

EXHIBIT

1

Flogging a dead norm? Newspaper coverage of anthropogenic climate change in the United States and United Kingdom from 2003 to 2006

Maxwell T Boykoff

Environmental Change Institute, Oxford University Centre for the Environment, Oxford OX1 3QY

Email: maxwell.boykoff@eci.ox.ac.uk

Revised manuscript received 7 June 2007

The journalistic norm of 'balanced' reporting (giving roughly equal coverage to both sides in any significant dispute) is recognised as both useful and problematic in communicating emerging scientific consensus on human attribution for global climate change. Analysis of the practice of this norm in United States (US) and United Kingdom (UK) newspaper coverage of climate science between 2003 and 2006 shows a significant divergence from scientific consensus in the US in 2003–4, followed by a decline in 2005–6, but no major divergence in UK reporting. These findings inform ongoing considerations about the spatially-differentiated media terms and conditions through which current and future climate policy is negotiated and implemented.

Key words: United States, United Kingdom, climate science, mass media, policy, content analysis

Introduction

The professionalised and institutionalised journalistic norm of 'balanced reporting' is generally considered to be a vital tool in carrying out 'objective' reporting that provides 'both sides in any significant dispute with roughly equal attention' (Entman 1989, 30). This norm guides how many news stories are framed and covered (Cunningham 2003) and can provide a valuable 'fairness check' for reporters who have neither the time nor the scientific understanding to verify the legitimacy of competing claims about any given issue (Gamson and Modigliani 1989; Dunwoody and Peters 1992). While effective in many cases, the employment of this norm to issues such as anthropogenic climate change can be problematic (Boykoff and Boykoff 2004). Rather than providing accurate information, 'balanced' reporting may instead perpetrate informational bias regarding scientific opinions on human contributions to climate change. This paper seeks to assess the potential for such bias by exploring

the extent to which 'balanced' media coverage (commonly called 'he said/she said' reporting) of anthropogenic climate change remains a significant feature in United States (US) and United Kingdom (UK) reporting of this issue.

Scientific understanding of the causes of climate change has evolved markedly in recent decades. Particularly in the last dozen years, reports and findings have signalled a broad scientific consensus that human actions are contributing to modern climate change – despite lingering uncertainties regarding the *extent* of attribution. For instance, the recent United Nations-sponsored Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) from Working Group I (WGI) states that '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' (IPCC 2007, 8; emphasis added). Fielding over 30 000 comments from experts and governments, this multi-stage peer-review and consensus-building process represents a

clear view of the state of scientific understanding of climate change and has been corroborated by numerous statements from national science academies and other scientific organisations. Moreover, a 2004 study of peer-reviewed scientific research on climate change found unanimous agreement about the presence of a detectable human 'signal' (Oreskes 2004a).

While acknowledging that this scientific consensus is not the 'truth' translated, this 'policy-relevant' information provides a critical input to national and international climate policy. Such solidified discourse on anthropogenic climate change has helped to shape institutional considerations of policy alternatives and their accompanying discursive frames and 'storylines' (Hajer 1995). In national contexts, however, divergent climate policy priorities and stances have contributed to complex mosaics of public trust in authority and conflict over decisionmaking (Lorenzoni and Pidgeon 2006). The US federal and UK governments, for example, have both been important actors in international climate negotiations but have played very different roles, the US being branded a foot-dragger, whereas the UK has portrayed itself as a champion of domestic action and international cooperation. Equally, their domestic media have historically taken different approaches towards scientific conclusions on the causes of climate change (Boykoff and Rajan 2007). In combination, the arena of climate policy implementation remains contentious and particularly open to measured analysis of spatial differentiations in news coverage of scientific debates and their influence on national policies (Burgess 2005). When media framing confuses rather than clarifies scientific understanding of anthropogenic climate change, this can create spaces for policy actors to defray responsibility and delay action (Boykoff 2007). Thus, news media coverage plays a significant role in shaping possibilities for future climate policy implementation.

In this high-stakes arena of climate science, policy, media and public understanding, there has been a great deal of speculation regarding how this journalistic practice has been used or has 'disappeared' from reporting on anthropogenic climate change in recent years. In the following sections, this study interrogates these media practices through content analysis of US and UK newspapers from 2003 to 2006 in order to determine whether 'balanced' reporting remains a major contributor to informationally-biased reporting in these key countries, or if we are now flogging a dead norm.

Methods

The dataset for the study was composed of newspaper articles from US and UK 'prestige press' or 'quality' newspapers from 2003 to 2006. The research examined the *Los Angeles Times*, the *New York Times*, *USA Today*, the *Wall Street Journal* and the *Washington Post* in the US, and the *Independent* (and *Independent on Sunday*), *The Times* (and *The Sunday Times*) and the *Guardian* (and *Observer*) in the UK. The sample set was accessed and compiled through *Lexis Nexis* and *Proquest/ABI Inform* using the key phrases 'climate change' and 'global warming'.

In the US, these newspapers are considered as 'first-tier' or 'prestige-press' news sources, and each has an average daily circulation of nearly one million (Audit Bureau of Circulations 2006). In the UK, these newspapers are also considered to be highly influential, and each has an average daily circulation of over 200 000 (Audit Bureau of Circulations 2007) (see Table 1 for average daily circulation for each newspaper). Through a weighting measure by size of country population, this table provides a measure of the reach and influence of these dailies. While this estimation offers insights into their relative quantitative reach and influence, in terms of qualitative variables (such as type of readership), previous research has also identified these sources as major influences on policy discourse and decision-making at national and international levels (McChesney 1999; Doyle 2002), with policy actors routinely monitoring these sources for salient aspects of contemporary public discourse, including climate science. Moreover, beyond directly reaching their readers, these newspapers also influence news coverage in secondary sources, with other reporters, editors and publishers frequently consulting these 'broadsheets' for decisional cues on what is 'newsworthy' and repurposing their stories in regional and local print outlets. News coverage in these papers therefore provides opportunities to track the dominant news frames associated with anthropogenic climate change (Carvalho and Burgess 2005; Boykoff and Boykoff 2007).

In total, 9465 articles on climate change were published in these newspapers between 2003 and 2006, with 2543 articles in US newspapers and 6922 in UK sources. Beginning in January 2003, the sample consisted of a random selection of every sixth article as it appeared chronologically, making a sample of 1607 articles (17% of the population).¹ Through quantitative content analysis, codes were

Table 1 Average daily circulation per issue for selected US and UK newspapers, 2006

Newspaper	Average daily circulation per issue	Average daily circulation per issue per capita (× 10 ³)
<i>Los Angeles Times</i>	1 231 318	4.1
<i>New York Times</i>	1 683 855	5.6
<i>USA Today</i>	2 528 437	8.4
<i>Wall Street Journal</i>	2 058 342	6.9
<i>Washington Post</i>	960 684	3.2
<i>Guardian</i> (and <i>Observer</i>)	375 666	6.3
<i>Independent</i> (and <i>Independent on Sunday</i>)	233 058	3.9
<i>The Times</i> (and <i>The Sunday Times</i>)	718 221	12.0

Note: The US newspapers circulation is from the first three months of 2006 due to data availability (Audit Bureau of Circulations 2006) and UK newspaper circulation is based on information between 27 November and 31 December 2006 (Audit Bureau of Circulations 2007). For the UK newspapers, the Sunday circulation is weighted 1/7 of weekly figures and *USA Today* does not have a weekend edition. The per capita figures are estimated by US population of approximately 300 million and UK population figures of approximately 60 million residents.

assigned for varying treatments of anthropogenic climate change in each article. The coding was determined not just through frequency assessments of comments or frequencies of words or phrases. Importance was also placed on the labelling of quoted sources, utilisation of terminology, framing of relevant issues and identification of salient elements in each text, as well as tone and relationships between clusters of messages. Multiple stages of piloting were carried out on this content analysis measure to evaluate assessments of the employment of this journalistic norm. Also accounting for spuriousness, these analyses of US and UK sources produced an inter-coder reliability rate of 93.4 per cent, a level that meets established criteria for acceptable inter-coder reliability.² It is important to note, nevertheless, that such a quantitative approach has clear limits in terms of the detail and texture it can provide for analyses of meaning and discourse. Therefore, such considerations of climate science–media–policy interactions are necessarily complemented by qualitative approaches such as critical discourse analysis, semiotic analysis and interviews (for examples specific to this arena, see Carvalho 2005; Leiserowitz 2006; Boykoff 2007). More broadly, Fairclough (1995) and van Dijk (1988) provide valuable analytical frameworks for further analyses of how power and ideology weave through discourses over time.

Results

Figure 1 summarises the quantity of newspaper articles on climate change in the US and UK by

month across the four years and shows a steady increase in coverage leading up to the end of the study period, marked by a more rapid increase in UK newspaper coverage. During this period, coverage quadrupled in UK newspapers and increased approximately two-and-a-half times in the US. While more is not necessarily better, Figure 1 helps to identify key discursive moments in climate science-policy, as captured through media attention.

Peaks in UK coverage of anthropogenic climate change

The two largest increases in coverage in the UK took place during June–July 2005 and September–November 2006. June–July 2005 was marked by two particularly prominent moments that garnered heavy newspaper coverage: the Group of Eight (G8) Summit in Gleneagles, Scotland, and increased scrutiny of greenhouse gas emissions from air travel. The G8 summit was strategically preceded by a joint statement from 11 leading international science bodies – including the UK Royal Society and the US National Academy of Sciences – stating that ‘it is likely that most of the warming in recent decades can be attributed to human activities’ (Joint Science Academies Statement 2005, 1). Many news stories linked this joint statement to the G8 meeting. During this same period, media reports outlined European Commission investigations of a tax on aviation fuel, emissions charges and the potential inclusion of aviation in the European Union Emissions Trading Scheme (see Bailey this issue). This also coincided with the UK summer holiday

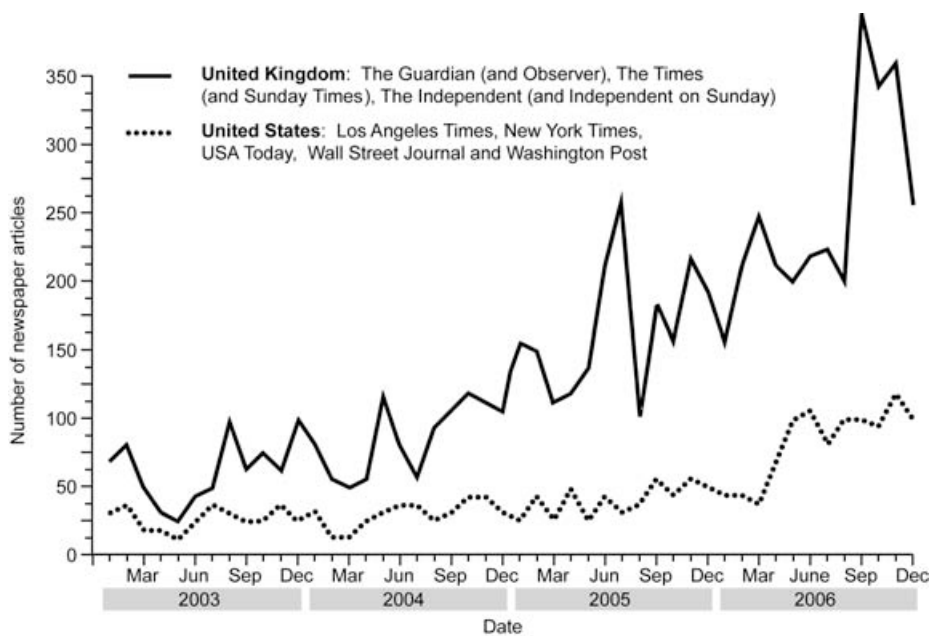


Figure 1 US and UK newspaper coverage of climate change

season, which spurred further discussions and critiques of 'carbon offsetting' in media reports.

The second increase in coverage in September–November 2006 can be attributed primarily to a series of key interrelated events. Mid-September marked the UK release of the Al Gore film *An Inconvenient Truth*. This contributed directly to an upsurge of reporting on climate change through personalised coverage of Al Gore, as well as indirectly as a news hook for covering related climate-change issues. Then, in late September, Britain's Royal Society took the dramatic step of issuing an open letter to Esso, the UK division of ExxonMobil, requesting it to stop funding groups engaged in deliberate disinformation campaigns to undermine scientific consensus on climate change (Adam 2006). Closely following this statement, Richard Branson made his much publicised 'donation' of three billion dollars to renewable energy initiatives and biofuel research. This personalised story was widely reported, being both hailed as a philanthropic act and critiqued as the funds were to be invested in Virgin Fuels rather than being donated to another organisation. Further increases during this period were connected to the much anticipated, discussed and criticised 'Stern Review', released on 30 October 2006.³ Intense media coverage of the

Stern Review fed into media attention in the Twelfth Conference of the Parties to the United Nations Framework Convention on Climate Change (COP12) meeting in Nairobi that began approximately a week later.⁴ The events and issues leading up to the conference boosted already heavy media coverage and linked to articles on public sentiment regarding climate policy action, such as the November 'Stop Climate Chaos' rally that attracted thousands of people to London's Trafalgar Square.

Peaks in US coverage of anthropogenic climate change

In terms of US coverage, the largest increase coincided with the end of this second period in the UK – November 2006. This was again associated largely with the Stern Review and COP12 in Nairobi, but was further fuelled by connected media coverage of US federal climate policy through the news hook of the mid-term Congressional elections and prominent state-level climate policy action.⁵ For instance, Arnold Schwarzenegger gained widespread recognition for approving a California bill to cap industrial greenhouse-gas emissions, which helped his re-election campaign (Finnegan 2006). Moreover, when the Democrats took control of the US Senate, Barbara Boxer (Democrat, California) replaced James

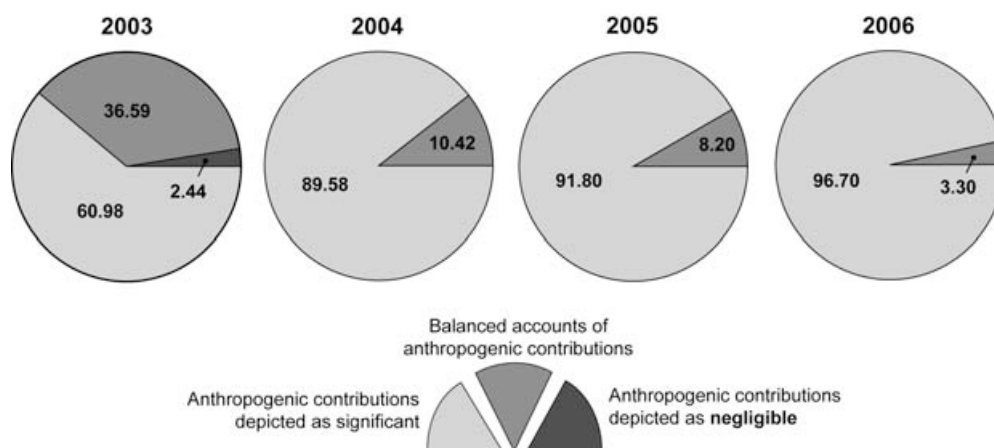


Figure 2 US newspaper coverage of anthropogenic climate change by year, 2003–2006, n=421

Inhofe (Republican, Oklahoma) as Chair of the Senate Environment and Public Works Committee. Inhofe had famously declared to the Senate floor (and has repeated many times since) ‘could it be that man-made global warming is the greatest hoax ever perpetrated on the American people? It sure sounds like it’ (Inhofe 2003). In contrast, Boxer has called global warming ‘the greatest challenge of our generation’, and has articulated plans for Congressional legislation to curb anthropogenic greenhouse-gas emissions (Simon 2006, A12).

The second largest increase in US coverage in May–June 2006 contributed to climate change becoming a key election issue that November. Chiefly, climate policy rhetoric in the elections was catalysed by heavy media coverage of the May 2006 US release of *An Inconvenient Truth*. US newspaper reports on the film release spanned several news, business, entertainment and style sections, pushing climate change from an ‘environmental issue’ to one garnering the attention of a wide range of interests and constituents. Such reach was evidenced by a *Washington Post* ‘Style’ section article covering the documentary premiere (Argetsinger and Roberts 2006) as well as by commentary such as ‘Business World: Warmed Over’ in the *Wall Street Journal* (Jenkins Jr 2006). During this period the US Supreme Court also agreed to hear the long-awaited case on the Environmental Protection Agency’s (EPA) authority to regulate greenhouse-gas emissions under the Federal Clean Air Act. This case turned on whether carbon dioxide was treated as a ‘pollutant’, and this question – coupled with

increased media attention of Gore’s film – generated an upswing in coverage.

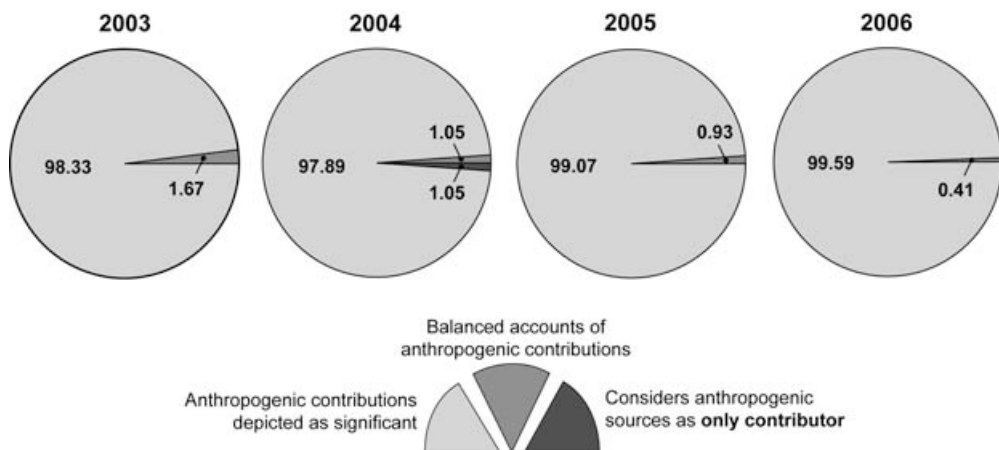
Tracking the ebbs and flows of coverage over this timespan provides a foundation for more specific content analysis of media reporting on human contributions to climate change in the US and UK. This quantitative approach produced results that facilitate the identification of ‘critical discourse moments’ where media representational practices may have shifted (Chilton 1987; Carvalho 2005). Carvalho’s discourse analysis of these British ‘quality’ newspapers from 1998 to 2000 defined these moments as those times ‘marked by particular events that potentially challenge existing discursive positions and constructs or, in contrast, may contribute to their further sedimentation’ (2005, 6).

Results from these analyses show that the portion of US coverage providing ‘balanced accounts’ of anthropogenic climate change decreased over the period (Figure 2). Statistical tests of difference – using z-scores to compare ratios – were then conducted to determine whether divergences in media coverage from scientific consensus were significant, in other words, whether reporting had perpetrated informational bias regarding scientific consensus through the professional norm of ‘balanced’ reporting. These analyses found that US media representations of anthropogenic climate change diverged significantly from the scientific consensus in 2003 and 2004, but that this was no longer significant in 2005 and 2006 (Table 2). Previous analyses of US newspapers found that coverage from 1990 to 2002 had diverged from the consensus view that humans very

Table 2 US newspaper discourse and scientific discourse regarding anthropogenic climate change: by year, 2003–2006; n=421

Year	Coverage of climate science depicting significant human contribution (%)	'Balanced' coverage of anthropogenic climate change (%)	Coverage of climate science depicting negligible human contribution (%)	Was the difference between newspaper coverage and climate science consensus statistically significant?
2003	61.0	36.6	2.4	Yes***
2004	89.6	10.4	0	Yes*
2005	91.8	8.2	0	No
2006	96.7	3.3	0	No

Note: Newspapers analysed: *Los Angeles Times*, *New York Times*, *Wall Street Journal* and *Washington Post*. When *USA Today* was included, the strength of significance did not change. Z-scores per year were: 2003, 7.68; 2004, 2.12; 2005, 1.84; 2006, 1.20, where the numbers represent the percentages of coverage in each year. The significance of divergence of US newspaper coverage from climate-science consensus was determined using z-scores to compare proportions. Z-scores per year were: 2003, 7.73; 2004, 2.22; 2005, 1.92; 2006, 1.31; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

**Figure 3** UK newspaper coverage of anthropogenic climate change by year, 2003–2006, n=1060

likely contribute to climate change (Boykoff and Boykoff 2004). These new results show that this trend continued for two further years but ended by 2005.

In the UK newspapers, the percentage of coverage giving 'roughly equal attention' to both views was comparatively low throughout the investigation period (Figure 3). Tests of the differences in coverage in these sources from the scientific perspective on anthropogenic climate change yielded no significant variations. Put differently, there is no evidence that the UK newspapers carried out informationally-biased coverage of anthropogenic climate change through

the employment of the journalistic norm of 'balanced' reporting (Table 3).

Discussion

The results from this analysis reveal a dramatic increase in the quantity of newspaper coverage of anthropogenic climate change in both the UK and the US over the study period, but also an evolutionary shift in US newspaper coverage in 2005 from explicitly 'balanced' accounts to reporting that more closely reflected the scientific consensus on attribution for climate change (Boykoff and

Table 3 UK newspaper discourse and scientific discourse on anthropogenic climate change by year, 2003–2006; n=1060

Year	Coverage of climate science depicting exclusive human contributions (%)	Coverage of climate science depicting significant human contributions (%)	'Balanced' coverage of anthropogenic climate change (%)	Was the difference between newspaper coverage and climate science consensus statistically significant?
2003	0	98.3	1.7	No
2004	1.05	97.9	1.05	No
2005	0	99.1	0.9	No
2006	0	99.6	0.4	No

Note: Newspapers analysed were: the *Independent* (and *Independent on Sunday*), *The Times* (and *The Sunday Times*) and *Guardian* (and *Observer*). The numbers represent the percentages of coverage in each year. Z-scores of significance of divergence of UK newspaper coverage from climate-science consensus on anthropogenic climate change, comparing proportions each year, were: 2003, 0.47; 2004, 0.37; 2005, 0.49; 2006, 0.47; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Boykoff 2004; Carvalho 2005). Why might this shift in US reporting have taken place?

The contributing influences can be considered in three primary ways: *political*, *scientific* and *ecological/meteorological* (Boykoff and Boykoff 2007). First, primarily *political* movements in climate rhetoric and policy promises comprised a substantial amount of coverage. Reporting of the Gleneagles G8 Summit is one prominent example of this phenomenon. Ahead of the Summit, on his home soil, Prime Minister Tony Blair voiced strong climate policy rhetoric, seeing this meeting as an opportunity to leave a positive 'legacy' of committed policy action (Lean 2005, 18). Moreover, en route to the meeting, George W. Bush made his clearest statement to date on anthropogenic climate change, declaring that 'I recognize that the surface of the Earth is warmer and that an increase in greenhouse gases caused by humans is contributing to the problem' (VandeHei 2005, A14). The Blair and Bush statements fed into tremendous US media speculation about a potential shift in the Bush Administration's stance on climate policy.⁶ This coverage was also primed by pronouncements at the state level that increased the pressure for US federal action, including the widely-reported executive order by Arnold Schwarzenegger calling for an 80 per cent reduction in Californian greenhouse-gas emissions by 2050. This prompted headlines across all the major US newspapers, such as 'California Sets Emission Goals that are Stiffer than US Plan' in the *Wall Street Journal* (Ball 2005), and 'Gov. Vows Attack on Global Warming' in the *Los Angeles Times* (Bustillo 2005).

Second, primarily *scientific* activities contributed to this critical discourse moment. Generating particular media attention was news leaked to the *New York Times* regarding drafts of the report by the US Climate Change Science Program. After this report had completed multiple stages of scientific peer review, it was revealed that Philip Cooney – the Bush White House Chief of Staff for the Council on Environmental Quality (CEQ) – had made key changes to the document before its publication. For instance, before the word 'uncertainties' Cooney had placed the words 'significant and fundamental', which then 'tend[ed] to produce an air of doubt about findings that most climate experts say are robust' (Revkin 2005, A1).⁷ Moreover, the aforementioned joint statement by 11 international science bodies was released just as news was unfolding about Cooney's editing of the Science-Program documents. It was also significant that this statement included the science bodies of Brazil, China and India (Joint Science Academies Statement 2005), and media coverage noted how this bridged some of the tensions between the North and South on responsibility for emissions and reductions.

Third, *ecological/meteorological* events in 2005 expressed a biophysical agency, further contributing to this shift. The most dramatic among various extreme weather events occurring that year was when Hurricane Katrina made landfall on the US Gulf Coast, devastating large parts of New Orleans. While scientific research is still debating the extent of connections between climate change and hurricane intensity and frequency, Katrina prompted widespread speculation and discussion in climate policy

and public circles, and many media reports on the potential link between human activities, future storm events and climate change. As Juliet Eilperin reported in the *Washington Post*

Katrina's destructiveness has given a sharp new edge to the ongoing debate over whether the US should do more to curb greenhouse gas emissions linked to global warming (Eilperin 2005, A16)

while further commentaries on the link between extreme weather events and international climate policy reaching the public domain came from prominent political actors. For instance, Jürgen Trittin – the then German Minister of the Environment – commented that

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. (Bernstein 2005, D5)

Such dynamic intersections fed into this critical media discourse moment. These moments not only shaped ongoing media representations of discourse on human-induced climate change, but these media representations also fed back into ongoing interactions at the science–policy interface. For example, media shifts prompted by these political, scientific and ecological/meteorological issues were articulated by Dan Vergano in *USA Today* in a piece entitled 'The Debate is Over: Globe Is Warming'. He wrote

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. (Vergano 2005, 1A)⁸

In addition to explaining this US shift, a second set of questions centre on comparisons and contrasts between US and UK media coverage and why there was no significant divergence in UK reporting on anthropogenic climate change. Why was coverage in the UK different from that in the US before 2005? As very general comparisons, the US and UK contexts share several similarities. For a better part of two centuries, influential policy actors in both the UK and US have shared a commitment to liberal-capitalist development frameworks, utilitarian views of environmental services and exploitative interactions with nature. Equally, in both countries, entrenched

technological optimism and an aversion to precautionary action in the absence of conclusive scientific evidence have also influenced the wider regulatory architectures of environmental policy (Boykoff and Rajan 2007). Finally, through time, modern media communications have expanded their reach and influence, forming increasingly powerful social, political, economic and cultural institutions (Starr 2004).

Regarding contrasts, two notions are most salient in terms of media coverage of anthropogenic climate change: *domestic environments* and the *uses of context and labelling*. The former considers complexities primarily at the national and community scale, while the latter deals principally with actions by individual journalists and editors. The first notion centres on key political economic and cultural variants that influence reporting. Prominent among these are differentiated regulatory and societal networks and institutions that have shaped varied carbon-based industry decisionmaking behaviour and practices; similarly, carbon-based industry interests have shaped divergent federal climate policy priorities and actions (Pulver 2007). In the UK, the Labour and Conservative parties have both taken up forceful climate policy rhetoric. Meanwhile, resistance to international climate policy implementation in the US has primarily been the province of the Republican Party. For instance, the Bush administration has hitherto not followed advice from leading government agencies in prioritising international climate cooperation. In a 2001 report, the National Academy of Sciences (NAS) reaffirmed the presence of an anthropogenic climate signal, and stated the risks and the need for action (NAS 2001). Similarly, in 2002, an EPA report concluded that

The science is strongest on the fact that carbon dioxide is contributing, and will continue to contribute, to global climate change . . . it is clear that global warming is an issue that must be addressed. (EPA 2002,1)

Bush dismissively called these 'report[s] put out by the bureaucracy' (Seelye 2002, A23). Also, a 2007 *National Journal* poll revealed that 95 per cent of Democrats and just 13 per cent of Republicans answered 'yes' to the question 'do you think that it's been proven beyond a reasonable doubt that the Earth is warming because of man-made problems?' (*National Journal* 2007). So, while it has been a politically divisive issue in the US, this has been less the case in the UK.

Moreover, despite the fact that carbon-based industry interests have exerted considerable influence over climate policy in both countries, associated scientists and policy actors who have questioned the significance of human contributions – often dubbed ‘climate contrarians’ – have been primarily housed in US universities, think tanks and lobbying organisations (McCright 2007). These contrarian voices emerged in the US in the late 1980s, mainly through the Global Climate Coalition, which represented a consortium of primarily US-based coal and oil interests. These groups have since earned privileged access to influential US climate policy actors (Leggett 2001). That the anthropogenic climate dissenter and best-selling fiction author of *State of Fear* Michael Crichton⁹ has been reported to have been consulted by President George W. Bush on climate policy (Janofsky 2006) while the President ignores the advice of the NAS and EPA can be attributed in part to a convenient confluence of interests and objectives. Past research has examined how these individuals and groups have developed competing discourses that disempowered top climate science and effectively reframed climate science and policy issues as uncertain, thus breeding public confusion (Zehr 2000; McCright and Dunlap 2003). These contrarian groups have also sought to gain discursive traction through the media, and similarly, carbon-based industry interests have pursued media coverage by raising the visibility of climate contrarianism. For instance, in February 2007, the *Guardian* revealed that the US-based American Enterprise Institute – which receives funding from ExxonMobil – has offered \$10 000 ‘for articles that emphasize the shortcomings of a [recently released] report from the UN IPCC’ (Sample 2007, 1). However, amid the abundant evidence of ties between carbon-based industry, contrarian lobbying and US Federal Administration climate policy, the important issue is not necessarily funding sources. Rather, as Oreskes points out

the issue is that the research is supported by a sponsor who wants a *particular* result . . . and the researchers know in advance what that outcome is, producing an explicit conflict of interest, which undermines the integrity of the research performed. (2004b, 381)

Explanations for the formerly divergent but now converging coverage of climate science in the US and UK links to a second salient point regarding the *contextualisation and labelling* of reporting at the level of journalists and editors. While it is widely

accepted that censorship of dissenting views is both a misguided tactic and ultimately destined for positivist failure, just *how* contrarians have been treated through time has differed on opposite sides of the Atlantic. Previous research has found that situating controversial information in the larger context of the climate change issue has helped to mitigate perceptions of uncertainty and confusion (Corbett and Durfee 2004). Varied treatment of the contrarians in the US press before 2005 vis-à-vis UK coverage reveals key contributions to such perceptions, and hence informational bias. For instance, in coverage of the US-based oil multinational ExxonMobil, a *New York Times* article entitled ‘Exxon Backs Groups that Question Global Warming’ began:

Exxon Mobil has publicly softened its stance toward global warming over the last year, with a pledge of \$10 million in annual donations for 10 years to Stanford University for climate research. At the same time, the company, the world’s largest oil and gas concern, has increased donations to Washington-based policy groups that, like Exxon itself, *question the human role in global warming* and argue that proposed government policies to limit carbon dioxide emissions associated with global warming are too heavy handed . . . ‘There is this whole issue that no one should question the science of global climate change that is ludicrous. That’s the kind of dark-ages thinking that gets you in a lot of trouble’ [Tom Cirigliano, a spokesperson for ExxonMobil] noted. (Lee 2003, C5; emphasis added)

The US article was consistent with much US coverage before 2005, in this case, focusing attention on the multi-faceted philanthropy of ExxonMobil while also flatly reporting the company’s view on anthropogenic climate change. This was bolstered by the quote from the ExxonMobil representative, as the article provided scant context within which such assertions sit in the larger view of the widespread scientific consensus on human contributions to climate change. In contrast, an article in the UK’s *Independent* entitled ‘Exxon Spends Millions to Cast Doubt on Warming’ reported that

The world’s largest energy company is still spending hundreds of thousands of dollars to fund European organisations that *seek to cast doubt on the scientific consensus on global warming* and undermine support for legislation to curb emission of greenhouse gases. (Buncombe and Castle 2006, 32; emphasis added)

While these excerpts cannot provide sufficient evidence about how climate change is framed throughout each

news story, nor the tone or relationships between clusters of messages, they provide a window – and hence the opportunity – to examine divergent patterns of reporting in the US and UK before 2005.

Conclusion

This paper has examined shifts in the employment of the journalistic norm of ‘balanced’ reporting in the US and UK – as well as dynamic interactions therein – and their possible contribution to ongoing framings of climate science and policy. It has also identified important ways in which the mass media in each country have shaped, and continue to shape, the ongoing construction and maintenance of anthropogenic climate-change discourse. Finally, the paper has explored how different country contexts have engendered varying media representational practices, which may in turn have contributed – in complex ways – to divergent priorities in global climate policy and politics.

As such, this paper presents another example of how climate change science and policy shape media reporting and public understanding, as well as how journalism also influences climate science and policy decisions. Mass media have constituted key non-state interventions in shaping the variegated and politicised terrain within which people perceive, understand and engage with climate science and policy (Bord *et al.* 2000; Krosnick *et al.* 2006; Leiserowitz 2006). Thus, these results and analyses provide useful indicators of the terms and conditions through which current and future climate policy and action is negotiated and implemented.

This research finds that ‘balanced’ reporting on scientific investigations of human-induced climate change in these newspapers is no longer evident, and thus suggests that we may now be flogging a dead norm. While this provides some cause for optimism that media reporting may act as a stronger catalyst for public pressure for more decisive climate-policy action, many other challenges remain in ensuring climate science informs climate decision-making. Nevertheless, this research further informs considerations of key impediments to greater international climate-policy cooperation in the US and UK, as well as contributing to understanding the more general role of the mass media in science-policy interactions (Wilson 1995; McComas and Shanahan 1999; Smith 2005; Baron 2006).

It is important to remember, however, that science on anthropogenic climate change remains a histori-

cised process and consensus does not represent the end of the tale, but rather a period in the ongoing story. The focus of this paper has been on media representational practices; however, responsibilities as well as opportunities also lie with the scientific, policy and public communities. More media coverage of climate change – and more accurate coverage – will not necessarily solve these issues. For instance, studies have shown that without some scientific knowledge to provide a foundation of understanding to follow ongoing issues, more journalism will not help (Miller *et al.* 1997). Thus, this work forms just one part of the larger ‘cultural circuits’ of climate change policy reflection and action (Carvalho and Burgess 2005) that are themselves situated in the ongoing multi-scale socio-political and biophysical influences that frame policy alternatives. This means that instead of looking for paradigmatic change, we should more realistically seek a creeping evolution in how non-state actors such as the mass media influence climate policy and broader science-policy interactions.

Acknowledgements

I thank the Special Issue Editor and the anonymous reviewers for their helpful comments and suggestions. Thanks also to Mike Goodman, Monica Boykoff, J. Timmons Roberts, Jules Boykoff, Diana Liverman and the James Martin 21st Century School for their support and assistance at various stages of the project.

Notes

- 1 The US news articles consisted of 27 per cent from the *Los Angeles Times*, 33 per cent from the *New York Times*, 7 per cent from *USA Today*, 12 per cent from the *Wall Street Journal* and 21 per cent from the *Washington Post*. The UK news articles consisted of 35 per cent from the *Guardian* (and the *Observer*), 36 per cent from the *Independent* (and *Independent on Sunday*) and 29 per cent from *The Times* (and *The Sunday Times*).
- 2 This analysis was conducted in coordination with Michael K. Goodman, Lecturer at King’s College London School of Geography, and Jules M. Boykoff, Assistant Professor of Political Science at Pacific University.
- 3 For instance, *The Times* reported ‘The science debate is effectively over. The Stern review means that the economic debate is all but over. Only the political debate is left’ (Cavendish 2006, 7).
- 4 This conference discussed implementation of the first phase of the Kyoto Protocol as well as possibilities for participation by key ‘developing’ countries, such as China and India, beginning in 2012.

- 5 What had not been a particularly legible voting issue in previous elections had become rallying points for politicians in State elections as well as for Democrats seeking to regain control of both houses of US Congress.
- 6 A communiqué coming out of the meeting also acknowledged human contributions to climate change and included the signature of President Bush, despite his previous equivocations on the subject.
- 7 This was seen as a violation of scientific integrity to suit carbon-based industry interests, particularly once it was revealed that Cooney previously worked as a lobbyist for the American Petroleum Institute. Media scrutiny continued when it was discovered that his consequent resignation from the CEQ was followed just three days later by his appointment as a consultant to ExxonMobil.
- 8 Vergano later won the 2006 David Perlmán Award for Excellence in Journalism from the American Geophysical Union, signifying the importance of shifting science–media–policy interactions at that time.
- 9 Although a work of fiction, Crichton was awarded the 2006 American Association of Petroleum Geologists journalism award for this book.

References

- Adam D** 2006 Royal Society tells Exxon: stop funding climate change denial *Guardian* 20 September 1
- Argetsinger A and Roberts R** 2006 The reliable source *Washington Post* 19 May C3
- Audit Bureau of Circulations** 2006 Standard Certificates of Circulation: US Newspapers
- Audit Bureau of Circulations** 2007 Standard Certificates of Circulation: UK Newspapers
- Ball J** 2005 California sets emissions goals that are stiffer than US plan *Wall Street Journal* A4
- Baron J** 2006 Thinking about global warming *Climatic Change* 77 137–50
- Bernstein R** 2005 The view from abroad *New York Times* 4 September D5
- Bord R J, O'Connor R E and Fischer F** 2000 In what sense does the public need to understand global climate change? *Public Understanding of Science* 9 205–18
- Boykoff M T** 2007 From convergence to contention: United States mass media representations of anthropogenic climate change science *Transactions of the Institute of British Geographers* 32 477–89
- Boykoff M T and Boykoff J M** 2004 Bias as balance: global warming and the US prestige press *Global Environmental Change* 14 125–36
- Boykoff M T and Boykoff J M** 2007 Climate change and journalistic norms: a case study of US mass-media coverage *Geoforum* 36 1190–1204
- Boykoff M T and Rajan S R** 2007 Signals and noise: mass-media coverage of climate change in the USA and the UK *European Molecular Biology Organization Reports* 8 1–5
- Buncombe A and Castle S** 2006 Exxon spends millions to cast doubt on warming *Independent* 7 December 32
- Burgess J** 2005 Follow the argument where it leads: some personal reflections on 'policy-relevant' research *Transactions of the Institute of British Geographers* 30 273
- Bustillo M** 2005 Gov vows attack on global warming *Los Angeles Times* 2 June B1
- Carvalho A** 2005 Representing the politics of the greenhouse effect *Critical Discourse Studies* 2 1–29
- Carvalho A and Burgess J** 2005 Cultural circuits of climate change in UK broadsheet newspapers, 1985–2003 *Risk Analysis* 25 1457–69
- Cavendish C** 2006 The only argument left on emissions is political *The Times* 31 October 7
- Chilton P** 1987 Metaphor, euphemism, and the militarization of language *Current Research on Peace and Violence* 10 7–19
- Corbett J B and Durfee J L** 2004 Testing public (un)certainty of science: media representations of global warming *Science Communication* 26 129
- Cunningham B** 2003 Re-thinking objectivity *Columbia Journalism Review* 42 24–32
- Doyle G** 2002 *Media ownership: the economics and politics of convergence and concentration in the UK and European media* Sage, London
- Dunwoody S and Peters H P** 1992 Mass media coverage of technological and environmental risks *Public Understanding of Science* 1 199–230
- Eilperin J** 2005 Severe hurricanes increasing, study finds *Washington Post* 16 September A13
- Entman R** 1989 *Democracy without citizens: media and the decay of American politics* Oxford University Press, Oxford
- EPA** 2002 Climate action report 2002 *USA 3rd National Communication Under the UNFCCC* Environmental Protection Agency, Washington DC
- Fairclough N** 1995 *Media discourse* Edward Arnold, London
- Finnegan M** 2006 Election 2006: California races, California elections, a landslide for Feinstein and governor *Los Angeles Times* 8 November A1
- Gamson W A and Modigliani A** 1989 Media discourse and public opinion on nuclear power: a constructionist approach *American Journal of Sociology* 95 1–37
- Hajer M A** 1995 *The politics of environmental discourse: ecological modernization and the policy process* Clarendon Press, Oxford
- Inhofe J** 2003 The science of climate change Senate floor statement *Chair: Committee on Environment and Public Works* 28 July
- IPCC** 2007 *Climate change 2007: the physical science basis, summary for policymakers* IPCC, Geneva
- Janofsky M** 2006 Bush's chat with novelist alarms environmentalists *New York Times* 19 February A1
- Jenkins Jr H** 2006 Business world: warmed over *Wall Street Journal* 31 May A13
- Joint Science Academies Statement** 2005 Global response to climate change
- Krosnick J A, Holbrook A L, Lowe L and 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
- Lean G** 2005 Attack on London: Gleneagles may yet prove to be Blair's finest hour and leave a lasting legacy to the world *The Independent* 10 July 18
- Lee J** 2003 Exxon backs groups that question global warming *New York Times* 28 May C5
- 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 and Pidgeon N F** 2006 Public views on climate change: European and USA perspectives *Climatic Change* 77 73–95
- McChesney R W** 1999 *Rich media, poor democracy: communication politics in dubious times* University of Illinois Press, Urbana IL
- McComas K and Shanahan J** 1999 Telling stories about global climate change: measuring the impact of narratives on issue cycles *Communication Research* 26 30–57
- McCright A M** 2007 Dealing with climate contrarians in **Moser S C and Dilling L** eds *Creating a climate for change: communicating climate change and facilitating social change* Cambridge University Press, Cambridge 200–12
- McCright A M and Dunlap R E** 2003 Defeating Kyoto: the conservative movement's impact on US climate change policy *Social Problems* 50 348–73
- Miller J, Pardo R and Niwa F** 1997 *Public perceptions of science and technology: a comparative study of the European Union, the United States, Japan, and Canada* BV Foundation, Madrid
- NAS** 2001 Climate change science: an analysis of some key questions *Commission on Geosciences, Environment and Resources* National Academy of Sciences, Washington DC
- National Journal* 2007 Inside Washington: Congressional insiders poll *National Journal* 3 February
- Oreskes N** 2004a Beyond the ivory tower: the scientific consensus on climate change *Science* 306 1686
- Oreskes N** 2004b Science and public policy: what's proof got to do with it? *Environmental Science and Policy* 7 369–85
- Pulver S** 2007 Making sense of corporate environmentalism: an environmental contestation approach to analyzing the causes and consequences of the climate change policy split in the oil industry *Organization & Environment* 20 44–83
- Revin A** 2005 Bush aide edited climate reports *New York Times* 8 June A1
- Sample I** 2007 Scientists offered cash to dispute climate study *Guardian* 2 February 1
- Seelye K Q** 2002 President distances himself from global warming report *New York Times* 5 June A23
- Simon R** 2006 Green laws no slam-dunk in new Congress *Los Angeles Times* 18 December A12
- Smith J** 2005 Dangerous news: media decision making about climate change risk *Risk Analysis* 25 1471
- Starr P** 2004 *The creation of the media: political origins of modern communications* Basic Books, New York
- Van Dijk T** 1988 *News as discourse* Laurence Erlbaum, Hillsdale NJ
- VandeHei J** 2005 President holds firm as G-8 Summit opens: Bush pledges to help Africa, but gives no ground on environmental policy *Washington Post* 7 July A14
- Vergano D** 2005 The debate's over: globe is warming *USA Today* 13 June 1A
- Wilson K M** 1995 Mass media as sources of global warming knowledge *Mass Communications Review* 22 75–89
- Zehr S C** 2000 Public representations of scientific uncertainty about global climate change *Public Understanding of Science* 9 85–103