

Tackling Disruptive Geo-content Models

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COWI



Net turnover:
Euro Mill 826

Approx. **6,600**
employees

World-class
competencies within
**engineering,
economics and
environmental
science**

At any given
time, **12,000**
ongoing projects

85 years
of history

Global mega trends shape our industry...



GLOBALISATION



**URBANISATION
AND POPULATION
DEVELOPMENT**



SUSTAINABILITY



**PROJECT
COMPLEXITY
AND SIZE**



DIGITALIZATION

COWI Mapping in Numbers



OUR COLLEAGUES

500 Specialists
16 Locations
14 Nationalities
4 Continents
>1,000,000 Hours/year



OUR CARTOGRAPHY

4 Aircraft (2 pressurized)
2 Large Format Cameras Leica DMC-3
3 Large Format Cameras Vexcel UC
2 LiDAR ALS80 HP
1 Oblique Camera RCD 30 OP
Hexagon Content Program
up to 9 Line scanner ADS100 HP
up to 2 SPL 100 Photon Scanner



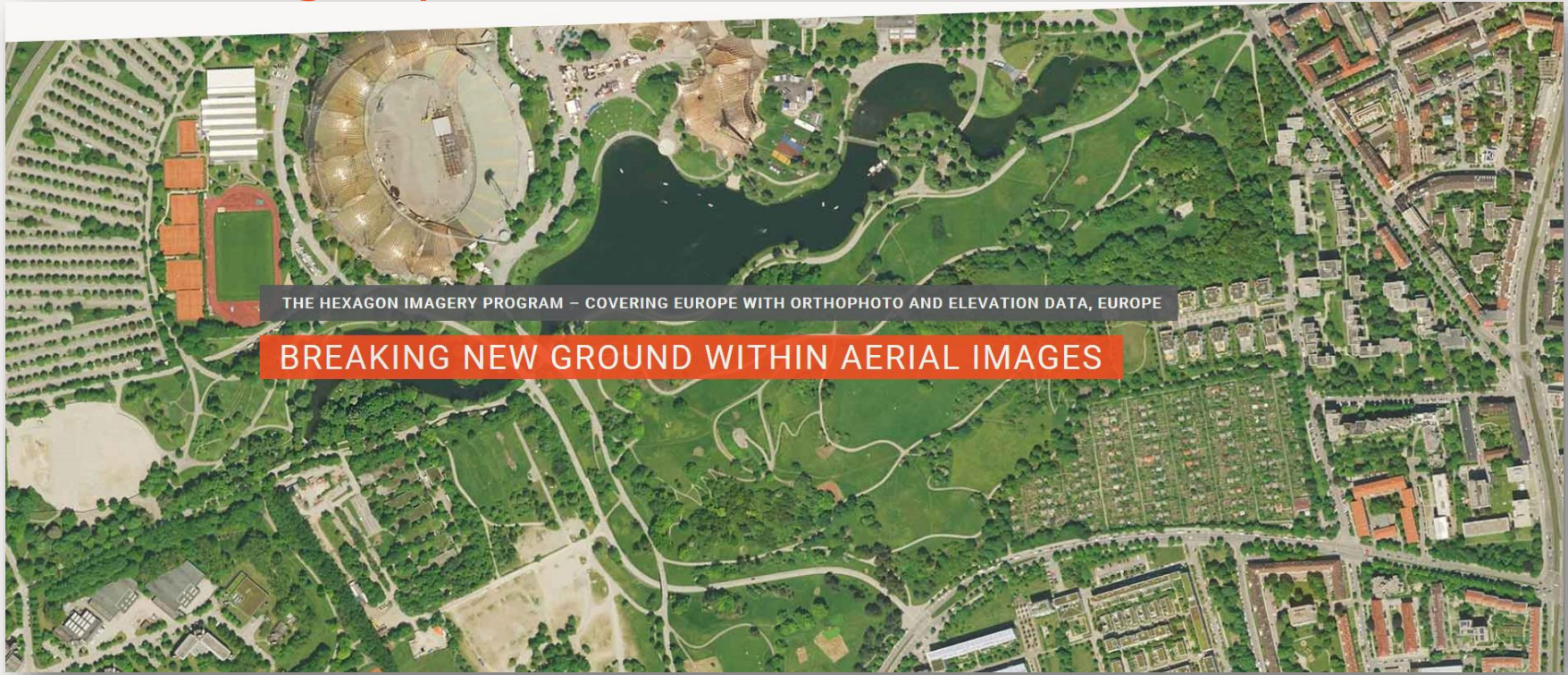
OUR GEOSERVICES

15 Mobile Panoramic Cameras
15 UAV (fixedwing/rotocopter)
Terrestrial Laserscanner
Totalstations/GPS/Bathymetry

COWI Mapping

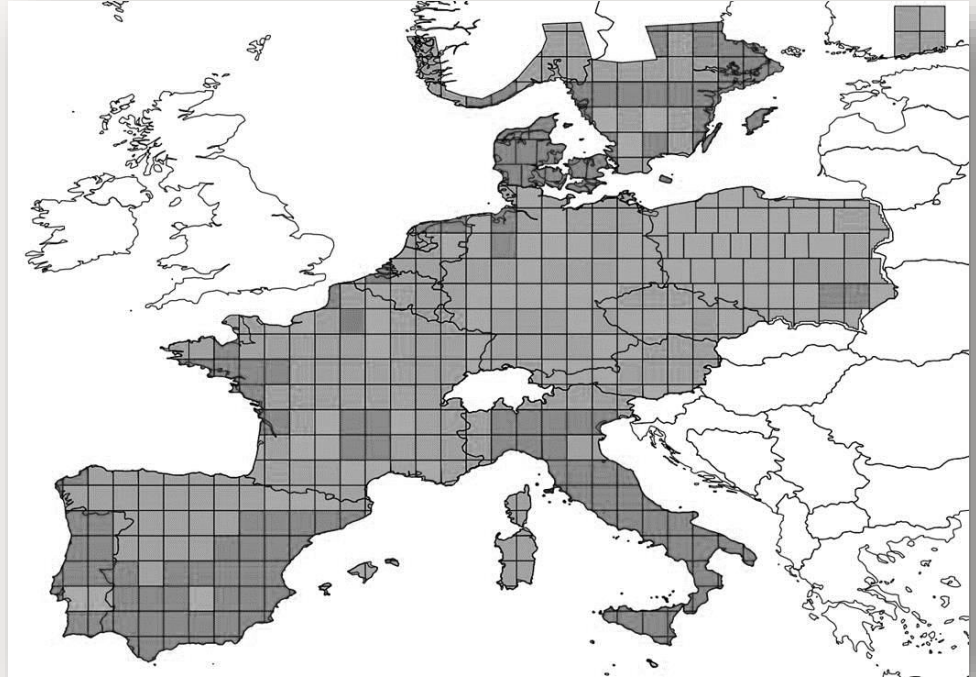


HxIP at a glimpse



The Hexagon Image Program (HxIP)

- › Covering greater Europe and the USA
- › RGB & NIR
- › 30 cm ortho
- › 80 cm DSM, 5 m DTM
- › WMS access or off-line delivery
- › Metadata
- › Update every 3-4 years
- › High Value Areas, 150 cities every 2 years
- › COWI Mapping Single European Hexagon Partner



Technical

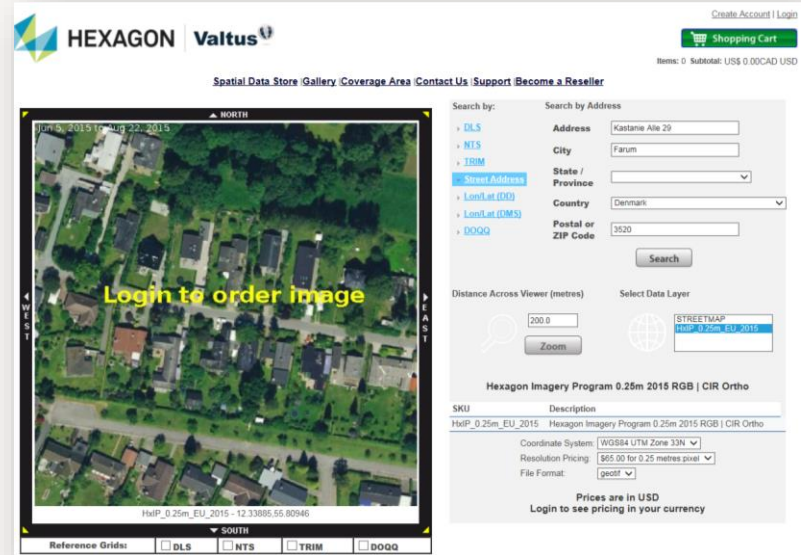
- > Accuracies:
 - > RMSE = 1.20 m
 - > Circular Error 90 (CE90) = 2.6 m and CE95 = 3.0
 - > GCP applied
 - > More GCP can be added at demand
- > Sensors:
 - > Leica ADS100 and DMCIII



DSM draped with RGB ortho

WMS & Specific Delivery

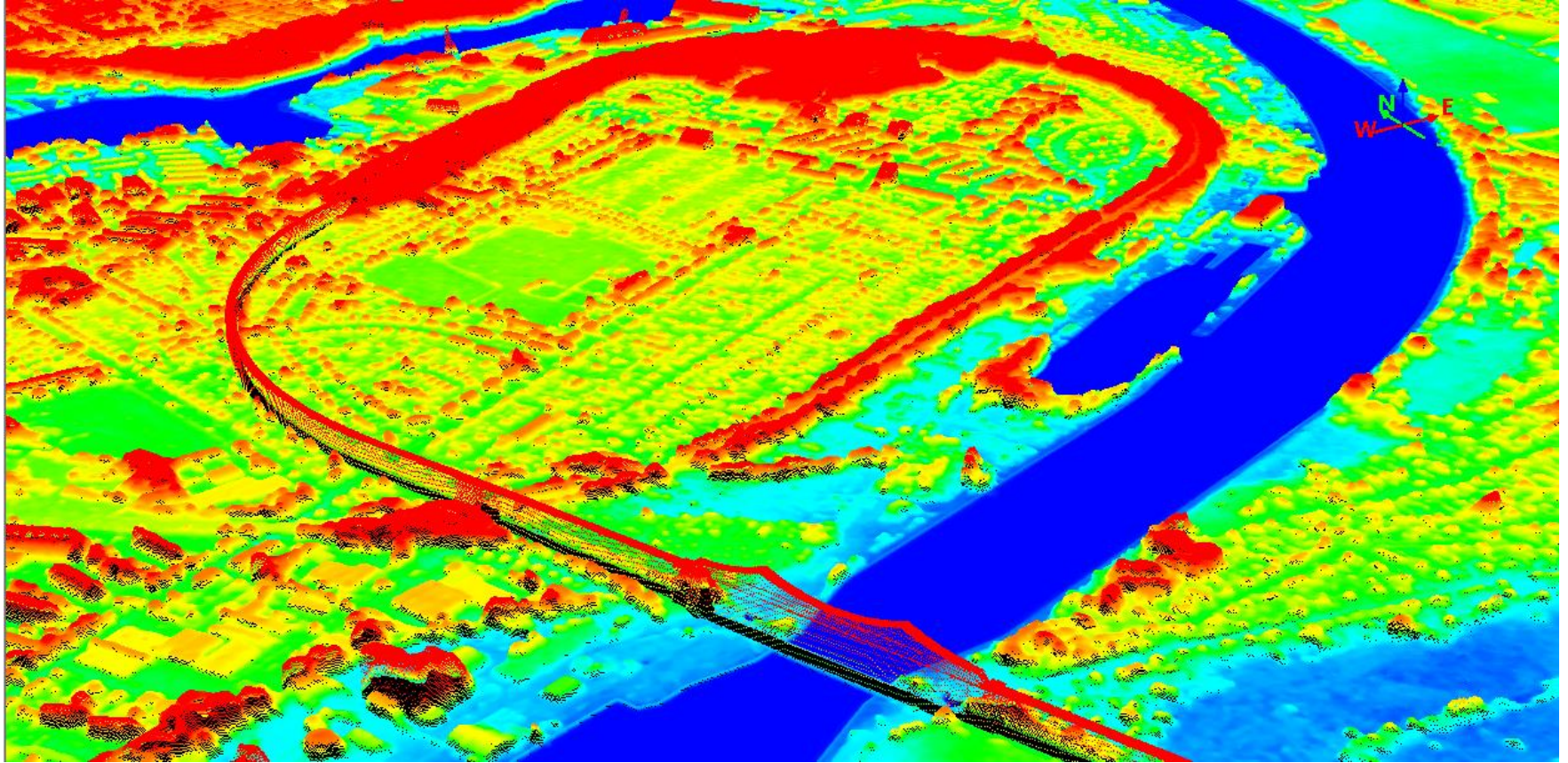
- Standard delivery from Valtus WMS
- or tailored delivery to your specs
 - Enhance accuracy with more GCP
 - 16 bit (standard 8 bit)
 - RGB, NIR
 - Combined w DSM



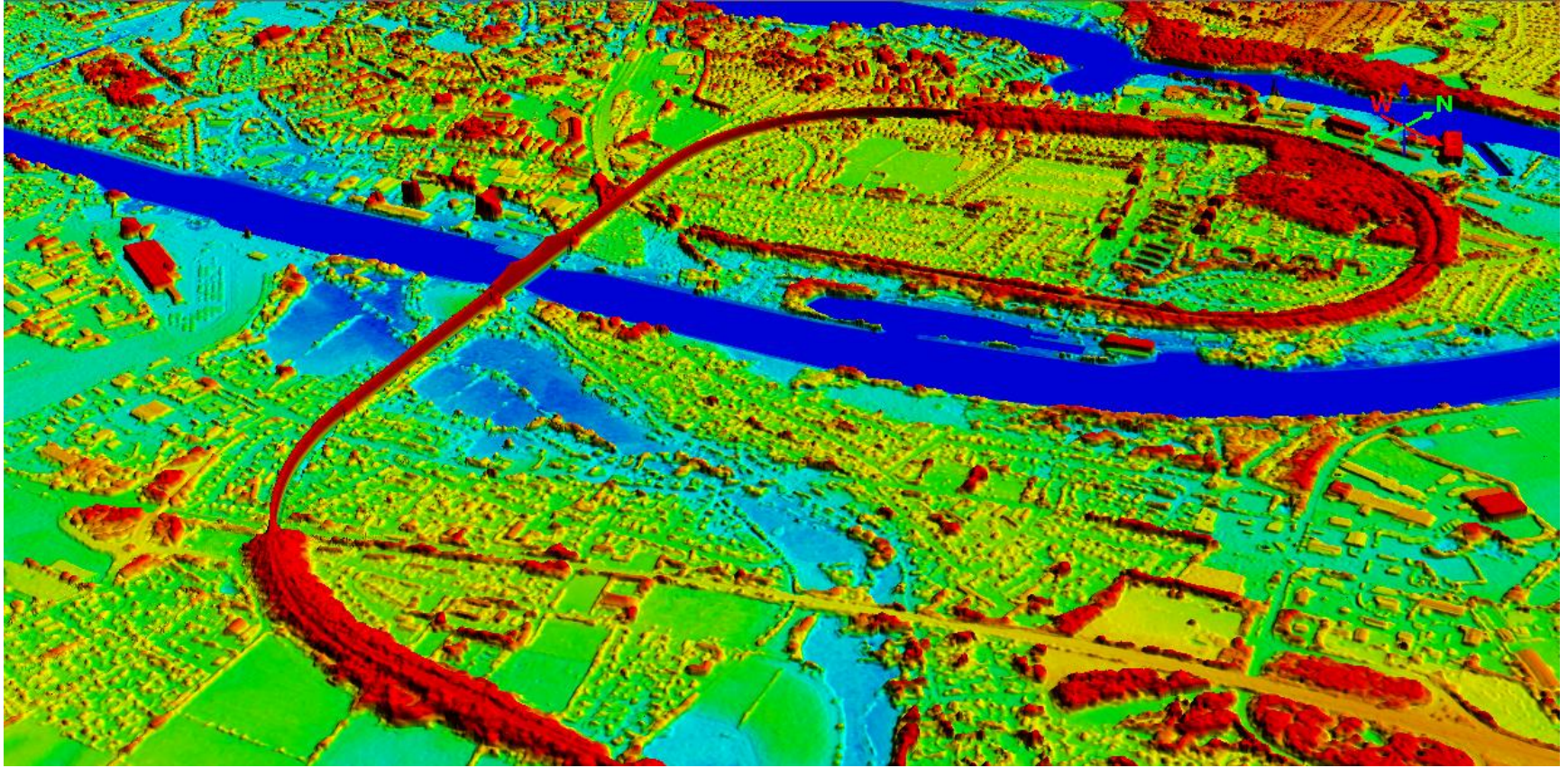
Berlin HxIP 30 cm



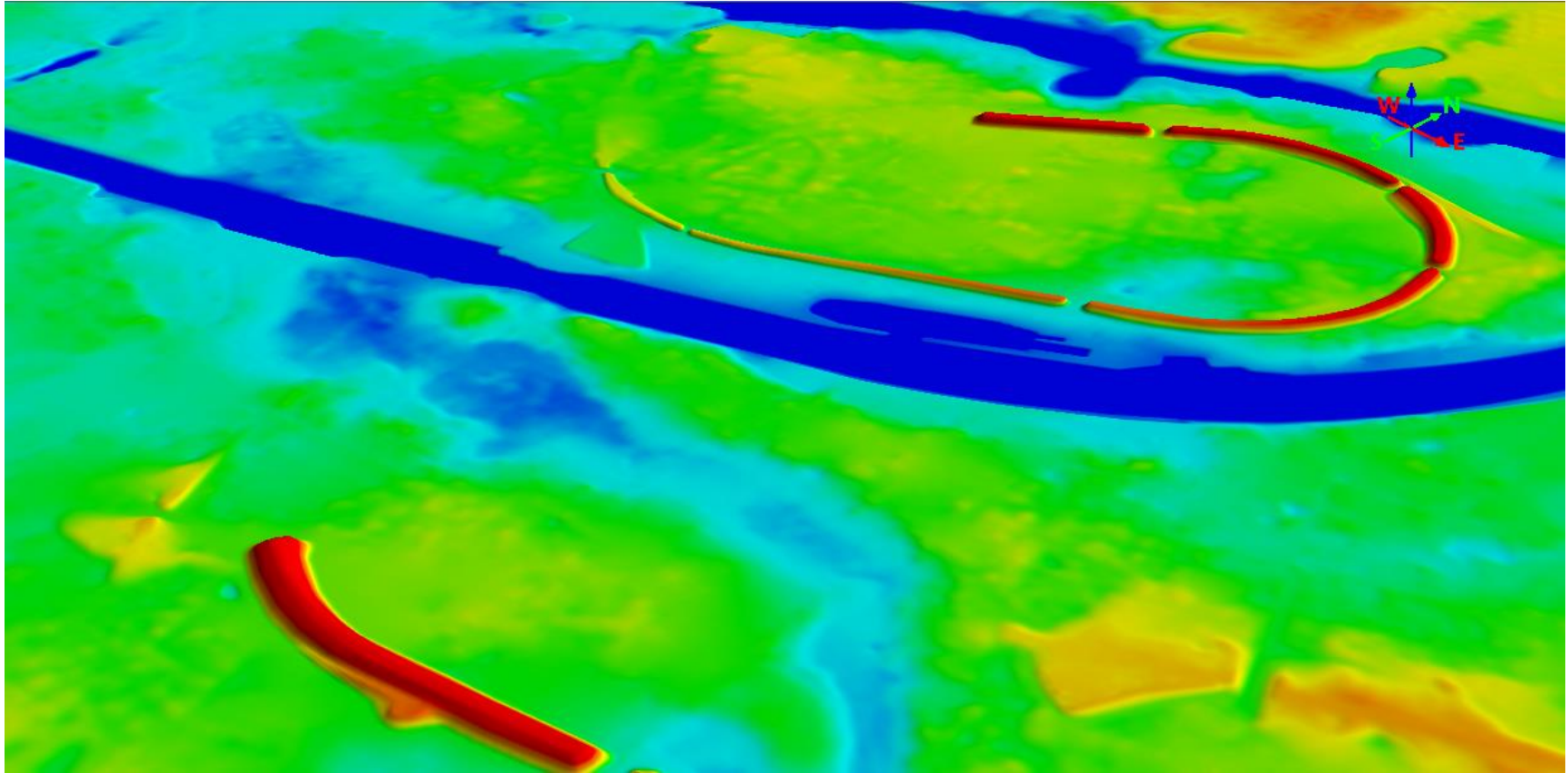
3D point cloud (x,y,z)



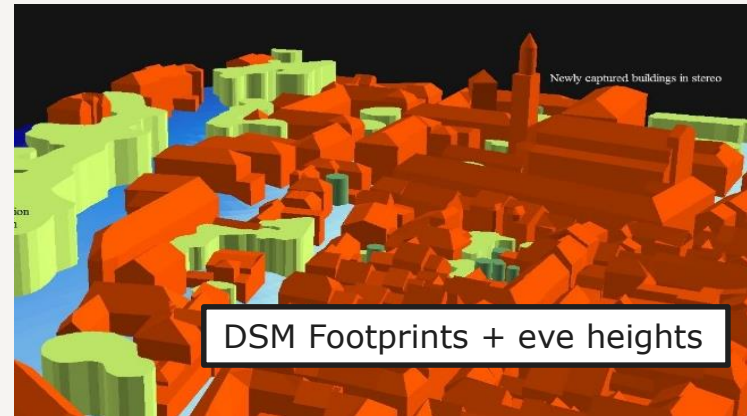
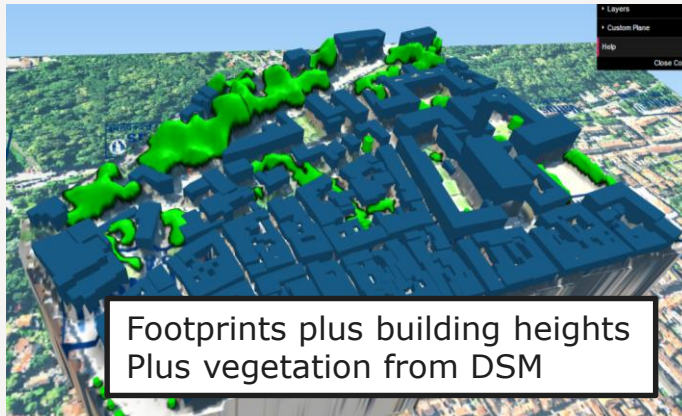
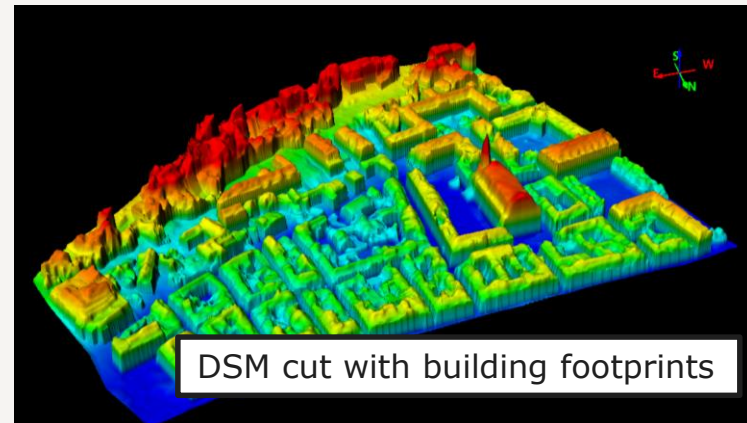
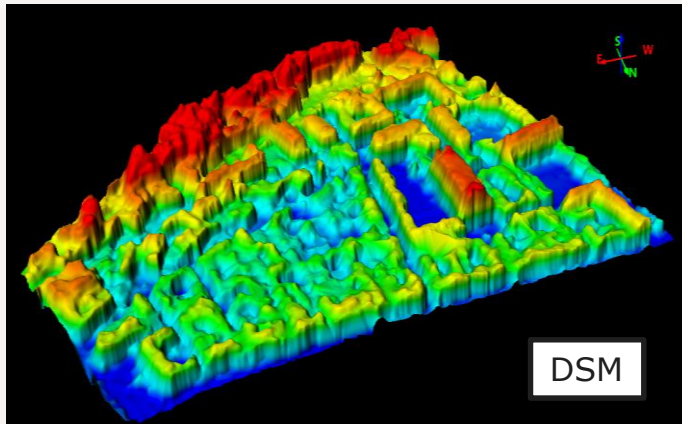
DSM 80 cm Resolution



DTM 5 m Resolution



Simple 3D objects from HxIP



The COWI Motivation

- New technologies within sensors and data processing have changed the geospatial market fundamentally
- New sensors are efficient, digital, intelligent and data feeds directly into the digital workflow with a high degree of automatization
 - Important players: Vexcel, Hexagon, Riegl, Bentley MicroStation & TerraSolid
- This has resulted in over-capacity
 - and the market is now super competitive selling services at cost price and even below
- The COTS – Commercial off the Shelf – model has proven to be a good business – for the clients and for COWI!
 - Denmark's Digital Orthophoto (DDO) since 1995
 - Denmark's Digital Streetphoto (DDG) since 2016

A Day in the Life of an Orthophoto - about meeting requirements

- > The main requirements from the client side:
 - > Provide quality & respect the time schedule
- > Delivery issues:
 - > Sever competition => low prices => priorities to best paid or feasible projects
- > Managing suppliers:
 - > Penalties, lock in resources (sensors and aircrafts), split in many LoTs
 - > Adverse towards new suppliers
- > Meeting the clients' requirements:
 - > Academic technical writing, avoid "too cheap", disqualification for minor reasons, 100% match w sample data

Free Data

- **INSPIRE** is the short name for the European Commission directive on **Infrastructure for Spatial Information in the European Community** (now the **European Union**) often referred to as "open geodata" (ref: Wiki)
- Free data – shared data – accessible data
 - Free data has no value if not shared
 - Shared data has no value if not accessible
 - Accessible data have reduced value if no common standards

Sharing

- Sharing requires a willingness, change of attitude and budgets!!
- Providing access to the many requires significant investments in IT infrastructure
 - The Data Distributor ("Datafordeler") in Denmark will make public data accessible
 - Including SDFE (NMCA Denmark) data, real estate valuation, business registry, etc.
 - Coming shortly: People registry, addresses, real estate db, cadastre, DTM
 - Costs: Euro 10 – 20 mill
 - COWI COTS service DDO WMS has been a success, including free data
 - Stability and speed
 - Agricultural control opts to use the COWI WMS

Open Data versus HxIP

Open Data	HxIP
Free	Cheap
"as is"	Under agreement/"as is"
Different levels of details	Consistent level of details
Quality vary	Standardized QC process
May be up-to-date	Is up-to-date
No control	Some control

HxIP - Making it work across Europe

- Work with local service providers – they know best
 - There is a long list of companies already working for COWI HxIP
 - Re-selling – all can do it!
- Be flexible
 - Licence agreements to match different markets

NMCA Involvement? Take Control!

- Quality control from NMCA
 - Develop HxIP to become authoritative data
- Step by step introduction and allow evaluation and feed-back
- Share standards
 - State clear requirements
 - Pragmatic specs
- Share knowledge
 - Best practise

Thank You for Your Attention

