Geophysical Research Abstracts
Vol. 15, EGU2013-1217, 2013
EGU General Assembly 2013
© Author(s) 2012. CC Attribution 3.0 License.

How to become relevant in applications? A holistic approach for inverse modeling

Yoram Rubin
UC Berkeley, Civil and Environmental Engineering, Berkeley, United States (rubin@ce.berkeley.edu)

To become relevant in applications, inverse modelers need to consider a few challenges that go beyond accurate identification of parameters or even models. For example, there is often a mention these days of UQ (for Uncertainty Quantification). While it is clear that UQ is an important goal, there is some ambiguity as to how to define the U and the Q in UQ. In this context, one can look at uncertainty surrounding environmental performance parameters (EPMs, such as concentrations or travel time), or go beyond groundwater-related EPMs and consider instead the uncertainty associated with potential impacts such as enhanced cancer-risk or economic impacts. Any of the choices could lead to different modeling strategies and to different characterization needs. It is obvious that decision-makers and modelers need different metrics for U and Q. Hence the first goal is to select the characterization goal. The second challenge is to associate the characterization goal with a strategy for data acquisition. There is a need here for a rational and defensible framework that could relate between characterization goals and characterization needs as well as budgetary constraints (e.g., what type(s) of data to collect? Where? How many?). The third challenge is to have credible inverse modeling tools. Credibility could be attained by making available assumption-free, well-tested, open-source (and hence transparent), and easy-to-operate codes. This talk will take a close look at these challenges and will suggest a few ideas on how to address them.