Coastal Geoarchaeology in the Mediterranean – on the Interdependence of Landscape Dynamics, Harbour Installations and Economic Prosperity in the Littoral Realm

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Mediterranean coastlines are highly dynamic landscapes with a horizontal progradation of up to tens of kilometres during the last 5000 years in some of the delta regions.[1] After the significant deceleration of post-glacial eustatic sea-level rise around 7000–6000 years ago,[2] a complex interplay of regional and local factors such as vertical tectonic movements, glacial isostatic rebound, sediment supply by rivers and coastal currents, deltaic compaction, and human intervention, led to locally different histories of coastal formation.[3] As the coastal zone provides essential access to food, maritime commerce and colonisation activities, its dynamical nature had a significant impact on the prosperity of ancient communities. In fact, Mediterranean harbours as the gateways to the maritime realm were constantly threatened by gradual sedimentation,[4] tectonic uplift or subsidence,[5] human impact,[6] as well as extreme events such as earthquakes or tsunamis.[7] Many harbours became landlocked due to coastal progradation with fundamental repercussions on the political and economic status of ancient *poleis*.[8]

From a historical and more general perspective, geoarchaeological questions such as those circulating around the impact of coastal changes on ancient societies in the Mediterranean, have predominantly been tackled by researchers with a strong background in geosciences.[9] Likewise, the most commonly accepted definitions of the discipline of geoarchaeology emphasise the application of geoscience tools, techniques and concepts (in combination with historical and archaeological data) in order to reconstruct the evolution of landscapes and ecosystems and its influence on human and cultural history.[10] This collection of full papers from Panel 2.3 "Coastal geoarchaeology in the Mediterranean – on the interdependence of landscape dynamics, harbour installations and economic prosperity in the littoral realm" comprises three contributions by authors, who, however, are deeply rooted in the realm of archaeology and demonstrate how to generate synergies through the combination of archaeological and earth-science data in an excellent way.

Florian Hermann and colleagues investigate whether gradual or abrupt coastal changes had an impact on the sudden decline of the production of Roman fish sauce (*garum*) in the 2nd century AD, which was located along the Hispanic coast and exported to the entire *Imperium Romanum.* Along the Algarve, where the hazard of major tsunamis is exemplified by the destructive Lisbon Tsunami of 1755,[11] the authors identify coastal progradation silting up the estuaries, where the excavated *garum* sites are located, to be most significant for the loss of harbour settings and the basis for trade economy.[12]

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Reinhard Stupperich and Corinna Stupperich use archaeological evidence and historical-geographical descriptions – mainly from the works of Pausanias – to infer details on the topography of the city of Troizen as well as a prosperous environment of the Troizenian landscape on the Peloponnese Peninsula. The fact that Classical Troizen, already equipped with a large military corps, was able to accommodate thousands of Athenian refugees during the Persian Wars indicates abundant local water supply and intense agricultural production. The economic decline of Troizen in Late Antiquity is then linked with coeval relative sea-level rise and seawater contamination of the coastal aquifers in combination with low rates of groundwater recharge.[13]

After reviewing the coastal changes of the Grosseto plain of Tuscany, Camilla Colombi presents current results of magnetometer prospection and percussion coring in a possible ancient harbour basin of the now silted up Lake Prile. While the geophysical data indicate a narrow, u-shaped subsurface construction framing a basin more than 200 m in length and void of major anomalies, the presented sediment core seems to show a low-energy regressive sequence, which is in agreement with the harbour hypothesis.[14]

Notes

[1] Stock et al. 2014, 168; Brückner et al. 2017, 878 fig. 1; 888 fig. 10.

[2] Stanley – Warne 1994, 229; Vött 2007a, 914; Vacchi et al. 2016, 193 fig. 13.

[3] Kraft et al. 1977, 947; Kraft – Chrzastowski 1985, 628.

[4] Marriner – Morhange 2007, 152; Stock et al. 2014, 59; Giame et al. 2019, 147 fig. 5; 162.

[5] Kolaiti et al. 2019, 31; Giame et al. 2019, 153.

[6] Stock et al. 2016, 992.

[7] Pirazzoli et al. 1992, 390; Reinhardt et al. 2006, 1061.

[8] Brückner 2005, Vött 2007b, 33; Brown 2013, 124; Stock et al. 2014, 58; Brückner et al. 2017, 878.

[9] Rapp – Hill 2006, 4–6.

[10] Rapp – Hill 2006, 1; Engel – Brückner 2014, 1.

[11] Dawson et al. 1995, 210–212; Chester – Chester 2010, 351–353.

[12] Hermann et al. 2021.

[13] Stupperich – Stupperich 2021.

[14] Colombi 2021.

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