LWF LAKE WINNIPEG FOUNDATION

Manitoba Water Management Strategy: Recommendations

Presented to the Expert Advisory Council
Manitoba Climate and Green Plan

Manitobans expect and depend upon clean, abundant, fresh water. As the land of 100,000 lakes, healthy water resources define our province's geography, drive our economy, shape our cultures and support our health and biodiversity.

Manitoba's provincial government is vested with the responsibility for safe, sustainable water management in our province. In turn, Manitoba's Expert Advisory Council has been entrusted with providing expert advice to the Minister of Conservation and Climate in order to fully realize an effective, sustainable, outcome-based provincial water strategy. Such a strategy must be supported by robust evidence, include measurable targets and defined timelines for action, and strengthen monitoring and reporting systems.

In response to the August 2020 engagement document, the Lake Winnipeg Foundation (LWF) provides the following recommendations to the members of Manitoba's Expert Advisory Council, in order to ensure Manitoba's Water Management Strategy effectively translates policy into meaningful practice to safeguard water for all Manitobans for generations to come.

GOVERNANCE

1) Recognize that Manitoba must lead by example.

Manitobans are the beneficiaries of clean, safe, fresh water in Manitoba. We cannot expect other jurisdictions to act to protect our water resources until we ourselves have taken all necessary steps to fulfill our own responsibilities for water protection. While a Manitoba Water Management Strategy must acknowledge the interjurisdictional nature of water management, its first premise must be a commitment to lead by example from within Manitoba.

2) Increase Indigenous representation at decision-making tables.

Water decisions in Manitoba invariably affect Indigenous rightsholders, communities and governments. Yet Indigenous people are largely absent from water decision-making processes. As a first step, increase Indigenous representation on the Expert Advisory Council itself, by requesting that Indigenous rightsholders be formally appointed to the council and included in the water sub-committee.

3) Expand Manitoba's Watershed District Program to cover all of agro-Manitoba.

Currently, Watershed District coverage is lacking in south-eastern Manitoba, within the Winnipeg River basin. Strengthening partnerships with municipalities in this region to form a new Watershed District will provide important opportunities for improved watershed management.

WATER MONITORING IN MANITOBA

4) Identify and use community-based monitoring data to support decision-making.

The Lake Winnipeg Community-Based Monitoring Network provides land managers and policy makers with the information necessary to identify localized phosphorus hotspots within larger watersheds. In the Red River valley, consistent hotspots have been identified over multiple years of monitoring. Targeting remediation efforts in phosphorus hotspots will reduce the amount of phosphorus entering Manitoba's lakes and rivers – and increase the value-for-money of water quality investments. The collaborative effort and high-quality data generated by this network should be acknowledged and used to inform Manitoba's Water Management Strategy.

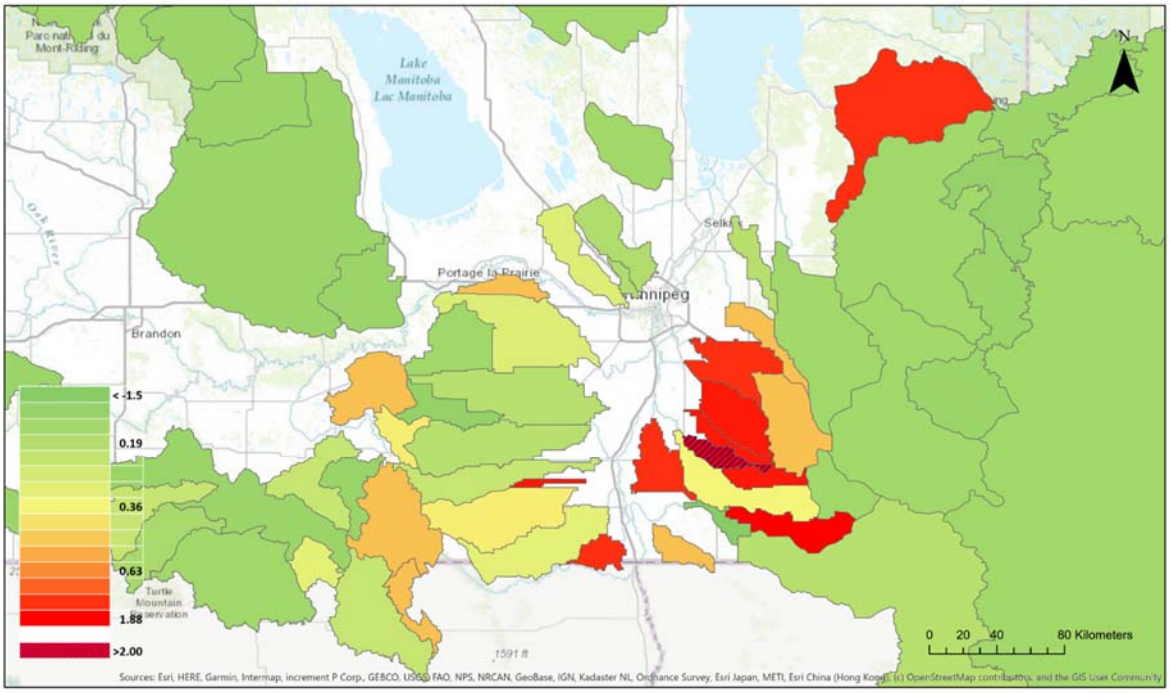

Figure 1. Phosphorus export (kg/ha/y) from Red River valley drainage areas sampled by the Lake Winnipeg Community-Based Monitoring Network in 2019. Phosphorus hotspots, shown in red, are high-priority areas for targeted investments to improve water quality.

KEY ISSUE 3: MAINTAINING HEALTHY WATERSHEDS

5) Acknowledge that phosphorus is the cause of algal blooms in freshwater ecosystems.

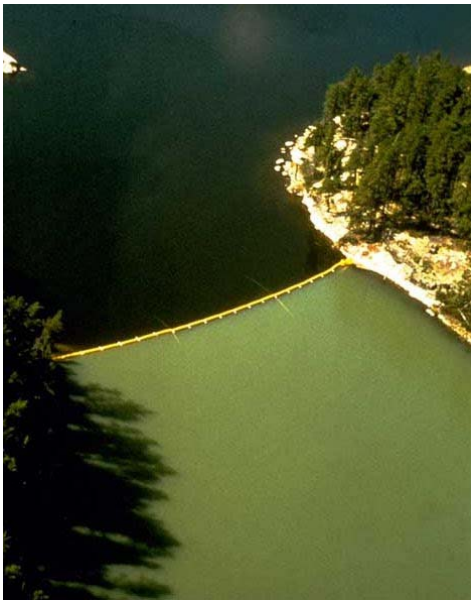

Figure 2. Lake 226 at the IISD-Experimental Lakes Area, demonstrating the connection between phosphorus and algal blooms. Nitrogen and carbon are added to the top basin, while nitrogen, carbon and phosphorus are added to the lower basin. The basin with phosphorus added developed blue-green algal blooms – the other basin did not. This iconic picture has been described as the single most powerful image in the history of limnology.

The role of phosphorus in promoting algal growth has been demonstrated by IISD-Experimental Lakes Area through five decades of research on whole-lake ecosystems[1]. This robust body of research, conspicuously absent from Manitoba's approach to addressing eutrophication, has been used across the world to manage and reduce harmful algal blooms[2,3]. IISD-ELA research demonstrates the critical importance of focusing on phosphorus to make effective use of public funds in combatting freshwater eutrophication[4].

PROVINCIAL PRIORITY 3: COMMITTING TO NO NET LOSS

6) Strengthen drainage regulations to comply with the legislative requirement of no net loss of wetland benefits.

[1] Schindler, D.W., Hecky, R.E., Findlay, D.L., Stainton, M.P., Parker, B.R., Paterson, M.J., Beaty, K.G., Lyng, M., and Kasian, S.E.M. 2008. Eutrophication of Lakes cannot be controlled by reducing nitrogen input: Results of a 37-year whole-ecosystem experiment. PNAS, 105: 11254-11258.

[2] Schindler, D.W., Carpenter, S.R. Chapra, S.C., Hecky, R.E., and Orihel, D.M. 2016. Reducing phosphorus to curb lake eutrophication is a success. Environmental Science and Technology, 50: 8923-8929.

[3] Fastner, J., Abella, S., Litt, A., Morabito, G., Voros, L., Palffy, K., Straile, D., Kummerlin, R., Matthews, D., Phillips, M.G., and Chorus, I. 2016. Combating cyanobacterial proliferation by avoiding or treating inflows with high P load – experiences from eight case studies. Aquatic Ecology, 50: 367-383.

[4] Higgins, S.N., Paterson, M.J., Hecky, R.E., Schindler. D.W., Venkitswaran, J.J., & Findlay, D.L. 2018. Biological nitrogen fixation prevents the response of a eutrophic lake to reduced loading of nitrogen: evidence from a 46-year whole-lake experiment. Ecosystems 21: 1088-1100.

While sound in policy, the commitment to no net loss of wetland benefits has not been effectively translated into practice. Currently, the compensation mechanisms enabled through Manitoba's Water Rights Regulation are inadequate to replace the wetland benefits lost through ongoing drainage licensing[5]. One such mechanism allows a drainage proponent to "compensate" for draining a wetland simply by signing a conservation agreement not to drain another. In real terms on the landscape, this represents a net loss of wetland benefits.

PROVINCIAL PRIORITY 4: REDUCING NUTRIENT LOADING

7) Prioritize phosphorus reduction at Winnipeg's North End treatment plant.

Fifteen years after its Environmental Act license was first issued, Manitoba's largest municipal wastewater treatment plant remains non-compliant with the phosphorus limits prescribed in its license. According to timelines presented by the city and province in January 2020[6], treatment plant upgrades will not be complete until 2032. Over the intervening 12 years, up to 1,865,880 kg of phosphorus exceedances may be released into Manitoba's waters[7], exacerbating algal blooms on Lake Winnipeg. To prevent this, upgrade timelines must be accelerated and every available opportunity to reduce phosphorus loading from the North End plant must be maximized, including through upgrades to biosolids facilities.

8) Monitor and quantify phosphorus runoff from manure application to effectively manage impacts on water quality.

Environmentally sound manure management is a critical pollution-prevention measure for Manitoba's hog industry, and must be based on strong evidence[8]. To date, phosphorus losses from manure-spread fields have not been quantified through water-quality monitoring, nor have current manure management practices been adequately evaluated. Further research is required on the factors that determine phosphorus retention and loss under different manure application conditions. Economic growth in Manitoba must respect limits to environmental capacity: for Manitoba's hog industry, these limits are prescribed by the availability of suitable cropland for manure application at rates that do not exceed the phosphorus removal rates of the growing crop.

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[5] Lake Winnipeg Foundation. Water Rights Regulation Submission to Manitoba Sustainable Development. January, 2019. https://www.lakewinnipegfoundation.org/sites/default/files/Water%20Rights%20Regulation%20-%20Lake%20Winnipeg%20Foundation%20Submission.pdf

[6] City of Winnipeg and Manitoba Conservation and Climate. Interim Phosphorous Reduction Plan and Nutrient Removal Implementation Plan. January 31, 2020 https://www.winnipeg.ca/waterandwaste/pdfs/sewage/20200130NEWPCC_UpgradePlansFinal.pdf

[7] Lake Winnipeg Foundation and International Institute for Sustainable Development. Interim Retrofit Solution. March 21, 2019. https://www.lakewinnipegfoundation.org/news/report-interim-retrofit-winnipeg%E2%80%99-north-sewage-treatment-plant-protect

[8] Lake Winnipeg Foundation. Livestock Manure and Mortalities Management Regulation Submission to Manitoba Sustainable Development. April 2017. https://www.lakewinnipegfoundation.org/sites/default/files/Provincial%20Submission%20on%20Livestock%20Manure%20and%20Mortalities%20Management%20Regulation%20-%20April%202017.pdf

PROVINCIAL PRIORITY 5: USING NATURAL INFRASTRUCTURE

9) **Provide funds for robust monitoring to quantify the ecological goods and services created through GROW and Conservation Trust investments.**

To be effective at increasing ecological goods and services, beneficial management practices (BMPs) must be tailored to Manitoba conditions, including both regional climate and site-specific topography and soils. Manitoba's cold climate, heavy spring melt, and flat terrain create unique circumstances that often undermine the performance of BMPs imported from warmer and hillier regions[9]. Research conducted in Ontario and the United States does not reflect Manitoban realities. Proposed BMPs must be monitored and evaluated here in Manitoba, to test assumptions about performance and ensure value for money.

PROVINCIAL PRIORITY 7: SUSTAINING ECONOMIC DEVELOPMENT

10) **Manage economic development within the natural limits of ecosystems.**

The relationship between water and economic development in Manitoba must be acknowledged as reciprocal: good quality water is not just an input to industry, but it must also be an output of industry. Where industry, including agriculture, is incapable of returning water to other users in reliable supply and of sufficient quality, economic development must be limited. Manitoba's Water Management Strategy must ensure no single water use or water user compromises the availability of sufficient, good quality water for all Manitobans.

GOAL AND SCOPE CONSIDERATIONS

11) **Include and address all activities of water users within the water strategy.**

To be effective, Manitoba's Water Management Strategy must be comprehensive and specifically designed to measure and address the cumulative effects of multiple, diverse, overlapping water uses within the province. The specific activities of all water users must be included in this strategy.

12) **Include all of Manitoba in the Manitoba Water Management Strategy.**

Water issues exist throughout the province of Manitoba, though undeniably unique across regions. A provincial water strategy that focuses only on select regions and select users does not represent or address the needs of all Manitobans.

[9] Liu, J., Baulch, H.M., Macrae, M.L., Wilson, H.F., Elliott, J.A., Bergstrom, L., Glenn, A.J., and Vadas, P.A. 2019. Agricultural Water Quality in Cold Climates: Processes, Drivers, Management Options, and Research Needs. Journal of Environmental Quality. 48: 792-802.

PERFORMANCE INDICATORS

13) **Quantify the increase in ecological goods and services achieved through Environmental Farm Plans to validate this performance indicator.**

Environmental Farm Planning, and associated programs like 4R Nutrient Stewardship, are valuable policy approaches. Yet researchers acknowledge that insufficient data exists to quantify the practical environmental outcomes of these programs, particularly for cold climate agriculture. While program enrollment represents an important first step, this must be backed by research supporting the effectiveness of beneficial management practices promoted and incentivized in Manitoba.

14) **Remove the indicator "Number of new production and processing developments"**

This is an indicator of economic activity, not of sustainable water management. As currently worded, it will provide no information on our collective success in managing water as a resource for the benefit of multiple water users.

The Lake Winnipeg Foundation (LWF) advocates for change and co-ordinates action to improve the health of Lake Winnipeg. Our long-term goal is to ensure policy and practices informed by evidence are implemented and enforced.

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