GIS and Archaeology: Thoughts of a Fellow Traveller

Jim Crow, HCA, University of Edinburgh
Thrace: Long Walls and Water Supply
Anastasian Wall, Derviş Kapı
Constructing the Water Supply System
Prof Derya Maktav, ITU
Orthophotos
High Resolution satellite images eg IKONOS®
IKONOS image draped over digital DSM with GPS points marked
5th c. CHANNEL LINE AND BRIDGE
HLC/HLA

- **HISTORIC LANDSCAPE CHARACTERISATION/HISTORIC LAND-USE ASSESSMENT EH/HS**
- Reading today’s landscape as *material culture*
- HLC assesses how past landscape is retained and seen in current landscapes; aims to study and protect present landscape as created by human action and perception
- Concerned with landscapes not sites
- Environment strongly influenced by human activity, living features (woodland, landcover etc) are as part of HLC as archaeological features.
1m Satellite Imagery, Thrace, Turkey
Pilot Historic Landscape Characterisation: Silivri, Thrace (Trakya), Turkey

Legend
- Coastal fields
- Horticulture
- Industrial
- Marsh
- Meadow
- Modern Fields
- Modern Fields (grid)
- Modern fields based on coastal fields
- Modern fields based on postmedieval fields
- Modern fields based on strip fields
- Orchard
- Other woodland
- Pasture
- Postmedieval fields
- Postmedieval fields based on coastal fields
- Postmedieval fields based on strip fields
- Quarry
- Recreation
- Rough ground
- Strip fields - medieval
- Strip fields - modern
- Strip fields - postmedieval
- Thracian forest
- Transport
- Urban
- Village
- Villas
- Water

AnastW_07

Scale: 0 0.5 1 2 3 4 5 km

North
Engineering the Byzantine Water Supply of Constantinople 2014-17

Leverhulme Research Trust

Jim Crow, Martin Crapper, Simon Smith, Riley Snyder, Kate Ward and Francesca Rugeri

University of Edinburgh
DTM Istanbul showing water features (after Kleiss) Mark Jackson 1996
Vertical scale x 2
Kate Ward Istanbul DTM
Length of the Water Supply of Constantinople Over Time

- **130 AD**: 1st c. Phase
- **373 AD**: 2nd c. Phase
- **c. 430 AD**: 4th c. Phase
- **626 AD**: 5th c. Phase
- **767 AD**: 16th c. Phase
- **Late Byzantine**: 12th c. Phase
- **Early Ottoman**: 5th c. Phase
COMPARATIVE AQUEDUCT STATISTICS
(all gravity fed)

Rome
- aqua Marcia: 91 km
- Anio novus: 87 km
- Total (11 aqueducts): 502 km
- Köln: 95 km
- Carthage: 132 km
- Pergamon (Kaius): 50 km
- Naples-Pompeii (aqua Augusta): 140 km

New York
- Old Croton (1842): 66 km
- Catskills (1916): 262 km

Constantinople: 501 km
TOTAL VOLUME OF PRIMARY BUILDING MATERIALS

1.36 million m$^3$
Structural Stone

3.17 million m$^3$

1.14 million m$^3$
Mortar

2.5 million m$^3$
quarried stone

456 Regulation Olympic Swimming Pools
Labour

• Without taking planning and logistics into consideration:
  – 4\textsuperscript{th}-century line required \textbf{11.3 million} man-days
  – 5\textsuperscript{th}-century line required \textbf{21.0 million} man-days

• To put these figures into perspective:
  – With a workforce of 2000 people, it would take almost \textbf{29 years} to build the 5\textsuperscript{th}-century line
    • Working 12 hour days
    • Every day of the year
    • No allowance for design and planning
    • Supply and demand are perfectly balanced
What we almost know

- Workforce: non-slave, skilled and unskilled
- Workforce organized by guild/workshop

- Construction divided into simultaneously built sections
- Construction processes
Demand
Kate Ward
Abb 303 pp268 Müller-Wiener Bildlexikon zur Topographie von Istanbul
Population distribution

Early-mid 5th Century
Early >10th
Middle >13th
Late →16th

Chora
Kyriake
Kastro
Apalirou

Chatzidakis 1989
M. Xenakis
Apalirou Kastro, Naxos
KASTRO APALIROU
landscape around fortress/town of Kastro Apalirou

Church of St John the Theologian Adissarou
St John the Theologian
Adissarou
Chatzidakis 1989

St John the Theologian
Adissarou
St John the Theologian, Adissarou
Naxos, Greece
Pilot historic landscape characterisation


“The landscapes like ours were created, and survive through the efforts of nobodies... the real history of the landscape should be the history of nobodies.”

-James Rebanks, *The Shepard’s Life*