

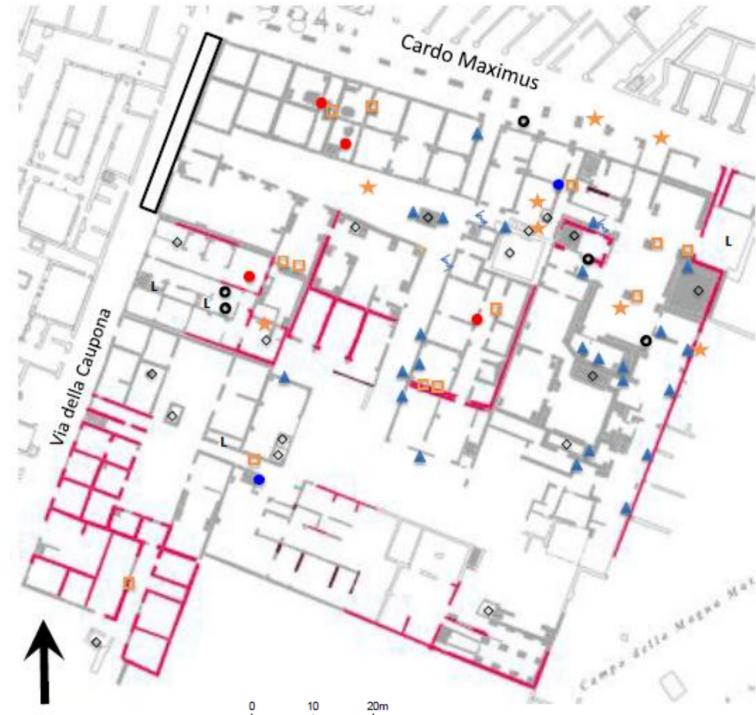
Liquid Footprints: Water, Urbanism, and Sustainability in Roman Ostia (4th cent. BCE- 6th cent. CE)



Introduction

Ostia was located ca. 20 km west of Rome, directly where the Tiber river meets the Mediterranean. The city was founded in the late 4th century BCE, and played a critical role in the development and prosperity of Rome, acting for a time as the city's main harbor. Ostia experienced profound urban changes over its lifetime, including modifications and reductions in its amount of water usage. On an urban level, the city always recycled, reinvented, and adapted to its dynamic demographic and cultural needs.

Ostia was located on the sea, on the banks of the Tiber river, and had easy access to potable ground water, but how did the city choose to use each of these different water sources, and how did the choices change over time? To what degree did these choices affect the ability of the city to sustain itself?



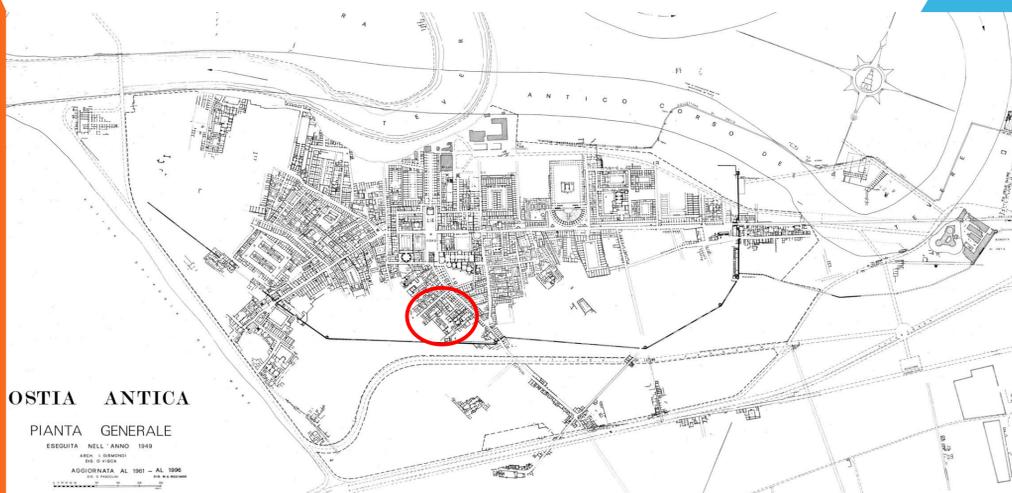
Hydraulic Features in *insula* IV.ii, Ostia.

Legend

- - Circular shaft
- - Rectangular shaft
- - Manhole/floor drain
- - Well
- ▲ - Channel
- ◇ - Fountain/basin
- L - Latrine
- ★ - Pb fistula
- ⚡ - Sinter (CaCO₃)

After Stöger 2011:158.

Nearly 80 water features identified in *insula* IV.ii, Ostia.



Overview map of Ostia's excavated area: *insula* IV.ii encircled.

Preliminary Results and Future Directions

To test this methodology, a single, well documented Ostian *insula* (block of buildings) was selected as a case study. The initial results of this study have demonstrated the remarkable diversity in the spatial and temporal distribution of hydraulic features within a single *insula*, several of which have not been previously recorded.

The conversion of a large room into a monumental cistern (est. cap. **98,000 l**) facilitated the creation of numerous water features in the late 2nd cent. CE. However, water features from centuries earlier continued to be used, and new ones independent of this cistern were still built. Why was this the case?

This project aims to identify the Water Footprint of Roman Ostia as a whole, and to identify the impact of different resource usage choices on urban growth and sustainability.

Methodology

This project creates a dialogue between the archaeology of Roman urbanism and the incredible advances in modern urban studies and resource awareness. By adapting the Water Footprint method (Hoekstra 2011), this urban hydraulic study identifies how water was used, wasted, and recycled throughout the city from a systematic and diachronic perspective.

- 1) The amount, distribution, and diversity in water usage is examined for three distinct phases of the city's hydraulic life, using a multivariable analysis modified for the available data.
- 2) Each footprint then incorporates digital mapping to model the patterns of water flow in physical reality (GIS, SOBEK).
- 3) These individual "footprints" of urban water usage are then synthesized to identify water usage trends at different scalar levels.

