

The Canadian
Geotechnical Society



La Société Canadienne
de Géotechnique

CGS Luncheon Presentations

Fully Integrated Groundwater-Surface Water Modelling to Forecast Soil Moisture at Field Scale in a Manitoba Catchment

Presented by:

Keshav Parameshwaran S, M.Sc. Candidate

University of Manitoba

About the Presenter:

Keshav a M.Sc. student at University of Manitoba. His research is on hydrological modelling for forecasting soil moisture. His areas of specialization are Groundwater Hydrology and Soil Science.

Presentation Abstract:

Soil moisture is crucial in the soil-plant-atmosphere system and is controlled by interacting factors like soil properties, vegetation, and precipitation. This study uses the fully integrated surface water - groundwater modelling software called HydroGeoSphere (HGS) to simulate soil moisture conditions within the Brunkild catchment. Observed soil moisture profile measurements were measured with Sentek sensors and it was augmented with readings from Real-Time In-Situ Soil Moisture Analysis (RISMA) stations. Meteorological variables required for model forcing were obtained from the RISMA stations, SNODAS (Snow Data Assimilation System), and MODIS. The results of the sand series showed a better fit for surface, 20 cm depths while the clay series had a better fit for surface, 20 cm, 50 cm and 100 cm depths. The model is calibrated for 2010-2020 time period using the aforementioned climate forcing data. Canadian Surface Prediction Archive (CaSPAR) data will be used for forecasting soil moisture for 2021 growing period.

Date: Wednesday, September 15, 2021

Time: Presentation at 12:00 PM

Registration Fee: Free Event!

Location: MS Teams Meeting

[Click here to join the meeting](#)

For event information, please visit:

<http://www.cgsmanitoba.ca/lunch-seminars/upcoming/>

Doreen Wang, EIT

CGS Manitoba Liaison

P: (204) 800-7189

E: cgs.manitoba@gmail.com

Calibration of a Site-Specific Geotechnical Resistance Factor for a Large Industrial Project Site in Western Canada

Presented by:

Kevin Baylis, M.Eng., P.Eng.

University of Manitoba

About the Presenter:

Kevin is a Geotechnical Engineer and Project Manager with Stantec Consulting Ltd. He has over eight (8) years of experience in the field of geotechnical engineering and recently graduated with a Master of Engineering degree from the University of Manitoba in Winter 2020. Kevin has worked on projects in Ontario, Manitoba, Saskatchewan, Alberta, B.C., and Australia. His project experience includes slope stability remediation, dam design, foundation design and review, and performing Pile Driver Analyzer (PDA) including Case Pile Wave Analysis Program (CAPWAP) analysis on deep foundations. Kevin is a well-rounded geotechnical engineer with a recent interest in reliability-based design.

Presentation Abstract:

A large industrial project in western Canada was retrospectively reviewed to observe the economic impacts of calibrating a site-specific geotechnical resistance factor for use in foundation design. The project consisted of installing 710 steel pipe piles and included a dynamic monitoring program to measure the geotechnical resistance of a portion of the production piles. The Simplified Reliability Method equation was coupled with a statistical analysis of the geotechnical pile resistance distribution obtained from dynamic pile monitoring data to calibrate site-specific geotechnical resistance factors. A sensitivity to the target reliability index was also reviewed. The results produced geotechnical resistance factors of $\Phi = 0.92$ to 0.74 which were compared to $\Phi = 0.4$ used in the original design. Foundation cost savings of \$615,000 to \$635,000 in 2020 Canadian dollars were estimated if a site-specific resistance factor were incorporated into the design on the project.

- This event qualifies for 1 Professional Development Hour. The event is classified as 'Informal Activity' under EGM's CPD Program.
- Please note that if you are unable to attend, someone else can be sent in your place. We are accepting walk-ins depending on seating availability.
- If you wish to be added to the mailing list, please send an email to cgs.manitoba@gmail.com