

Digital twins for the sustainable maintenance of ageing waterway infrastructure



ISPRS Workshop, 10th July 2025, Vienna

Berit Jost

Aeaging infrastructure

Carola Bridge, Dresden, Germany



Quay walls in harbors

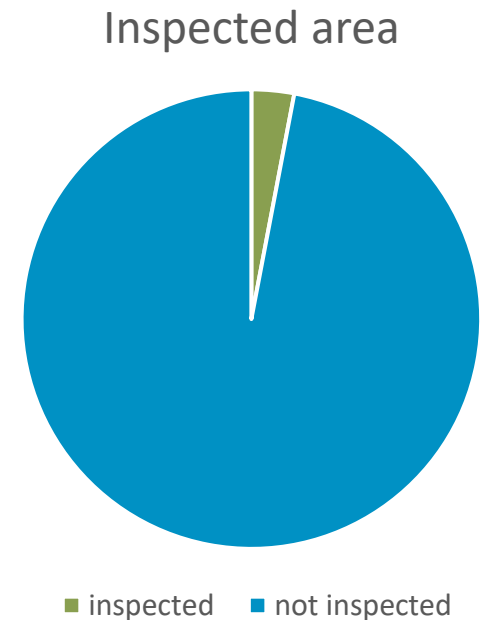
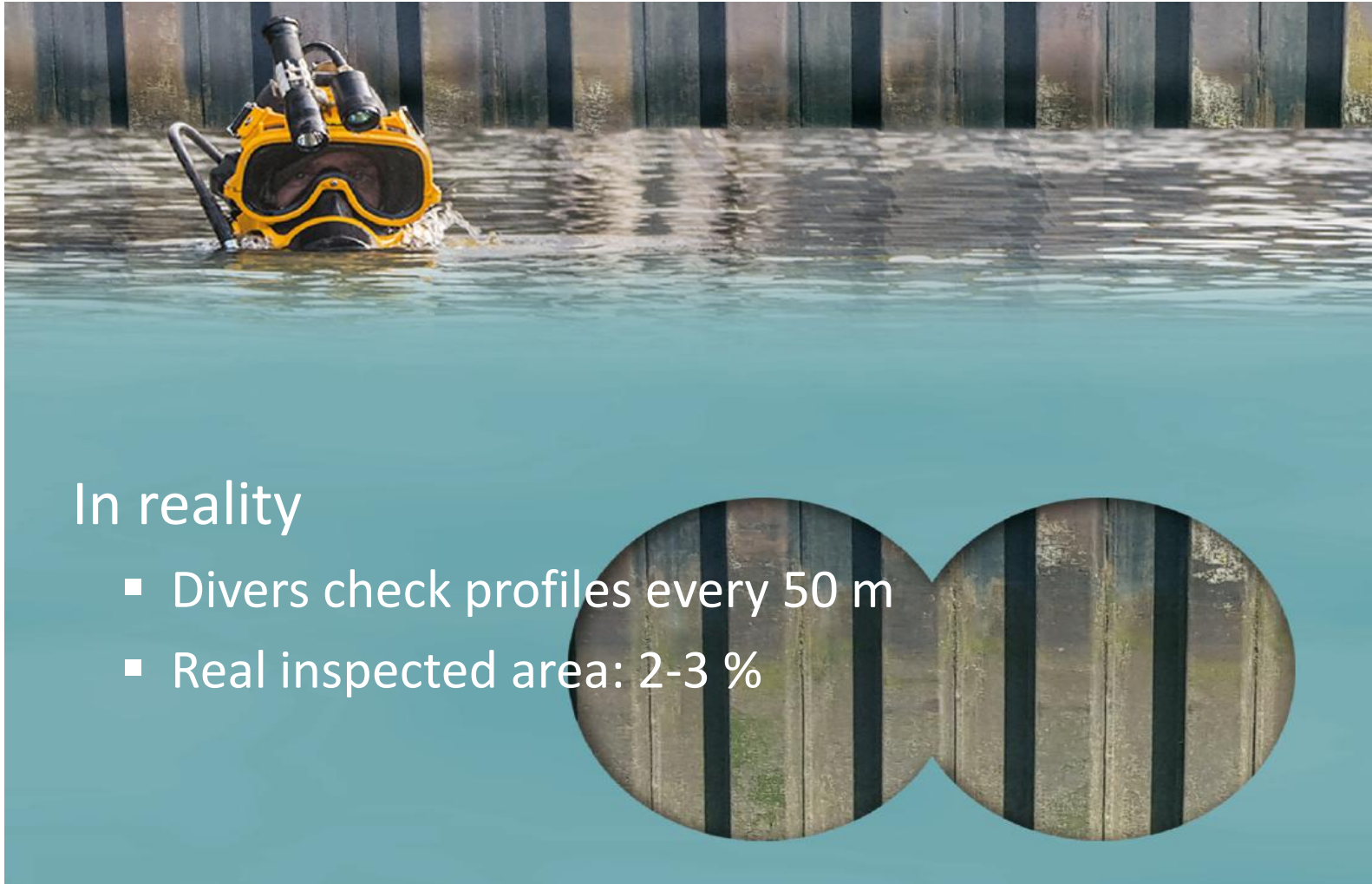
- Europe:
8,500 km in total
- U.S.:
37,000 km in total

Σ 45,000 km

Regular inspection above and below water necessary!!!



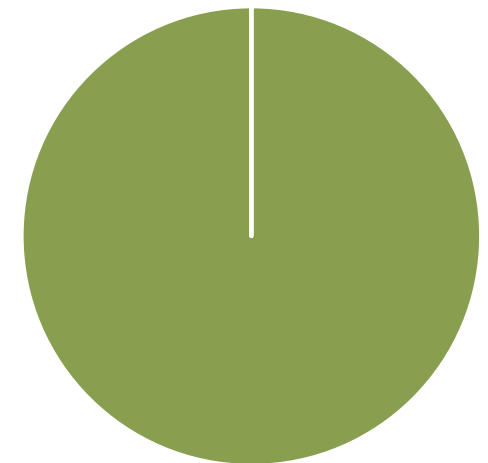
Infrastructure inspection



Digital infrastructure inspection



Inspected area



■ inspected ■ not inspected

Digital infrastructure inspection



Funded by:



on the basis of a decision by the German Bundestag



3D HydroMapper

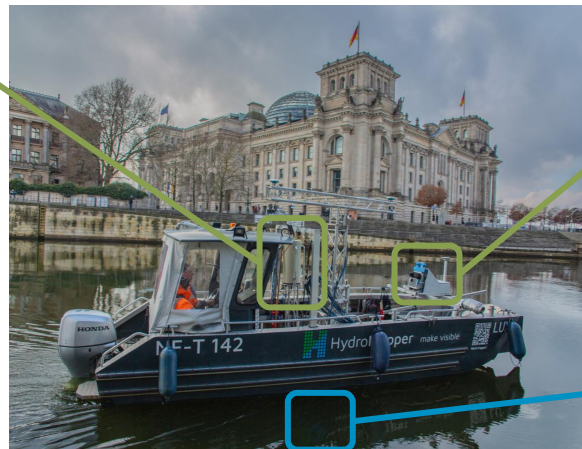
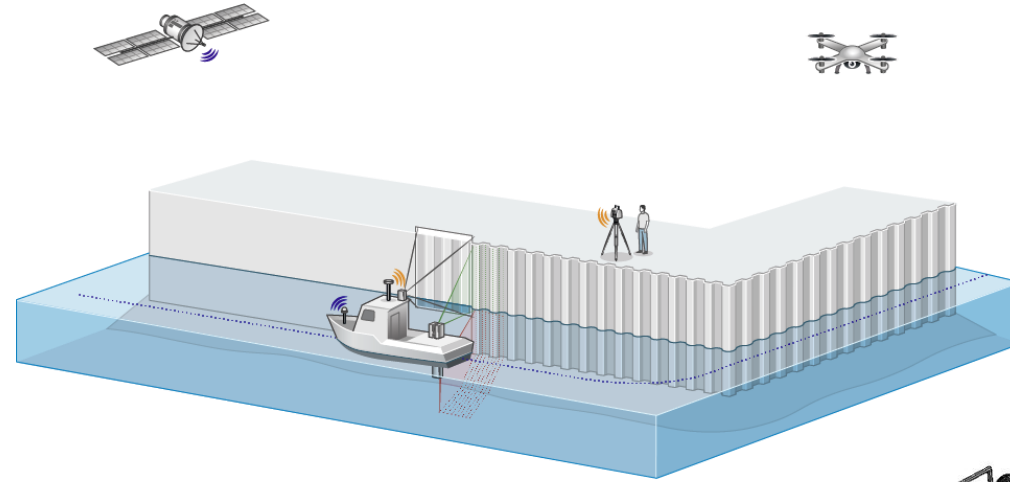
Camera array



Profile laser scanner

Multibeam

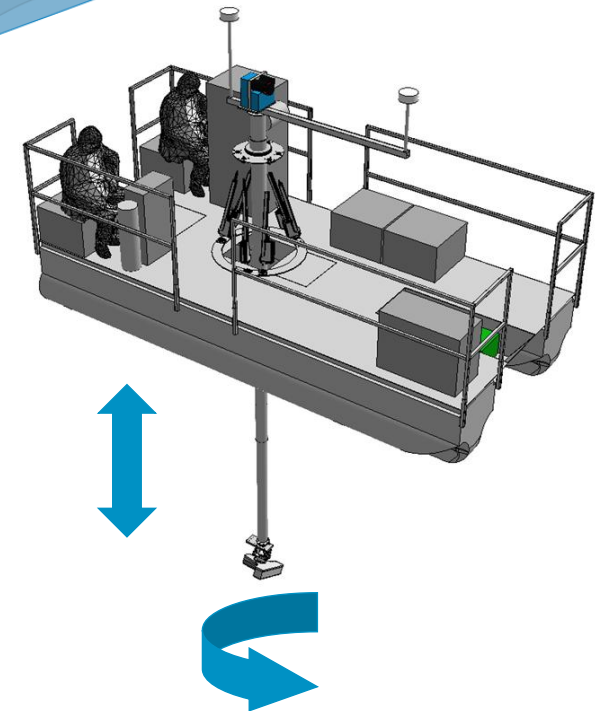
3D HydroMapper



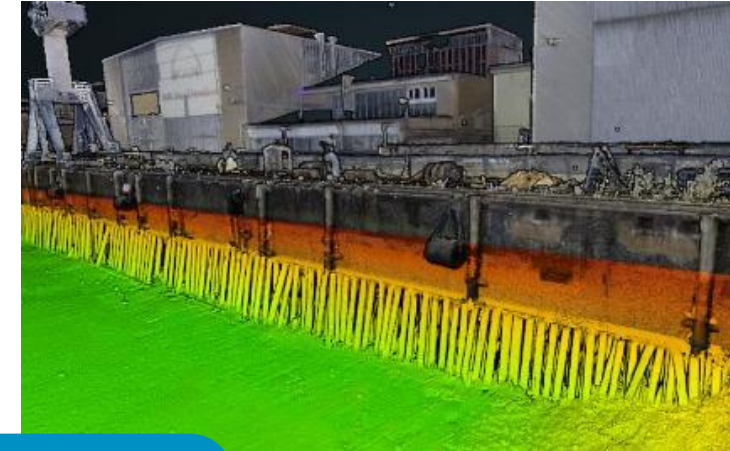
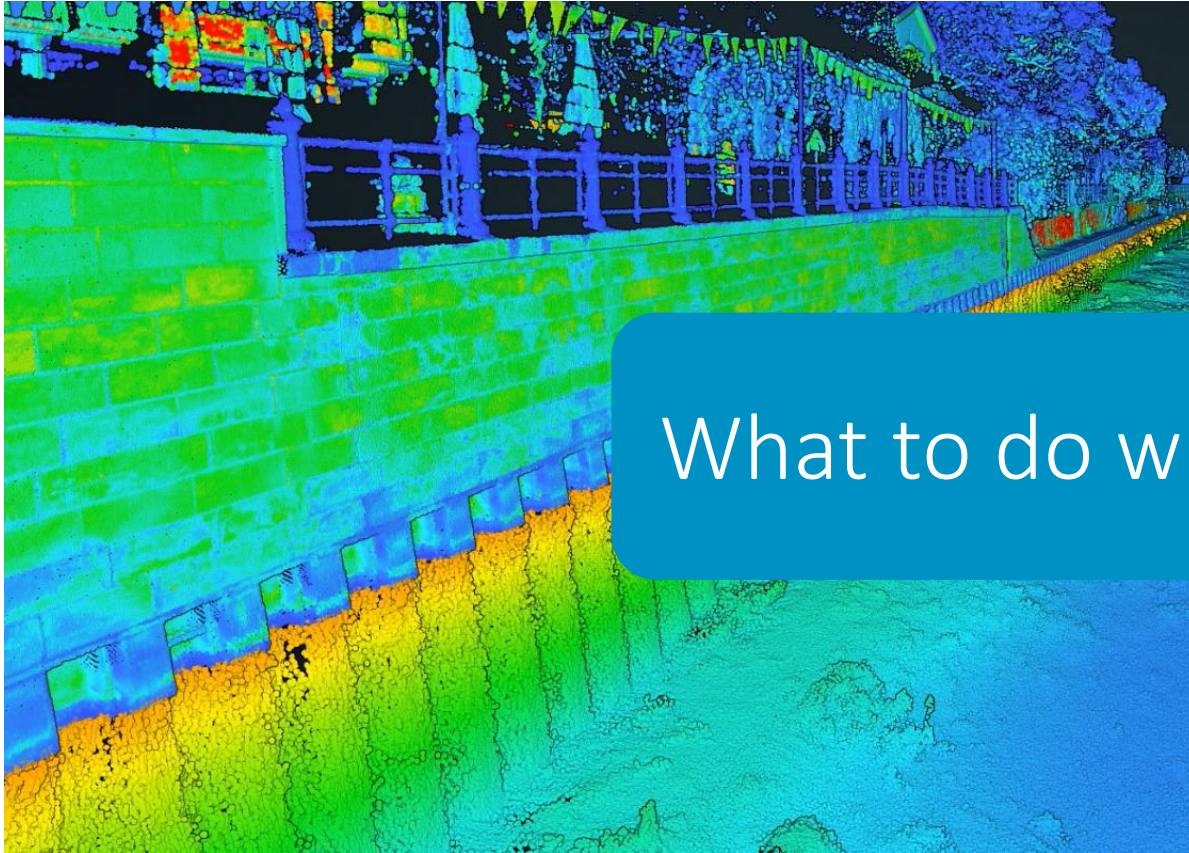
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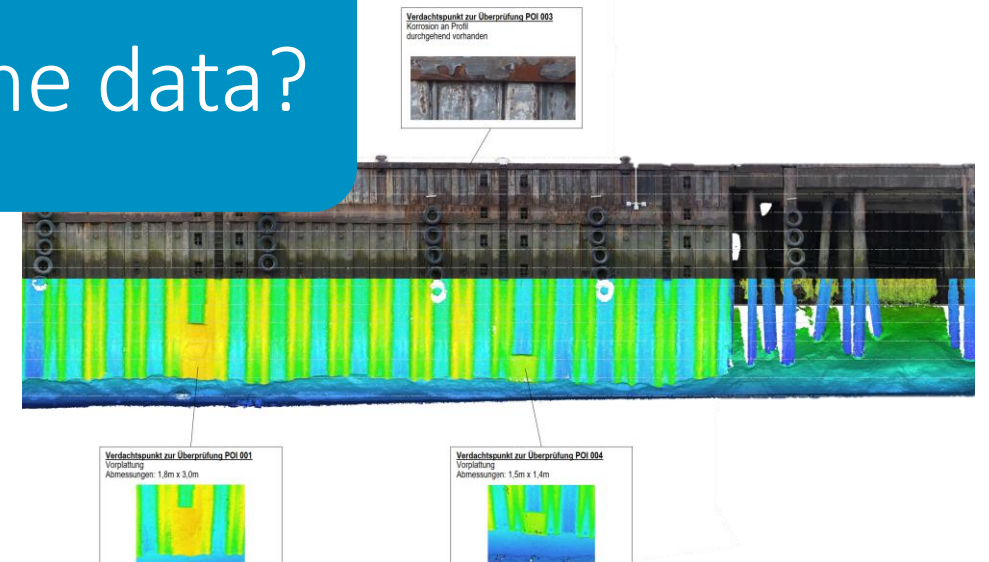
Multibeam



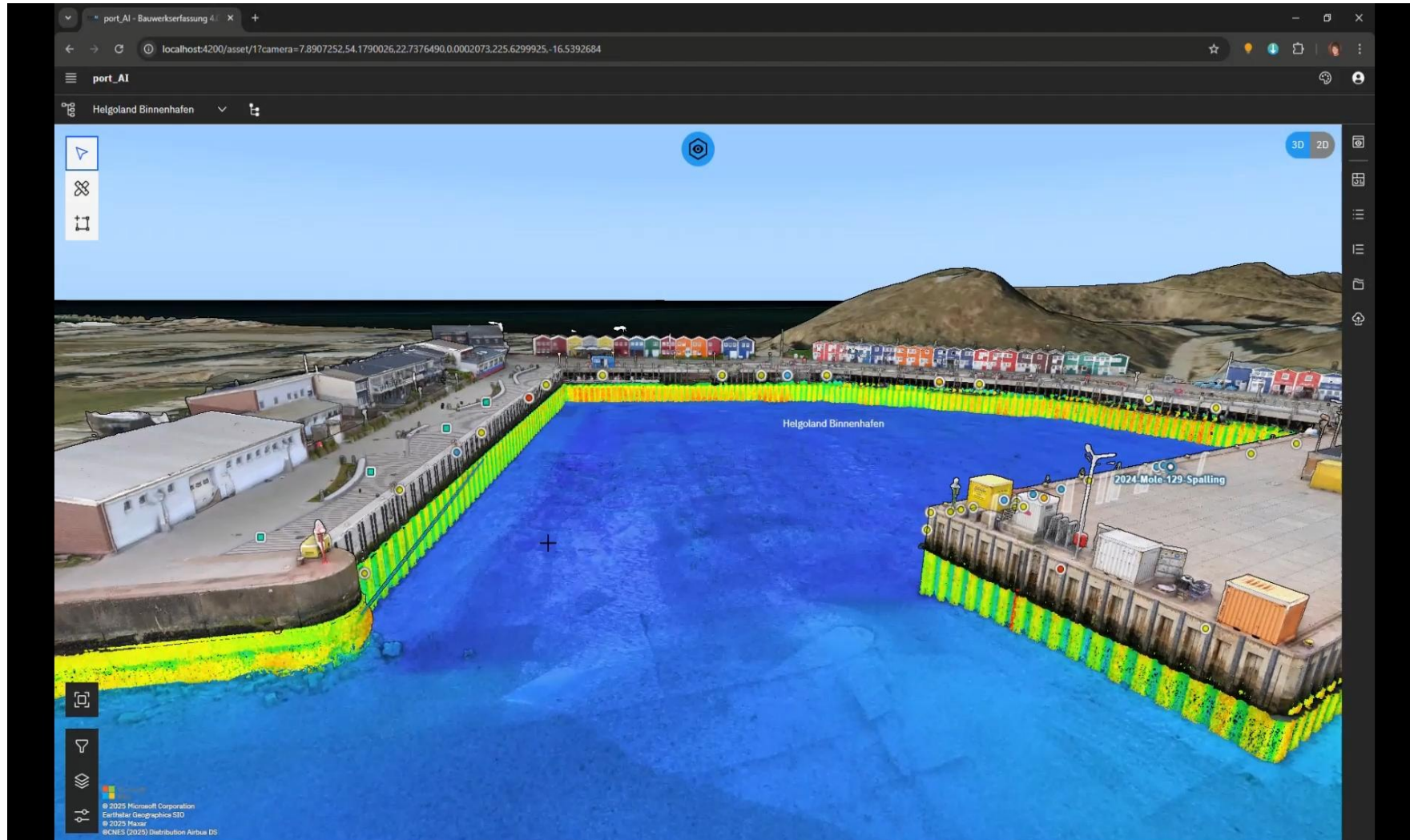
3D HydroMapper



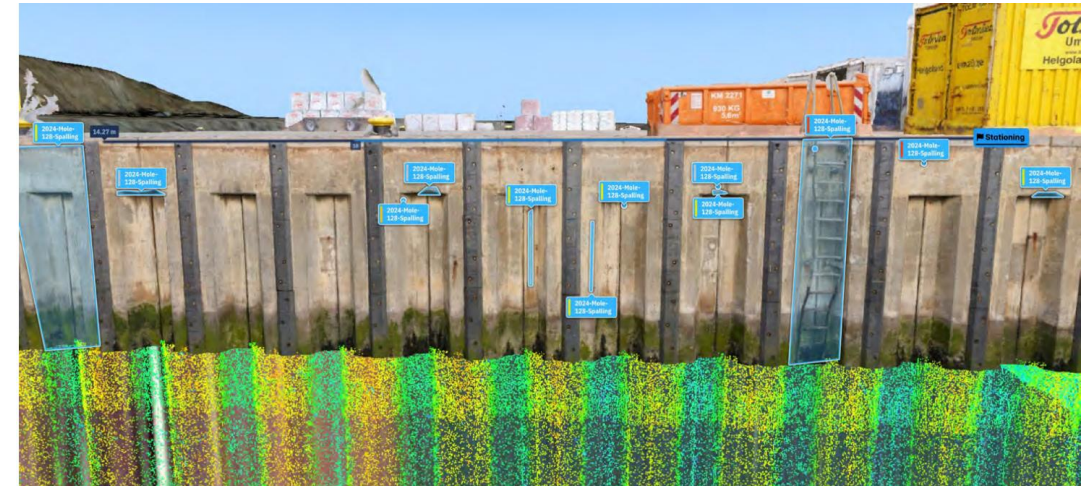
What to do with the data?



Port_AI: creating a digital twin



Port:Evolution: Managing data

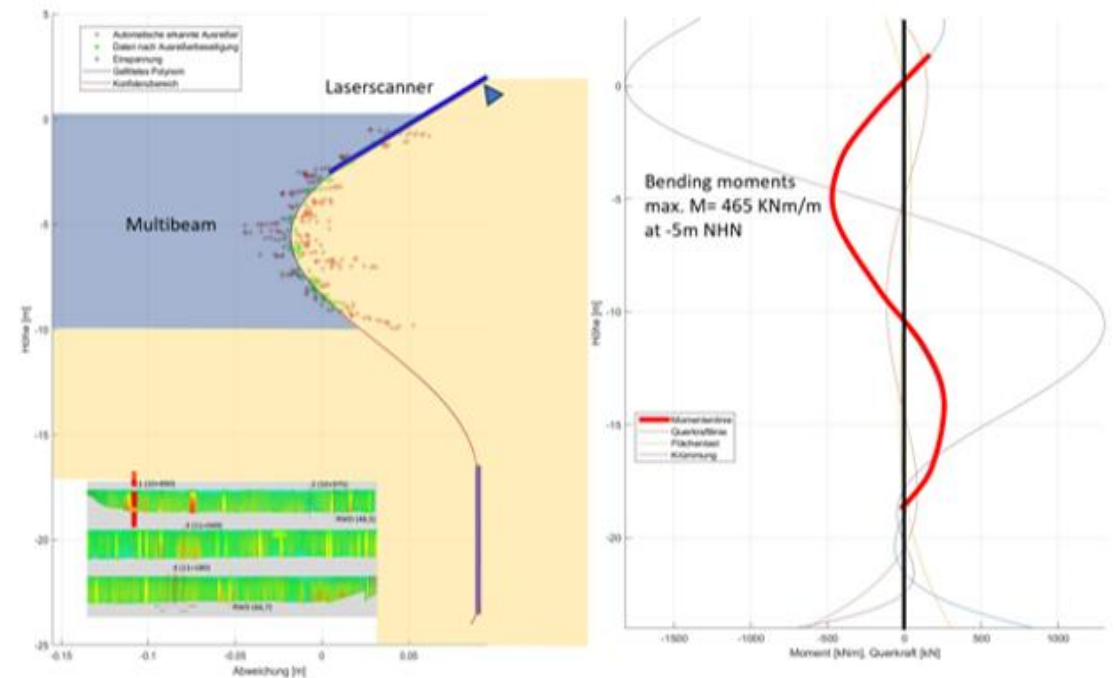


- Damage labeling and classification
- Repair measures
- Cost assumption

Sustainable lifecycle management

- Know the real condition of the infrastructure
- Forward-looking maintenance planning
- Extend service life
- Prevent disasters

Bending line of a sheet pile wall



Model: 150% overload

Reality: Approx. 70% load. 25 years of remaining service life!

Thanks for listening!

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