Integrating Climate Information into Watershed Planning: Post-Forum Summary Report

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Prepared by:

Toronto and Region Conservation for The Living City

ONTARIO CLIMATE CONSORTIUM

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Bonnie Fox, Conservation Ontario
Christine Tu, Region of Peel
Craig McCrimmon, Environment and Climate Change Canada
Frances Delaney, Ontario Climate Consortium
Heather Auld, Risk Sciences International
Ian McVey, Ontario Climate Consortium
Jenessa Doherty, Ontario Climate Consortium
Jo-Anne Rzadki, Conservation Ontario
Laura DelGiudice, Toronto and Region Conservation Authority
Mehmet Umit Taner, University of Massachusetts Amherst
Namrata Shrestha, Toronto and Region Conservation Authority
Noah Gaetz, Toronto and Region Conservation Authority
Peter Love, Ontario Climate Consortium
Richard Wyma, Essex Region Conservation Authority
Ryan Ness, Toronto and Region Conservation Authority
Teresa Cline, York Region

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Acronyms

BMP	Best Management Practice
CAs	Conservation Authorities
ECCC	Environment and Climate Change Canada
ERCA	Essex Region Conservation Authority
IJC	International Joint Commission
MECP	Ministry of the Environment, Conservation and Parks
OCC	Ontario Climate Consortium
TRCA	Toronto and Region Conservation Authority

1.0 Introduction

1.1 Overview

The fifth assessment report of the IPCC, under the auspices of the United Nations, stated that impacts of climate change are already being widely felt throughout society around the globe. A changing climate has already had impacts on the weather of Ontario. This has resulted in a variety of impacts to the communities and the natural system including flooding, record temperatures, loss of crops, changes in species distribution and vector borne diseases. The potential impacts of climate change, in the decades ahead, are expected to be as far-reaching as they are difficult to accurately predict, touching upon everything from ecosystems to urban infrastructure to insurance costs. Therefore, municipalities, provincial and federal agencies are increasingly expected by government and the general public to incorporate climate change in their planning and in their work.

Although many sources of climate data are available, there remains a significant gap as to how climate data and information informs planning activities. More specifically, watershed plans will need to be able to inform the way municipalities plan and design their infrastructure, and as a result incorporate climate data in a robust manner. With more and more Ontarians willing to consider climate change in their practices, they would like to know where to find the appropriate climate data and how to use the data for watershed plans.

With this context in mind, the *Integrating Climate Information into Watershed Planning Forum* was held at Black Creek Pioneer Village on June 11, 2018 in Toronto, Ontario, and was hosted by the Ontario Climate Consortium. The Forum brought together a wide cross-section of practitioners for an open discussion on how to better integrate climate information into watershed planning. Specifically, the Forum was guided by four objectives, including:

1. Understanding what climate information currently exists and how it can be included in Watershed Planning;
2. Facilitating information sharing and open discussion surrounding ideas, needs and examples relating to the integration of climate information into watershed planning;
3. Connecting watershed planning experts in Ontario with those working in climate information and create a Community of Practice to establish a network to share ideas and lessons learned; and
4. Sharing knowledge and experience of how climate change could be considered in watershed plans.

The agenda of the Forum was structured to include a series of presentations, a plenary panel discussion, interactive break-out discussion activities, and networking opportunities. The morning session began with an introduction to climate information and the policy context for watershed planning and building climate resilience in the Province of Ontario. These presentations were then followed by a plenary panel, which delved into the topics of current practices and challenges to increase understanding of what evolving climate change information and science means to watershed planning. Following the plenary panel, participants were engaged in Activity 1 where they were asked to brainstorm examples of where climate change information has been incorporated well in watershed plans, discuss any plans for integrating climate information into their work, and share any authoritative sources of climate information that they have come across.

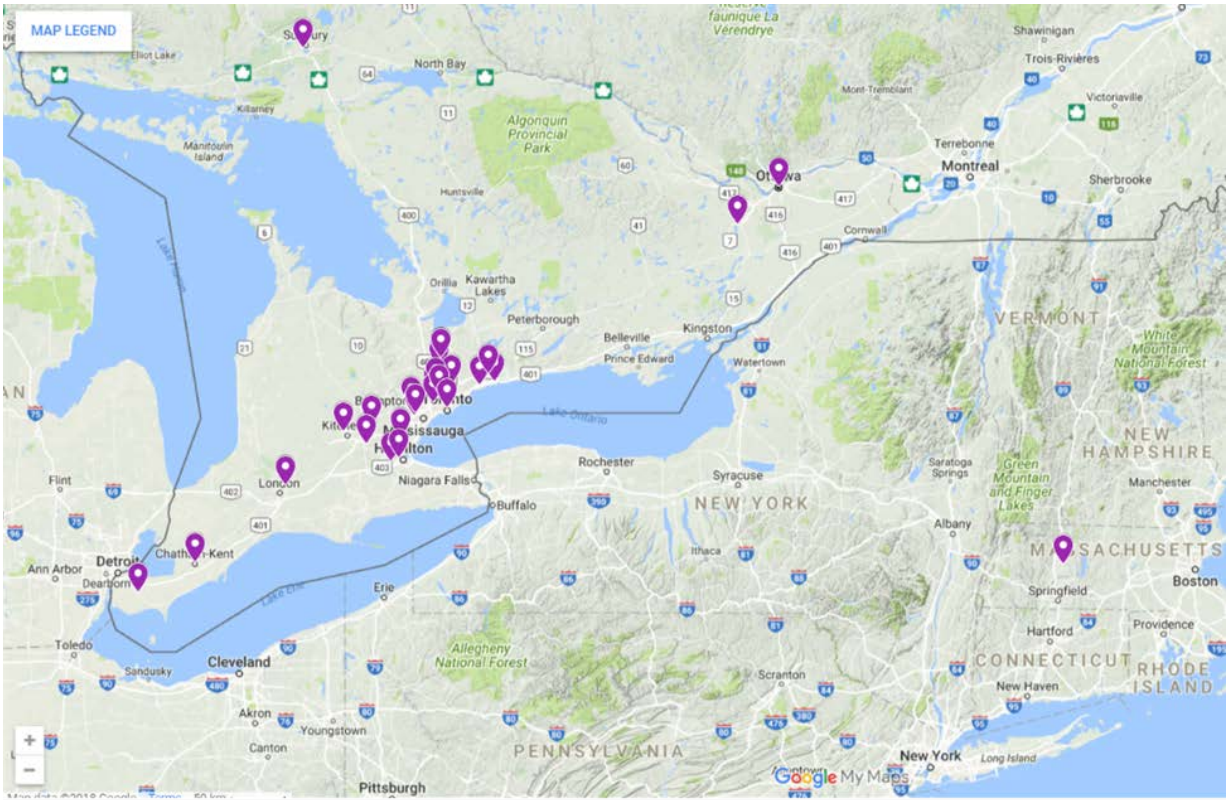
In the afternoon, two presentations were given to share case studies of how climate change information can be incorporated in the decision-making process and in water resource modelling. Activities 2 and 3 were then held where participants were asked to identify barriers to integrating climate information in to watershed planning. Through a Dotmocracy exercise, participants were asked to vote on their top three most important barriers to address in order to incorporate climate information in watershed planning.

The presenters and facilitators invited to and engaged in this event were practitioners involved in either watershed planning, climate information, or both. These included members of the Toronto and Region Conservation Authority, the University of Massachusetts (Amherst), Conservation Ontario, York Region, Region of Peel, Risk Sciences International, Environment and Climate Change Canada, Essex Region Conservation Authority, and the Ontario Climate Consortium Secretariat. Appendix I provides a full list of all speakers, plenary panelists, moderators and facilitators involved in the Forum.

1.2 Overview of Attendees

The Forum was well very attended with registration selling out within two weeks of opening online. Close to 80 participants attended from different regions in Ontario (see Figure 1), which was the maximum number allowable based on the venue. Participants represented many different organizations and agencies including a number of lower- and upper-tier municipalities, Conservation Authorities, and academic institutions (Appendix II provides a full list of attendees at the forum). As illustrated in Figure 1, participants ranging from eastern Ontario in Ottawa, to southwestern Ontario in Chatham, and to central Ontario in Sudbury attended in person at the Forum.

Figure 1. Origin of Participants in Attendance at the Forum



2.0 Summaries from Presentations and Activities

2.1 Welcome and Overview

Peter Love, Ontario Climate Consortium

Peter Love, Chair of the OCC, kicked off the Forum with a warm welcome to all attendees and an overview of the day. He highlighted the need to incorporate climate change into policies related to land use planning and the key role of watershed plans in assessing and informing these policies. The importance of this Forum was also highlighted given the lack of agreed-upon best practice on how to integrate climate change into watershed plans or policies. This Forum thus presents a valuable opportunity for open, peer-to-peer discussion on how to connect watershed planning to climate information, and address the barriers, needs, and priorities for considering climate change in watershed planning. He introduced the focus of the morning, which was on the current state and practice of watershed planning and climate change, and the focus of the afternoon, which was to share several case studies of how climate change can be incorporated into water resources management and watershed plans.

2.2 A Brief Introduction to Climate Information and its Translation

Glenn Milner, Ontario Climate Consortium

Glenn Milner, Senior Program Manager at the OCC, provided an introduction to climate information and the importance of leveraging and translating this information for decision-makers to inform policy and practice. He stressed that it is the processing and translation of data to information that generates meaning. Depending on the types of end-uses, processing climate information can require varying levels of effort and may involve trade-offs between the complexity, specificity and uncertainty of climate data. He was clear in saying that climate models will always contain uncertainties and so no climate data should be used in isolation. It is important to consider the best use of data in specific contexts, while taking stock of broader approaches that can help address data uncertainties. As climate data is becoming more accessible and understandable, it should be leveraged to help society plan its economic activities and infrastructure around future climate change scenarios, ideally informed by watershed plans.

2.3 Policy Context for Watershed Planning & Climate Resilience in Ontario

Laura DelGiudice, Toronto and Region Conservation Authority
and Bonnie Fox, Conservation Ontario

Laura DelGiudice from the TRCA and Bonnie Fox from Conservation Ontario co-presented an overview of the policy context for watershed planning and climate resilience in Ontario. Laura began by discussing the evolution of watershed management and the role of CAs. The presentation was then followed by a discussion on the evolving provincial policy context for watershed planning and the direction on climate change. With the recent changes in the provincial policy landscape, she emphasized that this provides a timely opportunity to consider how to integrate climate change with land use changes through watershed planning. Updates to the four Provincial plans resulting from the Coordinated Land Use Planning Review recognize the importance of watershed planning and has made it a requirement for informing municipal decisions around where growth can occur, how water and wastewater servicing should be planned, the design of new or expanded infrastructure, and how to identify and protect water resources, among others. The policies now require municipalities, in partnership with CAs, to undertake watershed and subwatershed planning to inform land use decisions.

Bonnie provided highlights of the results of the *Conservation Authorities Act* Review. She delved into the changes to the *Conservation Authorities Act*, including a new

Purpose Statement clarifying the role of CAs. Under the new Act, CAs have retained the authority to study and investigate the watershed. With respect to climate change, the new Act specifies that the provincial regulations for mandatory programs and services may include standards and requirements for climate change mitigation and adaptation. This recognizes the significant role of watershed planning to addressing climate change and increasing resiliency. Touching upon the *Conserving Our Futures* document, she spoke about new regulations to be expected from the Ministry of Natural Resources and Forestry which would outline the roles and responsibilities of CAs, and provide greater certainty on topics such as natural hazard management, watershed planning, and climate change. Overall, they highlighted that the changes in provincial policy and the *Conservation Authorities Act* provide an opportunity to work collaboratively towards a common, state-of-the-art technical and non-technical approach for considering climate and land use impacts together, and collectively consider how watershed planning can be a tool for building climate resilient communities.

2.4 Plenary Panel: Setting the Stage

The plenary panel included experts from both watershed planning and the climate change realm to discuss current practices, challenges and what evolving climate information and science means to watershed planning. These experts represented a range of perspectives including CAs (Ryan Ness, TRCA; Richard Wyma, ERCA), the private sector (Heather Auld, Risk Sciences International), and regional municipalities (Christine Tu, Peel Region; Teresa Cline, York Region). Panelists began by providing a brief presentation, followed by a group discussion moderated by Richard Wyma. The following is a summary of the panel discussion:

Q1. What are your thoughts on the current state of climate information and method/ guidance for incorporating climate change in watershed planning?

Panelists agreed that there are data uncertainties at both the global and regional scale. They stressed that models of future climate conditions are imperfect, especially at the local level, and so it is imperative to develop a robust decision-making system that incorporates uncertainties. It was recommended that flexibility needs to be built into the planning and adaptation processes for climate resilience. Watershed planning should play a strong role in influencing how communities will be developed.

One of the key messages was that exact data is not always needed. Rather, we need justifiable methodologies and transparency in how we address what we do not know. The panel also highlighted the need for a risk-based decision-making framework, which

would enable new collaborative models and open discussions within and across municipalities.

Q2. How do we shift from a top-down to bottom-up approach?

The panelists suggested that evidence-based decision-making is still needed, regardless of whether a top-down or bottom-up approach is employed. That being said, given the uncertainties of future projections (which can give a range of -20% to +125% for precipitation with a 100-year outlook, for example), a bottom-up approach has the potential to more accurately represent the variety of local priorities compared to more top-down approaches. Additionally, the panelists stressed that consistency in approaches are needed across regions and local municipalities, which can be further improved through case studies, information and data sharing, bringing community stakeholders together and involving policy-makers.

Q3. How do we begin to move climate information and plans forward, given our different contexts (what are we missing, how can we address policy conformity challenges)?

Panelists highlighted the importance of effectively communicating costs and benefits, and the return on investment. In particular, the monetary benefit of risk avoidance is not well understood in adaptation. As well, increased attention should be given to reputational risk as an impetus for why stakeholders should care about climate change and information. The understanding of risk thresholds, informed by robust future projections, or the risk tolerance of a system is also crucial for priority setting. With the overlap between municipal and watershed boundaries, further coordination and information sharing is needed across organizations, with guidance from the Province.

2.5 Activity 1: Establishing Current and Future Practice of Climate Information And Watershed Planning

Break-out discussions followed the plenary panel where participants were engaged in brainstorming responses to the following questions:

1. What kinds of watershed studies have you seen where climate change has been incorporated well?
2. What are you planning to do in relation to watershed planning and climate change?
3. What are the authoritative sources for climate information? What climate information sources exist that you have used (or could use)?

For Question 1, participants identified a range of watershed plans that have incorporated climate change information such as the *Rouge River Watershed Plan* and the *Grand River Water Management Plan*. A recurring comment made by participants was that while some plans did certain aspects well, there was no single plan that fully integrated climate information into their plans that could be considers the "best practice". Participants also identified several other documents including the Lake Simcoe Adaptation Strategy, the Great Lakes Study, as well as Markham's Subwatershed Study. A few jurisdictions outside of Ontario were also identified including Montreal, Fredericton, New York, and Florida. More specific examples are now being developed for information sharing among the OCC network.

For Question 2, participants were asked to identify planned future initiatives in relation to climate information and watershed planning. Participants found that in general, there is a lack of clear methods for incorporating climate change into watershed plans. As a result, many organizations are currently in the process of scoping climate information to be built into watershed plans (e.g., TRCA), or are in discussions among experts to understand what approaches can be completed that provide the most value while not exceeding budget and capacity constraints. Participants generally agreed that sensitivity analyses, impact modelling and/or qualitative interpretations of climate information are being considered. However, participants also emphasized that their context matters significantly in terms of the level of climate considerations that will likely be feasible. For example, some participants in smaller municipalities and/or CAs stated that watershed plans in general are not as high of a priority based on resource constraints and therefore may be unable to go further on climate change assessments using information given political will in their jurisdictions.

Lastly, when discussing Question 3, participants identified a variety of different sources of climate information. There were a number of recurring sources, which identified that many participants rely on the same authoritative sources for climate information (e.g. the MECP's Ontario Climate Change Portal, York University's LAMPS portal, Conservation Authority and Environment and Climate Change Canada's station network for observed data, the Pacific Climate Impacts Consortium, and Princeton University).

2.6 Decision Scaling Approach to Climate Risk Assessment

Alec Bernstein and Mehmet Taner,
University of Massachusetts Amherst

Alec Bernstein and Mehmet Taner from the University of Massachusetts Amherst co-presented on the Decision Scaling approach – an emerging approach that employs

climate information into risk assessment and management of water resources. Instead of beginning the risk analysis with climate model information, the approach takes a stakeholder-driven bottom-up approach, which begins with the identification of key performance targets by stakeholders (e.g. water flows and levels). The next step is to assess performance across many plausible futures through stress tests based on climate model information, which can then identify the likelihood of problematic conditions using climate models to understand what is most likely to happen. After walking through how the approach works, they then illustrated its application through two case study examples of the International Upper Great Lakes Study, and St. Croix Watershed (located between New Brunswick and Maine). This approach has been generalized as the Climate Change Guidance Framework for the International Joint Commission (IJC) and is being implemented in the Great Lakes and IJC basins to better understand how climate uncertainty affects project performance.

2.7 Incorporating Climate Change into Water Resources Modelling

Craig McCrimmon, Environment and Climate Change Canada

Craig McCrimmon from ECCC, presented a case study of the Great Lakes Integrated Modelling Framework. As part of the Great Lakes Nutrient Initiative (GLNI), several different climate models were employed to assess the outcomes of beneficial management practices (BMPs) and climate change scenarios for the Grand River Watershed, and nutrient loadings into Lake Erie. The base case (1990-2014) was compared to mid-century (2050-2062) and end-of-century (2088-2100) projections. Based on preliminary results, they found an increase in flow and loadings to the lake and less ice cover in the lake by late century. In the future, the team hopes to run watershed and lake models with the same climate change model information and use watershed climate change loading as input to the lake, as well as test using climate model output directly in the watershed model. Watershed models for several watersheds in the GTA are ready for climate change adaptation modelling including: the Rouge, Duffins, Carruthers, and Humber watersheds.

2.8 Activity 2: Brainstorming Barriers and Actions to Integrate Climate Information in Watershed Plans

Following the afternoon presentations, participants engaged in the second interactive activity at each of their break-out tables where they participated in brainstorming of barriers to and actions for integrating climate change information into watershed planning. Participants were provided with a template to help organize their perspectives into five thematic areas: governance, policy and planning, research and evidence, engagement, and implementation. Participants wrote their comments on sticky notes

and placed them onto the template under the appropriate theme. The following table presents a brief summary of the high priority barriers and actions identified.

Table 1. Summary of High Priority Barriers to and Actions Needed for Incorporating Climate Change Information in Watershed Planning

Barriers	Actions
• A lack of a clear definition of roles and responsibilities involved in watershed planning; • A lack of a comprehensive and holistic guidance from the Province related to climate change and watershed planning; • A misunderstanding of the costs and benefits of climate impacts on water resources; • A lack of meaningful information to guide decision-making as a result of limited data or too much complexity; • Funding limitations; • Inadequate performance monitoring; • Uncertainty in climate data predictions; • A lack of public participation and involvement; • Planning targets for growth do not consider carrying capacity of the watershed; • Target setting to enhance watershed resilience is very challenging in a complex, open system like the natural environment. Climate information adds to this complexity; and • A lack of collaboration between scientists and policymakers.	• Begin by focusing on tangible actions; • Building partnerships and collaborations among experts who can inform the integration of climate data into watershed plans; • Providing a clear definition of roles and responsibilities in terms of who can support the data and analysis side of watershed planning to ensure adequate policies are established that build resilience; • Expressing climate change actions, based on robust climate information, in terms of cost-benefit; • Providing consistent (and ideally authoritative) data from the same sources; • Establishing guidelines for implementation of climate actions in the watershed based on analyses with robust data; • Consider establishing “guidance” or best practices on target setting using climate information in support of watershed plans; • Enhancing departmental coordination across municipalities and CAs; • Bringing implementers to the table during the watershed planning process; and • Sharing information and standardized climate modelling approaches and information provided by the province.

2.9 Activity 3: Prioritizing Barriers and Actions to Integrate Climate Information in Watershed Plans

Each table was asked to report back with their most significant barrier and/or action, which were documented on flip charts at the front of the room and discussed among the full Forum participants. Based on those identified, participants were then asked to vote on three barriers that they agreed with the most. The barriers and gaps with the highest number of votes illustrate the potential for a research agenda that OCC can use to guide partnerships and initiatives related to climate information in the future. The top five barriers/actions identified through this activity are as follows:

1. A clear definition of roles and responsibilities of different governing authorities (CA's or Government) is essential to better integrate climate change information into watershed planning.

2. An effective watershed planning guideline that provides practical guidance to turn goals into actionable items would be extremely valuable. This could include guidance on how to set or develop targets using climate information that can support and enhance watershed resilience.

3. The challenges of communicating cost and benefit at the municipal council level and across departmental budgets should be addressed. This, in turn, may allow for more buy-in to provide resources to climate change and watershed planning processes as the costs or impacts avoided through proper and robust planning and implementation are demonstrated clearly.

4. There is a need for improved guidelines around performance monitoring that is outcome-based.

5. There is a mismatch between spatial, temporal scales of data and what is required by decision-makers. Case studies presented in the forum (e.g., decision scaling, sensitivity analyses and integrated modeling of various climate scenarios) demonstrate promising approaches to overcome this challenge, but there is still a need to take stock more broadly on what constitutes best practice and establish a consistent practice that watershed planners can use to consider climate change.

3.0 Key Messages and Recommendations from the Forum

Some of the key messages emanating from the discussions at the Forum are highlighted below.

- At the watershed scale, 100% certainty is not required to act on emerging trends.
- It is evident that there's a need for more bottom-up approaches, but that still incorporate robust climate data and information.
- Don't focus solely on climate modelling in watershed plans, but leverage this as one component. Vulnerabilities and priorities need to be identified, and models will not give all the answers.
- There's opportunity to reframe existing watershed plans to incorporate climate impacts and risk assessment.
- Certain components of watershed plans have been done well, but a holistic and comprehensive approach has not yet been taken.
- Projections at different scales can be consistent, but the scale and scope isn't always translatable for cross-purpose use.
- There is a need to understand existing thresholds to know the extent of vulnerabilities for various systems, and to establish targets to understand what practitioners are managing for at the watershed scale in light of climate change.
- Monitoring needs to be built into watershed plans, specifically to emphasize learning and adjustment over time. This could take the form of real-time data where possible.
- Better guidance needs to be provided at the provincial level in relation to climate change and watershed planning, providing more practical examples for municipalities and CAs.
- Opportunity exists to reframe existing work currently being completed but not being labelled as 'climate change'.
- There's a need to clearly articulate roles and responsibilities in the process of watershed planning, in terms of how climate change can be incorporated but also in terms of what and how watershed plans are informing planning at the municipal level.
- The level of information that would be valuable/useful for integrating climate change in watershed plans needs to be identified for various watershed scales and/or contexts to support in this process.
- Incorporating as many stakeholders as possible in the process and collaborating on this work is essential.
- Climate information data is complex; and as a result continued processing and translation of data into information is needed as more data are produced and are released.

- Deconstructing observed events in the context of the watershed is critical (e.g., what climate impacts were observed, how well were these impacts avoided, what was the cost, what were the benefits avoided impacts, etc.)
- There are not enough secondary sources of information available and many provincial scale studies on watersheds are limited in how concise they are and/or how locally relevant than can become.

4.0 Next Steps and Lessons Learned

Participants at the Forum were enthusiastic and satisfied with the way the event was organized according to the evaluation survey circulated following its completion. Of the 75 in attendance, 40 completed a post-forum evaluation survey. In general, participants were very positive and content with the presentation topics, the knowledge of the speakers and how the communication materials were organized throughout the Forum. Most of the participants identified at least one lesson learned or key message that was new or unique to them. Some of the take-home messages identified by participants included how to address climate data uncertainties for incorporating climate information in watershed planning, application of risk-based approaches, and the benefits of bottom-up approaches over top-down approaches.

OCC Forum Evaluation Survey – Key Performance Indicators and Feedback

Number of Forum Participants: 75

Number of Evaluation Forms Completed: 40

Forum Evaluation Results:

- 100% of respondents agreed that the length of the forum was appropriate. Two respondents indicated it was even too short based on their interest in the topic.
- 95% of respondents are interested in attending another climate change information forum or training session on a related topic.
- 90% of respondents agreed that the material was presented in an organized manner.
- 90% of respondents were very satisfied with the content of forum.
- 85% of respondents believed that the presenters were highly knowledgeable on the forum topic.

One helpful piece of feedback was that participants indicated they wanted more time after each presentation for discussion. There was an appetite from the audience to hear more about practical case studies based on lessons learned and what the province can do to assist municipalities in considering climate change information in their work.

There were also some suggestions to include a more diverse audience including First Nations and representatives from different sectors such as the building industry, agriculture, development review planners, infrastructure planners, and others who may have opposing views.

Almost all survey respondents also indicated strong interest to participate in similar climate change information and watershed planning events in the future. As the science develops, it may be worthwhile to re-convene stakeholders to provide the ability for additional discussion and updates on new case studies and/or practical examples on how practitioners have been integrating climate data in risk-based approaches across the watershed.

Appendix I – List of Presenters and Facilitators

Alec Bernstein, University of Massachusetts Amherst
Bonnie Fox, Conservation Ontario
Christine Tu, Region of Peel
Craig McCrimmon, Environment and Climate Change Canada
Frances Delaney, Ontario Climate Consortium
Heather Auld, Risk Sciences International
Jenessa Doherty, Ontario Climate Consortium
Jo-Anne Rzadki, Conservation Ontario
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Noah Gaetz, Toronto and Region Conservation Authority
Peter Love, Ontario Climate Consortium
Richard Wyma, Essex Region Conservation Authority
Ryan Ness, Toronto and Region Conservation Authority
Teresa Cline, York Region

Appendix II – List of Attendees

Alec Bernstein, University of Massachusetts, Amherst
Amanda Bathe, Region of Durham
Angela Porteous, Central Lake Ontario Conservation Authority
Angela Wallace, Toronto & Region Conservation Authority
Arthur Szybalski, Ontario Climate Consortium
Bahram Gharabaghi, University of Guelph
Barbara Veale, Conservation Halton
Beth Willliston, Toronto and Region Conservation Authority
Bill Thompson, Lake Simcoe Region Conservation Authority
Bob Morris, Credit Valley Conservation
Bonnie Fox, Conservation Ontario
Brad Stephens, Toronto and Region Conservation Authority
Carl Jorgensen, Conservation Sudbury
Chandra Sharma, Toronto and Region Conservation Authority
Chitra Gowda, Conservation Ontario
Christine Tu, Region of Peel
Christopher Davidson, Golder Associates Ltd.
Craig McCrimmon, Environment and Climate Change Canada
Daniel Brent, Toronto and Region Conservation Authority
Darcy Boyd, Ministry of Environment, Conservation and Parks
David Burnett, Toronto and Region Conservation Authority
Eleanor Stainsby, Ministry of the Environment and Climate Change
Elyssa Elton, Toronto and Region Conservation Authority
Frances Delaney, Ontario Climate Consortium
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George Jacoub, Ministry of Environment, Conservation and Parks
Glenn Milner, Ontario Climate Consortium
Heather Auld, Risk Sciences International
Heather Brooks, Central Lake Ontario Conservation Authority
Hiral Desai, University of Waterloo
Ian McVey, Ontario Climate Consortium
Jade Schofield, Town of Ajax
Janet Ivey, Grand River Conservation Authority
Jason Wintermute, Lower Thames Valley Conservation Authority
Jennifer Dougherty, Credit Valley Conservation
Jinliang Liu, Ministry of Environment, Conservation and Parks
Jo-Anne Rzadki, Conservation Ontario
Karen Maaskant, Upper Thames River Conservation Authority
Kim Barrett, Conservation Halton
Kristina Dokoska, Ontario Climate Consortium
Kristy Kilbourne, Durham Region
Laura Del Giudice, Toronto and Region Conservation Authority

Learie Miller, Region of Peel
Lubna Seal, Ontario Climate Consortium
Mark Head, Region of Peel
Mark Peacock, Lower Thames Valley Conservation Authority
Maryam Nassar, Toronto and Region Conservation Authority
Mary-Ann Burns, Toronto and Region Conservation Authority
Mehmet Umit Taner, University of Massachusetts Amherst
Melanie Bennet, Lake Simcoe Region Conservation Autority
Michelle Moretti, York Region
Mike Fairbanks, York Region
Mike Stone, Hamilton Conservation Authority
Namrata Shrestha, Toronto and Region Conservation Authority
Noah Gaetz, Toronto and Region Conservation Authority
Paul Lehman, Mississippi Valley Conservation Authority
Peter Love, Ontario Climate Consortium
Pradeep Goel, Ontario Ministry of the Environment and Climate Change
Richard Wyma, Essex Region Conservation Authority
Robert Muir, City of Markham
Ruth Rendon, City of Vaughan
Ryan Ness, Toronto and Region Conservation Authority
Sally McIntyre, McIntyre Solutions
Scott MacRitchie, Ministry of the Environment and Climate Change
Scott Smith, Toronto and Region Conservation Authority
Sean McCullough, Town of Ajax
Shannon Carto, Environmental Commissioner of Ontario
Shari Dahmer, Toronto and Region Conservation Authority
Sharon Lam, Ontario Climate Consortium
Stephanie Shifflett, Grand River Conservation Authority
Teresa Cline, York Region
Tony Morris, Ministry of the Environment and Climate Change
Usman Khan, York University
Yuestas David, Toronto and Region Conservation Authority
Ziwang Deng, York University