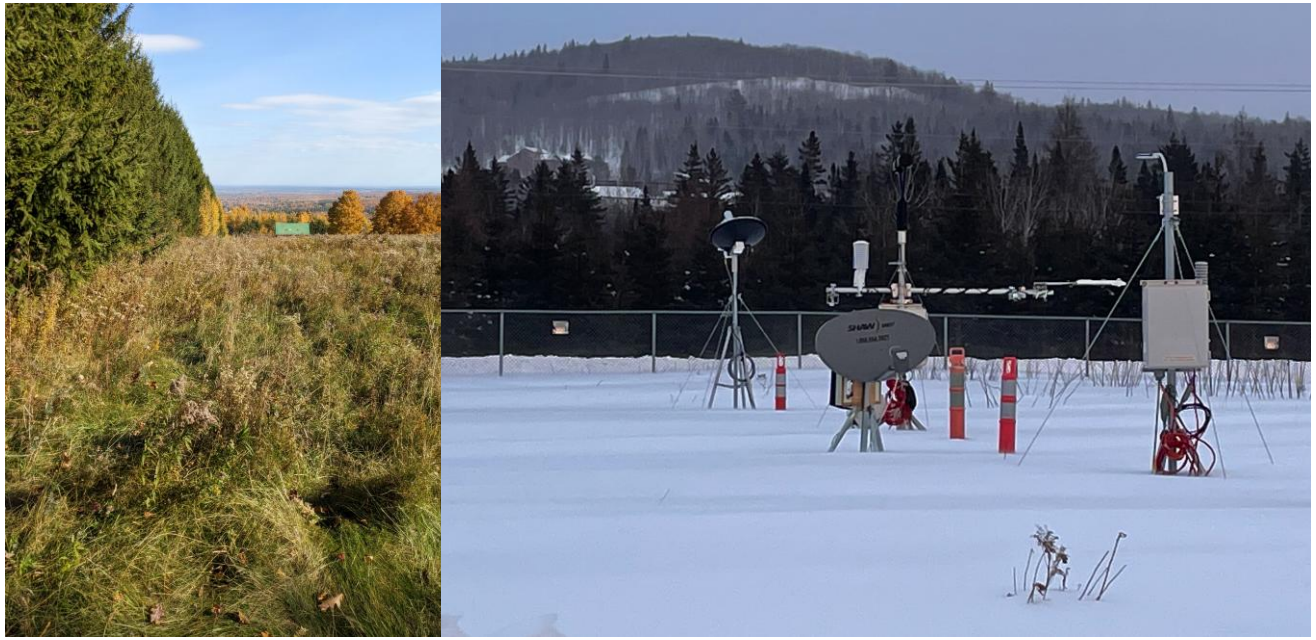
Cloud to Aquifer Natural Observatories

GWFO meeting

2026-01-14

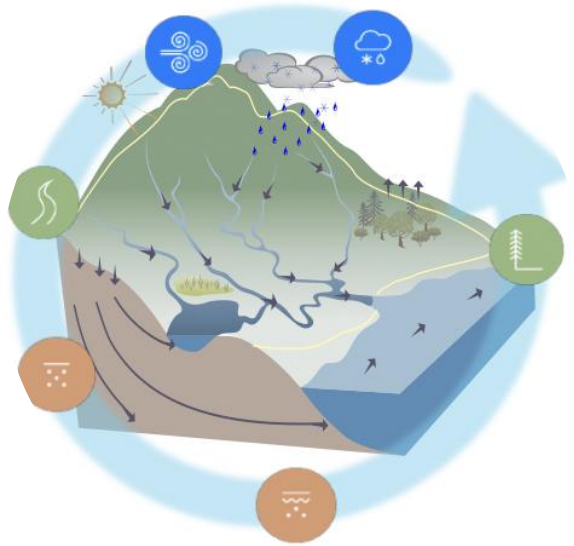
CANO



Funded by the Canada Foundation for Innovation (Innovation Fund), *Ministère de l'économie, de l'inovation et de l'énergie du Québec* and Research Nova Scotia

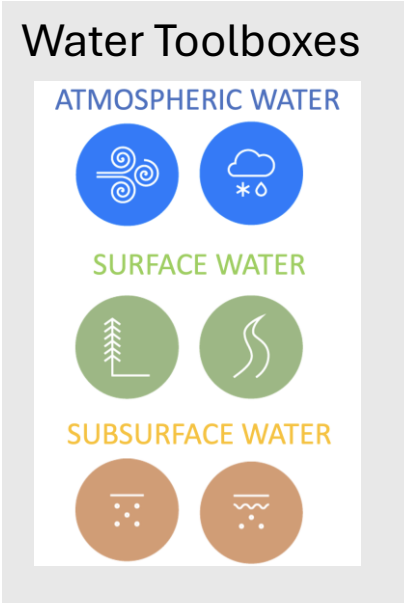
Goal

To build a network of instrumented observatories to trace water pathways, from the atmosphere to the aquifer in the cold and humid climate of Eastern Canada.



This infrastructure will enable the quantification of:

- Atmospheric water processes
- Hydrological processes at the land surface and in aquatic environment
- Soil and groundwater flow processes
- Water cycle interactions and response to change



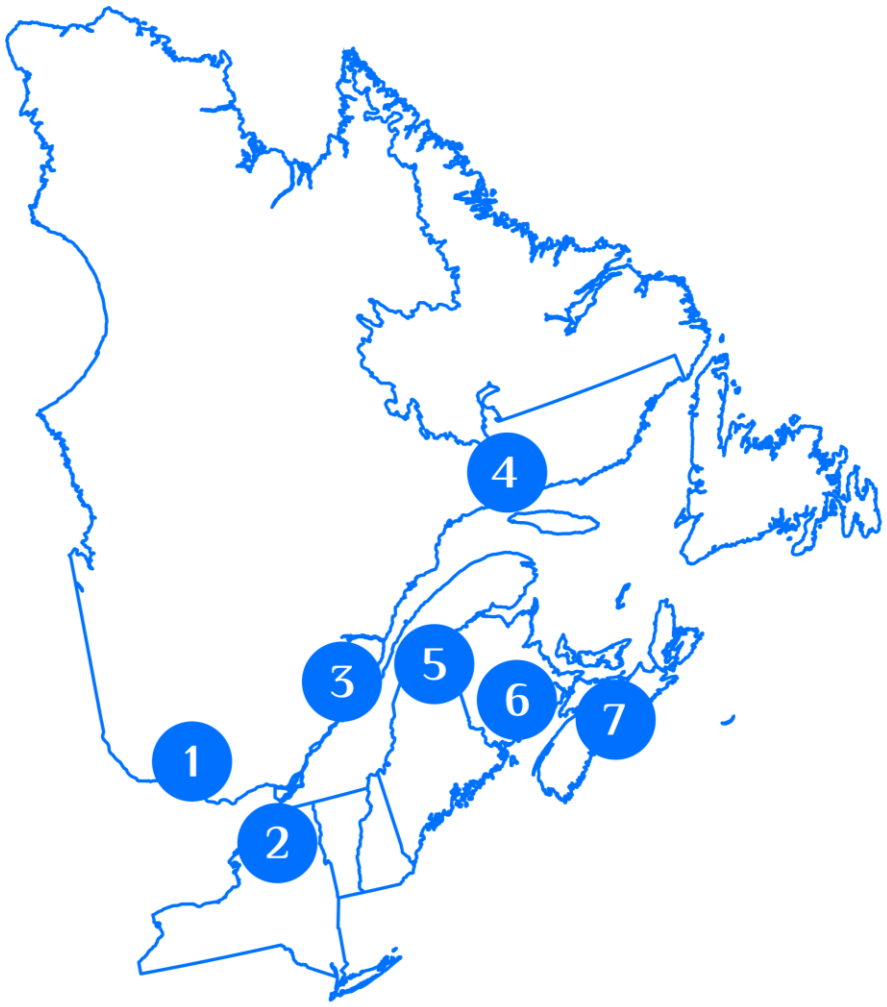
The Team

Name	Institution	Department
Marie Larocque	UQAM	Earth and Atmospheric Sciences
Julie Thériault	UQAM	Earth and Atmospheric Sciences
François Anctil	Université Laval	Génie civil et génie des eaux
Alejandro Di Luca	UQAM	Earth and Atmospheric Sciences
Manuel Helbig	Dalhousie University	Physics and Atmospheric Science
Audrey Maheu	Université du Québec en Outaouais	Sciences naturelles
Daniel Nadeau	Université Laval	Génie civil et génie des eaux
Julie Talbot	Université de Montréal	Geography
René Therrien	Université Laval	Géologie et génie géologique
Paul del Giorgio	UQAM	Biological Sciences

The Observatories

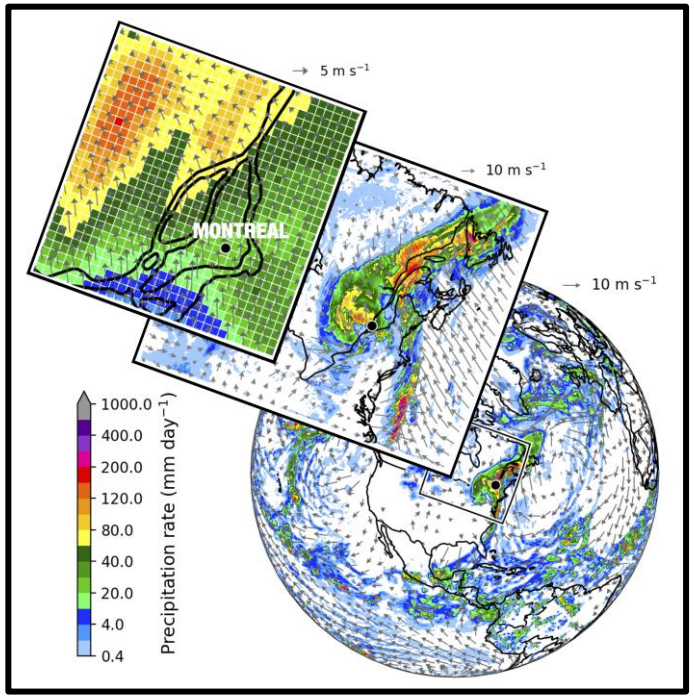
CANO Locations

1. Kenauk Nature (QC)
2. Covey Hill (QC)
3. Forêt Montmorency (QC)
4. Bernard River (QC)
5. Iroquois River (NB)
6. Acadia Res. Forest (NB)
7. Major Lake (NS)



Computing and field preparation laboratories

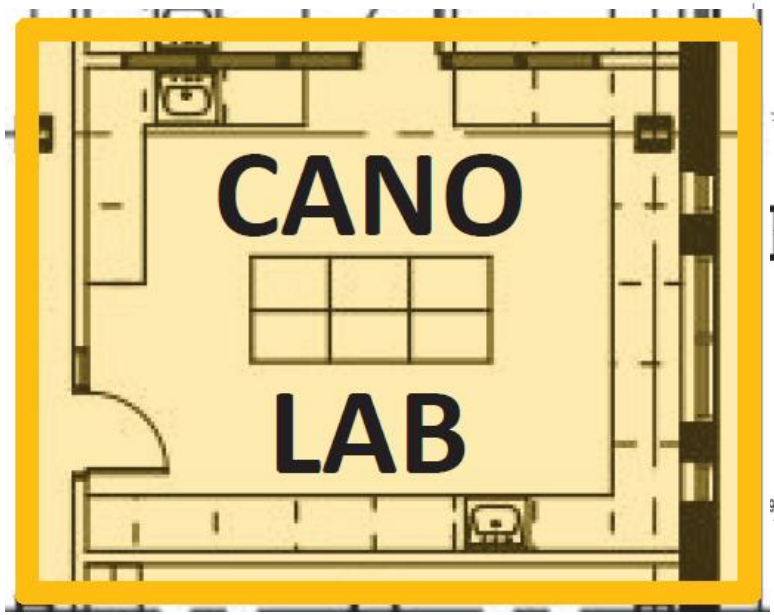
Regional very-high resolution climate modelling

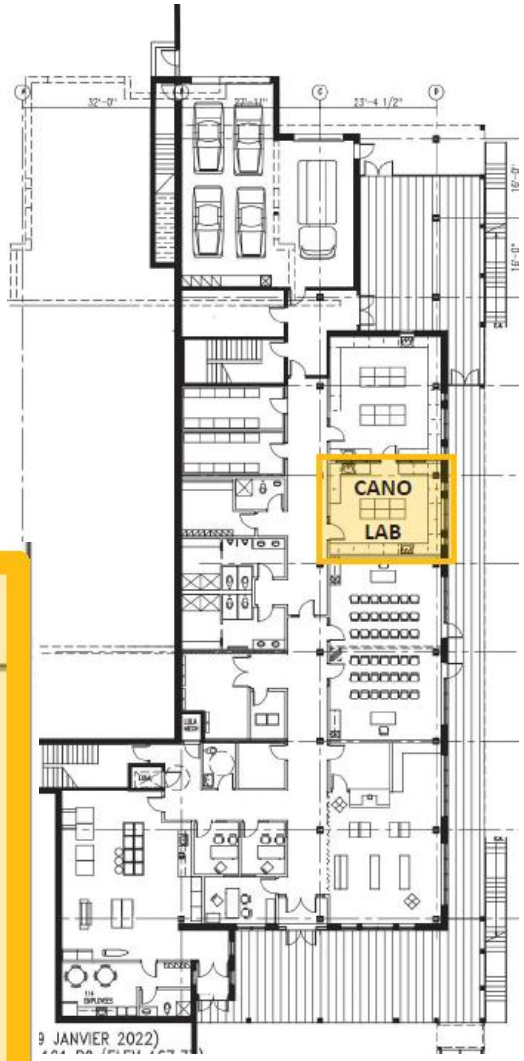


Field preparation lab

Laboratory space at Kenauk Nature

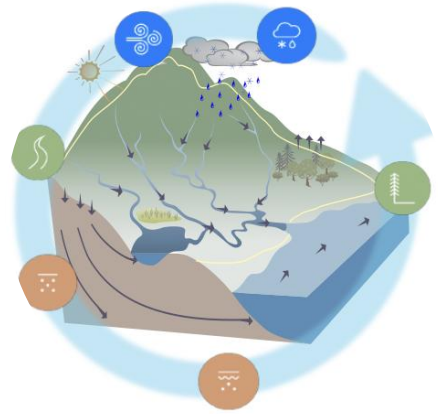
Approx 415 sq. ft





Atmospheric water toolbox

Mesures de l'eau atmosphérique



VARIABLE MESURÉE	LOCALISATION CANO						
✓ : Variable déjà mesurée / X : Instruments CANO à ajouter	1	2	3	4	5	6	7
CORE VARIABLES							
Couverture nuageuse	X	X	✓	X	X	X	X
Conditions météorologiques standard	X	X	X	X	X	✓	X
Bilan radiatif	X	X	✓	✓	X	✓	X
Quantité de précipitations	X	X	✓	X	X	X	X
Flux atmosphériques (CO_2, H_2O, énergie)	X	X	✓	✓	X	✓	X
ENHANCED VARIABLES							
Précipitations dans l'atmosphère	X	X	✓	-	X	-	-
Caractéristiques et formes des précipitations	X	X	X	-	X	-	-
Conditions atmosphériques verticales	X	X	X	-	X	X	-

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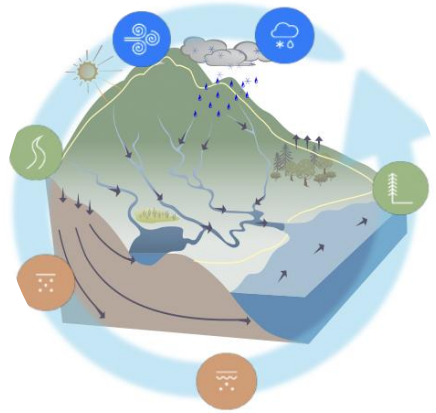
Surface water toolbox



Mesure de l'eau de surface

VARIABLE MESURÉE	LOCALISATION CANO						
✓ : Variable déjà mesurée / X : Instruments CANO à ajouter	1	2	3	4	5	6	7
CORE VARIABLES							
Profondeur du manteau neigeux	X	X	✓	X	X	✓	X
Couverture neigeuse	X	X	✓	X	X	X	X
Débit	X	X	✓	X	X	X	X
ENHANCED VARIABLES							
Profil de température du sol et de la neige	-	-	✓	-	-	-	-
Évaporation de surface	✓	X	✓	✓	-	✓	X
Interception de pluie	X	-	-	-	-	-	-
Température de l'eau	X	X	✓	X	-	X	X
Chimie et composition de l'eau	X	X	-	X	-	-	-

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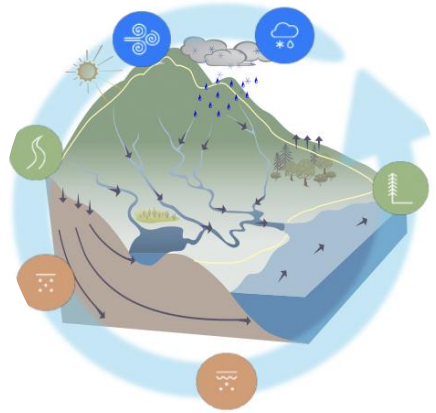
Subsurface water toolbox



Mesure de l'eau souterraine

VARIABLE MESURÉE	LOCALISATION CANO						
✓ : Variable déjà mesurée / X : Instruments CANO à ajouter	1	2	3	4	5	6	7
CORE VARIABLES							
Humidité et température du sol	X	X	X	X	X	✓	X
Charge hydraulique	X	X	✓	X	X	X	X
Conductivité et température de l'eau souterraine	X	X	X	X	X	X	X
ENHANCED VARIABLES							
Transpiration des arbres	X	X	✓	X	-	X	-
Distribution de température de l'eau souterraine acheminée aux rivières	X	X	-	-	X	-	-

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Timeline, operation and data sharing

Timeline

- All instruments must be installed by June 2028
- Groundwater wells and instruments were installed at Kenauk and Covey Hill in 2025

Operation and maintenance

- Co-PI and their institutions are responsible of their instruments, but we are still working on developing a detailed plan

Data sharing

- The initial plan is to make the core variables publicly available; we are still working on developing a detailed plan