

## 2019 Darcy Lecture

Friday, September 06, 2019, at 15:00  
Eawag, Swiss Federal Institute of Aquatic Science and Technology  
8600 Dübendorf, Ueberlandstrasse 133, Forum Chriesbach, FC C20

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### **Dancing with Models - The Importance of Model Partner Software**

Numerical simulators of groundwater flow and transport cannot fulfill their decision-support potential on their own. Instead, they must be used in partnership with equally sophisticated software that links models to data acquired at sites that they simulate - and that links models to the decisions that they are intended to support. As they “dance” with a model, these software packages can accomplish tasks such as history-matching, uncertainty analysis, predictive hypothesis-testing, sensitivity analysis, management optimization, and optimization under uncertainty.

The importance of model partner software is not nearly as widely appreciated in the groundwater industry as it should be. Model developers often design input/output protocols that make linkage to partner software difficult or impossible. Model users often build models that are unnecessarily complex, take too long to run, and have questionable numerical health. Education in model-value-adding numerical algorithms is rarely offered to modelers by universities. Graphical user interfaces do not provide comprehensive support for the wide range of ancillary tasks that decision-support modeling requires.

This lecture will explore how models can best serve the decision-making process. In doing so, it demonstrates the indispensable role that model-value-adding software should play in this process. It also addresses some currently available packages, as well as an easy-to-use, public domain, parallel model run manager with a nonintrusive model interface that allows rapid development of model partner software by any programmer.

Link to Darcy-Lecture-series:

<https://www.groundwater.org/lecture/darcy/darcy-2019.html>