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Using satellite time series for remote sensing based investigations of ancient acqueduct systems: the case of the Nasca puquios

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Using satellite time series for remote sensing based investigations of ancient acqueduct systems: the case of the Nasca puquios

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Satellite time series can provide valuable information to reconstruct ancient environmental changes, still fossilized in the present landscape. In particular, satellite derived moisture content and moisture patter variations over the seasons and years may facilitate the identification of areas involved in early environmental manipulation. Up to now, only a few number of archaeological studies on spatial patterns of moisture have been carried out through the world using satellite optical data. We focus on Landsat and ASTER multitemporal data acquired for some areas near Nasca basin (Peru) to extract information on ancient irrigation systems and artificial wet agro-ecosystems. The study area is particularly interesting mainly because it was populated since millennia ago despite its drought and critical environment conditions presented serious obstacles to human occupation.
Considering this extreme drought, which characterizes this area today as several centuries ago, ancient populations of the Nasca River valley devised an efficient system for retrieval water and to face the drought conditions. This system was based on underground aqueducts called puquios, which in part are still used today. Archaeological record put in evidence that during the Nasca flourishing period, the number and spatial distribution of puquios were larger than today. On the basis of satellite multitemporal moisture maps, Unknown puquios were identified and confirmed by ground survey. This information can be a basic
The successful results achieved in the Nasca Basin area may be also rejoined in similar environmental conditions (in Meso-America, Middle East, North Africa, Asia) where ancient populations devised aqueducts to face drought and retrieve water for domestic, ritual and agricultural needs.
Reference

Lasaponara R., Masini N., Following the Ancient Nasca Puquios from Space, in Lasaponara R. and Masini N. (Eds), Satellite Remote Sensing: A New Tool for Archaeology (Remote Sensing and Digital Image Processing), Springer, ISBN: 9048188008, pp. 269-290.