



BUILDING RESILIENCE: CANADA'S COASTAL ADAPTATION AND FLOOD MITIGATION CAPACITY



Flooding is a major global problem, particularly in coastal zones, along rivers and in urban areas. With the world's longest coastline and many urban settlements situated along coasts and rivers, Canada has developed world-class expertise in managing flood risk.

Climate change is expected to increase flood risk through sea level rise, more frequent coastal storms and more extreme precipitation, and there is an urgent need to build community resilience. Canadian firms have the expert knowledge and experience to design strategies to protect people, property and infrastructure from climate change and flood risks, as proven through their projects in countries around the world.

CANADA'S AREAS OF STRENGTH IN COASTAL ADAPTATION AND FLOOD RISK MITIGATION



INDUSTRY LEADING MULTI-HAZARD RISK ASSESSMENT AND ANALYSIS



ADAPTATION PROGRAM MONITORING AND EVALUATION



COLLABORATION WITH LOCAL PARTNERS THAT IS MINDFUL OF LOCAL CULTURE, HERITAGE AND ECONOMIC CONDITIONS



TRANSPARENT ACCESS TO DATA AND INFORMATION



CAPACITY BUILDING AND TECHNICAL TRAINING FOR LOCAL EXPERTS



ONLINE DECISION SUPPORT SYSTEMS FOR FLOOD RISK MANAGEMENT



CLIMATE CHANGE IMPACT AND ADAPTATION MONITORING SYSTEMS



GIS-BASED HAZARD INFORMATION AND MAPPING



AWARD-WINNING TECHNOLOGY INCLUDING ORIGINAL MONITORING AND FORECASTING TOOLS



EVIDENCE-BASED, REPLICABLE AND AUDITABLE ADAPTATION SOLUTIONS



Canadian companies are renowned for their unique capabilities in blending technical tools, such as risk assessment, forecasting and decision support, with local capacity building, stakeholder engagement and collaboration. Ethical practices, along with on-time and on-budget delivery, are hallmarks of the Canadian advantage and readily transfer to projects in international markets.

**COASTAL
ADAPTATION AND
FLOOD MITIGATION
CAPACITY**

Take advantage of Canada's expertise in developing resilient, cost-effective and sustainable infrastructure, tailored to your market.

The Canadian advantage: good governance, fairness and transparency, innovation in climate adaptation, leveraging local skills and capabilities, technology transfer, financial stability, project-delivery efficiencies, and value for money.

CANADIAN SUCCESSES AROUND THE WORLD



Dillon Consulting: Designing comprehensive solutions for flood risk reduction for Saint Lucia

When Hurricane Thomas caused severe flooding in the Cul-de-Sac River basin in 2010, the Government of Saint Lucia turned to Dillon Consulting for solutions. Dillon evaluated the watershed's climatic, hydrologic and hydraulic conditions; developed flood risk mapping; and designed structural and non-structural flood risk mitigation works. Dillon engaged with stakeholders, recommended ways to build resilience to severe flooding and provided technology transfer training. Dillon's team includes experts in water engineering, environmental management, community development, and public and private institutional capacity building. Dillon recently completed the National Physical Develop Plan for Dominica and is working on the same plan for the British Virgin Islands. Both plans involve coastal management and climate change. The firm has experience working in Asia, South America, Africa, Europe, Central America and the Caribbean. > dillon.ca



Baird: Combatting coastline erosion in Keta, Ghana, through sea defences, a coastal highway and 800 hectares of reclaimed beach lands

In this US\$100 million project, Baird developed a permanent solution to shoreline erosion threatening the community of Keta, Ghana, while protecting homes, strengthening infrastructure and reclaiming environmentally sensitive beach lands. Baird spearheaded all aspects of the project, including planning, analysis, conceptual and final design, site management and coordination. Through an extensive analysis of physical site conditions, a detailed shoreline analysis and a full geotechnical and geologic investigation, Baird designed robust solutions to mitigate the risk of storm surge and flooding. Baird is a global leader in innovative coastal and river engineering solutions with over 35 years of proven experience on some of the most challenging coastal adaptation projects. > baird.com

Canada's coastal adaptation and flood mitigation sector is ready to provide complete solutions.

Canada is home to established industry leaders and practitioners with proven track records in delivering coastal adaptation and flood mitigation solutions. Canadian companies are equipped to deliver innovative solutions to adaptation and flood mitigation in markets around the world.

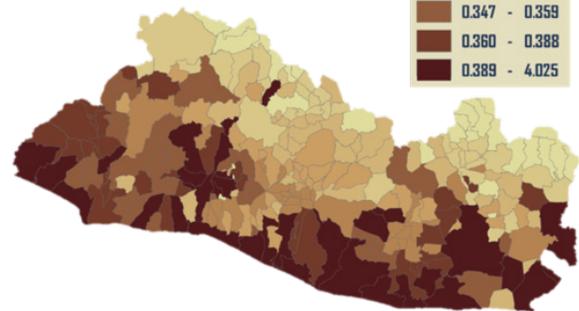
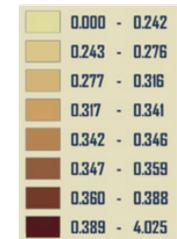
ESSA Technologies: Strengthening El Salvador's disaster preparedness, emergency response and climate resilience

El Salvador is highly susceptible to climate change and disaster risks, including severe storms, floods and landslides. Nearly 28% of its coastal zone will be lost to rising seas by 2100. From 2015–2017, ESSA worked with private sector partners and the Ministry of Environment and Natural Resources to integrate climate-resilient, low-carbon solutions into the national environmental impact assessment process. ESSA also prepared a national, multi-hazard study on infrastructure vulnerability, modelling almost 100 different hazard scenarios. The result was a comprehensive “hazard atlas” and estimates of financial risk to guide land use planning and development decisions. ESSA shared its expertise in climate action planning, capacity building and development training, hazard assessment and modelling, GIS analysis, science communication and knowledge synthesis. > essa.com

Multi-hazard Risk



AAL as % of Total Stock



Hatch: Developing world-class tools to reduce life-threatening flood risks in remote Indigenous communities

Kashechewan First Nation is prone to severe flooding that can engulf the community within minutes. To mitigate risk, Hatch worked with the Kashechewan community to develop two forecasting tools. The first is an innovative framework to evaluate the likelihood of dam failure. The second engages local traditional knowledge to produce a reliable 10-day forecast of ice-jam flooding. Hatch's work in Kashechewan earned the 2018 Award of Excellence from the Association of Consulting Engineering Companies of Canada.

Internationally, Hatch delivers an array of technical and strategic climate change-related risk and flood mitigation services. A recent project assessed flood risk and dam safety in Guinea, which identified protection measures for a downstream community of 148 people. > hatch.com



COMPETITIVE ADAPTATION AND FLOOD MITIGATION SOLUTIONS FROM CANADA

DESIGN & CONSULTANCY

- > **Arcadis**
arcadis.com
- > **Baird**
baird.com
- > **Northwest Hydraulic Consultants**
nhcweb.com
- > **R.J. Burnside International Ltd.**
rjburnside.com
- > **CBCL Ltd.**
cbcl.ca
- > **C-Core**
c-core.ca
- > **Cowater Sogema**
cowatersogema.com
- > **Dillon Consulting**
dillon.ca

- > **Ebbwater Consulting**
ebbwater.ca
- > **Engconsult Ltd.**
eng-consult.com
- > **ESSA Technologies**
essa.com
- > **Golder Associates**
golder.com
- > **Greenland Group of Companies**
grnland.com
- > **Hatch Ltd.**
hatch.com
- > **Hatfield Group**
hatfieldgroup.com
- > **Hemmera**
hemmera.com
- > **Norda Stelo**
norda.com

- > **Stantec**
stantec.com
 - > **Southern Harbour Consulting**
southernharbour.net
 - > **Source2Source**
source2source.ca
 - > **Wood Group**
woodgroup.com
- POLICY, GOVERNANCE & CAPACITY BUILDING**
- > **Baastel**
baastel.com
 - > **DE Design and Environment**
design-environment.com
 - > **Fokabs Inc.**
fokabs.com

- > **Okapi Environmental Consulting**
okapiconsulting.ca
- > **WaterSMART**
watersmartsolutions.ca

TECHNOLOGY & SOFTWARE

- > **Canadian Floating Fence Corporation**
canadianfloatingfence.biz
- > **Oneka Technologies**
onekawater.com
- > **Risk Nexus**
risknexus.com
- > **RiskLogik**
risklogik.com

REASONS TO DO BUSINESS WITH CANADA



ON TIME, ON BUDGET AND ETHICAL PROJECT DELIVERY



DIVERSE INTERNATIONAL EXPERTISE



SERVING DIVERSE INTERNATIONAL CLIENTS



AT FOREFRONT OF CURRENT TECHNOLOGIES AND PROCESSES



HIGHLY SKILLED AND DIVERSE WORKFORCE



HOLISTIC AND SUSTAINABLE SOLUTIONS FROM DESIGN TO IMPLEMENTATION



WORLD-CLASS CENTRES OF EXCELLENCE

CANADIAN ASSOCIATIONS AND INSTITUTIONS



Canadian Institute of Marine Engineering (CIMarE)

> www.cimare.ca



ASSOCIATION OF CONSULTING ENGINEERING COMPANIES | CANADA
ASSOCIATION DES FIRMES DE GÉNIE-CONSEIL | CANADA

Association of Consulting Engineers Companies of Canada (ACEC)

> www.acec.ca



Marine Environmental Observation, Prediction and Response Network

> www.meopar.ca



Ouranos

> www.ouranos.ca



Institut international du développement durable

> www.iisd.org



Fisheries and Marine Institute of Memorial University of Newfoundland

> www.mi.mun.ca



Global Institute for Water Security

> www.usask.ca/water

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www.tradecommissioner.gc.ca