
Changing structures - changing chances!
Thank You!

Von der Theorie in der Erhebungspraxis, zur Praxis in der Datentheorie

Befliegung
Sensorik
Datenprozessierung

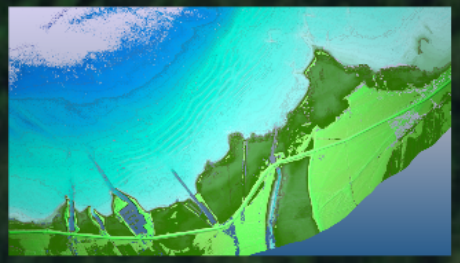
AHM
AIRBORNE
HYDRO
MAPPING
Analyzing the green heart beat of data

Wien, 11.02.2016

DI Frank Steinbacher

Targets within research project: AAHM

Targets:



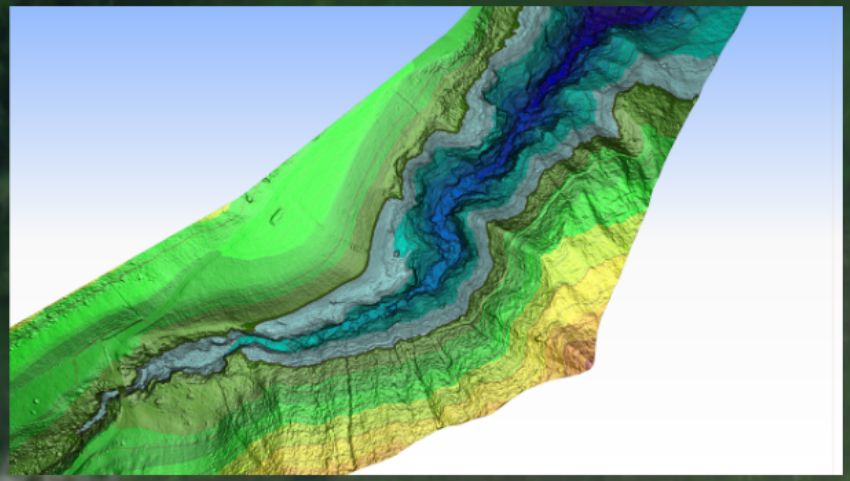
- demonstrate seamless topographic and bathymetric survey for different water regimes
- standardization in data capturing
- standardization and time reduction in data processing

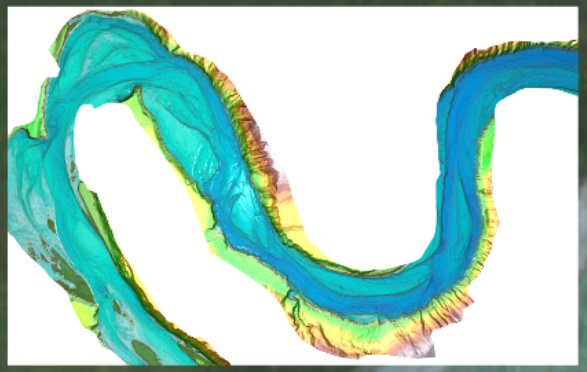
AIRBORNE HYDRO MAPPING

AIRBORNE LAND MAPPING

AIRBORNE NATURE MAPPING

AIRBORNE ICE&SNOW MAPPING

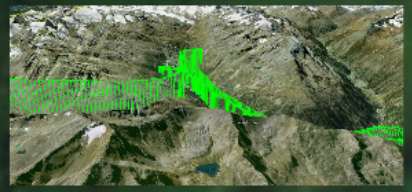


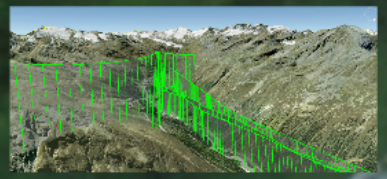


Survey: topography, weather, flow conditions

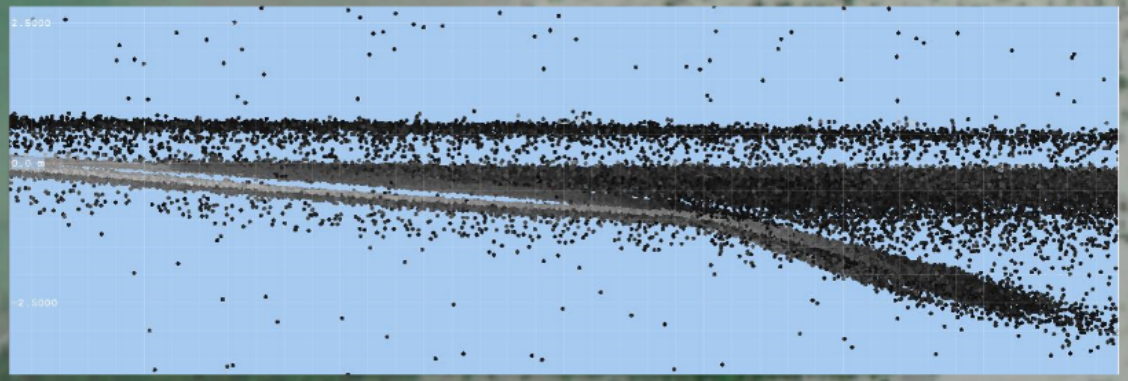




DO go for the mission within "constant" parameters



DO plan to fly the mission multiple times - the entire area!

Sensors

Flight speed: ~80kts

	VQ-820G	VQ-880G
Normal operation altitude:	~600m (eye-safety)	beam divergence variable
Footprint size:	~0.5m	
Pulse Repetition Rate:	256/512 kHz	up to 550 kHz
Scan pattern:		
Scan angle: non nadir	20° backward	20° forward& backward
Scan width @600m:	~400m	~400m
-> Results in about:	>20 points/m²	>40 points/m²
Data size (hydromapping):	~20GB/km²	~40GB/km²

Sensor set-up:

Topo-Bathymetric Lidar Scanner: Riegl VQ-820G / Riegl VQ-880G
RGB-Camera: Hassleblad H39 (IGI) (GSD ~5cm)
4K-Videocamera: Garmin Virb Elite

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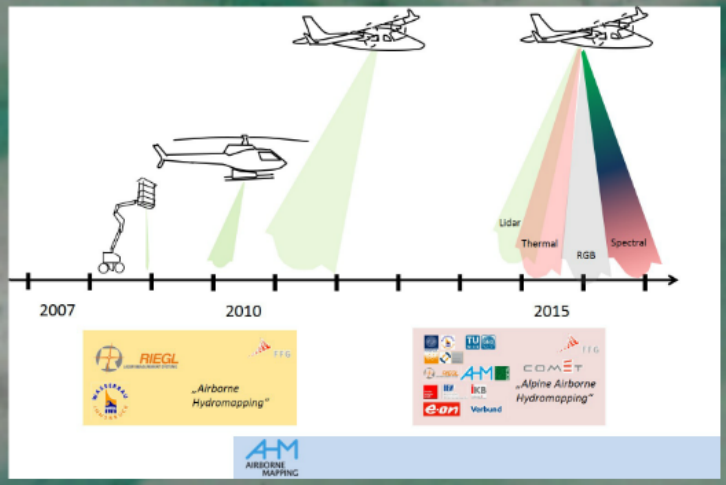
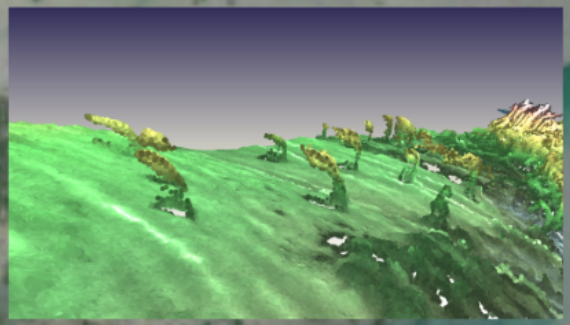
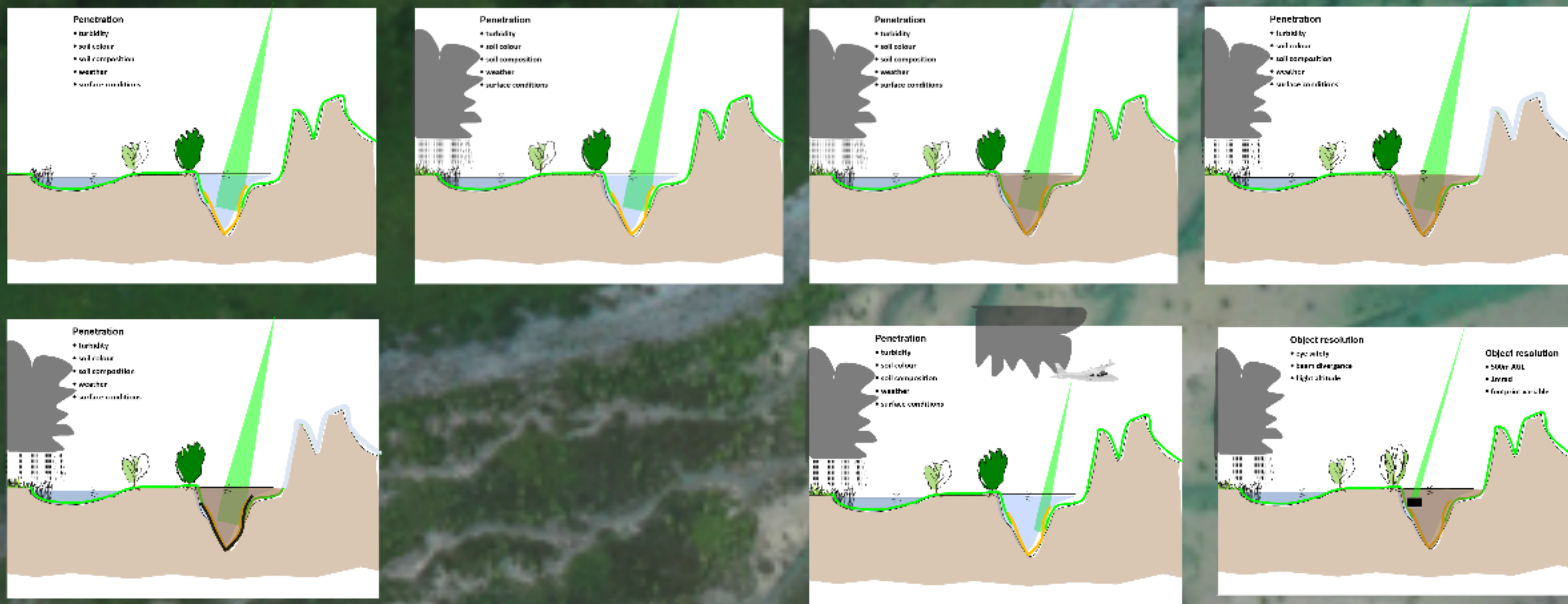
Thermal Camera: Infratec HD900 (GSD ~20cm)
Spectral sensor: Tetracam adc Micro (450nm-1000nm)



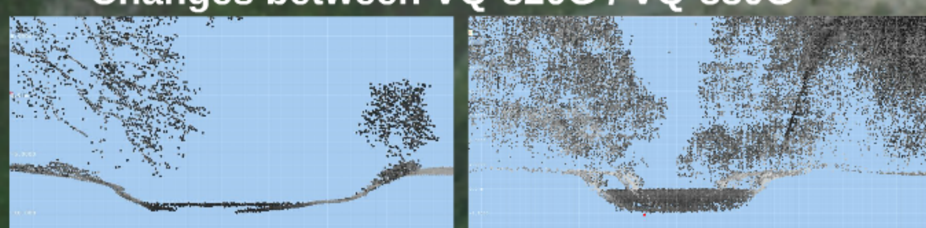


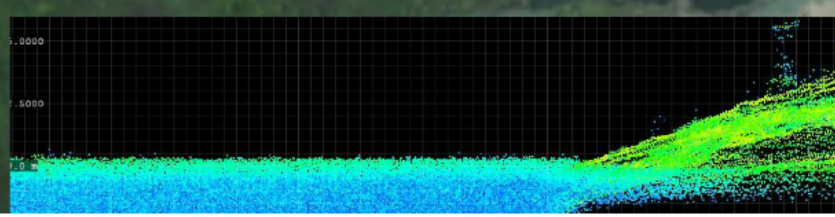
DO take into account for mission planning

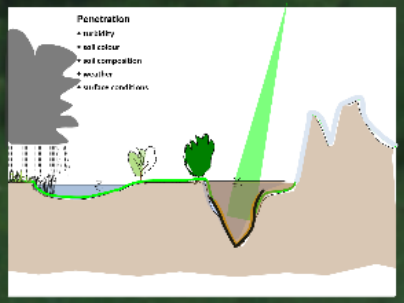


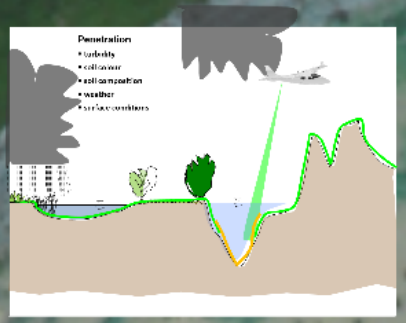
DO estimate the impact of influences during flight on data processing

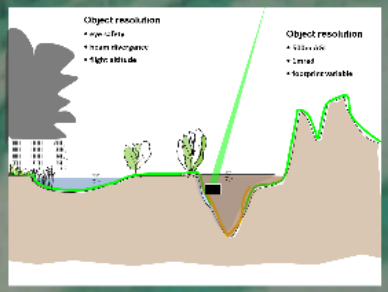
Changes between VQ-820G / VQ-880G











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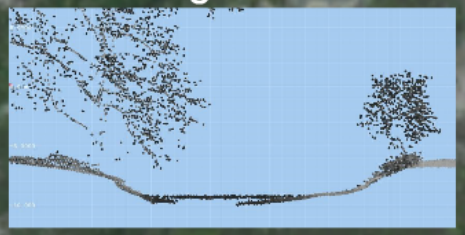
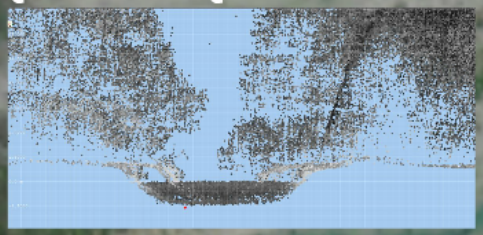
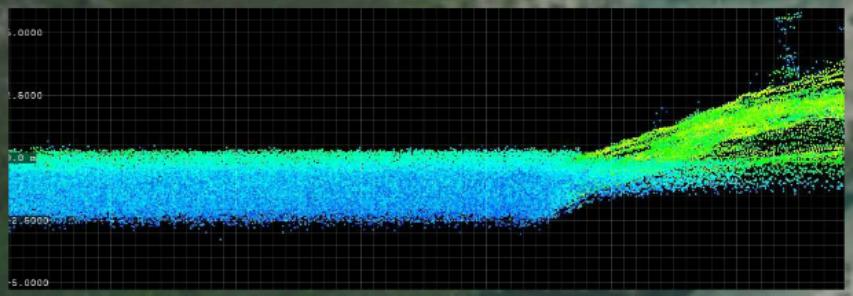




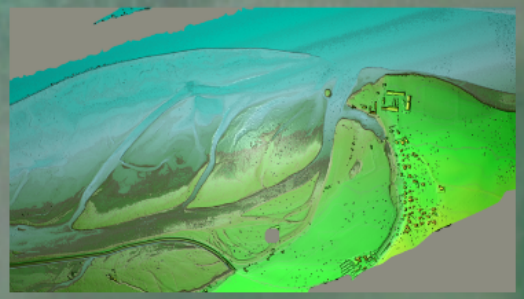


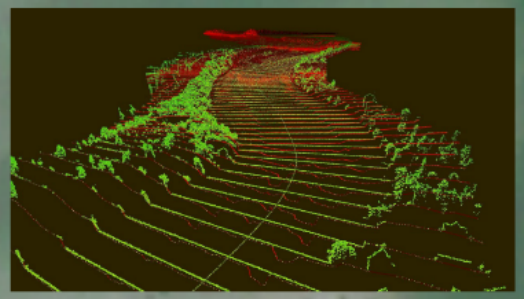
Combined data capturing and its possibilities

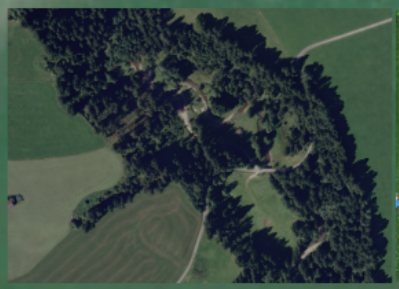
UNDERSTANDING PROCESSES
Airborne classification of river structures

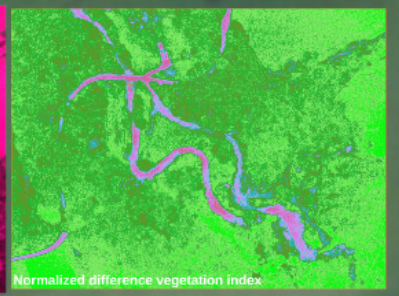
- topobathymetric survey
- RGB-imagery (5cm GSD)
- spectral imagery (Green, Red, NIR (Equivalent to Landsat TM2, TM3, TM4) (20cm GSD))
- thermal imagery
  (1°K resolution, 20cm GSD)

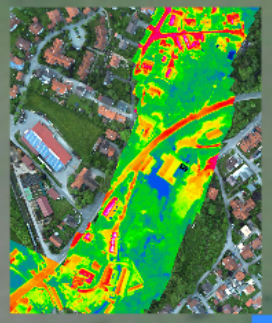
-> all datasets from one survey platform



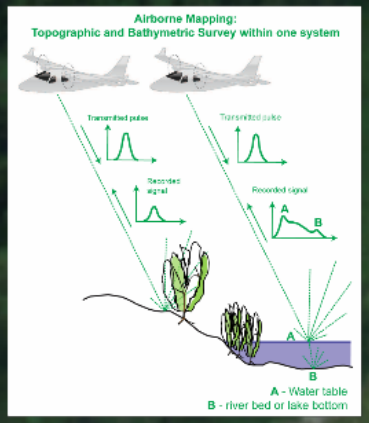


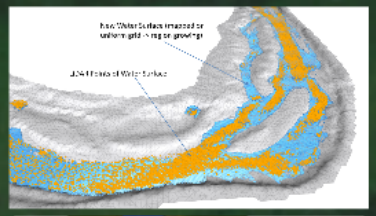


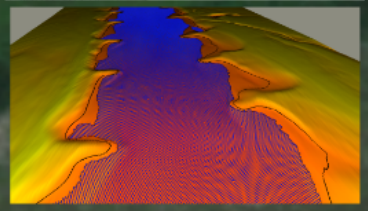


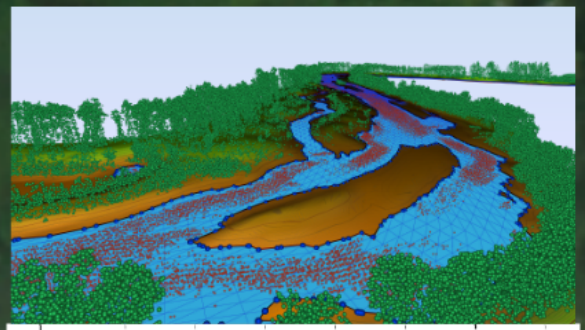


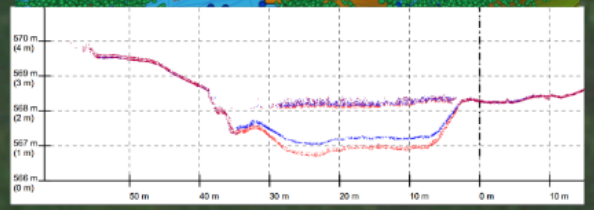
Data processing











- more time consuming data processing
  (amount of data, manipulation strip wise, day wise, weather wise)
- run-time and refraction correction on water side (right water surface model)
- need of foreign data (echosounder data, gauges, RGB values
- easier to make mistakes during processing
- visualization for processing and quality control needed

-> need to give access from raw data to end-user products

+ increase of point density improves filters/algorithms and machine learning processes
+ scan data can be used for foreign purposes (water, nature, urban)
+ monitoring changes possible in vertical and horizontal direction on topographic and bathymetric side
+ better visual access to non-power users, better communication of data to client

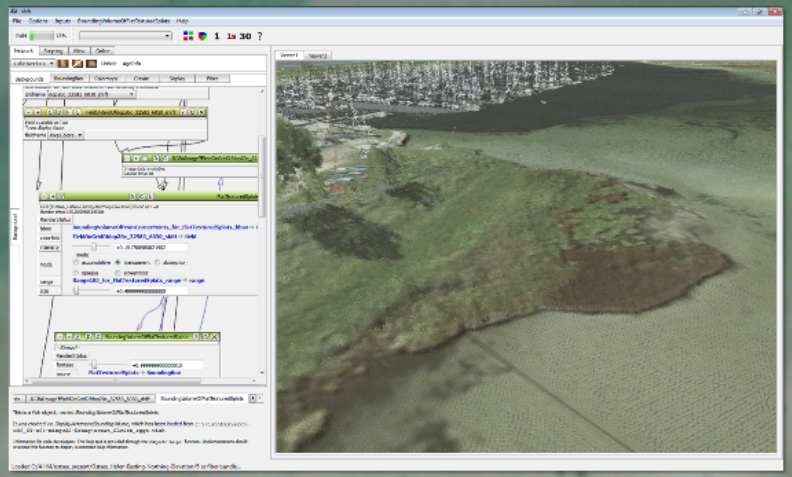
HydroVISH

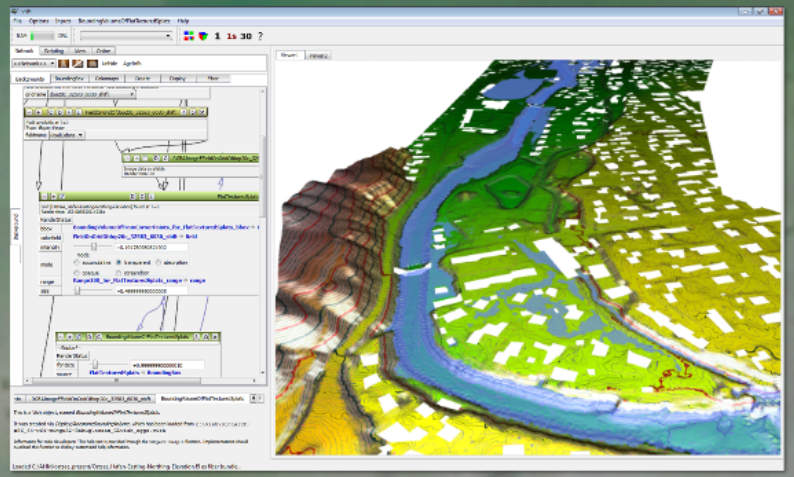
Limitless mass geodata processing!
We don’t promise simple but possible!

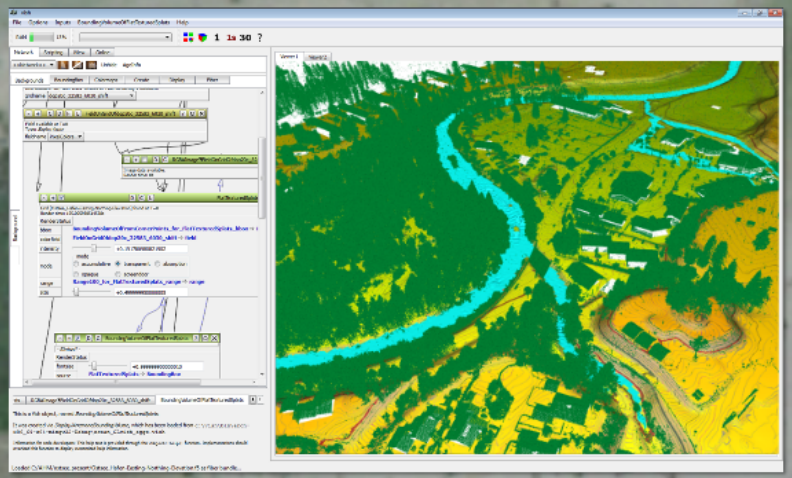
What are we facing with an topo-bathymetric datasets and what’s the difference to classic ALS?

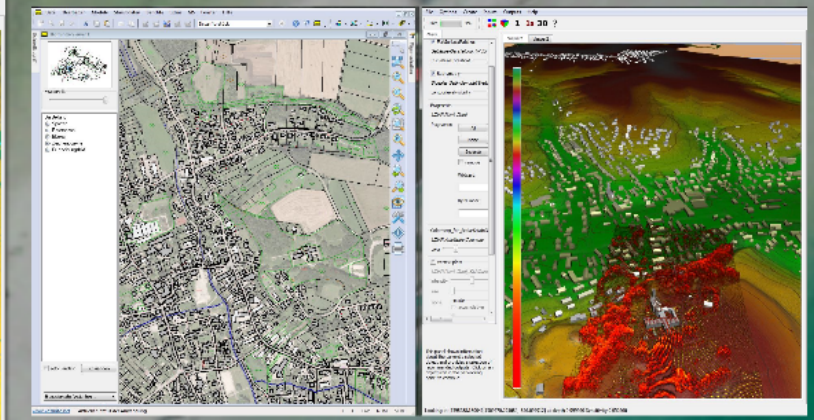
HDF5
Hierarchical Data Format Version 5

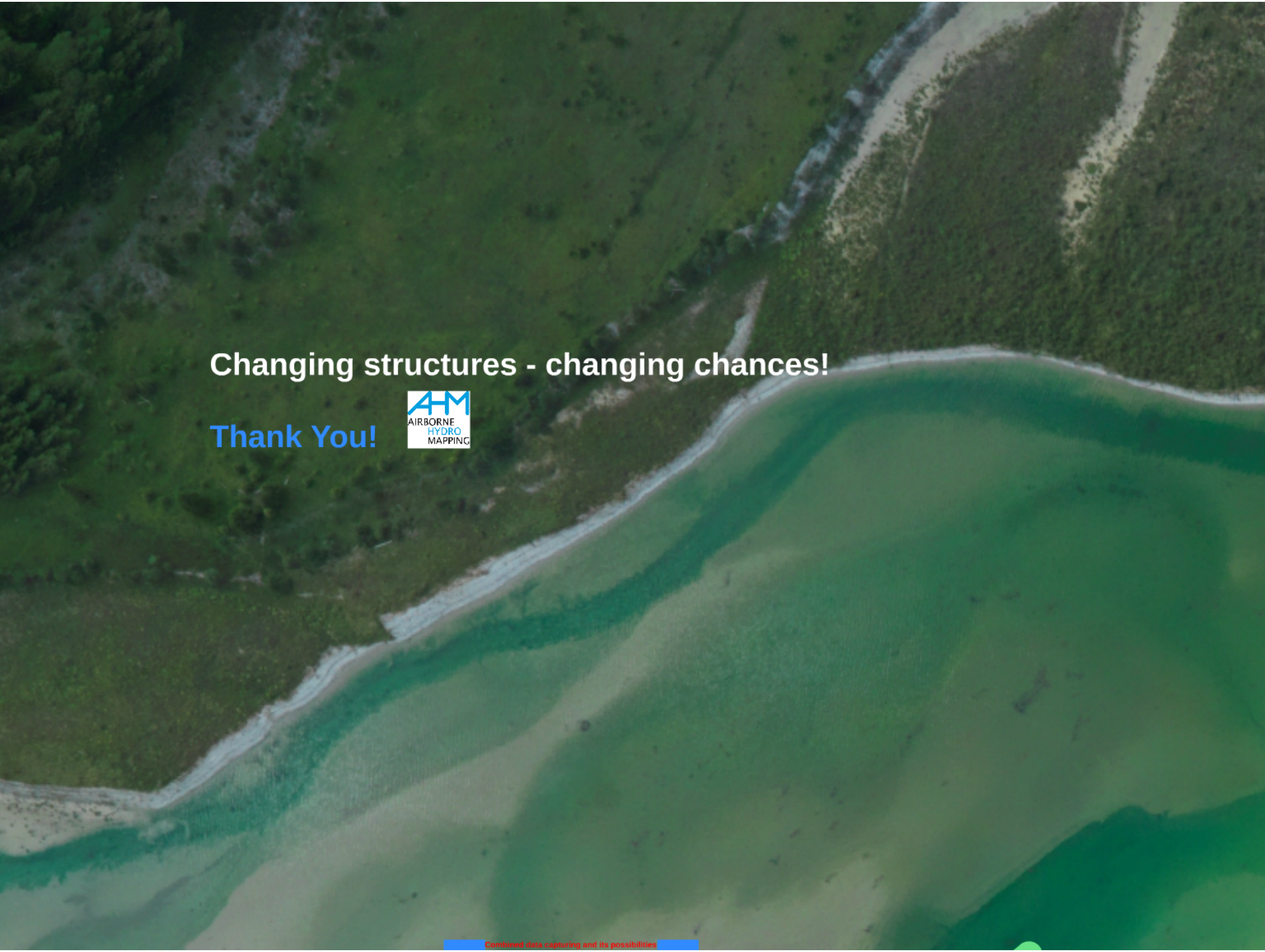
- **data visualization** — *what you see is what you understand*
- **data investigation** — *non-limited data investigation and analysis*
- **data management** — *handling the mass of data*
- **data processing** — *topo-bathymetric lidar datasets*
- **data storage** — *long lasting data accessibility*
- **filtering & classification** — *new methods and algorithms*
- **data conversion** — *convert/processing of items but keeping all data*
- **fluent workflow** — *from raw data to end-user*







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