Neue Möglichkeiten zur Kartierung von Waldschäden

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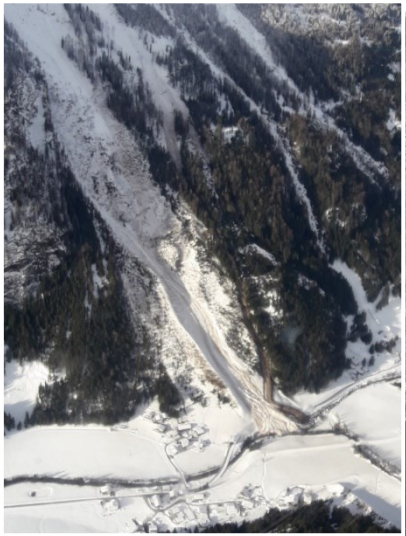
Institut für Naturgefahren

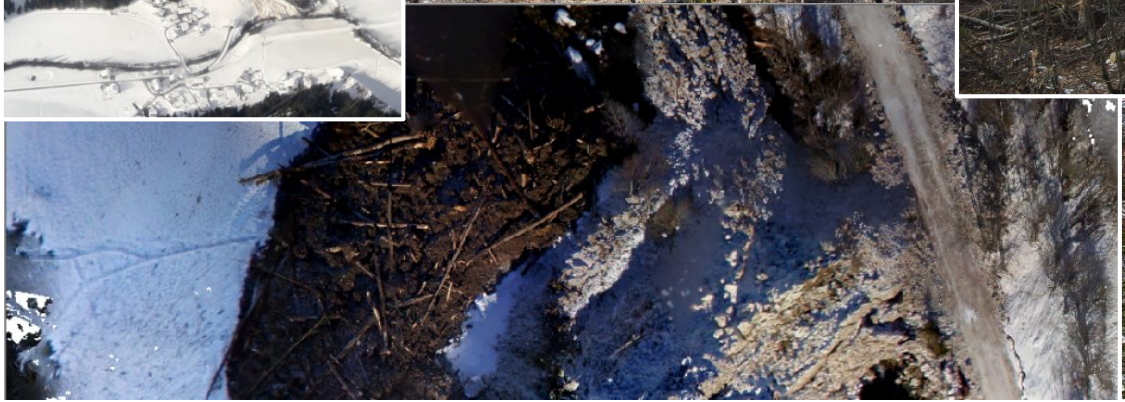
Innsbrucker Hofburggespräche

Innsbruck, Hotel Grauer Bär

20.11.2019

Einleitung

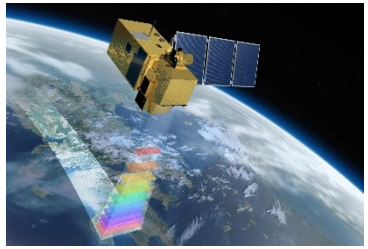


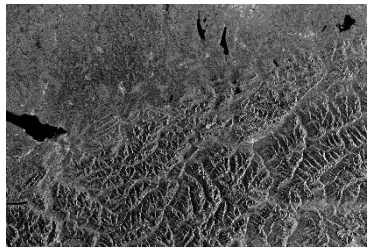


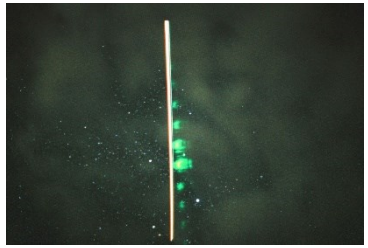
Quellen: WLV Tirol, BFW

Einleitung

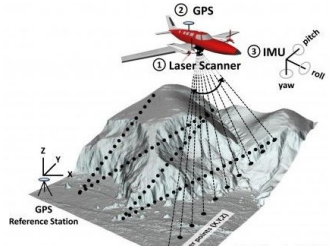
Satellit







Flugzeug / Helikopter



Nahbereichs -Erkundung

In-Situ

Quellen: https://www.nasa.gov; http://www.esa.int; laserdata.info; swissoptic.ag; http://www.enveo.at

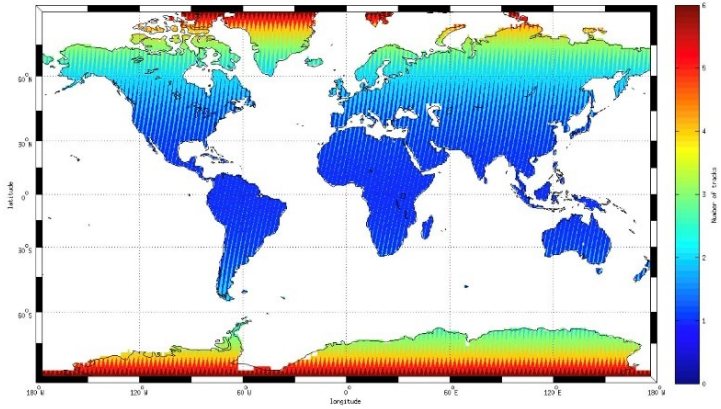
Sentinel 2 Satelliten

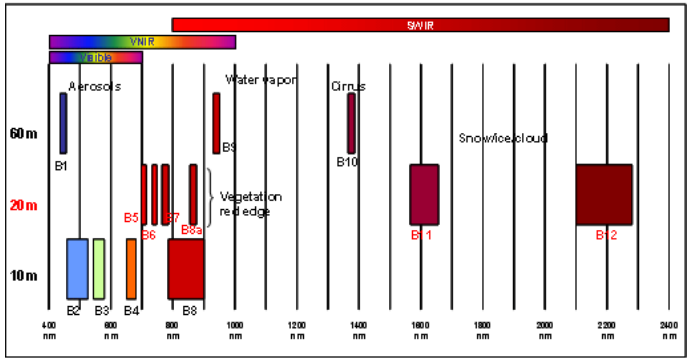
Eckdaten:

- Launch: 2015 (A) & 2017 (B)
- Polar, sonnensynchron, Höhe 790km
- Zeitliche Auflösung: mind. 5 Tage
- Optischer Satellit
- RGB+NIR: 10m Auflösung
- Stand: 7‘200TB, 14Mio Datensätze

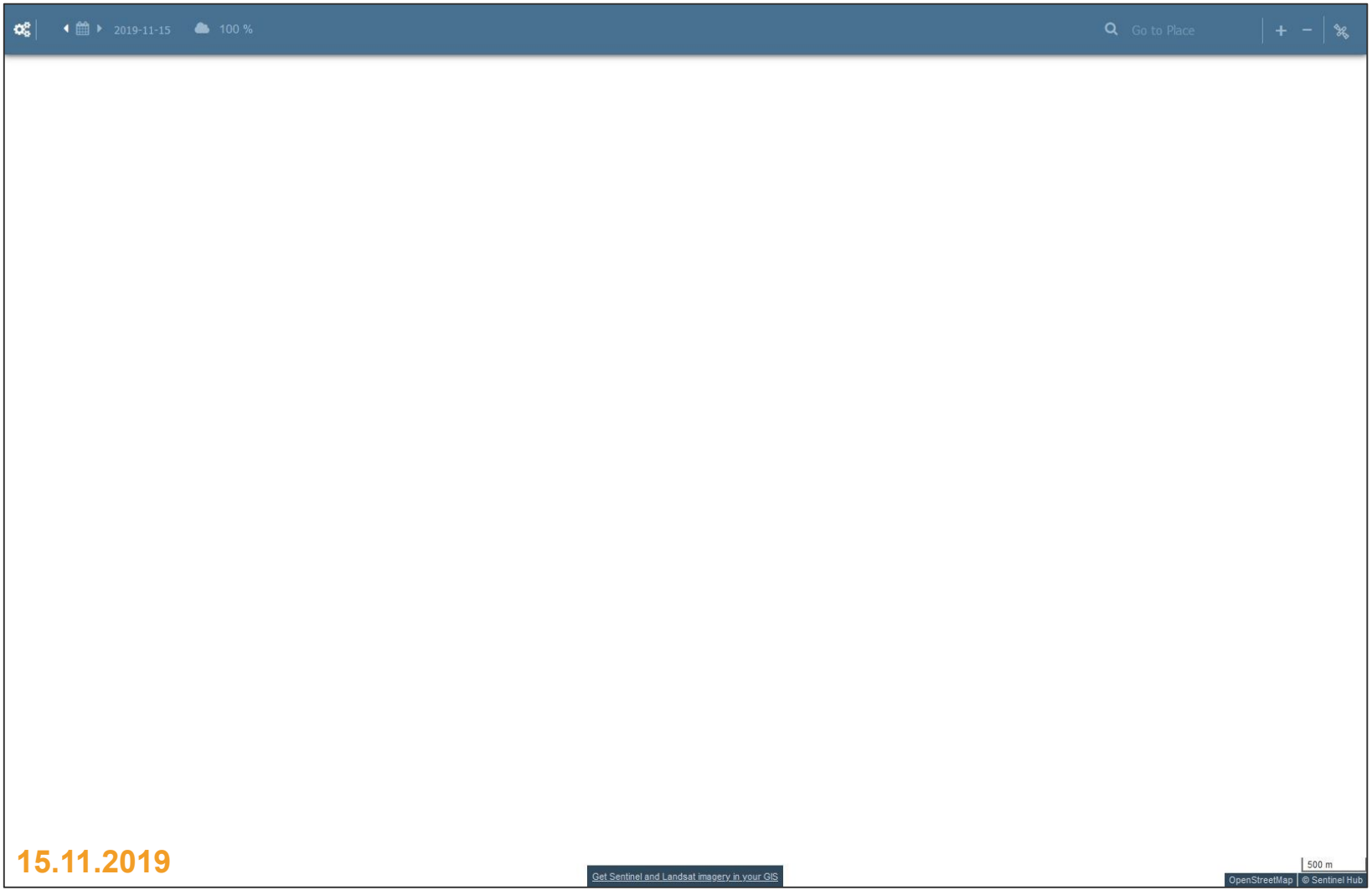
  → FREI VERFÜGBAR!

  → Sentinel Playground

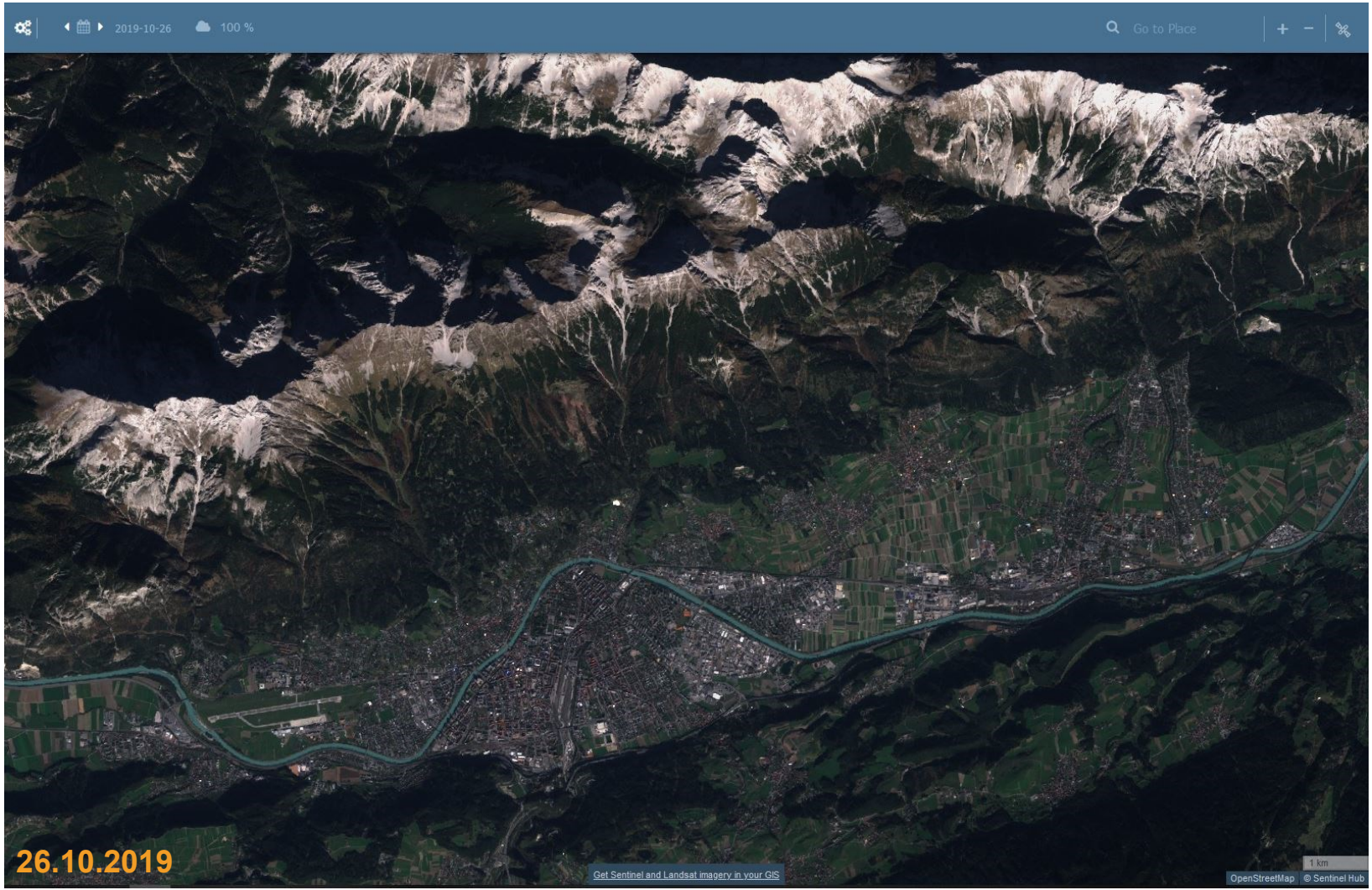




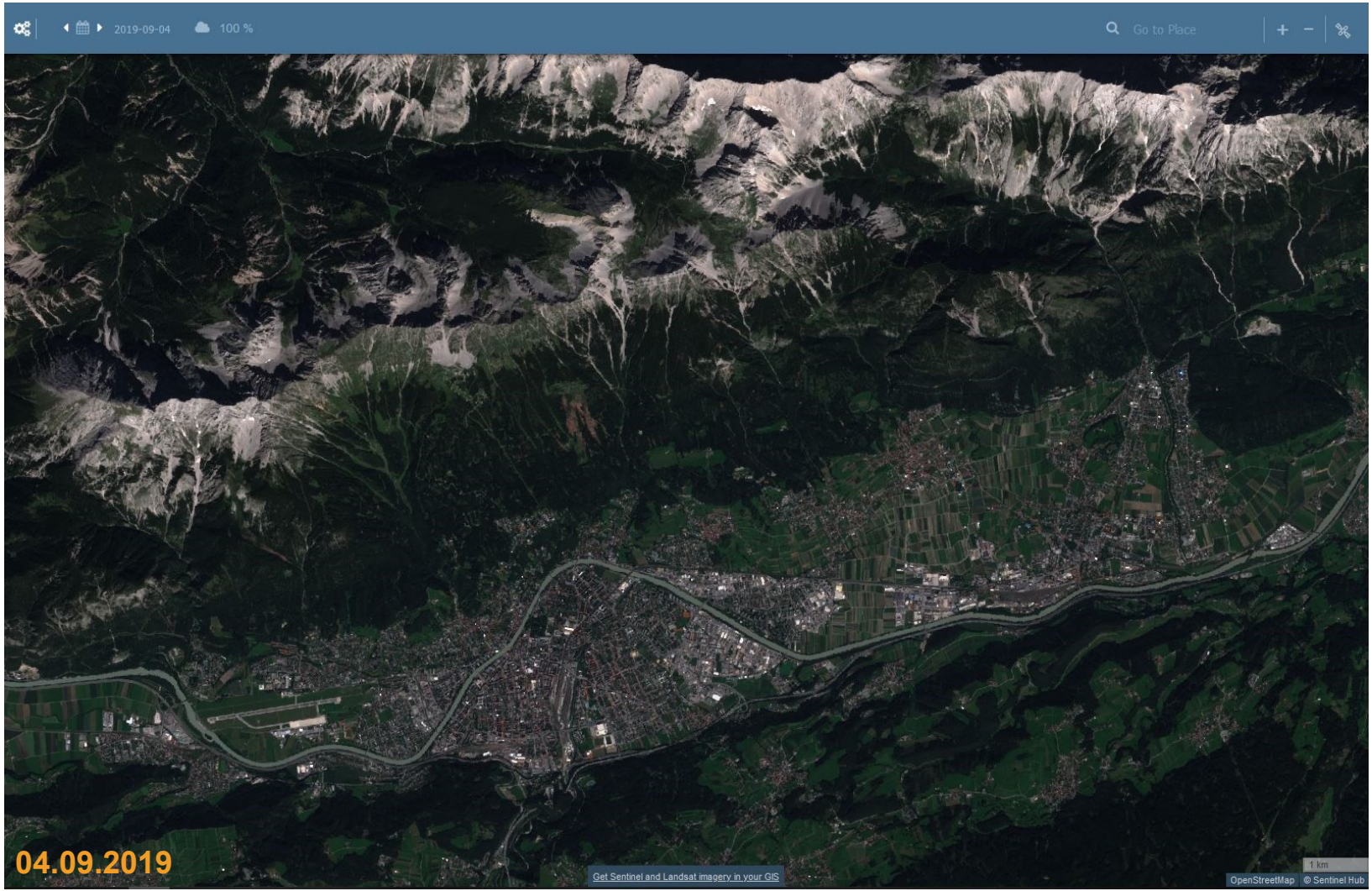
Quellen: http://www.esa.int


2019-11-15
100 %
Go to Place
15.11.2019
Get Sentinel and Landsat imagery in your GIS
500 m
OpenStreetMap
© Sentinel Hub

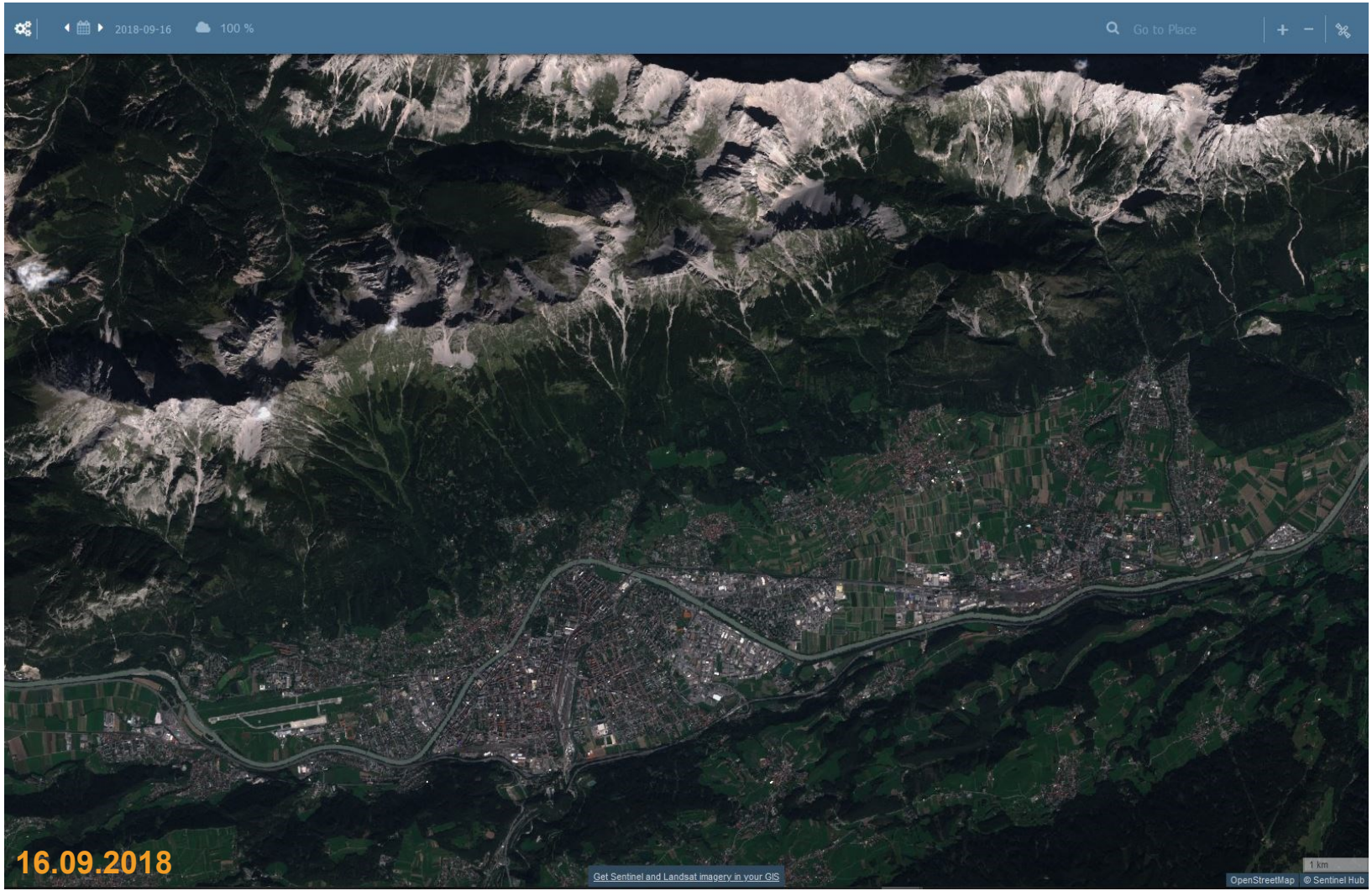
BFW
Bundesforschungszentrum für Wald

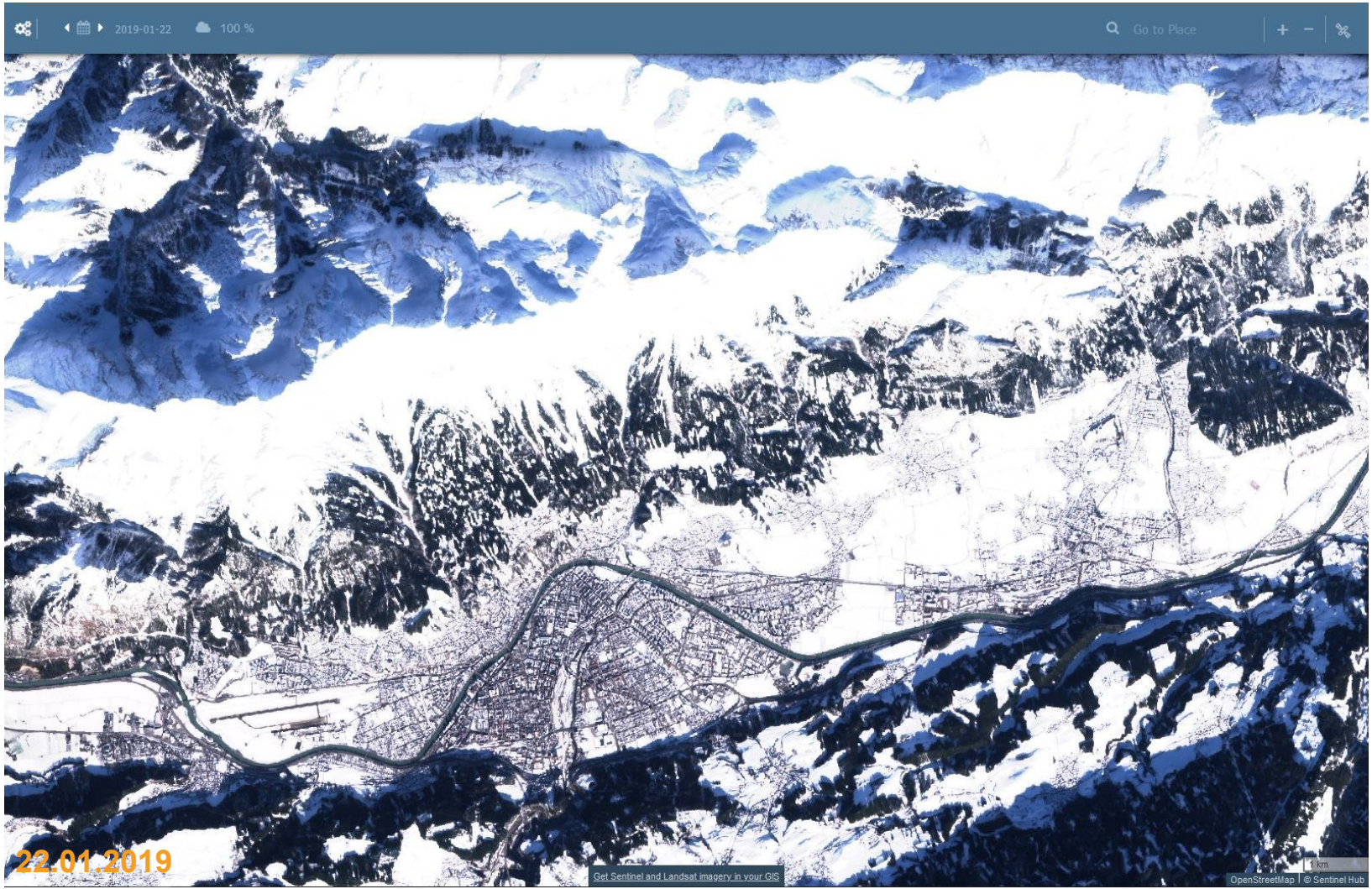


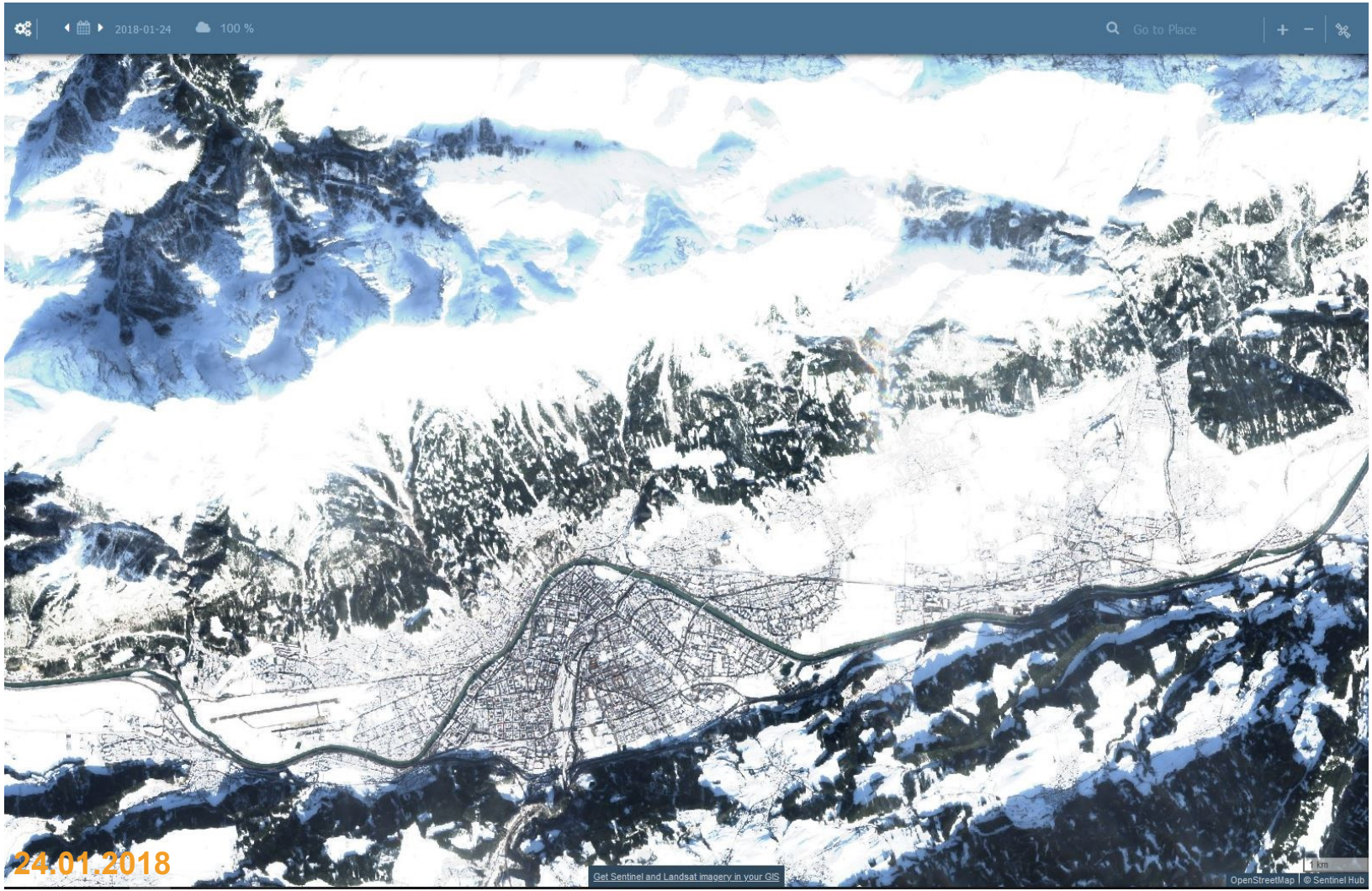
BFW
Bundesforschungszentrum für Wald

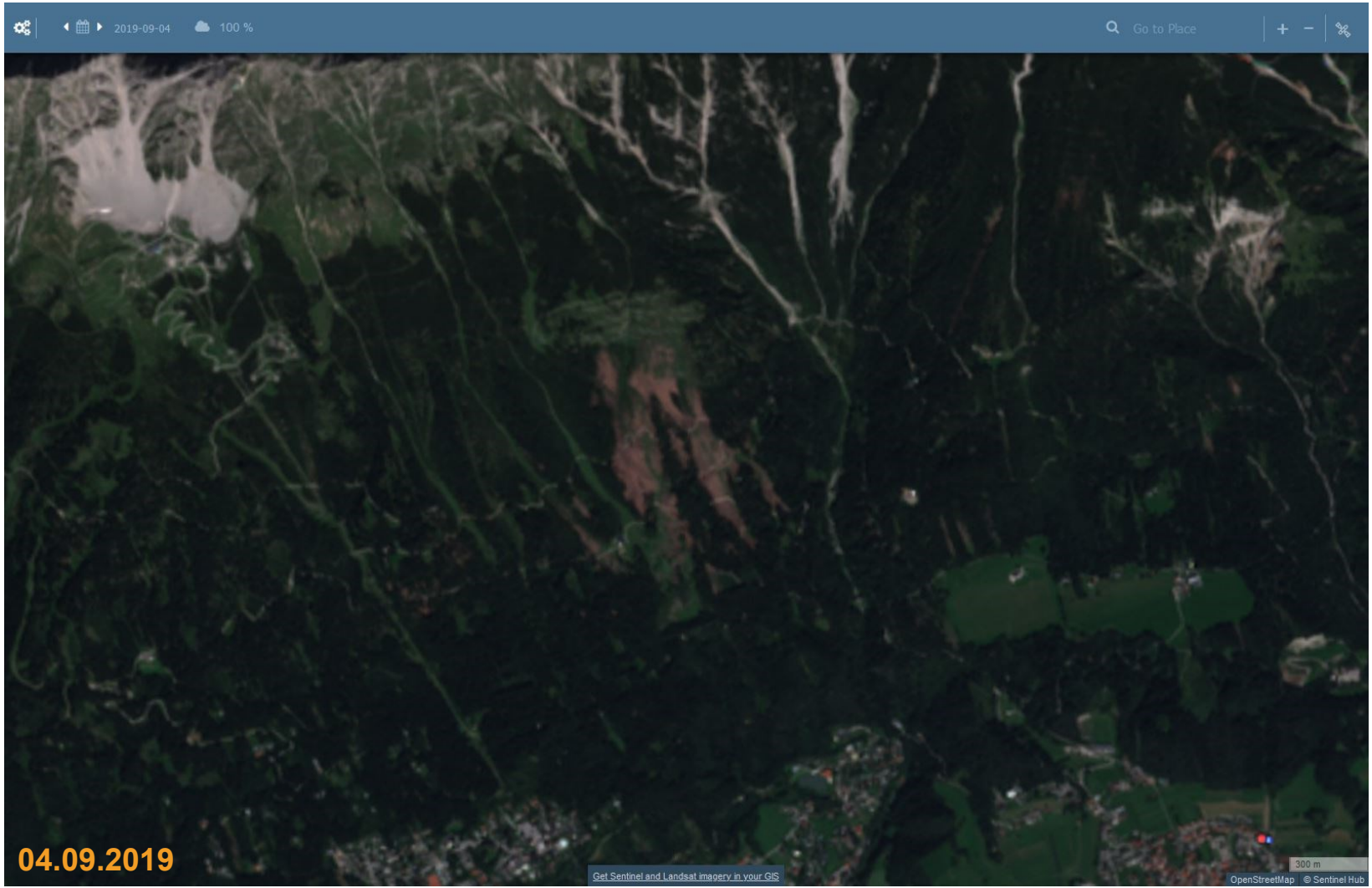


BFW
Bundesforschungszentrum für Wald




2019-01-22
100 %
Go to Place
22.01.2019
Get Sentinel and Landsat imagery in your GIS
1 km
OpenStreetMap | © Sentinel Hub


2018-01-24
100 %
Go to Place
24.01.2018
Get Sentinel and Landsat imagery in your GIS
1 km
OpenStreetMap | © Sentinel Hub


2019-09-04
100 %
Go to Place
04.09.2019
Get Sentinel and Landsat imagery in your GIS
300 m
OpenStreetMap © Sentinel Hub

Definition: Drohne

UAS, UAV, RPAS, uLFZ,… → ???

Camera +

GNSS +

Autopilot +

Image sources: infosperber.ch; airliners.de; dpreview.com; ebizradio.com; pixhawk.com

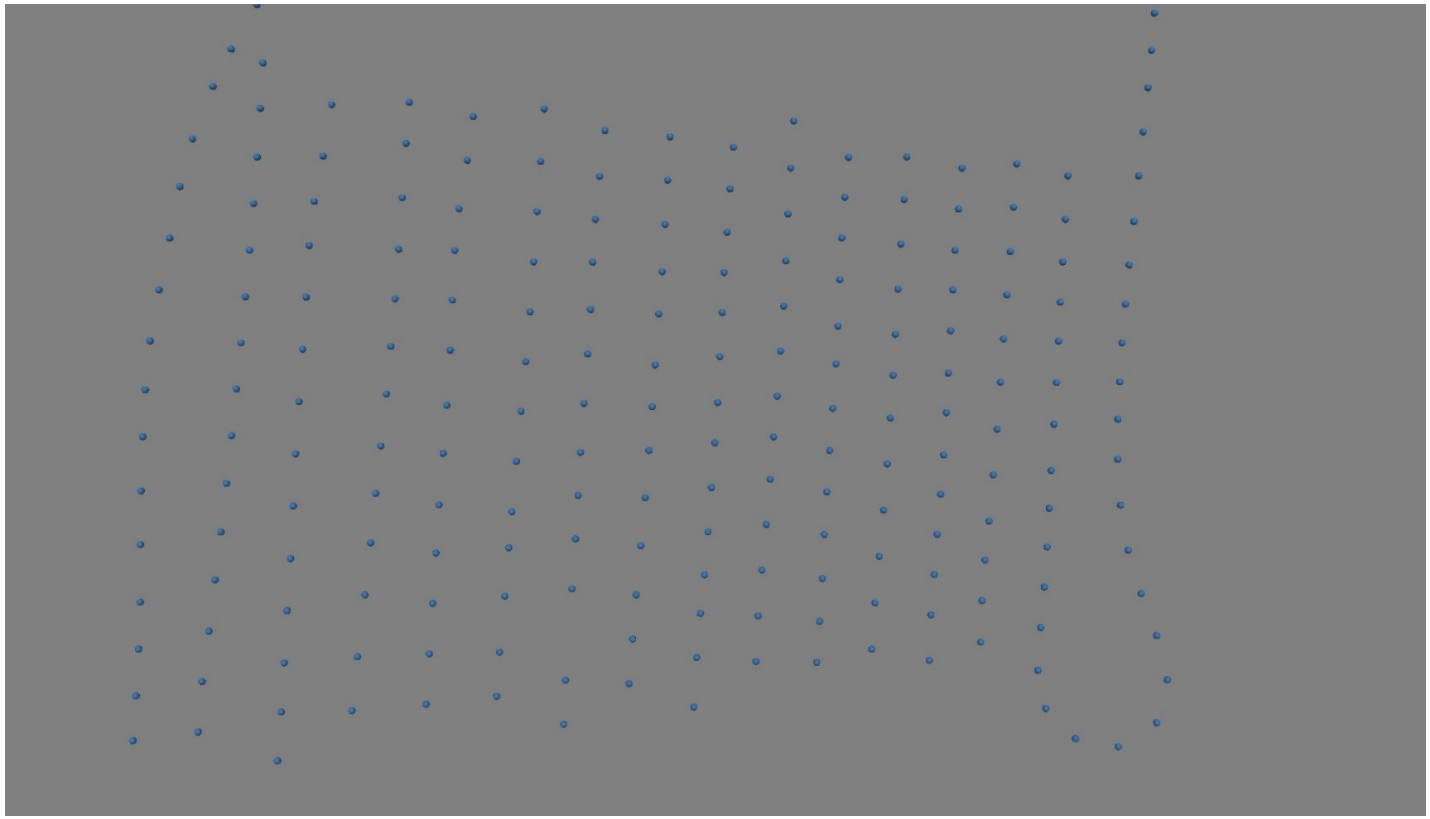
Arzler Alm - Drohne

	DJI Mavic 2
Flugzeit	20-25 min
Fläche	~30ha
GNSS	Single
Größe	0,2m (Ø Rotoren)
Abfluggewicht	~1kg
Max. Distanz	<300m

	DJI Hasselblad
Spektrum	RGB
Brennweite	10mm
Sensorgröße	1'' CMOS
Sensorauflösung	20 MP
Gewicht	100g

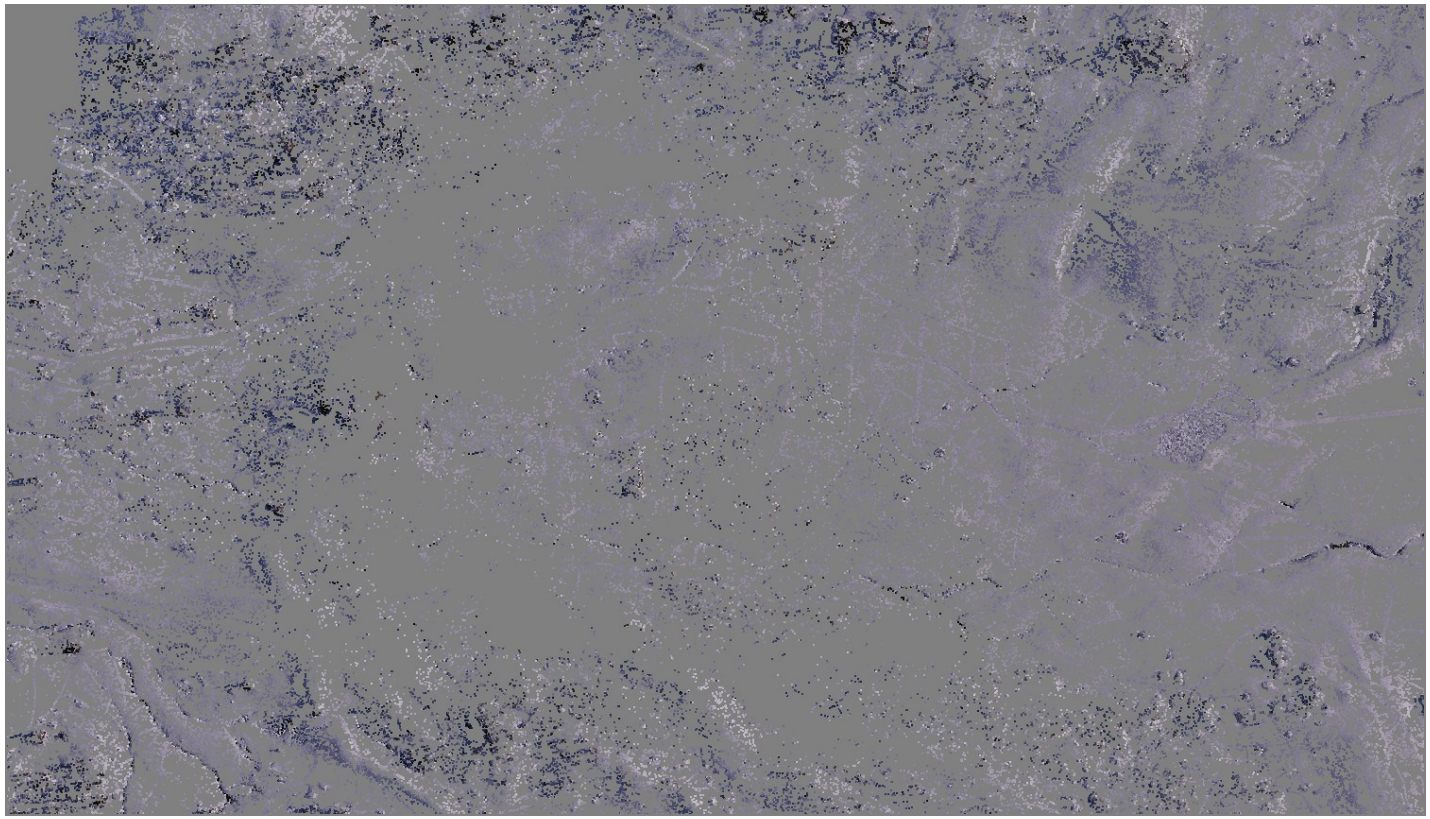
Image sources: www. shop.drohnen.de; www.dji.com

Photogrammetrie



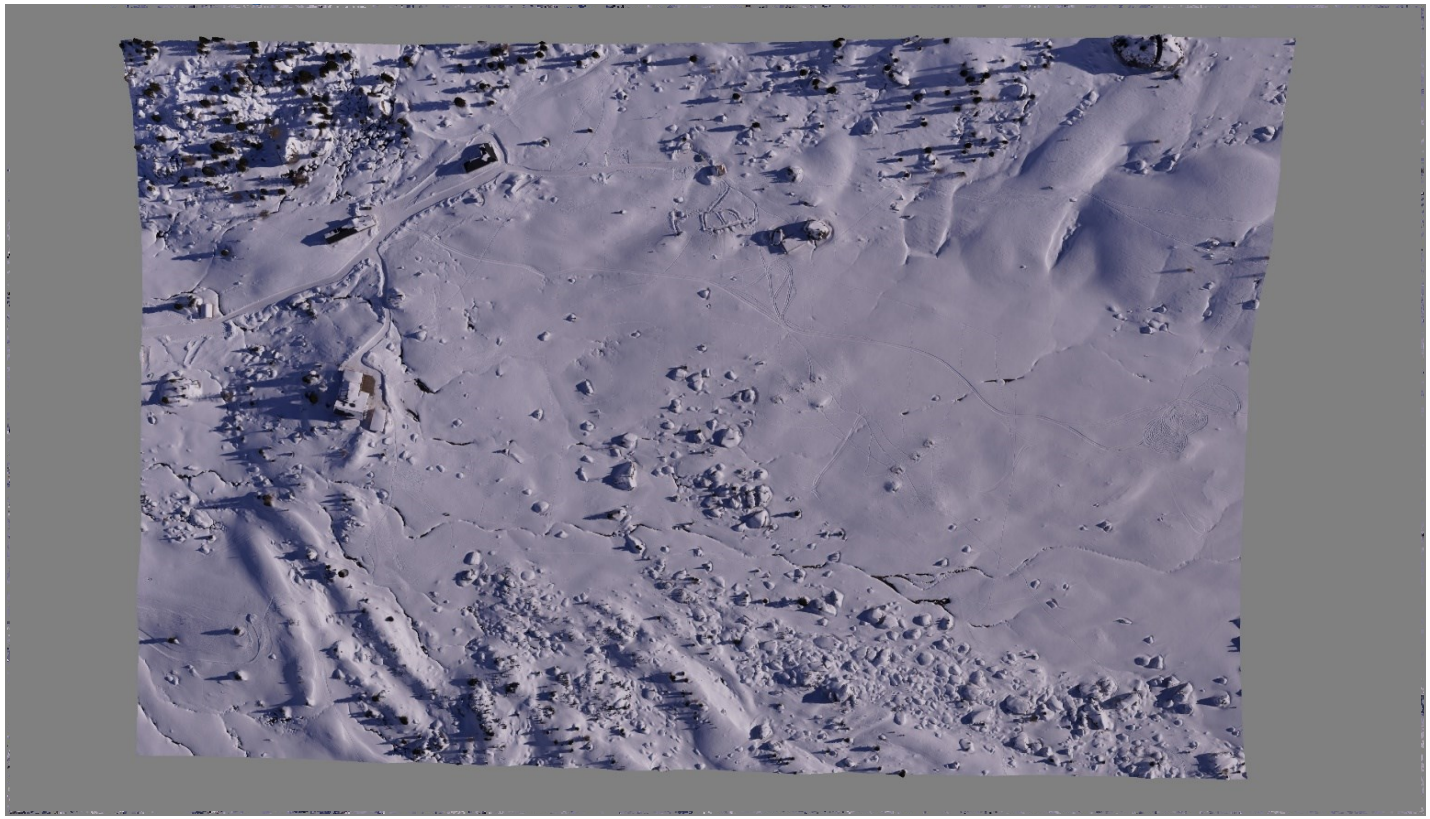
Georeferenzierte Photos

Photogrammetrie



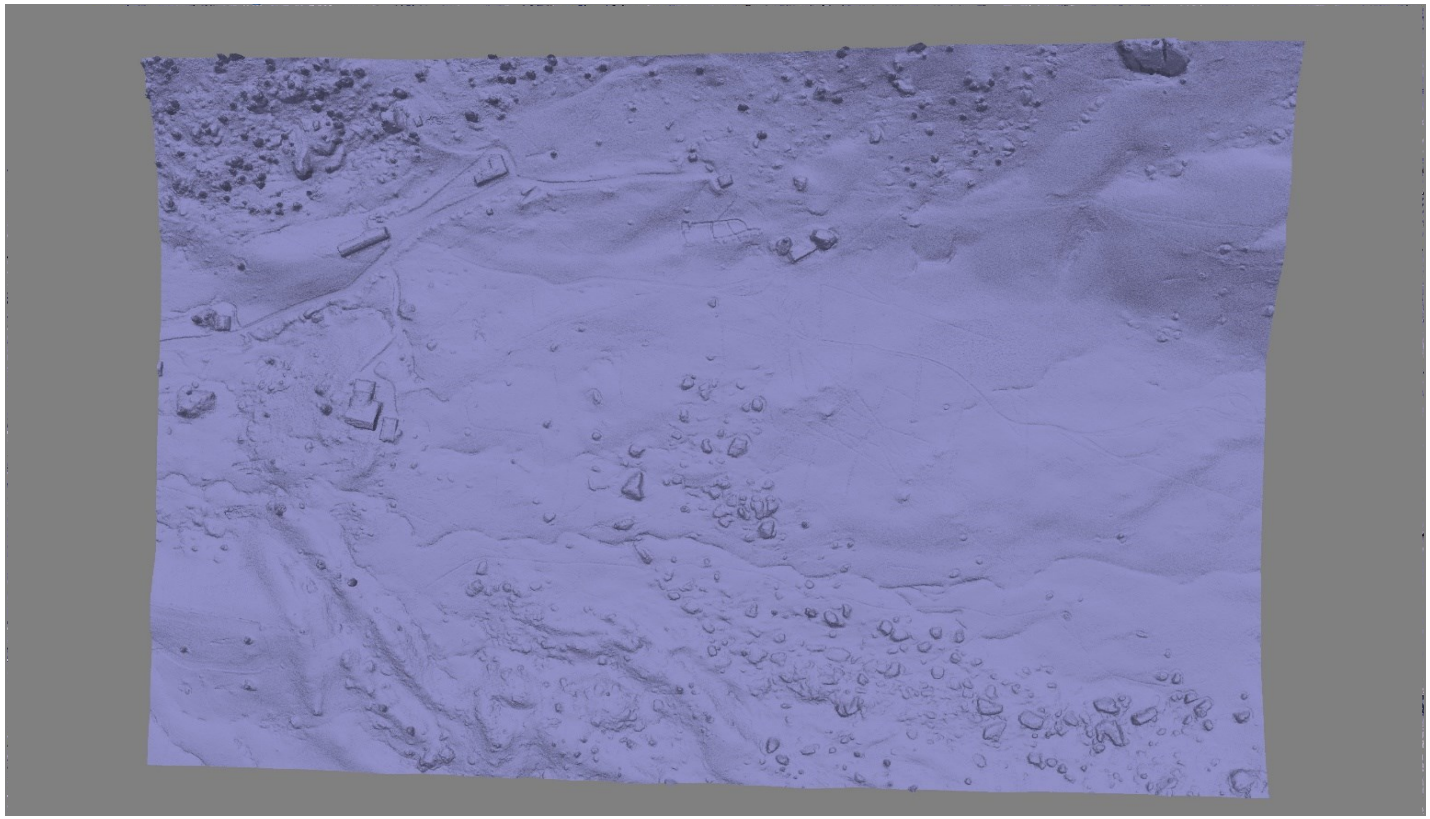
Punktwolke

Photogrammetrie



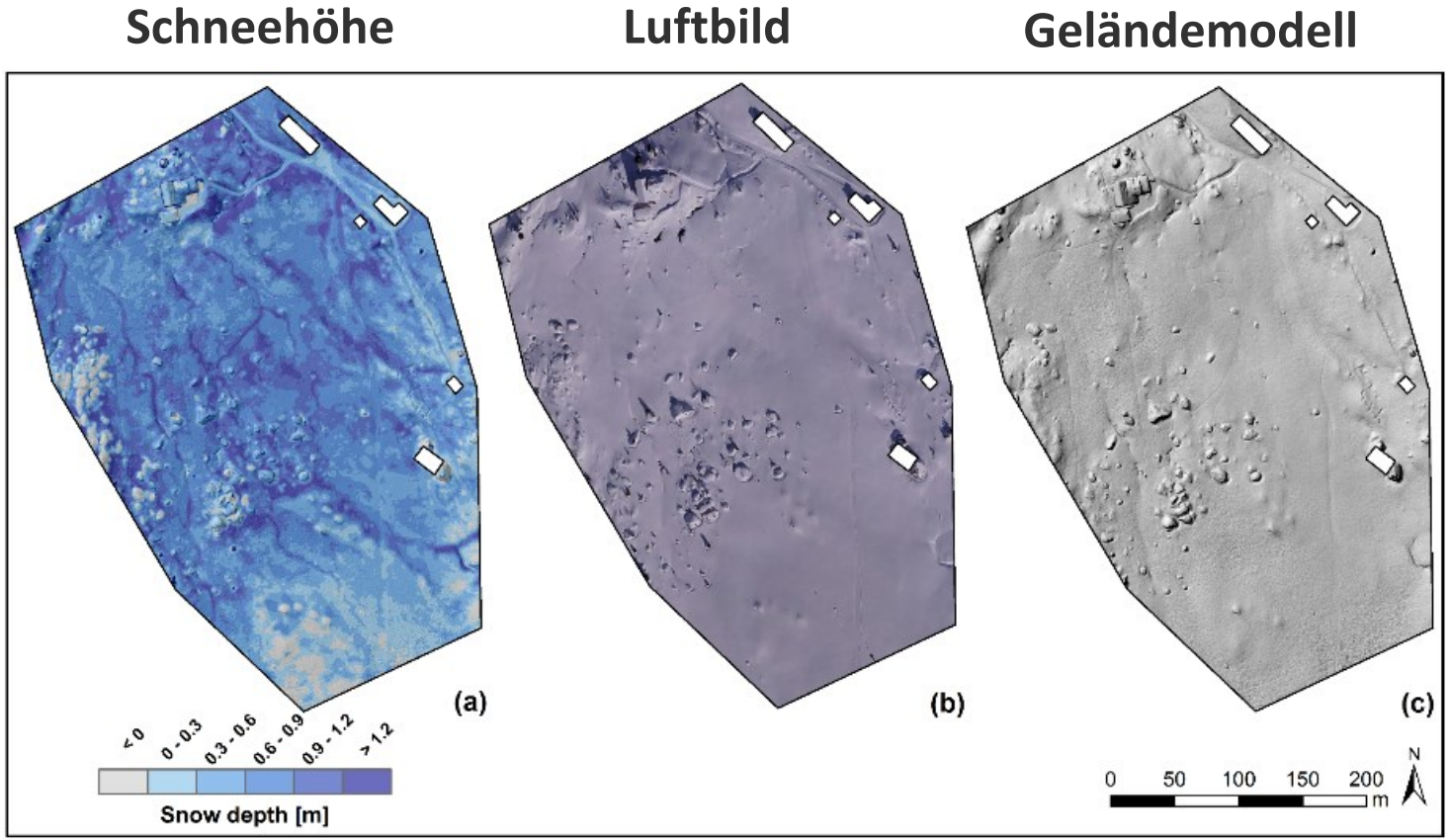
Luftbild

Photogrammetrie

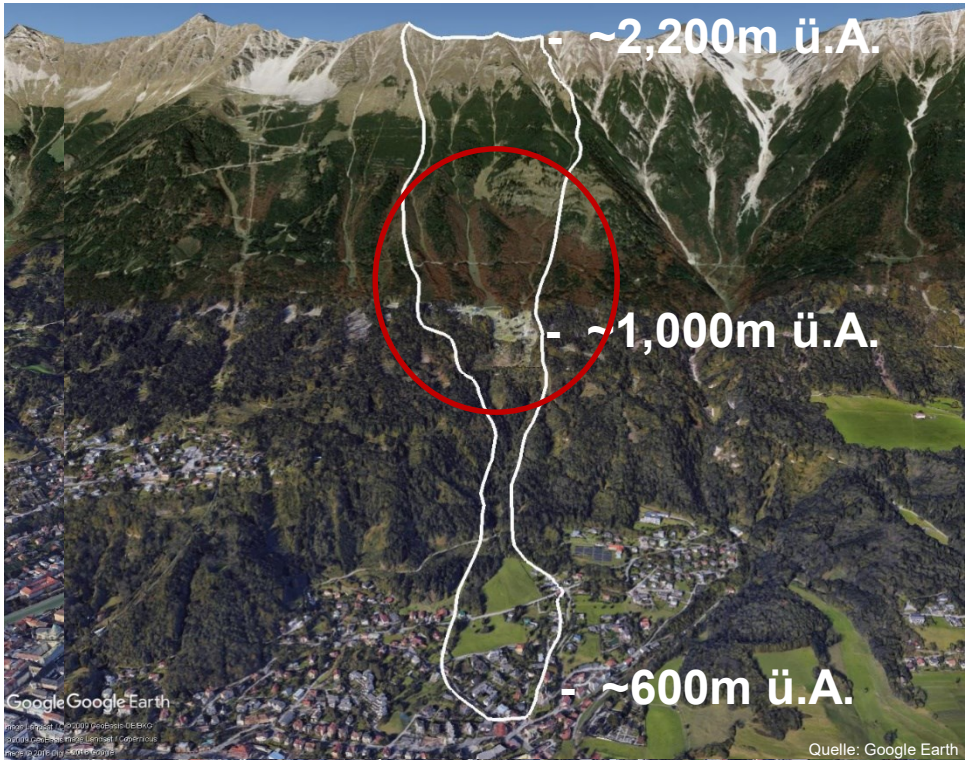


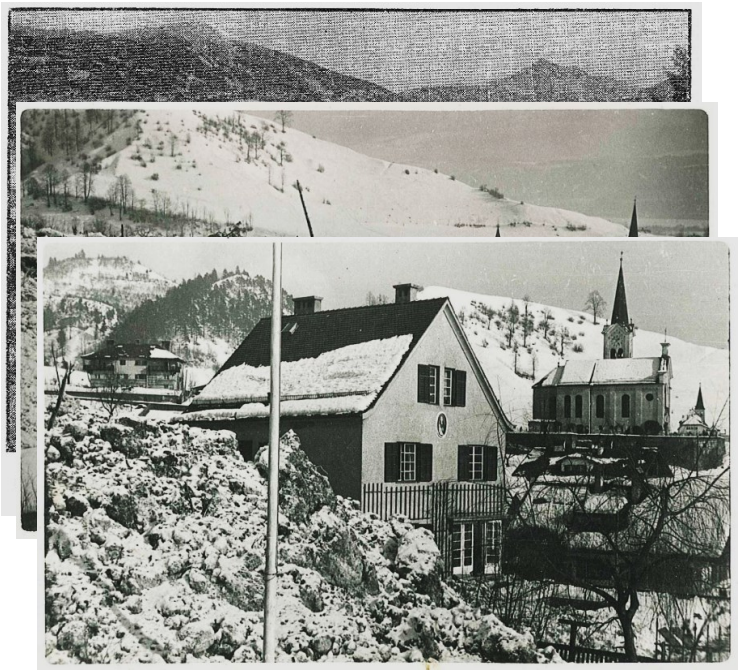
Geländemodell

Photogrammetrie



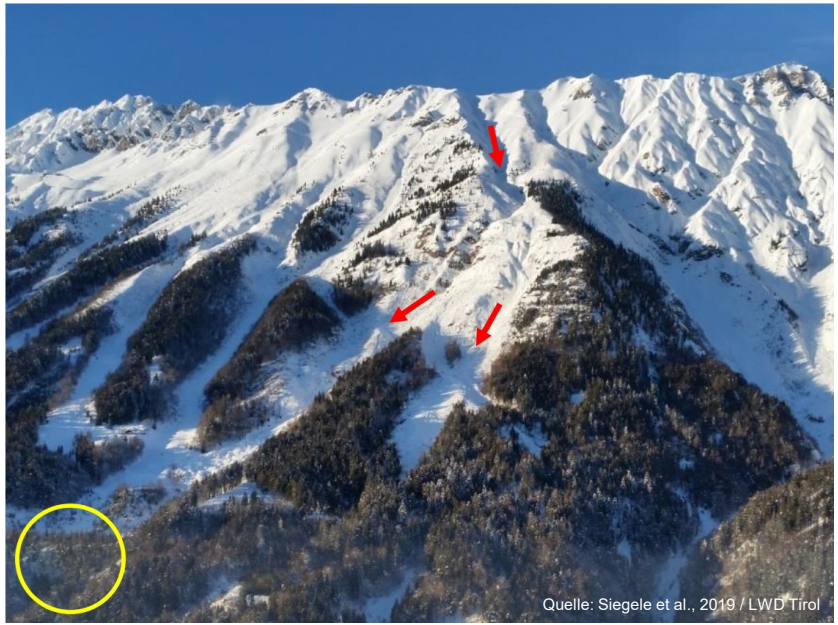
Arzler Alm Lawine





Quelle: Stepanek / Rauch

Arzler Alm Lawine – Ereignis Jan 2019



Arzler Alm Lawine – Befliegungen

UAS-Kampagnen

- 17. Jänner 2019
- Fokus: Ablagerung
- Area of interest: 0,5km²
- Luftbilder & Videos
- GSD: 0,04m (OP) | 0,16m (DOM)

Ablagerung

- Fläche: 1,8ha
- Mittlere Höhe: 3,1m
- Volumen: 57.000m³

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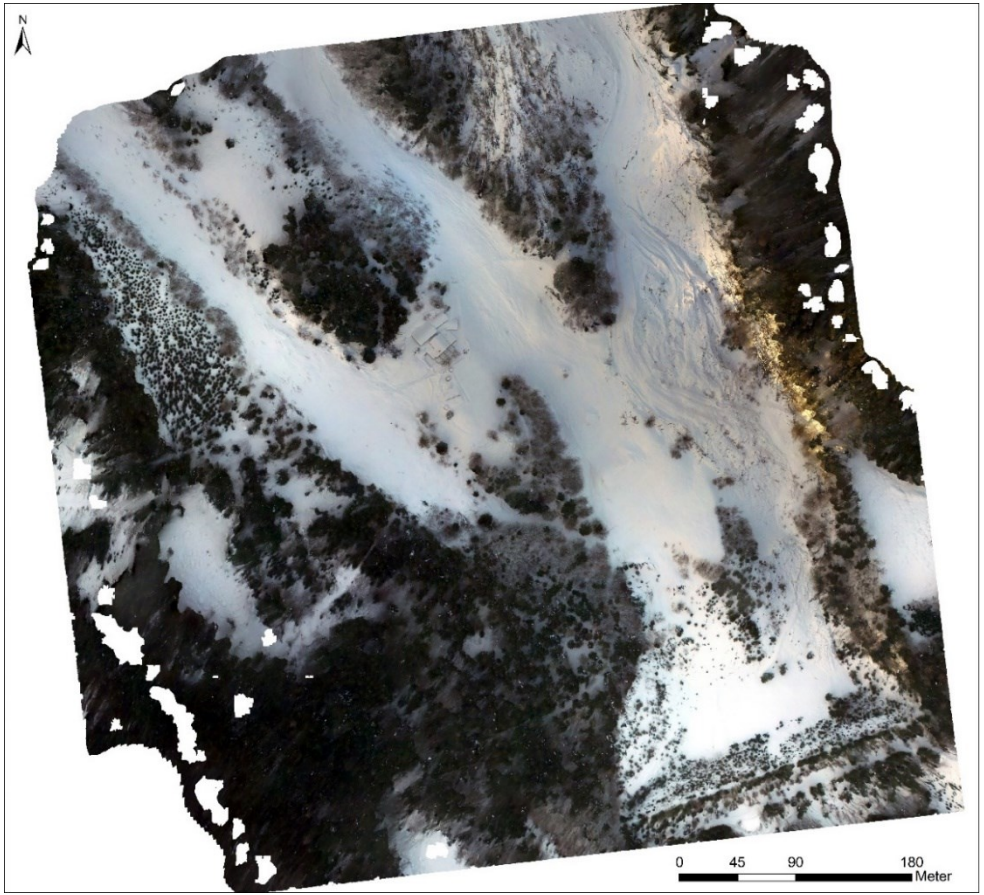

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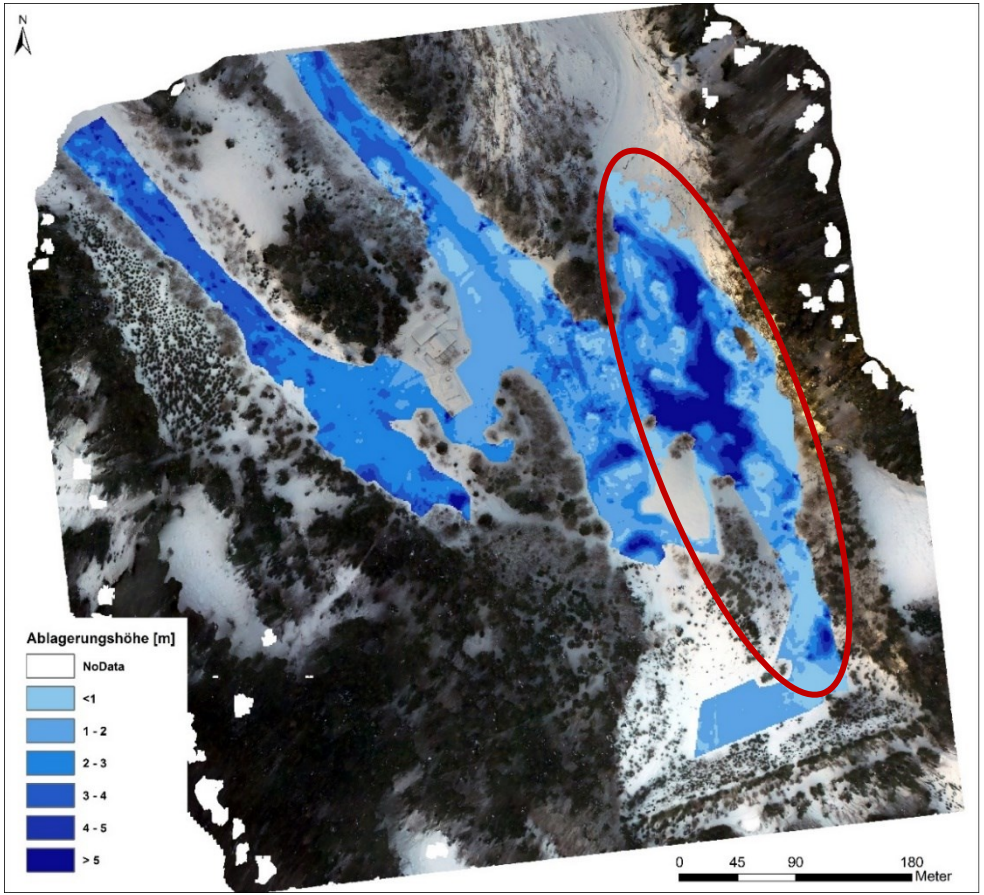


Arzler Alm Lawine – Befliegungen

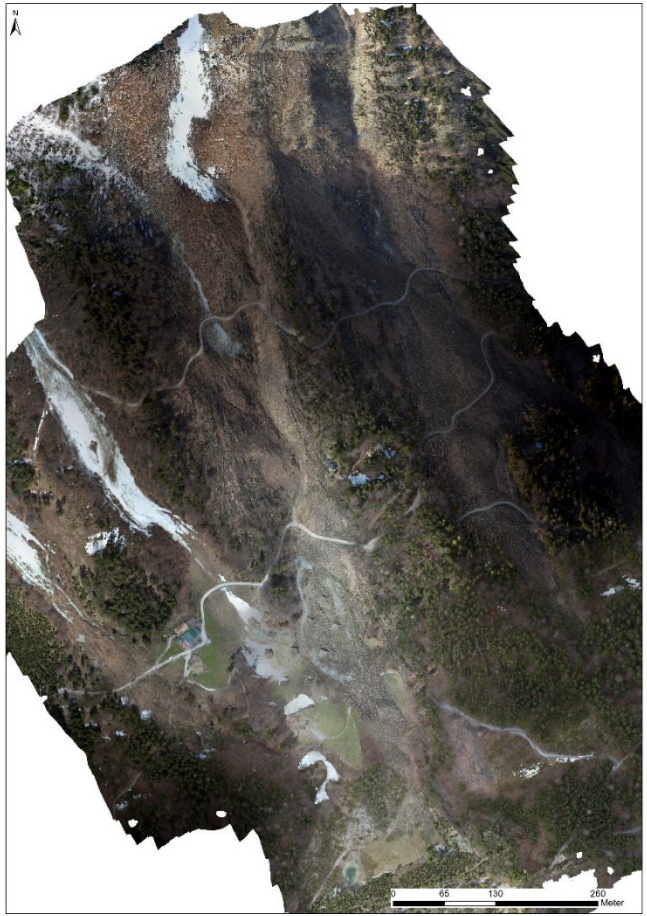
UAS-Kampagnen

- 15 & 16 April 2019
- Fokus: Waldschaden
- Area of interest: 0,9km²
- >2000 Luftbilder
- GSD: 0,02m (OP) | 0,08m (DOM)

Arzler Alm Lawine – Befliegungen

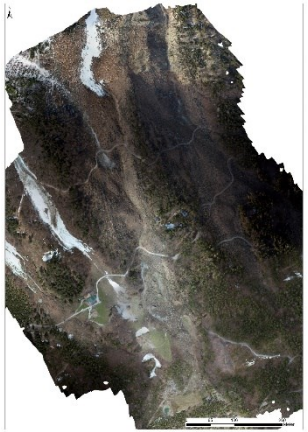
UAS-Kampagnen

- 15 & 16 April 2019
- Fokus: Waldschaden
- Area of interest: 0,9km²
- >2000 Luftbilder
- GSD: 0,02m (OP) | 0,08m (DOM)



Kartierung Waldschaden

Orthophotos

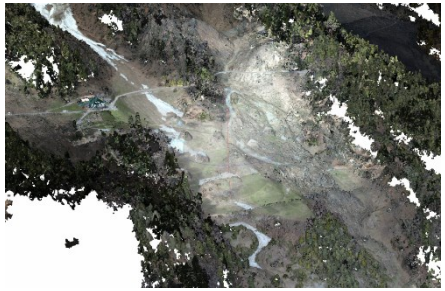


- Kartierung
- Rekonstruktion
- Planung Forst- und Feldarbeiten
- …

Oberflächen-modelle

- Ablagerungshöhen
- Bruchhöhen
- Holzvolumen
- …

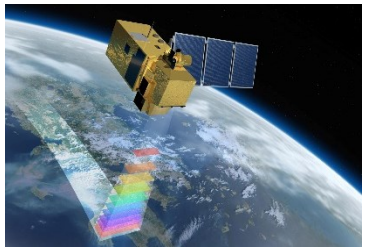
Punktwolken



- Detaillierte Informationen
- Fallrichtungen
- BHD
- …

Resümee

Sentinel 2 Satelliten



Aktualität

Low-Cost

Verfügbarkeit

Klein(st)-Drohnen

Große Flächen

Geringe Auflösung

Wenig Aufwand

Kleine Flächen

Hohe Auflösung

Hoher Aufwand

Fläche

Hotspots

Quellen: http://www.esa.int

Foto | Filmstill aus „See Aural Woods" (Luma.Launisch & Takamovsky)

Kontakt

Marc ADAMS

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Website: www.bfw.ac.at/drohnen

https://www.facebook.com/BundesforschungszentrumWald

https://twitter.com/bfwald

https://www.youtube.com/user/Waldforschung