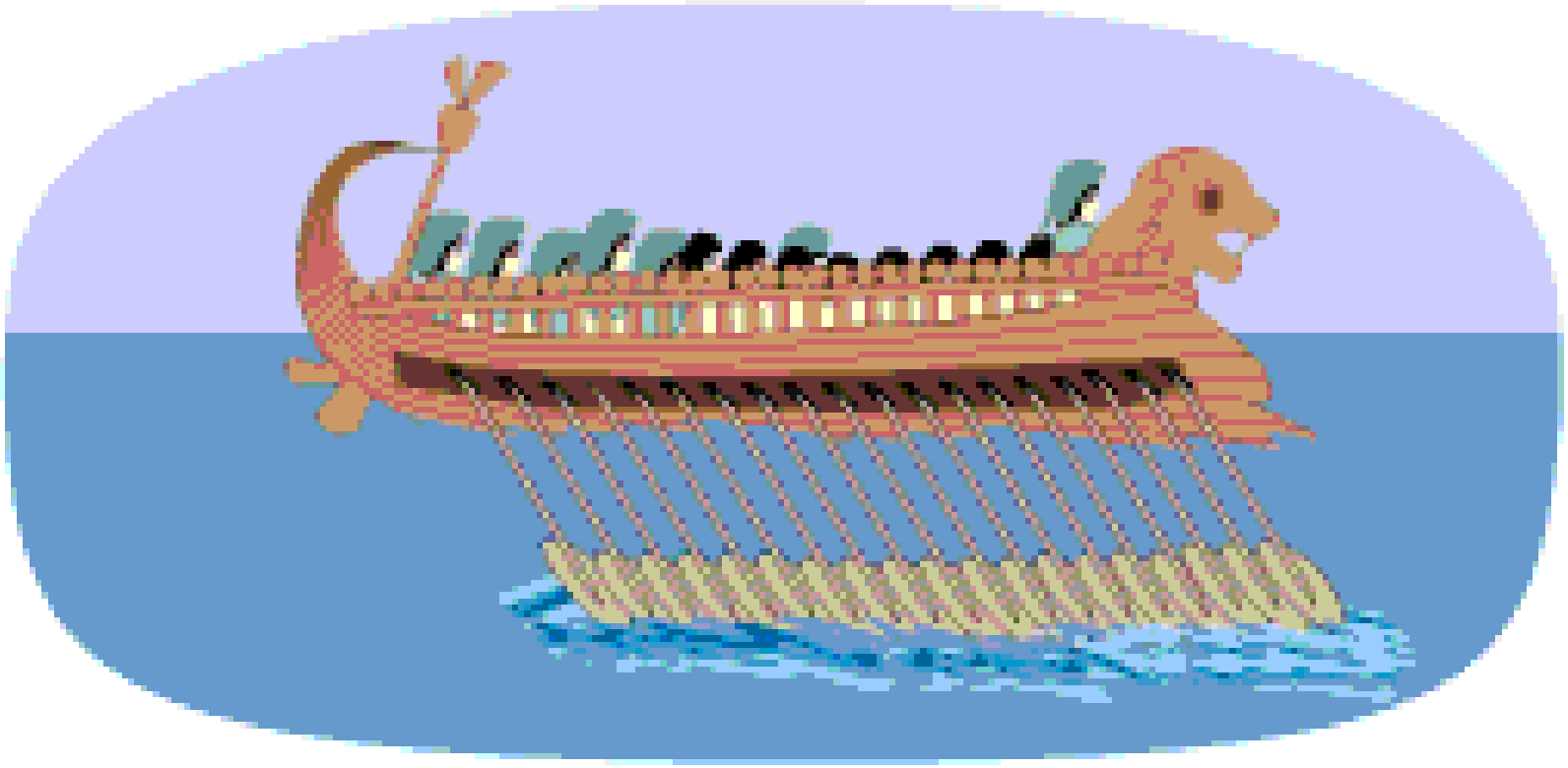
Geoarchaeology in Sicily



Dr. Chad Heinzel
University of Northern Iowa
Associate Professor Earth and Environmental Science

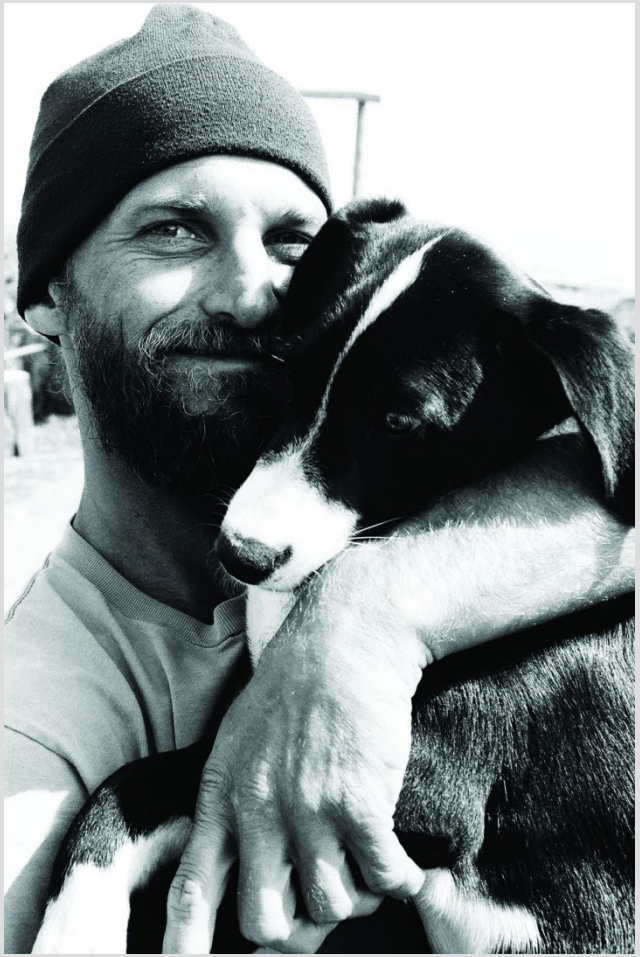
Why Sicily?
Why Geoarchaeology?

- Life is strange.

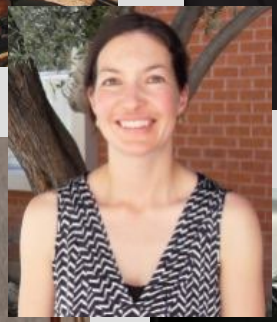
- It is my hope that by effectively quantifying and communicating the environmental successes and failures of past human societies, we can strengthen/improve our own interactions/relationships with the Earth's dynamic environments.

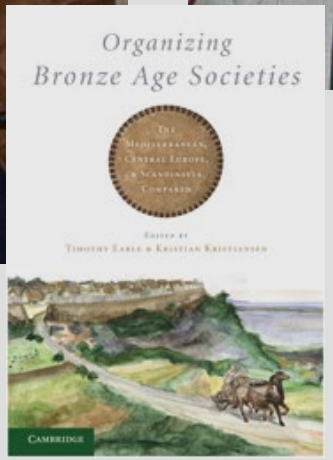
Contributing to humanity's *Sense of Place & Perception of Time*

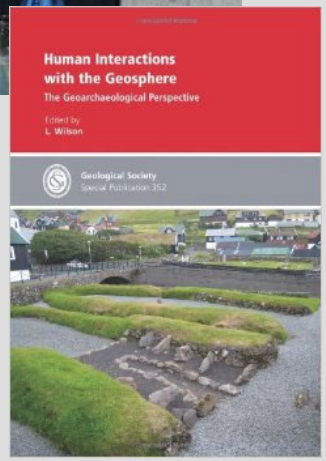
- If you love a place you have a duty to protect it & to love a place you must know it first!
  - Jeff Johnson – 180° South



People




Organizing
Bronze Age Societies
CAMBRIDGE


Human Interactions
with the Geosphere
The Geoarchaeological Perspective
Edited by
L. Wilson
Geological Society
Special Publication 352


Heineken
Soiled

Geography


EUROPE
©GraphicMaps.com
Atlantic Ocean
France
Slovenia
Croatia
Monaco
Bosnia & Herzegovina
Black Sea
Ligurian Sea
Adriatic Sea
Italy
Yugoslavia
Albania
Corsica
Balearic Sea
Spain
Tyrrhenian Sea
Greece
Aegean Sea
ASIA
Balearic Islands
Sardinia
Ionian Sea
Turkey
Syria
Sicily
Malta
Crete
Cyprus
Algeria
Mediterranean Sea
Lebanon
Morocco
Tunisia
Israel
AFRICA
Libya
300 mi
300 km
Egypt
Countries that border the Mediterranean Sea


Estwing

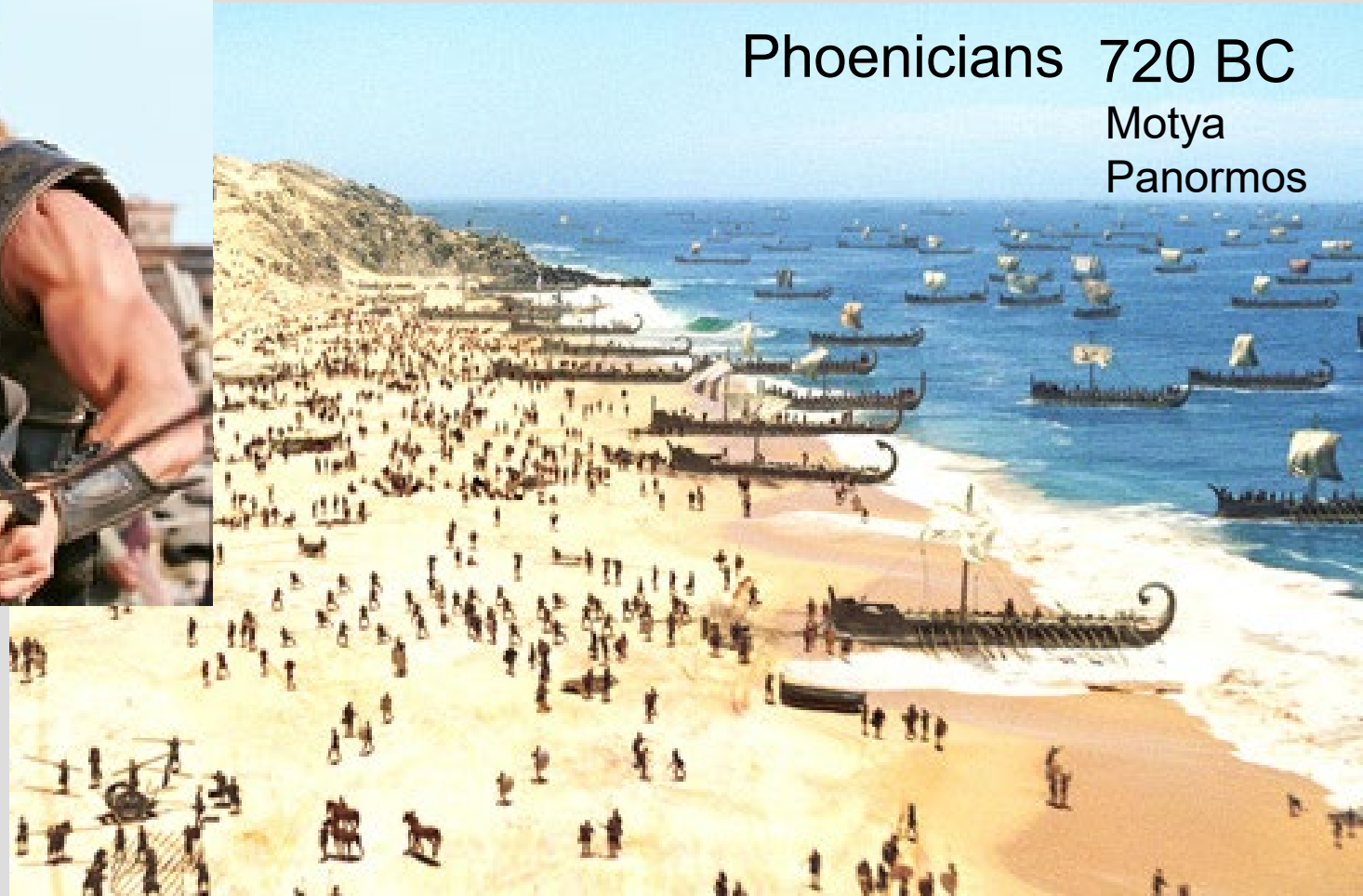
People

- Neolithic
  - 6,000 years BC
- Copper
  - 3500 to 3000 years BC
- Bronze
  - 2500 to 1200 years BC
- Iron
  - 900 to 734 years BC

After R. Leighton

Classical Sicily

Extensive socio-political change



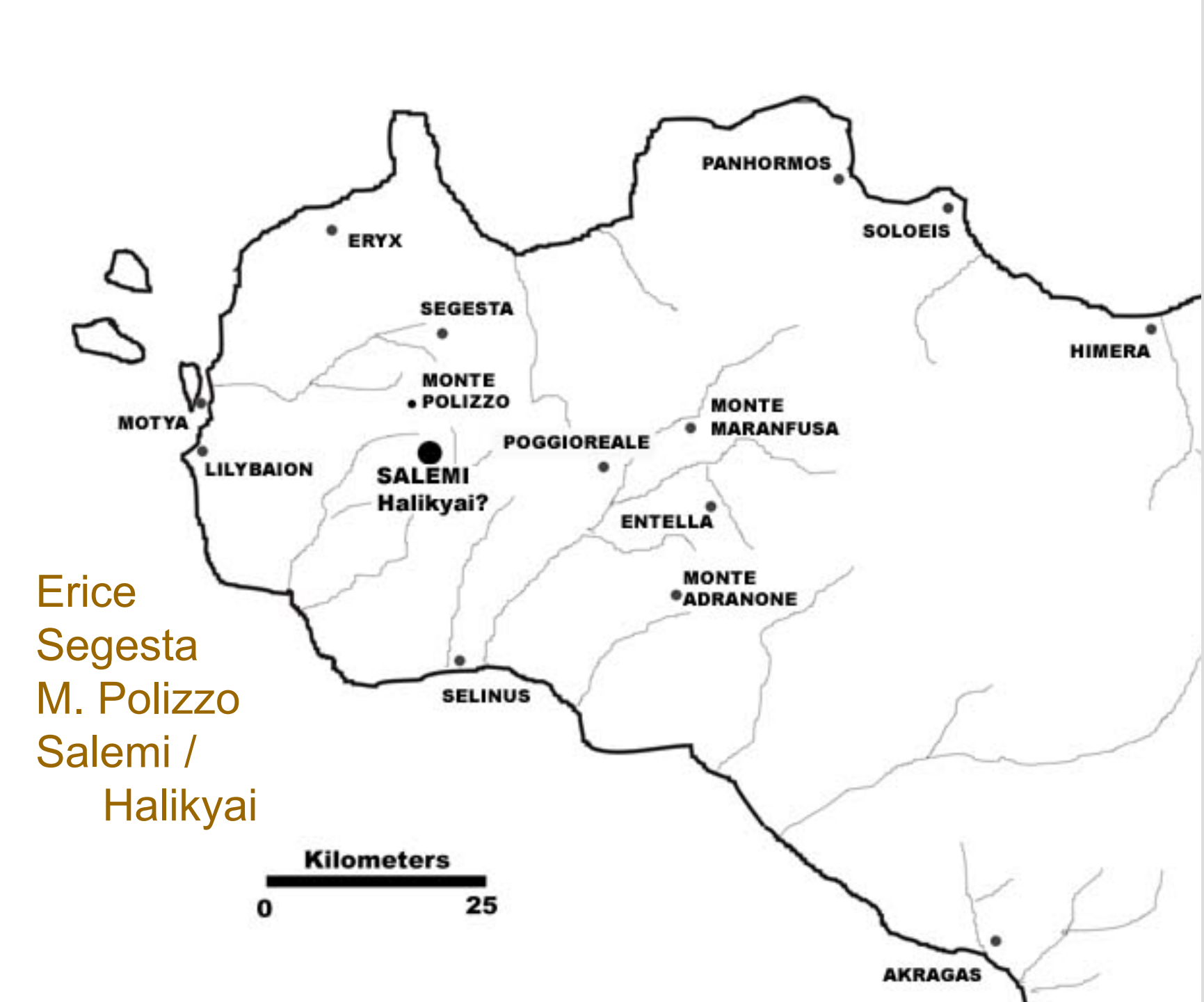
The Elymians

Possible origins

Greeks – Descendants of the Trojans

Thucydides – Refuges from the Trojan War

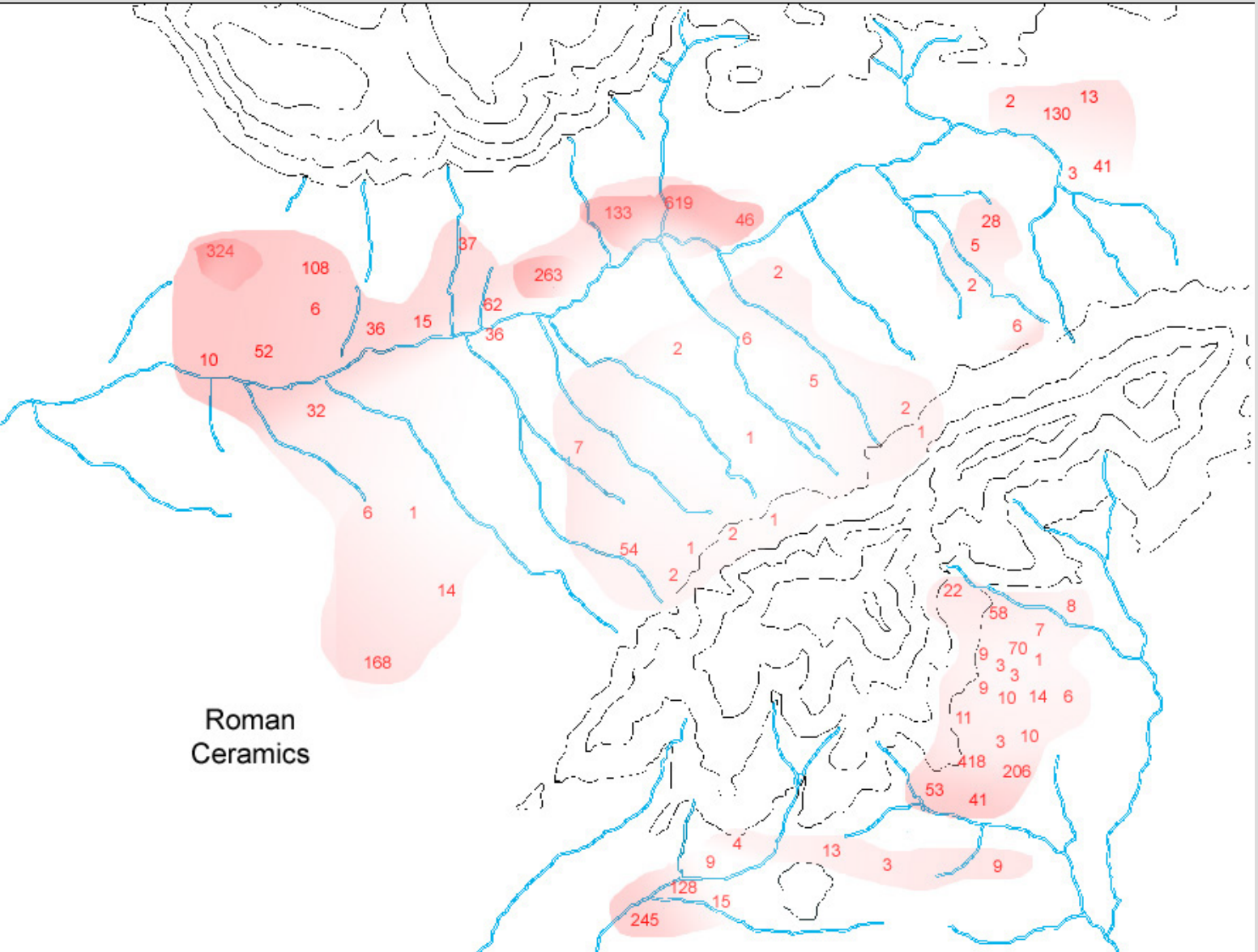
Virgil – Lead to Sicily by the Hero Acestes (Crinisus and Segesta)



Erice
Segesta
M. Polizzo
Salemi /
Halikyai


PANTHERS

Archeological Survey

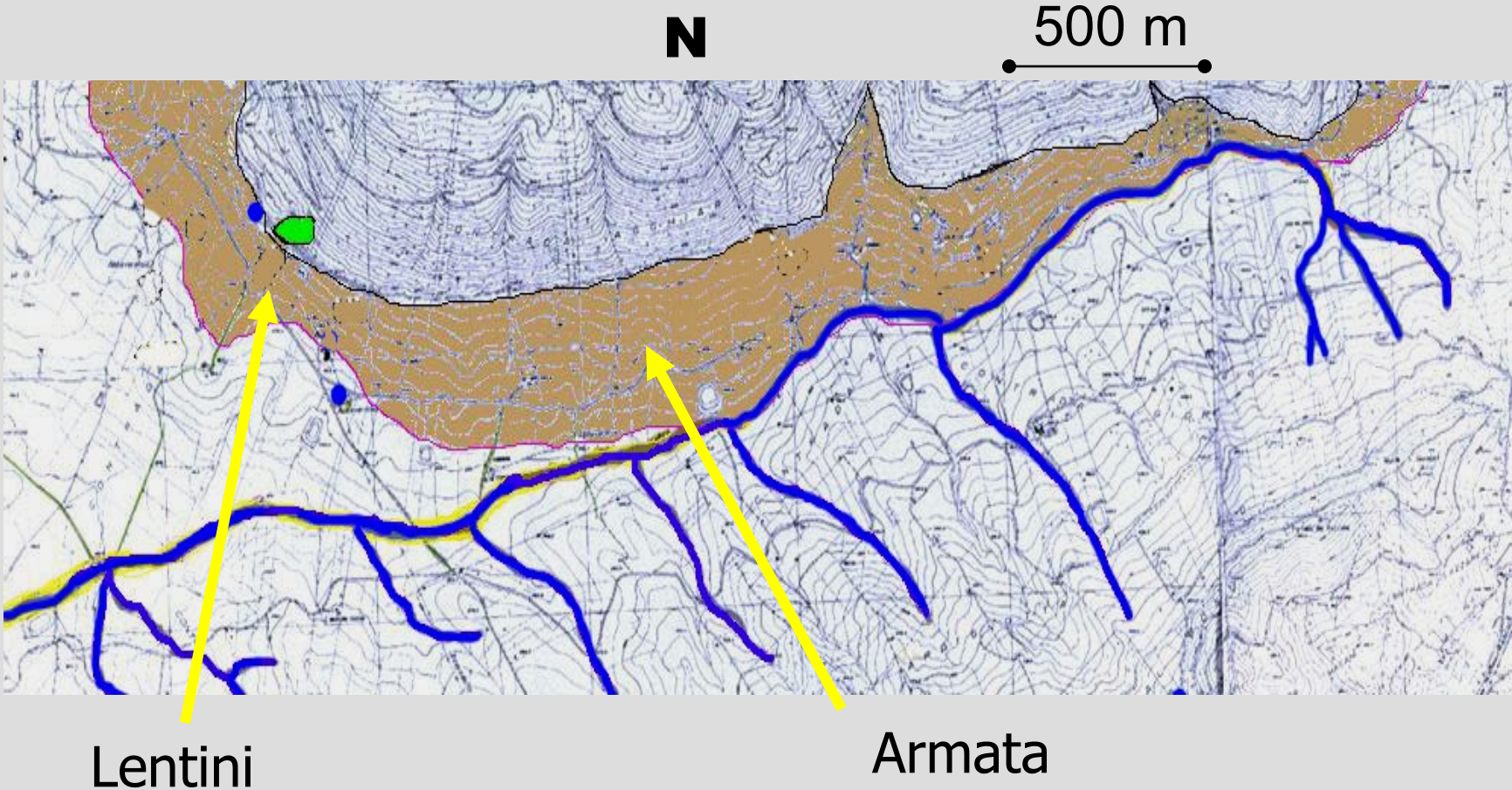


Find totals for MG/MP	
Neolithic	83
Bronze	431
Iron	817
Greek	93
Roman E	53
Roman L	14865
Byzantine	20
Medieval	760

Find totals for MK/PIT	
Neolithic	608
Bronze	559
Iron	561
Greek	49
Roman E	67
Roman L	10235
Byzantine	17
Medieval	90

Total overall, finds	
Neolithic	691
Bronze	990
Iron	1378
Greek	142
Roman E	120
Roman L	25107
Byzantine	37
Medieval	850

Montagna Grande Alluvial Fans

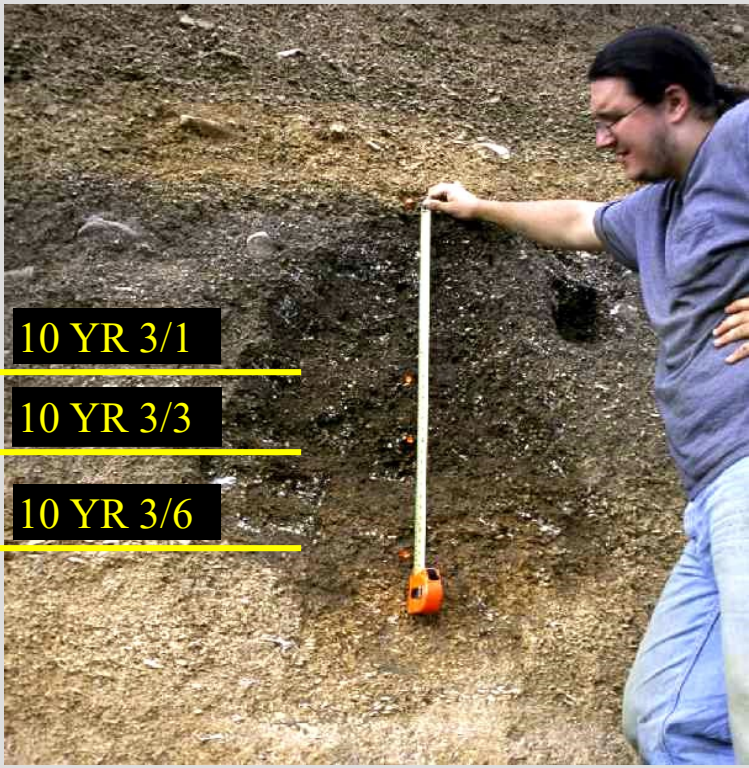


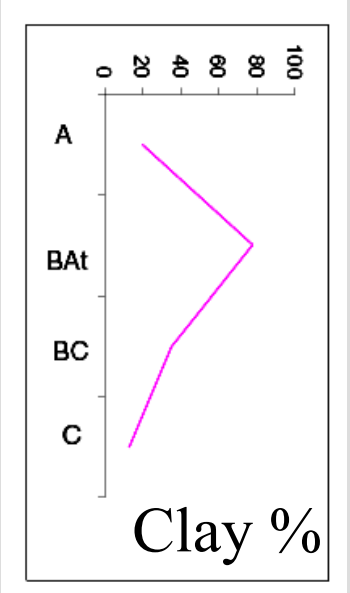
1:25,000

Landscape evolution

The Armata Paleosol

Structure	Horizons
Gr/platy	A
SBK	BAt
SBK	BC
Ma	C



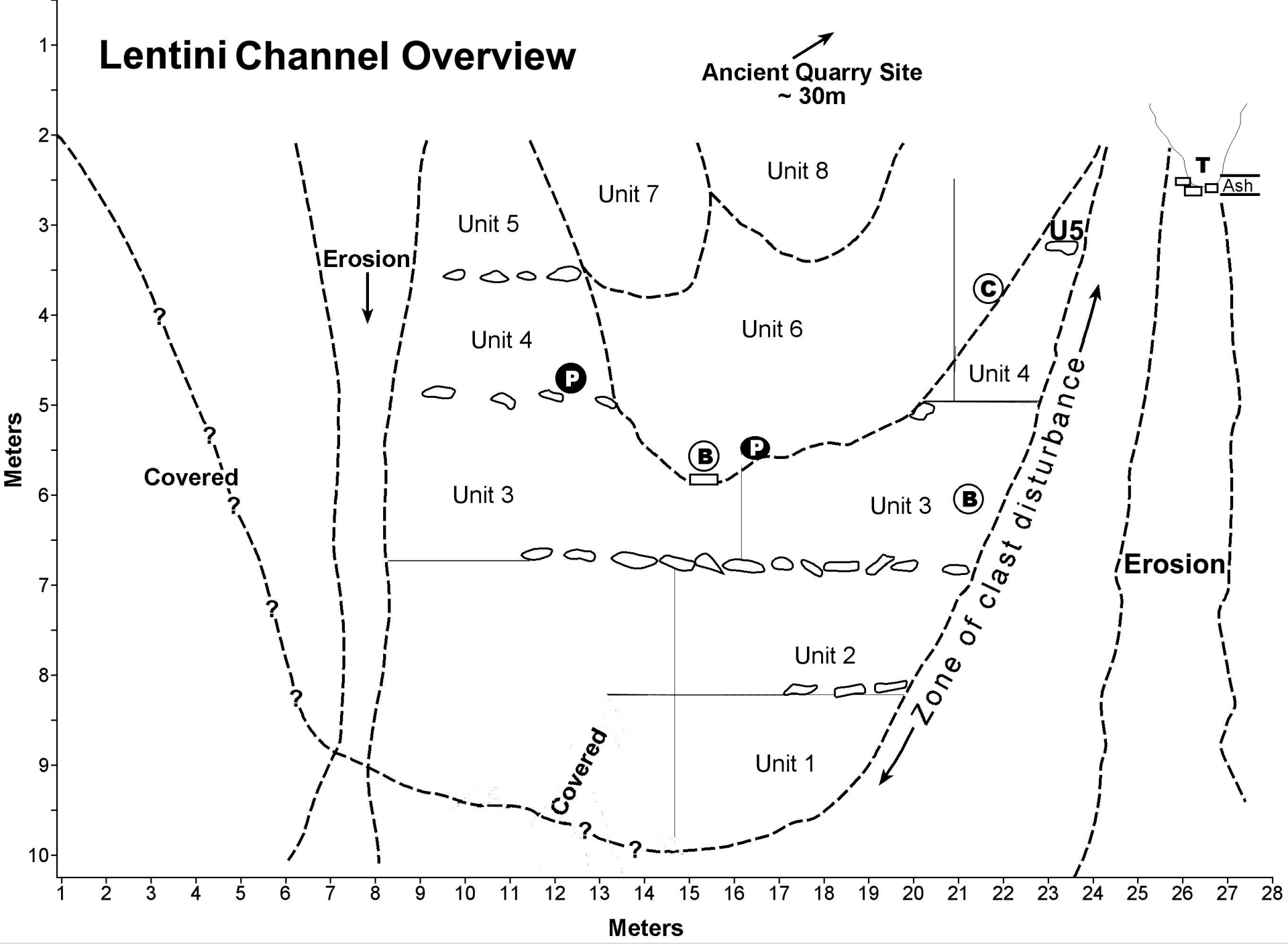


25
34
30
18

(6084 to 5837 cal. yrs. BC)
or
(7786 to 8033 cal. yrs. BP)

The Lentini Fan and Channel

Organic-rich Holocene Channel


Lentini Channel Overview
Ancient Quarry Site
~ 30m
Unit 8
Unit 7
Unit 5
Erosion
Unit 6
Unit 4
Unit 4
Covered
Unit 3
Unit 3
Unit 2
Unit 1
Covered
Zone of clast disturbance
U5
T
Ash
Erosion
Meters
Meters

Unit 6

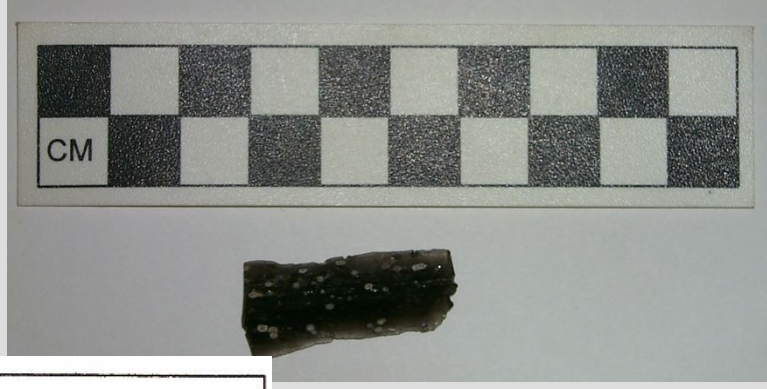
Unit 6

Unit 4

Unit 2

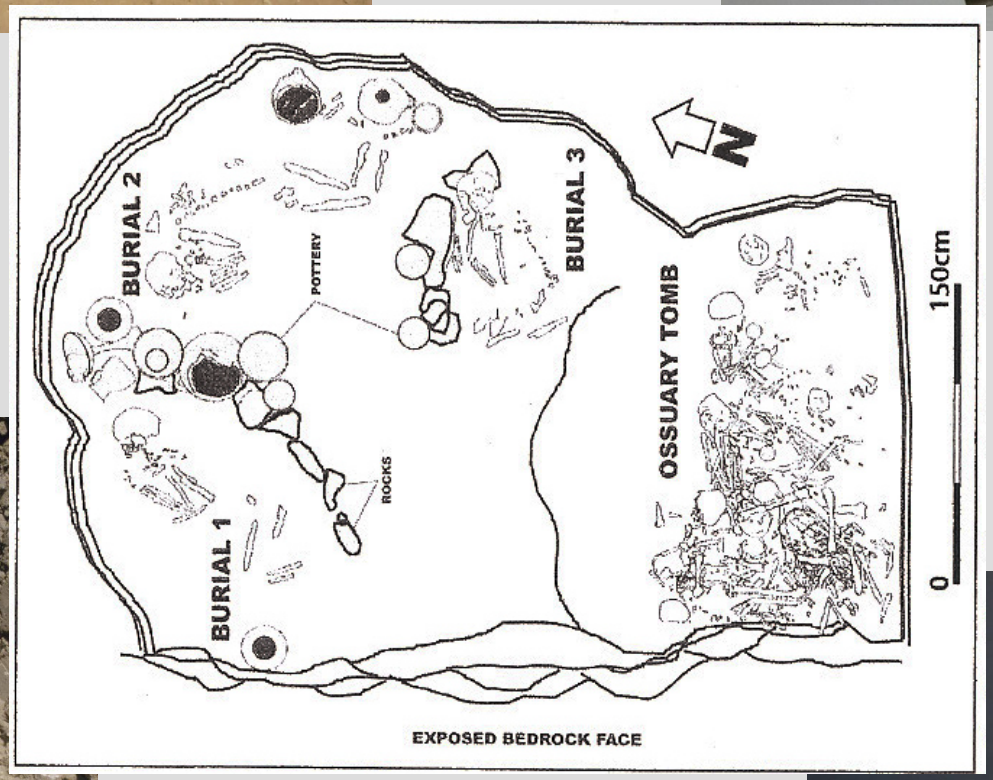
Pitrazzi

Practical Reuse?



Bronze Age
2000 BC

3 Flexed burials (adult)
15 funerary vessels
1 dog



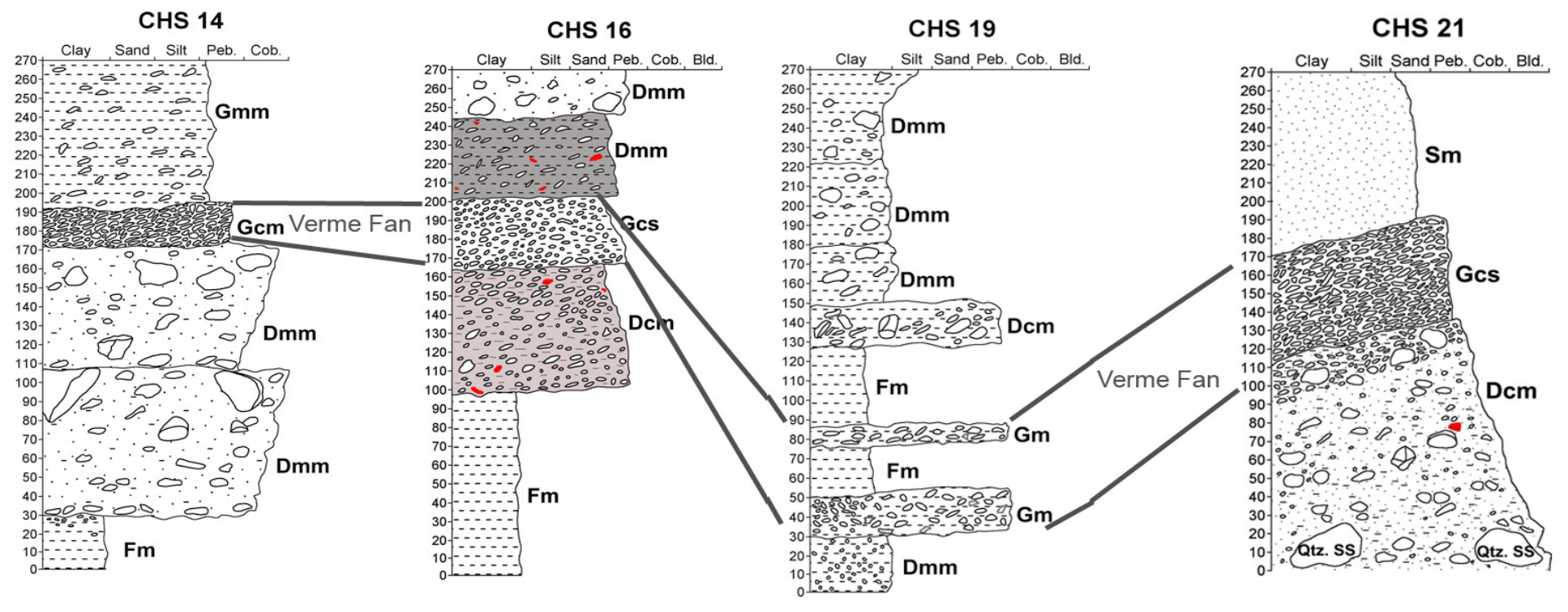
Late Copper Age
3000 BC

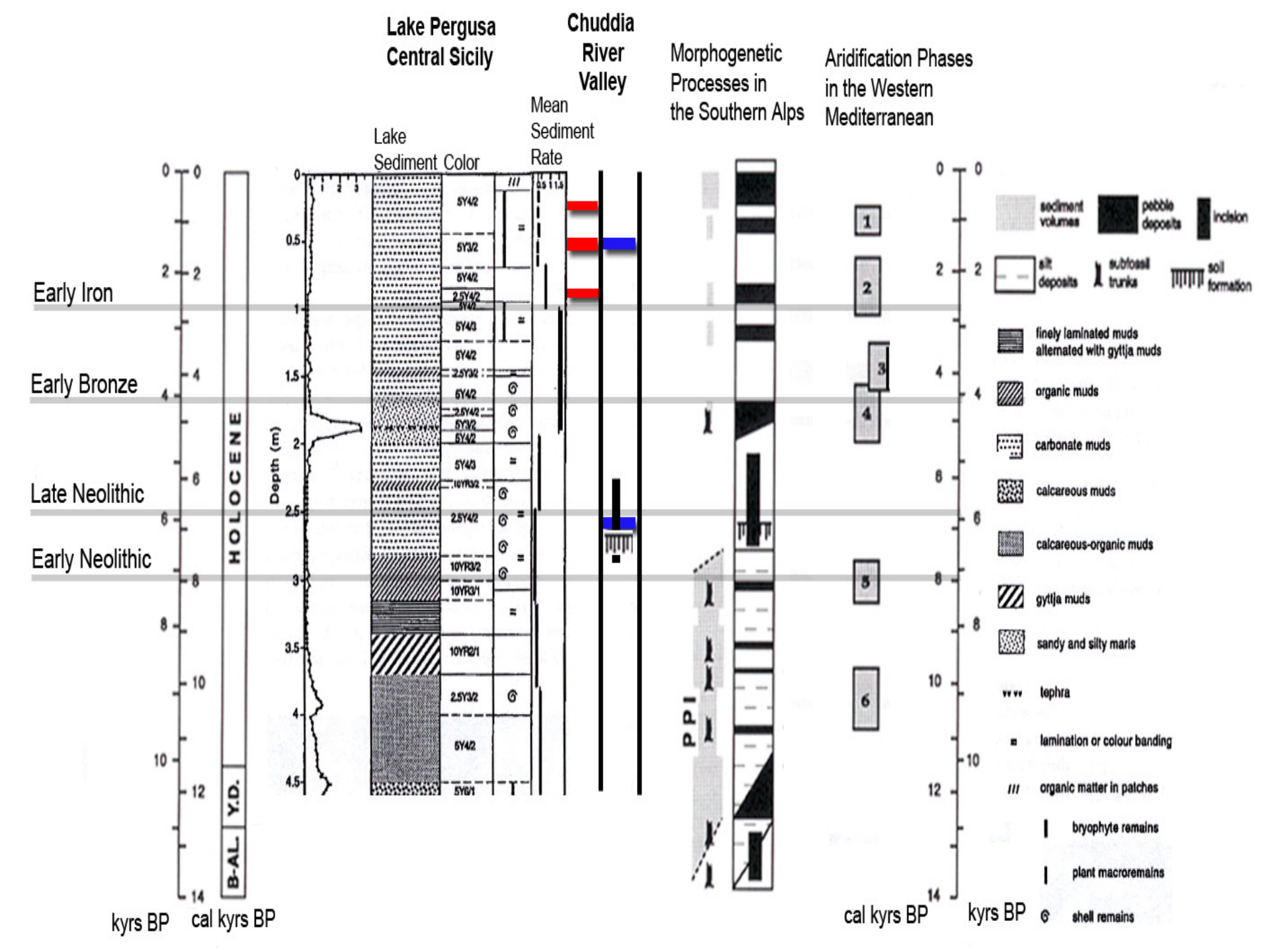
- 24 crania
- Lithics
- Stone beads (121)
- Malpasso vessel

Cultural Continuity?

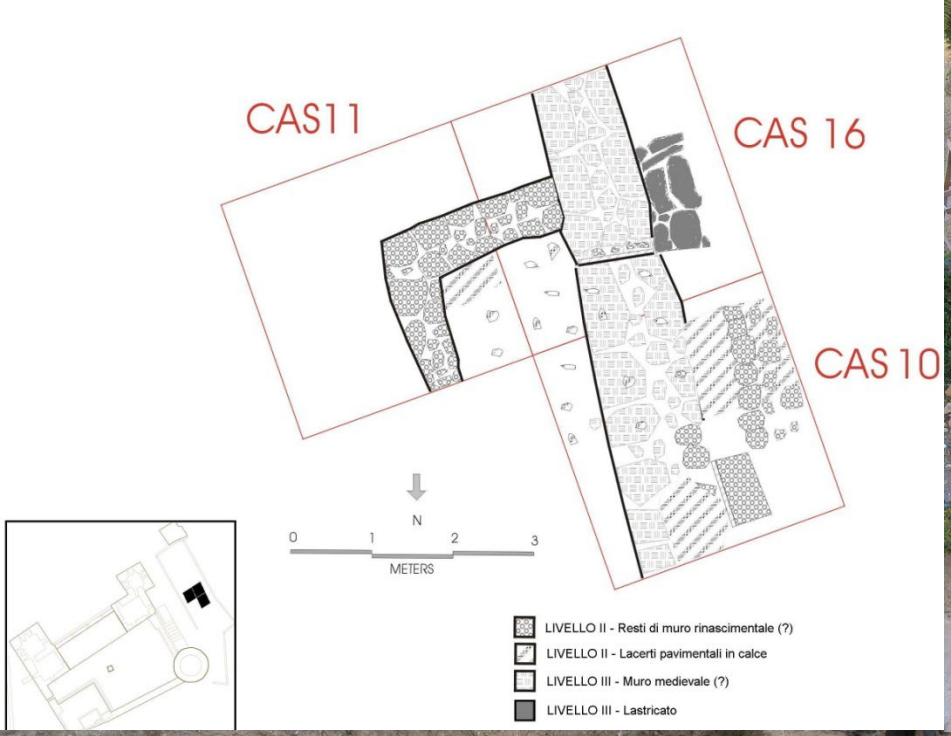
Alluvial Stratigraphy


14
16
21
19


CHS 14
Clay Sand Silt Peb. Cob.
Gmm
Gcm
Verme Fan
Dmm
Dmm
Fm
CHS 16
Clay Silt Sand Peb. Cob. Bld.
Dmm
Dmm
Gcs
Dcm
Fm
CHS 19
Clay Silt Sand Peb. Cob. Bld.
Dmm
Dmm
Dmm
Dcm
Fm
Gm
Fm
Gm
Dmm
Verme Fan
CHS 21
Clay Silt Sand Peb. Cob. Bld.
Sm
Gcs
Dcm
Qtz. SS
Qtz. SS

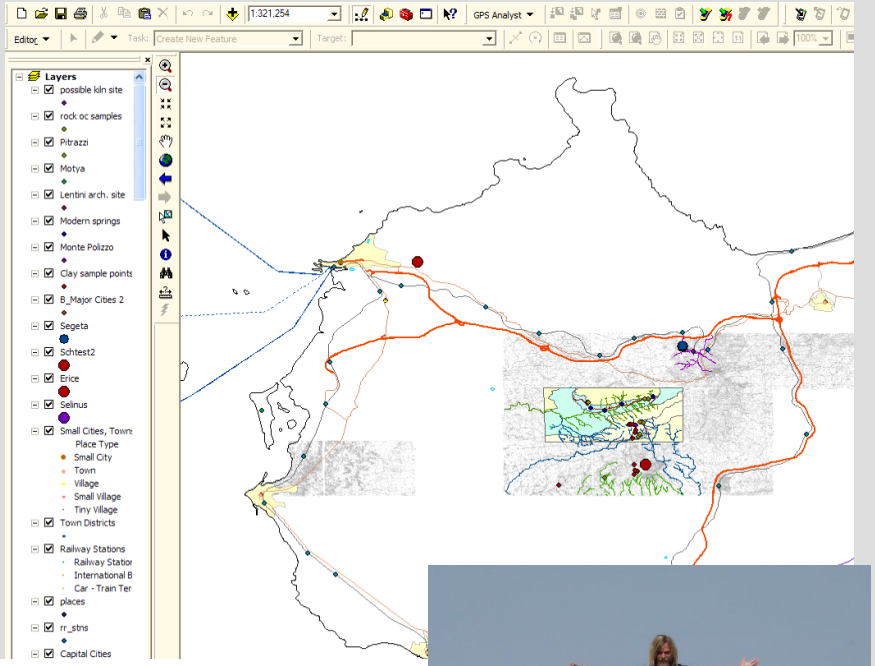

Lake Pergusa
Central Sicily
Chuddia
River
Valley
Morphogenetic
Processes in
the Southern Alps
Aridification Phases
in the Western
Mediterranean
Lake
Sediment Color
Mean
Sediment
Rate
Depth (m)
Early Iron
Early Bronze
Late Neolithic
Early Neolithic
HOLOCENE
Y.D.
B-AL.
PPI
kyrs BP
cal kyrs BP
cal kyrs BP
kyrs BP
sediment volumes
pebble deposits
incision
silt deposits
subfossil trunks
soil formation
finely laminated muds alternated with gyttja muds
organic muds
carbonate muds
calcareous muds
calcareous-organic muds
gyttja muds
sandy and silty marls
tephra
lamination or colour banding
organic matter in patches
bryophyte remains
plant macroremains
shell remains

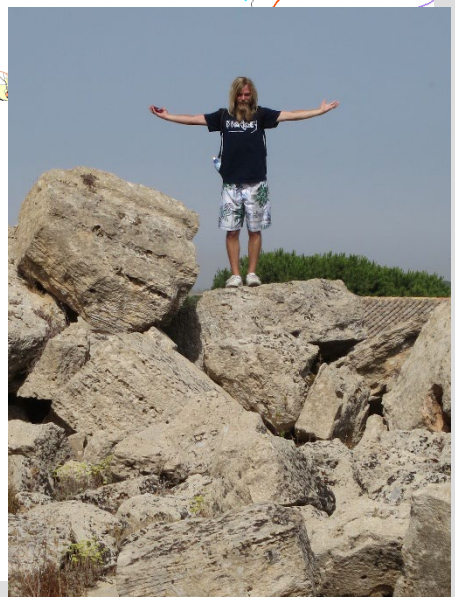
Salemi / Halikyai


CAS11
CAS 16
CAS 10
N
0
1
2
3
METERS
LIVELLO II - Resti di muro rinascimentale (?)
LIVELLO II - Lacerti pavimentali in calce
LIVELLO III - Muro medievale (?)
LIVELLO III - Lastricato


T. 1884

Synthesis, Settlement Patterns, & Interpreting human-landscape interactions





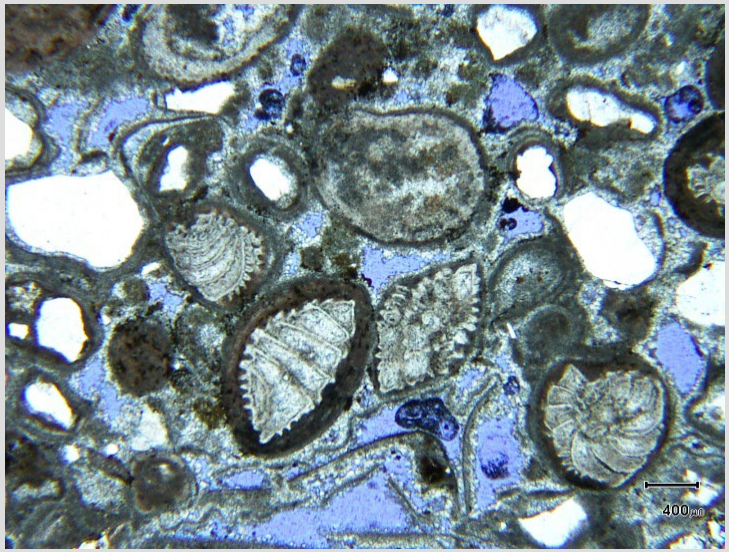
Problems

- Fragmented records
- Nature of preservation & recovery bias

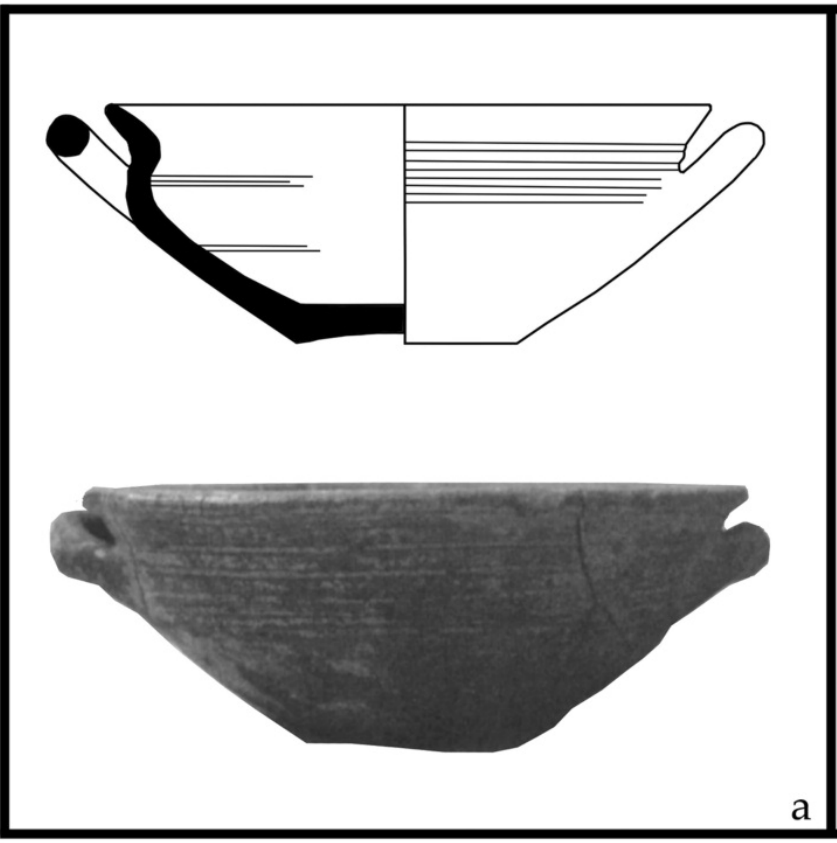
Solutions

- Geoarchaeology
  - Land use history
  - Interdisciplinary research
- Comprehensive and comparable survey data

Archaeometry



Tableware ‘index fossils’ for archaeology



1) Terravecchia Formation sampling point

2) MAB Formation sampling point

Alluvial deposits

MAB Formation (Middle Pliocene)

Planktic foraminifera marls (Trubi Formation, Lower Pliocene)

Biocalcarenites (Gessoso-Solfifera Formation, Upper Messinian)

Gypsum (Gessoso-Solfifera Formation, Upper Messinian)

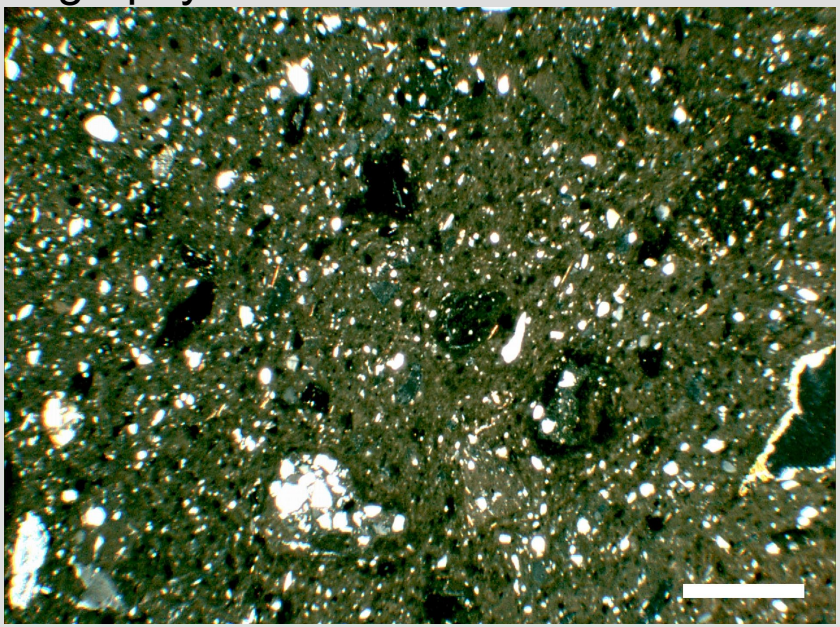
Calcarenites (Baucina Formation, Upper Messinian)

Terravecchia Formation: clay deposits (Upper Tortonian-Lower Messinian)

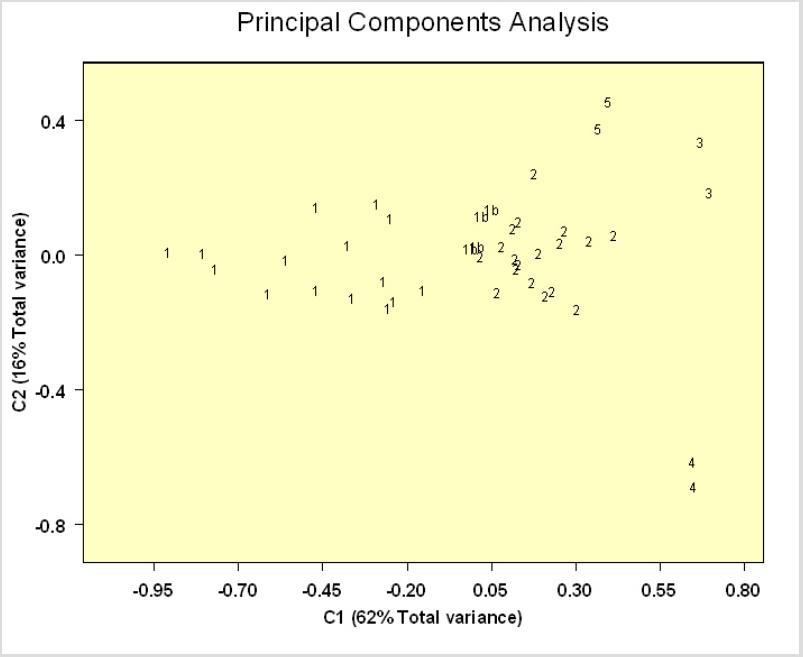
Terravecchia Formation: sand deposits (Upper Tortonian-Lower Messinian)

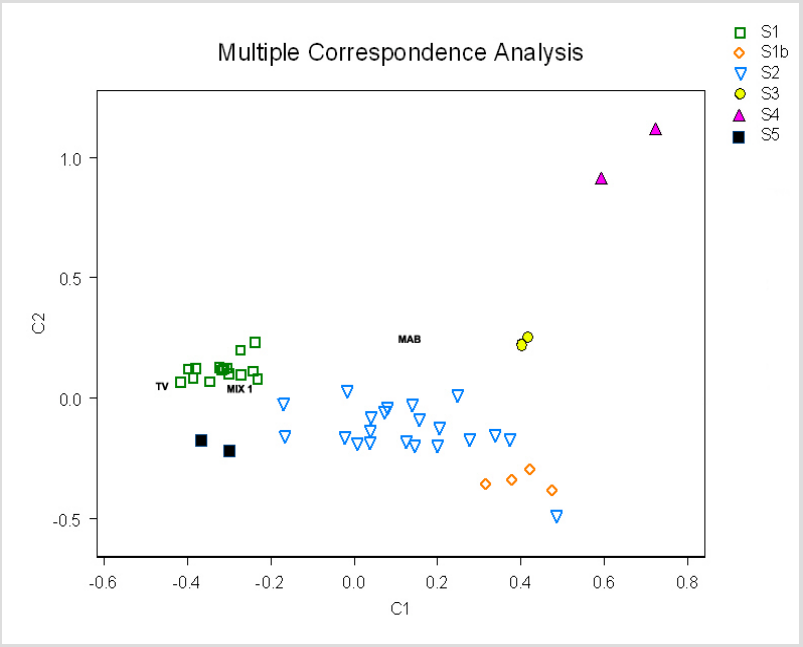
Terravecchia Formation: conglomerate deposits (Upper Tortonian-Lower Messinian)

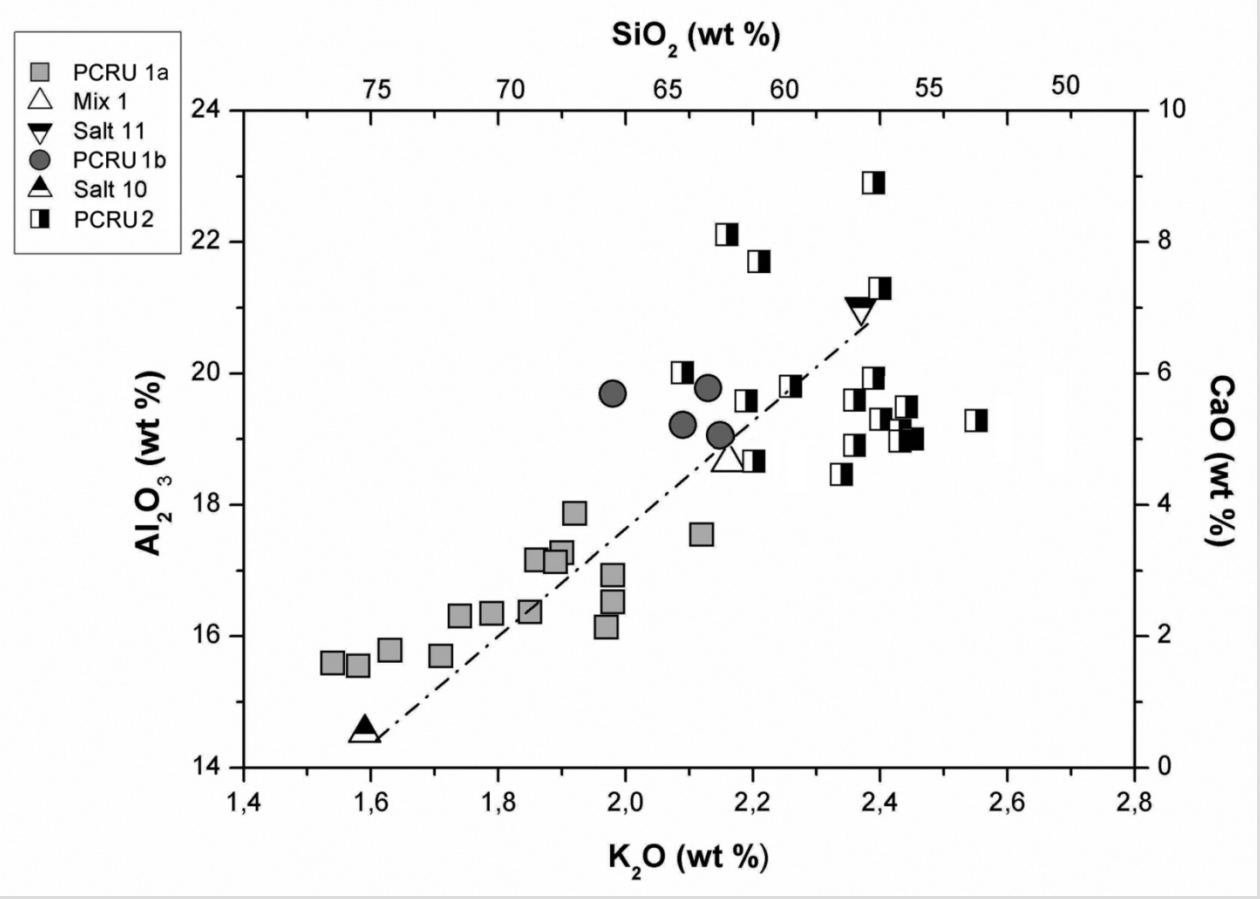
Petrography



XRF

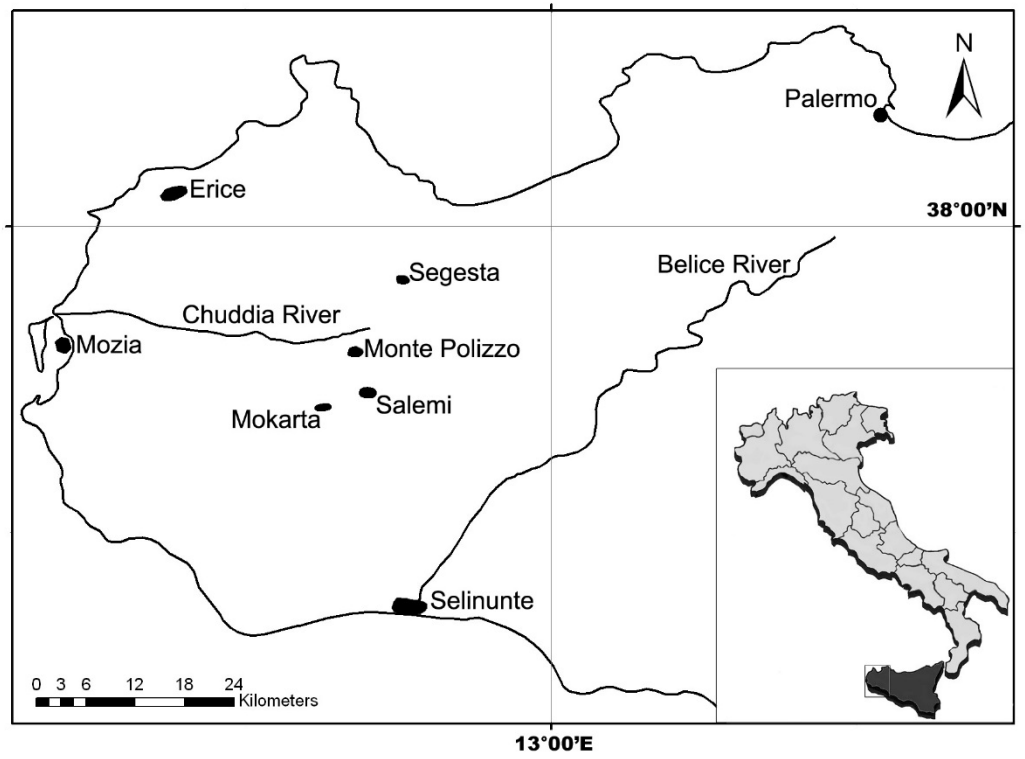


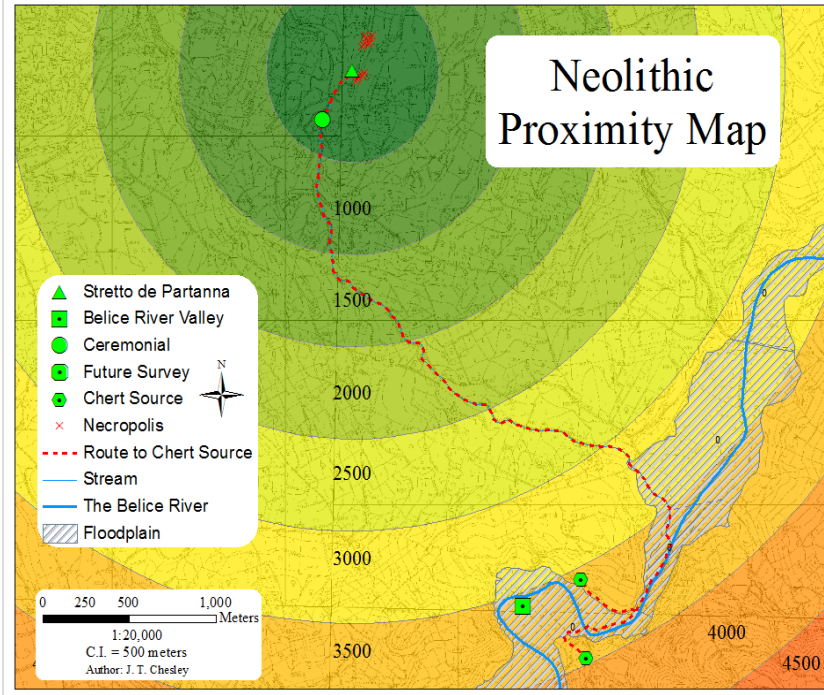


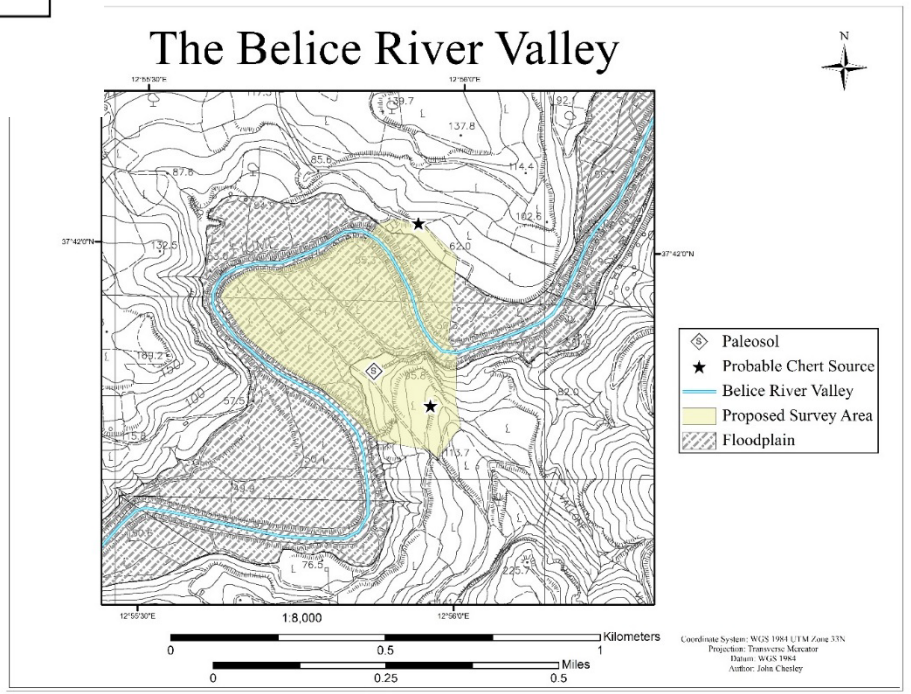


- 92% ceramics = Terravecchia Fm.
- Monte Polizzo = Production center (7-4th century BC)
- Advanced technology = mixed sources
- 8% ceramics = regional imports

On-going work…


N
Palermo
Erice
38°00'N
Segesta
Belice River
Chuddia River
Mozia
Monte Polizzo
Salemi
Mokarta
Selinunte
0 3 6 12 18 24
Kilometers
13°00'E

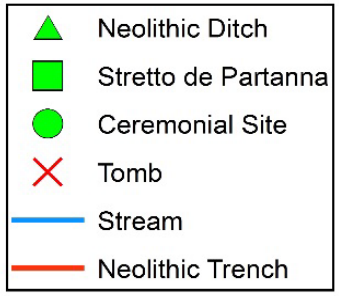

Neolithic
Proximity Map
Stretto de Partanna
Belice River Valley
Ceremonial
Future Survey
Chert Source
Necropolis
Route to Chert Source
Stream
The Belice River
Floodplain
N
1000
1500
2000
2500
3000
3500
4000
4500
0 250 500 1,000
Meters
1:20,000
C.I. = 500 meters
Author: J. T. Chesley

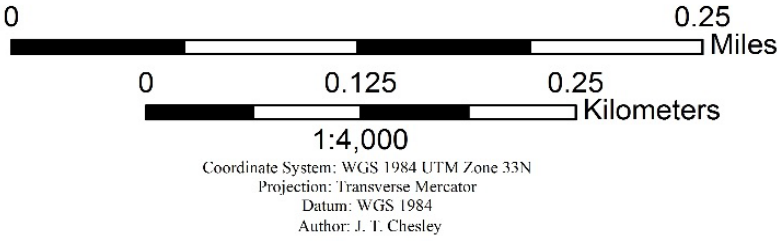

The Belice River Valley
N
Paleosol
Probable Chert Source
Belice River Valley
Proposed Survey Area
Floodplain
1:8,000
0 0.5 1
Kilometers
0 0.25 0.5
Miles

Stretto de Partanna

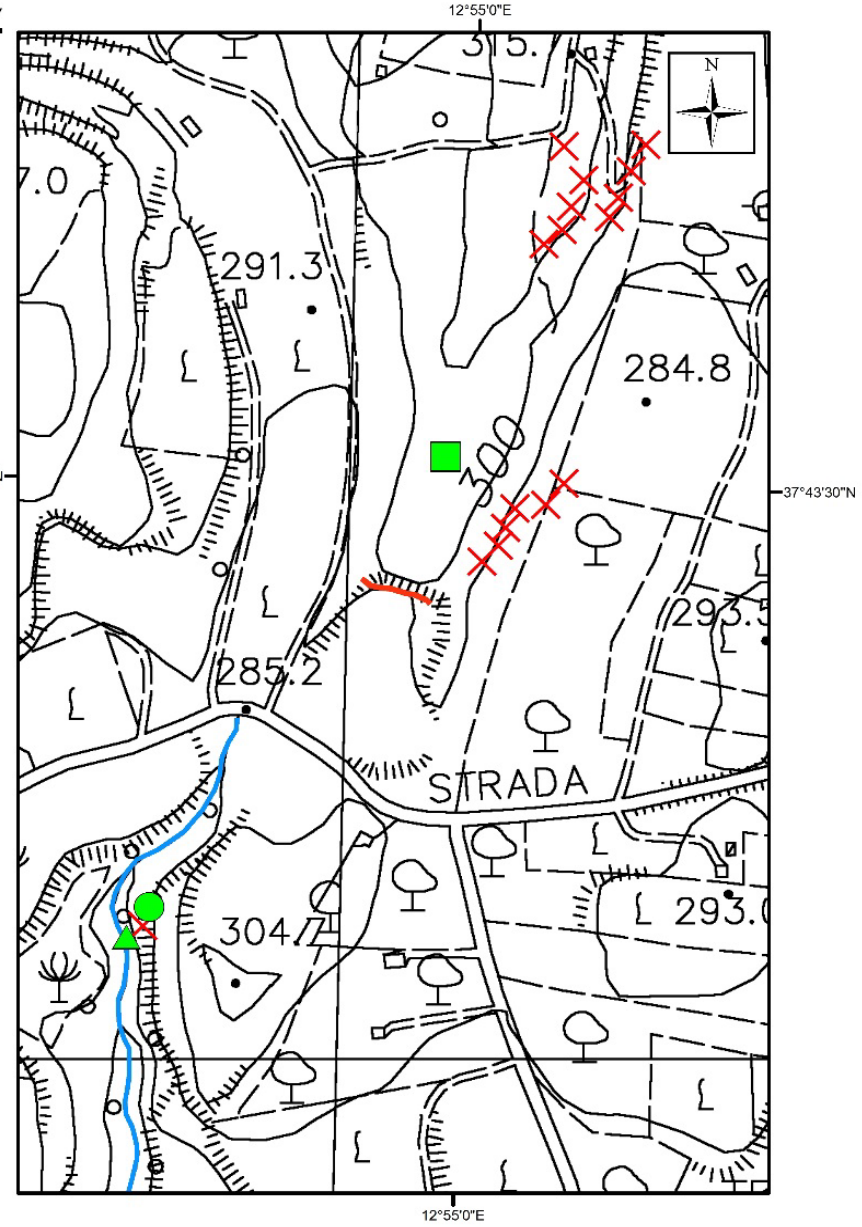
Grave of the drilled cranium

Ceremonial Site





Coordinate System: WGS 1984 UTM Zone 33N
Projection: Transverse Mercator
Datum: WGS 1984
Author: J. T. Chesley




0 10 20 30 40 50 60 70 80 90 100 110 120
1:1000 METRIC
10 CM
5 CM
0 10 Scale
R WRITING PAPER
teintheRain.com


Capstone in
Southern Italy


Old Style
Rome
GIBELLINA
SALEMI
...easy!