



2016/2017 Executive Committee

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2016 CGS-SOS Dinner Lecture

Climate Change and its Effect on Geo-Engineering Practice

Wednesday, September 21, 2016

St. Philip Neri Church, 2100 Jane St., Toronto, ON, M3M 1A1

Evening Program:	5:30 PM	Cocktails and Socializing
	6:30 PM	Dinner
	7:30 PM	Lecture

Abstract: There is a general consensus in the scientific community that the threat of climate change is real. The change in climate can be observed in rise of global air and ocean temperatures, widespread melting of snow and ice, rising sea levels, more frequent and intense droughts, and increased intensity of rainfall and floods. The quantity and distribution of moisture in soil is a function of local climatic conditions such as precipitation, maximum and minimum temperature, relative humidity, wind speed and solar radiation. Therefore, climate is a critical parameter in the design of many geotechnical and geo-environmental projects. The top boundary for many geotechnical/geo-environmental designs is the ground surface and is subjected to inward or outward moisture and heat flux, depending on the prevailing climatic and soil conditions. Most of the geotechnical infrastructure has been designed based on average historical climate data. Engineers are now faced with the challenge to assess if earth structures can deal with the current climate patterns and if they will maintain their integrity and serviceability when faced with different climate patterns in the future. Of the many techniques that have been developed for climate change risk assessment, very few have resulted in effective risk mitigation strategies. This presentation is focused on quantifying the effect of climate change and developing mitigation strategies for geotechnical and geo-environmental design problems involving surface moisture and energy balance, specifically for: (a) behavior of expansive soils and associated geotechnical design considerations; (b) analysis, design and performance of soil covers for waste applications; and, (c) fate and transport of contaminants in the subsurface. The goal of this research is to enhance our understanding of the effect of various climatic variables on geotechnical and geo-environmental design procedures and to develop mitigation strategies to address the adverse effects related to climate change. The presentation will also discuss a framework for practicing geotechnical engineers to take into account the effect of climate change in geotechnical and geoenvironmental designs. Specific examples will be presented for design on expansive soils and soil cover designs for waste management facilities.

Speaker: Dr. Rashid Bashir, Ph.D, P.Eng. Dr. Bashir is an Associate Professor of Geotechnical/Geo-Environmental Engineering at York University. He earned his Ph.D. in Civil Engineering from McMaster University in Hamilton, Ontario with specialization in contaminant hydrogeology and computational mechanics. Dr. Bashir has more than 16 years of experience in areas of Unsaturated Soils Mechanics, Geotechnical and Geo-Environmental Engineering, Mine & Contaminant Hydrogeology and Computational Mechanics. Before starting his faculty appointment in 2014, Dr. Bashir worked in the mining industry for more than 7 years. In the first three years, he worked as corporate mine hydrogeologist for the Cameco Corporation (world's largest uranium mining company). Dr. Bashir was engaged in dewatering of the Cameco's flooded Cigar Lake Mine. He also implemented depressurization at two of the Cameco's operating mines in northern Saskatchewan. Dr. Bashir also provided

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Southern Ontario Section
Toronto Group**



**La Société Canadienne de Géotechnique
Section Sud de l'Ontario
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hydrogeology support to Cameco's corporate development group for potential acquisitions around the globe. For the next four years he worked as a senior geotechnical engineer for Golder Associates in their unsaturated soils group. At Golder, Dr. Bashir's unsaturated soil mechanics expertise was applied to operations in North and South America, Asia, Australia, and Africa. His area of expertise and practice covered experimental, field and modeling aspects of unsaturated soils. Dr. Bashir is a registered professional engineer in the provinces of Saskatchewan and Ontario and has also testified before Canadian Nuclear Safety Commission as a subject matter expert. He is also a qualified Safety, Health, Environment and Quality auditor and a TapRoot® investigator.

Dr. Bashir has been working in the numerical and experimental aspects of unsaturated flow and transport for more than a decade, and has several published peer-reviewed journal papers, technical notes and conference papers. His expertise ranges from development of a new finite element formulation for unsaturated flow (Richards') equation, to the advancement in conceptual and numerical soil-atmospheric models, to innovative work on the effect of climate change on soil covers in Northern Climates. Since starting his academic appointment, Dr. Bashir has been publishing his research, which is primarily focused on climate change, unsaturated soil mechanics and soil-atmospheric modelling.

CGS Members – Early Bird:	\$25.00	<p>*Students: Please note that a limited number of spaces are available on a first come, first served basis through corporate sponsorship. Student Sponsors, who subsidize CGS-SOS events, will be recognized at the Dinner Lecture. Please purchase student sponsorships on Eventbrite to contribute to this worthwhile initiative and your company will be recognized at the event. We thank you for your support!</p>
CGS Members:	\$35.00	
Non-Members – Early Bird:	\$30.00	
Non-Members:	\$40.00	
Student:	\$25.00	

Please confirm your attendance by September 9, 2016, 11:30 PM to qualify for the Early Bid price or by September 16, 11:30 PM, using Eventbrite: <http://www.eventbrite.ca/>

This event will be booked solely through Eventbrite.

If you have difficulties using Eventbrite, please contact Andrew DeSira (Andrew.DeSira@ontario.ca) for assistance.

Visit the CGS-SOS website at: www.cgs-sos-toronto.com