

### **RESEARCH FIELD:**

Geological mapping, Structural geology, Tectono-stratigraphy.

### **RESEARCH TOPIC:**

Geological mapping of the Alpine orogenic belt and the Apennine fold-and-thrust belt.

### **PARTICIPANTS AND COLLABORATIONS:**

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### **RESEARCH DESCRIPTION:**

Geologic mapping represents the principal tool that geologists use to convey complete compilation of information about structure and stratigraphy of the solid Earth we live on. The fundamental information it provides, spans from the basic research approach devoted to the reconstructions of 3D architecture and tectono-stratigraphic evolution of orogenic belts, to protecting against natural hazards (e.g. seismic and flood risks), finding of needed natural and mineral resources (e.g. ground waters, oil and natural gas reservoirs), and land use (e.g. tunnels and dams projects). For the above reasons, since the last century, geological mapping always played a distinctive and primary role in the research activity of geoscientists of Torino and the Department of Earth Sciences. Our geological mapping related-research activity, that during last decades has been mainly dedicated to the CARG Project (Geological Map of Italy at 1:50,000 scale), is now continuing in different projects aimed to improve our knowledge of the tectono-stratigraphic evolution of different sectors of Apennine fold-and-thrust belt and tectono-metamorphic evolution of the Western Alpine orogenic belt.

In particular, our main effort is addressed in:

- i)* improving the definition of different tectono-metamorphic and stratigraphic units,
- ii)* representing meaningful structural knots in geodynamic contexts,
- iii)* updating existing maps with information that comes from modern stratigraphic, structural and petrological analysis.

Since geological maps are stored in GIS databases, the research activity is also an opportunity to test new methodological and technological approaches in representing geological knowledge, especially those supported by on-going IT (Information Technologies) innovation. Geological mapping is not always a fundamental tool for our data-constrained research, but we consider it integral to the professional development of future geoscientists, and particularly important as it applies to student understanding of spatial, temporal, and complex relations in the Earth system.

### **LABORATORIES OF THE DST IN USE:**

- SEM-EDS
- GeoSitLab

### **RESEARCH PRODUCTS:**

- Balestro G., Fioraso G. and Lombardo B. (2011) - Geological map of the upper Pellice Valley (Italian Western Alps). Journal of Maps, v2011, 634-654. doi: 10.4113/jom.2011.1213.
- Balestro G., Piana F., Fioraso G., Perrone G. and Tallone S. (2013) - Sharing data and interpretations of geological maps via standardised metadata and geoportals. Ital.J.Geosci. (Boll.Soc.Geol.It.), doi: 10.3301/IJG.2012.35

- Cadoppi P., Ghelli A. and Tallone S. (2008). Il marmo di Rocca Bianca (Val Germanasca, Alpi Occidentali). Addendum Atti del Convegno “Le risorse lapidee dall'antichità ad oggi in area mediterranea”, Canosa di Puglia (Bari), 25-27 Settembre 2006, GEAM Associazione Georisorse e Ambiente, Torino. ISBN: 978-88-6378-000-0, 25-30 + 1 tavola fuori testo.
- Festa A. and Codegone G. (2013) - Geological map of the External Ligurian Units in western Monferrato (Tertiary Piedmont Basin, NW Italy). *Journal of Maps*, v. 9, Issue 1, 1-14. Doi: 10.1080/17445647.2012.757711 (1:10,000 scale).
- Gasco I. and Gattiglio M. (2010) Geological map of the middle Orco Valley, Western Italian Alps. *Journal of Maps*, v2010, 463-477. Doi: 10.4113/jom.2010.1121.
- Gasco I. and Gattiglio, M. (2011) - Geological map of the upper Gressoney Valley, Western Italian Alps. *Journal of Maps*, v2011, 82-102. doi: 10.4113/jom.2011.1121
- Perrone G., Cadoppi P. and Giardino M. (2008). Carta delle Microzone omogenee in prospettiva sismica del Comune di Susa (TO). Allegato In: Gruppo di lavoro MS, 2008. Indirizzi e criteri per la microzonazione sismica. Conferenza delle Regioni e delle Province autonome - Dipartimento della protezione civile, Roma, 3 vol. e Dvd.
- Sacchi R., Balestro G., Cadoppi P., Carraro F., Delle Piane L., Di Martino L., Enrietti M., Galarà F., Gattiglio M., Martinotti G. & Perello P. (2004) – Carta geologica della bassa e media val di Susa tra San Giorio e Chiomonte. In “Studi geologici in Val di Susa finalizzati ad un nuovo collegamento ferroviario Torino-Lione”, Sacchi et al. (2004), Monografie del Museo Regionale di Scienze Naturali, 41, 117 pp.
- Vezzani L., Festa, A., and Ghisetti, F. (2010) - *Geological-Structural Map of the Central-Southern Apennines (Italy)*. 1:250.000 scale, Sheets 1 and 2. In: Vezzani L., Festa, A., and Ghisetti, F. (Eds.), *Geology and Tectonic evolution of the Central-Southern Apennines, Italy: Geological Society of America Special Paper 469*, 58 p., ISBN 978-0-8137-2469-0. DOI: 10.1130/2010.2469
- Vezzani L., Ghisetti F., and Festa A. (2004) – *Carta geologica del Molise (scala 1:100.000)*. Ed. S.EL.CA. Firenze. In: Festa A., Ghisetti, F., and Vezzani L., (Eds.), *Carta Geologica del Molise - Scala 1:100.000 - Note Illustrative: Litografia Geda, Nichelino (TO)*, 96 p., ISBN: 88-902635-0-4.

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