



Natural Resources  
Canada

Ressources naturelles  
Canada



Thursdays October 15 - November 19, 2020  
9:00AM PST/12:00PM EST - 12:00PM PST/3:00PM EST

**2020 VIRTUAL  
CRHNet SYMPOSIUM  
& DRR ROUNDTABLE**



**CRHNet**  
CANADIAN RISK &  
HAZARDS NETWORK



Roundtable funded by the  
Government of Canada  
Table ronde financée par le  
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# Flood Response during Covid-19: A dynamic dashboard of hazard and socio- economic variables for the emergency management community

A partnership between Natural Resources Canada and Statistics Canada

Heather McGrath, Vincent Decker, France Labrecque, Zachary Nick, Besjana Osmenaj

*Presented by: Heather McGrath*

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# Natural Resources Canada

- Committed to improving the quality of life of Canadians by ensuring the country's abundant natural resources are developed sustainably, competitively and inclusively
- The **Canada Centre for Mapping and Earth Observation (CCMEO)** is the Government of Canada's centre of excellence for geomatics, mapping and earth observations.
  - Provide nationwide core geospatial data (including: terrain model, hydro network, buildings layer)
  - Innovative geospatial solutions
  - **Emergency Geomatics Services (EGS)** provides critical, near real-time information to Public Safety Canada and emergency responders during ice break-up, flood events and post-event damage assessment.





# Statistics Canada

- Statistics Canada is the national statistical office. The agency ensures Canadians have the key information on Canada's economy, society and environment that they require to function effectively as citizens and decision makers.
- Collect, analyze and make available to Canadian citizens data on the latest demographic, social and economic data from Statistics Canada
- Statistics Canada has provided data for emergency events since 2016

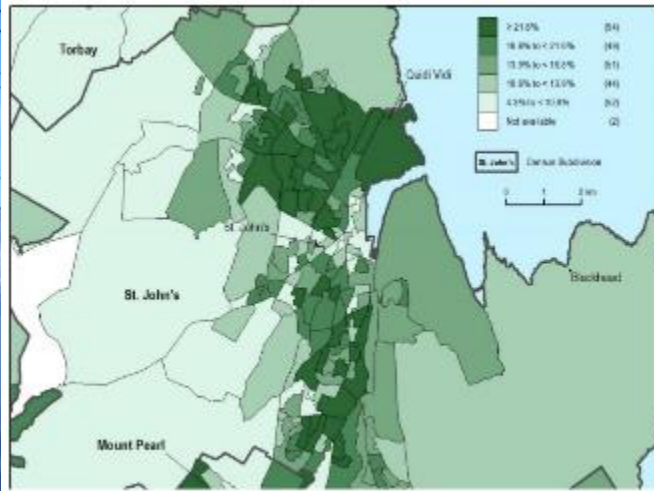


# Background

- StatsCan response to emergency has been a manual process
- Requested on-demand during the time of an event.
  - For example, during the record snowstorm in Newfoundland and Labrador last winter, Statistics Canada sent to provincial authorities (via email) spatial layers on the most vulnerable population and housing structures.
- COVID-19 Situational Awareness Dashboard
  - Partnership between NRCan and StatsCan



<https://news.yakub.com/winter-2020-canada-175921324.html>



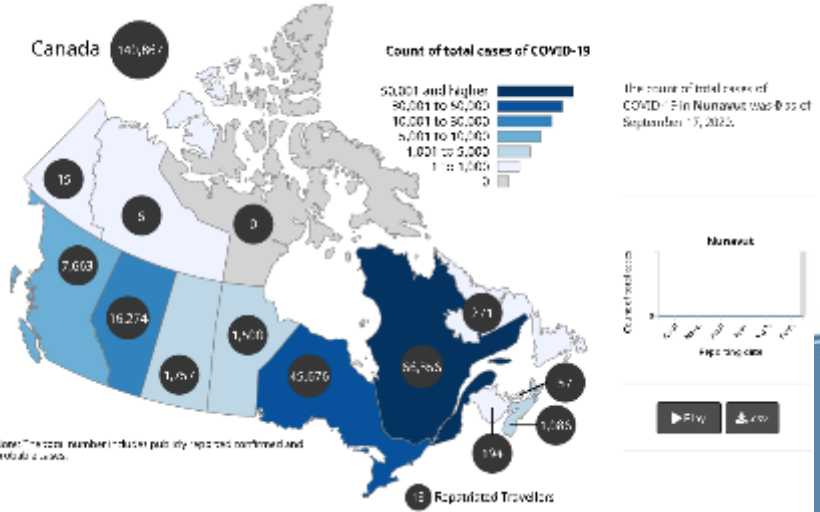
A view showing the partnership and collaboration agreed and a data set, which is a demonstration. Statistics Canada.

## COVID-19 Situational Awareness Dashboard

Updated September 17, 2020, 7 pm EDT

Cases Today	Total Cases	Deaths Today	Total Deaths
1,120	140,867	7	9,200
Recovered Today	Total Recovered	Tested Today	Total Tested
660	123,109	67,406	6,422,063

Count of total cases of COVID-19, by province/territory, as of September 17, 2020



# Motivation

- Provide an easy to use online system for the Canadian Red Cross, provincial government and emergency managers to have a better understanding of the socio-economic make up of the population at risk during hazard events
- Reduce communication and manual process during the time of an emergency



# Dashboard

- StatsCan and CCMEQ jointly leveraged the NRCAN Federal Geospatial Platform and established a sharable geospatial and statistically-enabled platform for better emergency awareness.
- NRCAN-CCMEQ provided
  - >50 near real time EO derived flood extents (RADARSAT-2 and RCM)
  - A web presence on geo.ca displaying data catalogues
  - Expertise with web mapping services, interoperability, standards and metadata
  - IM/IT Coordination with StatCan
- StatCan supplied
  - A set of indicators for vulnerable and impacted population, social economic and infrastructure data
  - All Covid-19 datasets provided by the Public Health Agency of Canada.
  - Dashboard design and implementation



# Data Layers

## Socio-Economic

- Population
  - Age, income, number of children, language spoken, population density, etc.
- Deprivation indices
- Structures
  - Housing age, type, suitability

## Hazard

- Floods
  - EGS Active (past 72hrs) and current year
  - VIIRS Floodwater Fractions (NOAA)
- Ice
  - Active (past 72hrs) and current year
- Fire
- Hurricane

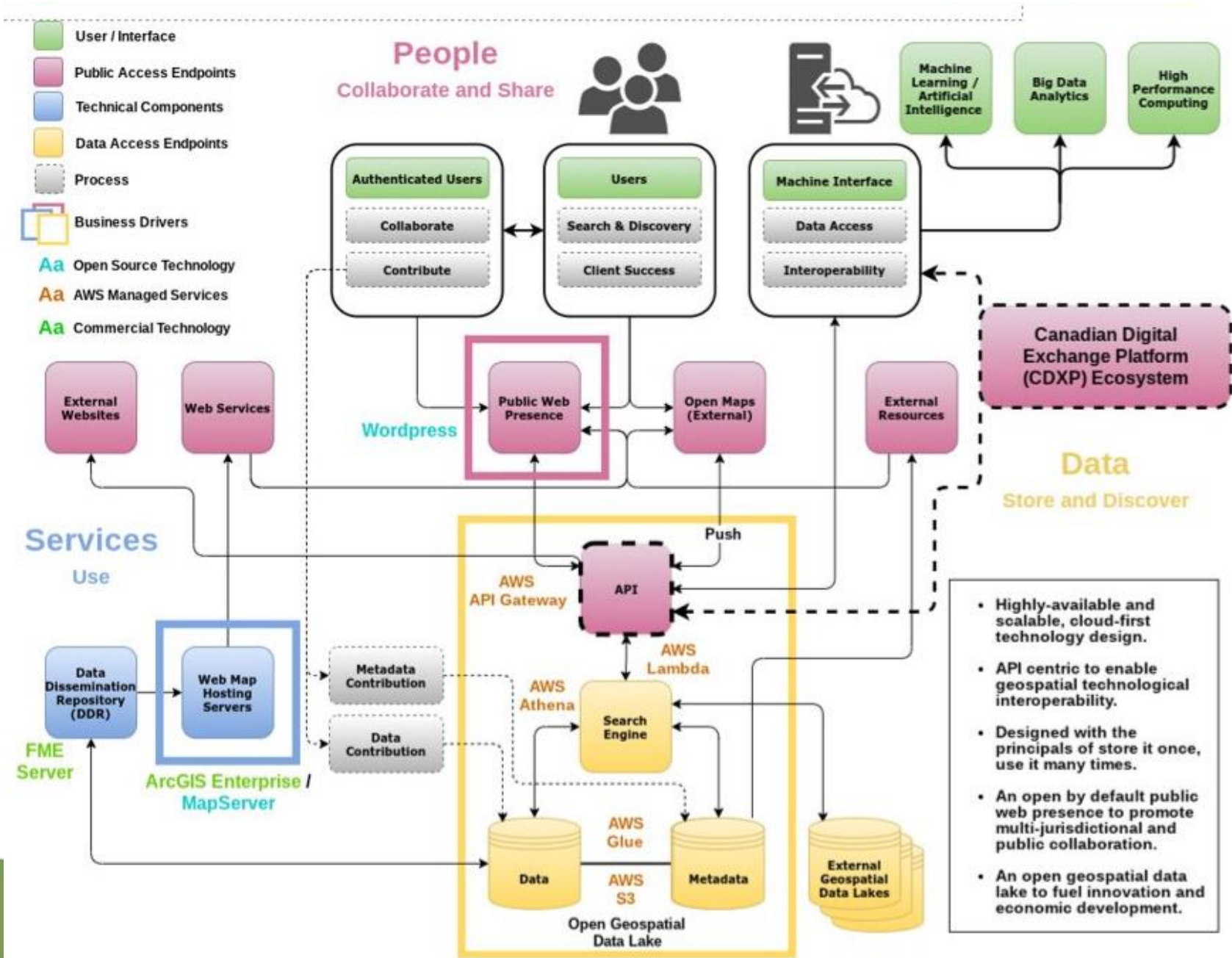
## Essential Facilities

- Schools, Hospitals, Police, Fire stations
- Road closures via provincial 511 services
- Communication towers (location and status)





# Target State Architecture (CGP)







User Tools

Interactive Map

Add / Change Map Layers

Total Population
Age Distribution
Household Size
Occupied Private Dwellings
Structural Type
Schools
Communications

Dynamic Data Summaries



35,111,800



14,063,110

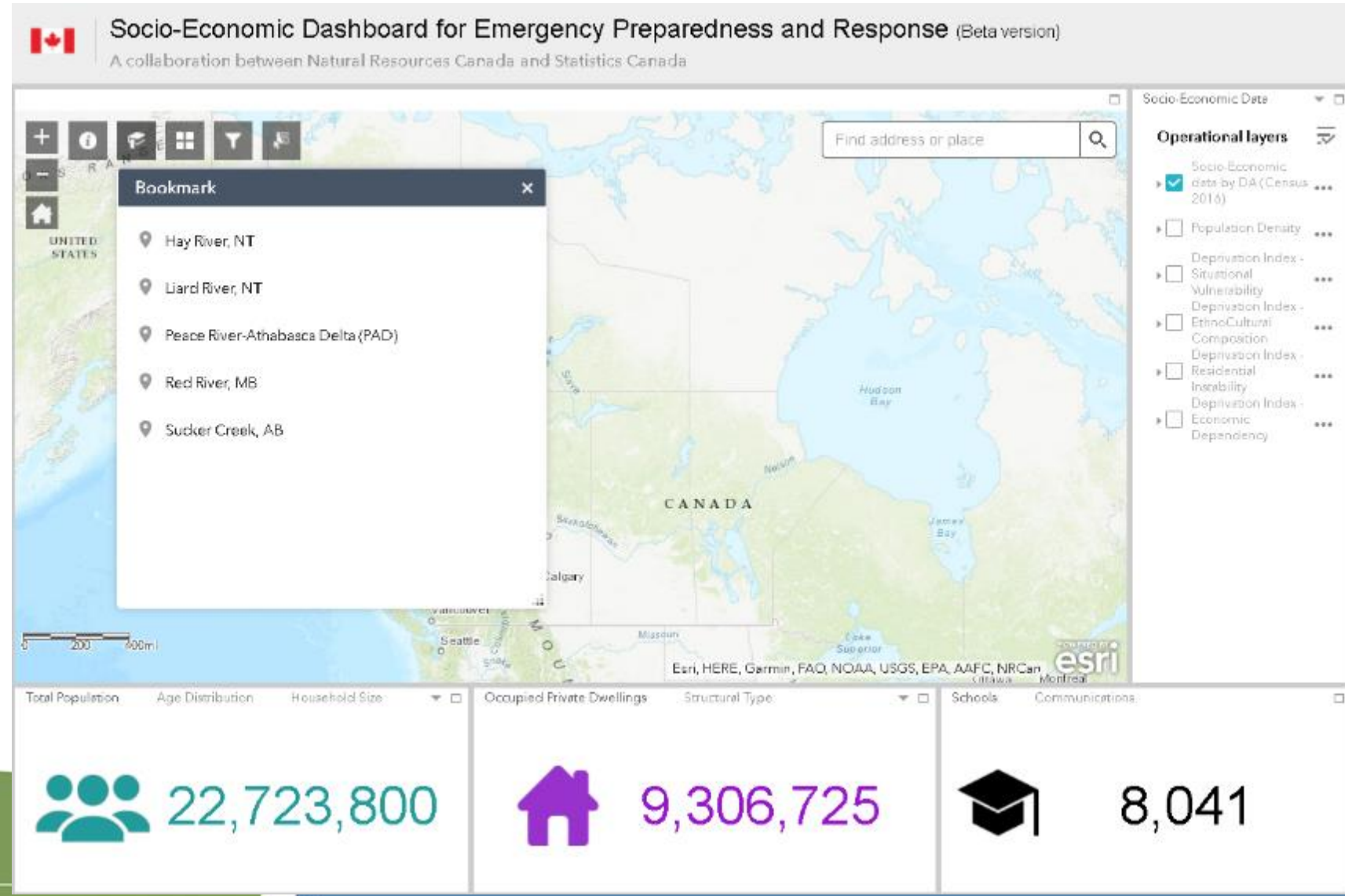


18,360



# Functionality

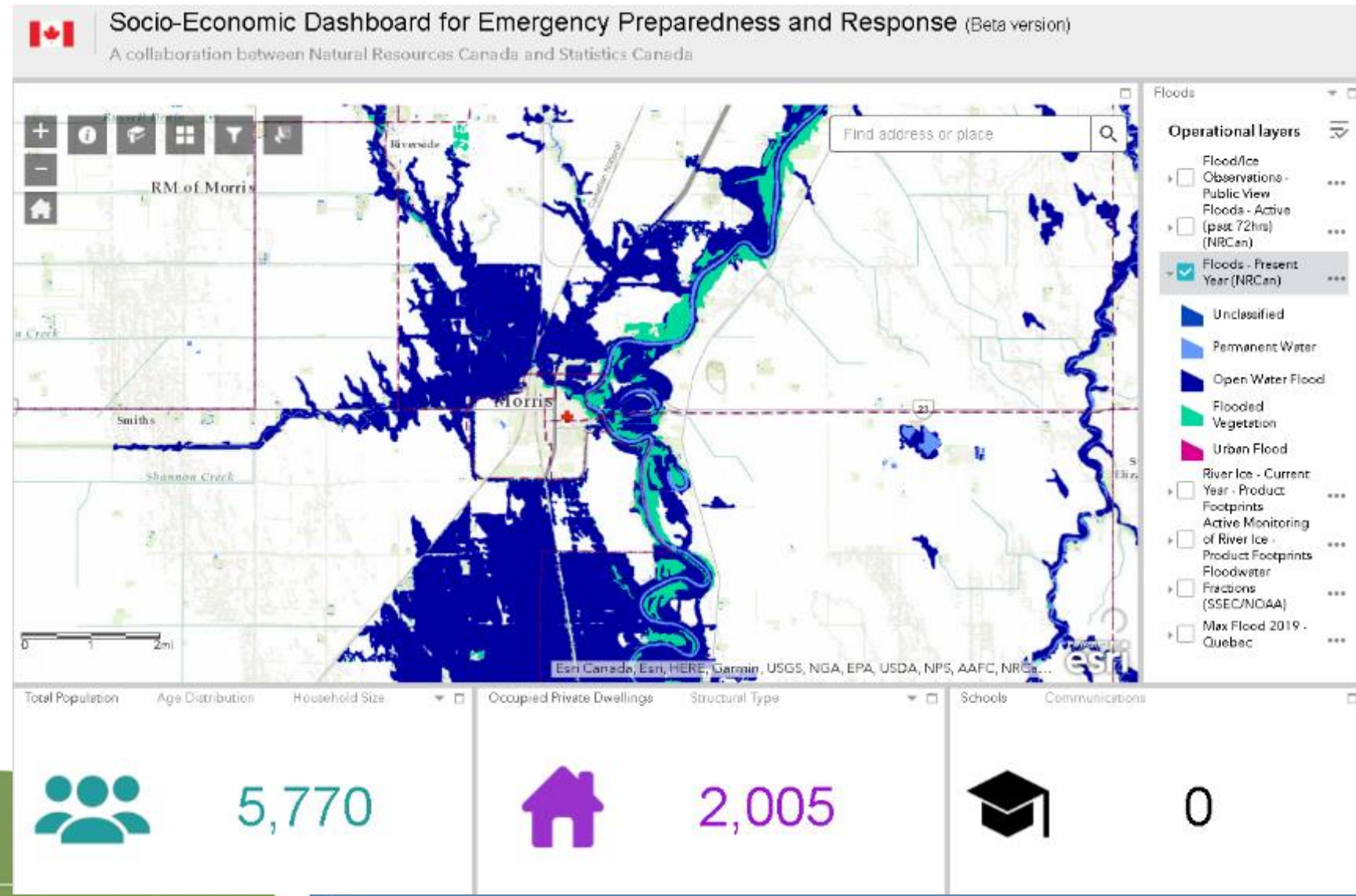
- During active floods events:
  - Bookmark locations are updated





# Functionality

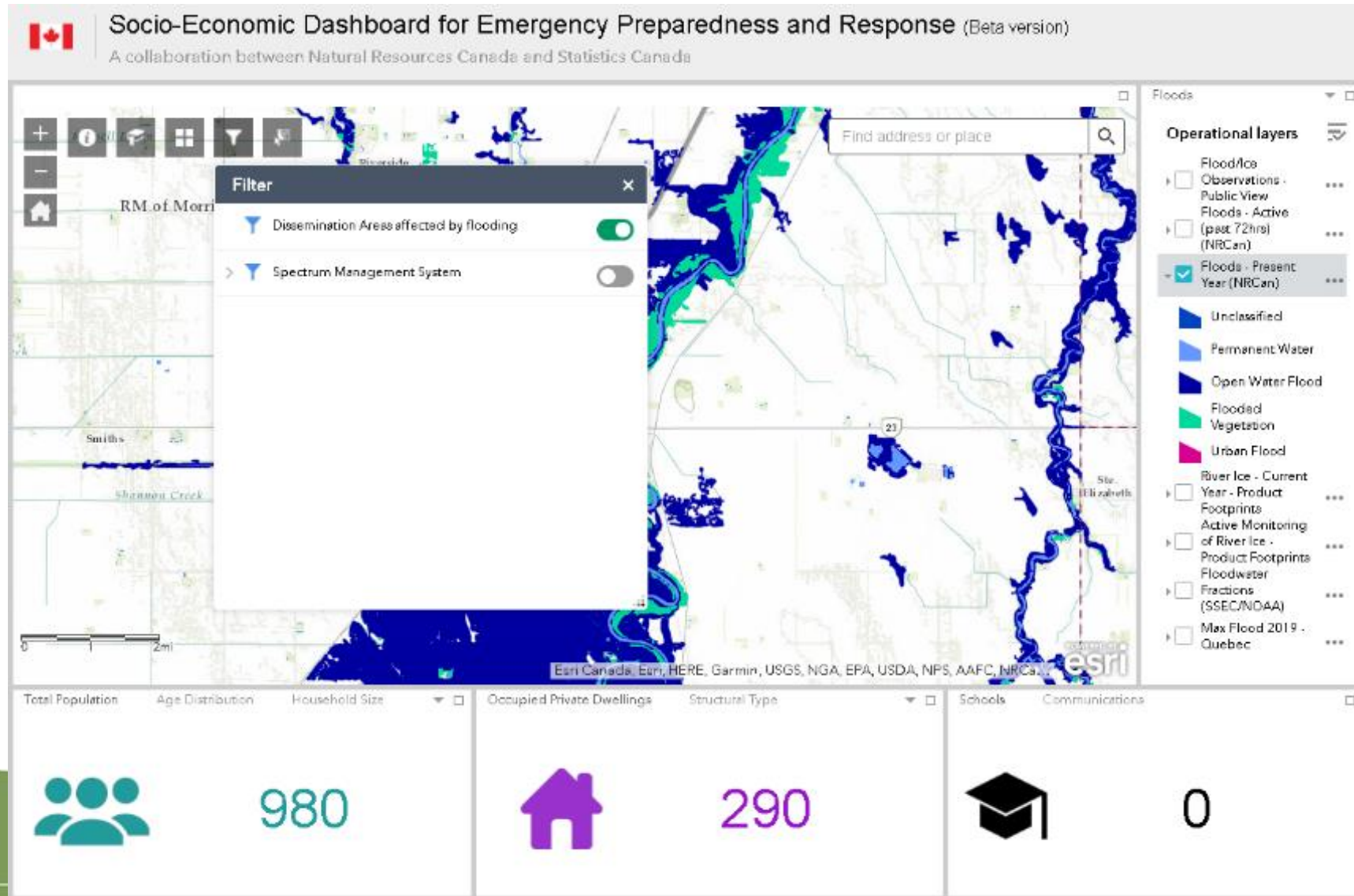
- Census blocks based on zoom level
- Dynamic summarized data
- View legends to describe display





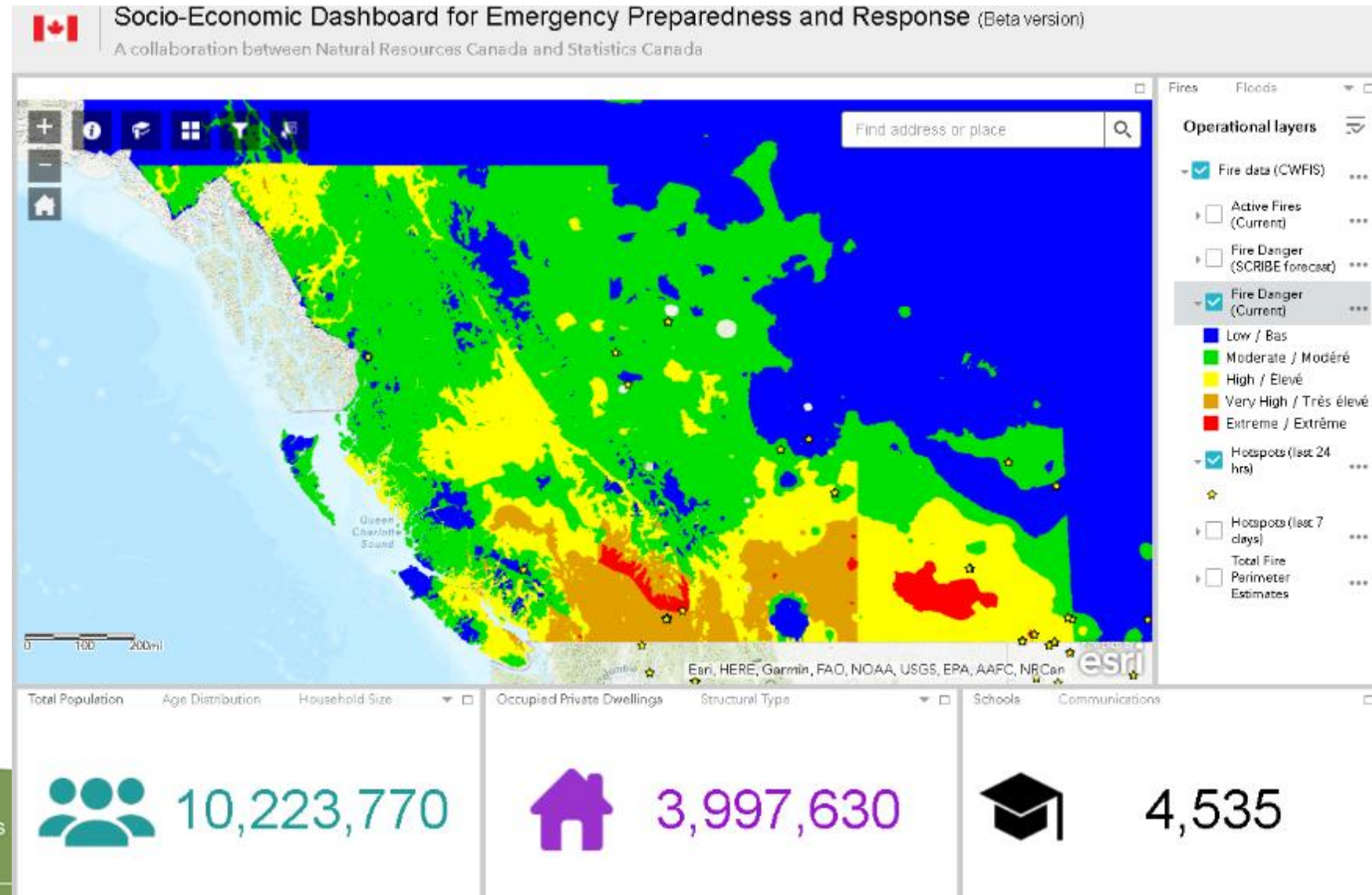
# Functionality

- Manually select or auto FILTER
- Using filter of dissemination blocks:
  - Total population affected drops to 980 from 5,770
  - Occupied buildings: 290 from 2005



# Functionality

- Connect to Canadian Fire Service dataset, current and future fire risk
  - Active Fires (current)
  - Fire danger (current)
  - Hotspots (last 24hrs)



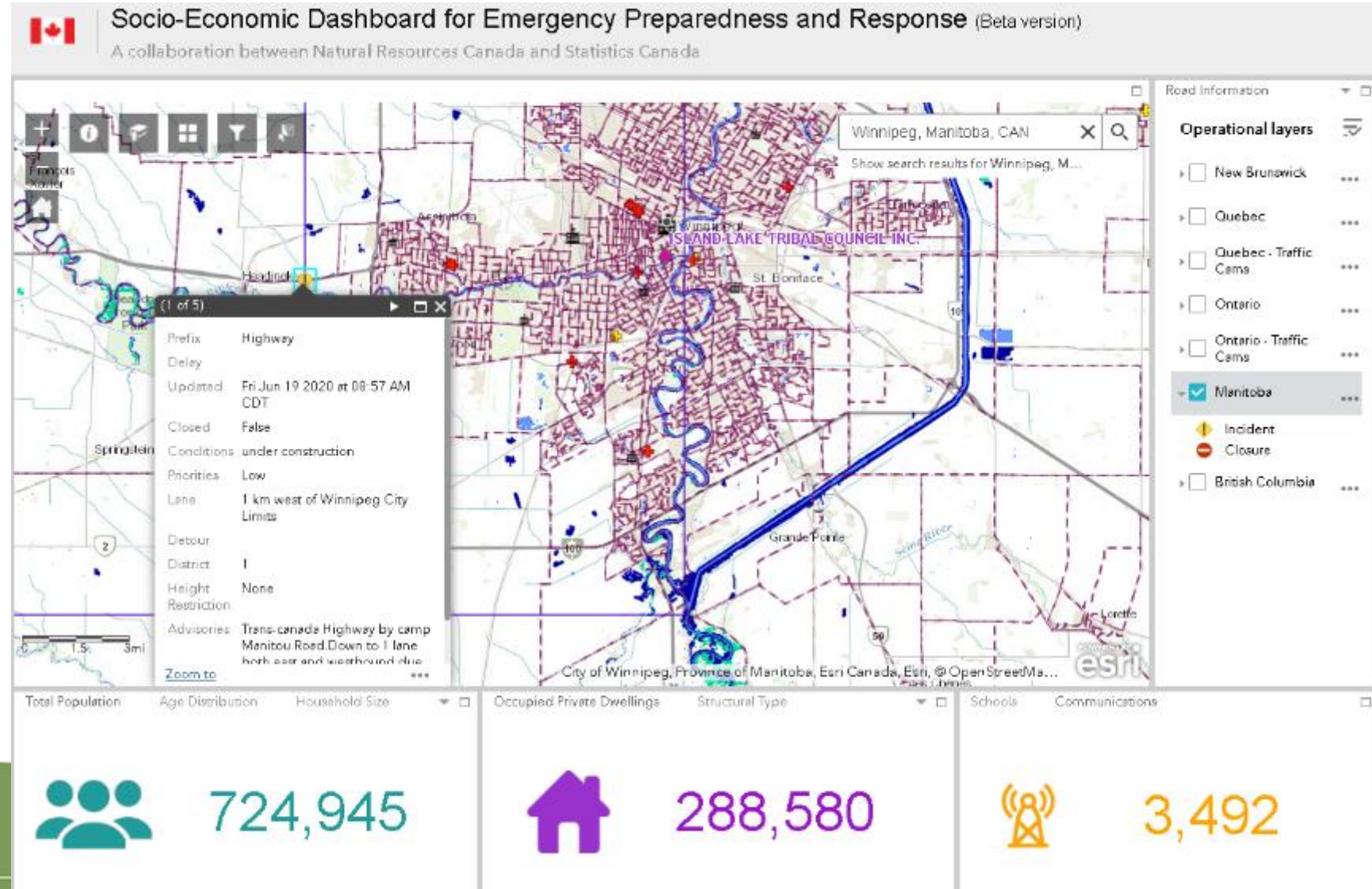
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# Functionality

- Transportation networks
  - Connect to provincial 511 road closures/incidents information
- Communication networks
  - Locations & status of communication towers
- Essential Facilities
  - Hospitals, police, schools, pharmacy, etc.



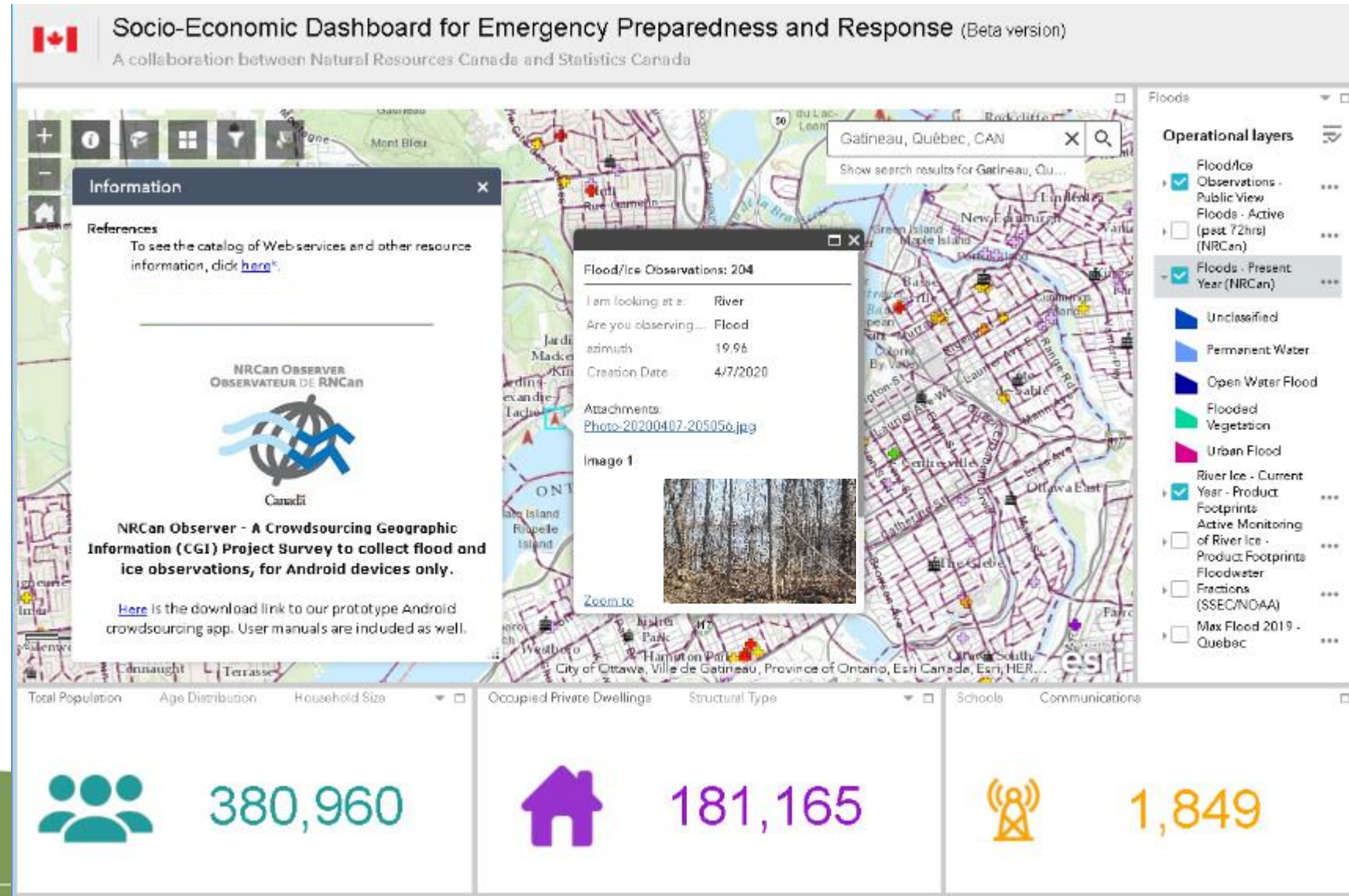
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# Functionality

- Link to NRCan crowdsourcing App.
- Users to upload photos of flood/ice
- View citizen contributions / observations & photos



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# Next Steps

- Evaluate feedback from Beta testers
- Explore capacity to include potential future flood extents
  - i.e.: what is the expected level in next +6, +12 or +24 hours
- Additional Hazards
- Consideration of different *User profiles*



# Thank you

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