

# REMOTE SENSING APPLICATIONS IN MAPPING OF FOREST COVER IN SLOVAKIA

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An aerial photograph of a city square in Košice, Slovakia. The central focus is a large, historic building with a complex roof structure, which is currently under renovation or reconstruction. The building's facade is partially obscured by scaffolding and construction materials. To the left of the building is a paved plaza with several large, mature trees. In the background, a row of multi-story residential buildings with red-tiled roofs lines the square. The overall scene is captured from a high angle, providing a clear view of the urban layout and the scale of the construction project.

# PHOTOMAP Ltd., Košice

2003 founded

2016 8 employees



**WHAT WE DO?**



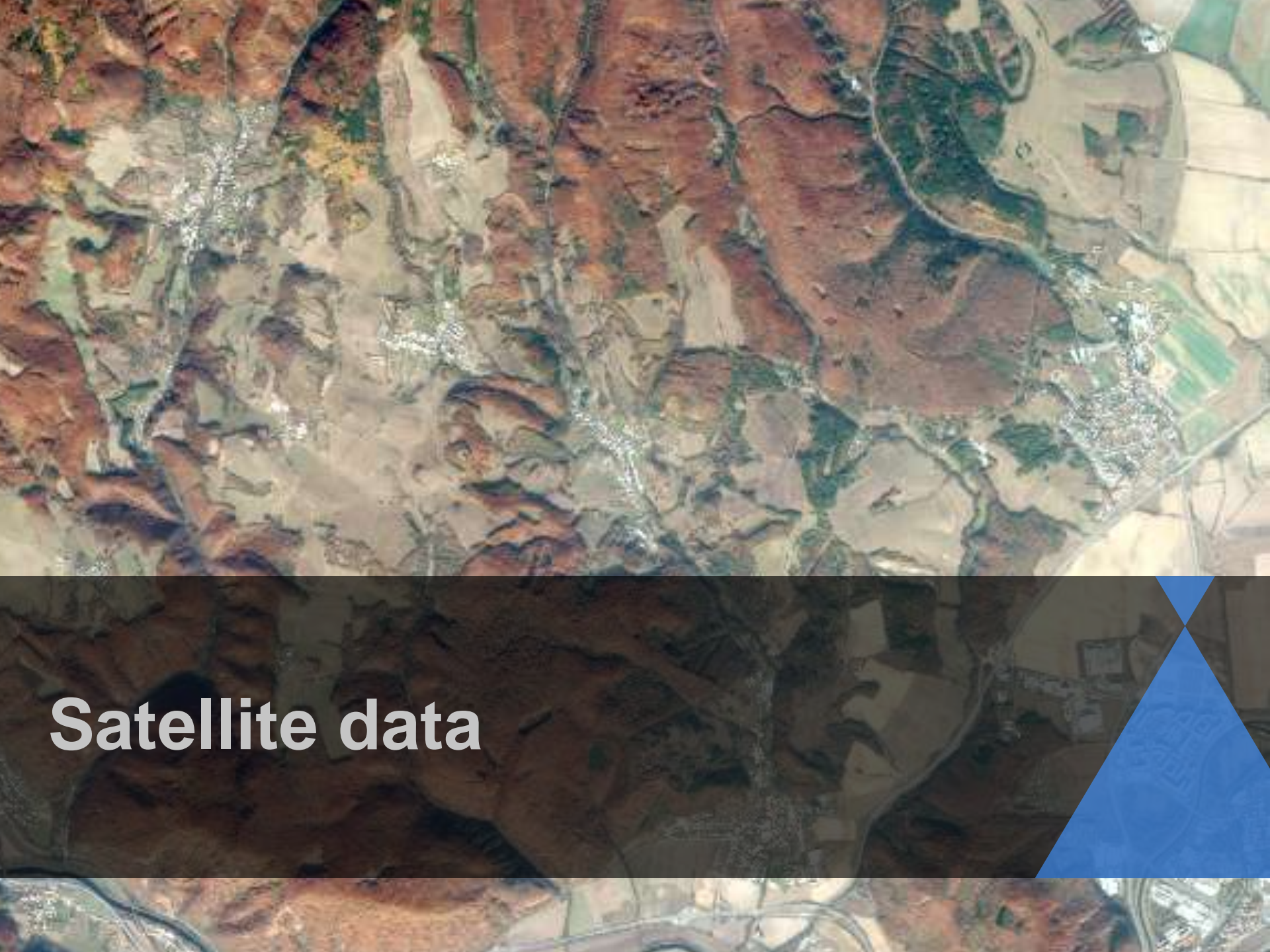
# REMOTE SENSING



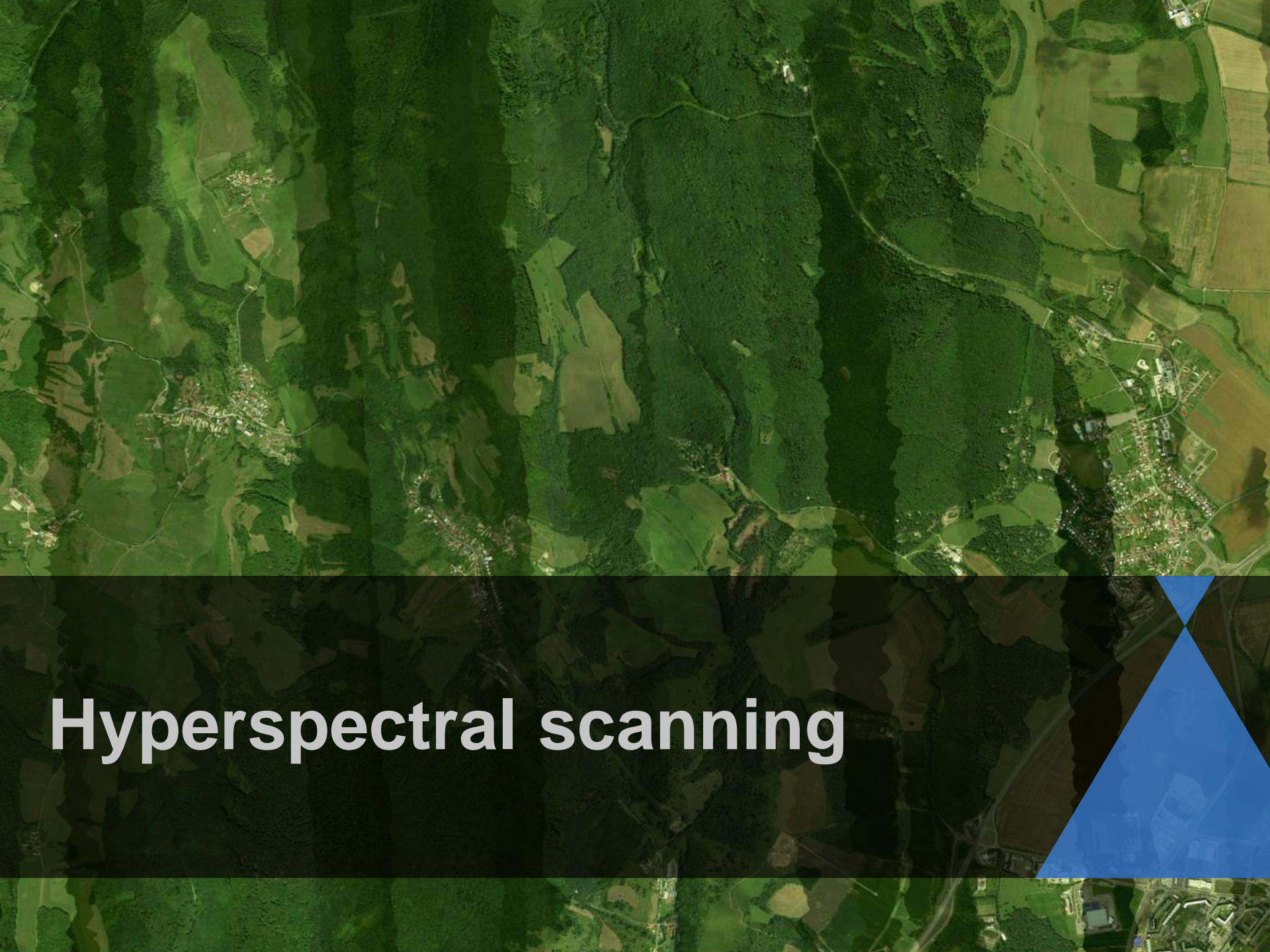
**Aerial photography**



# Aerial LIDAR scanning



**Satellite data**



# Hyperspectral scanning





# Oblique photography



# Thermal photography



# RPAS photography



# TERESTRIAL, UNDERGROUND & MOBILE MAPPING



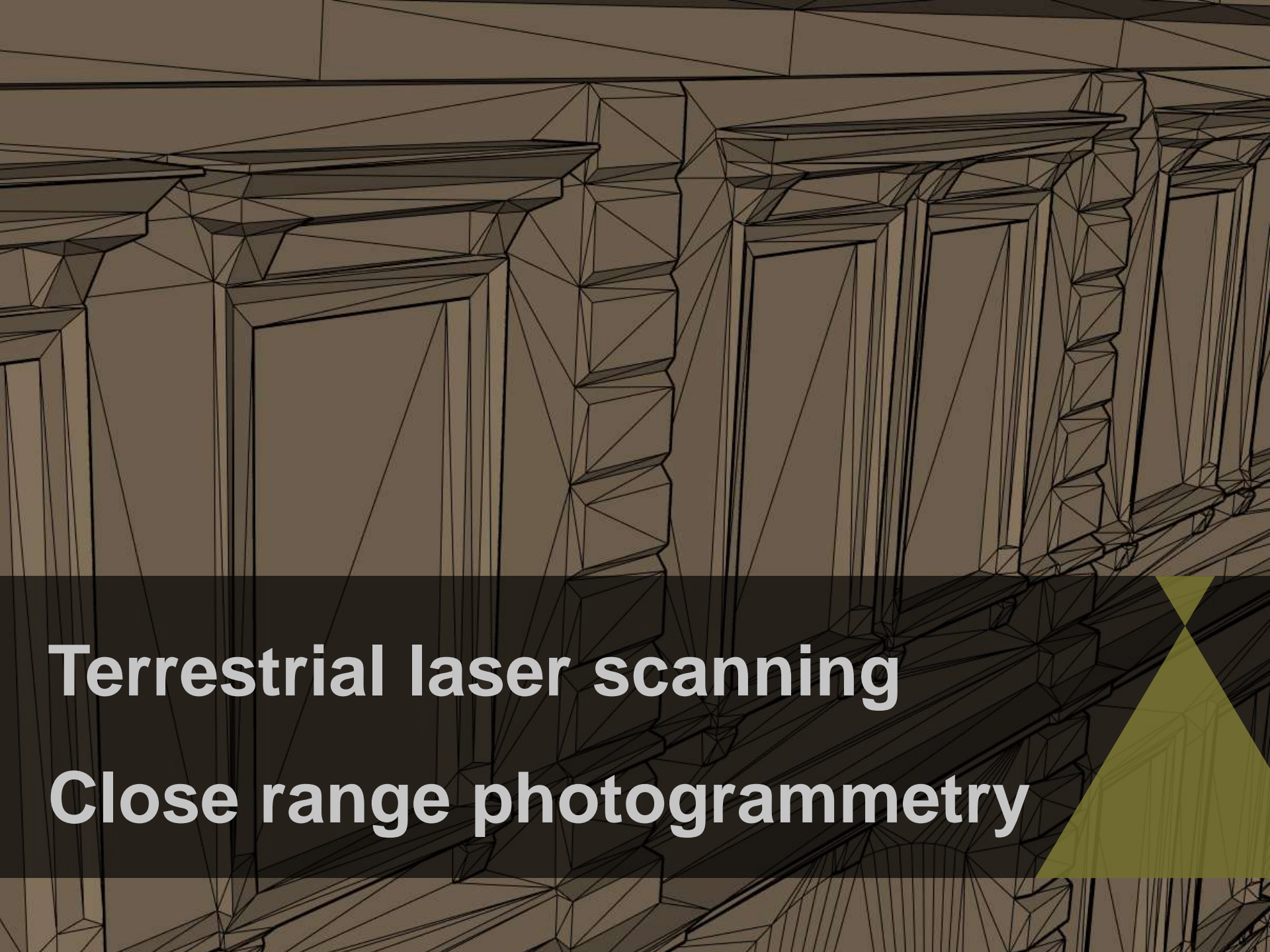


**Geodesy**  
**Cadastre**



**Indoor mapping**  
**Mobile mapping**





**Terrestrial laser scanning**  
**Close range photogrammetry**



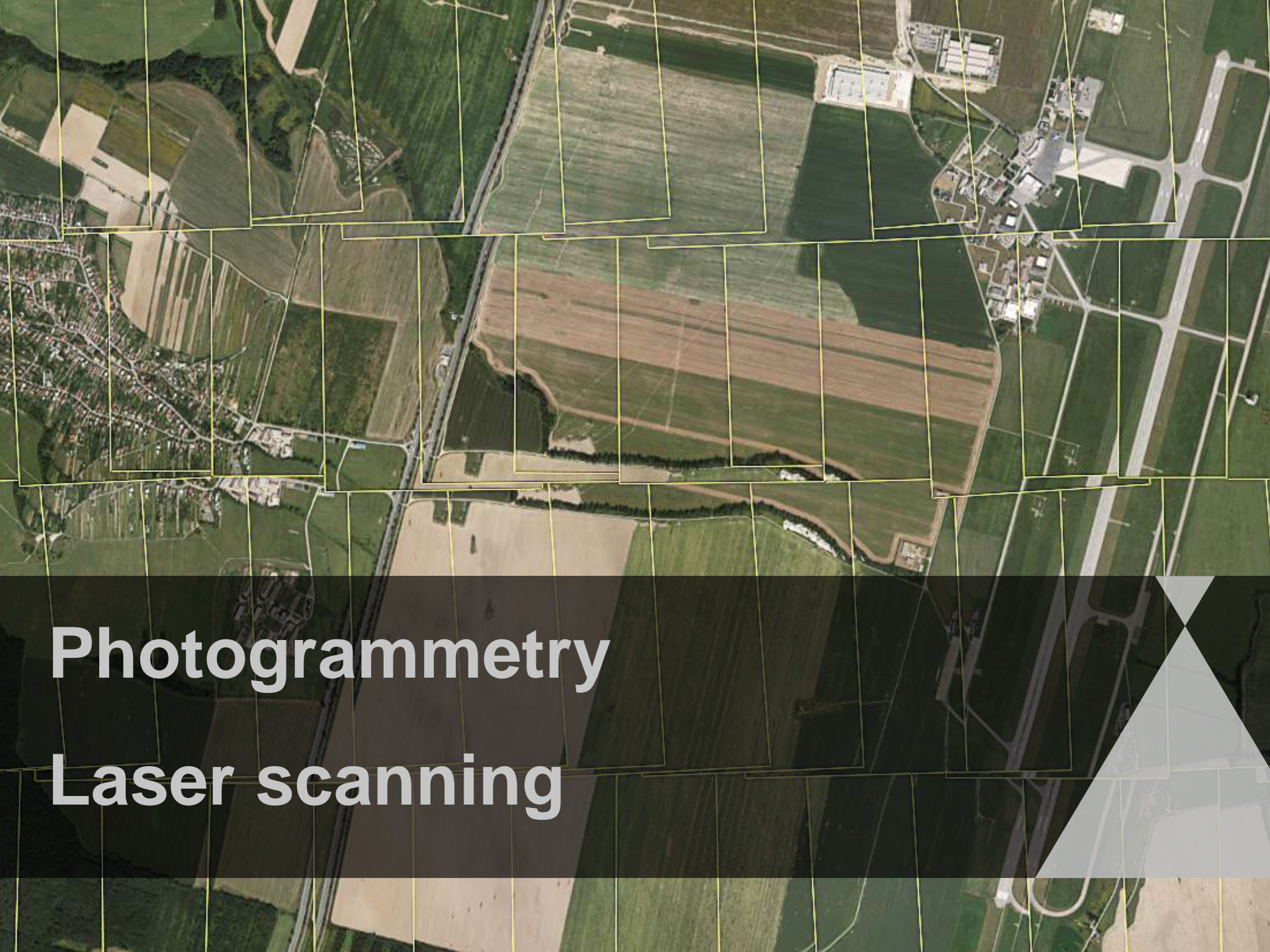
**Open pit & mine mapping**

**Cave mapping**



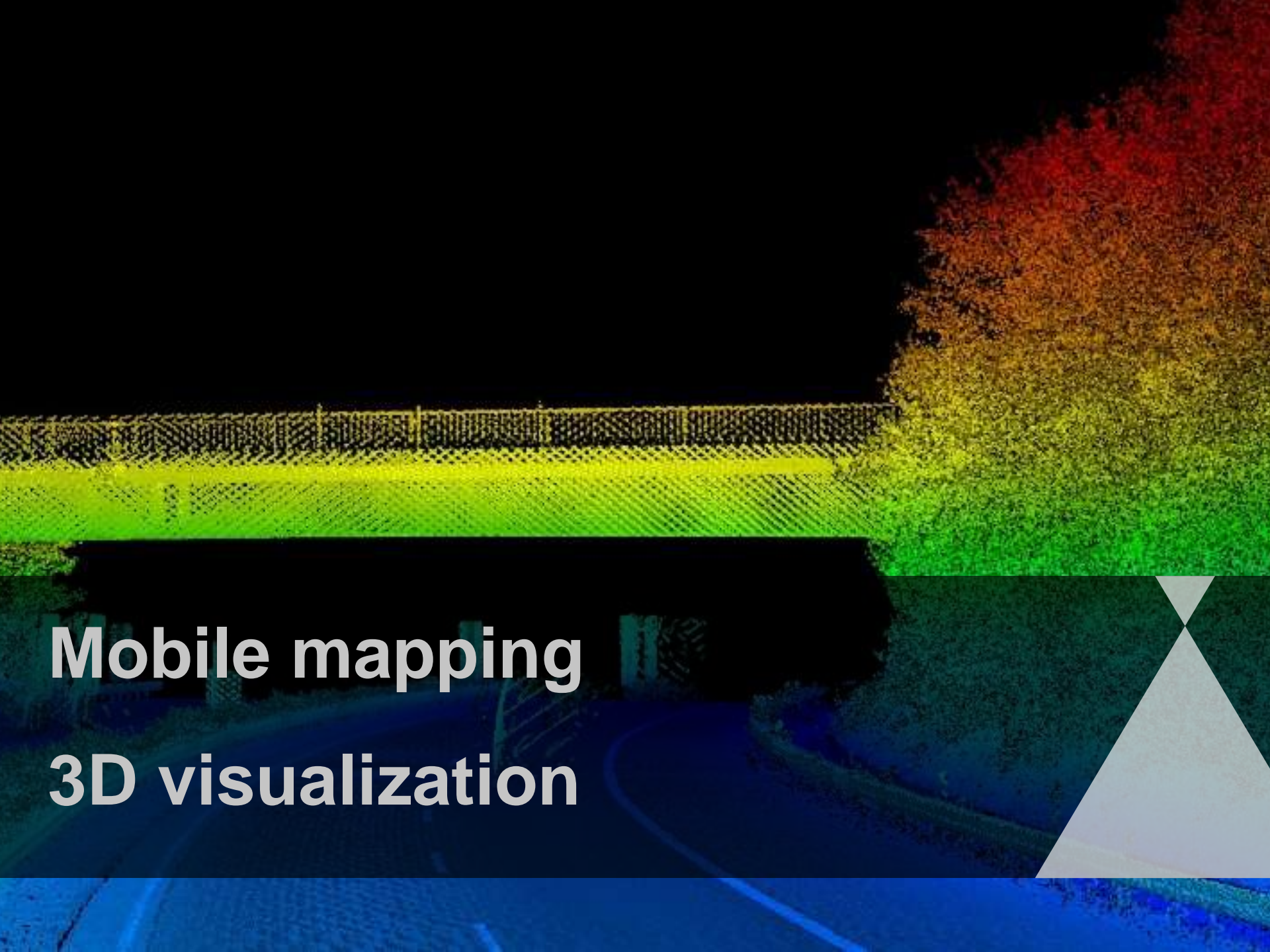


**DATA POSTPROCESSING**



**Photogrammetry**

**Laser scanning**



# Mobile mapping 3D visualization



# COOPERATION WITH NFC



**National Forest Center in Zvolen**

**Customer since 2006**

**Close cooperation**



**LEICA ALS 70 CM + RCD30 - NFC**  
**Cessna 402 or Cessna 206 - PHOTOMAP**



## **ALS 70 CM LIDAR**

**maximum measurement rate 500 kHz**

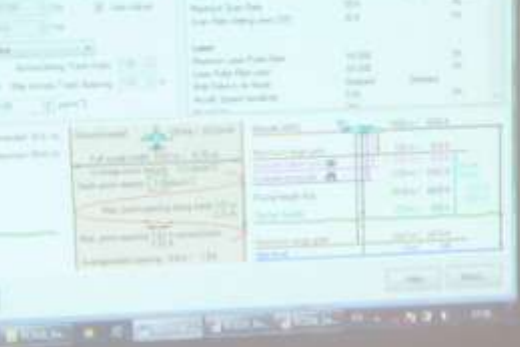
**average 2pts/m<sup>2</sup> @ 1500 AGL – 1,4 km**

**swath width / 228 km<sup>2</sup>/h @ 100kts**



**RC30 medium format digital camera  
RGBN channels, 53/83mm lenses  
GSD 17/10 cm @ 1500 m AGL**



A window with white blinds is partially open, revealing a large data table or spreadsheet. The table has many columns and rows of text, which are somewhat blurred but appear to be organized in a structured format, possibly a schedule or a list of data points.

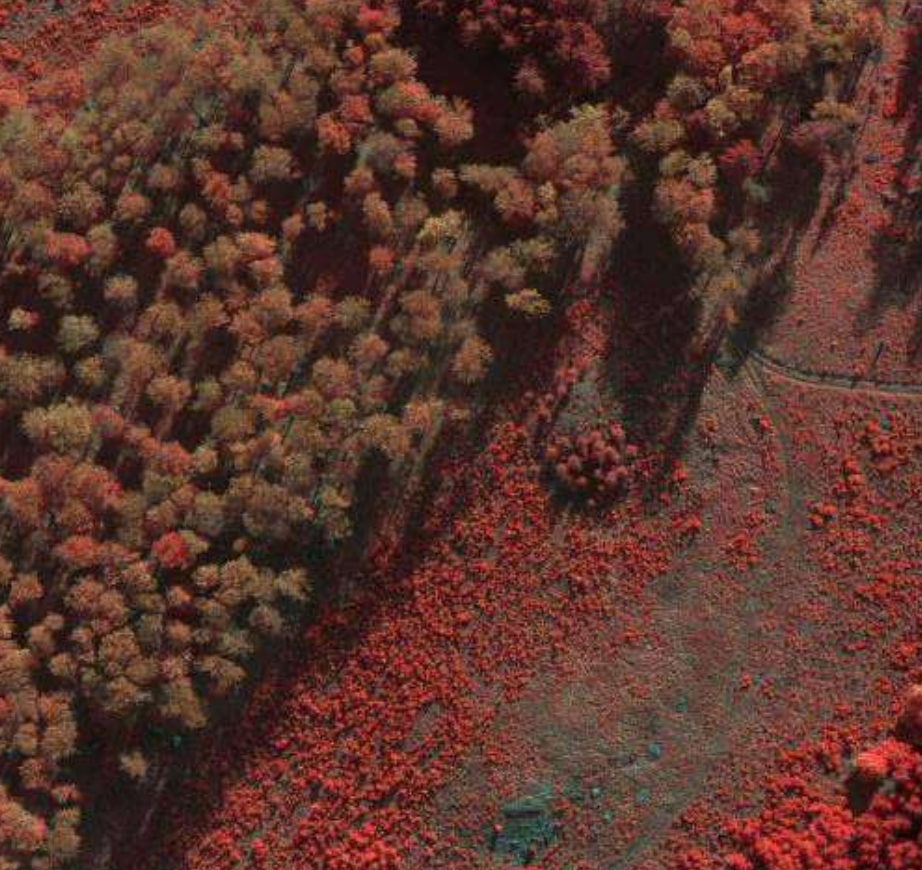
**mission planning, MOD permission, flight execution, classified data protection, trajectory computation, images and LIDAR processing, classification ...**





# REAL WORLD APPLICATIONS





**Orthophotomaps**  
**CIR**

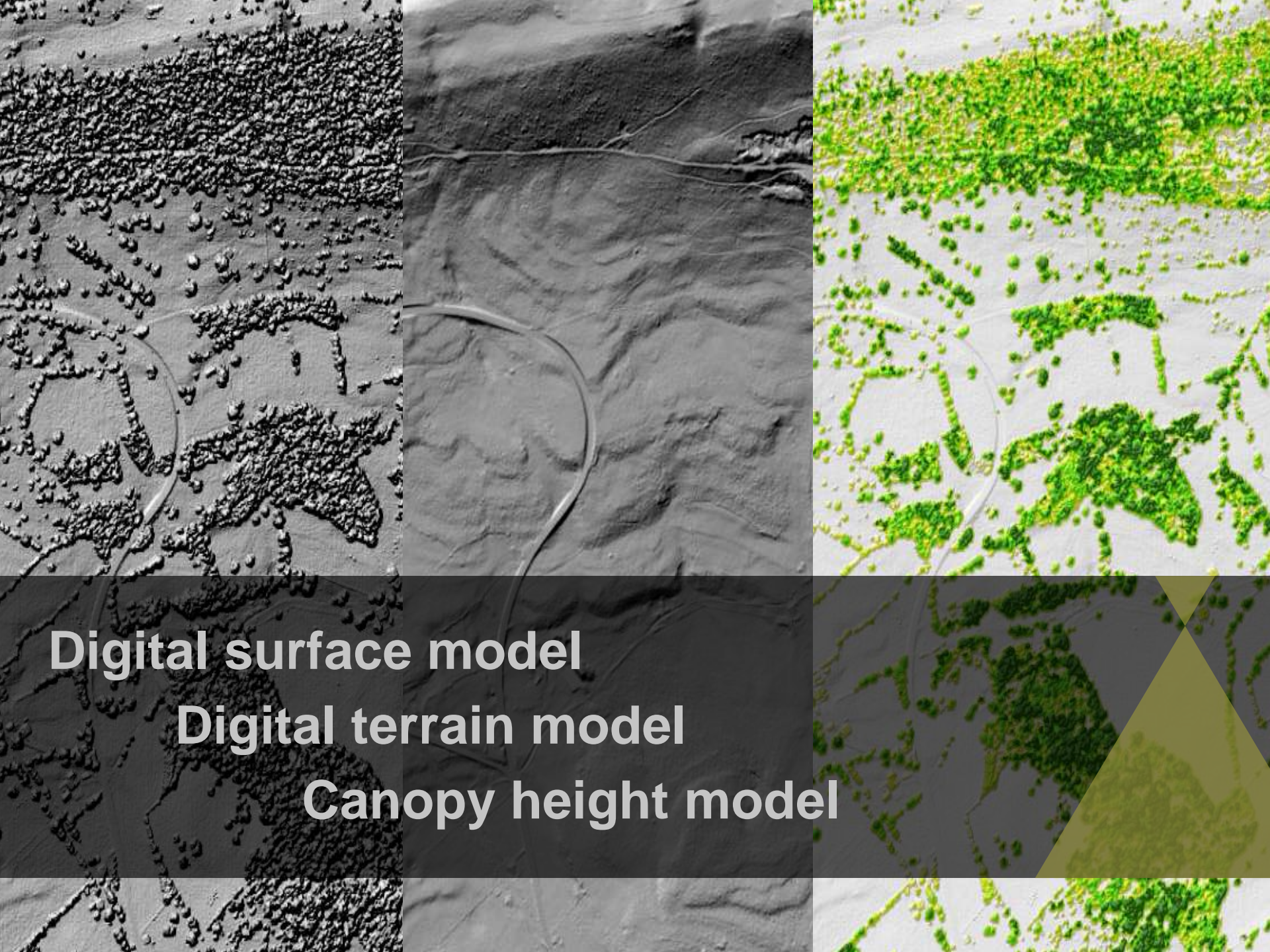
**RGB**





**Forest area delineation**  
**Large scale mapping**  
**Check against cadastral maps**





**Digital surface model**

**Digital terrain model**

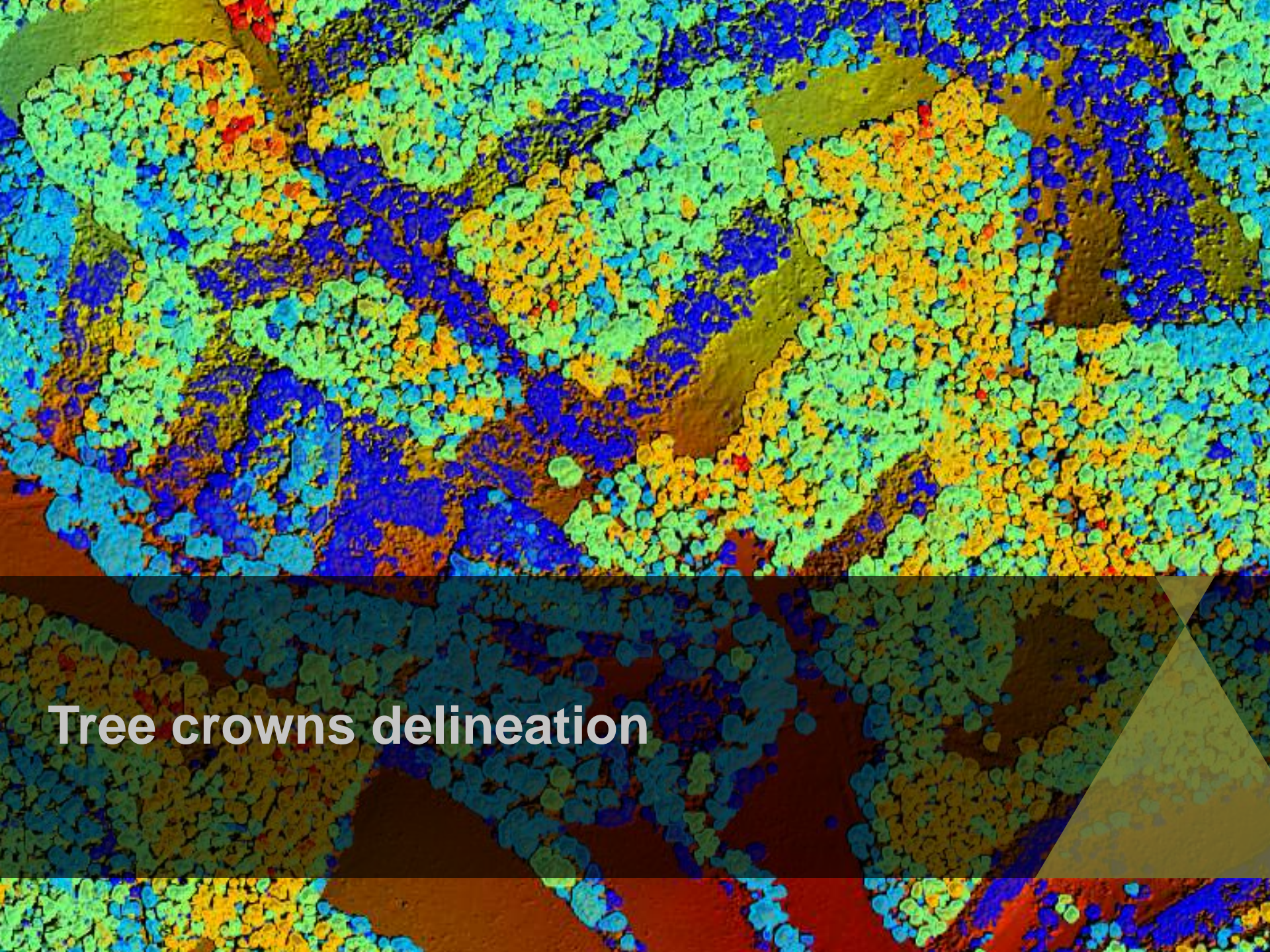
**Canopy height model**



# Tree heights

Point Size  Altitude (m)  Dist. Axis (m)  Coord.

Altitude (m) min.  max.  Altitude filter: min.  max.

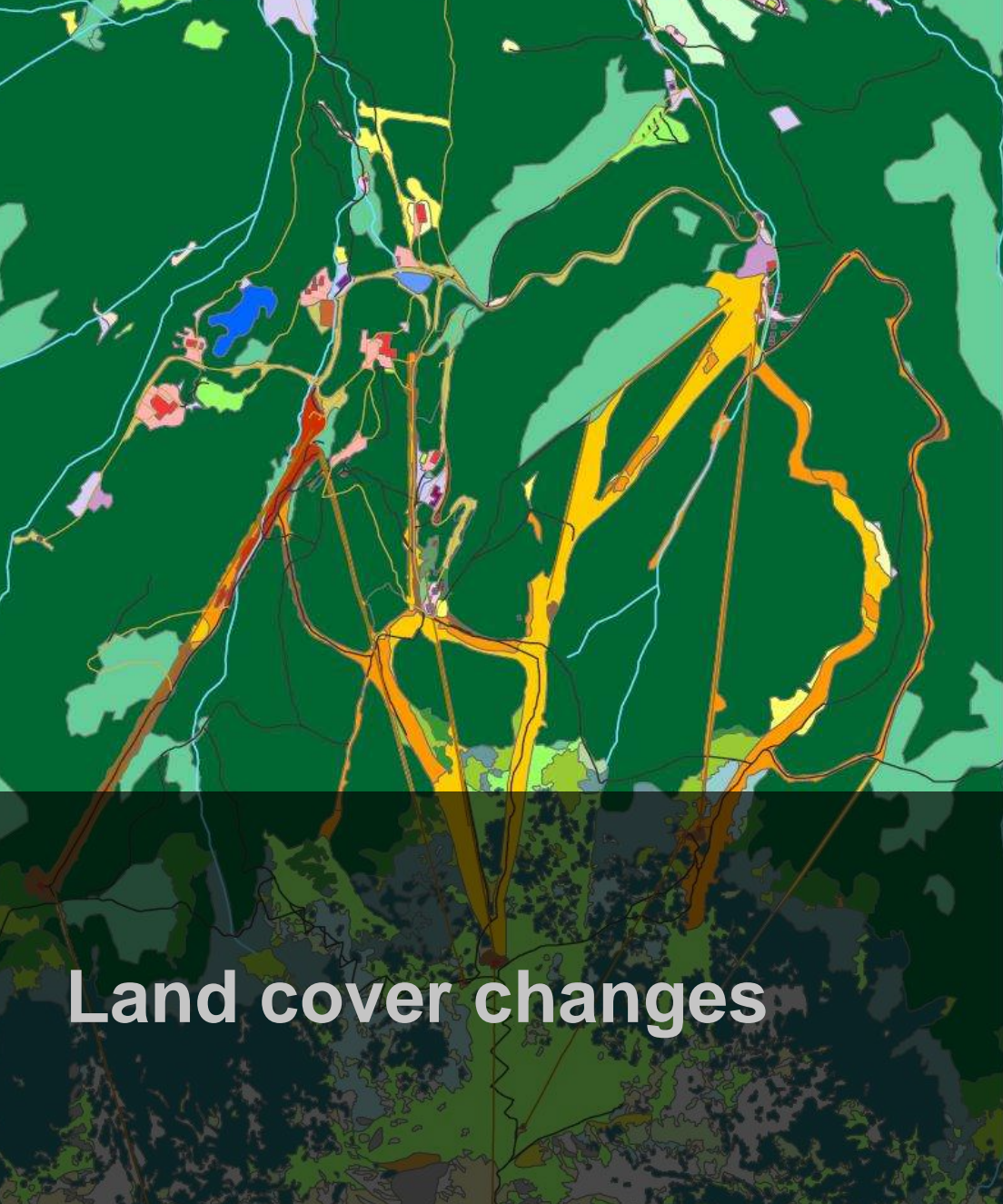


**Tree crowns delineation**



# Tree species classification






# Land cover changes

- 11232 - Ubytovacie zariadenia
- 11234 - Sidelná zeleň pri obytných budovách
- 12111 - Reštaurácie
- 12112 - Obchody
- 12113 - Zdravotnícke zariadenia
- 12115 - Úrady
- 12116 - Sidelná zeleň pri obchodoch
- 12121 - Vysielače
- 12122 - Meteostanice
- 12123 - Transformovne
- 12125 - Vodné zdroje
- 12126 - Sidelná zeleň pri špeciálnych zariadeniach
- 12211 - Cesty
- 12213 - Parkoviská
- 12214 - Odpočívadlá spevnené
- 12215 - Odpočívadlá nespevnené
- 12216 - Zeleň pri cestách
- 13310 - Areály výstavby
- 14212 - Ihriská
- 14214 - Stanice lanoviek a vlekov
- 14215 - Sidelná zeleň pri športoviskách
- 14216 - TP lyžiarskych areálov
- 14217 - Čiastočne deštruované TP I.a.
- 14218 - Deštruované TP I.a.
- 14222 - Chaty
- 14226 - Sidelná zeleň pri rekreačných zariadeniach
- 23110 - TP
- 23120 - TP so stromami a krami
- 31210 - Ihličnaté lesy súvislé
- 31220 - Ihličnaté lesy nesúvislé
- 32111 - Alpínske lúky
- 32112 - Čiastočne deštruované alpínske lúky
- 32121 - Alpínske lúky so stromami a krami
- 32122 - Alpínske lúky s kosodrevinou
- 32221 - Kosodrevina so súvislým zápojom
- 32222 - Kosodrevina s nesúvislým zápojom
- 32411 - Rúbaniská bez vegetácie
- 32412 - Rúbaniská s vegetáciou
- 32420 - Prirodzená mladina
- 32430 - Ihličnaté lesy s kosodrevinou
- 32440 - Lesné škôlky
- 33211 - Bralá
- 33212 - Sutiny
- 33321 - Alpínske lúky so sutinami
- 33322 - Deštruované areály nad HHL
- 51210 - Prirodzené vodné plochy
- 51220 - Umelé vodné plochy



The image features a topographic map of a mountainous region, rendered in various shades of blue. The terrain is characterized by numerous ridges, valleys, and peaks, with contour lines indicating elevation. A dark blue horizontal band spans the bottom portion of the image, containing the text 'Archeology' and 'Speleology' in white. A light green triangular shape is positioned in the bottom right corner, partially overlapping the dark blue band.

**Archeology**  
**Speleology**



# Monitoring and research of forest ecosystems - final project workshop 10<sup>th</sup> November 2015



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra



Source of used example images:



letecké meračské snímkovanie  
ortofotomapy a 3D vizualizácie  
geodézia, kataster a GIS  
banské meračstvo

# PHOTOMAP

**THANK YOU FOR YOUR ATTENTION**

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