

*15 years of practical experience
in airborne laser bathymetry -
Airborne HydroMapping GmbH*



3D Underwater Mapping from Above and Below

Vienna, 08.-11. July 2025



Short facts

AHM GmbH: founded in 2010 as academic spin-off of the University Innsbruck, Austria

Head office: **Innsbruck**, Tyrol

15 years of experience and competence in airborne topo-bathymetric data acquisition and processing

In-house software **HydroVISH & KomVISH** for visualization, processing & analysis of 3D survey & geomass data

10 employees



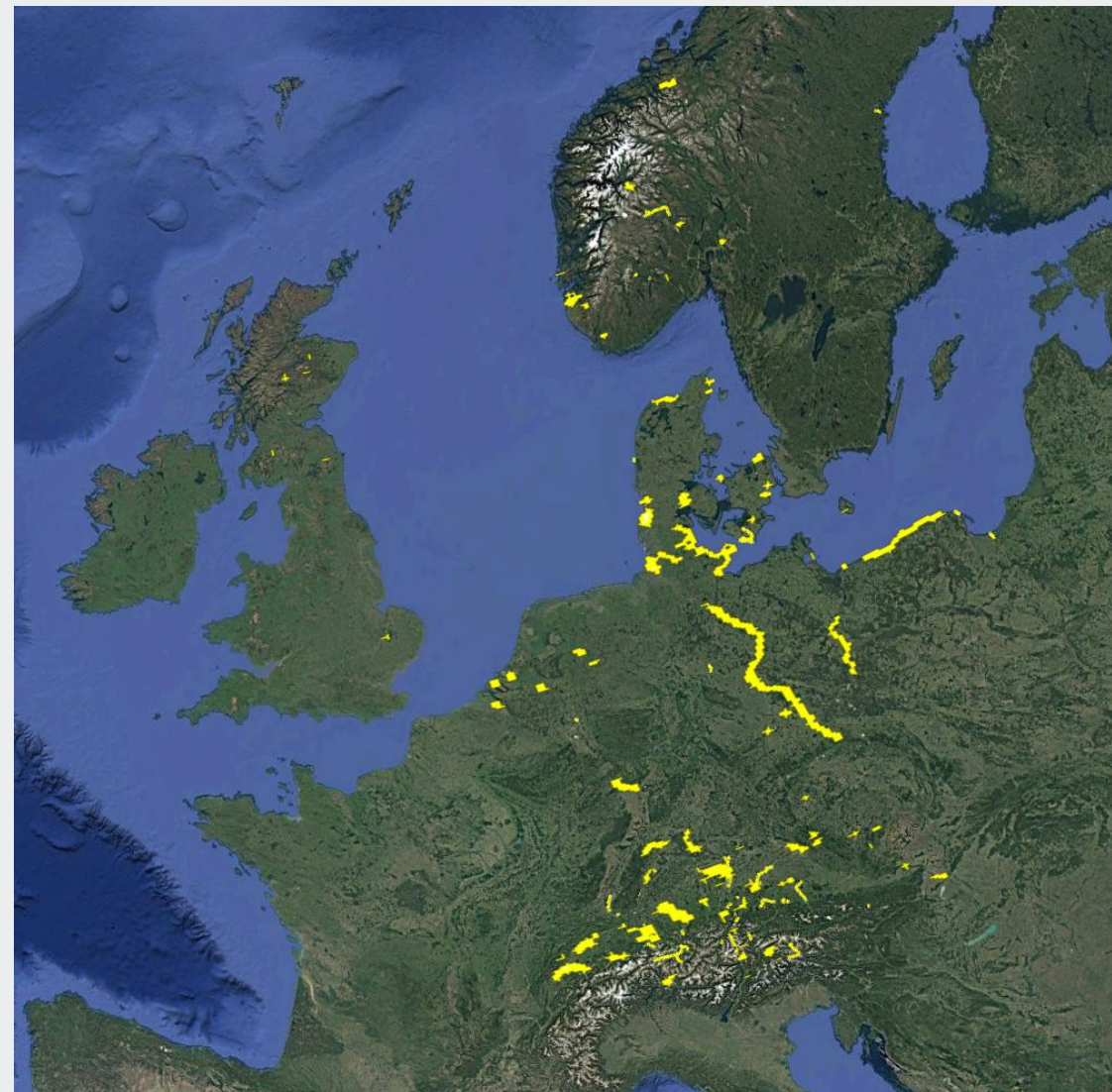
Short facts

Realized & running projects over last 15 years

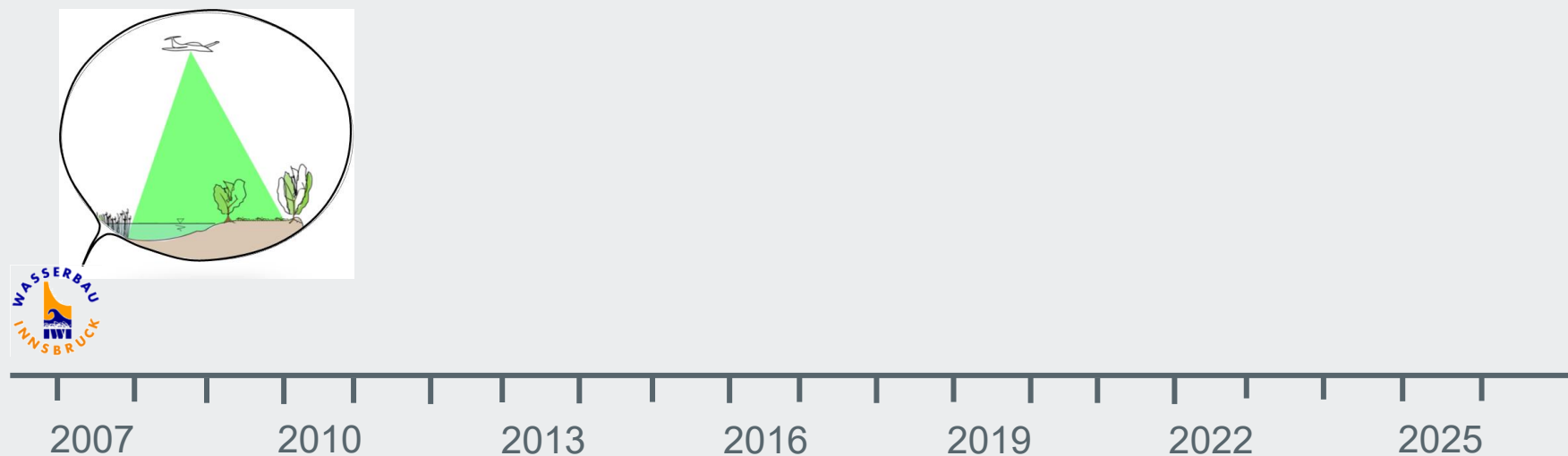


in Europe:
Austria, Germany, Switzerland, Denmark,
Norway, Poland, Italy, Czech Republic,
Sweden, France, Great Britain

off Europe: Nuuk, Greenland



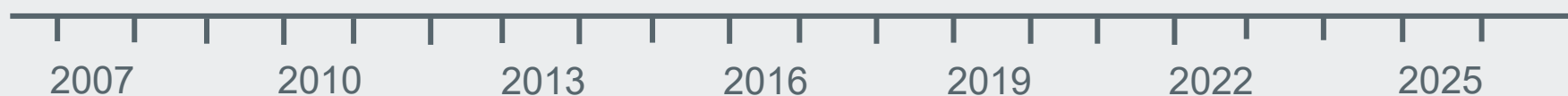
Kick-off times ... 2007-2010: Airborne Hydromapping



Main driver:

European Water Framework Directive

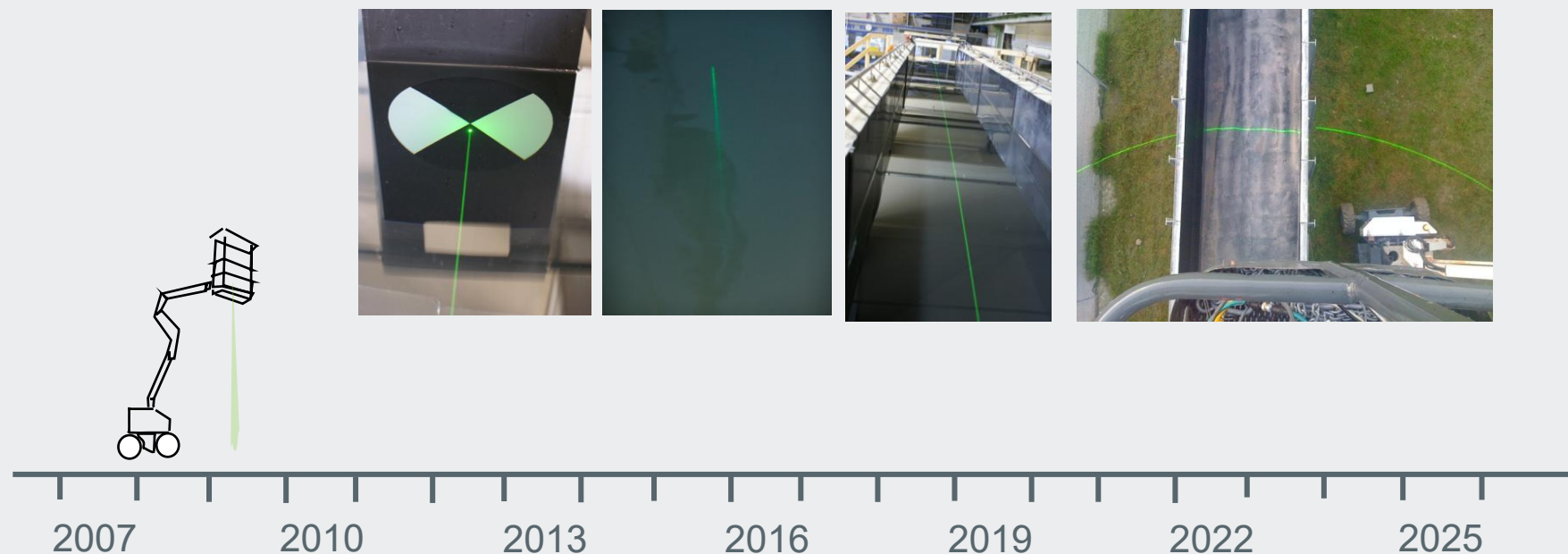
Kick-off times ... 2007-2010: Airborne Hydromapping



Austrian FFG-funded research project between academic & economic partners

→ Joined development of compact topobathymetric LiDAR system dedicated for airborne surveys

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Kick-off times ... 2007-2010: Airborne Hydromapping



RIEGL
LASER MEASUREMENT SYSTEMS

FFG

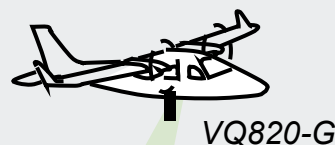
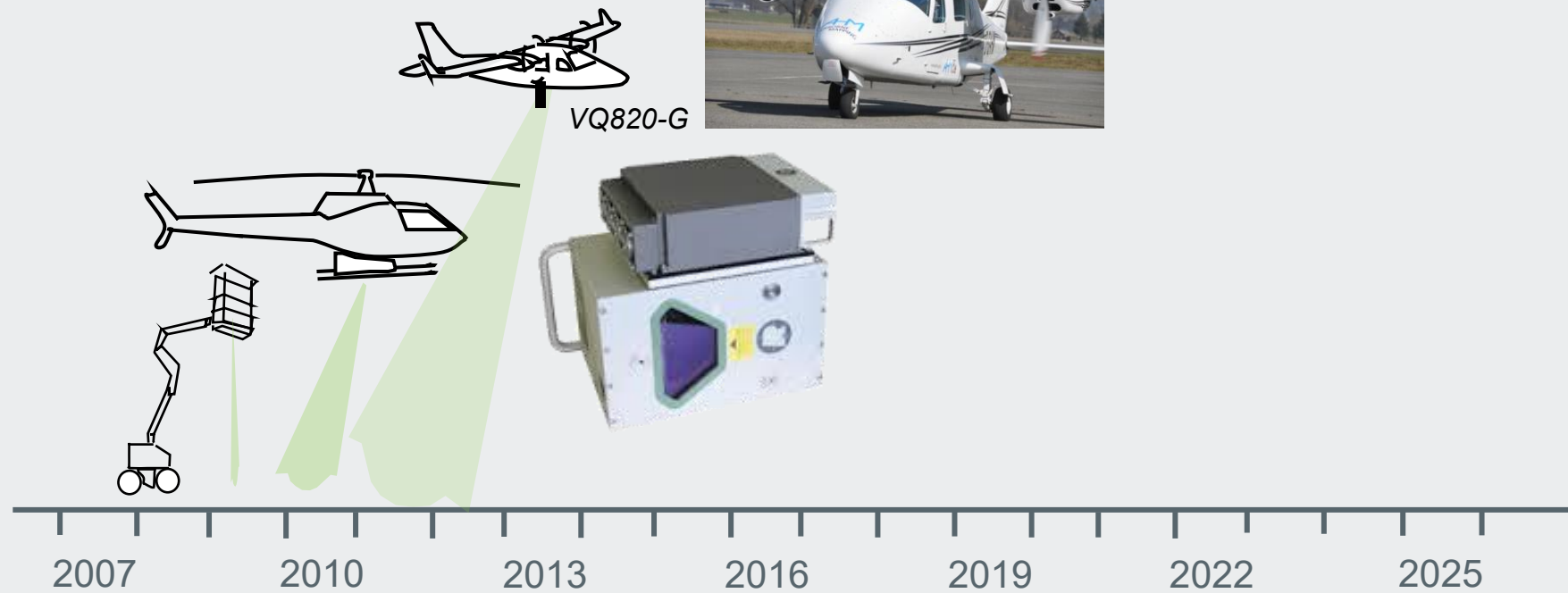
WASSERBAU
INNSBRUCK

Airborne Hydromapping

Austrian FFG-funded research project between academic & economic partners

→ Joined development of compact topobathymetric LiDAR system dedicated for airborne surveys

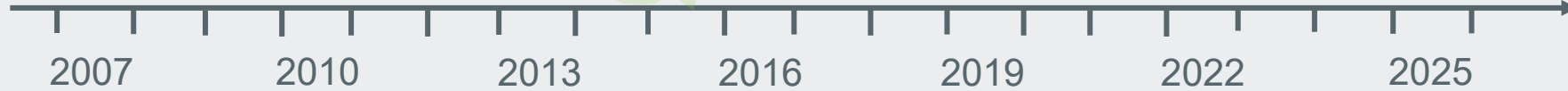
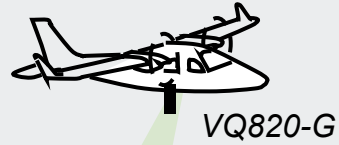
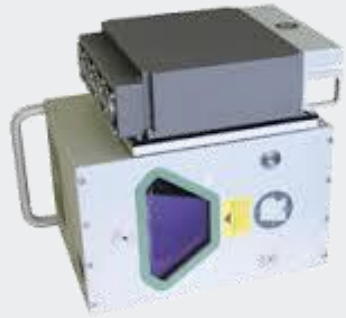
Kick-off times ... 2010-2011:



Foundation of AHM GmbH as academic spin-off of Innsbruck University
 Tecnam P2006T based in Augsburg, Germany
 Operating topobathymetric LiDAR sensor VQ820-G



Proofing by practice – 2012-2016:



Milliarden Messwerte erzeugt.
Das resultierende Tiefenmodell des Sees bietet, im Vergleich mit früheren Aufnahmen, eine um Größenordnungen verbesserte Qualität. Die Daten ermöglichen einen detaillierten Blick auf die Morphologie des Seebodens und dokumentieren sehr kleinräumige ebenso wie großflächige natürliche Strukturen und archäologisch relevante Objekte am Seegrund.

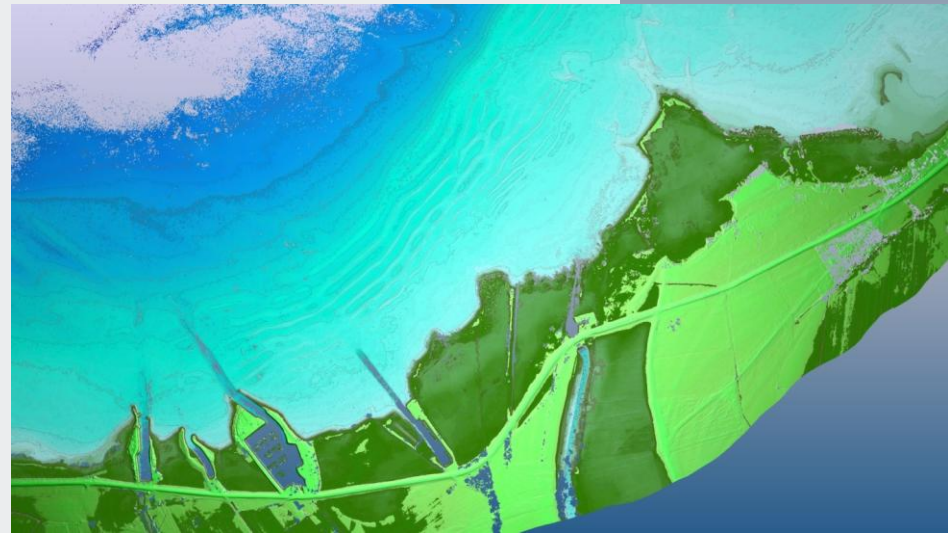
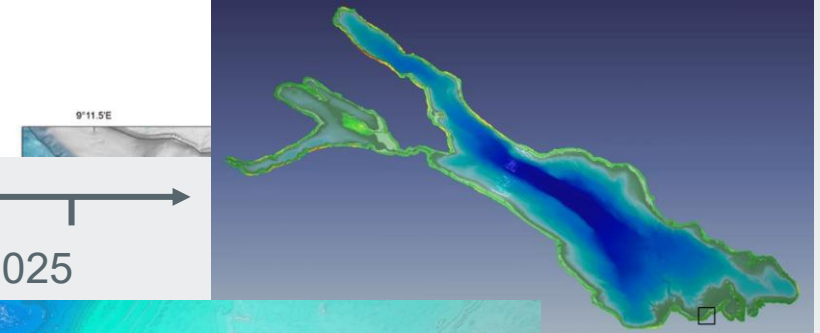


Neue Perspektiven Hochauflösende Geländemodelle

Laserscanning Mit dem Flugzeug entlang des Seeufers

In einem zweiten Projektabschnitt wurden zwischen März und Juni 2014 etwa 300 km² mithilfe eines bathymetrischen Laserscanners an Bord eines Vermessungsflugzeuges vermessen.

Mit dieser neuen Methode wurden insgesamt etwa 12 Milliarden Messpunkte mit bis zu 40 Einzelwerten je m² mit einer Genauigkeit von wenigen Zentimetern erfasst.

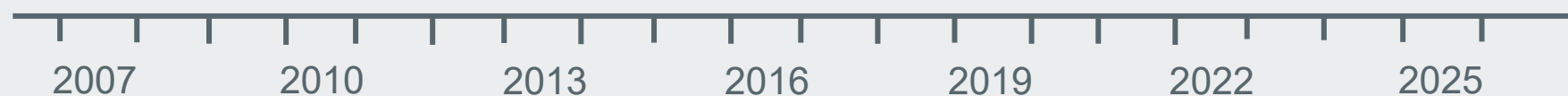


Lake Constance: IGKB - Tiefenschärfe

- Shoreline length 273 km
- Waterdepth down to 10 m



Research to practice – 2012-2016:



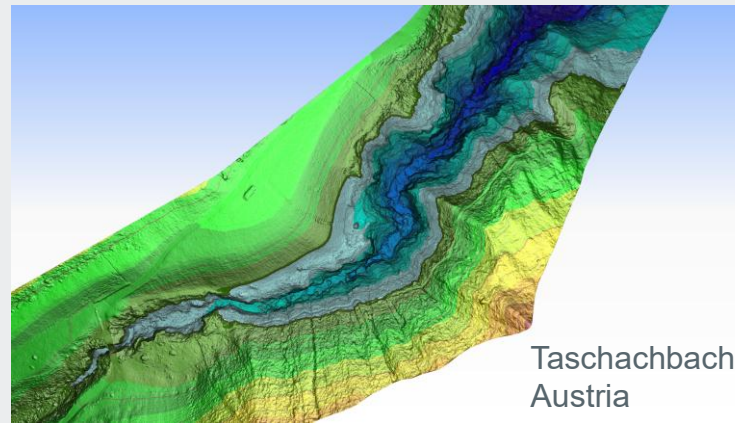
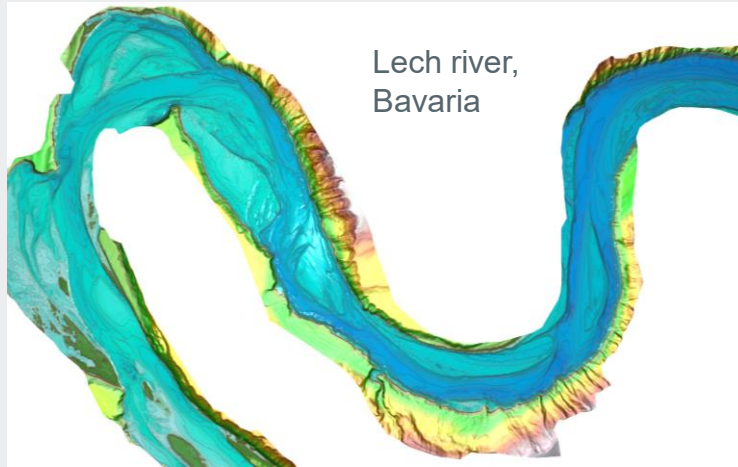
Alpine Airborne Hydromapping

Austrian FFG-funded research project between academic & economic partners

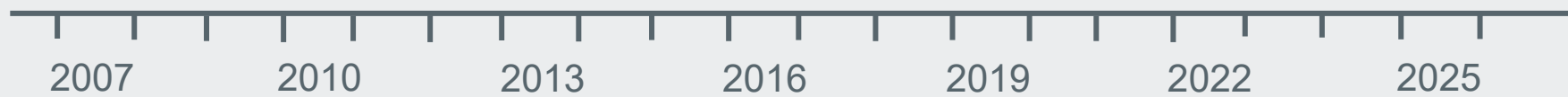
→ Close knowledge transfer from scientific institutions & sensor manufacturer to economic applicants of technology



Research to practice – 2012-2016:



Alpine & pre-Alpine test sites for data – acquisition/processing/evaluation



Alpine Airborne Hydromapping

Austrian FFG-funded research project between academic & economic partners

→ Close knowledge transfer from scientific institutions & sensor manufacturer to economic applicants of technology

2. Workshop zum FFG COMET K – Projekt „Alpine Airborne Hydromapping“

Gewässervermessung aus der Luft

sponsored by: RIEGL

11 + 12. Februar 2016
Technische Universität Wien
Department für Geodäsie und Geoinformation

Workshop Programm

Wissenschaftliche Partner: TU WIEN, FFG, RIEGL, AM, BEW, IKB, e-on, Verbund

Unternehmenspartner: RIEGL, AM, BEW, IKB, e-on, Verbund



Latest developments – 2016-2024:



2015: sensor upgrade to 2nd generation of topobathymetric LiDAR sensor VQ880-G

→ **Topobathymetry 2.0**



2011:
Tecnam P2006T



2021:
Tecnam P2012 SMP



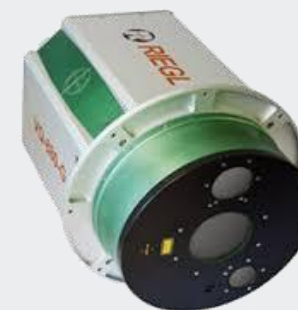
Topobathymetry 2.0 in practice



VQ820-G
 600 m (eye safety)
 532 nm
 fix (1 mrad)
 256 kHz
 20° backward



1
 yes
 (yes)



VQ880-G
 600 m (eye safety)
 532 nm
 variable (0.7-1.1 mrad)
 up to 550 kHz
 20° forward & backward

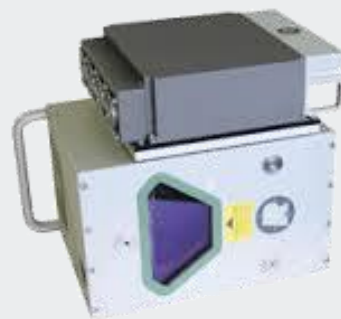


1.5
 yes
 yes

Altitude
 Wavelength
 Beam divergence
 Pulse repetition rate
 Scan angle
 Scan pattern

Secchi depth
 Online waveform
 Full waveform

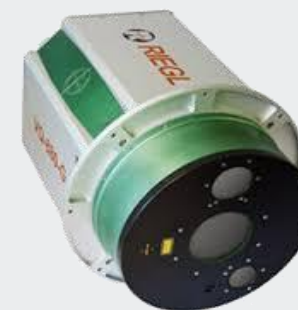
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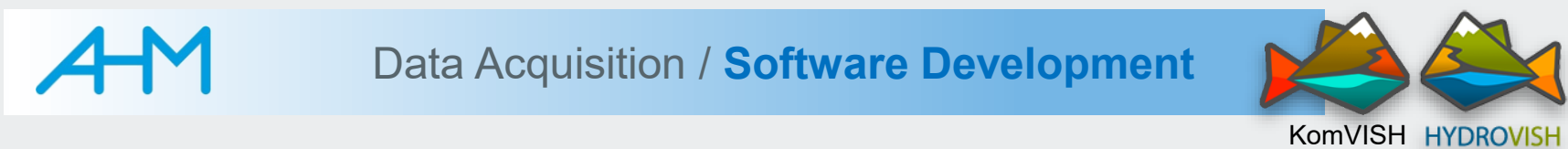
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Latest developments – 2016-2024:



Latest developments – 2016-2024:

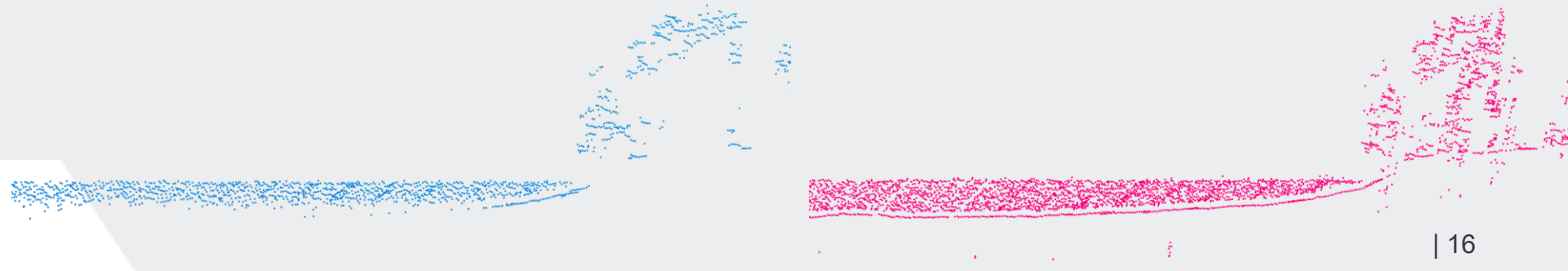
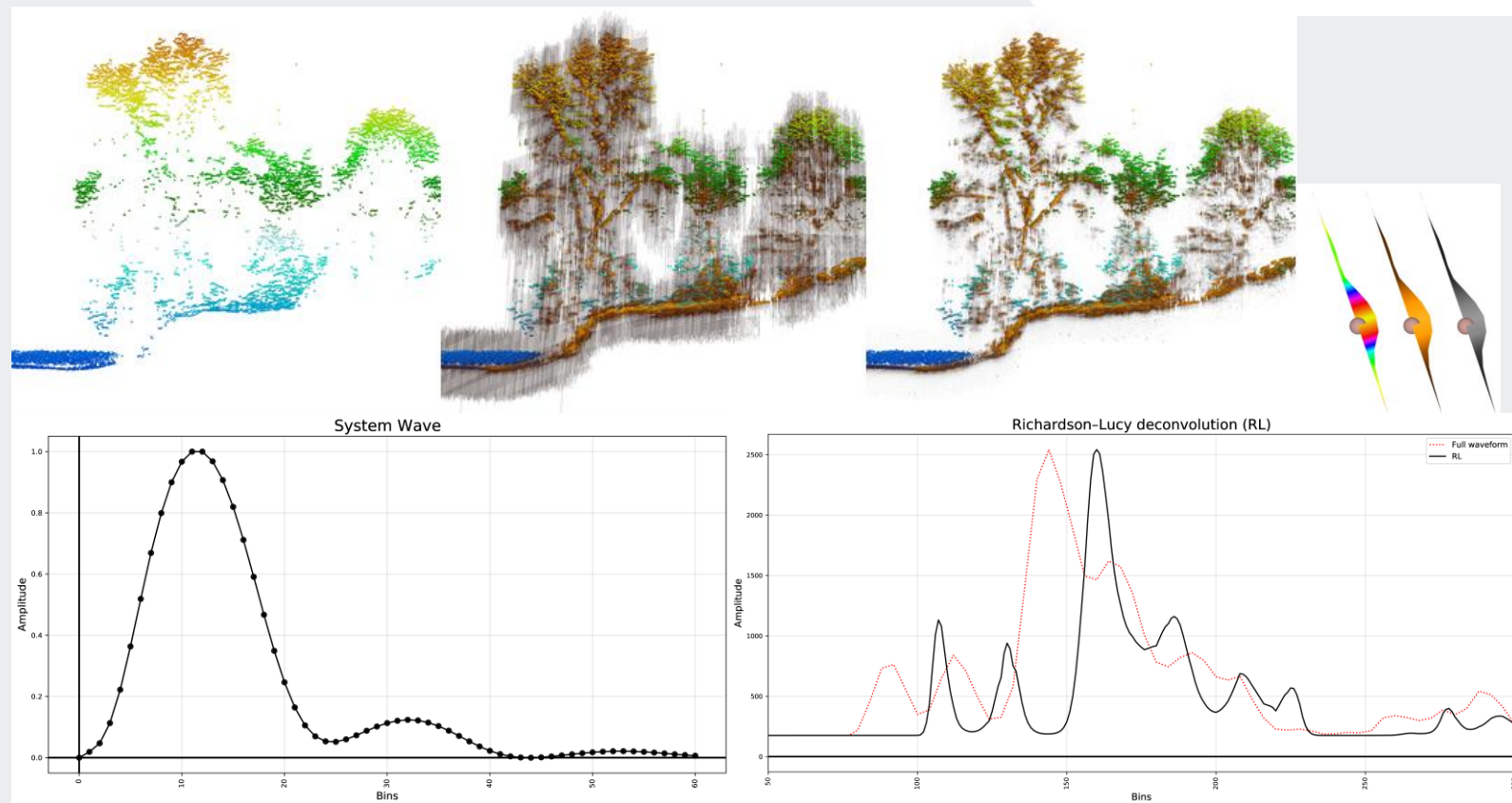
HydroVISH

Data visualisation, -processing & -modelling:

Full Waveform analysis

- Filtering
- Strip adjustment
- Classification
- Refraction
- DTM/DSM
- Profiles
- Contour lines
- Hydraulic meshes

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Latest developments – 2016-2024:

HydroVISH

Data visualisation, -processing & -modelling:

Full Waveform analysis

Filtering

Strip adjustment

Quality control

Classification

Refraction

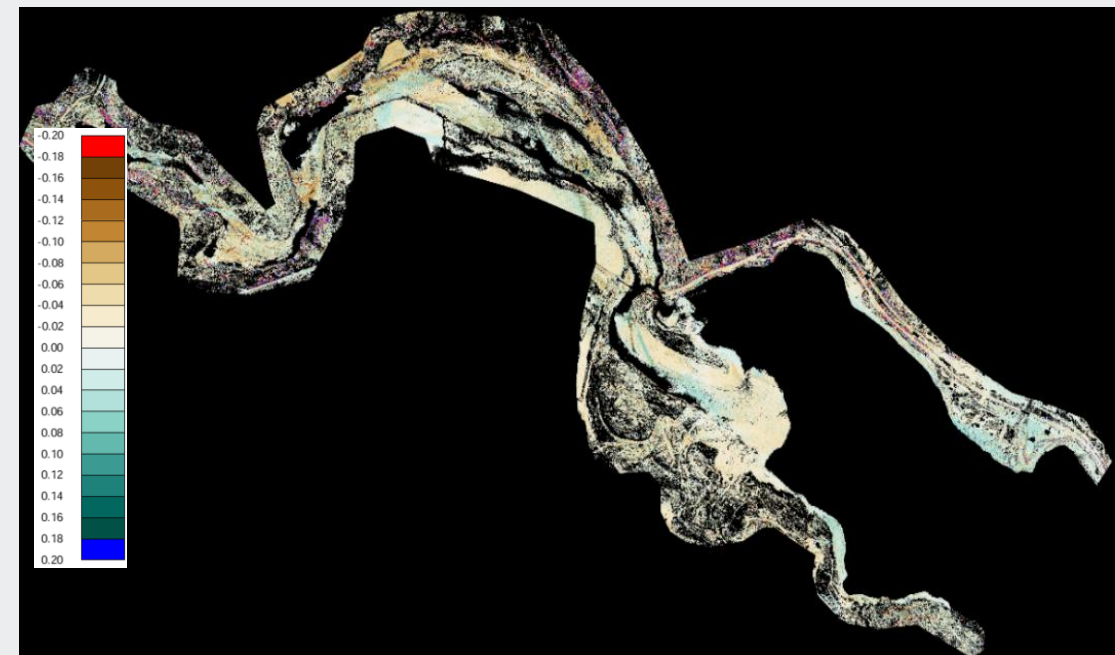
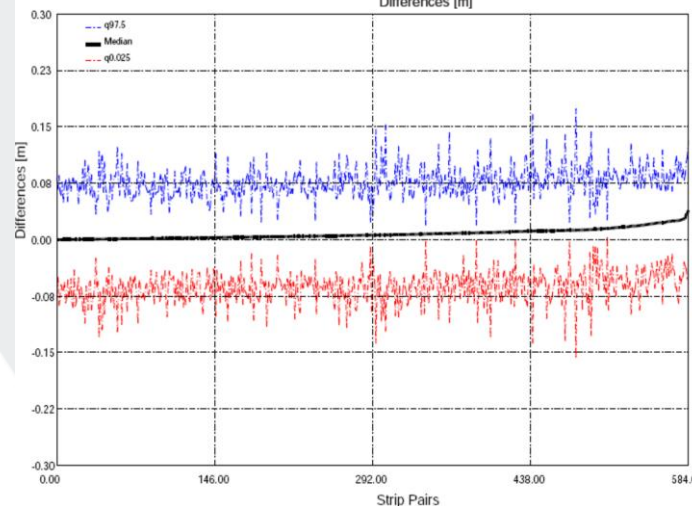
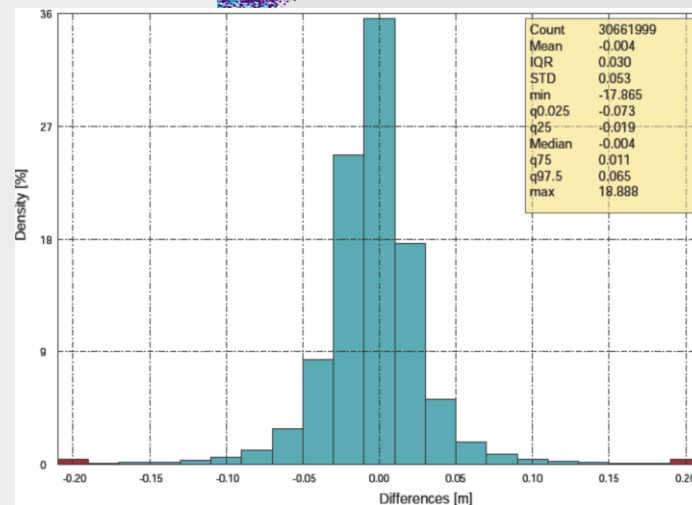
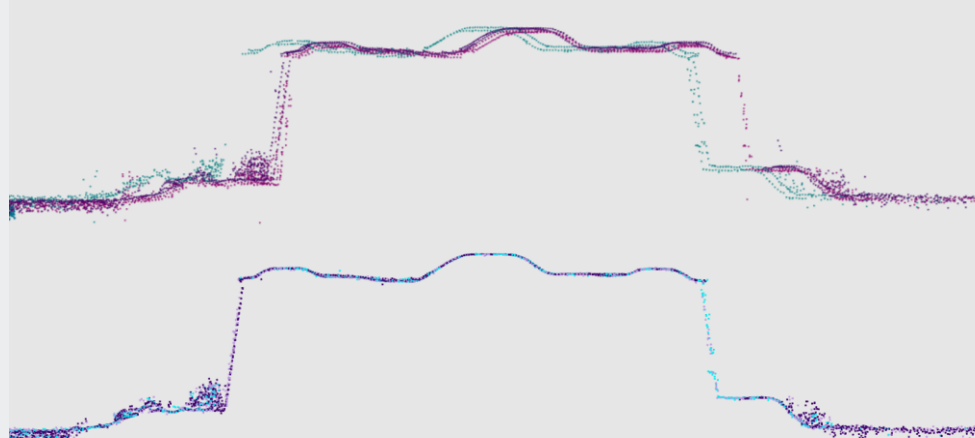
DTM/DSM

Profiles

Contour lines

Hydraulic meshes

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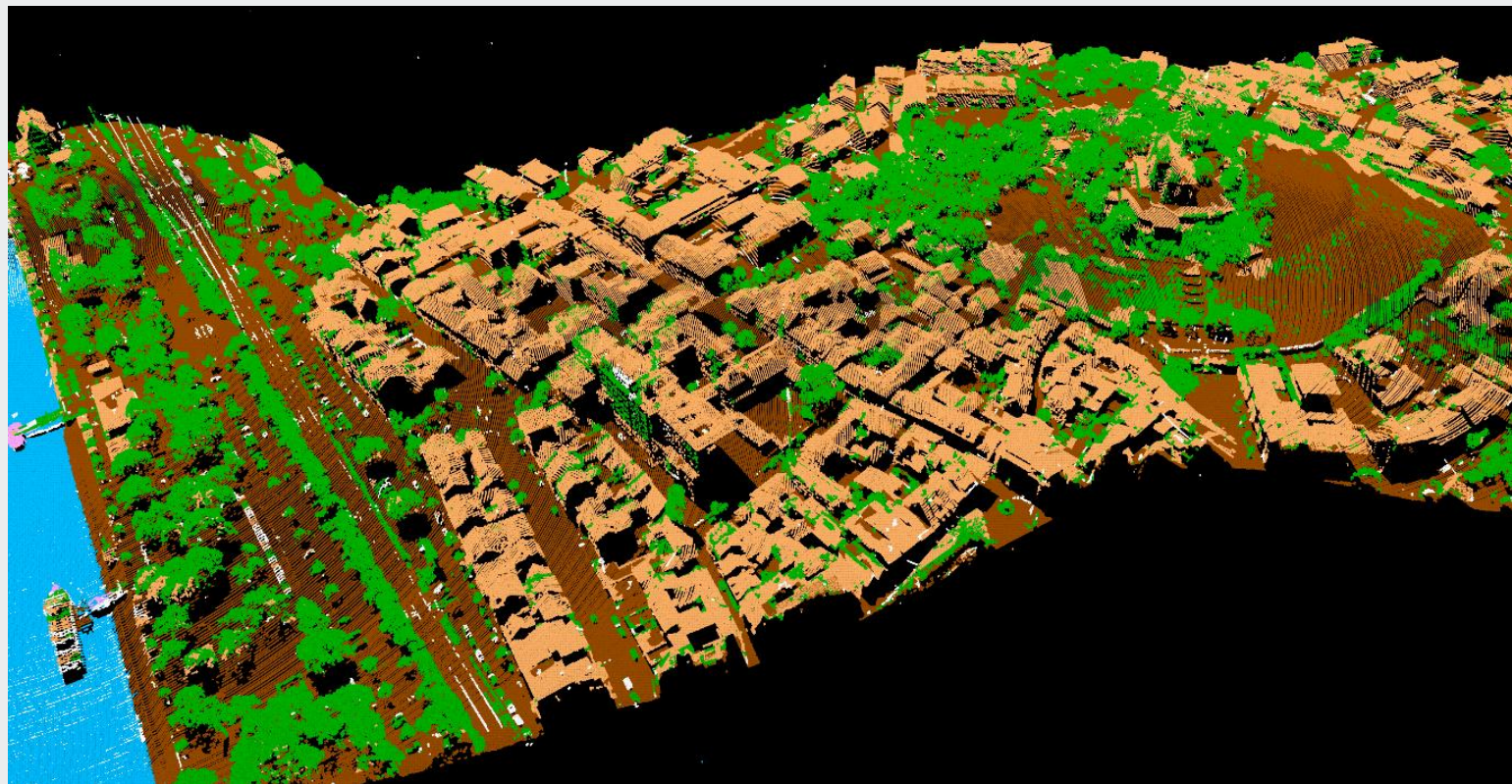
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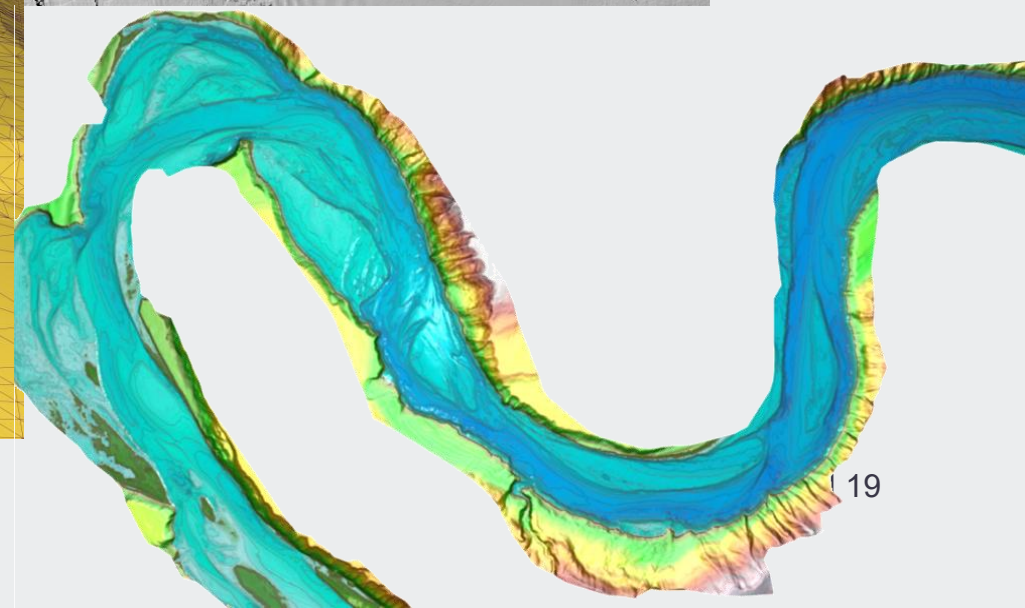
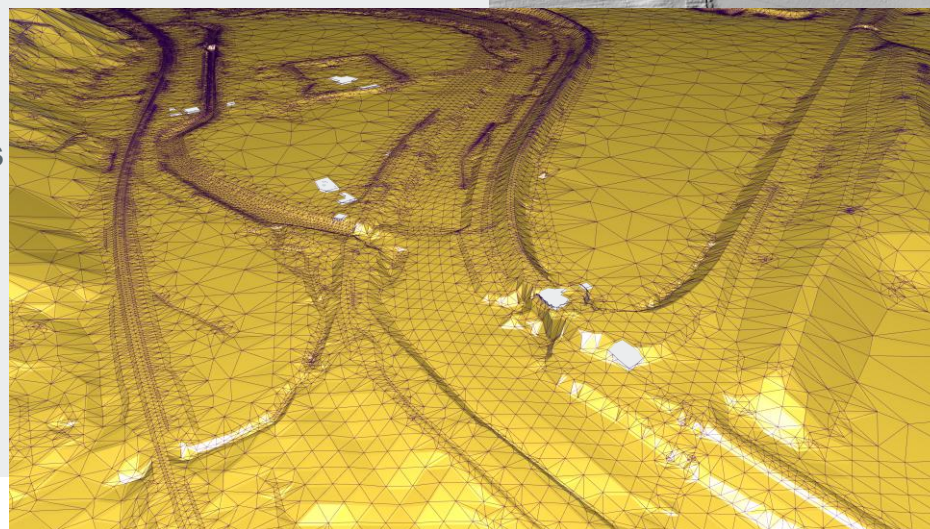
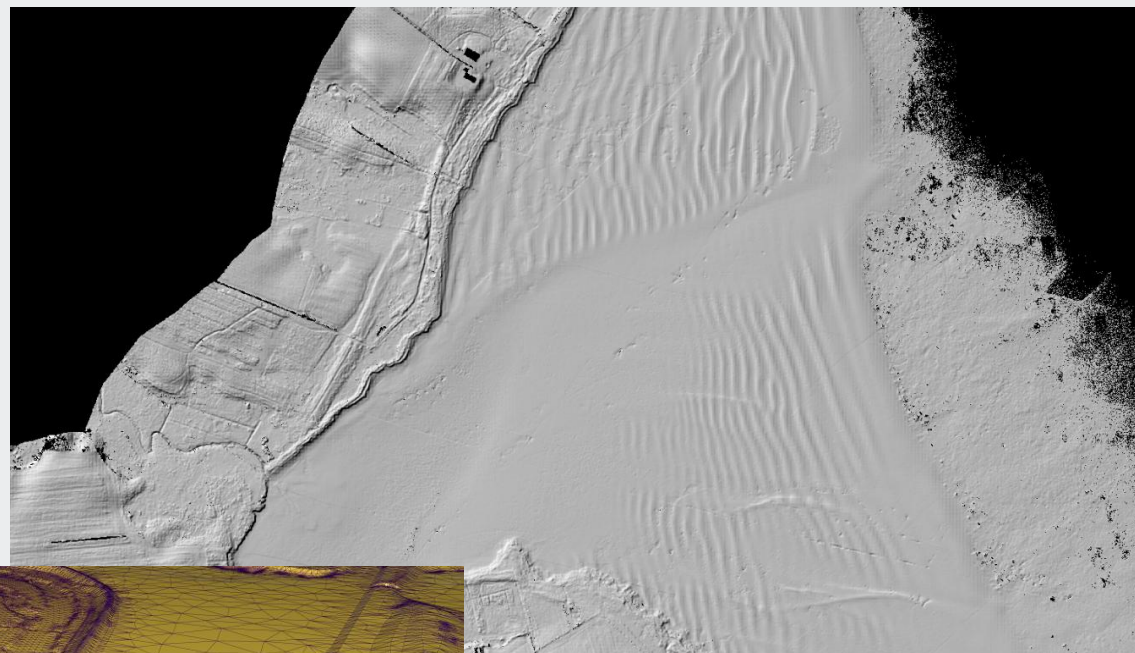
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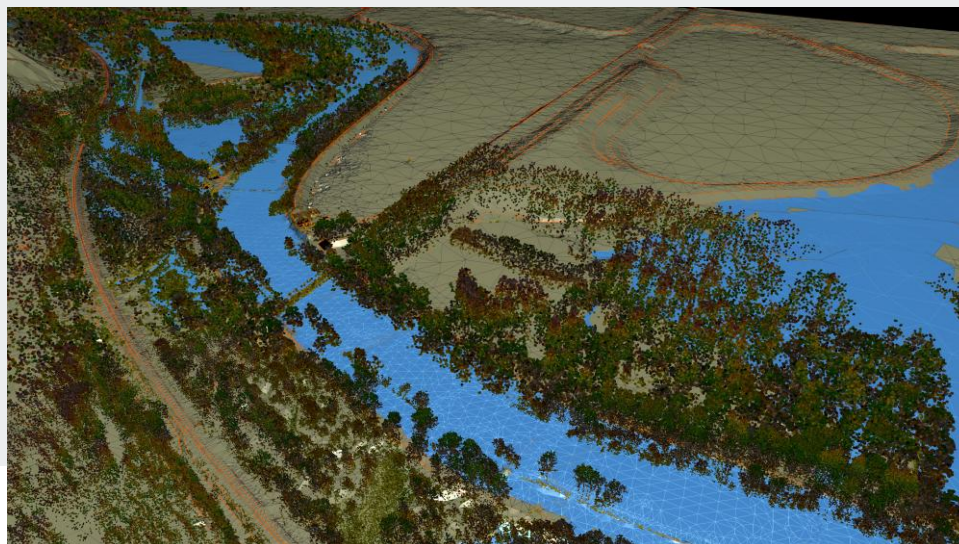
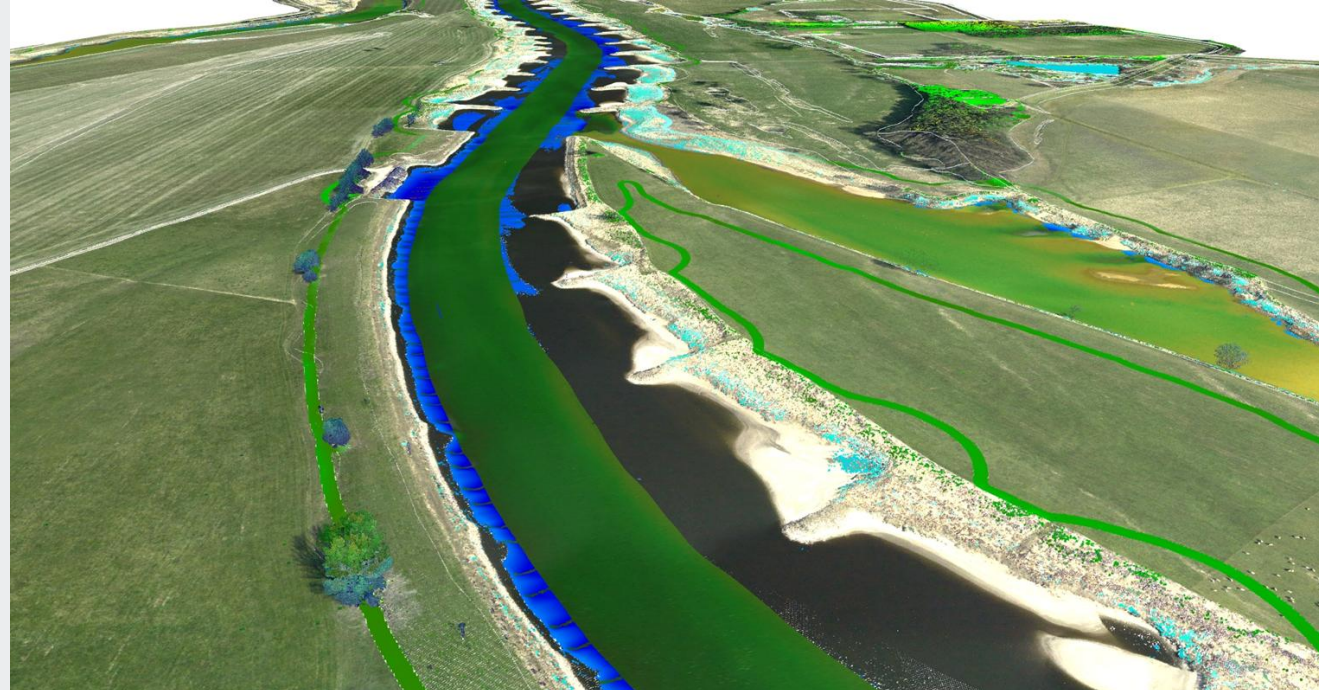
Latest developments – 2016-2024:

HydroVISH

Data merging

- LiDAR
- MBES
- RGB
- Hydraulics
- LoD

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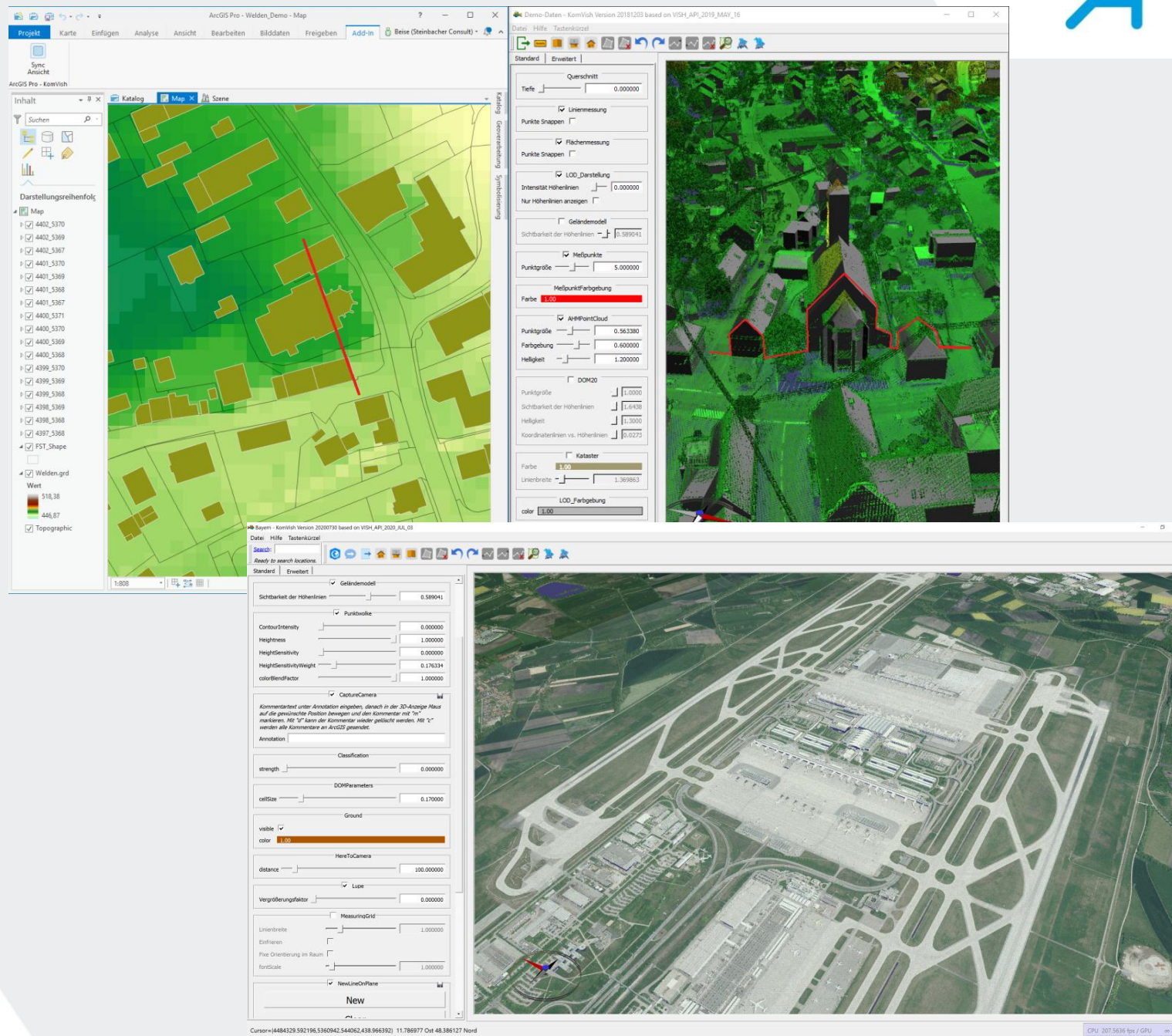


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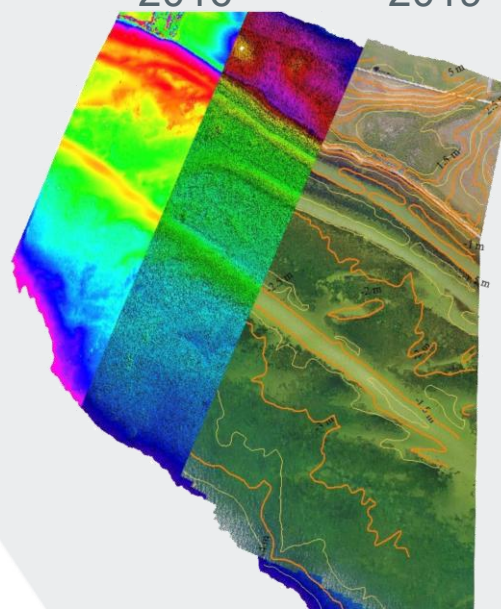
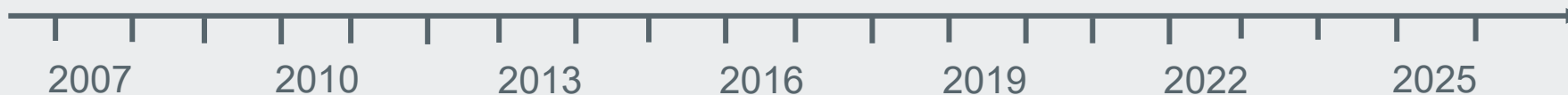
HydroVISH

3D-geodata Viewer KomVISH
as interface to 2D-GIS
(ArcGIS Pro & Kominfo)

Handling 3D-geomass data
(e.g. LiDAR & DSM-data Bavaria)

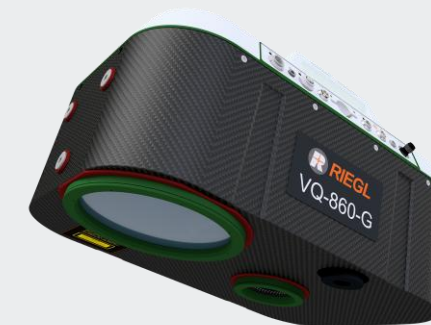


Future – 2025 & beyond:



Expanding network & competences:

Building up cooperation with ALM for applications of VQ840-G & VQ860-G



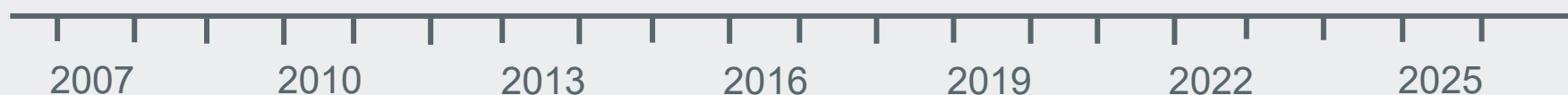
Future – 2025 & beyond:



Topobathymetry 3.0
green at ALL



eVTOL Ehang 216
<https://www.ehang.com>

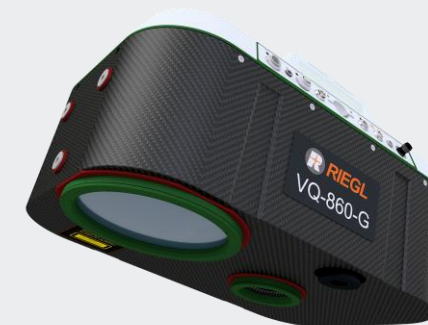


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Your multi purpose vehicle

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Battery Electric Vehicles
bus & logistic platforms

E-FORMICA

E-Formica EF-12EV,
420 kWh movable
charging & start/landing
platform for eVTOL



Thank you for your attention!

