



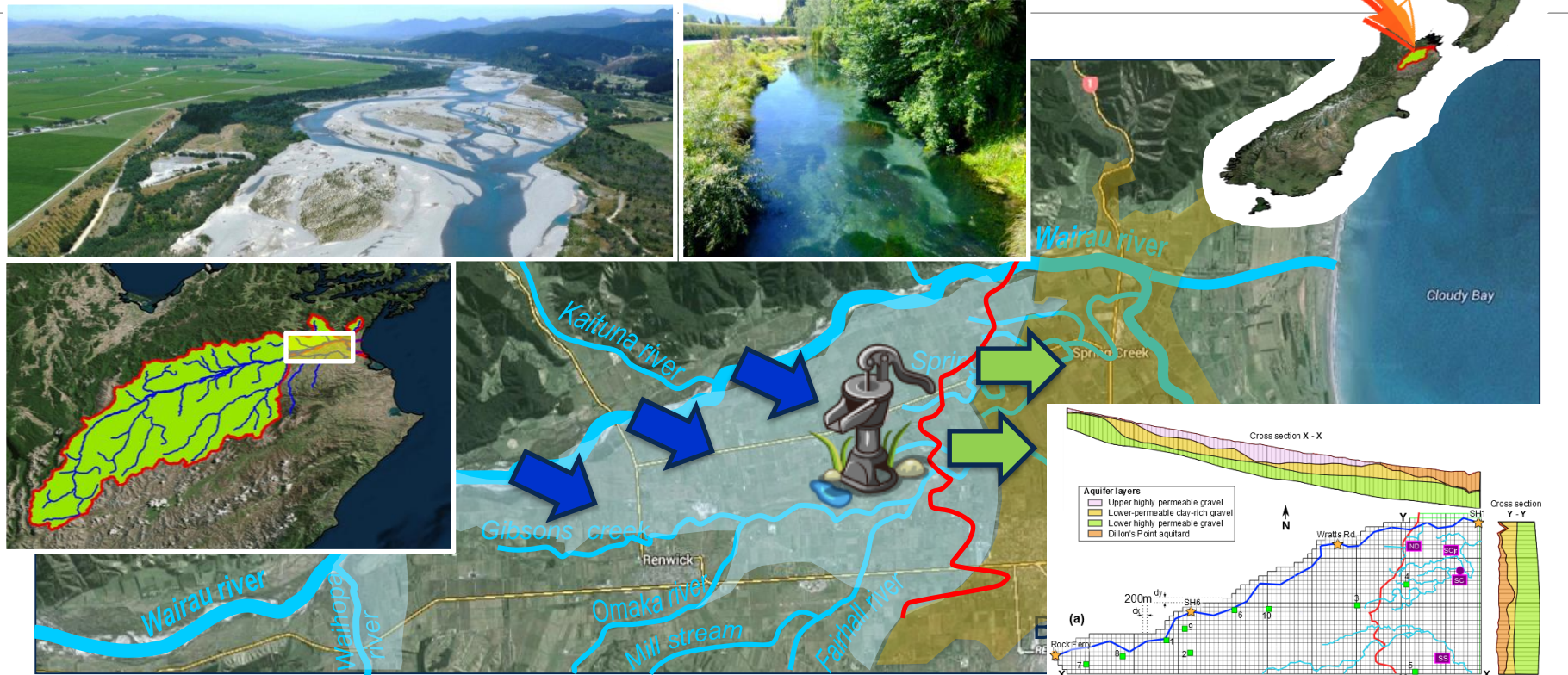
# A teaser to “Robust data worth analysis with surrogate models in groundwater” – preliminary work

Moritz Gosses<sup>1</sup>, Thomas Wöhling<sup>1,2</sup>

<sup>1</sup> Dresden University of Technology, Department of Hydrology, Germany

<sup>2</sup> Lincoln Agritech Ltd, Hamilton, New Zealand

# Wairau Plains and the need for surrogates



How to deal with the long run times of complex models?

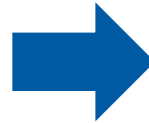
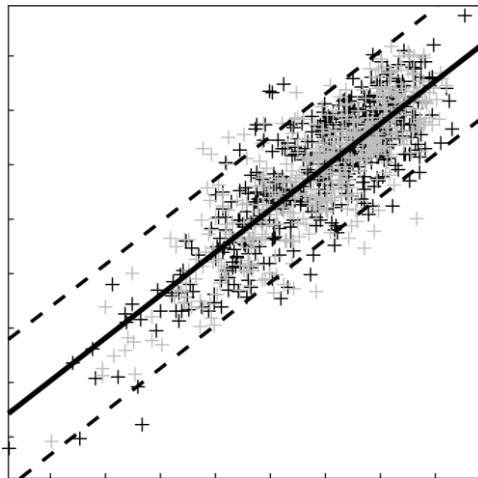
➤ Surrogate models

What is the cost of simplification?

# The cost of simplification?

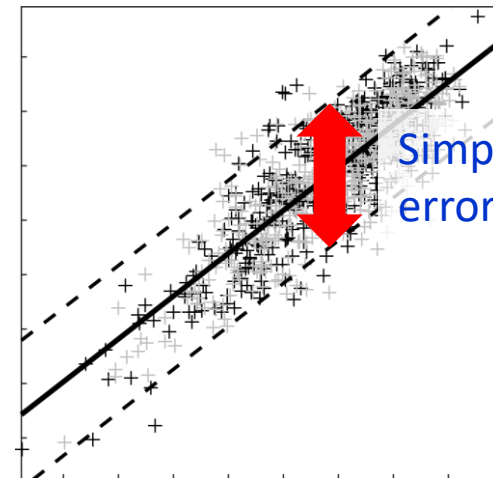
Estimations  
of the  
prediction by  
benchmark  
(one for each  
random  
parameter set)

Model prediction



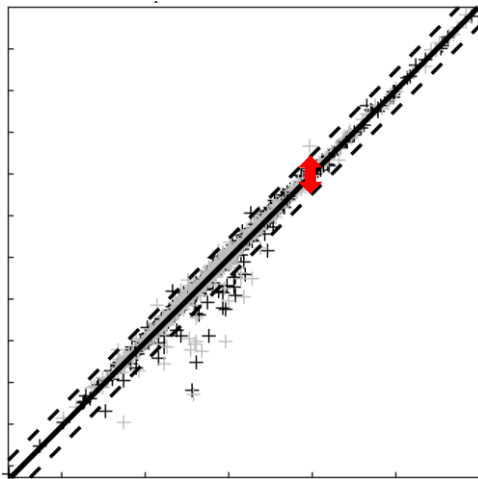
Estimations of the  
prediction by a  
surrogate (one for each  
different calibrated  
parameter set)

Model prediction



# The cost of simplification? – Different predictions

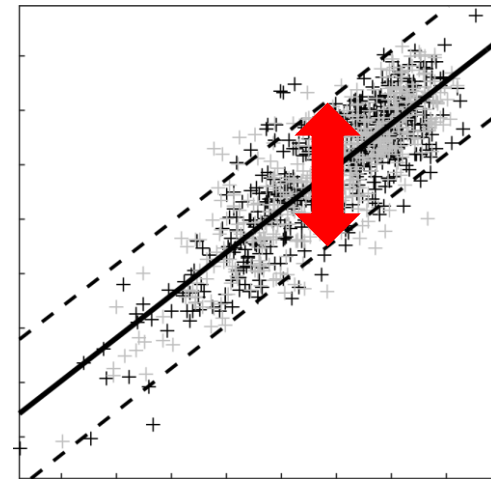
„Known“ prediction  
(measured and part of the  
calibration dataset)



Small simplification error

Simplification  
error

„Unknown“ prediction  
(not part of the calibration  
dataset)

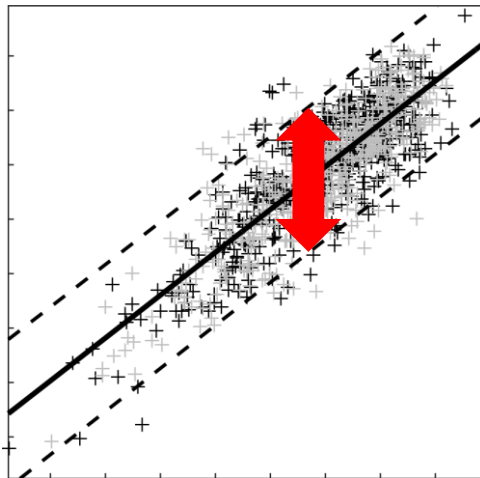


Large simplification error

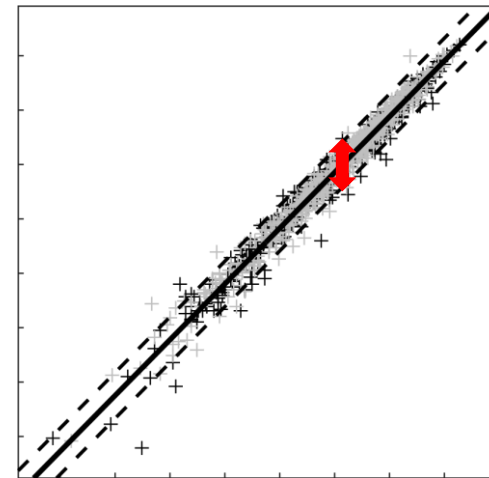
vs.

# The cost of simplification? – Different surrogates

Surrogate type 1



Surrogate type 2



Simplification  
error

The right tool for the job!

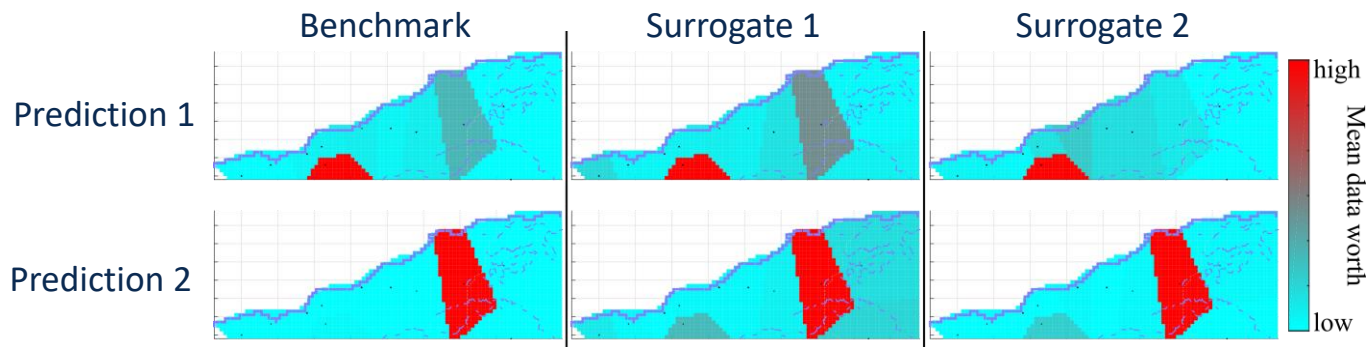
# More information?

Interested? More in:

Gosses, M., Wöhling, T., 2019. Simplification error analysis for groundwater predictions with reduced order models. *Advances in Water Resources* 125, 4156.

<https://doi.org/10.1016/j.advwatres.2019.01.00683>

Robust data worth analysis with surrogates?



Coming soon!