

Climatic changes and human impact on coastal areas of Sardinia: the example of the Mistras-Cabras barrier-lagoon system (Central-Western Sardinia)

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The current interglacial differs from those passed solely for the human presence; from the moment human transformed from hunter-gatherers to farmer, he substantially influenced the climate evolution. Clearing large areas of forest for agriculture was the first time of actual human manipulation of the ecosystem in which he lived. The coastal areas are those most affected by climate changes and are those in which small changes eustatic and/or anthropogenic cause significant environmental modifications. Sardinia in this context is a key area for the definition of the interaction between Man and Climate occurred in the last 4000 years. The sparse population of the coast up to modern times is an advantage to distinguish the climate signal from the anthropogenic. Integrated archaeological and geological studies conducted in the coastal barrier-lagoon Mistras-Cabras system showed that it developed as transgressive during the final stages of the Holocene sea level rise (about 6000 years BP) and become regressive (prograding) from about 2600 years BP. The regression of the coast was not, however, continued but characterized by three distinct phases associated to precise climatic fluctuations. The first phase lasted for about 400 years and spanned between 2600 and 2000 years BP. It is associated with the progradation of the coastline of about 250 meters. This time interval, known as Greek-Roman Warm, coincides with the beginning of the Punic and Roman attendance of the Mistras-Cabras area. At that time, the area, close to the ancient city of Tharros, hosted a landing and perhaps the port of the city, probably in front of the trading centre located at short distance from the shoreline. The second phase lasted about 440 years, and it developed between 1140 and 700 years BP during a new warm period, the Medieval. During this phase, the progradation of shorelines was of about 400 meters; that is nearly the double the previous one. This anomaly could be explained considering the little or no land use of the coastal area during the medieval time. The harbour was no more active and large sandy dunes developed and nourished the shore allowing a no man-influenced progradation of the coast. An intense exploitation of the coast, instead, occurred during Punic and Roman time. This induced erosive phenomena that had as result the relatively low progradation of the barrier-lagoon system. The third stage is the current one and begun about 164 years ago (post 1850 AD). Geological and archaeological data of the Mistras-Cabras system revealed that little human activities on the coast could influence its natural behaviour. Moreover, it is also evident, that little climatic changes both positive and negative can induce progradation or erosion of the system as well.

