Geophysical Research Abstracts
Vol. 16, EGU2014-7977, 2014
EGU General Assembly 2014

Drainage evolution and connection of intermontane basins in Central Apennines (Italy)

Tommaso Piacentini (1), Domenico Capolongo (2), Emanuele Giachetta (3), Enrico Miccadei (1), and Tullio Urbano (1)

(1) Department of Engineering and Geology, Università degli Studi "G. d'Annunzio" di Chieti-Pescara, Chieti, Italy (tpiacentini@unich.it), (2) Department of Earth and Geoenvironmental Science, Università degli Studi "A. Moro" di Bari, Bari, Italy, (3) Department of Geological Science, Università di Roma 3, Roma, Italy

The study of the geomorphological evolution of mountain chains can substantially contribute to geodynamic reconstructions and to understand the mechanisms that drive interactions among Earth surface processes and tectonic/climate forcing. The mountain chains' geomorphological features are the result of competing factors such as tectonics, eustasy, climate, lithologies and erosion rates. In this framework intermontane basins and drainage systems connecting and/or disconnecting them, are the main landscape units and most evident geomorphological and geological expression of surface processes and tectonics in mountain chains at intermediate spatio-temporal scale.

In this work we focus on the morphotectonic analysis of intermontane basins and related hanging landscapes in Central Italy and on the analysis of drainage features which have connected and disconnected them through time by means of longitudinal and transversal gorges. This is focused on the unraveling of clues to understand the geomorphological evolution of the intermontane basins during the Quaternary building of the Apennines chain in response to local and regional base level changes, to local tectonics and to regional uplift. Central Apennines chain is a NW-SE thrust belt, located in Central Italy, NE verging, built since Neogene time. It is made up of carbonate thrust sheets and terrigenous sinorogenic foredeep deposits. Since Upper Pliocene the thrust belt has been affected by extensional tectonics and regional uplift process and, finally, underwent the geomorphological effects of climate fluctuations, resulting in a strong morphogenesis, with changes in topography, base levels' elevation, and drainage systems morphology. This outlined the present morphotectonic setting composed of carbonate ridges separated by longitudinal and transversal valleys and gorges and by wide intermontane basins partially filled by Quaternary continental deposits.

The work is based on: 1) morphometric investigations of river network and relief 2) morphotectonic analysis and correlation of geomorphological markers 3) numerical modelling of river longitudinal profiles

We analyzed two different transversal transect oriented roughly SW-NE In the first one we compare the morphotectonic features (i.e. sedimentary sequence and geomorphological processes, tectonic events) of the main intermontane basins from SW to NE. The second one represent the projection of the main morphometric and geomorphological features (intermontane basins, karst and glacial present and paleo landscapes, drainage features) along a 100 km wide swath profile across Central Italy from the Tyrrhenian to the Adriatic coast.

The results of the morphometric and morphotectonic investigation on drainage features of Central Apennines are compared with the outcomes of numerical modelling by means of SIGNUM a TIN based landscape evolution model.