



Credit:
Megan Jordan

LET'S TALK ABOUT WETLANDS

Dr. Rebecca Rooney

22 April 2024

Waterloo Region Nature



<https://uwaterloo.ca/rooney-lab/>



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Who are we?



WATERLOO WETLAND LABORATORY

- Applied ecology research
- Co-production/ Co-innovation



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Link to profile:

[Visit Dr. Rooney's Profile Page](#)

Link to personal webpage:

[Rebecca Rooney](#)

1971 Ramsar, Iran



- The Ramsar Convention was the first of the modern global nature conservation conventions
 1. Establish and effectively manage the ecological character of Wetlands of International Importance (Ramsar Wetlands)
 2. Manage all wetlands in their territories sustainably – “wise use”
 3. Cooperate internationally concerning transboundary wetlands, shared species, and development projects

1971 Ramsar, Iran



Source: Ramsar.org, 2021

- Canada signed in 1981
- Designated 37 Ramsar Wetlands
 - 13,086,767 ha designated
- 8 Ramsar Wetlands in Ontario
 - 6/8 are in the Mixedwood Plains

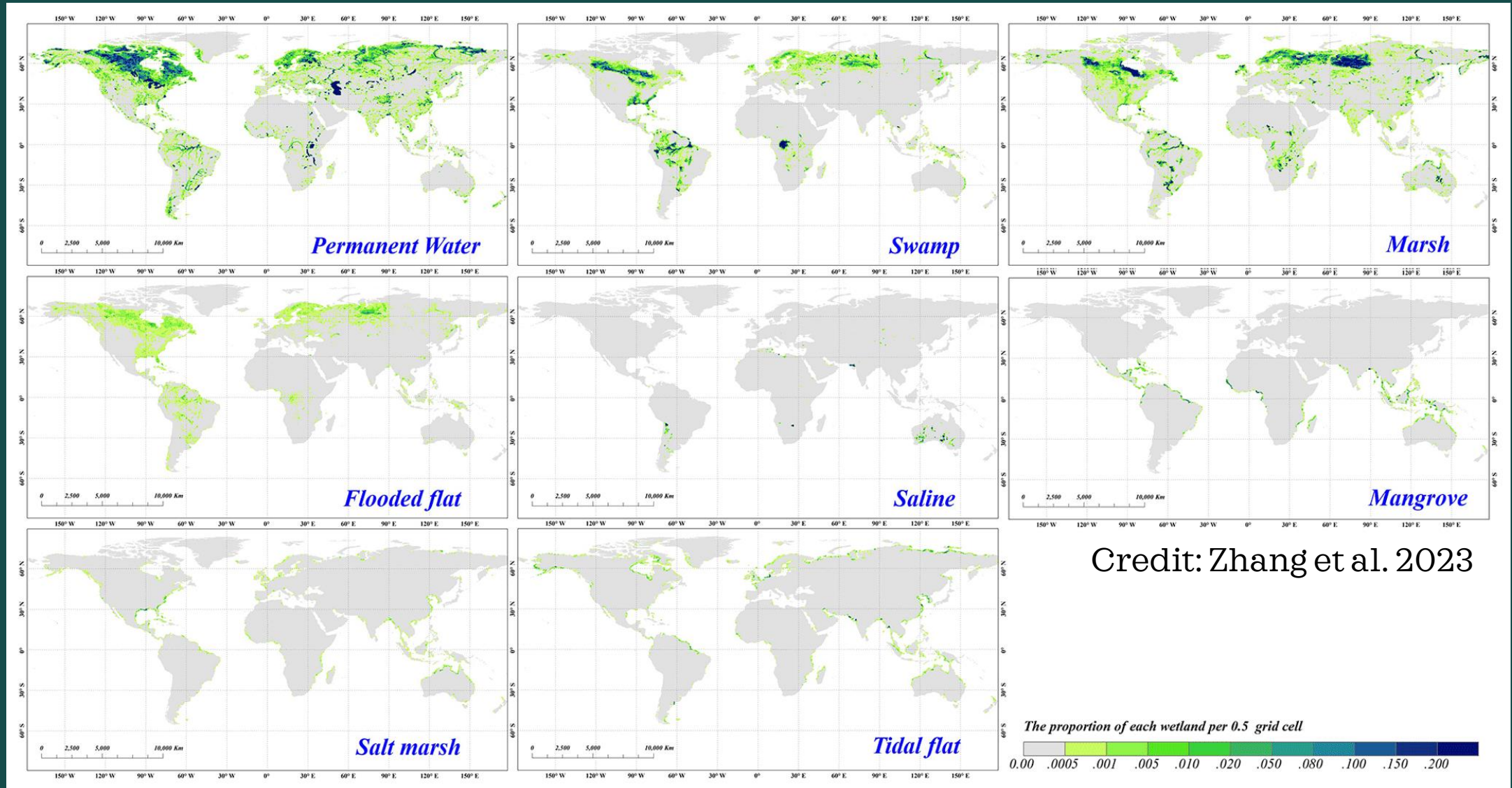
What are wetlands?

- Wetlands are lands permanently or seasonally covered by shallow water and/or land where water table is close to or at the surface



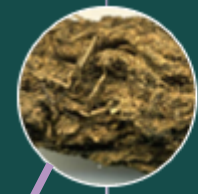
Wetlands globally

- 12-16 million km² (3% of Earth's surface)

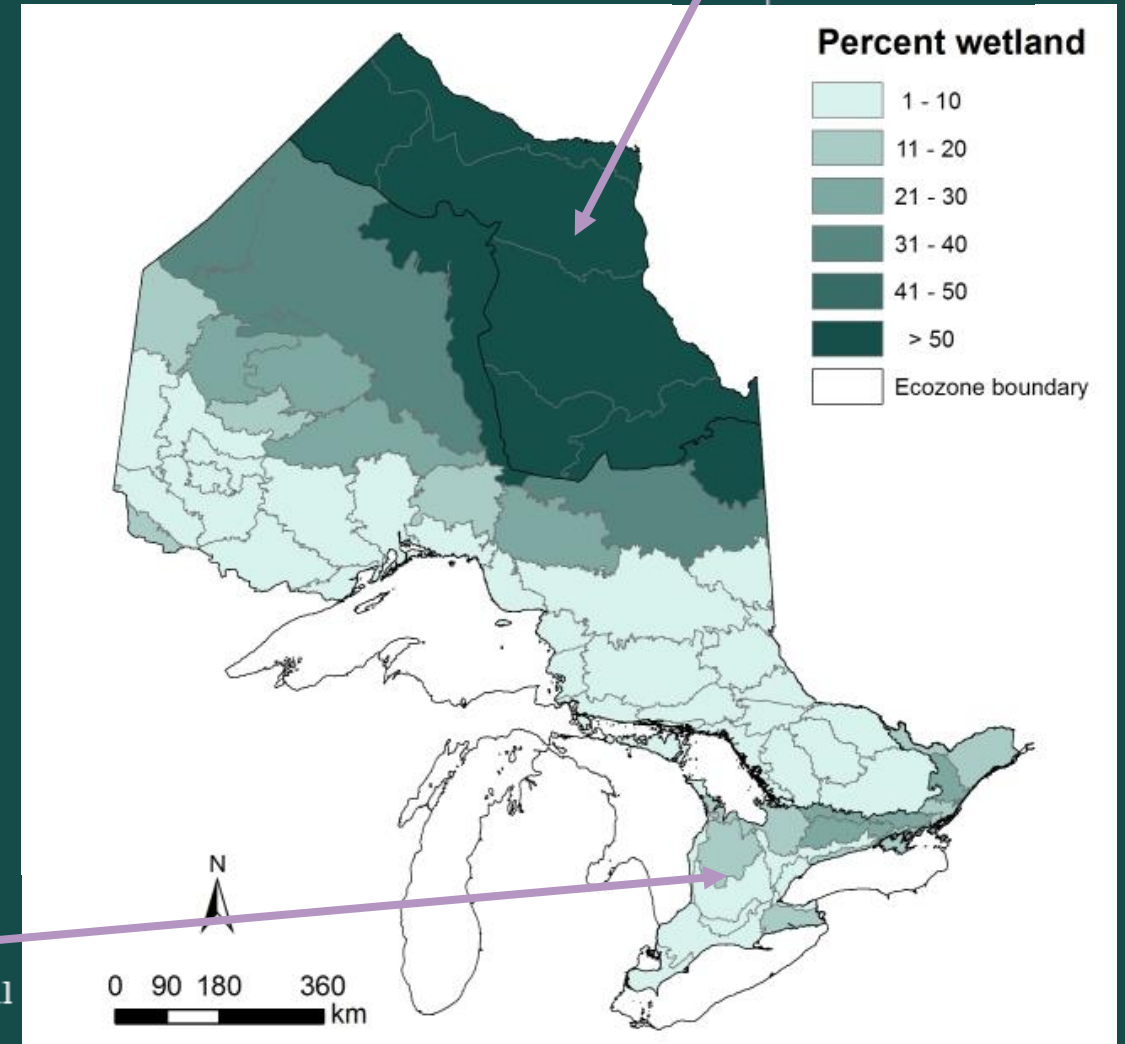


Wetland distribution in Ontario

- Expansive peatlands in the north
- Marshes and swamps in the south
 - Only 6% of land cover in Mixedwood Plains of southern Ontario



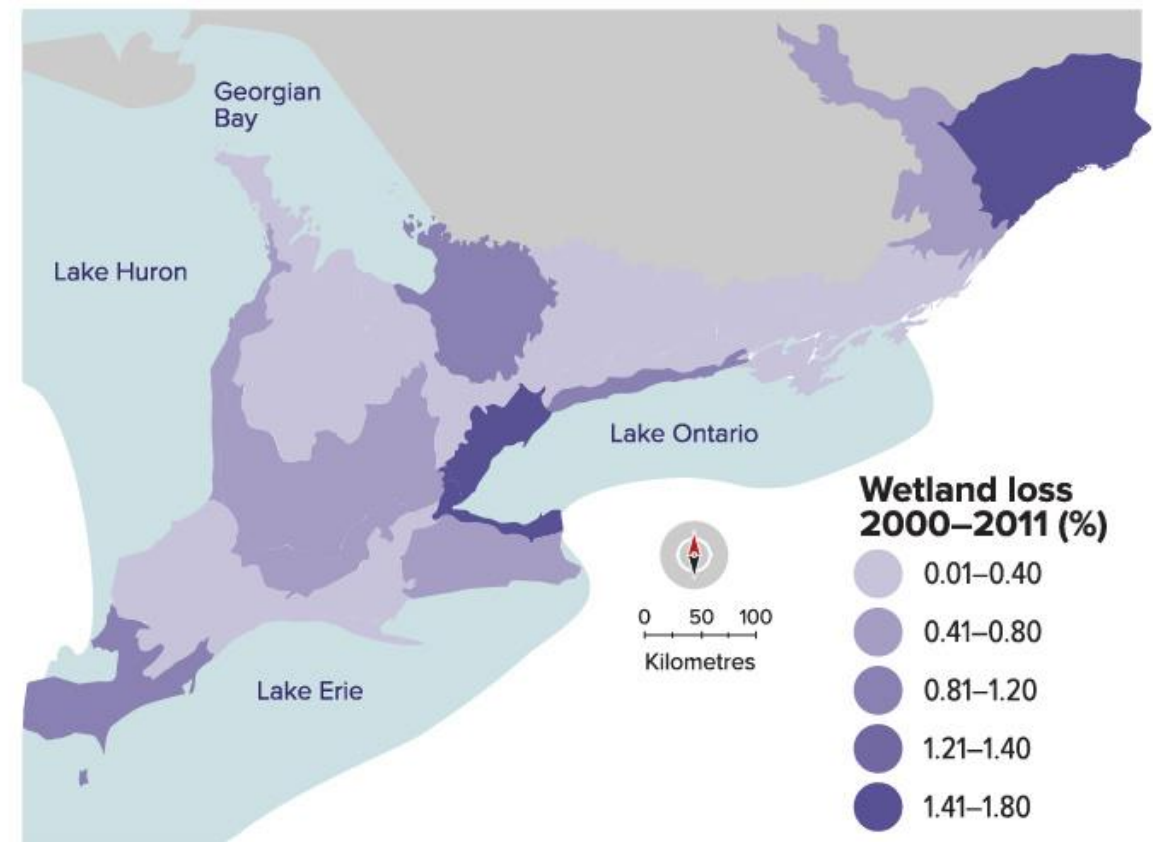
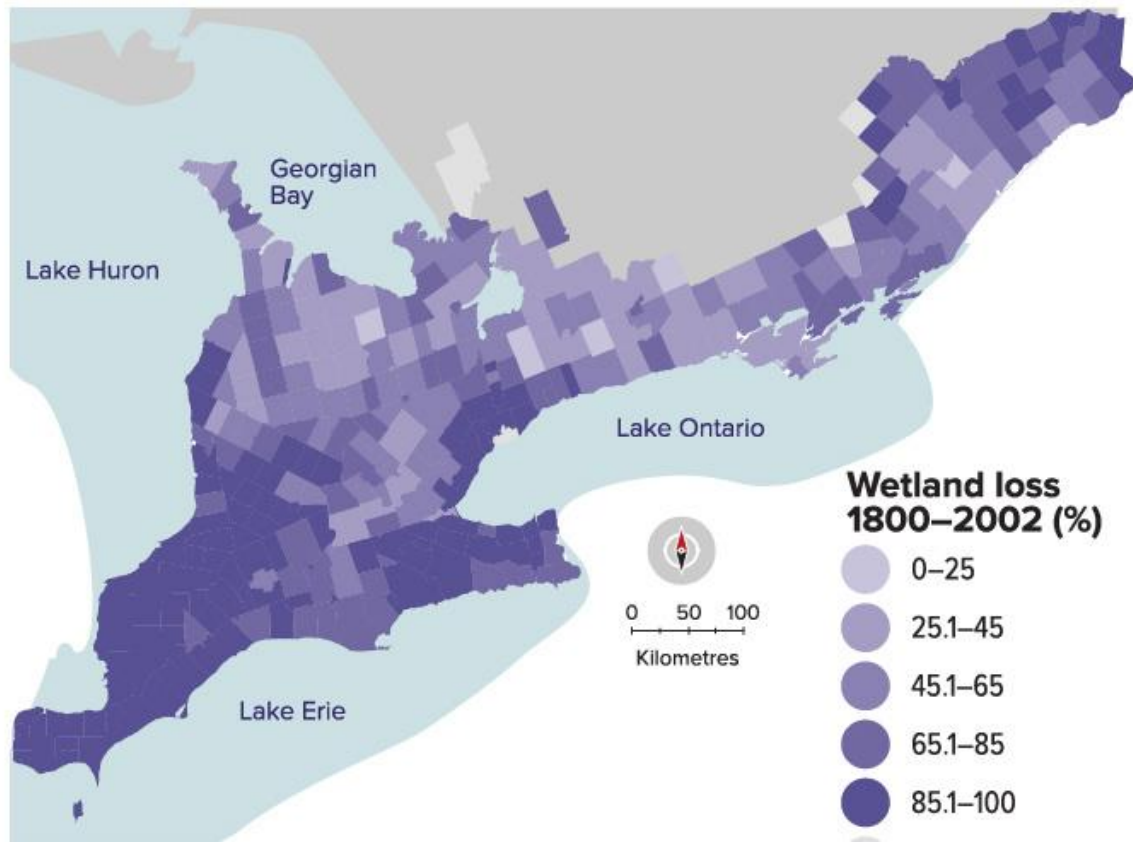
Peatland



Mineral

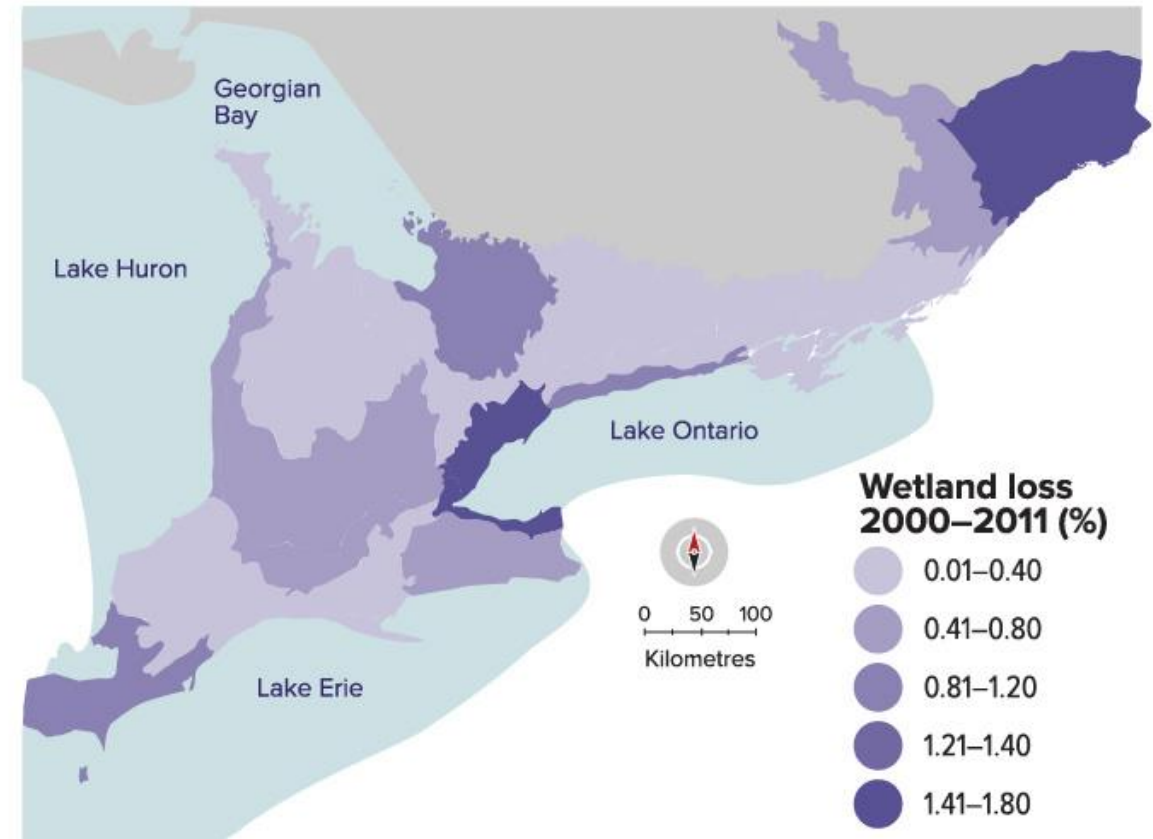
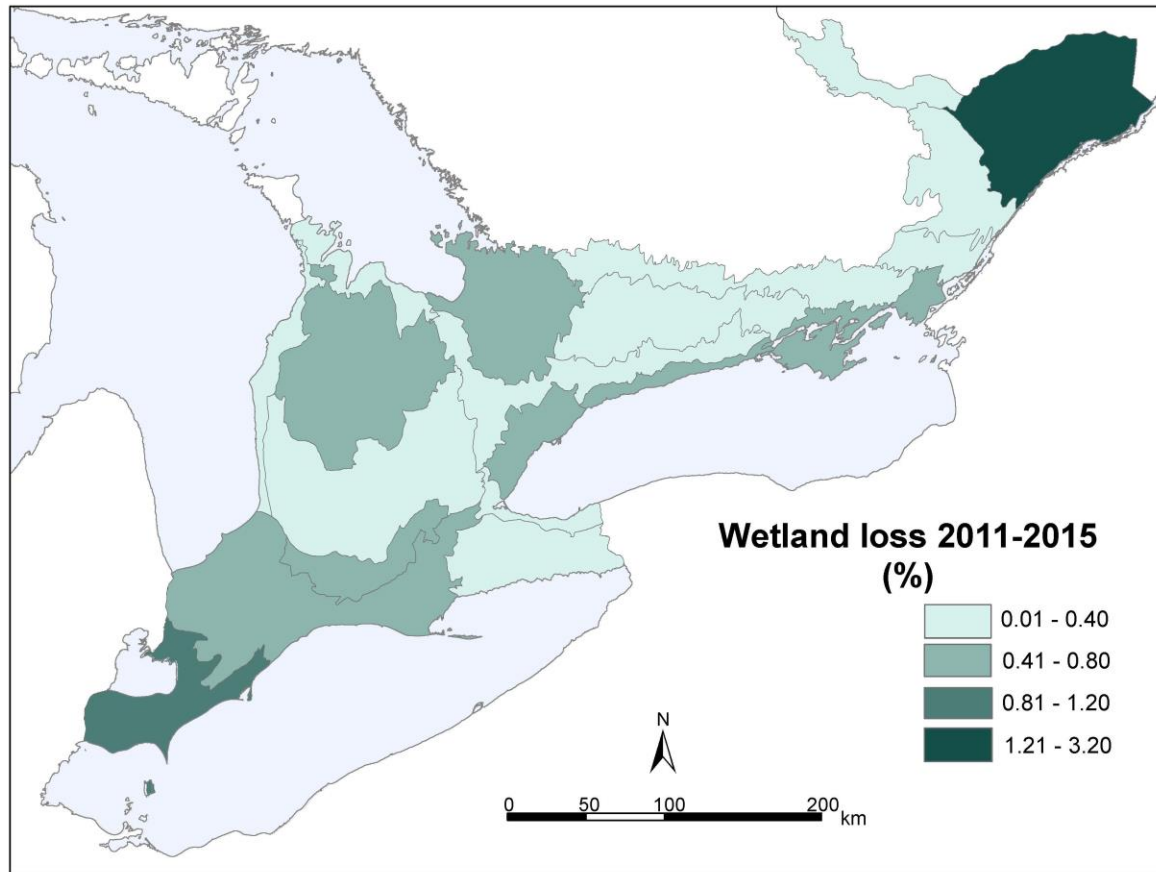
Historic distribution of wetlands in Mixedwood Plains of Ontario

- Historic wetland loss driven by agricultural conversion
- Contemporary loss driven by urbanization
- Figures from 2017 Ontario Wetland Conservation Strategy



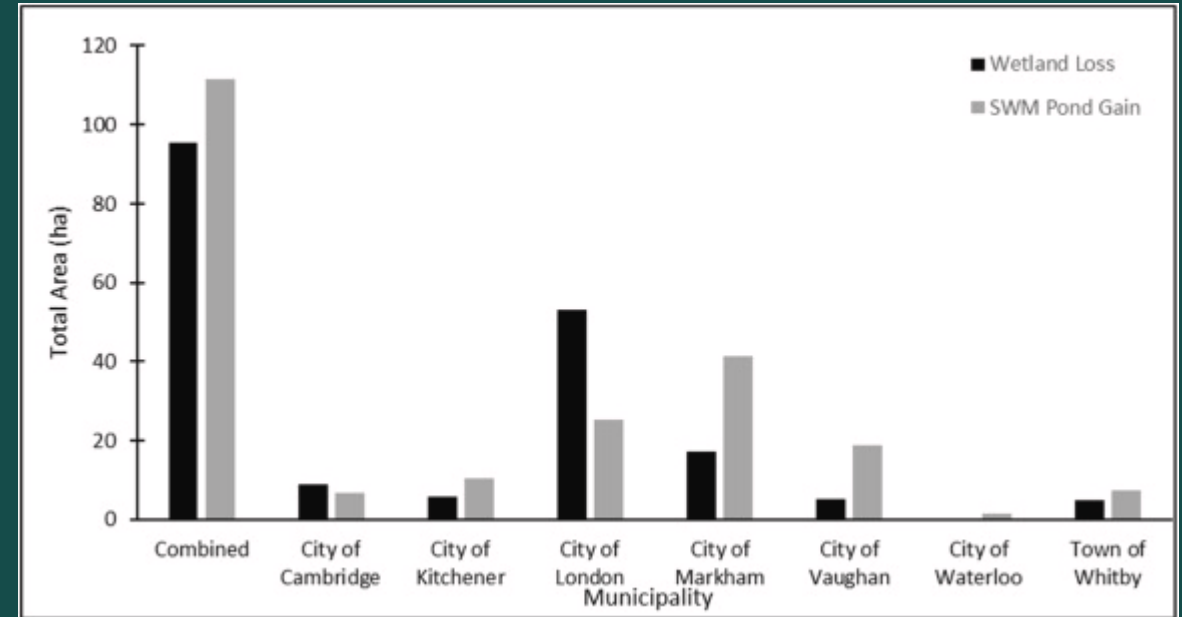
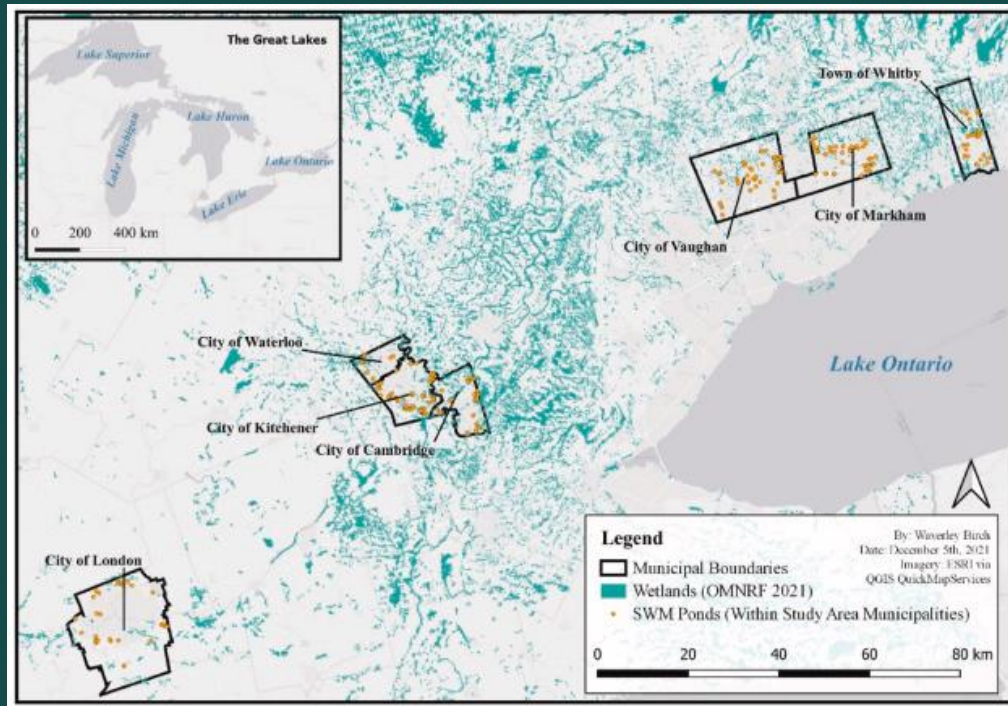
Historic distribution of wetlands in Mixedwood Plains of Ontario

- Historic wetland loss driven by agricultural conversion
- Contemporary loss driven by urbanization
- Figures from
 - Ontario Wetland Conservation Strategy (2017)
 - State of Ontario's Biodiversity Report (2021)



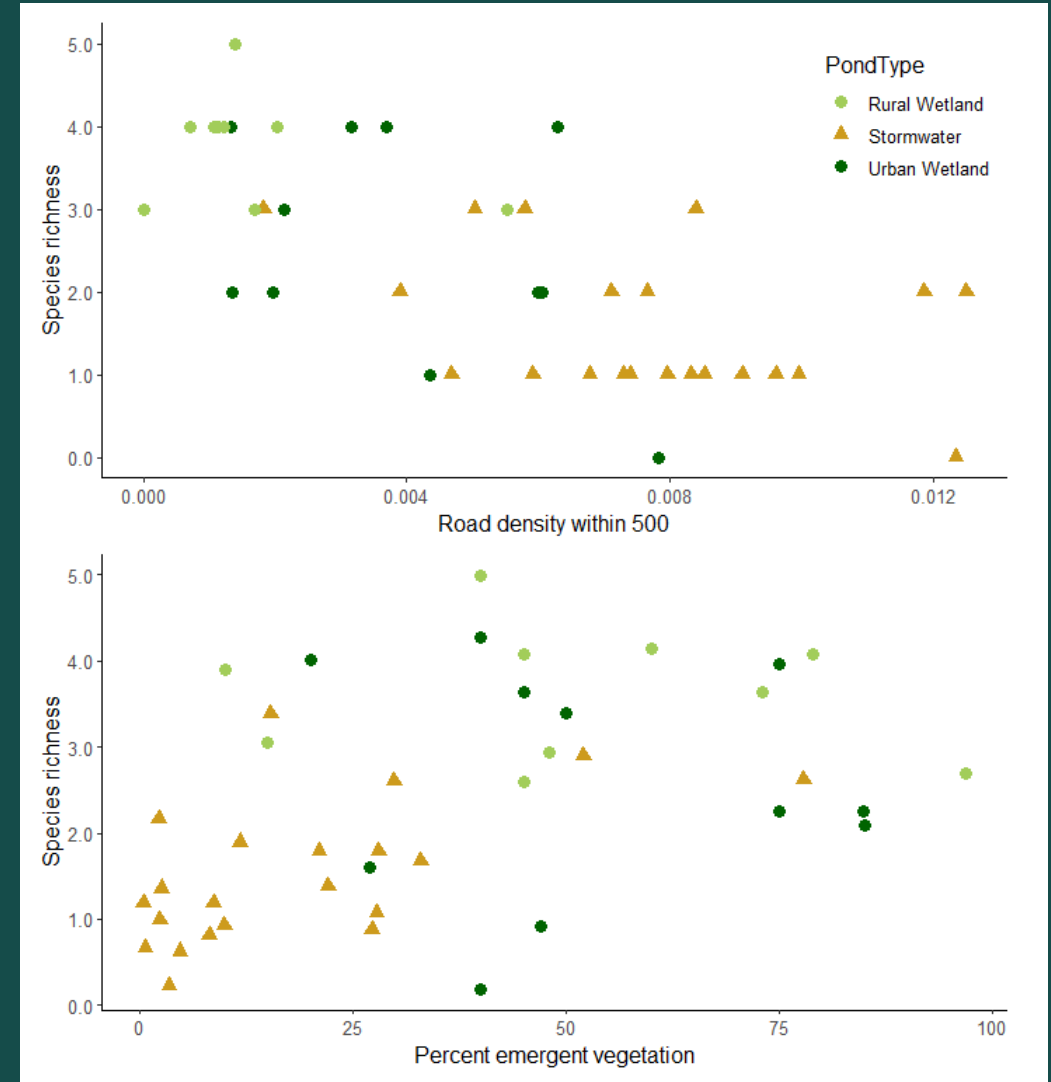
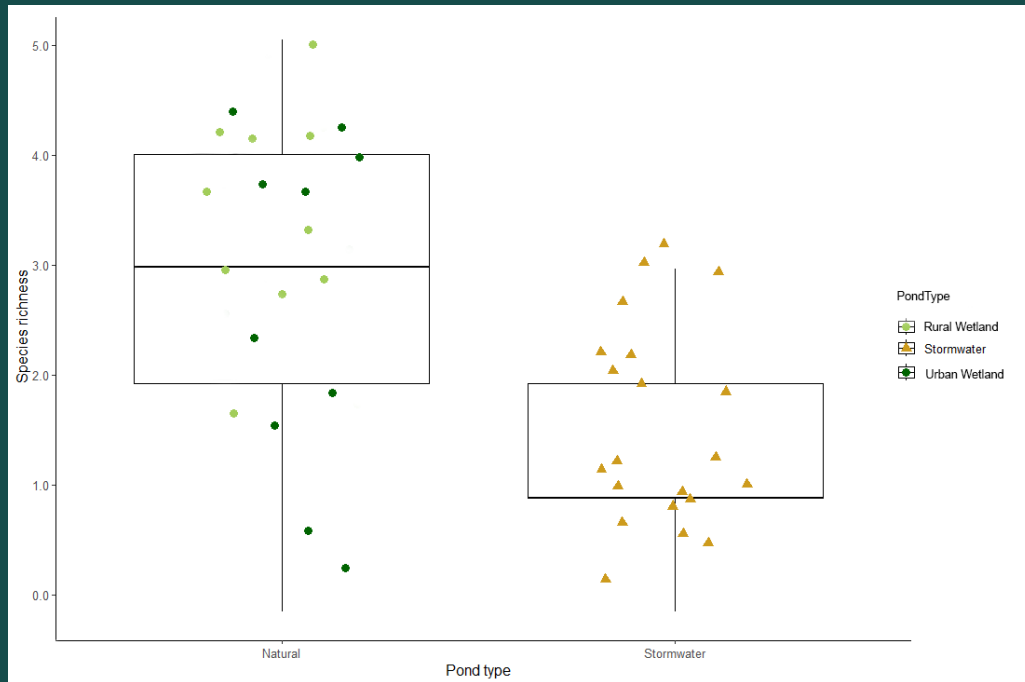
Stormwater ponds are created to replace drained wetlands

- Wetlands and stormwater management ponds in 7 fast-growing municipalities




- Wetlands are replaced with stormwater management ponds
 - Water needs to go somewhere!

Example: Frog diversity is lower in stormwater ponds



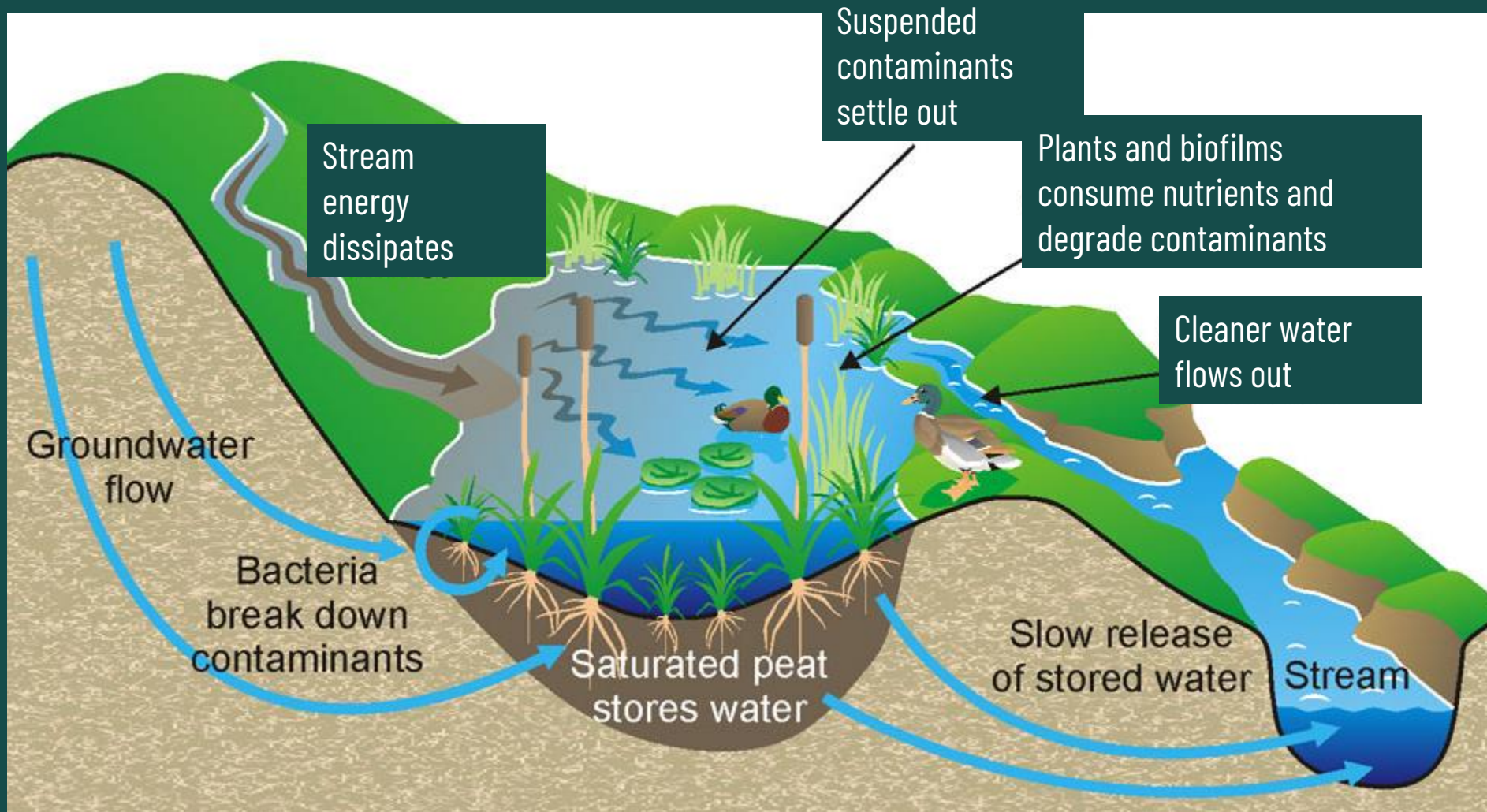
Why should we care? Ecosystem Goods & Services

- Food, fuel, fiber
- Water purification
- Carbon storage & sequestration
- Flood protection
- Recharge aquifers
- Shoreline stabilization/ erosion prevention
- Biodiversity and habitat
- Recreation & tourism
- Mixedwood Plains wetlands: **\$78 Billion CAD/yr**
 - Troy & Bagstad (2009) ~ Spatial Value Transfer Method - $V(ES_i) = \sum_{k=1}^n A(LU_i) \times V(ES_{ki})$



Ecosystem services: The benefits people obtain directly or indirectly from ecosystems - MEA 2005

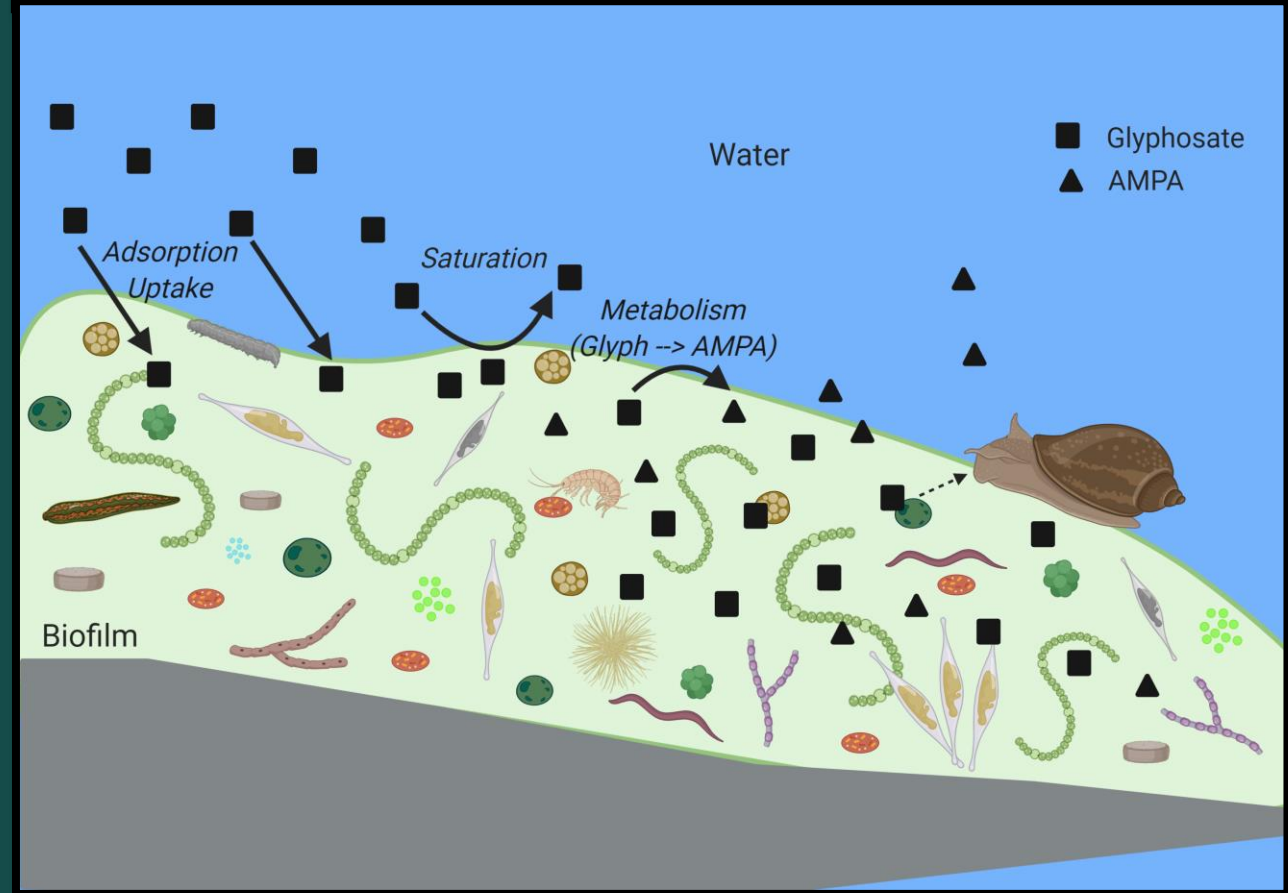
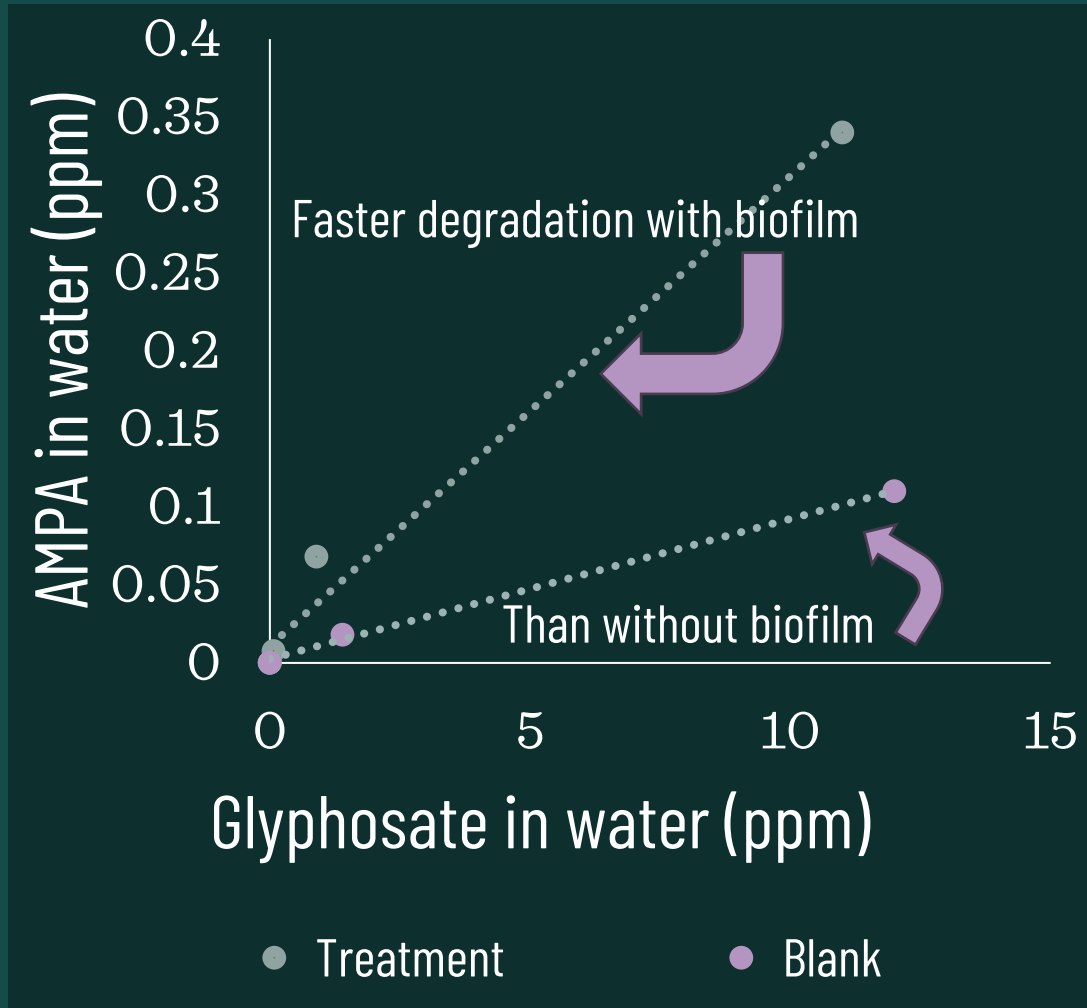
Water purification



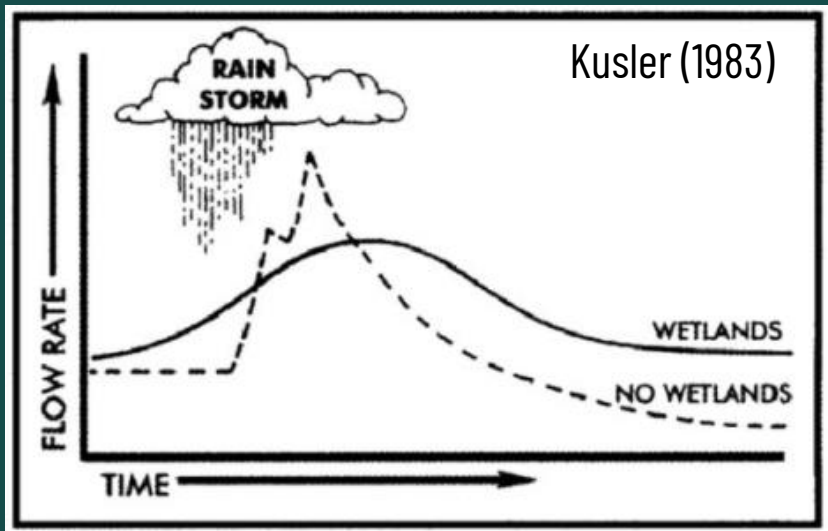
- Aziz and van Cappellen @ U Waterloo (2022) found wetlands in southern Ontario provide \$4.2 billion /y in nutrient pollution abatement

Source: Government of Alberta

Biofilms - the "active ingredient" in wetland water purification



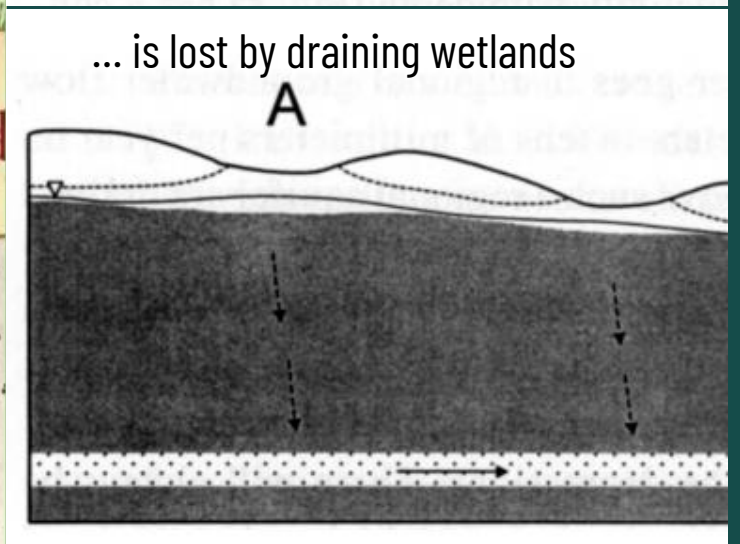
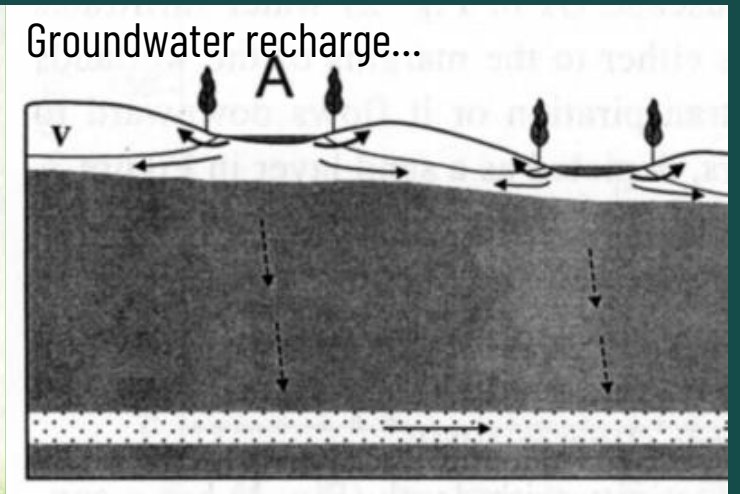
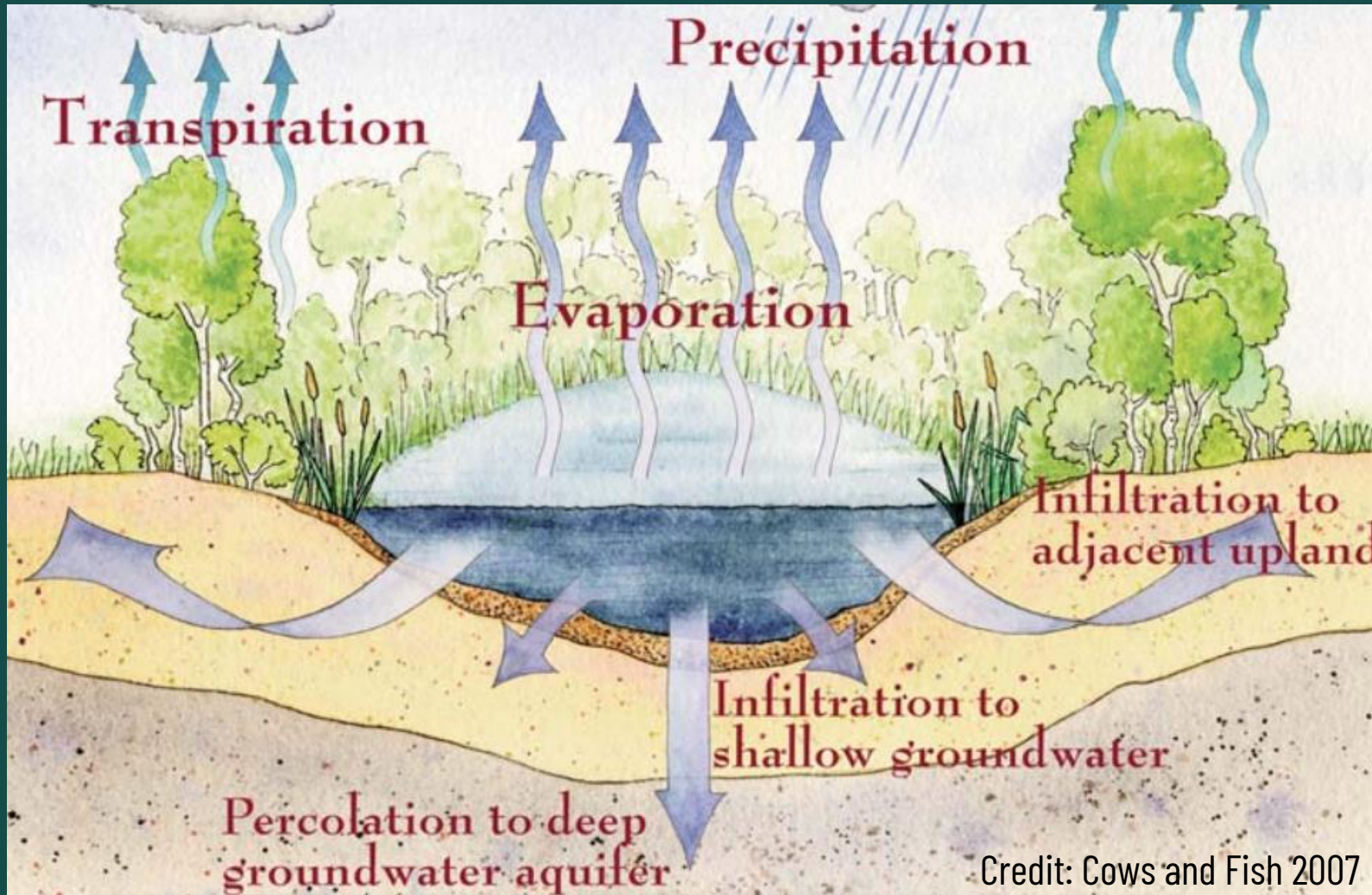
Flood protection



Summer of 2023: severe storms and flash floods caused \$340 million in insured losses in Ontario

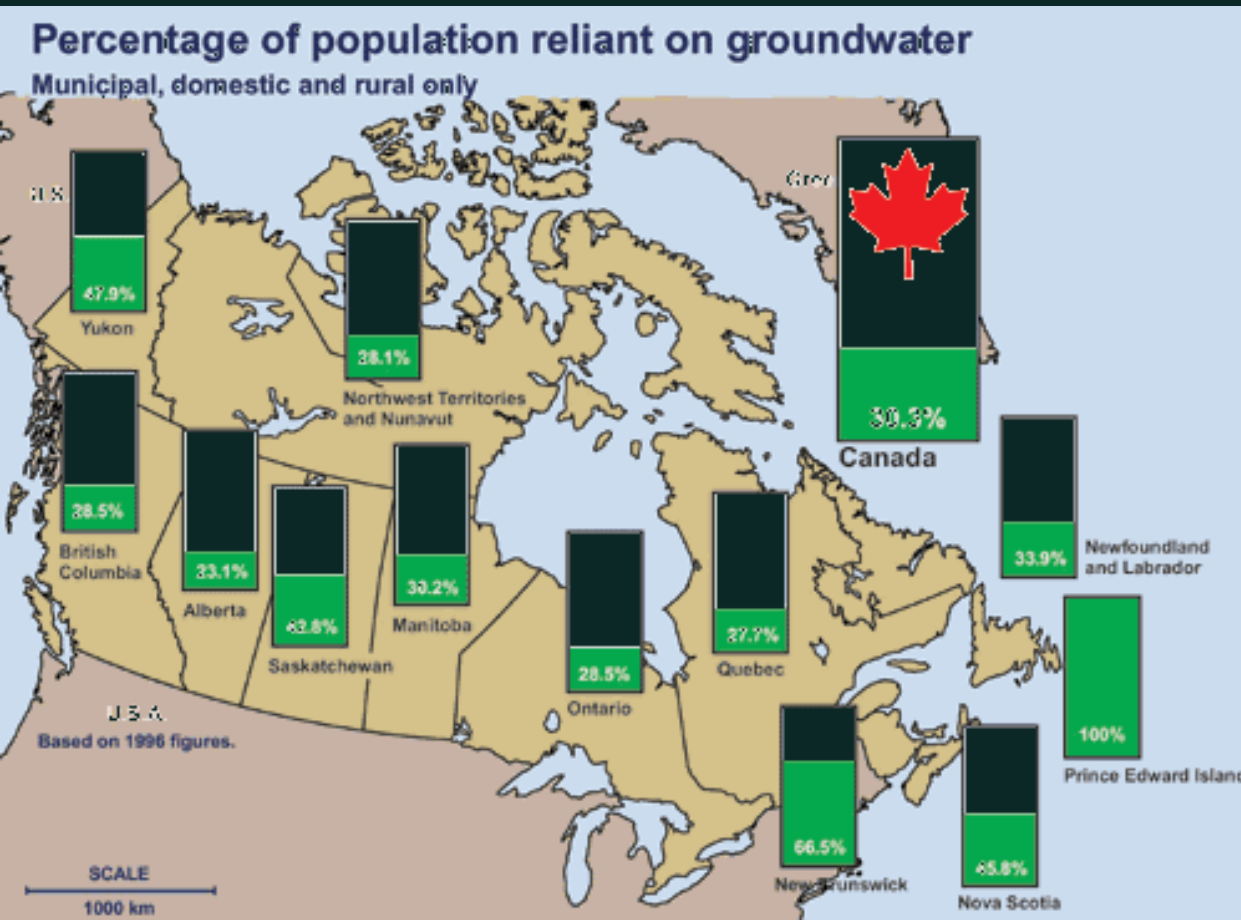


Recharge aquifers / supply water during drought



van der Kamp and Hayashi (1998)

Aquifers supply drinking water for 1 in 4 Ontarians



Erosion prevention

- Absorbing wave & current energy
 - 4.5 m of marsh reduces wave energy 50% - NOAA
- Holding soil in place with roots
- Slowing flood water flows
- Climate change: more storms and loss of lake ice increase erosion on the Great Lakes



Fowler's toad

Credit: Google Image



Least bittern

Credit: Mark Peck



Monarch

Credit: Rebecca Rooney



**Horsetail
spikerush**

Credit: Google Image



Bladderwort

Credit: Catriona Leven



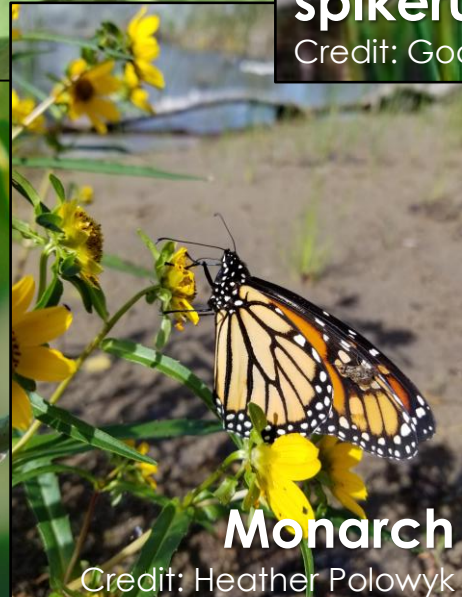
Swamp rose mallow

Credit: Matt Bolding



Barn swallow

Credit: Heather Polan



Monarch

Credit: Heather Polowyk



Blanding's turtle

Credit: Chantel Markle



Spotted turtle

Credit: Christina Davy



Calico pennant

Credit: Rebecca Rooney



Bent spikerush

Credit: Heather Polowyk



Tree swallow

Credit: Lisha Berzins

Fowler's toad

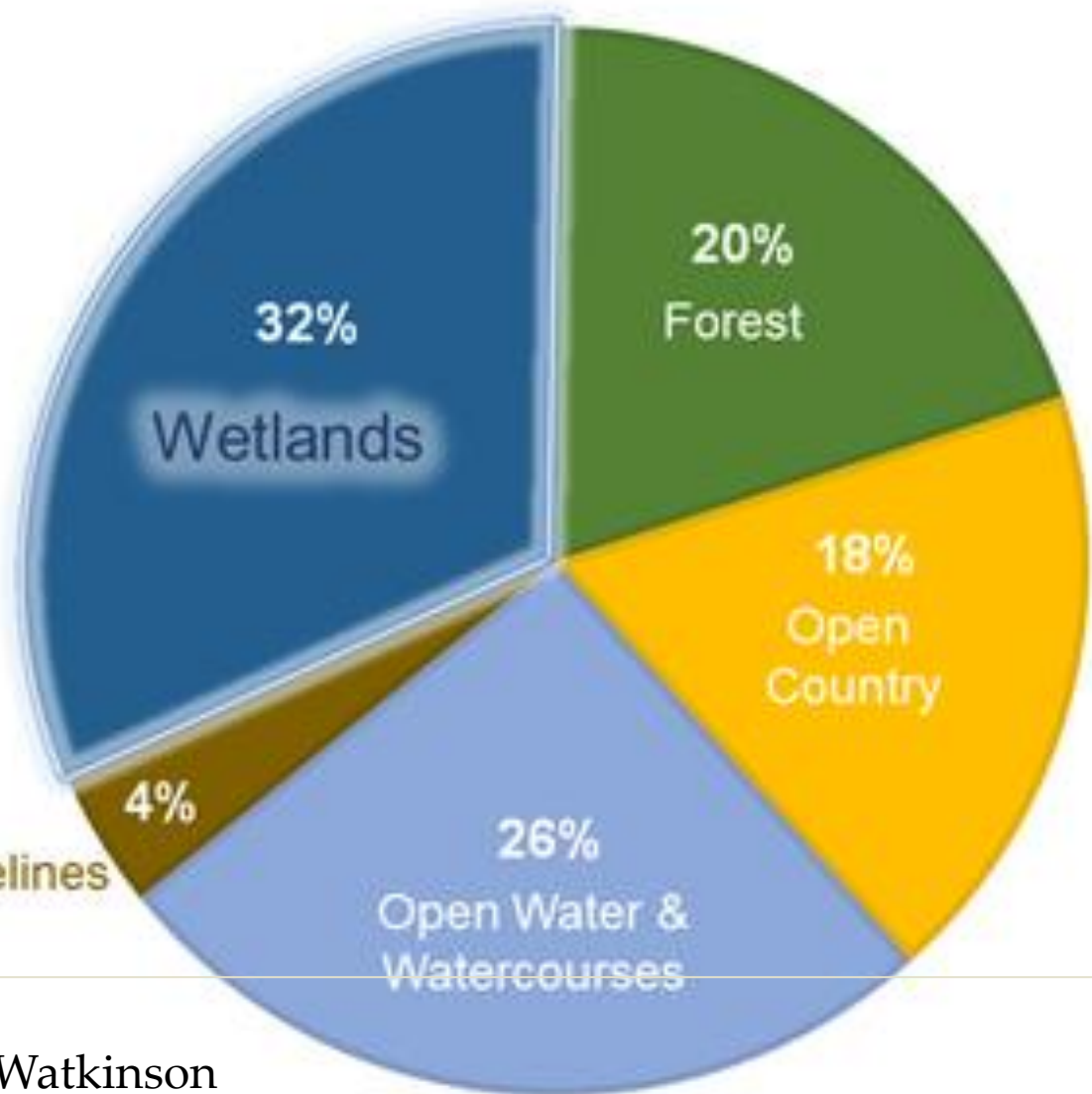
Credit: Google Image



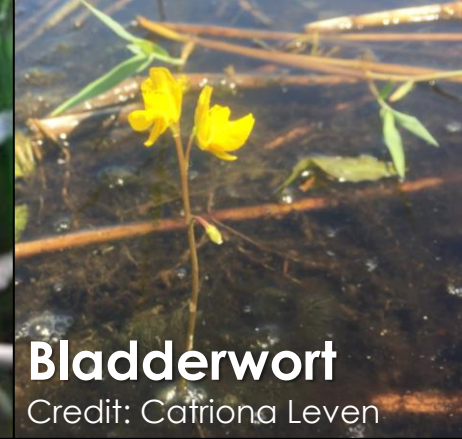
Monarch



Over 30% of Species At Risk Call Wetlands Home



Credit:
Autumn Watkinson



Bladderwort

Credit: Catriona Leven

Swamp rose mallow

Credit: Matt Bolding



Blanding's turtle

Credit: Chantel Markle



Spotted turtle

Credit: Christina Davy

Calico pennant

Credit: Rebecca Rooney

Bent spikerush

Credit: Heather Polowyk



Tree swallow

Credit: Lisha Berzins

Recreation and tourism

2011 Survey of
Bird Watching
Expenditures by
US Residents



47 million birders
\$41 Billion in
expenditures
666,000 jobs



Credit: Megan Bishop

Ecosystem services: functions vs. values

- **Functions:** generated by physicochemical and biological processes occurring naturally in wetlands
 - Microbial activity
 - Groundwater exchange
- **Values:** functions that benefit people and are contingent on loads and/or the number of folks that benefit
 - Remove pesticides from farm run-off
 - Recharge aquifer for people's wells

Urban Wetlands Are Not Wastelands

You want them in your backyard!



Credit: Megan Jordan



Credit: Megan Jordan

ONTARIO WETLAND EVALUATION SYSTEM



Southern Manual
4th Edition
2022

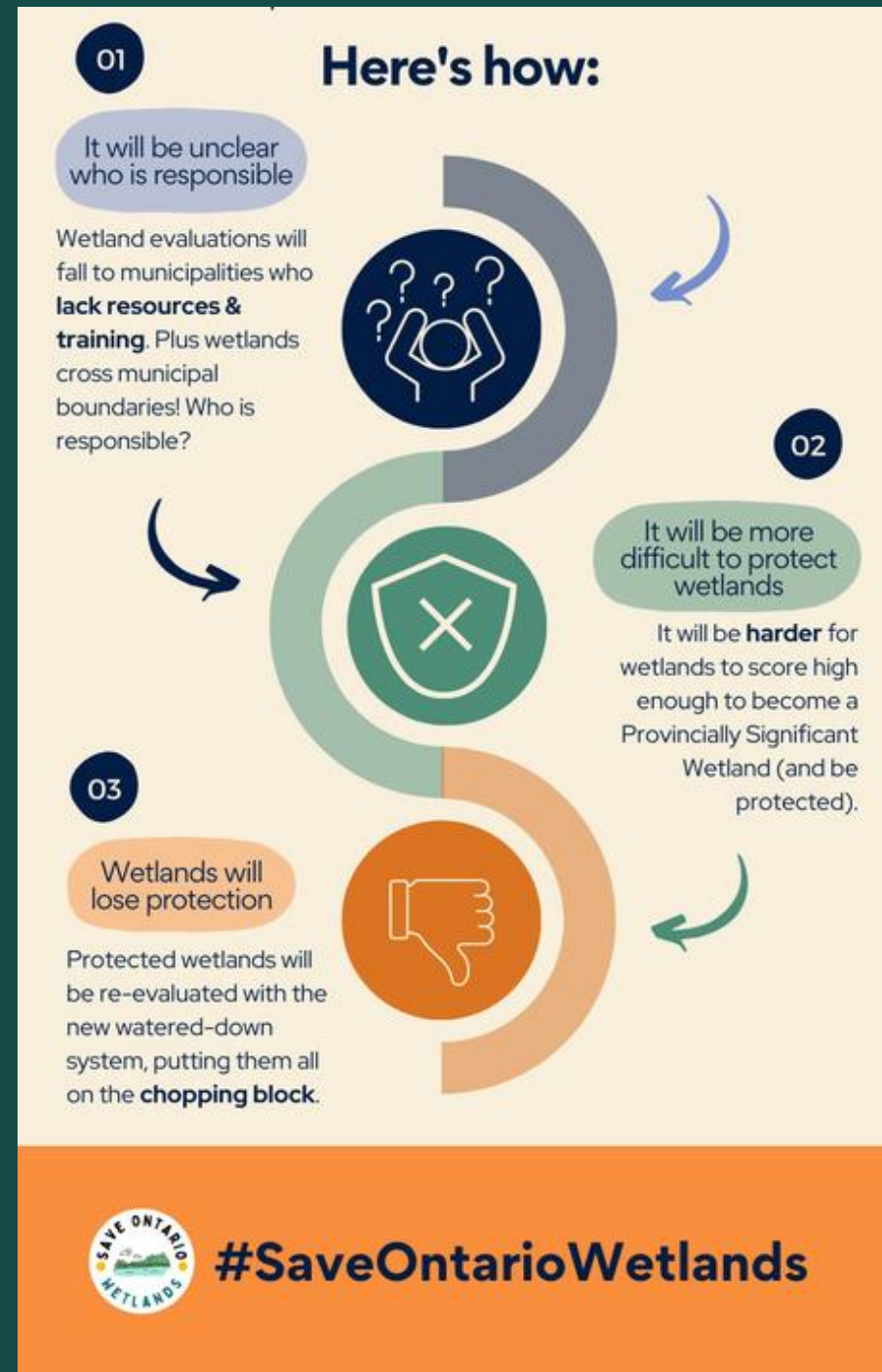
Ontario 

How do we protect wetlands in Ontario?

- OWES – the Ontario Wetland Evaluation System
 - Created in 1987 – truly pioneering!
 - Provides the “evaluation procedure” required by the Provincial Policy Statement
 - Measures functions and values of wetlands to yield a score
 - “Significant” wetlands are protected (score > 600, or >200 in any category)
 - Biological
 - Social
 - Hydrological
 - Special Features

Weakening of OWES in 2022 version 4.0

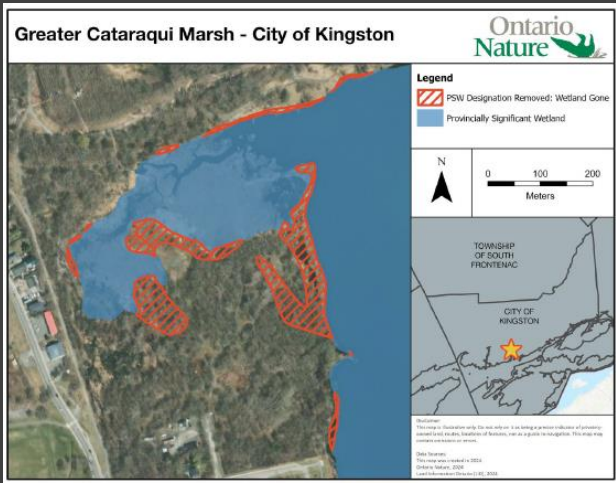
- MNRF no longer reviews or approves evaluations
 - PSWs can be re-evaluated with no oversight
 - Boundaries can be revised to make space for development
- MNRF no longer keeps the files in a database
 - Some municipalities may, but not all do
 - Rules differ from place to place
- Species at risk no longer confer wetland protection
- Wetlands are no longer complexed
- Re-evaluations are facilitated, so easy to chop away at PSWs
- **We predicted PSWs will be lost!**



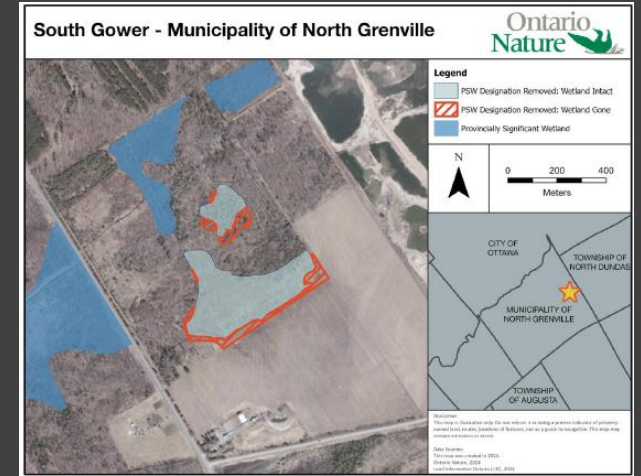
Our concerns have been confirmed...

Preliminary analysis
revealed PSW losses in
17 municipalities from
March 2023 to March
2024.

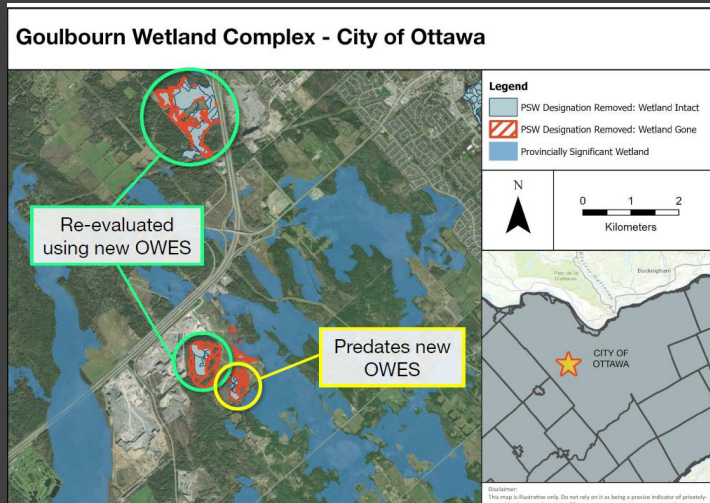




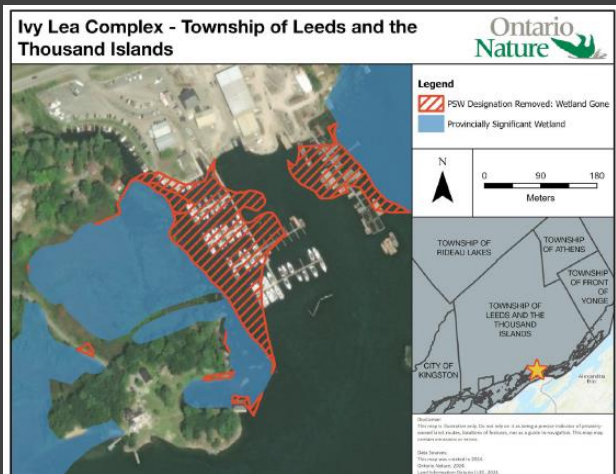
1.6 ha PSW lost



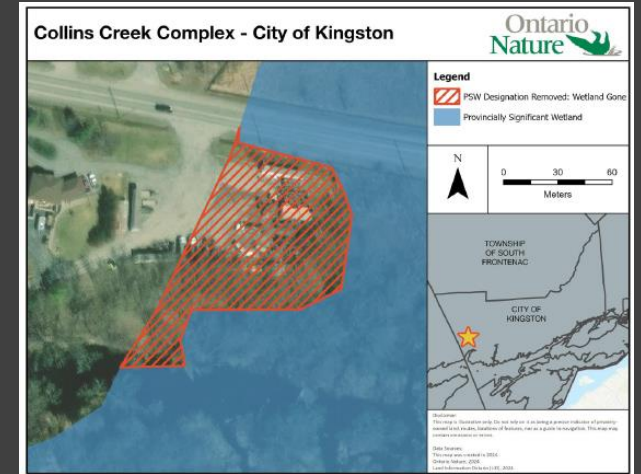
7.0 ha PSW lost



55 ha PSW lost



1.9 ha PSW lost



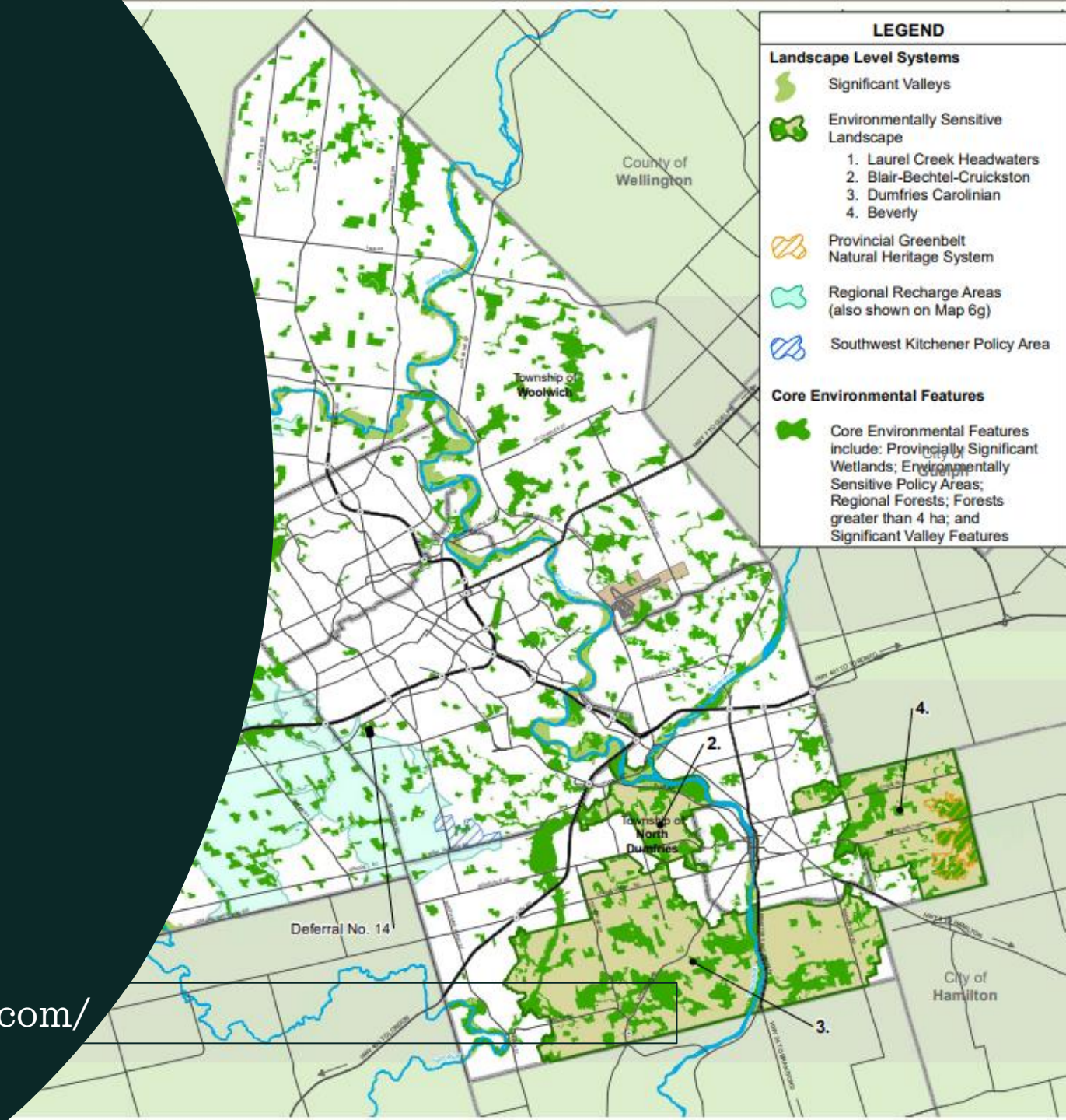
0.4 ha PSW lost


What can you do?

- Demand strong municipal wetland protections
- Support protection of our Greenlands Network and our official plan boundaries
- Subscribe to Waterloo Region Engage and pay attention to development proposals that endanger our wetlands: [EngageWR](#)
- Build community support for wetland protection



<https://saveontariowetlands.weebly.com/>



Waterloo Wetland Lab's  UNIVERSITY OF WATERLOO

Wetland Cleanup



Help clean up a local wetland, and learn about what you can do to protect them!

Wednesday, November 9, 2022
12 - 2 PM
 Fischer-Hallman Road & Columbia Street
 (across from Sobeys)
Rain date: Friday, November 11, 2022 | 12 - 2 PM

Send questions to Dr. Rooney (rebecca.rooney@uwaterloo.ca)

Contact your Councillors:
www.regionofwaterloo.ca/en/regional-government/council.aspx



SAVEONTARIOWETLANDS.WEEBLY.COM



<https://saveontariowetlands.weebly.com/>



Share your actions with me!

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