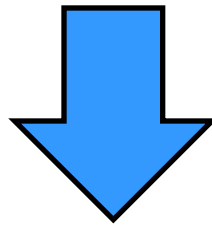




**Michael Rustler &
Hauke Sonnenberg**
Kompetenzzentrum Wasser Berlin

@MichaelRustler 
mrustl 

Introduction



Environmental models

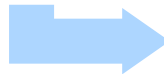
Challenges



(Usually) not implemented in



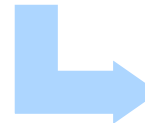
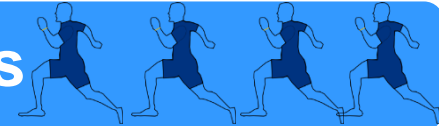
Generic



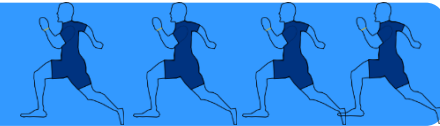
Case-specific



Sensitivity analysis



Calibration



Challenges



(Usually) not implemented in



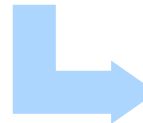
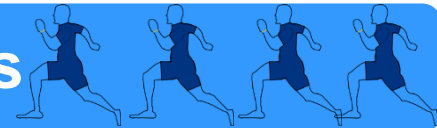
Generic



Case-specific



Sensitivity analysis



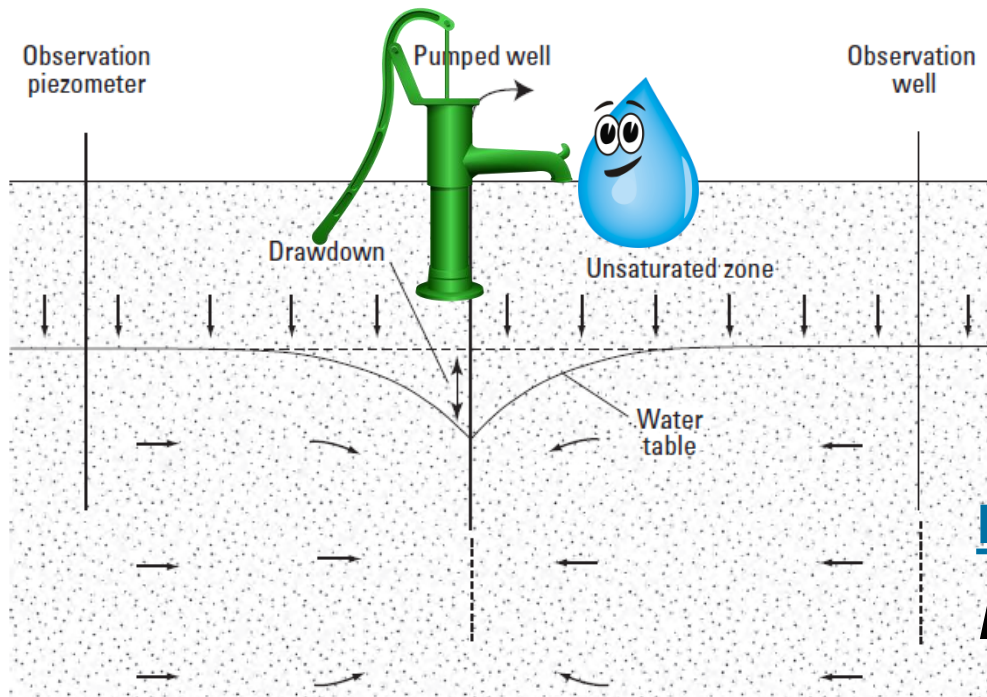
Calibration



*“If you’re going to do something **three times or more**, you should think about **writing a small package**” (Peng, 2016)*

Well drawdown model

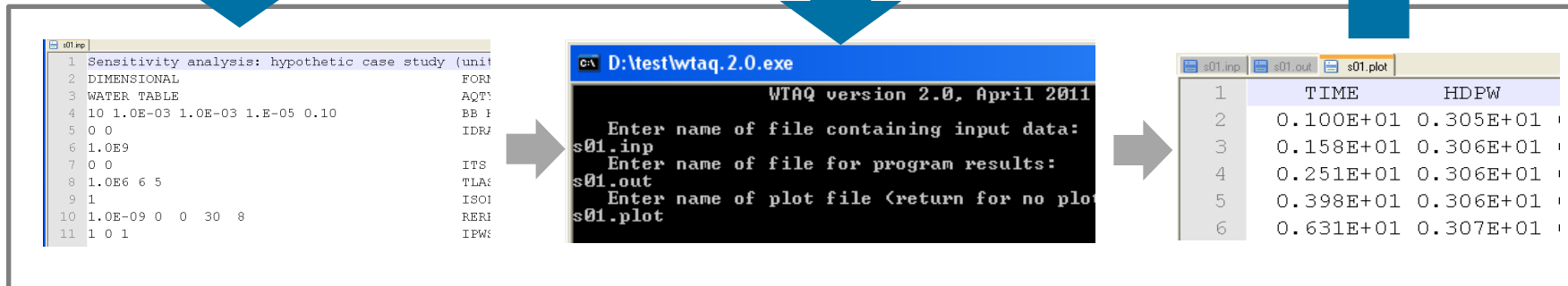
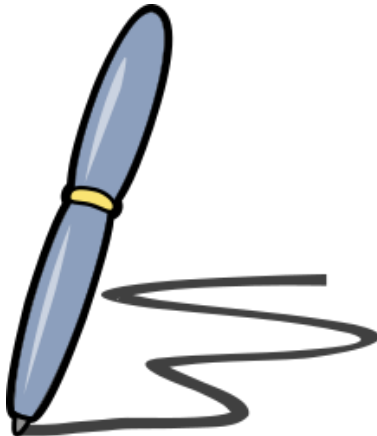
WTAQ Version 2—A Computer Program for Analysis of Aquifer Tests in Confined and Water-Table Aquifers with Alternative Representations of Drainage from the Unsaturated Zone



[Freely available at:](http://water.usgs.gov/ogw/wtaq)

<http://water.usgs.gov/ogw/wtaq>

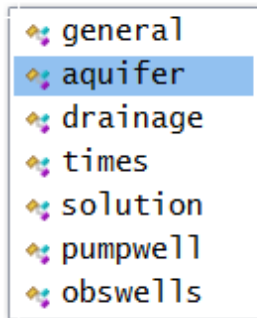
Usual workflow



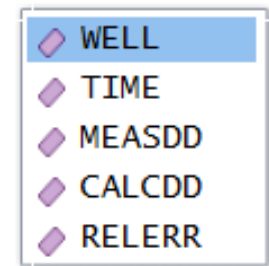
Our approach

createConfiguration()

input\$



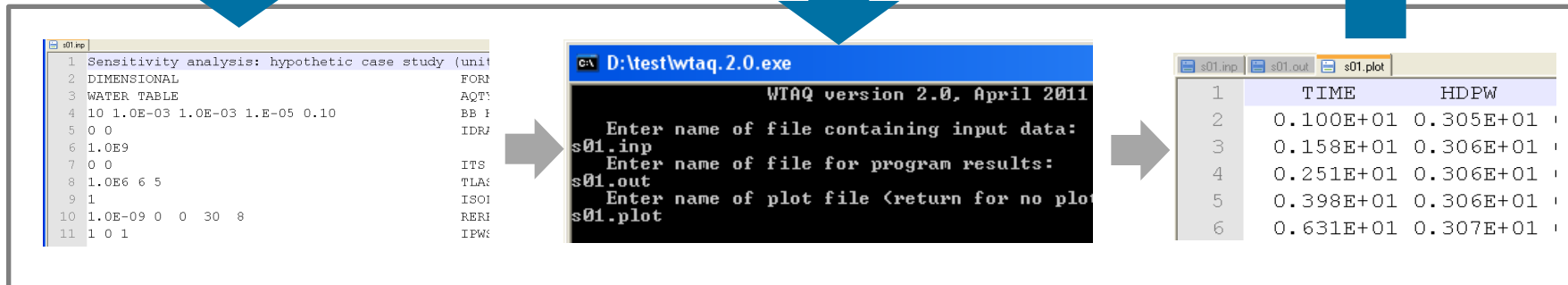
output\$



writeInputFile()

runModelEngine()

readOutputFile()



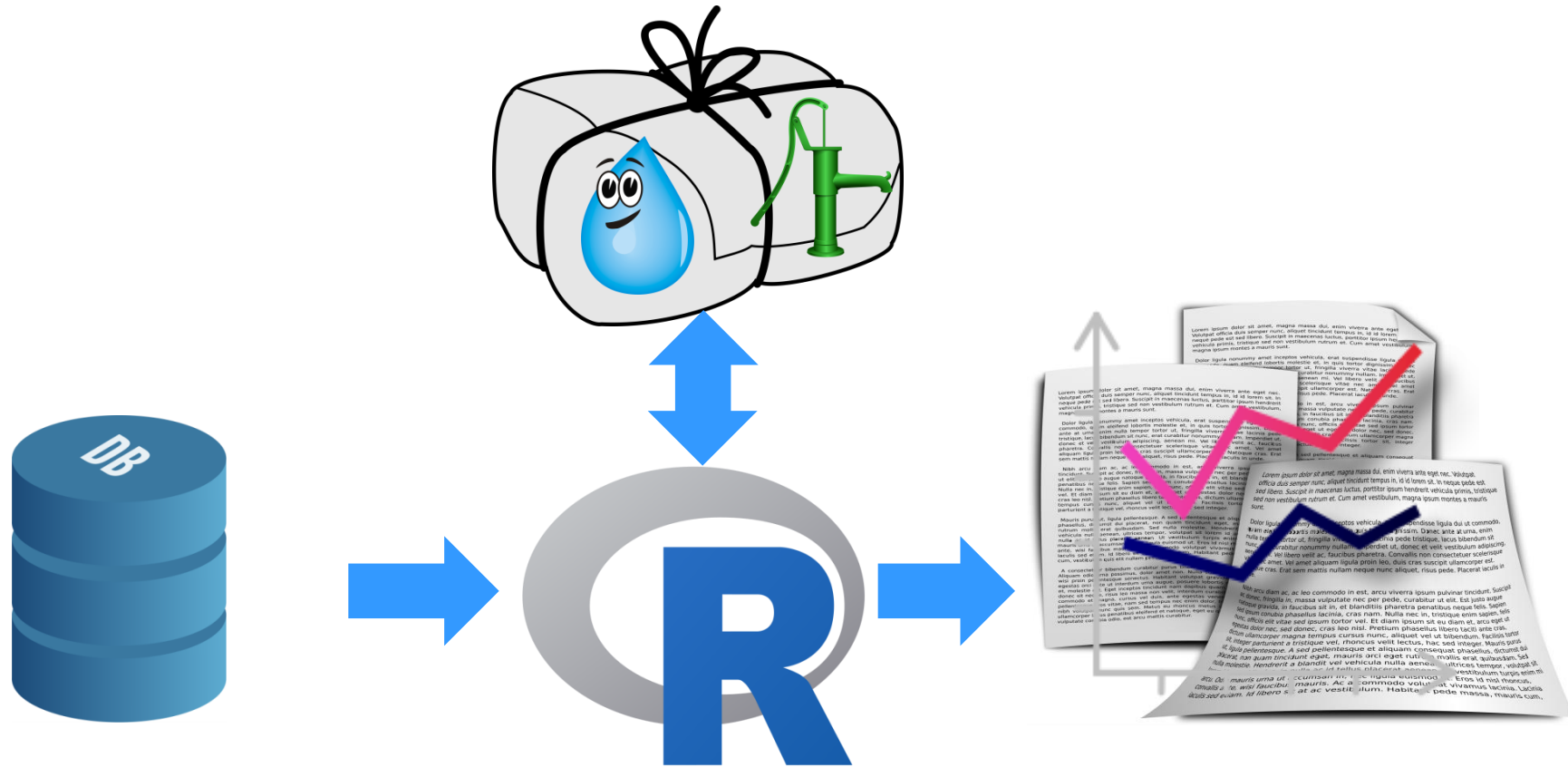


Model engine (source / binary)

+ functions:

1. **Create** model configuration (**R list**)
2. **Write** input file (**text file**)
3. **Run** model engine (**text file**)
4. **Read** output file (**R data.frame**)

Automated workflow



Summary

“Wrapped” models:



WTAQ-2 (USGS)



<https://github.com/KWB-R/kwb.wtaq>

Tutorial: *<https://kwb-r.github.io/kwb.wtaq>*



EPANET (USEPA)

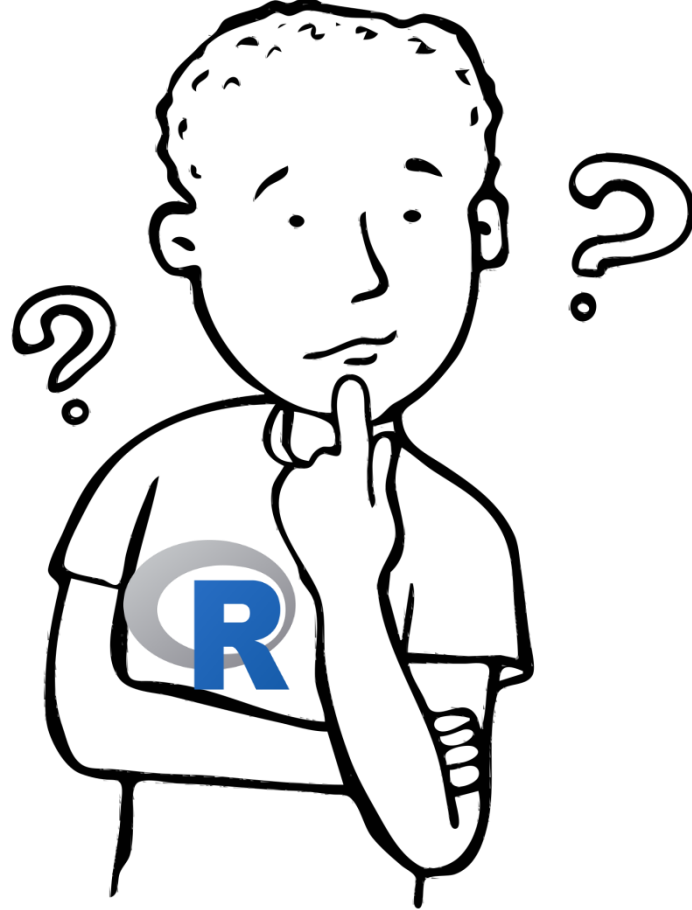


VS2DI (USGS)

Method: Wrap your model! (Sonnenberg et al. 2014)

<http://doi.org/10.13140/RG.2.1.2140.3683>

Thanks to  **VEOLIA** EAU for sponsoring this work within the project  **OPT | WELLS**



slides at <https://github.com/mrustl/useR-2016>

**Michael Rustler &
Hauke Sonnenberg**
Kompetenzzentrum Wasser Berlin

@MichaelRustler



mrustl

