# A National, Longitudinal Analysis of Canadian Municipal Response to Climate Change

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## Abstract:

Around the world, municipal governments are recognized as leaders in climate change response and as important actors in global climate governance. In 1999, our research team conducted the first and only national survey of Canadian municipal responses to climate change. All municipalities of 10,000 people or more were contacted, with results from 286 municipalities analyzed. Building on these results, in early 2010, our team will conduct another national survey of all municipalities, this time with populations over 5,000. This research initiative will provide an updated inventory of municipal response; identify the character of municipal actions and categorize the types of interventions (if any) municipalities have taken; systematically analyze the factors that drive municipal action; and, show how municipal action on climate change has evolved over the last ten years. In addition to these practical outcomes, this research will also clarify and test existing arguments for why municipalities take action, explaining and identifying the central factors and influences that motivate action. By surveying a large national sample of municipalities the power of our explanation for why and how municipalities are taking action increases tremendously and our ability to identify relationships between variables also increases. This paper presents the rationale and approach for this forthcoming survey, along with the challenges and opportunities experienced in preparing the survey.

## Introduction

In Canada and globally, research on municipal governments is gaining increased prominence. There are exciting reasons for this change. Some suggest that the international actions of municipal governments, particularly in relation to climate change, have the potential to challenge the orthodox conception of global governance (Okereke, Bulkeley & Schroeder 2009; Bulkeley 2005). At the national level in North America, there is evidence that the actions and advocacy of municipal governments are challenging the orthodox conception of municipal governments as creatures of subnational governments and/or subservient to the whims of formal government authorities. For example, in Canada, the small Quebec municipal government of Hudson successfully defended its authority to regulate pesticides – a federal government power – in a Supreme Court challenge, leading other municipalities across the country to quickly follow suit (see Pralle 2006). More recently, in the United States, the US

Conference of Mayors, successfully advocated for a $2 billion dollar annual federal block grant to fund energy efficiency and conservation in cities and counties – the first initiative of its kind (see Gore and Robinson 2009). Despite these phenomena, it remains that knowledge and theorizing of municipal government – as distinct from studies of political culture or public opinion across a large number of municipalities – is often derived from regional overviews or in-depth single city studies. These deep examinations have resulted in some of the more influential theories of urban politics, such as regime theory (Stone 1989), but are naturally incapable of making broader generalizations or claims about the actions, motivations or policy choices of city governments at large.

There are clear pragmatic reasons for the dominance of case studies when studying municipal governments. First, municipal governments are imbedded in several overlapping or parallel intergovernmental structures, leading to the need for deep description of these interrelations in order to unpack the character of governing that takes place at the local level. Second, the number of municipal institutions in a given country is extremely high. In Canada, the total number of municipal institutions is well over 3500. Third, where subnational authorities have the supreme power to influence the number and structure of municipal institutions there is little national consistency in the relationship between population size and number and structure of municipal authorities. Despite the breadth of these and other challenges, it remains that in the absence of a large cross-national study of municipal governments, the ability to generalize about similarities and differences between municipalities and the ability to test relationships between variables explaining different actions of municipal governments is extremely limited.

In response to the challenge of developing a larger national understanding of municipal governments, this paper reports on our efforts to implement a national survey of all municipalities in Canada with a population of 5,000 or more. The original intent of the paper was to share preliminary results from the survey. However, due to a number of challenges implementing a survey of this magnitude the survey has not yet been administered. Nonetheless, the experience of trying to undertake this study, along with its rationale provides the opportunity for a great deal of critical reflection and introspection. Hence, in the second section of the paper, the historic rationale for a large national survey on municipalities and climate change is presented. The third section reports on the approach being employed in this current survey effort, explaining the rationale for the approach and the mechanics of undertaking the study. The conclusion reflects on the experience of designing and implementing the survey to date as well as the anticipated outcomes from the survey.

## PAST APPROACH AND RATIONALE

Our proposed research aims to understand the current and potential roles of Canadian municipalities in mitigating and adapting to climate change by explaining broadly: (1) how Canadian municipal response to climate change has evolved over time; and (2) what factors explain the action and/or inaction of various municipalities across Canada. Since climate change has the potential to impact all regions of the world (IPCC 2007), it is not surprising that studies have primarily focused on the international, national, and regional scale. But failing to understand the impacts of actions taken by municipal governments not only minimizes both the immediate and predicted human, infrastructural, and ecosystem impacts of climate change, but also omits the important responses to climate change that municipal governments have already

taken (Worldwatch 2007; Bulkeley and Betsill 2003; Bestill and Bulkeley 2004, 2006; Robinson 2006; Gore and Robinson 2009). Municipalities in Canada, for example, were some of the first to take action to reduce greenhouse gas (GHG) emissions (Gore and Robinson 2005). The significance of municipal climate change action in Canada is reinforced by the knowledge that municipalities have direct control, indirect control, or influence over approximately 50% of domestic emissions (Municipalities Table 1999; Robinson 2000). Municipal governments in Canada clearly have the potential to play a prominent role in future efforts to mitigate and adapt to climate change; yet our knowledge of why municipalities take action in the first place and the factors limiting their future action remains very limited. This information is needed in order to raise awareness of the important role that municipal actions can have in addressing climate change and to support municipal efforts in this critical area. It was a recognition of the role municipal governments were playing and could play in climate change mitigation that led Robinson (2000) to conduct the first and only national survey of all Canadian municipalities with a population of 10,000 or more in 1999 – a total of 392 municipalities.

The 1999 survey focused on understanding the barriers to municipal responses to climate change. Surveys were mailed to municipal staff with primary responsibility for activities that could lead to emission reductions in the corporation. Responses were returned by fax or mail. The survey response rate was very high, with 60% of surveys returned (236 of 392).

The 1999 survey produced some unique data on municipalities. For example, it found that municipality size was a statistically significant factor contributing to climate change action – smaller municipalities were less likely to be active than larger municipalities (Robinson and Gore, 2005). Conversely, from an intergovernmental perspective, it was found that the province

of origin was not a statistically significant factor contributing to action. The data also revealed that there were more municipalities taking action to reduce GHG emissions than were registrants in the Federation of Canadian Municipalities Partners for Climate Protection (PCP) program – the dominant program supporting municipal climate action in Canada. This latter observation emphasizes the importance of undertaking a national survey of small, medium and large municipalities, as opposed to only studying those municipalities that are members of an existing municipal climate change network: A large national survey provides the opportunity to investigate the factors that are motivating action and to test existing arguments for why municipalities in Canada are responding to climate change. Hence, in 2010, we will be undertaking a new, expanded national survey of municipalities in Canada.

The 2010 survey will provide an excellent opportunity to compare and contrast municipal action in the last ten years, but to also expand the focus of the original survey to try to identify the relationships between more variables. It will provide practical, policy-relevant outcomes as well as data that have the potential to inform theoretical debates on municipal governments. More specifically, this research will: (1) provide an updated inventory of Canadian municipal responses to climate change; (2) identify the character of municipal responses and categorize the types of interventions (if any) municipalities have taken; (3) systematically analyze the factors that drive municipal action, and the barriers to action; and (4) understand how municipal action to climate change has evolved over time. The survey will also allow us to test four arguments that have been posed to account for why municipalities take action on climate change: (1) municipalities are motivated to take action due to their participation in national, regional, and international networks that promote and motivate

climate change response (Bulkeley and Betsill 2003; Betsill and Bulkeley 2004; Selin and VanDeveer 2007); (2) municipalities feel motivated to develop progressive action on local and global environmental issues due to citizen preferences (Robinson 2000; Robinson and Gore 2005); (3) municipalities are concerned about their international reputation and will take action to demonstrate leadership (Robinson 2000; Robinson and Gore 2005); and (4) municipalities take action on climate change because of the tangible co-benefits that can be achieved when reductions in GHG emissions are combined with broader efforts to improve the overall sustainability of a municipality (Berke and Conroy 2000; Edwards and Haines 2007; Parkinson and Roseland 2002; Portney 2002). But while the broad rationale for a large survey may be evident, the specifics of the approach and the pragmatic challenges of executing that approach are significant.

### CURRENT APPROACH: RATIONALE AND IMPLEMENTATION

The strength of our proposed research program derives from our ability to conduct a large, national quantitative survey of municipalities, whether they are taking action to address climate change or not, and to compare the 2010 data with the 1999 data, which we retain. By surveying a large population of municipalities the power of our explanation for why and how municipalities are taking action increases tremendously and our ability to identify relationships between variables also increases. This research will allow us to systematically answer our central questions and to test existing explanations for why municipalities are responding to climate change. This approach also complements existing and ongoing qualitative research on individual municipalities and climate change, which our team has also conducted. Accordingly,

this research seeks to identify and analyze barriers to and drivers of action. Therefore, response from small, medium and large 'action' and 'no-action' municipalities is required to produce a robust understanding of what prevents action and inhibits further action.

In the subsections that follow we discuss the substantive positioning of the 2010 survey and then provide an overview of practical survey delivery issues of relevance and interest to those considering other large scale local government surveys.

***Substantive positioning of the survey***

The 1999 survey was the first and still only cross-Canada large scale survey of municipal response to climate change but "response" emphasized mitigation alone, that is to say, actions taken to reduce the emission of greenhouse gas (GHG). One notable substantive addition to the scope of this survey and of the research in general is an additional focus on municipalities undertaking actions considered to be adaptation activities. The previous focus on mitigation reflected the fact that most municipal climate change action was dominantly efforts to reduce energy use and GHG emissions. However, in 2010 the nature of climate change response has evolved.

In Canadian local governments "climate change response" can now mean mitigation, adaptation or both. Adaptation is largely understood as encompassing activities geared toward responding to the range of social, political, physical and economic impacts of climate change. Accordingly, the 2010 survey seeks to inventory, define and analyze barriers and opportunities for both local government mitigation and adaptation activities. This substantive addition is important because the survey will now gather data on response on both types of activities and

allow, for the first time, a large scale understanding of how and why local governments engage in these two types of climate change response.

A second notable change in the evolution of this research relates to its scope. The original 1999 survey was first conducted as a doctoral thesis in Environmental Geography at the University of Toronto (Robinson, 2000). Because its origins emerged from a discipline with a strong emphasis on spatial analysis, theories and questions of interest in political science, municipal politics, or international relations were not applied, emphasized or tested. In 2005 with the addition of Gore to the research project, our research began to propose new research questions and hypotheses that were concurrently better grounded in spatial analysis and more specifically the discipline of land use planning and formally connected to theories of multilevel governance, intergovernmental relations, policy network analysis, and social constructivism.

Through the expansion of the theoretical underpinnings of this research we have pushed the research beyond its first goals to inventory Canadian mitigation action taken by local governments and to define and understand the barriers to these actions being taken to also include research questions and hypotheses that address issues of what we might now call "climate governance". As a result, we hope the potential richness of the survey will increase, but it has also meant a more complicated survey question design, while at the same time needing to keep the survey a manageable length (discussed below).

The third substantive difference is the inclusion of a high number of smaller local governments. This research will survey the same 392 municipalities surveyed in the 1999 study (all of those with populations greater than 10,000 people). This will allow for direct comparison to the 1999 results as well as the opportunity to analyze changes in mitigation action over time.

In addition to the 392 municipalities originally surveyed, we will expand the 2010 survey to include all Canadian municipalities with a population between 5,000 and 9,999 people. There are three reasons for adding municipalities with less than 10,000 people in the 2010 survey.

First, according to FCM's most recent progress report on the PCP program, of the 205 municipalities participating in the program, 33 have populations between 5,000 and 9,999 (FCM 2010). This large number of smaller local governments with formal commitments to mitigation activities signals a need to expand our research to also include this next grouping. At the same time, the 1999 survey revealed that municipal participation in FCM's PCP program could not be used as a proxy for all municipal action on climate change (Robinson, 2006). Second, existing research that does examine Canadian municipal response to climate change has tended to focus on the leadership of a handful of large Canadian municipalities such as Vancouver, Calgary, Edmonton, Toronto and Montreal (Boston, 2008; DeAngelo and Harvey, 1998; Lambright et al. 1996; Moore, 1994). Therefore, including smaller municipalities allows us to complement these in-depth qualitative studies. Third, previous national research on municipal drinking water services used a similar threshold (population of 1,000 or more) for its survey (Environment Canada 2006). This threshold was used because a municipality with a 1,000 people or more was understood to have population densities adequate for the possibility of municipal service provision (Environment Canada 2006b). Given that a significant volume of municipal GHG emission reductions result from improvements in municipal services (Robinson 2000), our survey will therefore include municipalities that have a clear potential to directly reduce GHG emissions through corporate operations. We considered expanding the scope

further by including all local governments with a population greater than 1,000 people but there are logistical constraints to that scale of expansion (see section below on approach).

By surveying all municipalities over 5,000 people our research will make a new and important contribution to broadening knowledge and understanding about Canadian municipal response to climate change and the factors leading to action. Moreover, if the federal government, as the lead institution in global climate change negotiations, is going to launch an effective national strategy that includes municipal governments, then such a strategy will be strengthened by having a comprehensive understanding of what actions small, medium and large municipalities are taking and their motivation for doing so.

***Mechanical Delivery of the Survey***

Effective reductions in GHG emissions and climate adaptation require long-term institutional commitment (Robinson 2006). Therefore, in contrast to surveying elected officials, we will survey municipal staff, specifically department heads and/or senior staff members. Staff have greater knowledge of specific policies and programs relating to GHG emissions and also typically have a longer-term relationship with the municipality through employment, i.e., institutional memory (Robinson 2000; Robinson and Gore 2005; Robinson 2006). Hence, following the 1999 approach method, staff with responsibility for the following municipal functions will be contacted: environmental management, planning, public works, waste management, transportation, transit, building inspection, and parks. The typical activities performed by staff in these offices have the potential to reduce GHG emissions and/or contribute to efforts to adapt the current or future climate change impacts. For example,

through transit-oriented land use planning, people can be encouraged to take transit rather than driving their cars. Landfill gas capture at municipal landfill sites is a commonly used municipal GHG emission reduction activity in Canada. In municipal water departments efforts may be underway to expand the capacity of the storm water system to manage extreme weather events. Through building energy retrofits, energy efficiency gains can be accomplished thus also resulting in emission reductions. Thus, because climate change does not fall neatly into the responsibility of one municipal department, a range of staff will be contacted. For smaller municipalities without multiple department heads and/or senior staff, the town clerk or Chief Administrative Officer will be contacted.

The original survey was sent through the post in envelopes personally addressed to the appropriate staff person. Originally we planned to rely on the contact information provided by the most recent addition of the Canadian Environmental Directory (Greyhouse 2009). The directory contains detailed contact information for Canadian municipal staff including their position. In the 1999 survey this directory was used to generate the contact list. However, this directory is proving a less reliable source for the development of the contact information in 2010. At the time this paper was written two RAs had spent 210 hours in pursuit of an accurate contact list for the 2010 survey with sixty percent of target municipalities completed. This process is a longer one in 2010 in part because the number of local governments being surveyed has now grown to 692, but the actual number of individual surveys being sent to municipal staff is approximately 5500.

When the development of the contact list began, our research team was still considering including local governments with populations between 1,000-4,999 people but this

further expansion would have added a further 1366 local governments meaning that approximately 4090 more surveys would need to be distributed. We accordingly decided to expand the original scope of the 1999 survey to all local governments in Canada with populations greater than 5,000 according to the 2006 Census with the possibility of engaging the 45 PCP members with populations under 4999 in a separate research project or survey.

Each potential participant will be contacted with a personalized letter introducing the research project and inviting the staff person to participate. One of the lingering decisions to be made is whether this contact will be made through a mailed letter, an emailed letter or both. This letter will provide directions for the completion of the survey and relevant research ethics information. After 2 weeks we will send a second letter to non-responders inviting them to participate. After 4 weeks we will send a final letter to non-responders.

Our survey will be completed through the Internet. Respondents will be provided with a password in their contact letters in order to complete the survey, which will be delivered through a secure website. Although Internet surveys should not be used as "simple substitutes" for telephone surveys, Canadian research shows that they are an effective and appropriate means of gathering information about the attitudes and characteristics of a population (Stephenson and Crête 2008). When compared with surveys distributed by mail, Internet surveys are less expensive to deliver, allow for efficient data collection and coding, and offer more flexibility with regard to the types of questions and data solicited (Kaplowitz et al. 2004; Kennedy et al. 2000; Stephenson and Crête 2008). Respondents are more likely to respond to sensitive questions (e.g. why no municipal action has been taken) on Internet-based surveys when compared with paper alternatives (Kaplowitz et al. 2004) and they are less likely to be

influenced by social desirability effects (Chang and Krosnick, 2003). Because this survey will query responses from municipal staff, participants will have easy access to technology and will be comfortable with the use of computers.

Since this survey is being conducted in municipalities where either or both official languages are spoken, respondents will have the opportunity to complete the survey in English or French and all correspondence about the research will be bilingual. When needed, translation will be provided by a translation service with experience in the municipal sector.

To allow for direct comparison to the 1999 survey, this survey will incorporate the questions from the original survey. Following the original survey's structure, the 2010 survey will contain predominantly closed ended questions, but also allowing space for respondents to include comments. The questions will allow respondents to: identify specific activities leading to emission reductions; identify specific activities leading to adaptation to the impacts of climate change; evaluate the factors contributing to mitigative and adaptive response; and in the case of no-action, identifying barriers to mitigative and adaptive response. We will also add new closed ended questions to solicit data that allows us to assess the four theoretical arguments for why municipalities are taking action.

Respondents will be able to complete the survey in 15 to 20 minutes. The original survey was designed with the same elements and completion time; its robust response rate supports a similar approach in 2010. One concern often raised about surveys as a data collection instrument is low response rate. Ten years ago when our original survey was first distributed, global, national, and local attention to climate change issues was markedly less than it is now, and yet staff from 60% of surveyed municipalities responded. In light of ongoing municipal

progress and wider-spread agreement on the need to respond to climate change, we obviously hope for robust participation by municipal staff.

When the 1999 survey was conducted, survey research soliciting data from local government staff was less common than it is now. Our research remains, to the best of our knowledge, the only cross-Canada study of municipal response to climate change yet there are many graduate students, faculty and NGO researchers working on qualitative and quantitative studies of smaller subsets of local governments in Canada meaning that local government staff are more frequently solicited as participants in research. Climate change and local government "research" activity is at a particular high pre- and post-COP 15 negotiations when the efforts of non-governmental organizations are considered. This flurry of activity has raised concerns about survey fatigue and leads us to consider whether we might deploy some form of incentive to increase the potential for a robust response rate. However, there is discrepancy, as evidenced by several studies, as to whether rewards (such as lotteries or prizes) given for the successful completion of questionnaires results in increased response rates.

For example, in his 1993 work, Church questions whether the outcome is worth the investment given the lack of statistical evidence to support increases in response rates. But, based on a study of 38 other studies, Church also notes that upfront tokens (i.e. cash in hand) do increase response rates (Church 1993). There is evidence (Deutskins et al. 2004; Göritz 2006; Porter and Whitcomb 2003) that shows that there is an increase in responses if there is the incentive for a reward at the end, even if it is just a small increase. Porter and Whitcomb (2003), particularly, note that the only statistically significant difference in their study with a control group offered no incentives and four levels of monetary lotteries ($50, 100, 150, 200)

was that between the control group and the $100 incentive group, though all incentives proved to generate increases of 0.7% - 1.4% over the control group after the initial email, and 1.1% - 2.3% after the third reminder email. Porter and Whitcomb (2003) note that the incentive should be reasonable and neither too small or not too large. Deutskins et al. (2004) do note that shorter questionnaires are less likely to require a personal compensation incentive as opposed to an altruistic one (i.e. a donation to a charity). These findings are important to consider in light of who our respondents are: local government staff. When considering the use of an incentive we began to wonder what would be an ethically appropriate incentive to offer local government staff for their participation? Ultimately, research has shown that "issue salience had a stronger impact on response rate than did any other issue or research-design decision including advance notice, follow-up contact, or monetary incentives" (Sheehan and McMillan 1999, p. 47). It is our hope that 'issue salience' in combination with a short survey that will be completed in the workplace will result in a robust response rate. Therefore, at this time, an incentive for survey response is not being considered.

***Data Analysis***

With survey data gathered, we will first produce a new, updated Canadian inventory of municipal mitigative and adaptive response to climate change. Municipalities will be assessed as "Action-" or "No-Action-" on both mitigation and adaptation fronts. The 2010 data will be compared with the 1999 data to assess how municipal action or inaction has changed over time. The types of action taken will be assessed to draw comparisons between planned-action, implemented action, and action leading to real emission reductions. The influence of province

of origin and municipality size will be tested. Drivers of, and influences on, action (e.g. influence of, and support from, senior levels of government and non-government organizations; advocacy by the public; leadership by politicians; desire for recognition; network affiliation) will be determined and compared with the 1999 data.

For Action-municipalities, barriers to further response will be assessed. For No-action Municipalities, barriers to their initiating response will be evaluated. Both sets of barriers will be compared with the 1999 data set and conclusions will be drawn about how these barriers have changed for mitigation; for adaptation this barrier set will be the first cross-Canada data assembled. These findings will then be considered in the context of ongoing efforts to support municipal response to climate change in Canada. The data will allow for an assessment of municipal perceptions of the effectiveness of federal and provincial governments' and non-governmental organization activities to reduce emissions and to trigger and/or advance adaptation activities. These data will allow us to evaluate the effectiveness of existing support to Canadian municipalities through provincial, federal, and international municipal and intergovernmental networks and programs.

In sum, this research will provide a strategic opportunity to advance knowledge on the factors driving municipal action on climate change in Canada. The size of the population surveyed will also provide the opportunity to produce results that have national policy influence and resonance. Since climate change is an issue still driven largely by international and national-sub-national negotiations, this national data will produce results that can feed directly into future climate change adaptation and mitigation strategies in Canada. This is particularly significant since the analysis and publication of results will be available as the world

takes stock of how to respond to climate change following recent global climate negotiations, and the Canadian federal and provincial governments examine their role in a future national, North American, and international climate governance system.

## CONCLUSION AND ANTICIPATED OUTCOMES

This national study of the evolution of Canadian municipal response to climate change offers a unique opportunity to gain theoretical insights about municipal governments in a Canadian context, which may be used comparatively in future research programs. For example, we are in regular conversation with researchers in the United States and Europe about trying to replicate the survey in those jurisdictions in future. The survey also offers a rare chance to develop a clearer understanding of the ongoing motivations and challenges municipalities confront in their response to, and participation in a complex policy area that involves and is influenced by a range of other institutions and governments. Other researchers and government officials have expressed enthusiasm for this work, particularly owing to our effort to include small through to large municipalities in the survey, and due to our effort to focus on intergovernmental relations and motivations for action. But this expanded scope and the practical challenges of compiling contact information for more than 5000 staff has certainly slowed the implementation process. Nonetheless, we anticipate that the survey will provide some significant and unique outcomes.

First, the survey will allow us to analyze how municipal climate activities have evolved over ten years. Because we will survey the same 236 municipalities that responded in 1999, we are able to directly compare and analyze how municipal activities have or have not changed over time. For example, we will know whether the barriers to mitigation action articulated in

1999 remain the same or different now. Similarly, the 2010 survey will allow us to statistically test evidence from 1999. For example, in 1999, municipal province of origin was not a statistically significant variable affecting municipal climate action. Owing to the changes in global, national and provincial climate awareness and actions in the last ten years, we anticipate that province of origin will be a significant variable affecting action. Second, our inclusion of a larger number of municipalities, specifically smaller municipalities, increases the national relevance of the expected findings. Because there are only 381 municipalities in Canada with populations over 10,000 people, a large majority of municipalities are in fact 'small'. Therefore, our survey will provide important insight into how municipalities at all different sizes and scales are grappling with this issue. Third, the inclusion of survey questions focused on the nature of intergovernmental and inter-municipal relations means that we will be able to test some prominent questions and theories about why municipalities act to address climate change. Thus, global reflections on the nature and importance of municipal networks for example, will be illustrated through our findings. Fourth, the survey will provide new insights into the issue of climate change specifically. Most importantly, it will offer new evidence on the issue of climate adaptation. This is very important in Canada and elsewhere as government and policy communities are now much more interested in understanding how municipalities can prepare or are preparing for the potential impacts of climate change. The addition of adaptation-specific data will form a 2010 baseline for these activities that will enable future comparative analysis. Lastly, our ultimate goal is to make the survey data publicly available. There will be important restrictions on what can be shared and when owing to confidentiality issues, but over time we plan to make as much of the data available as possible.

This will allow other researchers in Canada and globally the opportunity to better understand municipalities and climate governance in a more comprehensive and systematic manner and to complement and enhance our deep yet often anecdotal understandings of local governments in Canada.

**BIBLIOGRAPHY**

Berke, Philip R., and Maria Manta Conroy. 2000. "Are We Planning for Sustainable Development?: An Evaluation of 30 Comprehensive Plans" *Journal of the American Planning Association* 66(1): 21-33.

Betsill, Michele M. and Harriet Bulkeley. 2006. Cities and Multilevel Governance of Global Climate Change. *Global Governance* 12(2): 141-159.

Betsill, Michele M. and Harriet Bulkeley. 2004. Transnational Networks and Global Environmental Governance: The Cities for Climate Protection Program. *International Studies Quarterly* 48(2): 471- 493.

Boston, Alex. 2008. "Top Down, Bottom Up, Across, Inside Out" in *Perspectives on Local Government Leadership, Policy and Practice in Canada*, edited by Susan M. Gardner and David Noble. Toronto: Municipal World.

Bulkeley, Harriet and Michele M. Betsill. 2003. *Cities and Climate Change. Urban sustainability and global environmental governance.* London: Routledge.

Bulkeley, H. 2005. Reconfiguring environmental governance: Towards a politics of scales and networks. *Political Geography*, *24*, 875–902.

Bulkeley, H., & Kern, K. 2006. Local government and the governing of climate change in Germany and the UK. *Urban Studies*, *43*(12), 2237–2259.

Chang, Lin Chiat and Jon A. Krosnick. 2003. "Comparing Oral Interviewing with Self-administer Computerized Questionnaires: An Experiment." Unpublished manuscript.

Church, Allan H. 1993. Estimating the effect of incentives on mail survey response rates: a meta-analysis. *Journal of Public Opinion Quarterly* 59, 62-79.

DeAngelo, B., and L. D. Harvey. 1998. "The jurisdictional framework formunicipal action to reduce greenhouse gas emissions: case studies from Canada, USA and Germany," *Local Environment*, 3 (2): 111-136

Deutskins, E., De Ruyter, K., Wetzels, M., Oosterveld, P. 2004. Response Rate and Response Quality of Internet-Based Surveys: An Experimental Study. *Marketing Letters* 15 (1), 21-36.

Edwards, MM and A. Haines. 2007. Evaluating Smart Growth: Implications for Small Communities. *Journal of Planning Education and Research*, 27(1): 49-64

Environment Canada. 2006a. *Information on Greenhouse Gas Sources and Sinks. Canada's 2006 Greenhouse Gas Inventory – A summary of trends*. Retrieved from:

http://www.ec.gc.ca/pdb/ghg/inventory_report/2006/som-sum_eng.pdf

Environment Canada 2006b. *Water Use Data*. Retrieved from: http://www.ec.gc.ca/Water/en/manage/use/e_data.htm

Gore, C., & Robinson, P. 2009. Local government response to climate change: Our last, best hope? In H. Selin & S. VanDeveer (Eds.), *Changing climates in North American politics* (pp. 137–158). Cambridge, MA: MIT Press.

Gore, Christopher. 2010. The Limits and Opportunities of Networks: Municipalities and Canadian Climate Change Policy, *Review of Policy Research*, Vol. 27, No.1, pp. 27-46.

Göritz, Anja S. 2006. Incentives in Web Studies: Methological Issues and a Review. *International Journal of Internet Science* 1 (1), 58-70.

Grey House Publishing. 2009. *Canadian Environmental Resource Guide, 2009 Edition*. Toronto: Grey House Publishing.

IPCC. 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change,* edited by M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson. Cambridge, UK: Cambridge University Press.

Kaplowitz, Michael D., Timothy D. Hadlock and Ralph Levine. 2004. A Comparison of Web and Mail Survey Response Rates. *Public Opinion Quarterly* 68(1): 94-101

Kennedy, John M., George D. Kuh and Robert Carini. 2000. Web and Mail Surveys: Preliminary Results of Comparisons Based on a Large-Scale Project. Paper presented at the Annual Meeting of the American Association for Public Opinion Research, Portland, Oregon.

Lambright, W. Henry, Stanley A. Changnon, and L.D. Danny Harvey. 1996. Urban Reactions to the Global Warming Issue: Agenda Setting in Toronto and Chicago. *Climatic Change* 34: 452-478.

Moore, Jennie L. 1994. What's Stopping Sustainability? Examining Barriers to Implementation of Clouds of Change. Master's thesis. Vancouver: School of Community and Regional Planning. Municipalities Table 1999;

Okereke, C., Bulkeley, H., & Schroeder, H. 2009. Conceptualizing climate governance beyond the international regime. *Global Environmental Politics*, *9*(1), 58–78.

Parkinson, Sarah and Mark Roseland. 2002. Leaders of the Pack: an analysis of the Canadian 'Sustainable Communities' 2000 municipal competition. *Local Environment*, Vol. 7, No. 4: 411-429.

Porter, S. R., Whitcomb, M. E. 2003. The Impact of Lottery Incentives on Student Survey Response Rates. *Research in Higher Education* 44 (4), 389-407.

Portney, Kent E. 2002. Taking Sustainable Cities Seriously: a comparative analysis of twenty four US cities. *Local Environment*, Vol. 7, No. 4: 363-380.

Pralle, S. 2006. The "mouse that roared": Agenda setting in Canadian pesticides politics. *Policy Studies Journal*, *34*(2), 171–194.

Robinson, P. 2000. *Canadian municipal response to climate change: A framework for understanding barriers*. Ph.D. dissertation, University of Toronto.

Robinson, P. 2006. Canadian municipal response to climate change: Measurable progress and persistent challenges for planners. *Planning Theory and Practice*, *7*(2), 218–223

Selin, Henrik and Stacy D. VanDeveer. 2007. Political Science and Prediction: What's Next for U.S. Climate Change Policy? *Review of Policy Research* 24(1): 1-27.

Sheehan, Kim Bartel & McMillan, Sally J. 1999. Response Variation in E-Mail Surveys: An Exploration. *Journal of Advertising Research* 39 (4), 45-54.

Stephenson, Laura B. and Jean Crête. 2008. Internet Survey Methodology in a Canadian Setting: An Evaluation of Mode Effects. Paper prepared for presentation at the Annual Meeting of the Midwest Political Science Association, April 3-6, 2008, Chicago, IL.

Stone, Clarence. 1989. *Regime Politics: Governing Atlanta 1946-1988.* Kansas University Press.

Worldwatch Institute. 2007. *State of the World: Our Urban Future*. New York: W.W. Norton.