## *Byblos & the Sea* - an HFF funded Research Project
## Summary Report : Electrical Resistivity Survey - Mission 2 / October 2013
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## Field Director : Tomasz Herbich

Since 2011, the research program *Byblos and the Sea* has conducted a series of multi-disciplinary field investigations, the main objective of which was to locate the much attested Bronze Age harbor of the city which was responsible for its economic growth during Antiquity. Therefore, the five harbor possibilities which had been considered by Honor Frost as potential harbor installations around the headland of Byblos have been reinvestigated. Based on results, only the immediate southern vicinity of the ancient city (Fig. 1) has been retained as a possible harbor contender by *Byblos and the Sea* for the following reasons:

a) The mentioning in the Wenamun account of twenty boats moored in the harbor which the Prince of Byblos sees from his office on the headland;
b) Point a) indicates proximity between the Acropolis of Byblos and the harbor, hence the choice of the prospection area at the foot of the ancient *tell*;
c) The area presents a deep inward golf prior to silting and construction;
d) The protection the El-Yasmine Island offers to the area;
e) The location of two main valleys in the hinterland where evergreens were felled and logged down on riverbeds to the sea. Predominant SW currents would help drifting the towed logs or rafts on down currents northwards towards the city of Byblos and its harbor.


**Figure 1. View from the acropolis of Byblos nested on the headland overlooking the southern area to be prospected (©*Byblos & the Sea,* 2013, Martine Francis-Allouche).**

### Geophysical survey

To verify this hypotheses, and prior to any "invasive" intervention, *Byblos & the Sea* carried out a geophysical survey in October 2013 in a lot at the southern foot of the Byblian tell (Fig. 1). This survey was conducted under the scientific direction of Tomasz Herbich (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Warsaw, Poland). Measurements of this electrical resistivity profiling survey were taken by both geophysicists, Tomasz Herbich and Dawid Swięch (Fig. 2). The grid was set by the topographer Damien Laisney of Maison d'Orient, Lyon. The data were processed by Tomasz Herbich.

**Figure 2. Electrical resistivity survey at the southern foot of the archaeological *tells* of Byblos, on the Armenian Orphanage lot; Geophysicist, Tomasz Herbich, taking electrical resistivity profiling measurements.**

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The main objective of this geophysical survey was the localization of a possible antique harbor beneath this lot. The results were quite outstanding : a two dimensional image of a silted-in bay was rendered, showing an old shoreline at about a 100m inland from the actual seashore (Fig. 3); results are presented as maps of the apparent resistivity changes, with blue corresponding to lowest values of resistivity, such as clay or salt water and brown corresponding to the highest ones, such as compacted earth or structures (Fig.3).

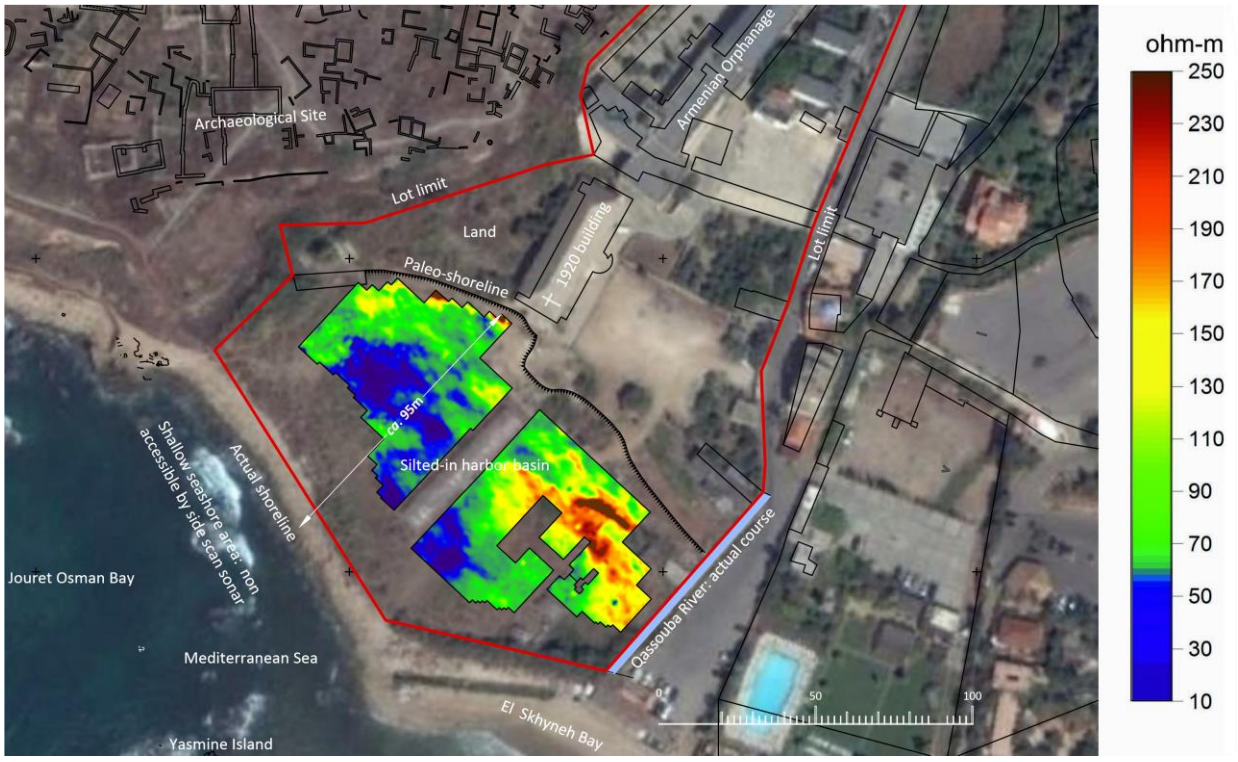


**Figure 3. A 2D Image of a silted-in bay with an old shoreline at approx. 100m inland from the actual coastline.**
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In conclusion, these geophysical readings allowed the detection of a silted-in basin buried under the Armenian Orphanage lot, laying at the southern foot of the antique city. Results are published in the Bulletin d'Archéologie et d'Architecture Libanaises (Francis-Allouche, M. and Grimal, N. *et al*. 2017. "Byblos maritime : une installation portuaire au piémont sud de la ville antique", BAAL 17, p. 133-196).

Results of the geophysical survey produced a good basis for further research: in January 2014, *Byblos & the Sea* conducted an auger coring campaign to verify the existence of the buried basin; a series of 29 auger coring drills were performed along lines perpendicular to the boundary between high and low resistivity areas, both in the northern and the southern parts of the prospected area (Fig. 4).


**Figure 4. Geophysical 2D image of the underground in the lower Armenian Orphanage lot, showing the buried basin and drilling location of 29 boreholes to verify its existence (mission 3). ©*Byblos &the Sea,* 2014, Nicolas Carayon**