1. Research activity

The main objective of my PhD project is to develop a hierarchical and multi-scalar approach to studying "landslide systems", meaning landslides of different types and with different state of activity which evolve affecting each other (*sensu* Guida et al. 1988, Guida et al. 1995, Valiante et al. 2016).
This research aims to contribute to the overall theme of landslide risk assessment and mitigation: the multi-scalar hierarchical approach in studying landslide systems allows to better define the hazard level associated with natural hillslopes considering that an entire landslide system can produce a "base level of hazard" on long term to be taken into account evaluating the hazard level associated with a single landslide unstable on short term.
During the first year or research both morphometric analysis on DEMs and field surveys on selected case studies have been performed. The morphometric approach has been carried out to evaluate the semi-automatic recognition of large areas affected by gravitational deformations starting from elevation data. Topographic Position Index (Weiss 2001) and Slope-Area relationship (Montgomery & Foufoula-Georgiou 1993; Booth et al. 2013; Tseng at al. 2015) have been tested until now. Survey activities focused on the analysis of recent reactivated landslides known to be part of a larger landslide system, searching whether a detailed geomorphological field survey can be a valid tool for describing these kinds of phenomena. The two approaches mainly differ in the scale of the analysis in order to evaluate if the study of a landslide system should be performed starting from the site scale or from a smaller scale.
Following the method proposed by Dramis et al. 2011, data collected from field activities were stored referring to a symbol-based representation. The recognized landforms were further elaborated in a GIS environment and stored using an object-oriented database in order to build a full-coverage hierarchical geomorphological map.

References

- Booth A. M., Roering J. J. & Rempel A. W. (2013). Topographic signature and a general transport law for deep-seated landslides in a landscape evolution model. Journal of Geophysical Research: Earth Surface. 118 (2). 603-624.
- Dramis F., Guida D. & Cestari A. (2011). Nature and Aims of Geomorphological Mapping. Chapter in: Smit M. J., Paron. & Griffiths J. S. (Eds). Geomorphological Mapping: methods and applications. Elsevier. 661 pp.
- Guida D., Iaccarino G. & Perrone V. (1988) – Nuovi dati sulla successione del Flysch del Cilento nell'area di Monte Centaurino: relazioni tra unità litostratigrafiche, unità litotecniche e principali sistemi franosi. Memorie della Società Geologica Italiana. 41. 299-310.
- Guida D., Iaccarino G., Lanzara R. & Peduto F. (1995) – Proposta di classificazione tassonomica dei fenomeni franosi. Giornate poster del Gruppo Geomineralogico, V Conferenza Scientifica Annuale del Dipartimento di Scienze della Terra, Università di Napoli "Federico II".
- Montogomery D. & Foufoula-Georgiou E. (1993). Channel Network Source Representation Using Digital Elevation Models. Water Resources Research. 29 (12). 3925-3934.
- Tseng C. M., Lin C. W., Dalla Fontana G. & Tarolli P. (2015). The topographic signature of a major typhoon. Earth Surface Processes and Landforms. 40 (8). 1129-1136.

- Weiss A. D. (2001). Topographic position and landform analysis. Poster at ESRI User Conference, San Diego, CA.
- **Valiante M.**, Bozzano F. & Guida D. (2016) - The Sant'Andrea-Molinello Landslide system (Mt. Pruno, Roscigno, Italy). Rend. Online Soc. Geol. It., 41, 214-217. doi: 10.3301/ROL.2016.132

2. Research products

a) Publications (ISI journals)

- **Valiante M.**, Bozzano F., Guida D. (2016) - The Sant'Andrea-Molinello Landslide system (Mt. Pruno, Roscigno, Italy). Rend. Online Soc. Geol. It., 41, 214-217.

b) Publications (NON ISI journals)

c) Manuscripts (submitted, in press)

- **Valiante M.**, Bozzano F., Della Seta M., Majetta S. & Moretto S. (2018) – A hierarchical model for the Rocca di Sciara north-eastern slope instabilities (Sicily, Italy). VI National Congress of the Italian Association of Engineering and Environmental Geology. (Abstract)
- Moretto S., Bozzano F., Brunetti A., Della Seta M., Majetta S., Mazzanti P., Rocca A. & **Valiante M.** (2018) – The 2015 Scillato Landslide (Sicily, Italy): Deformation behaviour inferred by Satellite & Terrestrial SAR Interferometry. 10th International Symposium on Field Measurement in Geomechanics, 16-20, July 2018, Rio de Janeiro. (Paper)

d) Abstracts

- Rizzo A. M. & **Valiante M**. (2016) - Geomorphological map of Mt. Pruno southern slope, Roscigno, Cilento, Vallo di Diano and Alburni Geopark. Rend. Online Soc. Geol. It., Vol. 40 (Suppl. 1), 762.
- Bozzano F., Brunetti A., Della Seta M., Majetta S., Mazzanti P., Moretto S., Rocca A. & **Valiante M.** (2018) – The 2015 Scillato Landslide (Sicily, Italy): Deformation behaviour inferred by Satellite & Terrestrial SAR Interferometry. 10th International Symposium on Field Measurement in Geomechanics, 16-20, July 2018, Rio de Janeiro.
- Iacobucci G., Troiani F., Della Seta M., **Valiante M.**, Esposito C., Martino S. & Bozzano F. (2018) – Unravelling the style and timing of slope-to-channel system morphoevolution in tectonically active landscapes: new insights from the Northern Apennines of Italy. EGU General Assembly 2018, Geophysical Research Abstracts, 20.