# Cuauhtémoc Tonatiuh Vidrio Sahagún |

Postdoctoral Associate Department of Civil Engineering Schulich School of Engineering, University of Calgary

# **Curriculum Vitae**

email: <u>cuauhtemoc.vidriosah@ucalgary.ca</u>

# **Education**

Ph.D. (2022) in Civil Engineering – Water Resources; University of Calgary, Canada.
B.Sc. (2017) in Civil Engineering (*academic excellence*); University of Guadalajara, Mexico.

# Experience

# Postdoctoral Associate

Department of Civil Engineering, Schulich School of Engineering, University of Calgary, Canada. Advisors: Drs. Alain Pietroniro and Jianxun (Jennifer) He.

#### Academic Advisor – Technical Team Nov. 2024 – present BGC Engineering Inc. Project contract: Flood frequency analysis manual for hydro-technical practitioners in Canada, awarded by Environment and Climate Change Canada.

**Doctoral Researcher** Department of Civil Engineering, Schulich School of Engineering, University of Calgary, Canada. Thesis: Hydrological frequency analysis under nonstationary conditions <u>prism.ucalgary.ca/handle/1880/114928</u> Advisor: Dr. Jianxun (Jennifer) He.

## **Research Assistant**

June 2016 – Aug. 2016

Sep. 2022 - present

Sub-coordination of urban hydraulics, Mexican Institute of Water Technology (IMTA). Project: Diagnosis of urban flooding in the Guadalajara Metropolitan Zone, Mexico. Advisors: Dr. Velitchko G. Tzatchkov and M.Sc.Eng. Oscar Jesus Llaguno-Guilberto.

# **Research interests**

- Understanding human-induced impacts on hydro-climatic extremes and water resources.
- Advancing modelling and prediction of hydro-climatic extremes under uncertainty.
- Enhancing local-scale applicability of hydrological and climate model projections.
- Advancing computing techniques in hydrology and water resources.
- Accelerating the transition from the research above to practice.

# Awards and honors

16. Enrique Dau Flores Distinction	Nov. 2023
by the College of Civil Engineers (CICEJ), Mexico, for outstanding PhD thesis.	
15. CSHS Professor Ric Soulis student paper award	June 2022
by the Canadian Society for Hydrological Sciences.	
14. 2022 Graduate student research excellence award - Civil engineering	May 2022
by the Schulich School of Engineering of the University of Calgary.	
13. Special mention distinction - 2 <sup>nd</sup> Water diaspora	Aug. 2021
by the Mexican Institute of Water Technology and the Autonomous National	
University of Mexico (UNAM).	
12. ENCI publication recognition	Feb. 2021
by the Department of Civil Engineering at the University of Calgary.	

11.	Youth Prize 2019 in science and technology	Aug. 2019
	by the government of Autlan, Mexico.	
10.	Enrique Dau Flores award	July 2019
	by the Mexican Association of Hydraulics (Jalisco).	
9.	Borys Yevhenovych Paton award (undergraduate student)	Feb. 2015
	by the Ministry of Science and Education of Ukraine.	
8.	Intel Foundation recognition (undergraduate student)	Feb. 2015
	by the Intel Foundation, Ukraine.	
7.	Silver medal (undergraduate student)	Oct. 2014
	at the Science and Engineering Fair, Guadalajara, México.	
6.	Bronze medal (undergraduate student) at MOCINN IV Science fair, Federal	Oct. 2013
	Institute of Education, Science and Technology of Pernambuco, Brazil.	
5.	<b>2<sup>nd</sup> Place (undergraduate student)</b> at the Mexican Engineering and Applied	April 2013
	Science Olympiad, Universidad de las Américas Puebla, Cholula, Mexico.	
4.	Bronze medal (undergraduate student), Hong Kong International Science	Oct. 2012
	Fair; International Movement for Leisure Activities in Sci. and Tech.	
3.	1 <sup>st</sup> Place (high-school student), environmental engineering, Intel Eco	Feb. 2012
	Ukraine, National Ecology and Nature Center, Kyiv, Ukraine.	
2.	Guadalajara Youth Prize 2011 (high-school student) by the municipal	Dec. 2011
	government of Guadalajara, Mexico.	
1.	Honorific Mention (high-school student), Global Environmental Issues	July 2011
	(GENIUS) Olympiad, State University of New York at Oswego, New York, USA.	-

# Funding, Research Proposals, and Scholarships

## Grant and research proposal experience

#### Collaborator

**Agency:** Flood Hazard Identification and Mapping Program – Environment and Climate Change Canada, Government of Canada.

**Title:** Floodplain mapping under nonstationary scenarios across Canada. **Status:** Accepted. **Role:** Contributed to developing proposal components on regional and mixed floods.

## Scholarships (competitive)

Eyes High international doctoral scholarship	2022
awarded by the Graduate Scholarship Committee of the University of Calgary.	
CONACYT doctoral scholarship	2017 – 2022
awarded by the National Ministry of Science and Technology of Mexico.	
Universidad de Guadalajara doctoral scholarship	2017 – 2022
awarded by the University of Guadalajara.	
Research internship scholarship	2016
awarded by the University of Guadalajara.	

# **Journal publications**

## Papers published, accepted, or under review

- Vidrio-Sahagún, C. T., He, J., Pietroniro, A. (2025). Improved correction of extreme precipitation through explicit and continuous nonstationarity treatment and the Metastatistical approach. *Water Resources Research*, 61(1), e2024WR037721. <u>https://doi.org/10.1029/2024WR037721</u>
- 13. Vidrio-Sahagún, C. T., Ruschkowski, J., He, J., Pietroniro, A. Design flood estimation: a threedecade systematic review of practices in flood hazard mapping in Canada. *Revision submitted to the Canadian Water Resources Journal*.
- Gizaw, Z., Vidrio-Sahagún, C. T., Pietroniro, A., and Schuster-Wallace, C. J. (2025) Modeling the lagged and nonlinear effects of weather conditions on abundance of Culex tarsalis mosquitoes in Saskatchewan, Western Canada using a bi-dimensional distributed lag nonlinear model. *Acta Tropica*, 107512. <u>https://doi.org/10.1016/j.actatropica.2024.107512</u>
- 11. Qamar, M. U., Vidrio-Sahagún, C. T., He, J., Tariq, U., and Ali, A. (2024). Prediction of monthly flow regimes using the distance-based method nested with model swapping. *Water Resources Management*, 1-17. <u>https://doi.org/10.1007/s11269-024-03923-8</u>.
- Vidrio-Sahagún, C. T., Ruschkowski, J., He, J., and Pietroniro, A. (2024). A practice-oriented framework for stationary and nonstationary flood frequency analysis. *Environmental Modelling & Software*, 173, 105940. <u>https://doi.org/10.1016/j.envsoft.2024.105940</u>.
- 9. Vidrio-Sahagún, C. T., He, J., and Pietroniro, A. (2023). Multi-distribution regula-falsi profile likelihood method for nonstationary hydrological frequency analysis. *Stochastic Environmental Research and Risk Assessment*. https://doi.org/10.1007/s00477-023-02603-0.
- Shahirnia, M., Vidrio-Sahagún, C. T., He, J., Valeo, C., van Duin, B., Beaudry, M., and Neumann, N. F. (2023). Land use and rainfall influences on bacterial levels and sources in stormwater ponds. *Environmental Science and Pollution Research*, 30(52), 112236-112251. <u>https://doi.org/10.1007/s11356-023-30264-7</u>.
- Vidrio-Sahagún, C. T., He, J., and Pietroniro, A. (2023). Nonstationary hydrological frequency analysis using the Metastatistical extreme value distribution. *Advances in Water Resources*, 176 (June), 104460. <u>https://doi.org/10.1016/j.advwatres.2023.104460</u>.
- 6. Vidrio-Sahagún, C. T., and He, J. (2022). The decomposition-based nonstationary flood frequency analysis. *Journal of Hydrology*, 612 (September), 128186. https://doi.org/10.1016/j.jhydrol.2022.128186.
- 5. Vidrio-Sahagún, C. T., and He, J. (2022). Hydrological frequency analysis under nonstationarity using the Metastatistical approach and its simplified version. *Advances in Water Resources*, 166 (June), 104244. https://doi.org/10.1016/j.advwatres.2022.104244.
- 4. Vidrio-Sahagún, C. T., and He, J. (2022). Enhanced profile likelihood method for the nonstationary hydrological frequency analysis. *Advances in Water Resources*, 161 (February), 104151. https://doi.org/10.1016/j.advwatres.2022.104151.
- Zhou, Y., Vidrio-Sahagún, C. T., Ryan, M. C., and He, J. (2022). Hydrological behaviour of an unregulated eastern slope river under changing historical climate. *Canadian Water Resources Journal / Revue Canadienne Des Ressources Hydriques*, 47(2–3), 137–153. https://doi.org/10.1080/07011784.2022.2055496.
- Vidrio-Sahagún, C.T., He, J., Kasiviswanathan, K. S. and Sen, S. (2021). Stationary hydrological frequency analysis coupled with uncertainty assessment under nonstationary scenarios. *Journal* of *Hydrology*, 598 (July), 125725, <u>doi.org/10.1016/j.jhydrol.2020.125725</u>.

1. Vidrio-Sahagún, C. T., and He, J. (2021). Flood hazard estimation under nonstationarity using the particle filter. *Geosciences (Special Issue Flood Risk Assessment in Urban Areas*), 11(1), 13. doi.org/10.3390/geosciences11010013.

## \*Publications in preparation

- 5. **Vidrio-Sahagún, C. T.,** Whitfield, P. Nonstationary and mixed floods: assessing the impacts of multiple flood types under climate change on flood hazards. *In preparation, to be submitted to Advances in Water Resources*.
- 4. Vidrio-Sahagún, C. T., Llaguno-Guilberto, O.J., Magaña-Hernández, F. A multi-causative attribution framework for flood and inundation events. *In preparation, to be submitted to Water Resources Research*.
- 3. Vidrio-Sahagún, C. T., Sendhil, H., He, J., Ryan, M. C., Newton, B., Birks, J., Taube, N. Hydrologic functioning of an Eastern Slope River: streamflow generation, hydroclimatic changes, and flood mechanisms. *In preparation, to be submitted to the Journal of Hydrology Regional Studies.*
- 2. Tagde, K., Akther, M., Vidrio-Sahagún, C. T., He, J., van Duin, B. Thermal performance of an extensive green roof in cold semi-arid regions. *In preparation, to be submitted to Energy and Buildings*.
- 1. Mohammadi, M., Vidrio-Sahagún, C. T., He, J., Saidi, S. Impacts of adverse weather on urban bus performance in a Canadian semi-arid continental City. *In preparation, to be submitted to the Journal of Transport Geography.*

# Supervising and advising experience

## Thesis director (supervisor) of undergraduate students

- 11. Mendoza Ibanez, Sergio Alejandro (2022 2024). *Forecasting water availability in the Chapala Lake based on machine learning*. B.Sc. in Civil Eng., Universidad de Guadalajara, Mexico.
- 10. Esparza Guerrero, Margarita (2020 2022). *Regional frequency analysis and design events for flood risk mitigation in Guadalajara*, B.Sc. in Civil Eng., Universidad de Guadalajara, Mexico. Awarded with honorific mention (Cum Laude).

## **Co-supervisor of graduate students**

- 9. Alawi Al-Aidros (2023 to date). *Nonstationarity in multiple hydrological signatures across Canada*, Master of Science (M.Sc.) in Civil Eng., University of Calgary.
- 8. Tagde, Ketan (2022 2024). *Thermal performance of extensive green roofs study case: the Calgary Municipal Building*. Master of Science (M.Sc.) in Civil Eng., University of Calgary.

## Co-supervisor of research assistants

- 7. Ruschkowski, Jake (Feb. 2023 Aug. 2023). *Stationary and nonstationary flood frequency analysis*. Department of Civil Engineering, University of Calgary
- 6. Solanki, Abhishek (June 2023 Aug. 2023). *Stationary and nonstationary flood frequency analysis*, Department of Civil Engineering, University of Calgary.
- 5. O'Neil, Garrett (June 2023 July 2023). *Stationary and nonstationary flood frequency analysis*, Department of Civil Engineering, University of Calgary.

## Co-supervisor of undergraduate research interns

4. Leung, Amanda (May – Aug. 2024). *Pan-Canadian geophysical priors for hydrological extremes*, Natural Sciences and Engineering Research Council of Canada (NSERC) Internship, University of Calgary.

- 3. Sendhil, Harshini (May Aug. 2023). *Hydrological behaviour of the Sheep River under changing historical climate*, MITACS Globalink Research Internship, University of Calgary.
- 2. Correa Carrillo, Maria Lizette (May Aug. 2019). *Hydrological analysis of extreme rainfall under a changing climate*, MITACS Globalink Research Internship University of Calgary.
- 1. González Pérez, Sara de Jesús (May Aug. 2019). *Hydrological analysis of extreme rainfall under a changing climate*, MITACS Globalink Research Internship, University of Calgary.

# **Teaching experience and development**

## **Teaching positions**

#### **Sessional instructor** 13. ENCI 504 – Uncertainty concepts in civil engineering (undergraduate Spring 2024 level). Schulich School of Engineering, University of Calgary. 12. ENGG 202 - Engineering statics (undergraduate level). Schulich School of Winter 2023 Engineering, University of Calgary. **Co-instructor** 12. ENCI 608 – Sustainable water systems (graduate level). Schulich School Winter 2025 and of Engineering, University of Calgary. 2024 **Guest lecturer** 11. ENCI 510 - Hydrology (undergraduate level). Schulich School of Fall 2023 Engineering, University of Calgary. 10. ENCI 608 - Sustainable water systems (graduate level). Schulich School of Winter 2023 Engineering, University of Calgary. 9. ENCI 619.62 – Special problems: statistical methods in water resources Fall 2022 (graduate level). Schulich School of Engineering, University of Calgary. **Short course Instructor** November 2020 8. Introduction to surface hydrology (undergraduate level). Mexican Institute of Water Technology (IMTA), Mexico. Workshop Instructor 7. Solar radiation modelling. International Forum for Science and Engineering April 2018 Students (IFSES 2018), Universidad de Guadalajara, Mexico. **Teaching Assistant** 6. SEDV 615 - Environmental impact assessment in the energy sector Summer 2022 (graduate level). School of Public Policy, University of Calgary. 5. ENGG 603 – Professional development II seminar (graduate level). Winter 2022. Schulich School of Engineering, University of Calgary. 2021, and 2020 4. ENGG 601 - Professional development I seminar (graduate level). Fall 2021, 2020, Schulich School of Engineering, University of Calgary. and 2019 3. ENCI 581 - Environmental engineering II (undergraduate level). Schulich Fall 2019 School of Engineering, University of Calgary. 2. ENGG 202 – Engineering statics (undergraduate level). Schulich School of Winter 2019 Engineering, University of Calgary. and 2018 1. ENCI 402 – Hydraulics (undergraduate level). Schulich School of Engineering, Fall 2018 University of Calgary. and 2017

## **Teaching development**

Postdoctoral Scholar Certificate in University Teaching and Learning

2022 - 2023

by the Taylor Institute for Teaching and Learning at the University of Calgary. Program to develop teaching expertise and interdisciplinary skills in postsecondary education. Courses included:

TI 0995 Equity, Diversity, and Inclusion.

TI 0899 Learning Spaces and Digital Pedagogy.

TI 0897 Theories and Practice.

TI 0896 Scholarship of Teaching of Learning Foundations.

TI 0894 Philosophy Statements and Teaching Dossiers.

# **Presentations**

## Invited talks

- 20. Vidrio Sahagún, C. T., (2025) Water extremes in a changing world through statistical approaches; NHS-CWRA (National Hydrological Services – Canadian Water Resources Association) Webinar Series, February 19th, 2025, Calgary, Canada.
- 19. Vidrio Sahagún, C. T., (2025) Toward water security and hydroclimate adaptation: advancing prediction of water extremes in changing and complex environments; Research seminar at the University of Saskatchewan, January 27<sup>th</sup>, 2025, Saskatoon, Canada.
- Vidrio Sahagún, C. T., (2024) In the quest for hydroclimate adaptation and water security in a changing world; Research seminar at the University of British Columbia Okanagan campus, September 11<sup>th</sup>, 2024, Kelowna, Canada.
- Vidrio Sahagún, C. T., (2024) Hydro-climatic extremes in the changing and complex natural and built environments: an overview of recent research advancements and future challenges for feasible adaptation; Research seminar at the University of New Brunswick, June 21<sup>st</sup>, 2024, Fredericton, Canada.
- 16. Vidrio Sahagún, C. T., (2024) Developing scenarios of hydrological change for gauged and ungauged basins across Canada: Statistical analysis of extremes and their changes; Environment and Climate Change Canada' grants and contributions Science Day, May 15<sup>th</sup>, 2024, Calgary, Canada.
- 15. **Vidrio Sahagún, C. T.**, (2023) Frequency analysis of extreme hydrological events and its challenges in civil engineering (*keynote speaker*); III International water youth forum of the Mexican Association of Hydraulics, November 16<sup>th</sup>, 2023, Guadalajara, Mexico.
- 14. **Vidrio Sahagún, C. T.**, (2023) A practical framework for stationary and nonstationary hydrological frequency analysis; 6<sup>th</sup> international research seminar of the Academic Division of Engineering and Architecture, Universidad Juárez Autónoma de Tabasco, November 8<sup>th</sup>, 2023, Villahermosa, Mexico.
- 13. Vidrio Sahagún, C. T., (2023) Workflow development for frequency analysis and non-stationarity; Environment and Climate Change Canada' Meeting for floodplain mapping Grants and Contributions, May 18<sup>th</sup>, 2023, Calgary, Canada.
- 12. Vidrio Sahagún, C. T., (2022) Modeling extreme hydrological events: an overview from floods to droughts in a changing environment; Engineering week 2022 (CUCSur), University of Guadalajara, November 16<sup>th</sup>, 2022, Autlan, Mexico.
- 11. Vidrio Sahagún, C. T., (2022) Modeling extreme hydrological events: an overview from floods to droughts in a changing environment; Seminar of the graduate program in Hydrometeorological sciences (CUCEI), University of Guadalajara, May 12<sup>th</sup>, 2022, Guadalajara, Mexico.
- 10. Vidrio Sahagún, C. T., (2021) Modeling extreme hydrological events: an overview from floods to droughts in a changing environment; Professional School of Fluid Mechanics Engineering, Universidad Nacional Mayor de San Marcos, November 23<sup>rd</sup>, 2021, Lima, Peru.

- 9. **Vidrio Sahagún, C. T.**, and He, J., (2021) Hydrological frequency analysis in a changing world; Faculty of Engineering, University of Guanajuato, March 23<sup>rd</sup>, 2021, Guanajuato, Mexico.
- 8. **Vidrio Sahagún, C. T.**, and He, J., (2021) Hydrological frequency analysis in a changing world; Mind Research Group (Ecuador) and Vida en Verde América A. C. (Mexico), March 22<sup>nd</sup>, 2021.
- 7. He, J., and **Vidrio Sahagún, C. T.**, (2020) Hydrological frequency analysis under nonstationary scenarios; International online lecture series on Mitigation of dam induced flood disaster due to hydrological extremes, October 22<sup>nd</sup>, 2020, Indian Institute of Technology, Roorkee, India.
- 6. Vidrio Sahagún, C. T., and Llaguno Guilberto, O. J., (2020) Understanding the key aspects of the flood modelling: from the design storms generation to the use of numerical simulation models; Seminar series on numerical modelling of hydrological and hydraulic phenomena and processes, July 28<sup>th</sup>, 2020, Universidad Santo Tomás, Bogotá, Colombia.
- 5. **Vidrio Sahagún, C. T.**, and Llaguno Guilberto, O. J., (2020) Understanding the key aspects of the flood modelling: from the design storms generation to the use of numerical simulation models; Mexican Association of Hydraulics, Jalisco Section, July 21<sup>st</sup>, 2020.
- 4. **Vidrio Sahagún, C. T.,** (2019) Impacts of climate change on water resources and extreme events: an overview for the civil engineering practitioner; College of Civil Engineers of the State of Jalisco (CICEJ), July 24<sup>th</sup>, 2019, Guadalajara, Mexico.
- 3. Saucedo Rodriguez B. P., and **Vidrio Sahagún, C. T.,** (2015) Water quality assessment and preliminary design of treatment processes for sustainable surface water resources exploitation; Society of Geography and Statistics of the State of Jalisco, May 18<sup>th</sup>, 2015, Autlán, Mexico.
- 2. **Vidrio Sahagún, C. T.,** (2014) Mexican youth in the scientific research; Science and Technology Fair CUSur, University of Guadalajara, November 7<sup>th</sup>, 2014, Zapotlán el Grande, Mexico.
- Vidrio Sahagún, C. T., (2013) Water supply aqueduct Chapala Guadalajara: Hydraulic overview; 2<sup>nd</sup> Dialogue Forum: Sustainable Development in the Metropolitan Zone of Guadalajara, April 17<sup>th</sup>, 2013, University of Guadalajara, Guadalajara, Mexico.

## Conference papers, oral presentations, and posters

- Vidrio-Sahagún, C. T., He, J., Pietroniro, A. (2024). Advanced bias correction of precipitation extremes through explicit nonstationary and ordinary-event-based approaches (Poster); American Geophysical Union (AGU) Fall Meeting, December 9<sup>th</sup> – 13<sup>th</sup>, 2024; Washington, D.C., USA.
- 28. **Vidrio-Sahagún, C. T.**, He, J., Pietroniro, A. (2024). A systematic framework for flood frequency analysis under stationary and nonstationary conditions (Oral); Canadian Water Resources Association 2024 Annual Conference, June 17<sup>th</sup> 20<sup>th</sup>, 2024; Saskatoon, Saskatchewan, Canada.
- Pietroniro, A., Gharari, S., Keshavarz, K., Keum, J., Pirani, J. F., Pierre, A., Sheikh, MD. R., Vidrio-Sahagún, C.T., Nadeau, D., Anctil, F., Coulibaly, P., He, K., Stadnyk, T., Whitfield, P., Clark, M., Pomeroy, J. (2024). Advancing Floodplain Mapping: Leveraging Local Hydrological Knowledge and Model-Agnostic Frameworks for Pan-Canadian Hydrological Modeling (Oral); Canadian Water Resources Association 2024 Annual Conference, June 17<sup>th</sup> 20<sup>th</sup>, 2024; Saskatoon, Saskatchewan, Canada.
- 26. Sendhil, H, Vidrio-Sahagún, C. T., He, J., Ryan, M. C., Newton, B., Birks, J., Taube, N. (2024). Hydrological behaviour of an unregulated river on the eastern slopes of the Rockies under historical climate change and variability (Oral); Canadian Water Resources Association 2024 Annual Conference, June 17<sup>th</sup> - 20<sup>th</sup>, 2024; Saskatoon, Saskatchewan, Canada.
- 25. **Vidrio-Sahagún, C. T.**, He, J., Pietroniro, A. (2024). A systematic framework for flood frequency analysis under stationary and nonstationary conditions (Poster); Bow River Basin Council (BRBC) Science Forum, May 8<sup>th</sup>, 2024; Calgary, Alberta, Canada.

- 24. Sendhil, H, Vidrio-Sahagún, C. T., He, J., Ryan, M. C., Newton, B., Birks, J., Taube, N. (2024). Hydrological behaviour of an unregulated river on the eastern slopes of the Rockies under historical climate change and variability (Oral); Bow River Basin Council (BRBC) Science Forum, May 8<sup>th</sup>, 2024; Calgary, Alberta, Canada.
- 23. Mohammadi, M., **Vidrio-Sahagún, C. T.**, He, J., Saidi, S. (2024). Impacts of adverse weather on urban bus performance (Oral); 103<sup>rd</sup> Transportation Research Board (TRB) Annual Meeting, January 7<sup>th</sup> 11<sup>th</sup>, 2024; Washington, DC, USA.
- 22. Vidrio-Sahagún, C. T., He, J., Pietroniro, A. (2023). A systematic framework for flood frequency analysis under stationary and nonstationary conditions (Poster); American Geophysical Union (AGU) Fall Meeting, December 11<sup>th</sup> 15<sup>th</sup>, 2023; San Francisco, California, USA.
- Vidrio-Sahagún, C. T., He, J., Pietroniro, A. (2023). Nonstationary extreme value analysis based on the Metastatistical distribution (Oral); STAHY 2023 – 13<sup>th</sup> International Workshop on Statistical Hydrology, held by the International Association of Hydrological Sciences, November 8<sup>th</sup>–10<sup>th</sup>, 2023; Boston, Massachusetts, USA.
- 20. Vidrio-Sahagún, C. T., He, J., Pietroniro, A. (2023). A practical framework for hydrological frequency analysis under stationary and nonstationary conditions (Poster); Alberta Low Impact Development Partnership Conference, November 13<sup>th</sup> 16<sup>th</sup>, 2023; Calgary, Alberta, Canada.
- Tagde, K., Vidrio-Sahagún, C. T., He, J. (2023). Thermal performance of the extensive green roof on the Calgary Municipal Building (Poster); Alberta Low Impact Development Partnership Conference, November 13<sup>th</sup> – 16<sup>th</sup>, 2023; Calgary, Alberta, Canada.
- Vidrio-Sahagún, C. T., He, J., and Pietroniro, A. (2023). A practical framework for stationary and nonstationary flood frequency analysis (Oral); Bow River Basin Council (BRBC) Science Forum, April 26<sup>th</sup>, 2023; Calgary, Alberta, Canada.
- 17. Shahirnia, M., **Vidrio-Sahagún, C. T.**, He, J., Valeo, C., van Duin, B., Neumann, N. F. (2023). Spatial and temporal variations of fecal indicator bacteria in stormwater ponds (Oral); Alberta Low Impact Development Partnership showcase, April 20<sup>th</sup>, 2023; Calgary, Alberta, Canada.
- Vidrio-Sahagún, C. T., He, J., and Pietroniro, A. (2023). A practice-oriented framework for stationary and nonstationary flood frequency analysis (Oral); Canadian Water Resources Association (CWRA) – Alberta branch Conference, April 02<sup>nd</sup> – 04<sup>th</sup>, 2023; Calgary, Alberta, Canada.
- 15. Vidrio-Sahagún, C. T., and He, J. (2022). The profile likelihood method with improved computational efficiency and numerical stability (Oral); Canadian Water Resources Association (CWRA) 2022 National Conference, June 5<sup>th</sup> 8<sup>th</sup>, 2022; Canmore, Alberta, Canada.
- Vidrio-Sahagún, C. T., and He, J. (2021). The nonstationary flood frequency analysis based on the decomposition of nonstationary stochastic processes (Oral); STAHY 2021 – 11<sup>th</sup> International Workshop on Statistical Hydrology, held by the International Association of Hydrological Sciences, Sep. 16<sup>th</sup>–17<sup>th</sup>, 2021; Valencia, Spain.
- 13. Vidrio-Sahagún, C. T., and He, J. (2021). The nonstationary flood frequency analysis based on the decomposition of nonstationary stochastic processes (Oral); "2<sup>nd</sup> Water Diaspora" Conference, organized by the Mexican Institute of Water Technology (IMTA), August 3<sup>rd</sup> 6<sup>th</sup>, 2021; Mexico.
- 12. Zhou, Y., **Vidrio-Sahagún, C. T.,** Ryan, M. C., and He, J. (2021). Hydrological response of the Elbow River under a changing climate (Oral); Monitoring for a Changing Environment virtual session, Bow River Basin Council (BRBC) Science Forum, February 23<sup>rd</sup>, 2021; Calgary, Alberta, Canada.

- 11. Vidrio-Sahagún, C. T., and He, J. (2020). Assessing the impacts of ignoring the nonstationarity in the hydrological frequency analysis (Oral); "1<sup>st</sup> Water Diaspora" Conference, organized by the Mexican Institute of Water Technology (IMTA), August 4<sup>th</sup> – 7<sup>th</sup>, 2020; Mexico.
- Vidrio Sahagún, C. T., and He, J. (2019). Stationary hydrologic frequency analysis for nonstationary datasets by incorporating uncertainty assessment (Poster); American Geophysical Union (AGU) Fall Meeting, December 9<sup>th</sup> – 13<sup>th</sup>, 2019; San Francisco, California, USA.
- González Pérez, S. J., Correa Carrillo, M. L., Vidrio Sahagún, C. T., and He, J. (2019). Statistical analysis of precipitation data from hydrometeorological stations and GCM Model outputs in Guanajuato and Guadalajara, Mexico (Poster); IFSES Forum, September 10<sup>th</sup> – 12<sup>th</sup>, 2019; Guadalajara, Mexico.
- 8. **Vidrio Sahagún, C. T.,** and He, J. (2019). Hydrological frequency analysis under non-stationary conditions (Oral); the 8th International Conference on Water Resources and Environment Research, June 14<sup>th</sup> 18<sup>th</sup>, 2019; Nanjing, China.
- Vidrio Sahagún, C. T. (2017) Estimation of the Outflow Hydrograph of a reservoir by solving the continuity equation by the Runge-Kutta Method (Oral); VII International Conference of Numerical Methods, June 15<sup>th</sup> – 16<sup>th</sup>, 2017; Guadalajara, Mexico.
- 6. **Vidrio Sahagún, C. T.** (2016). Analysis of transient state phenomena and damage reduction in aqueduct design: water hammer (Oral); IFSES Forum, April 18<sup>th</sup> 21<sup>st</sup>, 2016; Guadalajara, Mexico.
- Vidrio Sahagún, C. T. (2015). Optimized hydraulic design of sustainable aqueducts (Oral and Paper); XIV Iberoamerican Seminar on Water Supply and Drainage Networks, 1, 459-469, ISBN: 978-607-441-366-3, September 7<sup>th</sup> – 10<sup>th</sup>, 2015; Guanajuato, Mexico.
- Saucedo Rodríguez B. P., and Vidrio Sahagún, C. T. (2015). Comparative analysis of water sources for sustainable water supply (Oral and Paper); XIV Iberoamerican Seminar on Water Supply and Drainage Networks, 1, 557 – 579, ISBN: 978-607-441-366-3, September 7<sup>th</sup> – 10<sup>th</sup>, 2015; Guanajuato, Mexico.
- Vidrio Sahagún, C. T. (2015). Systematization of sustainable infrastructure design for micro pluvial runoffs for potable water supply and green energy generation (Paper and Oral); 36th IAHR World Congress Proceedings - IAHR World Congress 2015, ISBN: 978-90-824846-0-1, June 28<sup>th</sup> – July 03<sup>rd</sup>, 2015; The Hague, Netherlands.
- Vidrio Sahagún, C. T. (2014). Hydraulic design optimization of sustainable water supply by micro stormwater currents and its environmental impact (Oral); 32nd Youth Science Meeting hosted by UNESCO and University of Aveiro, July 20<sup>th</sup> – 27<sup>th</sup>, 2014; Aveiro, Portugal.
- Vidrio Sahagún, C. T., Michel Madera D., Vargas Espinoza M. E. (2014). A sustainable model for road development: green mobility, urbanism, and society (Oral). Iberoamerican Congress of Livible Cities, theme: Green City, March 19<sup>th</sup> – 21<sup>st</sup>, 2014; Guadalajara, México.

# Scientific and educational software

- FFA Framework (2024): Source codes and stand-alone application for conducting FFA systematically, accounting for nonstationarity using state-of-the-art techniques, and allowing for repeatability and reproducibility. By Vidrio-Sahagún, C. T., Ruschkowski, J., He, J., and Pietroniro, A. <a href="https://zenodo.org/records/8012096">https://zenodo.org/records/8012096</a>.
- DASME assistant (2017): diagnosis and design toolbox for sustainable exploitation of micro runoffs, by **Vidrio Sahagún, C. T.** and Saucedo Rodríguez B. P.

# **Technical skills**

- Programming languages, software development, and mathematical packages.
- Cluster computing
- Modelling of stormwater runoff and drainage networks
- Modelling of water distribution networks
- Hydrologic modelling
- Geographic information systems

# Affiliations, service, leadership, and organization activities

## Professional/scientific affiliations

- American Geophysical Union (AGU)
- International Association of Hydrological Sciences (IAHS)
- Canadian Water Resources Association (CWRA)
- College of Civil Engineers of the State of Jalisco (CICEJ) and Mexican Association of Hydraulics (AMH)

## PhD external examiner

- Rao Husnain Arshad (2024), PhD in Agricultural Engineering at the University of Agriculture, Faisalabad, Pakistan.

#### Journal reviewer

- Advances in Water Resources
- Water Resources Research
- Journal of Hydrology
- Geophysical Research Letters
- Environmental Modelling & Software
- Hydrological Sciences Journal
- Natural Hazards
- Hydrology
- Climate

## **Conference committees**

-	Special session organizer and convenor – Advancing predictions of hydro- climatic extremes; Canadian Water Resources Association Conference	2025
-	Special session convenor – Advancing the Integration of Climate, Surface Water, and Groundwater Systems: Canadian Water Resources Association Conference	2024
-	Reviewer – Conference on Postsecondary Learning and Teaching, University of Calgary	2023
-	Committee member – Hydro-ML Symposium on Big Data and Machine Learning in Hydrology and Water Resources, Penn State University.	2022
-	General secretary – North American Water Conference.	2017
-	Chairman of the international council – The International Forum for Science and Engineering Students (IFSES Forum).	2013 – 2017
Ge	neral	
-	Judge, Engineering Design Fair of the Schulich School of Engineering, University of Calgary.	2021, 2024
-	Judge, Calgary Youth Science Fair.	2020

Matlab (advanced), Python (basic), and R (basic) Linux shell bash (intermediate) EPA SWMM (basic) EPANET (basic) Raven (basic) ArcGIS and QGIS (basic)

#### Curriculum Vitae

- Board member of the University Students Federation, University of Guadalajara. 2016 2017
- Coordinator, "Youth dialogue: scientific and technological research in daily life", 2014 University of Guadalajara.
- Member of the General Council, University of Guadalajara (student 2013 2014 representative of the division of engineering).
- Chairman and Founding Member, Alianza Autlán Joven (NGO promoting science, 2013 2017 technology and culture in Autlán, Mexico).