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## Geoarchaeological evidence of multiple climatic and anthropic triggers driving the breakdown of the Terramare civilization (Bronze Age, Northern Italy)

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The Terramare civilization included hundreds of banked and moated villages, located in the alluvial plain of the Po River of northern Italy, and developed between the Middle and the Recent Bronze Ages (XVI-XII cent. BC). This civilization lasted for over 500 years, collapsing at around 1150 years BC, in a period marked by a great societal disruption in the Mediterranean area. The timing and modalities of the collapse of the Terramare Bronze Age culture are widely debated, and a combined geoarchaeological and palaeoclimatic investigation – the SUCCESSO-TERRA Project – is shedding new light on this enigma. The Terramare economy was based upon cereal farming, herding, and metallurgy; settlements were also sustained by a well-developed system for the management of water and abundant wood resources. They also established a wide network of commercial exchange between continental Europe and the Mediterranean region. The SUCCESSO-TERRA Project investigated two main Bronze Age sites in Northern Italy: (i) the Terramara Santa Rosa di Poviglio, and (ii) the San Michele di Valestra site, which is a coeval settlement outside the Terramare territory, but in the adjoining Apennine range. Human occupation at San Michele di Valestra persisted after the Terramare crisis and the site was settled with continuity throughout the whole Bronze Ages, up to the Iron Age. The combined geoarchaeological, palaeoclimatic, and archaeobotanical investigation on different archaeological sites and on independent archives for climatic proxies (offsite cores and speleothems) highlights the existence of both climatic and anthropic critical factors triggering a dramatic shift of the land use of the Terramare civilization. The overexploitation of natural resources became excessive in the late period of the Terramare trajectory, when also a climatic change occurred. A fresh speleothem record for the same region suggests the occurrence of a short-lived period of climatic instability followed by a marked peak of aridity. The unfavourable concomitance between human overgrazing and climatic-triggered environmental pressure, amplified the on-going societal crisis, likely leading to the breakdown of the Terramare civilization in the turn of a generation.

