



Multidisciplinary approach to assess landslide hazards in alpine environment: the geomorphological map of the upper Maira Valley (Western Alps, Italy).

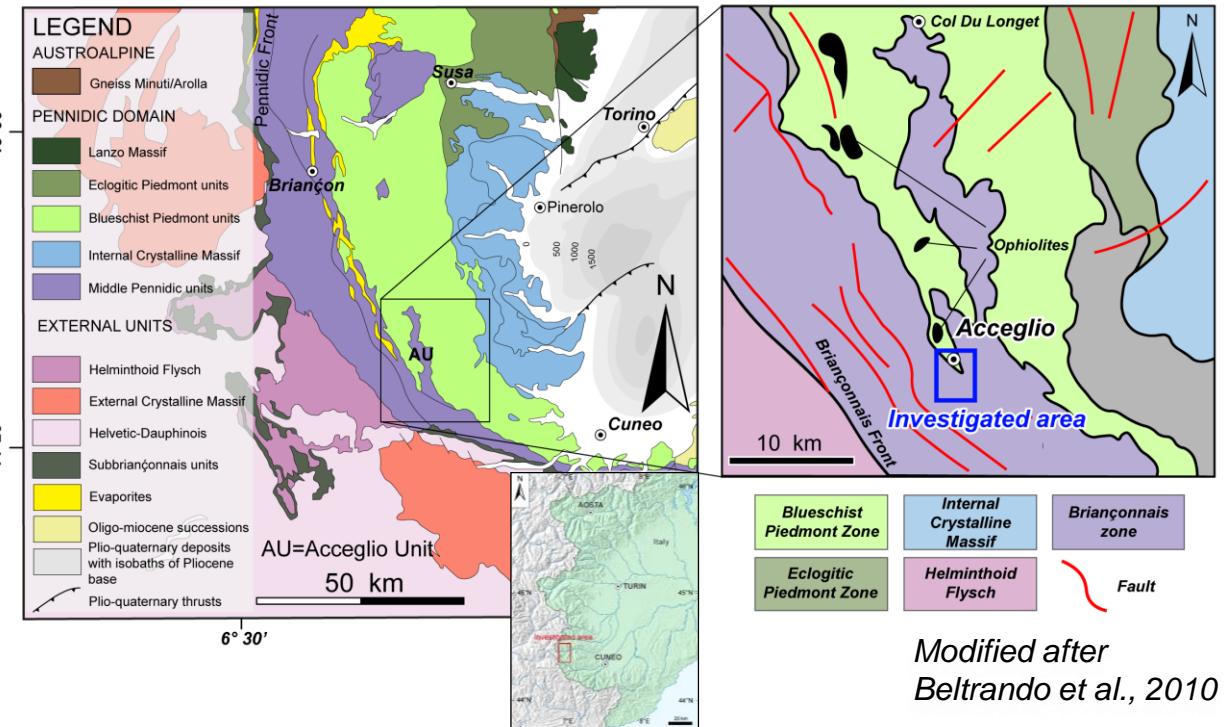
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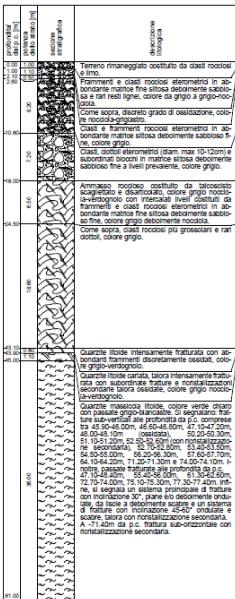
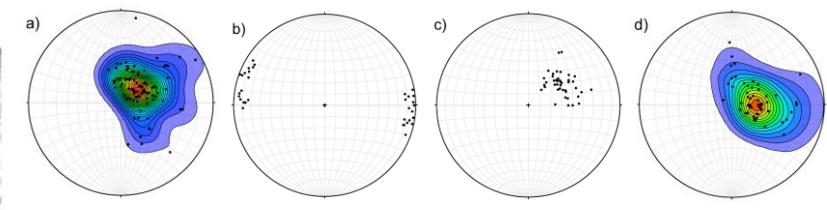
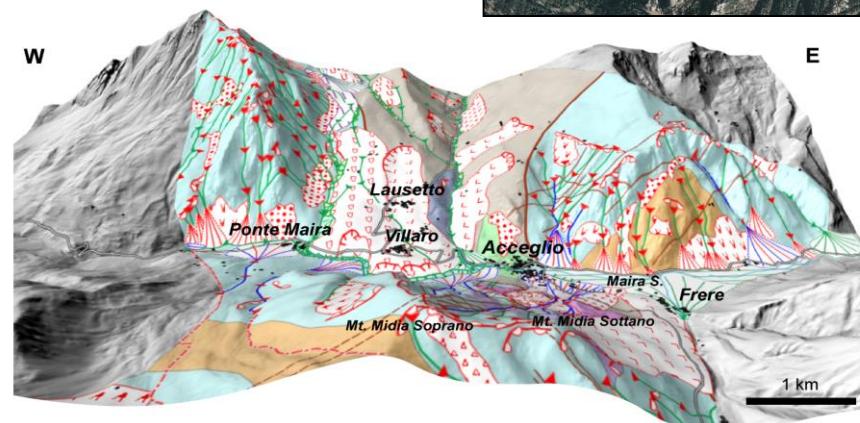
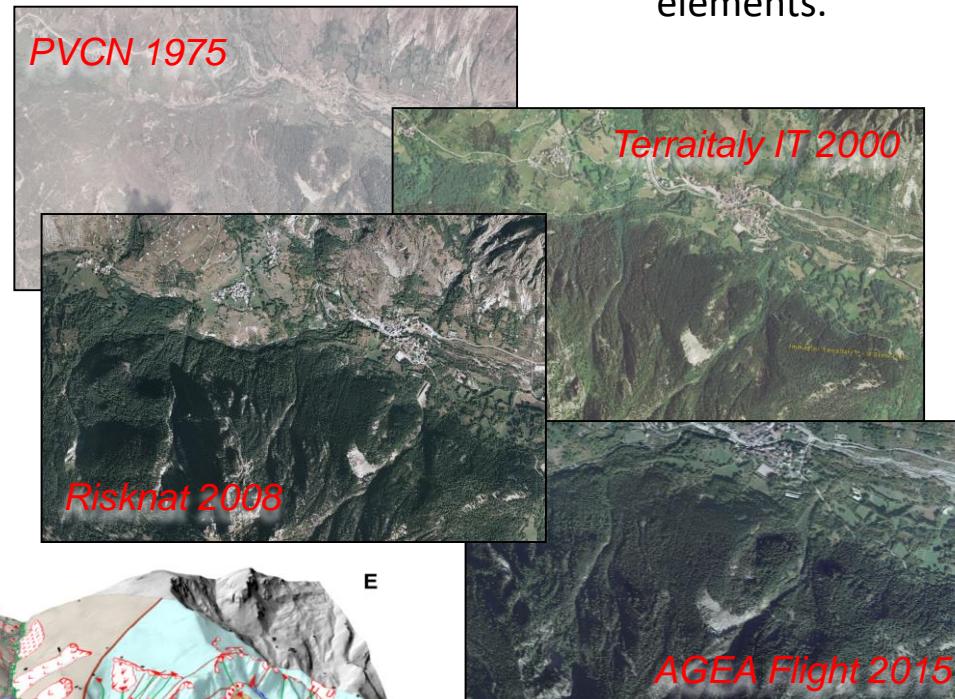
GEOLOGICAL SETTING



The Acceglio Unit outcrops as a half tectonic window (Middle Pennidic Domain) surrounded by blueschist facies metasediments (Schistes Lustrés, Upper Pennidic Zone; DEVILLE *et al.*, 1991; LEMOINE, 2003). The Acceglio Unit (SCHWARTZ *et al.*, 2000) consists of meta-volcanoclastic rocks overlain by Mesozoic to Tertiary sedimentary cover (Ultrabriançonnais).

METHODOLOGIES

- Geomorphological fieldwork
- Photointerpretation of multi-temporal aerial images and digital orthophotos
- Reinterpretation of boreholes lithostratigraphic data (SIFraP Project)
- 5 m DEM analyses
- equal-angle stereo diagrams projections of structural elements.



GEOLOGICAL-GEOMORPHOLOGICAL MAPPING AND FEATURES

LEGEND

QUATERNARY DEPOSITS

- Debris flow track
- Scarp of debris flow
- Avalanche/debris flow track
- Scarp of slow flow
- Rockwall affected by fall
- Rotational/translational scarp
- Deep-seated Gravitational Slope Deformation
- Scree slope

LANDFORMS DUE TO GRAVITY

- Debris flow cone
- Debris flow accumulation zone
- Poligenic fan
- Earth/mud flow body
- Rock fall talus
- Rotational/translational body
- Complex landslide

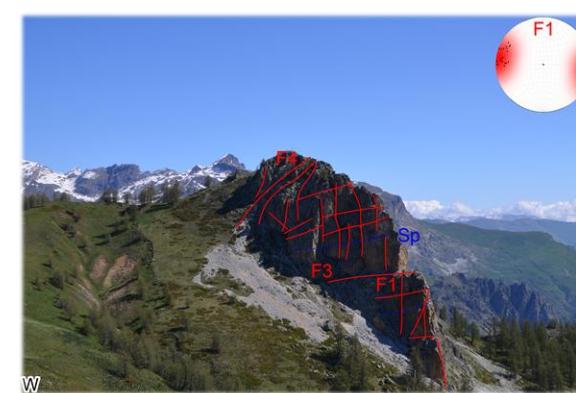
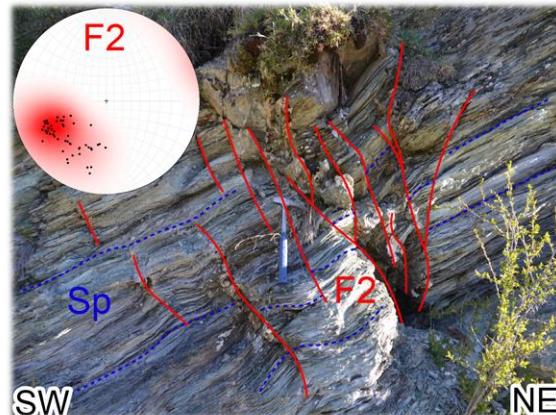
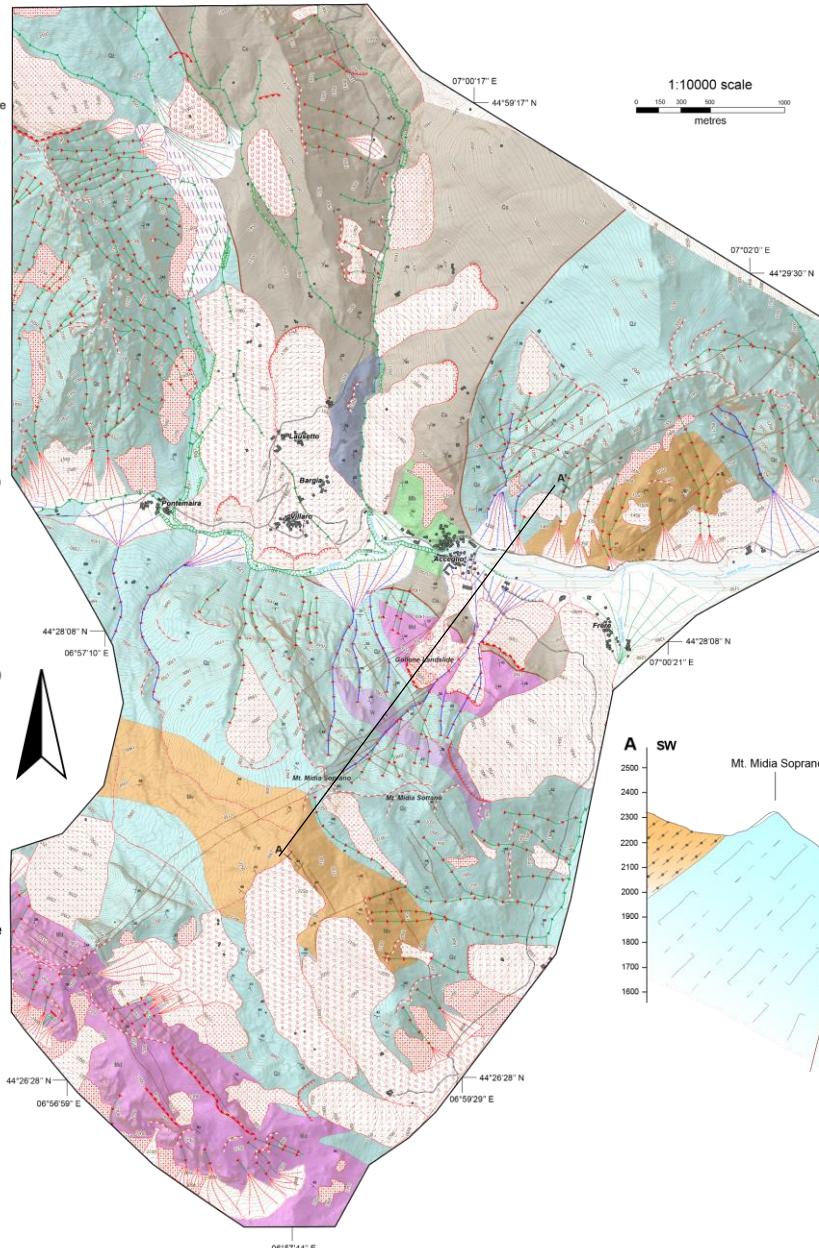
LANDFORMS DUE TO FLUVIAL AND GLACIAL PROCESSES

- Fluvial scarp
- Scarp due to denudation
- Gully/small valley
- Alluvial fan
- Incising channel
- Alluvial plane
- Fluvial-glacial fan
- Surface with glacial striæ
- Lithological contact
- Tectonic contact
- Fault (dashed when inferred)
- Main regional foliation
- Trace of geological cross-section
- Building
- Drillhole
- Primary road
- Contour (index, intermediate)
- Stream
- Man-made scarp

METAMORPHIC BASEMENT

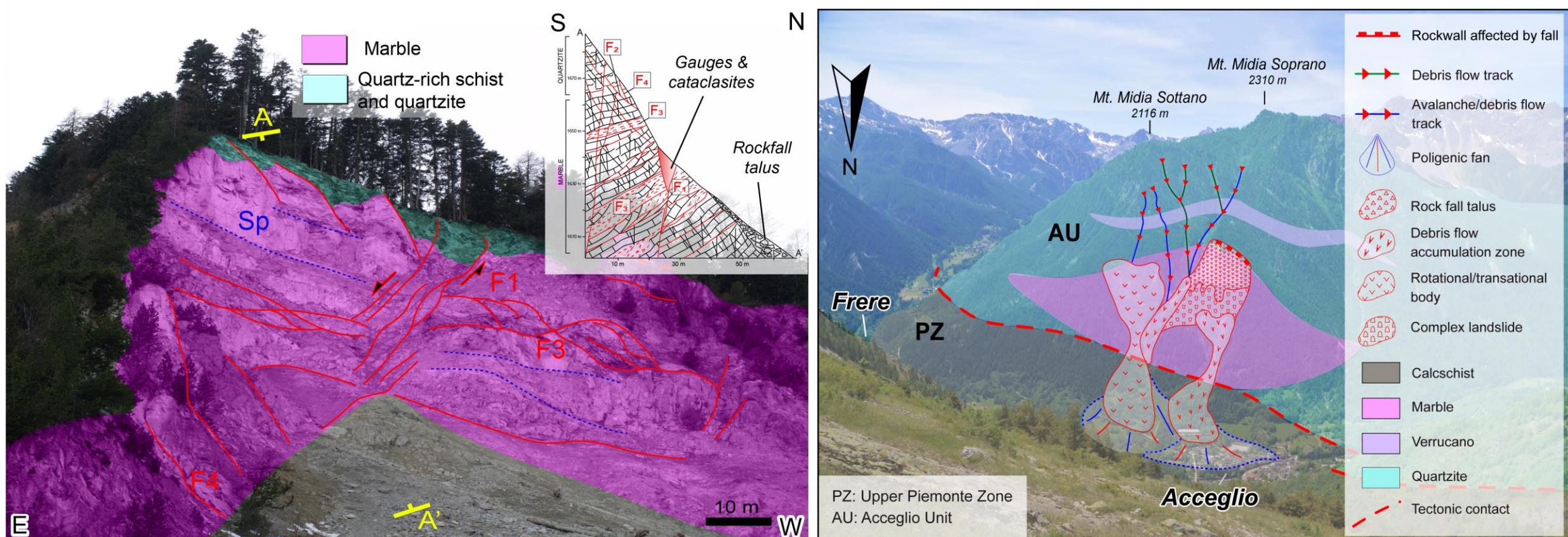
UPPER PIEDMONT ZONE

- Calcschist (Cs)
- Banded and massive metabasite (Mb)
- Serpentinite (Sr).
- Metabasites
- Calcschist
- ACCEGLIO UNIT
- Marble (Md).
- Quartzite in Verrucano facies (Vr).
- Quartzite and quartz-rich schist (Qz)
- Metavulcanite (Mv).
- Dolomitic marble
- Quartzites in Verrucano facies
- Quartz-rich schist and quartzites
- Metavulcanites and phyllites



CONCLUSIVE REMARKS

Our multidisciplinary fieldwork and mapping, combining a detailed structural geological study with a geomorphological approach, allowed us to find a strong correlation between landslide phenomena, discontinuities and rheology of the outcropping lithologies. In particular, the orientation of the fracture and fault systems or of the lithological contacts between different lithologies with respect to the slope is an important landslide predisposing factor.



References

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Thanks for your attention!