



LANDSLIDE GEO-INFORMATION SERVICES FOR THE ALPS

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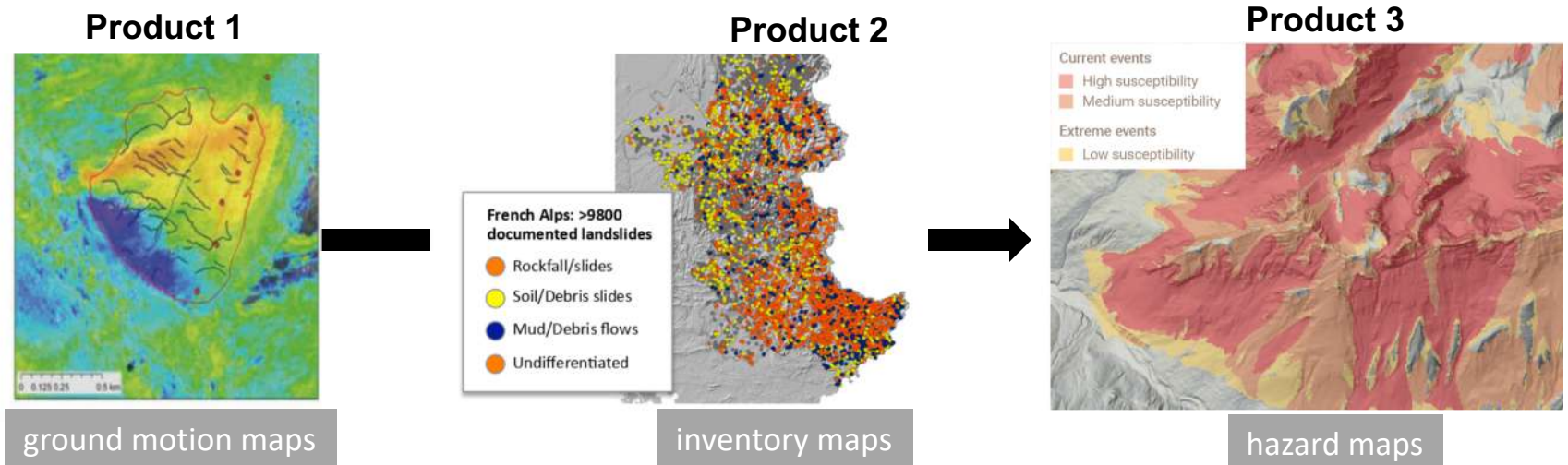
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“Geo-information Services for Landslides in the Alps (eo4alps-landslides)” has the objective of implementing regional products for landslide hazard assessment over the Alpine mountain range. It focuses on the creation of harmonized and advanced landslide inventories and susceptibility/hazard maps based on EO ground motion services linked to advanced modelling capabilities

“eo4alps-landslide” products delivered to end-users

- automatic landslide detection/ground motion using satellite optical/InSAR services
- harmonised and advanced landslide catalogues
- susceptibility/hazard maps consisting of possible landslide source areas and landslide runout modelling



A platform-approach for accessing the services - Geohazards Exploitation Platform



Landslide-Motion

This service is dedicated to the survey of unstable slopes in near-real time and in a systematic mode, and generates landslide ground motion products.



Landslide-Inventory

This service is dedicated to the creation and update of detailed catalogues of landslide events.



Landslide-Hazard

This service is dedicated to the forecast of spatial landslide hazard and landslide evolution scenarios.



User-driven

The services are user-driven with the engagement of many authorities and stakeholders responsible for landslide Disaster Risk Management.



Scales of analysis

The services are tailored for three analysis scales using specific data and models (Tier 1: regional/basin authority level; Tier 2: municipality level; Tier 3: slope specific level).



Interoperability

The services are accessible online and optimized for high performance computing. They are designed as generic as possible for application in other settings and interoperability with other information systems.



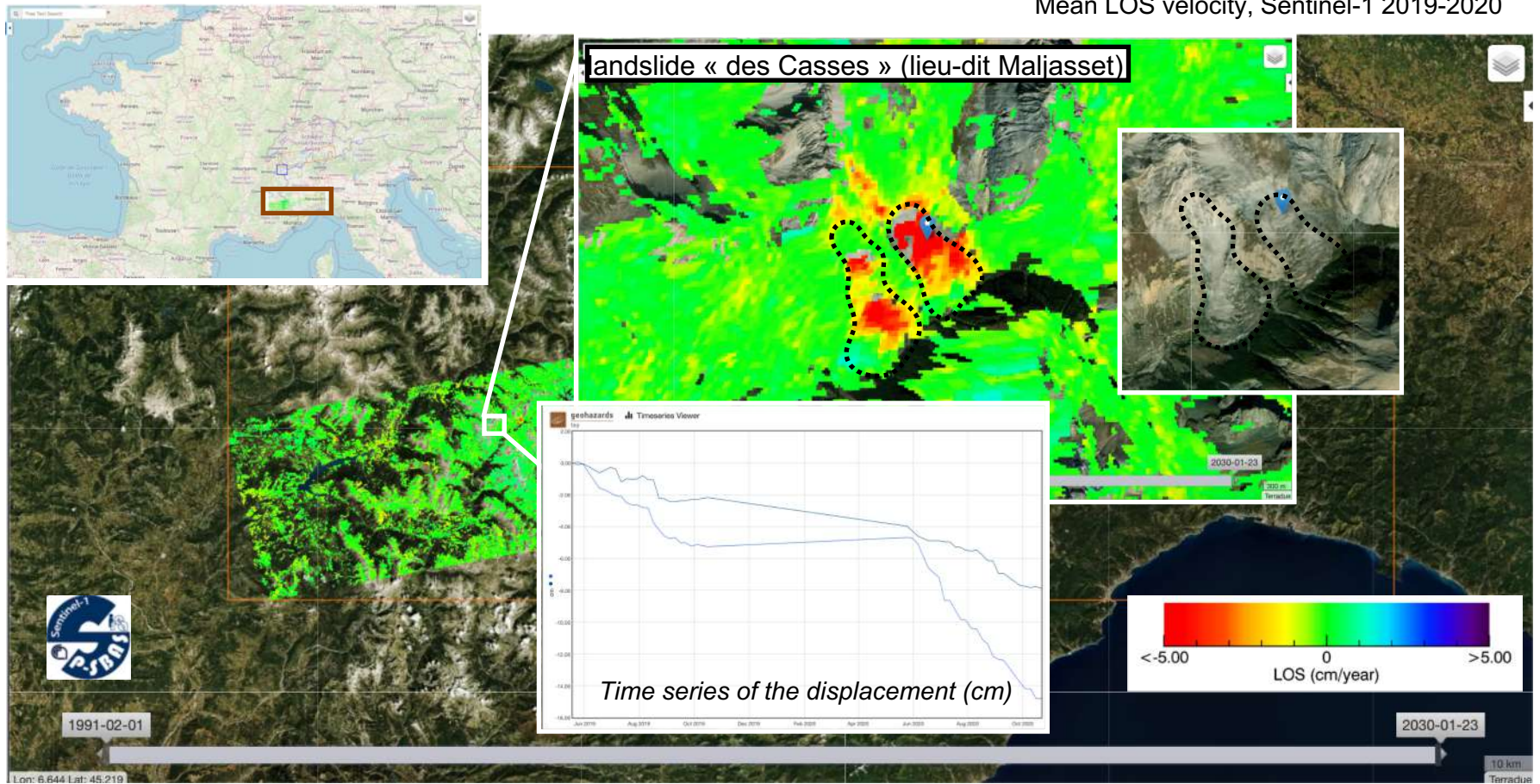
“is user-tailored and focuses on categories of services

eo4alps-landslides is accessible online on the Geohazards Exploitation Platform (GEP)

MORE

Access to a series of advanced ground motion services – InSAR and optical based

Systematic InSAR-S1 PS-BAS processing over the Alps



Access to a series of advanced ground motion services – InSAR and optical based

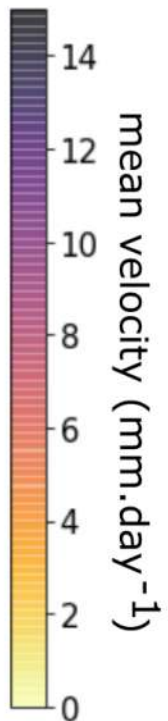
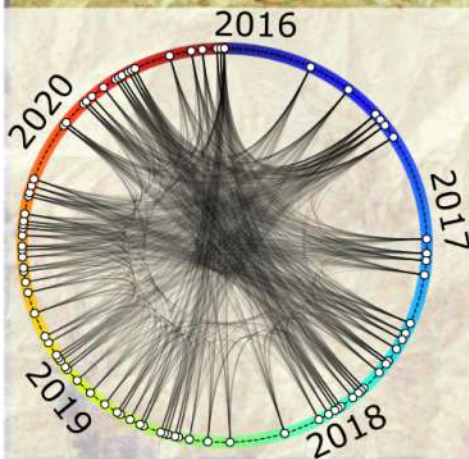
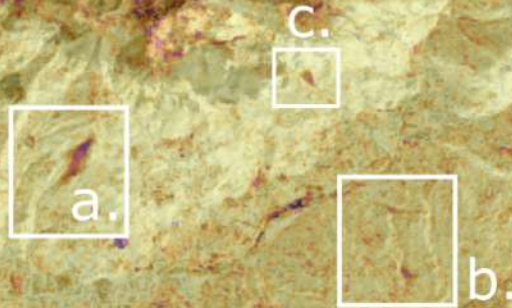
Systematic S2-offset tracking (optical image correlation) with MPIC-OPT

Image Matching technique to generate mean velocity maps and time series.



Ubaye Valley, French Alps - Sentinel-2 2015/2020

2km



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Ubaye Valley, French Alps - Sentinel-2 2015/2020

2km

Sanières

C.

a.

La Valette

Poche

b.



mean velocity ($\text{mm} \cdot \text{day}^{-1}$)

14

12

10

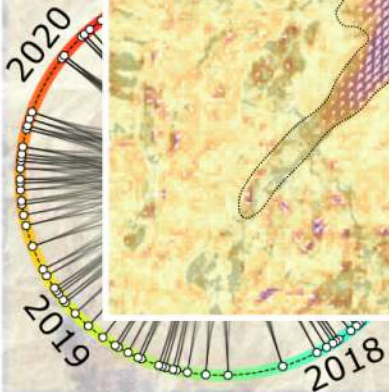
8

6

4

2

0



Landslide-Inventory

The module allows creating and updating landslide catalogues using several methods:

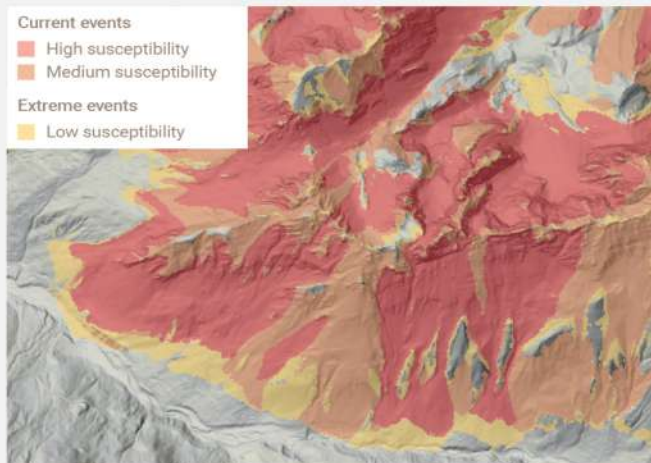
- Integrated motion maps combine various terrain motion maps and change detection maps to create landslide map features (MOTION-Combi).
- Landslide inventory maps from the fusion of integrated motion maps with existing landslide catalogues.
- Typology-differentiated landslide inventories by combining integrated motion maps with seismic-based detection methods (SEIS-Learn).
- Further, the module allows the visualization and updates of existing landslide inventories and access to GIS operations.



Landslide-Hazard

The module allows forecasting spatial landslide hazard and evolution scenarios using models with the identification of:

- Landslide source areas from the correlation of landslide inventories with predisposing and triggering factors (LAND-Stat).
- Failure susceptibility maps by weighting predisposing and triggering factors of the landslide source areas (LAND-Stat).
- Propagation area maps based on landslide type-specific run-out modelling (VolToo, Flow-R basic).
- Further, the module allows accessing to third-party highly sophisticated processing landslide softwares (Flow-R advanced, MIBSA) available at request through a system of quote.



Platform setup

eo4alps-landslides
focuses on selected use
cases in the French,
Swiss and Italian Alps

More than 20 landslide
practionners invoved in the
design and testing of the
services

