

OVERVIEW

The course is designed to provide an introduction to the model-based quantification of a wide range of water quality problems from various industries and disciplines, including contaminant hydrology, mining and water supply.

Taking this short course will help groundwater practitioners to:

- Understand the basics of coupled geochemical transport modeling.
- Learn how to apply state-of-the-art models to groundwater quality problems.
- Apply the theoretical framework with hands-on experience in the computer lab.
- Use the modeling tools MODFLOW, MT3DMS, PHREEQC-2 and PHT3D (which couples MT3DMS and PHREEQC-2).

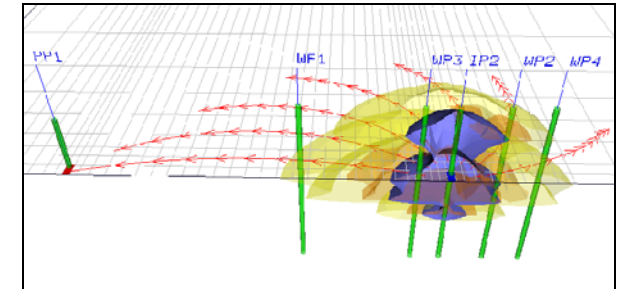
COURSE AUDIENCE

The course is aimed at consultants, engineers, students and researchers who undertake modeling studies of groundwater flow/transport processes and (bio)geochemical reactions as part of their work or studies.

COURSE INSTRUCTORS

The course will be presented by international experts, including: **Dr. Chunmiao Zheng**, Professor of Hydrogeology at the University of Alabama and developer of the world's most widely used solute transport model *MT3D/MT3DMS*; **Dr. Henning Prommer**,

Principal Research Scientist at CSIRO Land and Water Australia and author of the MODFLOW/MT3DMS-based reactive transport model *PHT3D*. **Dr. Vincent Post**, Assistant Professor at the Free University Amsterdam and author of the popular graphical user interface *PHREEQC for Windows* and co-author of *PHT3D*.



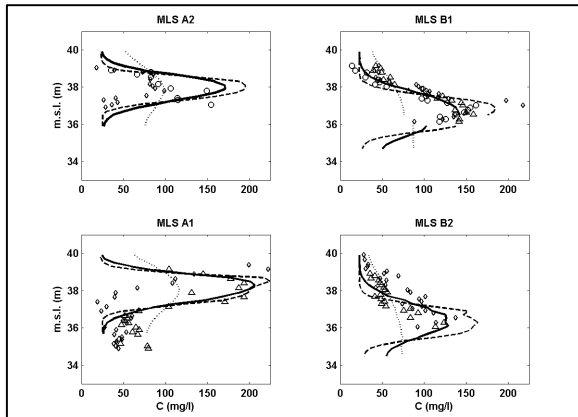
COURSE TOPICS

- Basics of advective and dispersive solute transport
- Development of conceptual models
- Numerical solution schemes
- Constructing MODFLOW/MT3DMS flow and solute transport models
- Overview of hydrochemical processes
- Principles of modeling biogeochemical processes such as complexation reactions, sorption, mineral dissolution/precipitation, ion exchange, NAPL dissolution, biodegradation, and microbial growth/decay
- Modeling of equilibrium and kinetically controlled reactive processes with PHREEQC-2
- Coupled modeling of transport and chemical reactions using PHT3D.
- Selected model applications for organic and inorganic pollution problems (e.g., natural attenuation of aromatic/chlorinated hydrocarbons and pesticides, bioremediation, ammonium plumes, mine tailings impact on groundwater) and for

water supply issues (aquifer storage and recovery, deep-well injection) will be presented and studied in lab exercises.

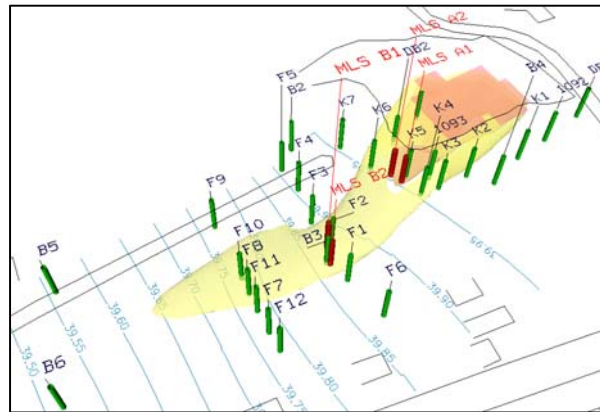
- Model calibration, sensitivity analysis, uncertainty analysis

Approximately half of the course will be devoted to computer labs. This involves simplified modeling exercises that are based on real-world problems to help participants translate theory into practice.



PREREQUISITES

Participants will benefit the most from this course if they have a working knowledge of groundwater (flow/transport) processes and at least a basic understanding of geochemical processes. Prior modeling experience is not an absolute requirement but it will increase the benefits from the course significantly.



COURSE LOCATION

The course will be held in XiFengSi Training Center of the Ministry of Land and Resources, Beijing, China.

Course Enrollment and Registration

The fee for the short course is \$1200 before August 15, 2009 and thereafter \$1500.

Enrollment for the course requires a deposit of \$100. The fee covers instruction, course notes, refreshments, and certificate of participation. Lodging and meals are not covered. Payment in full must be received prior to the beginning of the course.

If cancellation is made before August 31, 2009, tuition will be refunded except for the \$100 deposit. Cancellations made after that date will forfeit a \$150 processing fee in addition to the \$100 deposit. In case of cancellation, the right to course material is forfeited. Substitutions are permitted at any time prior to the start of the course. Please be advised that if the program is cancelled due to insufficient enrollment, all course fees will be returned, but will not be liable for any other expenses incurred by the prospective attendees.

Payment

Beneficiary's Name: Jie Liu
Account Number: 6222 0002 0010 9553362
Bank Name: Industrial and Commercial Bank of China, Beijing Municipal Branch, Beijing, PRC
SWIFT Code: ICBKCNBJBJM

TRANSPORTATION AND LODGING

Lodging is available at the XiFengSi Training Center (see the attached map for the location). Information regarding transportation and lodging will be sent upon registration.

Contact

Dr. Jie Liu
Center for Water Research,
Peking University, China
Phone: 86-10-8252 9073
Fax: 86-10-8252 9073
Email: jliu@coe.pku.edu.cn

Dr. Bin Liu
International Groundwater Modeling Center,
CIGEM
Phone: 86-10-62179997
Fax: 86-10-62173426
Mobile: 86-13720051002
Email: liub@mail.cigem.gov.cn

