



GeoVille

Information Systems and
Data Processing GmbH

SAFETRAIL

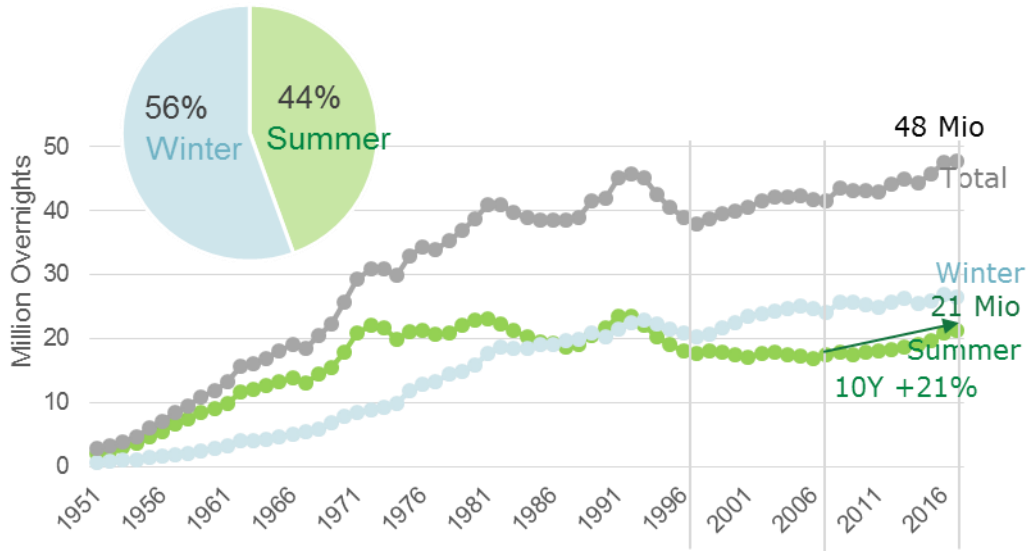
PROTOTYPE SUPPORTING SECURITY FOR ALPINE SUMMER TOURISM

25+

Innovating
with Experience
Delivering actionable
Earth Observation
services

NEREUS Space Data for Sustainable Tourism Workshop, 17. October 2024
presented by: Alexander Kreisel

www.GeoVille.com

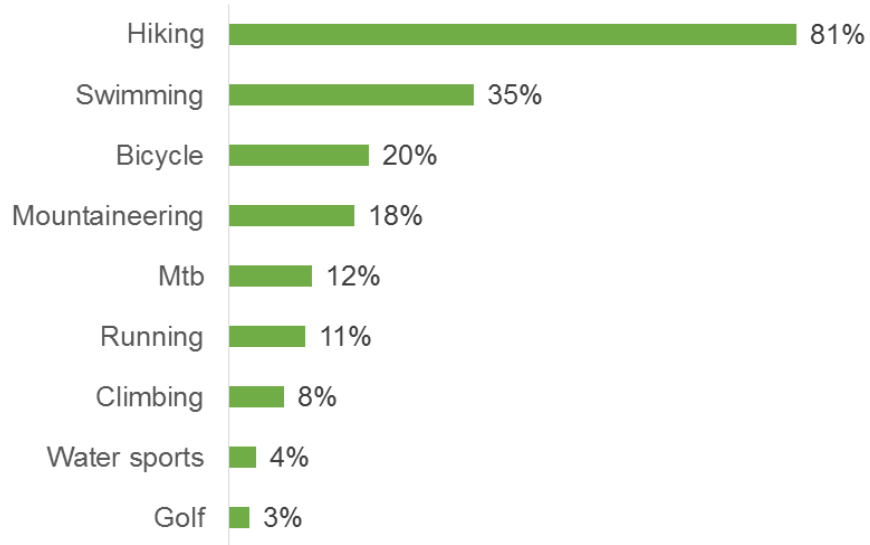


Source: Amt der Tiroler Landesregierung, Sg. Landesstatistik und tiris

Value added by Alpine Tourism

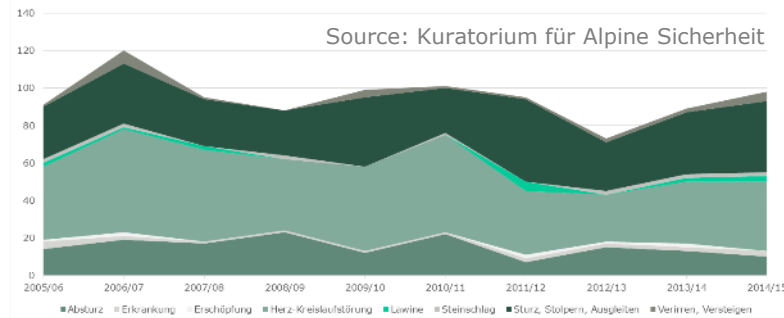
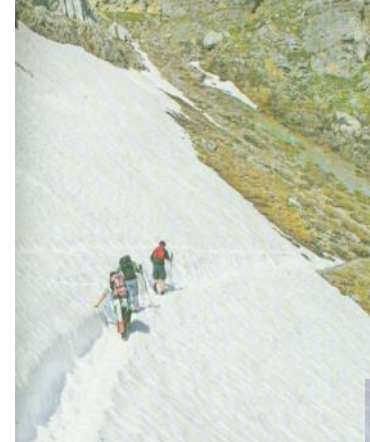
- Direct Value added in Tirol is **EUR 4.5 Billion**
- In Alpine regions like Tirol tourism generates 18% of Gross Domestic Product

TYPICAL SUMMER ACTIVITIES



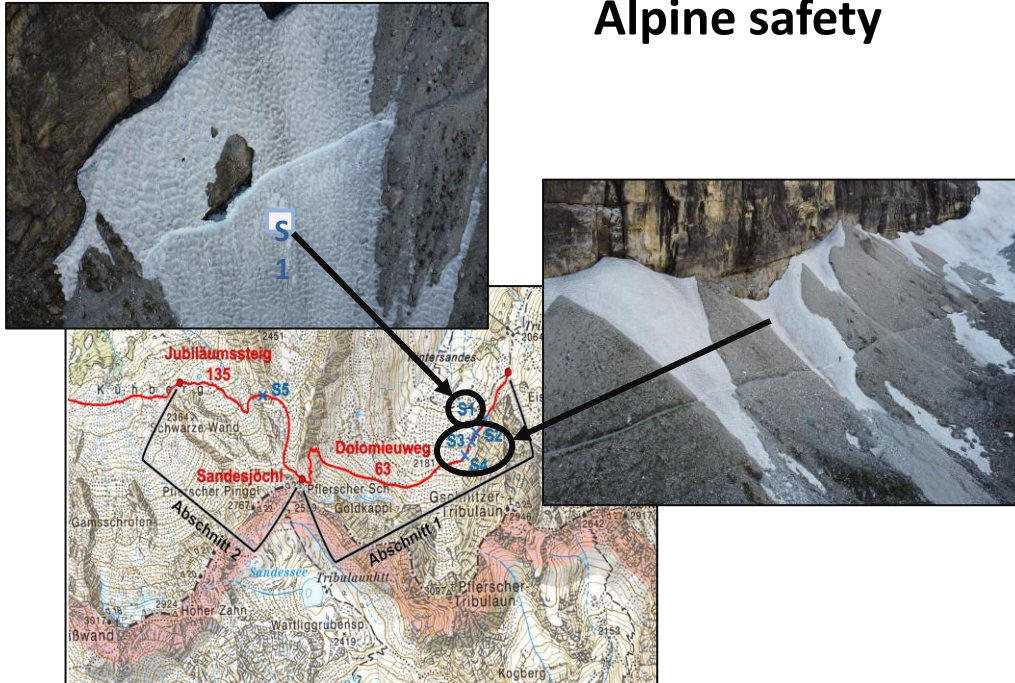
Main Causes in Alps during summer months

- Spring Snow fields (unexpected/underestimated)
- Icy conditions
- Rock fall (based on extreme temperature differences)
- Mass movements / debris / scree
- Cardiovascular failure
- Overconfidence / inexperience



PROBLEM IDENTIFICATION

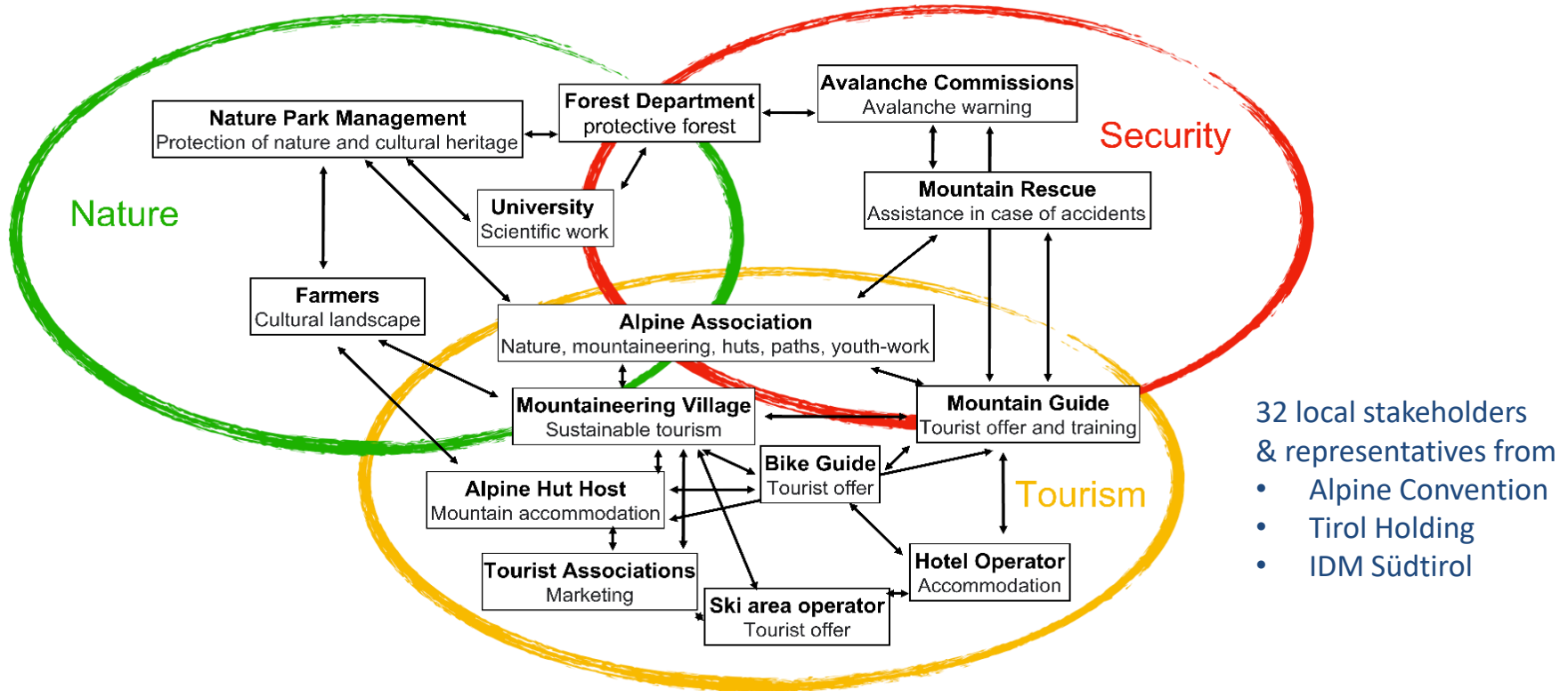
Alpine safety



Nature preservation



STAKEHOLDER RELATIONSHIP



Three Pilot Regions

1

Gschnitztal Valley –
North Tyrol



Medium elevation ecosystem with
temperate climate

2

Oetztal/Schnalstal Valley
North/South Tyrol



High alpine glacial and nival ecosystem

3

Dolomites
South Tyrol/Trentino



Southern calcaire ecosystem in dry
and hot climate

PRODUCT IDENTIFICATION AND DEVELOPMENT



Occurrence of snow

- Overall interest:** Strong interest of the stakeholder community.
- Drawbacks:** Classification approach simple. Issues encountered in shadowed and forested areas.
- Improvements:** Snow & ice properties (i.e. soft, hard, etc.) for trail risk classification.
-



Weather

- Overall interest:** Medium interest of the stakeholder community.
- Drawbacks:** Classification approach too simple. Resolution not sufficient and derived products too vague (e.g. orographic situation). Heterogeneous base data availability.
- Improvements:** Difficult due to variable quality of the input datasets in the various countries.
-



Trail condition

- Overall interest:** High interest of the stakeholder community.
- Drawbacks:** Classification approach too simple and not taking into consideration important parameters such as soil composition.
- Improvements:** Difficult due to missing information on soil composition.

PRODUCT IDENTIFICATION AND DEVELOPMENT



Trail
steepness

Overall interest: Medium interest of the stakeholder community.

Drawbacks: Trail data layer often over- or undersegmented resulting in a vague information provision since steepness is averaged over trail length.

Improvements: Higher segmentation of trails and more detailed Digital Elevation Model (DEM).



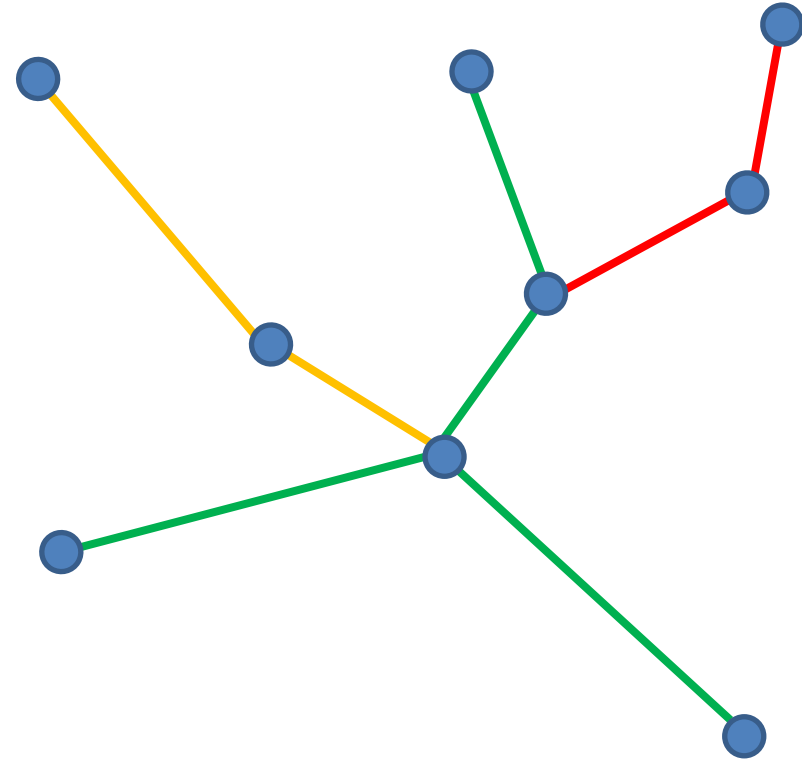
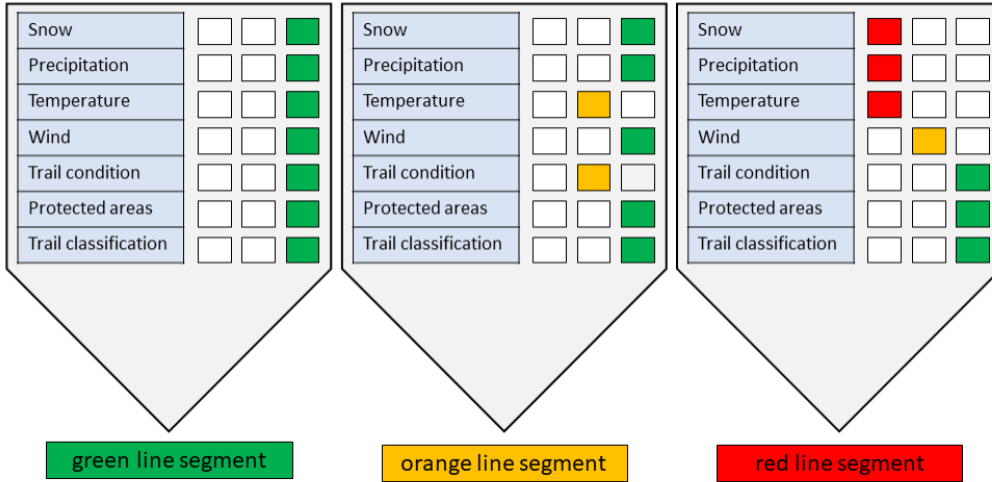
Protection
zone

Overall interest: High interest of the stakeholder community.

Drawbacks: Variable coverage within the countries. No standardized attributes for product delivery available.

Improvements: More spatial data needed with better product/time description.

VISUALIZATION RULESET – MAXIMUM RISK





Risks & Metadata



HIKING TRAIL



Risk Level: High



Risks

Snow Occurrence **High**

Temperature **Comfortable**

Wind **Calm**

Precipitation **Light**

Trail Condition **Dry**

Basic Information

Trail Classification **Moderate**

Protected Area **Yes**

Trail Details

Min Elevation [m] 2050

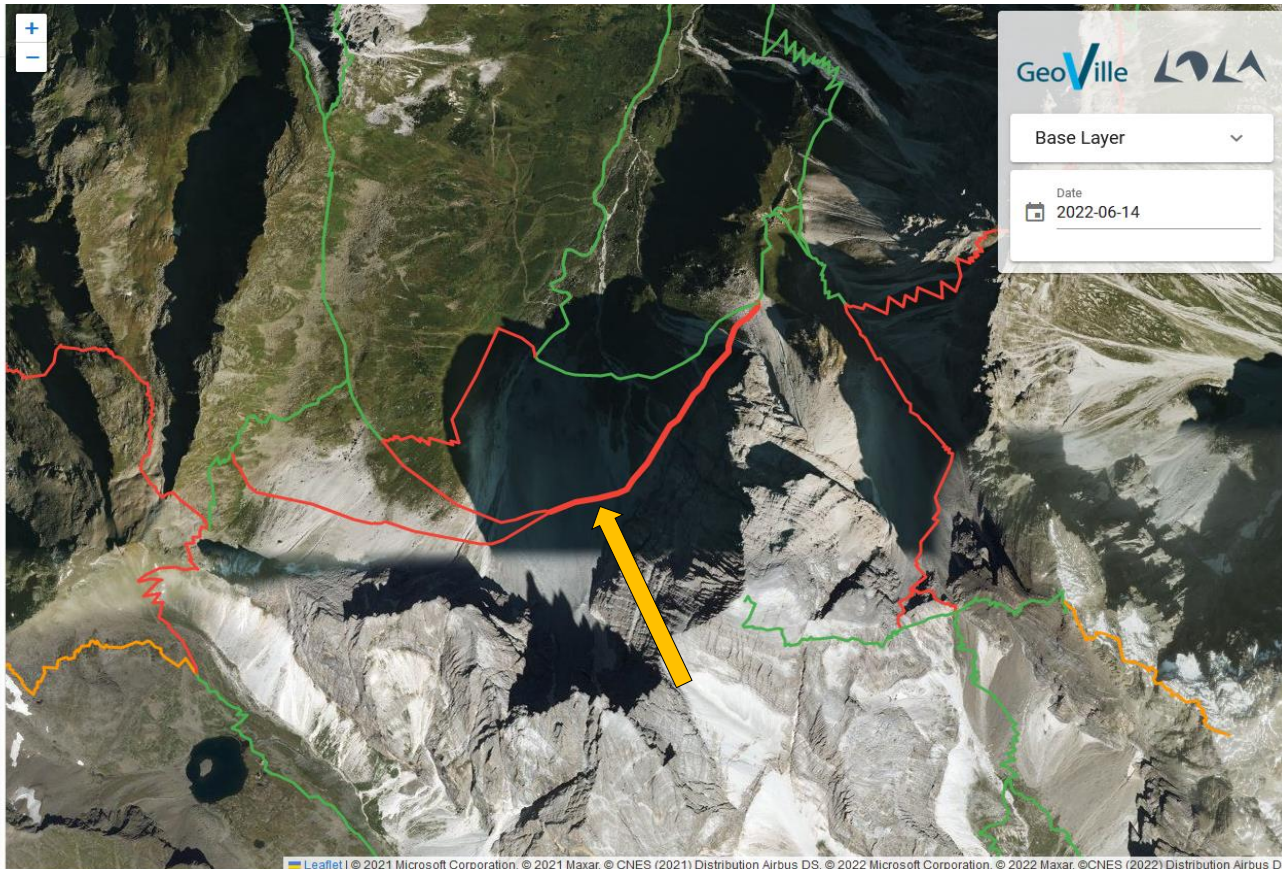
Max Elevation [m] 2189

Difference Elevation [m] 139

Mean Slope [degree] 28

Max Slope [degree] 51

Mean Aspect Name NE



Risks & Metadata

HIKING TRAIL

Risk Level: Medium

Risks

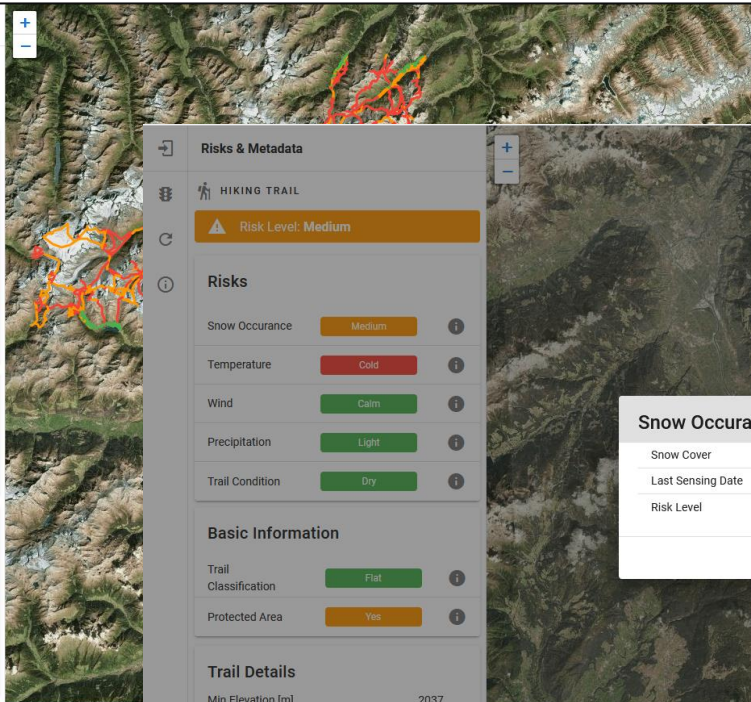
- Snow Occurance: Medium
- Temperature: Cold
- Wind: Calm
- Precipitation: Light
- Trail Condition: Dry

Basic Information

- Trail Classification: Flat
- Protected Area: No

Trail Details

Min Elevation [m]	1979
Max Elevation [m]	2054
Difference Elevation [m]	74
Mean Slope [degree]	17
Max Slope [degree]	28
Mean Aspect Name	NE



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Base Layer

Risks & Metadata

HIKING TRAIL

Risk Level: Medium

Risks

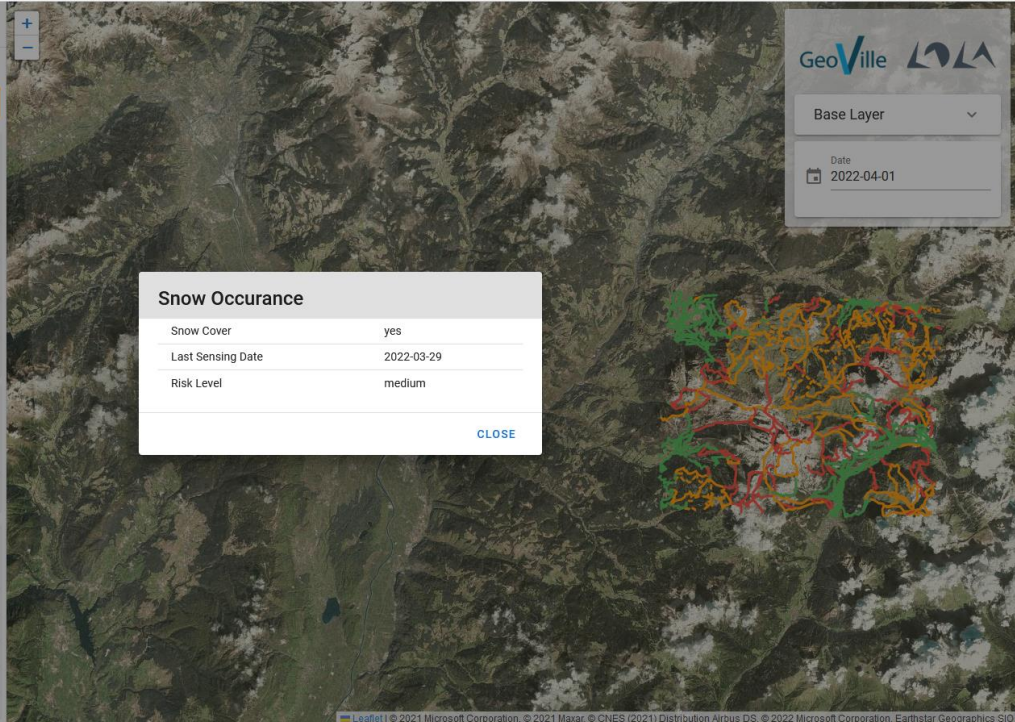
- Snow Occurance: Medium
- Temperature: Cold
- Wind: Calm
- Precipitation: Light
- Trail Condition: Dry

Basic Information

- Trail Classification: Flat
- Protected Area: Yes

Trail Details

Min Elevation [m]	2037
Max Elevation [m]	2090
Difference Elevation [m]	53
Mean Slope [degree]	15
Max Slope [degree]	19
Mean Aspect Name	NE



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Base Layer

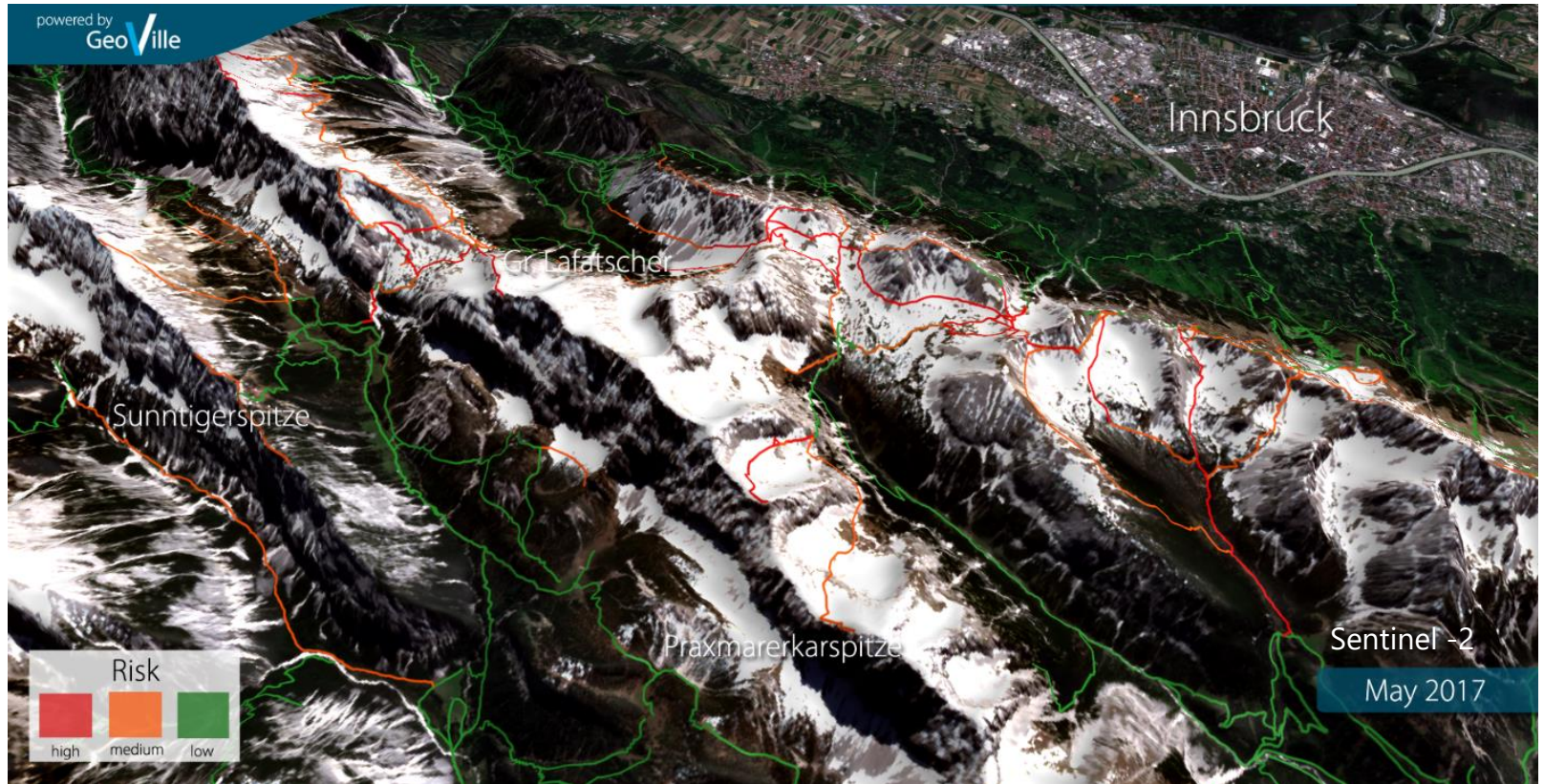
Date
2022-04-01

Snow Occurance

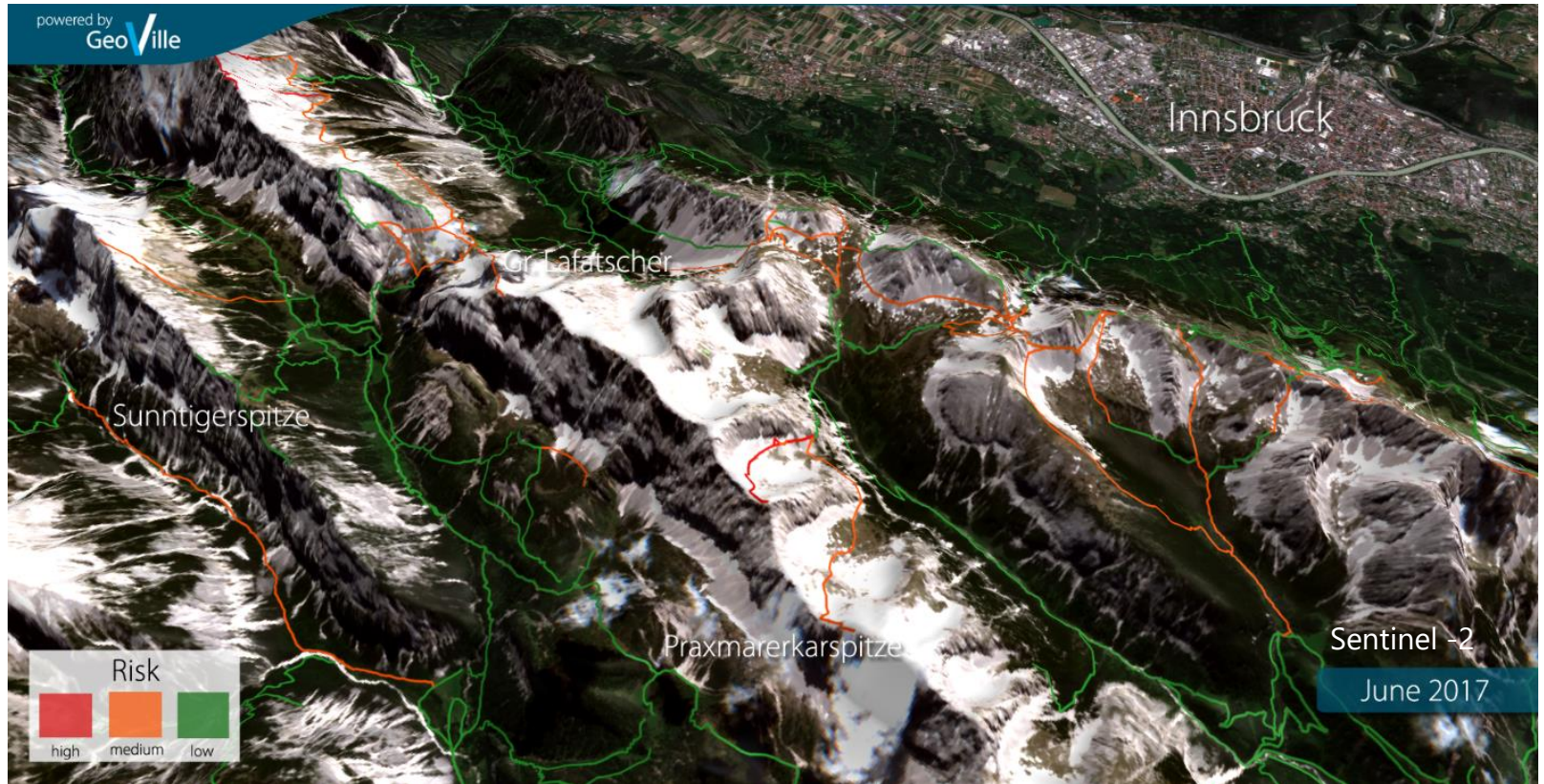
Snow Cover	yes
Last Sensing Date	2022-03-29
Risk Level	medium

CLOSE

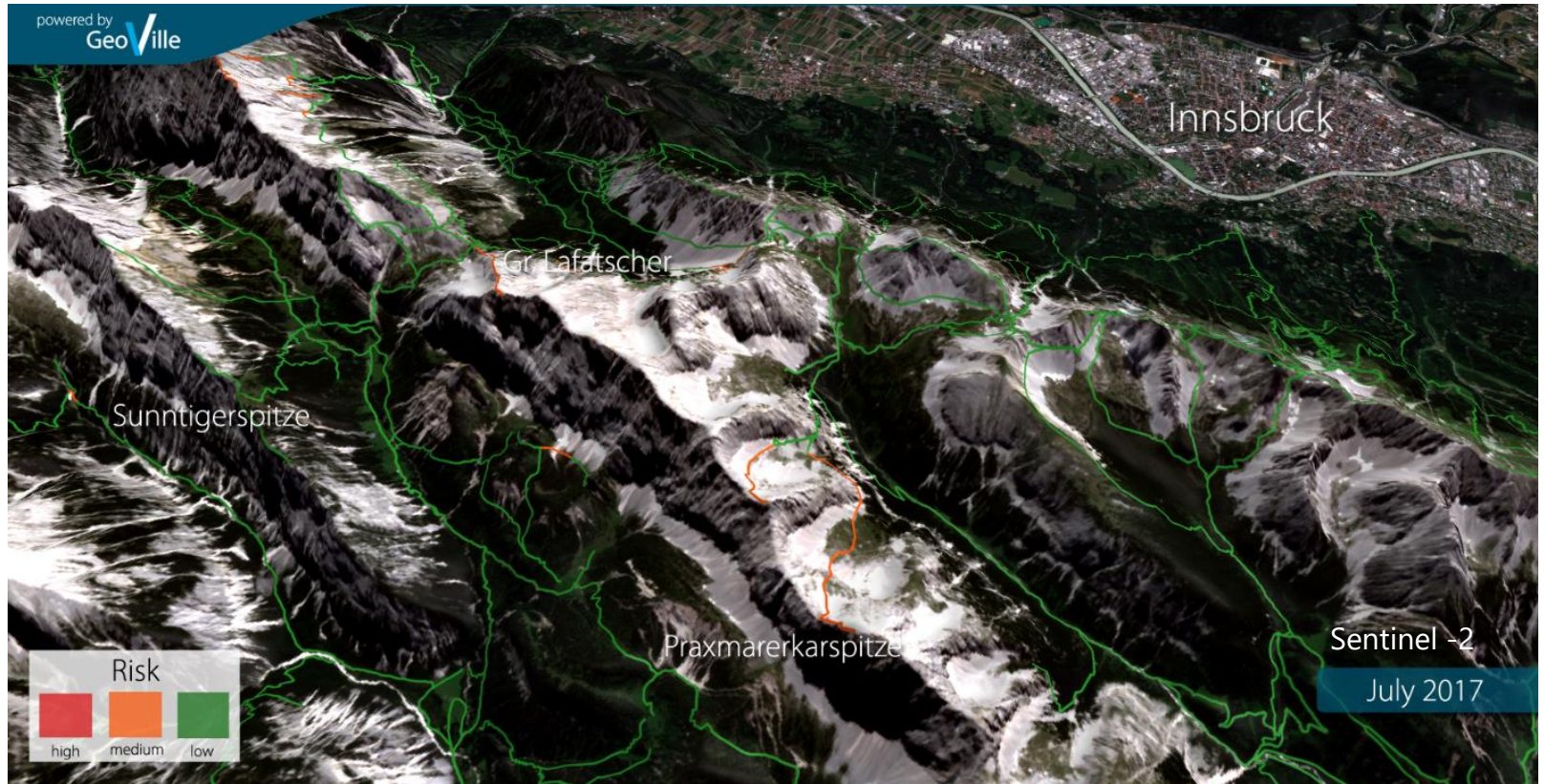
TRAIL RISK MONITORING – MOCK-UP SNOW FIELD



TRAIL RISK MONITORING – MOCK-UP SNOW FIELD



TRAIL RISK MONITORING – MOCK-UP SNOW FIELD





GLOBAL INSIGHTS AT YOUR FINGERTIPS

GeoVille is internationally renowned for its leading role in innovative Earth observation services and offers a one-stop-shop for targeted value-added geo-information products and related solutions.

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