2-Day Short Course

MODELING SALT & NITRATE TRANSPORT IN SOIL AND GROUNDWATER USING HYDRUS

Date: March 10 – 11, 2011 (8:30 am to 4:30 pm)

Location: Calgary, Alberta (University of Calgary, Olympic Volunteer Center at the McMahon Stadium, Oslo Room)

Course venue is inside a building located adjacent to the main U of C campus. It is well served by public transit (C-Train) and has ample parking. Many hotels and restaurants are conveniently located within walking distance.

Lecturer: Dr. Jirka Simunek is a Professor of Hydrology with the Department of Environmental Sciences of the University of California. He received an M.S. in Civil Engineering from the Czech Technical University, Prague, Czech Republic, and a Ph.D. in Water Management from the Czech Academy of Sciences, Prague. His expertise is in numerical modeling of subsurface water flow and solute transport processes, equilibrium and non-equilibrium chemical transport, multicomponent major ion chemistry, field-scale spatial variability, and inverse procedures for estimating the hydraulic properties of unsaturated porous media. He has authored and coauthored over 180 peer-reviewed publications, over 20 book chapters, and 2 books. His numeric models, HYDRUS-1D, HYDRUS-2D, and HYDRUS (2D/3D), are used by virtually all scientists, students, and practitioners modeling water flow, chemical movement, and heat transport through variably saturated soils. Dr. Simunek is a recipient of the Soil Science Society of America's Don and Betty Kirkham Soil Physics Award and a past chair of the Soil Physics (S1) of SSSA. He is an associate editor of Vadose Zone Hydrology, Journal of Hydrological Sciences, and Journal of Hydrology and Hydromechanics and a past AE of Water Resources Research.

Course Description:

This course will familiarize the attendees with the underlying theory and application of HYDRUS to salt and nitrate transport simulations. Prior knowledge of HYDRUS or numerical modelling software is not required, but some basic knowledge of flow and transport processes will be helpful. HYDRUS-1D is the software used to develop the Subsoil Salinity Tool promoted by Alberta Environment. HYDRUS-1D and 2D/3D would be appropriate for simulating soil and groundwater transport in larger salt-impacted sites in Alberta. Two reviewers in Ground Water (December 2010) are "favourably impressed by HYDRUS as a versatile modeling platform with a long, proven track record and a well-designed GUI for flow and transport under variably saturated conditions". This course is co-sponsored by the Calgary Geotechnical Society and O'Connor Associates Environmental Inc.

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Registration Fee: Includes course notes and the most updated version of the free HYDRUS-1D software.
Regular registration including GST: $1,050.
Student registration including GST: $ 630 (student number and institution required).

Registration Form

2-Day HYDRUS short course in Calgary (March 10-11, 2011)

Name: _____ **Title:**_____

Company:_____

Phone:_____ **Email:** _____

Fees (including GST): **If student registration:**
☐ Regular $1,050 **Student ID:** _____
☐ Student $ 630 **Education Institution:** _____

Please make cheque payable to: **Or Credit Card No. (VISA, MC or AMEX)**

O'Connor Associates Environmental Inc. _____ Expiry Date: __ / ____
318-11th Avenue SE, Suite 100
Calgary, AB T2G 0Y2 Name on Card: _____

Attn: Tai Wong Charge will show up as for OAK Environmental.

Receipts will be made available during registration at venue. Please email registration to:
hydrus@oconnor-associates.com

If you have further questions, please contact:
Frank Magdich: frank@oakenviro.com   Phone: 403-250-9810
Tai Wong: tai-wong@oconnor-associates.com Phone: 403-294-4255

Course Description:
Lecture 1: Vadose zone flow and transport modeling: An overview.
Lecture 2: The HYDRUS-1D software for simulating one-dimensional variably saturated water flow and solute transport.
Computer Session 1: HYDRUS-1D: Infiltration of water into a one-dimensional soil profile.
Lecture 3: On the characterization and measurement of the hydraulic properties of unsaturated porous media.
Lecture 4: Application of the finite element method to variably-saturated water flow and salt and nitrate transport.
Computer Session 2: HYDRUS-1D: Water flow and salt and nitrate transport in a layered soil profile.
Lecture 5: Inverse modeling.
Computer Session 3: HYDRUS-1D: One- or multi-step outflow experiment.
Lecture 6a: Application of the finite element method to 2D variably-saturated water flow and salt and nitrate transport.
Lecture 6b: HYDRUS (2D/3D) software for simulating two- and three-dimensional variably-saturated water flow and salt and nitrate transport.
Computer Session 4: HYDRUS (2D/3D): Subsurface line source.
Computer Session 5: HYDRUS (2D/3D): Furrow infiltration with a solute pulse.
Computer Session 6: HYDRUS (2D/3D): Flow and transport in a transect to a stream.
Lecture 7: Preferential and Non-equilibrium Flow and Transport.
Computer Session 7: HYDRUS-1D: Non-equilibrium Flow and Transport.
Lecture 8: Other applications and future plans in HYDRUS development.

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