

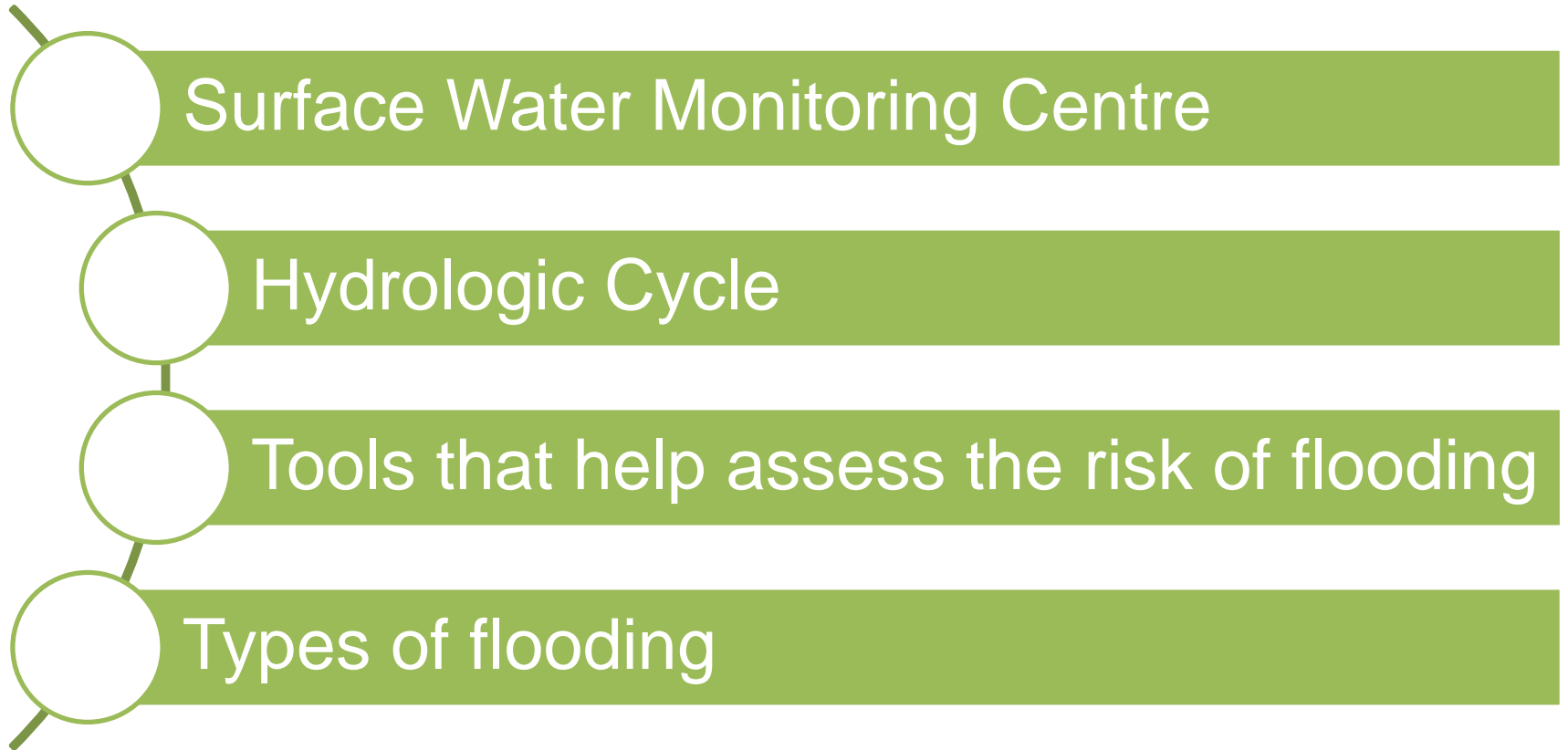


Surface Water Monitoring Centre (SWMC) Up North on Climate

Amber Langmuir

April 25, 2018

Outline

- 
- Surface Water Monitoring Centre
 - Hydrologic Cycle
 - Tools that help assess the risk of flooding
 - Types of flooding

Surface Water Monitoring Centre (SWMC)



Communications

Flood Forecasting

Emergency Management

Project Management

Weather

Water


What SWMC does

- Provide an Ontario scale early warning system for flood and drought (monitor, assess, message)
- Facilitate/support flood forecasting and warning in Ontario



Our Website

www.ontario.ca/flooding



How can we help you?

Search

contact us | français


Flood Forecasting and Warning Program

Information about the Flood Forecasting and Warning Program, which prepares provincial and local authorities in the event of a flood.

Current flood information

Flood information updated as of: February 18, 2016 - 9:15 am

Ontario flood map



Recommended for you

- Surface Water Monitoring Centre
- Low Water Response Program
- Conservation authorities

On this page

- Current flood information**
 - Ontario flood map
 - Locally issued flood messages
 - Provincial flood messages
 - Flood Message Definitions
 - Who to contact for flood information

<input checked="" type="checkbox"/> Provincial Messages Issued to MNRF Districts	<input checked="" type="checkbox"/> Provincial Messages Issued to Conservation Authorities
<input checked="" type="checkbox"/> Local Messages Issued by MNRF Districts	<input checked="" type="checkbox"/> Local Messages Issued by Conservation Authorities

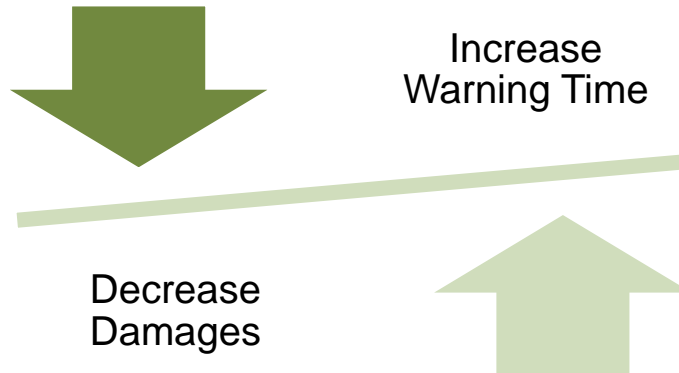
Why SWMC does this work

Legislative Requirements

- Under the Emergency Management and Civil Protection Act (and associated Order in Council) MNRF has a provincial mandate for the emergency management of water related natural hazards including flood

Reduce Impacts

- Reduce Loss of Life and injury
- Reduce property damage



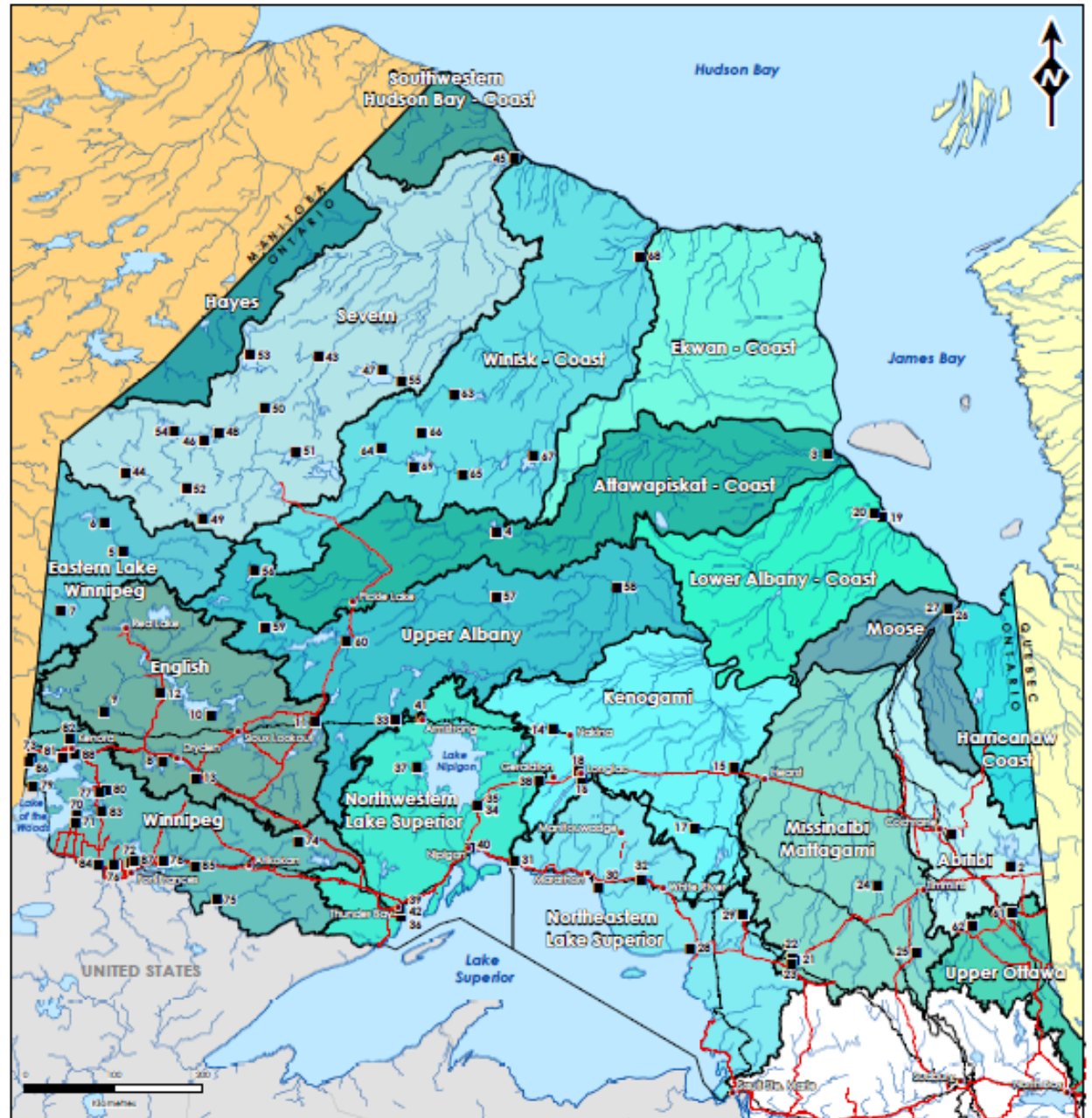
Flood Forecasting and Warning in Ontario

- Provincial Flood Forecasting and Warning Committee (PFFWC)
- Ontario Flood Forecasting and Warning Guidelines
- Training opportunities (including annual workshop)
- Sharing information, ideas and resources



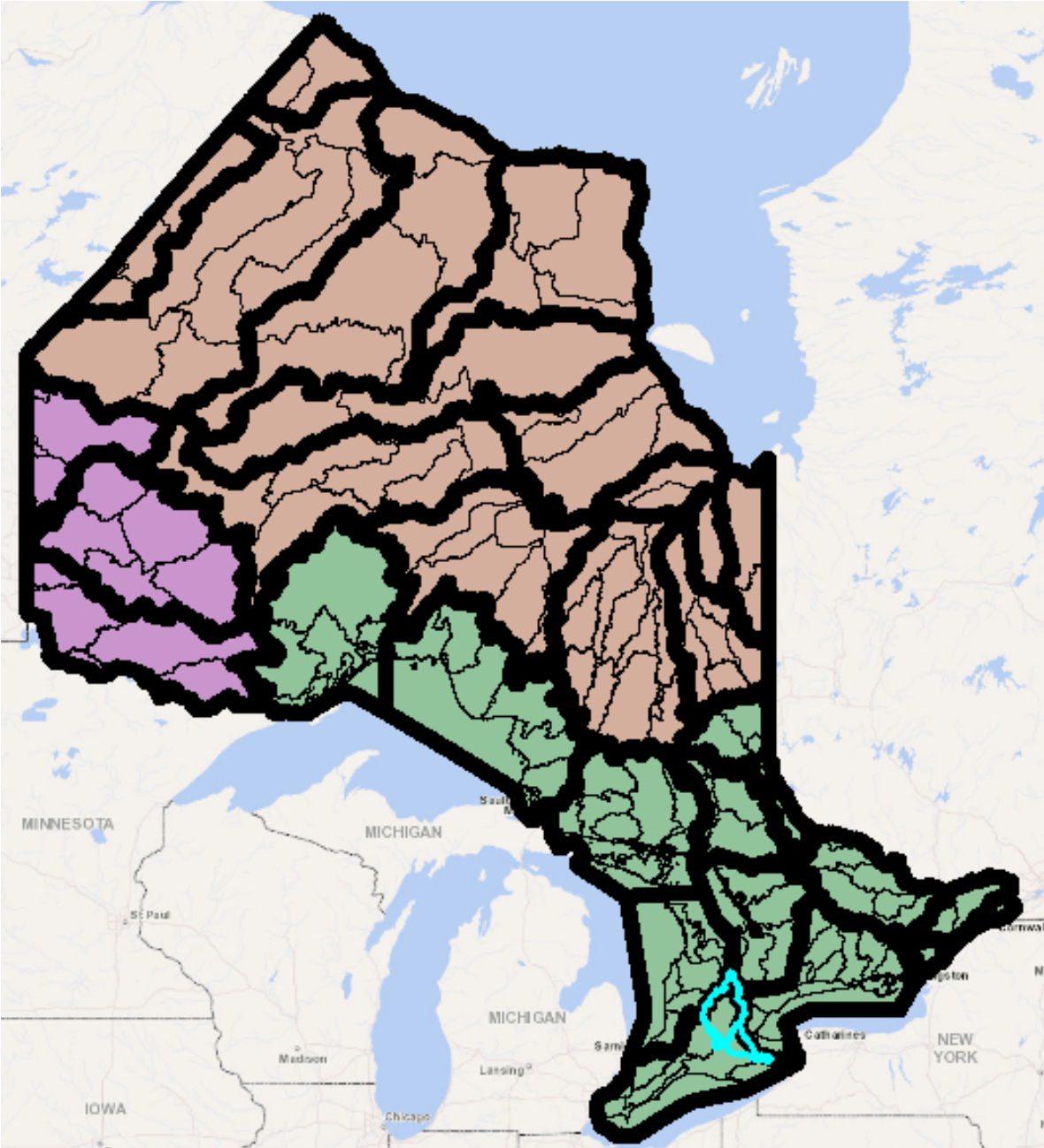
Watersheds

David's
beautiful
watershed
map



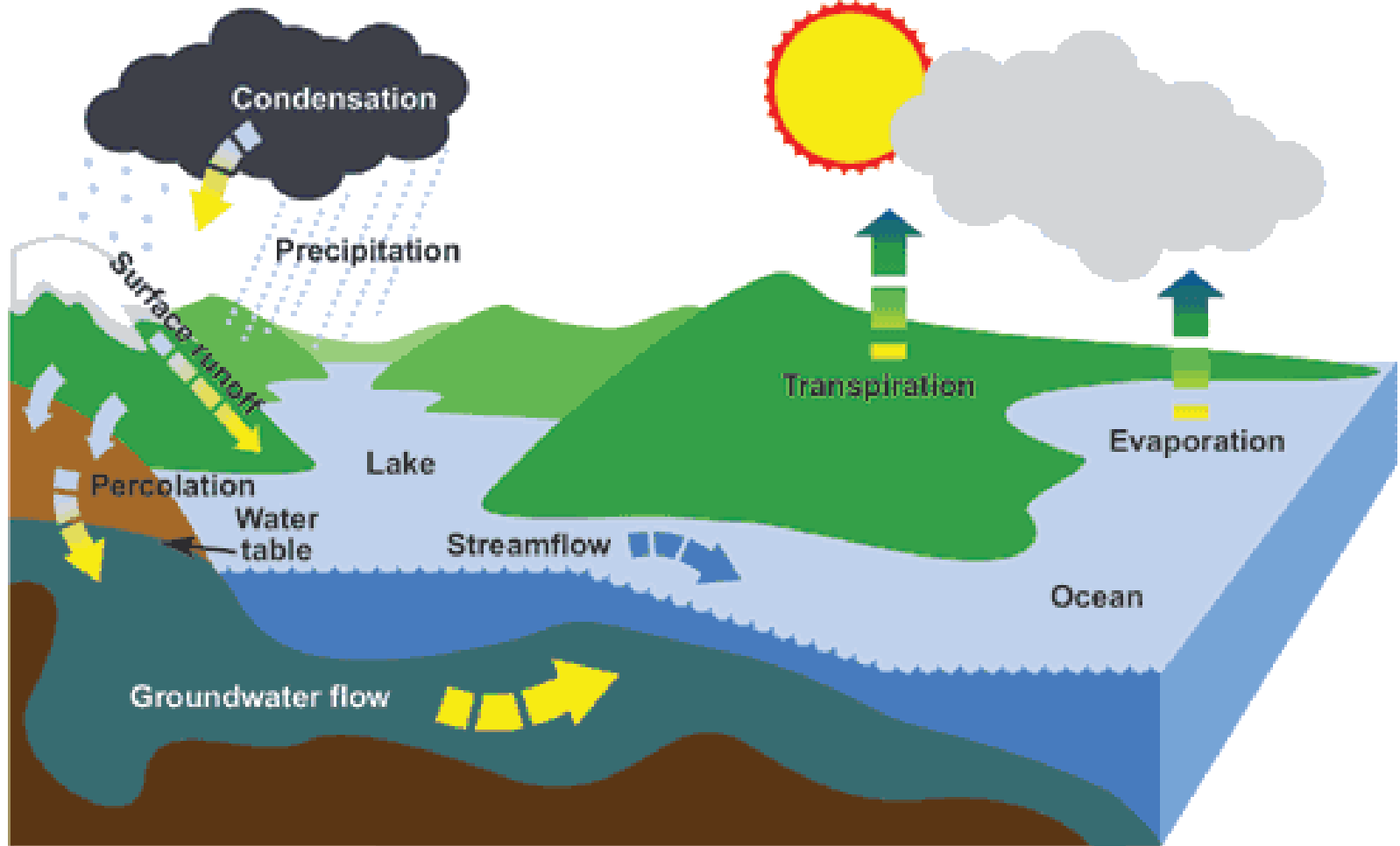
Watersheds

Amber's not-so-beautiful watershed map



The Water Cycle

The hydrologic cycle



What's in our Toolbox

- Understand the Hydrologic Cycle
- Assess the Risk of Flooding
- Help warn people



TOOL:



In Air Observations

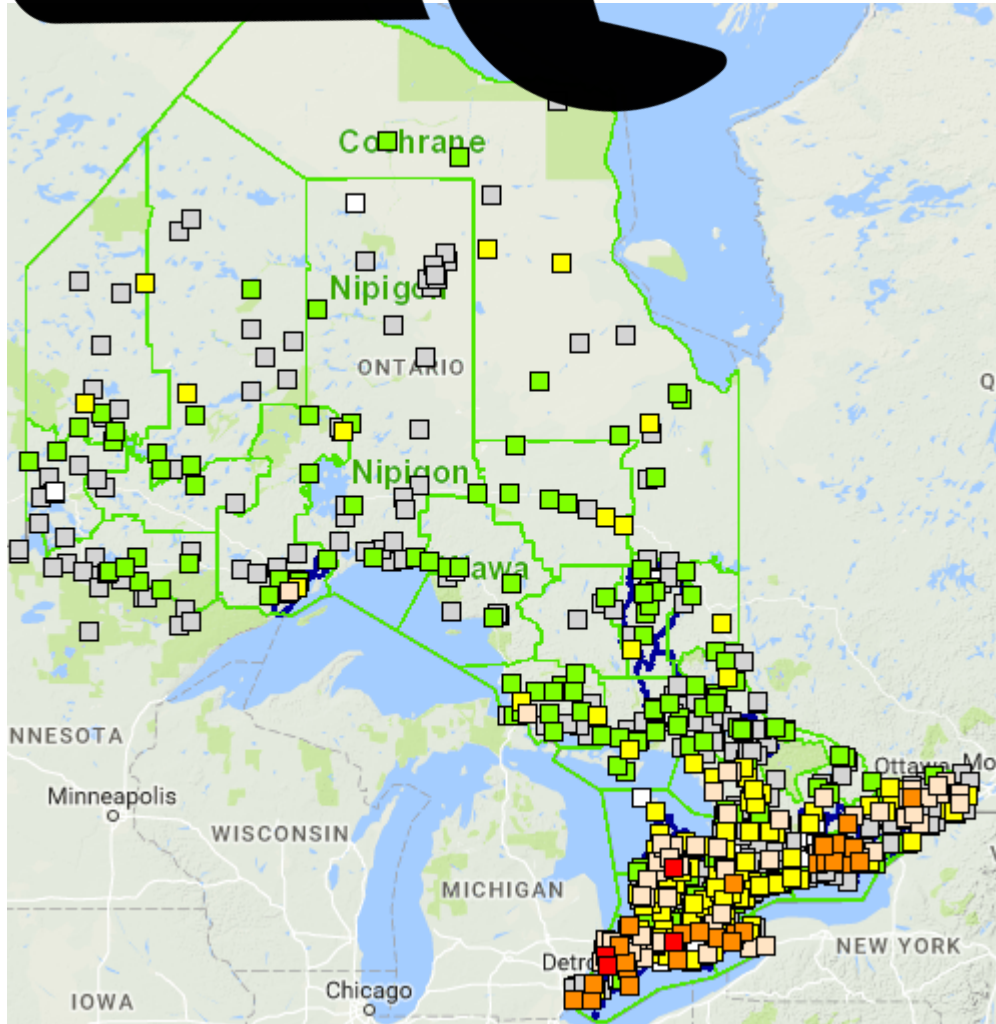
- Photos with a spatial reference
- Validate ice breakup models
- Assist with Satellite imagery

interpretation

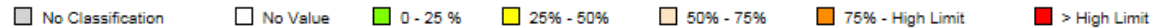


TOOL:

Stream Gauge Network



Water Level Classification Ranges



TOOL:



Real Time Gauge Cameras

- 9 active cameras
- Communication using Twitter!

<https://twitter.com/newswmc1>



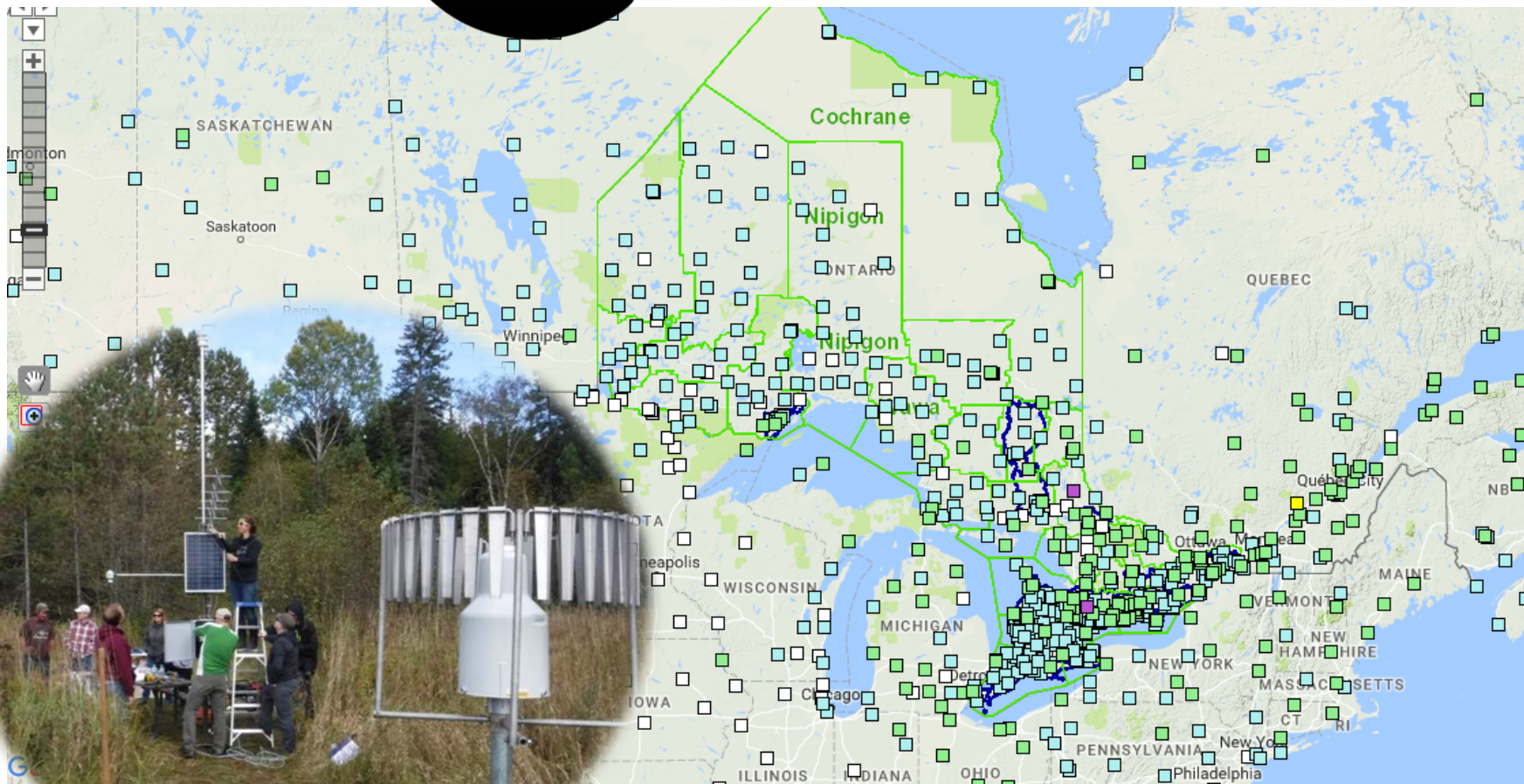
April 30th 2:00pm



April 30th 6:00pm

TOOL:

Weather Monitoring Network



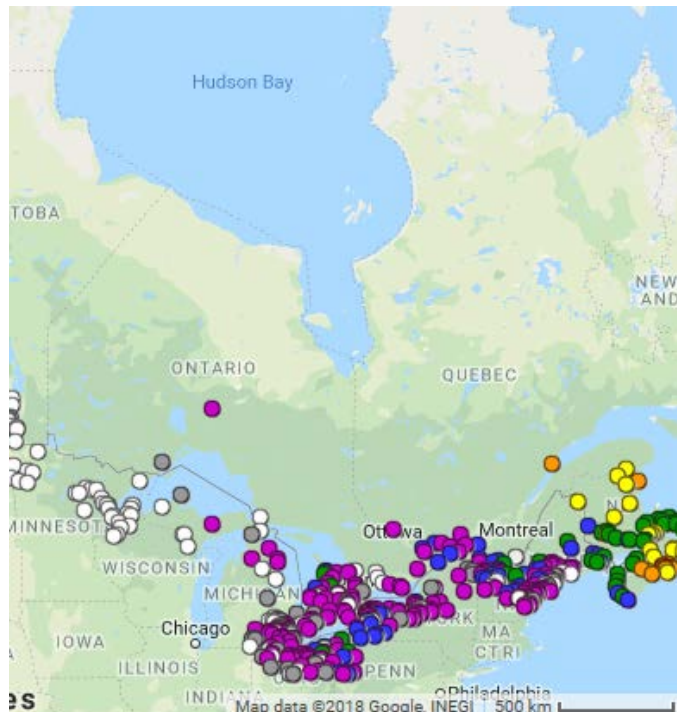
Rainfall



TOOL:

Citizen Science CoCoRaHS

- Community Collaborative Rain, Hail & Snow Network
- Volunteer based data collection (180+ in Ontario)
- SWMC purchased 75 units for northern distribution (fire/district staff/communities)



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



TOOL:



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



TOOL: MNRF AFFES

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

Types of Flooding



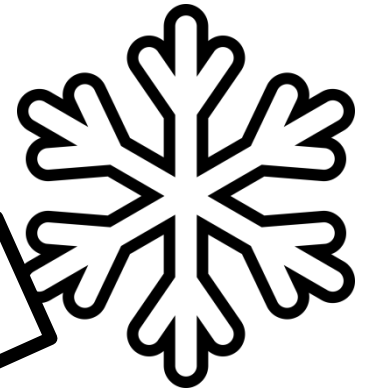
Spring
Melt

Rain
on
Frozen
Ground

Ice
Jams

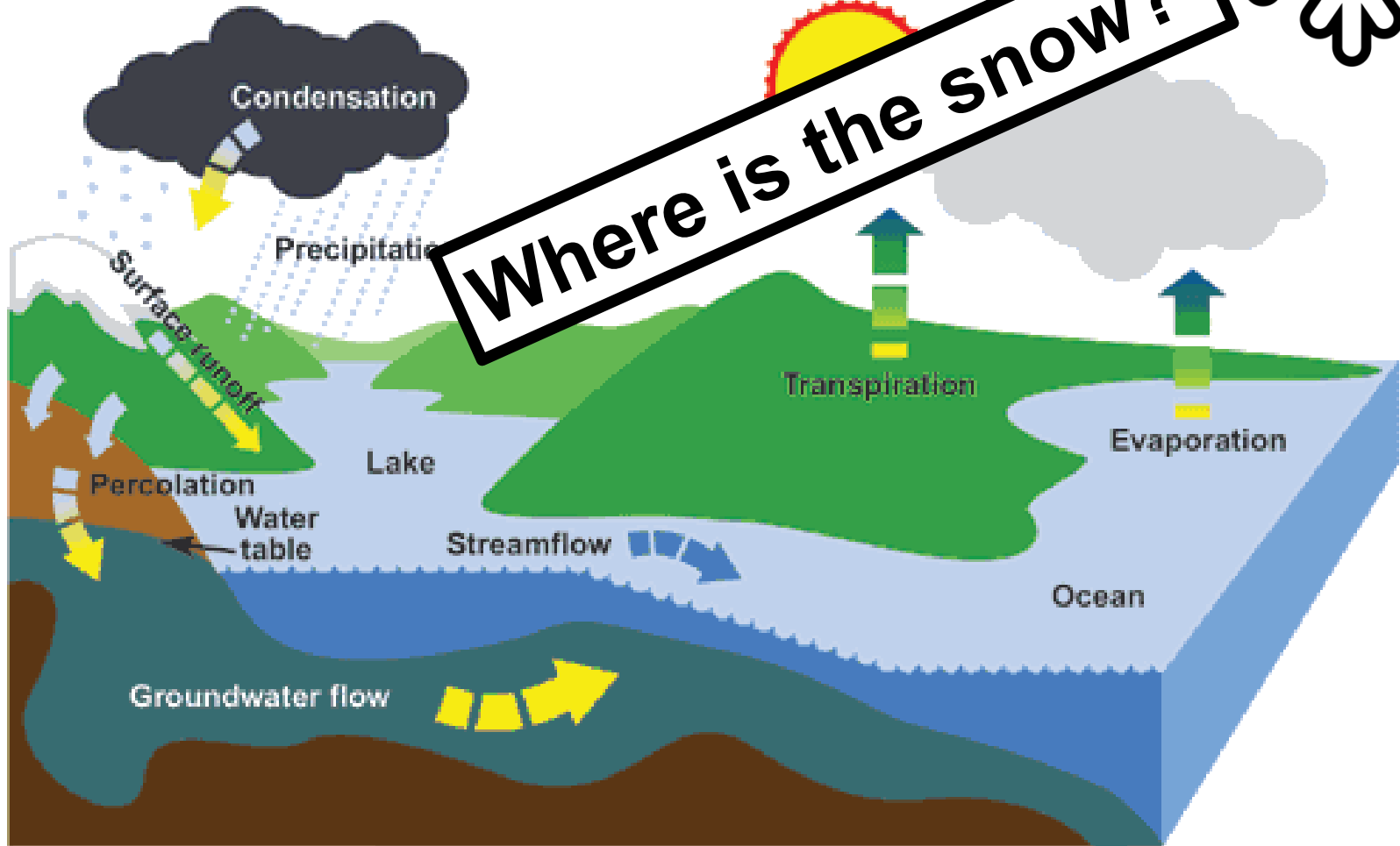
Severe
Storms

Flooding: Spring Melt



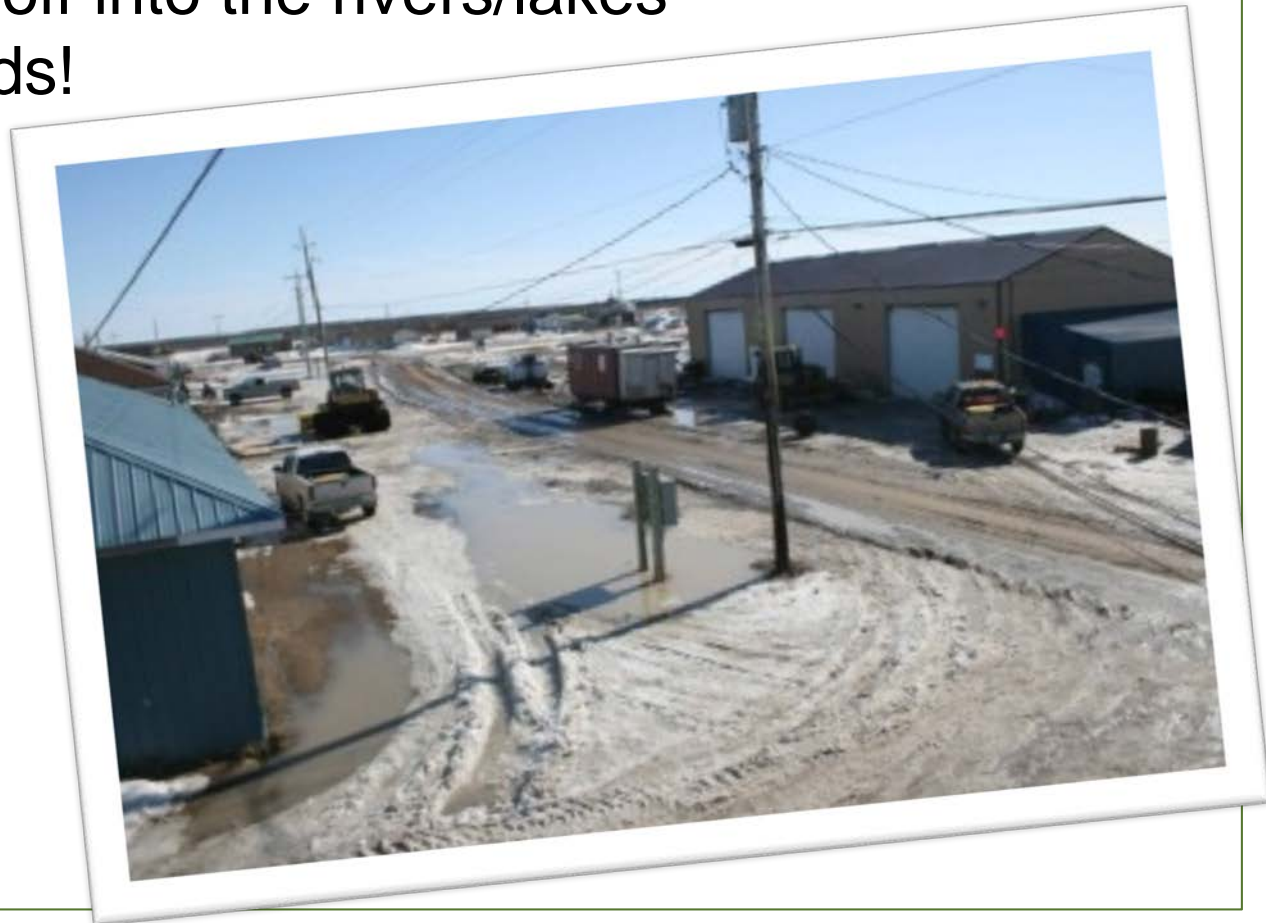
The hydrologic cycle

Where is the snow?



Flooding: Rain on Frozen Ground

- Frozen ground means that no rain can infiltrate into the ground
- All the rain runs off into the rivers/lakes
- Can lead to floods!

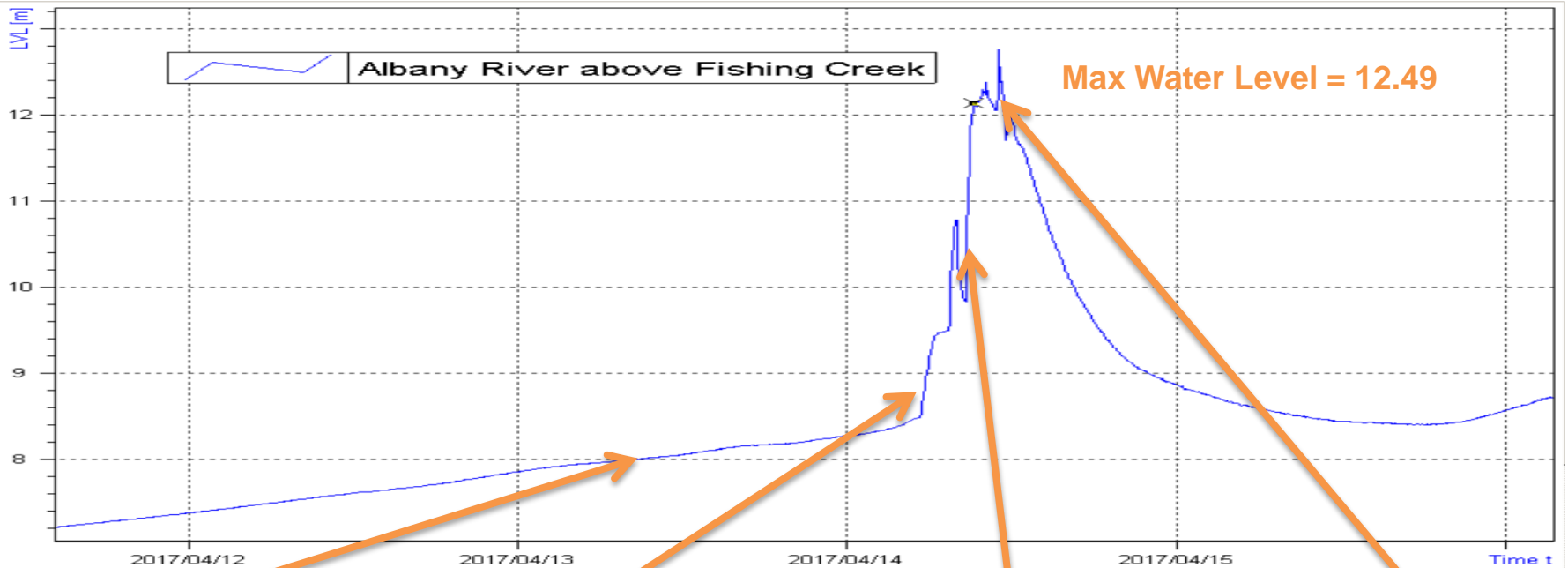


Flooding: Ice Jams

- Rising air temperatures cause
 - snow to melt (releases a huge amount of water!)
 - river ice to weaken
- The ground is still frozen
- Huge amounts of water enter the rivers
- Ice becomes trapped



Albany above Fishing Creek



April 13 15:00



April 14 15:00



April 14 18:00



April 15 12:00

Flooding: Severe Summer Storms

Wawa, Ont., damage from rain may exceed \$10M

Record rainfall created 15-metre holes along Trans-Canada Highway

CBC News · Posted: Oct 28, 2012 4:30 PM ET | Last Updated: October 28, 2012



Northern Ontario towns clean up after damaging flood

Storm washed out roads, killed motorcyclist near Thessalon

CBC News · Posted: Sep 14, 2013 6:03 PM ET | Last Updated: September 14, 2013

Thunder Bay crews busy as 80 mm of rain falls and floods parts of city

Environment Canada is warning another 20 mm of rain could fall Tuesday through Wednesday

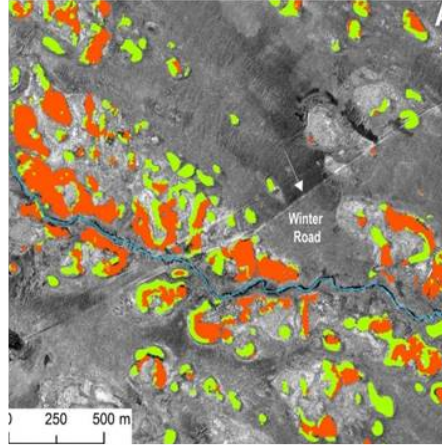
CBC News · Posted: Nov 29, 2016 11:42 AM ET | Last Updated: November 29, 2016

Naturally Resilient Initiatives: Examples

Community Wildfire Protection Plans



Permafrost Change and Vulnerability



Gray Jay Population Decline Research



Tree Seed Science & Policy



Climate Vulnerability Assessment Albany



Monitoring Change in Snow Cover Extent



Thanks!

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