

Isaac, B.N. and de Loë, R. 2020. Eutrophication and water quality policy discourse in the Lake Erie Basin. *Water Alternatives* 13(3):



Eutrophication and Water Quality Policy Discourse in the Lake Erie Basin

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ABSTRACT: Watershed-based approaches to addressing water quality issues often involve a diverse set of actors working collaboratively to develop policy. Such an approach is currently underway in the Western Lake Erie Basin, where the province of Ontario and the state of Ohio have embarked on a 40% phosphorus run-off reduction target to address eutrophication problems in the lake. In this study, we adopt the concept of discourse to inform our understanding of the collaborative process undertaken to develop domestic action plans (DAPs) to guide efforts by various stakeholders. We find that in both cases there were distinct groups of actors who shared and promoted a particular narrative or storyline. These storylines provided varying accounts of the science and policy aspects of the eutrophication problem in Lake Erie, and there was variation as well in the specific actors to whom they attributed responsibility. We illustrate how the storylines shaped the nature and form of the action plans. We provide a discussion of the policy implications of unequal capacities among different actor coalitions to influence trajectories and outcomes in the context of governance for water quality. It is shown that the potential of discourse coalitions to influence policy raises important questions as to whose voice is considered legitimate enough to be included in the policy process.

KEYWORDS: Lake Erie, eutrophication, water policy, discourse analysis, storylines, Canada, USA

INTRODUCTION

The last few decades have seen a shift from traditionally government-dominated governance towards modes of governing that emphasise networks, policy learning, argumentation, and inclusion of non-state actors in decision-making (Chhotray and Stoker, 2009; Sørensen and Torfing, 2007). This increasing trend towards including non-state actors has also meant that policy-making processes have become arenas in which a diversity of private and public actors interact, deliberate and negotiate among themselves in addressing environmental issues (Bäckstrand, 2003; Glasbergen, 1998). The policy-making process in Western democracies is thus no longer the sole purview of, or fully controlled by, governments; it now involves many new actors (Hajer and Wagenaar, 2003). The literature on environmental policy-making processes shows the many forms that the involvement of non-governmental actors can take (Kraft and Kamieniecki, 2007; Schlager, 2007). Some actors are involved in the policy process through advocacy coalitions because they hold deeply held shared beliefs about various aspects of policy (Sabatier, 1988); others are brought together into epistemic communities due to their shared knowledge of an issue (Haas, 1992).

While such approaches to understanding how actors influence the policy process are helpful in their emphasis on how 'rational' actors pursue their interests, they have generally overlooked important relationships among other key variables, including the socially constructed nature of knowledge and the constitutive role of language and discourse through which actors make sense of the world (Litfin, 1994; Hajer, 1995; Litfin, 1995). Many environmental and water policy processes involve actors whose identities are tied to social interactions and networks bound together by stories or narratives that give meaning to their actions (Blatter and Ingram, 2001; Lejano et al., 2013). Such actors can be drawn together in the policy process not only because they share interests, but also because they subscribe to a particular aspect of a narrative story about the policy issue. Hajer (1995) calls such a network of actors a 'discourse coalition'.

In order to understand the process and outcome of policy-making, many insights can be gained from the study of discourse coalitions and the storylines they promote; however, with some notable exceptions, there has been little research of this perspective in the water policy domain (Hajer and Versteeg, 2005; Huitema and Meijerink, 2010). We thus have a limited understanding of the exact nature and influence of discourse coalitions in various environmental contexts, including water policy processes. In this paper, we question how storylines and discourse coalitions influence policy development around water quality in the Lake Erie Basin. Over the last decade, there has been an increasing concern with nutrient run-off from watersheds in the basin, especially phosphorus which has been causing algal blooms and eutrophication in Lake Erie (OLEC, 2008). In response, Canadian and US governments at the federal, provincial/state and local levels have set nutrient run-off reduction targets at 40% by 2025 (from 2008 levels); they are working within policy settings that have been framed by domestic action plans, or DAPs (OLEC, 2018; ECCO and OMECC, 2018). By taking the processes to develop those DAPs as comparative cases, we identify the main storylines and discourse coalitions and show how they have influenced the outcome in the form of the final DAP policy documents.

DISCOURSE IN THE CONTEXT OF ENVIRONMENTAL AND WATER POLICY

The complexity of many environmental issues leaves ample room for diverse, yet plausible, interpretations of events and processes; these interpretations can be constructed by actors in order to promote a preferred policy approach (Dryzek, 2013). Actors often condense complex environmental processes into simple storylines and metaphors as shorthand for intricate cause and effect relationships. In the media and other public arenas, complex research findings and arguments are often reduced to eye-catching visual representations or simple and memorable one-liners (Scrase and Ockwell, 2010). In the process, significant meaning is lost and, at the same time, actors are able to reconstruct meanings in support of their visions and take advantage of opportunities to promote their ideas and build alliances (Fischer, 2003). Coalitions can be built by constructing an appealing version of discourses or concepts and then recruiting people, including those who may only have marginally overlapping views (Rydin, 1999).

Discourse in this paper refers to "an ensemble of notions, ideas, concepts and categorizations through which meaning is ascribed to social and physical phenomena" (Hajer, 2009: 60); it is "a shared way of apprehending the world (...) [that] enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts" (Dryzek, 2013: 9). A discourse 'coalition' thus forms when a similar message is promoted by diverse groups of actors who subscribe to more or less similar versions of the main policy issues, the cause and effect relationships at play, and the preferred solutions to the problems at hand. As they do not belong in the same policy domain necessarily, this loose network of actors may have different, or at best overlapping, perceptions and understandings of the specifics of the policy issue; they are unified by the shared way they define a particular issue (for example, the nature and causes of climate change) and the overlapping narratives to which they subscribe (such as the role of wind energy in mitigating climate change) (Jessup, 2010). These narrative stories or storylines can help coordinate the actions of large numbers of people and organisations that may be geographically

dispersed (Metze and Dodge, 2016; Dryzek, 2013). Different coalitions may compete for 'closure' to a problem in the form of establishing a dominant understanding of the policy problem and its solutions (Forsyth, 2003) which effectively excludes alternative conceptions of the problem and alternative approaches to addressing it. As such, understanding how discourse coalitions promote specific storylines within the policy process provides an important insight into the process and outcome of environmental policy-making (Bocking, 2005; Bøgelund, 2007).

A number of studies have demonstrated that dominant discourse coalitions can create a bias towards a particular conception of an environmental issue in the broader policy domain and can influence the perceived need for, and appropriateness of, particular policy responses (Bøgelund, 2007; Clare et al., 2013; Dang et al., 2012). Rantala and Gregorio (2014) show the specific strategies that discourse coalitions use to influence policy in the context of forest governance. Clare et al. (2013) focus on a discourse coalition between industry and key government decision makers in Alberta, Canada; this coalition favoured a business-as-usual approach to wetland management which combined minimal regulation with market-based instruments. These authors suggest that industry was able to tilt the 'balance discourse' in such a way as to create a policy environment where wetlands conservation was possible only insofar as it did not hinder activities by industry. The influence of discourse coalitions on the policy process, however, is never certain, nor is it a straightforward process. Metze and Dodge (2016), in their analysis of anti- and pro-fracking discourses in New York State and the Netherlands, show the fluid and highly contextual nature of discourse coalitions within the context of potential regulatory policy to protect water quality and avoid other negative effects.

Despite the significant role of discourse in the policy process (Wesselink et al., 2013), the prevailing approaches of many researchers in their effort to understand water issues have been criticised for ignoring the discursive aspect of water policy and governance (Ingram, 2013). Blatter and Ingram (2001), for example, noted that its emphasis on rationality and the search for certainty and control has meant that most research on water issues has privileged "predictability, parsimony, and simplicity". With some exceptions – for example, Molle (2008), Peters and Woodhouse (2019), Sneddon et al. (2017), Venot and Krishnan (2011) – in much of the recent water governance literature, there has been an overall disregard of the influence of discursive factors through which meanings are constructed and perceptions and interests of individuals may be influenced (Brisbois and de Loë, 2015; Clement et al., 2017). Even less explored is the way in which actors form coalitions in pursuit of their preferred policy positions, and promote narratives to impose those positions on others. This paper contributes to this conversation by asking how storylines and discourse coalitions influence policy development for water quality in the Lake Erie Basin. The insights from this research have implications for resource policy and governance as well as for the broader goal of sustainability through their highlighting of the main actors and of the various forms that the main actors' influence can take.

NUTRIENT ISSUES IN THE WESTERN LAKE ERIE BASIN

Over the last decade, algal blooms in the western part of Lake Erie have increasingly become a concern for the ecological health of the lake as well as for the health of the public that depends for its livelihood on the lake (International Joint Commission, 2014). In the 1960s and 1970s, the lake experienced similar deterioration in water quality from excessive algal growth (Burns, 1985). The problem, then, was addressed largely through the leadership of the Canadian and US governments under the Great Lakes Water Quality Agreement (GLWQA); this is a binational commitment that was signed in 1972 and renewed in 2012. However, after seemingly successful efforts at dealing with nutrient-related pollution in the 1980s and early 1990s in Lake Erie, the problem of algal blooms again resurfaced in the early 2000s (Baker et al., 2014; Kane et al., 2014). This recurrence of algal blooms is caused mainly by non-point source run-off of phosphorus – especially bioavailable dissolved reactive phosphorus – to the Western Lake Erie Basin (WLEB) (Maccoux et al., 2016). The sources of this phosphorus run-off include municipal

wastewater treatment plants, combined sewer overflows, septic tank systems, and other sectors that use fertiliser, such as golf courses and residential lawns; the single largest source of phosphorus in the WLEB, however, is agricultural run-off from farm fields (Michalak et al., 2013; Smith et al., 2015), including that from commercial fertiliser and manure. In August 2014, the City of Toledo, Ohio, had to shut down the drinking water supply of half a million people due to the presence of toxic microcystins coming from harmful algal blooms near the intake pipes of the water treatment plant on Lake Erie (Wines, 2014). Similar problems occurred on the Canadian side, albeit at a smaller scale, including problems on Pelee Island – where a two-week no-swim advisory was issued in the summer of 2015 – and more common localised blooms in the Chatham-Kent area (Hill, 2018).

Recognising the growing threats from eutrophication and excessive algal blooms, the latest revision of the Great Lakes Water Quality Agreement (2012) stipulated that the governments of Canada and United States develop a target to reduce harmful algal blooms in Lake Erie (Objectives and Targets Task Team, 2015). Through a binational collaborative process, Canada and the United States adopted a target of 40% reduction (from 2008 levels) in spring loads of total phosphorus and soluble reactive phosphorus for the western and central basins and nearshore priority areas (EPA, 2017). At the subnational level, the province of Ontario, the state of Ohio and the state of Michigan also signed a memorandum of understanding in June 2015; they agreed to work collaboratively to reduce phosphorus run-off by a similar target amount, but added an intermediate target of 20% reduction by 2020 (from 2008 levels). Since then, the province and the states have been working to develop DAPs that are designed to meet these commitments (OLEC, 2018; ECCC and OMECC, 2018). A broad array of actors with diverse views, interests and capacities are involved in the process of developing the DAPs. The focus of this study is on the policy development processes within the province of Ontario and the state of Ohio, as these regions represent the most significant sources of nutrient run-off to Lake Erie in their respective countries.

CONCEPTUAL APPROACH AND METHODS

The conceptual framework that guided data gathering and analysis builds on the work of Hajer (1995) and Dryzek (2005, 2013), with a focus primarily on the role of discourse within the policy process 'action situation' (McGinnis and Ostrom, 2014). Following in the footsteps of other researchers, including Takahashi and Meisner (2012), Whaley and Weatherhead (2014), and Rydin and Ockwell (2010), we have relied on Hajer's concept of storylines and discourse coalitions to explore the policy process. This has been complemented by an analytic scheme developed by Dryzek (2013) to categorise generic discourses on nutrients into distinct storylines. Both Hajer and Dryzek emphasise storylines as the main components of generic discourse around an issue, and both researchers focus on the importance of storylines in bringing actors together by way of a shared understanding of 'how the world works' (Rydin and Ockwell, 2010; Lejano et al., 2013). Storylines are narratives that allow actors to draw on various representations and categories to create and assign meaning to complex and often less-understood physical or social phenomena; they help provide a unified perception of the complex component parts of an environmental issue (Hajer, 1995). Storylines create 'communicative networks' among diverse groups of actors with different or, at best, overlapping perceptions; they do this by "condens[ing] large amounts of factual information intermixed with the normative assumptions and value orientations that assign meaning to them" (Fischer, 2003: 87). Storylines may emphasise some aspects of an event and conceal or downplay other aspects; in this way, they help define issues as 'policy problems' by assigning blame, responsibility and a sense of urgency (Scrase and Ockwell, 2010; Clement et al., 2017).

In the context of the Lake Erie eutrophication problem, actors are divided into camps that share and promote distinct explanations and views. The concepts of storyline and discourse coalitions are thus helpful tools for arriving at an enhanced and nuanced understanding of DAP policy development. Accordingly, Table 1 shows the use of a scheme adapted from Dryzek (2005), to guide data analysis and

to identify storylines that are distinct from the broader eutrophication-related discourse in the Lake Erie Basin.

Table 1. Analytic scheme for identifying storylines.

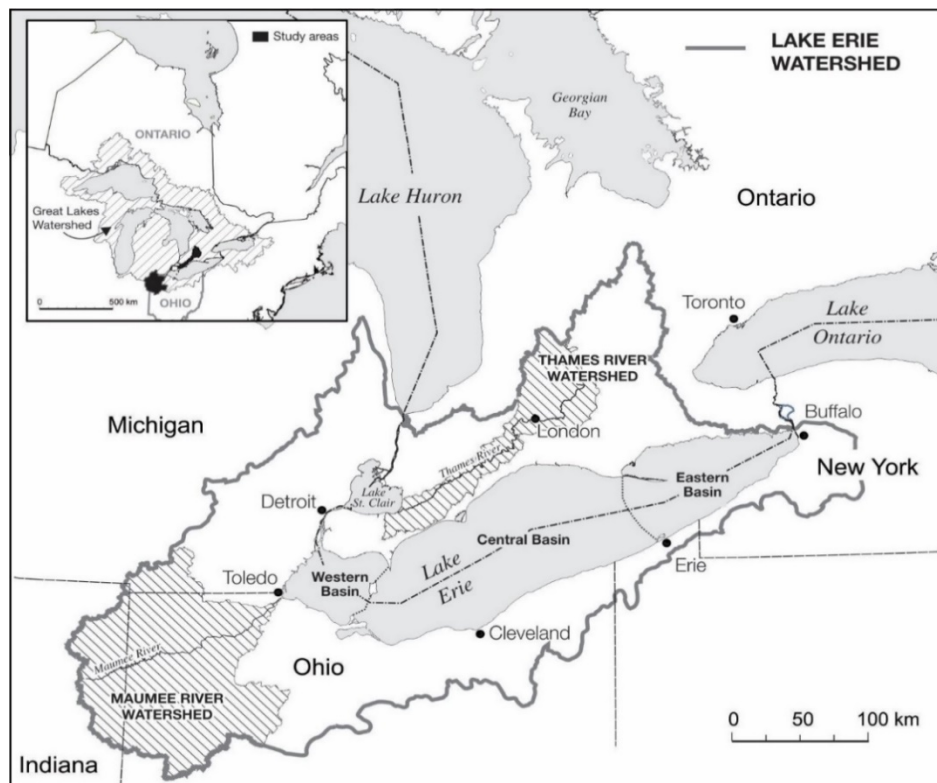
Elements of a storyline	Description
Basic entities recognised or constructed	The main variables that the discourse emphasises as being at play and influencing the progression of events; in the nutrient run-off and eutrophication discourse, for instance, some actors may not acknowledge the role of climate change while others assign it a prominent role.
Assumptions about natural relationships	The most defining feature of how entities and actors in the storyline connect to each other; this relates to how various public and private actors collaborate or compete with each other in demanding, developing or implementing actions to address Lake Erie's problems.
Agents and their subject positions	Human or non-human agents that are assuming and performing different roles; 'actors' in the context of the nutrients discourse include government, the farming sector and NGOs; the key non-human agent in this context is Lake Erie.
Key metaphors and other rhetorical devices	Metaphors and other linguistic expressions that are used to emphasise, persuade, legitimise, raise (or diffuse) a sense of urgency in relation to Lake Erie's problems.

The case studies considered in this paper are the Thames River Watershed in Ontario, Canada, and the Maumee Watershed in the American state of Ohio (Figure 1). The impact of their two different national contexts – including the structure of their respective federal governments and differences in political culture – may be relevant in shaping the final form of the policy outputs, or DAPs. In light of the watershed-based approach adopted to develop the DAPs, however, the emphasis is kept on how local and regional actors construct storylines in light of their knowledge, beliefs, and interests, in an attempt to influence the policy process. We have adopted a hierarchical method of comparative case study; we initially studied the two cases separately using a common research perspective and data collection technique. In the second stage, comparative analysis of the data and results was done in order to determine similarities and differences between the two cases and then find explanations for those differences (Verschuren and Doorewaard, 2010). Those two watersheds were our focus because they have been identified as the largest contributors of nutrients and as such they have been prioritised for nutrient reduction intervention (Objectives and Targets Task Team, 2015). The Maumee Watershed in Northwest Ohio is the single largest source of dissolved reactive phosphorus on the American side of Lake Erie; the algal blooms that it is generating are harming the lake's western basin (Ohio Environmental Protection Agency, 2018). The Thames River in Southwestern Ontario, Canada, is also a significant source of nutrient loads to the western basin via Lake St. Clair (Nürnberg and LaZerte, 2015). Agriculture is the dominant land use activity in both watersheds (International Joint Commission, 2014).

We employed a similar data collection strategy in both cases. We benefitted from the advice of McGinnis and Ostrom (2014) on how to identify the main groups of actors that are involved in the policy process in an action situation; these included actors in government, NGOs, farming communities including agribusinesses, municipalities, conservation authorities, soil and water conservation districts, academic institutions, and others who we thought to have insight into the matter. The sources of data included 55 semi-structured interviews with members of the groups of actors noted above who were identified (by snowball sampling) as having the relevant knowledge and expertise; 22 interviews were

held in Ontario and 33 in Ohio. Other sources of data included news media (88 relevant articles in Ontario and 200 in Ohio), direct observation (through participation in meetings, workshops, forums, field demonstration projects, and webinars), as well as websites and social media posts by relevant organisations. Another significant documentary source was the set of submissions of comments made by various stakeholders during the two-round DAP consultation process; these comments were sent to the Ontario Ministry of Energy and Climate Change (OMECC) in Ontario and to the Ohio Lake Erie Commission (OLEC) in Ohio. We analysed the data using the qualitative data analysis software QSR Nvivo.

Figure 1. Case study areas: Thames and Maumee Watersheds.



Source: Authors

RESULTS: STORYLINES, DISCOURSE COALITIONS AND THE POLICY PROCESS

Discourse on nutrients in Ontario

In debates around the issue of eutrophication in the Lake Erie Basin and nutrient runoff problems in southern Ontario, two storylines have been prevalent in the discourse; these storylines reflect a divide among how different actors define and characterise the nature, causes and possible solutions to the problem, as well as who is mainly responsible. Highlighting this divide, in her 2017 report the Environmental Commissioner of Ontario indicates that even though more controls are needed now to address the problem than in the 1970s, "there remains debate on exactly how and where to apply further controls" (Environmental Commissioner of Ontario, 2017: 149). As an interviewee from the municipal sector (CI-14) put it, "you find an opposing view between a lot of the stakeholders in different sectors that are in the watershed and they basically can be grouped into two main sectors: urban sector and rural sectors". Another interviewee from the agricultural sector (CI-09) describes these divisions among actors

as 'camps', with each camp having its respective ideas about the nature of the problem and its solutions. We provide the details of these two conceptualisations of the problem as they are signified by two storylines invoked by actors in their debates.

The 'external factors' storyline

This storyline is characterised by its depiction of the eutrophication problem as having causes and drivers that primarily lie outside of the decisions of actors and the current governance system. This storyline is mainly promoted by actors in the farming community and associated agribusiness; it promotes the idea that the issue of Lake Erie eutrophication is overly complex, involves interaction among multiple drivers, is poorly understood and, as such, that there is no clear and major action that can be taken to directly address it (Kelly, 2017; Fertilizer Canada, 2017). The storyline also shifts the focus away from agricultural nutrient run-off as the main cause of the problem, and towards the broader issue of the ecological health of the lake as it is linked to climate change, extreme weather events, and the resulting changes in the lake's internal biophysical dynamics. This storyline ascribes the eutrophication issue with a sense of mystery, as noted in a *CBC* article entitled *Toxic Algae Blooms: What You Should Know About the Enigmatic Phenomena*. The article further indicates that due to the complex linkages among many contributing factors, "no one really knows" about the exact cause and effect relationships leading to algal blooms (Powers, 2015).

This framing of the problem as a poorly understood and complex process is linked to recent changes in the temperature and ecology of Lake Erie; it suggests that these changes are conducive to the growth of algae and that the problem is made even worse by the growth of invasive species such as quagga and zebra mussels (International Joint Commission, 2018; Strayer, 2009). These invasive species are thought to have facilitated nutrient recycling within the lake as they consume phytoplankton and release phosphorus, thus further increasing the frequency of blue-green algal blooms (Pagnucco et al., 2015). Between 2011 and 2015, for example, 19% of the articles in the *Toronto Star* emphasised the connection between invasive species and algal blooms in Lake Erie and other parts of North America. In addition, recent changes in phosphorus pathways, which may be connected to legacy phosphorus in the soil, have also made it possible for dissolved reactive phosphorus (DRP) to move to the lake in increasing amounts; this has occurred despite total phosphorus run-off showing a decline over the past two decades (Stammler et al., 2017; Nürnberg and LaZerte, 2015). Some actors in the farming community who promote this storyline point out that, despite meeting the nutrient reduction targets set under the GLWQA in the 1970s, the lake is still deteriorating; they ask why, "some phosphorus loading level that was completely okay 10 or 20 years ago is now leading us to such a catastrophe in the Lake" (CI-22). They view the eutrophication problem as just one component of a larger problem, attributing it to a multiplicity of drivers that include "various pollutants, and they are kind of working in an interrelated, perhaps synergistic ways" (CI-09).

The external factors storyline also emphasises the effect of climate change in terms of more frequent extreme weather events; the proponents of this storyline assert that severe rain storms lead to heavy agricultural run-off (Michalak et al., 2013). These actors point to the potential ineffectiveness of best management practices (BMPs) in the face of such storm events (Bosch et al., 2014) and estimate that such events could cause as much as 90% of the total phosphorus load that enters rivers draining into Lake Erie (ECCC and OMECC, 2018; Grow Ontario Together, 2018). As such, the issue is even sometimes likened to climate change in terms of its nature, complexity, and the current capacity of the governance system to address it. As a member of a local watershed-based Conservation Authority indicates

so we are better off rather than resisting it, it's a little bit like climate change you know we can still have that argument that human activities aren't actually responsible for it but we would be a lot smarter to get on with the effects of it because while we are doing that we are probably going to actually improve our economy and our innovation. (CI-13)

Even though the groups of actors promoting this storyline include a diverse array of actors from many sectors, many of them represent agricultural organisations and their coalitions (Kelly, 2017; Bowman, 2017; Fertilizer Canada, 2017). One such coalition is Grow Ontario Together (GOT); it is a collaboration of major agricultural producers including the Beef Farmers of Ontario, the Grain Farmers of Ontario, and the Ontario Federation of Agriculture which is the largest farmers' association in the province (Grow Ontario Together, 2017). Another coalition of actors in the agri-food sector which promotes the external factors storyline is Ontario Food and Farm Care; its members indicate that,

[t]he issues with Lake Erie are complicated by nature as they involve complex interactions between nutrients and the biological environment they encounter. There are several forms of phosphorus which change as chemical pathways interact on the soil surface, inside of the soil and in the lake itself, along with some new invasive species (Dreissenid and Zebra mussels). It is suspected that these invasive species, about which we know little, have the capacity to affect these pathways. (Kelly, 2017).

The sense of mystery ascribed to Lake Erie eutrophication by actors promoting the external factors storyline, albeit based on some scientific understanding of the components of the problem, is often complemented with metaphors that are found in headlines of reports or in news items that further add a sense of obscurity to the issue. This is illustrated in this sampling of headlines (emphasis added):

- "Algae Bloom Predicted to *Blanket* Lake Erie This Summer" (CBC News, 2014).
- "*Soupy* Algae Blooms Threatening Great Lakes" (Toronto Star, 2011).
- "The Return of the Blue-Green *Slime*" (Aulakh, 2013)
- "The *Slimy* Truth: The Problem of Algal Blooms in the Great Lakes" (Goucher and Maas, 2014).

Given the framing of the issue as a problem whose exact cause and effect relationship is poorly understood and cannot be easily quantified (what is, for example, the exact contribution of phosphorus from a specific size of farm or field?), 'appropriate' solutions are couched in terms of incremental, voluntary and incentive-based 'business-as-usual' actions (Bowman, 2017; Fertilizer Canada, 2017). As defined in this storyline, the problem is not only nutrient run-off from farms; it is believed to be broad in scope and complexity, and thus the solution advocated is also inclusive of all stakeholders irrespective of their (quantified) contributions to nutrient run-off (McCabe, 2016; Currie, 2017). As the Christian Farmers Federation of Ontario puts it, "all citizens in Ontario need to work towards a solution to this complex problem" (Nywening, 2017). Similarly, the Grow Ontario Together coalition proposes that all sectors continue to do their part:

[T]he ecological health of the Great Lakes and its watershed can be protected and restored through continued stewardship efforts, targeted research, new and innovative technology for wastewater and storm water management, and a commitment to managing the watershed and its resources in a sustainable manner. (Grow Ontario Together, 2016)

Some actors promoting the external factors storyline push back against legislative intervention that may be taken as a kind of emergency response to Lake Erie's problems. An interviewee who represented the farming community noted that, "we think that the sense of urgency to do something is leading to decisions that could be based on convenience as opposed to actual science or actual potential for improving anything" (CI-22). Similarly, in its written comments to the DAP coordinating office, the Beef Farmers of Ontario indicated that "the consideration of further regulatory restrictions on the application of manure in the non-growing season is out of proportion with the facts and scientific reality" (Bowman, 2017). In this storyline, (CI-18; CI-16; CI-17) the insistence on a voluntary approach to curbing non-point agricultural run-off is also in line with the way the province's agricultural ministry defines best management practice as "a practical, affordable approach to conserving a farm's soil and water resources without sacrificing productivity" (Ontario Ministry of Agriculture Food and Rural Affairs, 2017).

The extent to which the actors promoting this storyline succeeded in getting their preferred framings of issues into the final policy document is gleaned from a comparison of the language in the four successive draft DAPs. These drafts were written in the period from October 2016, when the initial announcement of the policy and the call for public input (EBR 012-8760) occurred, to February 2018, when the final document was released. We observed many ways in which the language of the DAP final policy document had changed from that of earlier drafts; in the initial policy announcement it was declared that "a new approach is warranted" with "ambitious and aggressive actions" aimed at reaching the 20% interim reduction target by 2020 (EBR, 2016), while later versions contained more subdued language that failed to mention an interim target. With respect to application of nutrients, for example, the statement "Ontario will consider further restrictions" was modified to say that, "Ontario will engage with key sectors as it considers further restrictions"; this shift in language was accompanied by qualifications that further narrowed the scope of those restrictions (ECCC, 2018: 50). These changes in language indicated the extent to which policy, in the end, reflected the views of the actors who presented external factors as being the main source of the problem, thus requiring diminished urgency for action.

The 'weak governance' storyline

This storyline promotes the notion that the problem with the degradation in water quality in Lake Erie has primarily to do with weak or insufficient policies, lack of proper regulatory frameworks and enforcement mechanisms, and uncoordinated efforts. This storyline is promoted mainly by the environmental NGO (ENGO) community and by some municipal actors whose activities are closely linked to water quality issues in the basin. These actors view weaknesses in governance structures and processes at the provincial and federal levels as the primary factors that have led to Lake Erie's problems. They point out that due to insufficient coordination, policies that deal with water quality issues sometimes work against each other; specifically, "there has been inconsistent strategies, regulations and data collecting in various locations across the lake on both sides of the border, making efforts inconsistent" (Battagello, 2018). This storyline also holds that the problems with Lake Erie are, in part, the result of governments' reluctance to mandate agriculture to do its part in addressing nutrient run-off, thus making the achievement of phosphorus reduction targets difficult. As noted by a group of five ENGOs that are active on Lake Erie eutrophication issues, "Agricultural actions are mostly status quo and largely inadequate for achieving what will be needed to meet the targets" (Freshwater Future, 2017: 3). Actors in the municipal sector, including the City of Windsor and the City of London, as well as actors within the Great Lakes and St. Lawrence Cities Initiative (GLSLCI) argue that governance weaknesses have resulted in a double standard by the province; they feel that municipalities are disproportionately assuming the bulk of the responsibility for reducing nutrient run-off while operating under a heavily regulated operating regime (CI-14). This storyline further highlights that either mandatory regulations have not been imposed by the province – with voluntary actions from the agricultural sector being accepted – or there has been very little enforcement of existing regulatory frameworks such as the *Nutrient Management Act* (Province of Ontario, 2002). In an example of this view, the Environmental Commissioner of Ontario notes that "the Government of Ontario's preference so far for addressing phosphorus in run-off has been through voluntary and unevaluated programs, with questionable effectiveness" (Environmental Commissioner of Ontario, 2017: 149).

The actor coalitions promoting this storyline are led by ENGOs such as Freshwater Future, Environmental Defence, and the Canadian Freshwater Alliance; these organisations are often working in collaboration with US-based ENGOs. This linkage with ENGOs in the US (for example the Michigan League of Conservation Voters and the Ohio Environmental Council) is made possible by the shared nutrient-related discourse they are promoting on both sides of the lake (Freshwater Future, 2016). Their activities include preparing expectation documents, writing letters to the premier, and organising webinars with stakeholders. In July 2016, these organisations prepared a detailed 22-page document outlining the kinds of issues that they expect the domestic action plan to address; their expectations were drawn from their

interpretation of the provisions of the Great Lakes Water Quality Agreement and the *Great Lakes Protection Act*, and their document was submitted ahead of the official announcement of the DAP policy target in October 2016 (Freshwater Future, 2016). The Great Lakes Protection Act Alliance is a coalition of actors whose explicit goal is the achievement of the purposes of the act; they collaborate with a number of other ENGOs in trying to hold governments accountable, demanding a stronger response by the province of Ontario to Lake Erie's problems within the framework of the DAP (Great Lakes Protection Act Alliance, 2016). This coalition of actors, collaborating with other ENGOs, also organised a letter-writing campaign in October 2016; that campaign yielded hundreds of submissions in response to a call for comments on the Ontario DAP (Agriculture and Agri-Food Canada, 2017). In these submissions and in the news media, the weak governance storyline is accompanied by catch lines that are used by actors in their texts; in order to describe the problem they use such one-liners as "Lake Erie is the 'poster child' for eutrophication" and "Lake Erie's algae explosion blamed on farmers"; to highlight what they see as the appropriate policy response, they adopt slogans such as 'Invest in the environment' and 'Looking for leadership on water'.

In terms of policy response, the weak governance storyline emphasises a sense of urgency and the need for immediate action while calling for a strong regulatory framework and legislative action. Actors promoting this storyline oppose the province of Ontario's approach to agricultural run-off, which is seen as "overly reliant on voluntary adoption of agricultural best management practices" (Great Lakes Protection Act Alliance, 2016). As interviewee CI-07 indicates, "we don't need to postpone implementation with more studies first, or at least studies and implementation can happen at the same time". Such sentiments are also reflected in the news media, such as in an editorial in the *Toronto Star* entitled "Take Firm Steps to Cut Phosphorus in Lake Erie" (*Toronto Star*, 2016); media stories often build on information gathered through interviews with members of the binational advisory body, the International Joint Commission (IJC). Similarly, the Ontario Federation of Anglers and Hunters, an organisation with about 100,000 members, calls on the province to prioritise its actions, including further restrictions on the application of nutrients (Sucee, 2017). These actors further note that, "[i]t's time to 'get the house in order'" (ON-11); they call for stringent controls on agriculture, requesting the province to embark on an overall strategic framework to manage its nutrient runoff including the adoption of "land use policy reforms to reverse the continuing loss of wetlands in southern Ontario" (Environmental Commissioner of Ontario, 2017).

In examining the extent to which the ideas promoted by this storyline found expression in the final DAP policy document, we see only limited indications that they were included there. While there are references to the need for a strong governance structure to make the plan a reality, what form this structure would take is unclear; it mostly relies on existing coordination channels such as the Canada – Ontario agreement on Great Lakes, signed in 2014. The 'actions' section of the final DAP contains language on "ensur[ing] effective policies, programs and legislation", "improv[ing] the knowledge base", "educat[ing] and build[ing] awareness", and "strengthening leadership and coordination". Examining their contents, however, these seem to be either continuations of existing programmes that are already underway or references to provisions allowed by already existing legislative frameworks; there seems to be no indication so far of a dedicated regulatory framework for the specific purpose of addressing Lake Erie's problems.

Discourse on nutrients in Ohio

In addition to its involvement with Lake Erie eutrophication, Ohio has had a relatively long history of contributing via the Ohio River to nutrient run-off, algal blooms and hypoxia in the Gulf of Mexico, as well as to nutrient problems in the Grand Lakes St. Marys Watershed (Ohio Environmental Protection Agency, 2018; Han et al., 2012). As such, the issue of algae-related problems has been salient for about a decade; especially since 2010, "awareness of nutrient issues has grown dramatically among stakeholder groups" (Ohio Lake Erie Phosphorus Task Force, 2013: 3). The Toledo water crisis in 2014, which left half a million

people without drinking water due to toxic algae (Wines, 2014), further revealed the seriousness of the issue; it added vigour to the debates and served as "a wake-up call (...) [and] a paradigm shift" (CI-36) in the nutrients discourse. A distinct feature of the discourse in Ohio is that – at least since the release of the Ohio Phosphorus Task Force II report in 2013 – it has been established among the key policy actors that agriculture as a sector has been a significant contributor to the problem (Ohio Lake Erie Phosphorus Task Force, 2013, 2010). This understanding is illustrated, for example, in the move by Governor Kasich in 2011 to establish the Directors' Agricultural Nutrients and Water Quality Working Group; its mandate was to study the agricultural source of the problem and possible solutions (Zehringer et al., n.d.).

Interview data, various documents, and relevant news articles from Toledo's *The Blade*, *The Columbus Dispatch* and the *New York Times* provide two distinct but overlapping accounts of the nature of the eutrophication issue and of ways of addressing it. They highlight the major contribution by agriculture to the problem and the farmers' alleged reluctance to act, while also emphasising the uncoordinated and seemingly random approach by the state of Ohio in addressing the nutrients issue.

The 'farmers are shirking responsibility' storyline

This storyline holds that despite significant scientific research which found agriculture to be the single major contributor to the problem (Ohio Lake Erie Phosphorus Task Force, 2013), the farming community is not doing what is required to address the issue and thus is shirking its responsibility. The members of the discourse coalition that is advancing this storyline argue that, instead of acting, farmers are pointing fingers at other actors. An example of this view was advanced by an interviewee from the municipal sector who stated that, "when you talk with agriculture they point to manicured lawns and septic systems and combined sewers" (CI-34). In the wake of the Toledo crisis, a *New York Times* article highlighted how Lake Erie had been "long-troubled" and that "some efforts to control pollution have found powerful opponents in agriculture and the fertilizer industry" (Wines, 2014). Even before the Toledo crisis, initiatives were being taken to address agricultural source nutrient issues but, as a senior official in charge of coastal management indicated, "[t]he state of Ohio moved forward with a proposed legislation, rules and things of this sort to mandate certain types of actions and we received very strong push back from the agricultural side, agri-business and their lobbying" (CI-36).

The discourse coalition promoting this storyline is led by members of the environmental NGO community such as the Ohio Environmental Council, the Alliance for the Great Lakes, and the Environmental Law and Policy Centre (Meyer et al., 2017). Other members of this coalition include downstream municipal actors such as the City of Toledo, Lucas County, the Lake Erie Chartered Captains Association, and other ENGOS such as the National Wildlife Federation, the Lake Erie Foundation, and Advocates for a Clean Lake Erie (Szollosi et al., 2015; National Wildlife Federation, 2015). As illustrated in the news media, in addition to blaming the farming community, proponents of this storyline also accuse the Ohio Department of Agriculture (ODA) and the Kasich administration for failing to mandate farmers to take action (National Wildlife Federation, 2015; Henry, 2014). They point out that even though the main goal of the Ohio Directors' Agricultural Nutrients and Water Quality Working Group report was to address the increasing severity of the nutrient pollution coming from agricultural sources, the report still upheld that, "it was imperative that agricultural production in Ohio be maintained" (Zehringer et al., n.d.). Many in the ENGO community noted that the "main theme, unfortunately, for ODA is its continued reliance on voluntary action to solve the problem" (Meyer et al., 2017). Similarly, the downstream municipal actors maintained that,

[t]he agricultural community has a long way to go in both accepting that there is a problem, accepting that agriculture is playing a significant role towards that problem and then turning the corner to change practices in a way that will positively affect the Lake. (CI-51)

These actors also point out that Ohio's approach to addressing Lake Erie's problems puts strict requirements on wastewater plants even though the municipal sector has made a far smaller

contribution to the problem (Tuholske and Kilbert, 2015); they also accuse the state of Ohio of siding with farmers in only calling for incentive-based voluntary actions in the agricultural sector even though there has not been evidence that voluntary actions have helped to curb harmful algae (Hoornebeek et al., 2016). As such, these actors argue that, in the end, the solutions may "come down to how much longer Ohio's powerful agricultural industry can fend off efforts to impose stricter regulations on it" (Henry, 2014). The farming sector is sometimes depicted in this storyline as a sacred cow that cannot be challenged; Paul Krugman, for example, writing in the *New York Times*, describes the Toledo incident as resulting from the pursuit of economic interests in the name of the ideal of unfettered 'freedom' (Krugman, 2014).

In terms of a policy response to the problem, the 'farmers are shirking responsibility' storyline emphasises an immediate call for action that includes scaling up of BMPs to unprecedented levels, mandatory regulatory intervention, enforcing or enacting stronger regulations in the agricultural industry, and stricter controls on manure and fertiliser management (Meyer et al., 2017). As noted by a member of the Soil and Water Conservation District (SWCD), this push would need to become part of a larger and more effective movement to "counter those who will say, well, we are doing the best (...) whereas the larger voice can say we need to do more" (CI-28). Actors with a close physical connection to the lake, either as part of their daily lives or because of the way they make a living, emphasise this need for strong action; as one interviewee said, "we can't screw it up any more than we already have" (CI-36). The focus of this call for action by the agricultural sector has also been directed at the state government; one interviewee asserted that "until you enact provincial or state laws to govern or restrain, you can't do much against agriculture" (CI-61). The Board of Lucas County Commissioners similarly argued that achieving Ohio's goal of nutrient reduction was best achieved through Western Lake Erie Basin total maximum daily load procedures under the *Clean Water Act*. Thus, they commissioned two legal scholars to study such a possibility which resulted in the report "Legal Solutions to Lake Erie's Harmful Algal Blooms" (Tuholske and Kilbert, 2015; Wozniak et al., 2016).

When the final Ohio DAP document was released in early 2018, it did not include any provisions for mandating the farming sector to act towards reducing nutrient run-off; both the federal and the Ohio DAP stayed clear of any regulatory provisions. The document states that the Ohio DAP "does not establish any new legislation, rule, or enforceable standard. Rather, the actions listed in the DAP propose or describe recommended changes (...)" (OLEC, 2018: 7). An important provision related to this storyline's push for a regulatory approach, however, was the one made for developing a method to assess the open waters of Lake Erie in order to determine if the required data existed to make an 'impaired' designation. This is reflected in the following excerpt from the DAP:

Ohio EPA will develop, in cooperation with USEPA and scientific researchers, a method for assessing the open waters of Lake Erie. This will include evaluating what data is available, what threshold(s) should be met for listing as impaired as well as de-listing, and which beneficial use assessments can be supported (OLEC, 2018: 23).

The 'random acts of restoration' storyline

This storyline promotes the notion that the problem with eutrophication in Lake Erie is not so much that nothing is being done by concerned authorities and other stakeholders to address it, but rather that efforts have been fragmented, random and inefficient; there is, in other words, a problem of coordination. The actors promoting this storyline point to the failure to solve Lake Erie's problems despite multiple state and local expenditures and the annual US\$300 million that was allocated federally through the Great Lakes Restoration Initiative (McCarthy, 2015). They argue that the lack of coordination mechanisms is proven by the large sums of money that have already been spent on the Lake Erie Basin for the purposes of nutrient reduction and drinking water treatments; the Ohio Lake Erie Commission estimates these expenditures to be more than US\$3 billion between 2010 and 2016 (OLEC, 2016). In 2012, a report was issued by a working group that was jointly commissioned by the directors of

agriculture, natural resources, and the Ohio EPA, which had a mandate to address agricultural run-off. Three of the five major issues that the report identified directly related to the issue of coordination ("state and federal resources are not fully aligned"; "education and communication have been lacking"; "research is fragmented") (Zehringer et al., n.d.). The report further highlighted that the working group came across many instances of "fragmented government and nongovernment resources and programs" (ibid). In essence, some actors argue, even though a large number of projects and programmes are undertaken with the leadership of federal, state and local governments, as well as by watershed groups and other ENGOs, they contributed to no clear direction (CI-36). A former official with the Ohio EPA (CI-30) indicated that, "some people have their pet programs that they want to advocate for"; this lack of coordination "reflects a potential deficiency in current organizational arrangements for nutrient control" (Hoorbeek et al., 2016: 35).

Actors who promote this storyline further point out that not only were relevant projects and programmes not well coordinated by the concerned agencies but, as a researcher with Ohio State University (CI-33) indicates, the advice given by 'experts' to farmers on what BMPs to adopt may also have been fragmented or even conflicting. Research on improving best management practices was found to be "fragmented among various universities, and even across multiple departments within the same university" (Zehringer et al., n.d.: 3). Actors promoting this storyline also argued that there is some overall level of 'silo mentality' among agencies working on the nutrients issue; as one interviewee put it, "we call them random acts of restoration" (CI-36). Furthermore, some policies, such as the 2005 US biofuels policy, are viewed as giving farmers the wrong incentives to produce more, to farm even marginal lands that require significant amounts of phosphorus, and to displace crops that require less nutrients with corn, which requires relatively more (Jack Faucett Associates, 2017). In addition, crop protection programmes that guarantee payments to farmers are seen as encouraging the farming of marginal lands which are vulnerable to erosion; this further delivers phosphorus to the lake. A US congresswoman from the Toledo area, Rep. Marcy Kaptur, laments that "there's a state responsibility here that is very haphazard, very hit-or-miss" (Henry, 2016).

The policy response that the random acts of restoration storyline calls for is a focus on increasing coordination, efficiency and transparency of effort, including efforts to cooperate with the farming community. The actors advocating this response include the Ohio Lake Erie Commission, the Ohio Department of Agriculture, and various agricultural groups such as the Ohio Soybean Council and the Ohio Agribusiness Association (Ohio Farm Bureau Federation, 2017). The Ohio Lake Erie Commission, acting as the main coordinating entity, works in collaboration with various state and federal agencies; it also works with a long list of other partners, including 17 agencies that are actively and directly involved with specific tasks on nutrients issues in Ohio (Hoorbeek et al., 2017). Many actors, however, see OLEC as lacking the required authority to act as a true coordinating body that can also provide sufficient leadership to save Lake Erie; in response to this feeling, some groups have been led to call for "a Lake Erie Tsar. One person, where all the information from all the different factors, all the different universities go to and all the government agencies go to, to coordinate and to identify and to act on those" (CI-61).

In addition to improving the coordination of individual efforts, this storyline calls for bringing in a basinwide organising framework through the *Clean Water Act's* 'impaired' watershed declaration; such calls build on the IJC's (2014) calls for similar actions. In 2015, a group of ENGOs, including the National Wildlife Federation, the Alliance for the Great Lakes, the Ohio Environmental Council, and the Lake Erie Waterkeepers called on the EPA to designate the WLEB as 'impaired' and to subject it to procedures under the *Clean Water Act's* 303(d) list. They noted that by postponing the declaration of the Western Lake Erie Basin as impaired due to nutrients, "EPA has failed in its duty to protect Lake Erie and the people and wildlife which depend upon it" (Szollosi et al., 2015: 1).

This storyline seems to have been significantly accommodated in the final DAP policy document; this can be seen in the emphasis on the term 'coordination' and the need for projects and programmes to be continuously directed towards addressing coordinated or stated priority issues (OLEC, 2018). The term

'coordination' and its derivatives (coordinate, coordinated, coordinating) appears 34 times in the 29 pages of the DAP main document; the emphasis on the need for coordination was also clear:

Being able to track the expenditure of public and private dollars going toward nutrient reduction is critical to determining the effectiveness and efficiency of those expenditures. Improved coordination of where dollars go and improved accountability for results observed will be a high priority of the DAP (OLEC, 2018: 21).

Another significant provision of the final DAP that is in line with the establishment of an overarching coordinating framework, as promoted by this storyline, could also be seen in the call for the potential designation of the WLEB as impaired.

DISCUSSION

Storylines define policy problems and assign responsibilities

The case studies detailed above shed light on how storylines can help to frame issues in particular ways and present them as requiring particular approaches. The case studies also provide insights into the formation and evolution of discourse coalitions and the activities in which they engage in order to influence policy. There are similarities and differences in the two case studies in terms of the way the storylines construct the eutrophication issue as a defined 'problem' with specific sources and culprits, and in the courses of action they call for. The weak governance storyline in Ontario and the random acts of restoration storyline in Ohio are similar in their conceptualisation of the problem as well as their desired solutions. They both consider the governance structures and processes in the two regions to be largely to blame for the algal bloom issue, but they do it differently. The weak governance storyline relies on the argument that for a long time the water governance system in Ontario has been fragmented due to lack of institutional coordinative mechanisms among federal and provincial mandates and among provincial ministries dealing with water (Cook, 2014). Until the *Great Lakes Protection Act* came into effect in 2015 – the same year that the province signed a collaborative agreement with Ohio to reduce run-off by 40% – there was no provincewide regulatory framework targeting the reduction of nutrient run-off to Lake Erie. This storyline overlooks the importance of the Canada – Ontario agreement on Great Lakes as an institutional coordinative mechanism that brings together up to ten federal and provincial ministries that have a stake in the Great Lakes. Proponents of this storyline argue that the federal government has essentially downloaded its responsibilities to the province, which happens to have limited financial and human resources for undertaking the monitoring, enforcement and research activities that are necessary to maintain the health of the lake (Heinmiller, 2017).

While the weak governance storyline in Ontario emphasises the limited commitment by provincial and federal governments, the random acts of restoration storyline in Ohio emphasises the lack of coordination among state agencies and with federal departments in the effective administering of the significant amounts of financial resources being allocated annually by both levels of government (Sracic and Binning, 2016; Zehringer et al., n.d.). Approximately US\$3 billion was spent between 2011 and 2017 on Ohio's Lake Erie Basin to address nutrient reduction and drinking water treatment; the lack of effectiveness, despite this expenditure, is also linked to the government's provision of the agricultural sector with incentives – rather than firm mandates – to address nutrient run-off. This position, which is also articulated in the 'farmers shirking responsibility' storyline, emphasises that the institutional and regulatory framework has been especially weak when it comes to demanding action from the agricultural sector. According to this storyline, the farming community is assigned blame for failing to act responsibly on a shared resource, while the government is blamed for not taking bold action to establish mechanisms whereby delinquent actors could be held responsible. As such, both the farmers shirking responsibility

storyline and the random acts of restoration storyline invoke the same notion of lack of leadership from government actors in protecting the environment (Metze and Dodge, 2016).

Unlike the storylines whose proponents cite a specific actor who bears the bulk of the blame, with the external factors storyline there is no single actor that is named as being the main culprit for Lake Erie's problems. This storyline deflects focus and blame away from any single actor and instead puts it on the complex interrelationships among biophysical and climatic factors which are external to the governance system. Proponents call for a gradual – even years-long – adaptation of the governance system, including the agricultural sector, to the effects of climate change and other factors such as invasive species.

Thus, we can see the significant role played by storylines in supplying the policy process with a more or less coherent account of a policy issue. Such storylines are drawn from the broad and generic discourse around nutrients, emphasising certain aspects of the problem while ignoring or overlooking others; in this way they attribute cause and responsibility, and press for the most appropriate response in light of their particular framing of the story. Relationships among social and ecological agents are constructed in such a way as to attribute causes and responsibilities, often with the help of metaphors that condense and simplify large amounts of information. The (relative) truth claims of such storylines may be identified by comparing it with empirical evidence from scientific research (e.g. changes in biological and chemical properties of the waters) or even from the traditional ecological knowledge of indigenous peoples. Policy makers must consider the different truth claims if the final plan of action is to be perceived as legitimate by the relevant stakeholders (Armitage et al., 2015). A perception of legitimacy may improve the implementation process and give a particular policy action a better chance of actually achieving its goals of ecological restoration. Overall, this analysis of storylines provides us with insights into, and a more nuanced understanding of, the policy process as it is related to eutrophication issues and water quality.

Discourse coalitions reflect broader patterns of societal discourse

Discourse coalitions, to some extent, are not bound by geographic proximity; as such, the influence of discourse coalitions on policy in a given national or subnational context can come from outside that specific policy setting. In the case of the DAP policy in Ontario, we observe many instances of the American ENGO community working with ENGOs in Ontario; they collaborate on activities such as preparing expectation documents, writing letters to the premier, and organising webinars with relevant stakeholders. They have worked together on pushing the provincial government to respect and adhere to the stipulations of the GLWQA in drafting its DAP. This is an indirect influence from across the border on the views and the discourses promoted by the ENGO community in Ontario, which have in turn played a role in shaping the final policy output (Murdoch, 2004). Moreover, even though the IJC is not an ENGO, it has provided crucial vocabulary and language, which has benefitted the ENGOs pushing for more stringent approaches. Unlike government scientists, politicians, or other officials in Ohio and Ontario, the IJC staff seem not to fear the potential politicisation of their statements by the media or to worry about the 'tone' of their comments; this can be observed in IJC statements that describe the seriousness of the eutrophication problem and its impacts on the environment. It is also evident in their assertions of the level of commitment that is needed to adequately address the issue, such as an 'impaired designation' for Ohio's WLEB. Such relatively bold positions help legitimise the ideas and terms for argument put forward by actors who are demanding more action. In this regard, this binational advisory body seems to have influenced the discourse around the policy process and to have supplied ammunition to the discourse coalitions that are demanding stronger action. The IJC may thus have played an important role in shaping the nature of the nutrients discourse in both regions (Metze and Dodge, 2016).

The literature on discourse coalitions emphasises the key role that ideas and metaphors play in organising these coalitions and holding them together (Rantala and Gregorio, 2014; Metze and Dodge, 2016; Mander, 2008). In these accounts, the role of different interests is either mostly sidelined or else the discourse itself is understood to dictate interests (Hay, 2011; Kern, 2011; Hajer, 1995). In our results,

we saw actors brought together by a commonly held perception of the issues. The similarities in actors' ideas and in their framing of the issues, however, did not appear to be a sufficient factor in this coming together; the role of interests also seemed to have played a role. In the case of the external factors storyline in Ontario and the random acts of restoration storyline in Ohio, the interest of the farming community in avoiding regulations seems to have been the principal reason for their promotion of those storylines (Huitema, 2002; Kern, 2011). Governments in both Ohio and Ontario seem, in their approaches to environmental protection, to have also prioritised the protection of agricultural production and the economy in general. In the two cases we studied, we thus see actors brought together through an interplay of ideas and interests to promote a preferred policy response.

Importantly, this study found that even though various ideas may be at play within the broad eutrophication-related discourse, almost all of them share common elements of the broader metadiscourse of liberal environmentalism, which predicates "environmental protection on the promotion and maintenance of a liberal economic order" (Bernstein, 2002: 1). Our observation was that even those actors who are considered to be strong advocates of nature and the environment still seemed to use terms in their argumentation in the policy process that were similar to those of other mainstream economic sectors (Bingham et al., 2015). Even though some actors framed their preferred approaches in terms of deep ecology, expansion of wetlands, whole farm system transitions, and ecological farming, these positions seemed to be peripheral; most of the debate seemed to revolve around adopting the 'right mix' of voluntary, incentive-based and regulatory instruments for improved 'efficiency'. This overall focus on efficiency may be because those with positions at odds with the prevailing discourse often find it necessary to self-censure and reformulate their message in order to "squeeze in, to gain entry and a measure of legitimacy" (Torgerson, 2005: 114). The influence of the neoliberal paradigm is also indicated by references in the domestic action plans to environmental protection efforts as investments, and to measuring these investments in terms of future monetary returns in dollar amounts. The influence of the globally dominant liberal environmentalism that promotes the harmonious and mutually coexistent nature of continued economic growth and environmental protection thus also seems to have found expression within the water quality discourse in the Great Lakes Basin.

CONCLUSION

This paper demonstrates the significant influence of discourse on the policy process. It provides insights into how storylines can transform a broad environmental issue into a 'problem' with identifiable cause and effect relationships; it illustrates how storylines can assign responsibilities to actors who become the culprits. This study also shows how specific conceptualisations of a problem can make certain responses look more appropriate than others. A storyline can deflect focus and blame away from any single actor and insert it into a web of complex interrelationships among biophysical and climatic factors that act outside of the governance system; successfully promoting such conceptualisations can have important implications for the extent and level of urgency with which policy actors respond to environmental issues. An important role of storylines thus lies in supplying the policy process with a more or less coherent account of what is at stake and what needs to be done; the concept of a storyline provides us with a nuanced understanding and a richer appreciation of the discursive nature of many environmental policy processes.

This study also provides important insights into how discourse coalitions form and their impacts on the policy process. We observe that even though ideas, narratives and metaphors play an important role in holding discourse coalitions together, the role of interests also needs to be given due consideration. The observation that geographic distance may not deter policy actors from influencing the policy process is also a factor to which the policy studies community and decision makers in specific jurisdictions need to pay attention (Zelli et al., 2019). This concern is especially significant because governments typically work to further the interests of their constituents within political boundaries or other geographically

delineated jurisdictions. The potential for policy influence from other jurisdictions via discourse coalitions raises important questions as to whose voice has sufficient legitimacy to be considered in the policy process. The manifestation of the metadiscourse of liberal environmentalism brings with it conceptual issues with regard to the extent to which actors can influence discourse around specific environmental issues; this invokes the agency – structure debate in the broader social sciences. This study thus provides important insights that support the usefulness of the concept of discourse to a better understanding of freshwater policy and governance. It also helps illuminate the challenges associated with policy efforts towards sustainable resource use, and sustainability in general.

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