

Late-Quaternary incised valleys in the Northern Adriatic shelf and related alluvial plains

Summary: The project wants to analyse morphologies, patterns and sedimentary infillings of the incised and channelized systems existing in the Adriatic shelf and in the related alluvial plains. The research aims at evidencing the common characteristics and the differences, investigating the main factors that constrained their formation, reconstructing times and modes of their evolution.

In the last years the project of the new geological map of Italy surveyed large sectors of the coastal plains facing the Adriatic and the whole Italian side of the seafloor (CARG Project). These data allow to recognize a number of incised and aggrading landforms, formed during the last glacio-eustatic cycle (last 100 ka), both in the continental and in the shelf environment. Currently, only the general framework has been reconstructed, while specific and detailed investigations are largely lacking.

During the post-LGM transgression a major erosive phase occurred in the alluvial plains facing the Adriatic and the depositional infillings of the incised morphologies represent almost the only source of information about the geological evolution of the coastal and fluvial systems (Fontana et al., 2014). In particular, the incised morphologies of the early transgressive phase (19-9 ka cal BP) are documented in the present marine sector, while those formed in the late transgressive phase (9-7 ka cal BP) are testified in the present coastal and deltaic plains. The incised and channelized landforms are not only of fluvial origin, but they are partly related also to lagoon and costal environments (i.e. tidal inlets and marine scours).

The research considers marine and alluvial environments, thus, the PhD candidate needs to integrate the use of data collected through methods of marine exploration (high-resolution geophysical investigation, vibro and gravity cores) and continental investigations (LiDAR, remote sensing, stratigraphic cores and geotechnical tests).

The results of the research will be mainly related to the geomorphological and late-Quaternary evolution of the coastal and fluvial systems, but they will also have important outcomes for applied geological purposes, as the assessment of the use of the incised-valley infillings as possible sources for sands for re-nourish the Adriatic beaches. Moreover, this PhD project contributes to the detection in the coastal sector and in the shelf of areas potentially prone to severe differential compaction and characterized by specific permeability. In a broader view, incised valleys are also of interest for hydrocarbon production and examples from Northern Adriatic represent a recent analogue for the bedrock formations.

References

Fontana A., Mozzi P., Marchetti M., 2014. Alluvial fans and megafans along the southern side of the Alps. *Sedimentary Geology*, 301, 150-171.

CARG, Geological Map of Italy. http://www.isprambiente.gov.it/Media/carg/index_marine.html

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