



# LIVING LAB - ATLANTIC

## WEB APPLICATIONS FOR OPEN SCIENCE

### HYDROLOGY TOOL SET

<https://www.hydrotools.tech>



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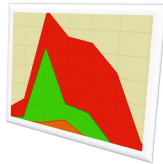
The various tools included in the suite can be used for advancing the understanding of local and watershed scale hydrological processes and can be used in many areas of environmental research, such as the assessment of the impacts of agricultural practices, urbanization, climate change, etc.

The tools have been developed using the following principles:

- Freely available (i.e., no cost and no user registration required);
- User-friendly interface, with streamlined and easy to follow procedures;
- Minimal input data requirements and input data generally available to the public;
- High degree of flexibility (e.g., choice of methods; adjustable parameters/coefficients).

## SWIB (2021)

SWIB (Soil Water Stress, Irrigation Requirement and Water Balance) is a model that allows users to estimate daily crop / soil water stress (either as water deficit or water excess), crop irrigation requirements and the impact of irrigation on aquifer storage, as well as a series of water balance components, based on user provided daily measured soil moisture and precipitation.



## SepHydro (2017)

SepHydro is a tool that offers several customizable digital filtering algorithms for performing hydrograph separation (or baseflow separation) and assessing surface runoff and groundwater contributions to streamflow based on user provided daily streamflow data.



## ETCalc (2022)

ETCalc is a tool that integrates several customizable methods for calculating daily Potential Evapotranspiration (PET), Reference Evapotranspiration (ETR) and Actual Evapotranspiration (ET) based on user provided meteorological data and crop coefficients.



## SNOW BUDDY (2022)

Snowfall and rainfall estimation tool (SNOW BUDDY) is an online tool for estimation of daily snowfall and rainfall amounts based on user-provided daily air temperature and total precipitation.



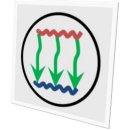
## SNOSWAB (2022)

SNOSWAB (Snow, Soil Water and Water Balance) is a complex online model for estimation of daily dynamics of snow-related processes (snowfall, snow accumulation, snowmelt), soil water content and water balance components (infiltration, drainage and surface runoff) based on user provided air temperature, precipitation, rainfall and evapotranspiration..



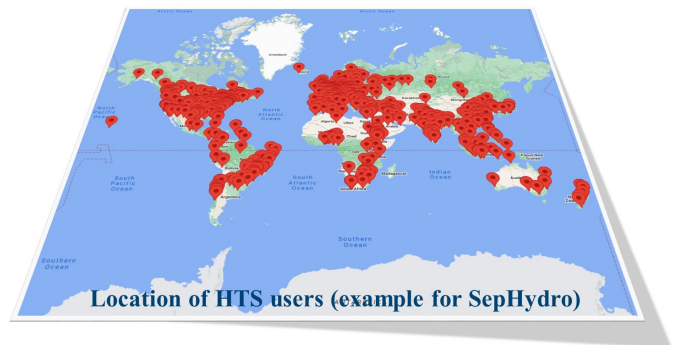
## RECHARGE BUDDY (2022)

Groundwater Recharge Estimation Tool (RECHARGE BUDDY) is an online tool for estimation of daily groundwater recharge, groundwater discharge and change in aquifer storage based on user-provided specific yield and daily water table elevations.



## HTS USER STATS

Unique visitors (all tools)	16,126
Data sets loaded to the tools	14,205
No. of analyses conducted by users	34,450



## REFERENCES

- Danielescu S, MacQuarrie KTB, Popa A (2018) SEPHYDRO: A Customizable Online Tool for Hydrograph Separation. *Groundwater* 56: 589-593. DOI: <https://doi.org/10.1111/gwat.12792>
- Danielescu S (2022) SWIB - An Online Model to Estimate Daily Crop Water Stress, Irrigation Needs, and Soil Water Budget. *Groundwater*. DOI: <https://doi.org/10.1111/gwat.13278>
- Danielescu S (2022) Development and Application of ETCalc, a Unique Online Tool for Estimation of Daily Evapotranspiration. *Atmosphere-Ocean* 2022, 1-13. DOI: <https://doi.org/10.1080/07055900.2022.2154191>
- Danielescu S, MacQuarrie K, Zebarth B, Nyiraneza J, Grimmett M, Levesque M (2022). Crop water deficit and supplemental irrigation requirements for potato production in a temperate humid region (Prince Edward Island, Canada). *Water* 14, 2748. DOI: <https://doi.org/10.3390/w14172748>



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Canadian Rivers Institute

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