

Visualizing... a new Nora:

3D documentation and web visualization

with very high resolution photogrammetric point clouds and 3D GIS

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Step 1: the photogrammetric survey



The **archaeological site of Nora** (Sardinia, Italy):

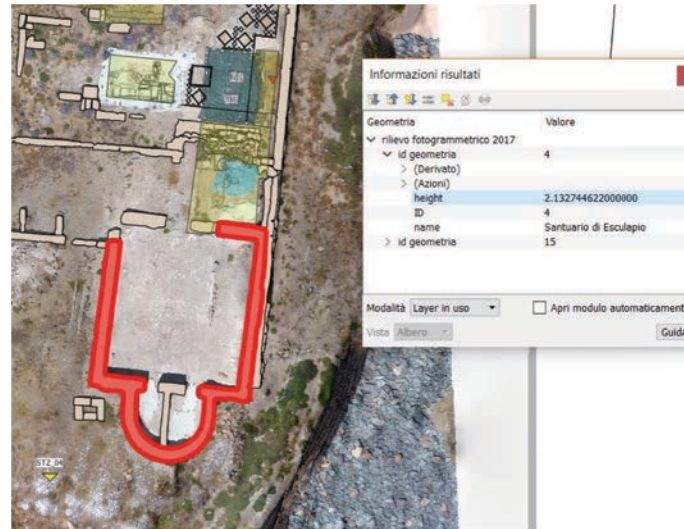
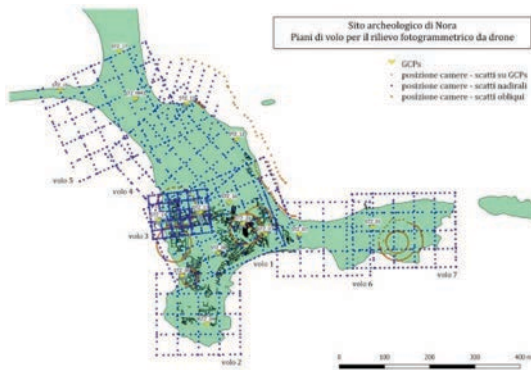
- a Phoenician Emporium (8th – 6th cent B.C.)
- a Punic settlement (6th – 3rd cent B.C.)
- a Roman city (3rd cent B.C. – Late Antiquity)

The partnership between the **University of Padova** and **3DOM-FBK** answered the need for a **cartographic update** of the site, to be used as a new 1:100 scale basemap.



The **photogrammetric survey**:

- 2400 aerial photos (GSD 1.7 cm)
- 1500 terrestrial photos



The final output has been a **high resolution orthophoto** (< 5 cm/pix), a useful layer for updating the plan of the site.

The map is linked to a **geodatabase** to enhance the informative capacity of the survey.



New techniques of **semantic enrichment** and **web visualization of 3D models** have been explored by employing recent **open source solutions**.

Potree

an open source WebGL based point cloud renderer

- To handle a web visualization of **large point clouds**
- To perform simple **geometric analyses**
- To **outline and identify** every single architectural compound, by showing a bounding box, with a label and a link to a further step of visualization.

Qgis2threejs

a plugin for QGIS

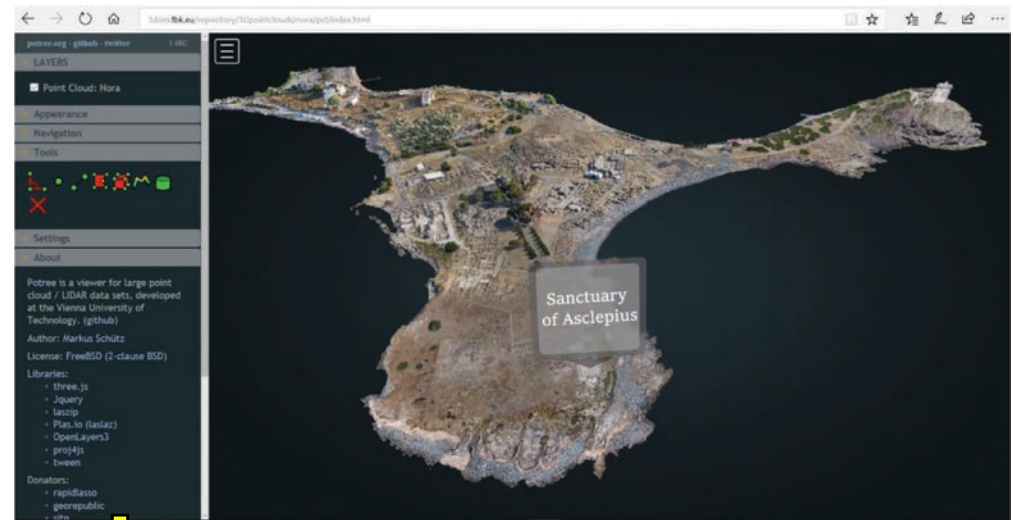
The script generates a 3D model from a bidimensional map in QGIS. The vertical dimension is added modelling DEMs and **extruding polygons**. The z value is extracted **from the point cloud** itself with 3DFier.

The outcome is a **queryable Web 3D GIS**.

Out-of-context finds, digitally recorded, are given new life in their own **context**.

The high-resolution photogrammetric survey provided more than a basemap: the 3D model of the city has been used as a new informative system, to **store and convey the complexity of the reality**, even beyond the visible.

The **dynamic and scalable approach** to the model offers a excellent factor for **dissemination and comprehension** of the site to researchers and even to a larger community.



Researchers

Make 3D GIS the standard tool to record archaeological excavations, connecting drawings, geodatabases and inferences.

Provide a web access to survey, digitize and describe.

We need to recapture the third dimension into our recording processes and into our inferencing mechanism.

Administrators

Provide a user-friendly and an easy-intellegible tools to inspire decision-making policies.

Public users

Combine attraction, intelligibility and education.

The new 3D visualization of the site can be combined with the virtual reconstruction of the ancient city, to explain historic events, transformation processes and excavation practice.

