

living planet symposium | BONN

23–27 May
2022

TAKING THE PULSE
OF OUR PLANET FROM SPACE



Digital Twin Germany: Towards a high-resolution, nationwide digital twin for government authorities

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Why do we need a Digital Twin Germany?

Answering major societal questions with a strong geo-relationship

- Security
- Climate Change
- Migration
- Electromobility
- Equivalent living conditions
- ...

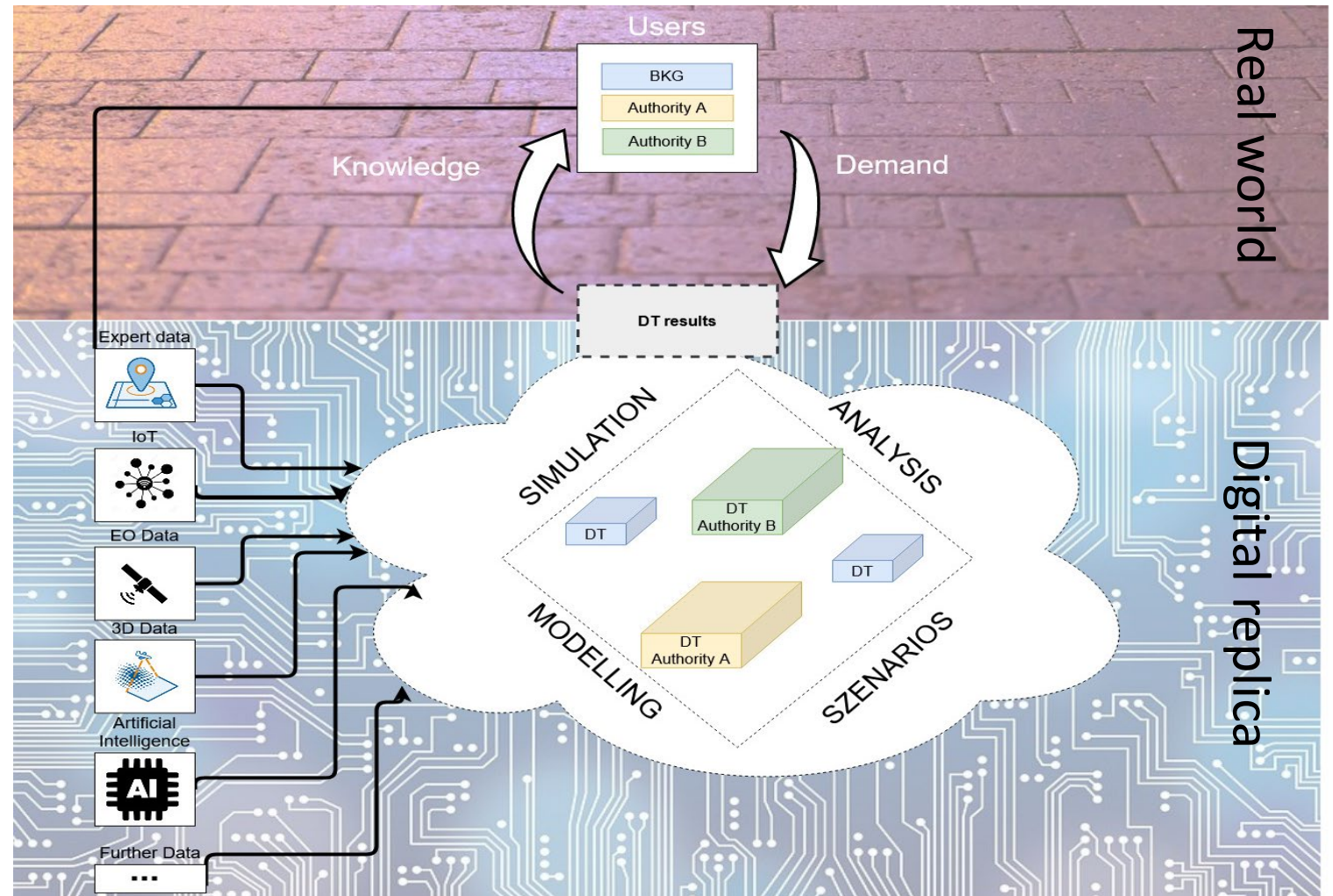
nationwide

homogeneous

Alexander Spatari via Getty Images

Governmental analysis and simulation infrastructure

- Demand-oriented consolidation of sector-specific data of the federal government
- Including expertise of BKG (POIs, routing, etc.) & a holistic 3D-model





We have to provide the experts with best suitable datasets and methods.





Ensure interfaces to digital twins
from EU to municipalities

Municipalities



München.
Digital. Twin.



CONNECTED
URBAN
TWINs

Germany



EU

Destination
Earth

Pilot Project Hamburg Metropolitan Region (MRH) – Testing the feasibility of a Digital Twin for Germany

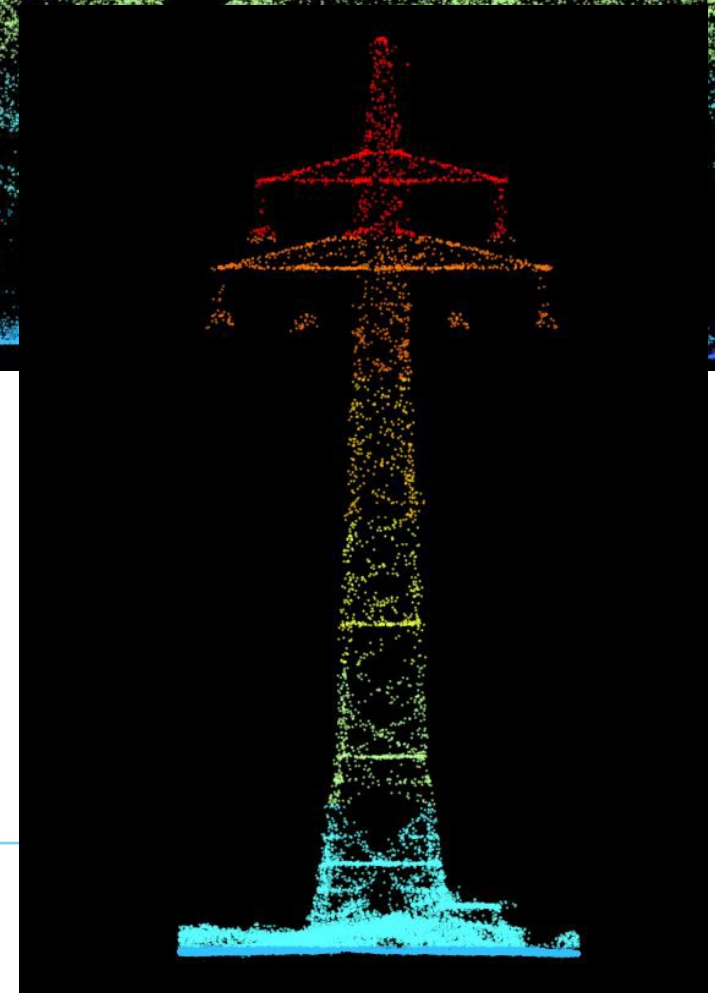
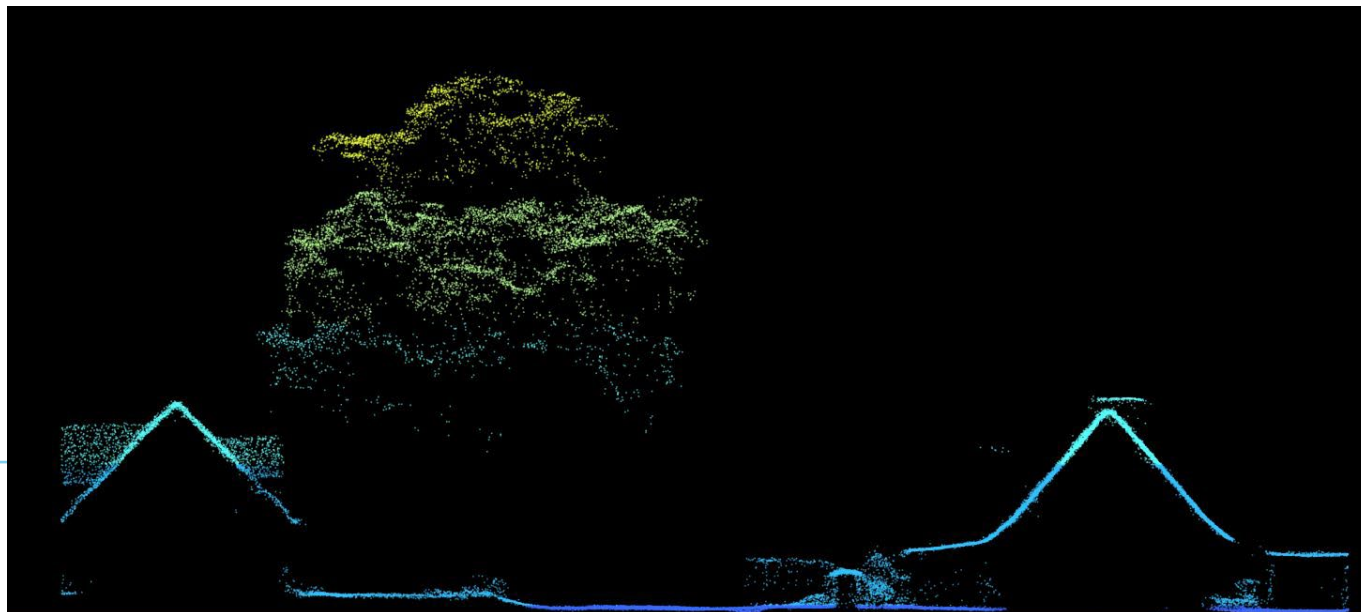
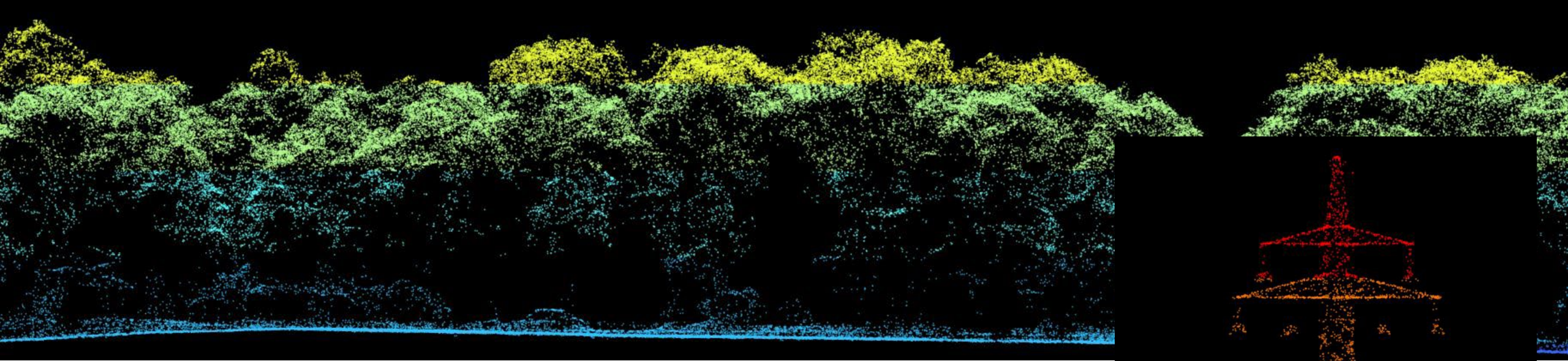
Overview of MRH (blue) and the planned flight lines (red)

Period: Oct. 21 – Feb. 22
Area size: 8650 km²
Sensor: Single Photon LiDAR
Flight hours: 90 h
Flight altitude: 3350 m
Point density: 42 pts/m²
Height accuracy: <10 cm

Objectives:

- Getting to know technologies, methods and data
- Establish cooperation with partners in the federal and state governments.
- Advertise at the political level and with cooperation partners to secure the necessary resources.

Preliminary results



Video



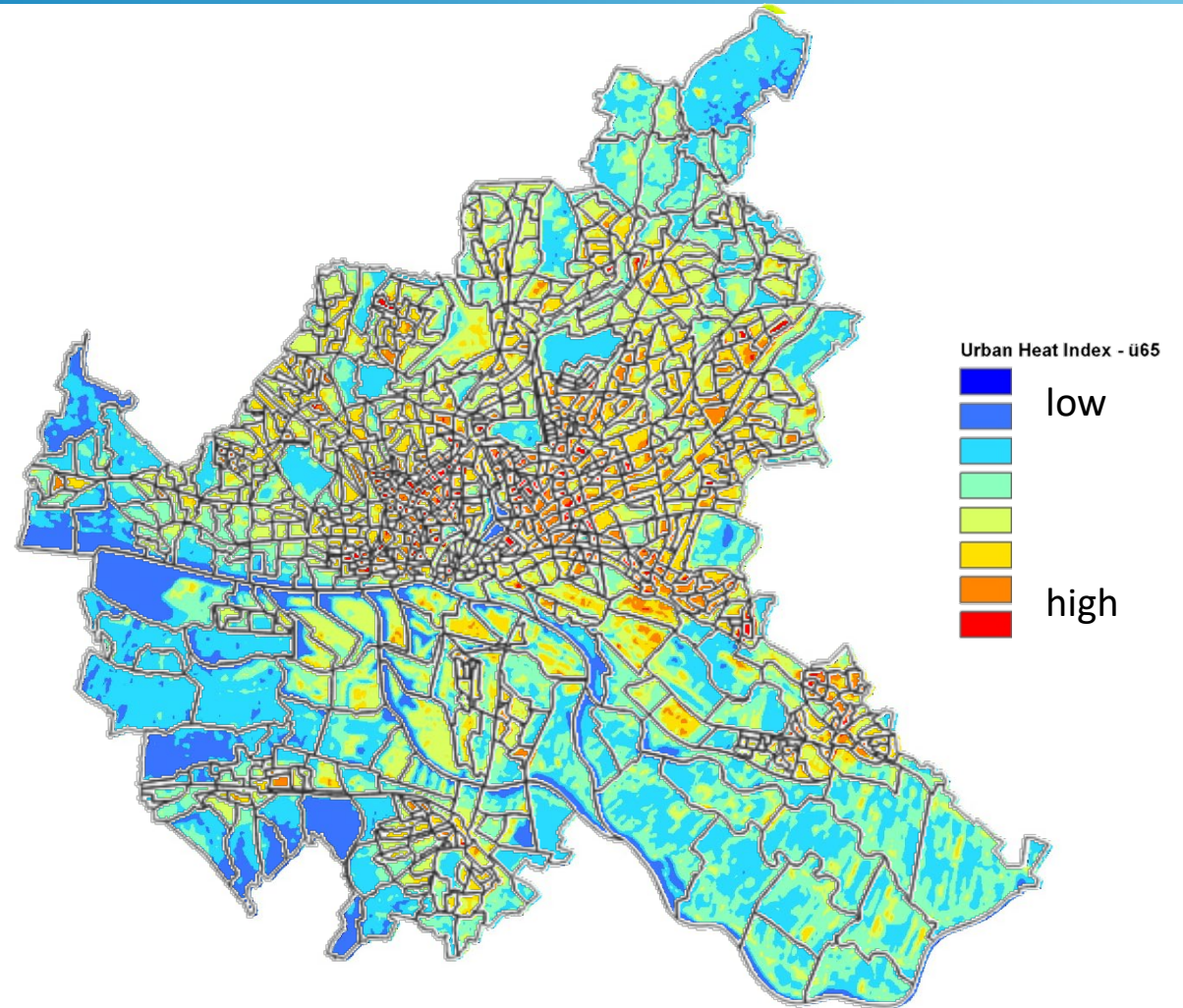
Sample application fields

Simple sample use case

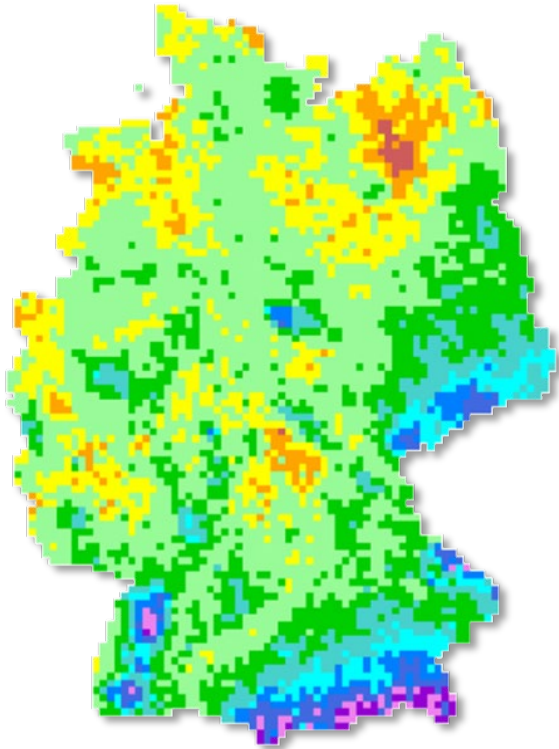
Land surface temperature in °C
derived from Landsat

Combination with population
statistics

Urban Heat Index



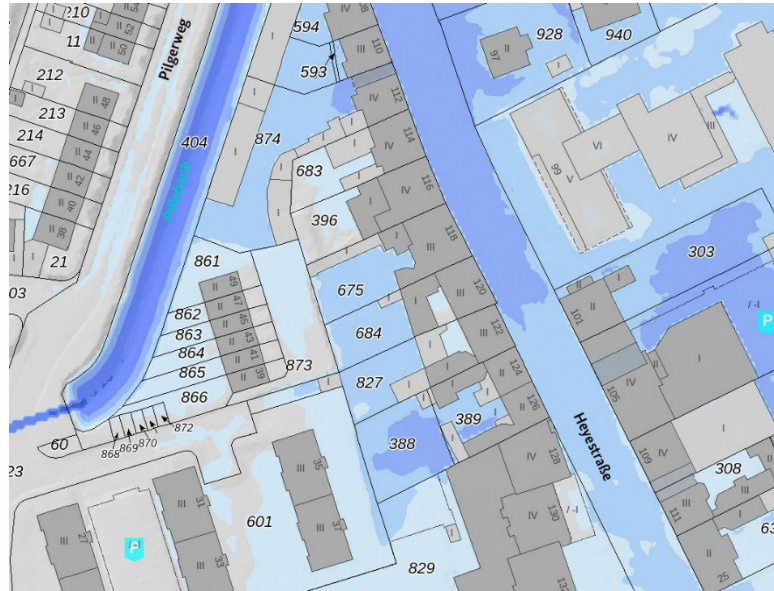
Storm rainfall information map



Probabilities of occurrence of storm rainfall, as a function of duration stages (5 min - 72 h) and annualities (1 a to 100 a)

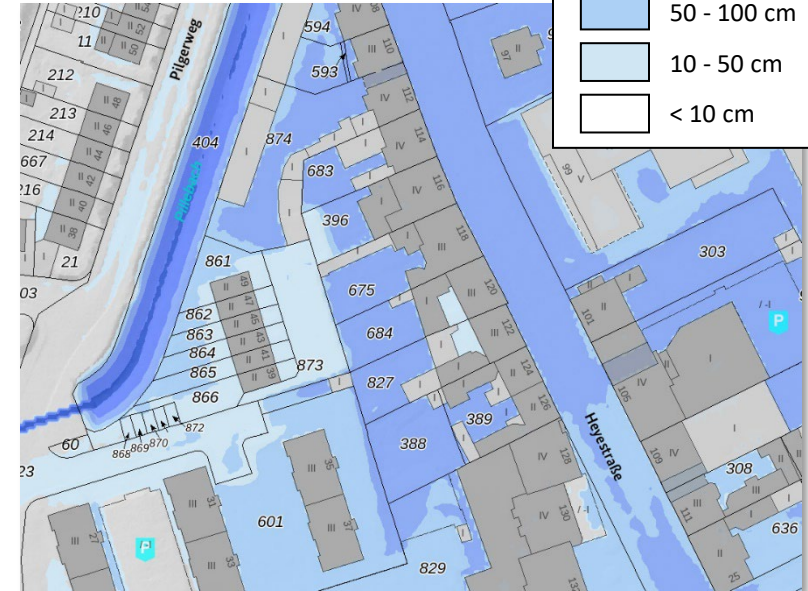
Scenario 1:
Rare event

$T_N = 100 \text{ a}$ ↓

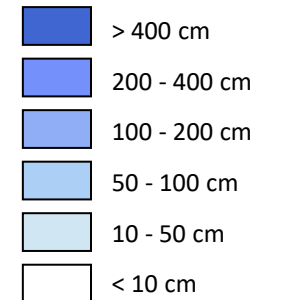


Scenario 2:
Extrem event

90 mm/h ↓



**max.
water level**



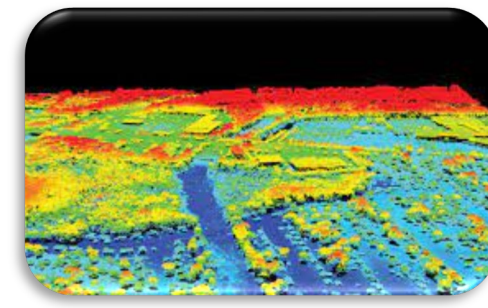
Project schedule



Demonstration project
Hamburg metropolitan
region in 2021

Conception phase/
Lessons learned
in 2022

Digital Twin Germany
from 2023



Summary

- Establish a tool for answering societal questions with strong geo-relevance
- Provide an analysis and simulation infrastructure for the federal government
- Demand-oriented consolidation of sector-specific data
- Ensure interfaces to get from EU to municipalities level





Federal Agency for
Cartography and Geodesy



Thank you for your kind attention!

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