Palaeohydrography of the Southern Venetian Plain in the Bronze and Iron Ages

Silvia E. Piovan[1] & Paolo Mozzi[2]

[1] Department of Historical and Geographic Sciences and the Ancient World, University of Padova (ITALY)

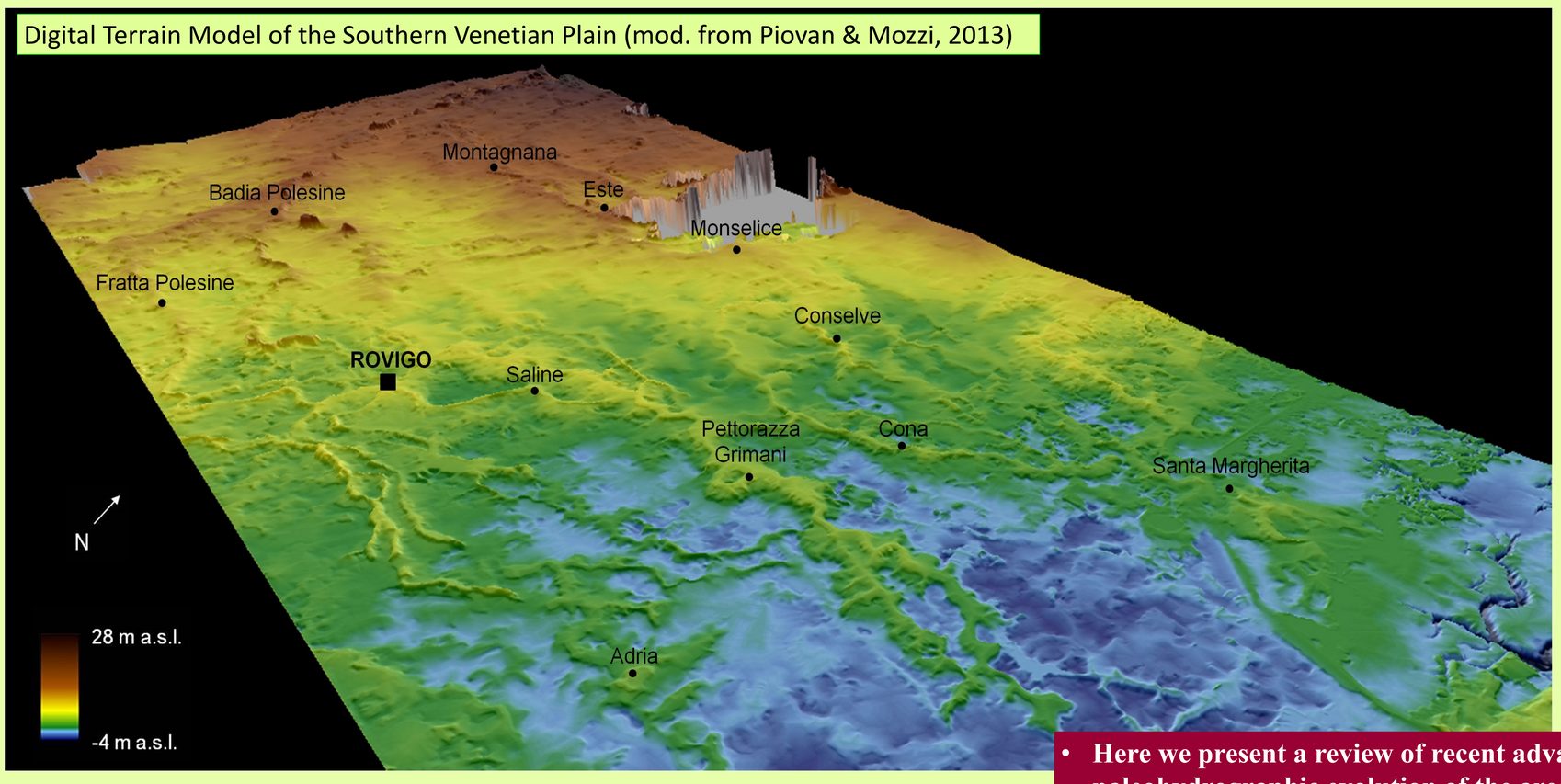
[2] Department of Geoscience, University of Padova (ITALY)

Frattesina 50 anni dopo

Frattesina fifty years later

The Po Delta between Europe and the Mediterranean in the centuries around 1000 BC

13th-15th April, 2018 - Museo dei Grandi Fiumi di Rovigo



Introduction

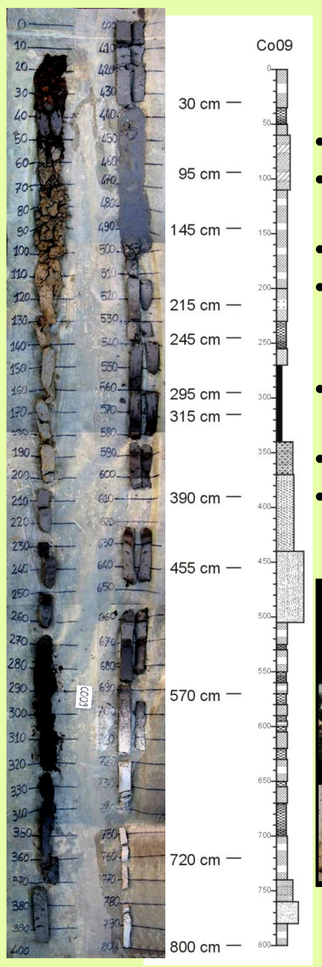
The Adige and Po rivers occasionally intersected In the Southern Venetian Plain during the last four millennia: the two sedimentary systems do not have well-defined boundaries.

Regional reconstructions of the late Holocene paleohydrography, such as Castiglioni (1978), Peretto (1986) and Marcolongo & Zaffanella (1987), mostly rely on remote sensing data; the time of activity of the different river branches and their connection to the Po or to the Adige system were largely hypothetical and commonly based only on the interpretation of landforms and their association with surface archaeological remains.

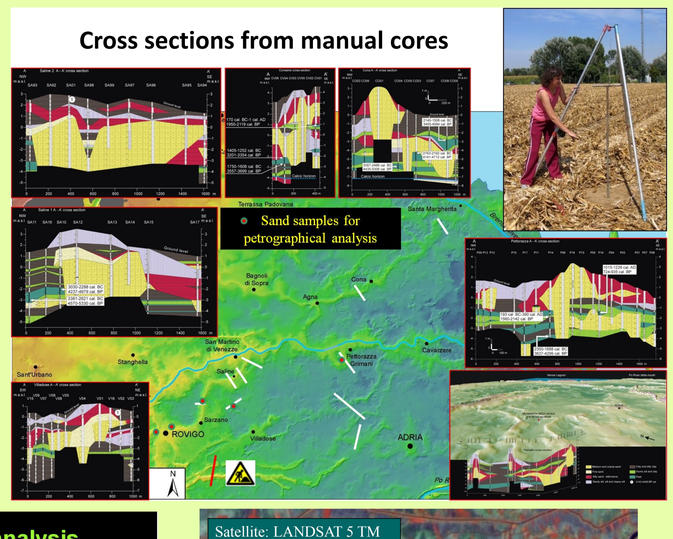
A comprehensive framework of knowledge concerning the late Holocene stratigraphic and paleogeographical setting of the area has been developed by Piovan et al. (2010 and 2012), based on high resolution stratigraphic data, radiocarbon dating and petrographical analysis. Specific investigations on the paleohydrographic evolution around Adria and relations with the geoarchaeological setting has been carried out by Corrò & Mozzi (2017) and Mozzi et al. (submitted).

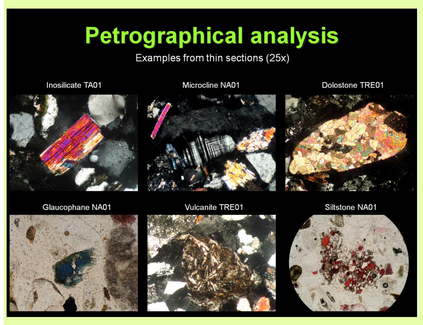
- **Here we present a review of recent advances on the paleohydrographic evolution of the area with a focus on the Bronze and Iron ages.**

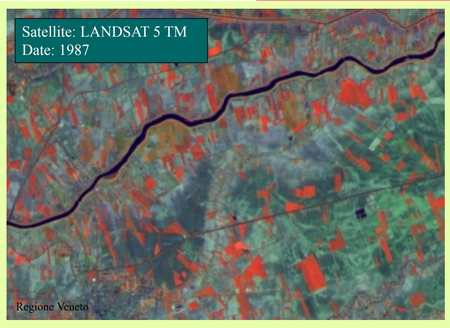
Methods



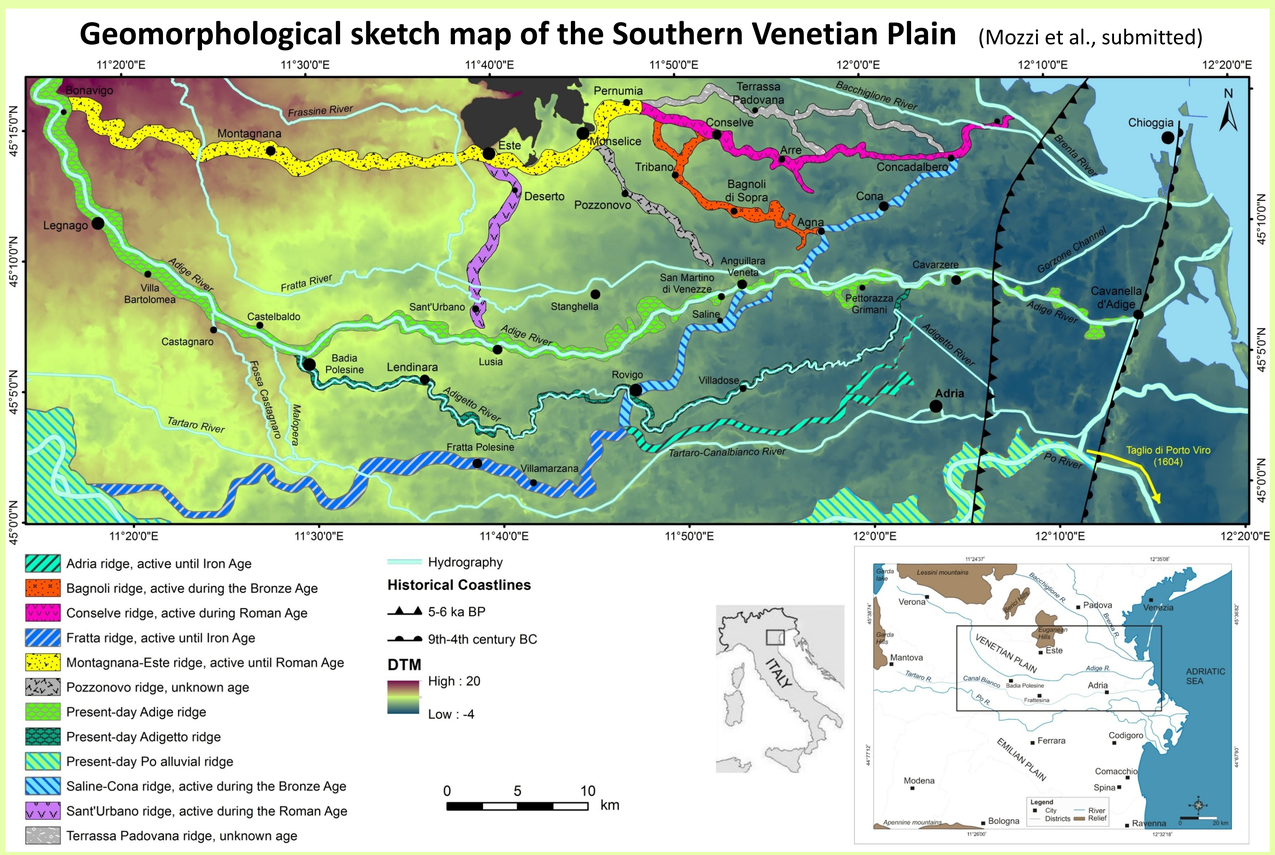
- Remote sensing
- DTM processing and analysis
- Field survey
- Boreholes (from 4 to 9-m depth) and open sections
- Sedimentological analysis
- Sand petrography
- Radiocarbon dating



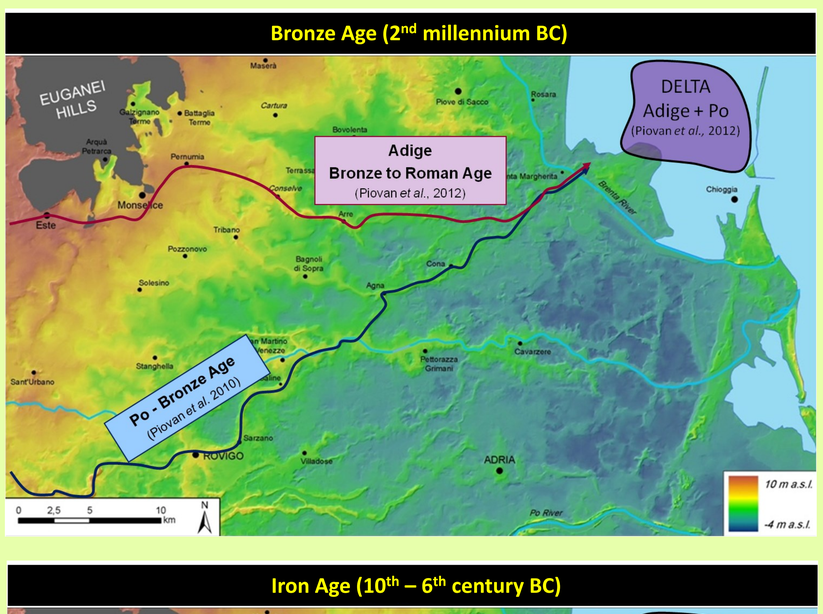




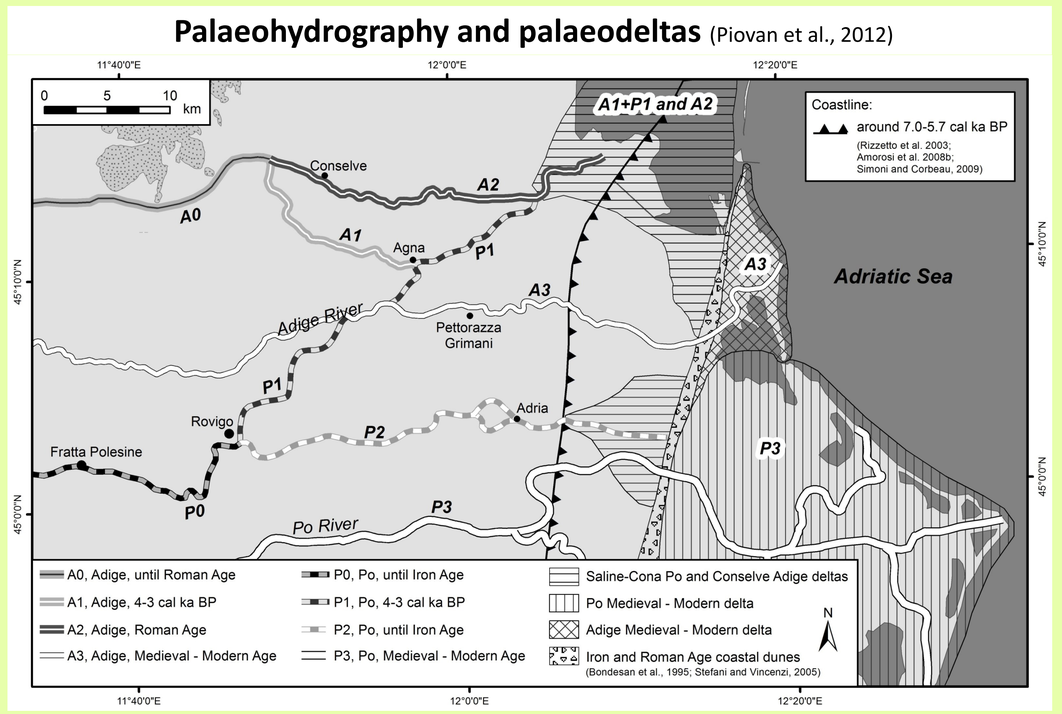
Results

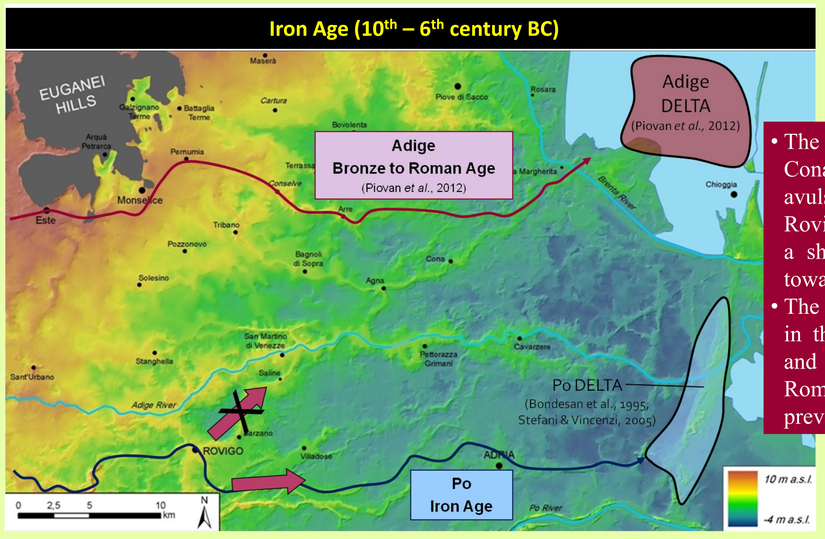


Palaeohydrography, alluvial ridges and deltas



The Fratta alluvial ridge was formed by the Po R. in the Bronze and Iron ages. South of Rovigo, the Fratta ridge divides in two branches, the Saline-Cona (SC) and Adria ridges (Piovan et al., 2010). The SC ridge runs SW-NE towards the Venice Lagoon and was active in the 3rd-2nd mill. BC. The Montagnana-Este Adige branch was its left tributary, thus the northernmost lobe of the Po delta was fed by both Po and Adige rivers (Piovan et al., 2012). The Adria ridge, which runs W-E towards Adria, was active in the early Iron Age until the 6th cent. BC (Balista, 2013; Mozzi et al., submitted), when the Tartaro R. started to flow in the area, with occasional inputs from the Adige R. as late as the 15th century AD (Corrò & Mozzi, 2017).





- The deactivation of the Saline-Cona Po branch through avulsion just upstream of Rovigo, around 1000 BC, led to a shift of the Po delta system towards Adria.
- The Adige River kept its mouth in the Southern Venice Lagoon and built its own delta until Roman times, prograding on the previous northern Po delta lobe.

Holocene alluvial plain aggradation started as a consequence of the post-glacial sea level rise: the result has been a fine-dominated alluvial succession with common peat levels, up to 8-m thick in Conselve and Cona, starting from 5.5 ka cal BP (Piovan et al., 2010, 2012). This phase of major aggradation also resulted in the formation of sandy alluvial ridges by both Po and Adige channel belts, which fed large crevasse splays.

Rates of vertical aggradation in the alluvial plain were particularly high since the Bronze Age. This suggests a possible influence of man-induced soil erosion, related to deforestion in the catchment, on the increase of the rivers' sedimentary load.

- The Bronze Age Saline-Cona Po branch debouched in the Southern Venice Lagoon, where the Brenta and Astico-Bacchiglione rivers also had their mouths. This created a potential network of connected waterways that linked the Adriatic Sea to both the Alpine area and the Central Po Plain.
- In the Final Bronze Age, when the Saline–Cona ridge was abandoned and the Fratta Po branch continued its way to the sea following the Adria ridge, this network of fluvial routes was completely altered, and the terminal Po River was separated from the Adige, Brenta, and Astico–Bacchiglione rivers by vast swampy terrains.

References

Balista C. (2013). Dal Po di Adria al fiume Tartaro. Trasformazioni paleoidrografiche tra l'età del Bronzo e l'età del Ferro attraverso le evidenze petrografiche dei sedimenti del sito di Amolara di Adria (RO), Padusa 49, pp. 159-192.

Castiglioni G.B. (1978). Il ramo più settentrionale del Po nell'antichità. Atti e Memorie Accademia Patavina SS.LL.AA., 90, pp. 157-164.

Corrò E., Mozzi P. (2017). Water matters. Geoarchaeology of the city of Adria and palaeohydrographic variations (Po Delta, Northern Italy). Journal of Archaeological Science: Reports, 15, pp. 482-491.

Marcolongo B. & Zaffanella G.C. (1987). Evoluzione paleogeografica della Pianura veneta Atesino- Padana. Athesia, 1, pp. 31-67.

Mozzi P., Piovan S., Corrò E. (submitted). Long-term drivers and impacts of abrupt river changes in managed lowlands of the Adige river and Northern Po Delta. Quaternary International.

Peretto R. (1986). Ambiente e strutture antropiche nell'antico Polesine. In: AA.VV. (Eds.) - L'antico Polesine. Testimonianze archeologiche e paleoambientali. Antoniana S.p.A., Padova, pp. 21-100.

Piovan S., Mozzi P., Stefani C. (2010) . Bronze Age palaeohydrography of the Southern venetian plain. Geoarchaeology, 25 (1), pp. 6-35.

Piovan, S., Mozzi, P., Zecchin, M. (2012). The interplay between adjacent Adige and Po alluvial systems and deltas in the late Holocene (Northern Italy). Géomorphologie, 4, pp. 427-440.

Piovan S. & Mozzi P. (2013). Lungo i dossi fluviali, dentro la pianura. In: Peretto R. & Bedetti S. (eds.) Trasparenze di Paesaggi. Atlante aerofotografico del Polesine. Tipografia Arte Stampa, Urbana (Padova), pp. 90-91.

Zecchin M., Brancolini G., Tosi L.,Rizzetto F., Caffau M., Baradello L. (2009). Anatomy of the Holocene succession of the southern Venice lagoon revealed by very high-resolution seismic data. Continental Shelf Research, 29, pp. 1343-1359.