



COLLABORATIVE DECISION-MAKING FOR DROUGHT MANAGEMENT: IMPROVING MULTI-ACTOR APPROACHES

ROB DE LOË, UNIVERSITY OF WATERLOO
Research conducted 2012-2015



WEPGN
Water Economics, Policy
and Governance Network



Canadian
Water
Network

COLLABORATIVE DECISION-MAKING FOR DROUGHT MANAGEMENT: IMPROVING MULTI-ACTOR APPROACHES

ROB DE LOË, UNIVERSITY OF WATERLOO

Research conducted 2012-2015

WHY DID WE DO THIS RESEARCH?

Drought management can be highly challenging; droughts can be experienced over a large geographic area, and the extent and severity of impacts can be exacerbated by local water uses.¹ In Ontario, these uses might include agriculture, aggregate washing, and watering at golf courses. Oftentimes, droughts are part of normal ecological cycles, but the risk and hardship faced by water-based industries and the public make drought a particularly important policy challenge. Technical approaches to managing drought promote the use of monitoring standards, early warning systems, and planned management actions. Building social capital and strengthening relationships can also contribute to reducing vulnerability through building adaptive capacity and reducing exposure and sensitivity.²

Collaborative approaches, created by government to generate policy and program recommendations for drought management, can provide a local view on drought challenges and a balanced viewpoint that includes all voices affected by decisions. An example of this type of collaborative relationship is Ontario Low Water Response and Water Response Teams. Ontario Low Water Response convenes collaborative groups – known as Water Response Teams – to determine the severity of drought in local watersheds and provide recommendations to the provincial government, including recommendations to declare a drought ‘emergency’, which triggers water restrictions in affected areas. One key challenge of this process is that Water Response Teams have recommended declaring water restrictions during severe low water conditions. However, the province has never enforced restrictions. Governments not following the recommendations of collaborative groups they have created to comment on policy problems is a common finding in collaborative governance research. The key focus of this research is to understand the role of Water Response Teams in decision-making, and to explore how international experiences can inform the Ontario drought management process.

In partnership with representatives of the Ministry of Natural Resources and Forestry, Ministry of Agriculture, Food and Rural Affairs, and Conservation Ontario, this project investigated:

- (A) How recommendations from collaborative Water Response Teams are used for government decision-making
- (B) What lessons we can learn about using collaborative approaches for drought management and response from other jurisdictions

ONTARIO LOW WATER RESPONSE

Low Water Response aims to ameliorate low water impacts, but it does not include specifications for emergency management of drought.³ The Ministry of Natural Resources and Forestry is the lead agency for low water response and alters the program as necessary. The program uses stream flow and precipitation indicators to determine increasing levels of concern and actions to reduce risks from low water (see Box 1). Water Response Teams are responsible for working collaboratively to determine when to declare a Level 1 or 2 level of concern about low water, and work to communicate the need to reduce water use in the community. Teams are also responsible for recommending the Ontario Water Directors Committee – Low Water Committee declares a Level 3; the highest level of concern about low water. The Ontario Water Directors committee is made up of field and water Directors from Ministry of Environment and Climate Change (MOECC), Ministry of Natural Resources and Forestry (MNRF), Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), and the Ministry of Municipal Affairs and Housing (MMAH). The recommendation to declare a Level 3 must include:

1. Evidence of voluntary water conservation at Level 1 and 2
2. Documentation of social, economic, and environmental impacts caused from low water
3. A prioritization of water uses that could be restricted if Level 3 is declared

Water Response Teams are formed around watershed boundaries. They are composed of applicable provincial government agency departments (MNRF, MOECC, OMAFRA, MMAH and others depending on the needs of local teams), conservation authorities, municipalities, and water users with a Permit to Take Water (PTTW). Conservation authority staff serves as one of the co-chairs, and the other co-chair is elected from the members of the team. Provincial representatives on the Water Response Team play an advisory role and are non-voting. A PTTW is required for anyone who withdraws 50,000 or more litres of water a day. The PTTW ensures responsible use of water during normal water levels. The Low Water Response program depends on the PTTW as a tool to reduce water during times of low water.

	INDICATES	TOOLS	ACTION
LEVEL 1	First indication of potential supply issue	<ul style="list-style-type: none"> ➤ 10% voluntary conservation for PTTW holders 	<ul style="list-style-type: none"> ➤ Conservation authority initiates team meetings. ➤ Water Response Team declares level
LEVEL 2	Potentially Serious issue	<ul style="list-style-type: none"> ➤ Additional 10% voluntary conservation ➤ Municipal outdoor water use bylaws enforced if applicable ➤ Conservation education 	<ul style="list-style-type: none"> ➤ Water Response Team declares level ➤ Teams start liaising with the Provincial Low Water Committee
LEVEL 3	Water supply fails to meet demand	<ul style="list-style-type: none"> ➤ Voluntary conservation ➤ Municipal Bylaws ➤ Water use conservation education ➤ Water Use Restrictions 	<ul style="list-style-type: none"> ➤ Water Response Team recommends the Ontario Water Directors – Low Water Committee declares a Level 3. ➤ The Low Water Committee reviews information and talks to provincial field representatives to determine whether to declare a Level 3.

Box 1: Levels in Low Water Response

WHAT DID WE FIND?

A: HOW RECOMMENDATIONS FROM COLLABORATIVE WATER RESPONSE TEAMS ARE USED FOR GOVERNMENT DECISION-MAKING

In Ontario, there are several levels of drought planning, management, and mitigation that result in a number of different types of outcomes and complexities for decision-making. Collaboration is used at the watershed level to make recommendations to the provincial government on whether water restrictions should be enforced during extreme low water. Collaborative teams also make recommendations to individuals (including both PTTW holders and the general public) on when to conserve water and practical methods to achieve water conservation targets. Municipalities and Conservation Authorities also have key roles to play in encouraging water conservation.

“I don’t think the political will is there because to go to Level 3 someone has to decide who is going to get what water and there is a lot of money at stake in this thing, so it is a tough decision to have to make”.

Conservation Authority

FIRST CONSIDERATION: WHAT TYPES OF OUTCOMES WERE ACHIEVED?

There are a number of different outcomes that resulted from Ontario Low Water Response and Water Response Teams. Collaboration led to a number of outcomes that likely would not have been created if a conventional top-down approach had been used, such as improved communication between water users in local areas, and strengthened relationships between government agencies and water users. These improved relationships resulted from team members deliberating over issues on Water Response Teams and getting to know each other outside of relationships typically perceived as competing interests for water.

Water Response Teams are *“tremendously valuable, you know for no other reason the power of networking bringing the brightest minds together in the region to talk about what is going on – it is a real resource”*. – Water User

One key outcome that was not achieved during the 15 years of the Low Water Response program was declaration of Level 3. Drought conditions were identified in local watersheds and Water Response Teams recommended the government take action to alleviate drought impacts. Despite Water Response Team recommendations, provincial restrictions on water use were never imposed. Some Water Response Team members questioned the purpose of Teams if their recommendations were not followed at the provincial level.

“I don’t think the political will is there because to go to Level 3 someone has to decide who is going to get what water and there is a lot of money at stake in this thing, so it is a tough decision to have to make”. – Conservation Authority representative

Water Response Team members reported that voluntary measures to reduce water taking at Level 1 and 2 rather than regulations (which, participants note, has led to conflict between government and water users in the past) motivated them to work together to solve challenges. However, the decision to conserve water during drought has economic implications and water users seek to protect their livelihood first in decisions on whether to conserve water. Therefore, restrictions would need to be enforced with persuasive disincentives to convince water users to stop using water during drastic low water conditions.

“(Level 3) is basically going to mean that they are going to tell us to not irrigate and before they go to the individual farmers at the pump site ... with a big enough fine to shut those systems down it will never happen because there is no way that a grower is going to stand by and watch his crop starve and lose his crop”. – Water User

Changing Individual Practices: In drought management the individual is a key player. Many water saving actions have additional benefits, most notably cost savings.

For example, one farmer in the Catfish Creek watershed started to plant strawberries and pumpkins in rye to reduce evaporation and runoff, resulting in using less water and lowering the farmer’s cost for watering crops, while also producing more aesthetically pleasing vegetables (e.g. pumpkins protected from the ground by the rye crop do not succumb to rot as easily as when exposed to mud). In recognition of these changes the water user received a local sustainability award.

SECOND CONSIDERATION: WHAT OTHER COMPLEX ISSUES AFFECT DECISION-MAKING?

A number of complexities may affect government decisions about water use restrictions during low water conditions.

The *duration* of drought can be difficult to forecast. For example, in two cases where Water Response Teams recommended imposing water restrictions, the low water condition dissipated after three weeks. If regulatory action had been taken prematurely, there may have been negative social and economic impacts for some water users. For example, if access to water had been restricted for farmers, crops may have suffered resulting in personal stress and financial strain.

Indicators and data are needed to recommend water restrictions and the following three difficult conditions must be met:

1. Provide evidence that voluntary water conservation occurred. Water users are not required to report their water conservation amounts, so determining reduction targets is based largely on verbal reports recorded during Water Response Team meetings.
2. Demonstrate that there are social, economic and environmental impacts caused by drought. Impacts from drought are difficult to measure, especially because standard indicators have not been developed at a provincial level and addressing low water often took precedence over documenting impacts. However, it may be difficult to develop standard indicators at the provincial level because each watershed has different social, economic, and environmental contexts.
3. Create a prioritization of water use, used to determine which uses should be restricted. This was difficult for collaborative teams, who felt that creating a priority of use should be the responsibility of the provincial government as restrictions to any water use would result in impacts to the water user facing restrictions.

Inadequate documentation of these three requirements is why the government did not enforce water restrictions recommended by Water Response Teams; team members who witnessed the impacts of drought firsthand questioned the government’s commitment to the collaborative groups and their overall utility.

“We want to be very careful about introducing regulatory, mandatory restrictions on people’s use of water when we are not really sure that it is necessary because people are pretty self-sufficient, they are pretty resilient and up until now we have been able to ride it out” – Provincial government representative

The provincial government is currently exploring alternative processes that maintain beneficial outcomes from Low Water Response, while simultaneously improving some of the challenges and complexities, such as how to declare Level 3. Government must stay accountable while ensuring that fair and balanced decisions by Water Response Teams reflect all voices and not just those physically present on the teams. The provincial government also has the responsibility to take into consideration the recommendations that are proposed by Water Response Teams and report on how recommendations are included in decision-making for Low Water Response.

B: WHAT LESSONS WE CAN LEARN ABOUT USING COLLABORATIVE APPROACHES FOR DROUGHT MANAGEMENT AND RESPONSE FROM OTHER JURISDICTIONS

Lessons can be learned from the challenges and successes of other collaborative drought management strategies. As part of this research, 11 national and international cases of drought management were compared based on how decisions were made and how programs were evaluated over time.

LESSON LEARNED: CHALLENGES OF COLLABORATION DURING EMERGENCY DECISION-MAKING

Using collaborative groups in decision-making often requires time-intensive input, and the structure of using collaborative groups can be complex and formal, using set participants and abiding by certain decision-making rules. This structure can create even more challenges when stakeholders and governments have differing views on the role collaborative recommendations play in final government decision-making.

A key challenge in many cases was enacting plans for collaborative groups. For instance, California's state plan for drought management includes a collaborative Impact Assessment Work Group to inform government decision-making. However, this group was not created; instead, regional drought plans were developed as needed. Similarly, Indiana planned for a task force to make decisions, advised by applicable government agencies. However, the need for quick decisions resulted in government based decision-making that did not include collaboration, ultimately replacing the taskforce.

LESSON LEARNED: THE IMPORTANCE OF COMMUNICATION

Programs were largely evaluated based on communication effectiveness by reviewing the events that took place during the drought, and mitigation actions were evaluated based on program objectives. To illustrate, in British Columbia, protecting stream flow for spawning Kokanee Salmon is a primary goal, which requires evaluating water quality and quantity measures to ensure the health of fish and their habitat are protected during times of low water. Evaluating the efforts of drought management did not focus on what collaboration was achieving differently than conventional approaches, as there are few resources to contribute to such measures. However, that makes it difficult to understand how to alter collaborative processes in order to achieve different outcomes.

Only the Murray Darling Basin used a published evaluation framework to measure progress on their objectives, including environmental, governance, and social and economic outcomes.⁴ The Authority in the Murray Darling Basin is unusual, however, as it is a semi-autonomous organization that needs to demonstrate to the government that it is effecting change in the basin. Decision makers should develop program evaluation indicators early and measure indicators often to understand what collaboration is achieving and contributing to policy and program development.

IMPLICATIONS FOR DECISION-MAKERS

Collaborative processes to inform government decision-making need to complement government decision-making process. Creating a collaborative process when government decisions are already planned may be redundant or harmful to relationships. However, when used properly, collaborative approaches can create several positive social and environmental outcomes that would not be accomplished through conventional policy or program creation avenues. If collaborative approaches are used for decision-making, members should be informed on how recommendations will be used in decisions. Collaborative approaches can be a beneficial component of drought management, particularly if collaborative approaches encourage voluntary water conservation that complements regulatory tools. The best approach to prepare, manage and mitigate drought should balance regulatory and incentive-based programs to entice water users and the public to conserve water in times of need.

Drought management requires quick decisions which can be difficult to achieve through deliberation, which is a key part of collaborative approaches. One role for collaborative groups, in international cases, was reporting local impacts of drought, which is less time



sensitive. This utilizes the local knowledge of collaborative group members and encourages reporting impacts of drought, which can be difficult to capture. Documenting drought impacts is necessary, but there are few standards for what should be collected and how to account for tradeoffs between social, economic, and environmental priorities. The effectiveness of drought management is often evaluated based on achieving program objectives. It was rare to capture environmental, governance, and social and economic outcomes in drought evaluation. However, research indicates that recognizing social, economic, and environmental outcomes can better target drought alleviation measures.

The Water Economics, Policy and Governance Network’s (WEPGN) overarching goal is to build knowledge and facilitate exchange between social science researchers and partners, thereby increasing the application of research to decision making and enhancing water’s sustainable contribution to Canada’s economy and society while protecting ecosystems. WEPGN was established with a SSHRC Partnership Grant. WEPGN’s objectives are to:

- Create a vibrant and multidisciplinary network of Partnerships amongst researchers, government agencies and community groups;
- Provide Insight by mobilizing knowledge from social science perspectives to improve our understanding of water’s role in Canadian society and economy;
- Strengthen Connections by facilitating a multidirectional flow of knowledge amongst researchers and partners to promote more efficient and sustainable water management;
- Provide high quality Training experiences for students and practitioners with interests in water policy decision-making and management.

This project by de Loë contributes to each of the above objectives, and is a notable example of a project that strengthens connections between researchers and partners to create and share knowledge that promotes efficient and sustainable water management.



TO CONTACT THE RESEARCHER, EMAIL RESEARCHSPOTLIGHT@CWN-RCE.CA. VISIT OUR REPORT LIBRARY AT WWW.CWN-RCE.CA

REPORT AUTHORED BY ALYSSA ROTH, UNIVERSITY OF WATERLOO

RESEARCH TEAM

ROB DE LOË, Water Policy and Governance Group, University of Waterloo

ALYSSA ROTH, Water Policy and Governance Group, University of Waterloo

PARTNERS

DEBORAH BROOKER, ONTARIO MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS

STEPHEN PETERSON, ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY

CRAIG CHARLTON, ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY

MATTHEW MILLAR, CONSERVATION ONTARIO

We thank our partners for their invaluable assistance with this project. All responsibility for errors and omissions rests with the project leader, Rob de Loë.

REFERENCES

KALLIS, G. 2008. Droughts. *Annual Review of Environment and Resources*, 33, 85-118.

¹ WILHITE, D. A., SVOBODA, M. D., AND HAYES, M. J. 2007. Understanding the complex impacts of drought: a key to enhancing drought mitigation and preparedness. *Water Resources Management*, 21 (5), 763-774.

² MCNEELEY, S. M. 2014. A “toad’s eye” view of drought: regional socio-natural vulnerability and responses in 2002 in Northwest Colorado. *Regional Environmental Change*, 14, 1451-1461.

³ ONTARIO MINISTRY OF NATURAL RESOURCES, ONTARIO MINISTRY OF THE ENVIRONMENT, ONTARIO MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS, ONTARIO MINISTRY OF MUNICIPAL AFFAIRS AND HOUSING, ONTARIO MINISTRY OF RESEARCH AND INNOVATION, ASSOCIATION OF MUNICIPALITIES OF ONTARIO, AND CONSERVATION ONTARIO. 2010. *Ontario Low Water Response*. Toronto, ON: Queen’s Printer for Ontario.

⁴ MURRAY-DARLING BASIN AUTHORITY. 2014. *Murray-Darling Basin Water Reforms: Framework for Evaluating Progress*. Canberra, ACT: Murray-Darling Basin Authority.