between science, policy, and the public; thus, representations of the environment shape many perceptions of environment problems and considerations for environmental governance.
2. Mass media stitch together formal environmental science and policy negotiations to the cultural politics of the everyday, where various actors work to make claims and articulate environmental challenges in particular (and oft-competing) ways.
3. A persistent challenge in media portrayals of the environment has been the propensity to treat many distinct environmental processes as one, and this highlights conflicts and debates in places where complexities and convergent agreement in science and policy may actually reside.
4. Fairness, accuracy, and precision in media reporting remain critical: To the extent that efforts have fallen short of such aims, media coverage of the environment has contributed to critical misperceptions, misleading debates, and divergent understandings, which are detrimental to efforts that seek to enlarge rather than constrict the spectrum of possibility for appropriate responses to various environmental challenges.
5. Many complex factors contribute to media representation practices: External (such as political economic challenges associated with corporate media consolidation) as well as internal influences (such as contributions from the deployment of journalistic norms) shape these representations.

6. Public engagement/resistance to media representations is highly variable; it is a dynamic, nonlinear, and contested terrain between the production of media texts and images and their interpretation and consumption.
7. How mass media represents environmental issues will remain important in the intersections between science, governance, and everyday lives and livelihoods in the twenty-first century.

FUTURE ISSUES

1. What can we expect to be the future of mass media as a bridge between formal environmental science and policy to our cafés, pubs, living rooms, and kitchen tables amid the multifarious challenges in the twenty-first century?
2. How do news and entertainment media differentially influence how environmental issues are taken up or resisted in our everyday lives?
3. What are ongoing internal and external multiscale challenges that mass media—journalists, editors, newsrooms—face when covering various environmental issues (e.g., macrolevel political economic pressures and microlevel journalistic norms)?
4. How does the background and training of the journalists writing the articles affect the quantity of news coverage on the environment as well as the content?
5. Are environment and science reporters “endangered species” in the political economy of news coverage on the environment? Or, as environmental challenges potentially become more pronounced, will more newsrooms employ environment and science journalists?
6. What are the ongoing and future roles that various claims makers have in the creation, maintenance, or silencing of news discourses on various environmental issues?
7. What empirical work can be done to provide more textured understandings of media and the environment?
8. What will the future hold for media representational practices in the shaping of neoliberal environmental governance?

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Cox R. 2006. *Environmental Communication and the Public Sphere*. London: Sage

Miller CA, Edwards PN, eds. 2001. *Changing the Atmosphere*. Cambridge, MA: MIT Press

2004-2009 World Newspaper Coverage of Climate Change or Global Warming

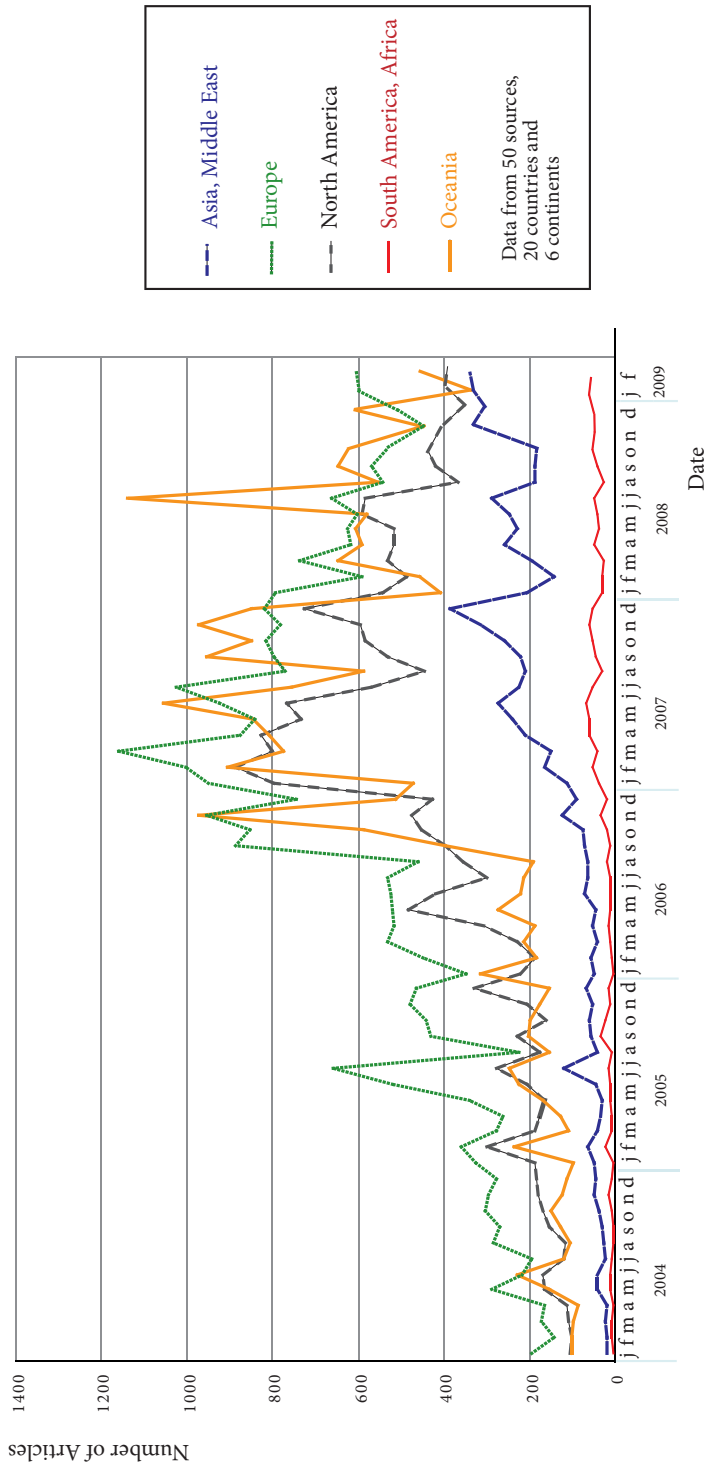


Figure 1

This figure tracks newspaper coverage of climate change or global warming in 50 newspapers across 20 countries and six continents over a five-year period (January 2004–February 2009). These newspapers (shown alphabetically) are *The Age* (Australia), *The Australian* (Australia), *Business Day* (South Africa), *Clarín* (Argentina), *Courier-Mail* (Australia), *Daily Express* (and *Sunday Express*) (United Kingdom), *Daily Mail* (and *Mail on Sunday*) (United Kingdom), *Daily News* (United States), *Daily Telegraph* (Australia), *Dominion Post* (New Zealand), *Fiji Times* (Fiji), *Financial Mail* (South Africa), *Globe and Mail* (Canada), *Guardian* (and *Observer*) (United Kingdom), *The Herald* (United Kingdom), *Hindu* (India), *Hindustan Times* (India), *Independent* (and *Sunday Independent*) (United Kingdom), *Indian Express* (India), *Irish Times* (Ireland), *Japan Times* (Japan), *Jerusalem Post* (Israel), *Jerusalem Report* (Israel), *Korea Herald* (South Korea), *Korea Times* (South Korea), *Los Angeles Times* (United States), *Mirror* (Sunday *Mirror*) (United Kingdom), *Moscow News* (Russia), *Nation* (Pakistan), *Nation* (Thailand), *National Post* (Canada), *New Straits Times* (Malaysia), *New York Times* (United States), *New Zealand Herald* (New Zealand), *Prague Post* (Czech Republic), *The Press* (New Zealand), *The Scotsman* (and *Scotland on Sunday*) (United Kingdom), *South China Morning Post* (China), *South Wales Evening Post* (United Kingdom), *The Straits Times* (Singapore), *The Sun* (and *News of the World*) (United Kingdom), *Sydney Morning Herald* (Australia), *Telegraph* (and *Sunday Telegraph*) (United Kingdom), *Times* (and *Sunday Times*) (United Kingdom), *The Times of India* (India), *Toronto Star* (Canada), *USA Today* (United States), *Wall Street Journal* (United States), *Washington Post* (United States), and *Yomiuri Shimbun* (Japan).

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