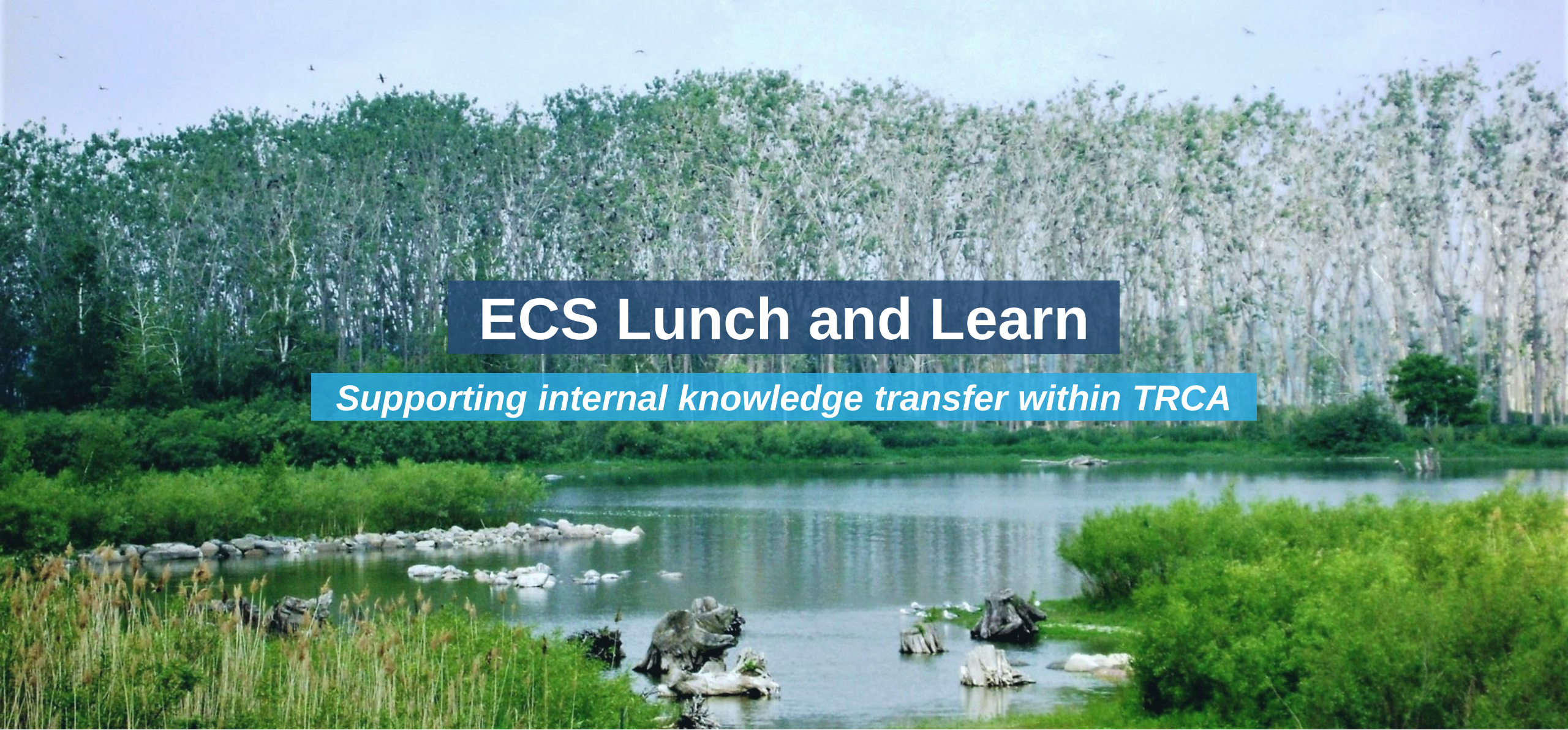




ECS Lunch and Learn

Supporting internal knowledge transfer within TRCA

July 14, 2021

TRCA Water Resource System

Methods and analysis for delineating Key Hydrologic Features & Areas

Presented by: Jonathan Ruppert, Research Scientist, Ecosystem & Climate Science, WPES, DES

July 14, 2021

Outline

1. Quick Background
2. Layer Creation/Updates
 - New Layers (ESGRAs, Seepages/Springs, SSWCAs)
 - Refinements (Wetlands, Inland Lakes)
 - New Classifications (Permanent/Intermittent Streams)
3. Overview of WRS Identification and Mapping

Definition & Relevant Policies

- Water Resource System (WRS)

“ground water features and areas and surface water features (including shoreline areas), and hydrologic functions, which provide the water resources necessary to sustain healthy aquatic and terrestrial ecosystems and human water consumption.” - Growth Plan (2020)

- Relevant policies for Water Resource System (WRS), include:

- *Provincial Policy Statement (2020)*
- *Growth Plan (2020)*
- *Greenbelt Plan (2017)*
- *Oak Ridges Moraine Conservation Plan (ORMCP; 2017)*



Water Resource System (WRS)

Key Hydrologic Areas (KHAs)

- Significant Groundwater Recharge Areas (SGRAs);
- Highly Vulnerable Aquifers (HVAs);
- Significant Surface Water Contribution Areas (SSWCAs);
- Ecologically Significant Groundwater Recharge Areas (ESGRAs);

Key Hydrologic Features (KHF's)

- Permanent streams;
- Intermittent streams;
- Inland lakes and their littoral zones;
- Seepage areas and springs;
- Wetlands.

Overview of WRS at start of 2020

WRS Component	2019 Availability	New Areas Mapped	Lead	Partner
Seepages areas and Springs	N	Y	WPES	ORMGP
Wetlands	Y	N	WPES	BIDA
Inland lakes and their littoral zones	Y	N	WPES	BIDA
Permanent and Intermittent Streams	N	N	WPES	-
ESGRAs	Y	Y	WPES	BIDA/ORMGP
SSWCAs	N	N	WPES	-
HVAs*	Y	N	-	-
SGRAs*	Y	N	-	-

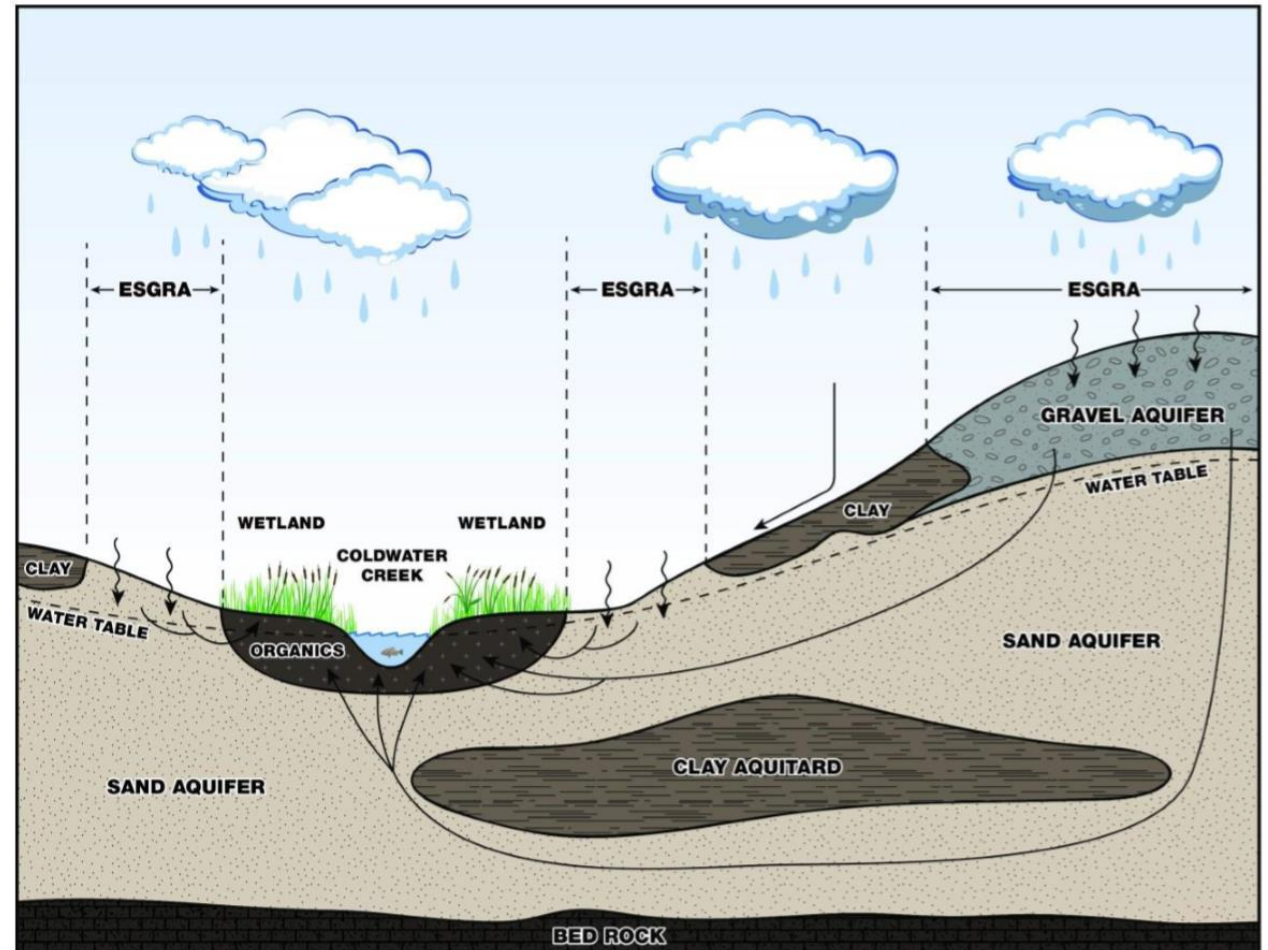
*Source Water Protection data layers.

Outline

1. Quick Background
2. **Layer Creation/Updates**
 - **New Layers (ESGRAs, Seepages/Springs, SSWCAs)**
 - Refinements (Wetlands, Inland Lakes)
 - New Classifications (Permanent/Intermittent Streams)
3. Quick Overview of WRS Mapping

Ecologically Significant Groundwater Recharge Area (ESGRA): Definition

“Areas of land that are responsible for replenishing groundwater systems that directly support sensitive areas like coldwater streams and wetlands” (LSRCA, 2014)

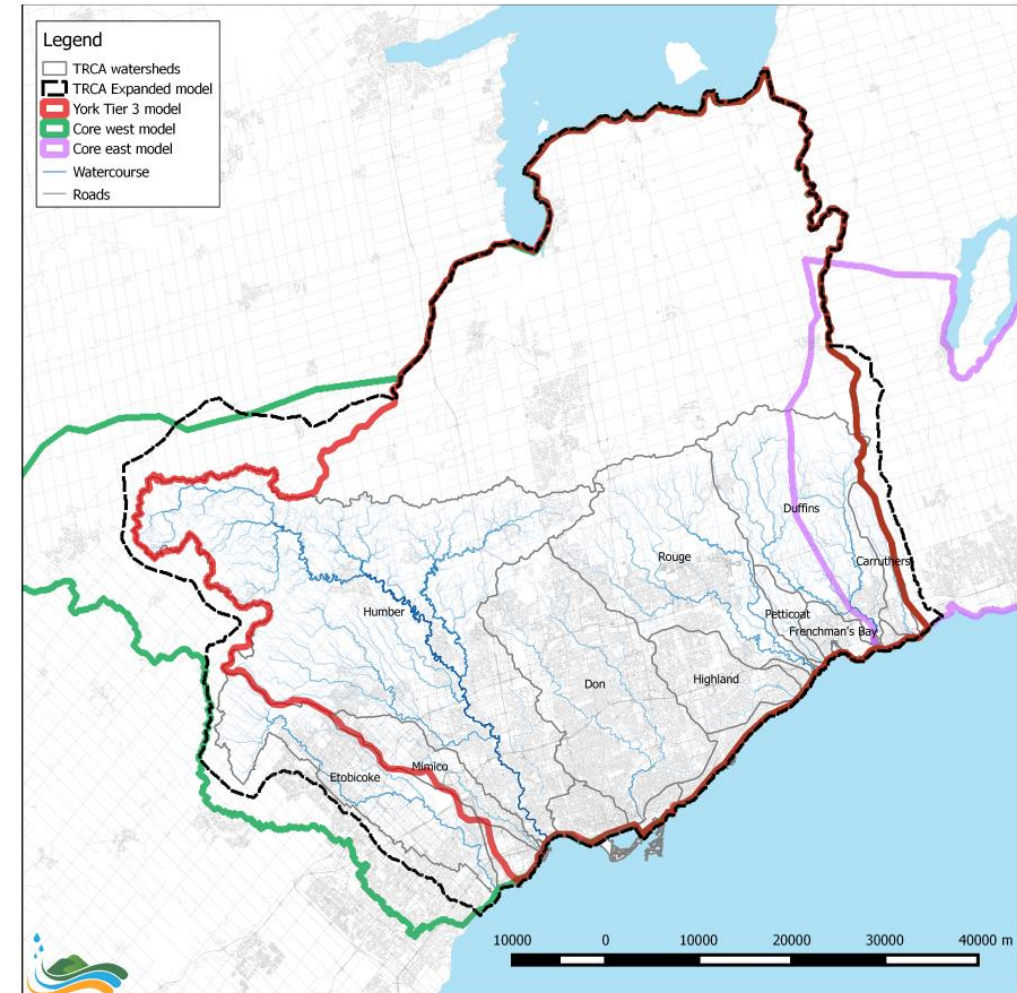


ESGRA precedents

- LSRCA – Western Lake Simcoe watersheds – 2012-2013 (Earth FX)
- LSRCA – Southern Lake Simcoe Watershed – 2015 (Golder)
- CLOCA – All watersheds – 2014 (Earth FX)
- Previous coarse-scale TRCA mapping based on surficial geology and known coldwater ecosystems – 2007-2008

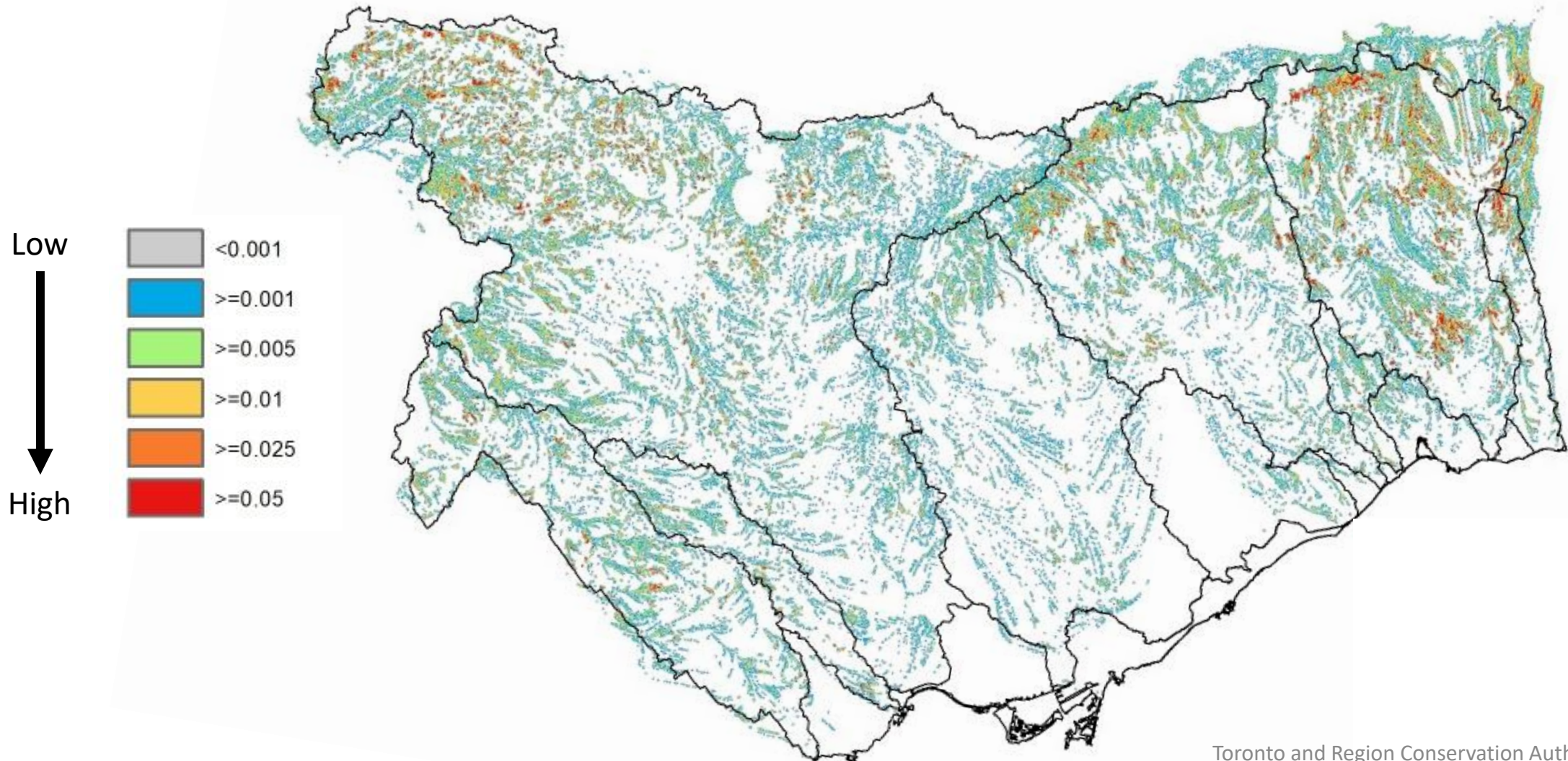
Development of mapping scenarios

1. ORMGP expanded York Tier 3 Water Balance Model to create **TRCA Expanded Groundwater Flow Model**
2. Reverse particle tracking used to determine recharge pathways for ecologically significant features (all wetlands and all streams)
3. TRCA technical cmte. reviewed ESGRA mapping scenarios based on model outputs to find optimal solution



Raw model output (endpoint density)

No Ecological Links & No Polygons!



Ecological evaluation component

- Objective: evaluated ESGRA scenarios to determine the *proportion of highly groundwater-dependent ecosystems (HGDEs) whose recharge areas are covered*
- Evaluated 3 types of **HGDEs**:
 - **Coldwater fish** clusters (highest density of records; spp. determined by aquatic biologists) 
 - Groundwater-obligate **wetland flora** clusters (highest density of records; spp. determined by terrestrial biologists) 
 - **Fen wetlands** (understood to be HGDEs) 

Ecological evaluation component

- Coldwater fish clusters (high density areas)

Common name	Scientific name
American brook lamprey	<i>Lethenteron appendix</i>
Brook trout	<i>Salvelinus fontinalis</i>
Brown trout	<i>Salmo trutta</i>
Mottled sculpin	<i>Cottus bairdii</i>
Northern brook lamprey	<i>Ichthyomyzon fossor</i>
Slimy sculpin	<i>Cottus cognatus</i>



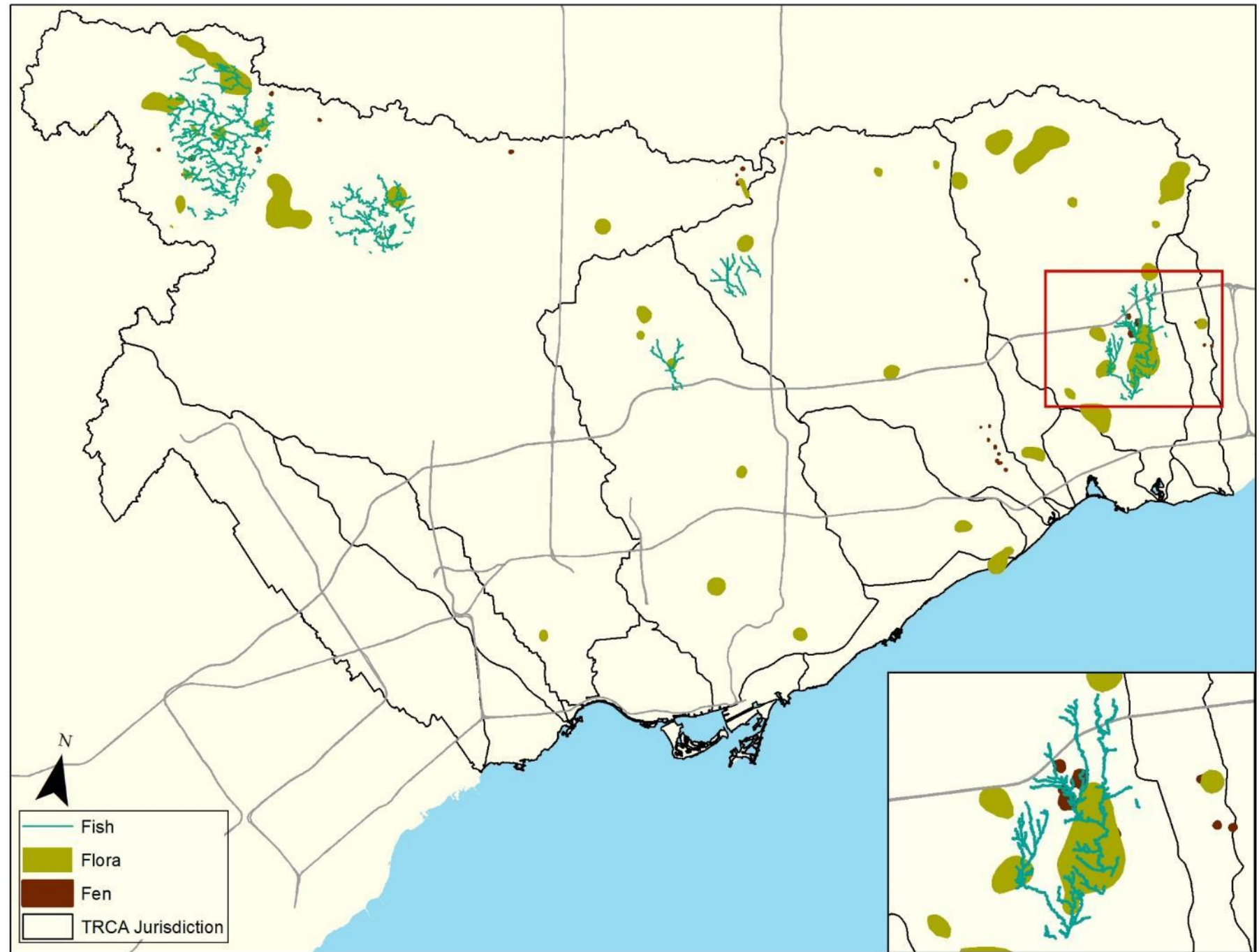
Ecological evaluation component

- Groundwater-obligate **wetland flora** clusters (high density areas)

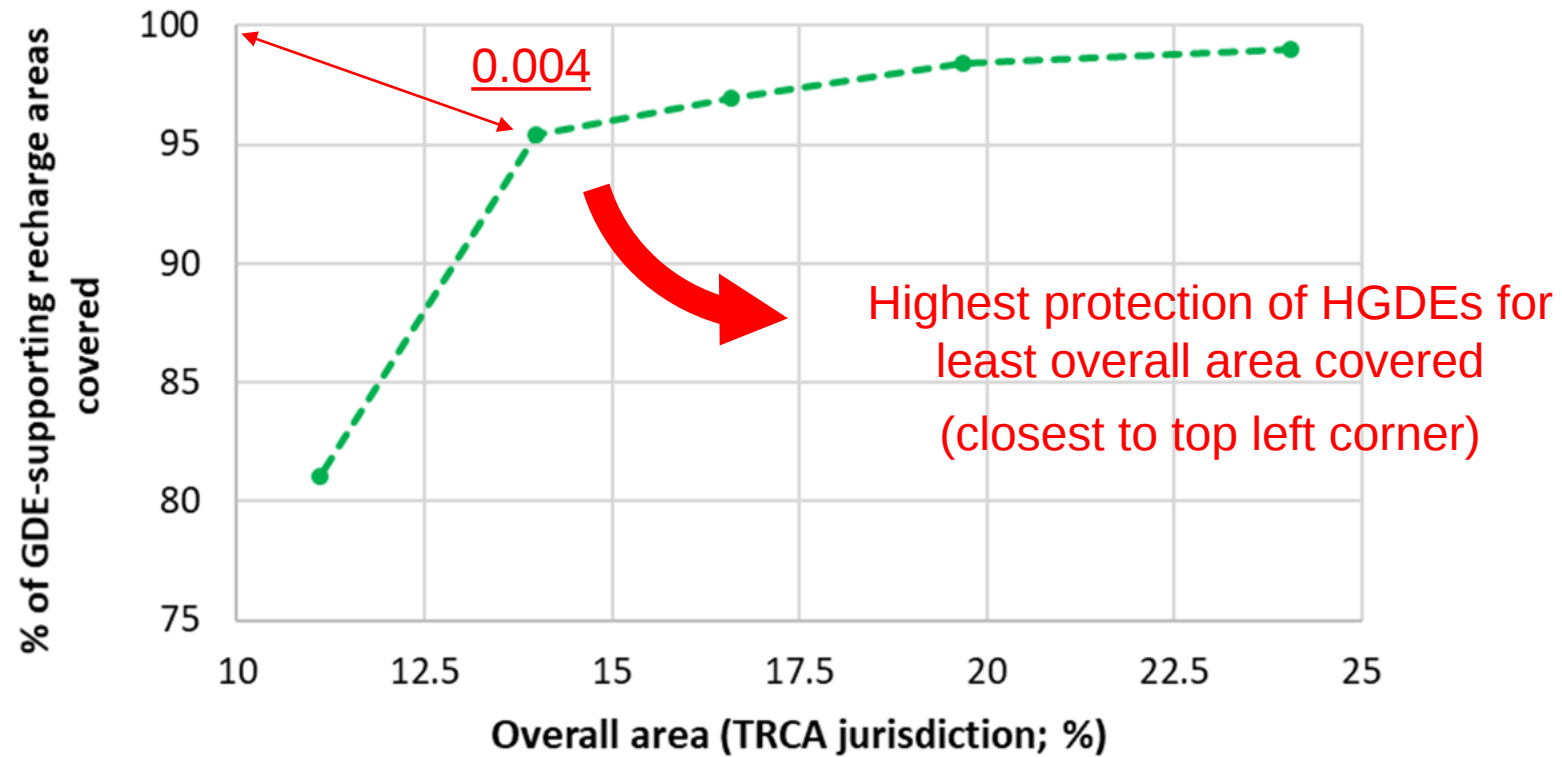
Common name	Scientific name	Common name	Scientific name
American speedwell	<i>Veronica americana</i>	Schweinitz' sedge	<i>Carex schweinitzii</i>
Bristle-stalked sedge	<i>Carex leptalea</i>	Shining ladies' tresses	<i>Spiranthes lucida</i>
Bulblet fern	<i>Cystopteris bulbifera</i>	Showy lady's slipper	<i>Cypripedium reginae</i>
Fen star sedge	<i>Carex interior</i>	Skunk cabbage	<i>Symplocarpus foetidus</i>
Fringed brome grass	<i>Bromus ciliates</i>	Smooth-sheathed sedge	<i>Carex laevivaginata</i>
Fringed gentian	<i>Gentianopsis crinita</i>	Thin-leaved cotton-grass	<i>Eriophorum viridicarinatum</i>
Golden saxifrage	<i>Chrysosplenium americanum</i>	Three-seeded sedge	<i>Carex trisperma</i>
Hooded ladies' tresses	<i>Spiranthes romanzoffiana</i>	Turtlehead	<i>Chelone glabra</i>
Loesel's twayblade	<i>Liparis loeselii</i>	Two-seeded sedge	<i>Carex disperma</i>
Marsh marigold	<i>Caltha palustris</i>	Variegated scouring-rush	<i>Equisetum variegatum</i> ssp. <i>variegatum</i>
Marsh pennywort	<i>Hydrocotyle americana</i>	Water avens	<i>Geum rivale</i>
Naked mitrewort	<i>Mitella nuda</i>	Yellow sedge	<i>Carex flava</i>
Rough sedge	<i>Carex scabrata</i>		



HGDEs (indicators)



Scenario #9 – “optimized” scenario

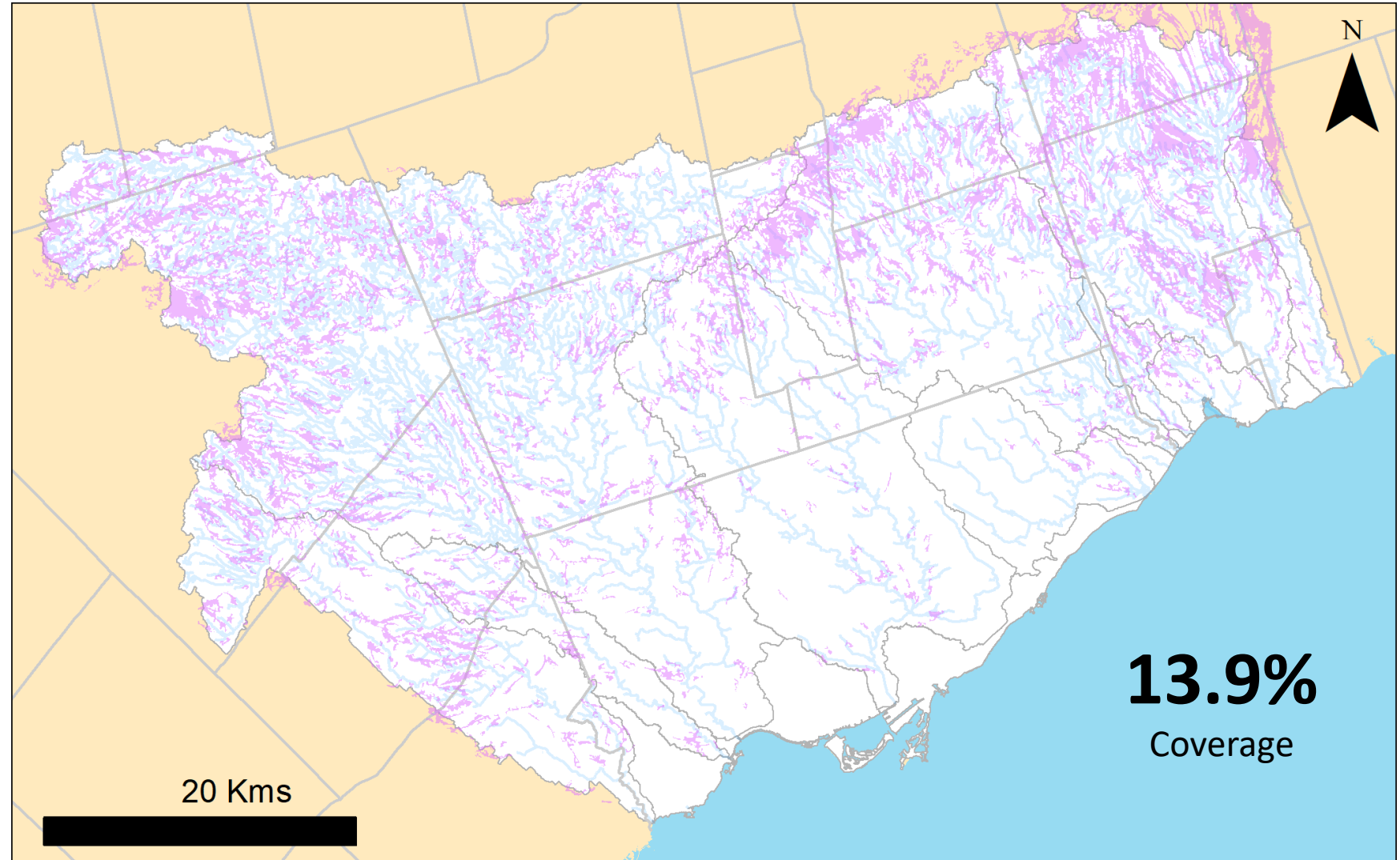


Comparison with precedents

	TRCA (2019)	LSRCA (2012)	LSRCA (2013)	LSRCA (2015)	CLOCA (2014)
Density Thres.	0.004	0.01	0.005	0.0005*	0.05*
Min. Size (ha)	5	4.5	4.5	10	4.5
Area of watershed (%)	13.9	15.3	21.3	29.0	38.0

ESGRA: Mapping

Watershed area (%)	13.9
HGDE protected (%)	95.4
Minimum size	5 ha
Overlap: ORMCP (%)	40.5
Greenbelt (%)	62.4
2017.Nat.Cov (%)	29.4
TNHS (%)	38.7
Other NHS designations (%)	46.4
SGRA (%)	56.2

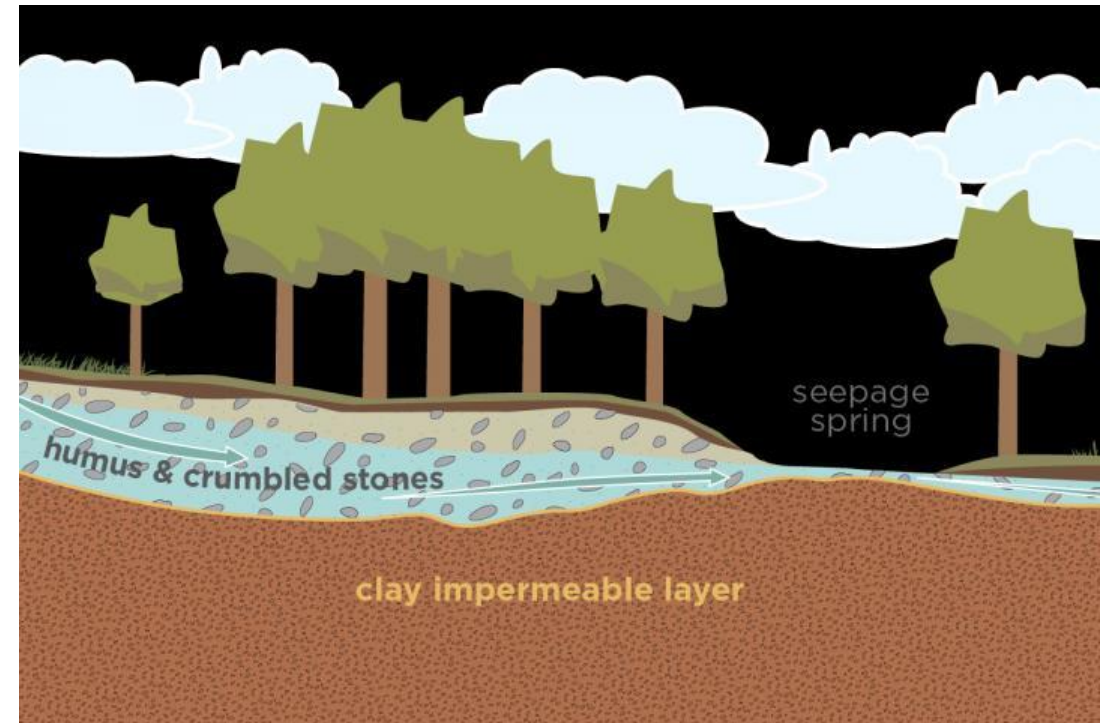


Seepage areas and Springs: Definition & Issues

“Sites of emergence of groundwater where the water table is present at the ground surface”

– *Growth Plan (2020)*

- No comprehensive sampling or database exists for seepages/springs
- Layer was developed that best approximates the location of this key hydrologic feature



Seepage areas and Springs: Methods

Final layer is comprised of two sub-components:

1. A linear layer describing the watercourses where groundwater discharge in the stream is predicted to be stronger than the regional average stream discharge (i.e., describing strongly discharging streams; Polyline)
2. A polygon layer describing areas with strong potential for groundwater discharge at surface (i.e., water seeping out of the ground, at least during part of the year; Polygon).

Seepage areas and Springs: Mapping

- Post-processing to remove areas that intersected with urban land uses (*this includes airport, commercial, high density residential, industrial, institutional, landfill, medium density residential, mixed commercial entertainment, railway, and roads*)
- Removed small features (> 1 hectare in size)



Significant Surface Water Contribution Area (SSWCA): Definition

“Areas, generally associated with headwater catchments, that contribute to baseflow volumes which are significant to the overall surface water flow volumes within a watershed.” – *Growth Plan* (2020)

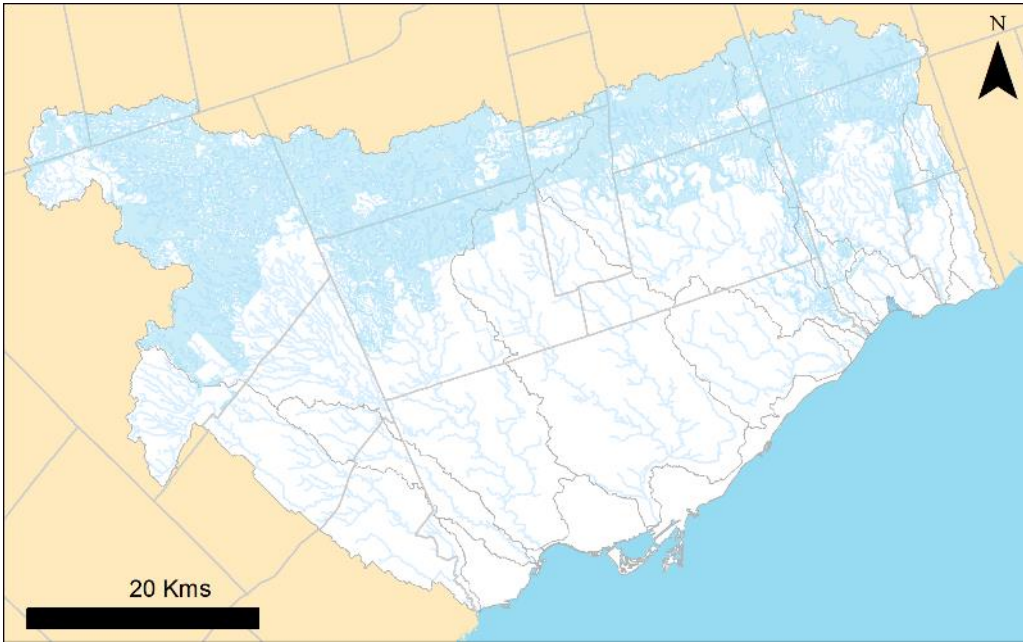
“SSWCAs are those areas which are both SGRAs and ESGRAs; the methodologies used to delineate SGRAs and ESGRAs should be used to identify SSWCAs.” – *Further Clarification from Province* (early 2021)

SSWCA = SGRA + ESGRA: Methods

- **SGRAs – Significant Groundwater Recharge Areas**
 - Identified by Source Water Protection Program and based on the volume of recharge that occurs, not where water resources contributing to recharge expresses itself (e.g., streams)
- **ESGRAs – Ecological Significant Groundwater Recharge Areas**
 - Identified as a likely site of groundwater recharge for the receiving feature that they support (streams and wetlands), but not based on the volume that they contribute.
- **SSWCAs** - overlap of areas that provide a large volume of groundwater recharge, and where that recharge has been found through groundwater modelling to support sensitive areas like coldwater streams and wetlands.

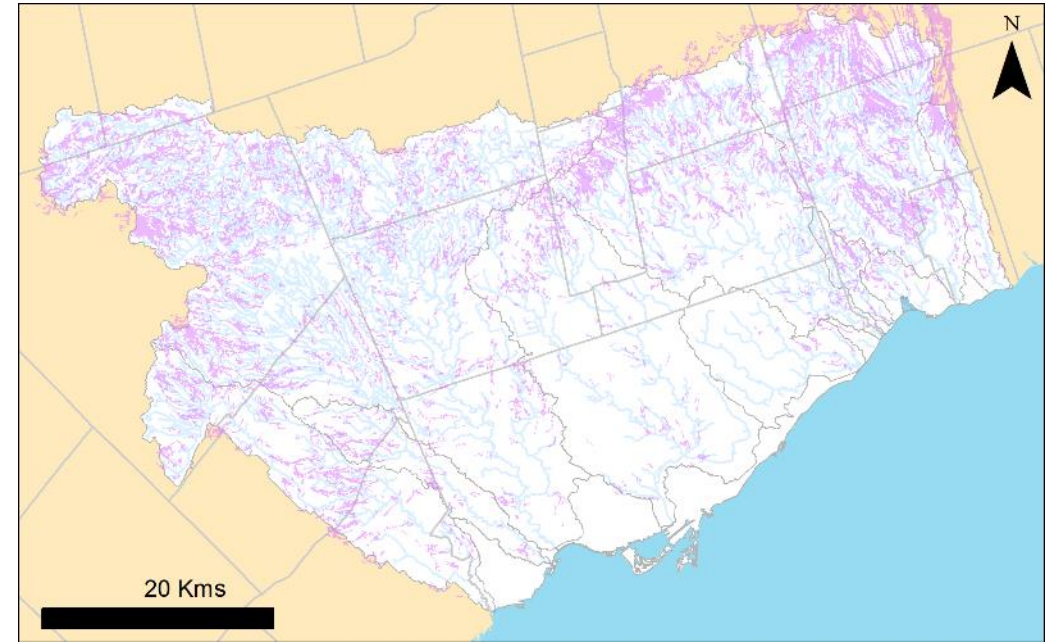
SSWCAs: Mapping

SGRAs



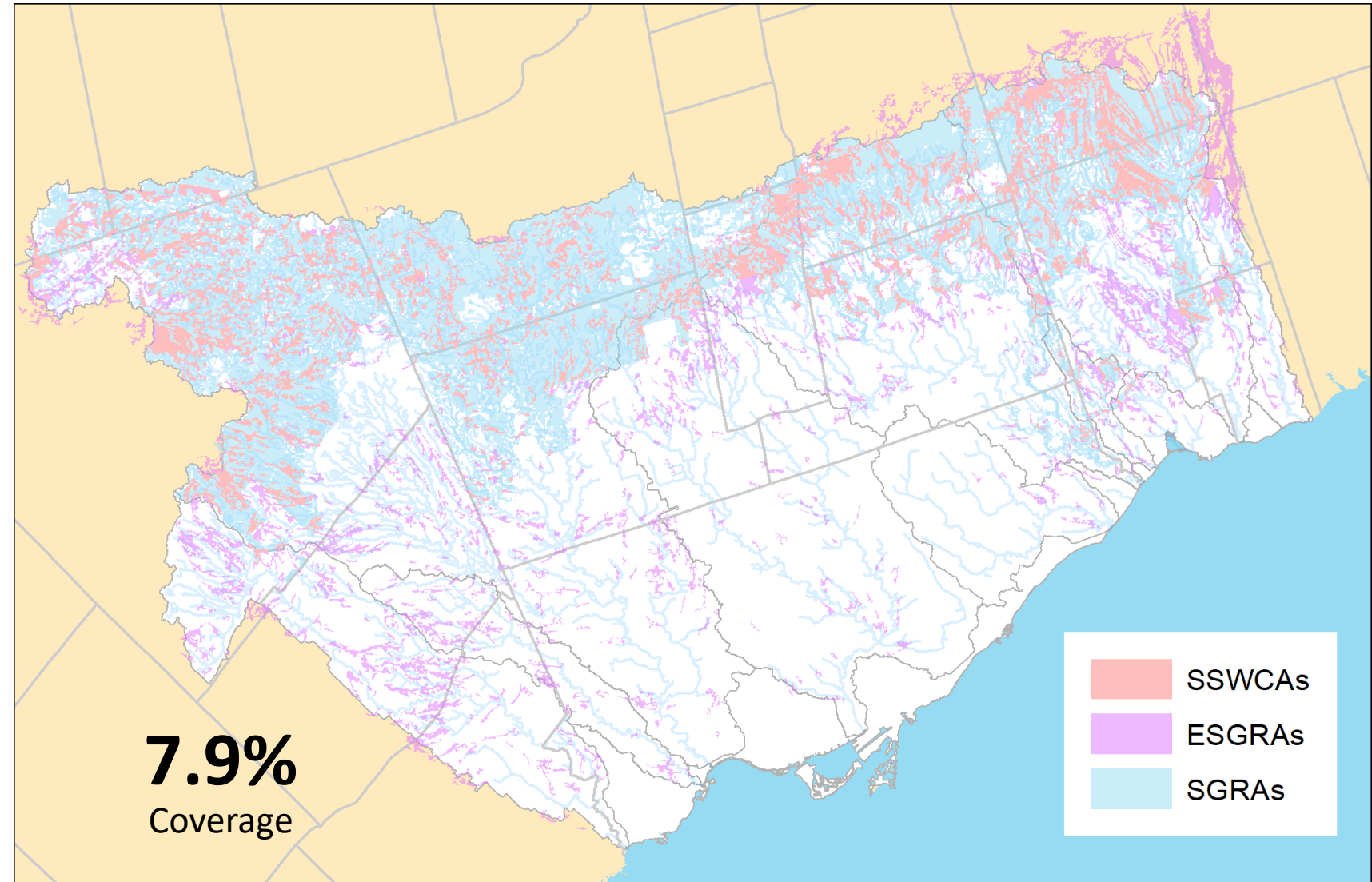
+

ESGRAs



SSWCAs: Mapping

- Largely confined to upper headwaters and within greenbelt areas
- No new areas are mapped
- Patterns follow SGRAs and ESGRAs



Outline

1. Quick Background

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- New Layers (ESGRAs, SSWCAs, Seepages/Springs)
- **Refinements (Wetlands, Inland Lakes)**
- New Classifications (Permanent/Intermittent Streams)

3. Quick Overview of WRS Mapping

Wetlands: Definition

“Lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens.”

– Growth Plan (2020)



Wetlands: Methods – Identified Issues

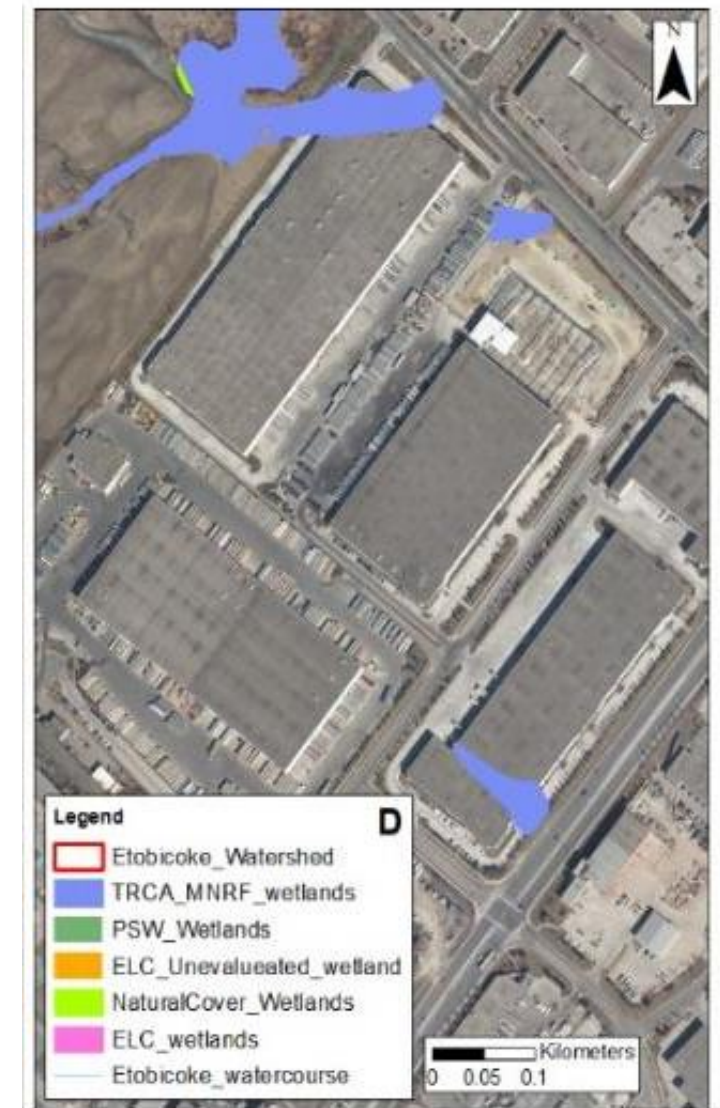
- **Many different wetland layers exist in the TRCA database**
- **Why would this be the case?**
 - Serve different purposes (e.g. strategic direction to site level planning)
 - Fulfill need for data at multiple spatial scales (e.g. regional level to site level)
 - Created using different methods (e.g. remotely sensed to field collected)
 - This results in varying levels of accuracy and spatial coverage (e.g. spatial coverage of remotely sensed data to accuracy of field collected data in surveyed areas only)
- **Many issues were arising, including:**
 - Municipal partners are seeking consolidated data for regional initiatives like WRS and NHS
 - Integrating multiple objectives into one strategic watershed plan
 - Inconsistent designation of features (e.g. wetlands, inland lakes, stormwater ponds)

Wetlands: Methods – Data Layers

Layer	Method Used	Spatial Coverage	Accuracy Level	Date
Natural Cover Wetlands	Ortho-photo interpretation	Entire jurisdiction	Medium	2017
ELC Wetlands	Field collected by TRCA	Surveyed Areas Only	High	2019 (>15 years is obsolete)
MNRF Wetlands (3 layers) <i>ELC_MNR_unevaluated_wetland</i> <i>MNR_PSW_wetlands</i> <i>MNR_LocalSignif_wetlands</i>	Field evaluated by trained personnel and/ flagged for evaluation	Surveyed Areas Only	High	2020
All Regulation Layers	Combining three MNRF layers	ELC+MNRF areas only	High	2018
TRCA MNRF Combined	Combining ELC+MNRF	ELC+MNRF areas only	High	2018

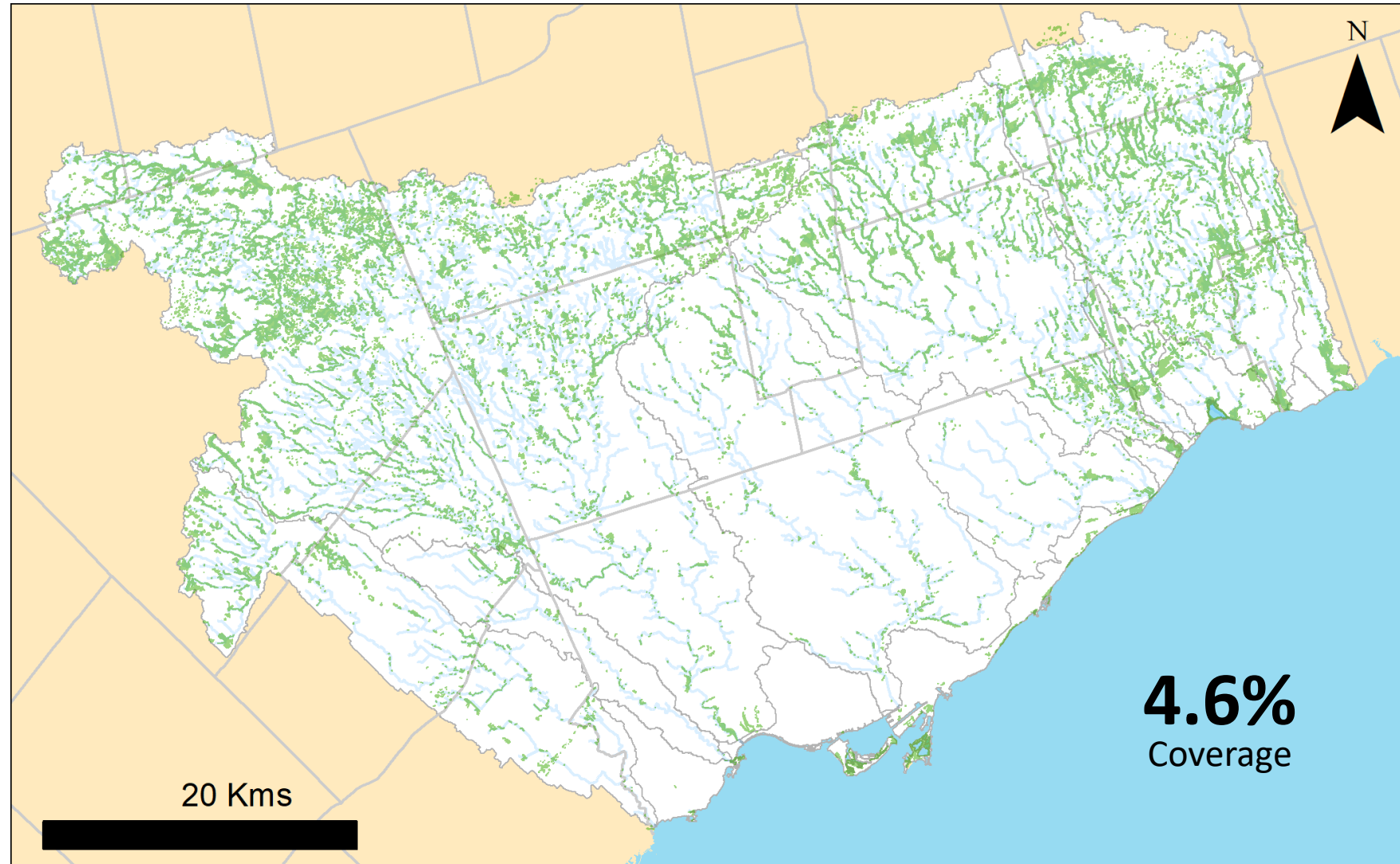
Wetlands: Methods – Refinement

- Create a more inclusive wetland “*TRCA refined wetland*” layer
 - Overlay TRCA ELC + TRCA Restored +MNRF Wetlands + Natural Cover Wetlands
- Conduct desktop level QA/QC to remove any discrepancies
 - Use orthophoto and other documented up-to-date information (from variety of expert sources)
 - The tracking tool developed by GIS will document every change made, rationale, and other comments associated with them
- This “*TRCA refined wetland*” layer will be used in the WRS



Wetlands: Mapping

- One final “refined” comprehensive wetland layer
- **32,352 wetland records were reviewed**
- Includes 2019 and 2020 regulation update (113 wetlands added)
- QA/QC on ~1600 wetlands revealed **93.4% accuracy**



Inland Lakes and their Littoral Zones: Definition

Inland Lake - *“any inland body of standing water, usually fresh water, larger than a pool or pond or a body of water filling a depression in the earth’s surface.”*

– Greenbelt Plan (2017)

Littoral zone - Developed shoreline policies - Growth Plan (2020)

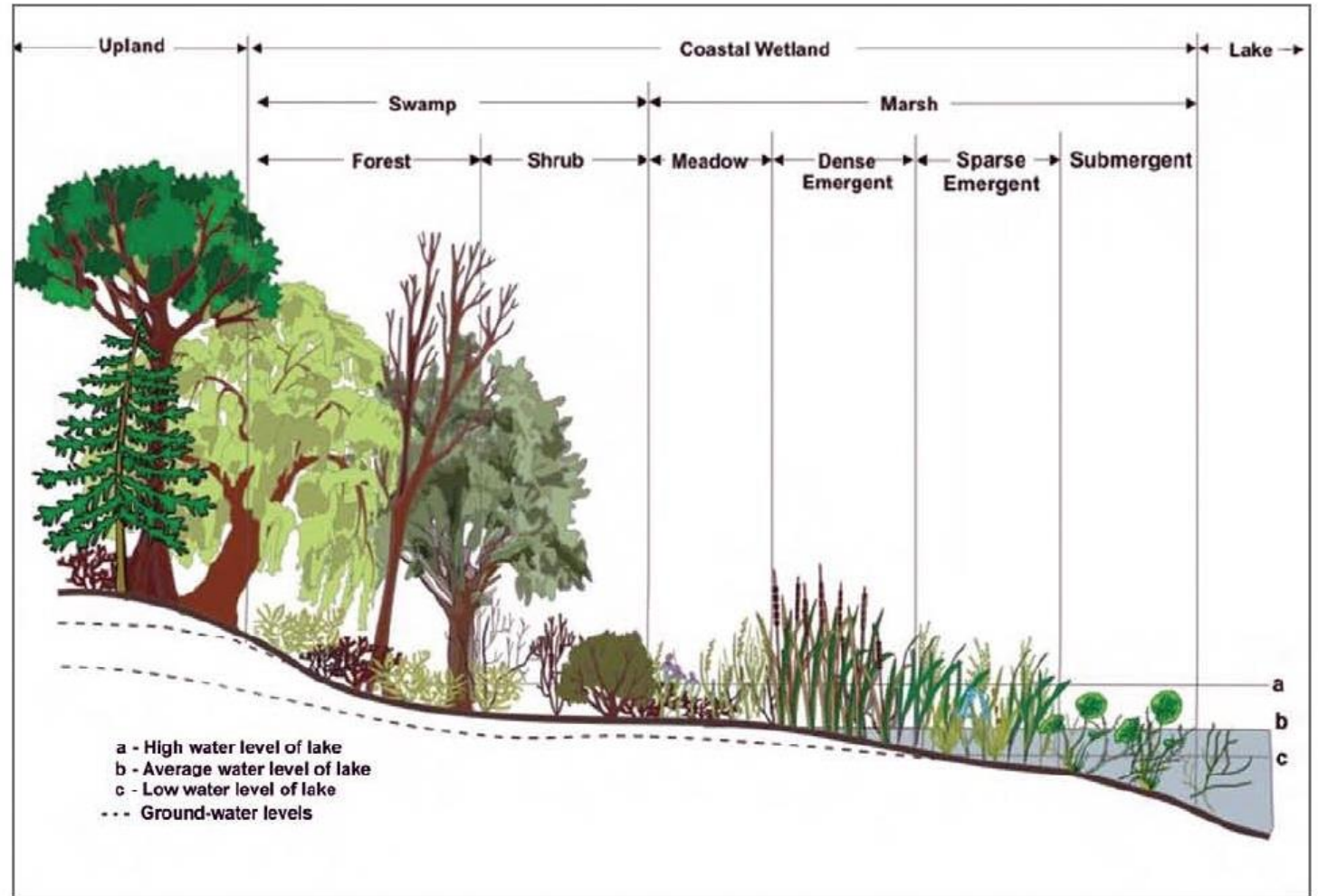
- No good definition of “littoral” in these policy documents



Inland Lakes and their Littoral Zones: Definition

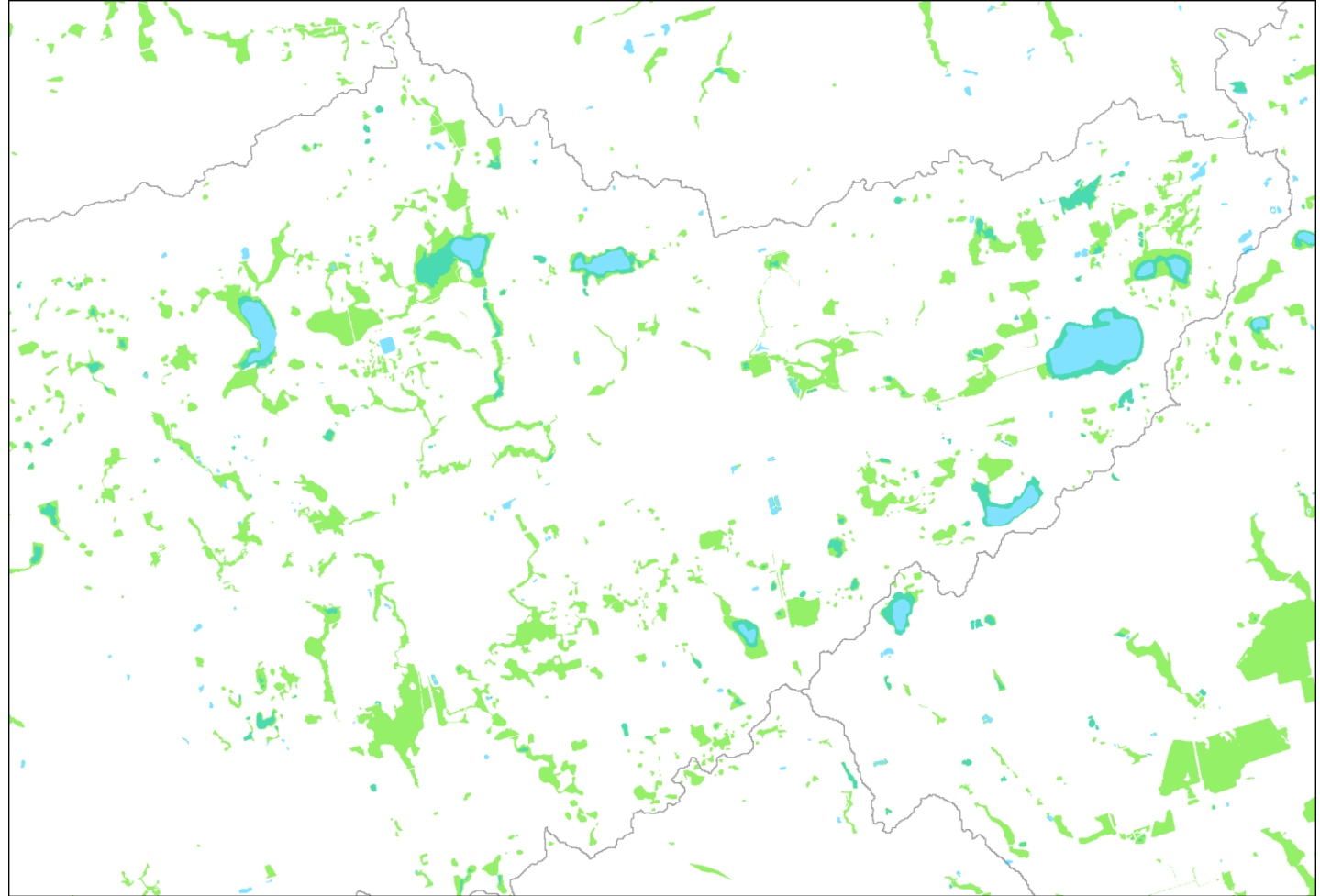
Littoral Zones - *“The shallow water zone in a lake, pond or river, where most of the aquatic plants (emergents, submergents and floating plants) exist, and within which most of the primary production occurs. The width and depth of the littoral zone depends on dissolved nutrients, soils, depth contours, water temperature, and water clarity (which affects light penetration). Marshes as a rule are entirely in the littoral zone.”*

– OWES (2013)



Inland Lakes and their Littoral Zones: Methods - Issues

- Layer being used was created for cartographic purposes
- Artificial and natural features combined are combined
 - Lake, Natural pond, Estuary, Stormwater management pond, Artificial, Unknown
 - Features can have very different intended functions
 - Stormwater management, Irrigation (golf course), Ornamental, Recreational, Natural – habitat provisioning
- Accuracy issues are apparent as well (photo interpretation)
- Overlap apparent with other KHF, such as wetlands



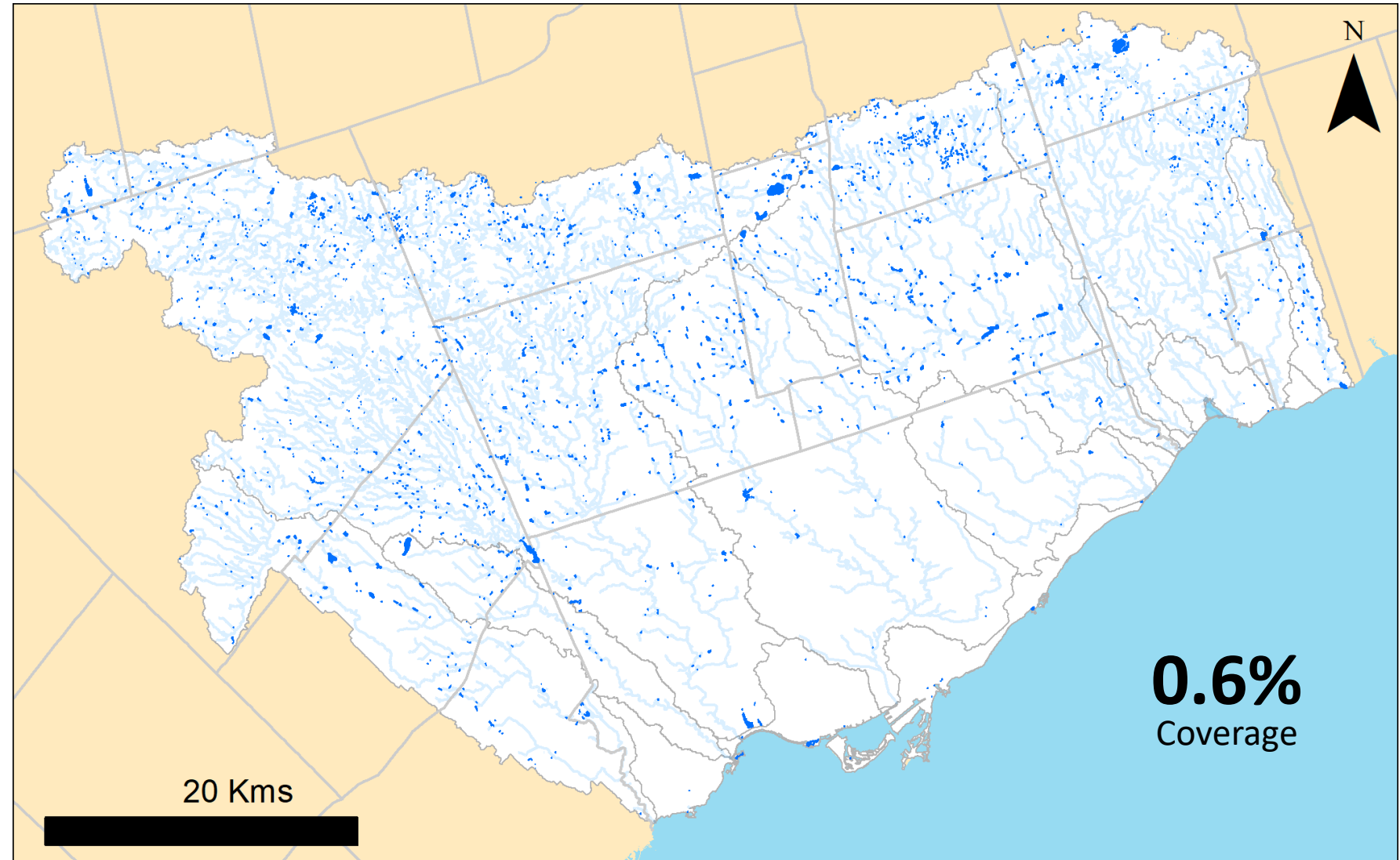
Inland Lakes and their Littoral Zones:

Methods - Refinement

- Using the new refined wetland layer, the following steps were taken to refine the inland lakes and littoral zones layer:
 1. A waterbody was removed if layer overlapped with refined wetland layer (when it was 2/3 or more covered);
 2. Field verified data took precedence for delineating the outline of a particular feature;
 3. Orthophotography verification was completed to determine if the feature is still on the landscape via most recent data from 2019 (remove/edit if it is not still on the landscape or changed in shape);
 4. Identify stormwater infrastructure where possible, using existing data and orthophotography, so it can be separated from non-stormwater features (where possible).

Inland Lakes and their Littoral Zones: Mapping

- One final “refined” comprehensive layer
- **3,887 records** were reviewed (1,433 removed; 125 added)
- 2,329 inland lakes in the final layer
- Of these 649 are identified as SWMPs



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- New Layers (ESGRAs, Seepages/Springs, SSWCAs)
- Refinements (Wetlands, Inland Lakes)
- **New Classifications (Permanent/Intermittent Streams)**

3. Quick Overview of WRS Mapping

Permanent and Intermittent streams: Definition

- **Permanent streams**

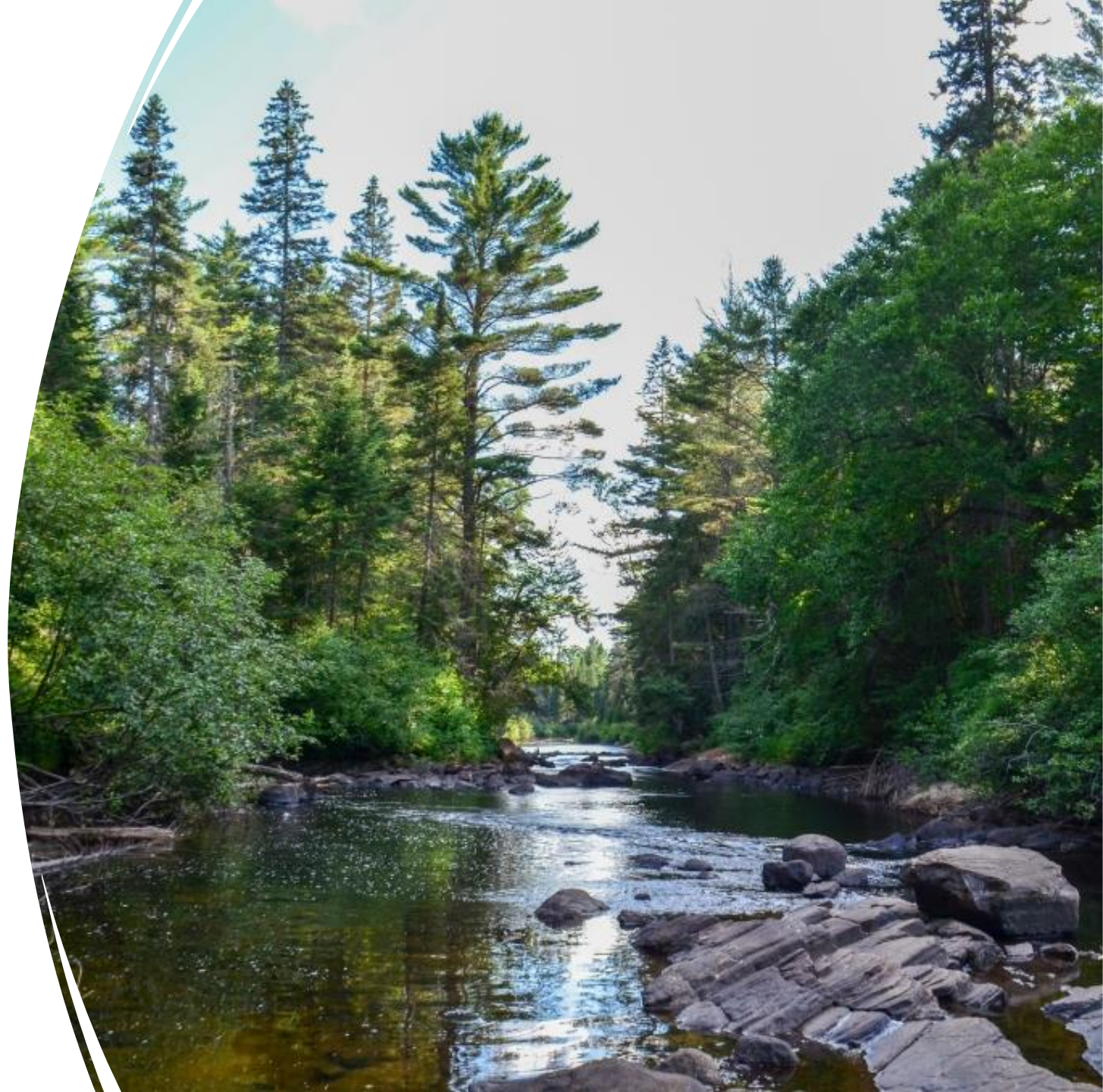
“a stream that continually flows in an average year. ”

– Greenbelt Plan (2017)

- **Intermittent streams**

“watercourses that contain water or are dry at times of the year that are more or less predictable, generally flowing during wet seasons of the year but not the entire year, and where the water table is above the stream bottom during parts of the year. ”

– Greenbelt Plan (2017)

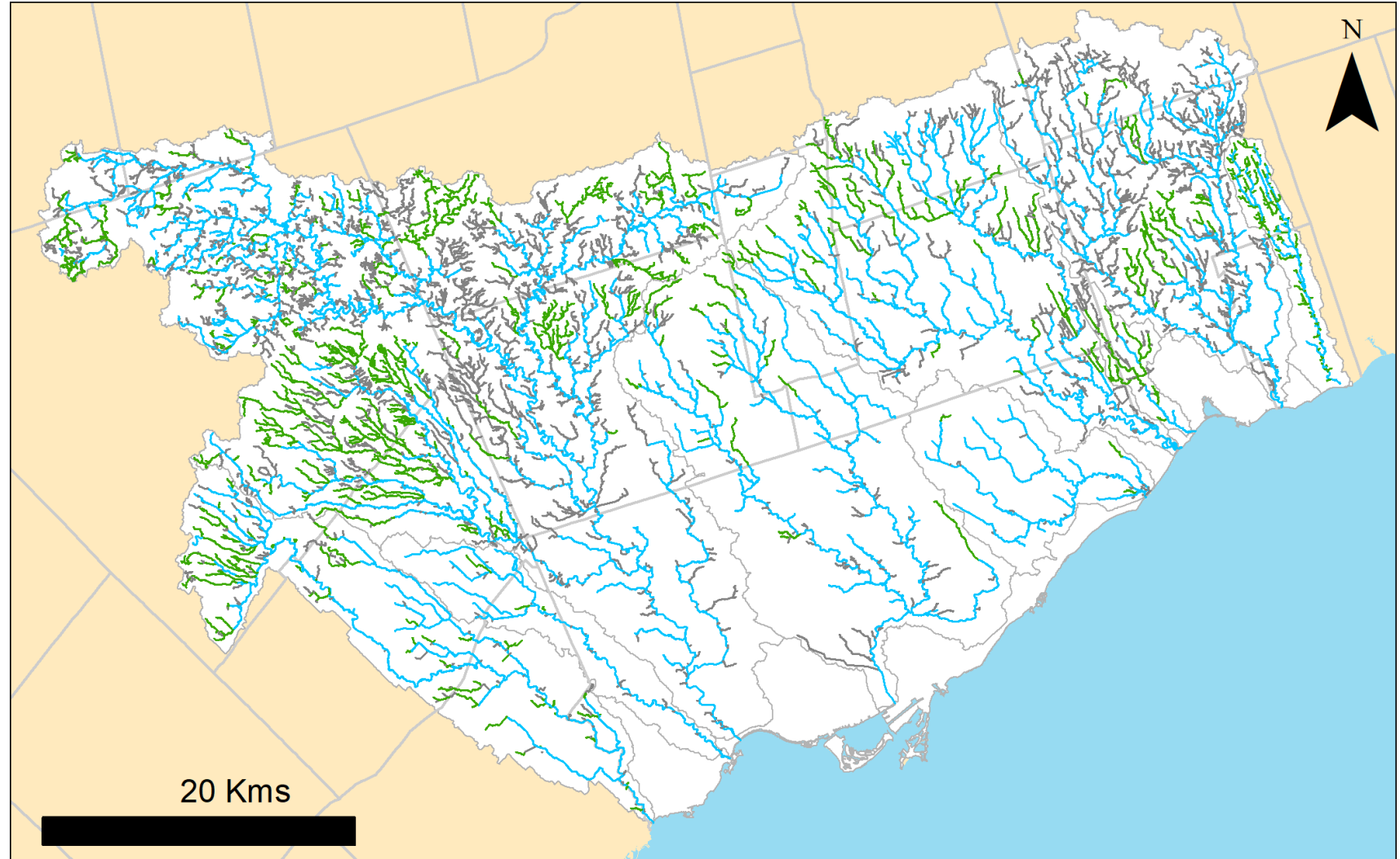


Permanent and Intermittent streams: Methods

- No intermittent/permanent stream layer existed for the jurisdiction
- The base layer for this work was the 2020 TRCA regulated watercourse layer
- The data used to infer permanency of flow within reaches includes:
 1. Headwater Drainage Features Survey Data (Etobicoke and Carruthers only)
 2. Baseflow Data
 3. TRCA Instream Temperature Data
 4. TRCA Instream Barrier Survey Data
 5. RWMP Fisheries and Temperature Data
 6. TRCA Historical Fisheries Data
 7. Orthophotography Interpreted 2017 and 2018 Imagery
 8. Valley and Stream Crossings Survey Data

Permanent and Intermittent streams: Mapping

- Permanent (Blue) – 46.2% (~1800 km)
- Intermittent (green) – 21.2% (~820 km)
- Unknown (grey) – 32.6% (~1250 km)
- Humber (~38%) and Duffins (~50%) of watercourse is unknown



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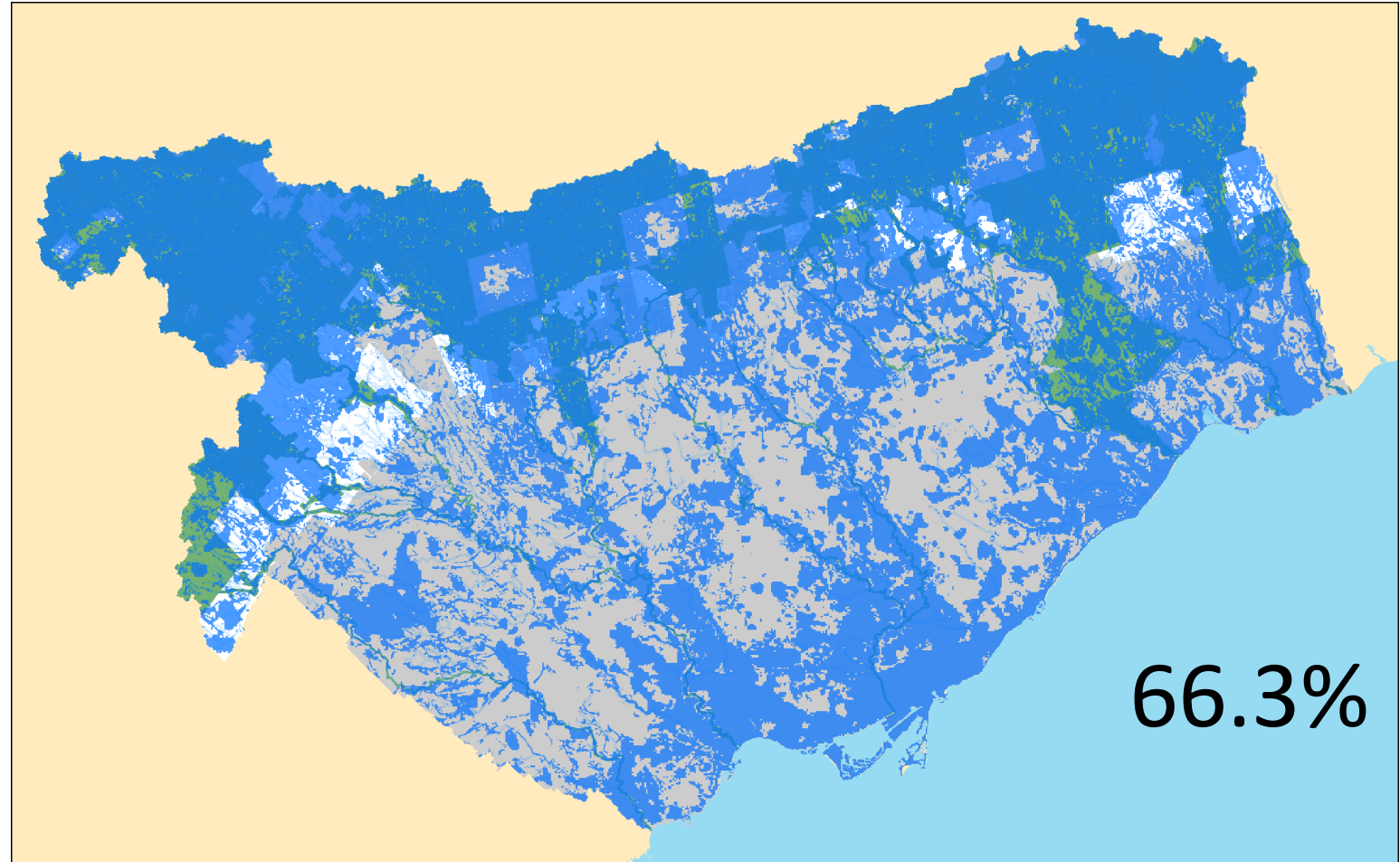
WRS: Mapping – All KHAs & KHF

Key Hydrologic Areas (KHAs)

- SGRAs
- HVAs
- SSWCAs
- ESGRAs

Key Hydrologic Features (KHF)

- ~~Permanent streams;~~
- ~~Intermittent streams;~~
- Inland lakes and their littoral zones;
- Seepage areas and springs;
- Wetlands.



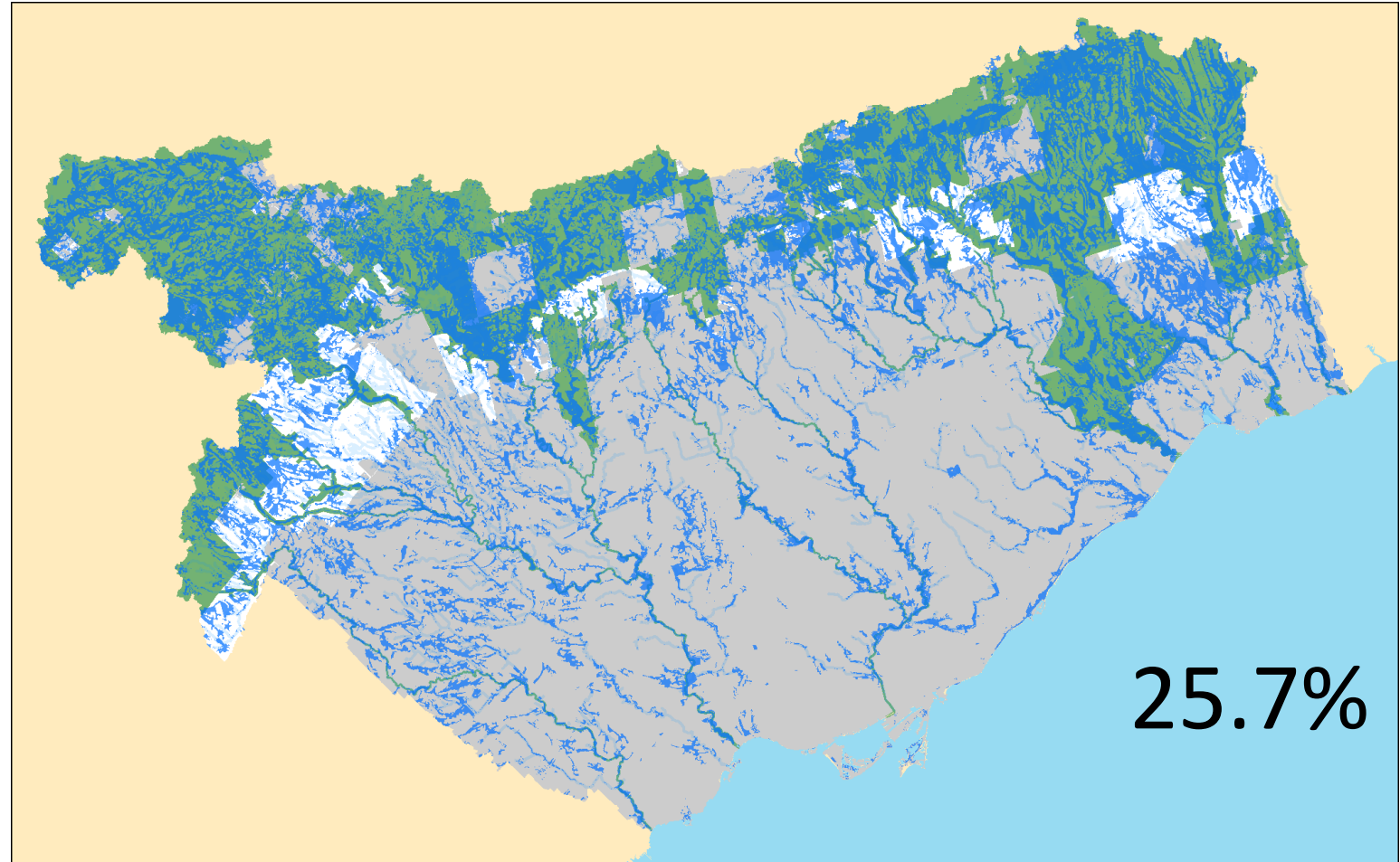
WRS: Mapping – Remove Source Water Protection Areas

Key Hydrologic Areas (KHAs)

- ~~SGRAs~~
- ~~HVAs~~
- SSWCAs
- ESGRAs

Key Hydrologic Features (KHF)

- ~~Permanent streams;~~
- ~~Intermittent streams;~~
- Inland lakes and their littoral zones;
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- Wetlands.



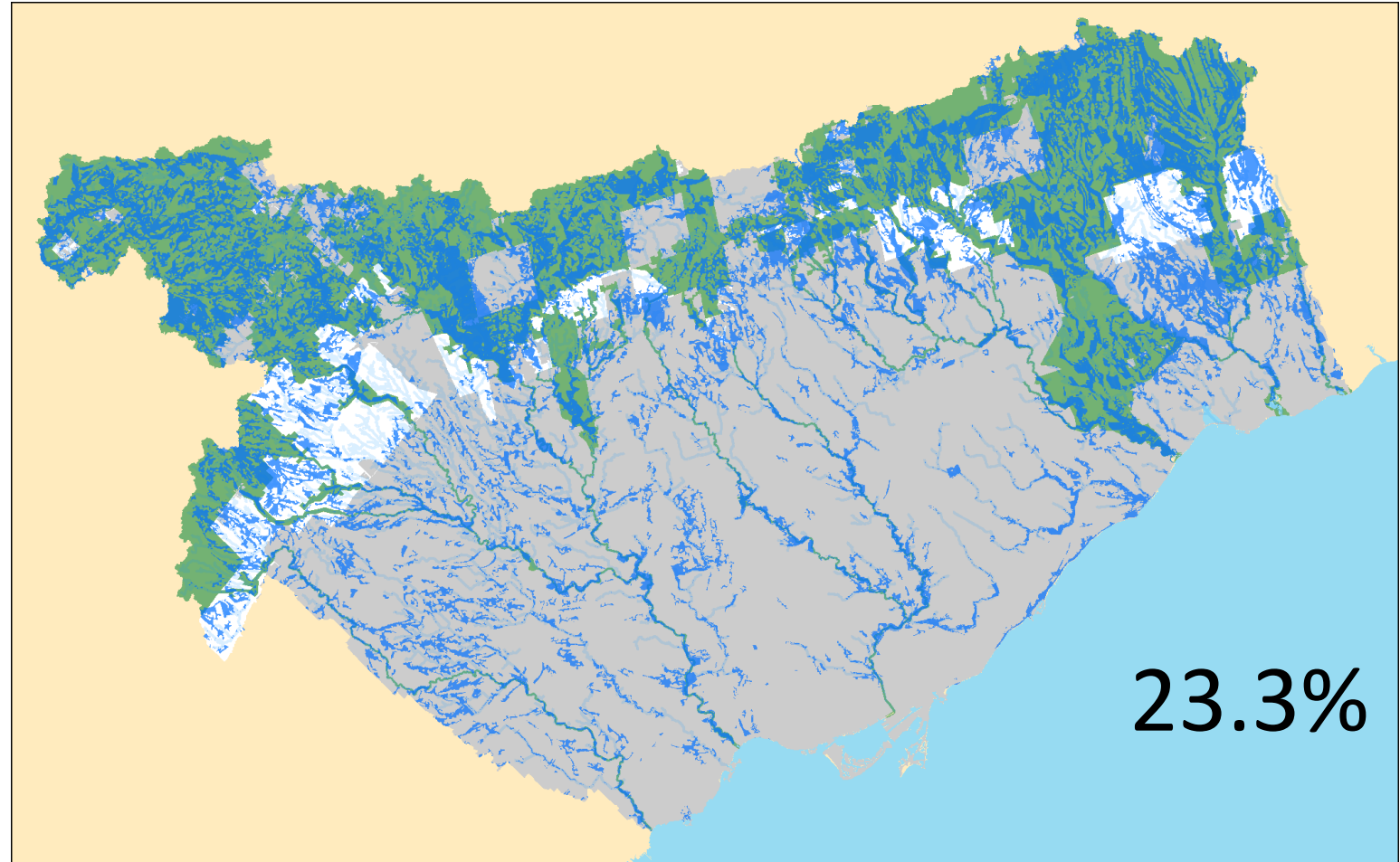
WRS: Mapping – Newly Mapped Layers

Key Hydrologic Areas (KHAs)

- ~~SGRAs~~
- ~~HVAs~~
- ~~SSWCAs~~
- ESGRAs

Key Hydrologic Features (KHF)

- ~~Permanent streams;~~
- ~~Intermittent streams;~~
- ~~Inland lakes and their littoral zones;~~
- Seepage areas and springs;
- ~~Wetlands.~~



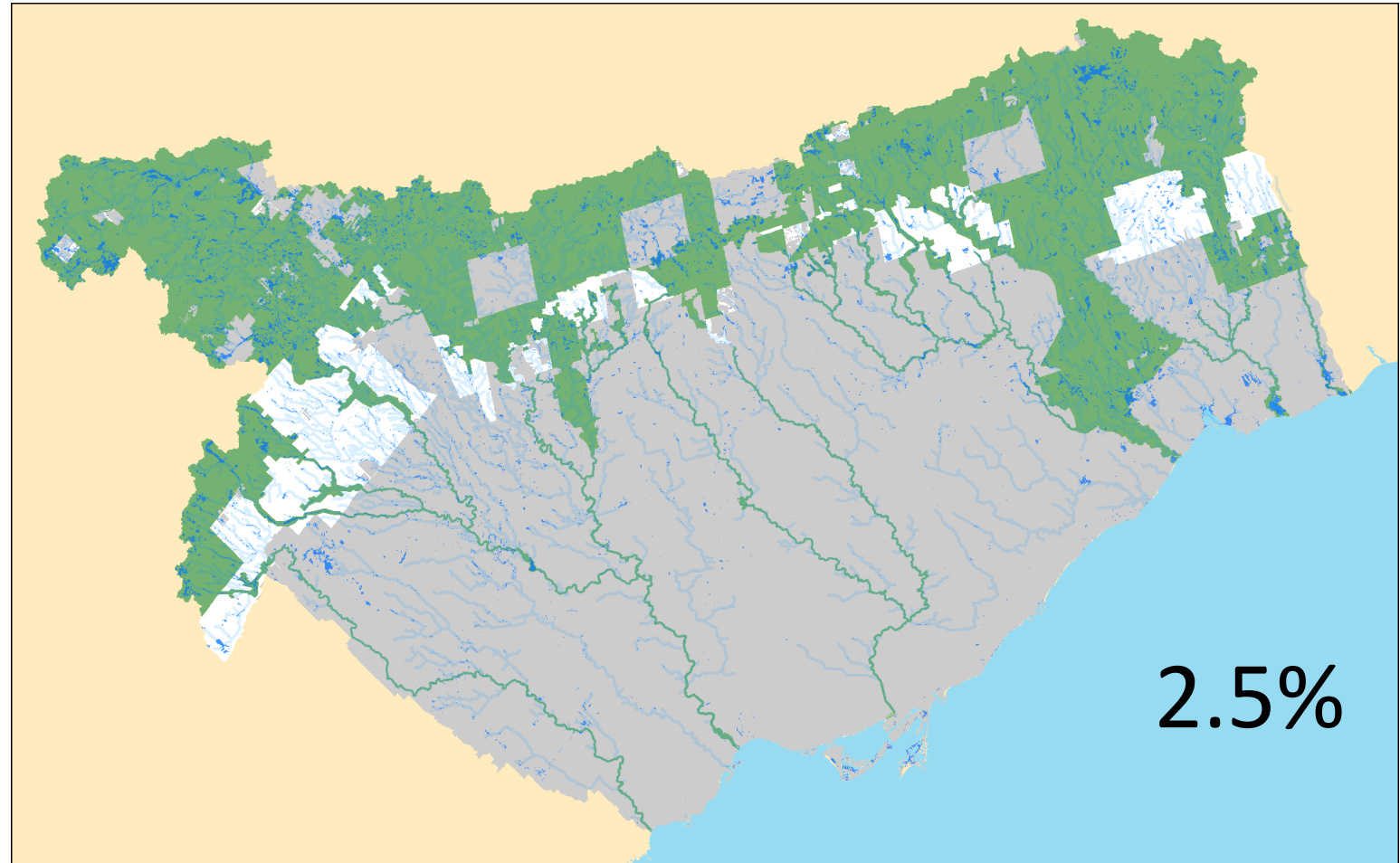
WRS: Mapping – New Additions to WRS

Key Hydrologic Areas (KHAs)

- SGRAs
- HVAs
- SSWCAs
- ESGRAs

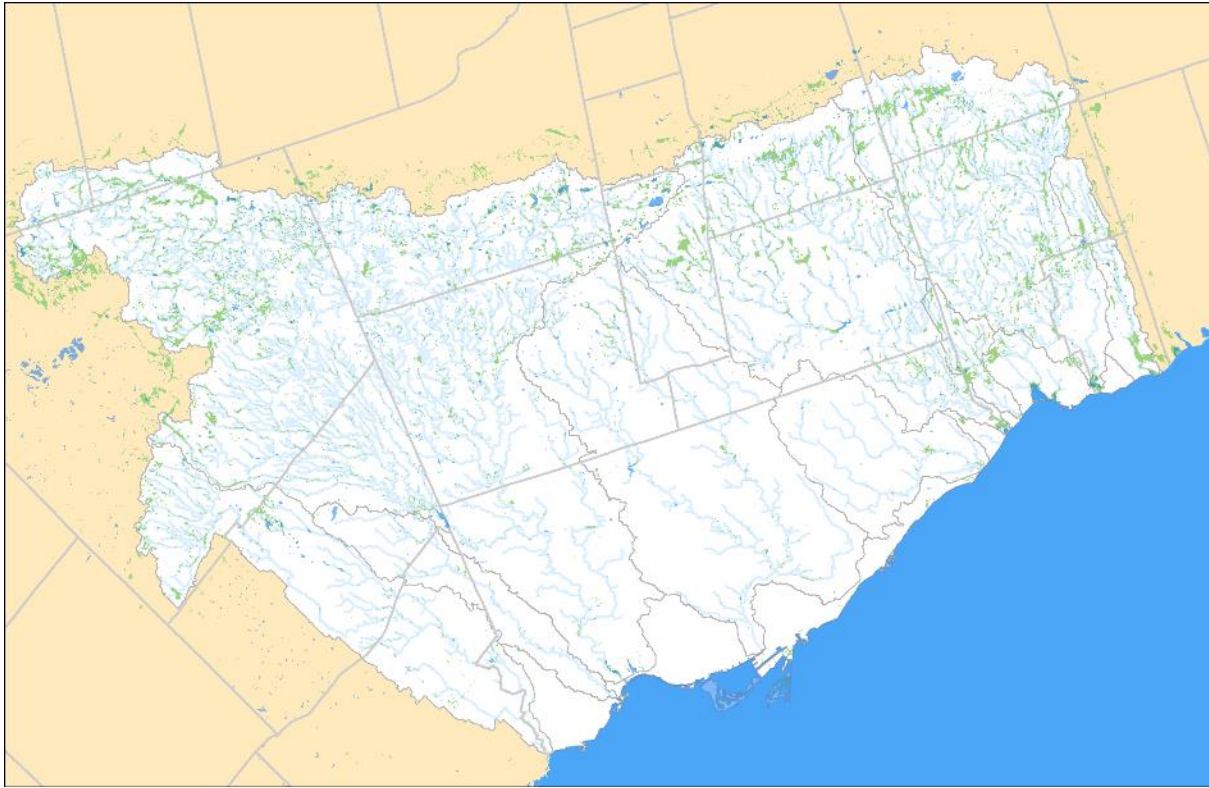
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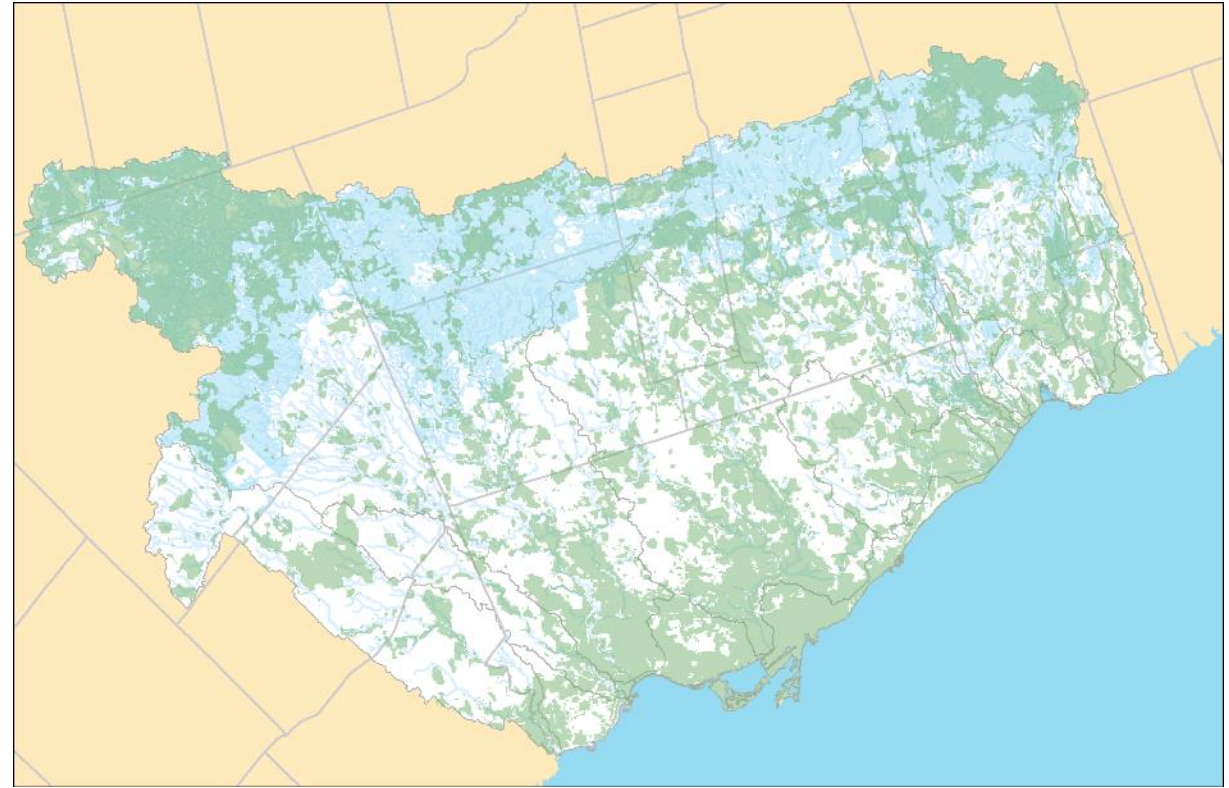


Summary: Prior to WRS Update

KHFs

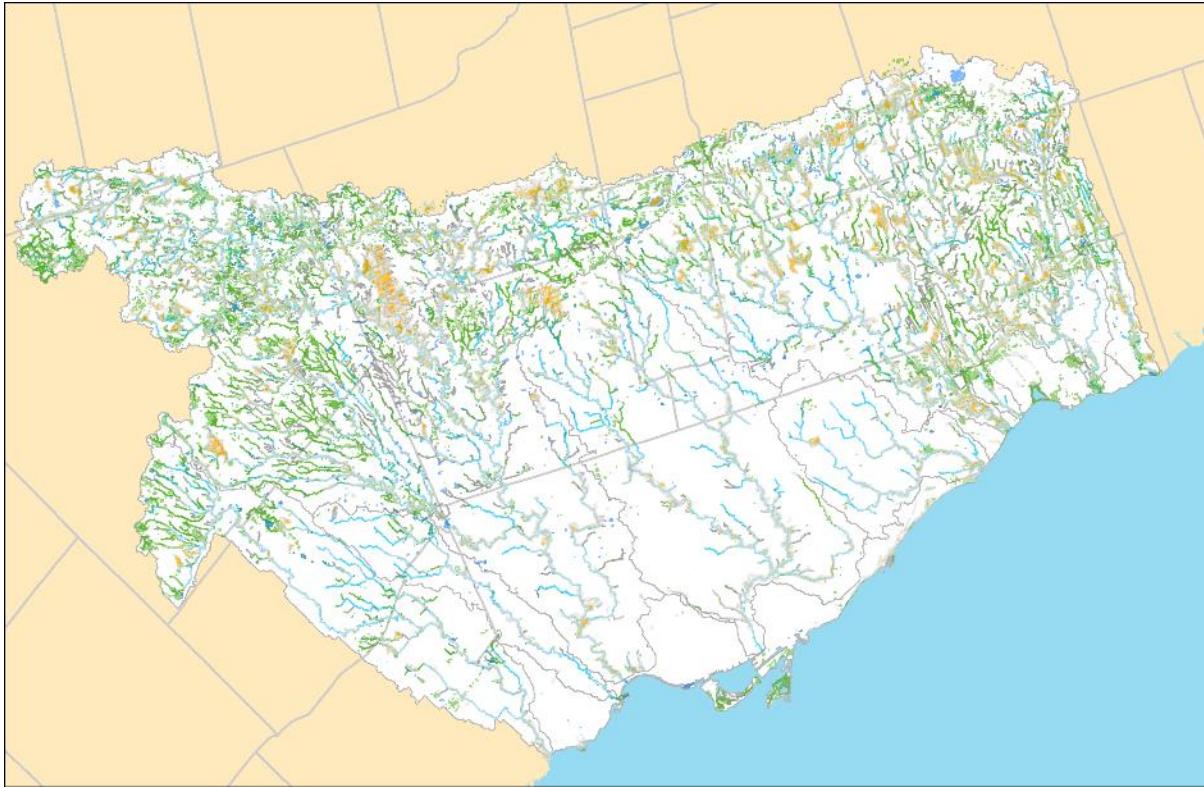


KHAs

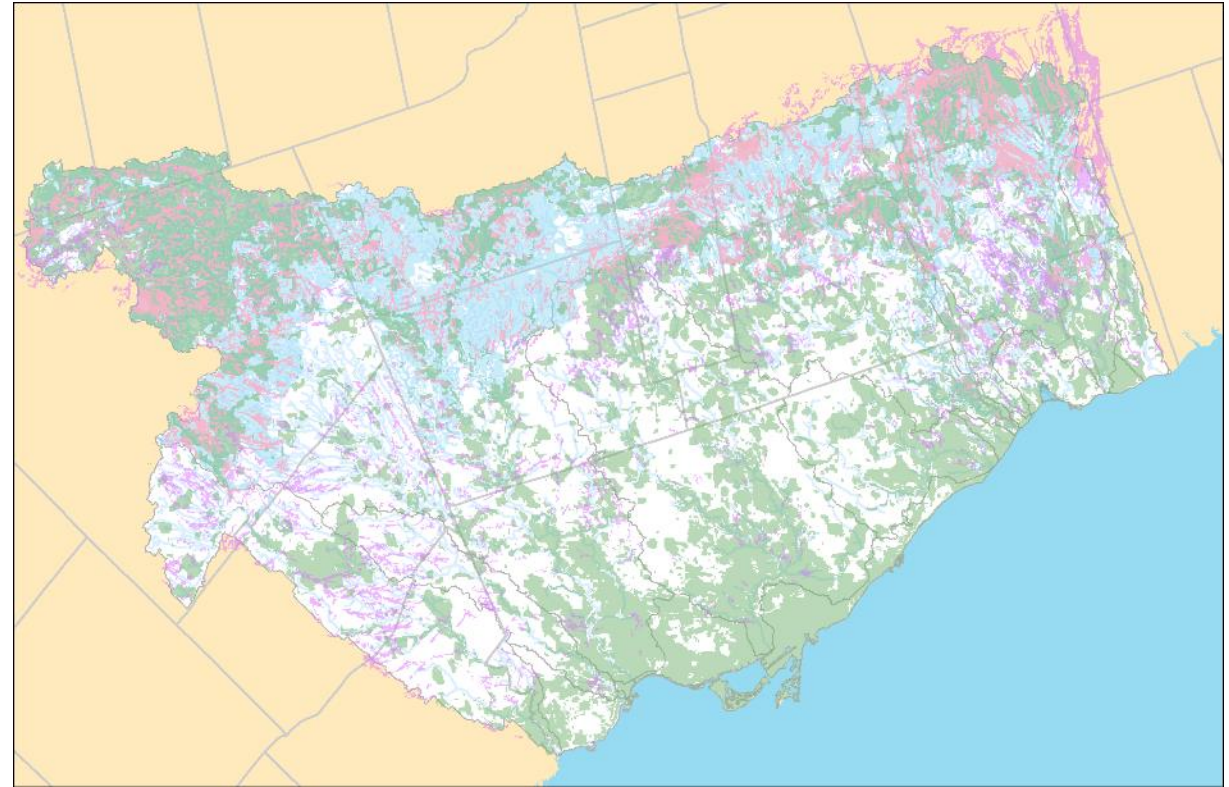


Summary: After WRS Update

KHFs

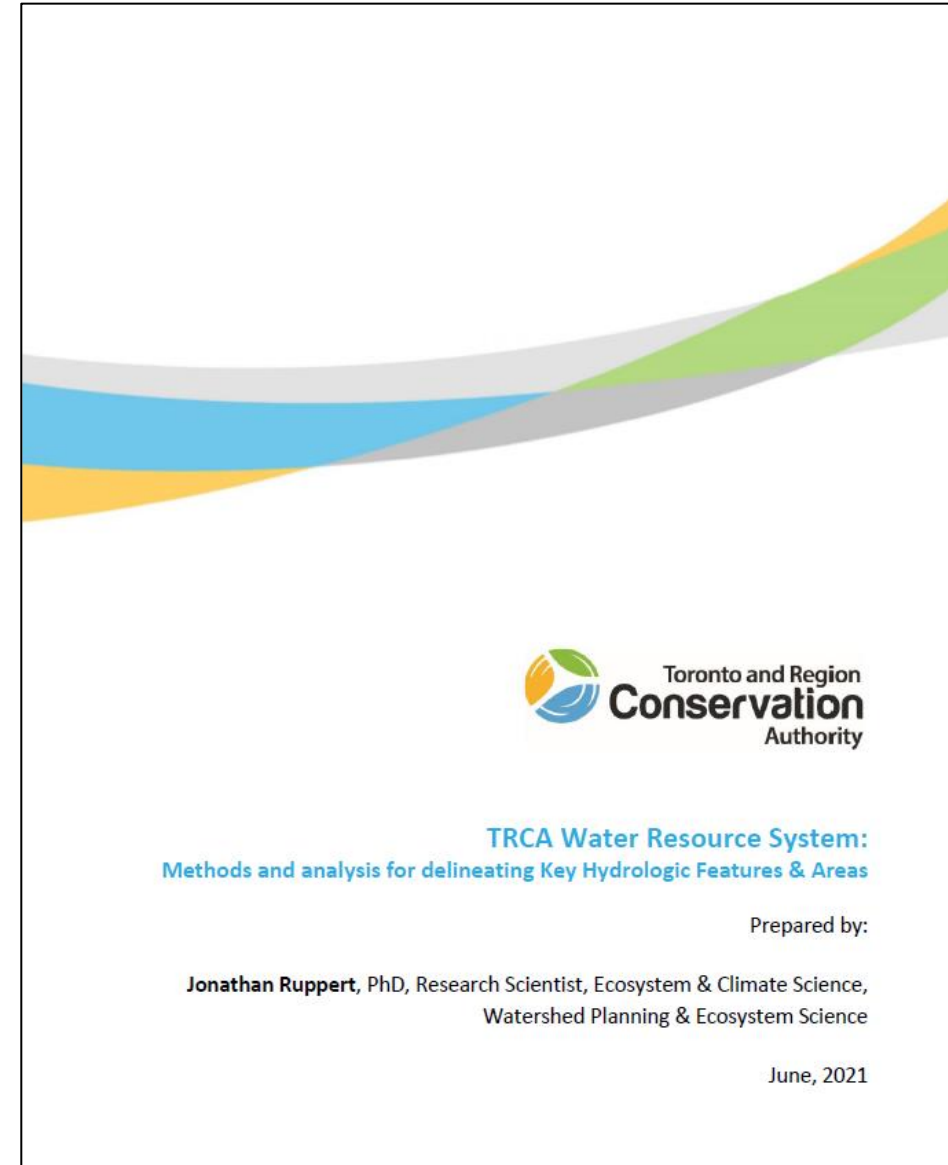


KHAs



Final Draft Report

- Background
 - Methods & Analysis
 - Mapping & Jurisdiction Overview
 - Implications
 - Future Considerations
-
- Draft GIS layers available as well!
 - WRS Draft available on the Online Reporting Hub!



Project Team



Laura DelGiudice, Associate Director, Watershed Planning and Ecosystem Science (WPES),
Development and Engineering Services (DES)

Jason Tam, Manager, Business Intelligence and Data Analytics (BIDA), Information Technology and
Records Management (ITRM), Corporate Services (CS)

Tony Morris, Senior Project Manager, Watershed Planning and Reporting (WPR), WPES, DES

Steven Ling, Technologist, GIS, BIDA, ITRM, CS

Daniela Macleod, Specialist, GIS, BIDA, ITRM, CS

Mason Marchildon, Hydrologist, Oak Ridges Moraine Groundwater Program (ORMGP)

Upcoming ECS Lunch and Learns!

Wednesday, August 4
11:00am-12:00pm

**Broadview and Eastern EA
and Port Lands Flood
Protection Implementation**

By Meg St John and
Maryam Iler

Tuesday, September 14
11:00am-12:00pm

**TRCA's Road Ecology
Program**

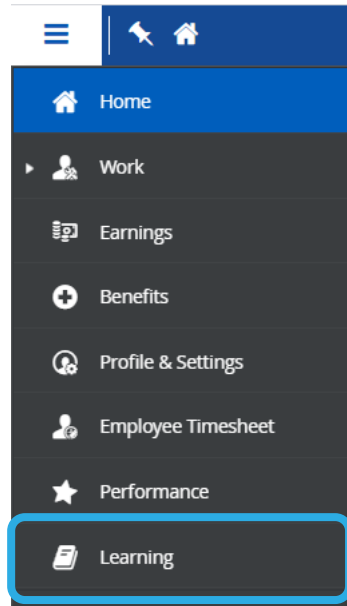
By Lyndsay Cartwright,
Andrew Chin, and
David Lawrie

Tuesday, October 26
11:00am-12:00pm

**Carruthers Creek
Watershed Plan**

By Tony Morris

Learning Management System



 Course Catalog

CATEGORIES FILTERS Lunch and Learn X Q

4 items

New

Lunch and Learn: Teams, OneDrive and SharePoint

EN

Webinar

New

Lunch and Learn: Hobbies for Mental and Physical Health (Please read...

EN

ILT (Instructor-Led Training)

New

Lunch and Learn: Thermal Imaging for Restoration and Conservation

ENROLLED EN

Webinar

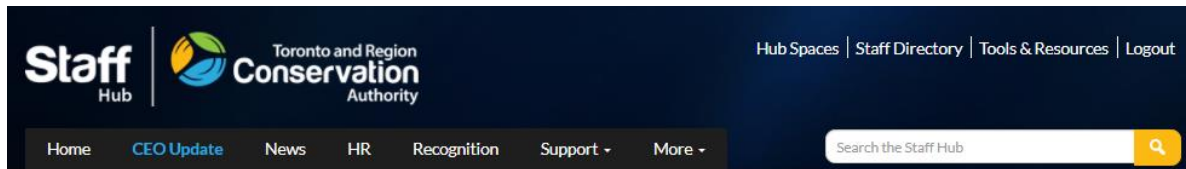
New

Lunch and Learn: Natural Heritage System Update

ENROLLED EN

Webinar

Scientific Knowledge Sharing Hub



[Home](#) > [Scientific Knowledge Sharing](#)

Scientific Knowledge Sharing

Evidence-based decision making is at the core of what TRCA does. Several of our Business Units engage in generating new scientific knowledge to support watershed management actions and decisions.

It is critical that the knowledge generated is effectively shared.

The Scientific Knowledge Sharing platform is dedicated to sharing the latest scientific knowledge generated by TRCA and our partners. It is a place where staff can learn about and engage in the scientific work TRCA is undertaking.

PLEASE NOTE: There are several TRCA teams engaged in generating new scientific knowledge. Currently the content on the platform is specific to the Watershed Planning and Ecosystem Science business unit. Additional content from other TRCA teams will be added as the platform develops.



Knowledge Sharing: Learn More

- [Watershed and Ecosystems Reporting Hub](#)
- [Environmental Monitoring](#)
- [Research and Science Working Group](#)
- [TRCA Research Agenda](#)
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Knowledge Sharing: Latest Updates

[Knowledge Sharing - Climate Change Analysis at the Local Scale](#)

April 19, 2021 by Hub Admin [Featured](#)

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Past Recordings

Watersheds and Ecosystems Reporting

Draft Web Application

Laura Del Giudice, Senior Manager, Watershed Planning & Reporting
Kristina Dokoska, Project Coordinator, Ontario Climate Consortium

September 21, 2020

Introduction to the LID Treatment Train Tool

Presented by – Steve Auger, Sahila Abbasi and Yumina David

November 5, 2020

TRCA's Recent Floodplain Mapping Updates

Wilfred Ho*, Christina Bright*, Mike Todd**

* Flood Risk Management, Development & Engineering Services
** Information Technology & Records Management

November 10, 2020

Working with Indigenous Communities

Lunch and Learn

November 17, 2020

Green Infrastructure in Asset Management Planning

Presented by:
Michelle Sawka, Senior Research Scientist
Tracy Timmins, Research Analyst
Ecosystem and Climate Science

December 8, 2020

Explore TRCA's Biodiversity

How to get the most from our enormous natural heritage data set.

Presented by: Gavin Miller, Flora Biologist, Paul Prior, Fauna Biologist, and Parth Sheth, GIS Technician.

December 17, 2020

Evaluating the effectiveness of fish habitat restoration across the Toronto waterfront

Kaylin Barnes¹, Lyndsay Cartwright¹, Rick Porttiss¹, Jon Midwood², Christine Boston², Monica Granados³, Thomas Sciscione¹, Colleen Gibson¹, Olusola Obembe³

ECS Lunch and Learn
January 14, 2021

¹ Toronto and Region Conservation Authority
² Fisheries and Oceans Canada
³ FRIreview.org

Erosion Risk Management Program

Lunch and Learn Presentation

Presented by: Matt Johnston, Associate Director
Ashour Rehana, Manager
David Gingerich, Analyst

January 27, 2021

The Meadoway

Research Overview

The Meadoway
COMMUNITY POWERED GREEN SPACES

Presented by: TRCA

TRCA's Natural Heritage System Update

Presented by:
Narmata Shrivastha, Senior Research Scientist
Andrew Chin, Research Analyst
Ecosystem and Climate Science | Watershed Planning and Ecosystem Science | Development and Engineering Services

24 Mar 2021

Thermal imaging for ecosystem conservation and restoration

Jonas Hamberg
Visiting Postdoctoral Fellow
TRCA (ECS) & University of Toronto
Advisors: Jonathan Boppert & Patrick James (UofT)

Credit: NASA/JPL

Lake Ontario Fish and Aquatic Ecosystem Health

- Eat Safe Fish:** A Collaborative Engagement with the Mississaugas of the Credit First Nation – by Valerie Francoella
- Don River Mouth Naturalization Project:** Restoration of Fish Habitat in Toronto - The First Piece in a Very Large Puzzle – by Angela Wallace
- From Rivers Downstream to Lake Ontario:** 20 years of aquatic sampling through The Regional Watershed Monitoring and Toronto Waterfront Monitoring Programs – by Jan Moryk and Angela Wallace

Lake Ontario Restoration Initiatives

- Determining Practical Key Performance Measures for Wetland Restoration Practitioners:** Challenges and considerations – by John Stille
- RAP Delisting and the Adoption of the Integrated Restoration Prioritization Tool:** Compiling TRCA data on waterfront and inland restoration planning and projects within the Toronto Area of Concern – by Andrew Ramesbottom and Colleen Gibson
- Winning the War One Battle at a Time:** Managing phragmites and DSV at a Toronto waterfront park – by Jennifer Smith

Precision Biomonitoring Webinar Series:

PRECISION BIOMONITORING
— Intelligent DNA Solutions —

eDNA: Applications, Advantages and Implications!

May 12, 2021

Lunch and Learn

Wetlands, Warehouses or Both? – The Story of Project Lonerast and the Lower Duffins Wetland Complex.

Presented by: Steve Heuchert, Development Planning and Permits
Shauna Fernandes Chagani, Planning Ecology

May 12, 2021

Long-Term Monitoring of Lake Ontario Coastal Wetlands Reveals Distinct Water Quality Profiles Associated with Hydrogeomorphic Type

Kathryn Thomas¹, Krista Chomnicki², Andrea Kirkwood¹

¹ Ontario Tech University
² Toronto and Region Conservation Authority

Watershed and Ecosystems Reporting Hub

Introduction and Demo of TRCA's New Reporting Hub

Presented by: Shari Dahmer
Project Manager, Watershed Planning & Reporting

June 23, 2021

Thank you

For questions about the ECS Lunch and Learn Series, please contact:

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