

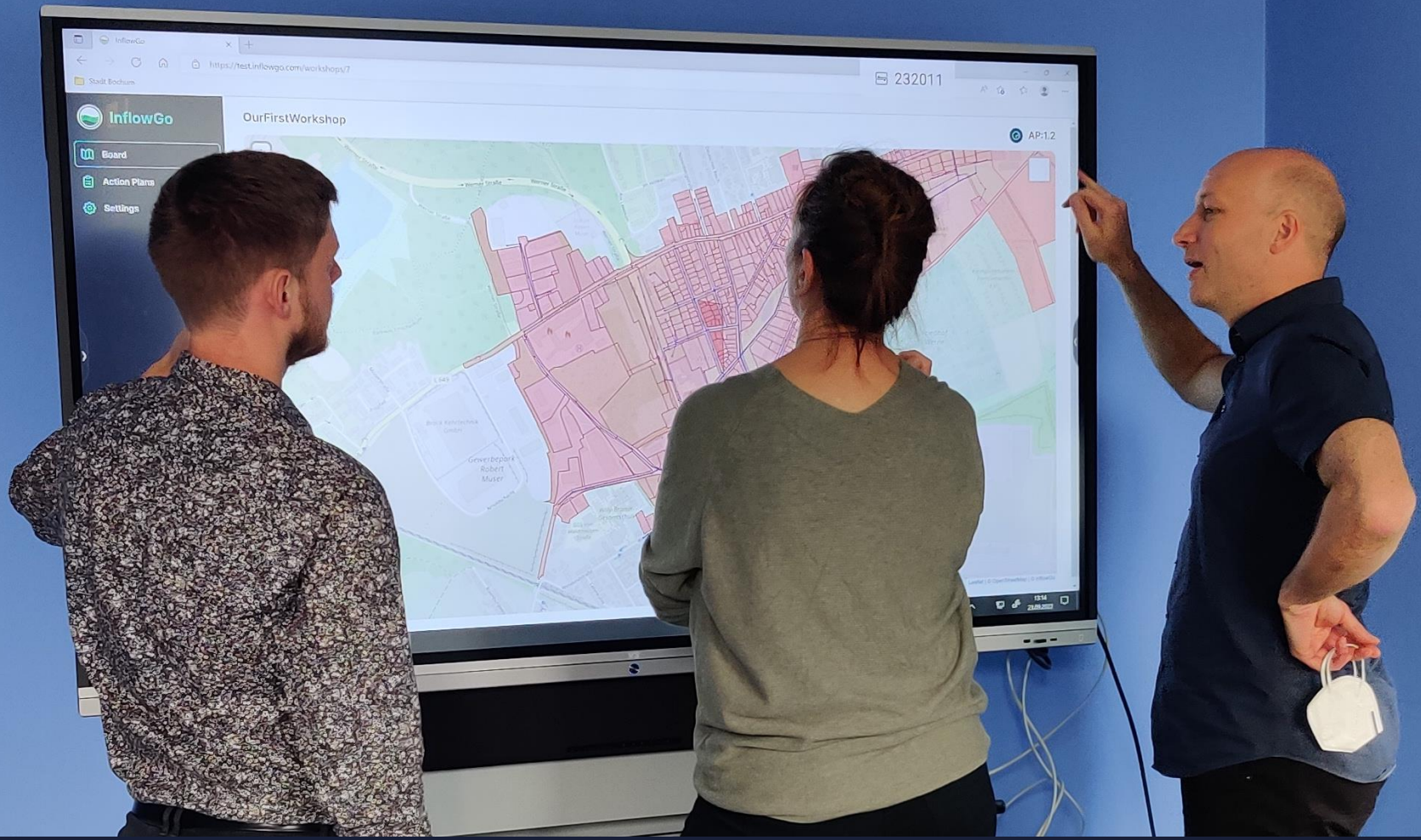
# Hydrodynamisk modellering med maskinlæring

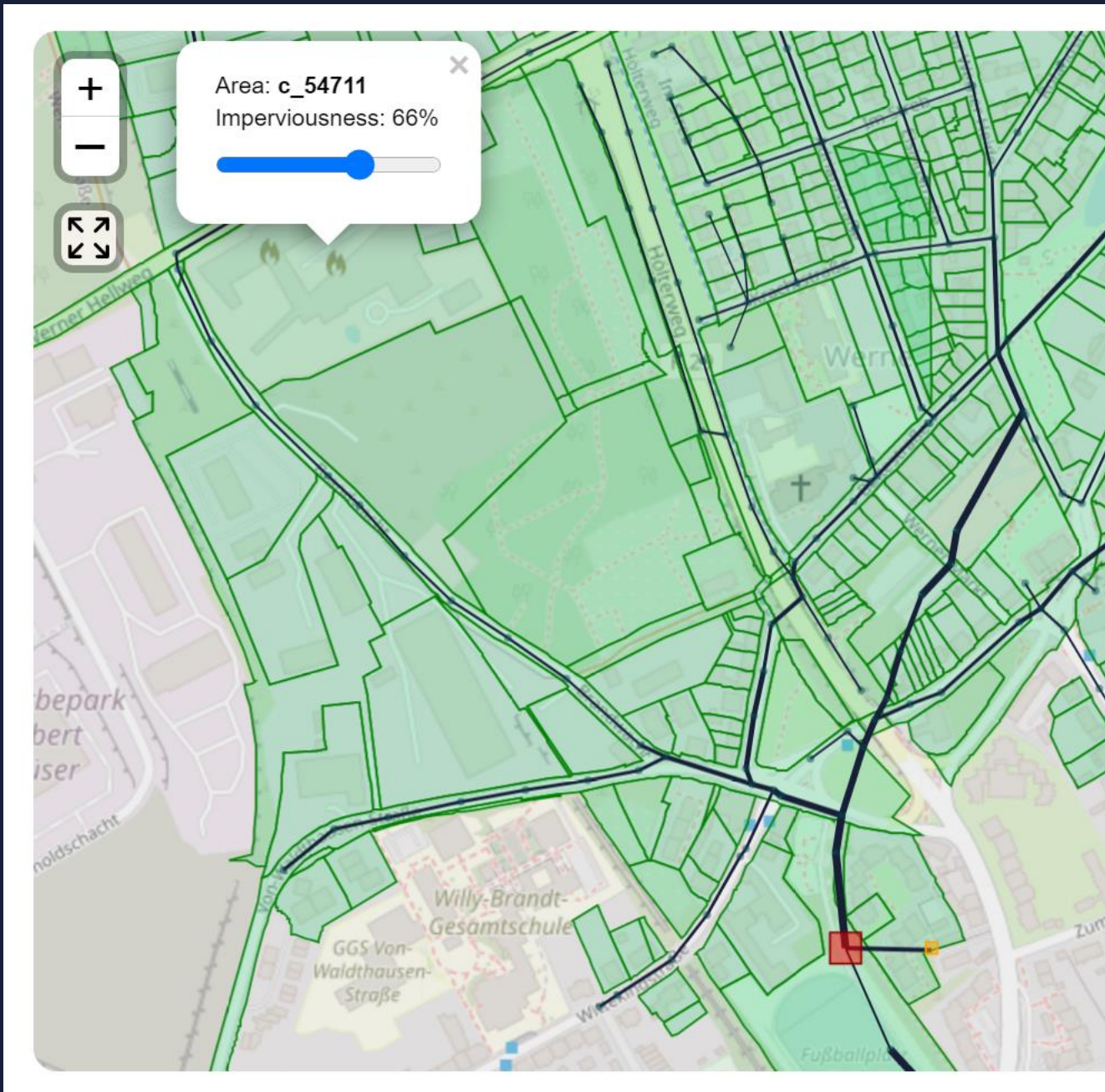


Morten Grum, WaterZerv

EVA temadag: Nedbør - Data og værktøjer

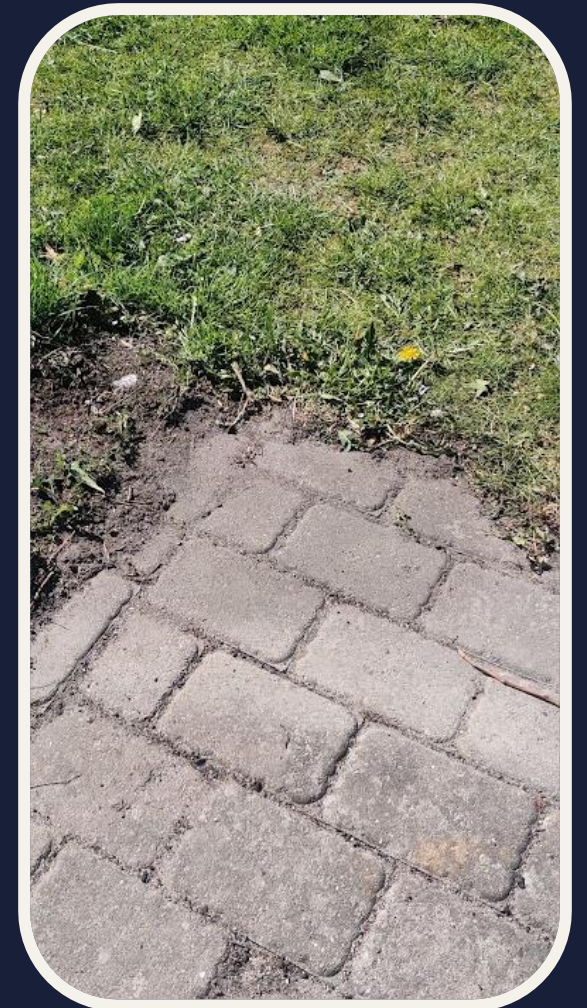
11. maj 2023

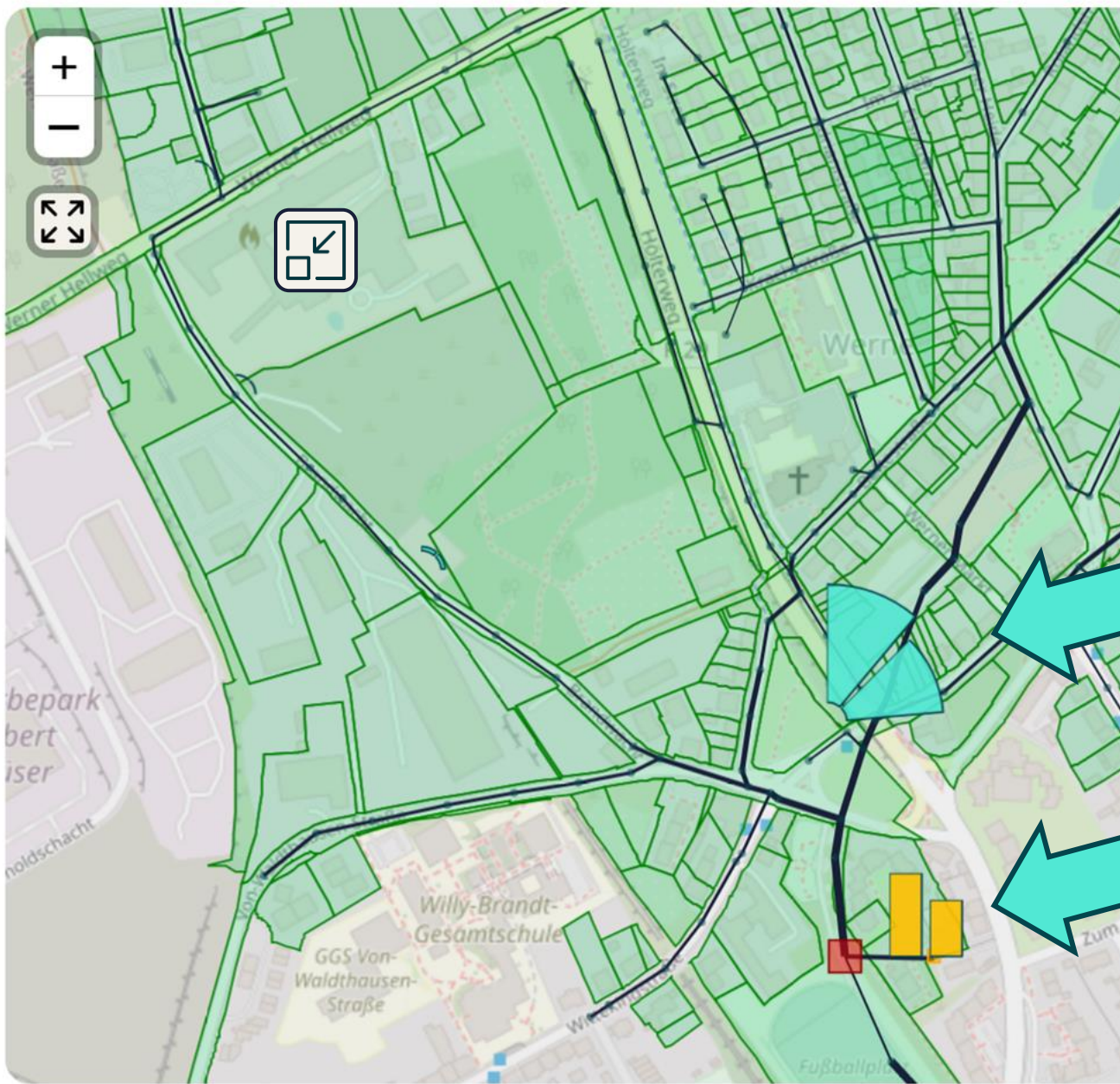




AP:1

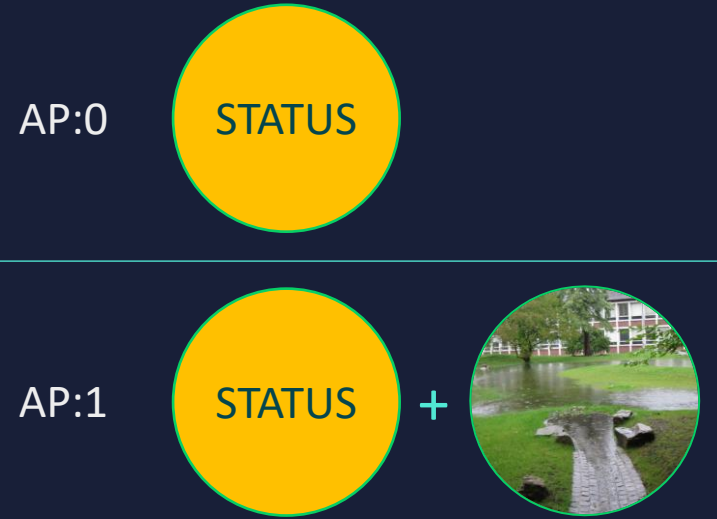
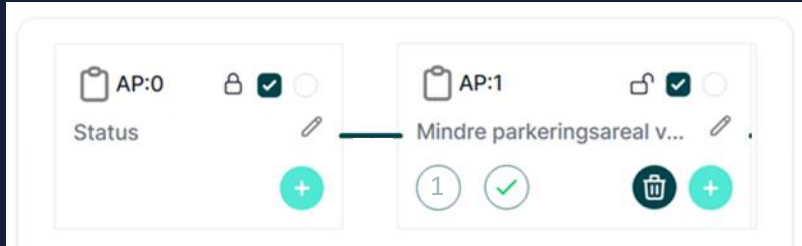
Vi ændre befæstelsesgraden

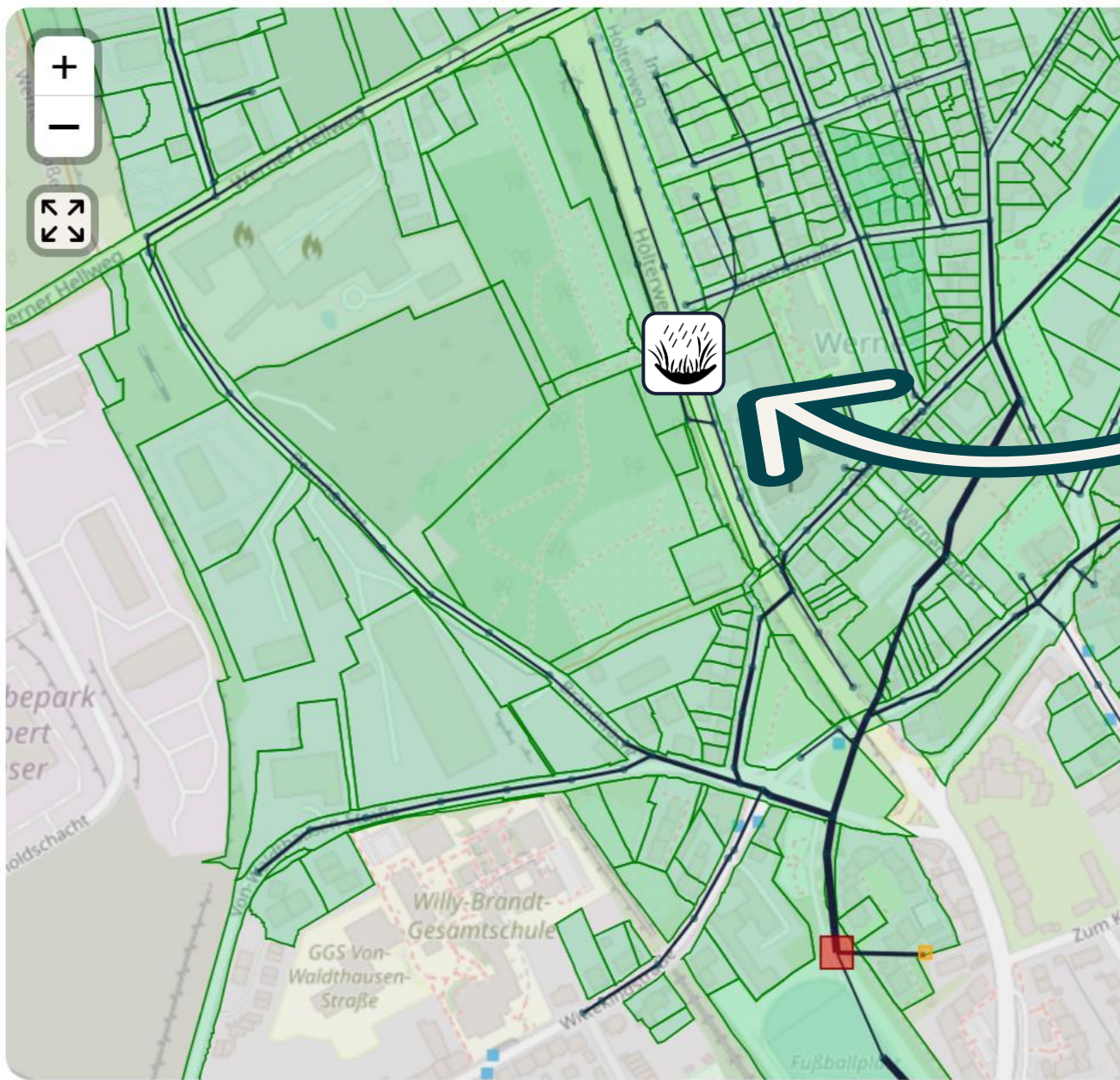




**Ændrede:**

- gentagelsesperiode for overløb og vand på terræn
- og årlige mængder

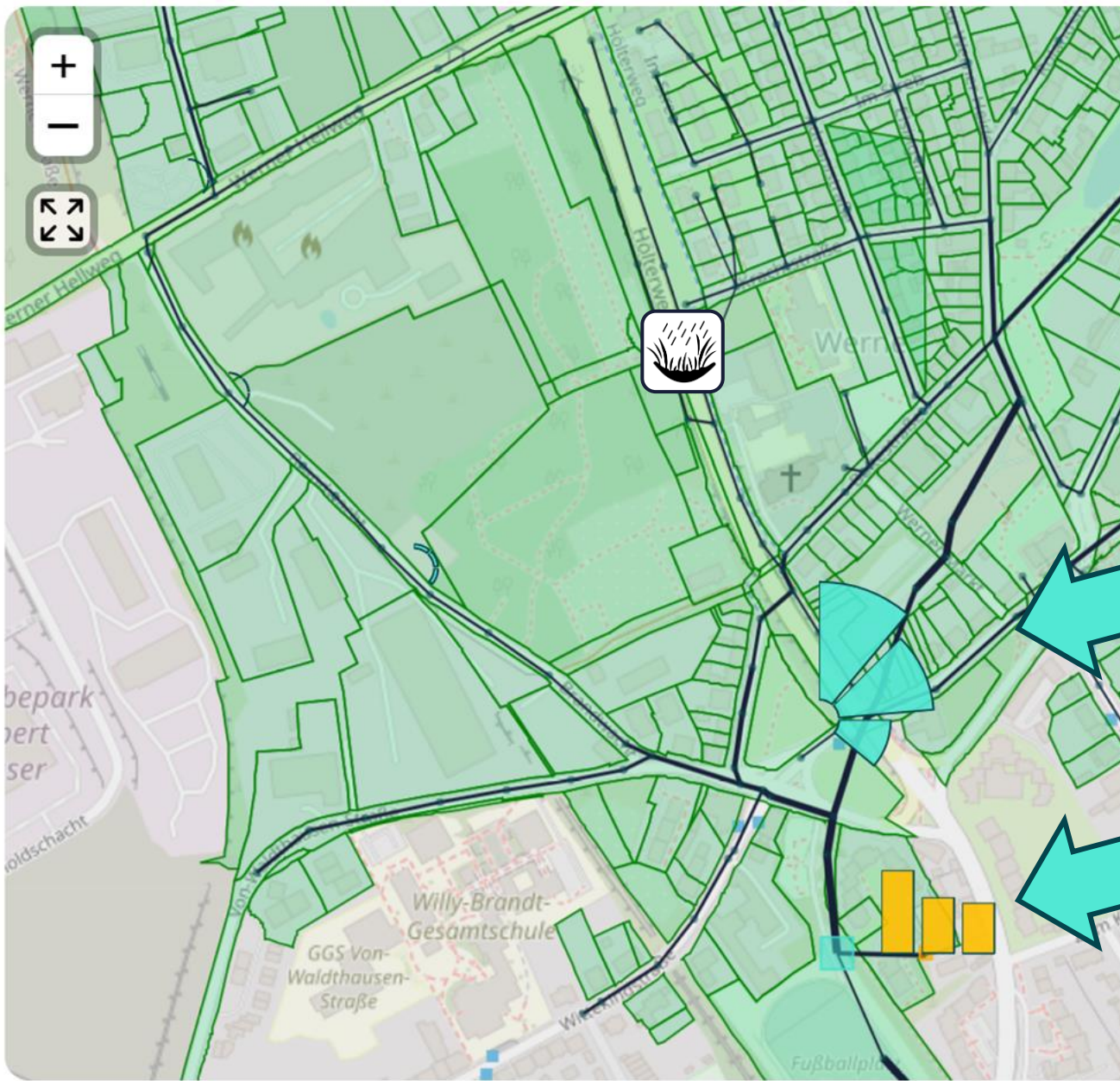




AP:2

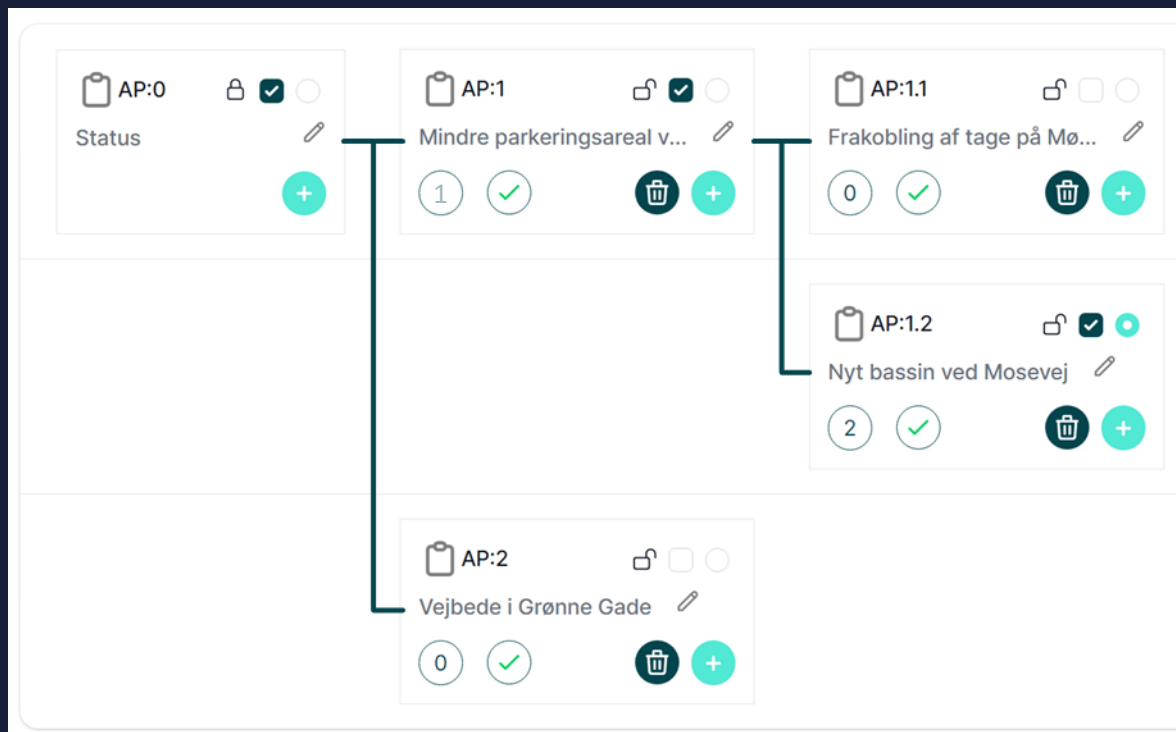
Vi indsætter vejbede





**Ændrede:**

- gentagelsesperiode for overløb og vand på terræn
- og årlige mængder



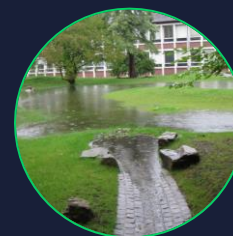
AP:0

STATUS

AP:1

STATUS

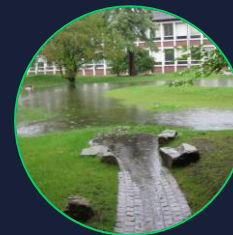
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AP:1.1

STATUS

+



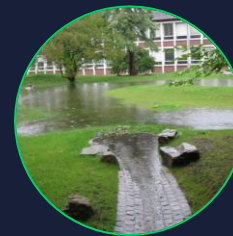
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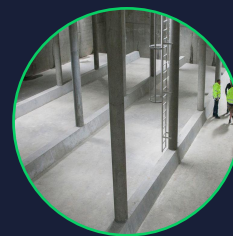
AP:1.2

STATUS

+



+



AP:2

STATUS

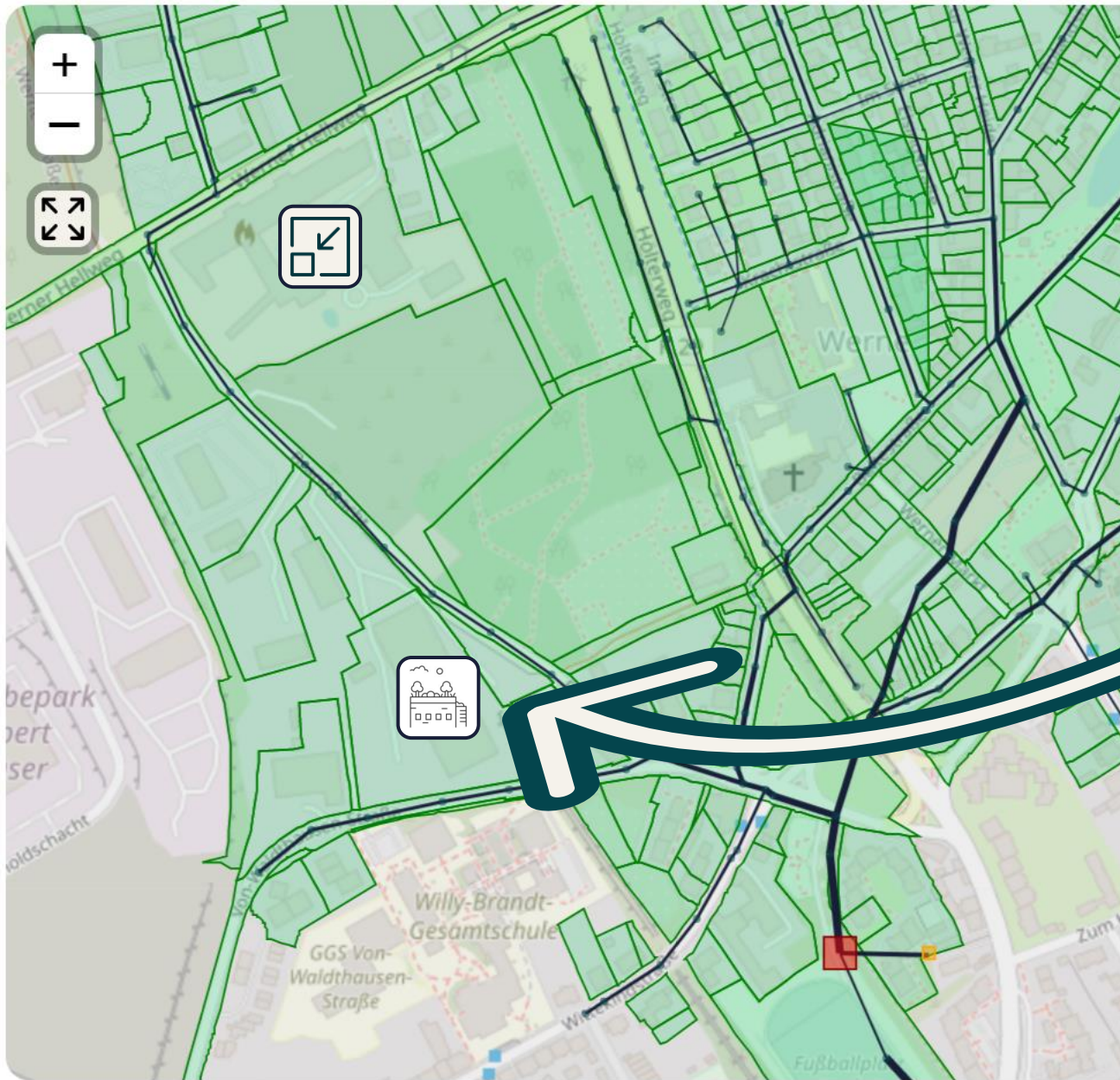
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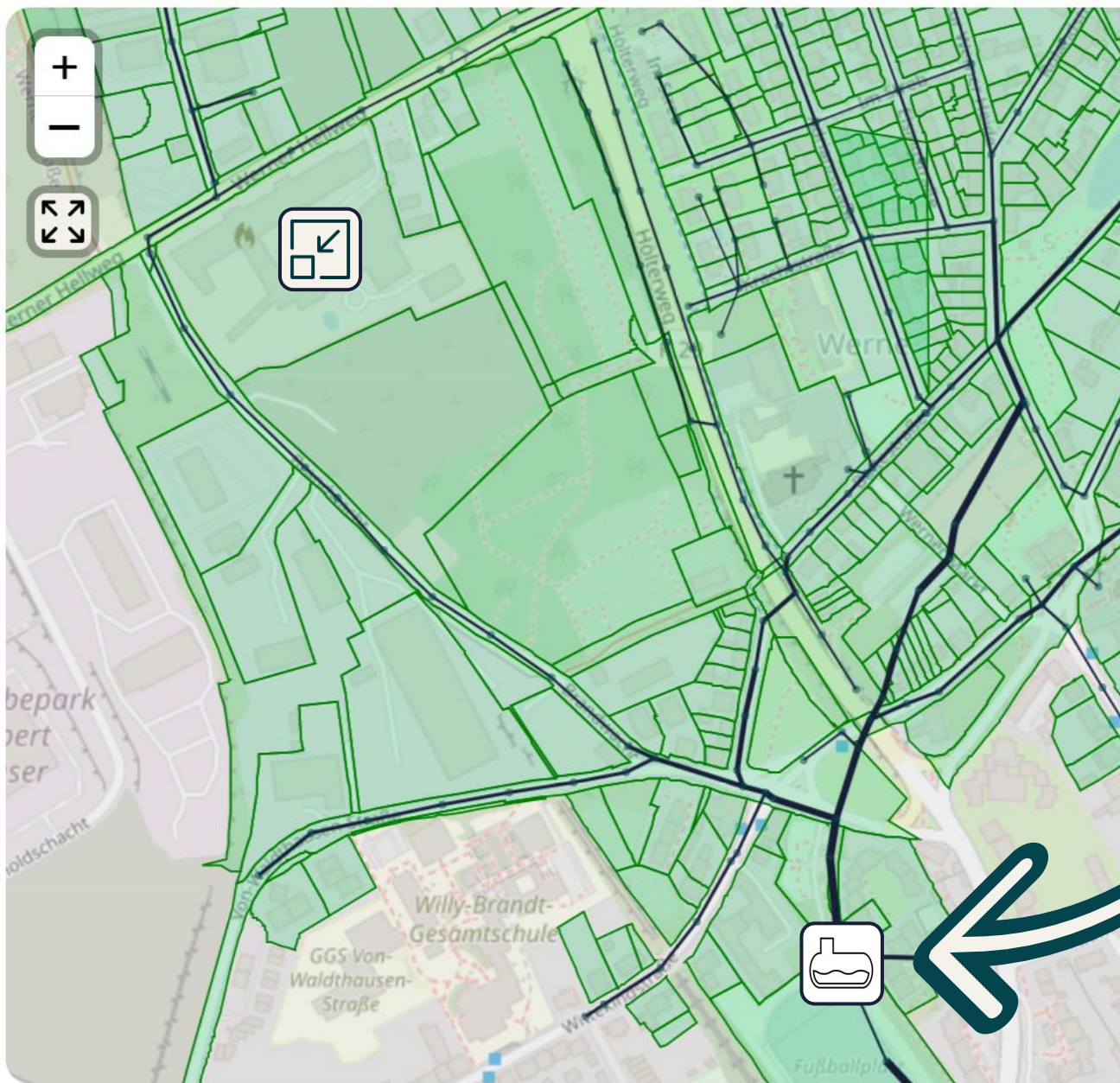
AP:1.1

Reducerede befæstelsesgrad  
med grønne tage



AP: 1.2

Reducerede befæstelsesgrad  
med bassin

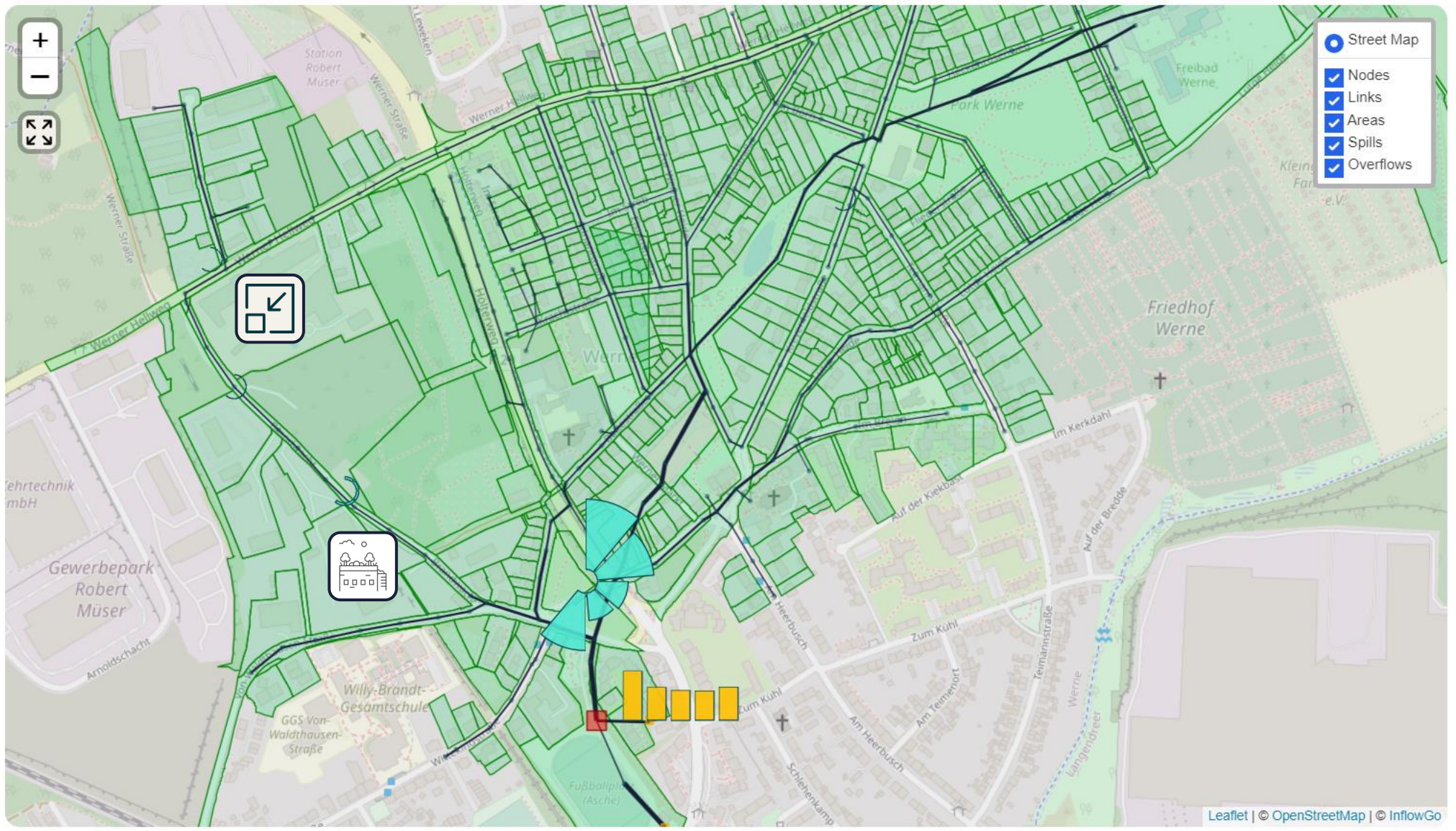


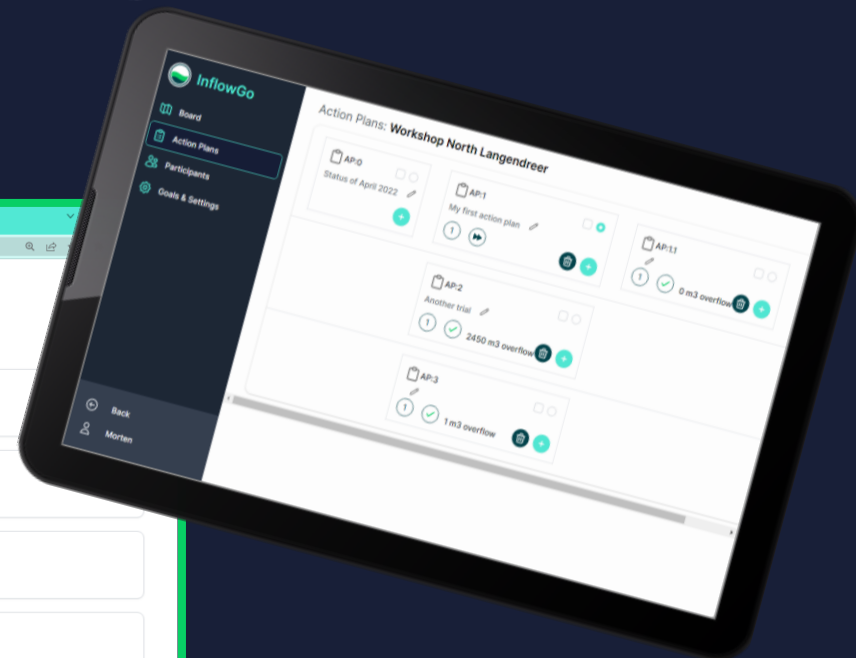
- Board
- Action Plans
- Participants
- Goals & Settings

- Exit Workshop
- Morten

### EVA Workshop - 11. maj 2023

AP:1.1





**Participants**

WaterZerv	DTU
DTU	DTU
DTU	Stadt Bochum
Stadt Bochum	Stadt Bochum

Navigation sidebar: Board, Action Plans, **Participants**, Goals & Settings, Exit Workshop, Morten

Men det går jo ikke  
afløbsberegninger kan jo tag timer!

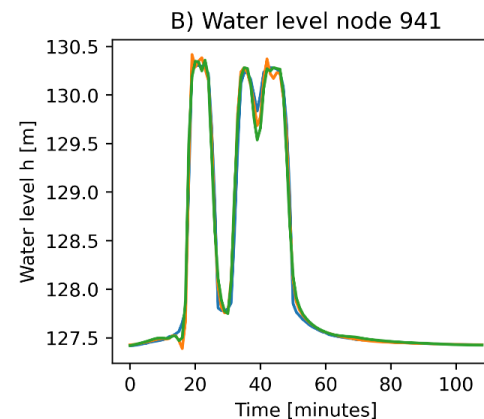
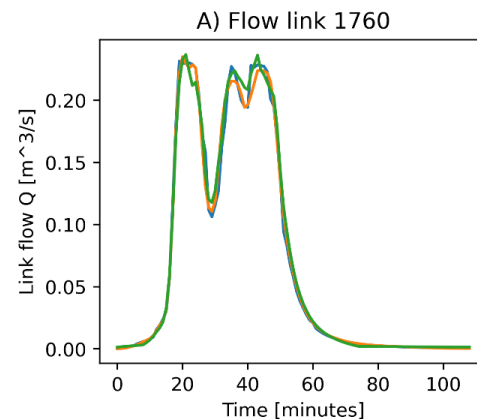
*eller hvad?*



# Hydrodynamisk modellering med maskinlæring

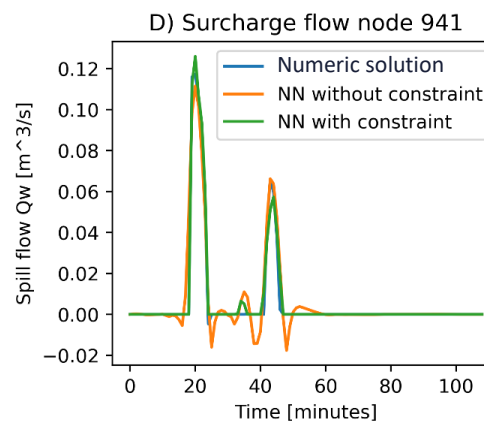
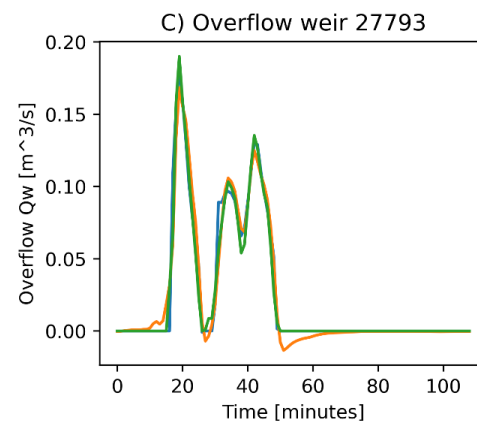
~ 100 x hurtigere end eksisterende metoder

Flow







Vand niveau

Overløb

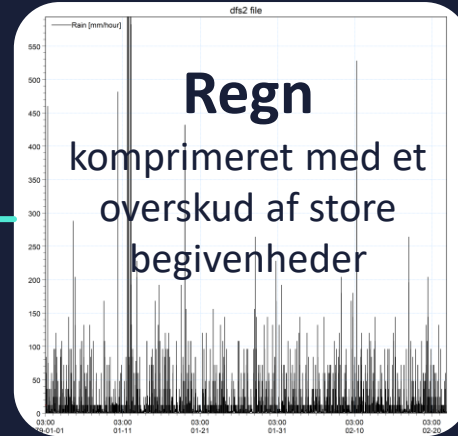


Vand på terræn

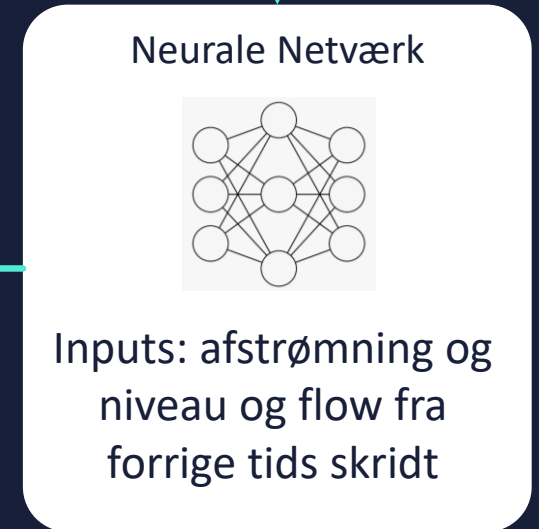
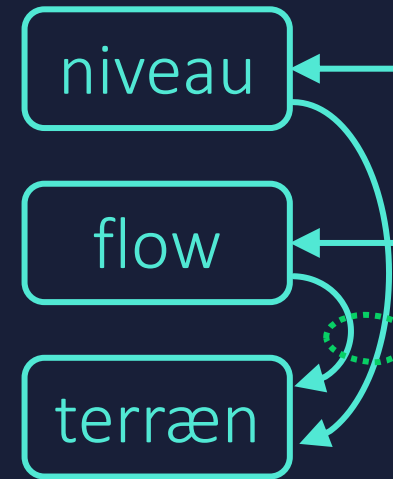
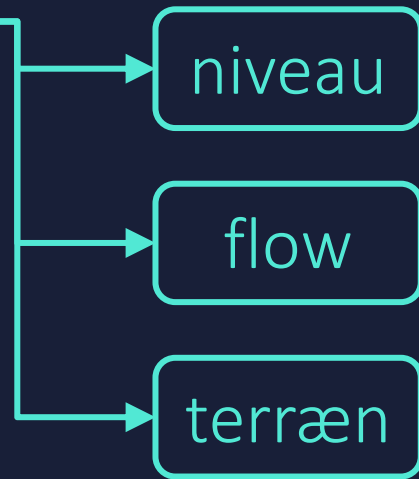
# Hydrodynamisk modellering med maskinlæring

Ændring i	<b>Generation 1</b> (den vi bygger på i dag)	<b>Generation 2</b> (i udvikling)
hydrologien	Kræver <b>ikke</b> gentræning 	Kræver <b>ikke</b> gentræning 
hydraulikken	Kræver gentræning 	Kræver <b>ikke</b> gentræning 

# Generation 1:



60 knuder  
58 ledninger  
i Bochum, Tyskland



FYSISK  
BEGRÆNSNING

Neurale netværk trænet ved at minimere forskellen







En AI-accelererede afløbsmodel  
hvor man arbejder sammen

Workshop

Evaluering

Udvikling

