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# Approaches to Highly Parameterized Inversion: Pilot-Point Theory, Guidelines, and Research Directions: Usgs Scientific Investigations Report 2010-5168

By John E Doherty

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.Pilot points have been used in geophysics and hydrogeology for at least 30 years as a means to bridge the gap between estimating a parameter value in every cell of a model and subdividing models into a small number of homogeneous zones. Pilot points serve as surrogate parameters at which values are estimated in the inverse-modeling process, and their values are interpolated onto the modeling domain in such a way that heterogeneity can be represented at a much lower computational cost than trying to estimate parameters in every cell of a model. Although the use of pilot points is increasingly common, there are few works documenting the mathematical implications of their use and even fewer sources of guidelines for their implementation in hydrogeologic modeling studies. This report describes the mathematics of pilot-point use, provides guidelines for their use in the parameter-estimation software suite (PEST), and outlines several research directions. Two key attributes for pilot-point definitions are highlighted. First, the difference between the information contained in the every-cell parameter field and the surrogate parameter field created using pilot points...

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