

THE RETURN ON INVESTMENT OF NATURAL INFRASTRUCTURE

The financial impacts of extreme weather events driven by climate change are escalating and affecting more and more Canadians.

COMMUNITIES NEED TO ADAPT.



Governments need to decide what infrastructure will help protect our homes and communities.



Natural infrastructure is a viable option. This includes things like conservation and restoration of natural features, such as ponds, wetlands and vegetated areas.



Water damage is the main driver of growing insurance costs.

WHAT IS NATURAL INFRASTRUCTURE?

Natural infrastructure is “a strategically planned and managed network of natural lands, such as forests, wetlands, and other open spaces, which conserves or enhances ecosystem values and functions and provides associated benefits to human populations.”^{1,2}

¹Benedict, M. and McMahon, E. 2006. Green Infrastructure: Linking Landscapes and Communities. 2nd edition. Washington, DC: Island Press.

²Gartner, T., Mulligan, J., Schmidt, R., and Gunn, J., eds. 2013. Natural Infrastructure: Investing in Forested Landscapes for Source Water Protection. World Resources Institute. Accessed at: www.wri.org/publication/natural-infrastructure.

NATURAL INFRASTRUCTURE IN ACTION



Naturally occurring ponds in the coastal town of Gibsons, British Columbia, provide **\$3.5 million to \$4 million** of stormwater storage services annually.



A 250-metre naturalized channel in the town of Oakville, Ontario, provides **\$1.24 million to \$1.44 million** of stormwater conveyance and storage annually.



Naturally occurring wetlands in southern Ontario reduce flood damage costs to buildings by **\$3.5 million** (or 29%) at a rural pilot site and by **\$51.1 million** (or 38%) at an urban pilot site.



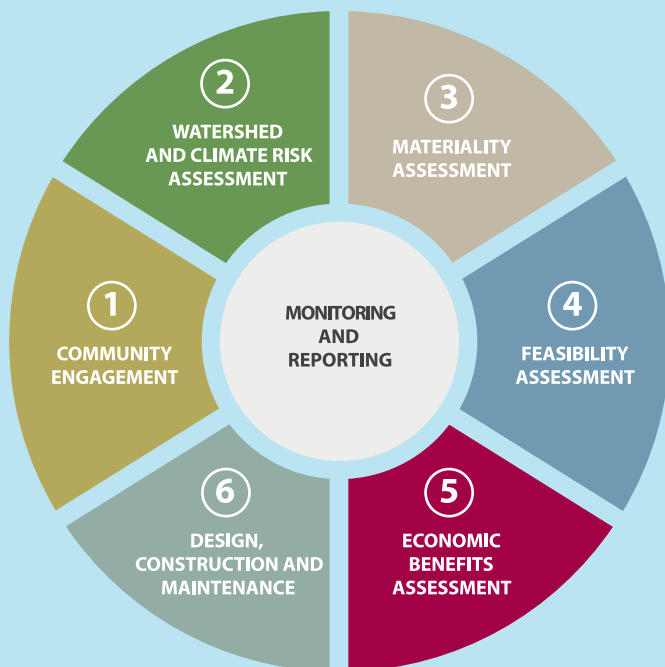
A restored and engineered wetland in Manitoba is valued at **\$3.7 million** for the flood reduction, water quality improvement, carbon sequestration and other benefits it provides.



DECISION-MAKERS NEED A FRAMEWORK FOR EVALUATING THE RETURN ON INVESTMENT (ROI) OF NATURAL INFRASTRUCTURE.

The framework provides an improved due diligence process for the assessment and implementation of natural infrastructure projects and adds economic rigour to the way in which costs and benefits are assessed. This framework outlines the necessary steps organizations can follow to:

1. Evaluate the business case of such investments
2. Confirm that the projects deliver the intended benefits.



A FINAL THOUGHT ON NATURAL INFRASTRUCTURE

Natural infrastructure offers valuable environmental and social benefits not typically attainable through grey infrastructure solutions. For example, while naturally occurring ponds provide stormwater storage capacity to minimize flooding, they also create habitat for aquatic species, improve biodiversity and beautify the community.

Source: Combatting Canada's Rising Flood Costs: Natural infrastructure is an underutilized option. Accessed at: ibc.ca

1

COMMUNITY ENGAGEMENT:

Public engagement is a key factor in determining if a natural or grey infrastructure project gets implemented.

2

WATERSHED AND CLIMATE RISK ASSESSMENT:

It is critical to assess the broad range of climate change and land use impacts on watersheds to understand key risks facing communities today and in the future (e.g., floods, drought, water quality issues and habitat loss).

3

MATERIALITY ASSESSMENT:

Materiality assessments involving key community stakeholders are required to prioritize the most pertinent watershed challenges and to direct the focus of potential natural and engineered infrastructure solutions towards those that can generate "multiple wins."

4

FEASIBILITY ASSESSMENT:

A feasibility analysis, which consists of assessing the technical, legal and regulatory, organizational, social and economic factors for implementing projects, can confirm which natural and/or built infrastructure projects best address the priority issues.

5

ECONOMIC BENEFITS ASSESSMENT:

A comprehensive assessment of the financial, environmental and social costs and benefits – a Total Economic Value (TEV) assessment – is required to compare and contrast natural infrastructure investments against traditional, engineered alternatives. TEV assessments help illuminate otherwise uncaptured benefits of natural infrastructure, which go over and beyond traditional, engineered solutions (e.g., habitat creation, biodiversity improvements and community aesthetics).

6

DESIGN, CONSTRUCTION AND MAINTENANCE:

To ensure that natural and built infrastructure projects are implemented on time and on budget, multiple considerations warrant attention, including the complexity of infrastructure design, construction length and extraneous impacts (e.g., weather-related project disruptions). Longer-term success of both natural and built infrastructure relies on regular operation and maintenance.

MONITORING AND REPORTING:

The use of natural infrastructure for climate adaptation is still a novel approach. Accordingly, the documentation, monitoring and reporting of the actual benefits versus the actual costs incurred from the time of project implementation is critical for further driving the "value for money" business case for natural infrastructure investments.

Natural infrastructure has a role to play in reducing flood damage. At the local community or watershed level, or as part of new models being developed to fund needed infrastructure, natural infrastructure deserves to be a part of every discussion on flood mitigation.