

**Mediated messages about climate change:
reporting the IPCC Fourth Assessment in the UK print media**

Mike Hulme

School of Environmental Sciences, University of East Anglia, Norwich, UK
and Tyndall Centre for Climate Change Research, UK

<m.hulme@uea.ac.uk>

A submission to *Science Communication*

5 September 2007

Abstract

As climate change increasingly engages individuals, institutions and businesses across society, the role of the media in representing scientific understanding of the phenomenon becomes increasingly important. This study examines how the three Working Group reports of the most recent Intergovernmental Panel on Climate Change (IPCC) assessment were presented in the national UK print media on the day following publication. 55 separate newspaper items across the 11 newspapers surveyed were examined and coded in terms of page space, position in the newspaper and dominant linguistic repertoire. Analysis was oriented to understand the roles of framing, linguistic discourse and ideology in the way messages about climate change from scientific assessments are mediated by the UK press. The study concludes that linguistic repertoires that represent alarmist and fatalistic discourses are more dominant than other repertoires that emphasise agency and empowerment. Some reasons for this are suggested.

Key words: Climate change, IPCC, newspaper reporting, linguistic repertoires, ideology

Introduction

Increasing attention has been paid in recent years to the ways in which the science of anthropogenic climate change is reported in the print media. Boykoff and Boykoff (2004) undertook a thorough analysis of the influence of the journalistic norm of bias in the coverage of 'global warming' in the US prestige press during the period 1988 to 2002, a study recently updated in Boykoff and Boykoff (2007) and extended in Boykoff (2007) and Boykoff and Rajan (2007). For the British print media, Carvalho (2005; 2007) has examined the role of ideological cultures in shaping and framing newspaper coverage of climate change during the period 1985 to 2001, while Carvalho and Burgess (2005) and Smith (2005) have critically examined the role of the media in constructing public perceptions of climate risk. Earlier work by Trumbo (1996) and Weingart *et al.* (2000) traced the influence of the news media in, respectively, the framing of climate change (in the USA) and in shaping discourses about climate change (in Germany).

These analyses all contribute to the wider study of how climate change risks are constructed by multiple public audiences and constituencies and how such constructions translate into individual or collective action (Lorenzoni *et al.*, 2005). Attempts to answer these questions have drawn upon social and behavioural psychology (e.g. Lowe, 2006; Leiserowitz, 2006; Baron, 2006) and the communication sciences (e.g. Nicholson-Cole, 2005; Moser & Dilling, 2007). Investigations of the discourses surrounding climate change cannot avoid attending to the roles of language, for example in the ways scientific uncertainties are contextualised, communicated and understood (e.g. Corbett & Durfee, 2004; Patt, 2007), the use and power of linguistic metaphors (e.g. Moser & Dilling, 2004; Nerlich, 2007), and the use of semiotics in advertising (e.g. Linder, 2006) and visual imagery in campaigning (e.g. Doyle, 2007). There is also emerging an important and vigorous debate about the scientific legitimacy and social efficacy of a new discourse of

‘catastrophic’ climate change (Ereaut & Segnit, 2006; Lowe, 2006; Hulme, 2007; Kerr, 2007; Risbey, 2008).

Central for navigating through this conjuncture of science, media, risk and policy is the idea of ‘framing’ (e.g. Entman, 1993). Frames are ways of organising key ideas, often controversial ideas, so as to resonate with core values and assumptions held by the public. Either implicitly or explicitly, frames tend to selectively privilege some aspects, or policy responses, of a complex issue. They may be analysed as the individual frames of reference that people utilise to make sense of the world, which may also be collectively held, or in terms of how frames are constructed and organised in the wider world that is encountered by individuals. Nisbet and Mooney (2007) have recently drawn attention afresh to the importance for scientists to engage in the active framing of public policy problems, for example climate change.

This study documents how coherent, politically delicate and finely honed messages emerging from an intergovernmental scientific assessment are translated into a heterogeneous set of public readings through a single medium in a national context. The study uses the case of climate change and the publication of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) in the spring of 2007 and examines how the national UK print media represented the key messages of the three Working Group (WG) reports on the Saturdays following their respective public launches on the previous Fridays. By using this very tightly controlled sampling strategy, the study contains both synchronic (comparative) and diachronic (sequential) elements.

This critical examination illuminates some of the contested dimensions of framing, linguistic discourse and ideology reported in the above cited literature. Rather than focus on the way in which ‘balance’ and scientific uncertainty about climate change are represented in the print media – the emphasis of most previous work - I explore the extent

to which the IPCC reports were presented to the British public in terms of fatalistic melodrama and/or personal agency. Ereuat and Signit (2006) identified these two categories of discourse – described by them using the linguistic repertoires of ‘alarmism’ and ‘small actions’ – as dominant in UK public climate change discourse in their late 2005/early 2006 analysis. This study addresses the following questions: how varied is the reporting of the three IPCC Working Groups across the British print media? What messages from the IPCC Reports do the different newspapers choose to highlight and which to suppress? What are the dominant linguistic repertoires used in this reporting?

The study elaborates on the contrast observed between UK and US headline reporting of the IPCC WG-1 report in February 2007 (Hulme, 2007) and complements recent work which examined the way in which international TV channels reported the IPCC WG-2 and WG-3 reports in April and May (Painter, 2007).

Method

The three Working Groups of the IPCC Fourth Assessment Report – science (WG-1), impacts and adaptation (WG-2), mitigation (WG-3) - released their respective Summaries for Policymakers (SPM) on three Fridays in the late winter/early spring of 2007 (IPCC 2007a,b,c) – respectively on 2 February, 6 April and 4 May. Together with the Synthesis Report due to be finalised later in 2007, these three reports constitute the most comprehensive and visible global assessment of scientific¹ knowledge concerning climate change. It follows the IPCC Third Assessment Report published in 2001 and precedes the Fifth Assessment Report due (possibly) in about 2013. The release of these three reports in the first half of 2007 is therefore a marker event within an entire decade for the way in

¹ WG-1 contains mostly natural science, WG-2 a mixture of natural and social science, and WG-3 a mixture of mostly economics, social science and some engineering and natural science.

which internationally and inter-governmentally assessed knowledge of climate change is made publicly salient.

The SPM for each Working Group consists of a 16-20 page document which is agreed, line-by-line, over a four day assembly consisting of lead scientific authors from the assessment exercise together with delegations of government nominees and IPCC staff. See Leemans (2008) for a summary of this process. The three Working Groups each convened an international media conference on the morning of the last day (a Friday) of their assembly to present the key messages from the SPM: WG-1 convened in Paris, WG-2 in Brussels and WG-3 in Bangkok.

For each of the Saturdays immediately following the release of the respective Working Group SPMs – i.e., the next day, namely: 3 February, 7 April and 5 May – a copy of the ten national daily UK newspapers was purchased². These newspapers are listed in Table 1, together with information about their ownership, circulation, readership, style and ideology. The style categories of ‘quality’, ‘middle market’ and ‘popular’ are those used by the UK Newspaper Marketing Agency and is strongly linked to the sociological status of the readership profile. ‘Quality’ press equates to ‘prestige’ press in the United States. Following Carvalho (2007), I understand ideology to mean ‘a system of values, norms and political preferences, linked to a program of action vis-à-vis a given social and political order’. Her study examined the relationship between climate change reporting and ideology for three quality UK papers – *The Times*, *The Guardian* and *The Independent*. I adopt her ideological classification and extend it to the other eight newspapers surveyed here.

² An eleventh newspaper was also purchased and included here – the *Eastern Daily Press* which is the main regional newspaper for the East Anglian region of England, with a catchment population of about 2 million. Whilst a relatively large readership, being based in Norwich – the home of the University of East Anglia and its climate expertise – its coverage of climate change stories is generally much greater than for a typical regional UK newspaper.

All of the printed items for each newspaper – news reports, editorials, opinion-pieces - relating to the previous day's IPCC respective WG report release were identified and carefully read. There were a total of 55 items across all newspapers and all Reports; these are listed by headline in the Appendix. The print coverage was analysed in terms of the morphological and structural organisation of texts - volume (printed area, excluding visual imagery) and positioning in the newspaper – and in terms of language and rhetoric. Additional attention was given to article headlines in order to identify the tone that was used to attract the reader's attention. Each of the 55 items identified was coded in terms of its dominant linguistic repertoire using the 12 repertoires identified by Ereaut and Segnit (2006; see Table 2), themselves grouped into three dominant discourses: 'alarmist', 'optimistic' and 'pragmatic optimistic'. Ereaut and Segnit (2006) developed this analytical framework from academic discourse analysis following Potter and Wetherell (1987) and they define linguistic repertoires as 'systems of language that are routinely used for describing and evaluating actions, events and people'. Their particular classification is adopted for this study because it was derived from climate change discourses represented in the UK print media, plus TV, radio and web coverage. It is specific to the UK and is recently derived – 2005 and 2006. Four of the 55 selected items could not be coded and a number of items reflected repertoires drawn from more than one of the categories listed in Table 2. (See Appendix for the codings). The nature and role of accompanying visual imagery was not considered in this analysis since such imagery raises different sets of questions (see Doyle, 2007).

Results

Table 3 shows the volume of coverage for each newspaper for each of the three Working Group SPMs. The coverage by the 'quality' newspapers was clearly substantially greater

than in the ‘popular’ newspapers with one title – the *Daily Star* – not mentioning any of the three IPCC Reports. There was a significant difference in volume of coverage between the three Reports, WG-2 receiving, collectively, only about 67% of the coverage of WG-1 and WG-3 receiving only about 30%. This trend was evident for most newspapers, although *The Times* and the *EDP* gave their greatest coverage to WG-2, whilst the *Financial Times* was fairly even in its coverage across all three Working Groups. None of the three ‘popular’ newspapers, with a combined readership of nearly 14 million (i.e., about half of the UK’s estimated readership of national daily newspapers), covered the WG-3 Report.

Page space is a crude index of coverage. Table 4 therefore identifies for each newspaper and for each of the three Working Group SPMs whether there was a front page story on the IPCC Report and whether the newspaper offered an editorial comment on the Report. Also listed are the actual page numbers on which the IPCC news reports were printed inside each newspaper. The WG-1 Report attracted five front page news-stories, the WG-2 Report two front page stories, the WG-3 Report none. Editorial comment was almost entirely missing for the WG-3 Report and only the *The Independent* ran an editorial comment for each Report release. Interestingly, two of the ‘popular’ newspapers – the *Daily Mirror* (WG-1) and *The Sun* (WG-2) – did run editorial comments. The siting of the news coverage inside each newspaper varied between newspapers and often reflected the specific logic for positioning news (e.g. national before international, political before environmental) of each newspaper. There was little systematic patterning here.

Turning now to the content of these reports rather than to coverage and placement, the dominant discourse used by the newspapers in their coverage of the WG-1 and WG-2 Reports was ‘alarmist’ (Table 5). This is consistent with the findings of Ereaut and Signit

(2006) that much of the UK public discourse on climate change has recently been dominated by this trope or repertoire. Although the coding undertaken here was based on the full content of each item, the headlines used for these stories captures the dominant tone of reporting for WG-1 - 'final warning', 'worse than we thought', 'hellish vision', 'climate of fear', 'climate disaster' – and for WG-2 - 'dire threats', 'global meltdown', 'melting ice doomsday', 'will kill billions', 'warming threatens everyone'. The subsidiary trope in the reporting of the first two Reports was that of 'establishment techno-optimism' (Table 5) in which emphasis was placed on national leaders to use the publication of the IPCC Report to push for stronger action on climate change.

Although there was considerably less coverage given to the WG-3 Report, the linguistic repertoires used in its reporting were markedly different from those used for WG-1 and WG-2 (Table 5). Over 80% of the WG-3 newspaper items followed a 'pragmatic-optimist' discourse with headlines such as 'warming can be controlled', 'we CAN reverse climate change', 'act - don't despair' and '13 years to turn it round'. This more active and engaged repertoire for reporting WG-3 was undoubtedly picked up from the more upbeat tone of the IPCC WG-3 SPM itself (e.g. 'Climate panel offers grounds for optimism': Hopkin, 2007; contrast the caricature of WG-2 and WG-3 in the cartoon in Figure 1). Unlike Ereaut and Signit (2006) whose survey found the repertoire of 'small actions' to be dominant within the pragmatic-optimistic discourse, the reporting of the IPCC Reports in the UK print media placed much more emphasis on technology and government actions (codes 8a and 8b; Table 5).

What do we learn from this analysis of the reporting by the national UK print media of the three IPCC Summary for Policy Maker Reports? In what ways are the key messages of the IPCC mediated by the British press? I suggest three over-riding findings which I summarise here, before in the final section discussing the wider implications of

these points in the context of the literature about the role of the media in climate change risk framing, perception, communication and action.

First, is the overwhelmingly alarmist tone of the reporting of the WG-1 and WG-2 Reports. The language of catastrophe, fear, disaster and death dominated nearly all of these items, a universal trait across all newspapers with perhaps the exception of the *Financial Times* and, to a lesser extent, *The Times*. In contrast, the more upbeat reporting of WG-3 used a more engaged set of repertoires emphasising the role of agency in managing climate change risks, especially the potential of technology and government policy. This followed, however, the two earlier rounds of reporting disaster and impending catastrophe and in all newspapers (except the EDP) the coverage given to WG-3 was significantly less (70% less overall) than that given to WG-1. There was no reporting at all of the WG-3 Report in the 'popular' press, these three titles representing nearly 50% of UK's national newspaper readership.

The second point to note is the considerable over-claiming that occurred in the accounts of the IPCC WG-1 Report. Many of the items not only reported on the key findings about the functioning of the world's climate system – the focus of WG-1 – but offered embellished interpretations of what the consequences of future warming would be for the world. These impacts - invariably described as catastrophic, disastrous and fearful - were to be the subject of the subsequent WG-2 Report, but about these impacts WG-1 was completely silent. Much of the newspaper reporting of the science of the climate system therefore felt it necessary to offer their own interpretations of the impacts of the climate change reported by recycling previously published accounts and reports, or through creative imagination.

The third finding that emerges from this analysis is that there was very little mention in any of the reporting of WG-2 about the possibility, or even the necessity, of

adaptation to climate change. Yet this was a strong theme in the IPCC WG-2 Summary for Policymakers. Only the *Financial Times* used the active word ‘adapt(ion)’ in a headline – ‘Scientists warn world must adapt to climate change’ - and if the other WG-2 newspaper items mentioned the possibility of adaptation at all, it was always in the final paragraphs of the item, almost as an afterthought. It was also noticeable that the reporting of WG-2 displaced most of the adverse impacts of climate change on areas of the world other than the UK, particularly in the developing world. And in the two newspapers that made up-front specific mention of expected impacts within Britain, quite contradictory messages were communicated: the *Daily Express* reporting ‘Britain faces catastrophe within 50 years’ and the *Daily Mirror* claiming ‘Britain would become warm and prosperous’ as a consequence of climate change.

Discussion and Conclusion

There are some clear limitations to this study. Most obviously when comparing the volume of newspaper coverage of the three IPCC Working Group Reports is the competition for news on the three respective Saturdays. The greater volume of reporting of WG-1 may simply reflect the lack of other newsworthy items on that day or, conversely, the poor coverage given to WG-3 might reflect a major breaking and competing news item. Indeed, the UK local government elections were held on Thursday 3 May, the day before the WG-3 SPM was released, and the full results from these elections were only available to the Saturday editions of the national newspapers. This undoubtedly would have influenced editorial policies for most of those newspapers for Saturday 5 May and the coverage given to WG-3. Conversely, 6 April was Good Friday and the following day was Easter Saturday, the beginning of a UK Bank Holiday weekend when traditionally there are fewer domestic political stories breaking. On the other hand,

Painter (2007) found a similar difference in coverage between WG-2 and WG-3 in his survey of international TV coverage of these two Report releases suggesting that local UK news factors were not the entire reason for this difference.

There are other limitations to the study. Only one day's coverage of the IPCC Reports has been sampled, although admittedly the day on which they were likely to receive most attention. No Sunday newspapers were sampled – these often provide more considered and reflective articles - and, apart from one regional newspaper (the *EDP*), only national – not regional - print media. Other forms of media reporting – TV, radio, internet – were not sampled in this study (although again the study by Painter (2007) examined the coverage on international TV channels of the WG-2 and WG-3 Reports).

Notwithstanding these limitations what conclusions can be drawn from this study which have a bearing on the issues raised at the beginning – i.e., questions about the framing of climate change, about the language of media discourse on climate change, and about the role of newspaper ideologies?

The study suggests that the way the IPCC assessment is structured – into three clearly demarcated Working Groups – and the way these three WGs report sequentially – climate system science, followed by impacts and adaptation, followed by mitigation - affects the framing of climate change as received by readers of the British print media. Greatest attention in the print media is paid to the conclusions of WG-1 (problem-oriented) compared to those of WG-3 (solutions-oriented) simply because WG-1 reports first and hence captures the 'newsworthy' tag most powerfully. An interesting thought experiment would be to consider what the balance of print media coverage would be if WG-3 reported first and WG-1 last.

Furthermore, because WG-1 (solely physical climate science, saying nothing about social impacts or adaptation) precedes WG-2 (impacts and adaptation) and WG-3 (policy

and mitigation) the reporting of climate system science (WG-1) gets embellished in the print media with ad hoc and often casual interpretations about the implications of the projected climate change for society and environment. Given the instinctive preference of the media for dramatic representations of science stories (see for example Hargreaves *et al.*, 2003; Corbett & Durfee, 2004) more consideration should be given by the IPCC to the likely ways in which its key messages, compartmentalised into three rather artificial chunks separated in time, will get represented in the media. At the very least there seems a *prima facie* argument for the release to the public of a single synthesis report rather than three separate and somewhat contradictory partial reports. To the contrary, the IPCC Synthesis Report of AR4 was only released six months later in November 2007.

The consequence of this structural framing, combined with journalistic norms and practises, is that the representation of the IPCC climate change assessment in the UK print media adopts an overwhelmingly alarmist repertoire. Over 75% of items reporting on WG-1 and WG-2 fell into this category. This has the effect of presenting climate change through scary, and almost pre-determined, doom-laden scenarios saturated in the language of fear and disaster, rather than as a contingent phenomenon with a malleable outcome which can be heavily influenced by policy choices. Adaptation – reducing society’s sensitivity to climate change – was largely absent, or at best marginalised, from the reporting of WG-2, while discussion of the potential policy options for mitigation – reducing society’s exposure to climate change – was relegated in third place to the less extensive reporting of WG-3.

These latter two findings are consistent with those of Painter (2007) in his study of international TV coverage of WG-2 and WG-3, suggesting that the underlying reasons were not unique to the UK. Similar biases towards favouring an ‘alarmist’ discourse are also evident in the way in which the intersection between climate change and international

development has been increasingly reported in the UK quality print media (Doulton, 2007).

There is some evidence of the effect of newspaper ideologies on the way climate change was reported, as found by Carvalho (2007) and suggested by Gavin (2007), but I suggest that this effect is not dominant in this case study. The neo-liberal capitalist newspapers, *The Times* and *Financial Times*, tend to take the least alarmist line in reporting WG-1 and WG-2 and reflect some degree of techno-optimism in terms of dealing with climate change. This is most evident in the case of the *Financial Times* which reflects its 'can-do' business mentality. Since Carvalho's (2007) study ended in 2001, *The Independent* newspaper has adopted a much more aggressive ideological position on climate change with a strident environmental campaigning ethos which lends itself to adopting exaggerated positions on matters such as climate change. This is clearly reflected in the coverage in this case study with this newspaper carrying by far the greatest coverage of the IPCC reports, and in nearly every case for WG-1 and WG-2 adopting an 'alarmist' repertoire (see Appendix). There is a curious paradox in the coverage by the *Daily Mail* – far from reflecting its neo-conservative ideology and its well-stated sceptical editorial line about the reality of anthropogenic climate change, its (modest) coverage of all three WGs adopts an alarmist tone: 'UN's extreme weather warning', 'The global meltdown', 'The long-range forecast: malaria and skin cancer'.

This rather ambiguous relationship between coverage of the 2007 IPCC reports and newspaper ideology suggests the demarcation issue in the national UK print media in their coverage of climate change has changed. Rather than examining whether newspaper coverage reflects anthropogenic climate change as real or not (cf. earlier studies of media balance and bias by, for example, Boykoff & Boykoff, 2004; Carvalho & Burgess, 2005) the distinguishing question now is whether climate change is presented as looming

catastrophe with little attention on agency (e.g. *The Independent*) or whether a more contingent and engaged tone is adopted (e.g. *Financial Times*). The battle lines are thus drawn now rather differently and they do not quite so easily or self-evidently map onto ideological positions of the newspapers. Nevertheless, this case study suggests that the former ‘alarmist’ discourse about climate change is now pre-dominant in the national UK print media.

This case study demonstrates the differentiated roles of the IPCC and of the UK print media in shaping and mediating the way in which climate change is portrayed and understood by the British public, what Carvalho and Burgess (2005) call the ‘cultural circuit of climate change’. The way the IPCC frames (reports) climate change continues (cf. earlier criticism by Rayner & Malone, 1998) to present it first and foremost as a phenomenon to be understood through natural science, with the contributions of the social sciences relegated to a subservient role. The UK print media respond to this framing by adopting a linguistic repertoire in reporting the IPCC assessment. This repertoire fuels an ‘alarmist’ discourse over others which emphasise contingency, agency and opportunity.

The reasons for this preference need further investigation. They may be as much to do with journalistic norms and practises in favouring bad news and melodrama over more nuanced and contingent interpretations of climate change than they are a result of different newspaper ideologies. Whatever the reason, this tendency in UK media coverage has been in evidence in other salient science-society-policy debates such as GM foods (Burke, 2004; Cook *et al.*, 2006) and MRSA ‘superbugs’ (Nerlich, 2007). ‘Alarmist’ discourses seeking changes in public behaviour have been shown often to be counter-productive. Fear-based communication strategies frequently fail in achieving desired behavioural outcomes (e.g. Cantrill, 1992; Moser & Dilling, 2004; Nicholson-Cole, 2005; Lorenzoni *et al.*, 2007).

Although the IPCC offers an international and inter-governmental scientific assessment process for generating legitimated and politically powerful scientific messages, exactly how these messages are mediated within and between different countries and cultures is worthy of much more study. Publics in different social networks, in different countries and in different cultures end up hearing and reacting to different messages as they are mediated by different social institutions.

Acknowledgements

Helpful comments were received on an early version of this manuscript from Asher Minns, Lorraine Whitmarsh, Suraje Dessai and Neil Jennings. Asher Minns traced much of the data shown in Table 2. James Painter is thanked for sharing his study of international TV coverage of the IPCC WG-2 and WG-3 Reports.

References

- Baron, J. (2006) Thinking about global warming **Climatic Change** 77, 137-150.
- Boykoff, M.T. and Boykoff, J.M. (2007) Climate change and journalistic norms: a case study of US mass-media coverage **Geoforum** (in press)
- Boykoff, M.T. (2007) Flogging a dead norm? newspaper coverage of anthropogenic climate change in the USA and UK from 2003-2006 **Area** (submitted)
- Boykoff, M.T. and Boykoff, J.M. (2004) Balance as bias: global warming and the US prestige press **Global Environmental Change**, 14, 125-136.
- 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 Organisation Reports**, 8(3), 207-211.
- Burke, D. (2004) GM food and crops: what went wrong in the UK? **EMBO Reports**, 5(5), 432-436.
- Cantrill, J. (1992) Understanding environmental advocacy: inter-disciplinary research and the role of cognition **Journal of Environmental Education** 24(1), 35-42.
- Carvalho, A. (2005) Representing the politics of the greenhouse effect: discursive strategies in the British media **Critical Discourse Studies** 2, 1-29.
- Carvalho, A. (2007) Ideological cultures and media discourses on scientific knowledge: re-reading news on climate change **Public Understanding of Science** 16, 223-243.
- Carvalho, A. and Burgess, J. (2005) Cultural circuits of climate change in the UK broadsheet newspapers, 1985-2003 **Risk Analysis** 25(6), 1457-1470.

- Cook,G., Robbins,P.T. and Pieri,E. (2006) “Words of mass destruction”: British newspaper coverage of the genetically modified food debate, expert and non-expert reactions **Public Understanding of Science**, 15, 5-29.
- Corbett,J.B. and Durfee,J.L. (2004) Testing public (un)certainly of science media representations of global warming **Science Communication** 26(2), 129-151.
- Doulton,H.L. (2007) “**Ten years to prevent catastrophe**”? **discourses of climate change and international development in the UK ‘quality’ press** Unpublished MSc Dissertation, School of Development Studies, UEA, Norwich, UK
- Doyle,J. (2007) Picturing the clima(c)tic: Greenpeace and the representational politics of climate change communication **Science as Culture** 16(2), 129-150.
- Entman,R. (1993) Framing: toward clarification of a fractured paradigm **Journal of Communication** 43(4), 51-58.
- Ereaut,G. and Segnit,N. (2006) **Warm words: how are we telling the climate story and can we tell it better?** Institute for Public Policy Research, London, 32pp.
- Gavin,N.T. (2007) Global warming and the British press: the emergence of an issue and its political implications Unpublished paper presented at the Political Studies Association’s ‘Elections, public opinion and parties’ Conference, University of West England, Bristol, September 2007
- Hargreaves,I., Lewis,J. and Speers,T. (2003) **Towards a better map: science, the public and the media** ESRC, London, 58pp.
- Hopkin,M. (2007) Climate panel offers grounds for optimism **Nature** 447, 120-121.
- Hulme,M. (2007) Newspaper scare headlines can be counter-productive **Nature** 445, 818
- IPCC (2007a) **Climate change 2007: the physical science basis** WGI Summary for Policymakers, Cambridge University Press, Cambridge, UK, 18pp.
- IPCC (2007b) **Climate change 2007: climate change impacts, adaptation and vulnerability** WGII Summary for Policymakers, Cambridge University Press, Cambridge, UK, 23pp.
- IPCC (2007c) **Climate change 2007: mitigation of climate change** WGIII Summary for Policymakers, Cambridge University Press, Cambridge, UK, 24pp.
- Kerr,R. (2007) Pushing the scary side of global warming **Science** 316, 1412-1414.
- Leemans,R. (2008) Governance of policy relevance assessments: personal experiences with the IPCC and the Millennium Ecosystem Assessment **Global Environmental Change** (in press)
- Leiserowitz,A. (2006) Climate change risk perception and policy preferences: the role of effect, imagery and values **Climatic Change** 77, 45-72.
- Linder,S.H. (2006) Cashing-in on risk claims: on the for-profit inversion of signifiers for “global warming” **Social Semiotics** 16(1), 103-132.
- Lorenzoni,I., Nicholson-Cole,S. and Whitmarsh,L. (2007) Barriers perceived to engaging with climate change among the UK public and their policy implications **Global Environmental Change** doi:10.1016/j.gloenvcha.2007.01.004
- Lorenzoni,I., Pidgeon,N.F. and O’Connor,R.E. (2005) Dangerous climate change: the role of risk research **Risk Analysis** 25(6), 1387-1398.
- Lowe,T.D. (2006) **Is this climate porn? How does climate change communication affect our perceptions and behaviour?** Tyndall Centre Working Paper No.98, Norwich, UK, 37pp.

- Moser,S.C. and Dilling,L. (2004) Making climate hot: communicating the urgency and challenge of global climate change **Environment** 46(10), 32-46.
- Moser,S.C. and Dilling,L. (eds.) (2007) **Creating a climate for change: communicating climate change and facilitating social change** Cambridge University Press, Cambridge, 549pp.
- Nerlich,B. (2007) 'The post-antibiotic apocalypse' and the 'war on superbugs': catastrophic discourse in microbiology, its rhetorical form and political function Unpublished manuscript, University of Nottingham, UK
- Nicholson-Cole,S. (2005) Representing climate change futures: a critique on the use of images for visual communication **Computers, Environment and Urban Systems**, 29, 255-273.
- Nisbet,M. and Mooney,C. (2007) Framing science **Science**, 316, 56.
- Painter,J. (2007) All doom and gloom? International TV coverage of the April and May 2007 IPCC reports Unpublished manuscript, Environmental Change Institute, University of Oxford, UK
- Patt,A. (2007) Assessing model-based and conflict-based uncertainty **Global Environmental Change** 17(1), 37-46.
- Rayner,S. and Malone,E. (eds.) (1998) **Human choice and climate change: vol.1 – the societal framework** Batelle Press, Columbus, Ohio, 491pp.
- Potter,J. and Wetherall,M. (1987) **Discourse and social psychology: beyond attitudes and behaviour** Sage, London
- Risbey,J.S. (2008) The new climate discourse: alarmist or alarming? **Global Environmental Change** (in press)
- Smith,J. (2005) Dangerous news: media decision making about climate change risk **Risk Analysis**, 25, 1471-1482.
- Trumbo,C. (1996) Constructing climate change: claims and frames in US news coverage of an environmental issue **Public Understanding of Science** 5(3), 269-283.
- Weingart,P., Engels,A. and Pansegrau,P. (2000) Risks of communication: discourses on climate change in science, politics and the mass media **Public Understanding of Science**, 9, 261-283.



Figure 1: A characterisation of the key messages in the IPCC WG-2 ('impacts report') and WG-3 ('mitigation report') published in the magazine *Tiempo*, July 2007 [Source: Lawrence Moore and *Tiempo*]

	Ownership	Circulation ('000s)	Readership ('000s)	% Readership ABC1	Style	Ideology
<i>The Daily Telegraph</i>	Telegraph Group Limited	892	2,136	85	Quality	Conservative
<i>The Times</i>	News International	602	1,726	89	Quality	Neo-liberal capitalist
<i>The Guardian</i>	Guardian Newspapers Ltd	364	1,256	92	Quality	Social-democratic
<i>The Independent</i>	Independent Newspapers (UK) Ltd	238	802	87	Quality	Anti-establishment
<i>Financial Times</i>	Financial Times Ltd	445	394	93	Quality	Neo-liberal capitalist
<i>Daily Mail</i>	Associated Newspapers Ltd	2,303	5,205	65	Middle Market	Neo-conservative
<i>Daily Express</i>	Express Newspapers	770	1,767	59	Middle Market	Conservative
<i>Eastern Daily Press</i>	Archant Ltd	67	174	50	Middle Market	Liberal
<i>The Sun</i>	News International	3,064	8,004	38	Popular	Popular
<i>Daily Mirror</i>	Trinity Mirror plc	1,566	3,923	44	Popular	Social-democratic
<i>Daily Star</i>	Express Newspapers	796	1,754	36	Popular	Popular

Table 1: The characteristics of the eleven newspapers surveyed in this study. All newspapers have national circulation except for the Eastern Daily Press. Social classes A, B and C1 represent middle classes (upper, middle and lower), and exclude the classes 'skilled working', 'working' and 'lower subsistence'. The ideologies are from Carvalho (2007), supplemented by the author. [Sources: Newspaper Marketing Agency from National Readership Survey; Archant Ltd.]

Discourse	Code	Repertoire	Sub-repertoire	Caricature
Alarmist	1	Alarmist		'We're all going to die'
Optimistic	2	Settlerdom		'What's all the fuss about'
	3	British comic nihilism		'Oh, bugger it and open another bottle'
	4	Rhetorical scepticism		'It's bad science, over-hyped'
	5	Expert climate change denial		'I beg to differ'
	6	Warming is good		'Relax, don't worry ...'
	7	Free market protection		'Ah, but what you haven't thought of is ...'
Pragmatic optimistic	8a	Techno-optimism	Establishment	'Technology will provide the answer'
	8b		Non-establishment	
	9	David and Goliath		'A small number can change the world'
	10a	Small actions	Personal	'I'm doing my bit for the planet – and maybe my pocket'
	10b		Corporate	

Table 2: The 12 linguistic repertoires identified by Ereaut and Segnit (2006) as capturing public discourse about climate change in the UK. The verbal caricatures are taken from their study. These 12 repertoires are grouped into three meta-discourses.

	WG-1	WG-2	WG-3	All
<i>The Daily Telegraph</i>	1,560	1,080	310	2,950
<i>The Times</i>	1,420	1,570	420	3,410
<i>The Guardian</i>	2,100	520	310	2,930
<i>The Independent</i>	3,000	1,880	690	5,570
<i>Financial Times</i>	1,110	1,000	800	2,910
<i>Daily Mail</i>	425	275	20	720
<i>Daily Express</i>	95	430	260	785
<i>Eastern Daily Press</i>	725	1,120	1,000	2,845
<i>The Sun</i>	480	270	0	750
<i>Daily Mirror</i>	1,500	275	0	1,775
<i>Daily Star</i>	0	0	0	0
Total	12,415	8,420	3,810	24,645

Table 3: Page space (measured in cm²) devoted in each newspaper to textual reporting (ignoring visual imagery) of the three IPCC Working Group reports on the three Saturdays immediately following the release of the respective Summaries for Policy Makers.

	WG-1		WG-2		WG-3	
		pages		pages		pages
<i>The Daily Telegraph</i>	F	14-15	F	4		10
<i>The Times</i>	F	32-33	*	26-27		28
<i>The Guardian</i>	*F	12		7		12
<i>The Independent</i>	*F	2-5	*F	2-3	*	28
<i>Financial Times</i>	*	5		7		6
<i>Daily Mail</i>		37		?		47
<i>Daily Express</i>		11		29		18
<i>Eastern Daily Press</i>	*F	5	*	10-11		8-9
<i>The Sun</i>		20	*	8		-
<i>Daily Mirror</i>	*	14-15		4		-
<i>Daily Star</i>		-		-		-

Table 4: Positioning of the coverage of the three IPCC Working Group reports in each newspaper * = editorial; F = front page story; numbers refer to the pages on which main coverage occurred (excludes editorial, guest columns, front page).

Discourse	Code	Repertoire	WG-1	WG-2	WG-3
Alarmist	1	Alarmist	18	12.7	1.1
Optimistic	2	Settlerdom	-	-	-
	3	British comic nihilism	-	-	-
	4	Rhetorical scepticism	-	0.5	-
	5	Expert climate change denial	-	-	-
	6	Warming is good	0.5	-	-
	7	Free market protection	-	1.8	-
Pragmatic optimistic	8a	Techno-optimism, establishment	4.5	3	3.1
	8b	Techno-optimism, non-establishment	1	-	3.3
	9	David and Goliath	-	-	0.25
	10a	Small actions, personal	-	-	1
	10b	Small actions, corporate	-	-	0.25
		No category	4	-	-
Total			28	18	9

Table 5: Allocation of repertoires used in the 55 newspaper items covering the WG-1, WG-2 and WG-3 reports. Some items were allocated more than one repertoire, hence the fractional numbers.

Appendix: Articles, identified by headlines

* indicates front page story

linguistic repertoire codes are indicated next to each headline (cf. Table 2)

WG-1 Report (28 items)

The Independent

- 1 * *Final warning*
- 1 *UN delivers definitive warning on dangers of climate change*
- ? *Bush stands alone in his refusal to take heed*
- 1 *The temperature is rising and humans are to blame*
- 1 *Carbon dioxide rate is at highest level for 650,000 years*
- 1,8a Editorial – *Now it is up to the world's political leaders to deliver more than hot air*
- 1 Op-ed from Mark Lynas - *The hellish vision of life on a hotter planet*

The Guardian

- 1 * *Worse than we thought*
- ? *Front-page sketch – The scientists spoke cautiously but the graphics said it all*
- 1 *Why the news about warming is worse than we thought: feedback*
- 1,8a Editorial – *No more excuses*
- 1 Op-ed from Jerry Leggett – *Mayday alert for the world*

The Times

- 1,8a * *New fears on climate raise heat on leaders*
- 1 *Damning report seeks to end debate over global warming*

The Daily Telegraph

- 1,8a * *Only man can stop climate disaster, say UN scientists*
- 1 *Official: global warming is all our fault*

Financial Times

- 1 *World's scientists convinced that humans cause global warming*
- 8b *Insurers add voices to climate debate*
- ? *Call for urgent action to avoid disaster*
- 8a Editorial – *Urgent need for action on climate change – we need a clear and predictable worldwide price for carbon*

Daily Express

- 1 *Why we must act on global warming*

Daily Mail

- 1,6 *UN's extreme weather warning, for 100 years*

Daily Mirror

- 1 *You have been warmed*
- 1,8a Editorial – *Green alert*

The Sun

- 1 *Climate of fear – starkest warming yet*

EDP

- ? * \$10,000 offered to 'spin' report
- 1,8a Prompt action call on climate change
- 1,8a Editorial – Serious questioning to the third degree

WG-2 Report (18 items)

EDP

- 1 *The dire threats that confront our planet*
- 1 Editorial - *We're still fiddling while world burns*

The Times

- 1,7,8a *More hunger, drought and hurricanes on the way as the world warms – an international panel concluded that Britain would be one of the few beneficiaries of rising temperatures*
- 8a *White House is resolute at staying cool over the forecasts*
- 1,7 *Looking on the bright side of a bleak outlook*
- 4,10 Editorial - *A climate of intolerance – facts, not emotion, should inform discussion of climate change'*

Daily Mail

- 1 *The global meltdown: billions will be hit by flood and famine, warns the UN*

Daily Telegraph

- 1 * *Climate change could create 50m environmental refugees by 2010*
- 1,8a *World finally agrees that global warming threatens everyone*

Daily Express

- 1 *Melting ice doomsday*

The Guardian

- 1 *Scientists' stark warning on reality of warmer world*

The Independent

- 1 * *The children who will pay the price for climate change – UN predicts the poorest will be worst affected*
- 1,7 *How the worst effects of climate change will be felt by the poorest*
- 1 Editorial – *The world's biggest polluters can no longer ignore the evidence*

Financial Times

- 1,8a *Scientists warn world must adapt to climate change*

Daily Mirror

- 1,7 *Boom and dust: UN's grim prediction on toll of global warming*

The Sun

- 1 *Global warming 'will kill billions'*
- 1 Editorial - *Climate of fear*

WG-3 Report (9 items)

EDP

1,8b,9,10a Climate ready for change of policy

The Times

8a,8b Global warming can be controlled – but only if nations act now, UN told

Daily Mail

1 The long-range forecast: malaria and skin cancer

Daily Telegraph

8a,8b World given deadline on climate change

Daily Express

8b,10a Experts: we CAN reverse climate change

The Guardian

1,8a,8b UN scientists warn time is running out to tackle global warming

The Independent

8a,8b,10a,10b Climate change can be halted, UN concludes

8a Editorial – Act, don't despair, on climate change

Financial Times

8a,8b 13 years to turn round global warming