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# The tipping point trend in climate change communication

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ABSTRACT

This article documents the use of tipping points in climate change discourse to discuss their significance. We review the relevant literature, and discuss the popular emergence of tipping points before their adoption in climate change discourse. We describe the tipping point trend in mainstream US and UK print news media and in the primary scientific literature on climate change by replicating the methodologies of Oreskes [Oreskes, N., 2004. The scientific consensus on climate change. Nature 306, 1686] and Boykoff and Boykoff [Boykoff, M.T., Boykoff, J.M., 2004. Balance as bias: global warming and the US prestige press. Global Environmental Change 14, 125–136]. We then discuss the significance of climate change tipping points and their popular use in terms of generative metaphor.



## 1. Introduction

On 6 December 2005, in a presentation to the American Geophysical Union (AGU), James Hansen stated that, "we are on the precipice of climate system tipping points beyond which there is no redemption" (Hansen, 2005, p. 8). Hansen's warning helped initiate a tipping point trend in climate change communication that was quickly reflected in public debate. These warnings were front page news by January 2006, with *The Washington Post* reporting that, "[t]his 'tipping point' scenario has begun to consume many prominent researchers in the United States and abroad..." (Eilperin, 2006, p. A01). Tipping point warnings are now evident not only in prestige media and popular discourse, but in the primary science and U.S. congressional testimony as well. Only 2 years after Hansen's initial tipping point warning, the AGU dedicated a half-day session to exploring the relevance and scope of tipping points to climate systems. Kerr (2008), covering the session for *Science*, concluded that use of the notion had become acceptable: "Tipping points, once considered too alarmist for proper scientific circles, have entered the climate change mainstream" (p. 153).

The rapid mainstreaming of tipping point warnings of climate change danger raises several questions. Do tipping points represent an important shift in climate change discourse or, as the editors of *Nature* suggest, is this simply old wine in new bottles? Do tipping points induce unwarranted anxiety and perhaps fatalism (Nature, 2006; Hulme, 2006), or, on the other hand, do they help correct for the "false sense of security" produced by smooth projections of change, which can lull society into inactivity (Lenton et al., 2008, p. 1792; cf. Lenton and Schellnhuber, 2007; Risbey, 2008)? Should we draw any conclusions from the fact that popular discourse on tipping points precedes use of the concept in peer-reviewed climate change science? Does the divergence of tipping point warnings from the terminology found in the Intergovernmental Panel on Climate Change 4th Assessment Report (IPCC AR4) require explanation?

This article documents the use of tipping points in climate change discourse and discusses their significance in light of these questions. First, we review the relevant literature on climate change communication and revisit Schön's (1979) distinction between concepts, re-description, and generative metaphors to theorize how new perspectives on climate change are developed. Second, we trace the mainstream emergence of tipping points through the work of Malcolm Gladwell to clarify its popular associations. Third, we describe the tipping point trend in the primary scientific literature on climate change, and in mainstream U.S. and U.K. print news media. Fourth, we examine trends that emerge in scientific and media discourse.

## 2. Climate change communication: the research literature

Research into climate change communication has broadened significantly in recent years and now deals substantively with interdisciplinary scientific communication, the scientist/

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policymaker interface, international diplomacy, as well media coverage and public understanding. Researchers concerned with public understanding have long recognized that news media are important sources of scientific information among non-scientists. Nisbet and Myers (2007) comprehensive summary of the results of 20 years of public opinion surveying found "strong connections between patterns in media attention to global warming and shifts in poll trends" (p. 445). Research investigating the connection between scientific knowledge, media, and public understanding of climate change frequently suggests a "gap" between scientific and media representations of anthropogenic climate change. The idea is that a communication failure between journalists and scientists results in divergent representations of the issue, and that the difference or 'gap' in depictions of climate change prevents the public from learning about its relevance to society. Two studies are frequent points of reference for establishing this conclusion. Oreskes (2004) canvassed the statements of major professional scientific organizations and analyzed a random sample of the abstracts of the research literature from 1993 to 2003 to argue there was scientific consensus regarding the fact of anthropogenic climate change. Boykoff and Boykoff (2004) conducted a content analysis of US prestige newspapers to determine how well news represented this claim. Other researchers have used cross-national media comparisons to illuminate the greater divergence of US media from other national media on this point (Dispensa and Brulle, 2003), or focused on specific instances of political economic manipulation (McCright and Dunlap, 2000, 2003; Antilla, 2005; Lahsen, 2005; Jacques et al., 2008).

A second research tradition dealing with climate change communication prioritizes the relationship of communication to motivation and social change. These researchers argue that lacking correct information is not the main barrier to action. Instead, it is important to ask how climate change problems are made relevant to specific audiences in different contexts (cf. Moser and Dilling, 2007) and to acknowledge the importance of culture (Hulme, 2008; cf. Pettenger, 2007). A frequent concern is the way problem formulations generate or dampen opportunities for social change. For example, Skodvin's (2000) focus on "problem diagnosis" illuminates social interactions where facts and values intermingle in the co-constitution of problem statements and solution paths: "scholarly attention has been redirected from the processes whereby scientific knowledge is communicated to policymakers towards the processes [whereby] scientific knowledge is integrated with policy concerns in comprehensive problem definitions that form interpretative frameworks whereby problems are made negotiable..." (Skodvin, 2000, p. 18).

Problem diagnoses are often expressed in the language of marketability or framing. Ungar's (2007) concepts of "issue culture" and "bridging metaphors," for example, are discussed in terms of selling climate change. People will attend to climate change insofar as it fits or fails to fit conceptions of a "hot crisis," a frame of understanding that accelerated action on stratospheric ozone depletion (Ungar, 1998). Similarly, Williams (2000) argues that climate change must be treated in terms of "packageable solutions" to compete for media attention and to avoid skeptical counter-claims. If the problem is not reconfigured to suit conventional forms of action, or if it is not "'packaged' in a way that makes the situation a matter of common sense and at the same time resolves our orientation to the problem in terms of action," then media will lose interest and coverage will decline (Williams, 2000, p. 66).

The degree to which climate change communication must accommodate to preexisting institutional conditions is an open question and recommendations to embrace media conventions often seem to demand acquiescence to the rules of the game. Schneider (1988) calls this situation the "double ethical bind," where a concern for scientific accuracy must be balanced by attention to media effectiveness (p. 114). The bind has prompted concerns that the bending of problem formulations to accommodate media conventions disadvantages indigenous voices and more expansive ecological perspectives that embrace cultural dimensions of climate change (Smith, 2007; Hulme, 2008).

In this second research tradition, a key issue is the lack of commensurability between problem statements and proposed solutions (Williams, 2000; Ereaut and Segnit, 2006; Moser and Dilling, 2007; Risbey, 2008). Those emphasizing the extent of the problem are often charged with forwarding "fear appeals" or even "climate porn," which suggests a perverse pleasure is gained by circulating catastrophic visions of the future (Ereaut and Segnit, 2006). Others defend alarmist portrayals on the grounds that modern institutions are inadequate for addressing the challenge, and that commitments to existing institutions render climate change incapable of solution. In each case, problem diagnoses are criticized for presuming an unworkable set of solutions.

Risbey (2008) distinguishes alarmist from alarming perspectives and he suggests that a "new discourse is emerging which underscores the scope of the problem and the scope and feasibility of solutions. This discourse differentiates itself from existing discourses which view the magnitudes of the problem or of solutions as prohibitive" (p. 26). From this viewpoint, differences in problem formulation are not attributed to distortion, inaccuracy, or evaluated in terms of the positivist problem solving ideologies critiqued by Smith (2007) and Hulme (2008). Instead, problems are evaluated for their consistency with scientific understanding. It is in recognition of the malleability of problem setting processes and as part of an effort to introduce greater urgency into the diagnosis of climate-related threats that tipping point warnings have emerged.

One difficulty in assessing the appropriateness of tipping point warnings is the frequent slippage from physical to biological to social referents, a potential conflation introduced by Gladwell's (2000) interpretation of epidemiological perspectives. Is the notion appropriate as a description of the way physical components of the climate system change, or as a means of understanding social behavior, or both? Is it intended as a scientific concept, or as a metaphor? In discussing tipping points in climate change communication, it is helpful to revisit Donald Schön's work on problem setting in social policy and to distinguish between concepts, re-description, and generative metaphor.

Schön sought to understand how new perspectives on policy problems were developed from the adoption of generative metaphors. Schön (1979) believed that policy disputes often resulted from the use of "conflicting frames, generated by different and conflicting metaphors" (p. 139). He hoped greater clarity on the role of generative metaphor would help explain cognitive innovations, and serve as a critical tool for clarifying conflicts based in competing metaphors. For Schön, generative metaphor takes place when a familiar description is displaced by "a different, already-named process," which then serves as an alternative description able to illuminate and re-prioritize different aspects of a complex situation (p. 141). "What makes the process one of metaphor making, rather than simply of redescribing, is that the new putative description already belongs to what is initially perceived as a different, albeit familiar thing..." (p. 141).

A generative metaphor has a lifecycle. There will be an initial and unjustified use of the metaphor, then the formulation of an analogy able to restructure perception of an existing situation, and only then the potential development of a concept or general model (pp. 142–143). The initial application of the metaphor will look like a silly mistake, and it often is. On such occasions, the effort to rethink a situation is unlikely to proceed beyond the initial experiments with the metaphor. Hansen, for instance, spoke of a