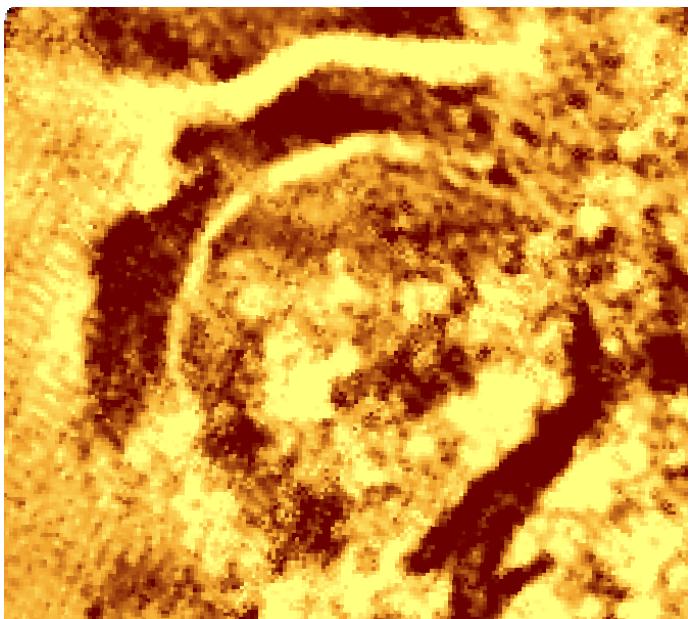


# Domestic Patterns of Neolithic Agricultural Villages in Eastern Thessaly: A Remote Sensing Approach

T. Kalayci, F.X. Simon, G. Cantoro, C. Cuenca Garcia,  
J. Donati, M. Manataki, and A. Sarris

Laboratory of Geophysical - Satellite Remote Sensing and Archaeo-environment



International Open Workshop:  
Socio-Environmental Dynamics over the Last  
12,000 Years

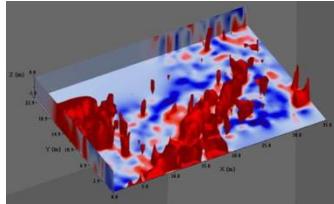
March 24-27, 2015





**FORTH**

Institute for Mediterranean Studies

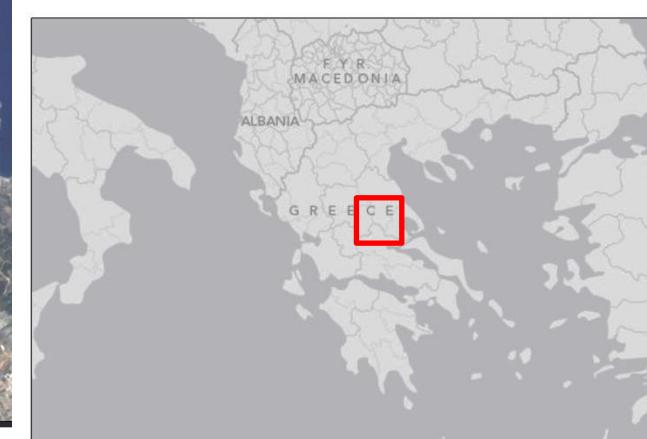
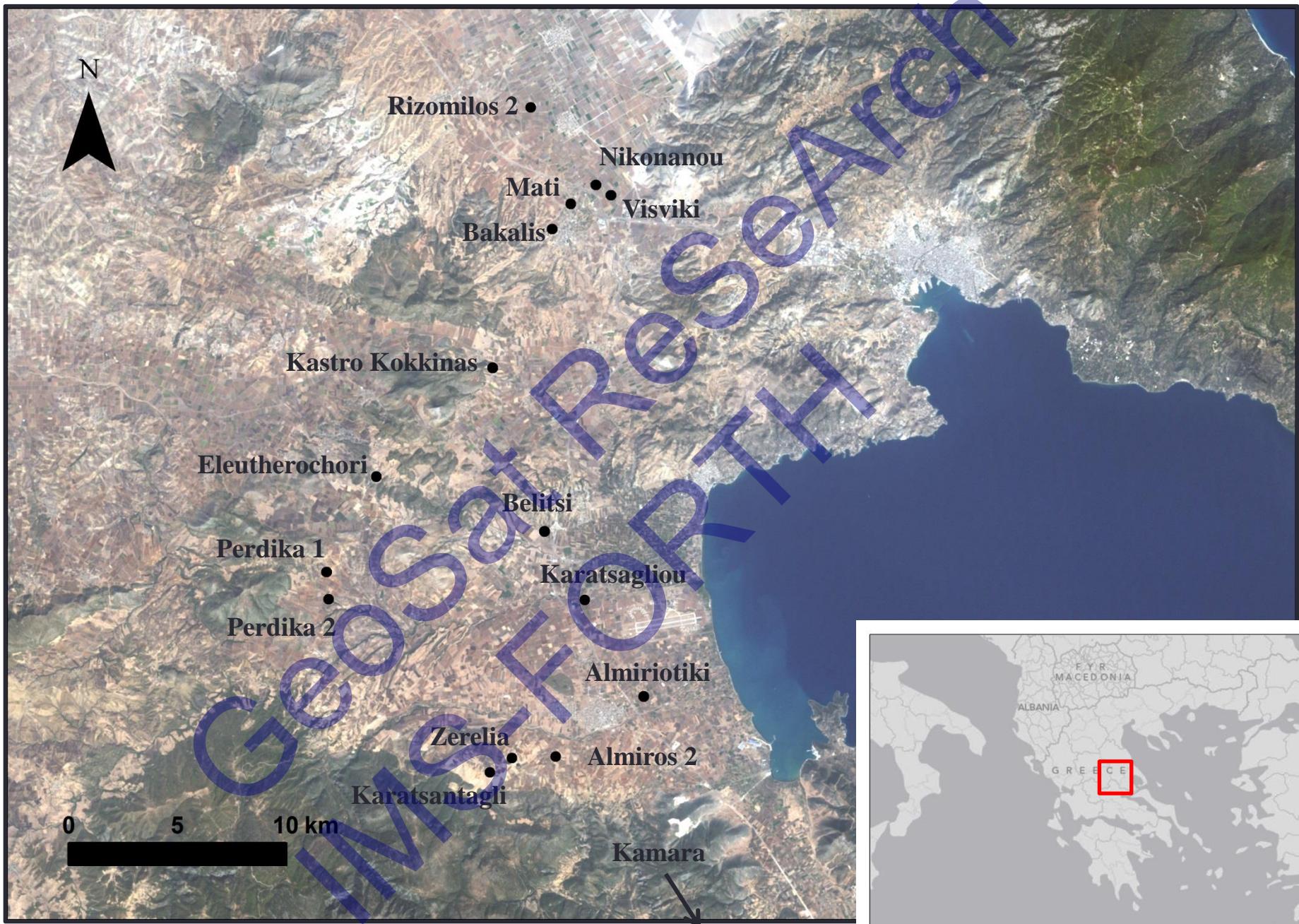


**Geographic Information Systems  
Satellite Remote Sensing  
Geophysical Prospection  
Archaeo-environment  
Photogrammetry**

**Amorium Urban Archaeology Project  
Island Cultures in a Diachronic Perspective: The Case of Therasia  
Egeria: Mediterranean Medieval Places of Pilgrimage  
Byzantine Heritage Network  
Digital Crete: Mediterranean Cultural Itineraries  
Recapturing Neolithic Cultural Heritage in Southern Balkans  
Omphalion Pedion Survey Project**

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# Thessaly



# Chronology of Research in Neolithic Thessaly



- 1901-1903: Excavations at Sesklo and Dimini  
1908: Excavations at Zerelia



- 1960-1977: Trial Excavations at several Neolithic sites by Theocharis and Milojcic  
1977-1979: Excavations at Dimini by Hourmouziades



- 1984: Halstead's catalogue of prehistoric sites in Thessaly, based on a survey made by French  
1992: Gallis' catalogue of sites in E. Thessaly.



- 1990-present: Field survey in Almiros plain 13<sup>th</sup> EPCA & the Netherland Institute at Athens  
1990-2005: Rescue excavations (national road, Lake Karla)



- 2005-present: Extensive satellite R.S. & geophysical survey by GeoSat ReSeArch Lab of IMS

# Status of Knowledge in Neolithic Thessaly

Documenting settlements in Thessaly  
& GIS analyses for

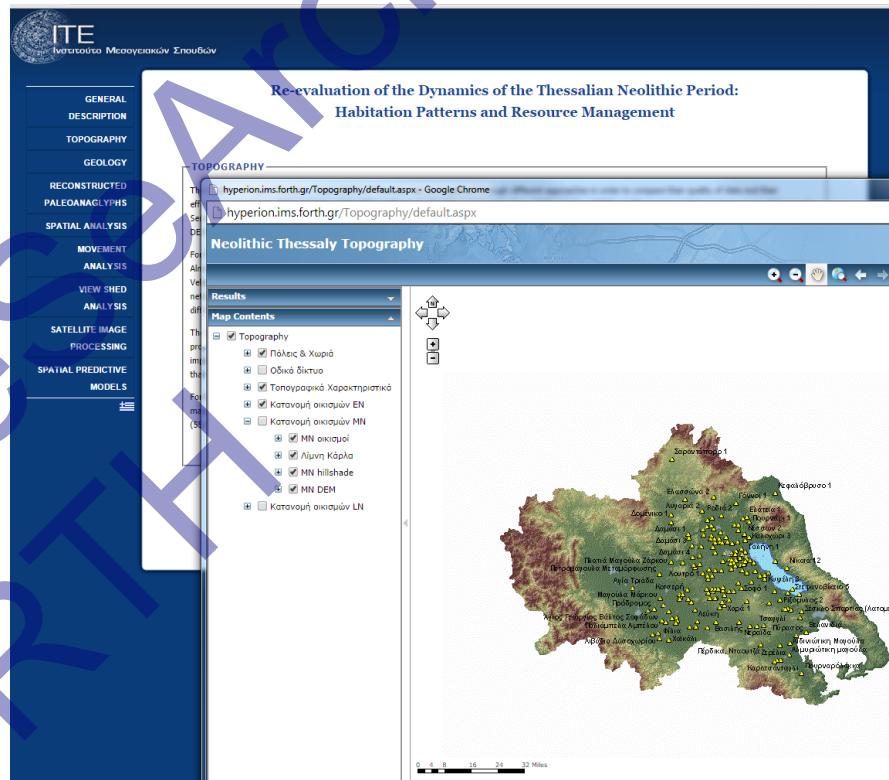
- management of the natural landscape
- Understanding distribution patterns

342 documented magoulas

181 sites (53% of the total) are established on alluvial deposits & 81 sites on fluvial deposit areas.

These formations are of low altitude & are ideal for cultivation.

<http://neolithicthessaly.ims.forth.gr/>



# Habitation Patterns of the Neolithic Agricultural Villages

This paper presents the preliminary results of a multi-year geophysical and remote sensing fieldwork campaign to study the physical landscape and social dynamics of Neolithic settlements within the coastal hinterlands of eastern Thessaly (Greece).

IGEAN (Innovative Geophysical Approaches for the Study of Early Agricultural Villages of Neolithic Thessaly) project, is implemented under the "ARISTEIA" Action of the "Operational Programme Education And Lifelong Learning" and is co-funded by the European Social Fund (ESF) and National Resources (2013-2015).

AIMS: Application of non-destructive, remote sensing techniques to explore multiple settlements & extract new archaeological data on an extensive scale, to analyze the broader characteristics of Neolithic habitation in Thessaly.



The project has been successful in documenting the diachronic development of Neolithic sites from core habitation mounds ( $\leq 1$  hectare) to large, sprawling communities several hectares in size.

# Habitation Patterns of the Neolithic Agricultural Villages

IGEAN

INNOVATIVE GEOPHYSICAL APPROACHES FOR THE STUDY OF EARLY AGRICULTURAL VILLAGES OF NEOLITHIC THESSALY

Ελληνικά

Home Archaeological sites Topographic surveys Excavations Geophysical prospections Publications Bibliography

Home

## Αρχαιολογικές θέσεις

A/A	Όνομασία θέσης	Εγγύτερος οικισμός	Δήμος	Νομός	
101	Αγ. Νικόλαος Κανάλια	Agios Nikolaos Kanalia	Κανάλια	Δ. Κάρλας	Μαγνησίας
37	Αγία Σοφία 1	Agia Sofia	Αγία Σοφία	Δ. Τυρνάβου	Λάρισας
154	Αγία Τριάδα	Agia Triada	Αγία Τριάς	Δ. Σελλάνων	Καρδίτσας
201	Άγιοι Ανάργυροι 2	Agioianargyroi 2	Άγιοι Ανάργυροι	Δ. Κραννώνας	Λάρισας
124	Άγιος Γεώργιος Βάλτος Σοφάδων	Agios Georgios Valtou Sofades	Σοφάδες	Δ.	

International Conference:  
Communities, Landscapes,  
and Interaction in Neolithic  
Greece  
IGEAN Conference



Institute for Mediterranean  
Studies, Rethymno,

### Layers transparency

- Velestino4
- SatelliteRSA anomalies
- GPR\_0\_9\_1\_0m.tif
- geomag3
- geomag2
- geomag1

High : 111.863

Low : -110.75

- svel4\_chunk.gif
- PCA.img
- ndvi.img
- Geoeye.img



<http://igean.ims.forth.gr/>

## Methodology

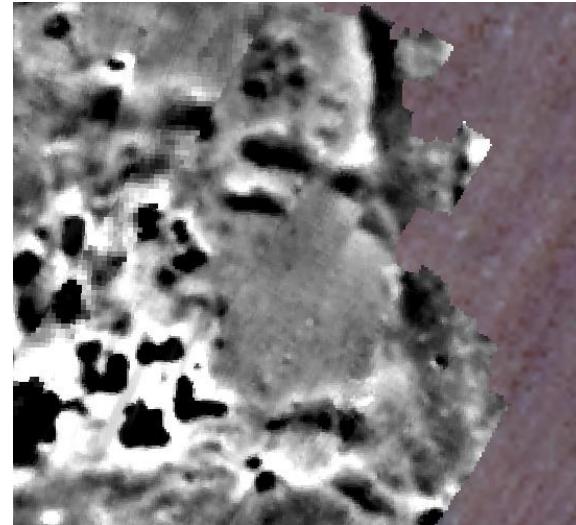
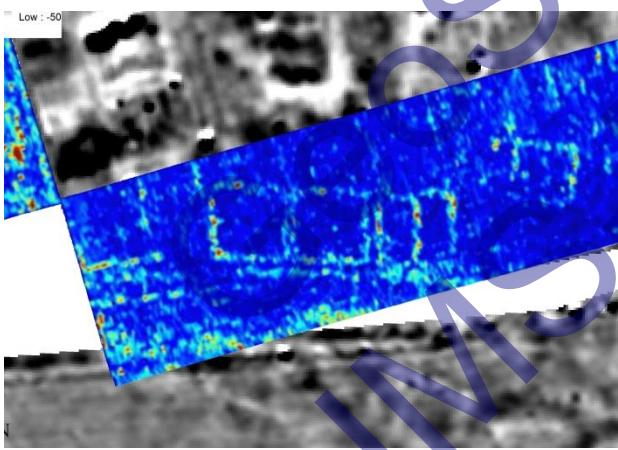
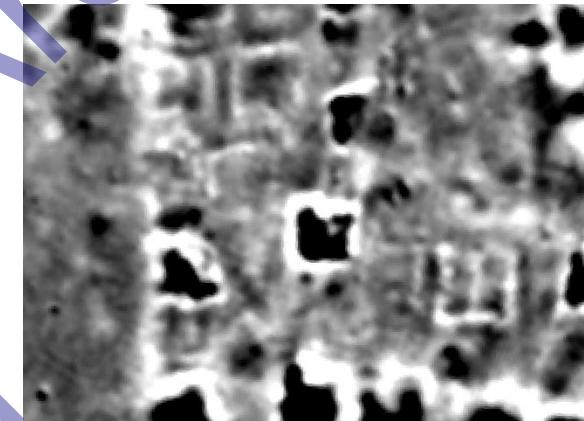
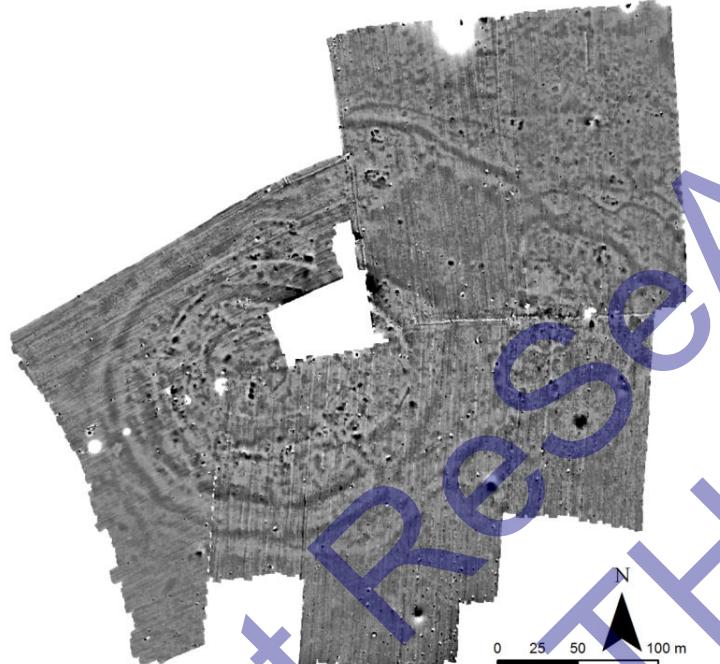
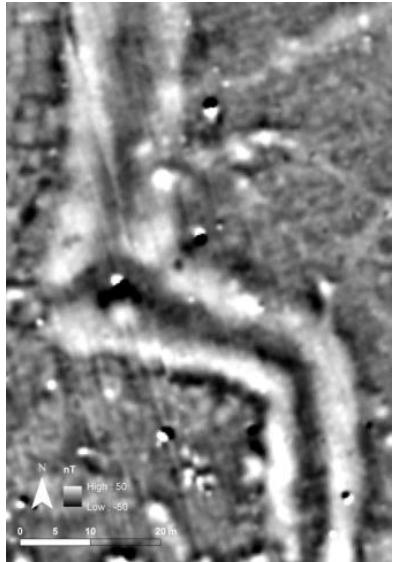


Geosat Research Institute

# Methodology

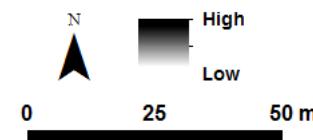
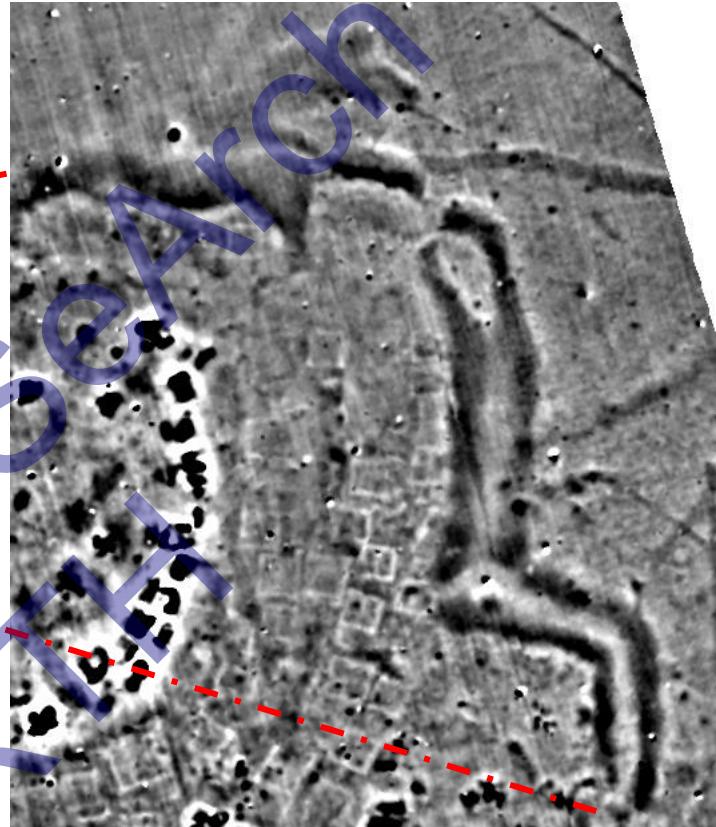
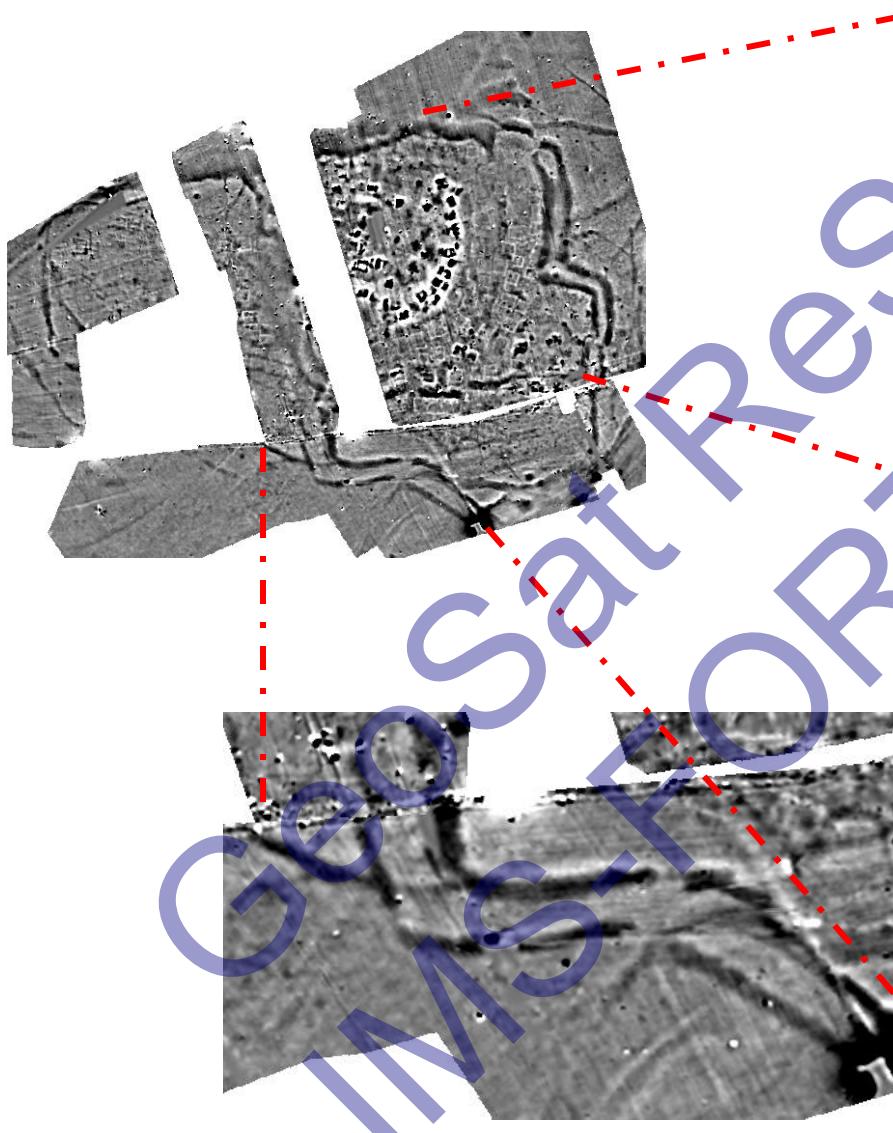


SITE	COVERAGE (in hectares)			
	Magnetics	EM	GPR	UAV
1. Almyriotiki	8.42	7.75	1.28	20.84
2. Almiros 2	6.60	2.39	0.37	7.31
3. Bakalis	0.45	0.36	0.29	-
4. Belitsi	1.32	1.78	0.37	11.74
5. Eleutherochori	-	0.18	0.18	-
6. Kamara	0.88	1.06	0.10	-
7. Karatsangliou	2.96	1.20	0.37	13.22
8. Karatsantagli	2.71	0.58	0.20	12.38
9. Kastro Kokkinas	1.08	0.72	0.09	-
10. Nikonanou	2.91	1.37	-	-
11. Mati	3.33	2.40	0.32	-
12. Perdika 1	5.19	2.32	0.44	-
13. Perdika 2	3.90	2.21	0.32	-
14. Rizomilos 2	10.48	3.16	0.36	-
15. Visviki	5.12	-	1.90	-
16. Zerelia	4.83	1.88	0.72	33.88
TOTAL (<5 weeks fieldwork)	60.18	29.36	7.31	99.37



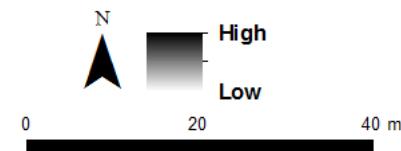
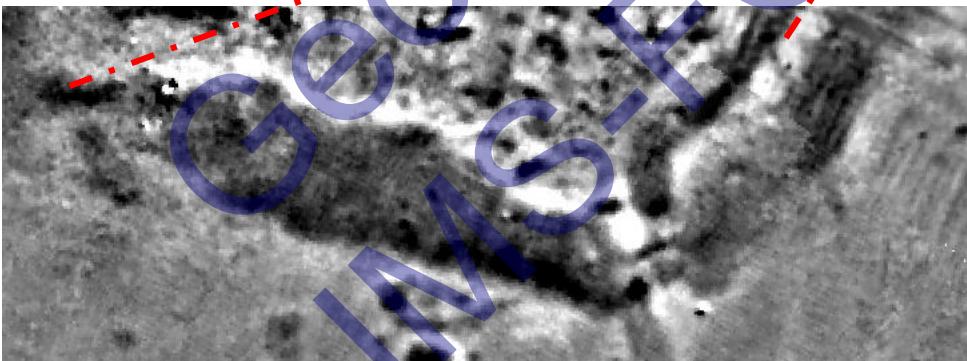
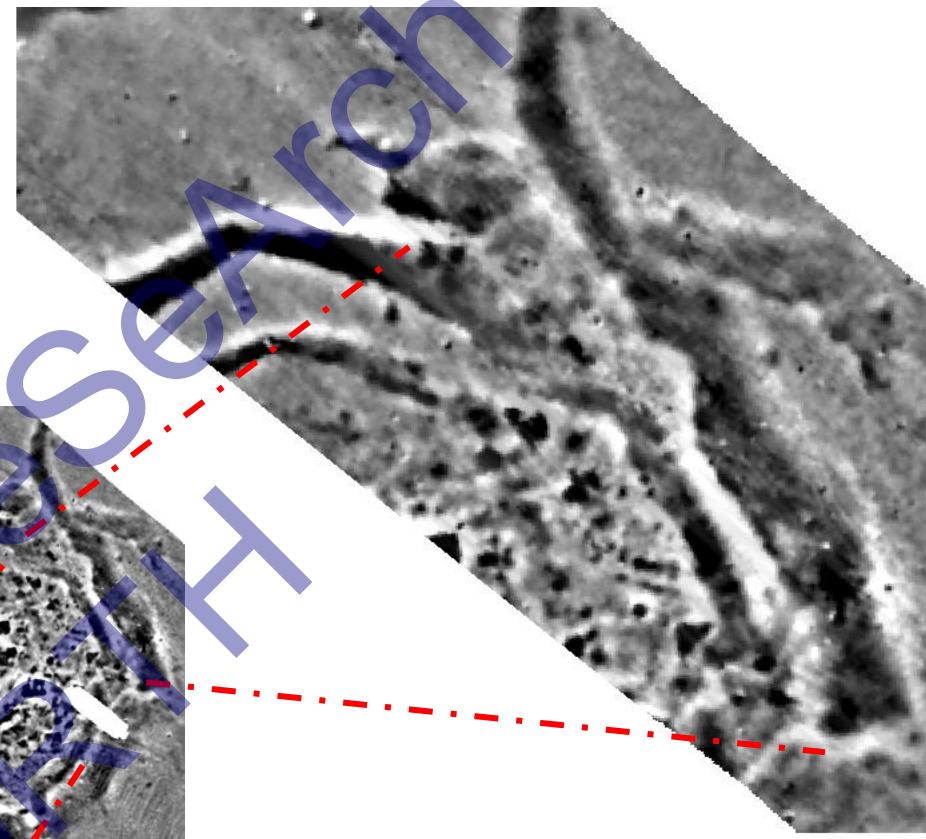
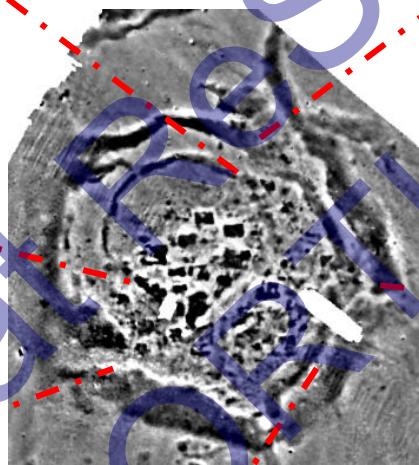
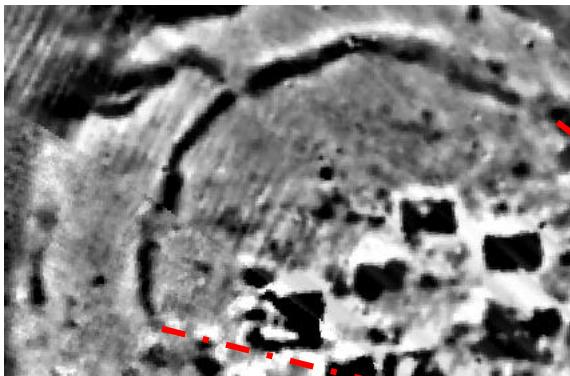
# Enclosures

## Almyriotiki: EN-MN-LN



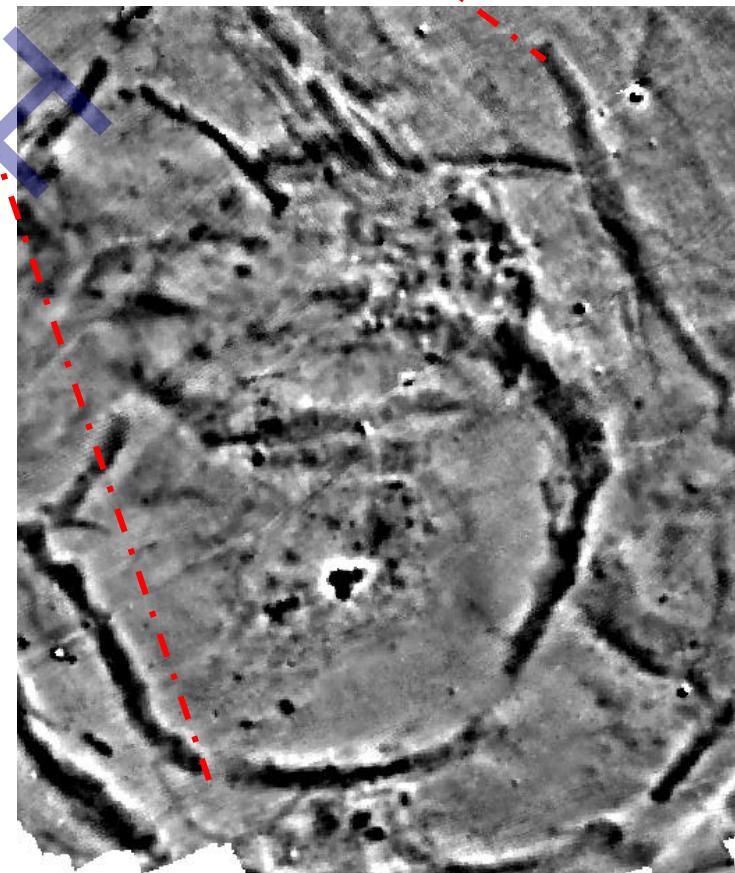
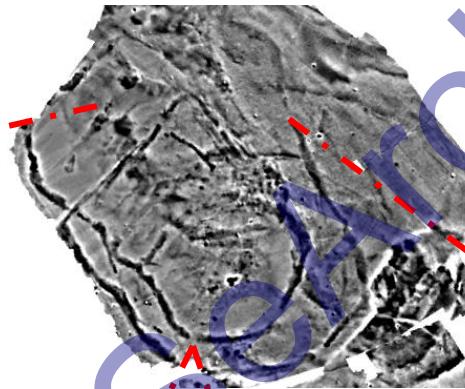
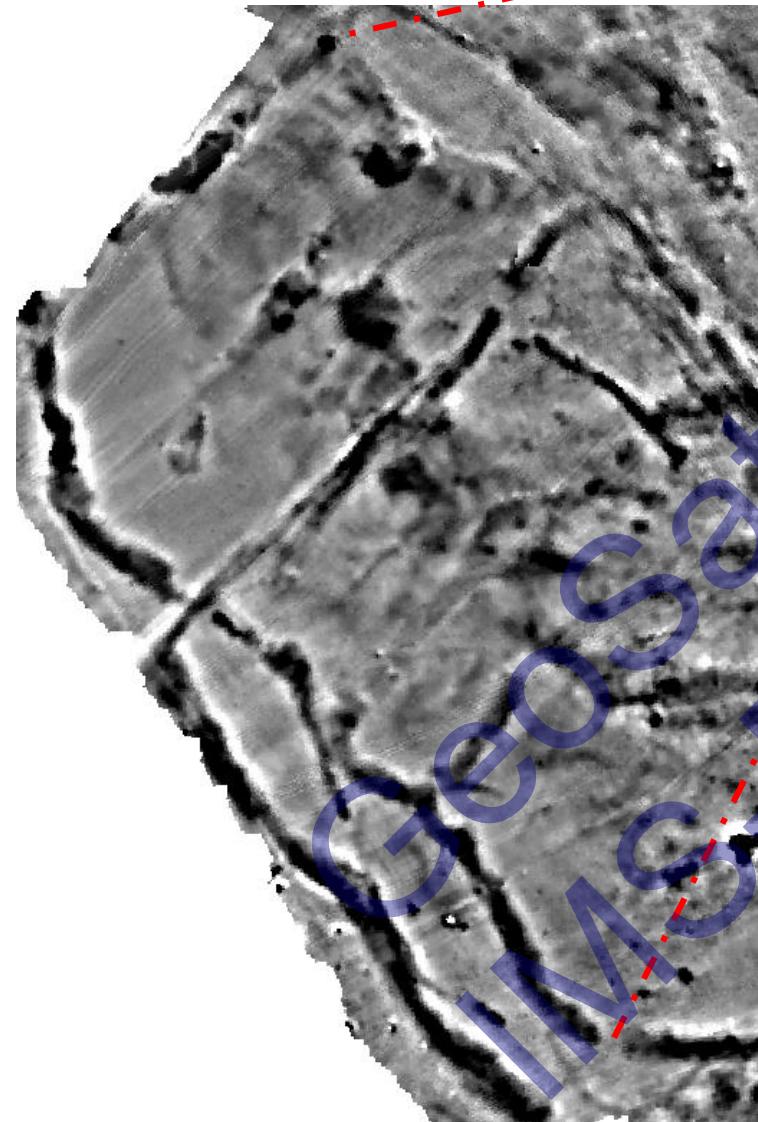
# Enclosures

## Alymros 2: EN-MN



# Enclosures

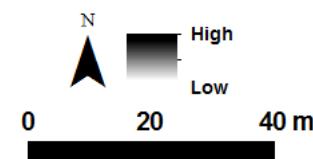
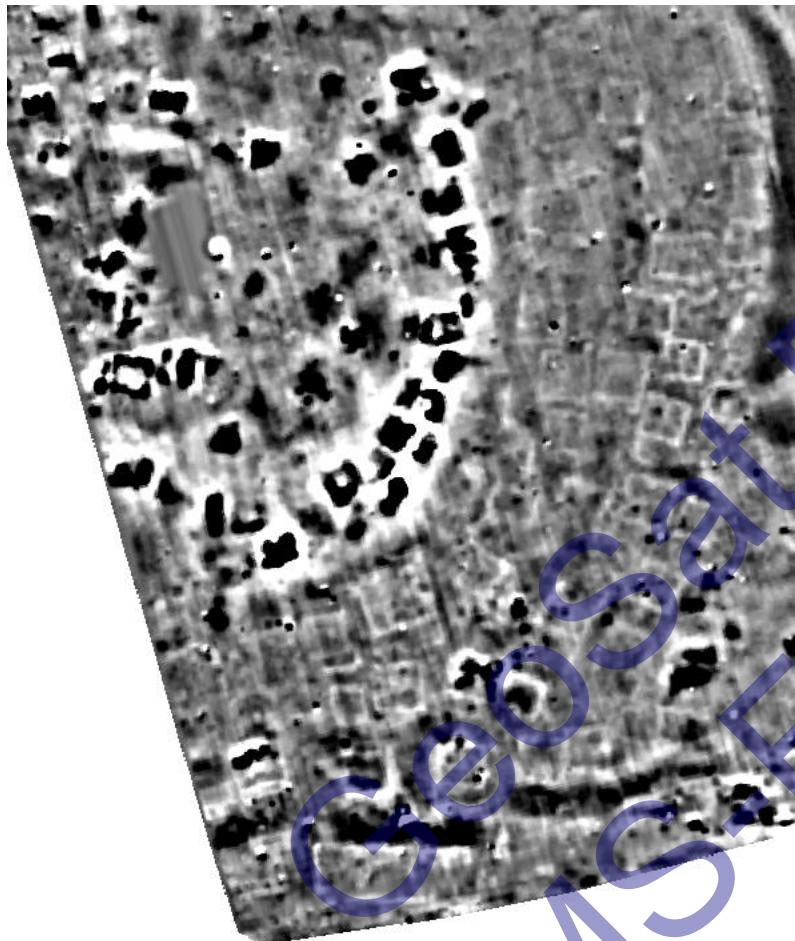
## Perdika 2: EN-MN



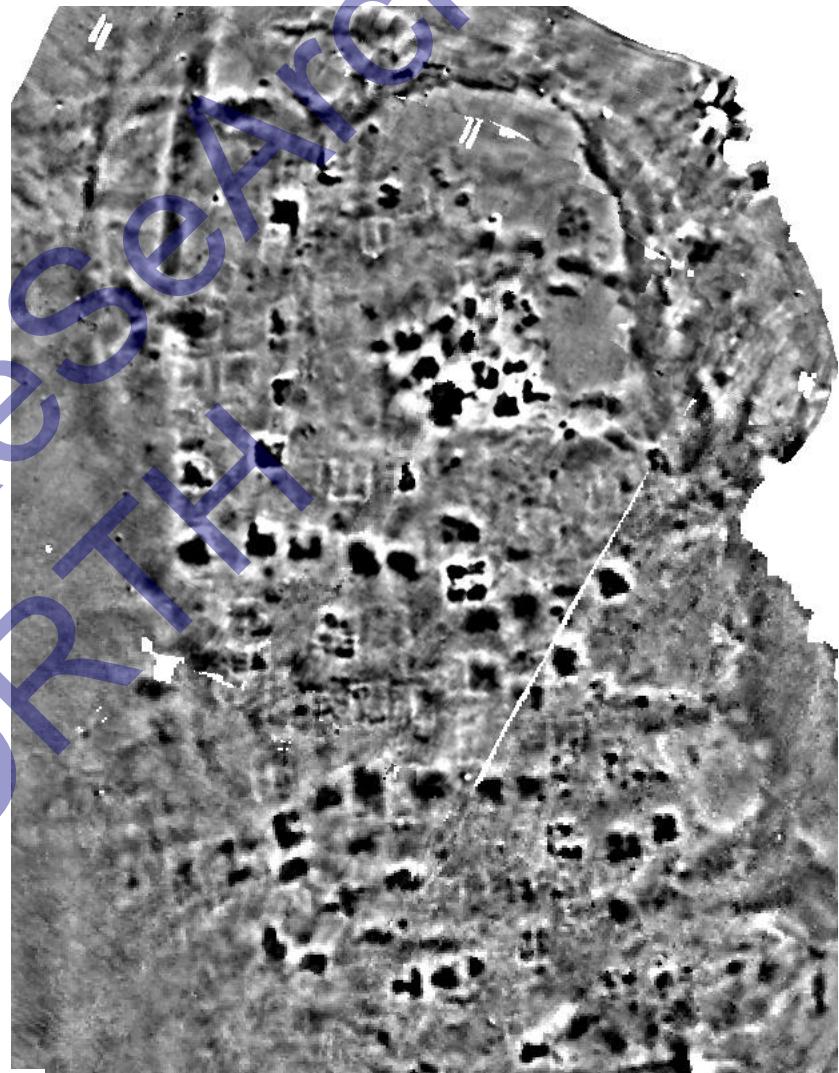
Geosat Research  
IMSGORT

# Structures

Almyriotiki: EN-MN-LN

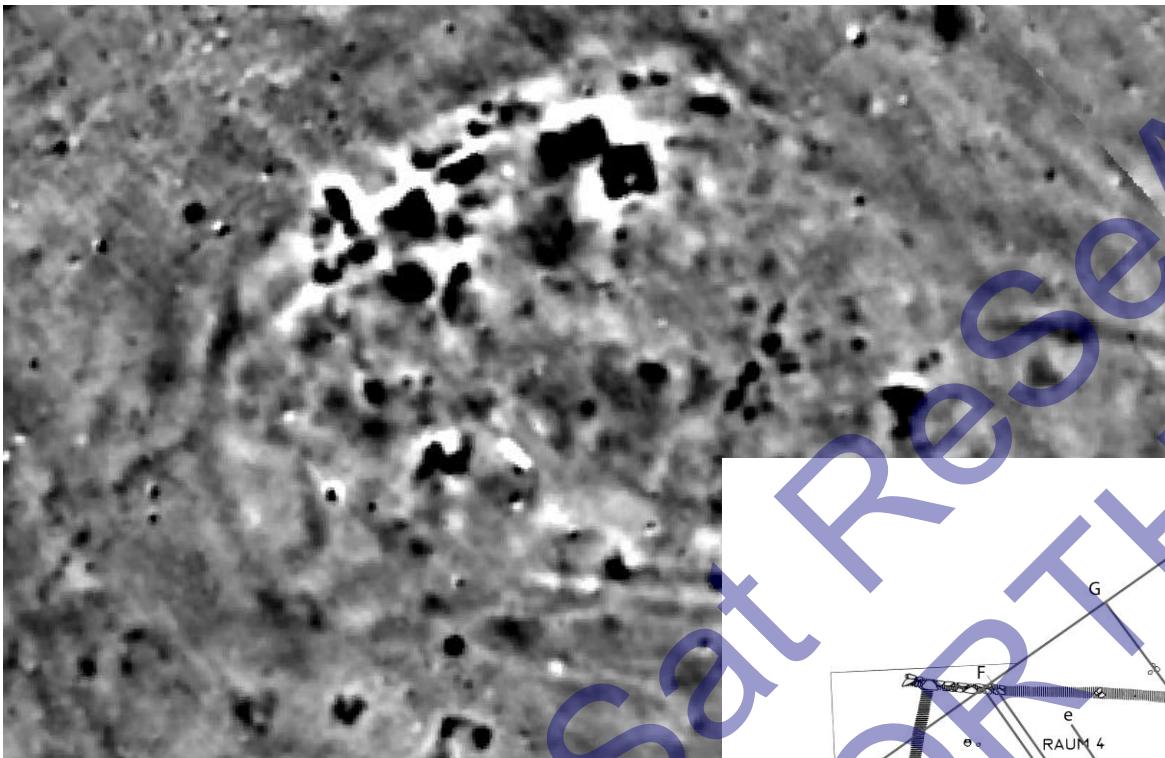


Perdika 1: EN-MN



# “Special” Buildings

Visviki: EN-MN-LN

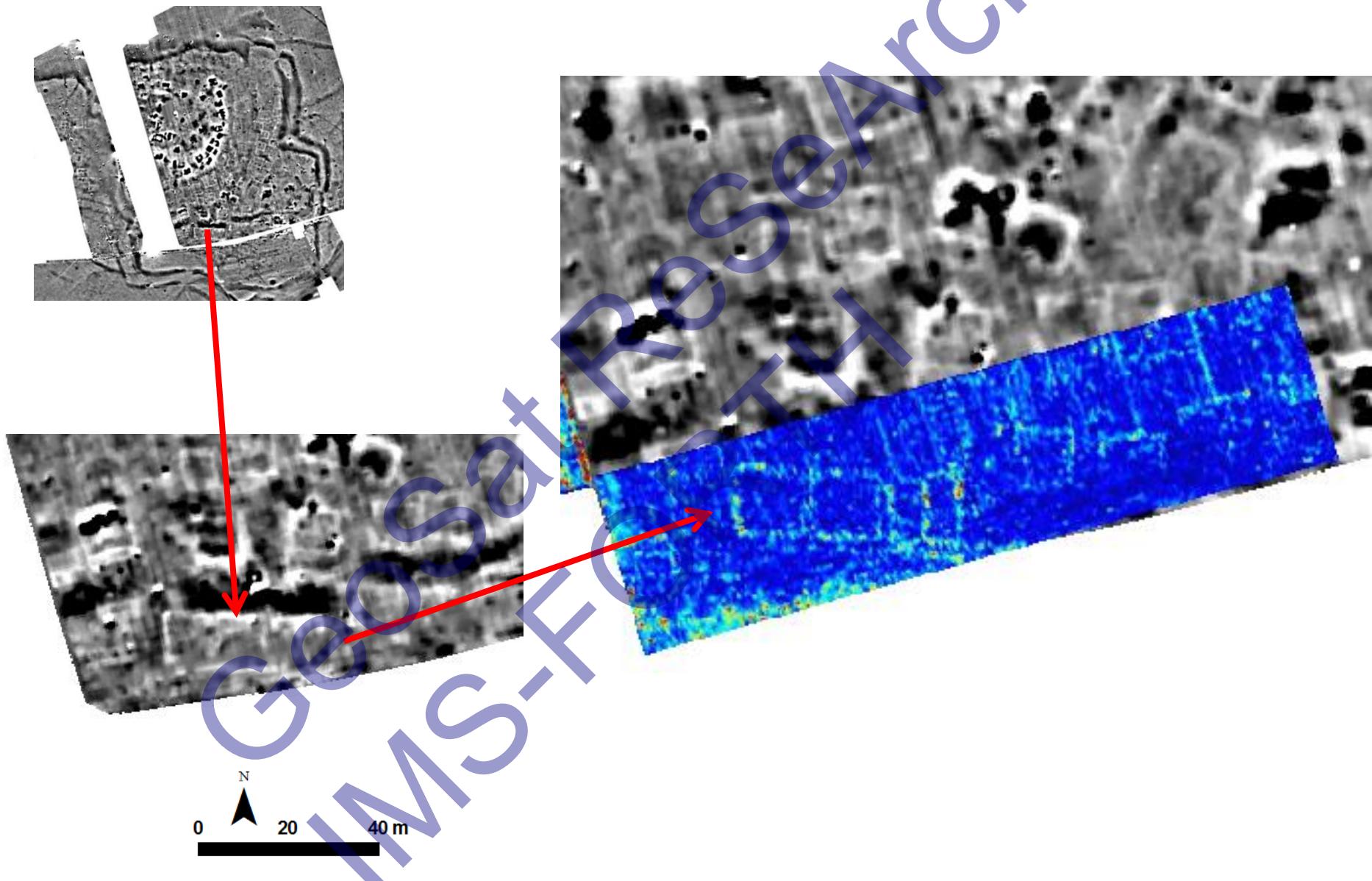


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High  
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0 12.5 25 m



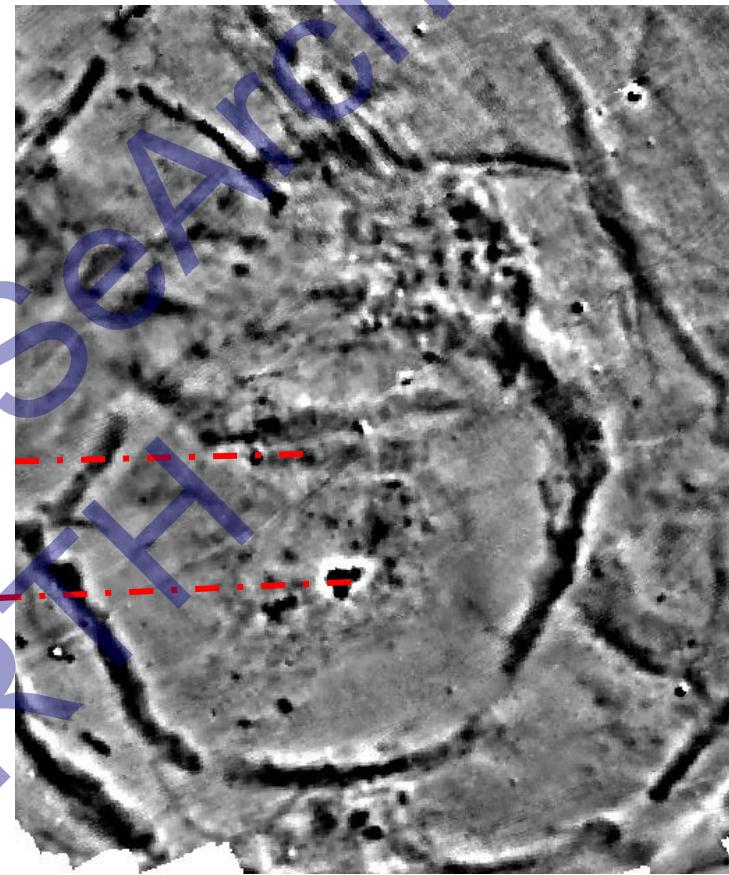
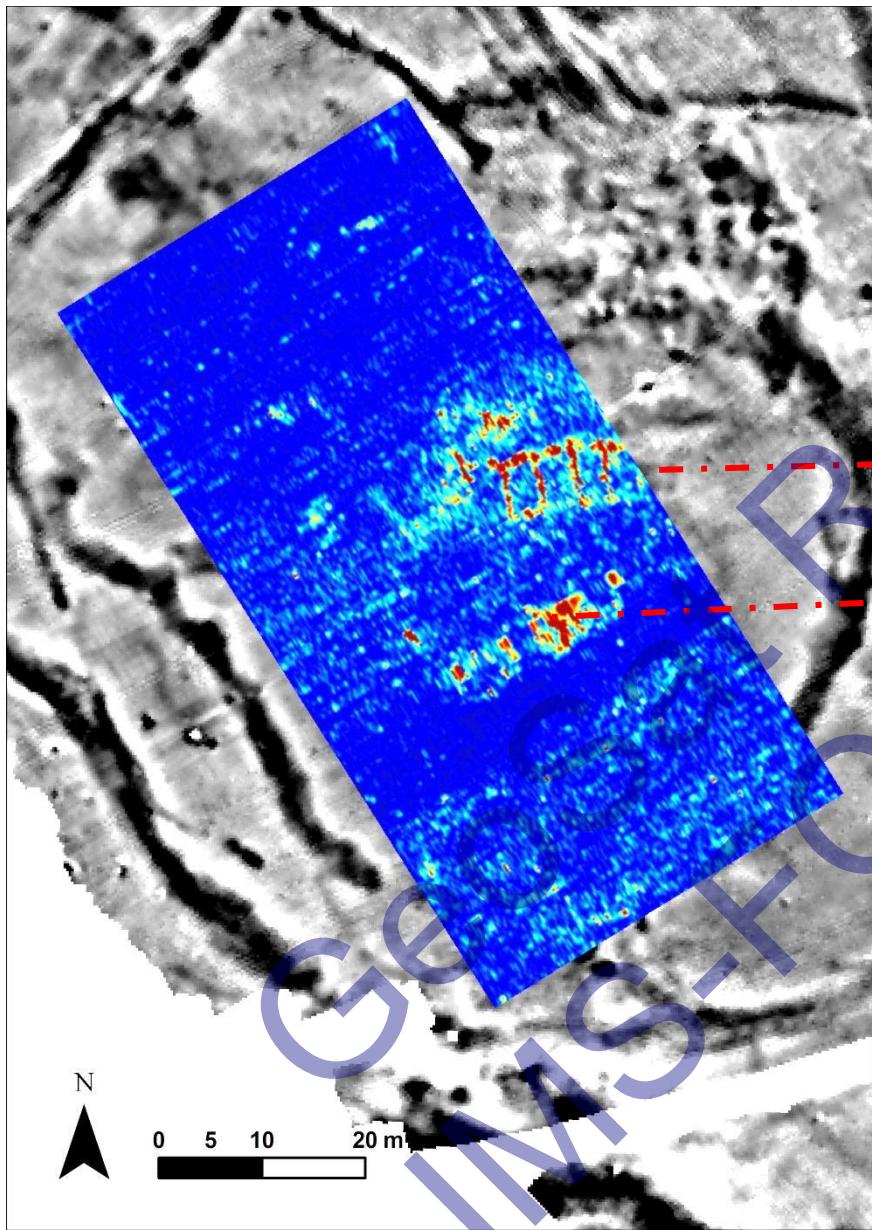
# “Special” Buildings

Almiriotiki: EN-MN-LN



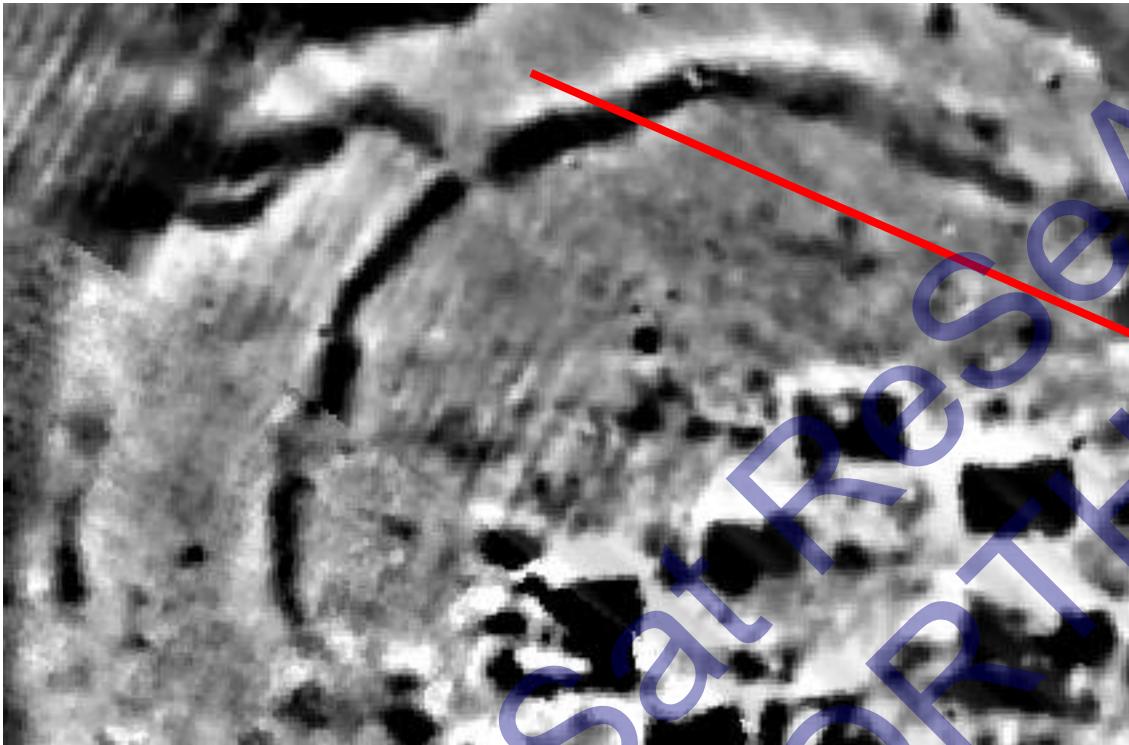
# “Special” Buildings

## Perdika 2: EN-MN

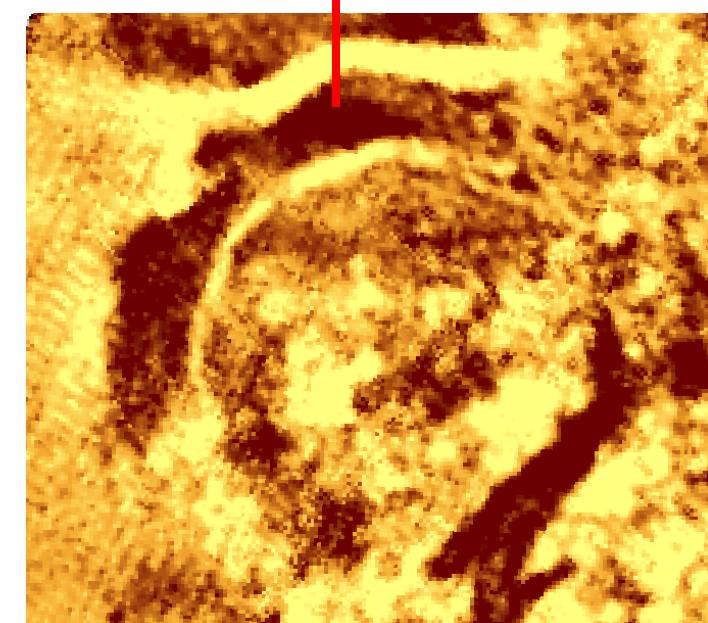


“Empty” Spaces

Alymros 2:EN-MN



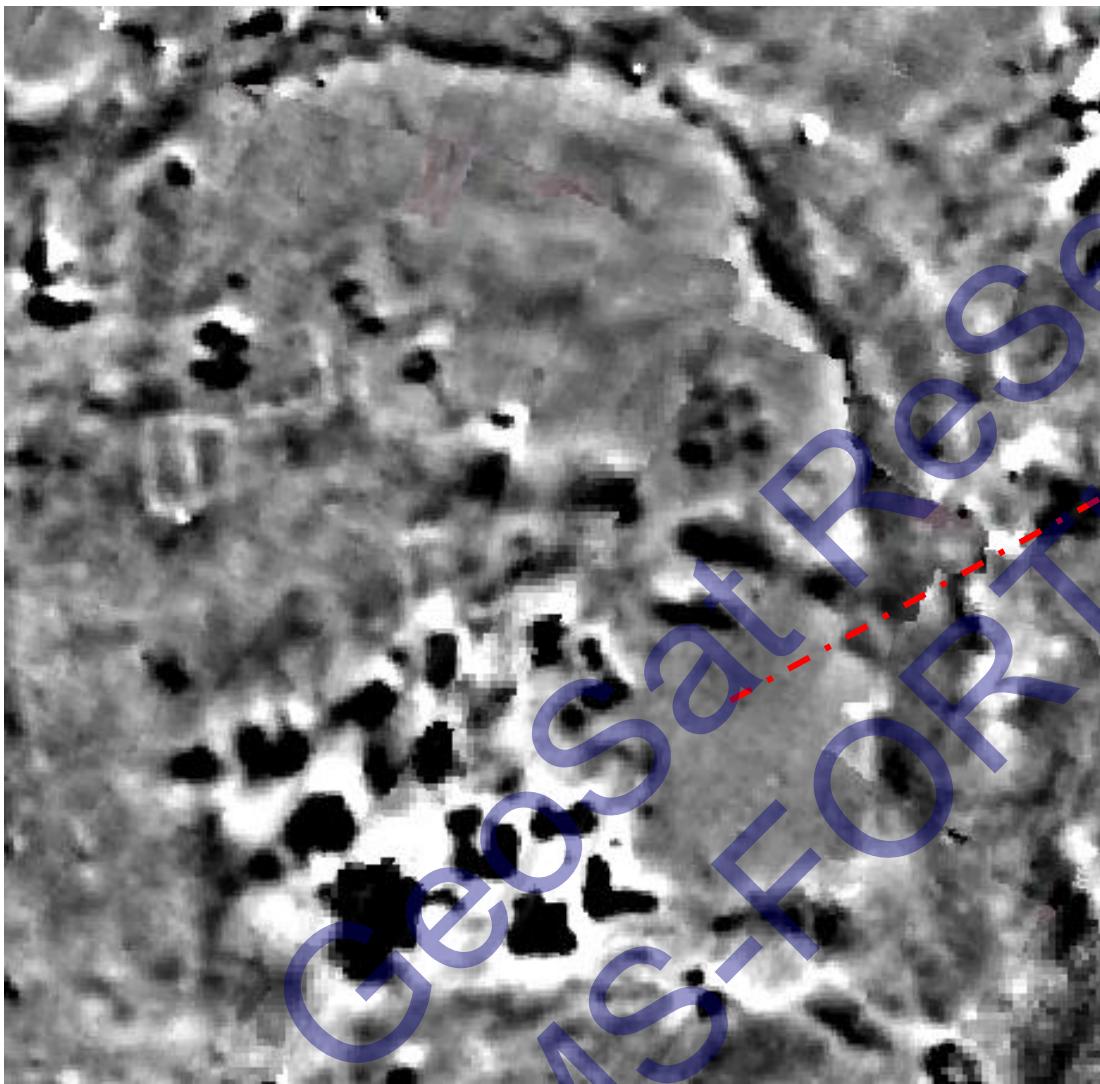
Low magnetism  
Low susceptibility



GeoSatReSeArch  
IMS-FORUM

“Empty” Spaces

Perdika 1: EN-MN



## Conclusions

- **Successful Employment of Geophysical and Satellite RS techniques:**  
Importance of using an arsenal of various approaches (manifold geophysics)

**BUT, MOST IMPORTANTLY;**

- A landscape of variation

**Similar and divergent characteristics of settlements in planning and structural materials)**

- Dimension of settlements and structures
- Internal organization of the structures, clusters of structures
- open/unbuilt spaces, pits, a.o.
- burnt and unburnt structures / mudbrick & stone structures?
- Corridors and entrances
- Existence of enclosures (ditches/fortifications)

- (A) Built Environments and Settlement Patterns
- (B) Neolithic Landscapes and Paleo-environment
- (C) Land Use & Farming Dynamics
- (D) Territoriality, Interaction, and Connectivity of Settlements



Ευρωπαϊκή Ένωση  
Ευρωπαϊκό Κοινωνικό Ταμείο



ΕΠΙΧΕΙΡΗΣΙΑΚΟ ΠΡΟΓΡΑΜΜΑ  
ΕΚΠΑΙΔΕΥΣΗ ΚΑΙ ΔΙΑ ΒΙΟΥ ΜΑΘΗΣΗ  
επένδυση στην κοινωνία της γνώσης  
ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ & ΘΡΗΣΚΕΥΜΑΤΩΝ, ΠΟΛΙΤΙΣΜΟΥ & ΑΘΛΗΤΙΣΜΟΥ  
ΕΙΔΙΚΗ ΥΠΗΡΕΣΙΑ ΔΙΑΧΕΙΡΙΣΗΣ



Me

τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης