Lithologic and glacially-conditioned controls on regional debris-flow sediment dynamics

References

Brandner, R. Mittel- und Obestrias in Frotschbach und Seiser Alm. - Excursionsfuhrer Jahrestagg. *Osterr. Geol. Ges., Seis am Schlern*, 80-97 (Innsbruck, 1982).

Stingl, V. & Mair, V. *Introduzione alla geologia dell'Alto Adige* (Provincia Autonoma di Bolzano, Ufficio Geologia e prove materiali, Bolzano, 2005).

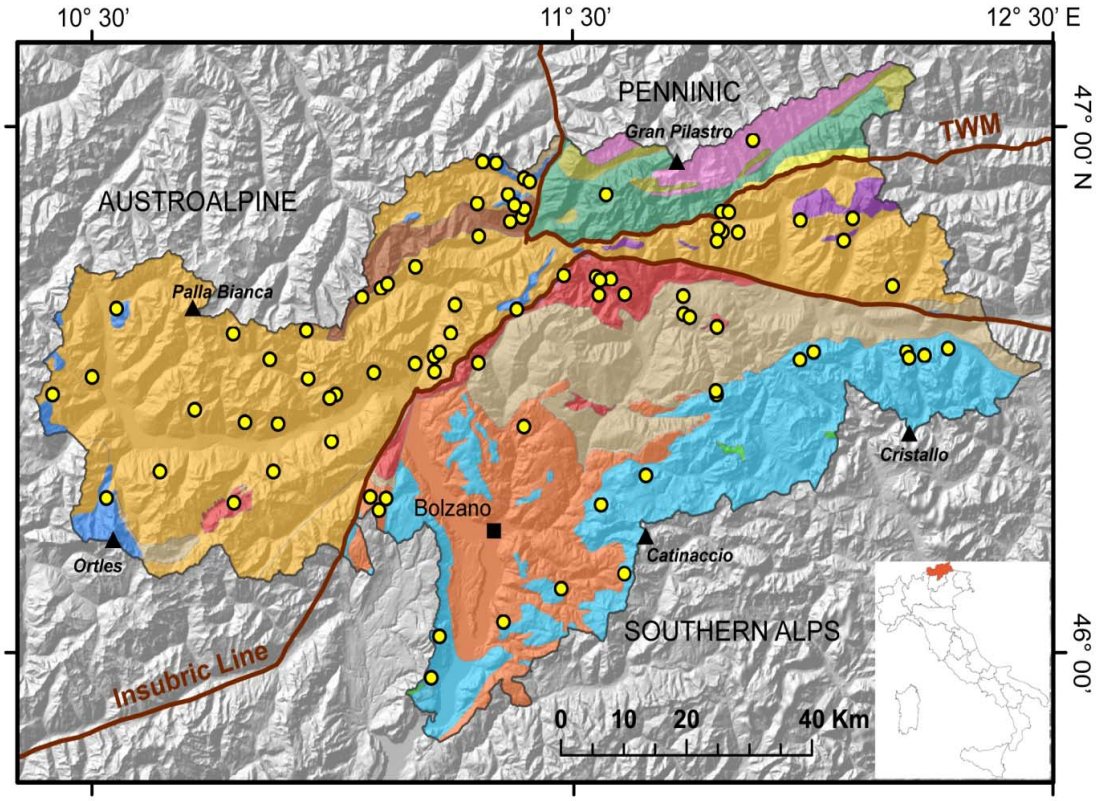
Table DR1. Specific sediment yield (SSY) as a function of basin area (A) across dominant geology types

Dominant Geology	Scaling relation	n	R^2	F	p-value
Granites & Gneisses	$SSY = 530A^{-0.46}$	15	0.48	11.77	0.003
Schists & Phyllites*	$SSY = 640A^{-0.47}$	13	0.48	10.06	0.009
Limestones & Dolostones	$SSY = 490A^{-1.02}$	13	0.75	32.98	0.0001
Quaternary deposits	$SSY = 1890A^{-0.70}$	27	0.39	15.92	0.0005
Bedrock* & **	$SSY = 580A^{-0.52}$	47	0.34	22.67	0.00002

* The relation does not include three basins with $A < 0.3$ km^2

** All "bedrock" basins including four underlain by volcanics and two by marls, sandstones and conglomerates

Figure DR1. Simplified geological map of Alto Adige showing the locations of study basins (after Brandner, 1982; Stingl and Mair, 2005); data layers from Geo-browser, Autonomous Province of Bolzano). Austroalpine units (western Alto Adige) mainly consist of a complex suite of metamorphic rocks including paragneiss, orthogneiss, micaschist, calcschist, biotite gneiss, phyllite, and lesser marble. The Southern Alps comprise Permian volcanics (i.e., quartz porphyries) and granitoids, quartz phyllite (central-southern Alto Adige), as well as sedimentary Permo-Jurassic rocks (mostly dolostones and limestones) (south-eastern Alto Adige). The Penninic units, exposed within the Tauern Window, occupy the north-eastern tip of the Province; they include calcschists, phyllites, ophiolitic bodies, and granitic gneisses.



AUSTRALPINE
- Mesozoic sediments
- Monteneve unit
- Permian plutons
- Tertiary plutons
- Low grade metamorphic basement
- Medium to high grade metamorphic basement

SOUTHERN ALPS
- Cretaceous-paleogene sediments
- Permo-Jurassic sediments
- Permian volcanics
- Permian plutons
- Low grade metamorphic basement

- Study basin
- ▲ *Prominent peak*

TWM = Tauern Window Margin

PENNINIC
- Calcschists with ophiolitic bodies
- Matrei zone
- Old crystalline basement and relative cover
- Central gneiss