

Lesson 35: HEC-HMS Calibration

53:119
Hydrology



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HEC-HMS Event Calibration

Calibration/validation terms

- Calibration (or *Parameter Estimation*)
 - Adjust model parameters to improve the performance of the model simulation for a “calibration event”
- Validation (or *Model Acceptance*)
 - Prove that the model has predictive ability by assessing its performance for events not used for calibration



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Calibration process

- Initial parameter estimation
- Manual calibration
 - Trial-and-error manual adjustment of parameters based on visual (and other) comparisons
- Optimization
 - Automated adjustment of parameters based on an objective function (error measure)



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Systematic approach for manual calibration

- Runoff volume calibration first
 - What parameters control volume prediction?
 - Subbasin Model: Loss Method: *CN*
- Runoff timing calibration second
 - What parameters control runoff timing prediction?
 - Subbasin Model: Transform: *SCS lag time*
 - Reach Model: Routing: *Muskingum K*



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Manual calibration with constraints

- Constrain parameters to change in a systematic way for all subbasins or reaches
- Example: Subbasin *CN* calibration
 - Adjust **all** subbasin *CN*s by a calibration constant α :

$$CN_1 = \alpha \cdot CN_0$$

