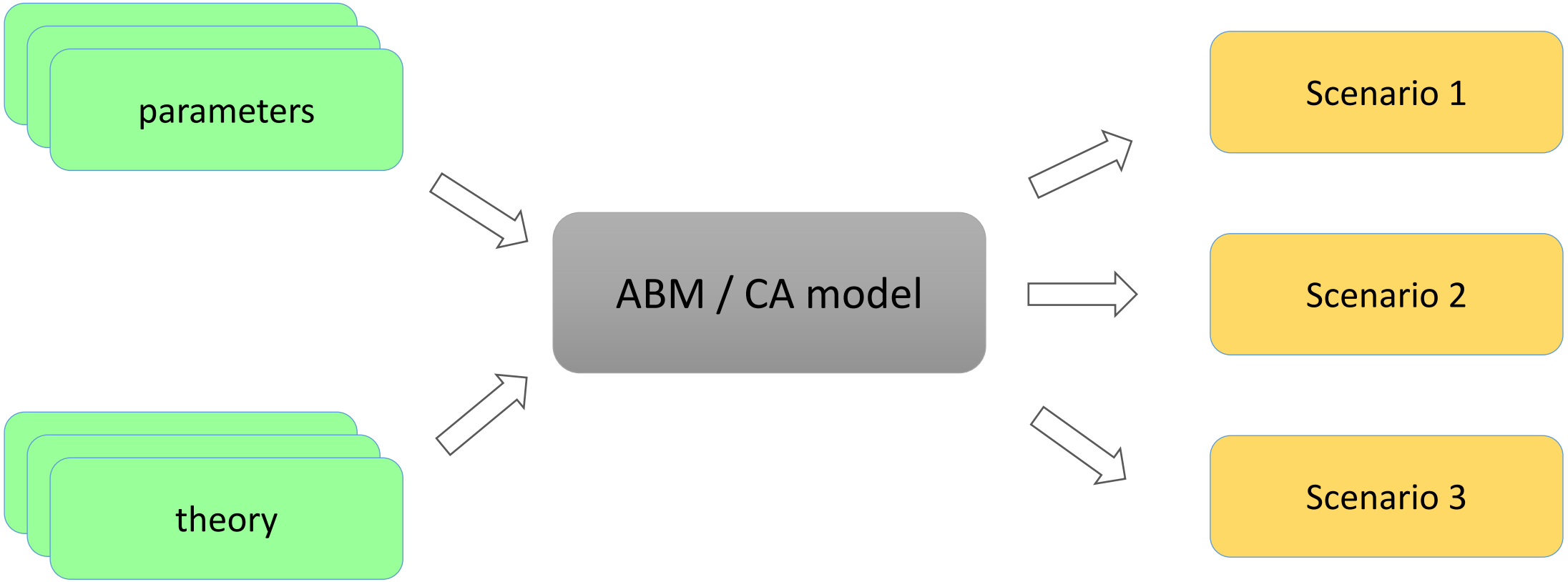
Spatial Simulation

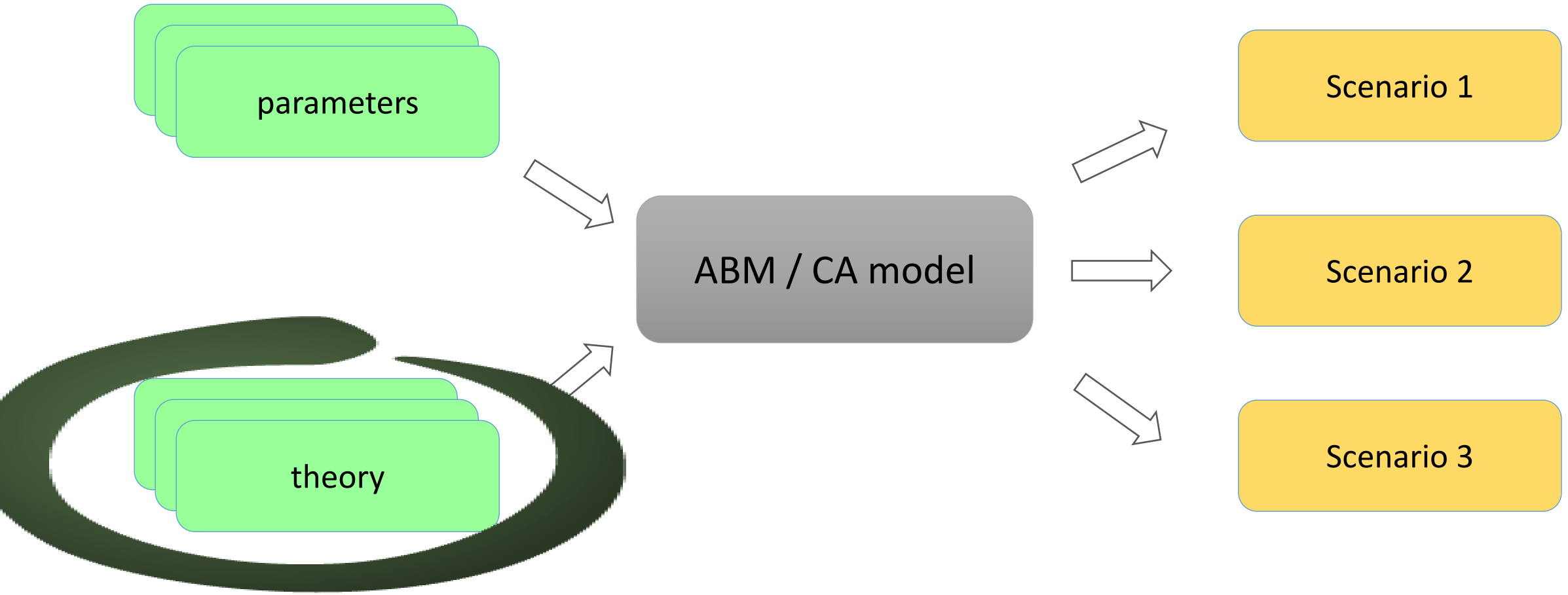
Winter Semester 2022 / 23

The modelling process – getting the big picture

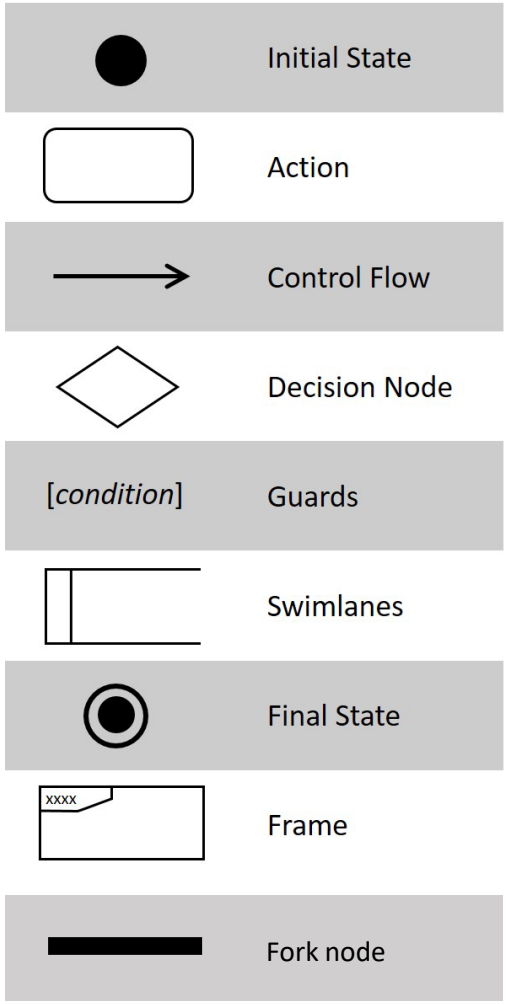
The modelling process

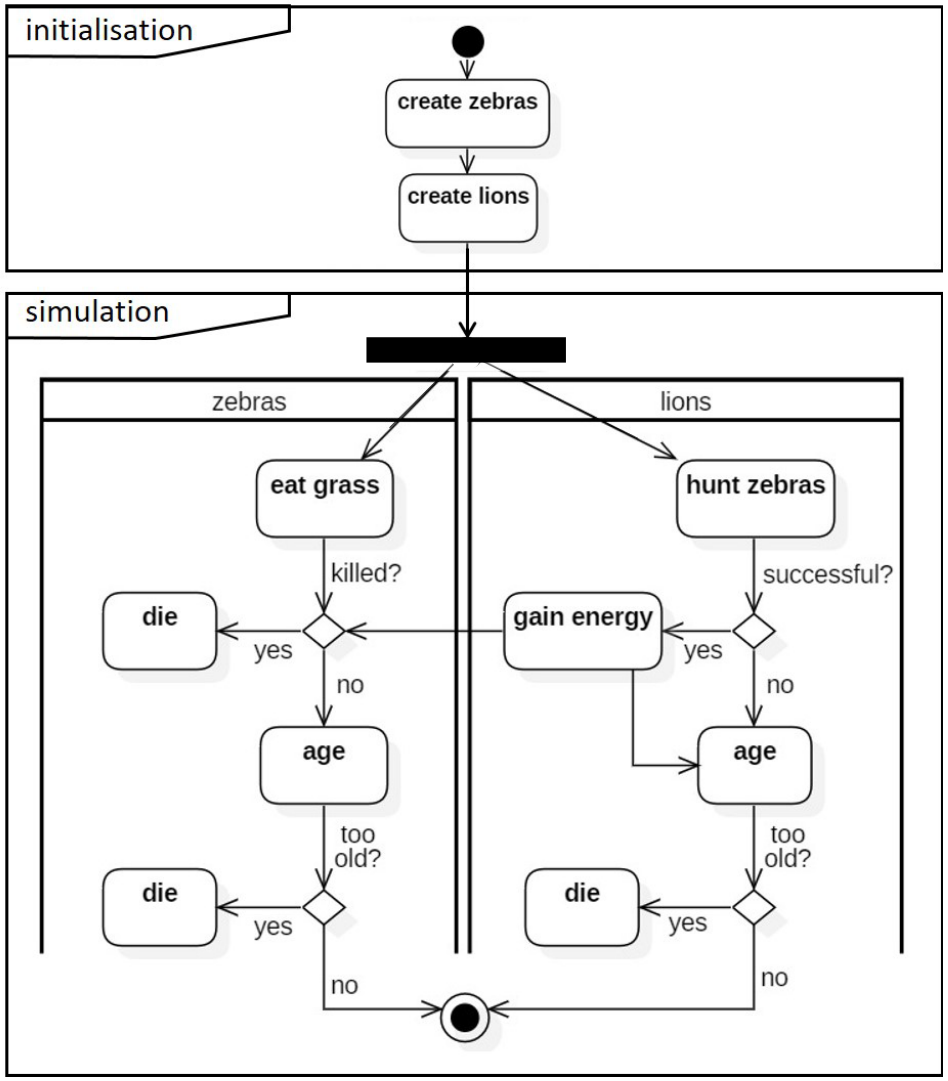


The modelling process: conceptualisation

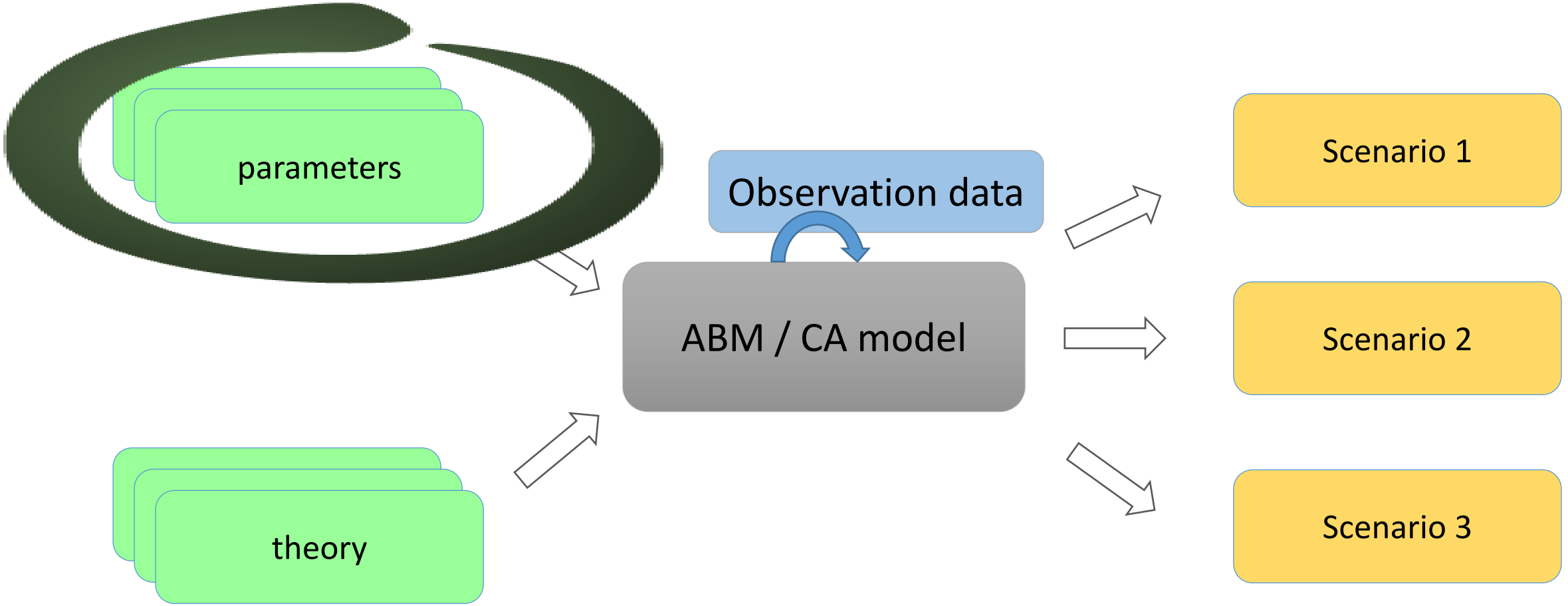


UML Activity diagram: an example



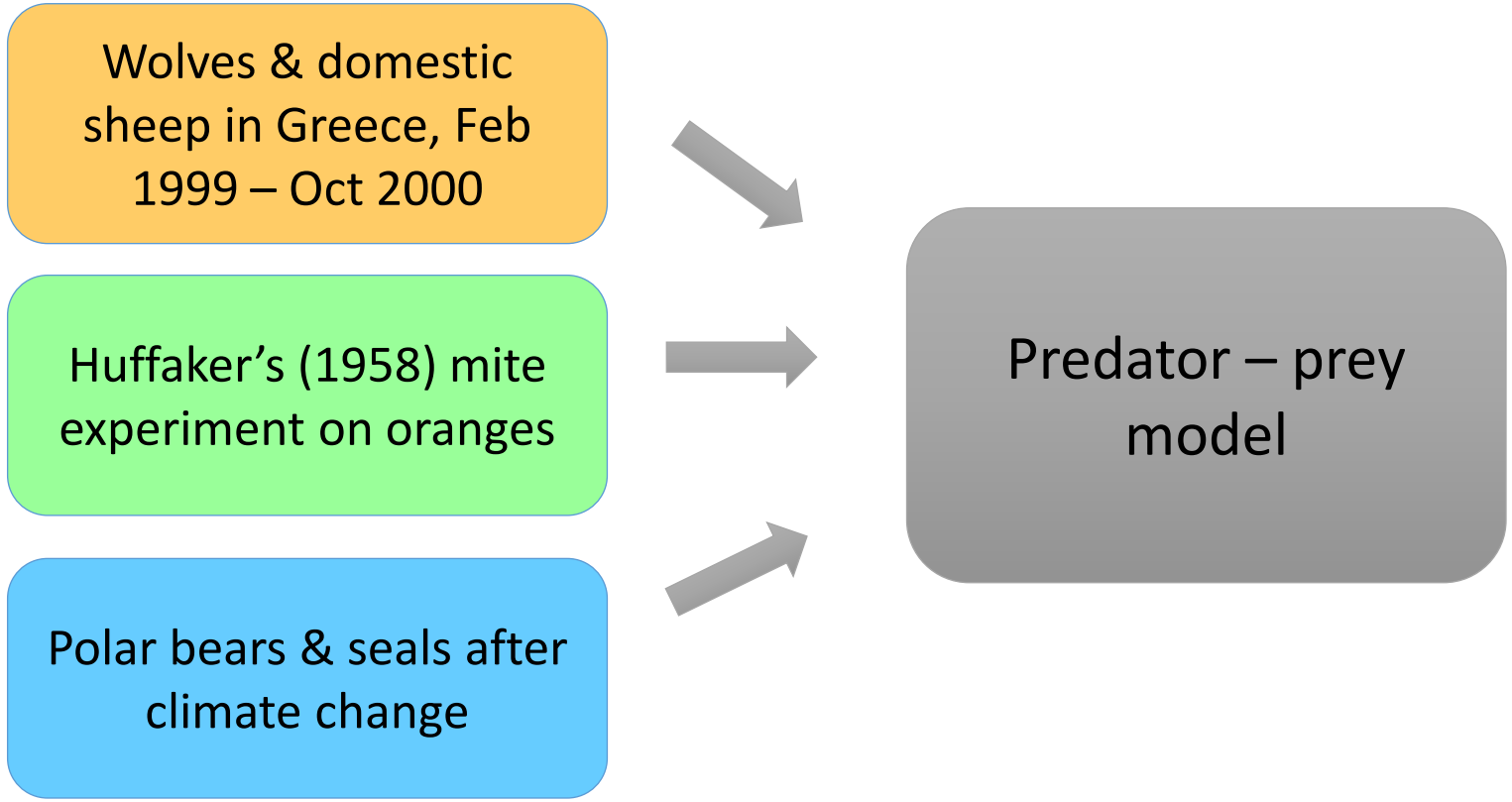


The modelling process: parameterisation

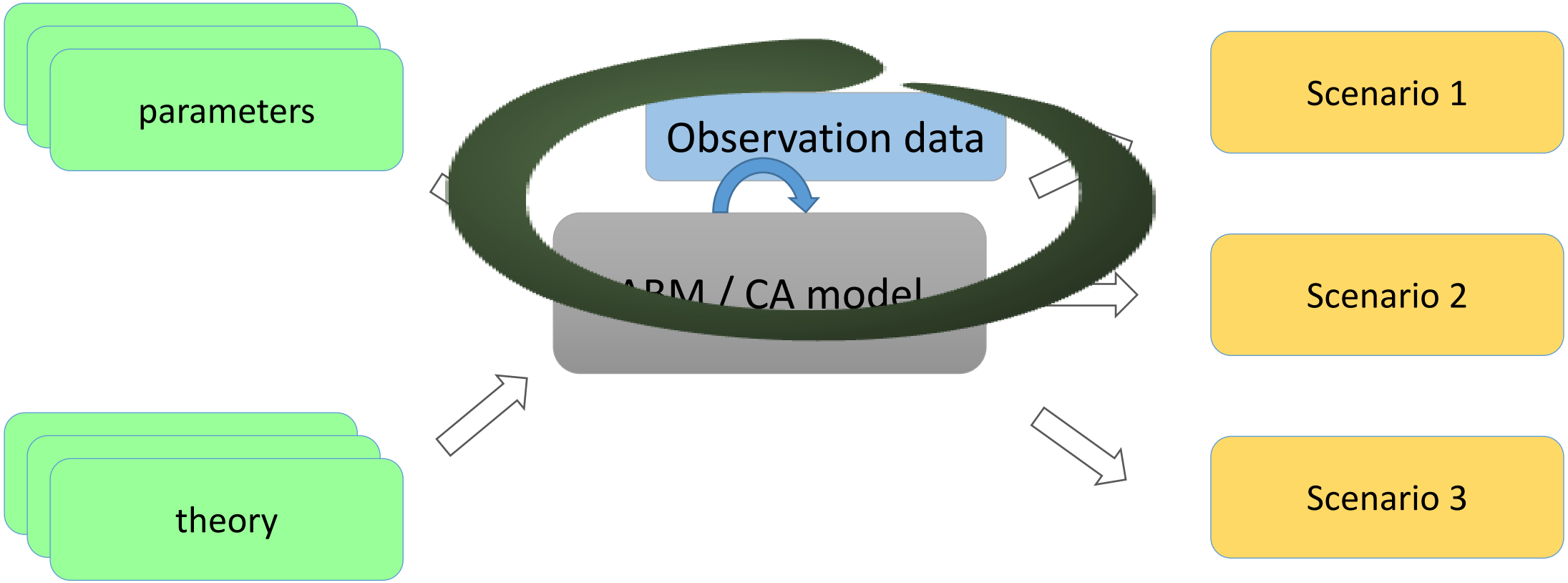


Parameterisation

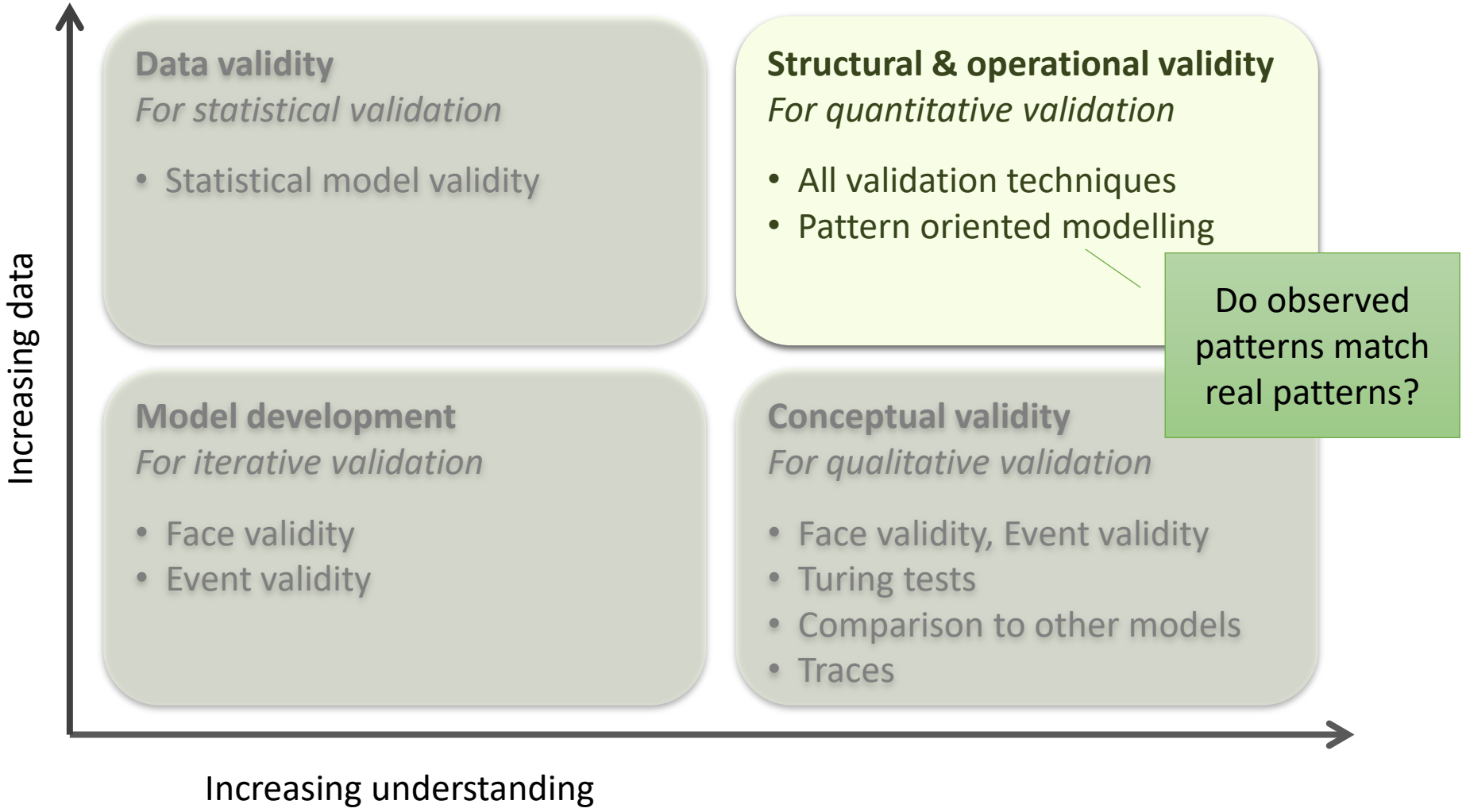
..adapt a generic model to a specific question – and make it geographic



The modelling process: validation

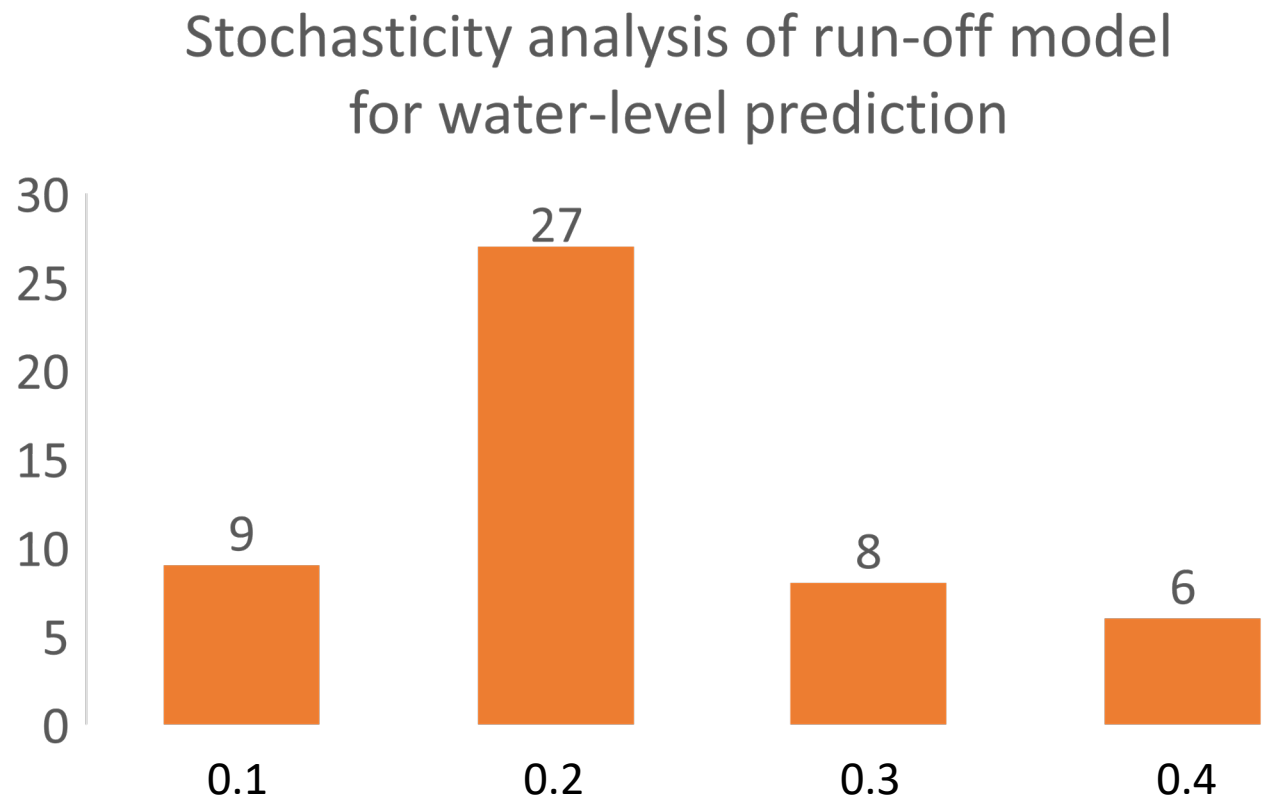


Methods for validation



from: Rykiel 1997

Validation result



Distribution of results from 50 simulations of the same model

Simulated

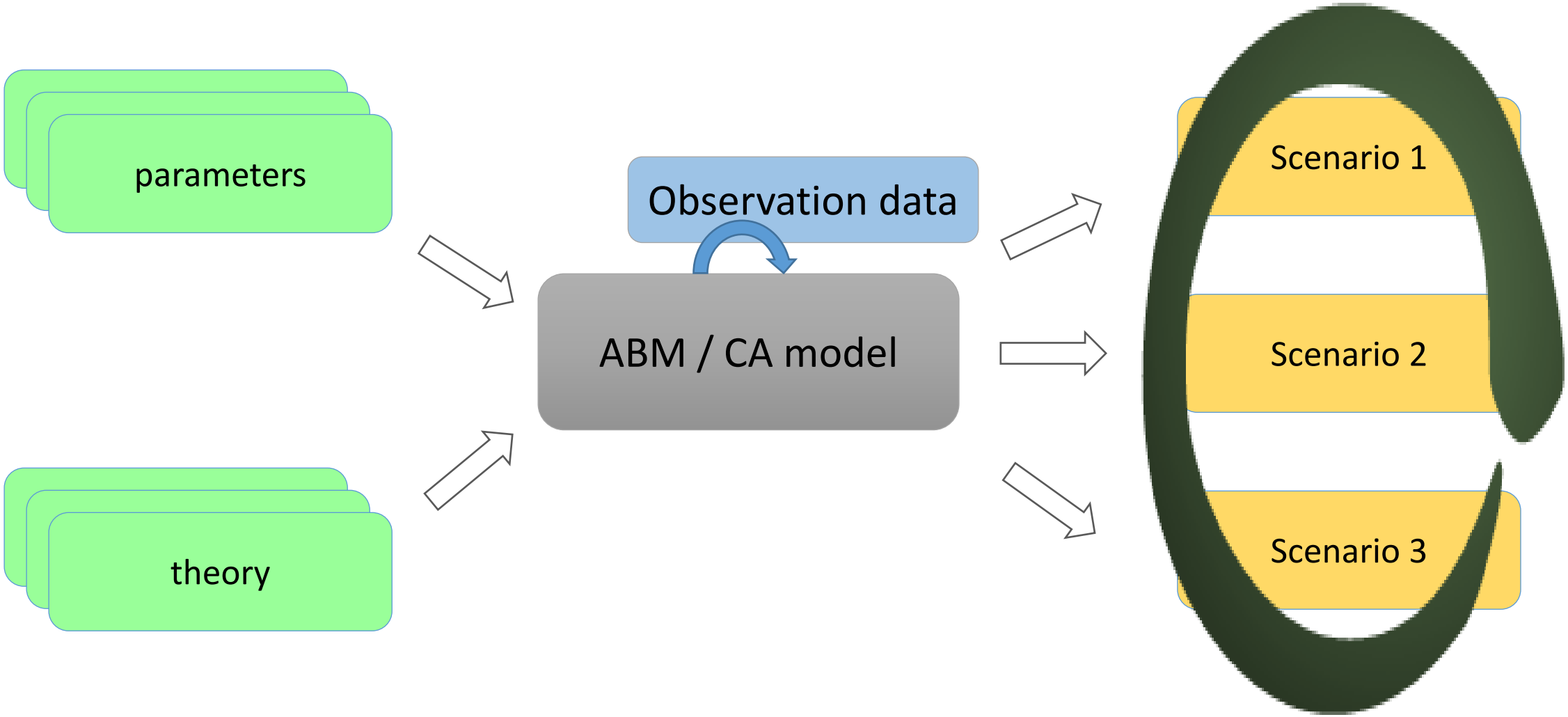
Mean: 0.222
Median: 0.2
Std: 0.878
95% CI: 0.197 – 0.246
(given a normal distr.)

Observed

0.213

The observed value lies within the 95% confidence interval of the simulated prediction

The modelling process: answer the RQ



Scenarios: an example

What is the most likely driving factor that drives growth of the city of Luzern?

By means of an „Urban sprawl“ model, explore the importance of drivers in different scenarios:

- Closeness to water
- Closeness to center
- Closeness to roads
- Avoiding densely populated areas

Weekly task: Design your modelling research

1. Select a project (one of the suggested projects, or your own project)
2. Define a research question (1 paragraph)
3. Formulate a conceptual model (sketch as UML diagram)
4. Specify necessary input data and the relevant parameters
5. List at least four validation patterns & respective quantitative output variables for available validation data
6. Describe 2 or 3 scenarios to address your research question (1 paragraph)

You can work alone or in groups. If you work in a group, each of you needs to upload the report. Specify the members of the group in the submission text.