

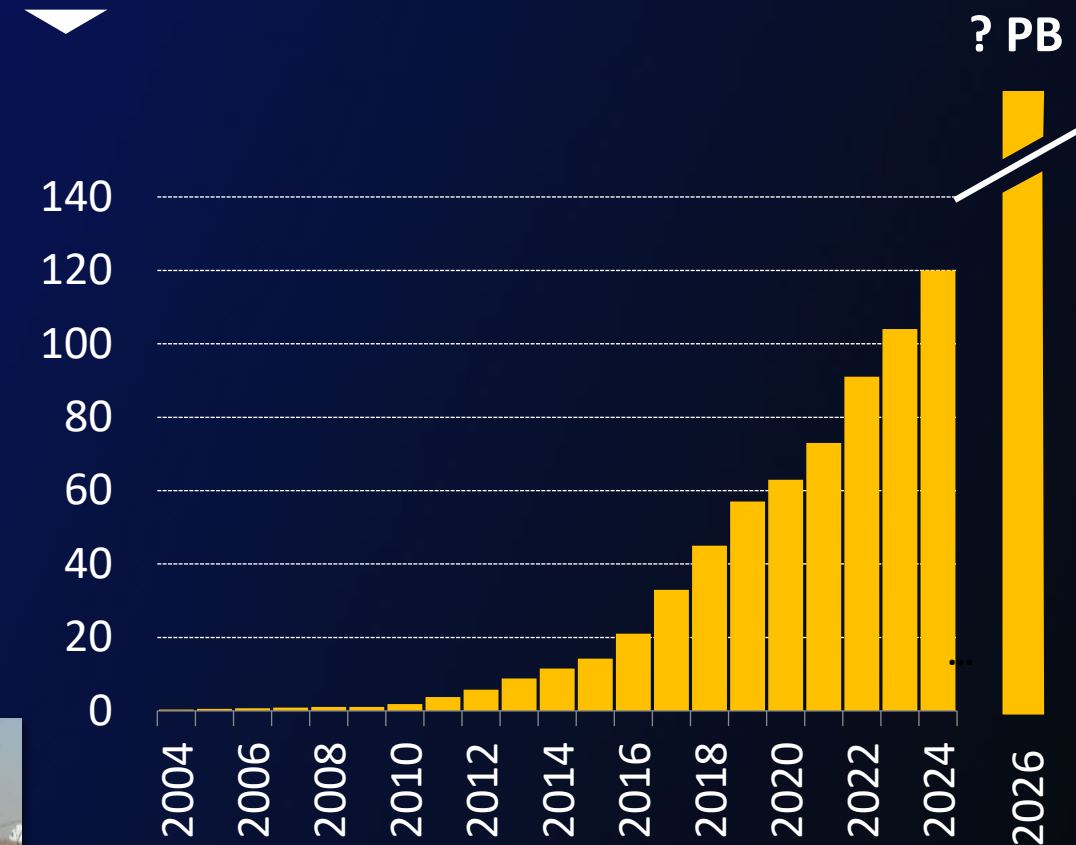
Increasing Amounts Of Geospatial Information – A Safety Hazard?

Trends for the inventory of geodata

- The quantity is rapidly increasing, the reasons:
 - new platforms
 - new sensors
 - more computing power
- i.e:
 - better spatial/temporal resolution
 - new data types

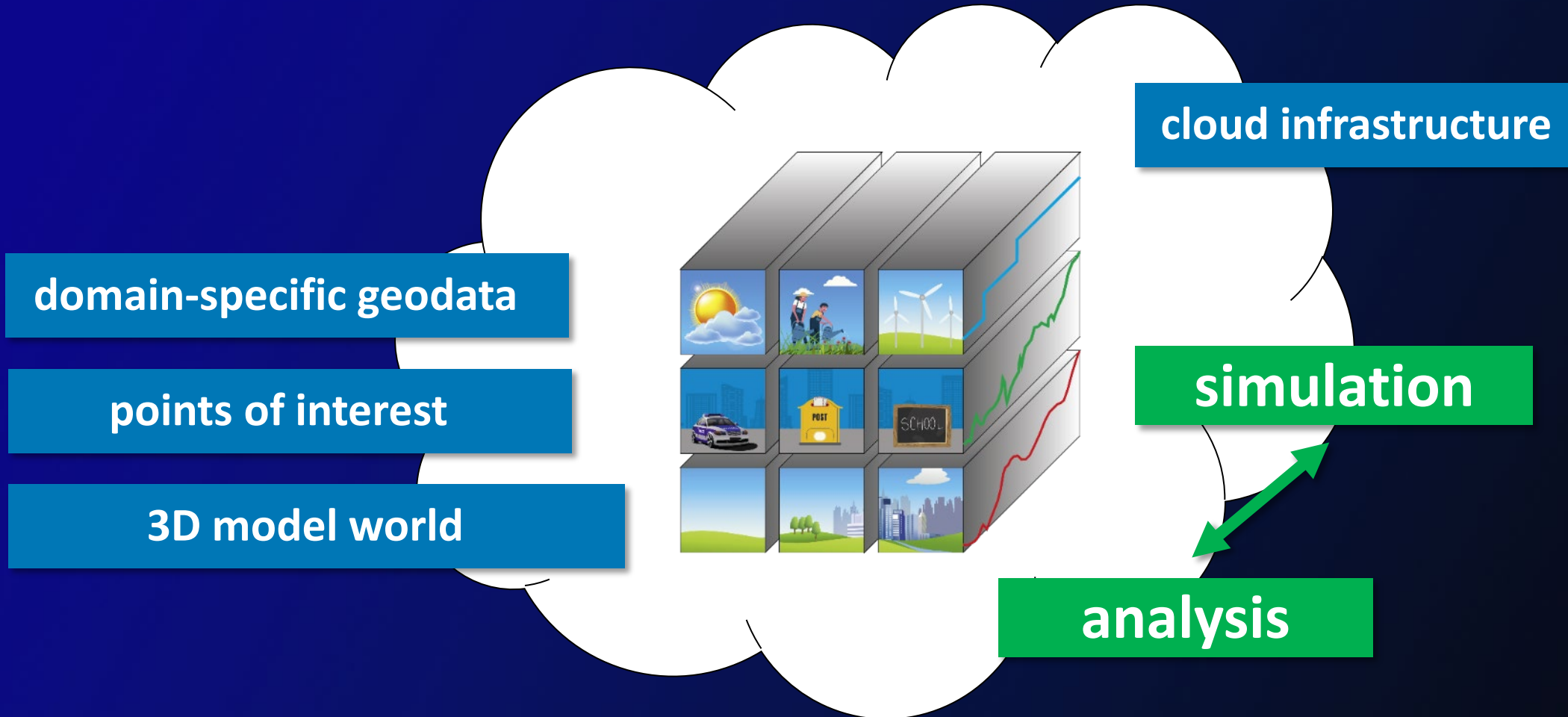


Volume of the meteorological
DWD database in petabytes (Source: DWD)



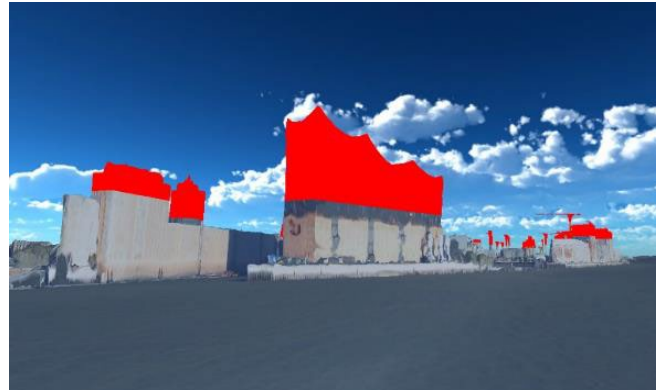
Geospatial digital twins

are currently among the most advanced tools for supporting decision making



Geospatial digital twins

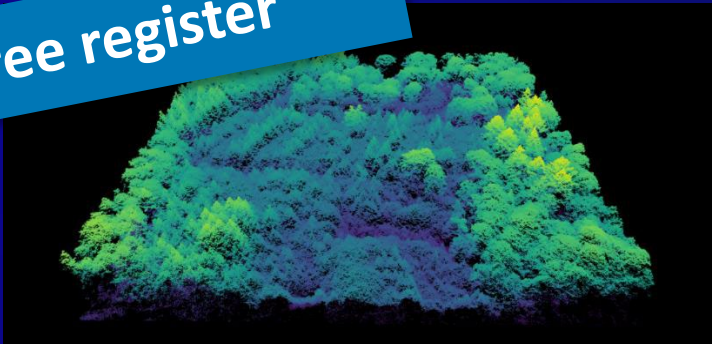
Example: Electronic Terrain and Obstacle Data



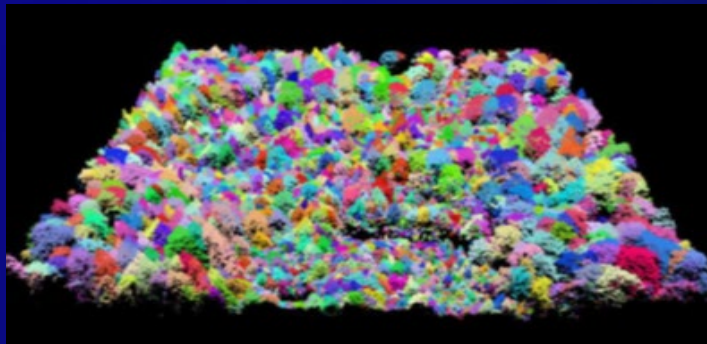
Geospatial digital twins

Examples: Tree register, heavy rainfall prevention

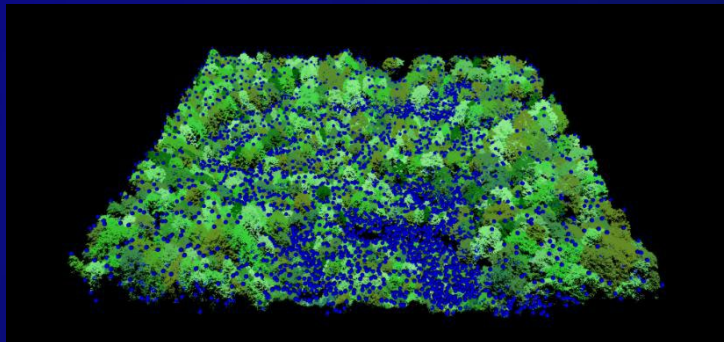
tree register



point cloud
elevations colored

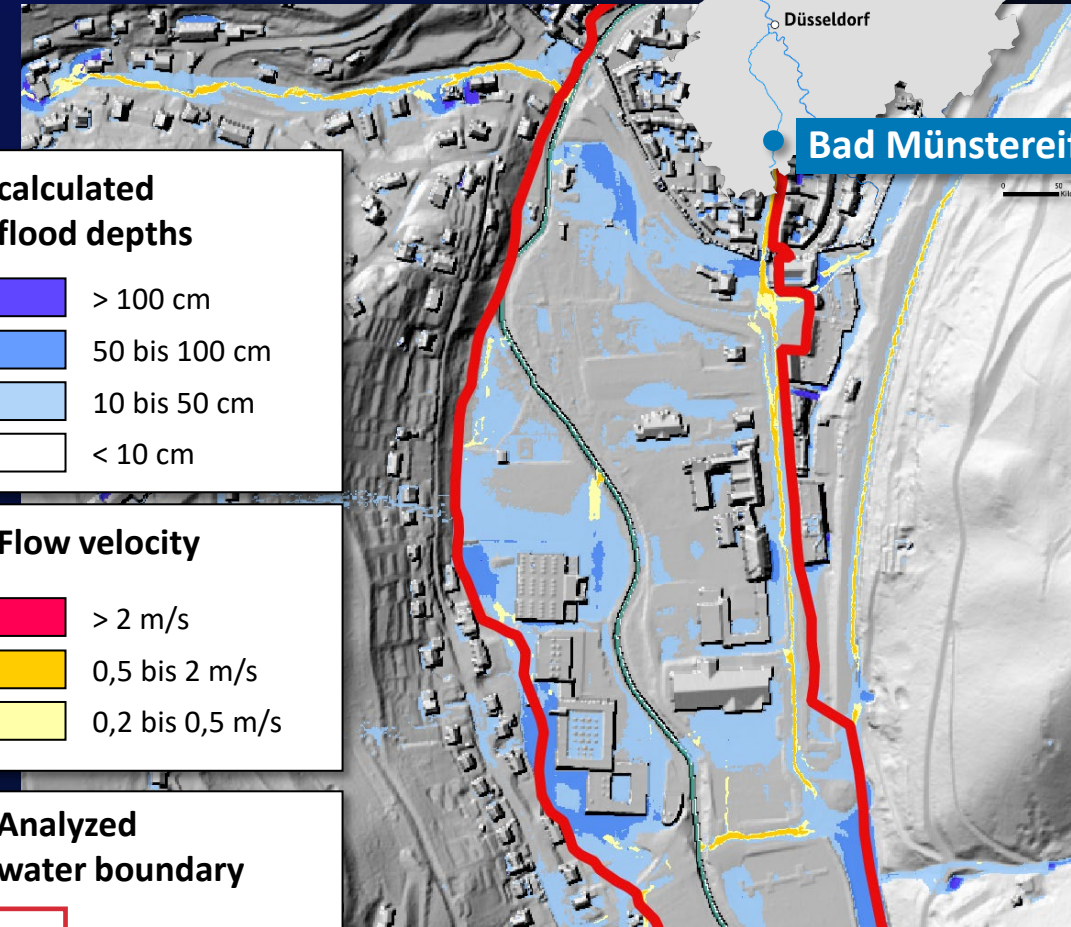


Color-coded
individual trees

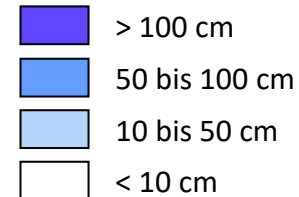


Individual tree
crowns

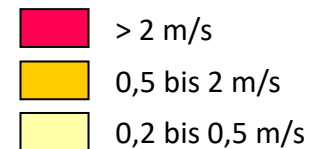
heavy rainfall prevention



calculated
flood depths



Flow velocity



Analyzed
water boundary



Do public geospatial data pose a security risk?

Public geoinformation fosters innovation and aids decision-making processes!

➡ Many approaches to improving access to geoinformation

- European requirements, such as the obligation for public bodies to make high-value datasets (HVDs) available
- National Geoinformation Strategy 2.0 (NGIS), Further Development of GDI-DE

However, in the hands of attackers, geoinformation can potentially pose a significant threat to national security.

Do public geospatial data pose a security risk?

Who can use geospatial data to carry out attacks, and how can this be done?

State actors (military forces) within the targeting process



Shahed drone from Idmental on <https://commons.wikimedia.org>
RS-24 on MZKT-79221 from Vitaly V. Kuzmin on <https://commons.wikimedia.org>
Ch-47M2 Kinschal on a MiG-31K from kremlin.ru on <https://commons.wikimedia.org>

State-directed low-level agents, criminals, psychopaths, politically motivated perpetrators

Do public geospatial data pose a security risk?

Geospatial data

- often play a significant role in the targeting processes of state actors (foreign military forces)
- public geospatial data generally serve only as a "second source". Examples of relevant information include elevation data and the locations of points of interest (POIs).



Do public geospatial data pose a security risk?

State-directed low-level agents, criminals, psychopaths, politically motivated perpetrators

In contrast to the situation with state actors, "public" geospatial data plays a crucial role for low-level agents, criminals, psychopaths, and politically motivated perpetrators.

Do public geospatial data pose a security risk?

**There are cases in which freely available geospatial data endangers national security!
We must—and we can—do something!**

- Establishing a close exchange between the bodies holding geospatial data and the security authorities regarding this topic**
- Identify and assess potential targets (e.g., critical infrastructure)**
- Ensure graded access to the geodata and geoinformation in question**
- Adjust “publicly” available datasets to security needs if necessary**

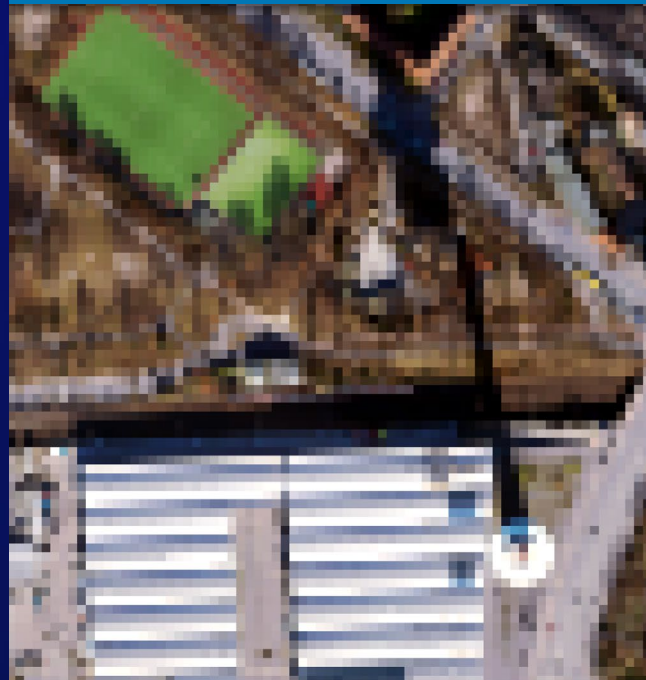
Approaches to solutions

Reduction of resolution in flight survey data

Digital orthophotos



commercial satellite
imagery data

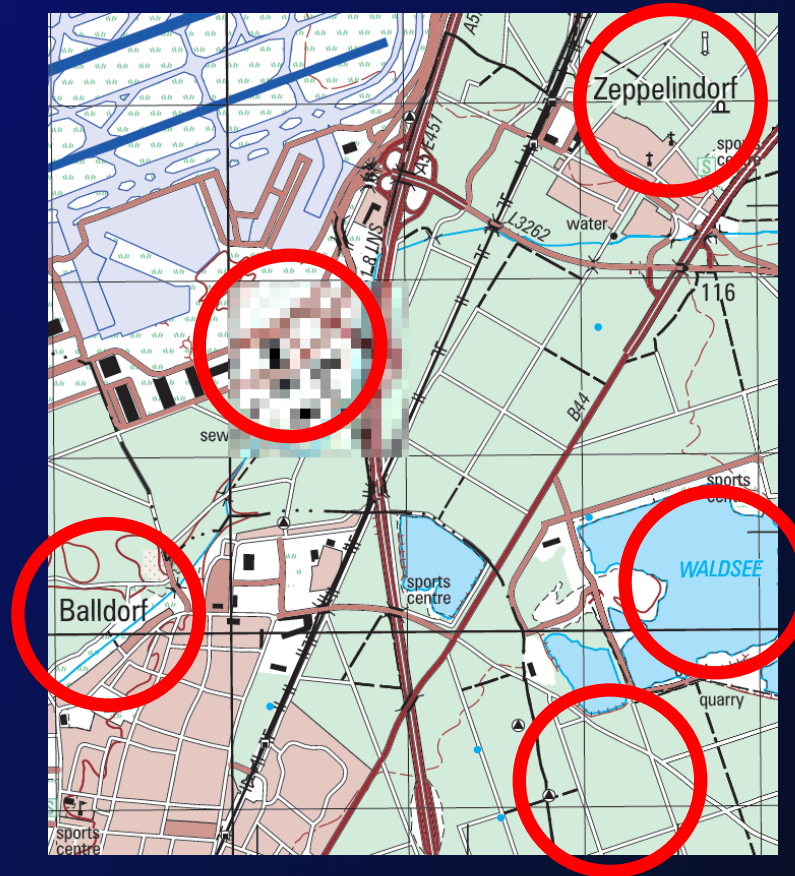


Sentinel data



Approaches to solutions:

Manipulated representation of geospatial data (POIs)



pixelation

name changes

legending

Summary

- Geodata and geoinformation are being produced and used in ever greater numbers, including for planning and managing infrastructure projects
- Geodata and geoinformation are often used for planning and carrying out attacks.
- To prevent the unauthorized use of geodata and geoinformation,
 - A close and trusting communication between the authorities holding geodata and the security agencies is necessary.
 - The datasets that could be of interest to a potential attacker has to be identified and evaluated and a graded access to the dataset in question has to be ensured
 - Protective measures for some datasets are necessary. These can include, for example: reducing the resolution in publicly available datasets, pixelation

Thank you for your attention

Prof. Dr. Paul Becker

President (retired) Federal Agency for Cartography and Geodesie .

PaulBecker9@icloud.com

Tel. +49 172 45 49 775