# THE MULTILAYERED EVOLUTION OF THE FLUVIAL SYSTEMS IN THE GULF OF TRIESTE SINCE THE LGM (ADRIATIC SEA)

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The Isonzo (Soča in Slovenian) is the easternmost large river of the southern Alps, with a catchment of 3400 km2 extending between Slovenia and Italy. This fluvial system is been bounded to the east by the carbonate bedrock of the Karst and by northern Istria, thus, it represents the limit of the large alluvial environments that characterize northern Italy, as the Po and Venetian-Friulian plains.

Through the analysis of a dense network of CHIRP profiles, multibeam DTMs and sediment cores collected in Adriatic seabed, both in the Italian and Slovenian sides of the Gulf of Trieste, this work reconstructs the evolution of the Isonzo River fluvial system at the scale of the entire gulf. Thanks to the recent geological map of Quaternary of Friuli Venezia Giulia Region [1], it is also possible to relate the submerged areas to the present alluvial plain. Thus, the megafan of Isonzo can be considered on its whole extent.

In particular, among the different ancient channel belts recognized in this work, we reconstructed the planform and the stratigraphic architecture of a paleo Isonzo over a length of almost 50 km, when this stream passed almost along the present coast, flowing near Trieste, Koper and Piran.

Alluvial systems are highly susceptible to environmental changes, such as variations in water and sediment discharge and in the position of the base level, making them natural data loggers capable of recording the various dynamics and forcing active at different scales over a certain time span. However, only extensive and detailed surveys allow to unwind the complex set of information stored in the alluvial stratigraphic record as documented in other alluvial systems of northern Italy [2,3].

The fairly well-known boundary conditions in terms of structural, geological and recent climatic-related configuration of the Isonzo basin allow to understand the timing and style evolution of the Isonzo systems starting from the Last Glacial Maximum (LGM) up to the Early Holocene, when the area was flooded by the Adriatic.

Due to its position, along the late Quaternary the Trieste Gulf has been directly influenced by the water and sediment discharge supplied by the Alpine glaciers during the LGM and it after experienced the constrain of the post-LGM rising sea level. In describing the evolution of the Trieste Gulf, this work provides therefore a potential analogue for a wide variety of areas scattered over the world, from paraglacial environments to distal megafan areas and continental shelves with gentle slope, now submerged.

Our reconstruction also provides an ideal case study for the prediction of the impact of sea-level rise on natural systems, which is of paramount importance in the perspective of the ongoing global warming and the predicted loss of continental ice.

## REFERENCES

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