An Overview of Flood Forecasting and Warning In Ontario

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Overview

Introduction to the Surface Water Monitoring Centre

What's Unique about Ontario

- Conservation Authorities
- Flood Forecasting and Warning in Ontario
- Flooding Mechanisms

SWMC's Toolbox

- Hazard Identification Risk Assessment
- Antecedent Precipitation Index
- Storm Surge
- Hydrometric/Climate Network
- Satellite Imagery
- Weather Support

Interest in ECCC Products

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Introduction to the Surface Water Monitoring Centre



- Communications
- Flood Forecasting
- Emergency Management
- Project Management
- Weather
- Water

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What we do

Provide an Ontario scale early warning system for flood and drought (monitor, assess, message)

Facilitate/support flood forecasting and warning in



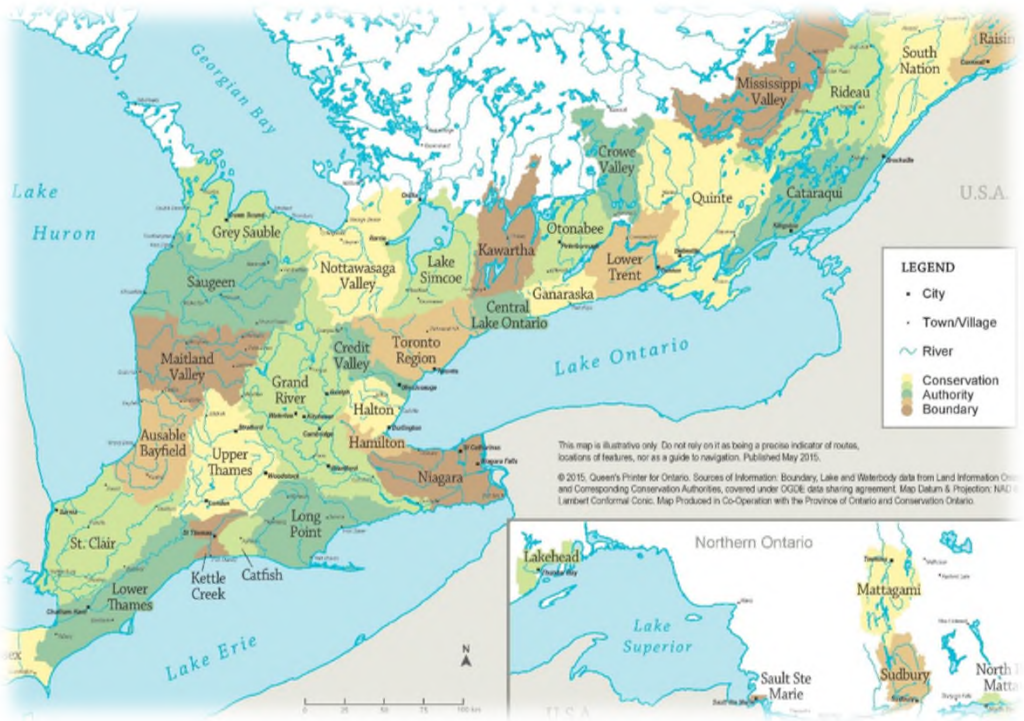
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What Makes Ontario Unique



Conservation Authorities

- Watershed based
- 36 Conservation Authorities
- Maintain programs that will protect life and property from natural hazards such as flooding/erosion
- Joint flood management



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Flood Forecasting and Warning In Ontario

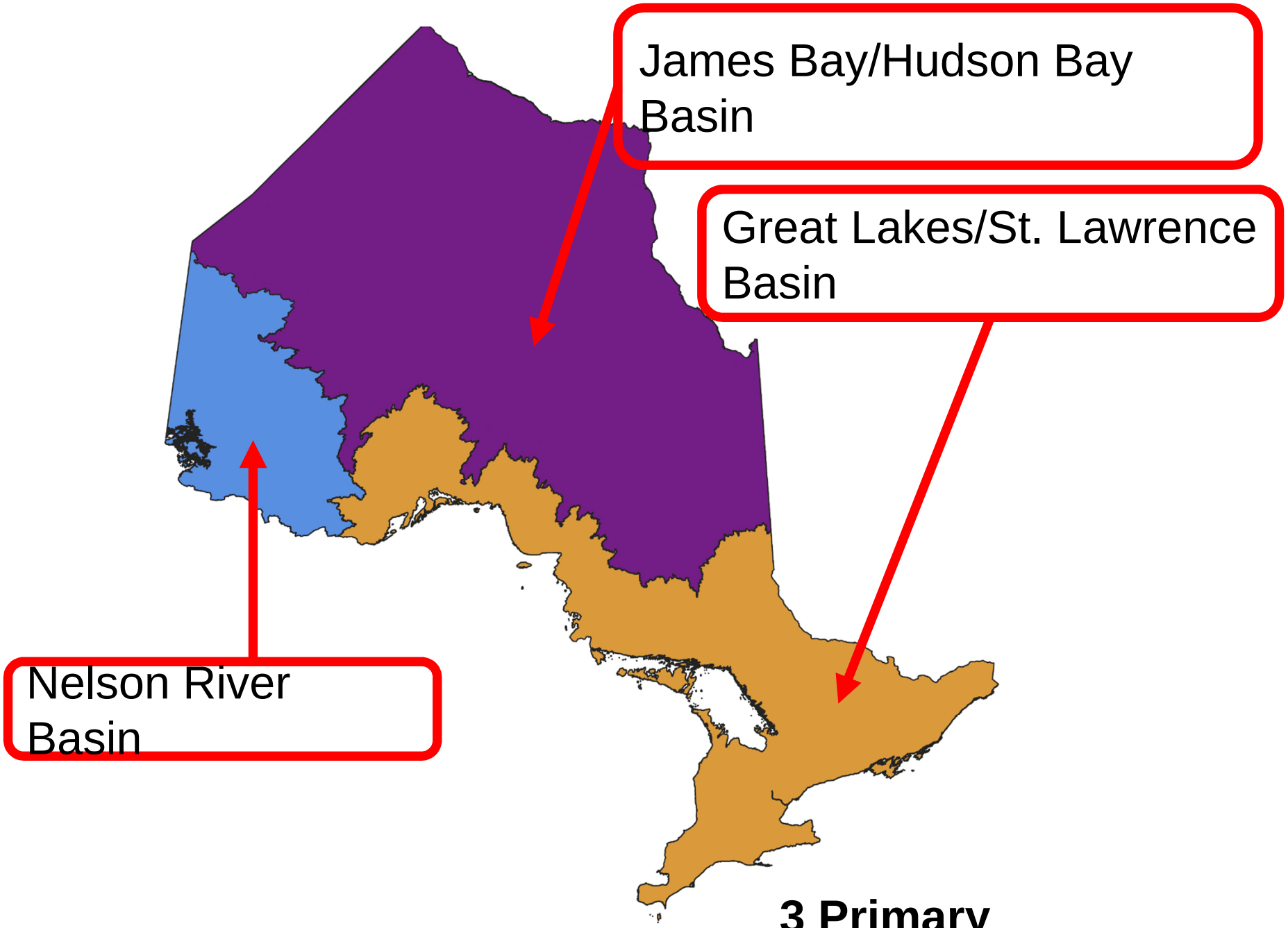


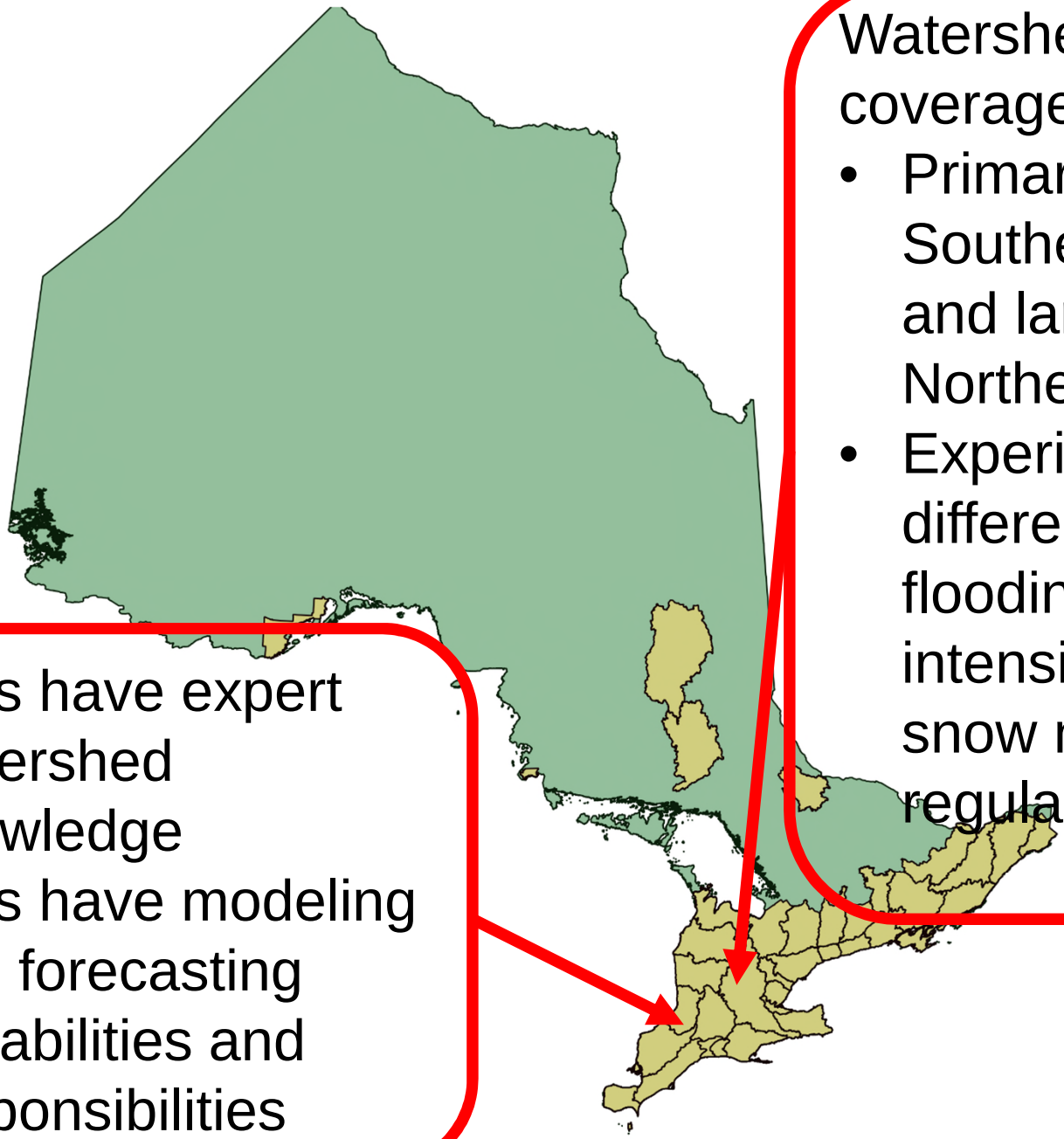
- Provincial and Local Scale assessment and messaging
- Provincial Flood Forecasting and Warning Committee (PFFWC)
- Ontario Flood Forecasting and Warning Guidelines
- Training opportunities (including annual workshop)

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Flooding Mechanisms

- Many different flooding mechanisms
- Many different watershed characteristics
- No “one” tool for flood forecasting
- Riverine flooding

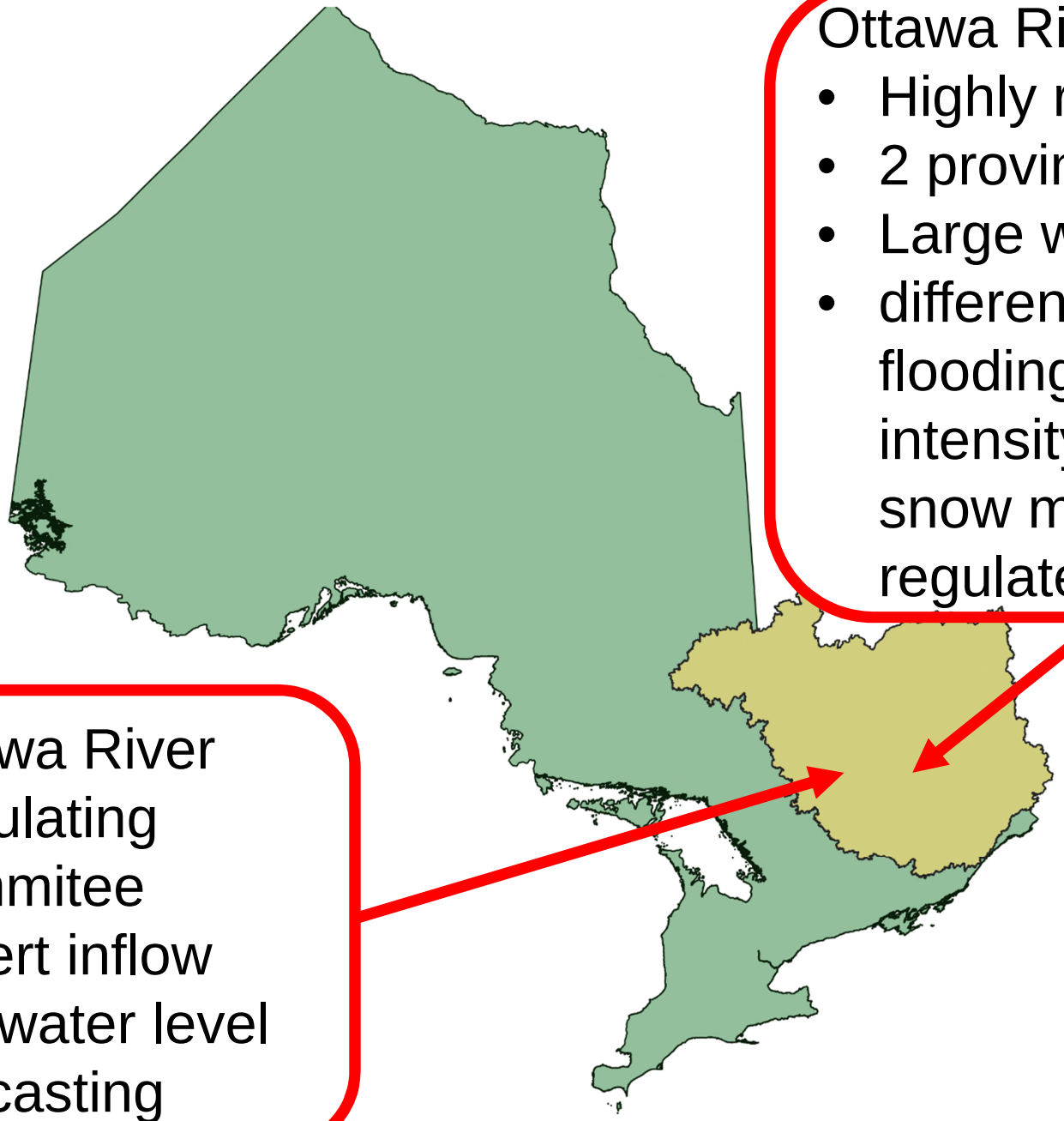

James Bay/Hudson Bay Basin
Great Lakes/St. Lawrence Basin
Nelson River Basin
3 Primary Watersheds



Watersheds with CA coverage

- Primarily in Southern Ontario and large cities in Northern Ontario
- Experiences many different types of flooding: High intensity rainfall, snow melt, regulated systems

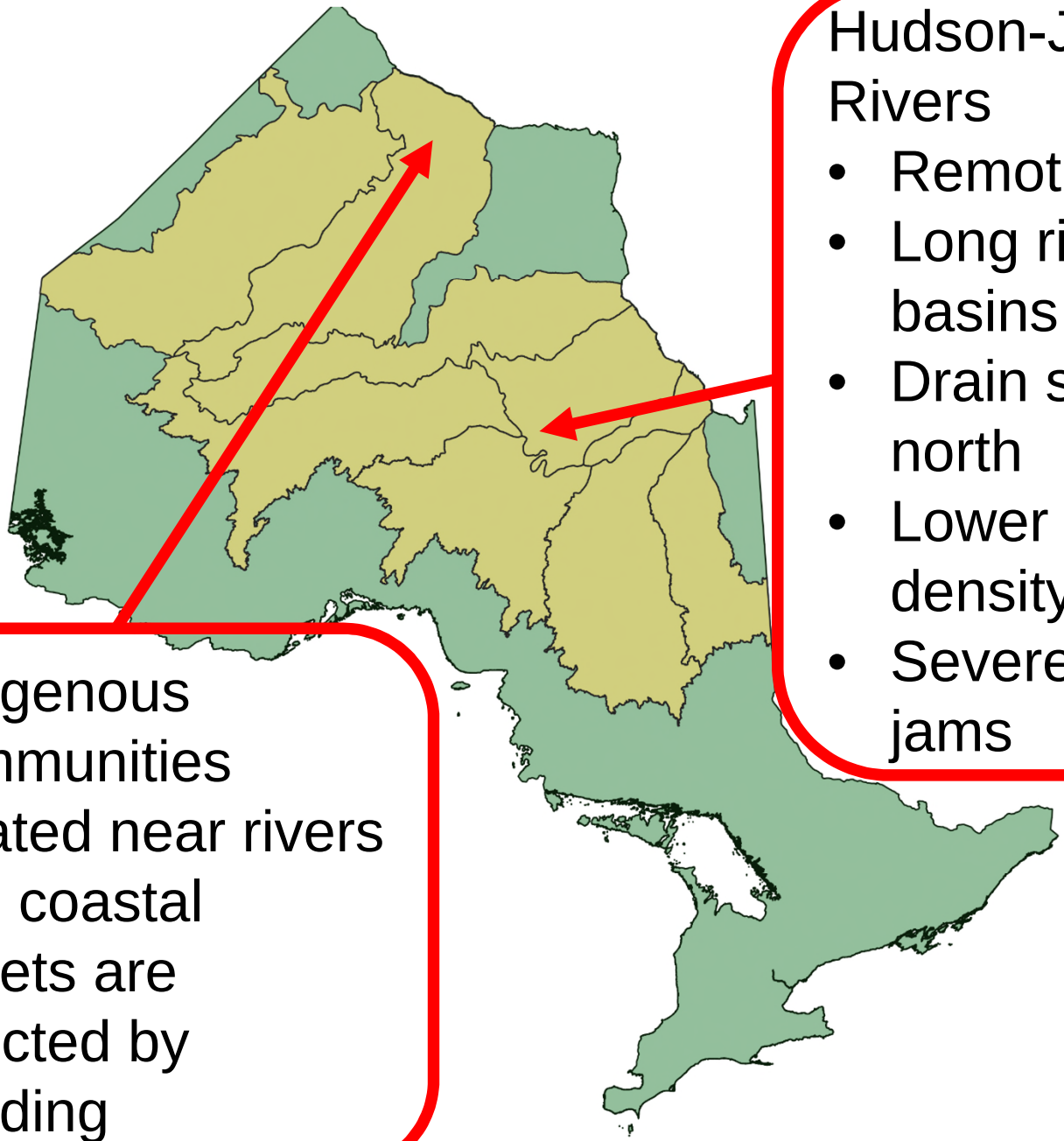
- CA's have expert watershed knowledge
- CA's have modeling and forecasting capabilities and responsibilities



Ottawa River Basin

- Highly regulated
- 2 provinces
- Large watershed
- different types of flooding: High intensity rainfall, snow melt, regulated systems

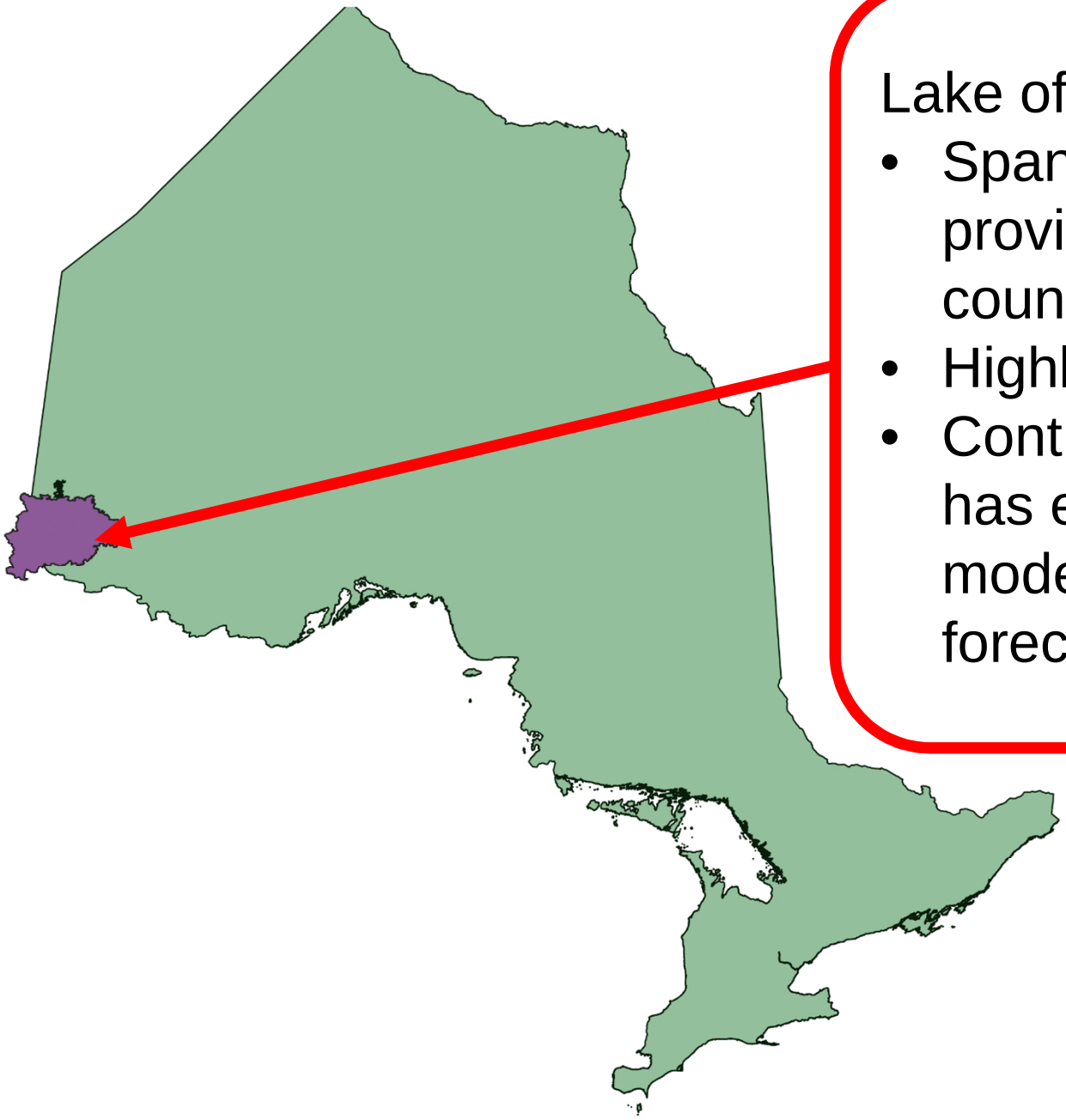
- Ottawa River Regulating Commitee
- Expert inflow and water level forecasting



Hudson-James Bay Rivers

- Remote
- Long rivers/ large basins
- Drain south to north
- Lower gauge density
- Severe annual ice jams

- Indigenous communities located near rivers and coastal outlets are affected by flooding



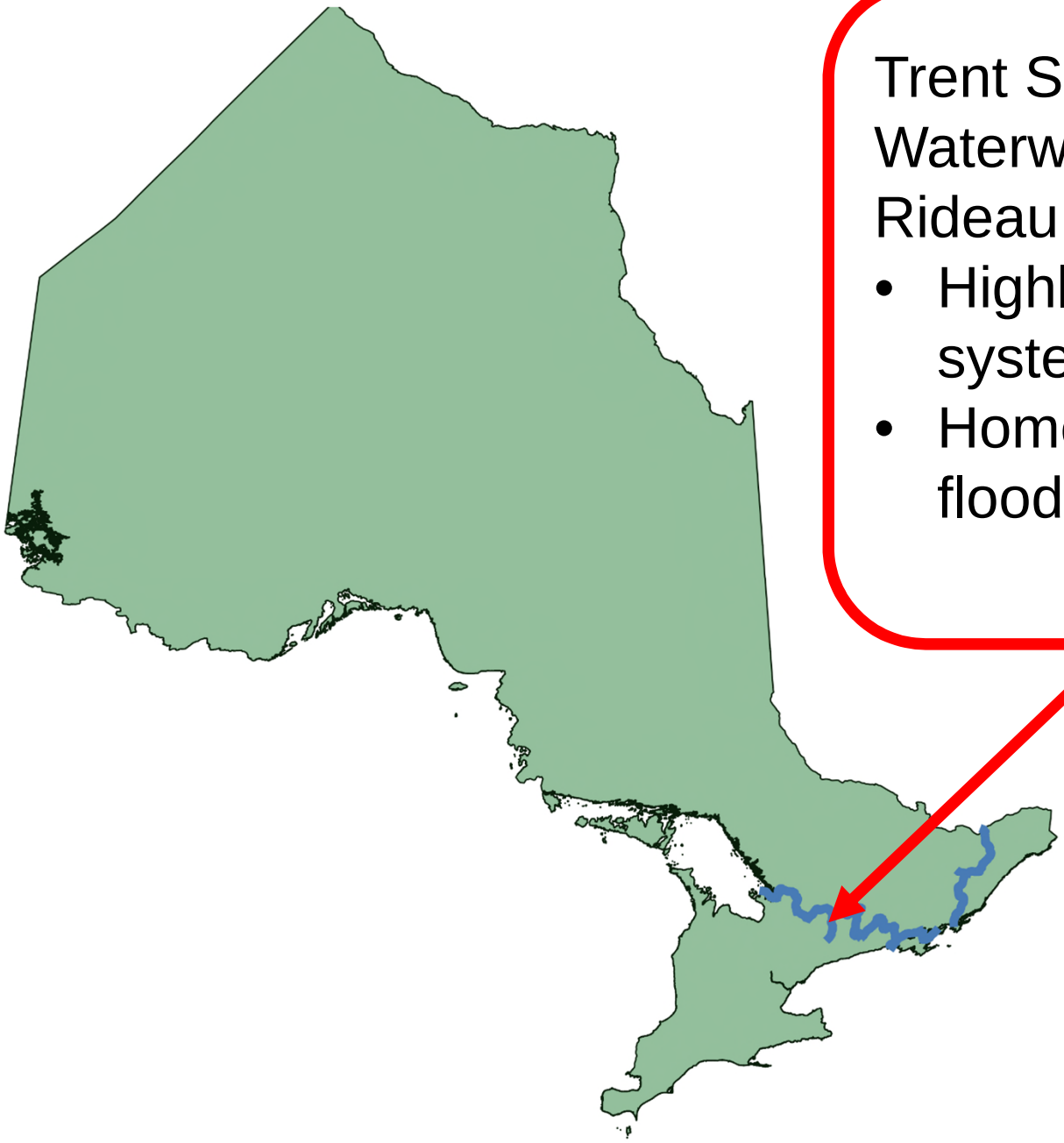
Lake of the Woods

- Spans 2 provinces and 2 countries
- Highly regulated
- Control board has expert modeling and forecasting



Great Lakes

- Static water level flooding
- Surge related flooding (Erie)
- Spans 2 countries



Trent Severn Waterways and Rideau Canal

- Highly regulated systems
- Homes in floodplain

What's in SWMC's Toolbox



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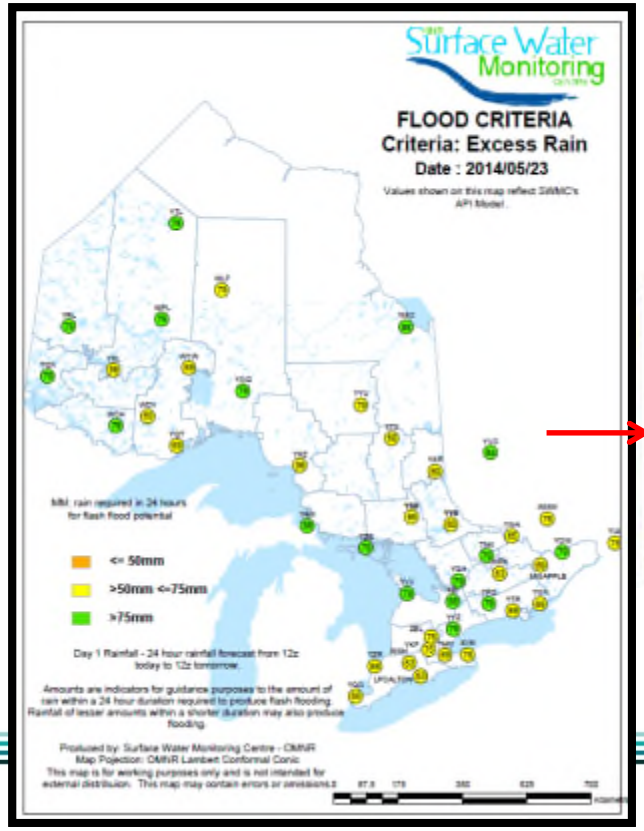
Daily Flood HIRA

- Daily provincial scale Hazard Identification Risk Assessment
- Use a series of tools and resources to determine the potential for flooding in the province
- Results are provided to partners, who assess local potential for flooding
- If required, standard flood messages are provided to local partners

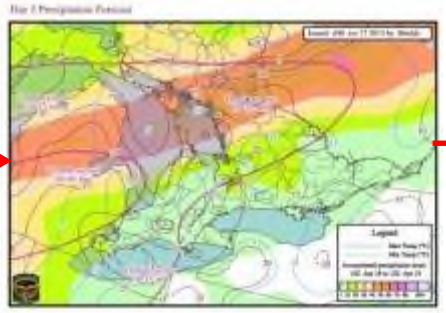
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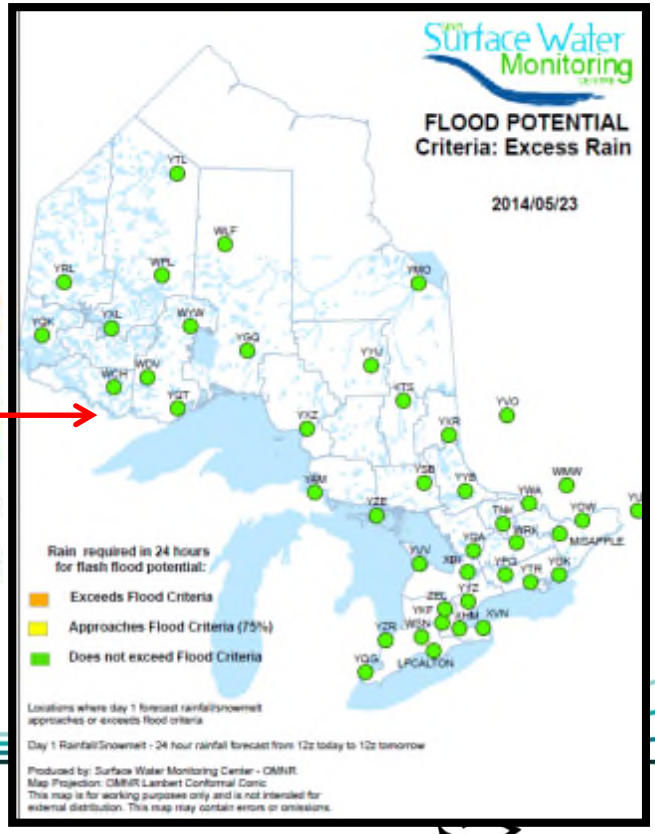
Antecedent Precipitation Index

- Combined with Frozen Ground Model
- Rain required to produce flood potential in next 24 hrs



WEATHER FORECAST

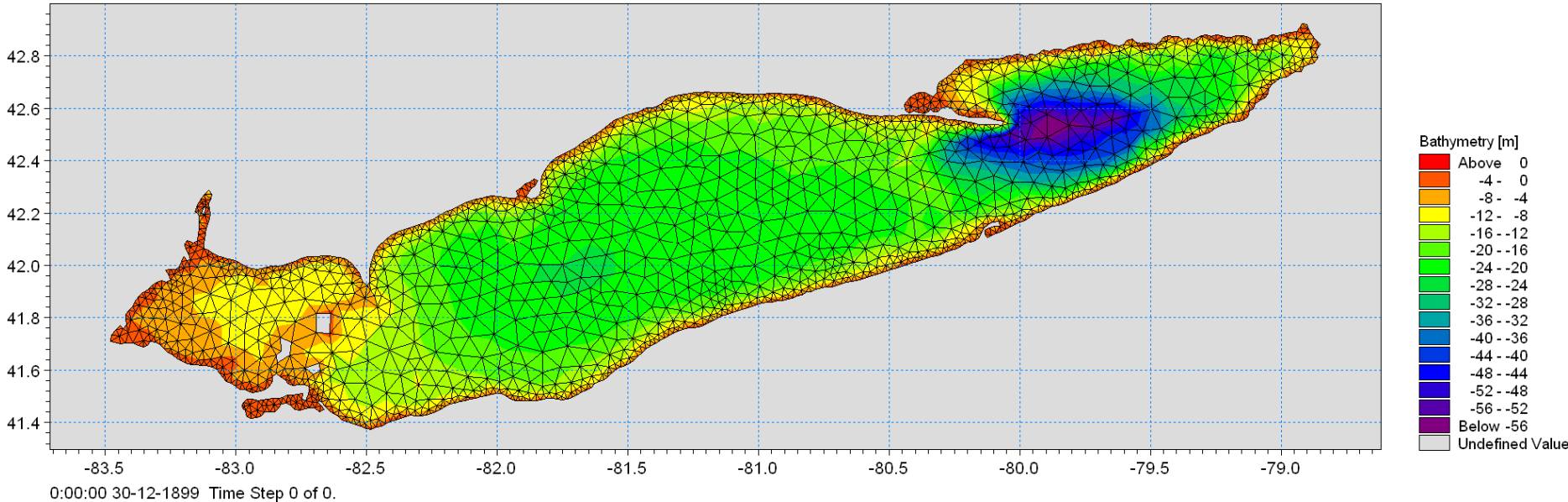




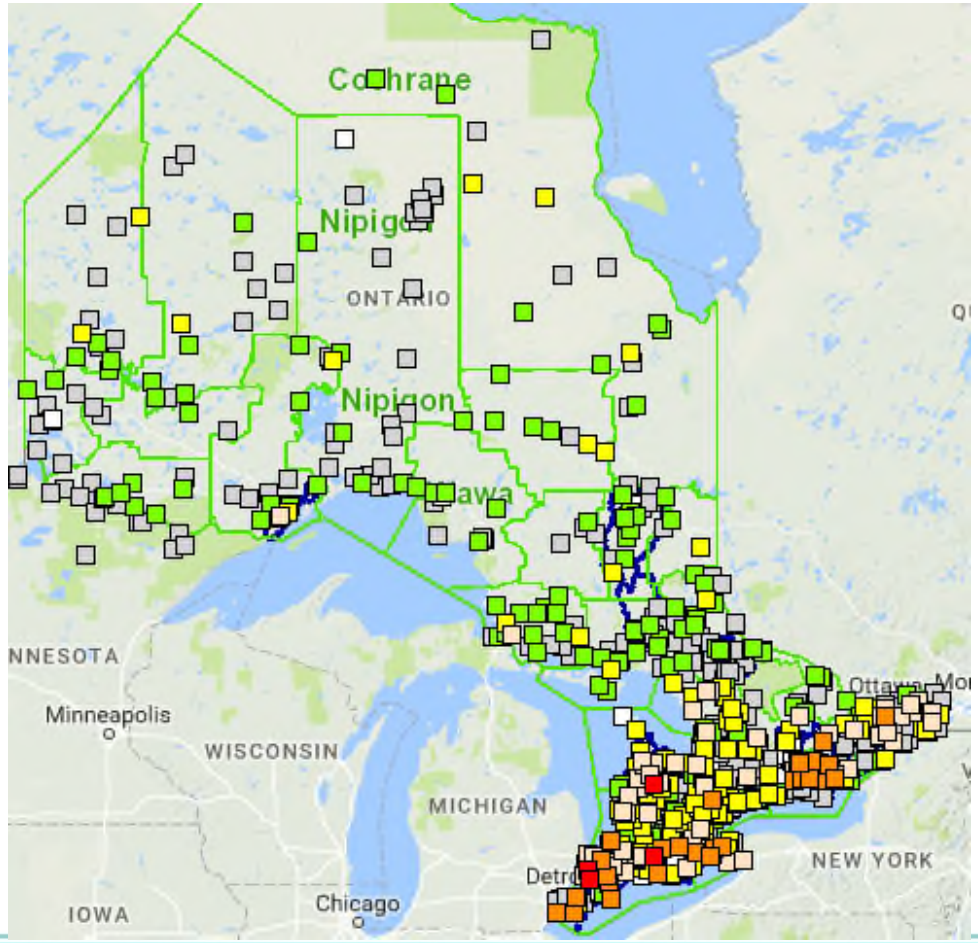
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Storm Surge on the Great Lakes

- Great Lakes Storm Surge Operational System
- DHI's MIKE 21 Hydrodynamic and Spectral Waves
- Uses ECCC meteorological data and near real time water level data
- Produces a 48 hour forecast, outputs reports and animations



Hydrometric and Climate Network

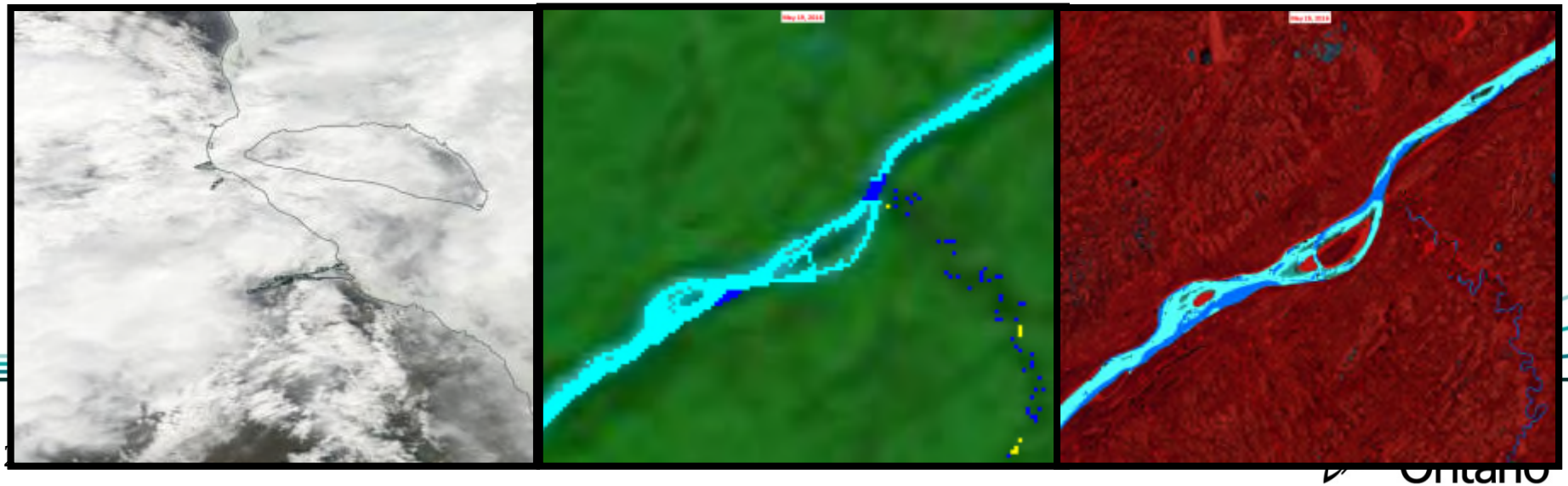




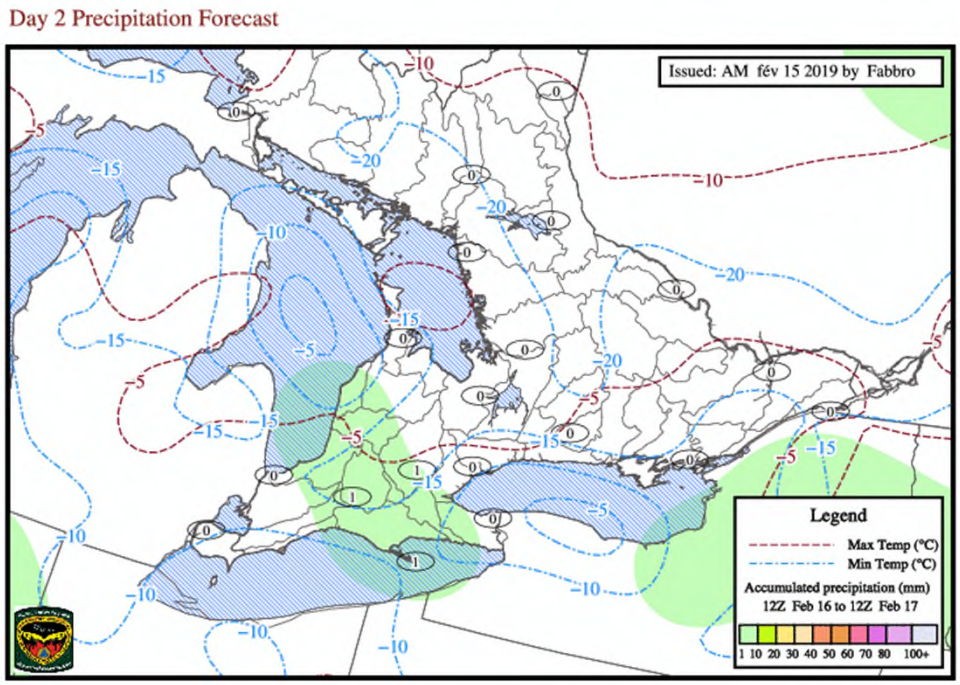
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Satellite Imagery

- Assists in predicting the location and timing of ice jamming
- produce “ice roughness” maps (Rougher ice indicates possible ice jamming locations)
- Useful for visualizing and communicating the size, location and movement of the ice jams



MNRF Weather Services



- Ministry of Natural Resources and Forestry Aviation Forest Fire and Emergency Services
- 5 day weather forecast for Ontario
- Daily briefing from ministry meteorologist
- Monthly weather outlook
- (experimental) Convective outlook maps

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Interest in ECCC Products

- Flow forecasting in ungauged basins
- Trans-boundary waters (sharing resources and improving communication)
- Great Lakes – inland and surge, data security
- James-Bay-Hudson Bay – flow and ice prediction
- Weather - CAPA, integrate gridded weather forecasts with hydrology and hydraulic models
- Collaboration – model selection framework, roles wrt data sharing, using hydraulic models to improve rating curves

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Questions

Should you have any questions, please do not hesitate to contact myself or Dave:

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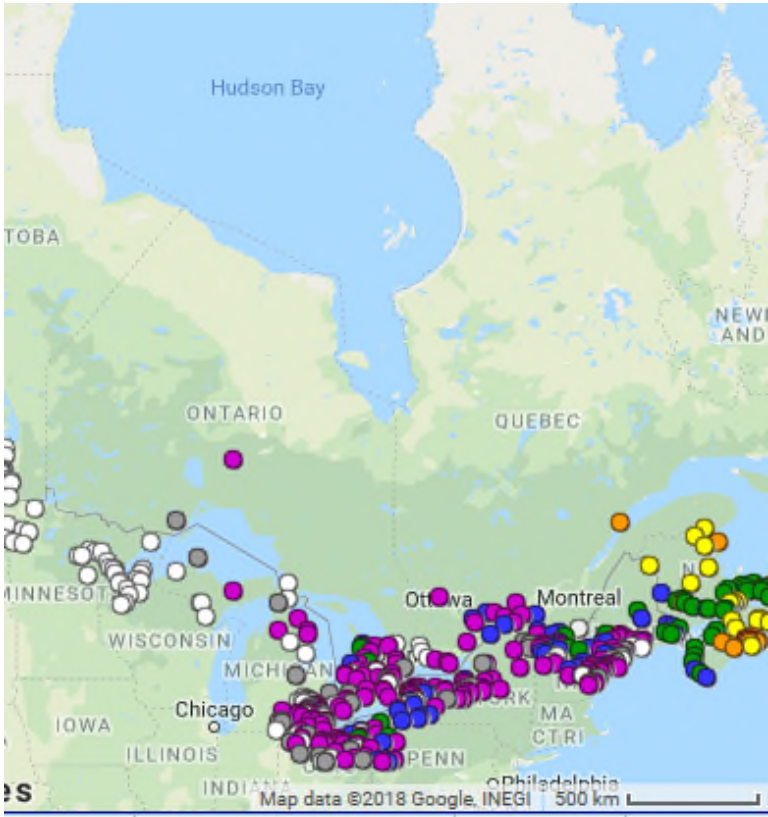
Dave Burritt – Dave.Burritt@Ontario.ca

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Appendix

Other Sources of Information

- Reports from our partners
- Community Collaborative Rain, Hail & Snow Network
- Twitter
- Extranet



Number	Station Name	Precip (in.)	Snowfall (i...
B-15	High River 0.5 ESE - BRBC	0.00	0.0

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