

# **METHODS AND GUIDELINES FOR EFFECTIVE MODEL CALIBRATION**

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With application to:  
UCODE, a computer code for universal inverse modeling, and  
MODFLOWP, a computer code for inverse modeling with MODFLOW

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Table 1: Statistics and graphical analyses, related figures, and the guidelines in which the figures are presented. <sup>1</sup>

<b>Statistic or graph (ordered by function)</b>	<b>Figure<sup>2</sup></b>	<b>Guideline</b>
<b>Sensitivity Analysis Statistics</b>		
Dimensionless scaled sensitivities	13, Table 3	11
Composite scaled sensitivity	3, 4, 16, 17, Table 3	3, 11, 14
One-percent scaled sensitivity map	none <sup>3</sup>	11
Parameter correlation coefficients <sup>4</sup>	5, 6, 16	3, 14
Linear confidence intervals on parameters	10, 14, 16	9, 13, 14
<b>Model Fit Statistics and Graphical Analysis</b>		
Fitted error statistics	11	10
Graph of weighted residuals versus weighted simulated values	12	10
Graphs using independent variables	7, 8	8
Runs test	9	8
Normal probability graphs	15	13
<b>Evaluate Estimated Parameter Values</b>		
Compare estimated parameter values with reasonable ranges	10	9
Linear confidence intervals on parameters	10, 14, 16	9, 13, 14
Parameter correlation coefficients	5, 6, 16	3, 14
Influence statistics	none <sup>5</sup>	
<b>Evaluate Predictions</b>		
Prediction scaled sensitivities	16, 17	14
Linear and nonlinear confidence intervals on predictions	none <sup>6</sup>	

1. The statistics and graphs often are useful for other guidelines as well. See Table 2.
2. Unless otherwise indicated.
3. No example is provided in this report.
4. Repeated because of their frequent application for two purposes.
5. No example is provided in this report. See Anderman (1996) and Yager (in press).
6. No example is provided in this report. An example is shown by Christensen and Cooley (in press).