

Samah Larabi, PhD

Hydroclimate Scientist

Tel: 250-472-4484; slarabi@uvic.ca

RESEARCH DOMAINS

Deploying and applying innovative statistical methods for environmental sciences, Hydrological Modelling, Optimization/Calibration, Machine learning/Deep learning, Statistical hydrology, Climate Change.

EDUCATION

PhD. Water Sciences

2014 - 2017

Institut National de la Recherche Scientifique, Québec City, QC, Canada.

Area of study: Statistical hydrology, Hydrologic modelling, Model Calibration.

M.Eng. Mathematics and Modelling

2010 – 2013

Polytech Clermont-Ferrand, Graduate School of Engineering, Clermont-Ferrand, France.

Area of study: Mathematical and Statistical modelling, Scientific Computing, Machine Learning, Operations Research, Software Engineering.

RESEARCH EXPERIENCE

Hydroclimate Scientist

April 2022 - present

Pacific Climate Impacts Consortium, University of Victoria, Victoria, BC, Canada.

- *Improving large-domain hydrologic modelling including model structure, spatial discretization, parameter estimation, regionalization and computational efficiency.*
- *Investigating climate variability and change and its hydroclimatic implications.*

Postdoctoral fellow in hydrology

April 2019 – March 2022

Pacific Climate Impacts Consortium, University of Victoria, Victoria, BC, Canada.

- *Investigated the potential impact of climate change on the management of water release and fish habitat.*
- *Developed methods for efficient process-based and large-scale model parameter estimation.*

Hydroclimate postdoctoral Scientist

October 2017 – March 2019

Department of Civil Engineering, Université de Sherbrooke, Sherbrooke, QC, Canada.

- *Deployed a sub-daily modelling chain to estimate potential future changes in hydrologic regime of medium size watersheds in Québec.*

Hydrologic Modelling Scientist – Intern

August 2016 – December 2016

Direction de l'expertise Hydrique du Québec, Développement durable, Environnement et lutte contre les changements climatiques – MDDELCC, Québec City, QC, Canada.

- *Analyzed and evaluated the impact of evapotranspiration models on streamflow accuracy.*

Hydrologic Modelling Scientist – Intern

February 2016 – March 2016

BC Hydro, Burnaby, BC, Canada.

- *Developed and evaluated hourly forecasting hydrologic models.*

PUBLICATIONS

Khorsandi M., St-Hilaire A., Arsenault R., Martel J-L., **Larabi S.**, Schnorbus M. and Zwiers F. (2023) Future flow and water temperature scenarios in an impounded drainage basin: implications for summer flow and temperature management downstream of the dam. *Climatic Change*, 176, 164. <https://doi.org/10.1007/s10584-023-03634-w>.

Larabi S., Schnorbus M. and Zwiers F. (2023). Diagnosing the ability of reservoir operations to meet hydropower production and fisheries needs under climate change in a Western Cordillera drainage basin. *Climatic change*, 176:161, <https://doi.org/10.1007/s10584-023-03632-y>.

Larabi S., Mai, J., Schnorbus, M., Tolson, B. A., and Zwiers, F. (2023). Towards reducing the high cost of parameter sensitivity analysis in hydrologic modeling: a regional parameter sensitivity analysis approach. *Hydrol. Earth Syst. Sci.*, 27, 3241–3263, <https://doi.org/10.5194/hess-27-3241-2023>.

Larabi S., Schnorbus M. and Zwiers F. (2022). A coupled streamflow, water temperature and water quality (VIC-RBM-CE-QUAL-W2) model for the Nechako Reservoir. *Journal of Hydrology: Regional Studies*, <https://doi.org/10.1016/j.ejrh.2022.101237>.

Larabi S., St-Hilaire A., Chebana F., and Latraverse M. (2018). Using Functional Data Analysis to calibrate and evaluate hydrological model performance. *J. Hydrol. Eng.* 23(7). Doi:10.1061/(ASCE)HE.1943-5584.0001669.

Larabi S. (2017). Novel calibration approaches for automatic calibration applied to a conceptual semi-distributed hydrologic model. Ph.D. Thesis, INRS-ETE, Quebec, Canada

Larabi S., St-Hilaire A. and Chebana F. (2017): A new concept to calibrate and evaluate hydrological model based on functional data analysis. *Journal of Water Management Modeling* 26:C442. <https://doi.org/10.14796/JWMM.C422>

Larabi S., St-Hilaire A., Chebana F., and Latraverse M. (2017): Multi-criteria process-based calibration using functional data analysis to improve hydrological model realism. *Water Resour Manage.* Doi: 10.1007/s11269-017-1803-6.

St-Hilaire A., Boucher, M-A., Chebana F., Ouellet-Proulx S., Zhou Q-X., **Larabi S.**, Dugdale S. and Latraverse M. (2015): Breathing new life to an older model: the CEQUEAU tool for flow and water temperature simulations and forecasting. In proceedings of the 22nd Canadian Hydrotechnical conference, Montreal, Qc, Canada, 29 April-2 May 2015.

CONFERENCES AND POSTERS

Larabi S. and Schnorbus M.A., 2023. Can Process-based Calibration Improve Hydrologic Model Identifiability and Realism?

Talk at the American Geophysical Union Meeting, San Francisco, CA, USA, 11-15 December 2023.

Larabi S., Schnorbus M. and Zwiers F. 2022. Reliability of the Nechako Reservoir to meet hydropower production and fisheries needs under climate change.

Talk at the Pacific Climate Impacts Consortium Seminar series, Victoria, Canada, October 26-2022.

Larabi S. and Schnorbus M.A., 2022. A process-based sensitivity guided calibration of the VIC model.

Poster presented at the Global Water Future Annual Open Science Meeting, 16-18 May 2021.

Larabi S., Schnorbus M.A., Mai J. and Tolson B.A. 2021. Transferring Sensitivity Analysis Information for a Land Surface Model.

Poster presented at the American Geophysical Union, 13-19 December 2021.

Larabi S., Schnorbus M.A., Mai J. and Tolson B.A. 2021. Hydrologic Parameter sensitivity across a large-domain.

Poster presented at the Global Water Future 4th Annual Open Science Meeting, 17-19 May 2021.

Larabi S., Leconte R. 2019. Impact des changements climatiques sur le régime hydrique de bassins versants du Québec de taille comprise entre 25 et 500 km².

Poster presented at Colloque Association Québécoise de télédétection/ la recherche en hydrologie au Québec (AQT/RHQ), Sherbrooke, Canada, May 15-17 2019.

Larabi S., Leconte R. 2019. Estimation de l'impact des changements climatiques anticipés sur le régime hydrologique de bassins versants de tailles variant entre 25 et 500 km².

Invited Speaker, OURANOS. Montréal, Canada, March 27 2019.

Larabi S., St-Hilaire A. and Chebana F. 2017. A new concept to calibrate and evaluate hydrological model based on functional data analysis.

Talk during the 50th International Conference on Water Management Modelling (ICWMM), Toronto, Canada, March 1-2 2017.

Larabi S., St-Hilaire A. and Chebana F. 2016. A multi-criteria process-based calibration coupled with functional data analysis applied to a conceptual model.

Talk during the 7th conference of the International Commission on Statistical Hydrology (STAHY), Quebec City, Canada, September 26-27 2016.

Larabi S., St-Hilaire A., Chebana F., and Latraverse M. 2016. A Two-Step Approach calibration using functional data analysis to evaluate hydrological model performance. Case study: Calibrating CEQUEAU model on the Lac St-Jean drainage basin.

Talk during the 69th National Conference of the Canadian Water Resources Association (CWRA), Montréal, Canada, May 25-27 2016.