

# JBA CANADA 30m FLOOD DATA EXECUTIVE BRIEFING.

JBA's Canada Flood Map and Pricing Data were the first to offer national coverage for all major flood types at 30m resolution. Use of the best available terrain dataset and Canada-specific local hydrological data enable insurers to reliably assess and quantify fluvial, pluvial and storm surge flood risks.<sup>1</sup> The maps and pricing data can be used for indicative property-level flood assessment for insurance risk selection, pricing and underwriting; portfolio management and optimisation; and land use planning by governments and disaster risk reduction schemes.

## Background

JBA estimates that over 10 million people, almost a third of the population, will be exposed to inland flood risk by 2020 in Canada. A study from Natural Resources Canada further concludes that the frequency and magnitude of storm surge flooding is set to increase in the future.<sup>2</sup> As a result, it is critical to include flooding from all three major flood types (storm surge, pluvial and fluvial) in flood risk assessments to better understand the risk. Comprehensive, national-scale flood maps are key to managing and properly insuring this risk to mitigate the impact of flood in the future.

**Pictured below**  
30m flood map  
extents for the  
100-year return  
period, Toronto,  
Canada (fluvial).



## HIGHLIGHTS.

**First national coverage maps  
for all major flood types provide  
comprehensive view of flood**

**Informed risk selection for  
underwriting and risk pricing**

**Portfolio accumulation  
management and diversification**

As the global leader in flood risk management, we continually invest in the development of maps and models to bring the latest science and data to the forefront of flood risk management practices.

## National coverage maps provide comprehensive view of flood

JBA's Canada Flood Map is the most widely used map in the Canadian (re)insurance market, providing comprehensive coverage for fluvial, pluvial and storm surge flooding. The whole population is captured to enable flood assessment at any location in the country.

The Canada Flood Map is developed using JBA's national hydrological study. In collaboration with the University of Waterloo, this study is the first of its kind to be carried out in Canada and a significant step towards defining national standards for flood mapping. The peer-reviewed mapping methodologies are based on observed river gauge, rainfall and snowmelt data to reflect unique local factors influencing flood, enabling the best estimation of flood in each region and a realistic view of the risk.

Fluvial, pluvial and storm surge flood each behave in different ways and have different impacts on risk.

<sup>1</sup> Faulkner, D., Warren, S. and Burn, D. (2016) "Design floods for all of Canada", *Canadian Water Resources Journal*, Vol 41

<sup>2</sup> Lemmen, D.S., Warren, F.J., James, T.S. and Mercer Clarke, C.S.L. editors (2016): *Canada's Marine Coasts in a Changing Climate*; Government of Canada, Ottawa, ON, 274p.

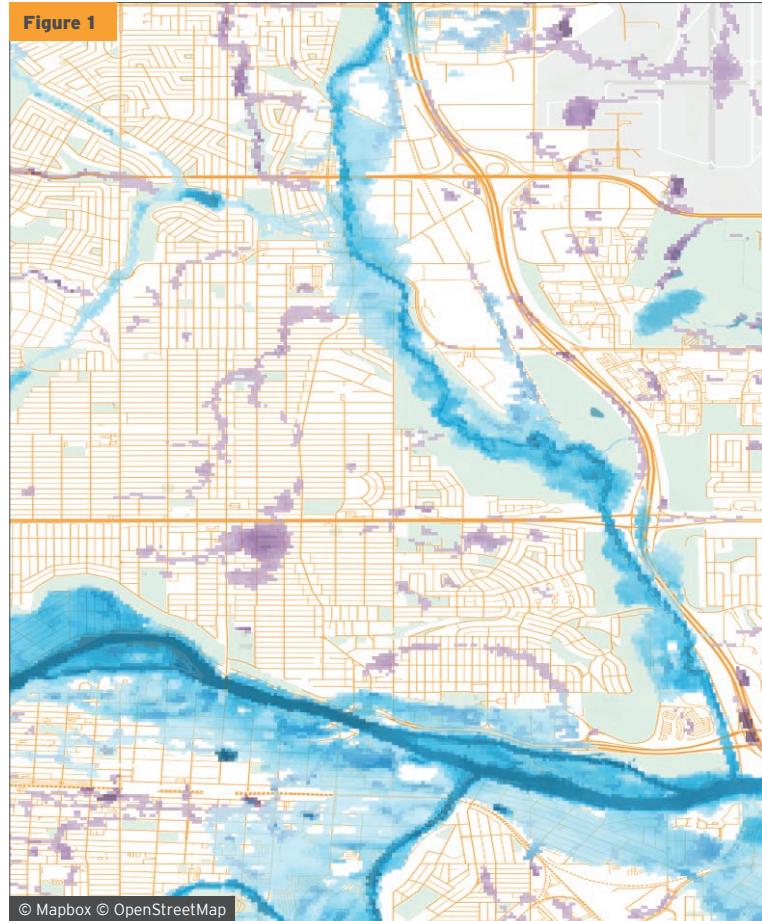
**Figure 1**  
30m flood map extents for the 100-year return period, Alberta, Canada. River flood (blue) and surface water flood (purple).

These three flood types are explicitly modelled by our experienced hydraulic modellers, providing an opportunity to consider each type of flooding separately in the risk assessment process and identify which flood type may be the driver of loss in each location.

Our Canada Flood Map is the first to provide extensive storm surge coverage in order to capture the significant impact of this flood type, as seen in past events. For example, the 1976 Groundhog Day winter storm caused tens of millions of dollars of damage on the coast in New Brunswick and Nova Scotia, demonstrating the need to include storm surge when considering flood risk in Canada.

## Informed risk selection and pricing for underwriting

Developed using JBA's 30m Canada Flood Map, our Canada pricing data provides an annual cost of flooding to achieve an indicative property-level flood assessment, aiding risk selection and pricing decisions. Pricing data is provided as annual damage ratios by flood type, coverage and building construction. Flood data is analysed using a variable resolution grid system, with finer analysis cells in



cities, towns and rural communities. This granularity enables an understanding of how flood risk can change from one location to the next to implement more profitable risk-reflective pricing strategies.

The river flood map is complemented by flood defence data based on a variety of sources, including information from national agencies and credible local knowledge where available to JBA. The dataset delineates areas protected by flood defences and provides the standard of protection (expressed as a return period) associated with each.

The combination of flood map and defence data enables users to decide how to consider flood defences based on their own risk appetite, by choosing whether to incorporate none, some, or all of the defended areas for their risk assessment. Pricing data is available with or without the ability to consider river defences on the annual cost of flood.

## Portfolio accumulation management and diversification

JBA's Canada Flood Map is available for a range of return periods, from 20 to 1,500 years. This enables

## MAP FEATURES.

### 30m resolution mapping

### Fluvial, pluvial and storm surge flooding

### Flood extents and depths

### Expected annualised cost of flood

### 7 return periods

### Defended and undefended view of risk

### Impact of snowmelt captured

users to perform analysis against a range of flood severities, from low to extreme, for the development of a more detailed risk profile.

The maps are also beneficial for accumulation assessment, allowing the user to make informed decisions at the point of underwriting as to the make-up and diversification of their portfolio in a given location, influencing long-term portfolio profitability.

When used in conjunction with our Canada Flood Event Set, you can identify which locations may flood simultaneously and the variations in event frequency across different locations.

The combination of maps, pricing data and event set can help to improve long-term profitability through effective portfolio planning and diversification.

### Data access

To enable easy integration into pre-existing systems, we provide flood maps and pricing data in a range of formats either directly from JBA or via our network of resellers. We also offer consultancy opportunities to help you identify exposure hotspots, run

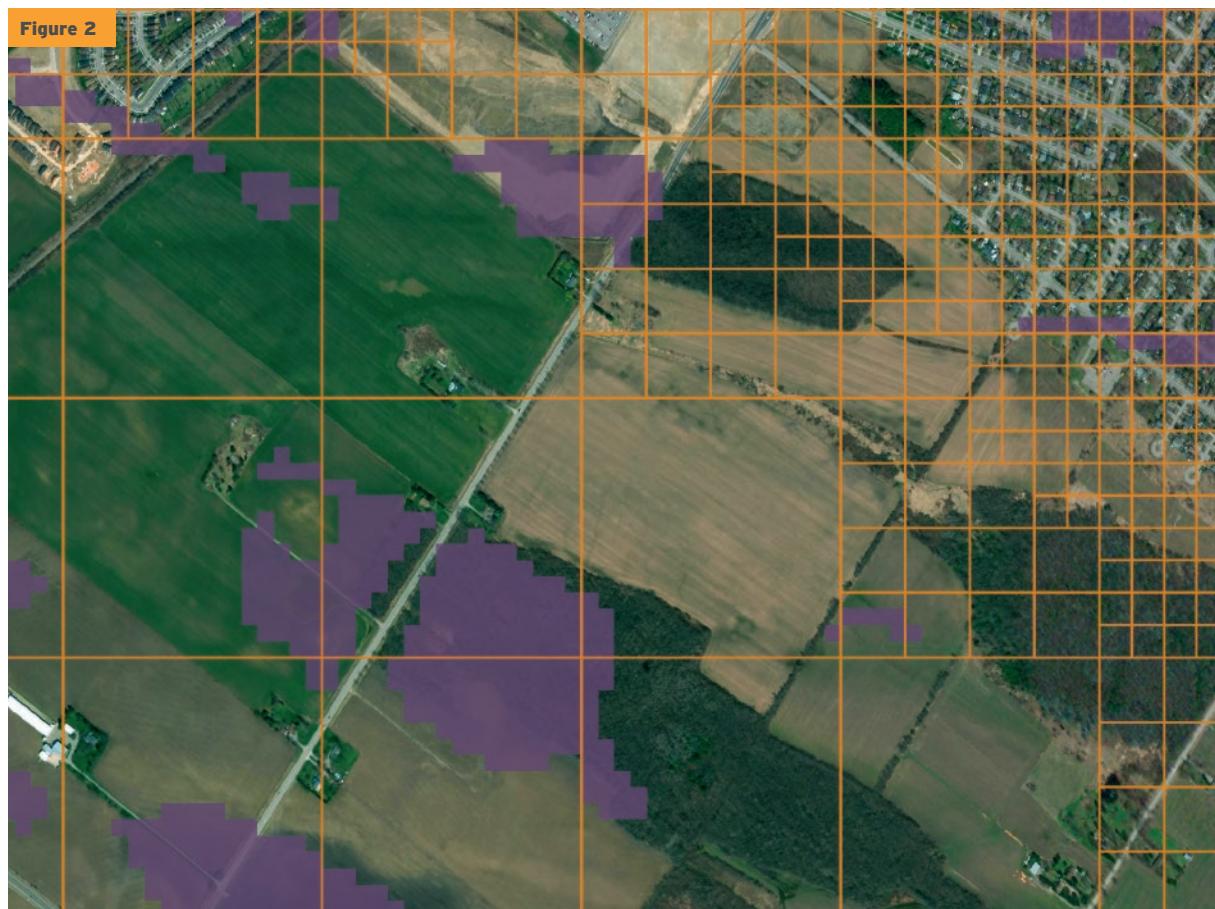
bespoke flood risk assessments and manage your accumulations.

### About JBA Risk Management Limited

Established in 2011, we are a global leader in flood risk management. Affectionately known as The Flood People, our flood maps, catastrophe models and analytics are used by some of the world's largest insurers, reinsurers, financial institutions, property companies and governments. We're experts in translating complex, scientific data into useful information, using sophisticated hydraulic approaches and models to provide cutting-edge flood risk intelligence.

As part of the JBA group, established over 20 years ago, we work closely with leading academic institutions in the field of flood risk. We also support our independent charity, JBA Trust, which enables research, education and training in the water environment sector.

Our commitment to continuous improvement and detailed research and development is what makes us the number one choice for many insurers, reinsurers, financial institutions and governments.



**Figure 2**  
Canada variable resolution grid used in pricing data analysis. Smaller analysis cells are used in urban areas, with larger cells in less populated areas, to enable risk-reflective pricing at property-level.

# GLOBAL LEADERS IN FLOOD RISK MANAGEMENT.

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