



Rock-solid Geosciences and Software Solutions

Terranum



About

Founded in May 2011, Terranum Sàrl offers cutting-edge expertise in the fields of natural hazards, geology, hydrology, meteorology, environment, remote sensing, and software developments tailored to the specific needs of the geoscience community.

All of Terranum's partners are graduates from the Institute of Earth Sciences at the University of Lausanne. As a Swiss university spin-off, the research for innovative and powerful solutions is firmly embedded in Terranum's genes.

Partners – Office

- Dr Pascal Horton, hydrological engineer
- Dr Clément Michoud, engineering geologist
- Dr Thierry Oppikofer, geologist

Partners – Scientific advisors

- Dr Marc-Henri Derron, geologist
- Dr Michel Jaboyedoff, geologist
- Lucien Schreiber, geologist

Contact

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References

On demand

Contact us

Consulting



Natural hazards

Backed by its broad experience in landslides, rockfalls, debris flows, rock instabilities and other hydrological and geological hazards, Terranum provides innovative and tailored expertise in natural hazards, particularly in the following areas :

- Regional susceptibility mapping of natural hazards
- Local-scale hazard mapping of geological and hydrological hazards
- Quantitative and qualitative risk analysis
- Advice and assistance to project owners
- Advanced GIS analysis, modelling and interpretation
- Regional reconnaissance and detailed field mapping
- 2D and 3D trajectographic propagation modelling
- Conceptual modelling and slope stability calculations
- Identification and monitoring of pre-failure destabilizing factors
- Landslide monitoring using LiDAR, InSAR, GPS and geotechnical methods

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Geology and environment

With backgrounds in traditional, quaternary, environmental and engineering geology, Terranum offers scientific and technical expertise in geology and the environment in a variety of subjects :

- Traditional geological mapping in the field and in GIS
- Detailed study of Quaternary geology with field mapping and GIS analyses
- Structural studies at local and regional scales in the field and on DEMs
- Manual mapping, modelling and advanced interpretation in GIS
- Statistical analysis and spatial interpolation of 3D data
- Modelling of 3D horizons of regional geological structures
- GIS vectorisation of existing printed maps
- Agronomic mapping of agricultural and forest soils

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Hydrology and meteorology

With our broad experience in hydrology and related fields, Terranum offers scientific and technical expertise in hydrology and meteorology in a variety of topics :

- Development, calibration and operational use of hydrological models
- Regional susceptibility mapping of hydrological hazards
- Modelling of static flooding and surface runoff
- Statistical forecasting of precipitation using an optimised analogue method
- Modelling the impact of global warming on hydrological systems
- Climate analyses and exploitation of large climate datasets
- Development of AI-based models (deep learning) in hydrology and climate
- R&D projects in hydrology and climate
- Real-time management of meteorological data from measuring stations

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3D measurements and remote sensing

With its scientific and technical skills in the acquisition, processing and interpretation of LiDAR and photogrammetric point clouds, ground-based and spaceborne InSAR data, and satellite image analysis, Terranum has acquired unique expertise for 3D surveys and remote sensing of natural processes, with a particular focus on:

- 3D modelling of the topography and infrastructure
- Monitoring landslide displacements and ground deformations
- Monitoring the deformation of galleries and other cavities
- Deformation measurements on man-made infrastructure
- Terrestrial and satellite radar interferometry (InSAR)
- Optical and multispectral satellite imaging
- Structural geology analysis on 3D data
- Detection and quantification of rockfalls or erosion

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Software and GIS developments

With years of experience in software development for geosciences, including Flow-R, AtmoSwing, ToolMap and Coltop3D, Terranum offers personal solutions adapted to your needs. Tailor-made developments can be made in the following areas :

- Development or adaptation of hydrological models
- Management and dynamic analysis of hydro-meteorological time series
- Creation of WebGIS platforms
- Creation of Python modules for geoscience applications
- Development of software integrating a GIS engine
- Development of models based on artificial intelligence
- Support for GIS data management in public administrations
- Creation of customised GIS scripts and routines
- Development of relational geodatabases

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Software Products



Software Products



Flow-R

Software for propagation modelling of gravitational natural hazards.

Optimised for regional-scale susceptibility mapping, Flow-R rapidly assesses the propagation extents based on several published and proven empirical models.

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AtmoSwing

Software for statistical precipitation forecasting.

Based on the analogue method, AtmoSwing provides probabilistic meteorological forecasts for flood management or hydroelectric power production.

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ToolMap

Software for digitising and geological mapping.

ToolMap is a free, open-source digitisation software with a unique vectorisation system designed to produce complex vector GIS maps.

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Riskko

Online natural hazard risk calculator.

Riskko is an online risk calculator that enables a rapid assessment of the financial risk for humans and objects exposed to various natural hazard processes.

[More](#)

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Hydrology, Meteorology, Software Development,
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