



Adapting the Hazus Flood model for use in Canada

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History

- Hazus-MH released in 2003
- FEMA (USA) and NRCCan (Canada) sign a Cooperative Research and Development Agreement (CRADA) in 2011 at the 5th Annual Hazus User Conference, Seattle, WA

History

- Hazus Shell and Earthquake model adapted for Canada in 2012
- Hazus Flood model adaptation for Canada started in 2013; anticipated completion end of 2013 or early 2014

Similarities

- Canada and contiguous USA share a 3,987 mile border, while the Alaska-Canada border is 1,538 miles long
- The Five Great Lakes are spanning over 750 miles
- Pop quiz: can you name them?

Similarities

- A: Superior, Michigan, Huron, Erie, and Ontario; contain 21% of World's and 84% Continent's surface fresh water
- A number of watersheds straddle the World's longest border, requiring cooperation on multiple levels

Similarities

- Building code along the border
- Type of construction along the border
- Cadastral nomenclature
- UTM zones

Differences

- As of time of this presentation, lack of provincial, territorial hydrologic region regression equations and spatial data for discharge determination of ungaged streams
- No free, RESTful access to 3m, 10m, 30m DEM like USGS' NED

Differences

- No NFIP in Canada, thus no community FIRM enrollment, respectively PreFIRM and PostFIRM are irrelevant
- Current building inventory exposure pertains only to Residential General Occupancy

Hazus Flood Canada

- The scope of the Adaptation of Hazus Flood model in Canada is to allow use of the same robust Hazus-MH risk assessment methodology while acknowledging the differences of the data available in USA and Canada

Hazus Flood Canada

- The Adaptation Hazus Flood model for Canada
 - excludes the use of Level 1 H&H processing;
 - provides only the RES data;
 - puts the onus on data gathering and maintenance on the individual provinces and territories

Hazus Flood Canada

- Currently in beta; Example: 200 year inundation of Seymour



Hazus Flood Canada

- Seymour was aggregated by 3 CTs 59015011101, 59015011102, 59015011103, and utilizes the same administrative (CT) nomenclature and (2006) data as the original Hazus Canada produced by Atkins in 2011 that included the Earthquake model only.

Hazus Flood Canada

- Seymour Building Inventory

Dollar Exposure

By Occupancy By Building Type

Table Type: General Occupancy Type Greater Vancouver, BC [590] Building

☒ Show Scenario Census Blocks:

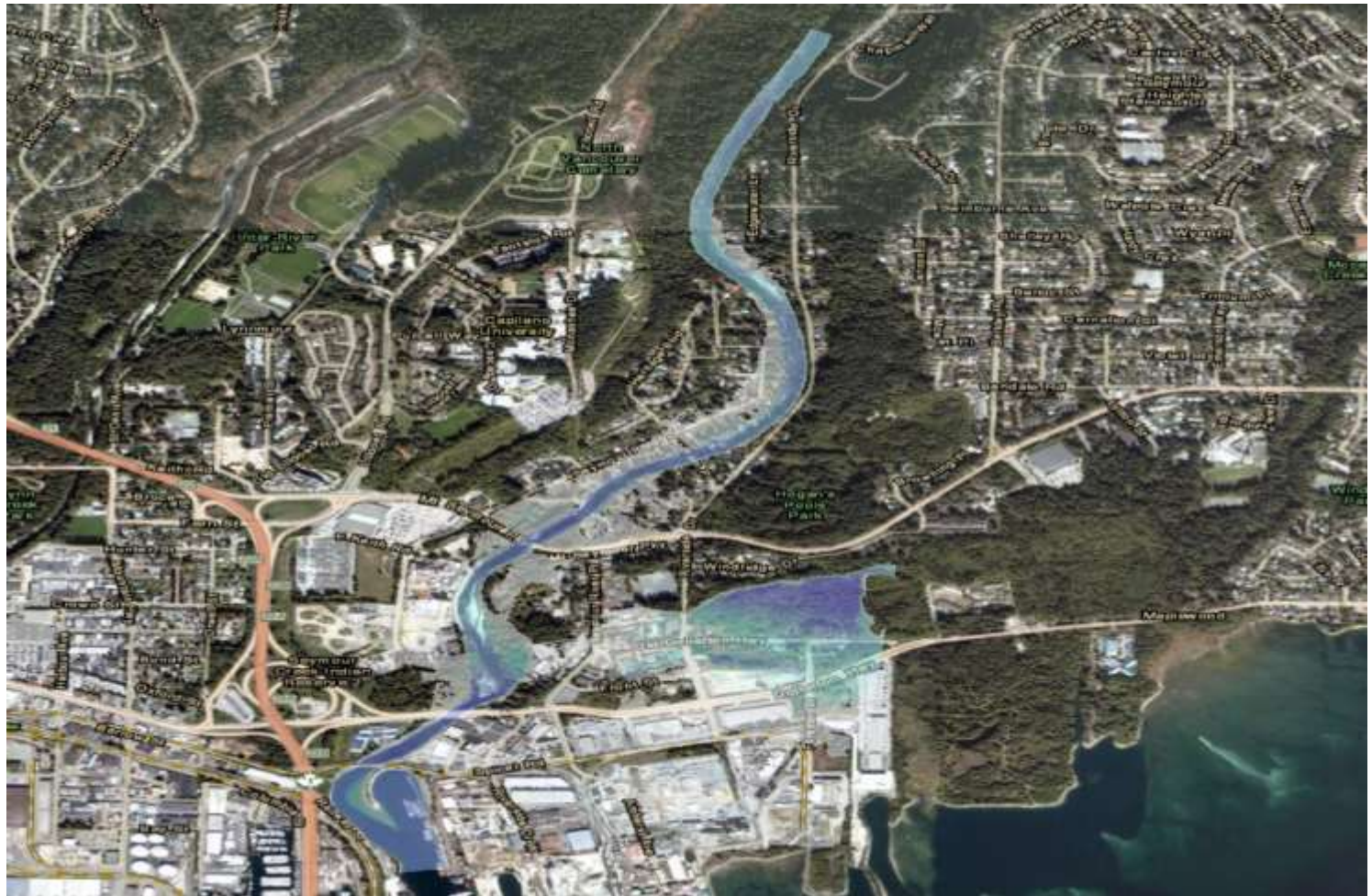
	CensusBlock	TotalExposure	Residential	Commercial	Industrial	Agriculture
1	590150111010213	20949	20949	0	0	0
2	590150111010220	25575	25575	0	0	0
3	590150111010221	52132	52132	0	0	0
4	590150111020228	71152	71152	0	0	0
5	590150111030570	55480	55480	0	0	0
6	590150111030573	28141	28141	0	0	0
7	590150111030574	3606	3606	0	0	0
8	590150111030576	23525	23525	0	0	0
9	590150111030577	0	0	0	0	0

Close Map Print

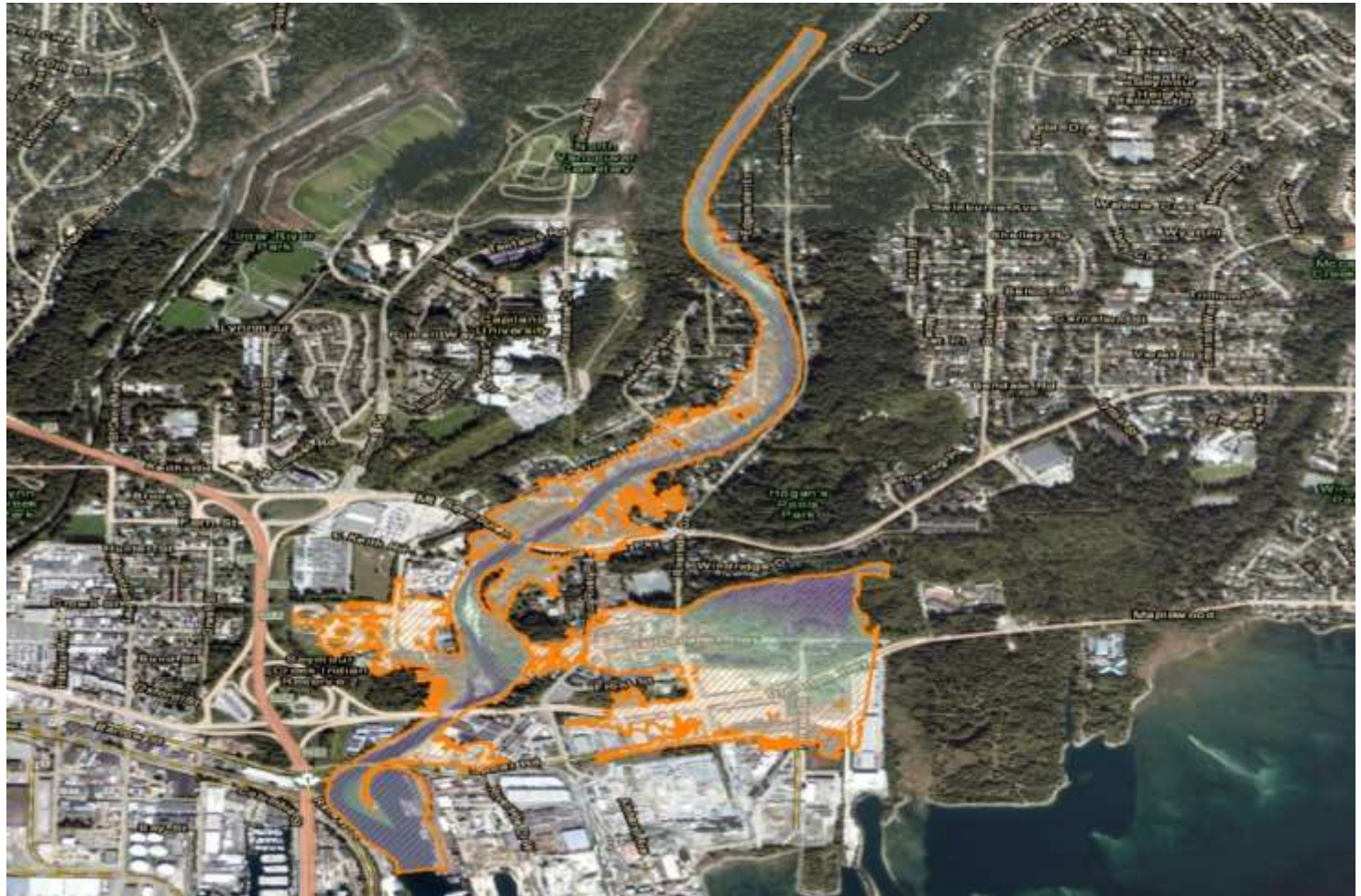


Hazus Flood Canada

- Seymour Hazard depths up to 6.5m

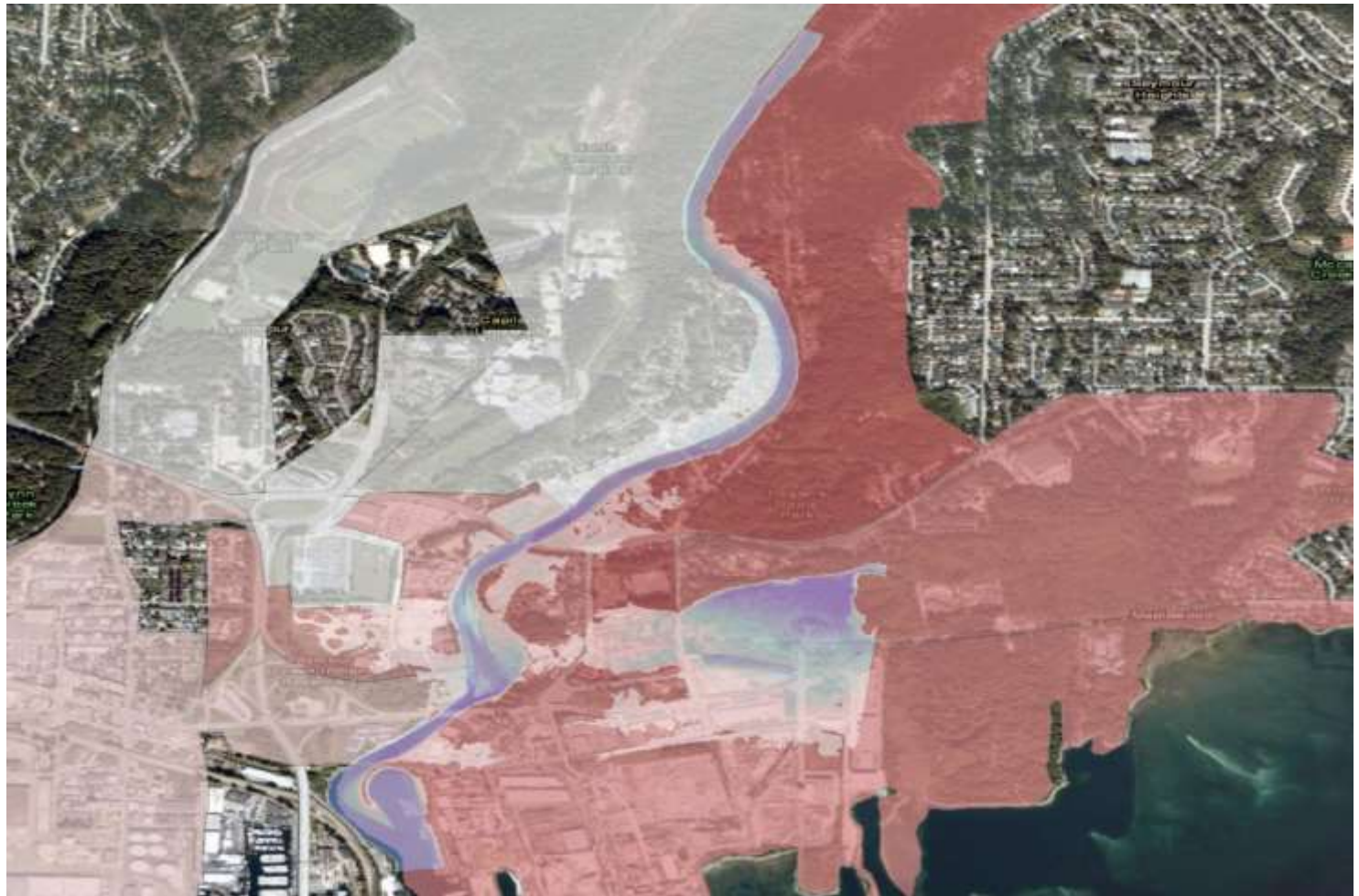


- Seymour Floodplain in orange

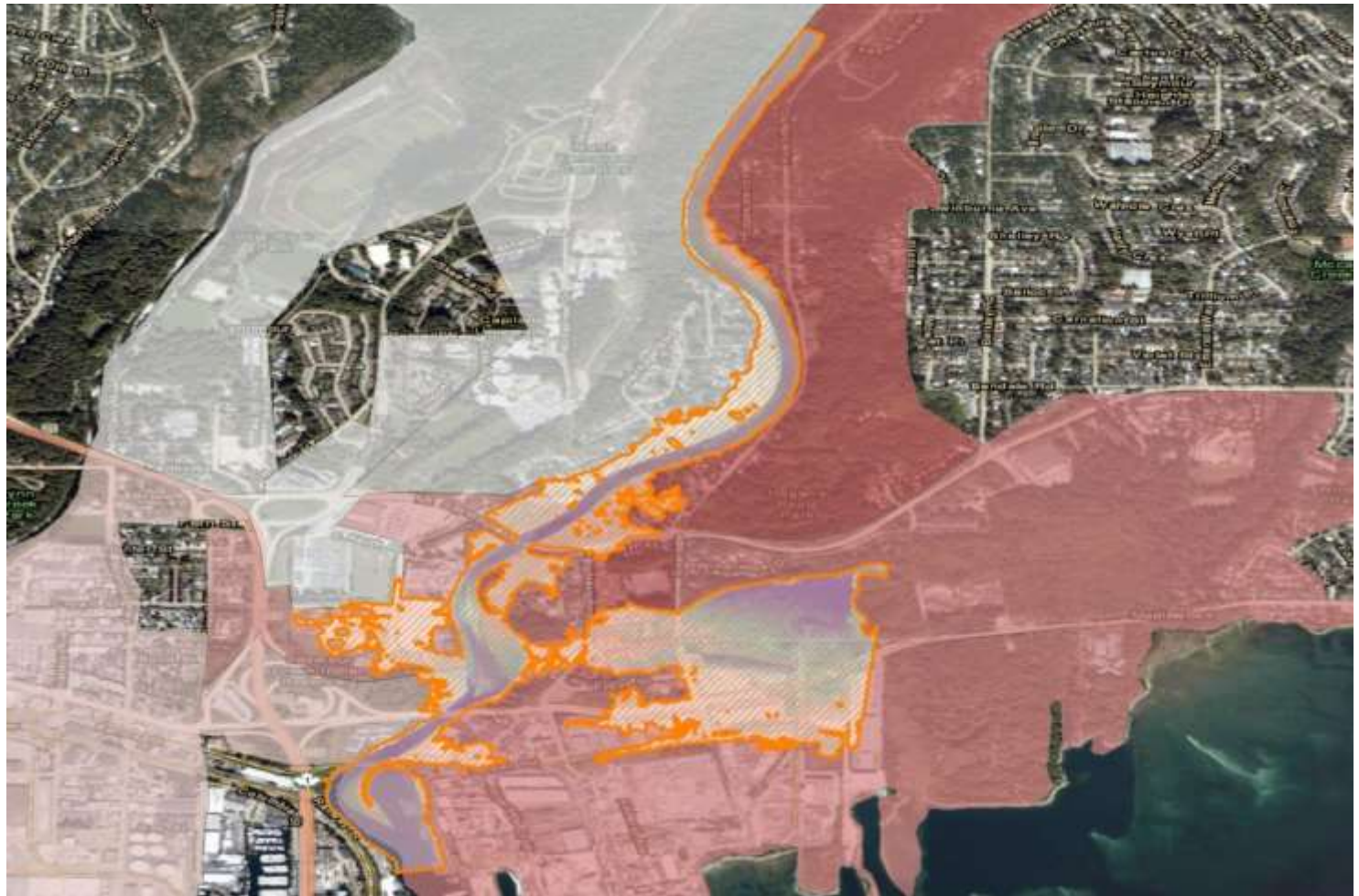


Hazus Flood Canada

- Seymour Results



- Seymour Results, with Floodplain



Hazus Flood Canada

- Seymour Results, table

Direct Economic Losses For Full Replacement Value

By General Occupancy By Specific Occupancy By General Building Type **Total**

Results for
Scenario: _SeymourUDG Return period: 200

Total

	CensusBlock	TotalLoss	BuildingLoss	ContentsLoss	InventoryLoss	RelocationC
1	590150111010219	2163	1327	835	0	
2	590150111010220	4693	2893	1796	0	
3	590150111010221	3586	2233	1351	0	
4	590150111020228	5352	3275	2066	0	
5	590150111033570	50	31	19	0	
6	590150111033573	17	10	7	0	
7	590150111033574	229	139	90	0	
8	590150111033576	113	70	43	0	

Close Map Print

Hazus Flood Canada

- In addition to spatial, and tabular information Hazus Flood Canada will provide the following nine reports:
 - Building Damage by Building Type
 - Building Damage By General Occupancy

Hazus Flood Canada

- Building Damage Count by General Building Type
- Building Damage Count by General Occupancy
- Building Stock Exposure by Building Type
- Building Stock Exposure by General Occupancy

Hazus Flood Canada

- Depreciated Direct Economic Losses for Buildings
- Direct Economic Losses for Buildings
- Global Summary Report

Hazus Flood Canada

- Hazus Flood Canada may optionally provide
 - well refined Census Block coverage
 - dasymetric building exposure distribution

Questions?

- Answers
- Read our recent *Canadian Water Resources Journal* publication “Hazus: A standardized methodology for flood risk assessment in Canada” at <http://www.tandfonline.com/eprint/2aQnhKwGs3xwSbUZChSI/full>

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