

## **Geoarchaeological Survey of Batroun 2018 – Clement Flaux and Nicolas Carayon**

The Geoarchaeological survey of Batroun and Anfeh continued from the 1st to the 15th of October 2018. Five lines of approach were undertaken:

1. Survey of past sea-level indicators. Preserved uplifted marine terraces indicate a relative sea-level drop and have been related to coseismic movement, i.e. rapid, vertical displacement of the Lebanon coast (**fig. 1**). Further work is needed to refine local amplitude and past uplifts in order to better constrain paleo-geographies in relation to coastal archaeology.
2. Survey of erratic blocks,  $\geq 1 \text{ m}^3$ , along the coast. Some blocks encrusted with marine fossils prove that they were pulled off from the coastline and displaced on shore. These blocks record past high-energy events having affected the Lebanon coast, such as an extreme storm or tsunami.
3. Cosmonuclide dating provides a surface exposure dating which still has unrealized potential in archaeological settings such as rockcut outcrops or quarry walls. The so-called Phoenician sea-wall and great trench in Batroun and Anfeh, respectively, were selected for sampling and testing with this new method which could be fruitful on the Lebanon rocky coast (**fig. 2**).
4. A preliminary underwater survey of the coast was performed to give a first overview of the potential of the sea bottom at Batroun.. Archaeological remains are rare and sparse, but include some masonry blocks and one anchor.
5. Two cores were made just outside the modern harbour to elucidate ancient shorelines of the Batroun northern cove (**fig. 3**). Another core was extracted on the coastal floodplain of El-Jawz River, north of Batroun. The bedrock remained unreached after drilling 21 meters of Holocene coastal sediments, mostly composed of dark muds. This unexpected Holocene sediment thickness emphasizes important shoreline changes since the maximum marine ingressions ca. 6000 years ago.

Our project relied on a multi-disciplinary approach to better understand the geoarchaeological signature of the north Lebanon coast. Radiocarbon, cosmonuclide and ceramic dating will be combined aiming to better assign the chronology of fossil coastal surfaces including Holocene marine terraces, quarry faces, erratic blocks and sediment palaeo-shores. The final objective is to refine the geo-archaeological framework of past maritime activities along the northern Lebanon coast.

## Mission 2



**Fig. 1:** Two uplifted platforms in Salaata, north of Batroun.

## Mission 2



**Fig. 2:** Rock sampling of the quarry floor for cosmonuclide dating.



## Mission 2



**Fig. 3:** Coring at the edge of Batroun modern's harbour.