
Polar bears and energy-efficient lightbulbs: strategies to bring climate change home

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Received 31 May 2002; in revised form 15 November 2003

Abstract. Global climate change is the focus of climate politics organized across scales by a range of organizations. These organizations represent climate change in ways they hope will make the problem relevant to people and thereby inspire political action. The strategies require a choice of objects to bring climate change home to constituents. Some objects are ‘more local’ to certain constituencies—that is, they are more meaningful. Greenpeace Canada represents the impact of climate change via the object of the hungry polar bear. The Cities for Climate Protection campaign makes climate change relevant, in part, by its focus on the cost-saving benefits of energy efficiency. The process of localizing climate change constitutes society. I use feminist science studies as a theoretical basis to support my argument that organizations localizing climate change might choose objects that are more accountable to their constitutive effects on societies. I point out potential pitfalls in the choice of the polar bear and energy efficiency, and suggest some possibility in these objects.

Introduction

The question of how best to engage the public in efforts to confront global climate change poses a significant challenge to activist organizations, policymakers, and academics (Jasanoff and Wynne, 1998). Peter Tabuns, Executive Director of Greenpeace Canada, notes that “no one knows how to make climate change relevant [to people]” (interview, 26 June 2003). In this paper I address this issue by way of an analysis of two campaigns: the Cities for Climate Protection (CCP) campaign and Greenpeace Canada’s (GPC) climate campaign.

I pose two related questions. First, how do the strategies employed by GPC and the CCP campaign attempt to inspire public support for greenhouse-gas mitigation measures? Engaging the public on climate change is especially difficult because global climate change is perceived as spatially and temporally distant. The perception is not unexpected given that scientists, advocates, policymakers, and constituents have constructed a global interpretation, vision, and community around climate change (Boehmer-Christiansen, 1994; Demeritt, 1998a; 1998b; 2001; Hinchliffe, 1996; Jasanoff, 2001; Jasanoff and Wynne, 1998; Shackley and Wynne, 1996; Taylor, 1997; Taylor and Buttel, 1992). The two organizations’ strategies are efforts to localize global climate change to enable the public to see climate change as a local problem with local solutions. Some of the ways ‘local’ may be understood include: at a political-jurisdictional level, as a time–space specific, material-discursive context always articulated with the global (Barad, 2003; Massey, 2002); as an area, but only to afford discussion (Cox, 1998); as particular, parochial, and small compared with the global universal; in terms of an event in a place that affects a specific group of people; or as a local issue in the sense of being familiar and/or relevant to daily life. This paper is concerned with the local understood as relevance to daily life. Daily life is always already rooted in some place and linked to larger-scale processes, but this is not necessarily acknowledged. The strategies of the campaigns further assume that making climate change locally relevant to individuals and communities will inspire people to act. I consider how

'local' is constituted, how the process of 'localizing' climate change occurs, and how local relevance might be recast.

The scientific understanding of climate change is one process that constitutes societies (Demeritt, 1998a; 1998b; 2001; Hinchliffe, 1996; Miller and Edwards, 2001; Taylor, 1997; van der Sluijs et al, 1998). Similarly constitutive are social movements, nongovernmental organizations, and other publics that create new facts and may certify scientific knowledge (Jasanoff and Wynne, 1998, page 46). In this light, I examine the choice of objects that GPC and the CCP campaign use to bring climate change home—polar bears and the bottom-line benefit of energy efficiency, respectively. These choices constitute society by concealing some relations and revealing others and by directing society toward some means of understanding and certain ways of acting. Thus the second question I address in this paper is: how do these objects perform or intervene to shape society? The objects often deployed to understand climate change (models, measurements) and to make climate change understandable to policymakers (ice melt, temperature change) have constituted societies as a global community (van der Sluijs et al, 1998). The objects of polar bear starvation and the worth of energy efficiency, chosen to perform climate change locally, communicate it to urban dwellers and residents of Canada in complex ways. I contribute to the question of how to engage the public on climate change by presenting empirical material on the two campaigns and linking it to theory from feminist science studies. I reflect on the ways these objects shape society.

The CCP campaign is a global effort launched by the International Council for Local Environmental Initiatives (ICLEI) to focus attention on the local sources of greenhouse-gas emissions and to lower those emissions. I devote greater time to the CCP campaign because this section is based on primary research—specifically, 135 in-person confidential interviews I conducted in Minneapolis, MN, Tucson, AZ, and Seattle, WA, as well as telephone interviews with campaign contacts in twelve other cities.

Since the early 1990s, GPC has used the icon of the polar bear to dramatize the effect climate change will have on the North. People dressed in polar bear suits pose at climate talks and with local politicians as a means to increase public awareness and support for the nationally and internationally oriented climate politics of GPC. The section on GPC's strategy is derived from an interview with the Executive Director, Peter Tabuns, and with Media Director, Andrew Male, in addition to a review of secondary sources.

I begin by explaining how scale acts when a political effort claims that a process is local or global. I discuss how adopted objects derive from location and then how (boundary) objects as material-semiotic actors may serve as a bridge to translate global climate change into local relevance. I introduce the notion of achieving context-specific relevance through 'practicing facts' (Dumit, 1997) that temporarily elevate aspects of climate change which can be seen and felt by residents of Canada and of US cities. Also important to my argument is the concept of situated knowledge because, if practised, it could produce more effective objects to link climate, in better ways, to people's lives. Next, I examine my research on the CCP campaign and critique the CCP campaign participants' choice of cost saving through energy efficiency as the means to encourage changes that might lower greenhouse-gas emissions. Under the section entitled "Practicing facts", I show how some of my respondents are thinking of objects to bring climate 'home' other than the bottom line of energy conservation. I then switch to GPC's choice of the polar bear as a familiar symbol and point out some positive and negative aspects of this choice. I conclude by returning to the framework concepts of 'localizing', boundary objects, facts, and situated knowledge.

Location, objects, and knowledge

“We will not give up ... the stakes are too high, the science too decisive, and our planet and our children too precious.”

Frank E Loy, a top US negotiator, preparing to leave the Sixth Conference of the Parties at the Hague without an agreement (quoted in Revkin, 2000a)

The Intergovernmental Panel on Climate Change (IPCC), a body of scientists responsible for interpreting research on global climate change and producing assessments for the policy community, concludes that “There is increasing evidence from many sources that the signal of human influence on climate emerged from natural variability, sometime around 1980” (Revkin, 2000b). Behind this statement are figures such as the fact that carbon dioxide accounts for 81% of total US greenhouse-gas emissions, and 99% of that amount is derived from fossil-fuel combustion (USEPA, 1998, page ES-4). As cautious, authoritative bodies such as the IPCC (Edwards and Schneider, 2001; Jasanoff and Wynne, 1998) more strongly point to the anthropogenic causes of global climate change, GPC and the CCP campaign cities seek ways to make climate change locally meaningful in order to mitigate its impact. These groups want to inspire citizens to care and act via symbols that make more sense to them than the technically difficult science of climate change. The polar bear is a striking icon of the North relevant to Canadians, Inuit, and Cree, among other nationalities, and a powerful reminder of polar-ice melt. The CCP campaign, further, has read US culture—it is materialistic and its lifestyle is apparently not up for negotiation (Luke, 2000, page 56)—and so the campaign has developed strategies, such as the cost-saving benefit of energy efficiency, that they think are “more likely to resonate with short-term political force” (Juisto, personal communication, 24 July 2001).

The campaigns are similar in the broad sense that they are both attempts to address national-scale and international-scale climate politics and to engage publics in democratic societies. They differ in other respects. The ICLEI focuses on the city scale as a means to approach the national and international level, but it is also specifically interested in cities as sources of greenhouse-gas emissions and sites of action. GPC aimed to move the nation of Canada toward adoption of Kyoto, which required gathering citizen and policymaker support. The constraints and politics these two efforts face are also different. The CCP campaign, directed from within municipal government, has a reformist bent whereas GPC’s activism could be seen as more radical and visible. The choice of objects to carry climate change home is notably different: polar bears and energy efficiency. GPC’s symbol represents an impact of climate change whereas the CCP cities’ object is directed toward mitigation and the benefits (lower emissions and cost saving) of energy efficiency. I highlight these differences here to indicate that I realize they exist. I do not make a point-by-point comparison; instead, I reflect on how objects used by the campaigns to make climate change locally relevant perform.

Scale and relevance

Political strategies may make the global or the local visible. Making climate local or global is an act that constitutes society; it has consequences. Scales are material-discursive representational practices (Jones, 1998) that can be conjured into being (Tsing, 2000). For instance, local can suggest the community but actually mean the individual as in a UK climate campaign (see Hinchliffe, 1996), whereas neoliberalism “conjures scale” to make the world think it is global (Tsing, 2000, page 119; see also Massey, 2000).

Constituting society through scale-making is a political act open to critique because of what becomes visible and what disappears. Critiques of scale conjuring are leveled at the way, for instance, environmental political strategies make desertification,

deforestation, soil erosion, and population into global problems, concealing local specificity and social relations and damaging local knowledge, livelihoods, and ecosystems in many places (Basset and Zuéli, 2000; Fairhead and Leach, 1996; Peet and Watts, 1996; Schroeder, 1997). Critiques also focus on politics that make people think something globally active is actually limited to the local. For example, Timothy Thomas, an unarmed African-American man, was killed on 7 April 2001 by a member of the Cincinnati, Ohio, police force. The media called the killing, and the subsequent riots, a local issue—Cincinnati's problem. Use of the term 'local'—in the sense of being contained by that city—in a word, erases a history of fear and hate and undermines critiques of the relational process of racism. Conjuring racism as only local, and neoliberalism, for instance, as the only economics in town (Massey, 2000), makes processes seem to exist in one scale alone or to exist pervasively.

Climate change has been framed by the physical and natural sciences (Taylor, 1997) as a threat to the planet as a whole and to 'our common' future (Demeritt, 1998a; 1998b; Hinchliffe, 1996; Taylor, 1997; Taylor and Buttel, 1992). Approaches based in an appeal to the global and to scientific certainty avoid "the more difficult work of making global warming meaningful" to different publics (Demeritt, 1998a, page 6). They fail to see that socio-environmental change is local and that "most people do *not* have problems of a global nature" (Taylor, 1997, page 151, his italics). The strategies of the CCP and GPC are a response to this framing. To campaign proponents, polar bears and energy-efficient lightbulbs are more local to citizens than the tons of greenhouse gases collecting in the atmosphere. They are closer to home—they fall within some people's scope of concern or interest according to the CCP campaign and GPC. Although global is not equivalent to what is spatially remote and home is constituted by local—global things and processes and is not necessarily geographically close, the strategies of these campaigns support that false distinction.

The relational nature of scales and the simultaneity of local and global⁽¹⁾ may be revealed by political efforts. Climate change is at once local and global, and, although people do not necessarily acknowledge this, political strategies can make the relationship visible. Revealing how an issue is at once local and global and changing how people think about their relationship could be practiced for progressive purposes. Rather than weeding out the globalness of climate change, localizing what has been understood as a 'global' problem could be done by situating it within a relational context that may include the places people live, their histories, daily lives, cultures, or values. Doing this can help people to grasp the extent of an issue, its relevance to their lives, and its relationship to the lives of others. The feminist movement did this by showing how the personal is international (Enloe, personal communication, 15 November 1996). Another good example is the Cree's battle against Hydro Québec, which took them to the schools, streets, and legislature of New York to ask people to understand that an energy contract with Hydro Québec would be built on the loss of Cree land, livelihood, and ecosystem devastation as well as being an attack on Cree sovereignty (see Isacson and Salzman, 1996; Jenson and Papillon, 2000).

Despite the problematic nature of a strategy that just focuses locally, it is also true that the CCP campaign, in localizing climate change, is addressing the need to look at the city-specific aspects of climate change. This specificity has remained less evident in the global outlook of climate-change discourse. Thus, making global climate change local is a process of reshaping the globalized scientific and policy discourse about the causes and consequences of climate change and appropriate responses to it in ways

⁽¹⁾ See, for instance, Howitt (1993), Katz (2001), McDowell (1993), M^cGuirk (1997), Martin (1999), Massey (1993; 1994), Ruddick (1996), Sletto (2002), Swygendouw (1997).

that are meaningful to people's lives as they vary by place and by individual (see also Harding, 1998). In the process of making something local, the undifferentiated discourse of climate science (Demeritt, 1998a) and politics at the international level—where some people apparently do have global problems—could become differentiated when the formal fact of the contribution of carbon dioxide to global warming becomes the practicing fact (Dumit, 1997) of urban quality of life or polar bear survival. In other words, through climate campaigns, the practicing facts that come from aspects of places, the values people hold, the networks they are part of, and the specific experiences of people in Tucson, AZ, and Churchill, Ontario, could become part of the discourse of climate change. The basis of the campaigns would then be in shared, practical truths (Proctor, 1998a).

Facts and knowledge

The climate strategies in this study rely on certain facts to support claims. Facts are material objects that travel (Dumit, 1997). The ability to travel means that facts are able to communicate to many communities, to extend into other domains, and to last through time and space. Facts are also unevenly known because they do not reach everyone (Dumit, 2000). Facts are also local (Dumit, 1997); they “function locally as a temporary resting place for explanations” (2000, page 210) but do not settle in one place such that they are true “once and for all everywhere” (page 215). Indeed, local knowledge is more mobile, and universal knowledge is more parochial, than has been assumed (Eglash, 2003, page 129; see also Law and Mol, 2001). Dumit (2000) found that changing the venue of where questions get asked is a way to make some facts stronger for people suffering from specific illnesses, the subject of his research. In the case of climate change, some participants in the CCP campaign, some of my respondents, and GPC focus on the practicing facts of asthma rates and the hazards of climate change for polar bears. I see these efforts as potentially changing the venue to make some local, practicing facts temporarily stronger—polar bear starvation and the cost-saving benefit of energy efficiency—by bringing the global climate into city-scale life or into the realm of national icons. They seek to change the meaning of climate change.

Global problems derive from a particular location (class, race, nationality) that gives the world and climate problems particular meanings. “Many people know that we have global environmental problems because their institutional, linguistic and social location facilitates global discourse” (Taylor, 1997, page 165). Location, according to feminist theory (Haraway, 1988a; Rich, 1986), refers to historically and culturally specific identities constituted through social relations. Location is culturally constructed *and* subjects have the critical capacity to shape identity (Fraser, 1997). The view from locatable positions—identities recognized as being constituted in relational time–space contexts, as opposed to subjectivities seen as transcending all that—is situated knowledge.

‘Located’ means situated; it does not mean local in the traditional sense of the ‘local level’ or a place (Haraway, 1997, page 121; King, 1994). Situated does not mean being in one place, but instead involves “multiple modes of embedding that are about both place and space in the manner in which geographers draw that distinction” (Haraway, 2000, page 71). The local, Haraway adds, is neither small-scale nor unable to travel. She refers here, perhaps, to the notion that local efforts are associated with the parochial and the ineffective (see Escobar, 2001). Situated knowledge recognizes one's place in the history of how humans and nonhumans have been differently constructed. It is useful as a basis for making choices “*for* some worlds and not others” (Haraway, 1997, page 37, her italics). Situated knowledge is partial because it is embodied (Suchman, 1999). It facilitates connections to others across differences.

The perspectives people achieve through situated knowledges are sources of strong objectivity (Harding, 1986; 1993). “Objectivity is always a local achievement. It’s always about holding things together well enough so that people can share in that account powerfully” (Haraway, 2000, page 161). Haraway’s statement is derived from a long dialogue in which feminists sought a means to maintain the notion of objective accounts of the world, some forms of the universal, and keep, as well, the powerful poststructural notion of different knowledges based in multiply identified subjects and constructed subject positions (see Benhabib et al, 1995; Fraser, 1997; Fraser and Nicholson, 1990; Haraway, 1991; Harding, 1986; Tuana, 2003). Feminists sought an objectivity formed through partial perspective, ongoing debate, and through the “lived work of knowledge production ... for which we are all responsible” rather than a universal, unauthored, unaccountable, singular declaration of fact (Suchman, 1999, page 1). Better empirical descriptions of truth, of objectivity, can be found sometimes in temporary, local resting points for facts, rather than in universalized facts that are not time or space specific (Dumit, 2000).

Campaigns to localize climate change have the potential to encourage the practice of situated knowledge. Effective objects could be built through “collective knowledge of the particular and multiple locations of their production and use” (Suchman, 1999, page 5). King, argues, in the same spirit, that locals and globals exist in layers; the layering effect is the “simultaneous perception of material, literal embodiments and discursive abstractions” (1994, page 102). By way of example, the gay movement created “transhistorical continuities across time and cultures, to produce objects like ‘the homosexual’, [which were] within and accountable to very local, indeed culturally quite narrow, political meanings and strategies” (page 102). The terms (gay, homosexual) were “pluralized universals” that were situated and traveled globally. These objects were quickly replaced with others (King, 1994). Objects can be built, in the manner Suchman and King suggest, on the situated knowledge of people—which encompasses responses to animals close or far and the breathability of cities. Practicing facts can be found to reveal the relationship of processes that link local and global. Campaigns could promote situated knowledge and practicing facts to constitute society on the basis of how people, polar bears, and climate are related.

Boundary objects

To this point, I have explored the possibility of strategies that do not bifurcate local and global and that instead employ situated knowledge to reveal practicing facts that are personally meaningful and that may derive from aspects specific to some places. Within these strategies are the actual objects used to localize climate change, which are the focus of the following discussion.

Objects such as the cost-saving benefit of energy efficiency or polar bears are material-semiotic actors (Haraway, 1988b). They are neither neutral nor innocent. Objects are the product of material-discursive practices (Barad, 2003); they generate meaning and societies adopt “objects that count” (Haraway, 1991, page 195). As boundary objects, the cost-saving benefit of energy efficiency and polar bears are “temporary bridges that allow communication across different groups” (Star and Griesemer, 1989, page 393) they are “plastic and have different identities in many social worlds” (page 409). The concept of ‘global warming potential’ and the temperature range of 1.5°C–4.5°C have served as boundary objects that enabled communication across communities and stabilized scientific knowledge so that it could be used in policy (Jasanoff and Wynne, 1998, page 37; van der Sluijs et al, 1998). These objects are part of interactions that “materialize worlds” (Haraway, 1994, page 64). They can be used for local purposes and have different identities in the various worlds they inhabit,

but these objects also apply universally as a common thread or a temporary anchor (Star and Griesemer, 1989, pages 409–414). Representation across social worlds allows for many participants to be part of the process of translation and adoption of representations and also for the instability and impermanence of the boundary itself (Barad, 1996; Star and Griesemer, 1989).

Different interpretations abound in scientific analysis and lay interpretation of what causes climate change, what it will bring, and what society should do about it. Different interpretations can be managed in several ways by boundary objects.

“via a ‘*lowest common denominator*’ which satisfies the minimal demands of each world by capturing properties that fall within the minimum acceptable range of all concerned worlds; or

via the use of versatile, plastic, reconfigurable (programmable) objects that each world can *mould to its purposes locally*; or ...

each participating world can *abstract or simplify the object* to suit its demands; that is, ‘extraneous’ properties can be deleted or ignored” (Star and Griesemer, 1989, page 404, my italics).

Star and Griesemer argue that difference in values, information, identity, experience, and so on results in different interpretations of boundary objects, which are then resolved by the creation of a common representation which does not, however, indicate consensus (see also Proctor, 2001). The boundary object is a temporary choice and it is not a complete representation (Star and Griesemer, 1989, page 414). Representations are an exchange (Adams, 1994, page 128, cited in Barad, 1998, page 92) and a struggle over meaning produced within uneven relations of power (Jenson, 1990). Meaning, however, is “an ongoing performance of the world” such that, when discursive practices construct boundaries, there is no determined or final meaning (Barad, 2003, page 824).

Boundary objects are impermanent and ambiguous though they appear to have a certain stability gained from holding “a variety of scientific and policy endeavors together in a common envelope of interpretation” (van der Sluijs et al, 1998, page 312). From this common envelope, certain communities will derive meanings salient to each (1998). Berg (2002) suggests boundary objects, gender-equity policies in his case, maintain the status quo in part because they are so open to different, flexible interpretations. Some objects emerge that, because of this flexibility, make a status quo by restricting or ‘anchoring’ discourse around, for instance, the increased temperature range possible (1.5 °C–4.5 °C) through climate change (van der Sluijs et al, 1998). Significantly, however, it matters how different communities take up and interpret the object and the attached idea—that climate change needs action—and how it then becomes part of consciousness (Jasanoff, 2001). Less status-quo-serving objects might then be counter-deployed and might perform in different ways.

In the next section, I introduce the CCP campaign and explore the way CCP participants in the campaign have made global climate change local. I argue that the use of the economic benefit of energy efficiency as the primary localizing object of the campaign constitutes US society by hiding the social relations embedded in climate change and elevating one value, the bottom line, while concealing other reasons to protect the climate. It localizes, paradoxically, by way of what is assumed to be a universal interest.

Localizing global climate change: the CCP campaign

The CCP campaign, launched by the ICLEI in 1991, seeks municipal commitments to lower urban greenhouse-gas emissions. The campaign is based on three premises: a significant amount of emissions are produced in cities; cities have the capacity to reduce those emissions; and cities can set an example by lowering municipal emissions.

It aims to make cities serve as an example to state, national, and international political bodies that may be slow to act. ICLEI has enlisted 403 cities worldwide; in the United States, the cities range from Los Angeles, CA, and Dade County, FL, to Burlington, VT, and Tucson, AZ. To participate in the campaign, cities must pass a resolution, conduct an emissions inventory, and design a local action plan to address carbon dioxide emissions. Local action plans are directed at transportation, residential, industrial, commercial, municipal, and waste sectors.

The majority of the 139 US cities that have signed on agree to lower their carbon dioxide emissions by 20% of 1990 levels by the year 2010. Most emissions in cities derive from energy use and transportation (DeAngelo and Harvey, 1998). Residential-sector emissions are typically 20% of total emissions while the transportation sector contributes about 30%. Actions such as installing energy-efficient lightbulbs and windows that can both lower emissions and save money are most favored by the city administrators and politicians leading the campaign. Administrators must demonstrate the cost-effectiveness and emissions reductions of efficiency retrofits as a means to get the city council resolution necessary to join the CCP campaign. They struggle to get urban citizens, city council members, and other members of city government interested in climate action.

Switching off: the difficulties of getting people to care about climate change

An infomercial in a First Glasgow bus in Scotland showing a light switch and the caption “Do you switch off when someone mentions global warming?” characterizes the difficulty of catching the public’s attention on climate change. The message captures both the mind numbingness of the phenomenon and the mundane ease and finality of doing one’s part—turn off the lights! Politics organized around climate change strives to find ways to make the issue meaningful to people’s lives in order to promote action. People tend to act when an environmental problem comes close to home as research on the Endangered Species Act, NIMBY,⁽²⁾ and environmental justice among others has shown. Climate change is not so close.

One obstacle to getting people to care about climate change is the fact that it is technically complex and, for most of the 1990s, was portrayed as scientifically uncertain. One respondent noted that it is “hard to sell the world thing at the local level. Now, as the issue is becoming more visible, it gives us permission to talk about the global” (city administration, interview, Minneapolis, MN).⁽³⁾ At the time the campaign began, and even during my preliminary interviews, the nation had not accepted that climate change was actually happening. Municipal administrators had difficulty with the science and felt ill-equipped to discuss it in public fora. The media, my respondents pointed out, was intent on providing equal time to the naysayers, which gave the impression that they were evenly represented in scientific communities. Said one respondent, “It’s easy to slip into denial when there’s just a little bit of disinformation” (NGO, interview, Tucson, AZ).

CCP proponents also face the problem that the effects of climate change are not locally visible. In Minneapolis, global warming “cannot compete with neighborhood survival, crime or deteriorating housing” (city administration, interview, Minneapolis, MN). Unlike threats to personal health that galvanize the public, the effects of climate change are first felt by species more sensitive to biosphere changes than are humans

⁽²⁾ NIMBY—not in my backyard.

⁽³⁾ The interviews were confidential. I identify respondents according to their occupation or affiliation and their city. Interviews in Tucson were conducted in November 1997, Minneapolis in June 1997, Seattle in April 1998. Telephone interviews in the other cities represented were conducted during August 2000.

(IPCC, 2001) and those effects are currently invisible to most people. The respondent below represents a sentiment widely expressed—that climate change, to many people’s understanding, does not represent a rapid and drastic change.

“On [National Public Radio’s] Science Friday, they were talking about global warming and they said in the next 30 years they expect at most a one to two degree [change] and some of the people were saying, ‘Well, what is that?!’ ‘An average degree!’? I think that people in general say ‘Oh, one or two degrees, oh well, what the hell!’” (business, interview, Tucson, AZ).

A view echoed by many is that people realize climate change is both global and local, but they “can’t get their hands around” it: “It’s clearly a global problem. It’s my problem locally. I can’t embrace anything bigger than that ... I can’t get my hands around the global thing. It’s just overwhelming” (business, interview, Tucson, AZ). In answer to the overwhelming nature of climate change, the uncertainties, and the complexities was the idea, voiced repeatedly, that cities need to find local reasons to address climate change.

“The thought that the world is getting smaller in a sense that someone is generating greenhouse gases over here, and it just does not affect the local environment, but it affects the overall environment ... It kind of appeals to people who have a sense of community overall ... This is a global issue and we want to be part of it. In another community, they may have another reason for wanting to do something ... *I think there are a lot of reasons. You just have to localize it*” (city administration, interview, Seattle, WA, my italics).

Even though the respondent above invokes a number of reasons for acting on climate change from the city scale, and local action plans list a range of measures, most cities focus on the cost-saving benefits of energy efficiency.

Lowest common denominator politics: the boundary object of saving energy to save money—and, by the way, the planet

The promotion of energy efficiency is a strategy used by many climate campaigns, as well as by environmentalists more generally, as a means to reduce energy consumption. The bus blurb advocating switching off the light mentioned earlier is similar to another notice which asked its constituents “Did you know that boiling a kettle half full instead of full four times a day could save enough electricity to run a TV set for four hours?” The US Department of Energy tells people “You have the power. Turn it off” and features an image of earth in someone’s palm (<http://www.eren.doe.gov/femp/yhpt/artwork.html>). GPC’s website questions readers as to whether they know how much energy can be saved by washing clothes in warm, rather than hot, water (<http://www.greenpeace.ca/>). Energy efficiency and conservation were also the theme of a climate-change campaign directed at UK citizens, the Helping the Earth Begins at Home campaign (Hinchliffe, 1996). Research conducted in Germany and Great Britain has proposed that energy efficiency is the best starting point for greenhouse-gas-emissions abatement (Assenza, 1996). The United Nations Framework Convention on Climate Change documentation similarly suggests that, in addition to the responsibility of nations, cities, and industries to redesign transportation and production systems and use renewable energy, “... Individual citizens, too, must cut their use of fossil fuels—take public transport more often, switch off the lights in empty rooms ...” (<http://www.unfccc.de/resource/beginner.html>).

These efforts rely on people to change their energy-use behavior. Advocacy of energy conservation and efficiency continues despite debate about whether it lowers energy use (see, for instance, Greening and Greene, 1998; Grubb, 1992; Inhaber, 1997; Joskow, 1995; Joskow and Marron, 1992; Lovins, 1996; Saunders, 1992; Wackernagel and Rees, 1997).

The reliance on the individual's energy use is problematic as well. An analysis of the UK climate campaign showed that respondents felt that they could do nothing in the face of others' apathy and, even if they did, their contribution would mean little given the enormity of the problem. Some felt that they had slight scope to make small or great changes to their lifestyle or appliances (Hinchliffe, 1996). Energy conservation, finally, tends not to be a "galvanizing force for social movements" nor to generate controversy or social debate (Shove et al, 1998, page 296).

Nonetheless, the CCP-campaign participants rely on energy efficiency to make climate change relevant to city dwellers. Describing the rationale, one respondent pointed out, "since we're looking at global emissions, we're not concerned with the location of a plant but in looking at the cause of emissions, which is consumption, so we aim at reducing demand through [energy] efficiency" (NGO, interview, Minneapolis, MN). The notion that climate was being or should be 'sold' by addressing the cost-saving benefit of energy efficiency was expressed by the vast majority of my respondents and was particularly prevalent among those in city government. It was evident in the emphasis of most local action plans on efficiency and cost-saving potential. An analysis by ICLEI showed heavy reliance on energy-efficiency measures as the primary means to achieve reductions in carbon dioxide emissions (Jessup, 1997).

Energy-efficiency measures used by municipalities include installing efficient lighting, adding insulation and weatherproofing, and purchasing energy-efficient appliances. Between 1990 and 1997, Portland's energy-efficiency measures for municipal facilities reduced energy use by over 15% (City of Portland, 1997). Further, in 1999, the City of Minneapolis reduced carbon dioxide by an estimated 408 248 tons, representing 10% of the carbon dioxide reduction goal. The retrofitting of 104 buildings accounted for an estimated carbon dioxide reduction of 10 363 tons and changing streetlight timers in 1983 reduced an additional 7337 tons of carbon dioxide annually. Savings from the city's municipal-building retrofits will be reinvested in energy-conservation projects (Fischer, personal communication, 20 April 1998).

My respondents see the money-saving potential of energy conservation as a day-to-day issue whereas climate change is not. They also claim they are pragmatic to demonstrate the cost-saving benefit of emissions abatement. City administrators are certain, furthermore, that saving money will have universal appeal to urban citizens and, therefore, will be an effective strategy.

"For most people, if you say global warming, they think first of all it's somewhere else, it's off in the future. If you can bring the issue closer to home, in terms of energy efficiency Energy efficiency is good for a lot of reasons besides the fact that it reduces carbon dioxide emissions" (NGO and Education, interview, Seattle, WA).

The following quote assumes that three different groups—the city council, business, and economically depressed people—will all respond most readily to saving money.

"We have not tried to reach people on climate change. We have used it in some literature, but climate change won't make the city council, business and economically depressed people do anything. It is not a personal, day-to-day issue. What is, is reducing energy [use] and saving money" (city administration, interview, San Diego, CA).

Another respondent told me, "cost effective that's the word, that's the buzzword now" (business, interview, Seattle, WA). Finally, a city administrator noted that "long-term global warming is not going to be a selling point; it boils down to dollars" (city administration, interview, Kansas Overland Park, KS).

The focus on energy efficiency has an effect beyond its potential to lower emissions and engender public interest in city climate action. Through their choice of this object, municipal politicians and administrators enable what is speakable. I refer here

to Foucault's argument that discourses "form the objects of which they speak" (1972, page 49). The CCP campaign is part of a hegemonic neoliberal discourse that appoints cost saving as the gatekeeper to possibility. Cost saving falls within the realm of what can be said. By playing into the overriding concern with the bottom line, saving money overshadows other values and reasons for climate protection. Values are not just reflected by the bottom-line approach; they are constructed through it (Demeritt, 1998a). In constricting the speakable, the discourse of money saving shapes what can be attempted or, in other words, it sets a boundary between possible and impossible action. Change, then, occurs only when savings can be demonstrated.

Local relevance in the campaign is established by whatever works, which depends, in part, on what is attempted and what administrators think can be attempted.

"Not everyone is going to relate to the same thing. Some people will relate to the global environmental crisis [on the basis] of personal eco-guilt or [some will relate to] economic opportunities ... or maybe there are many buttons to push—*whatever works* to get people connected" (NGO and Education, interview, Seattle, WA, my italics). 'Whatever works' could be the basis for legitimate reforms pursued by administrators with a good sense of what will work. Or it could be the more dangerous approach of ends justifying the means. In the middle of these two lies a third, still suboptimal, possibility that 'whatever works' leads down a few short avenues of action.

As the link to the discourse of what society values—embodied in a dollar saved—energy efficiency is a far too easy action in the list of things that need to be changed to decrease greenhouse-gas emissions. It is the low-hanging fruit that ICLEI consultant Ralph Torrie admonished his municipal government listeners to reach beyond (1999). Further, efficiency is the fail-safe, politically uncontentious response that allows a one-way technological process to intervene in change without "sufficient thought to the shape of the [energy-efficient] future" (Shove, 1998, page 1110). Moreover, it transforms a principle such as ecological integrity into an interest and then into a commodity (Dryzek, 1990, page 83). Further, energy efficiency is a mechanism that limits the possible in its diversion of attention from more thorough changes. It is an inadequate answer to rising levels of urban and national greenhouse-gas emissions. Finally, both efficiency and conservation operate within a fossil-fuel economy.

Boiling climate protection down to dollars localizes it in a paradoxical manner. It appeals to a concern, constructed as universally applicable and appreciable, to bring home a global phenomenon. Furthermore, energy efficiency and cost saving, as means to encourage action by the public, focus on what people can do as individual consumers or, at best, as households. Individuals and households are still typically treated as passive, ignorant, and responsive to price stimulus rather than as active, knowledgeable people for whom energy has different meanings (Shove et al, 1998). The campaign ends up with universals directed at individuals who are misunderstood as passive consumers (Slocum, 2004).

The climate, moreover, disappears in the focus on energy efficiency. Strikingly, Minneapolis renamed its Urban Carbon Dioxide Reduction Plan as 'The Energy Plan' and eliminated references to climate change. Speaking about state-level efforts to lower emissions, one respondent noted:

"While we had government employees well educated and concerned about the topic of climate change ... attending [Northwest Council on Climate Change⁽⁴⁾ meetings], and each agency was responding to climate change as best it could through education, land use planning or transportation, *in no agency was climate change spoken directly*. The term simply did not occur at least in the written materials of the agencies" (NGO, interview, Seattle, WA, my italics).

(4) <http://www.nwclimate.org/>

The final oddity of this strategy is that the reason to care about climate in the first place is absent. The effects of climate change are not invoked. Instead, people are asked to care about the savings they can achieve.

Climate politics and the strategies that make them up are material-discursive practices that direct society down particular paths. Society is shaped by the designation of a campaign to lower urban greenhouse-gas emissions and the means it chooses. Society is formed by what is speakable, which limits the possible. It tends in a particular direction when the focus of local-scale climate action is, predominantly, energy efficiency and the justification is, mainly, personal cost saving. There are other reasons to consume less energy and produce fewer emissions—for instance, concern for the fates of children and polar bears.

Practicing facts: other objects

The CCP campaign's focus on the bottom-line benefit of energy efficiency may have some positive aspects. First, rather than get into a debate about the existence of climate change, it was reasonable, at the time, for administrators to suggest ways that people could benefit from doing things that would lower emissions. Second, energy is located intimately in daily life. If energy use is reduced it could deeply affect how people live and should be recognized as guided by the different contexts in which people find themselves (Shove, 1998). Appliances, moreover, are socially and culturally laden objects whose meanings change over time, they are not just mundane commodities (Shove et al, 1998, page 306). They could come to mean something closely tied to local (non)human life. Energy conservation may be part of a larger energy strategy that includes the use of renewables as in the case of Santa Monica and Portland. Third, the boundary object of cost-cutting through energy efficiency has been molded to suit the local purposes, for instance, of solar coalitions in Tucson that promote solar water heaters and other solar products.

There is also evidence from the campaign and related efforts that indicates more hopeful ways of localizing climate change. I proposed earlier that the global, undifferentiated discourse of climate change becomes locally differentiated when it is taken on by cities that try to make this problem relevant to people living in Seattle, WA, and Burlington, VT. Overwhelming facts about tons of emissions, necessary reductions, and incomprehensible news about degrees of warming become the practicing facts of communities. Finding a way around the incomprehensibility this respondent said "I think the things we're doing are beneficial in other ways ... regardless of whether the big picture ... we've concentrated on our community and these things are good for our community even if ..." (business, interview, Tucson, AZ). The wild salmon in Seattle's rivers and harbor could be threatened, farmers' growing seasons are changing in Minnesota, the maple trees in Burlington might move north, and asthma rates around Tucson will rise. These are the local objects, valued for their meaning and inherent worth to some people, that some climate advocates suggest using to make people aware of what climate change could do.

In Salt Lake City and Los Angeles global climate change melts into urban air pollution. Reasons for the dissolution of atmospheric changes into urban air are pragmatic, according to my respondents from city government. Not only must cities concern themselves with levels of air pollutants because of the federal linking of clean air and transportation funding, but air pollution is also more locally comprehensible than climate change because people see and breathe it. Rising levels of childhood asthma were noted in several cities as a means to get people to pay attention to greenhouse-gas emissions. For instance: "We know that automobile emissions are causing respiratory problems. All the people who came to Arizona in the old days

'cause they had asthma can't do it here in our cities anymore ...” (business, interview, Tucson, AZ).

In the struggle to find what message might reach the public, some recognize that an urban climate politics has to be differentiated to fit the audience. It is true, as the respondent proposed earlier, that there are many buttons to push because people value different objects. Tailoring the message, as the respondent below suggests, is a way of locally differentiating the climate politics.

“We assume they understand about species and ozone ... we need to find a message that is pertinent It is incumbent on us to tailor the message ... I'm flexible; I can go from issue to issue. We need to learn what the messages are that work” (city administration, interview, San Diego, CA).

Campaigns could point, for example, to local impacts already felt and validate the concerns and knowledge of area residents. For instance, one director of a local NGO told me:

“I love hearing people say ‘I have been working on this farm for 27 years and there is definitely something different. I get up every morning and ... the first thing I do is to think about what the weather is going to be like today and I have been doing this for 27 years and it is changed” (NGO, interview, Minneapolis, MN).

Similarly, an American Green Network poll showed that 57% of voters polled think they have seen changes in their local weather as a result of global warming. Almost three quarters of those respondents say that the changes are for the worse (American Green Network and Hinckley, 1998).

Respondents also noted that US citizens need to change what they value, which could be encouraged by organizations' strategies. The respondent below claims that bicycling is a radical act. He eschews factual information about pounds of emissions produced or avoided and talks instead about how much fun he has when he bikes.

“... what I'm going to put my resources into is telling people, ‘I have a great time bicycling’. Or, I'll show up to meetings riding a bicycle. And I think that'll have a bigger impact than, you know [the carbon dioxide chart]. It could be combined. Tell people, ‘oh, I produced 2 pounds less carbon dioxide by bicycling to meetings’. It's [carbon dioxide charts and similar information that are] too easily denied or ignored. I don't think people base what they do on information” (NGO, interview, Tucson, AZ).

Climate change becomes the proverbial forest that people do not see as they look up at city trees. Tree planting is a favorite strategy of cities to confront greenhouse-gas emissions. It is a visible means to contribute to urban beautification and sequester carbon dioxide—albeit a small amount compared with fewer sport-utility vehicles, less vehicle miles traveled, or energy conservation. Burlington is acting on climate change because its maple trees may be affected by climate change. And, as this politician noted, “people understand trees—they hold all the carbon. Most people learn that in school. And so they understand that they can contribute by doing something positive like planting trees ...” (politician, interview, Minneapolis, MN).

At some level, people understand trees and other mysterious parts of the ecosystem. They want breathable cities and salmon in the river. In the next section I explore the strategy of localizing climate change via the multinational (Euro-Canadian, Cree, Inuit, and so on) icon of the polar bear whose home, the North, is melting.

Bears performing

“... what would a human be without elephants, lions, cereals, oceans, ozone or plankton? ... less than a human. Certainly not a human.”

Latour (1998, page 231) seeing in the French ecologist position the notion that these things not be treated merely as means to human ends

Ice melts off the western Hudson Bay two weeks earlier than it did twenty years ago, which means polar bears have less time to hunt seals—their primary source of food for eight months of the year (Churchill, 2000). Bears store fat from these hunts to tide them over the summer months. As a result of earlier ice breakup, the bears' condition, over a seventeen-year period, has progressively deteriorated. The bears are 10% thinner and have fewer cubs than they did twenty years ago (Stirling, 2000).

The world's largest land-based predators, the polar bears, are respected as powerful beings by the Cree and Inuit. Polar bears serve as a source of food and clothing for First Nations and as an economic boon for northern Manitoba as tourists flock there to photograph them and scientists to study them (Waytiuk, 2002). In Churchill, near the Wapusk National Park, the day-to-day life of residents is deeply affected by the bears' movements (2002). The bears of the western Hudson Bay, however, are hemmed in—there is no habitat to the south and they cannot move farther north because that habitat is occupied by other bears (Stirling, 2000). The IPCC asserts that some species will not adapt to global climate change as well as others (IPCC, 2001). The bears, some fear, will slowly starve (Waytiuk, 2002). Said climate scientist Robert E Wrigley, the polar bear is “an obvious warning symbol of the changes we're bringing down, not only on our heads, but on all wildlife. That's why we should care” (Waytiuk, 2002, page 14).

GPC addresses, directly, the material consequences of unchecked climate change on nonhuman life. Demonstrators at the Sixth Conference of the Parties at the Hague donned polar bear costumes and dramatized ‘die-ins’ to emphasize the devastating effects of climate change on these bears (Churchill, 2000). Peter Tabuns, Executive Director of GPC, noted,

“The polar bear is coming to symbolize the disappearing north, the end of the kind of climate we all grew up with The habitat that polar bears depend on is being wiped out. That is pretty strong stuff, emotionally and intellectually” (quoted in Churchill, 2000).

As part of GPC's campaign to pressure Canada to adopt the Kyoto Protocol, demonstrators, dressed as thin, unhappy-looking polar bears, urged negotiators at the Sixth Conference of the Parties at the Hague to reach an agreement in order to save the polar bear and other nonhuman life. Collapsing in a parody of polar bear demise, GPC activists attempted to bring the stark point of inevitable polar bear mortality home to climate negotiators.

The image of GPC activists in polar bear suits has an element of comedy that some argue is essential to politics (Merrifield, 2002; NGO, interview, Seattle, WA; resident, interview, Tucson, AZ). Polar bear hunger is not funny, but if people laugh first they might listen later. The bears, further, are not far out on the ice, creatures in their pristine habitat; they are, admirably, out of place—in the Sixth Conference of the Parties accosting delegates, on the street with signs which people associate with the jobless, and in bars having a beer with unofficial representatives.

Organizations deploy symbols to shape a common vision about the global environment (Jasanoff, 2001, citing Anderson, 1991). Tabuns told me that the polar bear costumes were first used in England before they were taken up by the Canadian arm of Greenpeace. They are a “significant part of Canadian iconography” as Canadians are “used to thinking of Canada as a Northern country” (interview, 26 June 2003). Part of Canadians' identity, he notes, is wrapped up in being Northern. Because of the growing awareness that the poles will feel the affects of climate change most severely, the bear becomes an “easy to connect the dots” type of symbol—the polar bear “says ice and snow”. It is also a “simple, emotional symbol . . . people identify with the polar bear . . . it will matter to them” that the bear's habitat is melting. Climate change was “wiping out part of Canadians' understanding of themselves, of something familiar.”

Further, because of the magnificence of the bear, the knowledge of the melting Arctic, and the Northern identification, the polar bear is a symbol that does not need text with it—the bear can stand alone. Northern people affected by climate change need text. The media was very quick to pick up on the polar bear, which signaled to GPC that it had hit on a successful icon. Despite its success, Tabuns thought perhaps 5–10% of the public was aware of and interested in the dangers of climate change.

According to Andrew Male, Media Director for GPC, the polar bear was chosen not because it was the most relevant animal to Canadians, but because the polar bear is “familiar to everyone” (interview, 20 June 2003). Importantly, it was the ‘obvious animal’ because of the data showing that polar bears are being negatively affected by the melting ice attributed to the increase of globally averaged surface air temperature from growing amounts of greenhouse-gas emissions in the atmosphere. Male said that, rather than bringing people to the western Hudson Bay, GPC personalized the plight of the bear by taking the bears to Ottawa to pose with political leaders prior to the Bonn Conference (see figure 1)

Lately, the Canadian government has linked climate change to drought in the western part of the country, thunderstorms in the Arctic, and the need to have indoor ice rinks where once they would stay frozen outdoors. The polar bear was a symbol that focused on a selective impact. Tabuns agreed with my respondents that there is a danger in discussing reports on climate impacts because these accounts are too filled with “doom and gloom” (NGO, interview, Seattle, WA) and because impacts for parts of the United States still tend to be distant or uncertain. A message of hope and threat, Tabuns argued, is a better strategy. The hope his organization underscores is that of economic opportunity, particularly job creation in the area of energy efficiency. Similar to observations from the CCP research, he also noted that the polar bear will not work for all sectors but that icons have to be crafted to the sector and the mood of the audience. Tabuns suggested that, depending on the audience, there are different objects and multiple buttons. For instance, he thought the effects of climate change on the bald eagle might resonate more in the United States. Having “put everything [they] had into



Figure 1. Greenpeace Canada sending New Democratic Party Leader Alexa McDonough off to Bonn, Germany, for the United Nations Framework Convention on Climate Change 6 Part 2 Conference of the Parties, July 2001. The placard reads “Bonn” Vacances (© Greenpeace Canada/ Calzavara, June 2001, Ottawa, Canada).

[the fight to ratify Kyoto]” (interview, 26 June 2003), GPC is now trying to develop a strategy to move forward. Its current campaign attacks Esso gas (Canadian subsidiary of Exxon/Mobil) for its efforts to prevent greenhouse-gas mitigation and urges Canadians to boycott this company.

Polar bears are boundary objects that serve as a bridge because of their universal appeal to Western culture as distinctly Northern charismatic megafauna. They are awe-inspiring animals and dangerous super carnivores that hunt beluga whales. They are also used in Coca Cola commercials—a mother bear and her playful cubs drinking Coke. People know polar bears; they are familiar. Their faces appear in World Wildlife Fund commercials and grace the cover of *National Geographic* (Rosing, 2000). They localize climate change by appealing to Canadians specifically by way of their performance as a national symbol. The polar bear charts a clear route into the imagination and the emotions of people who think of themselves as environmentalists in some sense of that word or as people who care about or live in the ‘disappearing North’. GPC’s strategy places the bear’s body directly in the way of the warming that will melt its habitat. It makes climate change visible through the effects on a particular non-human life. There are, then, useful aspects to the choice of this object but there are also a few potential difficulties.

Charismatic victims: potential problems with the polar bear

Society gravitates towards the fate of charismatic animals (see Philo and Wilbert, 2000; Wolch and Emel, 1998) but not so quickly towards that of less visible animals. Use of a charismatic species makes nature appear exotic and distinct. Alongside the focus on megafauna is often a representation of the natural as far removed from the social, when science studies have shown that this is not the case (Castree and Braun, 1998; 2001; Haraway, 1997). Haraway (1997, page 62), advises readers not to rely in any way – “emotionally, intellectually, morally or politically” – on the notion of ‘the natural’ because of the negative consequences for some people and environments. Equally, anthropomorphism, if it means romanticizing the nonhuman, does not make for a better strategy (Haraway, 2000).

The choice of the polar bear to represent the dangers of climate change and to stand for nonhuman life is situated within the historical binary of culture – nature. Located on the lesser side of the binary, the polar bear is in need of protection from humans’ undue influence on the climate that supports her habitat: humans cause; nature is affected. Science has crafted the bear into an “effective object” (Haraway, 1991, page 185). His existence stands on science. Her weight is important. By drawing on the science *alone*, “environmental politics becomes a narrowly technical issue of what to do with a pre-given nature” (Demeritt, 2002, page 781). Nature, then, has no active trickiness, no possible agency; it is accounted for by scientific measurements and supremely acted upon by the effects of anthropogenically produced greenhouse-gas emissions.

The bear appeals to the need to protect what Westerners understand as nature—something distinct from them and out there on the ice. Polar bears become victims in this scenario. The problem with understanding people or animals as victims is that this is a process of identity creation. There are those who pity and others who have become only victims: the two are separate. Without an understanding of the relations that are part of bears becoming victims of emissions, the bears are drained of agency. But animals are not just “a passive surface on which we inscribe meaning” (Philo and Wilbert, 2000, page 5). Flora and fauna are agents (Haraway, 2001; Rocheleau and Ross, 1995), and we do not know of what a polar bear is capable (paraphrase of Latour, 1998, page 233).

The basis of knowledge, value, and response by this strategy is science, understood as neutral and objective, rather than as a relational analysis and moral understanding of the relationship of humans to nonhumans. The use of scientific facts about the polar bear is based in the idea that nature's secrets can be revealed. And, although science definitely works, it does not name inherent attributes of nature and it should not attempt to probe what is understood as a fixed boundary separating nature from culture (Barad, 1996). Nature, finally, is neither that which holds secrets to be discovered nor a blank slate on which anything might be inscribed because, Barad writes, walking the line between strong positivist and constructivist camps, "... not any representation of reality will do—since not any result one can think of is possible: the world 'kick's back'" (1996, page 188).

The issue is the basis society uses to make decisions, not whether science works or is valuable—it does and it is. In this case, whether the politics are international or city-scale, scientific facts are used as the neutral and primary basis for action. But it is problematic to "derive an 'ought' (e.g., a climate-change policy directive) solely from an 'is' (scientific knowledge about climate change)" (Proctor, 1998b, page 292; see also Benhabib, 1992). Deriving an 'ought' from an 'is' fails to recognize that value-based positions and political assumptions are fundamental to the framing of both policy and scientific questions. Decisionmaking about whether to act and what can be done is a different process than getting the facts and it can be solely those facts that lead to policy (Turner, 2001). The basis of decisionmaking could involve ethics (see Dryzek, 2000a, 2000b; Eckersley, 2000; Goodin, 1996; O'Neill, 2001; Proctor, 1998b) or a more open accounting of the relations behind decisions. Understanding the relations of power in the political, economic, and cultural aspects of climate change must occur alongside getting the facts.

The global discourse of environmentalism has pinpointed people as culprits or left them out altogether (Cronon, 1995), which has made the discourse vulnerable to critiques from the standpoint of political ecology (Guyer and Richards, 1996; Neumann, 1998; Schroeder, 1997), Native American sovereignty rights (Grossman, 2001; Ishiyama, 2003; Mackenzie and Dalby, 2003), environmental justice (Di Chiro, 1995), and wise use (McCarthy, 1998). It may be easier to gather support for polar bears than for the people who live in Northern communities who face socio-environmental changes to their home or for people who are at risk because polar bears come into their towns searching for food when they cannot hunt seals. As Tabuns said, "people look like people all over the world" (interview, 26 June 2003). He did note that the Inuit have been part of GPC's message on climate change. A strategy that does not feature people, however, might lead some to believe that people have fair political representation, the capacity to adapt, or, perhaps, they deserve what they get because, after all, people cause climate change (see also Castree, 2003).

The bear, a national icon, is more relevant and comprehensible than climate change. As a boundary object, its 'extraneous' properties, some of which I have discussed above, are deleted by some of the worlds that use this object to translate climate change. GPC assumes that parts of society will be more viscerally attuned to starving polar bears than to the dispersed measure of our greenhouse gases in the atmosphere or threats to Arctic and/or coastal communities, and they are probably right. But the bear is constituted by the nature/culture binary, the reliance on science to decide value, and the need for victims. More charitably, the bear is also constituted by an ethics that says polar bears have a right to exist and, furthermore, humans are different, even lesser humans, without bears. Nonetheless, GPC could do more to make the extraneous properties visible.

Summary and conclusions

The boundary objects used in the two campaigns are neither uniformly positive nor uniformly negative in the way they perform and thereby constitute society. Though these boundary objects perform the useful work of translation across difference and, in this case, work to bring climate change home, they travel on the basis of being simplified, lowest common denominators. Their potential lies in the idea that boundary objects are temporary, allow for many participants in translation, and have different identities in the worlds they inhabit. Importantly, “each world can mould them to its purposes locally” (Star and Griesemer, 1989, page 404). Depending on the context, simplification or flexibility might prove less or more useful (for example, Berg, 2002 noted earlier). Climate campaigns should use objects that draw from and produce situated knowledge because these will be accountable and relevant to daily life, which is a process lived and constituted at all scales. Rather than one object sufficing for a nationwide campaign located in cities, many objects, suitable to local contexts, could be used. This idea is audible in the words of my respondents. GPC and some CCP campaign participants and nonparticipants have turned to local facts and appeal to an ethics of care (Proctor, 1996) for future children and polar bears to inspire action. Relevance to local life makes practicing facts real.

Practicing facts can change the meanings of the formal facts universalized in climate science and politics when they make sense locally and draw on strong objectivity. Polar bears and energy or cost do this in some ways and in other ways they do not. The intent of localizing climate change makes sense. However, rather than either a global discourse of climate change or a locally specific one, the campaigns should make sense of the way scaled processes are articulated in climate change and draw from constituents’ located, partial perspectives to adopt other objects. An affinity politics recognizing how important and related are human and nonhuman lives might then grow stronger.

Admirably, GPC and the CCP realized that globalized climate science “cuts science loose from its moorings in all those localized, historically warranted, social and cultural spaces ...” (Jasanoff and Wynne, 1998, page 77). To enable action on climate change they sought to bring climate home to their constituents—a wide array of nonexpert publics who are citizens and policymakers. Haraway and Barad argue, respectively, for scientific realism and agential reality, concepts which recognize that science works and that scientific facts are important to many politics but require accountability to knowledge claims and action proposals. “Science grows from and enables concrete ways of life” (Haraway, 1988b, page 8; 1997, page 97) and “agential reality grounds and situates knowledge claims in local experiences” (Barad, 1996, page 179). Facts should be recognized as embedded in the moral discourse of science (Haraway, 1997). Persuading fact into hard reality (Haraway, 2001, page 131), rather than fact being only an expert process of climate scientists, means making it a practicing fact real to various constituencies. This is done by differentiating a climate discourse that incorrectly assumes people have common, global problems and by recognizing the socio-environmental and relational nature of climate change. In Haraway’s dog genetics example she notes that the expert knowledge of “disease-related genes are not the right port of entry to a universe of *consequential facts* for dog people practicing love of the breed” (page 132, my italics), but also true is that the “new genetics is not an abstraction in dog worlds” (page 134). Facts, to “get real”, need “official science” (page 131; Dumit, 2000) and communities of people, in my example, concerned about some facet of climate change.

Bears

The polar bear is a boundary object that attempts to translate the immensity and distance of climate change into something more meaningful to a number of publics

in Canada. It is a temporary bridge that allows communication and understanding among the constituencies of scientists, policymakers, and citizens. It is also an object derived from meaning and location in the feminist sense. In this way, the polar bear localizes climate change for some people who live in Canada. The object is constituted by the partial perspective of Northern people about their different relationships to a nonhuman life. Strong objectivity, locally achieved by an affinity community, connects differentiated people who recognize an account of why the climate is warming and what then may happen to any species, which this community may not view as nature, separate from society. That is, the polar bear object may appeal to some communities looking for “still another sense of common life and future” (Haraway, 2001, page 135).

GPC minimally used scientific data on polar bears but not the formal facts of tons and degrees that in other cases have alienated people (Hinchliffe, 1996), invited debates over bad and good science (van der Sluijs et al, 1998) and tended not to compel the desired action (Jasanoff and Wynne, 1998). Instead, the polar bear moves the abstract, formal fact of rising temperatures into the hearts of Northern people by way of the practicing fact of polar bear suffering. The animal was already familiar, as Male pointed out, and needed only to be linked into responses to the bear which derive from its national symbolic power, its participation in some people’s daily life, and its role as charismatic nature. Though there remains the problem that the object is still understood as nature, the use of the bear changes the meaning of climate science by wrapping it in Northern identities. The bear disrupts the accepted wisdom that climate change is a common threat. For the western Hudson Bay polar bear, after all, climate change is a much more keen threat, not one common to all humans and nonhumans.

Polar bears are made from the mythic, organic, textual, technical, historical, political, and economic (Haraway, 1991), which must be recognized alongside the important facts about weight loss from fossil-fuel-induced climate change. Boundaries from which societies derive knowledge about polar bears and climate change are necessary for making meanings. GPC’s boundaries say ‘we’ are a community of the North that values polar bears and ‘we’ all need to make sure they have a habitat and avoid starvation. Those boundaries may be temporary, but societies can act on their current, situated meaning nonetheless. The polar bear materializes worlds—one in which climate action is valuable because the lives of polar bears are important, because they are nature, although probably not because we would be less than human were we to lose them. That we would be differently human without polar bears needs to become part of the politics.

Lightbulbs

The object of cost saving through energy efficiency materialized another world in which the savings of retrofits performed as the best means to motivate society to act on greenhouse-gas emissions. The CCP took one universal—scientific knowledge on climate change—and communicated it locally via another universal. The boundary object served as a simplified lowest common denominator that administrators argued was the only possibility. Climate politics, however, ought to “make visible all those things that have been lost in an object” (Haraway, 2000, page 105). In the CCP cities’ politics, the climate is rendered invisible in the object of bottom-line energy efficiency. Values other than cost get lost in this object. The campaign’s strategy reduces climate change to an object that is “analytically manageable because its social relations are excluded” (Demeritt, 1998a, page 3; see also Buttell et al, 1990, cited in Hinchliffe, 1996, page 55). Energy, then, is simply a commodity and people are consumers of it. The object, further, erases difference under the assumption that everyone responds to saving money.

The disappearance of the climate behind the practicing facts of urban trees or air pollution within a politics aimed at mitigating the extent of climate change might also seem an ill-conceived strategy. However, it is not a matter of *either* the absence *or* the presence of climate change. Climate change is simultaneously absent and present in the objects discussed under practicing facts (trees, salmon, asthma, air pollution). These globals and locals in climate politics situate and resituate the discourse of climate change and responses to it. As perspective shifts through articulated layers of locals and globals and through layers of fact and historically specific situated knowledge, local truths (King, 1994) about the climate will be adopted and objects taken up, such as maple trees and air quality, that will produce and be accountable to certain contexts. These objects may, in the process, conceal climate change, but they reveal other problems (asthma rates, sprawl) directly related to climate change. This is the potential in the temporary aspect of boundary objects and their capacity to be reshaped locally.

The form which the absence and presence of climate change takes constitutes society in better and worse ways. I have argued that the disappearance of climate change into cost saving and energy efficiency is one of the more worse ways although this object is not totally devoid of potential. Further, trees, in one instance, are the cooling, carbon-absorbing, heat-conserving beautifiers of city streets. Then, they are forests, carbon sinks, and part of a global-scale solution wielded by US administrations that prefer the facts and politics of carbon sinking to changes in the fossil-fuel economy. Like energy efficiency, trees may be a way out of the more difficult work of confronting single occupancy vehicle use, its pollutants, and its carbon dioxide emissions. Depending on the context, trees can be objects that bring climate change home and objects that operate at a global scale to stall significant change. They might inspire some people to act on the basis that trees are good for city life and they absorb some carbon dioxide. The climate's simultaneous absence and presence, as a consequence of the choice of localizing objects, is potentially dangerous and possibly hopeful.

Situated climate politics

Although there are many examples of local-level concerns that galvanize people, there are also political efforts that appeal to people's capacity to understand the articulations that obtain through scales. Climate change is in some ways a good issue to address in its cross-scale forms. It is intimately related to the scaled production and consumption processes of the fossil-fuel economy that are so embedded in the way US citizens and Canadians live—and consequently for the way nonhuman life lives. Local life is lived at all scales (Massey, 2002) and can be understood by people in this way. Situated knowledge is a different kind of looking at and being in the local. It means thinking in different ways about oneself in relation to home and global, humans and nonhumans. In other words, it is about "responsibility at a distance or responsibility across (embedded) space" (Massey, 2002, page 25) "in order to ground our international connections" (page 24; see also Mohanty, 2003). Through situated knowledge, people could discuss and understand how climate change is about the material-discursive production of some forms of life and life-forms rather than others (Haraway, 1997, page 50) although not necessarily with the intent of reaching consensus [see Benhabib (1996), Dryzek (2000a), Fraser (1997) on deliberative democratic conversations that acknowledge difference]. Then the proponents of and participants in this politics could speak from a located place, offer a partial perspective on why it matters that the climate is changing, and discuss how they sit in relation to this phenomenon. The thought process is as important as the measures to mitigate climate change and the scientific discovery of what climate change will bring. I am arguing for a discussion promoted by

GPC and CCP campaign climate politics about how people are relationally connected to each other, children, and polar bears.

Evident from the words of many of my respondents is that people do not think only in terms of personal economic benefit even if the campaign may appeal to this means of valuation. It is clear that they are constructing practicing facts. However, the CCP campaign did not encourage them towards this path and it could. Many more networks need to be built to share ideas and come closer to knowing the boundary objects that would work to help make climate change relevant to people.

US citizens and Canadians have local–global problems. The climate and its associated locally relevant objects such as bike riding and Saguaro cacti, asthma, and maple trees need to be acknowledged in their articulated local–global complexity because climate change may be more long-term, more dangerous to less adaptive species, and more damaging to some people than society can imagine, let alone forecast. Reasons to care locally should not be reduced to cost-saving energy-efficient lightbulbs and other retrofits.

Having something in common is important; claiming too much in common erases differences. The commonness produced by global environmental discourse dissolves boundaries. The politics of the CCP and GPC reconstituted the boundaries dissolved in the global-climate-change discourse and put them back in the form of objects that try to speak to locally relevant things. Jasanoff and Wynne (1998, page 77) ask, “where will the universal, hegemonic, yet institutionally weakly grounded science of climate change turn for authentic, globally effective legitimation and public authority?” An answer might lie in localized climate politics such as the ones discussed here that could work to produce situated knowledge that queers the universal science and that could be encouraged to work more to show the relations in lightbulbs, polar bears, and climate change.

Localizing climate change means to transform it into problems that are materially and culturally relevant to citizens and also *to change what is relevant*. Work remains to determine what ‘home’, what global, what futures for whom, what method of cross-species cohabitation (Haraway, 2001, page 135) and caring people might want to create. Then these organizations could ask, ‘what might some publics be willing to do for polar bears and children?’ Fortunately, as far as the relevance of climate change goes, “The public is catching on—they are catching on faster than the politicians give them credit for” (NGO, interview, Minneapolis, MN).

Acknowledgements. I would like to thank my respondents whose time enabled me do the research and whose words made the paper possible. Several colleagues provided helpful comments on much earlier drafts including: David Angel, Jody Emel, Susan Hanson, Scott Juisto, Mazen Labban, Paul Laris, Judith Perry, and Dianne Rocheleau. Later drafts benefited from the advice of David Angel, Kate Boyer, and David Demeritt. I am also grateful for critiques from four anonymous reviewers and comments from the editor, Geraldine Pratt, all of which served to strengthen my argument. All shortcomings are my responsibility. This research was supported by a grant from the National Science Foundation (Award number BCS-9900876).

References

- Adams A, 1994 *Reproducing the Womb: Images of Childbirth in Science, Feminist Theory and Literature* (Cornell University Press, Ithaca, NY)
- American Green Network, Hinckley R H, 1998, “America speaks out on energy: climate change—the heat is on”, poll results, http://www.americangreen.org/poll_findings_climate.htm, accessed 29 September 2000
- Anderson B, 1991 *Imagined Communities* (New Left Books, London)
- Assenza M P, 1996, “Energy efficiency means no regrets” *Forum for Applied Research and Public Policy* 11 82–85
- Barad K, 1996, “Meeting the universe halfway: realism and social constructivism without contradiction”, in *Feminism, Science and the Philosophy of Science* Eds L Hankinson Nelson, J Nelson (Kluwer, Dordrecht) pp 161–194

- Barad K, 1998, "Getting real: technoscientific practices and the materialization of reality" *Differences: A Journal of Feminist Cultural Studies* **10** 87–128
- Barad K, 2003, "Posthumanist performativity: toward an understanding of how matter comes to matter" *Signs* **28** 801–831
- Bassett T J, Zuéli K B, 2000, "Environmental discourses and the Ivorian savanna" *Annals of the Association of American Geographers* **90** 67–95
- Benhabib S, 1992 *Situating the Self: Gender, Community and Postmodernism in Contemporary Ethics* (Routledge, New York)
- Benhabib S, 1996, "Introduction", in *Democracy and Difference: Contesting the Boundaries of the Political* Ed. S Benhabib (Princeton University Press, Princeton, NJ) pp 3–18
- Benhabib S, Butler J, Cornell D, Fraser N, 1995 *Feminist Contentions* (Routledge, New York)
- Berg L, 2002, "Gender equity as boundary object: or the same old sex and power in geography all over again" *Canadian Geographer* **46** 248–254
- Boehmer-Christiansen S, 1994, "Global climate protection policy: the limits of scientific advice, part 2" *Global Environmental Change* **4** 185–200
- Buttel F H, Hawkins A P, Power A G, 1990, "From limits to growth to global change: constraints and contradictions in the evolution of environmental science and ideology" *Global Environmental Change* **1** 57–66
- Castree N, 2003, "Environmental issues, relational ontologies and hybrid politics" *Progress in Human Geography* **27** 203–211
- Castree N, Braun B (Eds), 1998 *Remaking Reality: Nature at the Millennium* (Routledge, London)
- Castree N, Braun B (Eds), 2001 *Social Nature: Theory, Practice and Politics* (Blackwell, Oxford)
- Churchill J B, 2000, "Canada's 'gentle giants' await vanishing winter" *New York Times* 12 November, <http://www.newyorktimes.com>
- City of Portland, 1997 *City of Portland Carbon Dioxide Reduction Strategy Update 1997* Department of Energy, City of Portland, OR
- Cox K R, 1998, "Spaces of dependence, spaces of engagement and the politics of scale, or: looking for local politics" *Political Geography* **17** 1–23
- Cronon W, 1995, "The trouble with wilderness; or getting back to the wrong nature", in *Uncommon Ground* Ed. W Cronon (W W Norton, New York) pp 69–90
- DeAngelo B J, Harvey L D D, 1998, "The jurisdictional framework for municipal action to reduce greenhouse gas emissions: case studies from Canada, the USA and Germany" *Local Environment* **3** 111–136
- Demeritt D, 1998a, "Global climate change and the politics of social constructivism", paper presented at the Annual Association of American Geographers Conference, Boston, MA, available from the author david.demeritt@kcl.ac.uk
- Demeritt D, 1998b, "Science, social constructivism and nature", in *Remaking Reality: Nature at the Millennium* Eds N Castree, B Braun (Routledge, London) pp 177–197
- Demeritt D, 2001, "The construction of global warming and the politics of science" *Annals of the Association of American Geographers* **91** 307–337
- Demeritt D, 2002, "What is the 'social construction of nature'? A typology and sympathetic critique" *Progress in Human Geography* **26** 767–790
- Di Chiro G, 1995, "Nature as community: the convergence of environment and social justice", in *Uncommon Ground* Ed. W Cronon (W W Norton, New York) pp 298–320
- Dryzek J S, 1990 *Discursive Democracy: Politics, Policy and Political Science* (Cambridge University Press, Cambridge)
- Dryzek J S, 2000a *Deliberative Democracy and Beyond: Liberals, Critics, Contestations* (Oxford University Press, Oxford)
- Dryzek J S, 2000b *Legitimacy and Economy in Deliberative Democracy* (Australian National University, Canberra)
- Dumit J, 1997, "'But I looked it up': living with the truths of DES—toward an anthropology of facts", paper presented at the American Anthropological Association Annual Meeting, Washington, DC, available from J Dumit, Program in Science, Technology and Society, Massachusetts Institute of Technology, Cambridge, MA
- Dumit J, 2000, "When explanations rest: 'good enough' brain science and the new socio-medical disorders", in *Living and Working with the New Medical Technologies: Intersections of Inquiry* Eds M Lock, A Young, A Cambrosio (Cambridge University Press, Cambridge) pp 209–321
- Eckersley R, 2000, "Deliberative democracy, ecological representation and risk: towards a democracy of the affected", in *Democratic Innovation: Liberation, Association, and Representation* Ed. M Saward (Routledge, London) pp 117–132

- Edwards P N, Schneider S H, 2001, "Self governance and peer review in science-for-policy: the case of the IPCC second assessment report", in *Changing the Atmosphere* Eds C A Miller, P N Edwards (MIT Press, Cambridge, MA) pp 219–246
- Eglish R, 2003, "Universal and local knowledge" *Science as Culture* **12** 129–133
- Escobar A, 2001, "Culture sits in places: reflections on globalism and subaltern strategies of localization" *Political Geography* **20** 139–174
- Fairhead J, Leach M, 1996 *Misreading the African Landscape: Society and Ecology in a Forest – Savanna Mosaic* (Cambridge University Press, Cambridge)
- Foucault M, 1972 *The Archaeology of Knowledge and the Discourse on Language* (Random House, New York)
- Fraser N, 1997 *Justice Interruptus: Critical Reflections on the 'Postsocialist' Condition* (Routledge, London)
- Fraser N, Nicholson L, 1990, "Social criticism without philosophy: an encounter between feminism and postmodernism", in *Feminism/Postmodernism* Ed. L Nicholson (Routledge, New York) pp 19–38
- Goodin R E, 1996, "Enfranchising the earth, and its alternatives" *Political Studies* **44** 835–849
- Greening L, Greene D, 1998 *Energy Use, Technical Efficiency, and the Rebound Effect: A Review of the Literature* Hagler Bailly Services, PO Drawer O, Boulder, CO
- Grossman Z, 2001, "Let's not create evilness for this river: interethnic environmental alliances of Native Americans and rural whites in Northern Wisconsin", in *Forging Alliances Across Difference: Coalition Politics for the New Millennium* Eds J M Bystydzienski, S P Schacht (Rowman and Littlefield, Boulder, CO) pp 146–159
- Grubb M, 1992, "Reply to Brookes" *Energy Policy* **20** 392–393
- Guyer J, Richards P, 1996, "The invention of biodiversity: social perspectives on the management of biological variety in Africa" *Africa* **66** 1–13
- Haraway D J, 1988a, "Situated knowledges: the science question in feminism as a site of discourse on the privilege of partial perspective" *Feminist Studies* **14** 575–599
- Haraway D J, 1988b *Primate Visions: Gender, Race and Nature in the World of Modern Science* (Routledge, New York)
- Haraway D J, 1991 *Simians, Cyborgs and Women: The Reinvention of Nature* (Routledge, New York)
- Haraway D J, 1994, "A game of cat's cradle: science studies, feminist theory, cultural studies" *Configurations* **1** 59–71
- Haraway D J, 1997 *Modest_Witness@Second_Millennium. FemaleMan[®]_Meets_OncoMouse[™]: Feminism and Technoscience* (Routledge, New York)
- Haraway D J, 2000 *How Like a Leaf: An Interview with Thyrsa Nichols Goodeve* (Routledge, New York)
- Haraway D J, 2001, "For the love of a good dog: webs of action in the world of dog genetics", in *Digital Anatomy* Ed. C Lammer (Turia and Kant, Vienna) pp 115–138
- Harding S, 1986 *The Science Question in Feminism* (Cornell University Press, Ithaca, NY)
- Harding S, 1993, "Rethinking standpoint epistemology: what is strong objectivity?", in *Feminist Epistemologies* Eds L Alcoff, E Potter (Routledge, New York) pp 49–82
- Harding S, 1998 *Is Science Multicultural?* (Indiana University Press, Bloomington, IN)
- Hinchliffe S, 1996, "Helping the earth begins at home: the social construction of socio-environmental responsibilities" *Global Environmental Change* **6** 53–62
- Howitt R, 1993, "'A world in a grain of sand': towards a reconceptualization of geographical scale" *Australian Geographer* **24** 33–45
- Inhaber H, 1997 *Why Energy Conservation Fails* (Quorum Books, London)
- IPCC, 2001 *Climate Change 2001: Impacts, Adaptation and Vulnerability* Intergovernmental Panel on Climate Change Working Group 2, Geneva, Switzerland, http://www.grida.no/climate/ipcc_tar/wg2
- Isacson M, Salzman G, 1996 *Power* (Cineflix, Montreal, Quebec)
- Ishiyama N, 2003, "Environmental justice and American Indian tribal sovereignty: case study of land use conflict in Skull Valley, Utah" *Antipode* **35** 119–139
- Jasanoff S, 2001, "Image and imagination: the formation of global environmental consciousness", in *Changing the Atmosphere* Eds C A Miller, P N Edwards (MIT Press, Cambridge, MA) pp 309–337
- Jasanoff S, Wynne B, 1998, "Science and decision making", in *Human Choice and Climate Change: Volume I, Societal Frameworks* Eds S Rayner, E Malone (Batelle Press, Columbus, OH) pp 1–77
- Jenson J, 1990, "Different but not exceptional: the feminism of permeable fordism" *New Left Review* number 184, 58–68

- Jenson J, Papillon M, 2000, "Challenging the citizenship regime: the James Bay Cree and transnational action" *Politics and Society* **28** 256–286
- Jessup P, 1997 *Local Government Implementation of Climate Protection: Report to the UN Conference of the Parties* International Council for Local Environmental Initiatives, City Hall, West Tower, 100 Queen Street, West Toronto, Canada, M5HZN2
- Jones K T, 1998, "Scale as epistemology" *Political Geography* **17** 25–28
- Joskow P L, 1995, "Utility-subsidized energy-efficiency programs" *Annual Review of Energy and the Environment* **20** 526
- Joskow P, Marron D, 1992, "What does a negawatt really cost? Evidence from utility conservation programs" *Energy Journal* **13** 41–74
- Katz C, 2001, "On the grounds of globalization: a topography for feminist political engagement" *Signs* **26** 1213–1235
- King K, 1994, "Feminism and writing technologies: teaching queerish travels through maps, territories and pattern" *Configurations* **2** 89–106
- Latour B, 1998, "To modernize or ecologize?", in *Remaking Reality: Nature at the Millennium* Eds N Castree, B Braun (Routledge, London,) pp 221–242
- Law J, Mol A, 2001, "Situating technoscience: an inquiry into spatialities" *Environment and Planning D: Society and Space* **19** 609–621
- Lovins A, 1996, "Negawatts: twelve transitions, eight improvements and one distraction" *Energy Policy* **24** 331–344
- Luke T, 2000, "A rough road out of Rio: the right-wing reaction in the United States against global environmentalism", in *Consuming Cities* Eds N Low, B Gleeson, I Elander, R Lidskog (Routledge, New York) pp 54–69
- McCarthy J, 1998, "Environmentalism, wise use and the nature of accumulation in the rural West", in *Remaking Reality* Eds N Castree, B Braun (Routledge, London) pp 126–149
- McDowell L, 1993, "Space, place and gender relations: part 2—identity, difference, feminist geometries and geographies" *Progress in Human Geography* **17** 305–318
- M^cGuirk P M, 1997, "Multiscaled interpretations of urban change: the federal, the state, and the local in the Western Area Strategy of Adelaide" *Environment and Planning D: Society and Space* **15** 481–498
- Mackenzie A F D, Dalby S, 2003, "Moving mountains: community and resistance in the Isle of Harris, Scotland and Cape Breton, Canada" *Antipode* **35** 309–333
- Martin D G, 1999, "Transcending the fixity of jurisdictional scale" *Political Geography* **18** 33–38
- Massey D, 1993, "Power-geometry and a progressive sense of place: local cultures, global change", in *Mapping the Futures: Local Cultures, Global Change* Eds J Bird, B Curtis, T Putnam, G Robertson, L Tickner (Routledge, New York) pp 59–69
- Massey D, 1994 *Space, Place and Gender* (University of Minnesota Press, Minneapolis, MN)
- Massey D, 2000, "Entanglements of power: reflections", in *Entanglements of Power: Geographies of Domination/Resistance* Eds J P Sharp, C Philo, P Routledge, R Paddison (Routledge, London) pp 279–286
- Massey D, 2002, "Don't let's counterpose place and space" *Development* **45** 24–25
- Merrifield A, 2002, "Guest editorial: Seattle, Québec, Genoa: *Après le Déluge ...* Henri Lefebvre?" *Environment and Planning D: Society and Space* **20** 127–134
- Miller C, Edwards P (Eds), 2001 *Changing the Atmosphere* (MIT Press, Cambridge, MA)
- Mohanty C, 2003, "'Under Western Eyes' revisited: feminist solidarity through anticapitalist struggles" *Signs* **28** 499–538
- Neumann R P, 1998 *Imposing Wilderness: Struggles Over Livelihood and Nature Preservation in Africa* (University of California Press, Berkeley, CA)
- O'Neill J, 2001, "Representing people, representing nature, representing the world" *Environment and Planning C: Government and Policy* **19** 483–500
- Peet R, Watts M, 1996, "Liberation ecology: development, sustainability and environment in an age of market triumphalism", in *Liberation Ecologies* Eds R Peet, M Watts (Routledge, New York) pp 1–13
- Philo C, Wilbert C, 2000, "Animal spaces, beastly places: an introduction", in *Animal Spaces, Beastly Places: New Geographies of Human – Animal Relations* Eds C Philo, C Wilbert (Routledge, London) pp 1–34
- Proctor J D, 1996, "Whose nature? The contested moral terrain of ancient forests", in *Uncommon Ground* Ed. W Cronon (W W Norton, New York) pp 269–297
- Proctor J D, 1998a, "The social construction of nature: relativist accusations, pragmatist and critical realist responses" *Annals of the Association of American Geographers* **88** 352–376

- Proctor J D 1998b, "Expanding the scope of science and ethics" *Annals of the Association of American Geographers* **88** 290–296
- Proctor J D, 2001, "Solid rock and shifting sands: the moral paradox of saving a socially constructed nature", in *Social Nature: Theory, Practice and Politics* Eds N Castree, B Braun (Blackwell, Oxford) pp 225–240
- Revkin A C, 2000a, "UN conference fails to reach accord on global warming" *New York Times* 26 November, <http://www.nytimes.com>
- Revkin A C, 2000b, "Scientists now acknowledge role of humans in climate change" *New York Times* 26 October, <http://www.nytimes.com>
- Rich A, 1986 *Blood, Bread and Poetry: Selected Prose, 1979–85* (W W Norton, New York)
- Rocheleau D, Ross L, 1995, "Trees as tools, trees as text: struggles over resources in Zambrana-Chacuey, Dominican Republic" *Antipode* **27** 407–428
- Rosing N, 2000, "Bear beginnings: new life on the ice" *National Geographic* December, <http://www.nationalgeographic.com/ngm/0012/feature2/index.html>
- Ruddick S, 1996, "Constructing difference in public places: race, class and gender as interlocking systems" *Urban Geography* **17** 132–151
- Saunders H, 1992, "Does energy conservation worsen global warming?", in *International Issues in Energy Policy, Development and Economics* Eds F Fesharaki, J Dorian (Westview, Boulder, CO) pp 281–291
- Schroeder R A, 1997, "'Re-claiming' land in The Gambia: gendered property rights and environmental intervention" *Annals of the Association of American Geographers* **87** 487–508
- Shackley S, Wynne B, 1996, "Representing uncertainty in global climate science and policy: boundary-ordering devices and authority" *Science, Technology and Human Values* **21** 275–302
- Shove E, 1998, "Gaps, barriers and conceptual chasms: theories of technology transfer and energy in buildings" *Energy Policy* **26** 1105–1112
- Shove E, Lutzenhiser L, Guy S, Hackett B, White H, 1998, "Energy and social systems", in *Human Choice and Climate Change. Volume 2: Resources and Technology* Eds. S Rayner, E Malone (Batelle Press, Seattle, WA) pp 291–325
- Sletto B, 2002, "Boundary making and regional identities in a globalized environment: rebordering the Nariva Swamp, Trinidad" *Environment and Planning D: Society and Space* **20** 183–208
- Slocum R, 2004, "Consumer citizens and the Cities for Climate Protection campaign" *Environment and Planning A* **36** 763–782
- Star S L, Griesemer J R, 1989, "Institutional ecology, 'translations', and boundary objects: amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39" *Social Studies of Science* **19** 387–420
- Stirling I, 2000, "Running out of ice?" *Natural History* **109** 92
- Suchman L, 1999, "Located accountabilities in technology production", Department of Sociology, Lancaster University, <http://www.comp.lancs.ac.uk/sociology/papers/suchman-located-accountabilities.pdf>
- Swyngedouw E, 1997, "Neither global nor local: 'glocalization' and the politics of scale", in *Spaces of Globalization* Ed. K R Cox (Guilford Press, New York) pp 137–166
- Taylor P J, 1997, "How do we know we have global environmental problems? Undifferentiated science-politics and its potential reconstruction", in *Changing Life: Genomes, Ecologies, Bodies, Commodities* Eds P J Taylor, S E Halfon, P N Edwards (University of Minnesota Press, Minneapolis, MN) pp 149–174
- Taylor P J, Buttel F H, 1992, "How do we know we have global environmental problems? Science and the globalization of environmental discourses" *Geoforum* **23** 405–416
- Torrie R, 1999, Presentation at "The Heat is On" conference convened by the City of Minneapolis and the City of St Paul, MN, November, available from R Torrie, Torrie Smith Associates Inc., Unit 108, 95 Beech Street, Ottawa, Ontario, Canada K1S 3J7
- Tsing A L, 2000, "Inside the economy of appearances" *Public Culture* **12** 115–144
- Tuana N, 2003, "Material locations: an interactionalist alternative to realism/social constructivism", <http://www.uoregon.edu/~uophil/faculty/ntuana/material.html>
- Turner R S, 2001, "On telling regulatory tales: rBST comes to Canada" *Social Studies of Science* **31** 475–506
- USEPA, 1998 *US Greenhouse Gas Emissions and Sinks 1990–1996* United States Environmental Protection Agency, Washington, DC
- van der Sluijs J, van Eijndhoven J, Shackley S, Wynne B, 1998, "Anchoring devices in science for policy: the case of consensus around climate sensitivity" *Social Studies of Science* **28** 291–323

-
- Wackernagel M, Rees W, 1997, "Perpetual and structural barriers to investing in natural capital: economics from an ecological footprint perspective" *Ecological Economics* **20** 3–24
- Waytiuk J, 2002, "Arctic lords on the ice edge: scientists warn that global warming is posing a critical threat to the magnificent polar bears of northern Manitoba" *Americas* **54** 6–16
- Wolch J, Emel J (Eds), 1998 *Animal Geographies: Place, Politics, and Identity in the Nature – Culture Borderlands* (Verso, London)