Seismic hazard assessment is one of the most crucial topics in a tectonically active region such as the eastern Southern Alps (NE Italy), where historical strong earthquakes show still uncertain epicentre localization. In order to improve knowledge on geometric, kinematic and seismotectonic characteristics of the active faults in Friuli, we achieved new morphotectonic and paleoseismological studies. We present the results of three trench excavations recently.
carried out in Friuli. The study area belongs to the eastern corner of north-eastern Italy, where the SSE-verging, WSW-ENE trending fold and thrust-belt of the eastern Southern Alps (Middle Miocene – Present) joints the NW-SE trending dextral strike-slip fault systems (Pliocene – Present) of western Slovenia (Fig. 1). Medium to high historical and instrumental seismicity scattered along the Friuli area testifies active deformation (Locati et al., 2016). Some M>6 earthquakes caused widespread damage in Friuli and bordering regions: the 1348 (January 25, Carnia earthquake: Imax: 9, Mw: 6.6), the 1511 (March 26, Friuli-Slovenia earthquake: Imax: 9; Mw: 6.3) the 1873 (June, 29, Alpago earthquake. Imax: 9-10; Mw: 6.3), the 1936 (October 18, Cansiglio earthquake: Imax: 9; Mw: 6.1), the 1976 (Friuli earthquakes on May, 6 and September, 15: Imax: 10, Mw: 6.45 and Imax: 8-9, Mw: 5.9 respectively).

In order to locate paleoseismological trenches, detailed surficial geological and morphotectonic surveys were carried out. Moreover when possible, accurate analysis of seismic industrial lines was gathered to the surface data. These preliminary analyses were often joined to integrated geophysical investigations as electrical resistivity tomography, seismic refraction and reflection, Ground Penetrating Radar (GPR), passive seismic (HVSR, ReMi), and MASW.

On these bases we selected three different sites where digging paleoseismological trenches: the first investigated the Caneva – Col Longone tectonic system (Western Friuli); the second the Maniago thrust (Western Carnic Prealps) and the third was located along the Colle Villano thrust near the Italian-Slovenia border region (Fig. 1).

All the investigated trenches-sites indicated active tectonic deformations of historical age, suggesting high seismic hazard.

References