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Climatic and tectonic interactions at the contact between the Carpathian Mountains and the Pannonian Basin, East-central Europe, during the last 70,000 years

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The interplay between tectonic forces and continuous and slow vs. abrupt climatic changes result in a wide array of geomorphic processes and associated topography. The contact regions between mountains and basin are particularly well suited to study these interactions, as they preserve both the eroded topography and the associated sedimentary structures. In Europe, most of the studies addressing these issues were concentrated in the Alps and the Apennines, with the Carpathian Mountains (the longest mountain chain in Europe) receiving little attention. Here we discuss the interaction between tectonic and climatic factors in shaping the development of fluvial networks at the contact between the Carpathian Mts. and the Eastern Pannonian Basin. Our investigation is based on fluvial geomorphologic, sedimentologic and chronologic (OSL, 14C) investigation of several sedimentary profiles extending along the Someșul Mic River and of several of its tributaries. We analyzed the dynamics of the Some River, as well as that of the main collector, the Tisa river (in turn, the largest tributary of the Danube) on the background of tectonic and climatic changes during the past 70,000 years. Based on these results, we discuss how the fluvial systems are reacting to 1) slow tectonic forcing and 2) rapid climatic changes modulated by slow responding vegetation changes.