

Byblos & the Sea - an HFF funded Project
Summary report: Geophysical Tomography Survey
Mission 5 - March 2015

Byblos & the Sea is a multidisciplinary research project on the coastal and maritime area of Byblos co-directed by Martine Francis (affiliated researcher at the Collège de France) and Nicolas Grimal (Prof. at the Collège de France), in collaboration with the Directorate General of Antiquities of Lebanon. It is a continuation of a long term research program on coastal and maritime Byblos, started by Honor Frost in the 1960ies and resumed after the Lebanese civil war, since 1998.

Since 2011, the research program *Byblos and the Sea* has conducted a series of multi-disciplinary field investigations in collaboration with local and foreign specialists. The main objectives of this research program were to understand the maritime approaches to Byblos and locate eventually the much attested Bronze Age harbor of the city which was responsible for its economic growth during Antiquity.

On the bases of previous results (Geophysical Survey Oct. 2013 & Auger Coring campaign Jan. 2014) which have proven to be outstanding by confirming the existence of a silted-in basin buried under the so-called “Armenian Orphanage” lot, *Byblos & the Sea* carried out a Geophysical survey on that same lot in March 2015 (Fig.1), under the scientific direction of geophysicists Vivien Mathé and Adrien Camus (La Rochelle University, La Rochelle, Poitou-Charentes, France).



Figure 1. The lower Armenian Orphanage lot covering a silted-in harbor basin located via Geophysical prospection and Auger coring drills (Project *Byblos & the Sea*, Francis-Allouche, Grimal, 2015.

The objective of this mission was to survey the areas located on the paleo-shoreline (blue dotted line on Fig.1) of the silted-in located harbor basin to:

- a) Fine-tune results obtained by the previous geophysical resistivity survey
- b) Spot possible man-made structures such as a mole, a dock or other harbor buildings.

This tomography survey performed thirteen parallel NE-SW and NW-SE pseudo-sections across the land (Fig. 2-3), giving results in section and elevation, whereas former resistivity results (2013) gave two dimensional in-plan images. Both these highly efficient and complementary techniques were used to optimize results by cross-referencing them, eventually obtaining a three dimensional image of the harbor basin (Fig. 4).

Results are to be found in the Scientific Report *Tomographie Electrique à Jbeil 23-27 Mars 2015* (in French).



Figure 2. Example of a tomography pseudo-section across the lower Armenian Orphanage lot covering the buried harbor basin at the southern foot of the antique city of Byblos (Photo by M. Francis-Allouche).

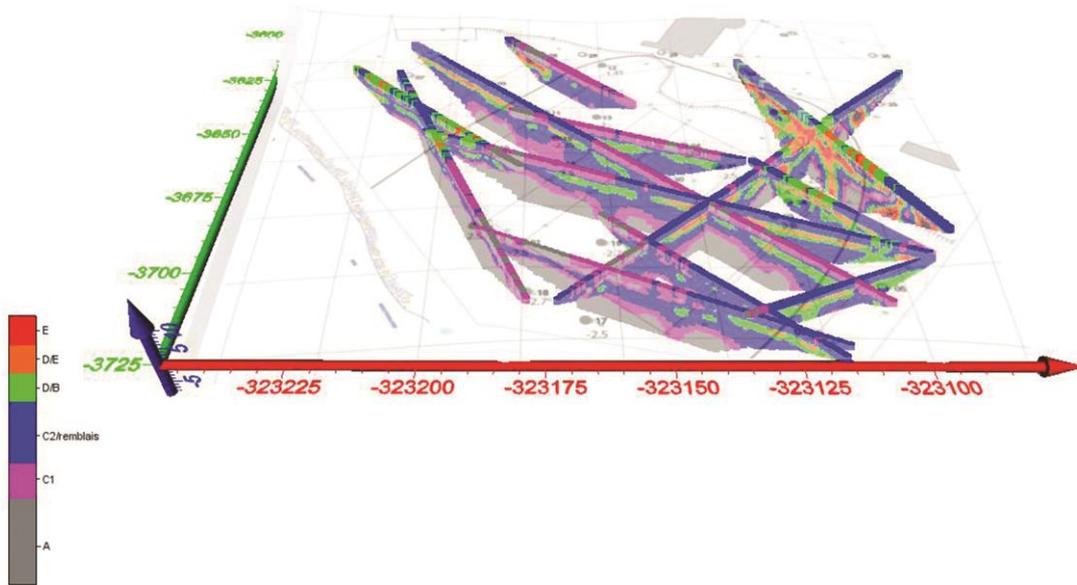


Figure 3. Thirteen parallel NE-SW and NW-SE pseudo-sections resulting in a 3D north-southern view of the basin: the gray color represents the bedrock; the magenta and the bleu represent the buried basin, the red and orange tones represent possible structures (Courtesy Vivien Mathé).

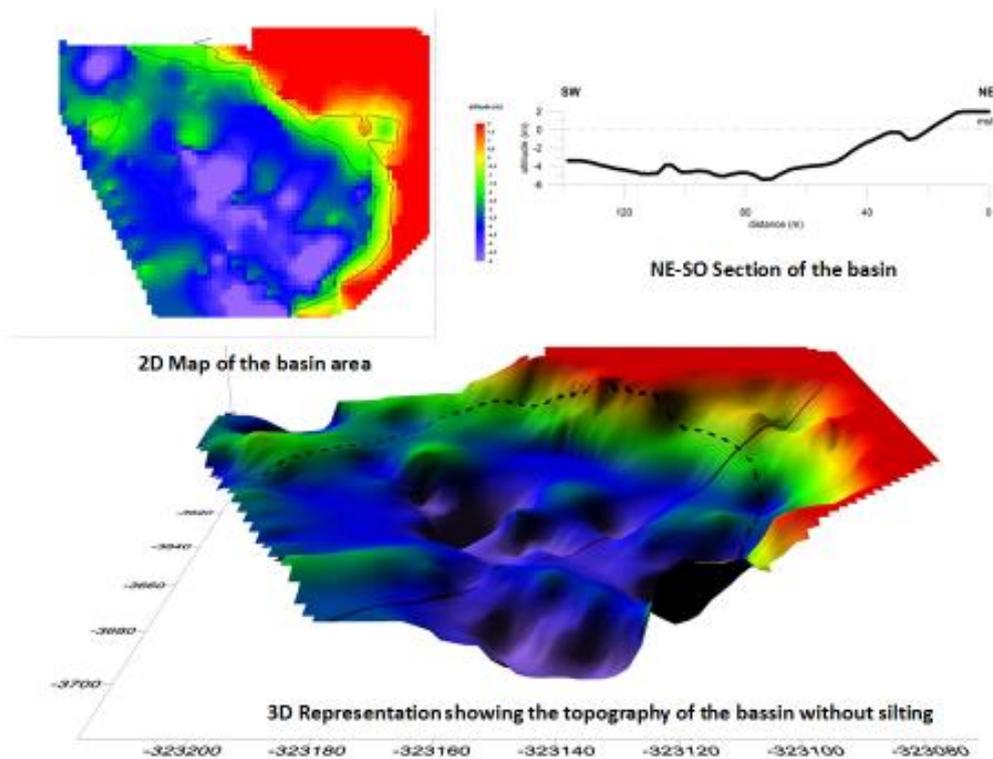


Figure 4. Based on results obtained by two complementary geophysical surveys and an auger coring campaign, the topography of the silted-in basin could be hypothetically reconstituted (Courtesy Vivien Mathé).