

# **‘IN THE SHADOWS OF A GIANT’**

## **A GIS-led Spatial Analysis of Saronic Gulf Coastscapes (Greece) from Early Bronze II–Late Bronze Age IIIA.**

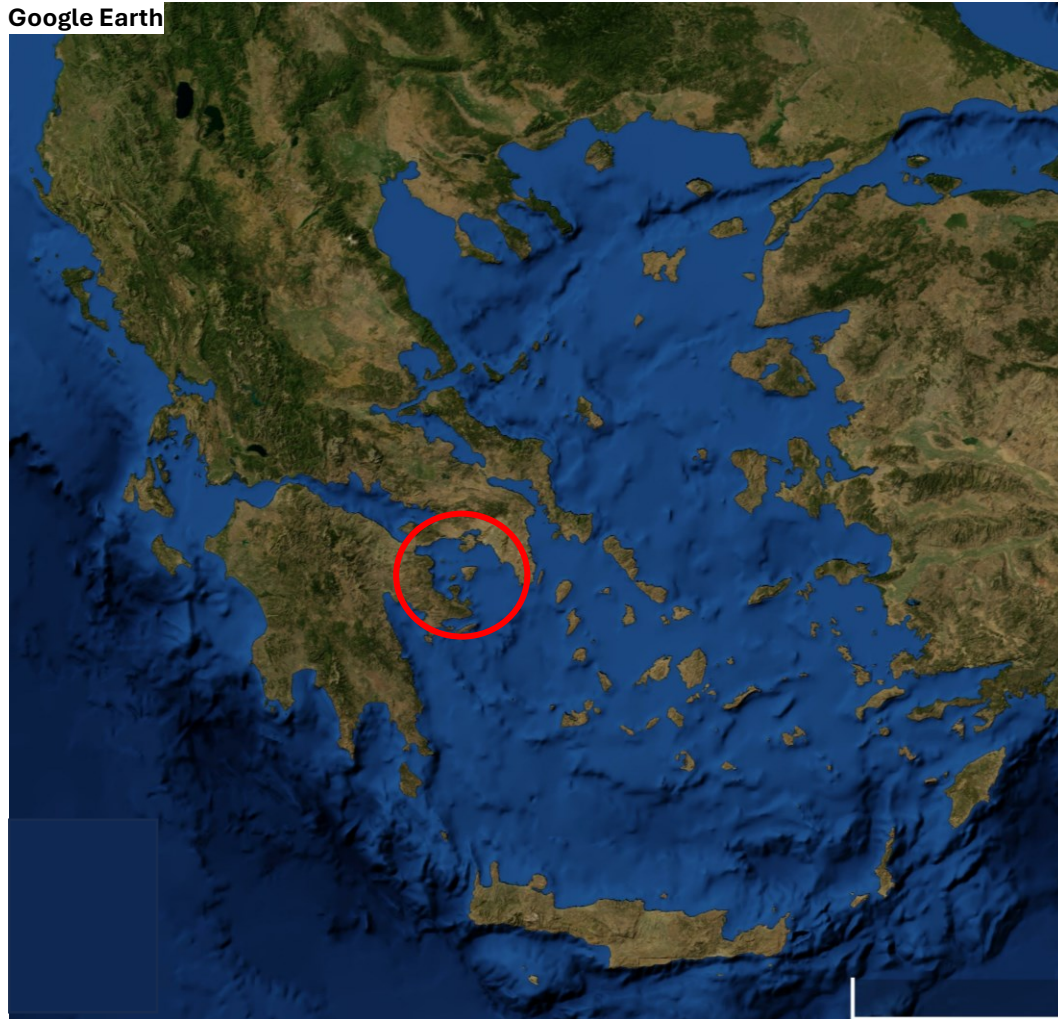


**EAA 2023 Belfast: Session 92 Marginal Landscapes and Coastal Adaptations during Prehistory**

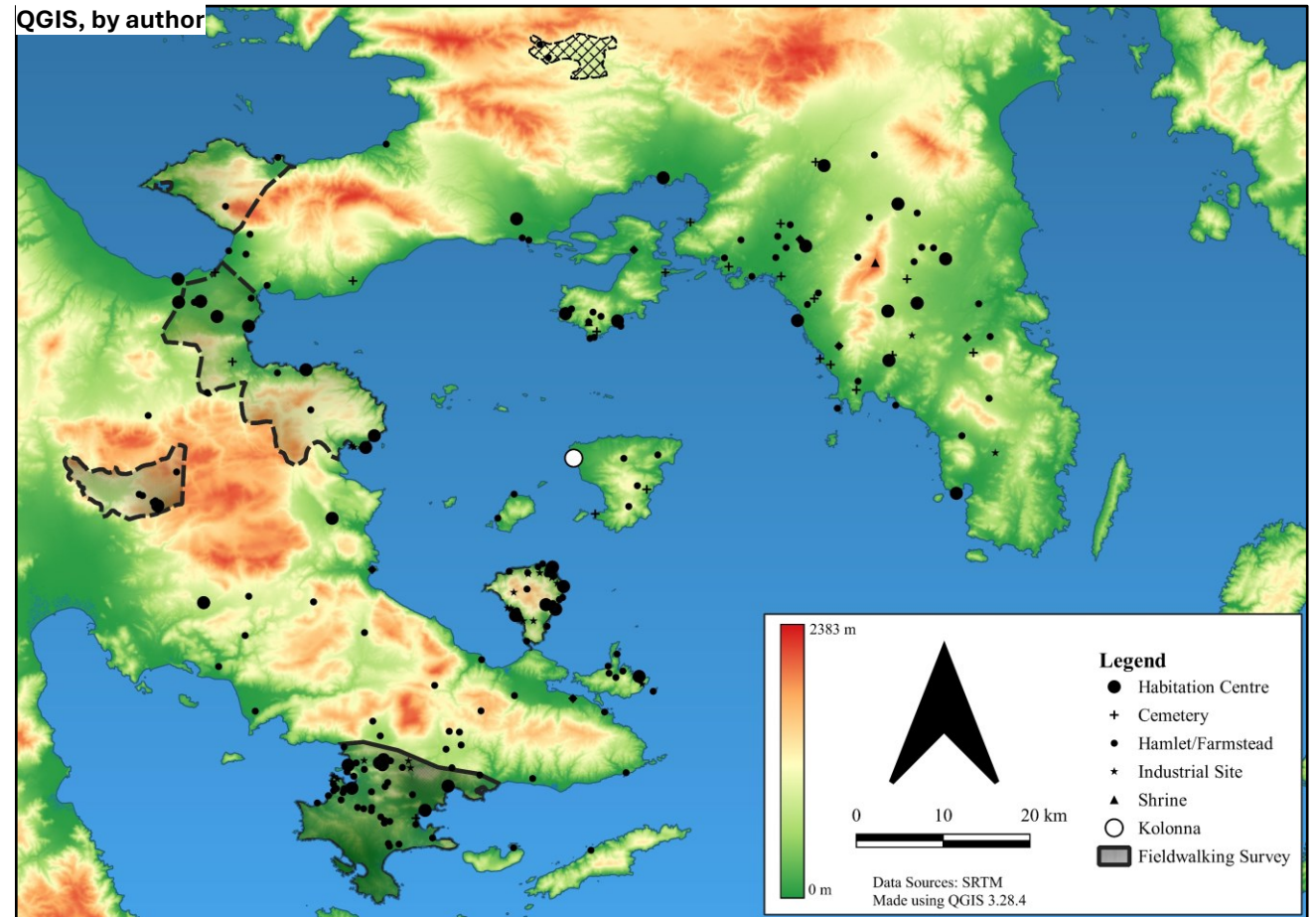
Christopher Nuttall, Postdoctoral Researcher  
Swedish Institute at Athens &  
National and Kapodistrian University of Athens

# SARONIC GULF

Google Earth



QGIS, by author



Study area

# KOLONNA (AEGINA)

By author



Kolonna

After Wild et al. 2010, table 3

| Cultural period, conventional (high) (a)<br>and historical chronology (b)                     | Settlement<br>Phase                     | Ceramic<br>Phase                         | Research<br>Areas |   |   |   | Imports<br>First Appearance                                                            |
|-----------------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------|-------------------|---|---|---|----------------------------------------------------------------------------------------|
|                                                                                               |                                         |                                          | 1                 | 2 | 3 | 4 |                                                                                        |
| Neol to<br>EH I                                                                               | I                                       | Phase A (c)                              |                   |   |   |   |                                                                                        |
| EH II<br>a: EBA II Late: 2450/2350 to 2200/2150 BC                                            | II<br>III<br>III (Rebuild.)             | Phase B<br>Phase C<br>Phase C            |                   |   |   |   |                                                                                        |
| EH III<br>a: EBA III: 2200/2150 to 2050/2000 BC<br>b: EBA III/MBA transition: 2160 to 2025 BC | IV<br>V (Destr.)<br>V (Reconstr.)<br>VI | Phase D<br>Phase E<br>Phase E<br>Phase F |                   |   |   |   | Peloponnese<br>Central Greece<br>Cycladic (schist fabric)<br>Local Cycladic Imitations |
| MH I<br>a: MBA I: 2050/2000 to 1950/1900 BC<br>b: MBA I: 2160/2025 to before 1800 BC          | VI<br>VII<br>VIII<br>VIII A             | Phase G<br>Phase G<br>Phase H<br>Phase H |                   |   |   |   | Lustrous Decorated<br>Minoan, Cycladic (Melos/Thera)                                   |
| MH II<br>a: MBA II: 1950/1900 to 1750/1720 BC<br>b: MBA II: before 1800 to 1700 BC            | IX                                      | Phase I                                  |                   |   |   |   | Local Minoan Imitations                                                                |
| MH III<br>a: MBA III: 1750/1720 to 1680 BC<br>b: MBA III: 1700 to 1600/1580 BC                | X                                       | Phase J                                  |                   |   |   |   |                                                                                        |
| LH I<br>a: LBA I: 1680 to 1600/1580 BC<br>b: LBA I: 1600/1580 to 1510/1485 BC                 | X                                       | Phase K                                  |                   |   |   |   | SE-Aegean                                                                              |
| LH II<br>a: LBA II: 1600/1580 to 1445/1415 BC<br>b: LBA II: 1510/1485 to 1400/1390 BC         |                                         | Phase L                                  |                   |   |   |   |                                                                                        |
|                                                                                               | Hiatus                                  |                                          |                   |   |   |   |                                                                                        |
| LH IIIA<br>a: LBA IIIA: 1445/1415 to 1340/1330 BC<br>b: LBA IIIA: 1400/1390 to 1340/1330 BC   |                                         | Phase M                                  |                   |   |   |   | Cypriote                                                                               |

Stratigraphic sequence at Kolonna

- Analysis start in Early Bronze II (2700 BCE)
- Terminating at the end of Late Bronze IIIA (1300 BCE).
- Long-term trends and incorporating several key societal developments
  - Emergence of long-distance trading networks (EB II)
  - Administration (EB II)
  - Nucleation (MBA)
  - Social stratification (MB III – LB II)
  - Formation of the Mycenaean palaces (LB IIIA).

| Chronology |     | Crete     | Cyclades | Greece       | Egypt                                                      |                                       |
|------------|-----|-----------|----------|--------------|------------------------------------------------------------|---------------------------------------|
| High       | Low |           |          |              |                                                            |                                       |
| 3100       |     |           |          |              |                                                            |                                       |
| 3000       |     |           |          |              |                                                            |                                       |
| 2900       |     | EM I      | EC I     | EH I         | 1 <sup>st</sup> -2 <sup>nd</sup> Dynasty<br>3100/3000-2700 |                                       |
| 2800       |     |           |          |              |                                                            |                                       |
| 2700       |     |           |          |              |                                                            |                                       |
| 2600       |     | EM IIA    |          | EH IIA       |                                                            |                                       |
| 2500       |     |           | EC II    |              | Old Kingdom<br>(2700-2136)                                 |                                       |
| 2400       |     |           |          |              |                                                            |                                       |
| 2300       |     | EM IIB    |          | EH IIB       |                                                            |                                       |
| 2200       |     |           |          |              |                                                            |                                       |
| 2100       |     | EM III    | EC III   | EH III       | 1 <sup>st</sup> Intermediate Period (2136-2023)            |                                       |
| 2000       |     | MM IA     | MC I     | MH I         | Middle Kingdom<br>(2116-1795)                              |                                       |
| 1900       |     | MM IB     |          |              |                                                            |                                       |
| 1800       |     | MM II     | MC II    | MH II        |                                                            |                                       |
| 1700       |     | MM III    | MC III   | MH III       | 2 <sup>nd</sup> Intermediate Period (1795-1540)            |                                       |
| 1600       |     | LM IA     | LC I     | LH I         |                                                            |                                       |
| 1500       |     | LM IB     | LC II    | LH IIA       | New Kingdom<br>(1540-1070)                                 | Hatshepsut/<br>Tutmosis III 1479-1425 |
| 1400       |     | LM II     |          | LH IIB       |                                                            |                                       |
|            |     | LM IIIA1  |          | LH IIIA1     | 18 <sup>th</sup> Dynasty<br>(1540-1295)                    | Amenhotep III 1391-1353               |
|            |     | LM IIIA2  |          | LH IIIA2     |                                                            | Akhenaten 1353-1337                   |
| 1300       |     |           |          |              |                                                            |                                       |
| 1200       |     | LM IIIB   | LC III   | LH IIIB      | 19 <sup>th</sup> Dynasty<br>(1295-1186)                    | Ramses II 1279-1213                   |
| 1100       |     | LM IIIC   |          | LH IIIC      | 20 <sup>th</sup> Dynasty<br>(1186-1070)                    | Ramses III 1184-1153                  |
| 1000       |     | Subminoan |          | Submycenaean |                                                            |                                       |

# DATA COLLECTION

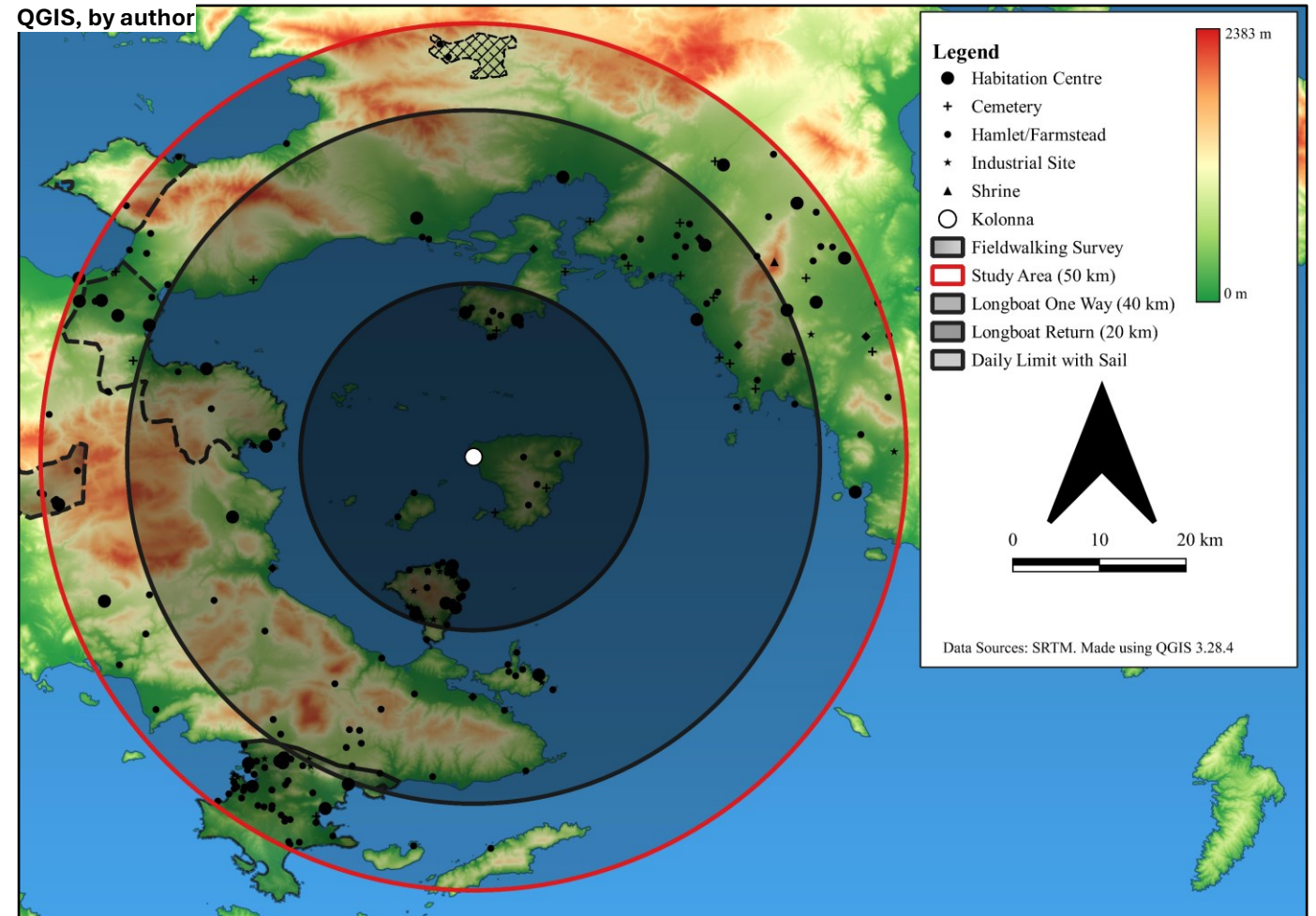
## SITE CLASSIFICATION

- Habitation centres
- Smaller habitation (farmstead/hamlet)
- Cemetery
- Shrine
- Industrial

## FIELDWALKING SURVEYS

- *Methana* (Mee & Forbes 1997)
- *Southern Argolid* (Jameson et al. 1995)
- *Eastern Corinthia* (Tartaron et al. 2006)
- *Mazi Plain* (Fachard et al. 2014)
- *Saronic Harbours (SHARP)* (Tartaron et al. 2011)

## RESCUE ARCHAEOLOGY AND SYNTHETIC SURVEYS



Catchment area and sailing distances

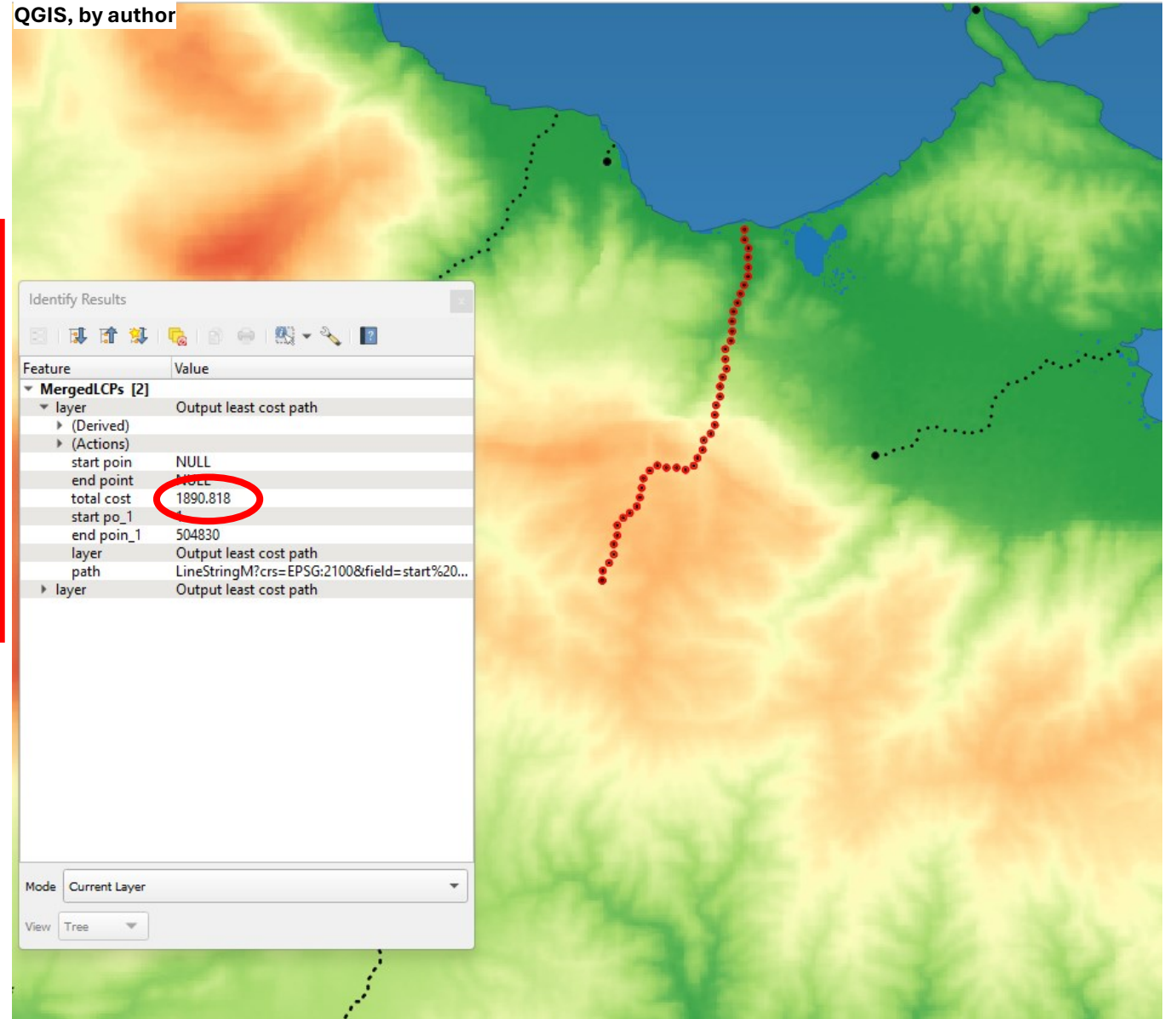
# LIMITATIONS

- Chronological synchronicity from survey data
- Rescue excavation and brevity
- Problematic periods: EH III and MH III-LH I
- Fuzzy chronological labels (e.g., EH, MH or LH).
- Chronological sequencing by chronotype

# METHODOLOGY

| ID | SITE                             | SUBREGION | SOIC? | SIZE | TYPE | RAW     | CV           |
|----|----------------------------------|-----------|-------|------|------|---------|--------------|
| 1  | Acharnai: The Menidi Tholos Tomb | Attica    | No    | NA   | BUR  | 884.873 | <b>30.48</b> |
| 2  | Acropolis of Athens              | Attica    | No    | NA   | HAB  | 556.61  | <b>19.17</b> |
| 3  | Agora (Athens)                   | Attica    | No    | NA   | BUR  | 506.64  | <b>17.45</b> |
| 4  | Aigaleo                          | Attica    | No    | NA   | BUR  | 377.468 | <b>13.00</b> |
| 5  | Alimos                           | Attica    | No    | NA   | FAR  | 325.205 | <b>11.20</b> |

1. Calibration of ancient coastline
2. Geospatial coordinates of site
3. SRTM Digital Elevation Model (DEM)
4. Slope calculation
5. Least cost path function to coastline
6. Conversion of resulting value



Least cost paths

# RESULTS

Median *coastality* (least cost path) *values* for all sites within different chronological phases

|                      | <u>FN-EH I</u> | <u>EH II</u> | <u>EH III</u> | <u>MH</u>   | <u>MH III-LH I</u> | <u>LH II</u> | <u>LH IIIA</u> |
|----------------------|----------------|--------------|---------------|-------------|--------------------|--------------|----------------|
| HABITATION CENTRES   | 4.04           | 6.40         | 1.37          | 6.04        | 3.95               | 2.99         | 4.04           |
| INDUSTRIAL SITES     | 4.24           | 6.11         | —             | —           | —                  | —            | —              |
| HAMLET/FARMSTEAD     | 7.44           | 6.99         | 3.66          | 3.51        | 2.96               | 2.96         | 7.92           |
| BURIAL               | 0.95           | 1.82         | —             | 2.69        | 2.91               | 3.69         | 4.69           |
| HABITATION (GENERAL) | 6.91           | 7.21         | 3.23          | 4.04        | 2.96               | 2.96         | 7.30           |
| NON BURIAL           | 6.60           | 6.74         | 3.23          | 4.04        | 2.96               | 2.96         | 7.30           |
| ALL                  | 6.67           | 6.74         | 3.23          | 4.68        | 2.91               | 2.96         | 7.62           |
| SITE COUNT           | 130            | 146          | 21            | 68          | 37                 | 49           | 117            |
| SOIC                 | 34 (28.33%)    | 47 (32.19%)  | 10 (47.62%)   | 27 (39.71%) | 18 (48.65%)        | 23 (46.94%)  | 22 (18.80%)    |

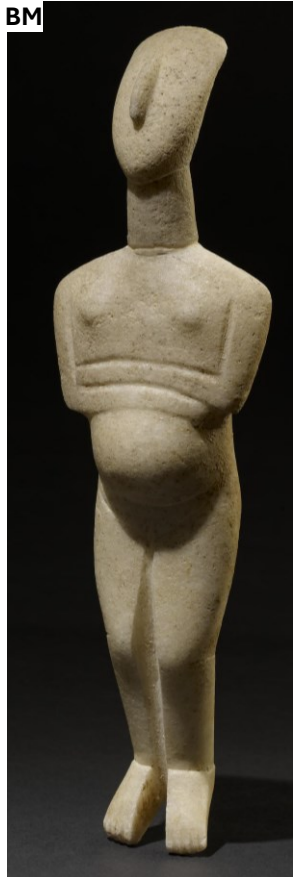
\*SOIC = Sites On the Immediate Coast

# RESULTS: EARLY BRONZE/HELLADIC II (2750 – 2350 BCE)

|                      | <u>FN-EH I</u> | <u>EH II</u> |
|----------------------|----------------|--------------|
| HABITATION CENTRES   | 4.04           | 6.40         |
| INDUSTRIAL SITES     | 4.24           | 6.11         |
| HAMLET/FARMSTEAD     | 7.44           | 6.99         |
| BURIAL               | 0.95           | 1.82         |
| HABITATION (GENERAL) | 6.91           | 7.21         |
| NON BURIAL           | 6.60           | 6.74         |
| ALL                  | 6.67           | 6.74         |
| SITE COUNT           | 130            | 146          |
| SOIC                 | 34 (28.33%)    | 47 (32.19%)  |

- Median *coastality value* for habitation centres increases **58.42%**
- Lower median *coastality value* for burials - greater use of coastal zone for burial

# AN INTERNATIONAL SPIRIT?



## Objects of Intra-Aegean Exchange



Konsolaki-Yiannopoulou 2019, fig. 2

## KAVOS VASIL (POROS) Fortified EB II Sites



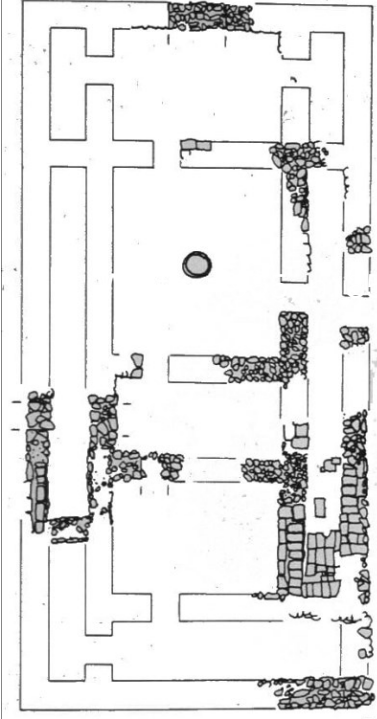
Lolos 2011, fig. 16

## LYKOPOULOU (SALAMIS)

BM = British Museum NAM= National Archaeological Museum Athens

# EARLY BRONZE/HELLADIC II KOLONNA

Rutter – Aegean Prehistory Dartmouth



Walter 1985, p. 85



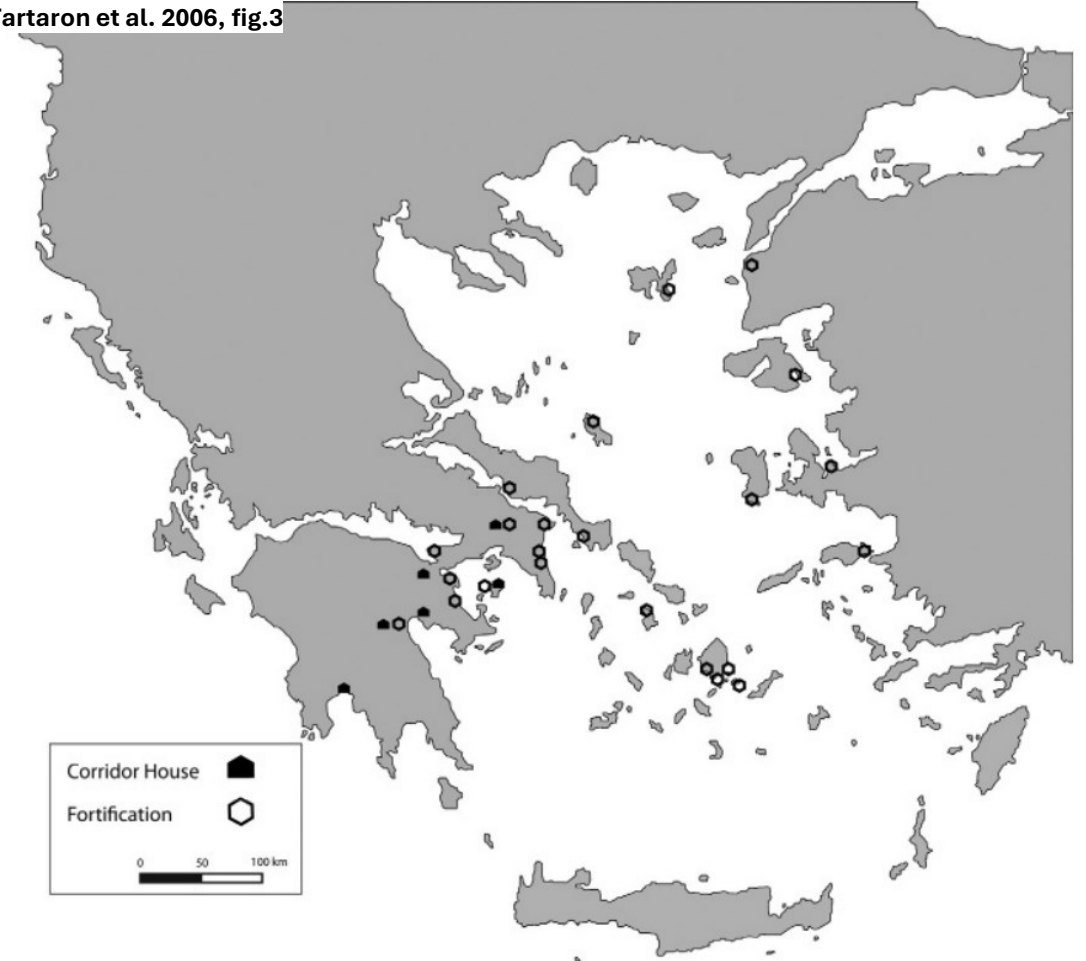
“Weisses Haus”  
Kolonna – Corridor  
House

Konsolaki-Yiannopoulou 2019, fig. 37



Andesite tools

Tartaron et al. 2006, fig.3



Corridor House distribution

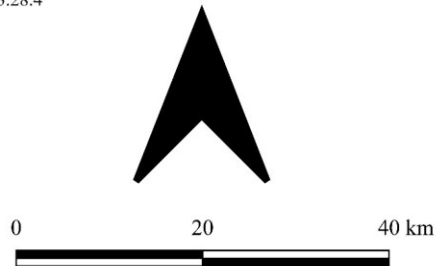
# EB/EH II COASTAL CEMETERIES



Data Sources: SRTM. Made using QGIS 3.28.4

## Legend

Cemetery +



Asteria Glyfada,  
Delpriza Kranidi  
and Ayios  
Kosmas

Kaza-Papageorgiou 2020, fig. 2



Google Earth

Asteria Glyfada

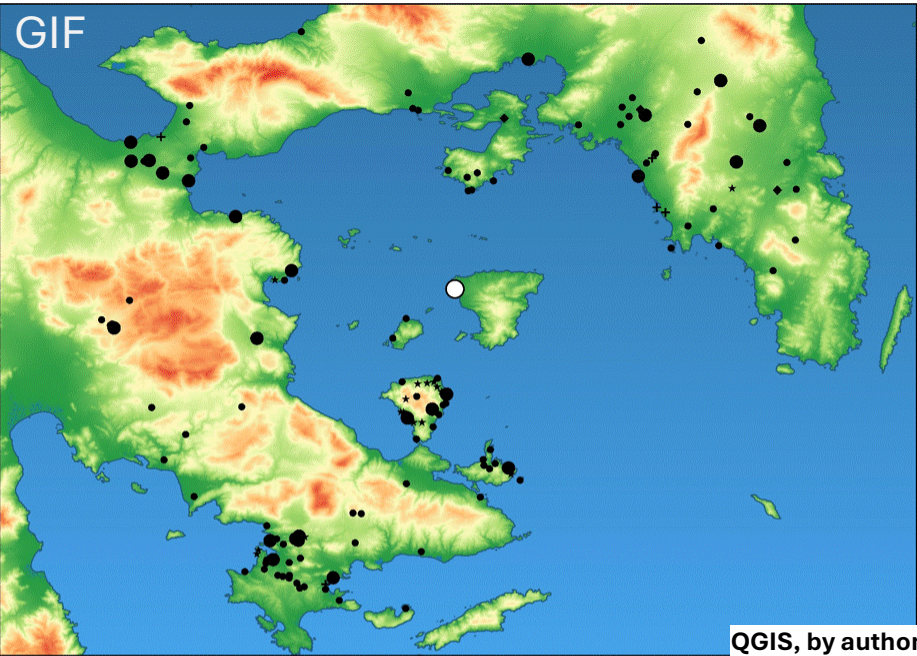
# RESULTS: EARLY BRONZE/ HELLADIC III (2350 – 2050 BCE)

|                             | <u>EH II</u>       | <u>EH III</u>      |
|-----------------------------|--------------------|--------------------|
| <b>HABITATION CENTRES</b>   | <b>6.40</b>        | <b>1.37</b>        |
| <b>INDUSTRIAL SITES</b>     | <b>6.11</b>        | –                  |
| <b>HAMLET/FARMSTEAD</b>     | <b>6.99</b>        | <b>3.66</b>        |
| <b>BURIAL</b>               | <b>1.82</b>        | –                  |
| <b>HABITATION (GENERAL)</b> | <b>7.21</b>        | <b>3.23</b>        |
| <b>NON BURIAL</b>           | <b>6.74</b>        | <b>3.23</b>        |
| <b>ALL</b>                  | <b>6.74</b>        | <b>3.23</b>        |
| <b>SITE COUNT</b>           | <b>146</b>         | <b>21</b>          |
| <b>SOIC</b>                 | <b>47 (32.19%)</b> | <b>10 (47.62%)</b> |

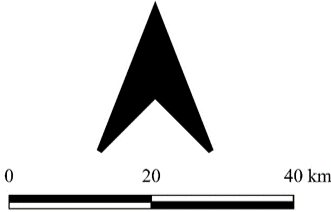
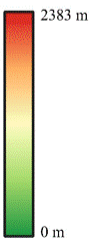
| REGION  |            | <u>EH II</u> | <u>EH III</u> |
|---------|------------|--------------|---------------|
| ARGOLIS | HABITATION | 8.73         | 2.91          |
|         | BURIAL     | 1.82         | –             |
|         | <b>ALL</b> | <b>7.88</b>  | <b>2.91</b>   |

- Drastic reduction in median *coastality value* for habitation centres (**78.59%**)
- Significant reduction in median *coastality value* for smaller habitation sites (**47.64%**)
- Extramural cemeteries entirely disappear
- Southeastern Argolid – median *coastality value* drops considerably (**66.66%**)

# EB/EH III: A TIME OF CRISIS?



Data Sources: SRTM. Made using QGIS 3.28.4

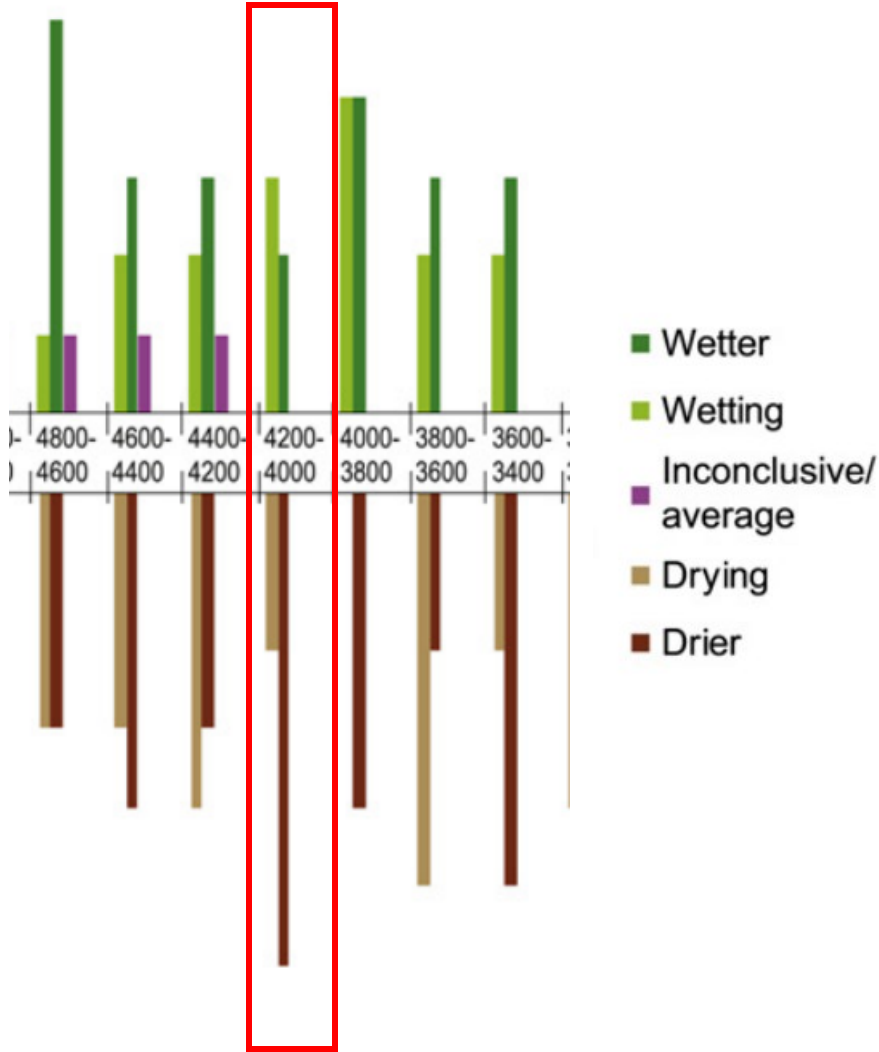


## Legend

- Habitation Centre ●
- Cemetery +
- Hamlet •
- Industrial Site \*
- Shrine ▲

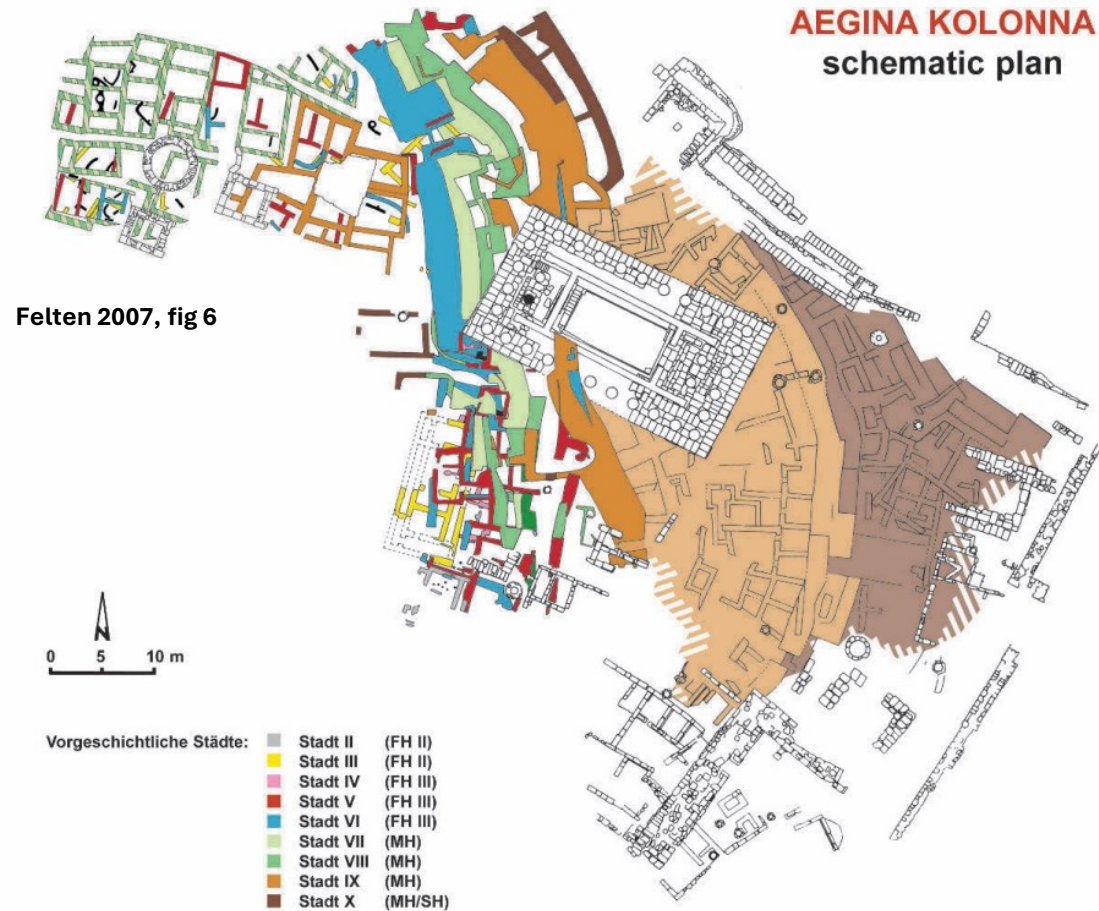
Early Helladic II

Adapted from Finne et al. 2011, fig. 6



Drier conditions in Early Bronze III

# EARLY BRONZE/HELLADIC III KOLONNA



Kolonna

Reinhold 2003, fig 165



Gold disk pendant  
(EB III) from Kolonna

# RESULTS: MIDDLE BRONZE/HELLADIC (2050 – 1800 BCE)

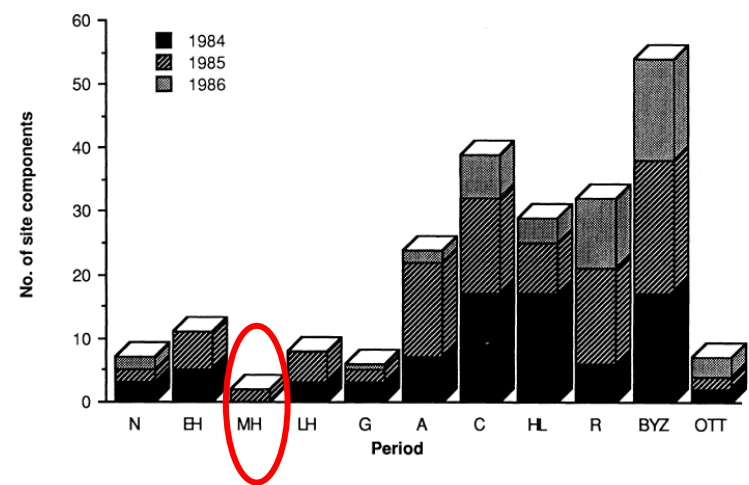
|                      | <u>EH III</u> | <u>MH</u>   |
|----------------------|---------------|-------------|
| HABITATION CENTRES   | 1.37          | 6.04        |
| INDUSTRIAL SITES     | –             | –           |
| HAMLET/FARMSTEAD     | 3.66          | 3.51        |
| BURIAL               | –             | 2.69        |
| HABITATION (GENERAL) | 3.23          | 4.04        |
| NON BURIAL           | 3.23          | 4.04        |
| ALL                  | 3.23          | 4.68        |
| SITE COUNT           | 21            | 68          |
| SOIC                 | 10 (47.62%)   | 27 (39.71%) |

| REGION |            | <u>EH III</u> | <u>MH</u> |
|--------|------------|---------------|-----------|
| ATTICA | HABITATION | 11.50         | 15.20     |
|        | BURIAL     | –             | 16.28     |
|        | ALL        | 11.50         | 15.71     |

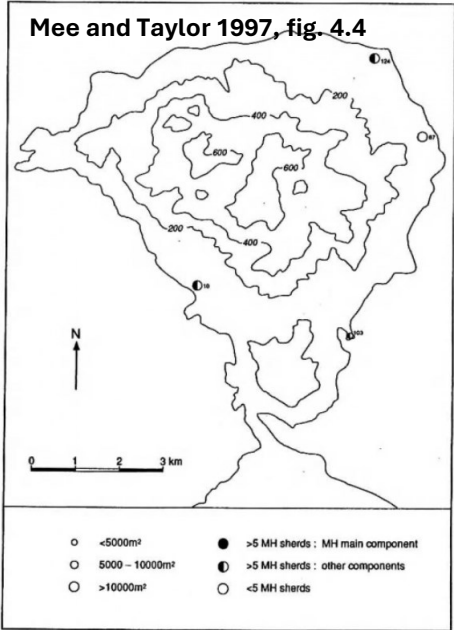
- Median coastality value for habitation centres increases **340.88%**
- Smaller sites follow EH III patterns
- Extramural burial is archaeologically detectable again
- In southwestern and southern Attica, there is an increase in the median CV for habitation

# MIDDLE BRONZE/HELLADIC NUCLEATION

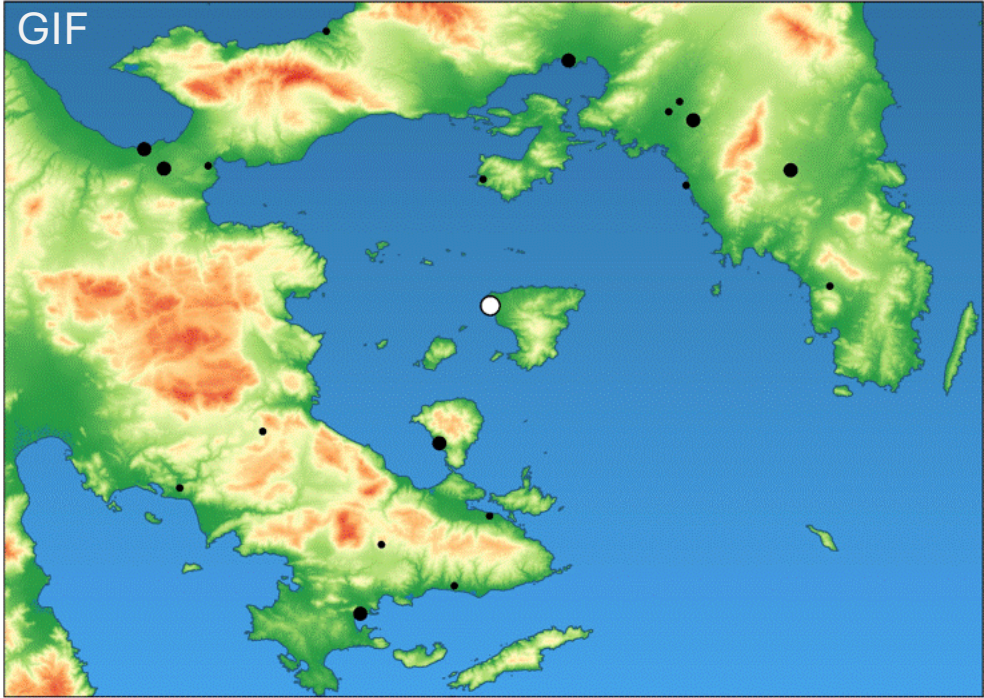
Wright et al. 1990, fig. 11



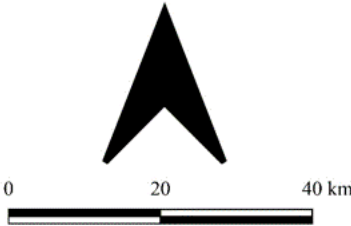
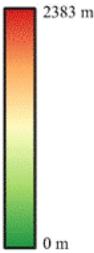
Nemea Valley Survey



Methana  
Survey Project



Data Sources: SRTM. Made using QGIS 3.28.4



- Legend
- Habitation Centre ●
  - Cemetery +
  - Hamlet •
  - Industrial Site ★
  - Shrine ▲

Early Helladic III

# A MARITIME CENTRE?



“Aegina Treasure”



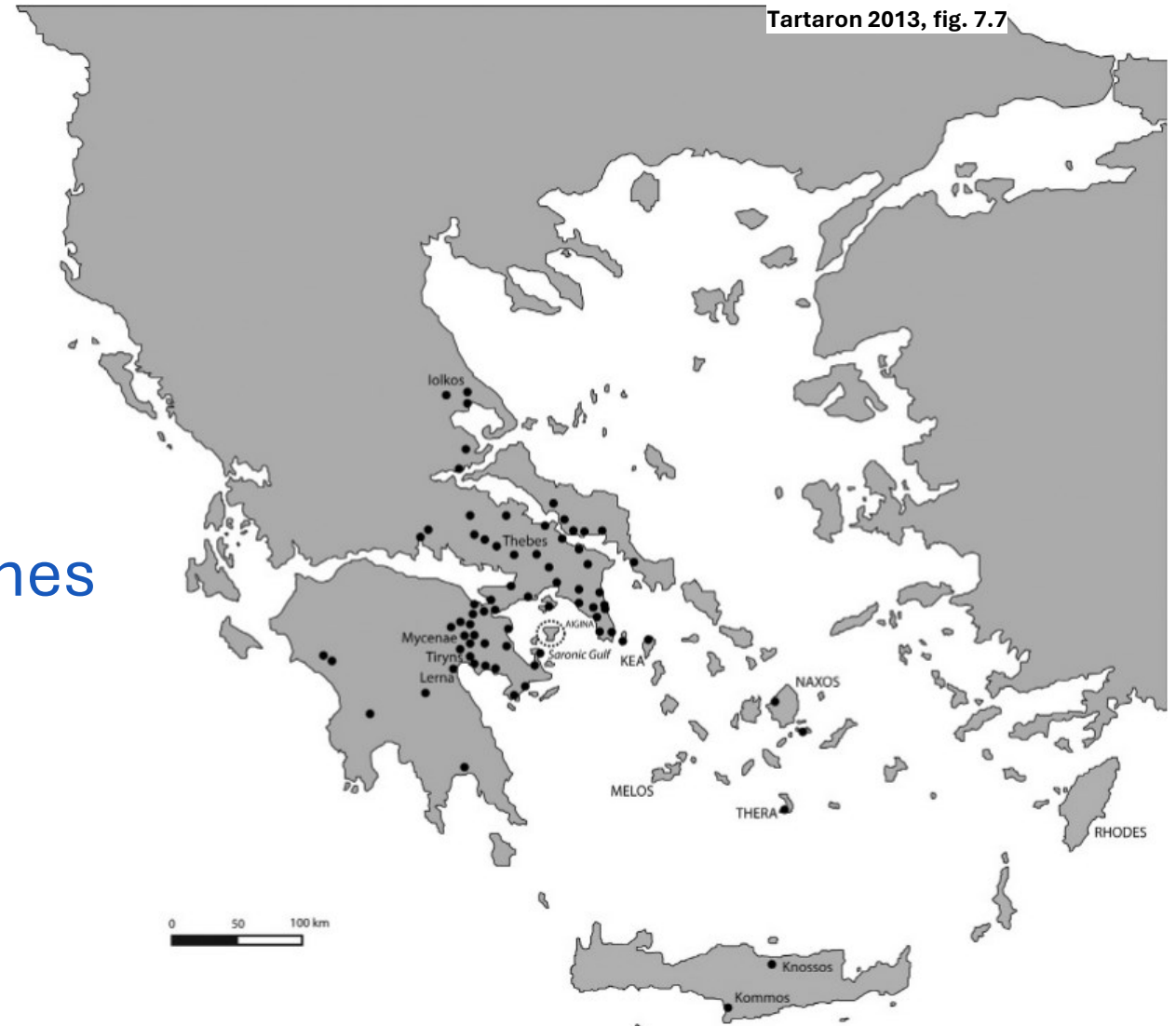
Siedentopf 1991, pl. 38. 162

Seafaring scenes



Gauss 2020, fig. 9: A

Matt-painted pottery



Distribution of Aeginetan pottery

# FORTIFIED DEFENSIVE SITES

## Megali Magoula, Galatas



<https://exploringgreece.tv/greece/attica/agios-nikolaos-anavyssos-beach-beautifies-attica/58305/>



## Ayios Nikolaos, Anavyssos

Also, Sklavos and Kanakia (Salamis), Palaikastro and Oga (Methana) and Ermioni Magoula (Hermionid)

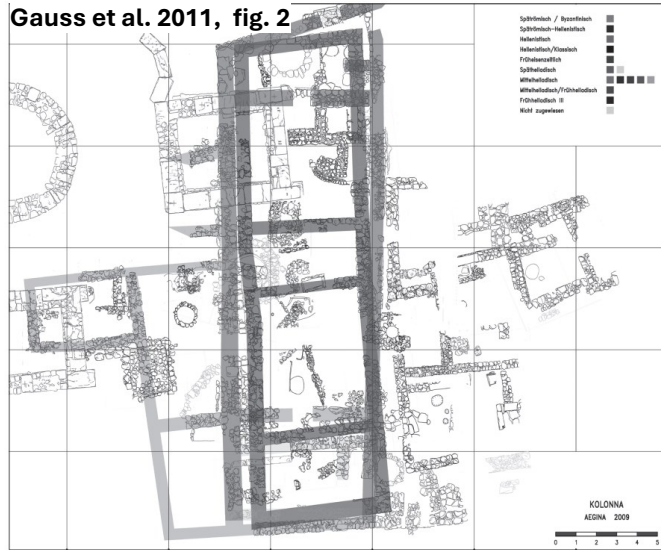
# RESULTS: MIDDLE BRONZE/HELLADIC III – LATE HELLADIC II (1800 – 1500 BCE)

|                      | <u>MH</u>   | <u>MH III-LH I</u> | <u>LH II</u> |
|----------------------|-------------|--------------------|--------------|
| HABITATION CENTRES   | 6.04        | 3.95               | 2.99         |
| INDUSTRIAL SITES     | –           | –                  | –            |
| HAMLET/FARMSTEAD     | 3.51        | 2.96               | 2.96         |
| BURIAL               | 2.69        | 2.91               | 3.69         |
| HABITATION (GENERAL) | 4.04        | 2.96               | 2.96         |
| NON BURIAL           | 4.04        | 2.96               | 2.96         |
| ALL                  | 4.68        | 2.91               | 2.96         |
| SITE COUNT           | 68          | 37                 | 49           |
| SOIC                 | 27 (39.71%) | 18 (48.65%)        | 23 (46.94%)  |

- Great deal of continuity from the MH to LH II
- The median *coastality value* is lower for both habitation centres and smaller sites
- Contemporary with the Shaft Graves at Mycenae

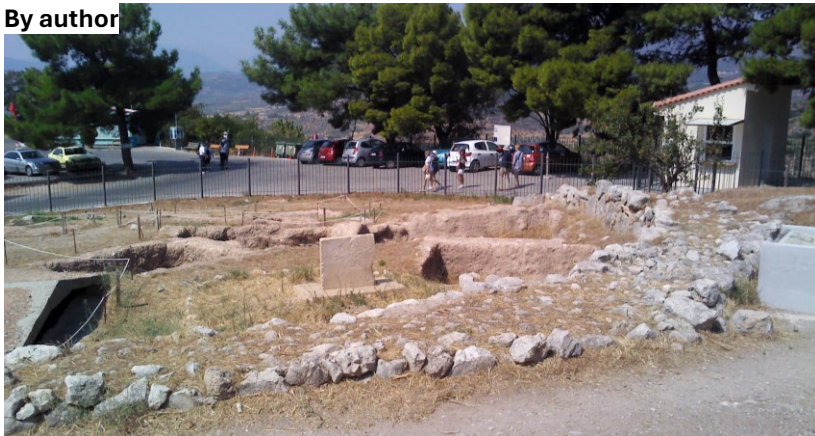
# SARONIC: SHAFT GRAVE ERA

Gauss et al. 2011, fig. 2



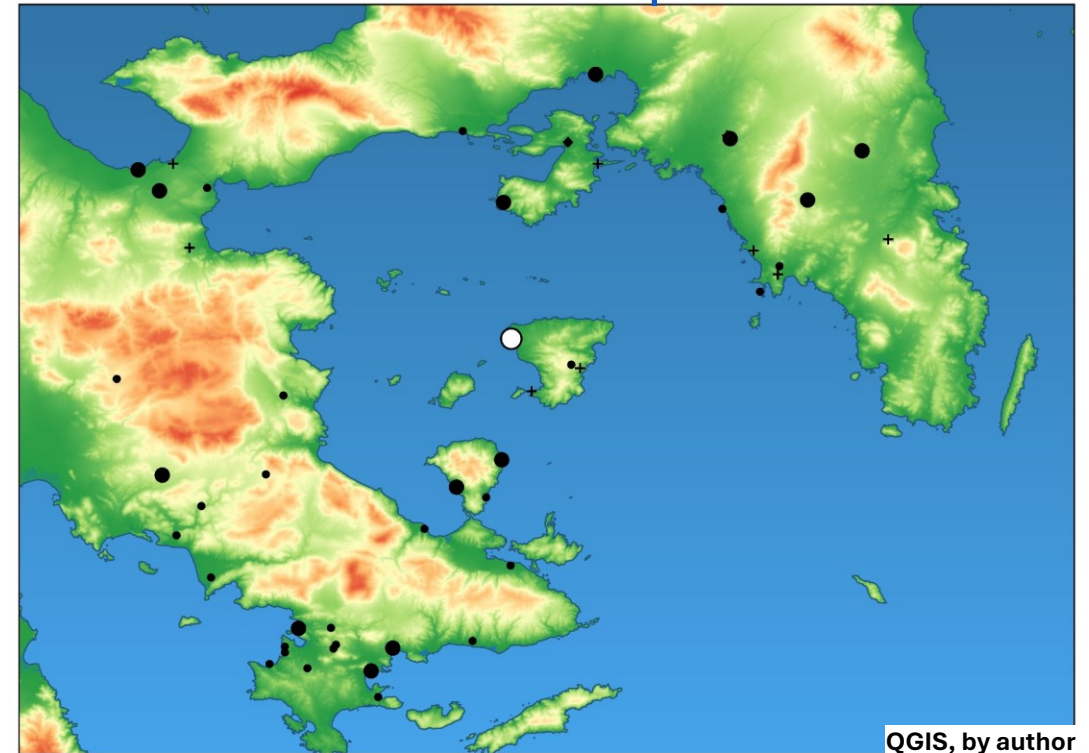
Large building  
complex, Aegina

By author



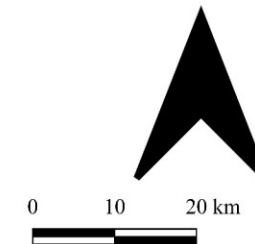
Grave Circle B,  
Mycenae

Growth at Eleusis, Kanakia and  
Athens Acropolis



QGIS, by author

Data Sources: SRTM. Made using QGIS 3.28.4



## Legend

- Habitation Centre ●
- Cemetery +
- Hamlet •
- Industrial Site ★
- Shrine ▲

MH III – LH II distribution

# SARONIC NETWORKS



Tholos 3 (MB III-LB I) at Megali Magoula, Galatas

Cretan form? – Konsolaki-Yiannopoulou 2010

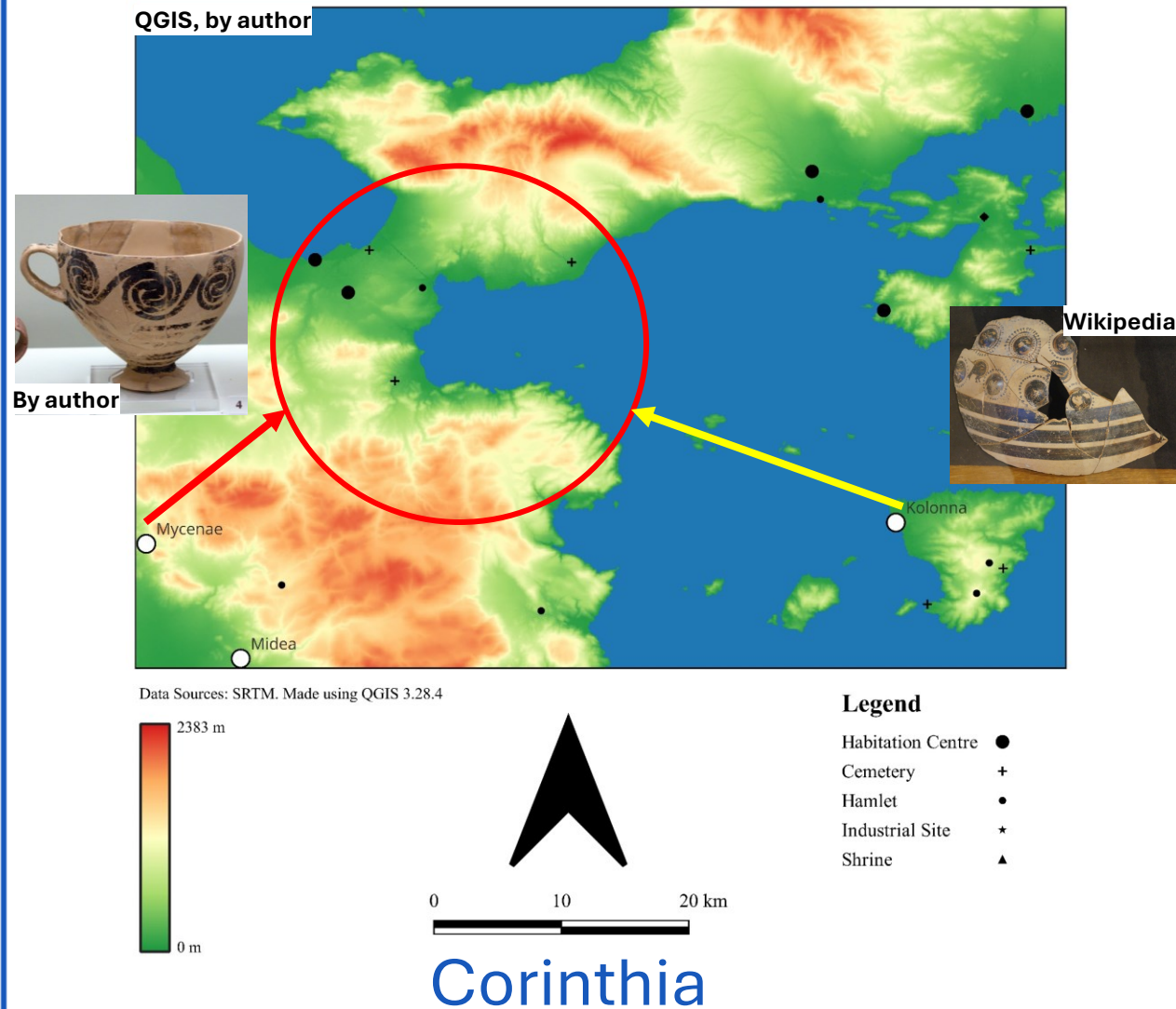
Aeginetans at Ayia Irini on Kea? Crego 2007



Aeginetan matt-painted pottery found at: Megali Magoula, Galatas, Athens, Eleusis, Ayios Kosmas and Kiapha Thiti



# EXTERNAL COMPETITION



LH II tholos tomb at Megali  
Magoula, Galatas

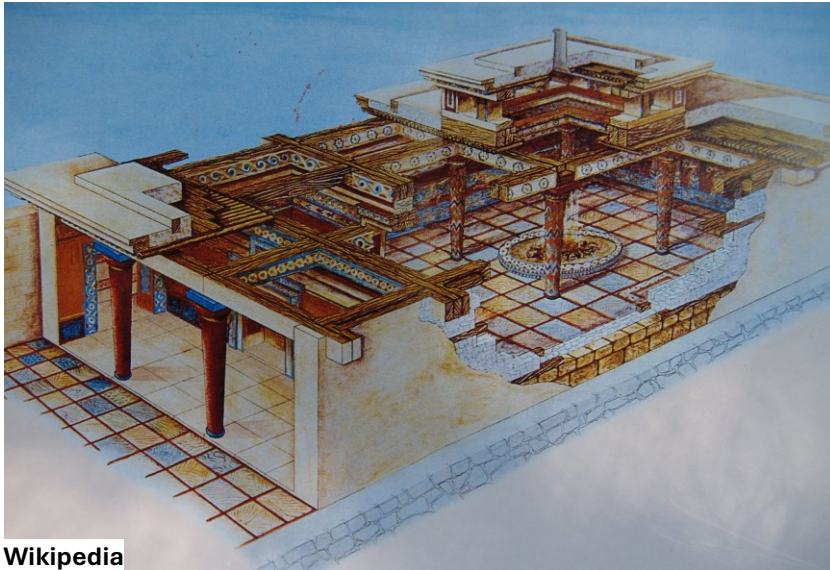
# RESULTS: LATE BRONZE/HELLADIC IIIA (1400 – 1300 BCE)

|                      | <u>LH II</u> | <u>LH IIIA</u> |
|----------------------|--------------|----------------|
| HABITATION CENTRES   | 2.99         | 4.04           |
| INDUSTRIAL SITES     | —            | —              |
| HAMLET/FARMSTEAD     | 2.96         | 7.92           |
| BURIAL               | 3.69         | 4.69           |
| HABITATION (GENERAL) | 2.96         | 7.30           |
| NON BURIAL           | 2.96         | 7.30           |
| ALL                  | 2.96         | 7.62           |
| SITE COUNT           | 49           | 117            |
| SOIC                 | 23 (46.94%)  | 22 (18.80%)    |

- Increase in median *coastality value* for habitation centres (**35.12%**)
- More sites identifiable - expansion of habitation (**49 – 117**)
- Proportion of sites on the immediate coast drops (**18.80%**)

# LATE BRONZE/HELLADIC III

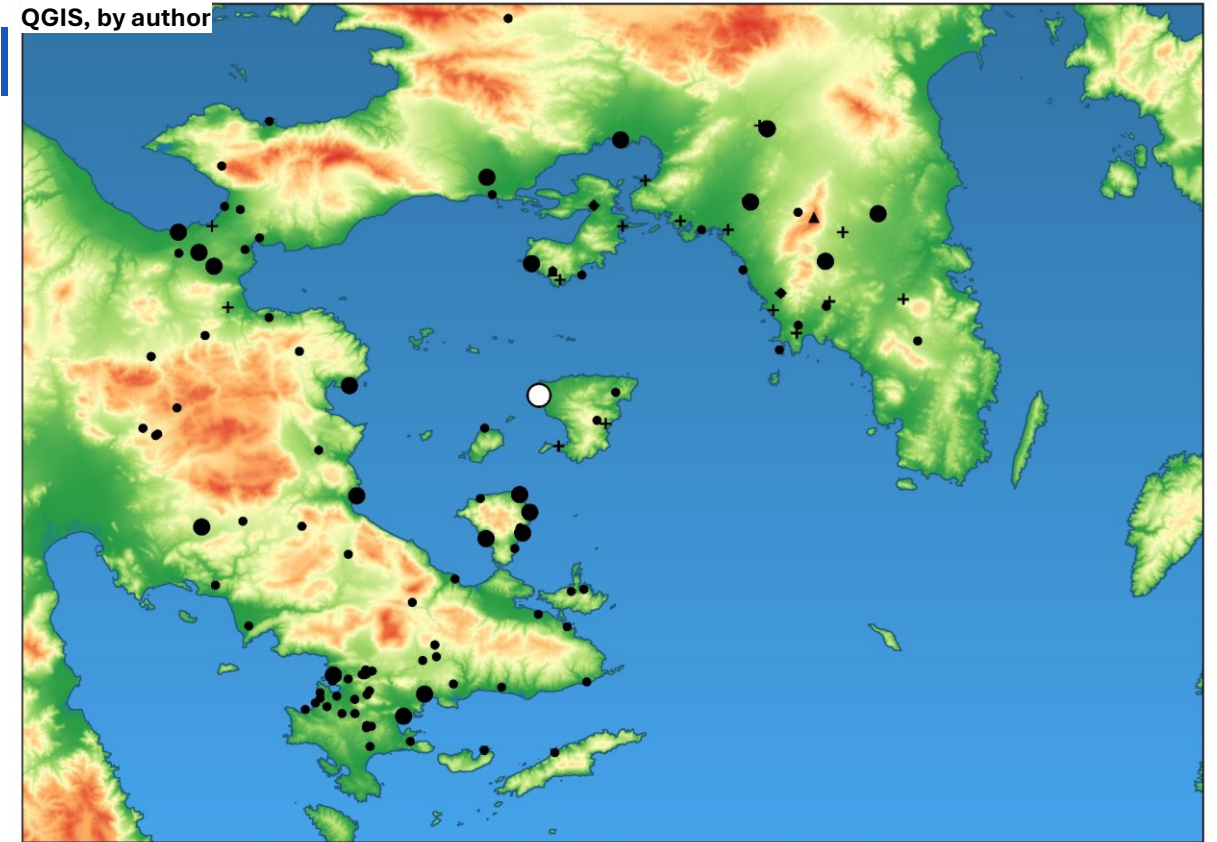
- Greater habitation of inland space
- Societal shift towards a more terrestrial, inland focus.
- 'Filling-in' of the landscape, seen elsewhere across the Peloponnese, stimulated by the economic needs of the Mycenaean palaces and stability



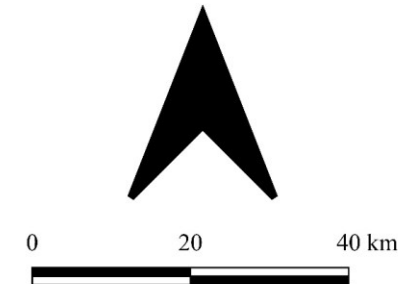
Wikipedia

Mycenaean  
Palace

QGIS, by author



Data Sources: SRTM. Made using QGIS 3.28.4



## Legend

- Habitation Centre ●
- Cemetery +
- Hamlet •
- Industrial Site ★
- Shrine ▲

# AYIOS IOANNIS KAZARMA

Wikipedia



Kazarma  
tholos

Wikipedia

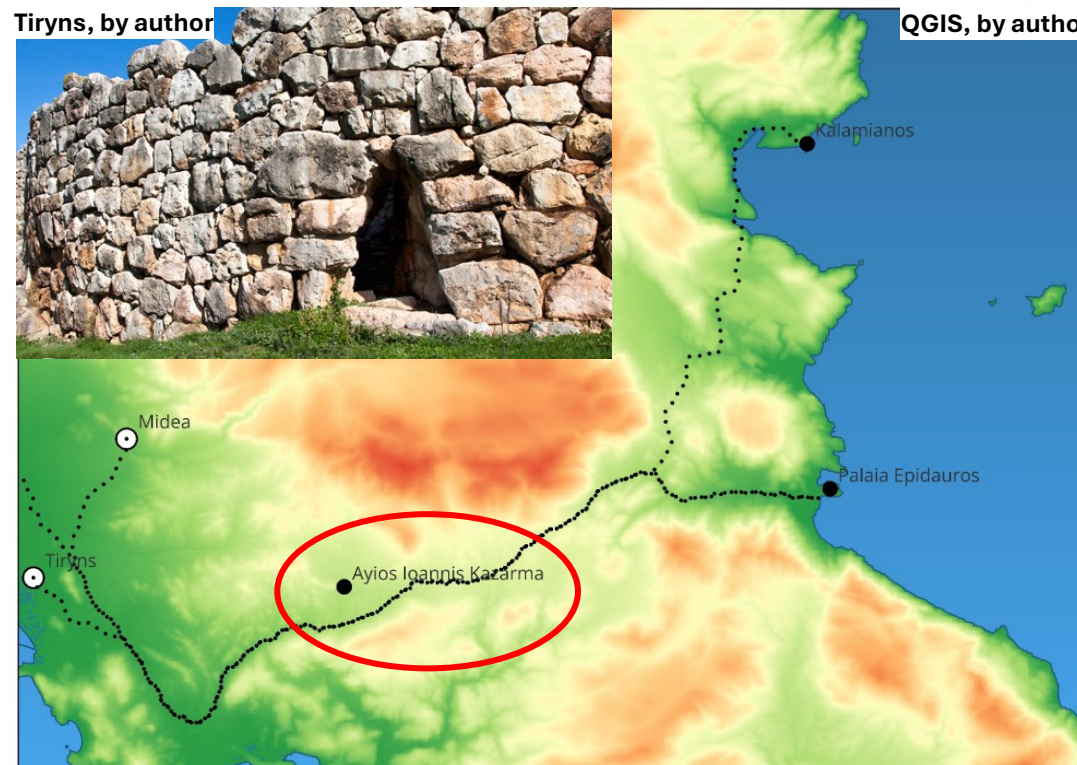


Kazarma  
bridge

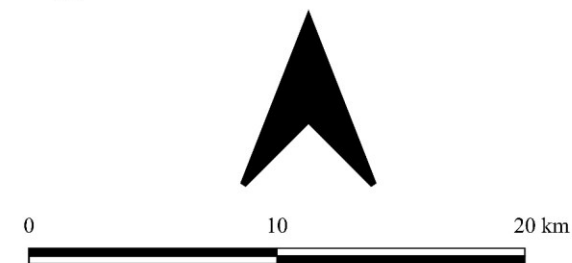
Tiryns, by author



QGIS, by author



Data Sources: SRTM. Made using QGIS 3.28.4



## Legend

- Habitation Centre ●
- Cemetery +
- Hamlet •
- Industrial Site \*
- Shrine ▲
- Least Cost Path ....

Inland route (Least cost  
path) to the coast

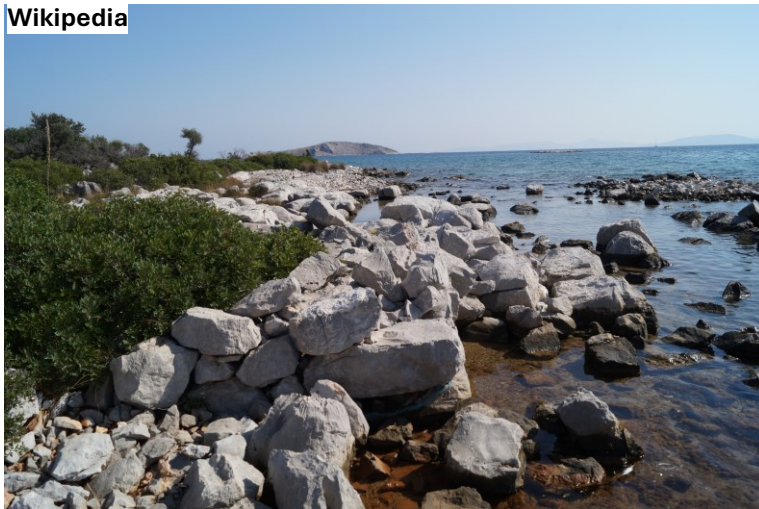
# KALAMIANOS

Wikipedia



Mycenaean  
bridge –  
Berbati-Limnes

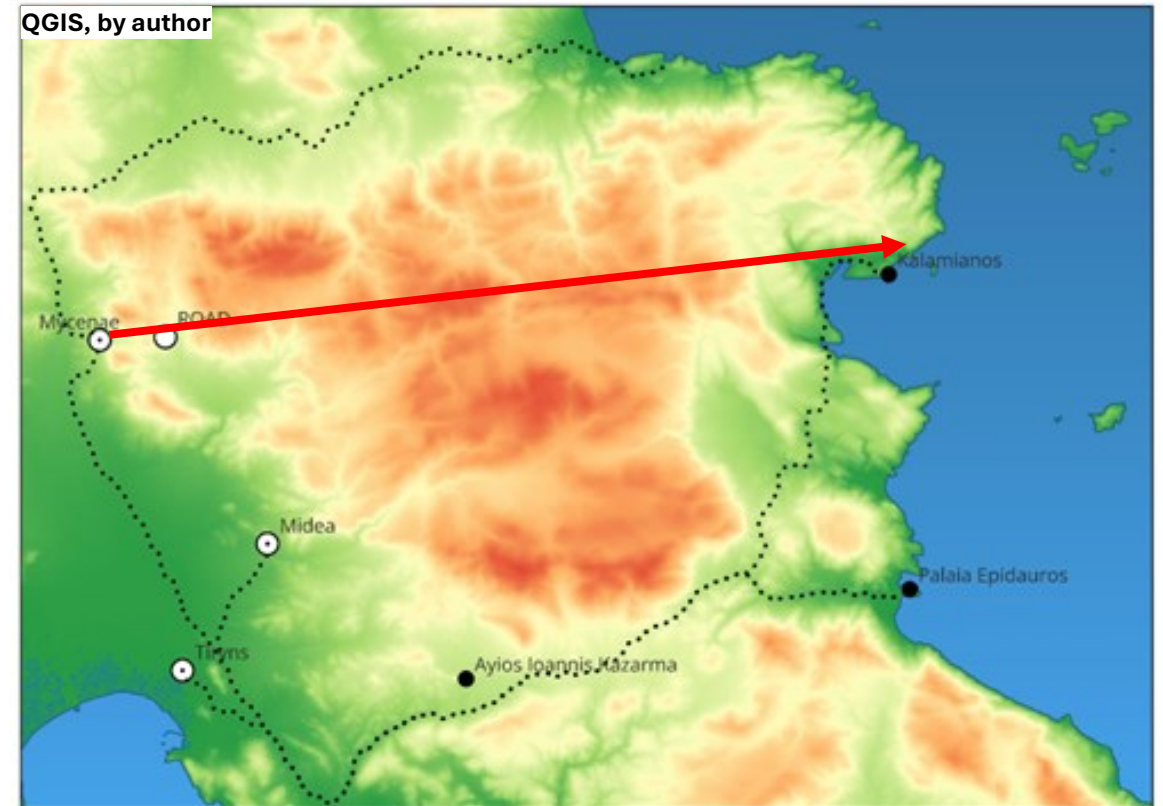
Wikipedia



Kalamianos

Mycenaean control over Saronic by LB III? – Tartaron 2013; Konsolaki-Yiannopoulou 2010

QGIS, by author



Data Sources: SRTM, Made using QGIS 3.28.4



## Legend

- Habitation Centre ●
- Cemetery +
- Hamlet •
- Industrial Site \*
- Shrine ▲
- Least Cost Path ....

Least-cost paths from the Argolid to  
the Saronic coast

# SARONIC COASTSCAPES

- Kolonna dominant in Saronic power dynamics between EB III and LB II
- Localised interest in agricultural produce
- Seafaring centre in the MBA
- Enterprise, exchange and coercive threat
- Decentralised power contemporary with a reorientation of Minoan contact
- Competition with Mycenae and loss of prominence



Large pithos (Storage) with seafaring scenes

# FINAL WORD

- Coastscapes integral to chronological developments
- EB III and MB III-LHB II more coastally focused
- EB II and LB IIIA less coastally focused
- The MBA lies somewhere between the two extremes
- However – greater coastality not connected to intensive maritime contact – connected to social challenges and change

By author



Saronic coast from Kolonna

# Thank you for your attention!

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Special thanks to:



Swedish  
Research  
Council



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—EST. 1837—