Curriculum Vitae

Sylvestre, Émile

Personal Information
Canadian citizen, 13.08.1991
ORCID ID: 0000-0001-6537-2313
Google Scholar ID: zr1PVGYAAAAJ
E-Mail: emile.sylvestre@eawag.ch

Education

6/14-10/20	Ph.D. in Civil Engineering, Polytechnique Montréal, Montréal, Québec. Thesis: *Systematic assessment of microbial risks associated with hydrometeorological events for drinking water safety management*. Supervisors: Prof. Sarah Dorner and Prof. Michèle Prévost.
9/10-5/14	B.Sc. in Civil Engineering, Polytechnique Montréal, Montréal, Québec.

Professionnal Experience

9/21-now	**Postdoctoral Researcher**, Swiss Federal Institute of Aquatic Science and Technology (Eawag). Department of Environmental Microbiology, Supervisor: Dr. Tim Julian. ▪ *Preparing, supervising and assessing B.Sc. and M.Sc. student projects.* ▪ *Disseminating research outcomes in internationally leading journals and conferences*.
11/22-04/23	**Consultant for National Research Council Canada**. Contact Person: Dr. Hans Schleibinger. ▪ *Critically reviewing standards and guidance documents on the management of Legionella in building water systems.* ▪ *Communicating technical information to building managers.*
9/21-9/22	**Consultant for Health Canada**. Contact Person: Teresa Brooks. ▪ *Conducting literature review and meta-analysis for a governmental agency to inform the update of their QMRA tool.*
6/20-8/21	**Research Associate**, Polytechnique Montréal. Supervisor: Prof. Michèle Prévost. ▪ *Compiling and analyzing governmental databases to evaluate the impact of regulatory monitoring of Legionella in cooling towers.*
6/17-9/18	**Guest Researcher**, KWR Watercycle Research Institute. Supervisors: Prof. Gertjan Medema and Dr. Patrick Smeets. ▪ *Planning and executing environmental sampling campaigns of pathogens and microbial surrogates at full-scale treatment plants.* ▪ *Conducting in-depth QMRA using site-specific data sets.*
6/14-10/20	**Ph.D. Student**, Department of Civil Engineering, Polytechnique Montréal. Supervisors: Prof. Sarah Dorner and Prof. Michèle Prévost. ▪ *Developing a research project in collaboration with municipalities, governmental agencies, and international research groups.* ▪ *Disseminating research outcomes in internationally leading journals and conferences*.
5/15-8/15	**Guest Researcher**, National Institute of Water and Atmospheric Research (NIWA). Hamilton, New Zealand. Supervisor: Dr. Graham Mcbride.

Research Projects

9/21-now **Waterhub in NEST**, Postdoctoral Researcher, Eawag.
- *Validating the performances of membrane bioreactors and chlorination systems for greywater treatment and reuse.*
- *Developing operational monitoring strategies to verify the performance of water treatment processes.*

9/21-now **LeCo project**, Postdoctoral Researcher, Eawag.
- *Characterizing the relationship between Legionella monitoring results obtained with culture and molecular-based methods.*
- *Providing recommendations to improve data collection and inform QMRA.*

11/22-04/23 **Module 16 for the Canadian Committee on Indoor Air Quality** (30 000 Can$). National Research Council Canada. Co-PI: **Sylvestre, É**., Julian, T.
- *Raising awareness on the health risk that Legionella can pose to humans.*
- *Developing a general understanding of building water safety planning, routine Legionella monitoring, and outbreak management.*

9/21-5/22 **Review of physical log removal credits for the Health Canada QMRA model update**. Health Canada (40 000 Can$). Co-PI: **Sylvestre, É**., Julian, T.
- *Updating the literature review of Hijnen & Medema (2010).*
- *Critically reviewing meta-analyses approaches.*

6/20-8/21 **Alliance project: Management of Legionella in Cooling Towers**. Research Associate, Polytechnique Montréal.
- *Analyzing Legionella monitoring results from about 3000 cooling towers.*
- *Assessing human health risks associated with exposure to Legionella in aerosols.*

8/21-9/21 Health risks associated with Cryptosporidium and Giardia at 4 drinking water treatment plants supplied by lakes. Gouvernment du Québec (3000 Can$).

3/18-9/19 Health risks associated with Cryptosporidium and Giardia at 30 drinking water treatment plants supplied by rivers. Gouvernment du Québec (5000 Can$).
- *Using QMRA to validate provincial regulatory treatment credits.*
- *Modelling and interpreting relationships between microbial indicators and pathogens in surface water sources.*

6/14-10/20 **Ph.D. project**. Polytechnique Montréal.
- *Identifying, sampling and characterizing microbial peak events in urban and rural drinking water sources.*
- *Validating the microbial reduction performances of full-scale drinking water treatment processes during snowmelt and rainfall events.*
- *Incorporating event-based monitoring results into QMRA.*

Publications in Peer-Reviewed Journals

Cavallaro, A., Rhoads, W. J., **Sylvestre, É.**, Marti, T., Walser, J. C., & Hammes, F. (2023). Legionella relative abundance in shower hose biofilms is associated with specific microbiome members. Manuscript submitted for publication.

Sylvestre, É., Reynaert, E., & Julian, T. R. (2023). Defining Risk-Based Monitoring Frequencies to Verify the Performance of Water Treatment Barriers. *Environmental Science & Technology Letters*, *10*(4), 379-384.

Li, C., **Sylvestre, É.**, Fernandez-Cassi, X., Julian, T. R., & Kohn, T. (2023). Waterborne virus transport and the associated risks in a large lake. *Water Research*, *229*, 119437.

Cantrell, M. E., **Sylvestre, É.**, Wharton, H. C., Scheidegger, R., Curchod, L., Gute, D. M., ... & Pickering, A. J. (2022). Hands are frequently contaminated with fecal bacteria and enteric pathogens globally: A systematic review and meta-analysis. *ACS Environ. Au*. 2023, 3, 3, 123-124.

Sylvestre, É., Dorner, S., Burnet, J. B., Smeets, P., Medema, G., Cantin, P., ... & Prévost, M. (2021). Changes in Escherichia coli to enteric protozoa ratios in rivers: Implications for risk-based assessment of drinking water treatment requirements. *Water Research*, *205*, 117707.

Burnet, J. B., Habash, M., Hachad, M., Khanafer, Z., Prévost, M., Servais, P., **Sylvestre É.** & Dorner, S. (2021). Automated Targeted Sampling of Waterborne Pathogens and Microbial Source Tracking Markers Using Near-Real Time Monitoring of Microbiological Water Quality. *Water*, *13*(15), 2069.

Sylvestre, É., Prévost, M., Burnet, J. B., Smeets, P., Medema, G., Hachad, M., & Dorner, S. (2021). Using surrogate data to assess risks associated with microbial peak events in source water at drinking water treatment plants. *Water Research*, 200, 117296.

Sylvestre, É., Prévost, M., Burnet, J. B., Pang, X., Qiu, Y., Smeets, P., ... & Dorner, S. (2021). Demonstrating the reduction of enteric viruses by drinking water treatment during snowmelt episodes in urban areas. *Water Research X*, 11, 100091.

Sylvestre, É., Burnet, J. B., Dorner, S., Smeets, P., Medema, G., Villion, M., ... & Prévost, M. (2021). Impact of Hydrometeorological Events for the Selection of Parametric Models for Protozoan Pathogens in Drinking-Water Sources. *Risk Analysis*, *41*(8), 1413-1426.

Sylvestre, É., Prévost, M., Smeets, P., Medema, G., Burnet, J. B., Cantin, P., ... & Dorner, S. (2021). Importance of Distributional Forms for the Assessment of Protozoan Pathogens Concentrations in Drinking-Water Sources. *Risk Analysis*, *41*(8), 1396-1412.

Sylvestre, É., Burnet, J. B., Smeets, P., Medema, G., Prévost, M., & Dorner, S. (2020). Can routine monitoring of E. coli fully account for peak event concentrations at drinking water intakes in agricultural and urban rivers?. *Water Research*, *170*, 115369.

Taghipour, M., Shakibaeinia, A., **Sylvestre, É.**, Tolouei, S., & Dorner, S. (2019). Microbial risk associated with CSOs upstream of drinking water sources in a transboundary river using hydrodynamic and water quality modeling. *Science of The Total Environment*, *683*, 547-558.

Burnet, J-B., **Sylvestre, É.**, Jalbert, J., Imbeault, S., Servais, P., Prévost, M., & Dorner, S. (2019). Tracking the contribution of multiple raw and treated wastewater discharges at an urban drinking water supply using near real-time monitoring of β-d-glucuronidase activity. *Water Research*, *164*, 114869.

Publications in Professional Journals

Sylvestre, É., & Dorner, S. (2017). Protection des sources d'eau potable de surface : Quel est le cadre juridique québécois en place? *Vecteur Environnement*, *50*(3), 34-37.

Sylvestre, É., & Dorner, S. (2017). Protection des sources d'eau potable de surface : Quels sont les outils réglementaires disponibles? *Vecteur Environnement*, *50*(2), 32-35.

Reports for Governmental Agencies

Sylvestre, É., Julian, T. R. (2023). Legionella Control in Building Water Systems: A Guide for Building Managers and Operators. Prepared for the National Research Council Canada.

Sylvestre, É., Julian, T. R. (2022). Review of Physical Log Removal Credits for the Health Canada QMRA Model Update. Prepared for Health Canada.

Sylvestre, É., Charron, D., Bédard, É., Prévost, M. (2021). Preliminary Health Risk Assessment using Regulatory Legionella pneumophila Monitoring Data from Cooling Towers. Prepared for the Régie du Bâtiment du Québec, the Société Québécoise des Infrastructure and Public Services and Procurement Canada.

Sylvestre, É., Burnet, J-B., Prévost, M., Dorner, S. (2020). Evaluation of Microbial Risks Associated with Protozoan Pathogens *Cryptosporidium* and *Giardia* in Source Water from 30 Drinking Water Treatment Plants in Québec. Prepared for the Ministère de l'Environnement et de la Lutte contre les changements climatiques du Québec.

Sylvestre, É., Pfeiffer, V., Burnet, J-B., Prévost, M., Dorner, S., Barbeau, B. (2018). Comments on "Guidance on the Use of Quantitative Microbial Risk Assessment in Drinking Water". Prepared for Health Canada.

Selected Oral Presentations at Scientific Conferences

Sylvestre, É., Rhoads, WJ., Julian, TR., Hammes, F. (2023). Comparing Quantification of Legionella pneumophila by qPCR and Culture for Risk Assessment: A Meta-Analysis. *International Symposium on Health-Related Water Microbiology*, Darwin, Australia.

Li, C., **Sylvestre, É.**, Julian, T., & Kohn, T. (2023). Risk assessment of waterborne virus in Lake Geneva: the present and the future (No. EGU23-4946). *Copernicus Meetings*, Vienna, Austria.

Sylvestre, É., Burnet, J-B., Prévost, M., Smeets, P., Medema, G., Dorner, S. (2019). Can stochastic models predict microbial peak events? *International Symposium on Health-Related Water Microbiology*, Vienna, Austria.

Sylvestre, É., Burnet, J-B., Prévost, M., Smeets, P., Medema, G., Dorner, S. (2019). Characterizing peak events in microbial risk assessment. *UNC Water Microbiology Conference*, Chapel Hill, North Carolina, USA.

Sylvestre, É., Burnet, J-B., Prévost, M., Smeets, P., Medema, G., Cantin, P., Vilion, Robert, C., M., Dorner, S. (2018). Does *E. coli* provide context for risk assessment regarding the magnitude and fluctuations of microbial contamination? *Water Quality and Technology Conference*, Toronto, Ontario, Canada.

Sylvestre, É., Burnet, J-B., Prévost, M., Smeets, P., Medema, G., Dorner, S. (2018). Including Climate Variability in QMRA Models for Drinking Water Safety: Case Studies for Heavy Rainfall and Rapid Snowmelt Events. *Water Quality and Technology Conference*, Toronto, Ontario, Canada.

Sylvestre, É., Burnet, J-B., Prévost, M., Smeets, P., Medema, G., Cantin, P., Vilion, Robert, C., M., Dorner, S. (2018). Using quantitative microbial risk assessments to evaluate treatment requirements at 26 drinking water systems. *UNC Water Microbiology Conference*, Chapel Hill, North Carolina, USA.

Sylvestre, É., Burnet, J-B., Prévost, M., Dorner, S. (2017). Capturing the high risk periods for water treatment plants by measuring peak microbial contamination at the water intake. *Water Quality and Technology Conference*, Portland, Oregon, USA.

Sylvestre, É., Burnet, J-B., Prévost, M., Dorner, S. (2017). Do current regulatory monitoring frameworks account for microbial risk associated with peak contamination events? *UNC Water Microbiology Conference*, Chapel Hill, North Carolina, USA.

Sylvestre, É., Burnet, J-B., Prévost, M., Dorner, S. (2016). Analysis of fecal indicator data to identify periods of microbial challenge in drinking water treatment plants. *Water Quality and Technology Conference*, Indianapolis, Indiana, USA.

Sylvestre, É., Tremblay, H. (2016). Cadre juridique de la protection des eaux potables de surface au Québec, *Rendez-vous international sur la protection des sources d'eau potable,* Québec, Québec, Canada.

Sylvestre, É., Burnet, J-B., Prévost, M., Dorner, S. (2016). Monitoring temporal variability of fecal indicator bacteria in drinking water sources, *National Drinking Water Conference*, Ottawa, Ontario, Canada.

Sylvestre, É., Benyahya, L., De Soissan, J., Saran, N., St-Gelais, N. (2016) Use of artificial neural network for fecal indicator nowcasting in a sewage-impacted recreational water source. *New England Graduate Student Water Symposium*, Amherst, Massachusetts, USA.

Sylvestre, É., Tremblay, H. (2016). Cadre juridique de la protection des eaux de surface au Québec, *Conférence ACRH*, Montréal, Québec, Canada.

Sylvestre, É., Burnet, J-B., Prévost, M., Dorner, S. (2016). Analysis of fecal indicator data to identify periods of microbial challenge in drinking water treatment plants. *UNC Water Microbiology Conference*, Chapel Hill, North Carolina, USA.

Selected Presentations as Invited Speaker

Sylvestre, É. (2022) Can we tackle heterogeneity in meta-analyses for microbial risk assessment? Environmental Microbiology Seminar Series, Eawag, Switzerland.

Sylvestre, É., Rhoads, WJ., Julian, TR., Hammes, F. (2022) Detection of Legionella by culture and qPCR methods in building water systems: Is there a golden ratio? Environmental Engineering Seminar Series, EPFL Lausanne, Switzerland.

Sylvestre, É. (2021) Risques microbiologiques liés aux utilisations potables et non potables des eaux de ruissellement du toit, des eaux pluviales et des eaux grises. Club de lecture sur les maladies d'origine hydrique de l'Institut national de santé publique du Québec (INSPQ), Québec, Canada.

Sylvestre, É., Dorner, S., Prévost, M. (2019)**.** Évaluation du risque microbiologique associé à la présence des protozoaires pathogènes Cryptosporidium et Giardia à l'eau potable. Comité d'experts sur les risques microbiologiques (CERMeau) de l'Institut national de santé publique du Québec (INSPQ), Québec, Canada.

Sylvestre, É., Dorner, S., Prévost, M. (2017). Evaluation of microbiological risks associated with contamination peaks in sources of drinking water. Veolia Research and Innovation Veri, Maisons-Laffitte, France.

Sylvestre, É., De Soissan, J., Saran, N., St-Gelais, N. (2016) L'apprentissage machine: un outil efficace pour la gestion sécuritaire des eaux récréatives, Congrès INFRA 2016, Montréal, Québec, Canada

Supervision Activities

1/23-now	Chiara Baum**,** M.Sc. Thesis Project (supervisor), Eawag. Topic: *Free chlorine disinfection of greywater for onsite non-potable greywater reuse.*
1/23-now	Muriel Cottagnoud**,** B.Sc. Thesis Project (supervisor), Eawag. Topic: *Evaluation of the association of viruses to particles in greywater and wastewater.*
1/23-now	Raya Heusser**,** B.Sc. Thesis Project (co-supervisor), Eawag. Topic: *Systematic review on the seasonality of legionellosis cases and associations with environmental sources.*
1/22-now	Lizhan Tang**,** Ph.D. project (co-supervisor), Eawag. Topic: *Modelling the exposure to Legionella through aerosols produced by showers.*
1/22-8/22	Shwetha Manohar Nayagar**,** MSc Thesis Project (supervisor), Eawag. Topic: *Validation of the virus removal performance of greywater membrane bioreactors.*
11/20-5/21	Marwan Chacrone, BSc Research Intern (supervisor), Polytechnique Montréal. Topic: *Compilation and analysis of cooling towers Legionella monitoring data.*
11/17-5/18	Nardine Fawzi, B.Sc. Research Intern (supervisor), Polytechnique Montréal. Topic: *Compilation and analysis of pathogen monitoring data in surface water sources.*
11/17-5/18	Stéphanie Ménard, B.Sc. Research Intern (supervisor), Polytechnique Montréal. Topic: *Compilation and analysis of pathogen monitoring data in surface water sources.*

Grants and Awards

Grants:

12/21	SNSF Swiss Postdoctoral Fellowship (declined, score: 8.19/9, success rate: 9.9%).
5/21	Postdoctoral Fellowship (B3X), Fonds de Recherche du Québec – Nature et Technologies, 2021-2023. (20 000 Can$ / 2 years).
5/21	Postdoctoral Fellowship, Natural Sciences and Engineering Research Council of Canada, 2021-2023. (90 000 Can$/ 2 years).
1/16	Doctoral Scholarship, Fonds de Recherche du Québec – Nature et Technologies, 2016-2019. (60 000 Can$ / 3 years).
12/15	Hervé-Aubin Scholarship, Fondation des Ingénieurs Municipaux du Québec. (5000 Can$).

5/15	Mobility Grant, Les Offices jeunesse internationaux du Québec. (1600 Can$).
5/13	Excellence Grant OeAD, Austrian Agency for International Cooperation in Education and Research. (2000 Can$).

Awards:

5/23	International Water Association 2023 Young Water Professionals Scholarship for best abstract (890 US$).
11/16	1st place, Aquahacking 2016, Project Leader, Info-Baignade, Gaspé Beaubien Foundation. (50 000 Can$).

Teaching Experiences

3/22-now	Lecturer, Case Studies in Environment and Health, ETH Zurich.
3/22-now	Teaching assistant, Practical Course in Microbiology, ETH Zurich.
1/21-05/21	Lecturer, Resilience of Urban Water Systems, Polytechnique Montréal.
9/20-12/20	Teaching Assistant, Physico-Chemical Water Treatment, Polytechnique Montréal.
1/18-5/18	Lecturer, Urban Water Management, Polytechnique Montréal.
1/17-5/17	Teaching Assistant, Urban Water Management, Polytechnique Montréal.

Services and Professional Development

Contribution to organizational/administrative activities and committees at Eawag:

- Member of the Environmental Microbiology Seminar Series Organizing Committee.
- Board Member of the Eawag Postdoctoral Scientists Association.
- External Examiner for M.Sc. Program.
- Participation in the Pathogen and Human Health Group Journal Club

Selected Training Activities at Eawag and Polytechnique Montréal:

- Preparing Successful Grant Proposals
- Writing Science Effectively
- Research Data Management

Ongoing collaboration with Prof. Françoise Bichai to develop teaching methods for introducing quantitative risk assessment in courses from B.Sc. and M.Sc. programs of Civil Engineering and Software Engineering at Polytechnique Montréal.

Referee Sevices for Water Research, Environmental Science & Technology, Journal of Applied Microbiology, Microbial Risk Analysis.

Media appearances

2/22	Les virus dans les eaux usées: au-delà du coronavirus, Agence Science Presse.
11/16	Déversement d'eaux usées: les baigneurs sur les plages montréalaises seront-ils avertis à temps?, Radio-Canada.
10/16	Montréal's Aquahacking competition encourages tech to tackle world's water problems by working with cities. Betakit.
10/16	Se baigner dans le St-Laurent, Quartier Libre.