

# IBC's New Flood Maps - Leveraging data to effectively assess and manage flood risk

## Speakers:

- **Lapo Calamai** - Director, Catastrophe Risk and Economic Analysis, IBC
- **Simon de la Hoyde** - Head of Sales, Insurance, UK, Ireland and Canada, LexisNexis Risk Solutions
- **Richard Toomey** - Manager, GIS Analytics, Insurance, LexisNexis Risk Solutions
- **Dermot McNally** - Product Champion, Insurance, LexisNexis Risk Solutions
- **Helen Smith** - JBA Risk Management

# Agenda

- **Overview of the work LexisNexis and IBC have been doing**
  - **Simon de la Hoyde** - Head of Sales, Insurance, UK, Ireland and Canada, LexisNexis Risk Solutions
- **Key findings from the research**
  - **Richard Toomey** - Manager, GIS Analytics, Insurance, LexisNexis Risk Solutions
- **Best practices for using the data in pricing and underwriting**
  - **Dermot McNally** - Product Champion, Insurance, LexisNexis Risk Solutions
- **JBA flood models and mapping methodology**
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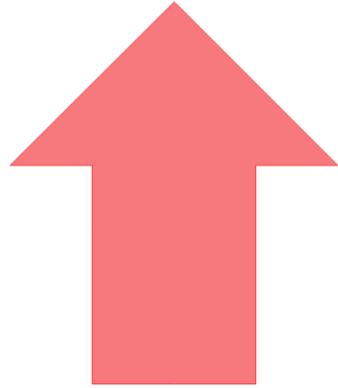
## Overview

- In 2015, IBC selected LexisNexis as lead vendor to manage its national flood program initiative
- Leverage LexisNexis® **Map View risk assessment and exposure management** platform
  - Extensive experience working with insurers in the UK, Ireland, Europe, US and Canada
- A key component of this initiative is the creation of all **new pluvial and fluvial flood maps for Canada** produced by JBA Risk Management

## Key Goals of the Program

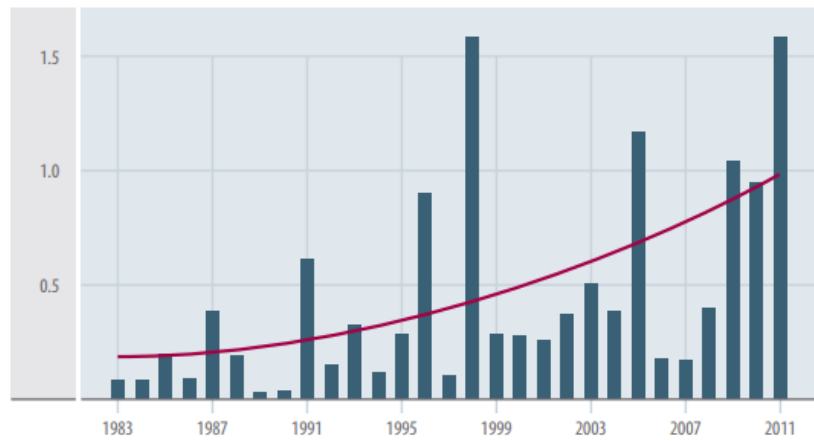
- **Quantify the extent of flood risk** and exposure across Canada
- Identify the number of properties at risk of flooding and the associated economic losses for any geography in Canada
- Identify **exposure hotspots**
- allow IBC to perform **sensitivity testing** of flood exposure and potential losses based on various **scenario analyses**

# The driving forces in the Canadian market



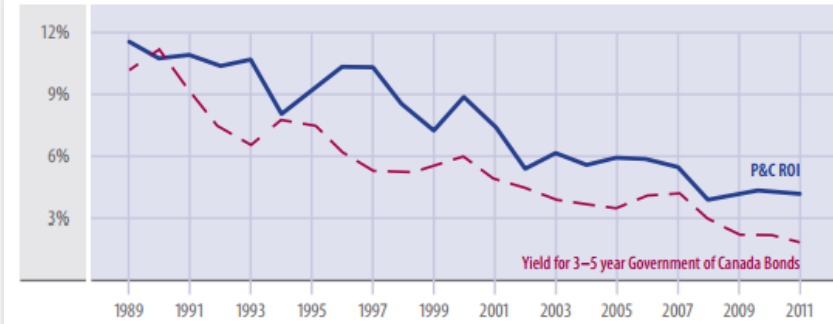
**Cat Losses**

Catastrophic losses in Canada in \$000,000,000, 1983 to 2011, and trend

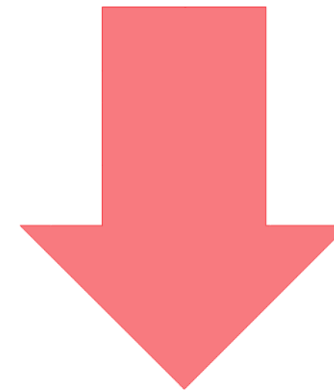


Source: IBC, PCS-Canada, Swiss Re, Munich Re, Deloitte

Return on investment compared with Government of Canada bond yield, 1989 to 2011

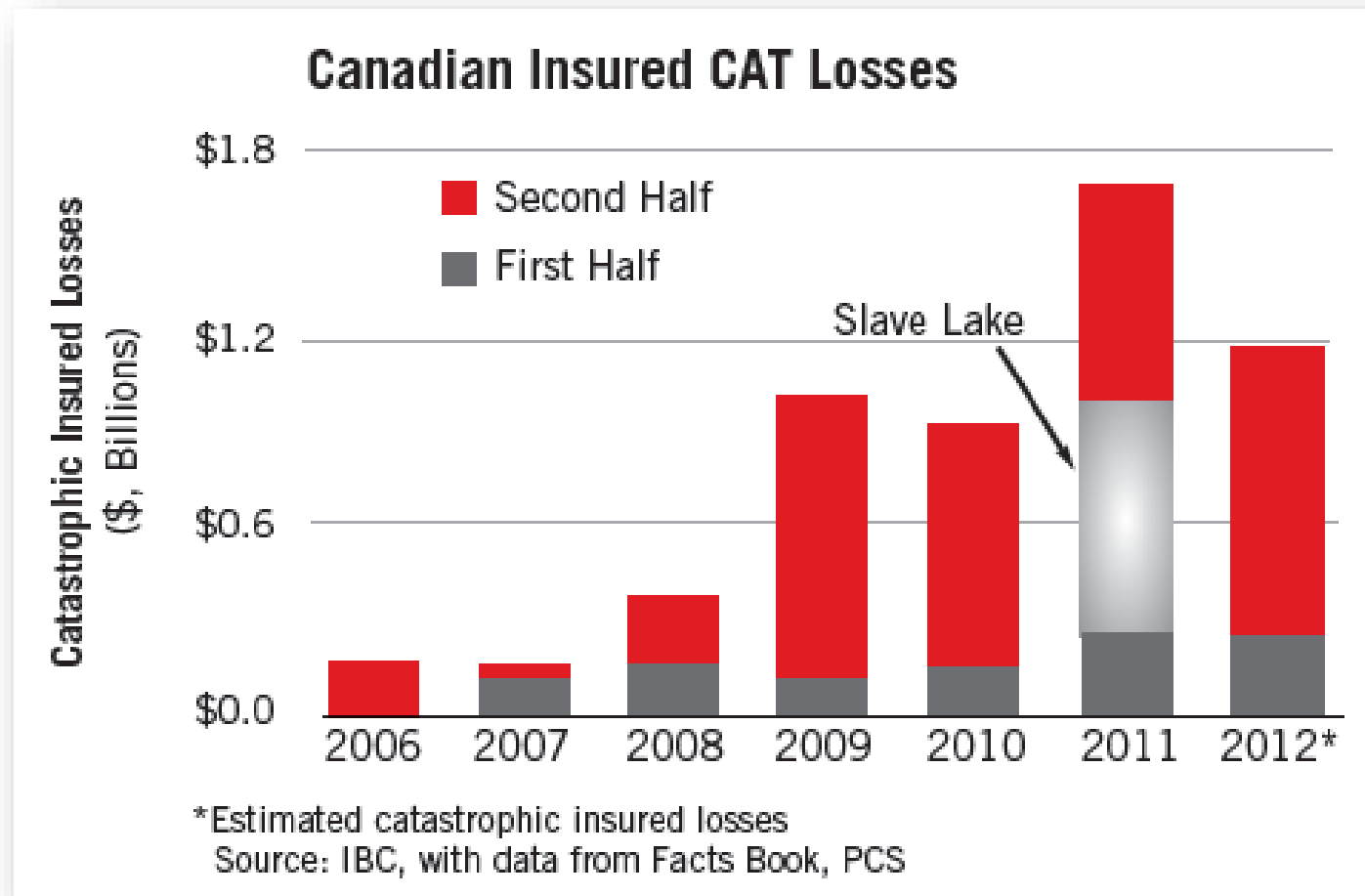


Source: IBC, MSA, Bank of Canada



**Investment Returns**

# Canadian Insured Cat Losses

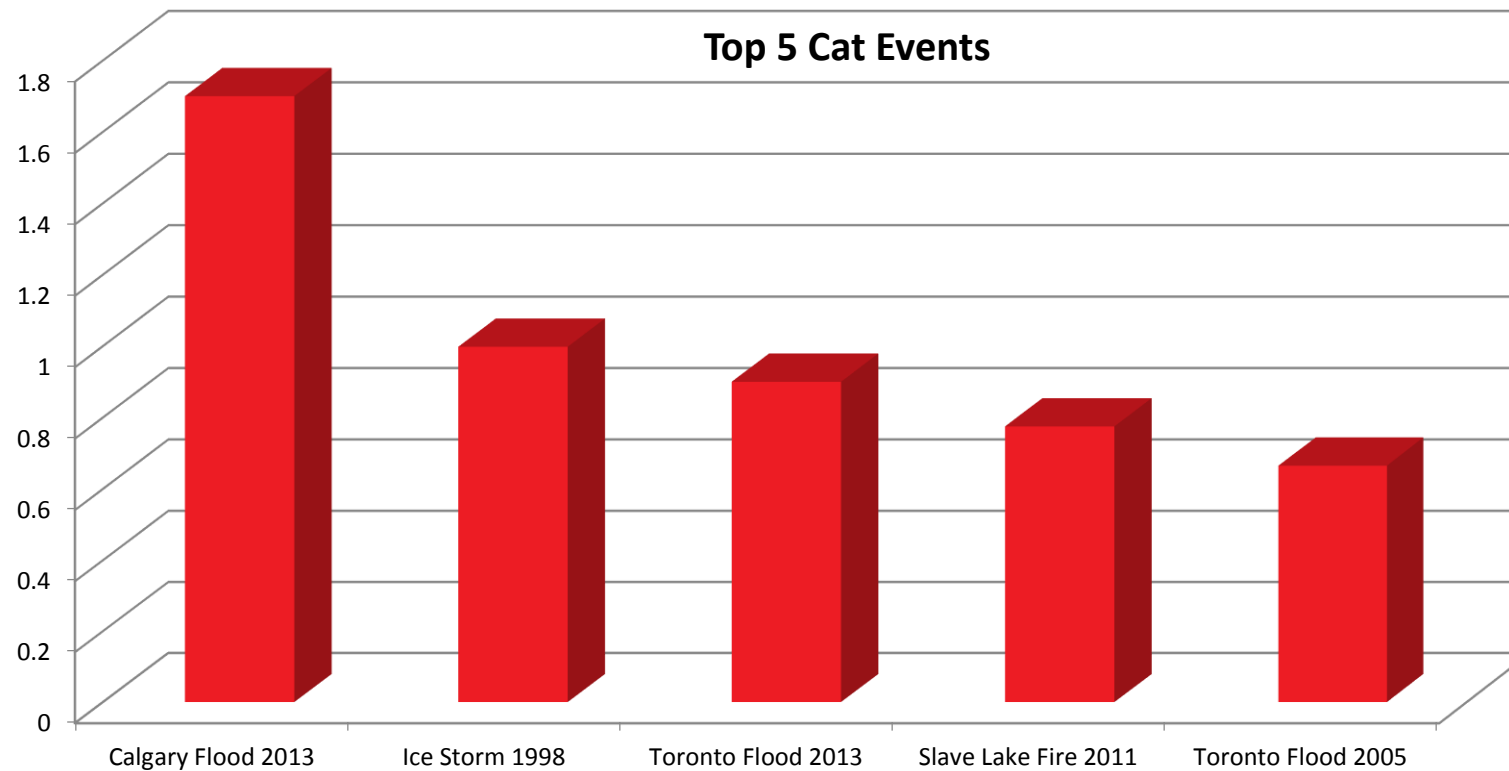


- Across Canada, insured damages from extreme weather events have cost almost **\$8 billion since 2010**.
- This is only a portion of the total economic costs to the country.

**2013 was a record year for cat loss with total insured losses at 3.2B**

# Water now the #1 peril, accounting for 50% of all claims

**\$22 Billion in flood damage across Canada in the past 10 yrs**





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# Data Gathering

	A	B	C	D	E	F	G	H	I	J	K	L
	Municipalities	Open/Closed	LIDAR	DTM/DEM	Aerial Imagery	Sewer Infrastructure	Built Environment	Landcover	Hydrometric	Rainfall	Snow/Ice	Historic events
1												
2	Toronto	closed	n	y	y	y	y	n	n	n	n	n
3	Montréal	closed	n	y	y	n	y	y	n	n	n	n
4	Calgary	open/IBC	y	y	y	y	y	y	y	y	n	y
5	Ottawa	open	n	n	n	n	y	n	n	n	n	n
6	Edmonton	closed	n	n	y	n	y	n	n	y	n	n
7	Mississauga	closed	n	y	y	y	n	y	n	n	n	n
8	Winnipeg	open	n	n	y	n	y	y	n	n	n	n
9	Vancouver	open	y	y	y	y	y	n	n	n	n	n
10	Brampton	closed	n	y	y	y	n	y	n	n	n	n
11	Hamilton	closed	n	y	y	y	y	y	n	n	n	n
12	Québec	open/IBC	y	y	y	n	n	n	n	n	n	n
13	Surrey	closed	y	y	y	y	y	y	n	n	n	n
14	Laval	open/IBC	n	n	n	n	n	n	n	n	n	n
15	Halifax	closed	y	y	n	n	y	y	n	n	n	n
16	London	closed	n	y	y	y	y	y	n	n	n	n
17	Markham	closed	n	y	y	y	n	n	n	n	n	n
18	Vaughan	open/IBC	n	y	n	n	n	n	n	n	n	n
19	Gatineau	open	y	y	n	n	n	n	n	n	n	n
20	Longueuil	open	n	y	n	n	n	n	n	n	n	n
21	Burnaby	closed	y	y	y*	y*	y*	n	n	n	n	n
22	Saskatoon	closed	n	y	y	y	y	y	n	n	n	n
23	Kitchener	open	n	n	n	n	n	n	n	n	n	n
24	Windsor	open/IBC	n	n	n	n	n	y	n	n	n	n
25	Regina	closed	n	y	y	y	y	y	n	n	n	n
26	Richmond	closed	n	y	y	y	y	n	n	n	n	n
27	Richmond Hill	closed	y	y	y	y	y	n	n	n	n	n
28	Oakville	closed	n	y	n	n	y	y	n	n	n	n
29	Burlington	open/IBC	n	n	n	y	n	y	n	n	n	n
30	Greater Sudbury	open/IBC	n	n	y	n	n	n	n	n	n	n
31	Sherbrooke	open/IBC	n	y	n	n	y	y	y	y	n	n
32	Oshawa	open/IBC	n	n	n	n	n	n	n	n	n	n
33	Saguenay	closed	y	y	y	n	n	n	n	n	n	n
34	Lévis	closed	y	y	y	y	y	y	n	n	n	n
35	Barrie	open	n	y	n	y	n	n	n	n	n	n
36	Abbotsford	closed	y	n	n	y	n	n	n	n	n	n

## Specific Data Types

- Terrain data (higher resolution the better)
- Hydrometric Data
- Snow cover
- Rainfall data
- Flood Defences outlines
- Historical Flood data
- Landcover

# Output

## **Flood Models:**

- River (Fluvial) Model
- Surface Water (Pluvial) Model
- Combined Model

## **Return Periods:**

- 1:20 year
- 1:50 year
- 1: 75 year
- 1:100 year
- 1: 200 year
- 1:500 year
- 1: 1500 year

## **ADR: Annual Damage Ratio**

- Property level version
- VRG version
- ADR Defended and undefended view

## **Confidence Layer:**

- Layer denoting the level of accuracy in the data in a particular area.

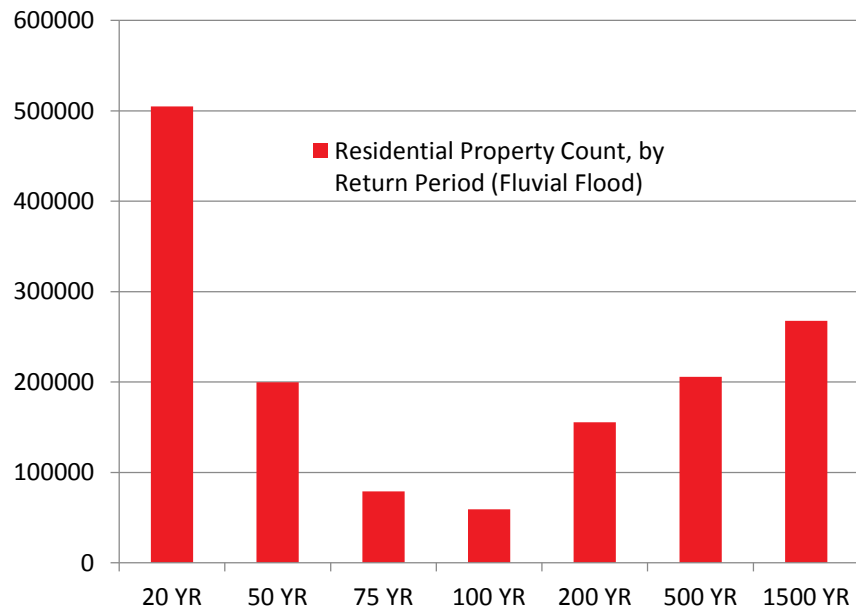
## **Defended Layer:**

- Layer denoting where there is a defence

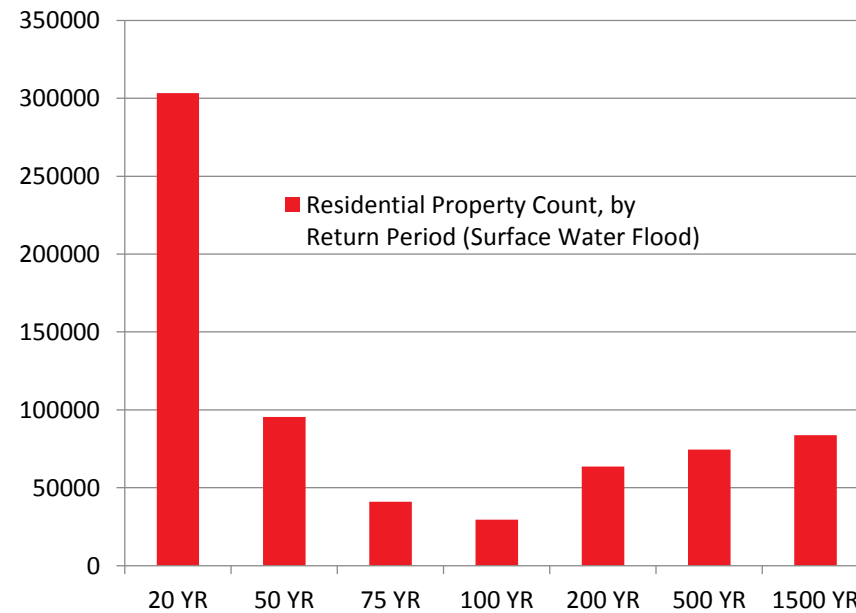
# Property Counts

- 8.6m residential addresses in Canada
- 1.8m susceptible to some level of flood according to JBA flood models.
- 2.1m covered by some type of flood defense.

## Residential Property Count, by Return Period (Fluvial Flood)



## Residential Property Count, by Return Period (Surface Water Flood)



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# Map View Platform Objective

- **Act as a hub for all of this data**
  - Active Policy/Risk data
  - Quote/what-if data
  - Peril data sets
  - Points Of Interest (Fire stations, key hazard locations etc.)
- **Provides required geospatial processing capabilities**
  - Geocoding: finds the spatial position of a specified address
  - Distance calculation
  - Point-in-polygon (for peril scoring and other purposes)
  - Accumulation calculations
  - On-map visualisation
  - Interactive selection tools, shape drawing
- **Deliver this optimised for the Insurance industry**
  - Follow industry process
  - Used directly by Insurance professional
  - Workflow and tools unconstrained by traditional GIS approach

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