# WHY MODEL?

(Data modeling)
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### WHAT'RE YOU GOING TO LEARN TODAY?

- What are models?
- When should we model?
- Why many models?
- Exercises
- What's next?

### **DEFINITION**

"Models are formal structures represented in mathematics and diagrams that help us understand the world."

### **MOTIVATION**

"Practice [modeling] and you will better understand complex phenomena."

What are "complex phenomena?"

## DÖRNER'S DEFINITION



- 1. Problem is polytelic
- 2. Variables evolve dynamically
- 3. Variables are interdependent and compounded
- 4. There is no clear problem definition
- 5. There is no single cause and effect

#### **TYPES OF MODELS**

- Simplifications of the world (=abstractions)
- Mathematical analogies (=functions)
- Exploratory artificial constructs (=simulations)

Models must be "tractable" (apply logic). What about metaphors?

### **EXERCISE 1**

#### Test Dörner's list:

- Al
- Covid
- Climate change
- Capitalism
- Communism
- Electric cars
- Zombies

## **MANY-MODEL THINKING**

"We achieve wisdom through a multiplicity of lenses."

## **CRITERIA FOR MANY-MODEL THINKING**

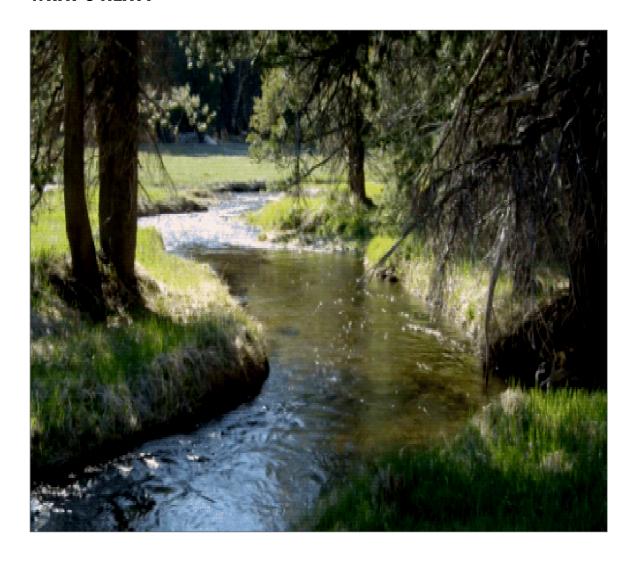
"The success of many-model thinking depends on a degree of separability."

#### **EXERCISE 2**

Analyse a recent decision you've made:

- Which model did you use, and why?
- If you used only one model, why?

## **WHAT'S NEXT?**



#### IN THE COURSE

- Lecture "Decision intelligence"
- Data vs. models (2 optional articles)
- When you should model (REDCAPE)

### **YOUR CHALLENGES**

What?	When?
Read ch. 2 "Why model?"	Aug 31
Complete 2nd test challenge	Aug 31
List possible research questions	Sep 2
Check FAQs x 2 in GitHub	n.d.
Ask questions (class/GitHub)	n.d.

<sup>\*)</sup> do this every week until December

## **ANY QUESTIONS?**



This presentation is available online.