
Hydrographentag 2016


DO know and understand the tech side?
DO know and understand the tech side?
DO find asap on target site data your driving factors by first analysis!
DO know your driving factors on topobathymetric survey
Capturing reality, never possible before?


Hydrographentag 2016
The amazing variety of waters
know and understand the tech side?
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find asap on target site data your driving factors by first analysis!
take into account for mission planning
estimate the impact of influences during flight on data processing
know your driving factors on topobathymetric survey
tide, sea fog, wind, waves, turbidity, submergence, ground truth, time
Capturing reality, never possible before?
Danke schön!

Hydrographentag 2016

1. – 2. Juni 2016
Jadehochschule Oldenburg

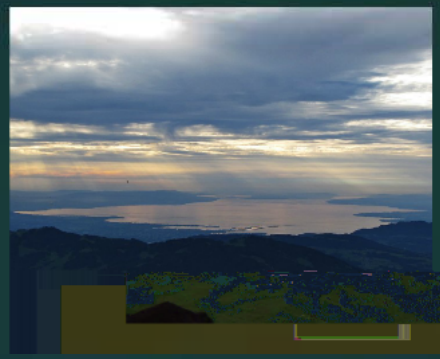
Airborne Topobathymetrie in schwierigen Gewässern - Licht in trüben Gewässern

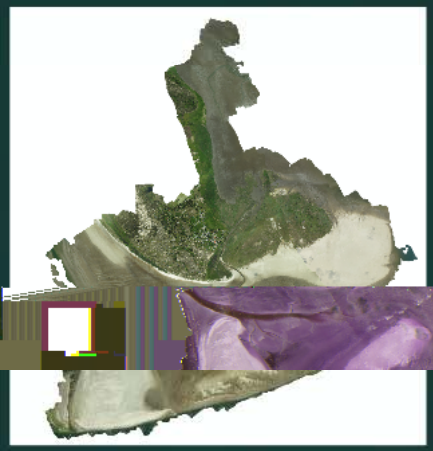
Einsatzmöglichkeiten & Einschränkungen in der Praxis

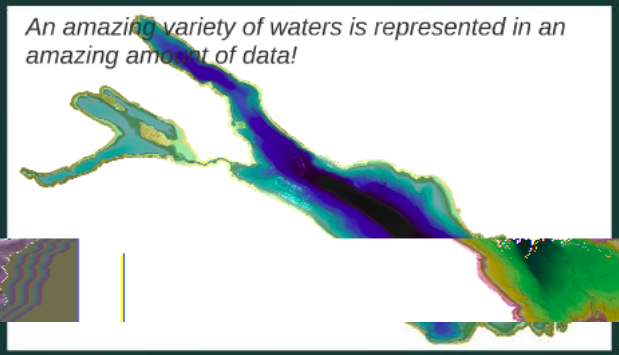
Frank Steinbacher & Ramona Baran*

*r.baran@ahm.co.at

The amazing variety of waters







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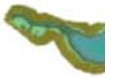
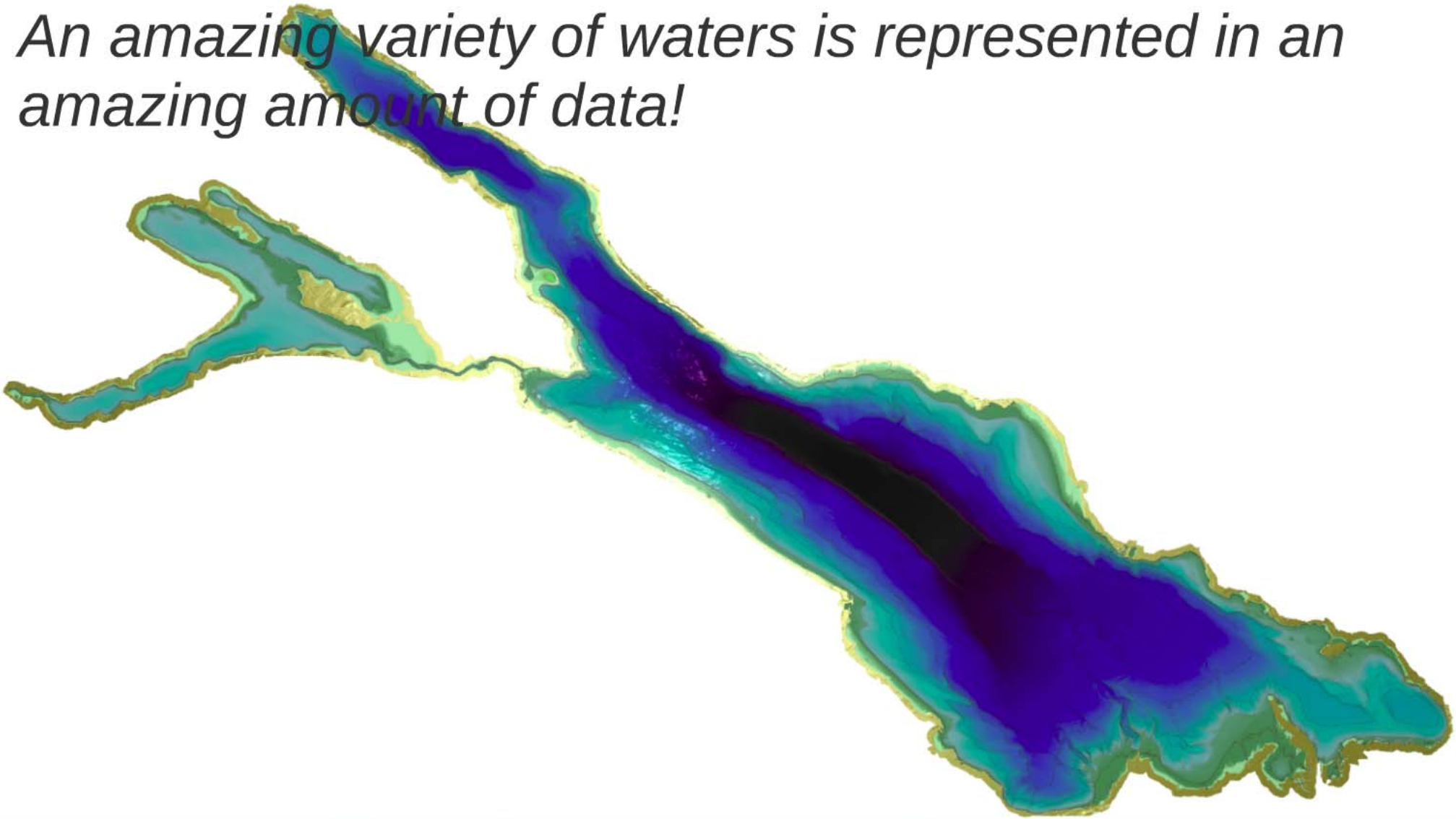
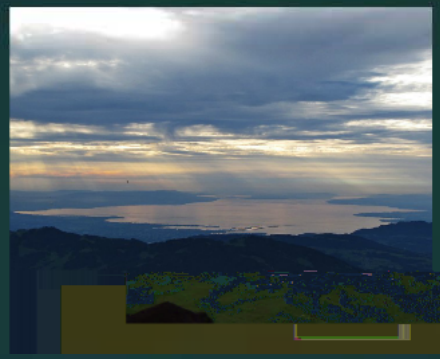
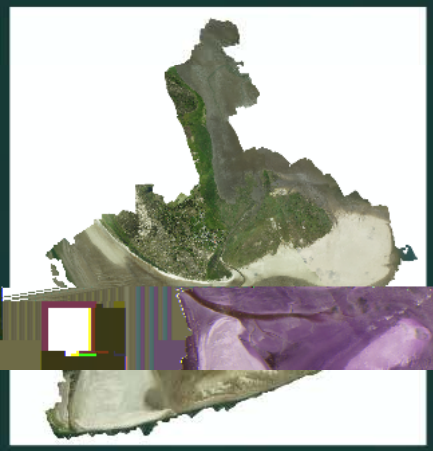


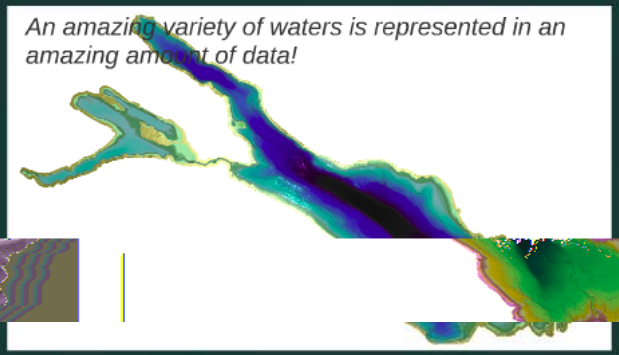
An amazing variety of waters is represented in an amazing amount of data!



The amazing variety of waters







Don't promise to much!!!
Try to be realistic!


NEVER
GIVE UP!
There is the right timewindow

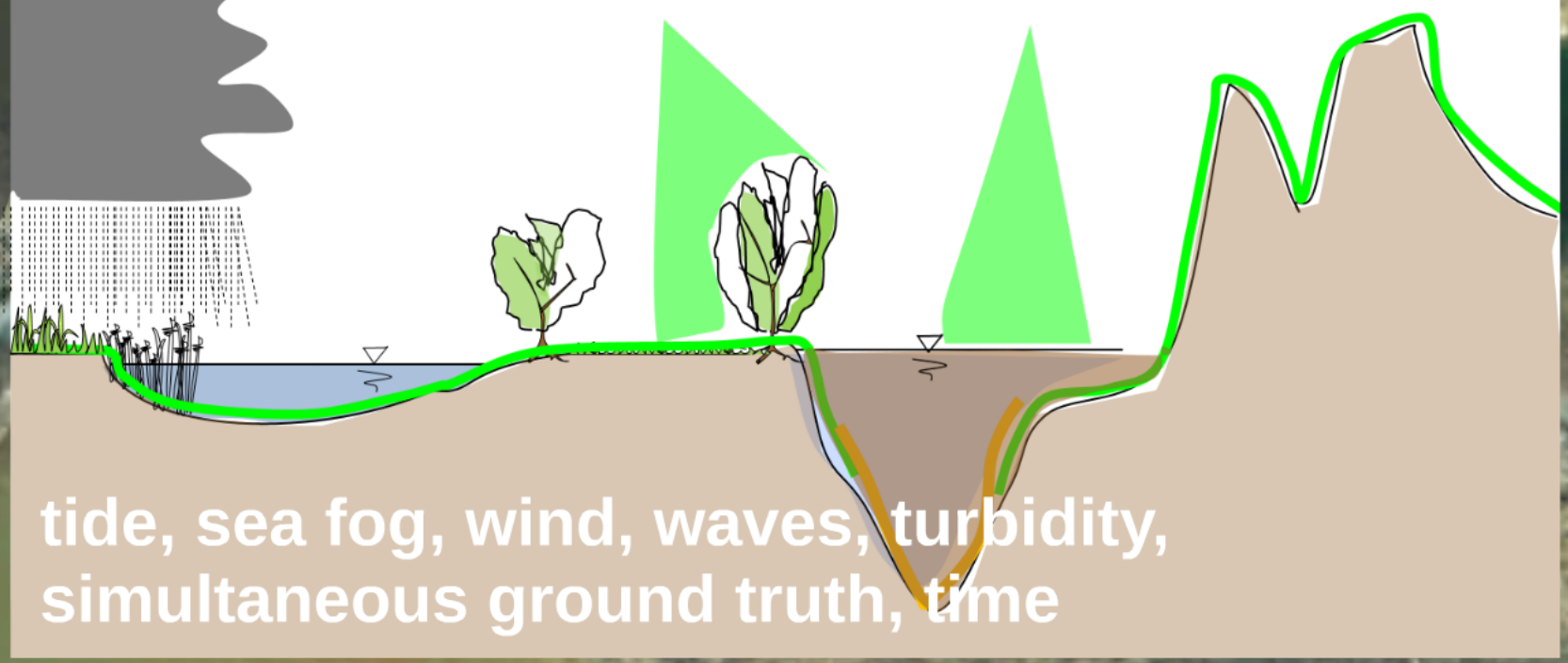
DO know your driving factors on topobathymetric survey

Penetration
- turbidity
- soil colour
- soil composition
- weather
- surface conditions

Shadowing
- inclination
- vegetation
- flight planning

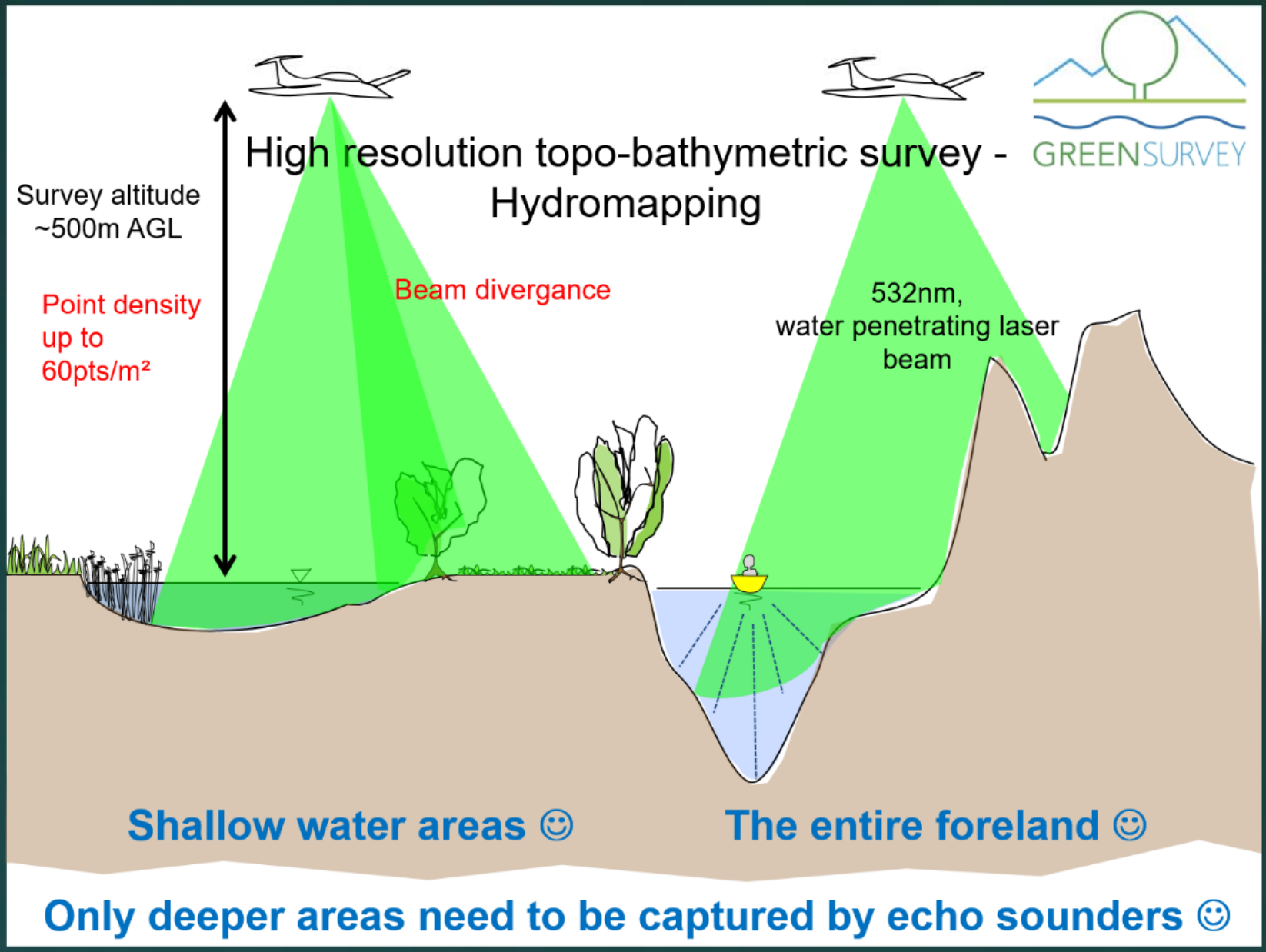
Object resolution
- eye safety
- beam divergance
- flight altitude

Data quality
- Goal of survey?
- GCP
- survey speed
- water surface echos



tide, sea fog, wind, waves, turbidity, simultaneous ground truth, time

DO know and understand the tech side?



DO know and understand the tech side?

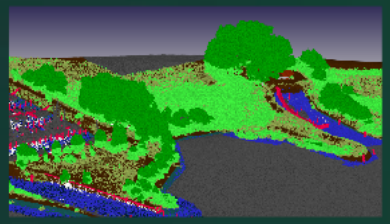
Changes in survey due to technical changes

Flight speed: ~80kts

	VQ-820G	VQ-880G
Altitude:	~600m (eye-safety)	beam divergence variable
Footprint:	~0.5m	
Pulse Repetition Rate:	256 kHz	up to 550 kHz
Scan pattern:		

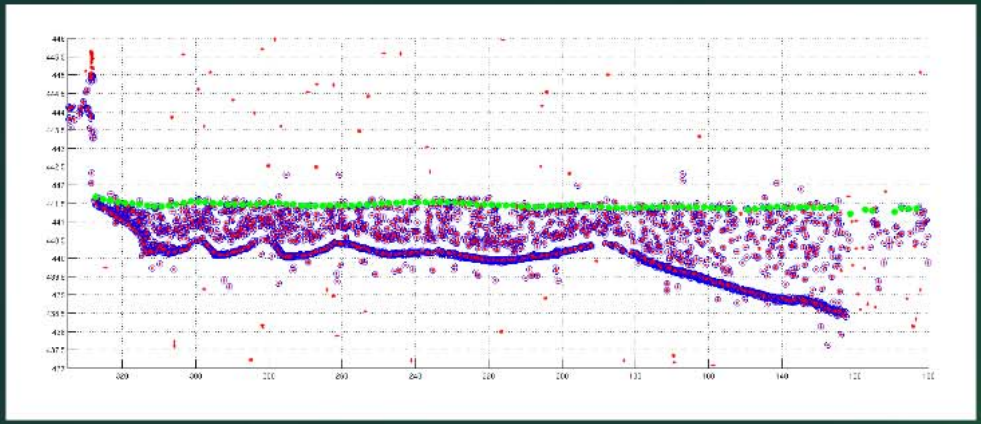
DO know how to handle your data within your software

data size / data format / the way data looks like



+ higher point density
+ more sensible optics (water surface, vegetation, atmosphere)
+ more detailed structures (inclination)
+ new possibilities in automatic processing (machine learning)

- spend more time on data processing
  (amount of data, data handling (export, copying)
- easier to make mistakes - mistakes take longer to handle
- need to adjust software procedures to data structure



DO go for the mission within "constant" parameters

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


F9
F8
F11
F7
F12
F10
F14
F6
F13
F5
F15
F16
F4
F17
F3
F2
F1
F18
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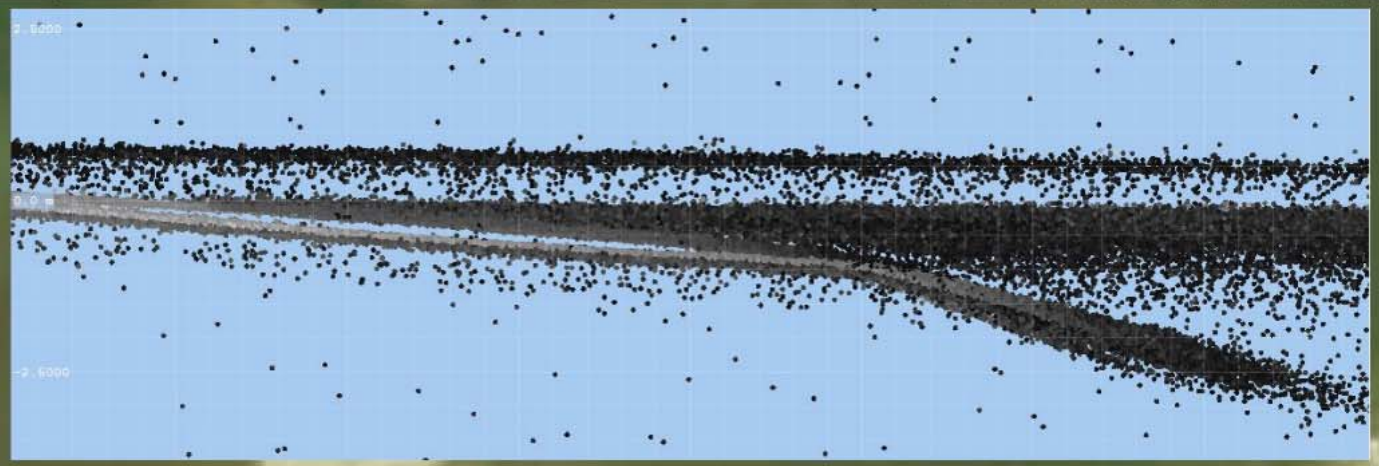

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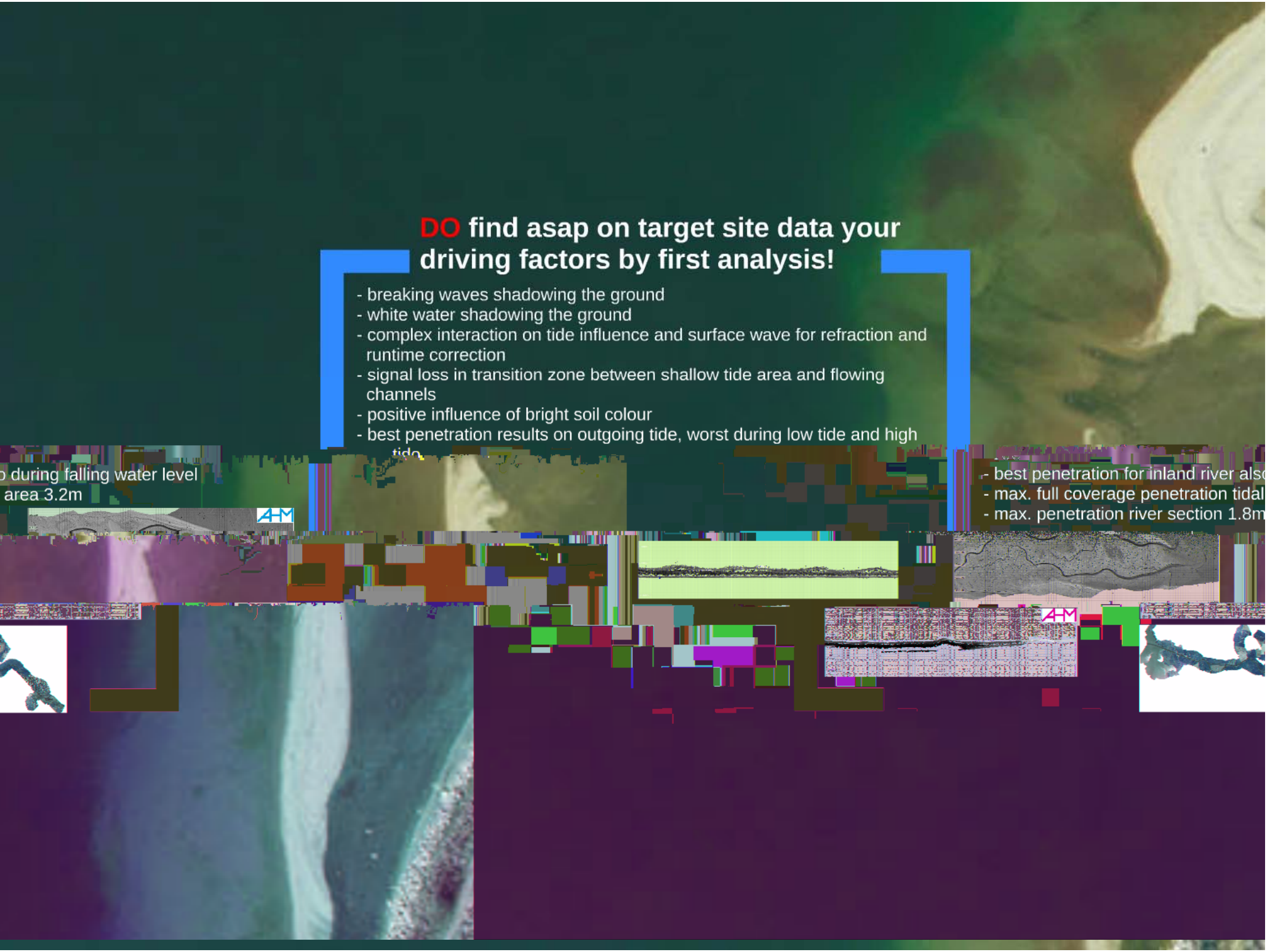
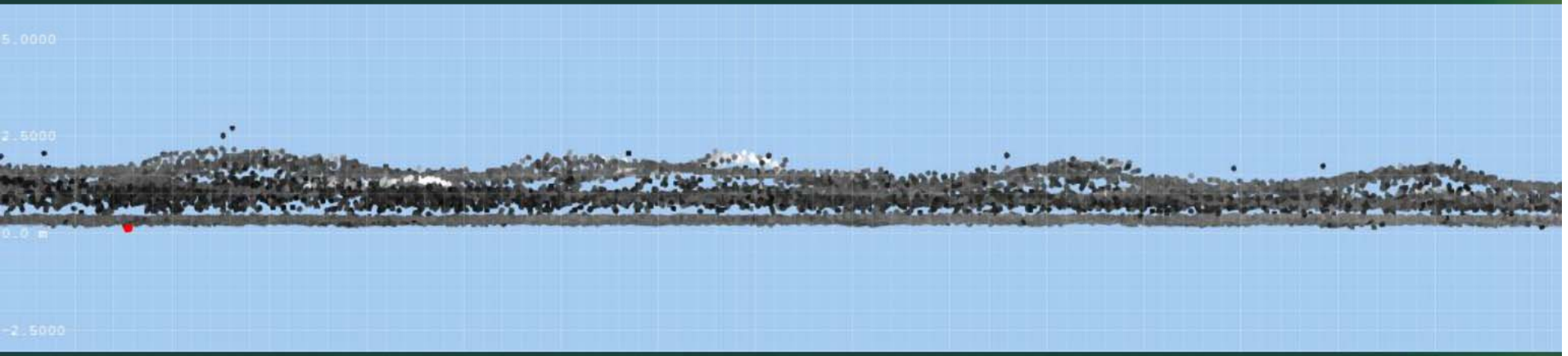
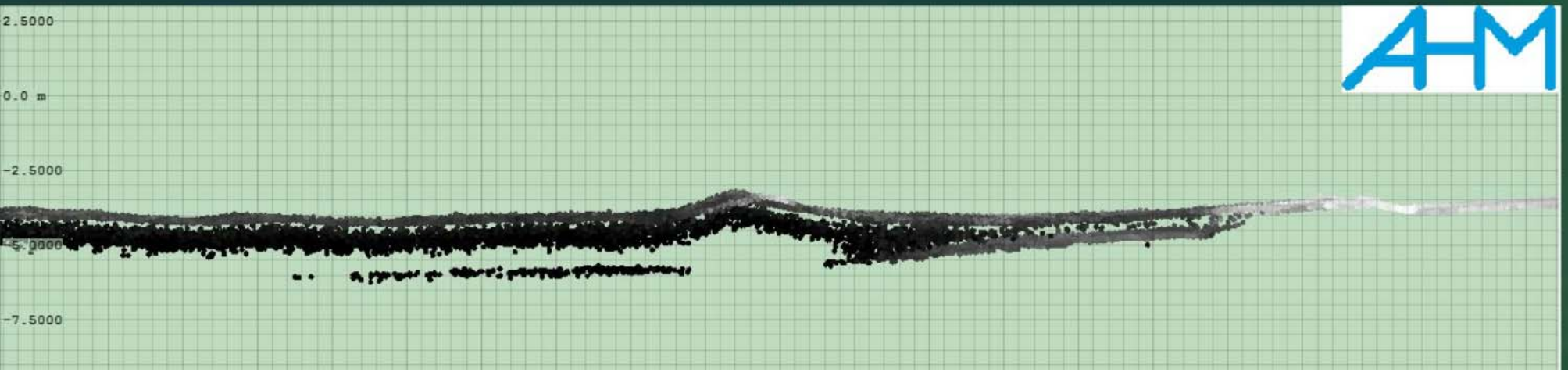
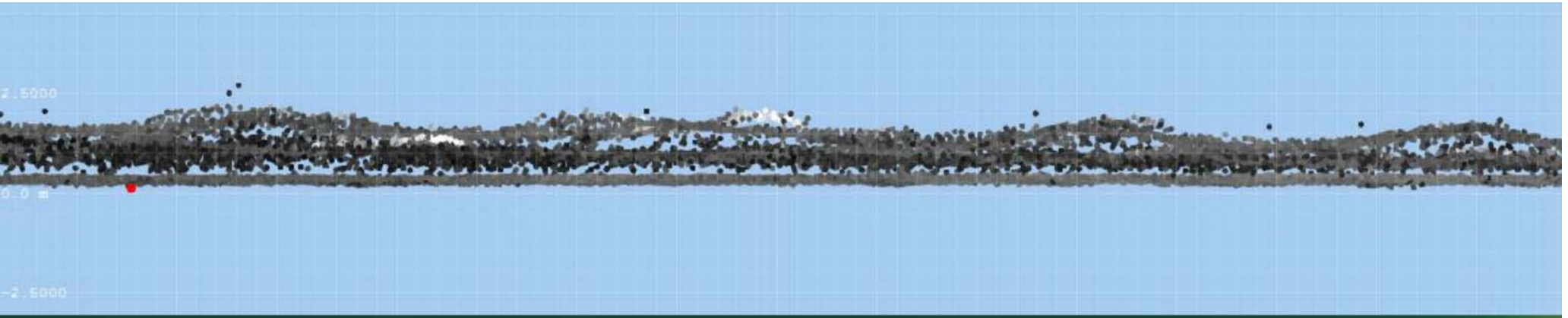
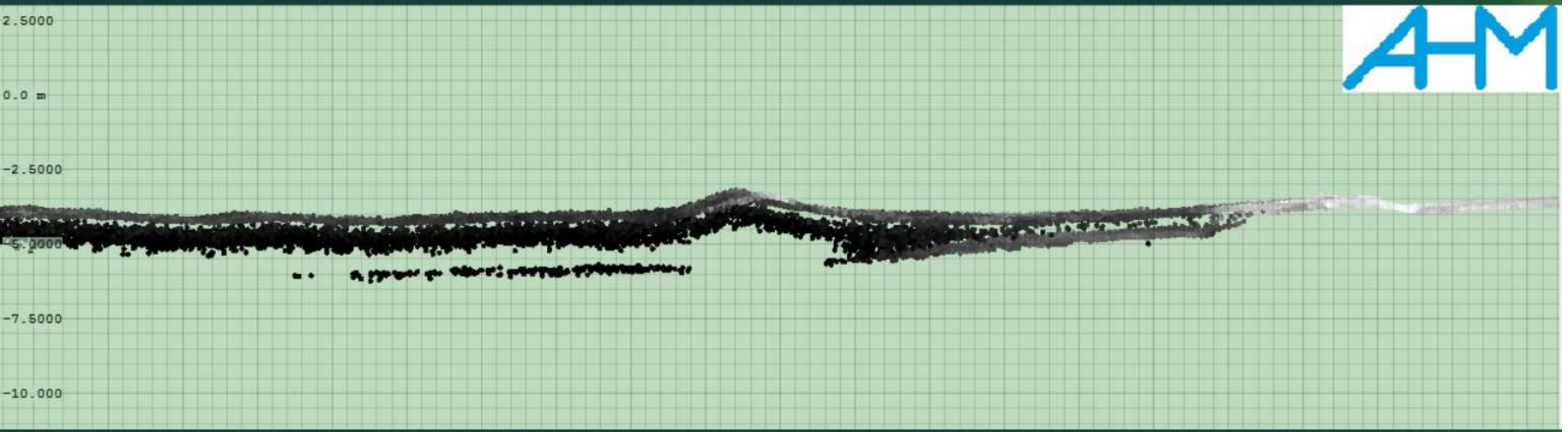

DO find asap on target site data your driving factors by first analysis!
- breaking waves shadowing the ground
- white water shadowing the ground
- complex interaction on tide influence and surface wave for refraction and runtime correction
- signal loss in transition zone between shallow tide area and flowing channels
- positive influence of bright soil colour
- best penetration results on outgoing tide, worst during low tide and high
o during falling water level
area 3.2m
- best penetration for inland river also
- max. full coverage penetration tidal
- max. penetration river section 1.8m

- best penetration for inland river
- max. full coverage penetration t
- max. penetration river section 1

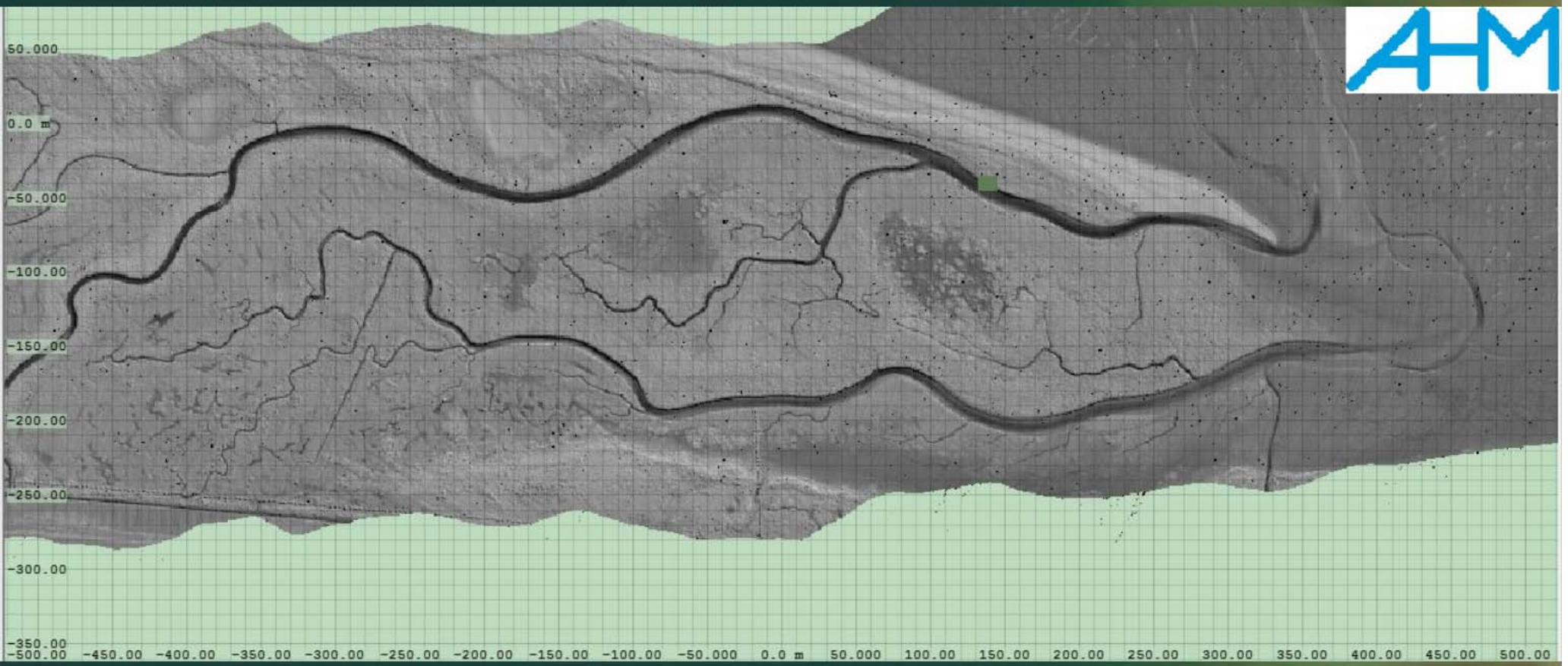





2.5000
0.0 m
-2.5000


2.5000
0.0 m
-2.5000
-5.0000
-7.5000
-10.000

uring falling water level
ea 3.2m




-300.00
-350.00
-500.00
-450.00
-400.00
-350.00
-300.00
-250.00
-200.00
-150.00
-100.00
-50.000
0.0 m
50.000
100.00
150.00
200.00

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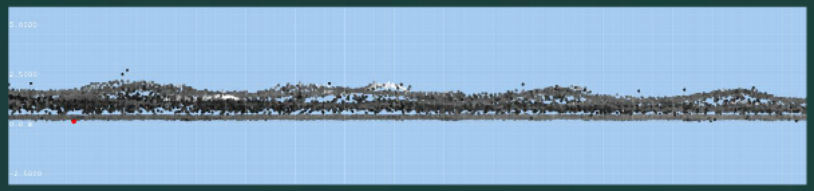
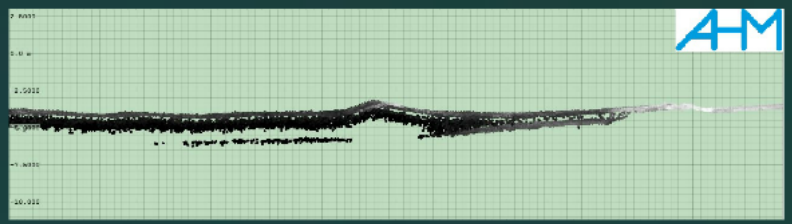
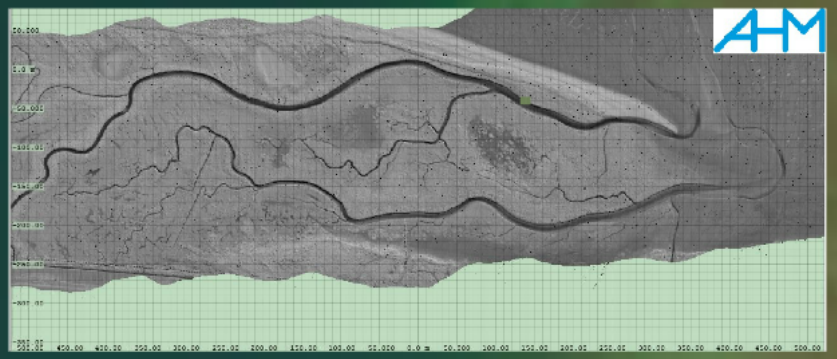
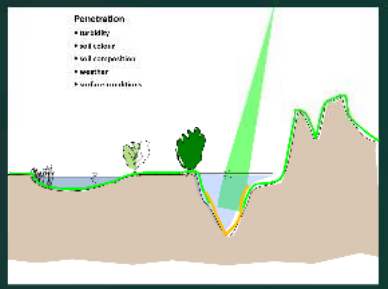
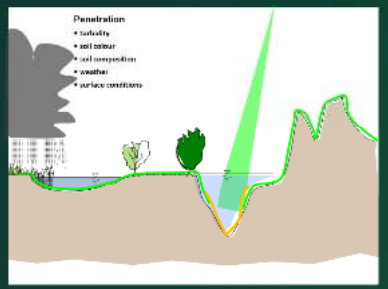


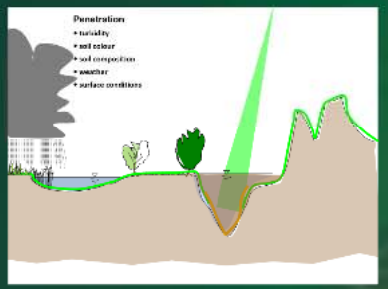


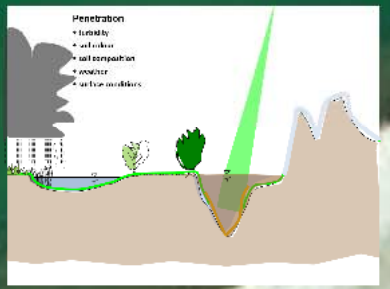


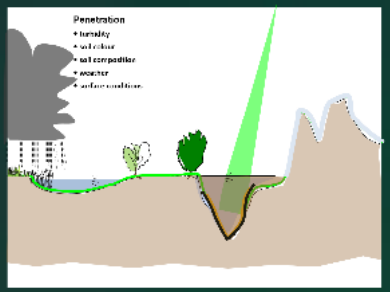
DO take into account for mission planning

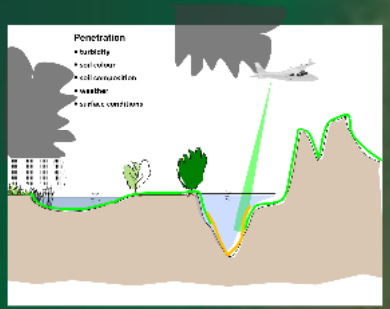


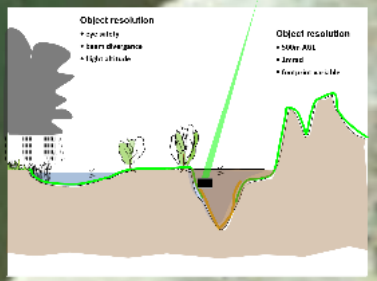




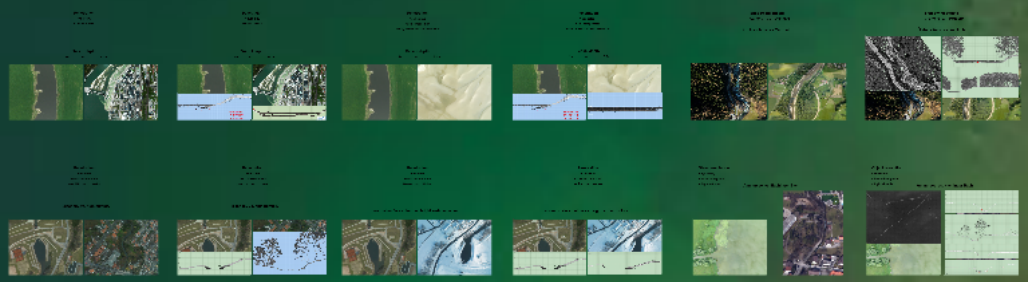


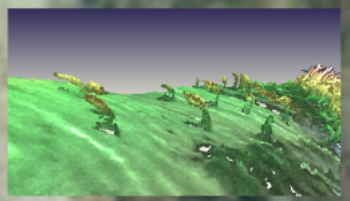






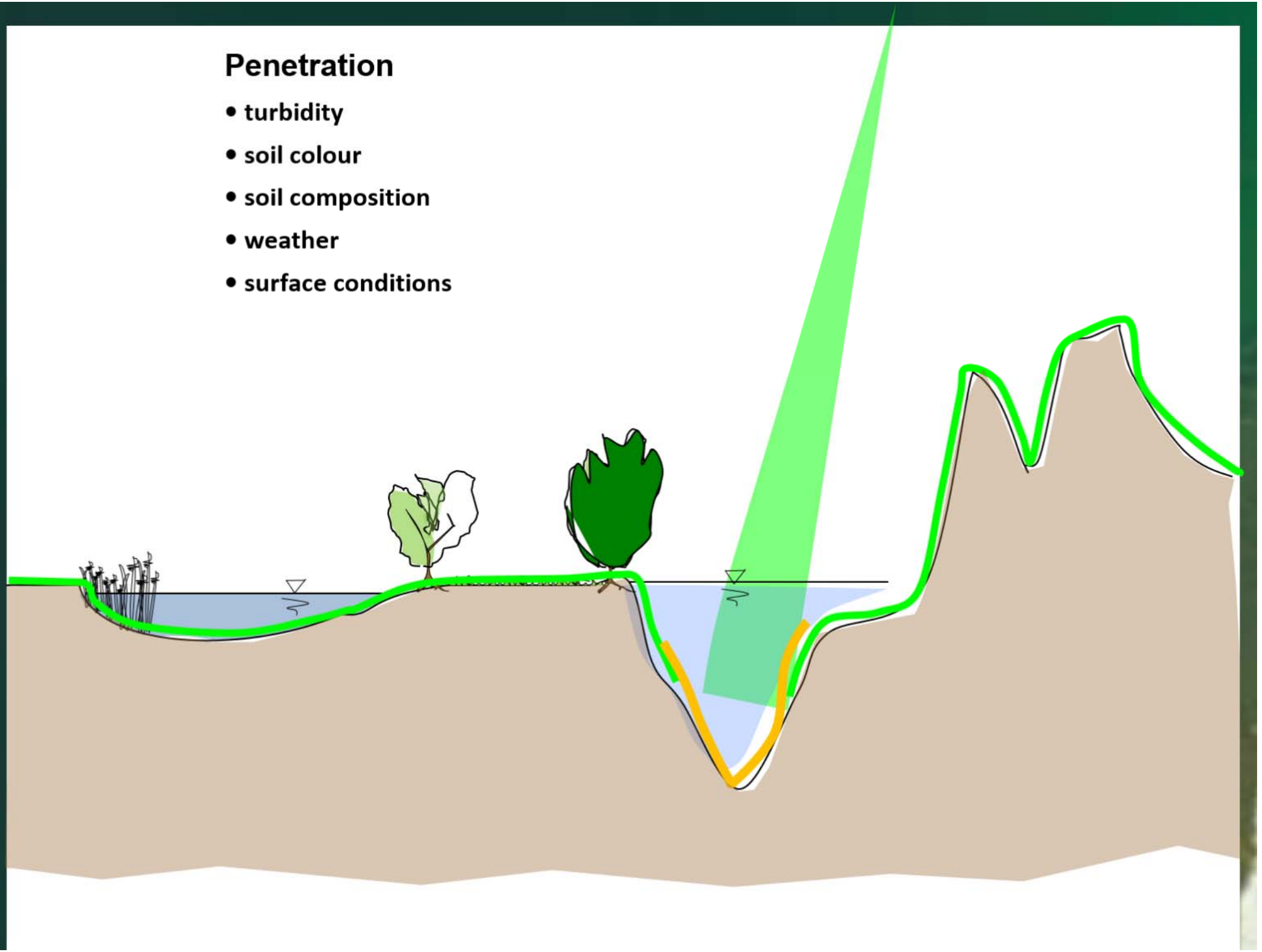
DO estimate the impact of influences during flight on data processing





Penetration

- turbidity
- soil colour
- soil composition
- weather
- surface conditions



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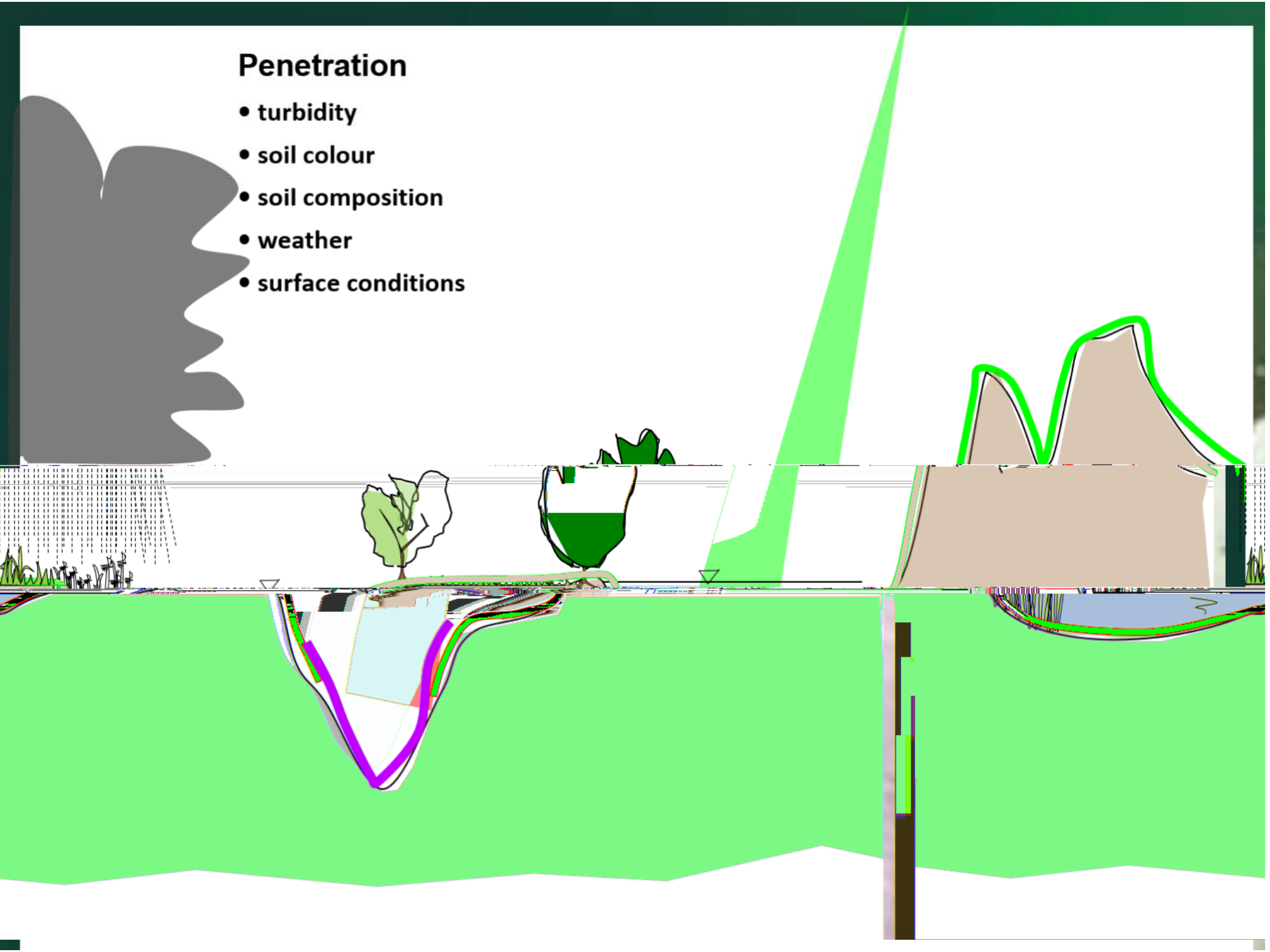

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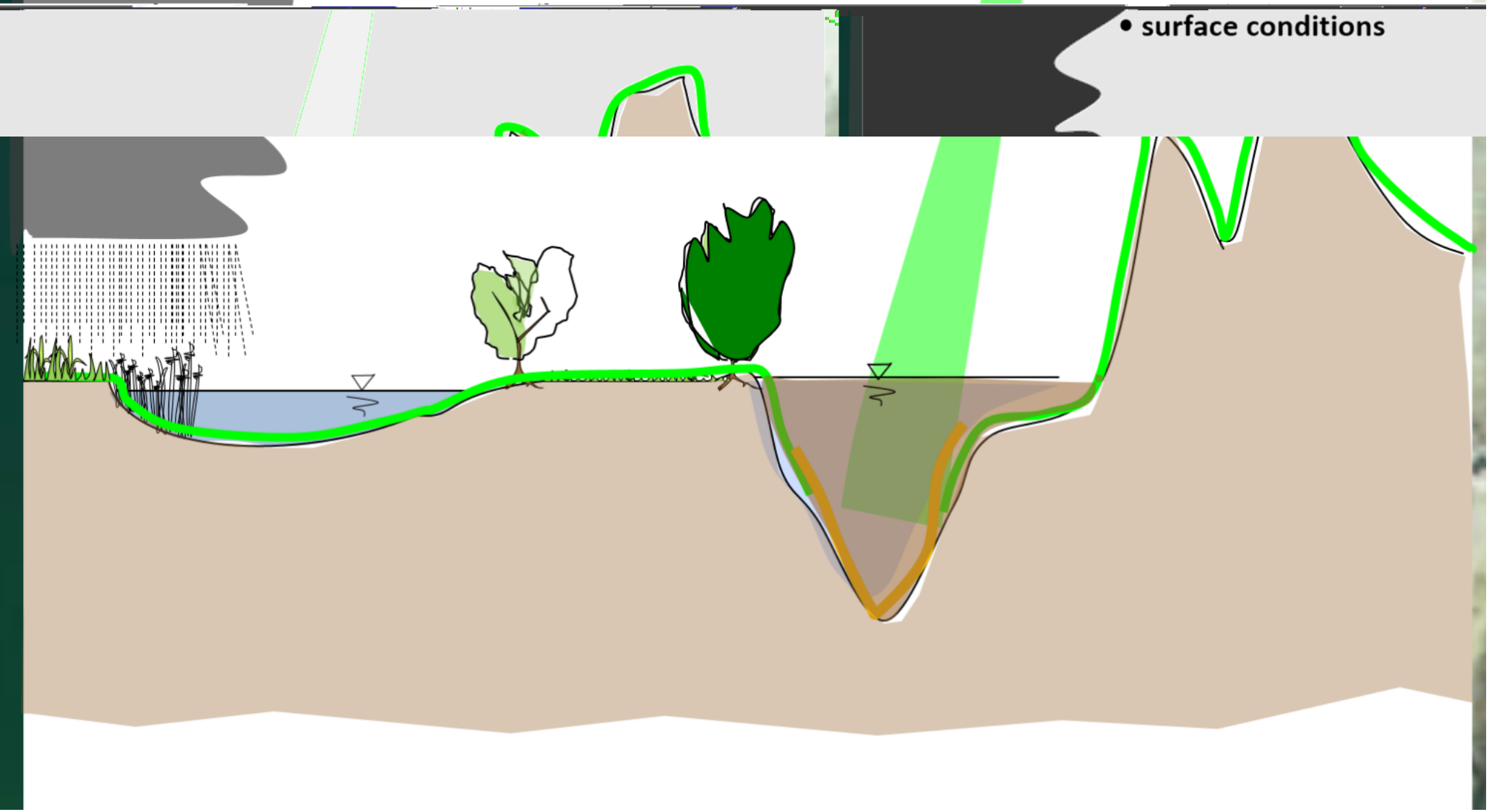

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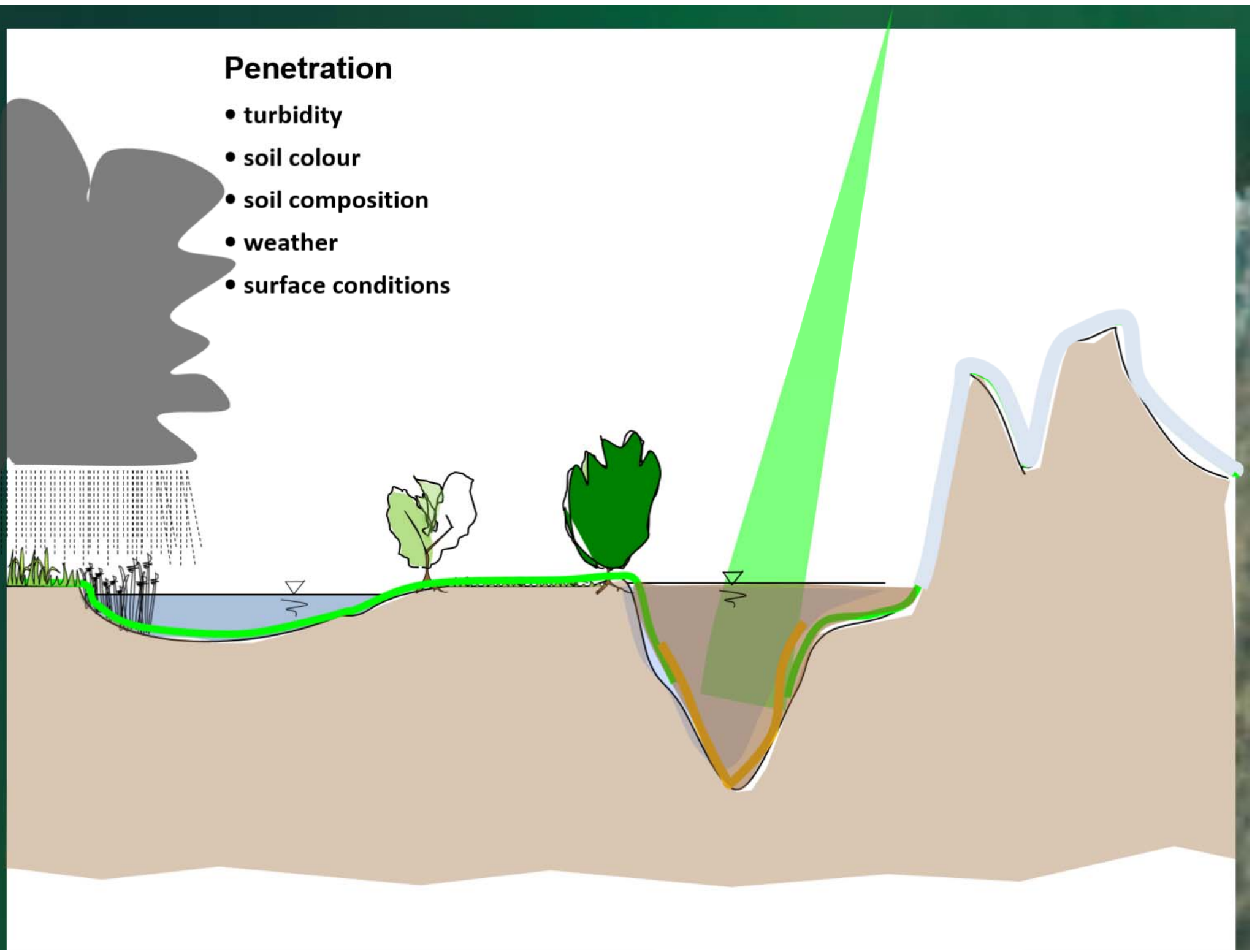

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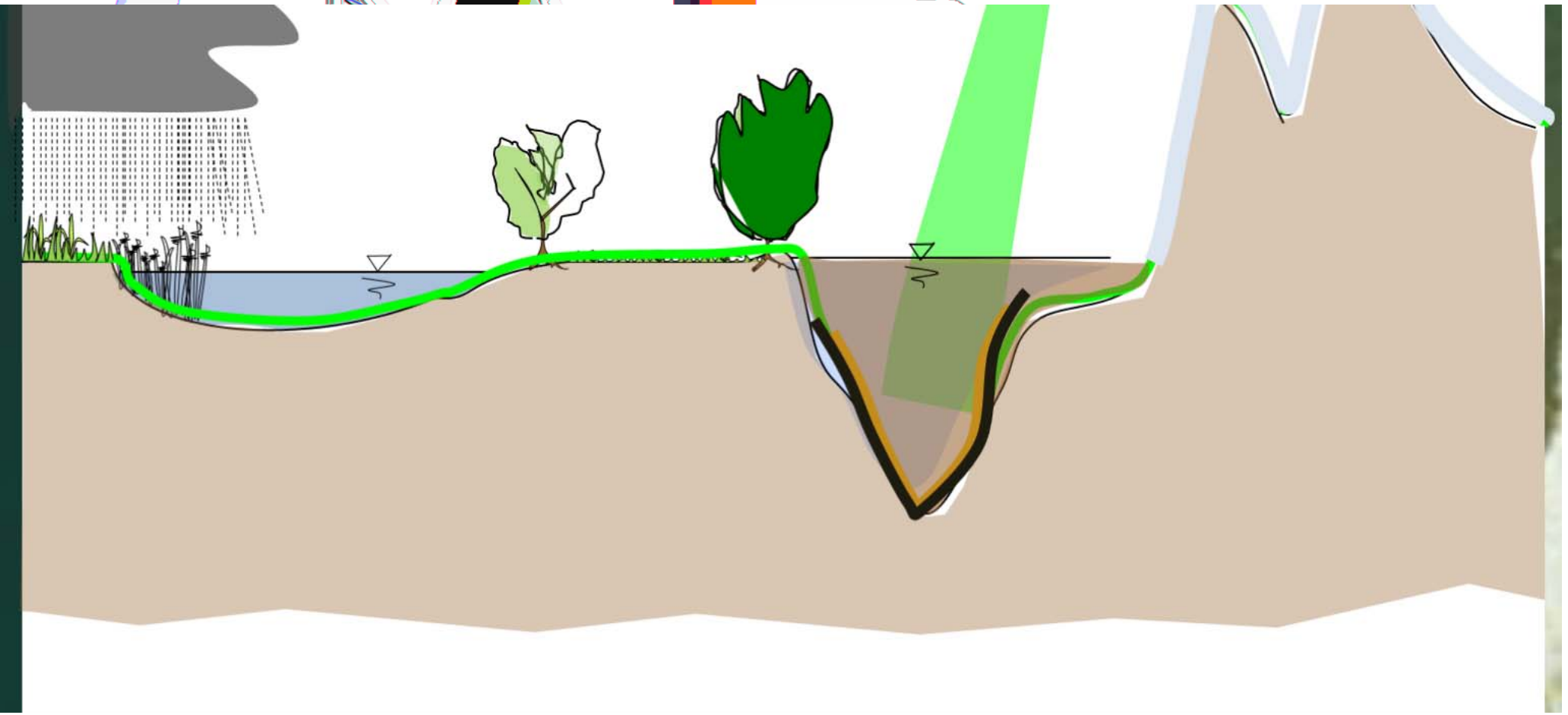
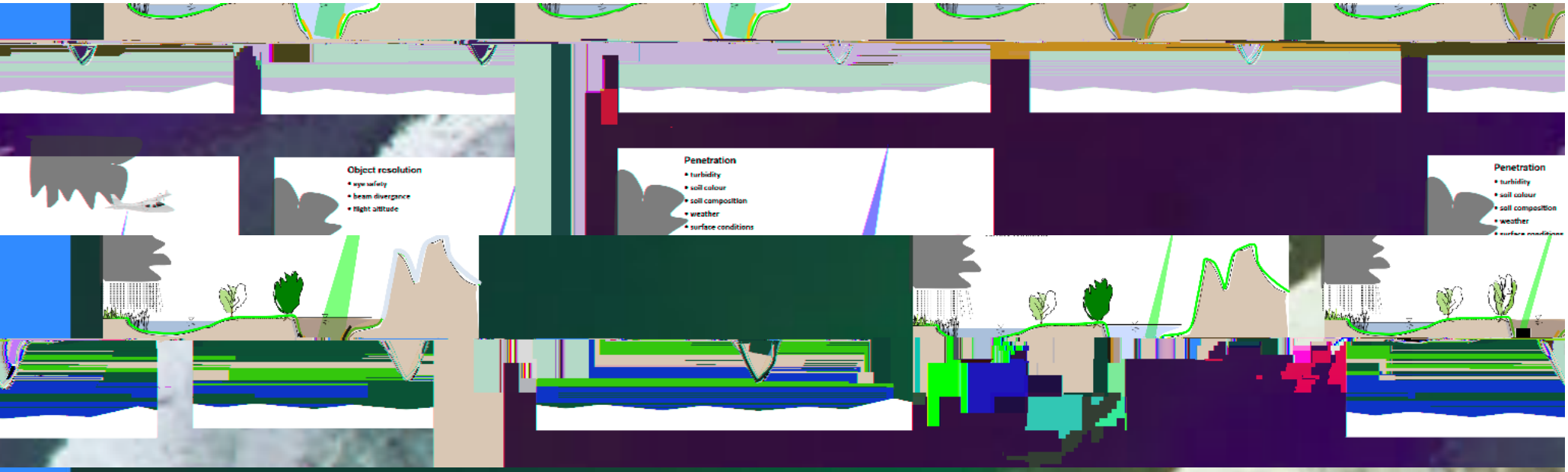




***DO** estimate the impact of influences during flight on data processing*

Penetration

- turbidity

ELBE vs. RHEIN

Secchi depth

1m vs. 0.7m

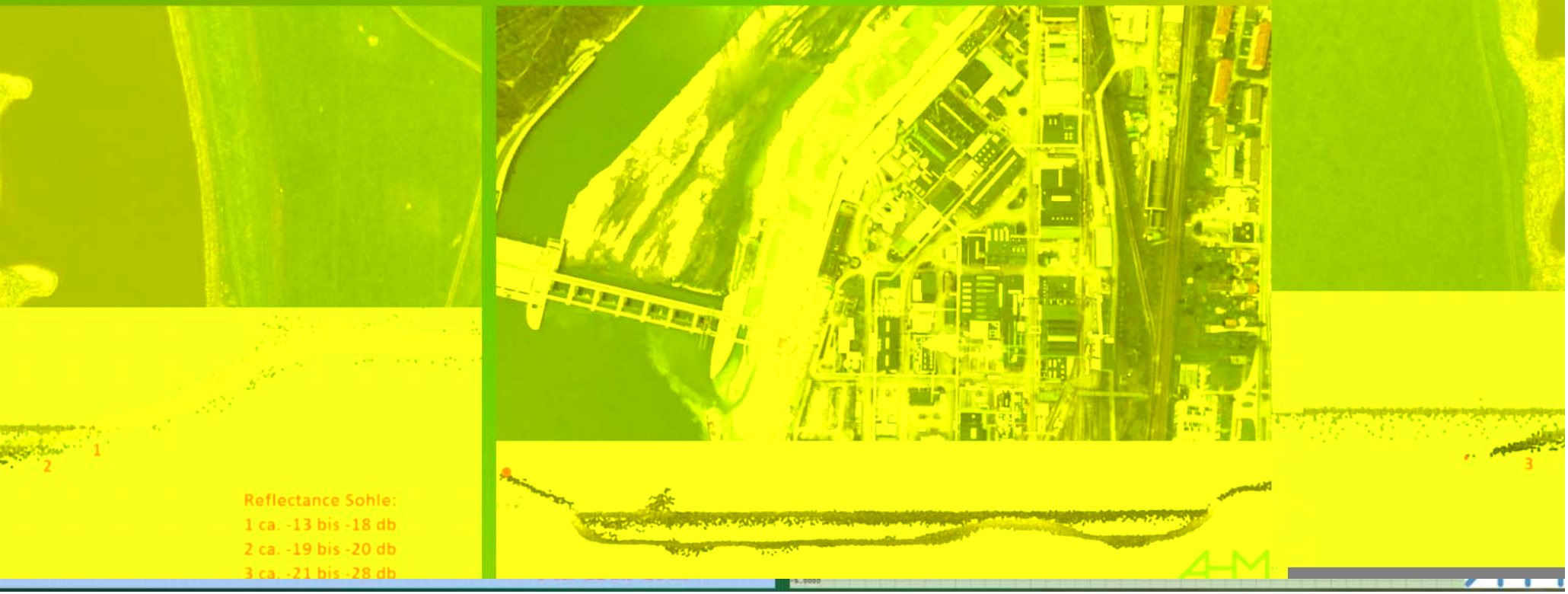
Penetration

- turbidity

ELBE vs. RHEIN

Secchi depth

0.7m



Penetration

- soil colour
- soil composition

ELBE / RHEIN vs. WADDEN SEA

Secchi depth

1m vs. 0.2m

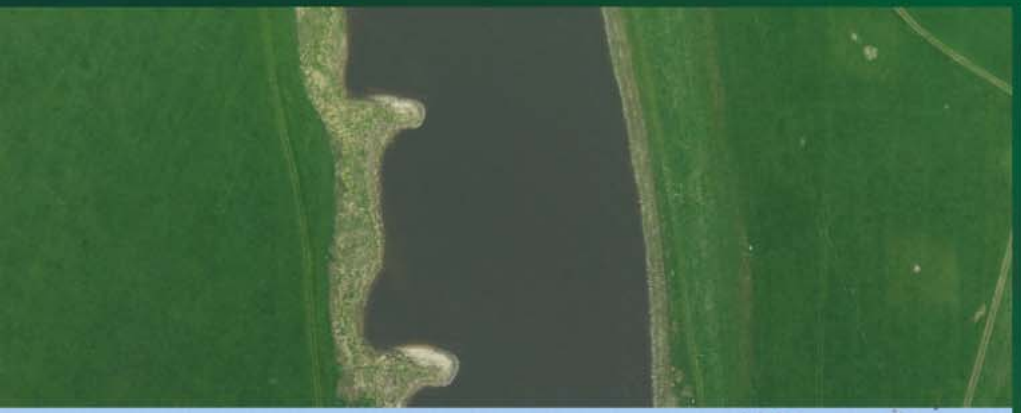
Penetration

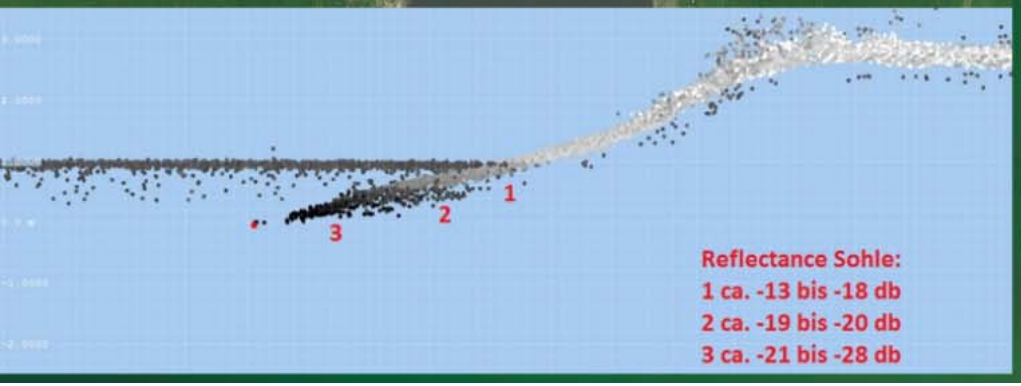
- soil colour
- soil composition

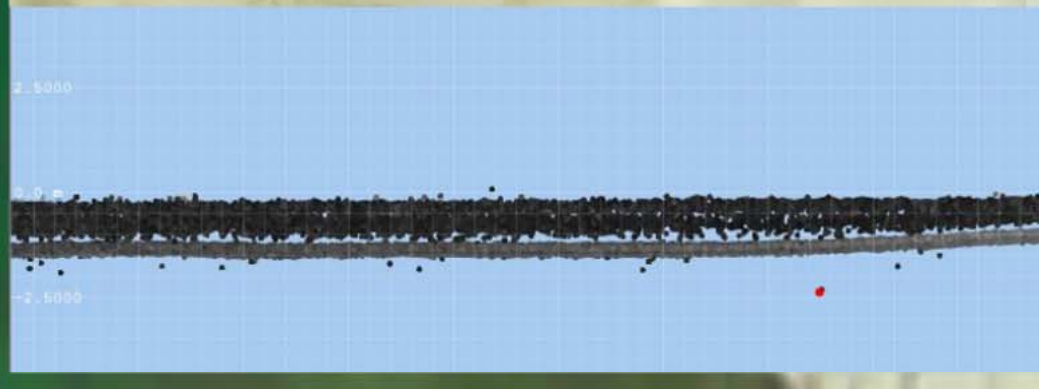
ELBE / RHEIN vs. WADDEN SEA

Secchi depth

1m vs. 0.2m

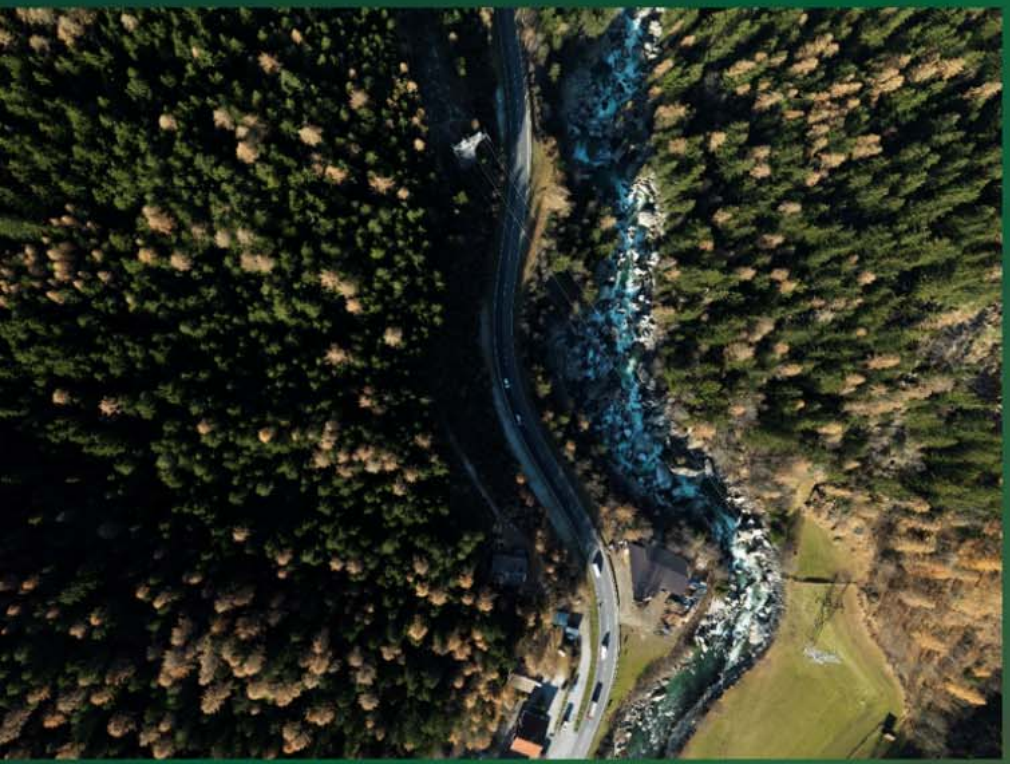






Shadowing effects
VQ820G vs. VQ880G

Ötztaler Ache vs. Wertach



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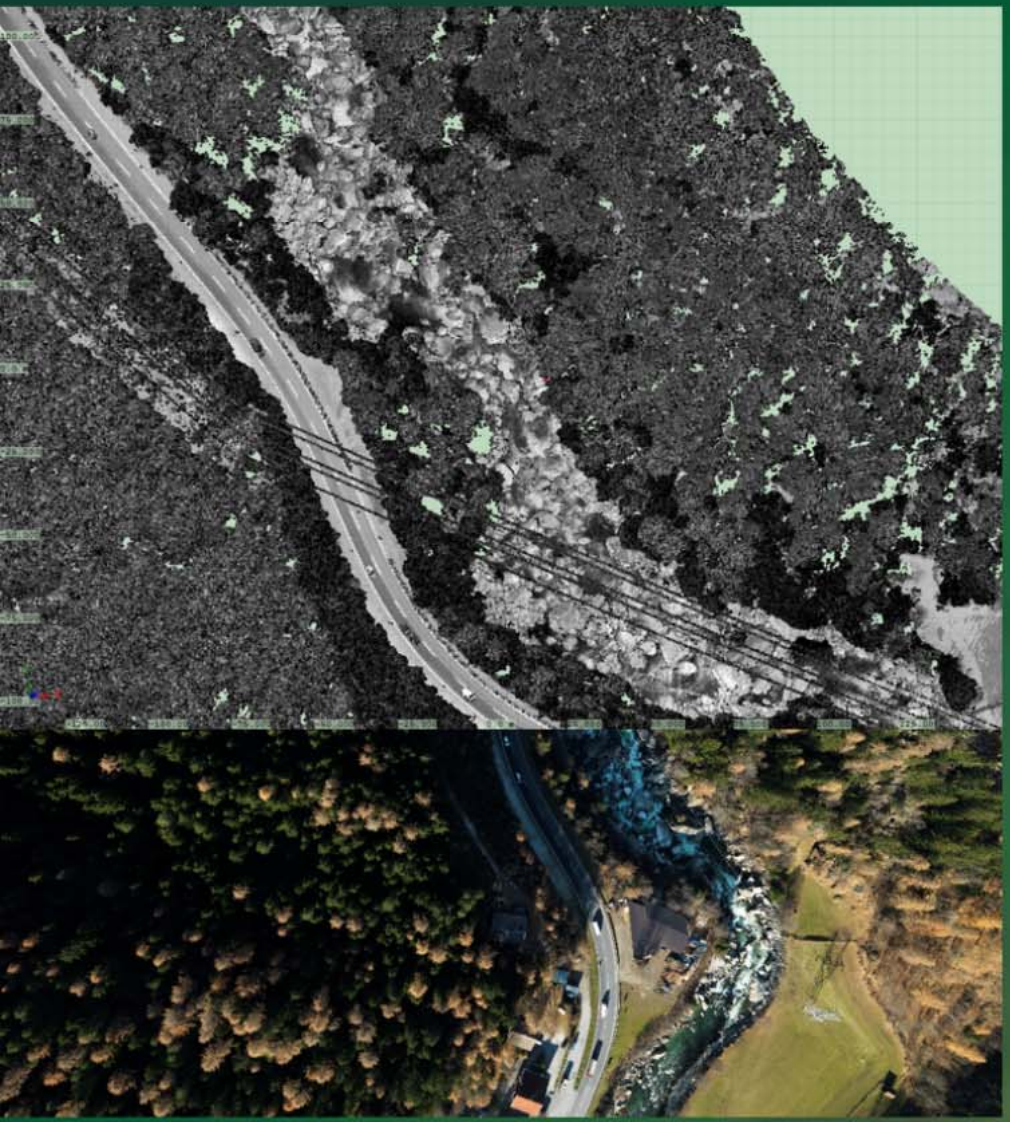
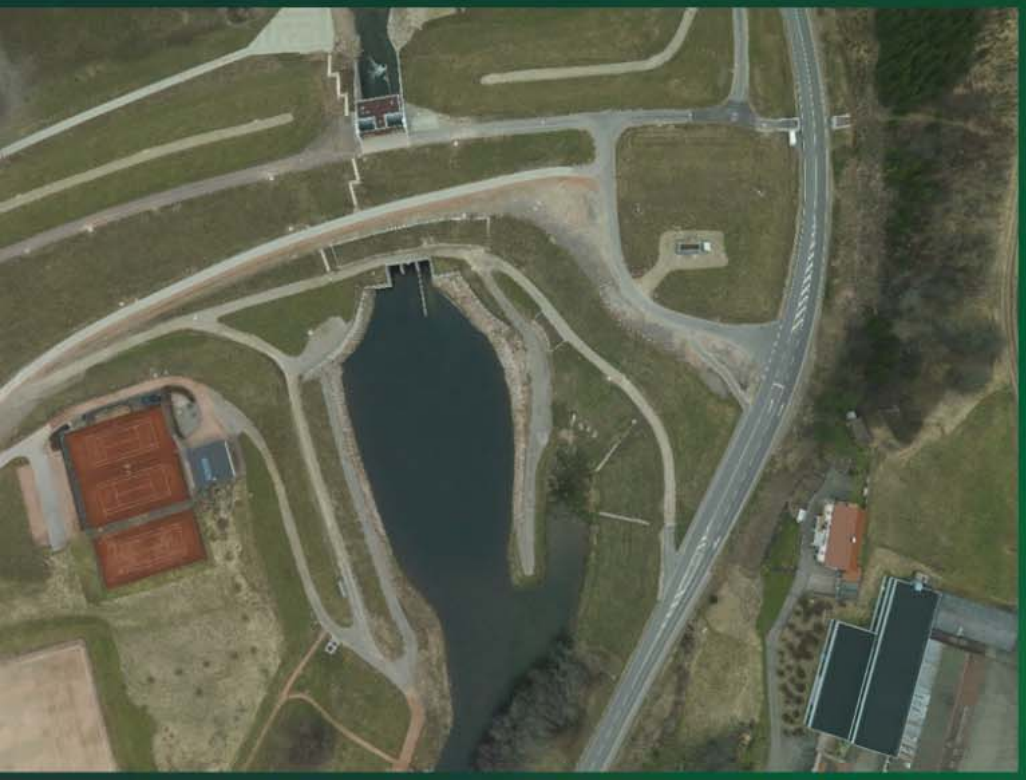


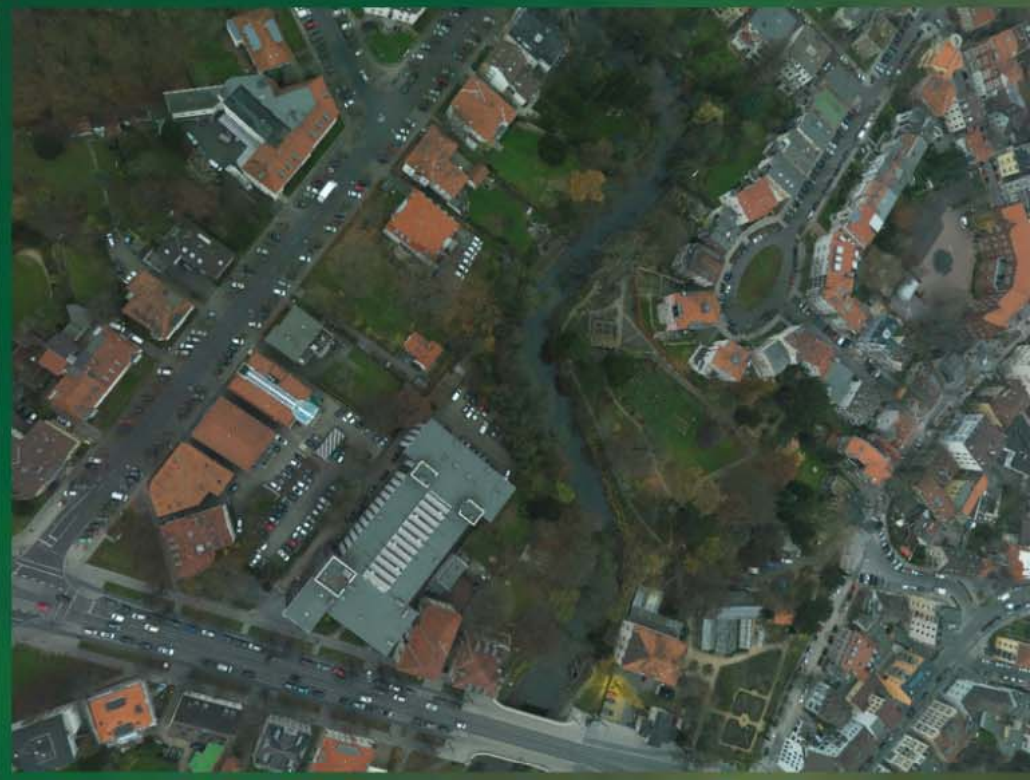
Penetration

- weather
- surface conditions

WOLTER vs. OKER

clear sky vs. high humidty





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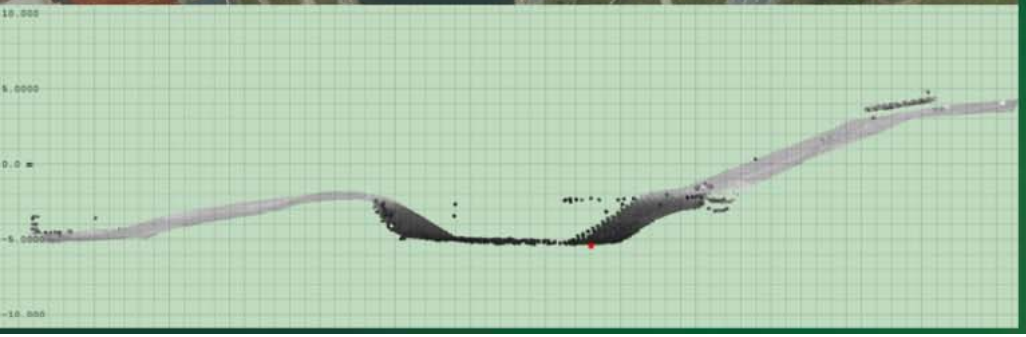
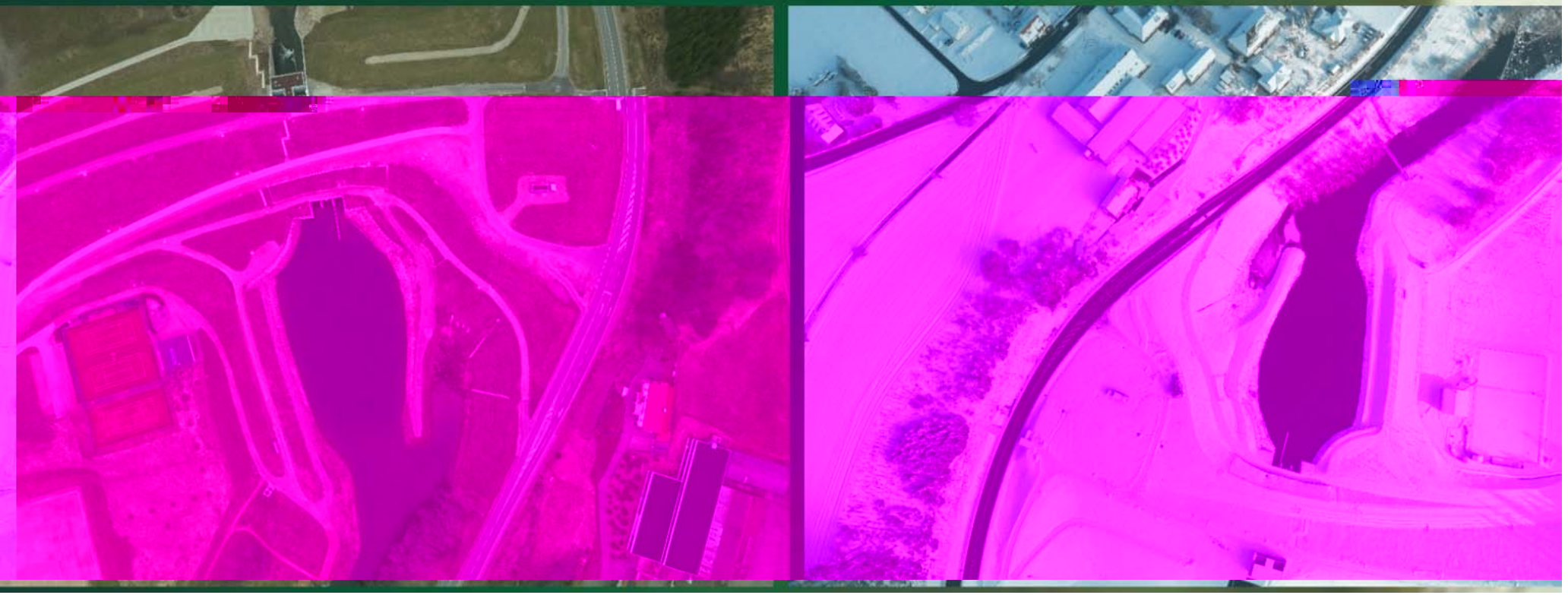


Penetration

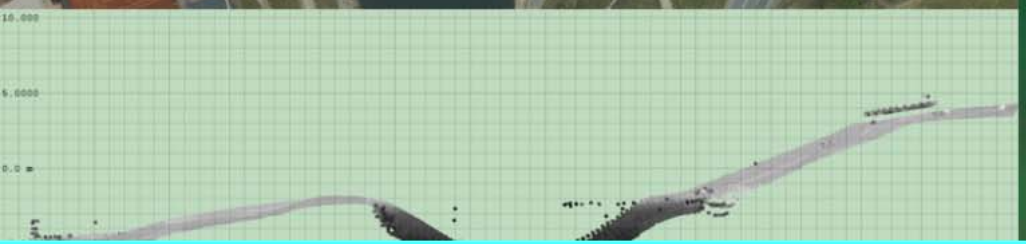
- weather
- surface conditions

Wolter vs. Wolter

normal surface colour vs. bright surface colour



normal surface colour vs. bright surface colour

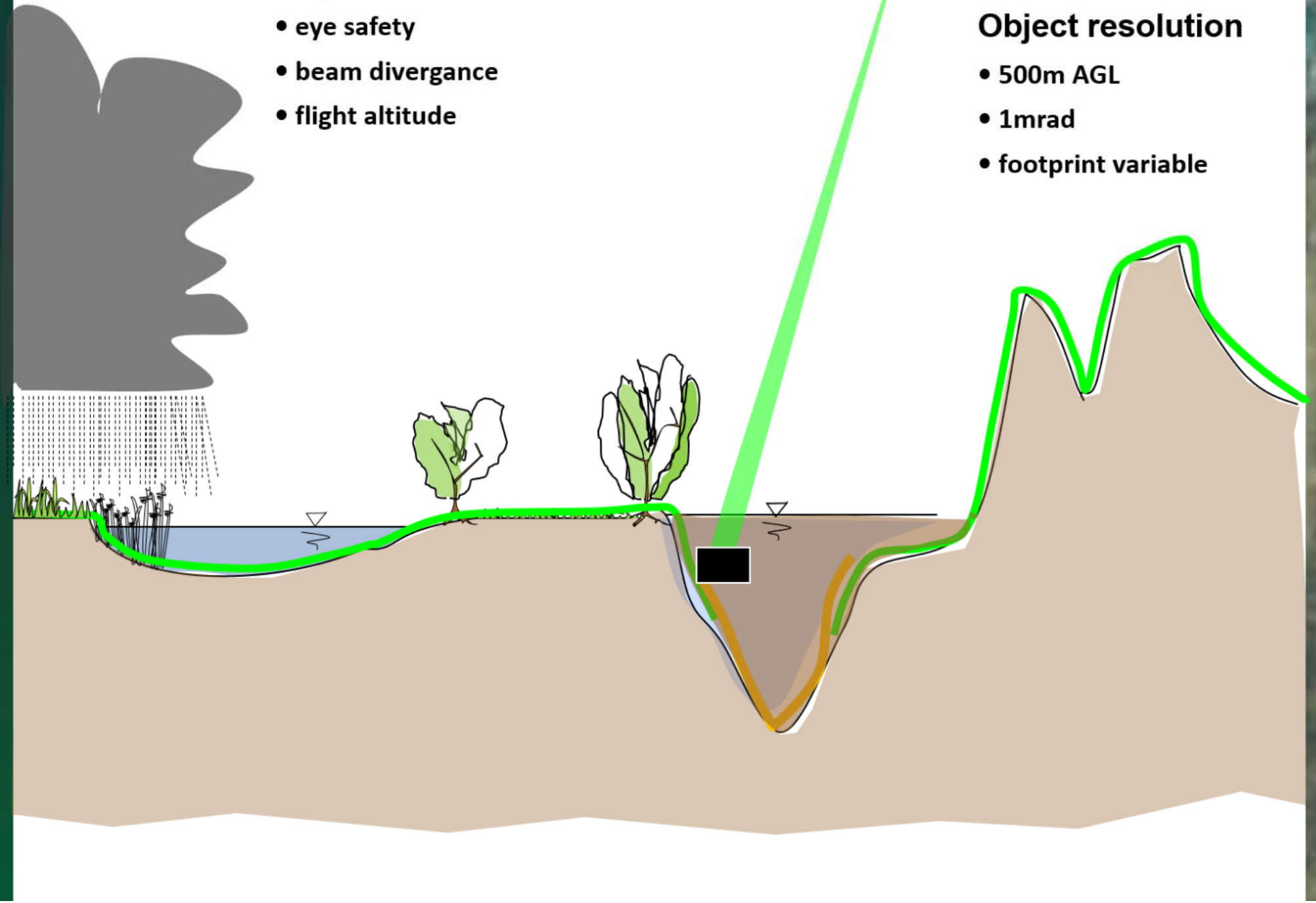


Object resolution

- eye safety
- beam divergance
- flight altitude

Object resolution

- 500m AGL
- 1mrad
- footprint variable



Object resolution

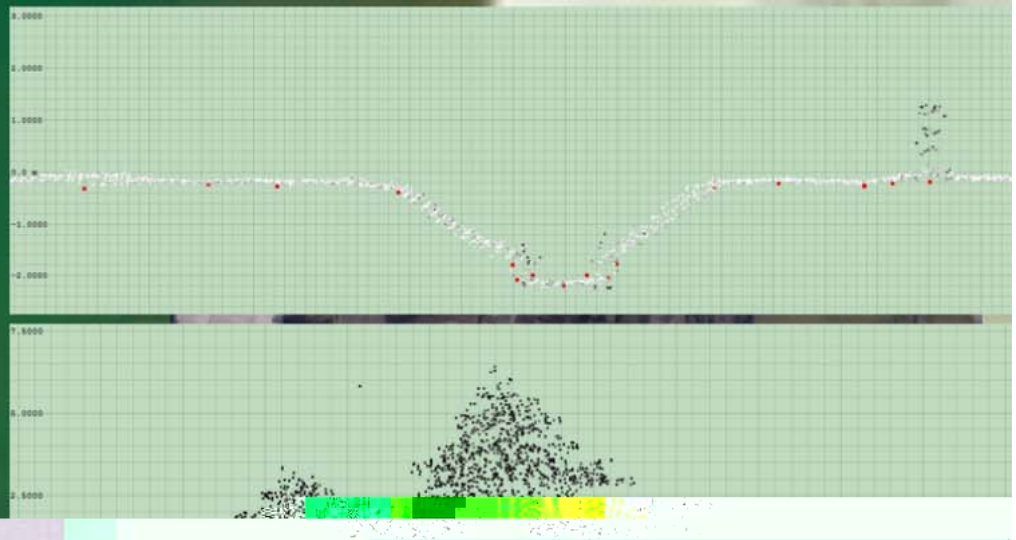
- eye safety
- beam divergance
- flight altitude

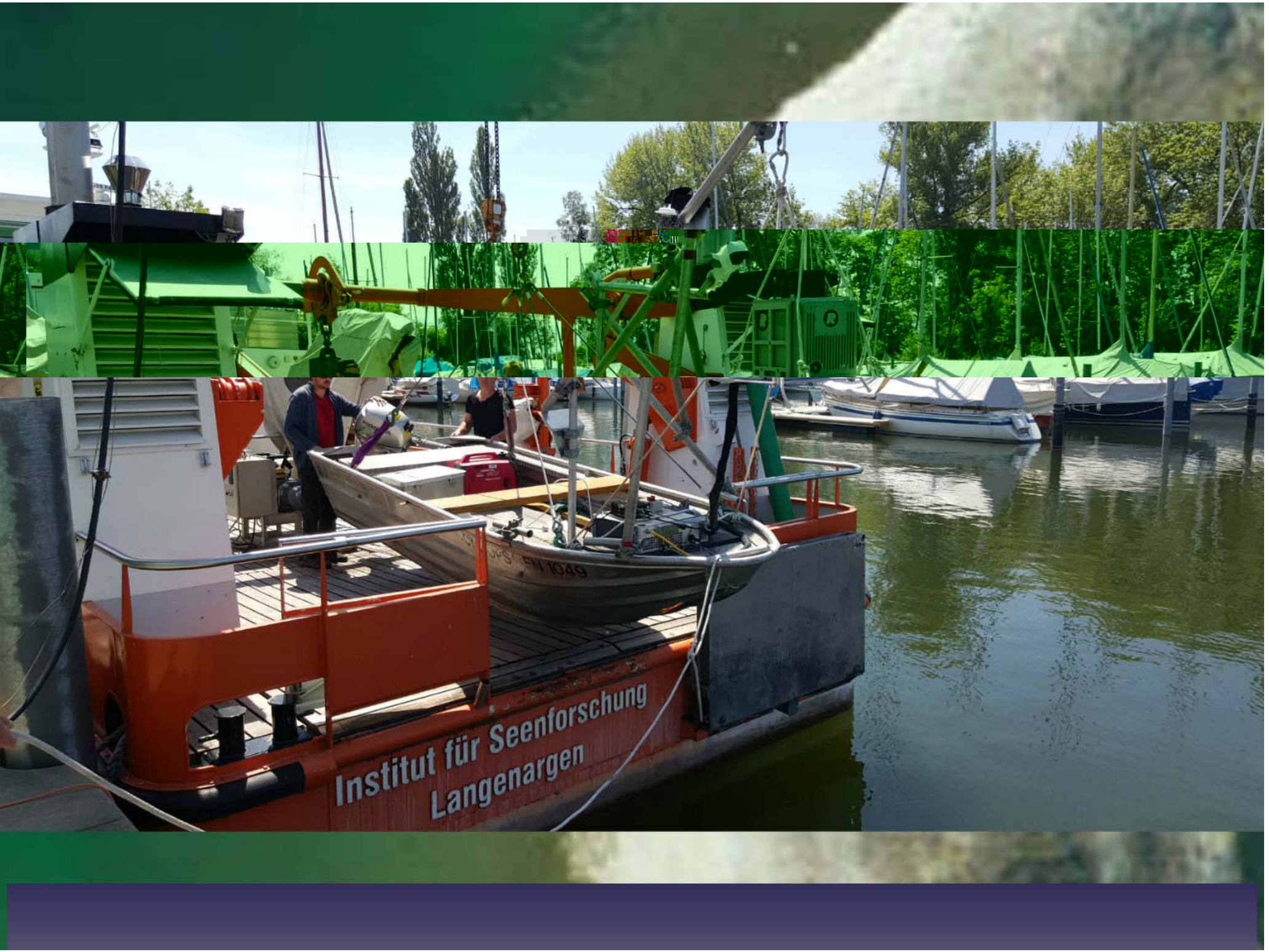
Ammersee vs. Hachinger Bach

Object resolution

- eye safety
- beam divergance
- flight altitude

Ammersee vs. Hachinger Bach

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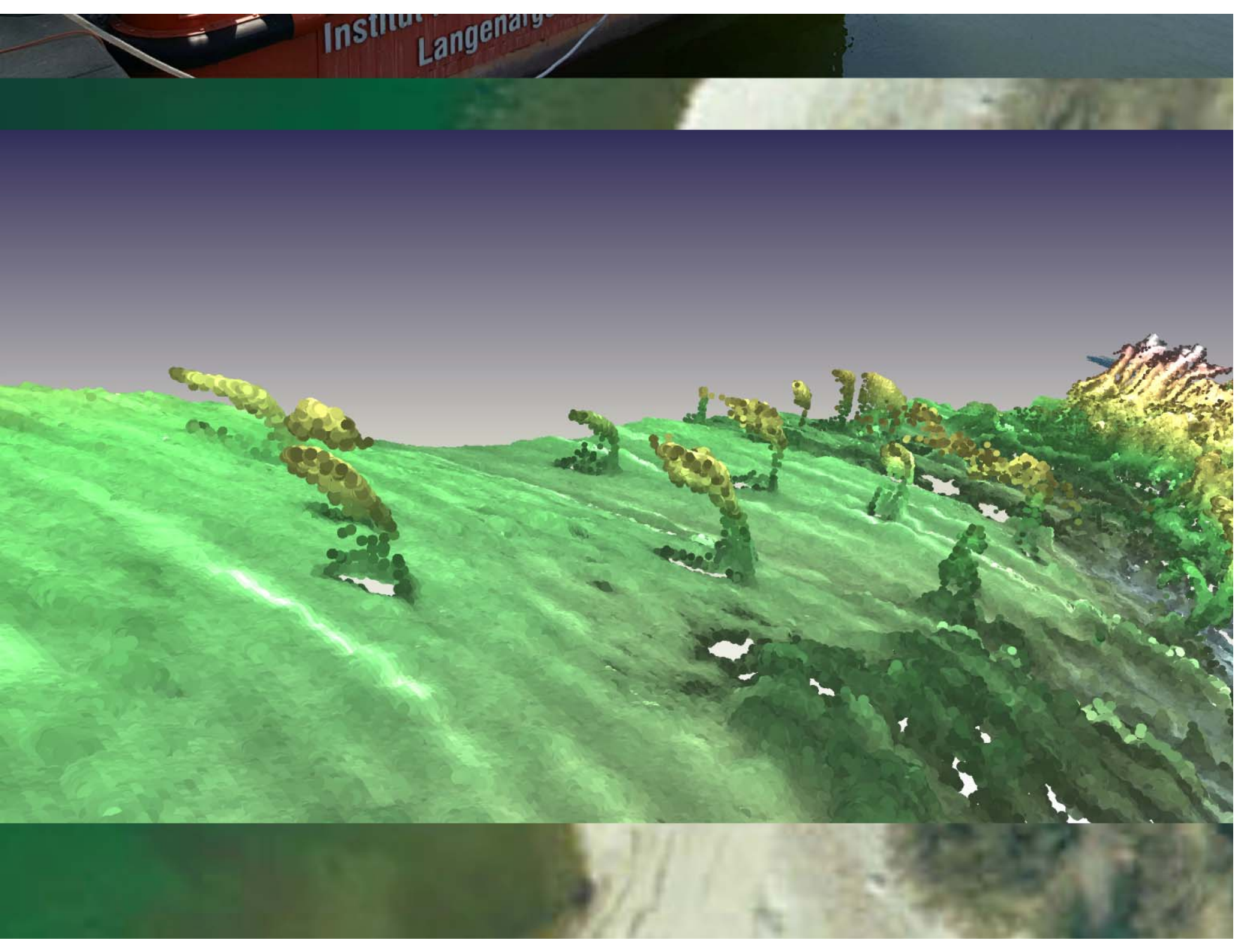

Capturing reality, never possible before?

Danke schön!