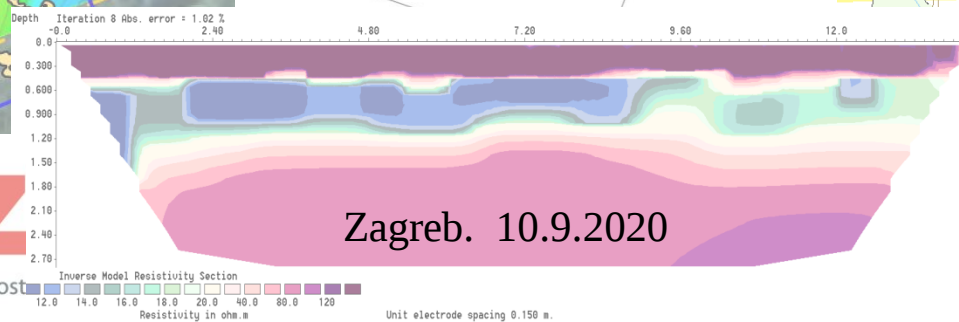


SECRETS OF IRON – FROM RAW
MATERIAL TO AN IRON OBJECT

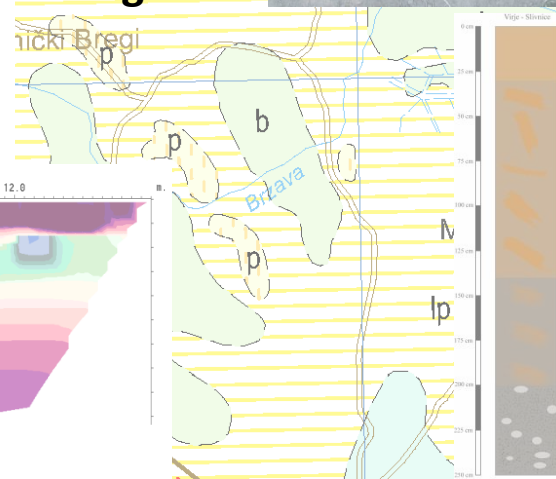
TRANSFER – IRON PRODUCTION ALONG THE DRAVA RIVER IN THE ROMAN PERIOD
AND THE MIDDLE AGES: CREATION AND TRANSFER OF KNOWLEDGE, TECHNOLOGIES
AND GOODS. THE CASE STUDIES OF VIRJE, VELIKE HLEBINE, DEDANOVICE,
BAKOVČICE, NAĐBARICE AND ŽDALA

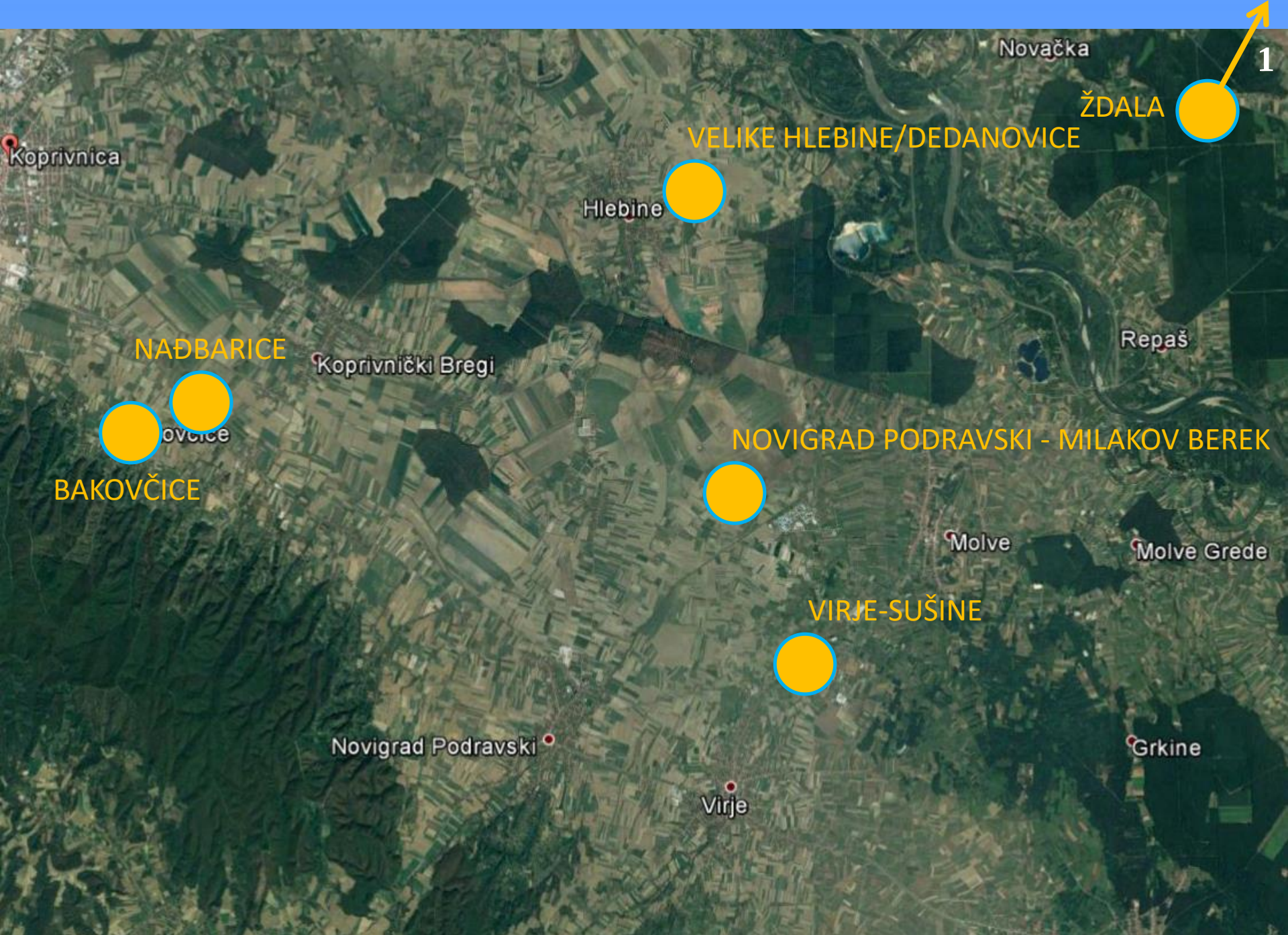
Head of the project:
dr. Tajana Sekelj Ivančan

Authors:
Branko Mušič, Tajana Sekelj-Ivančan, Barbara Horn and Igor Medarić



Zagreb. 10.9.2020





1

Novačka

ŽDALA

VELIKE HLEBINE/DEDANOVICE

Hlebine

NADBARICE

Koprivnički Bregi

Repaš

ovcice

BAKOVČICE

NOVIGRAD PODRAVSKI - MILAKOV BEREK

Molve

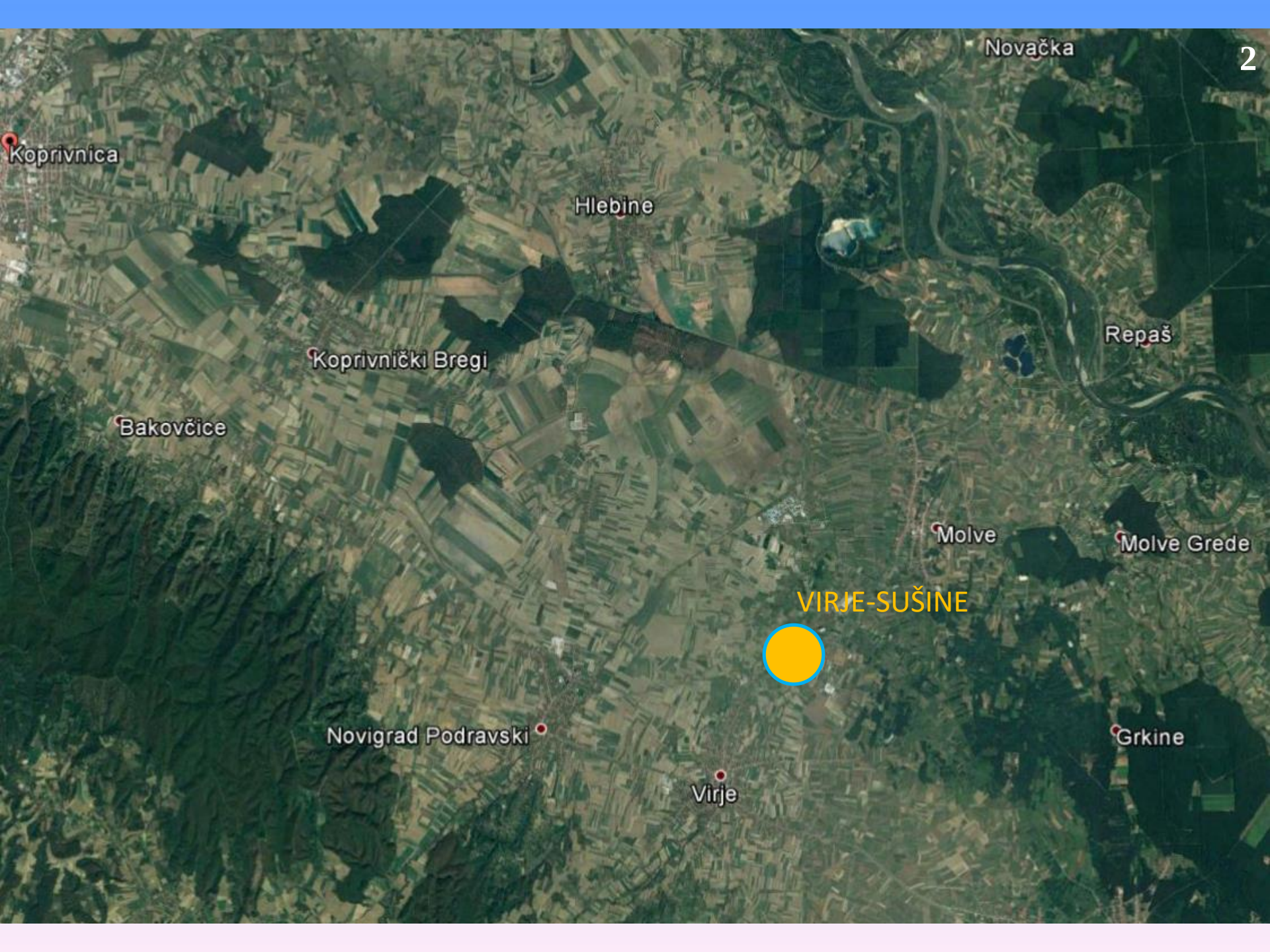
Molve Grede

VIRJE-SUŠINE

Novigrad Podravski

Grkine

Virje



Novačka

2

Koprivnica

Hlebine

Koprivnički Bregi

Bakovčice

Repaš

Molve

Molve Grede

VIRJE-SUŠINE

Novigrad Podravski

Virje

Grkine

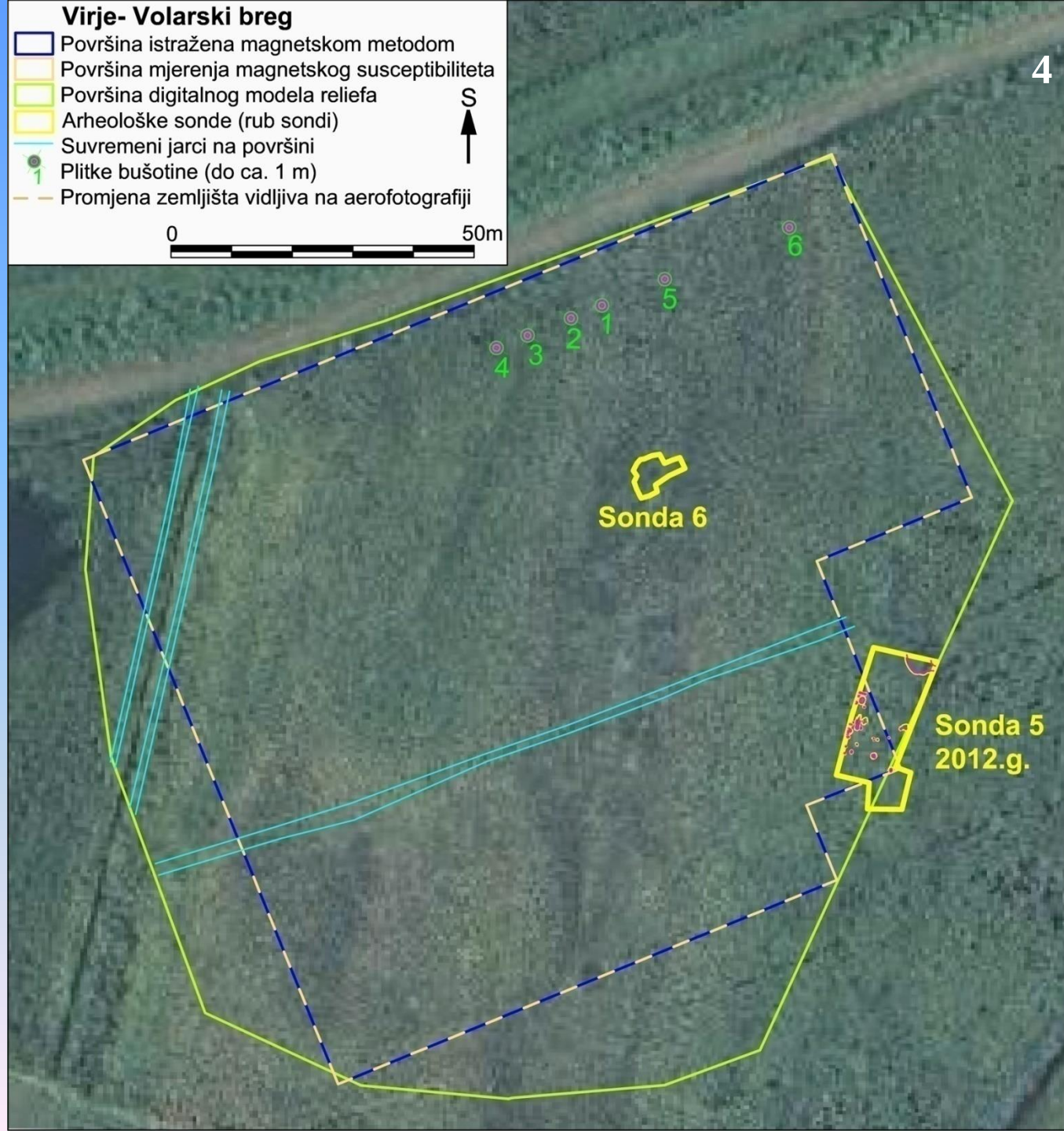


VIRJE - SUŠINE

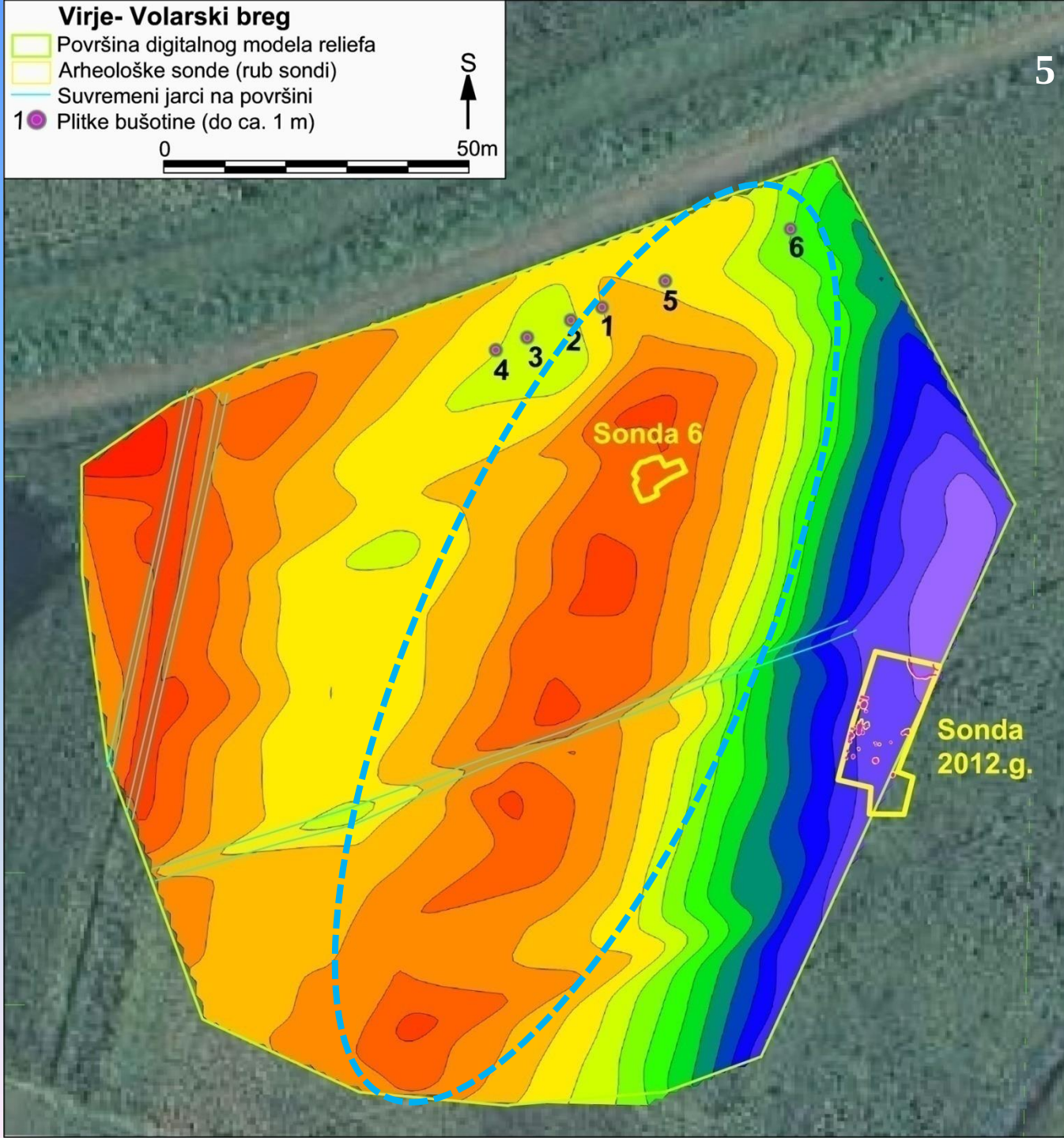
AREAS SURVEYED BY MAGNETIC METHOD (*Geometrics G-858*) AND MAGNETIC SUSCEPTIBILITY MAPPING

(*Kappameter KT-5*)

ARCHAEOLOGICAL TEST SOUNDINGS

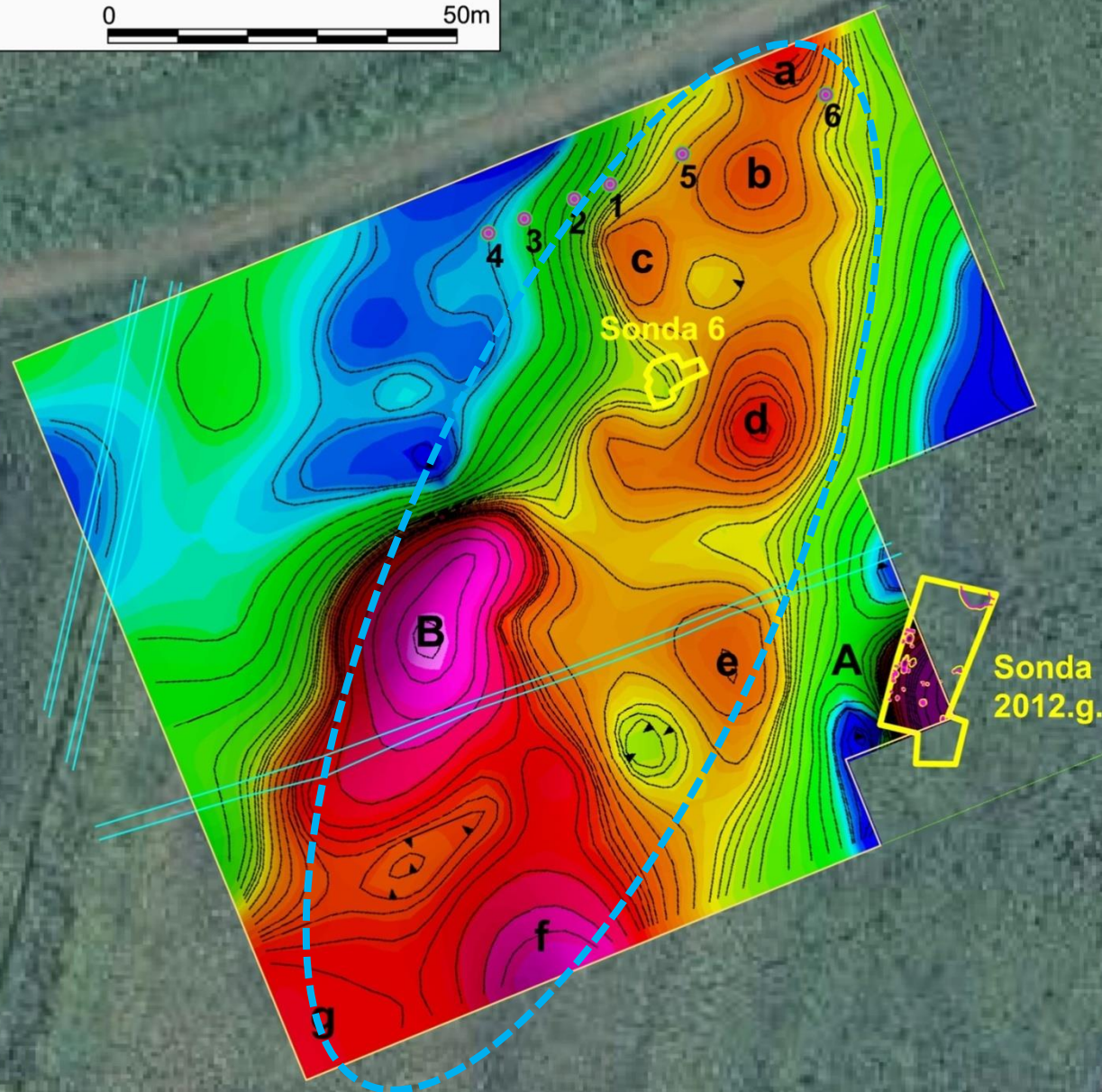
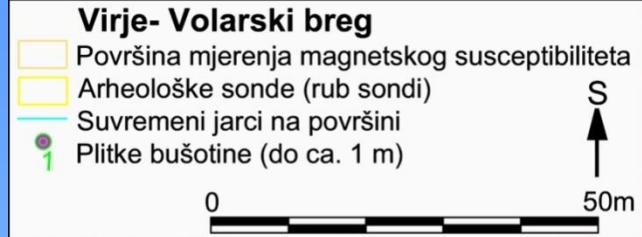


slightly elevated terrain



MAGNETIC SUSCEPTIBILITY MAPPING

(Kappameter KT-5)



Virje- Volarski breg

 Površina istražena magnetskom metodom

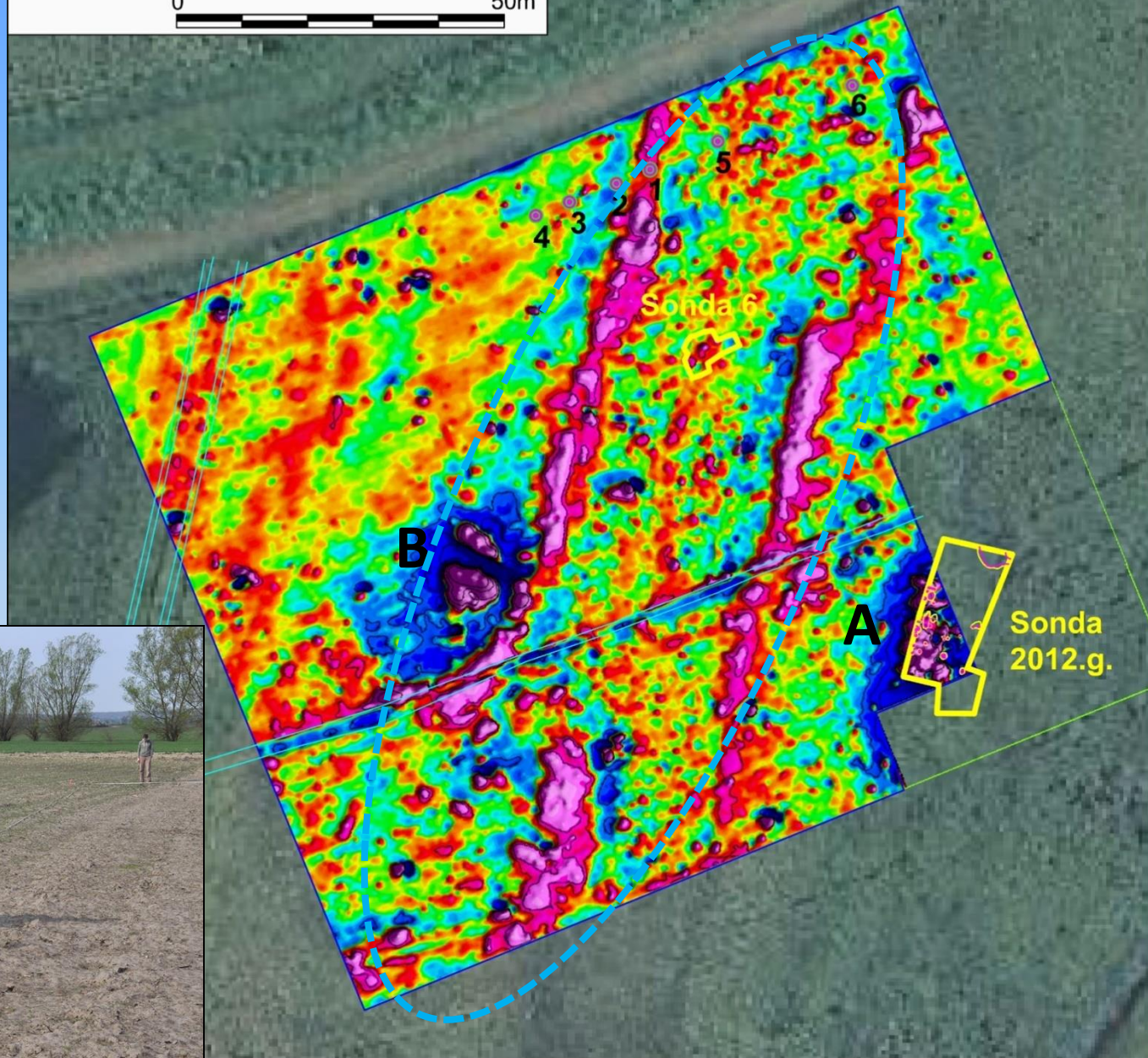
 Arheološka sonda (rub sonde)

 Suvremeni jarci na površini

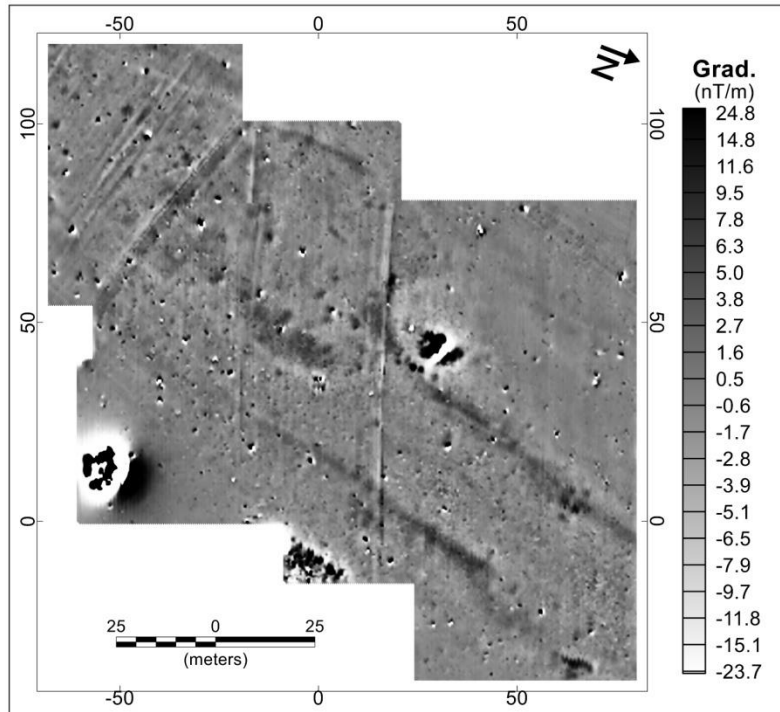
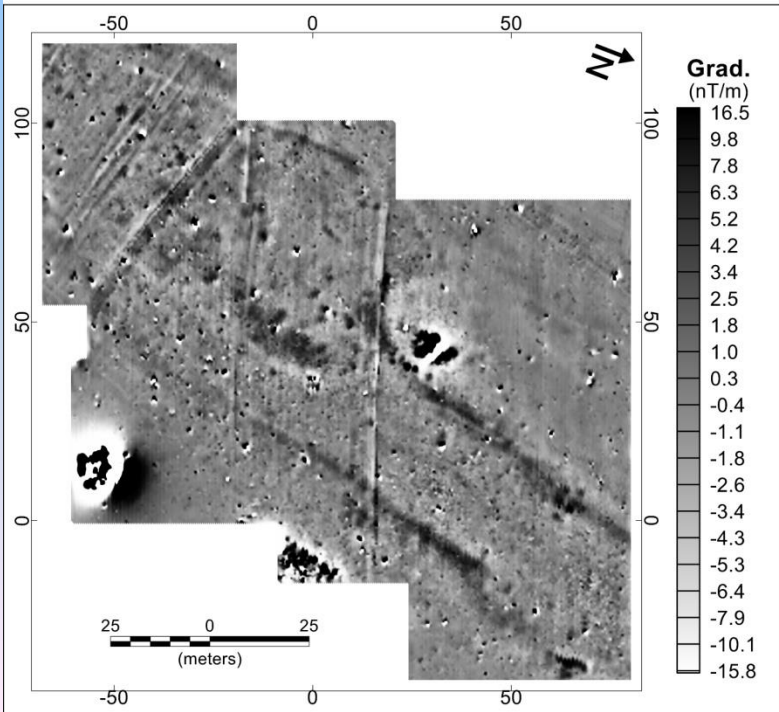
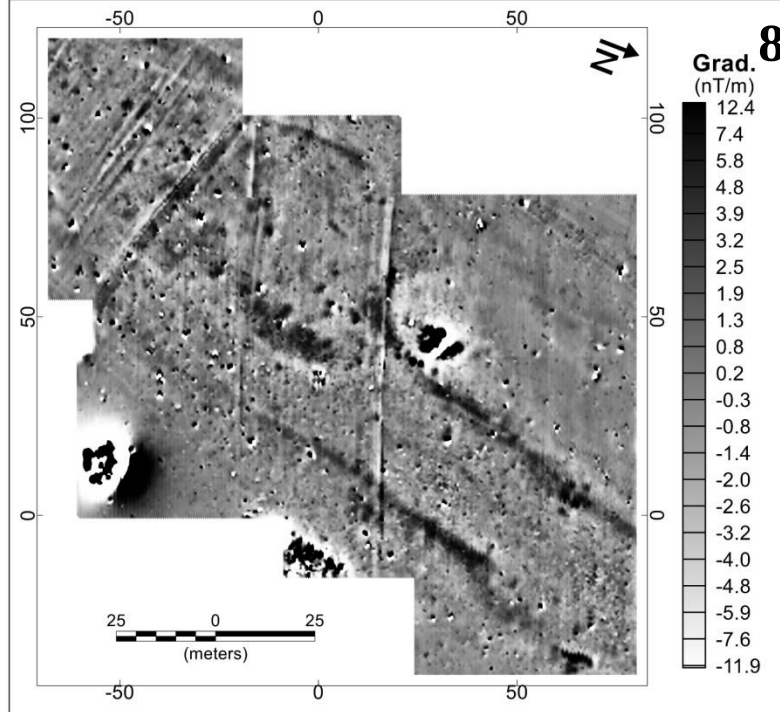
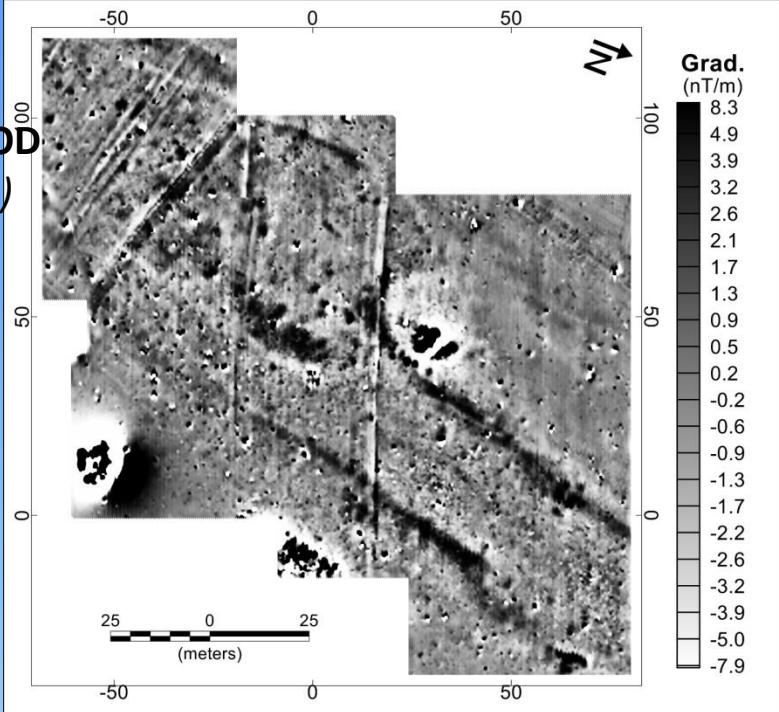
 1 Plitke bušotine (do ca. 1 m)

 S

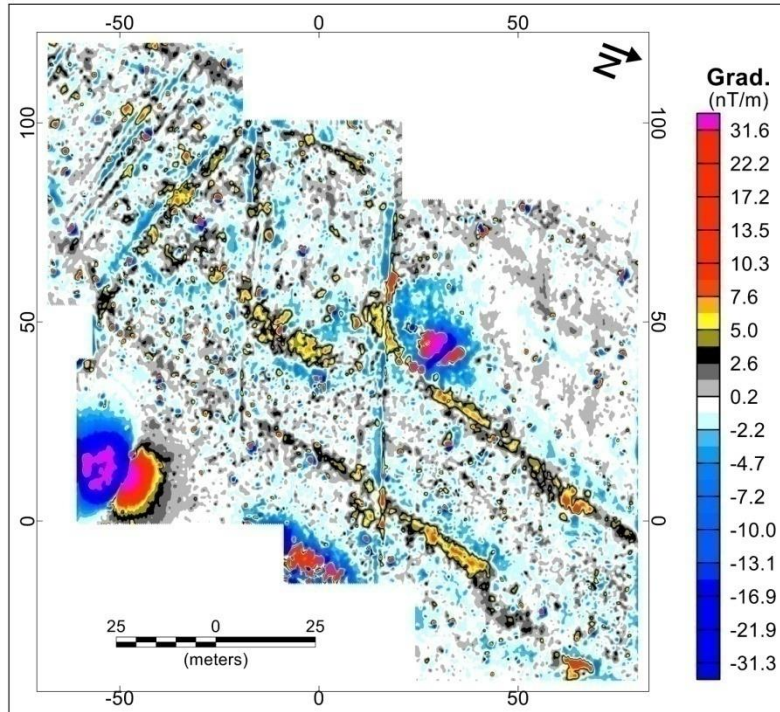
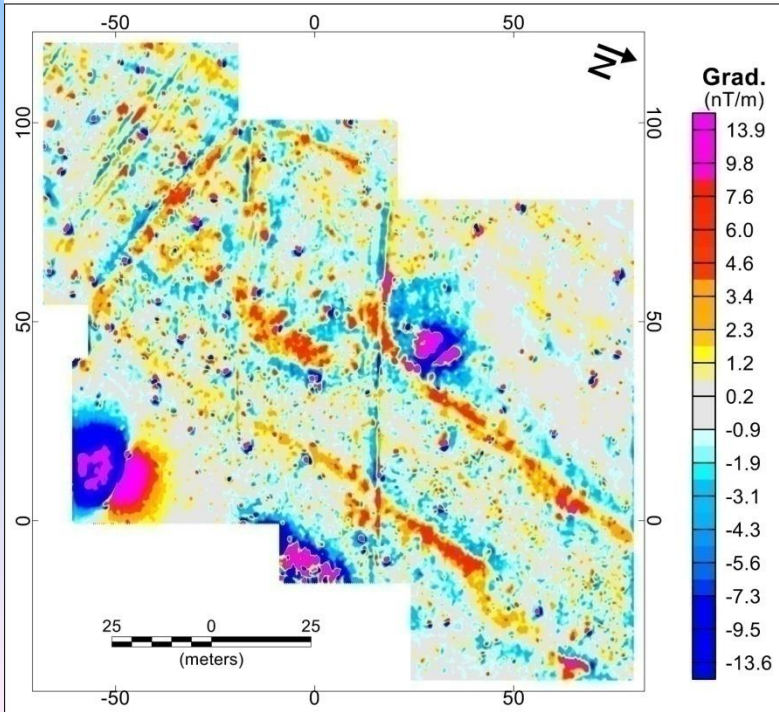
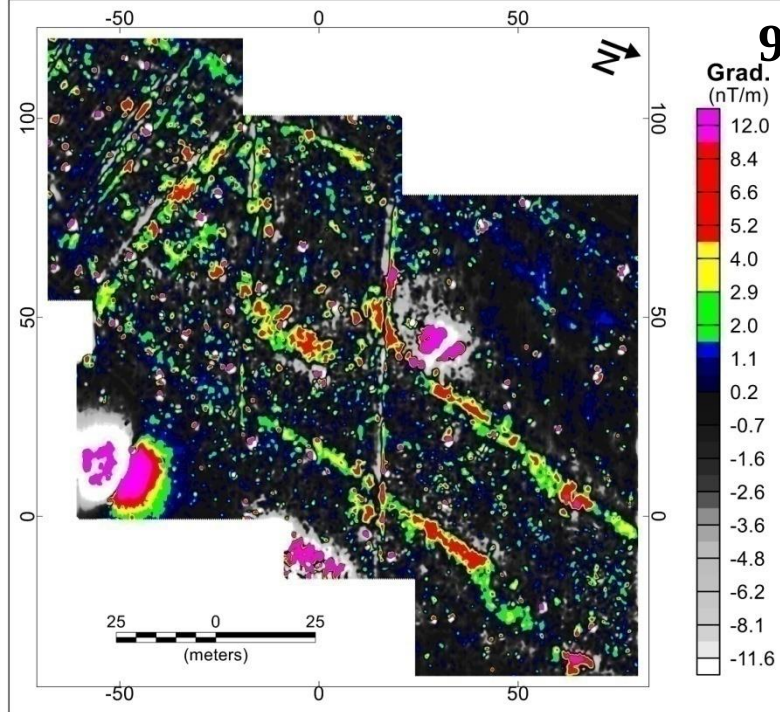
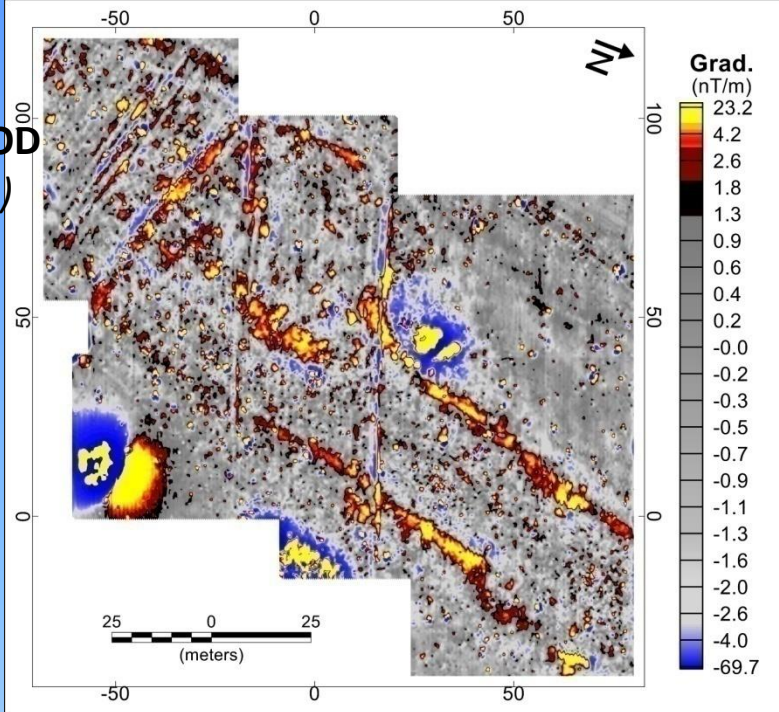
 0 50m



MAGNETIC METHOD
(Geometrics G-858)



MAGNETIC METHOD
(Geometrics G-858)



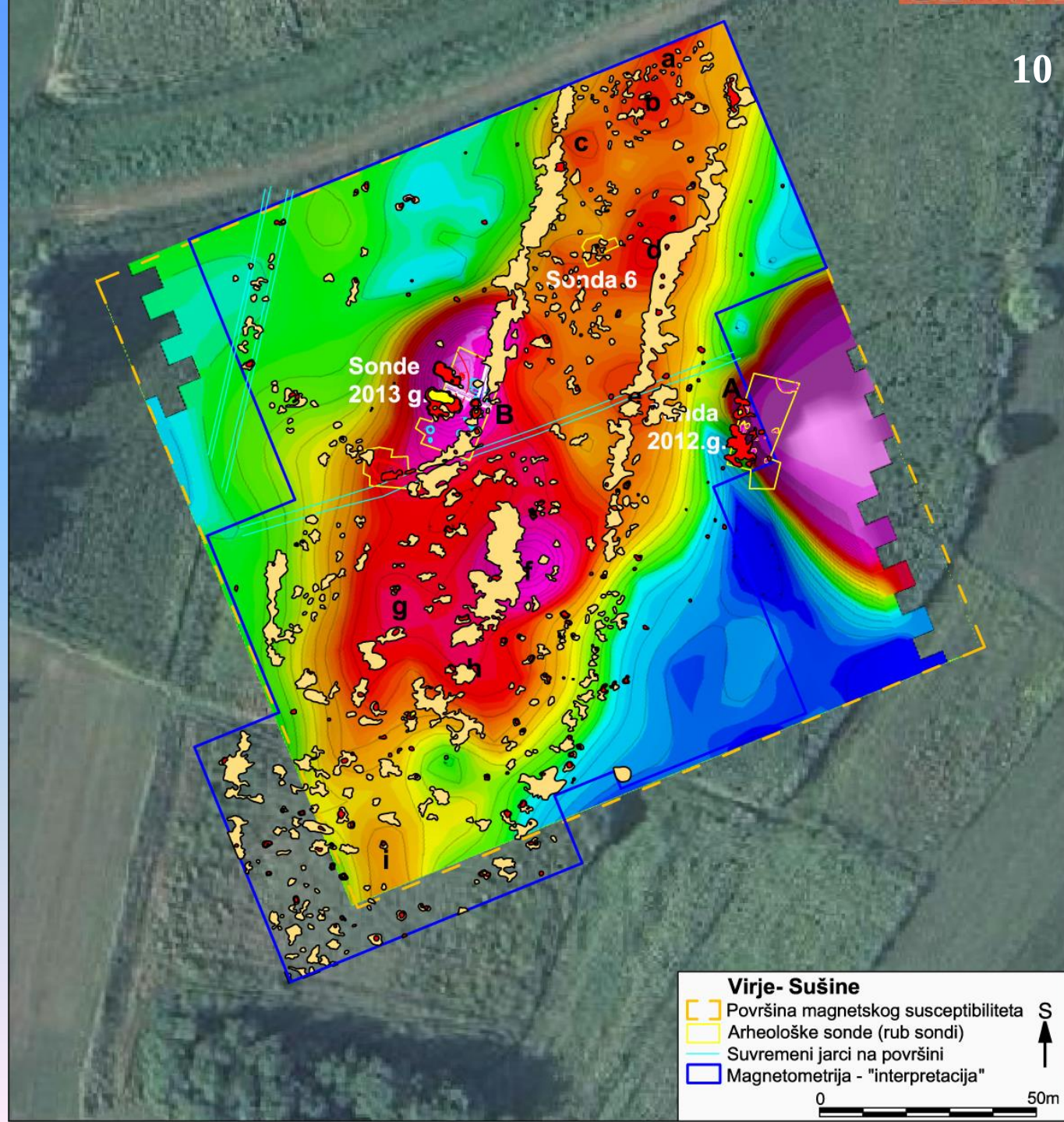
RESULTS ON: MAGNETIC SUSCEPTIBILITY MAPPING

(Kappameter KT-5)

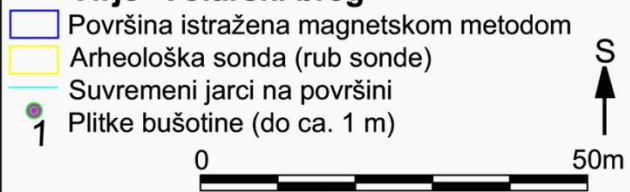
and

MAGNETIC METHOD

(Geometrics G-858)



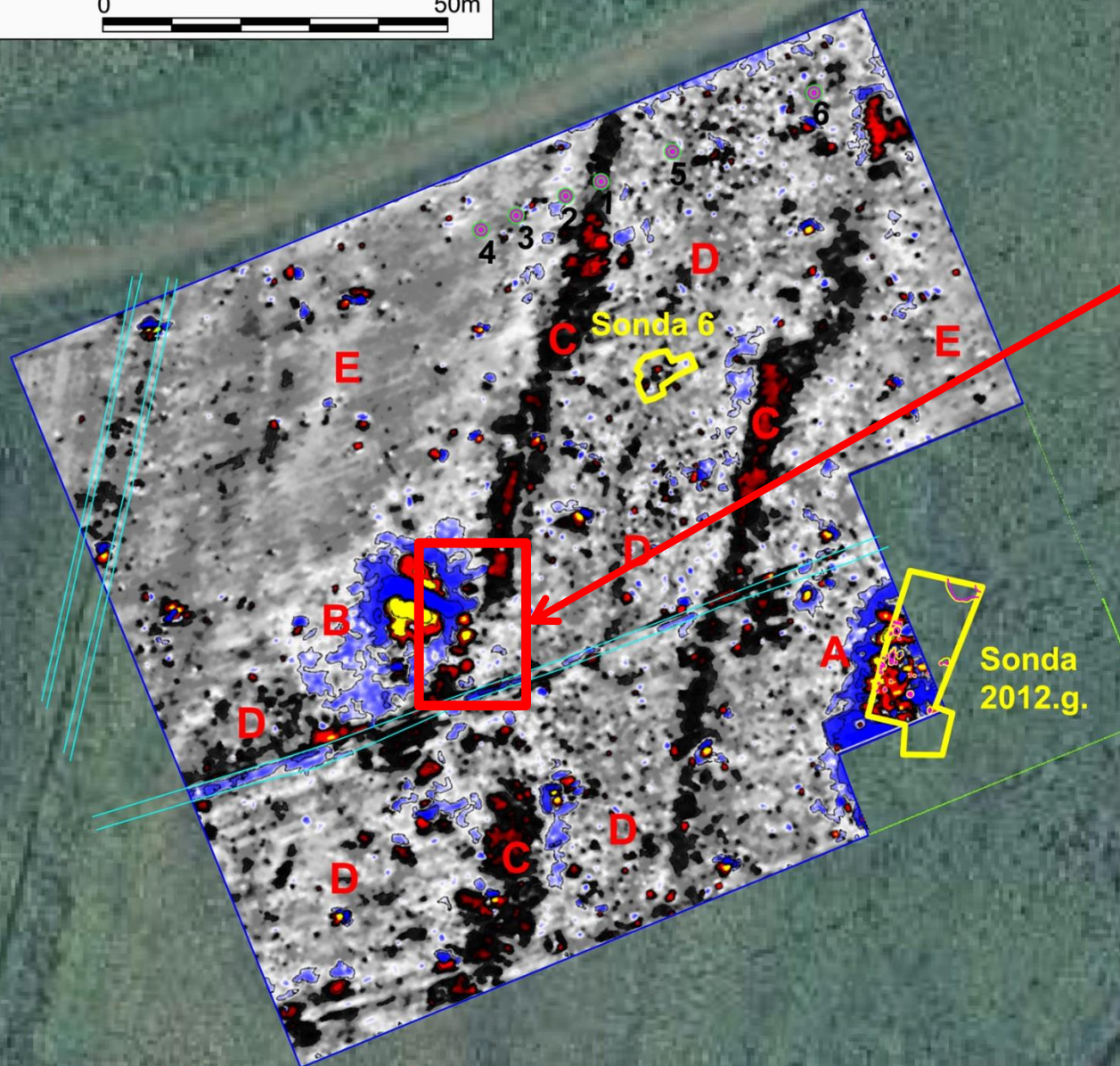
Virje- Volarski breg



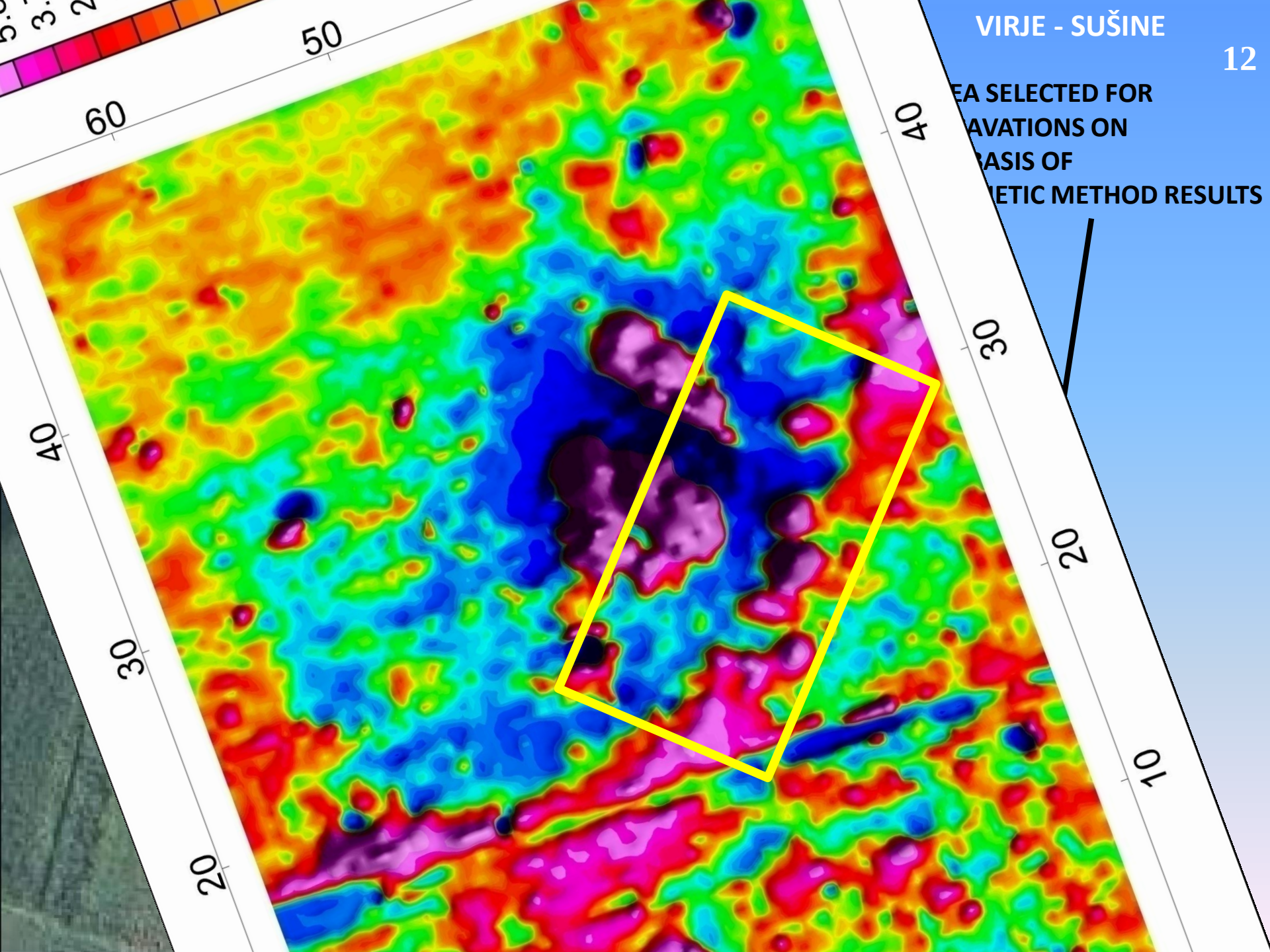
VIRJE - SUŠINE

11

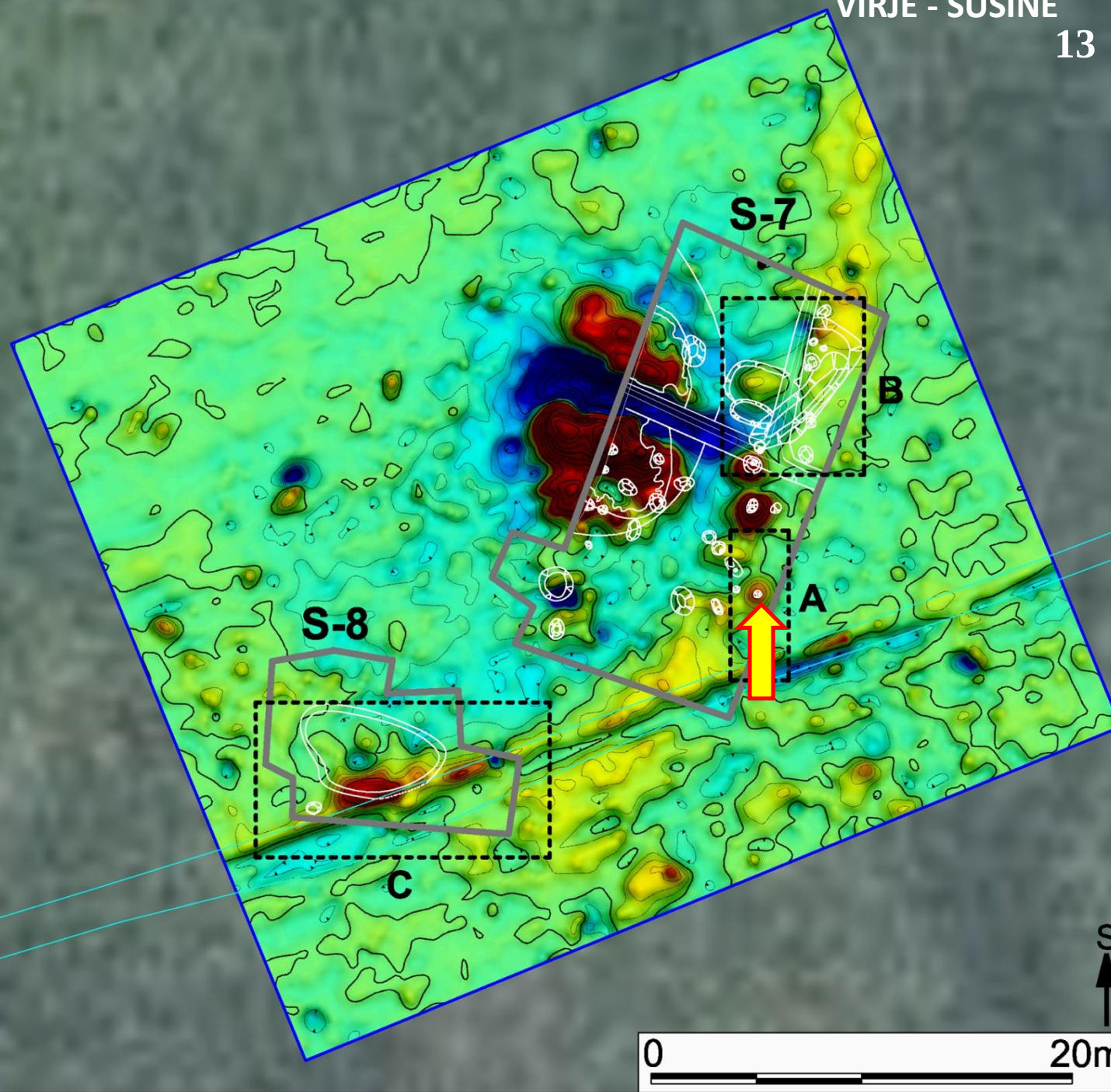
AREA SELECTED FOR
EXCAVATIONS ON
THE BASIS OF
MAGNETIC METHOD RESULTS



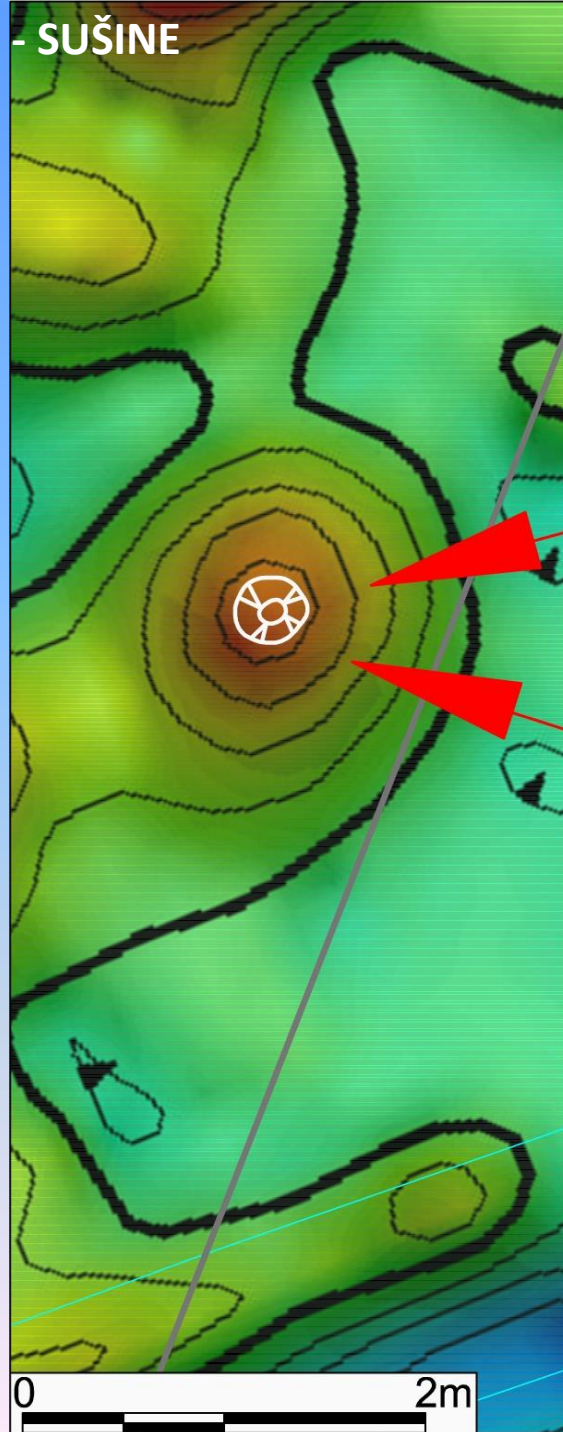
AREA SELECTED FOR
EXCAVATIONS ON
BASIS OF
MAGNETIC METHOD RESULTS



**MAGNETIC METHOD
RESULTS AND
EXCAVATED REMAINS OF
IRON-SMELTING
ACTIVITIES**



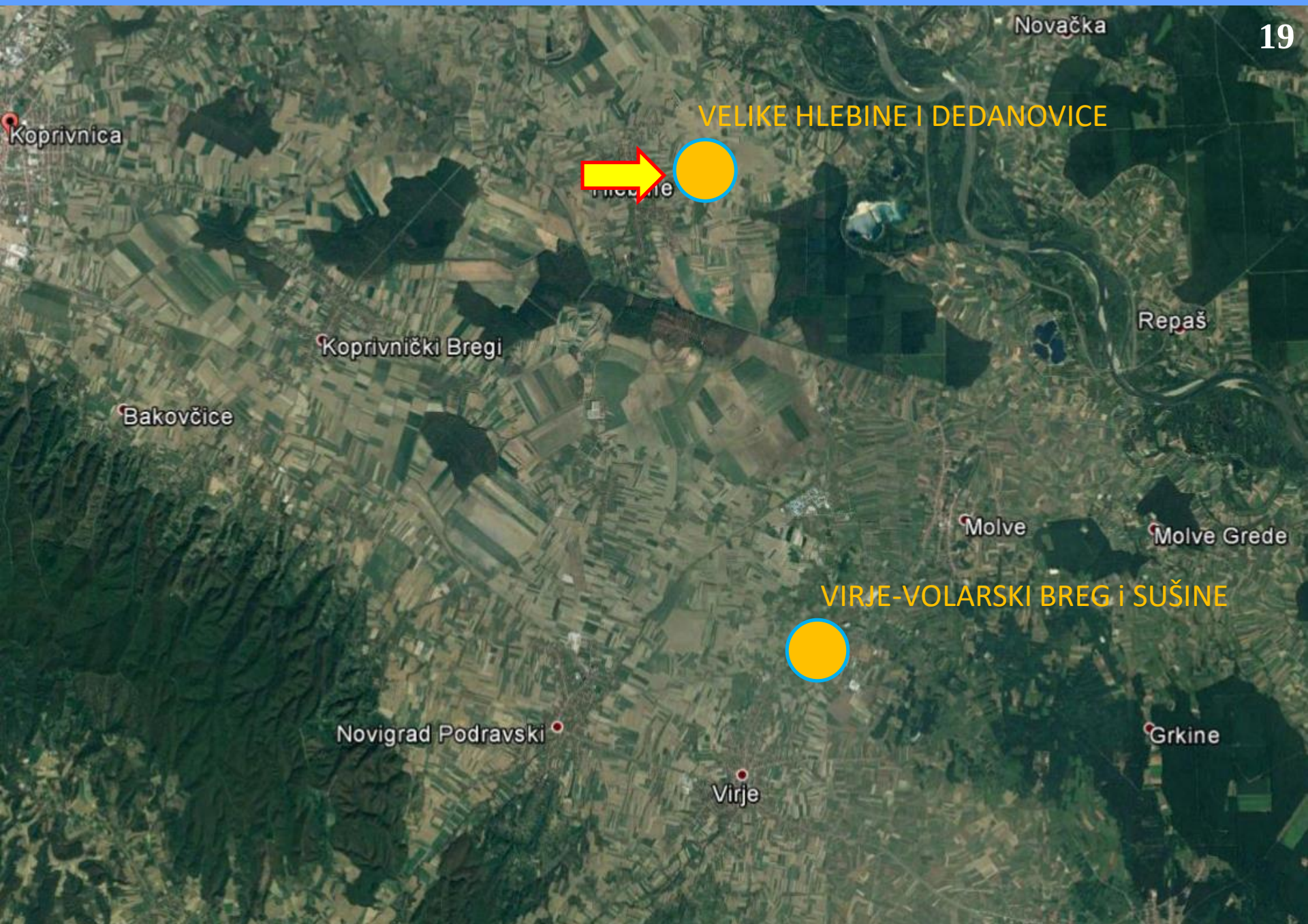








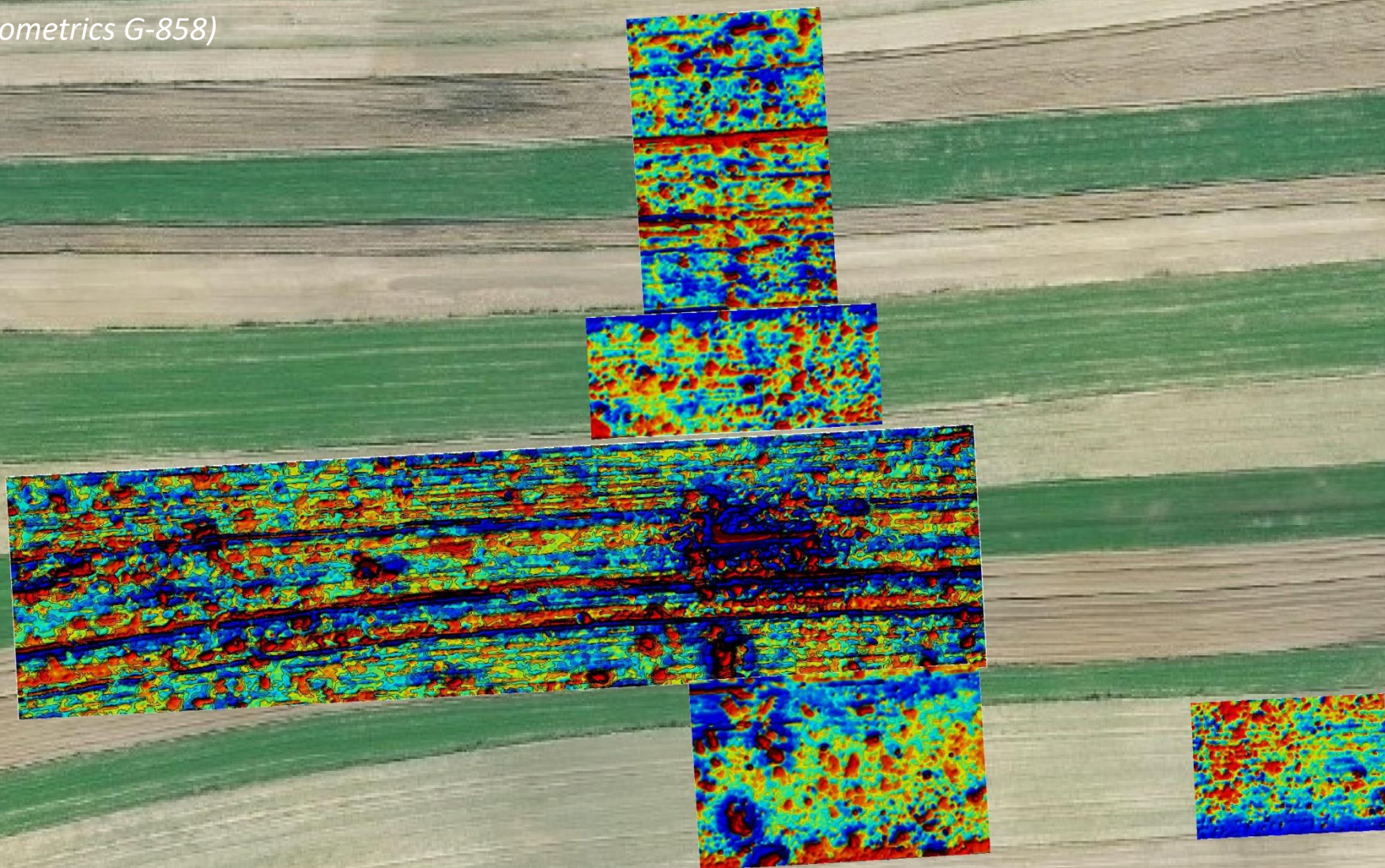




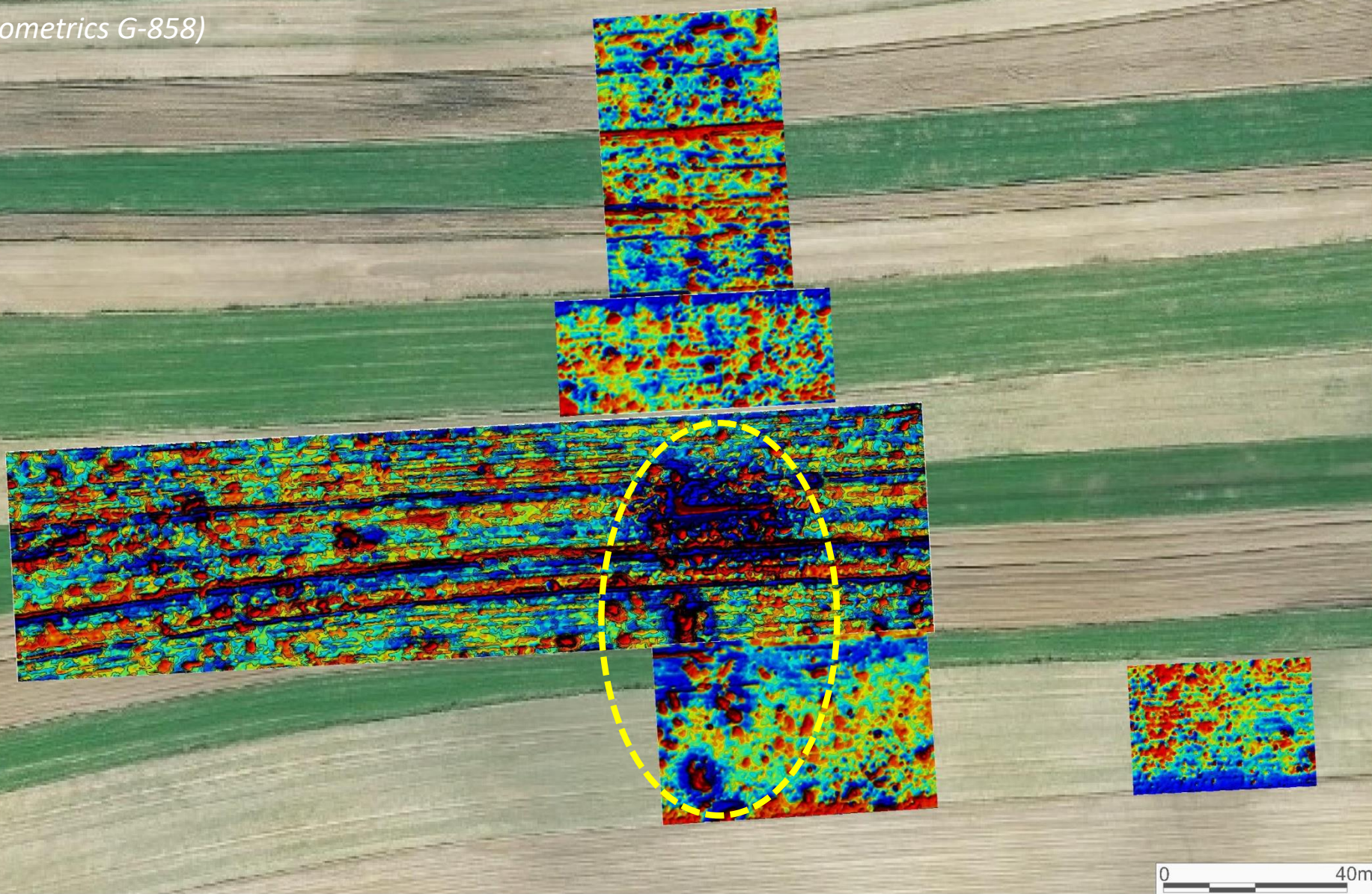


MAGNETIC METHOD

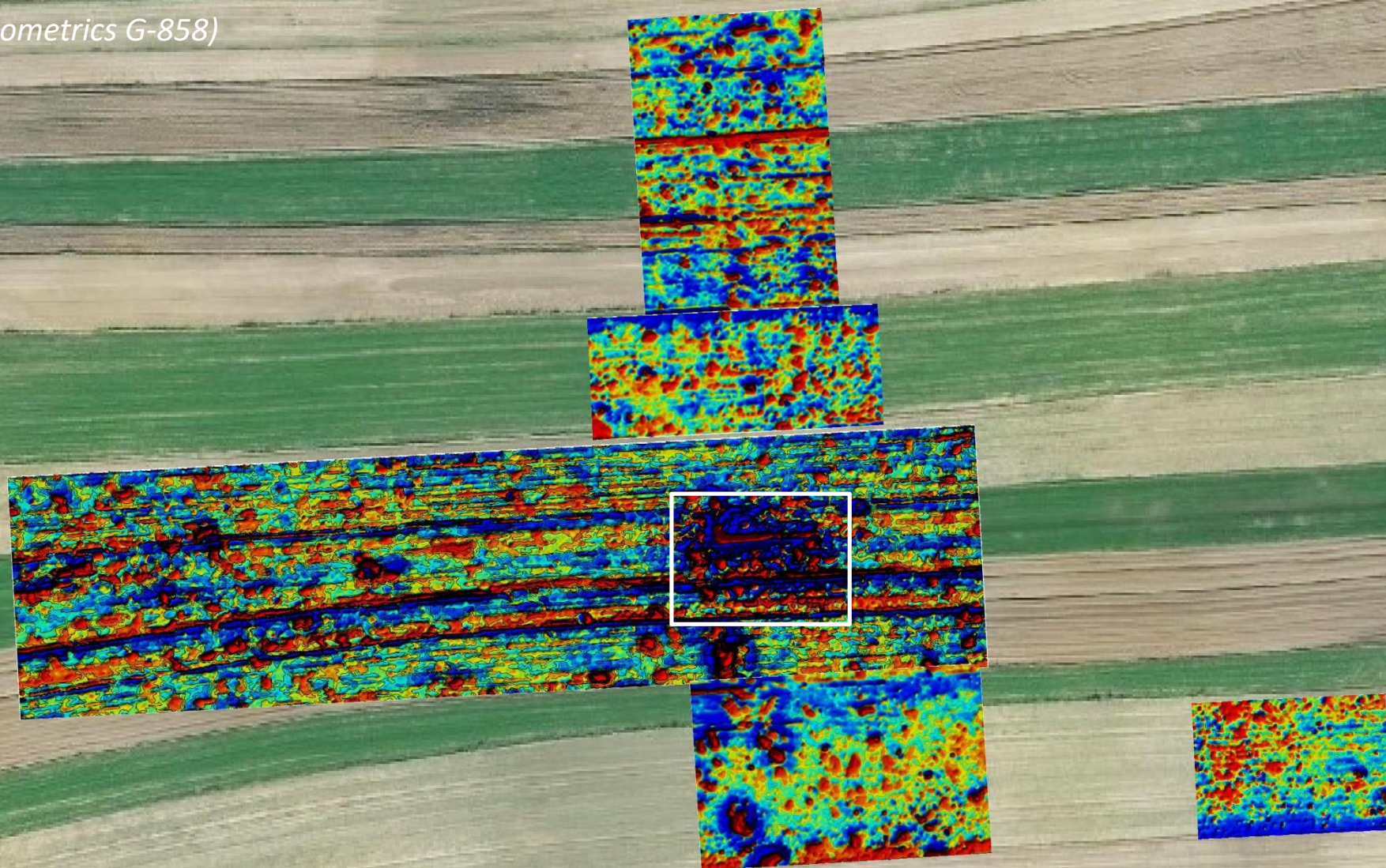
(Geometrics G-858)



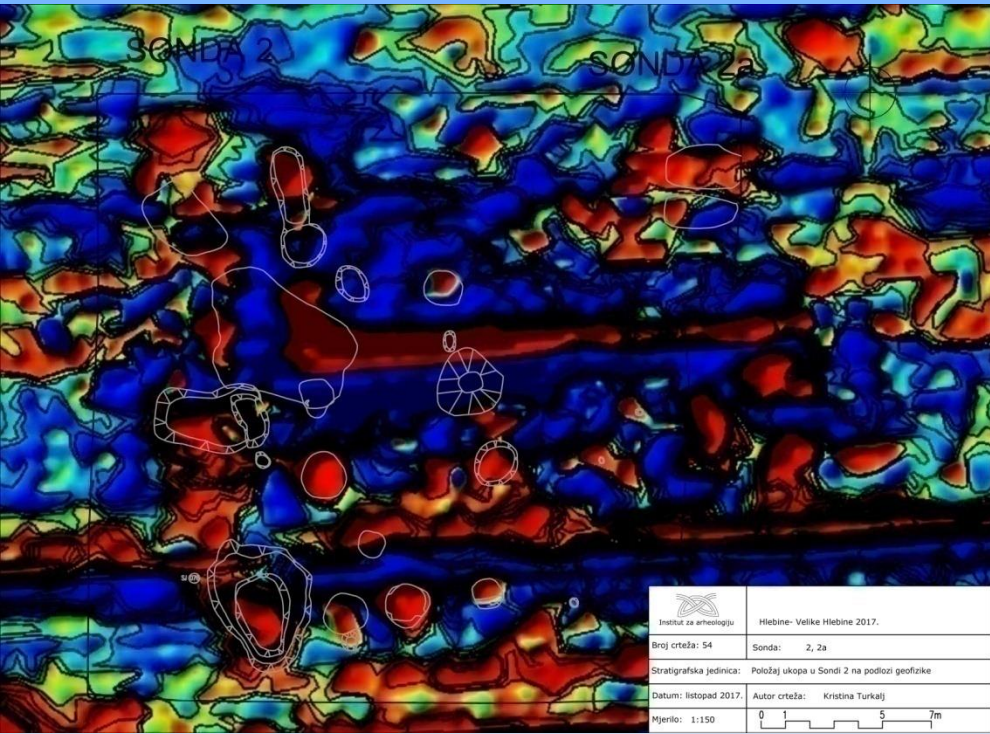
MAGNETIC METHOD (Geometrics G-858)



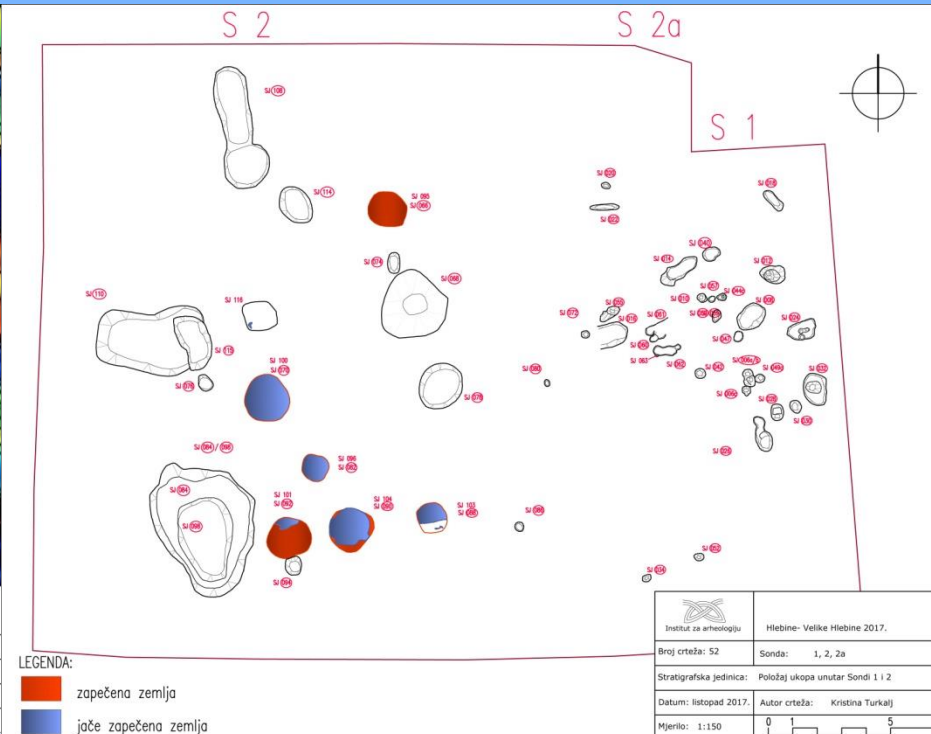
MAGNETIC METHOD (Geometrics G-858)



Magnetic method results

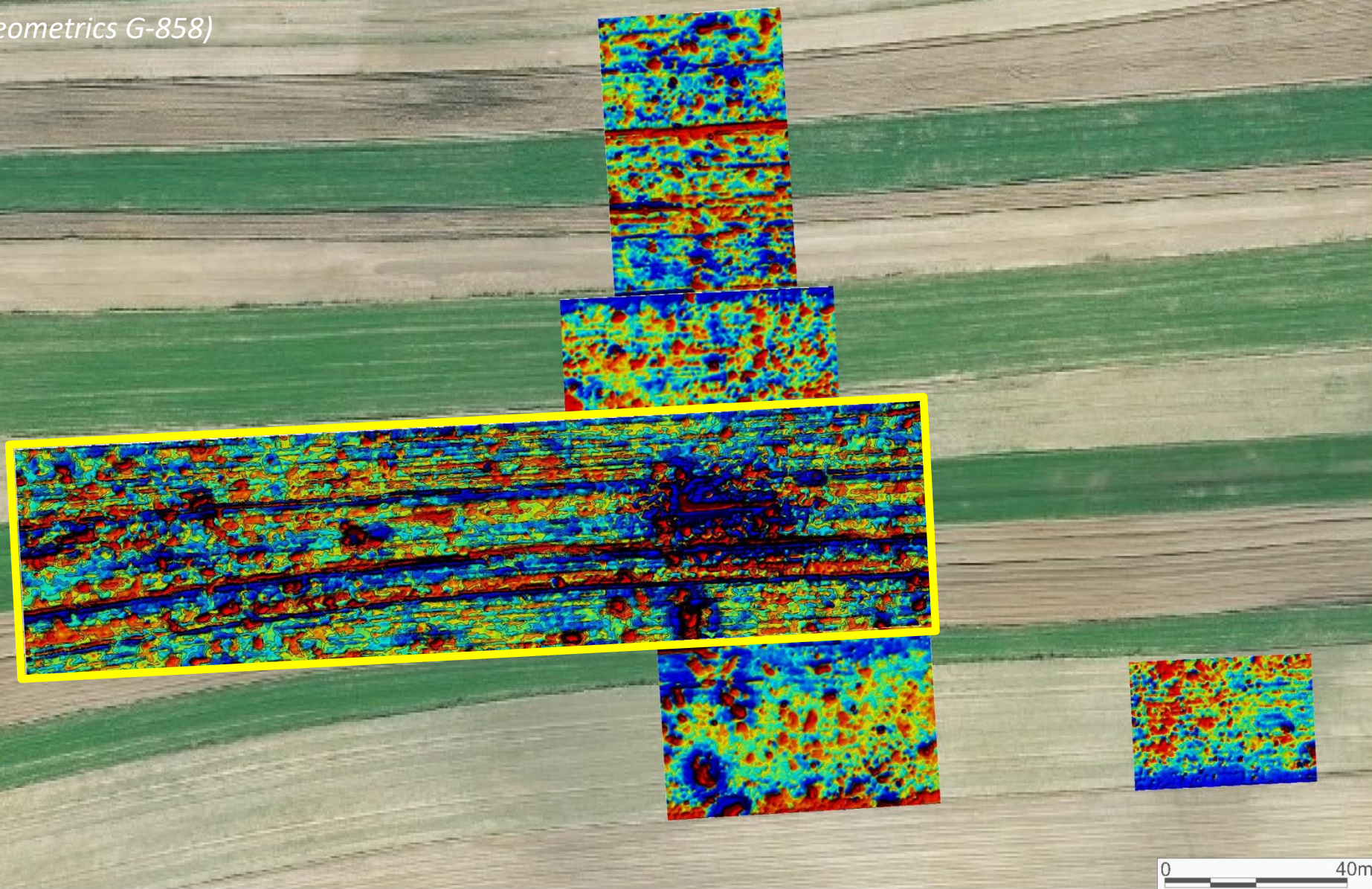


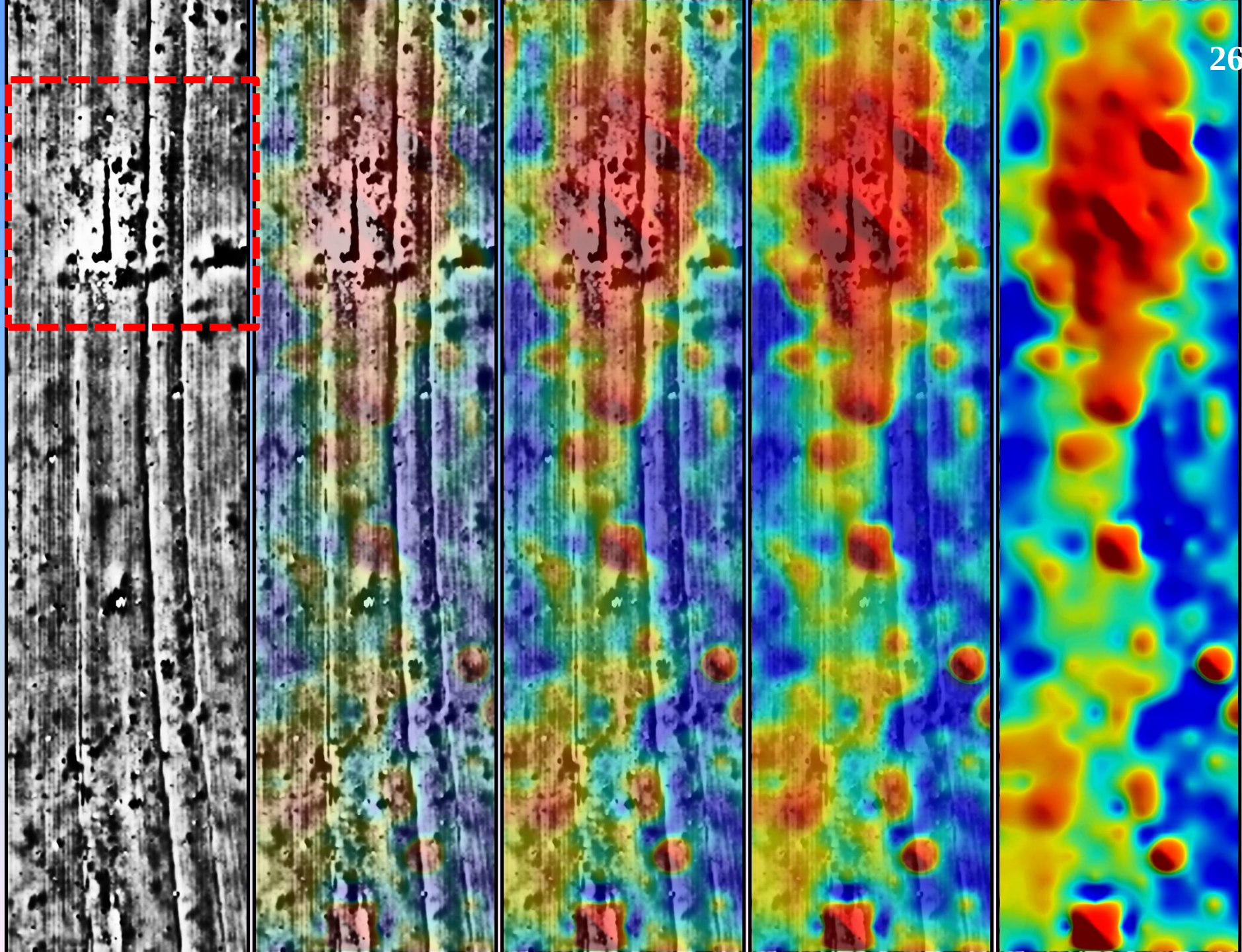
Excavated remains of workshop

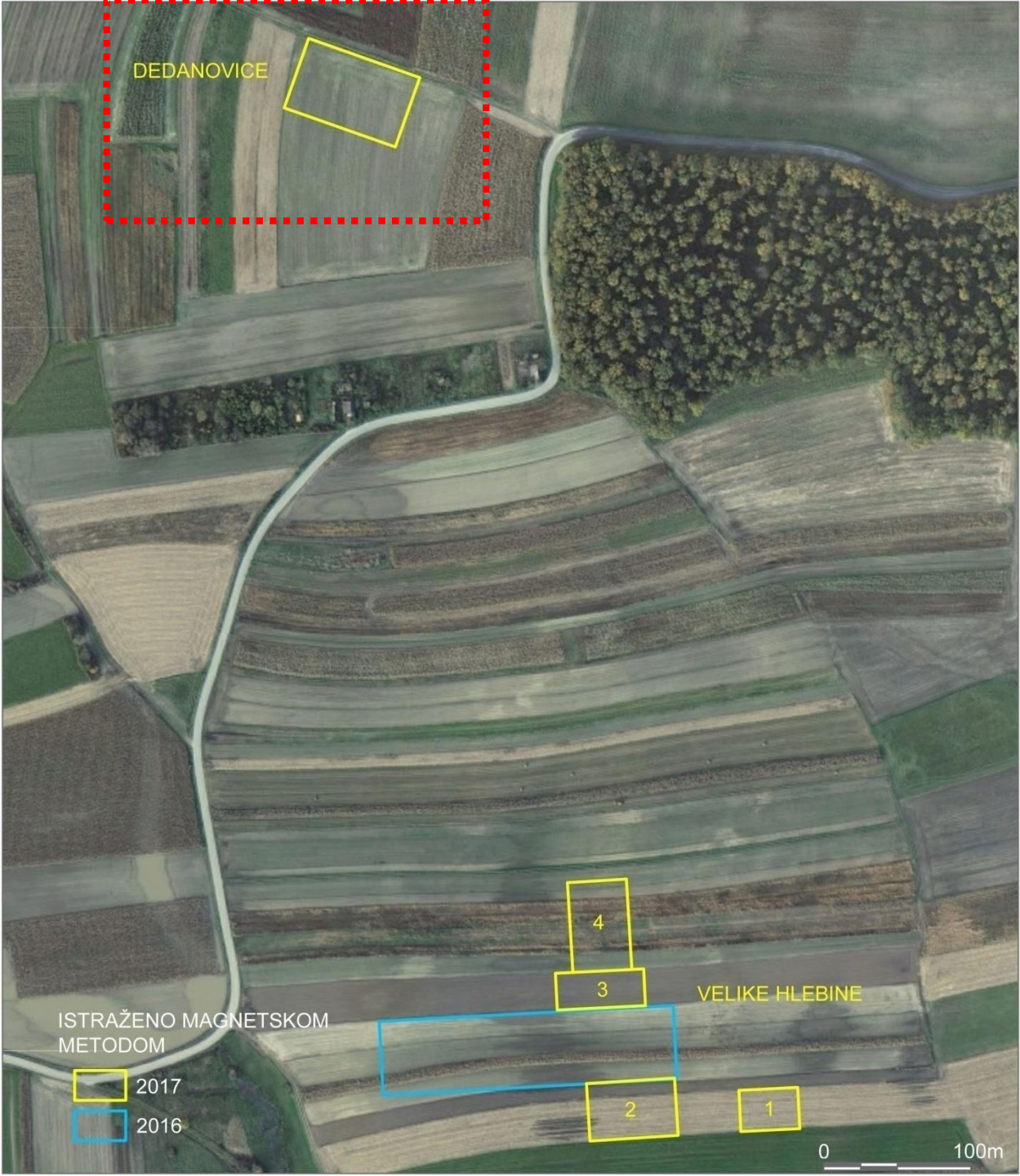


MAGNETIC METHOD

(Geometrics G-858)

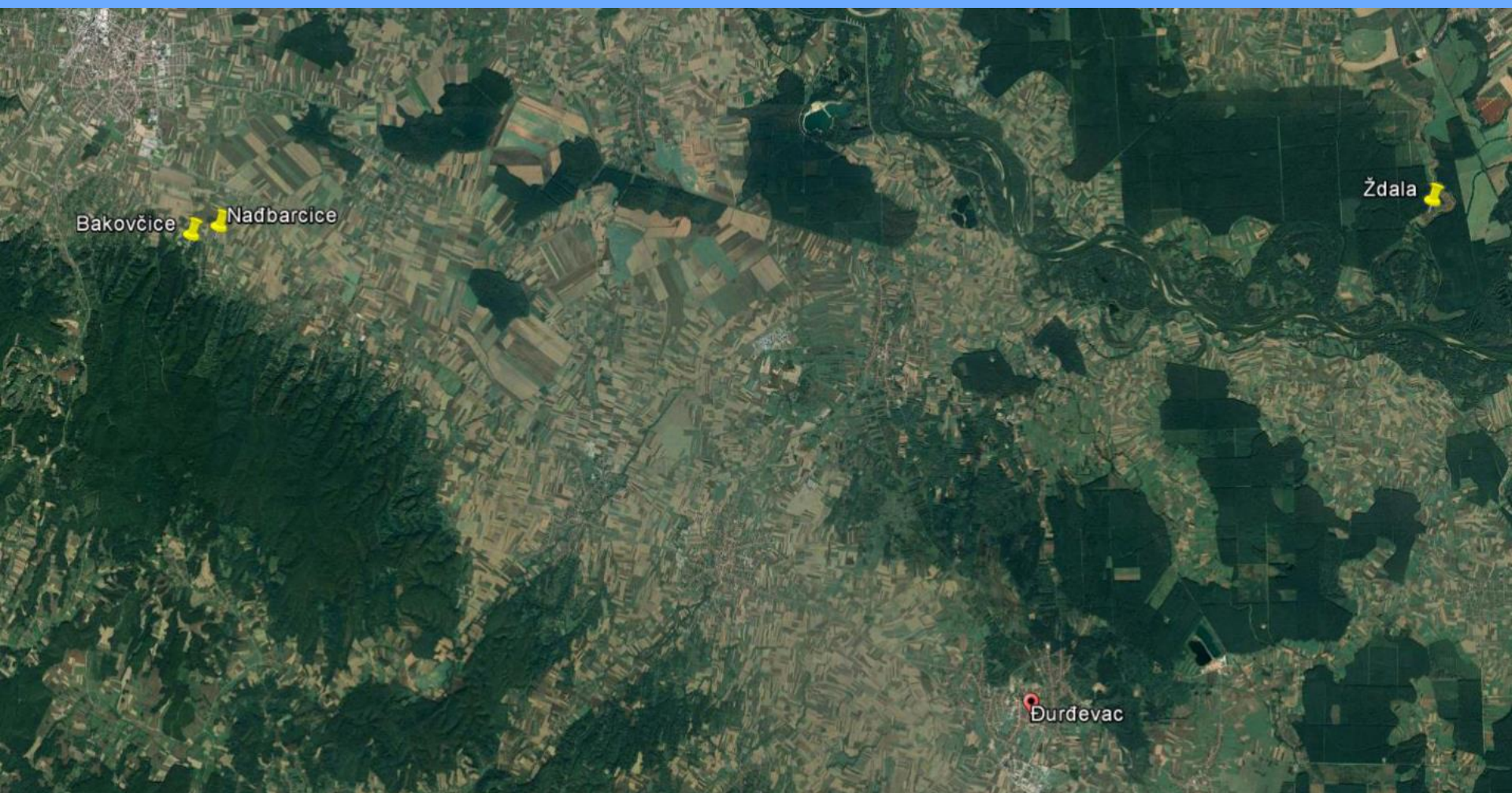




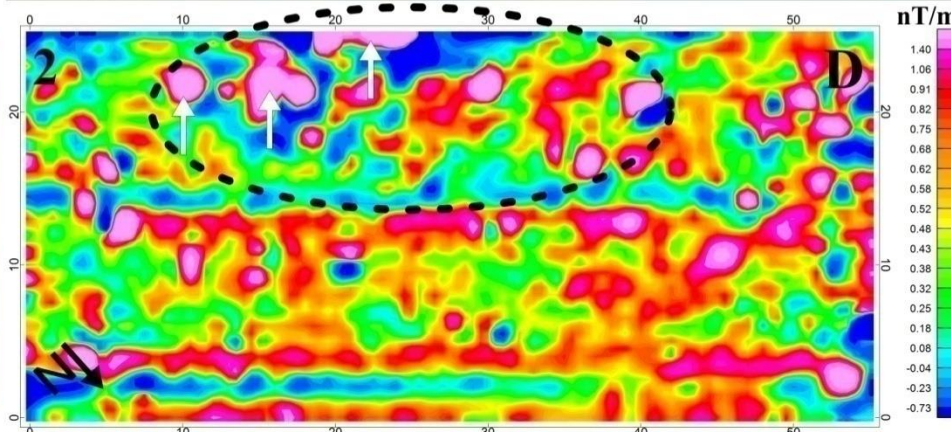
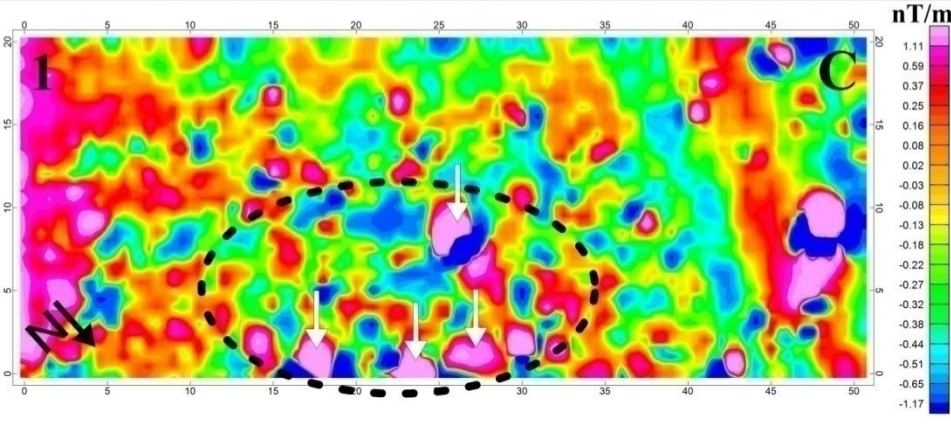
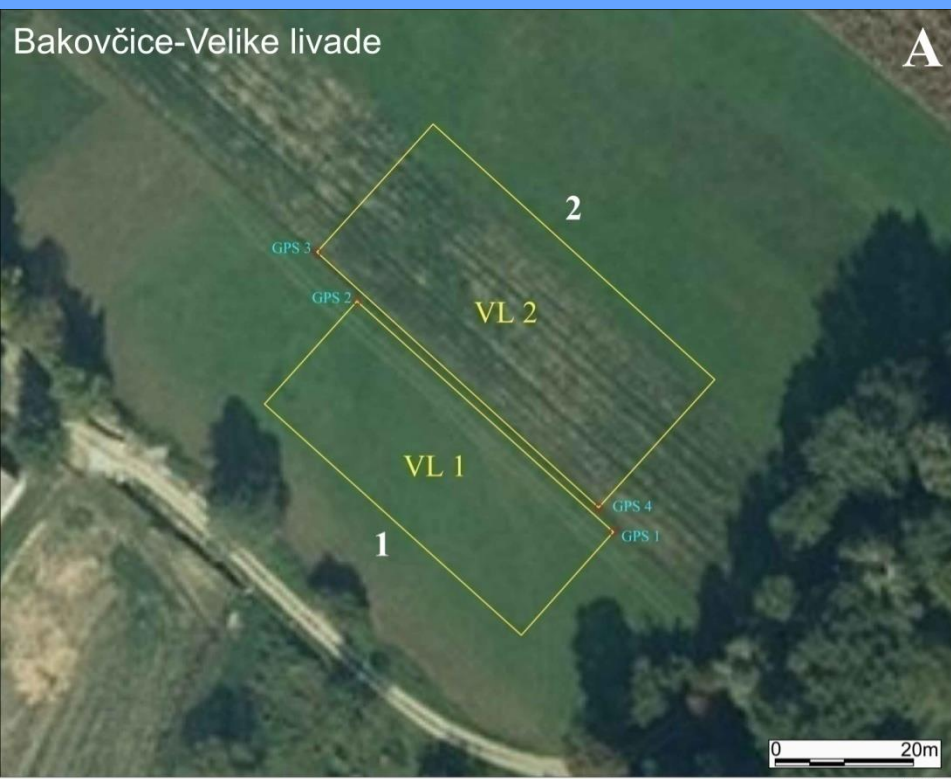


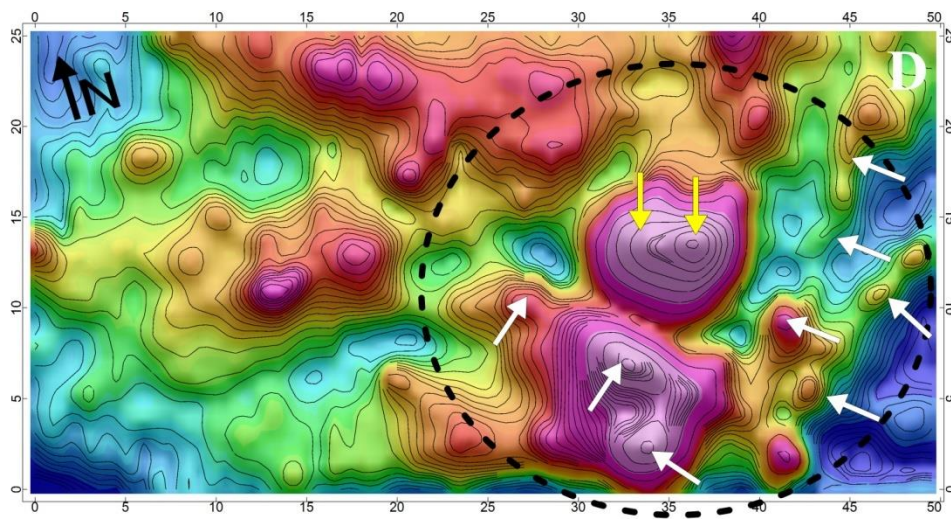
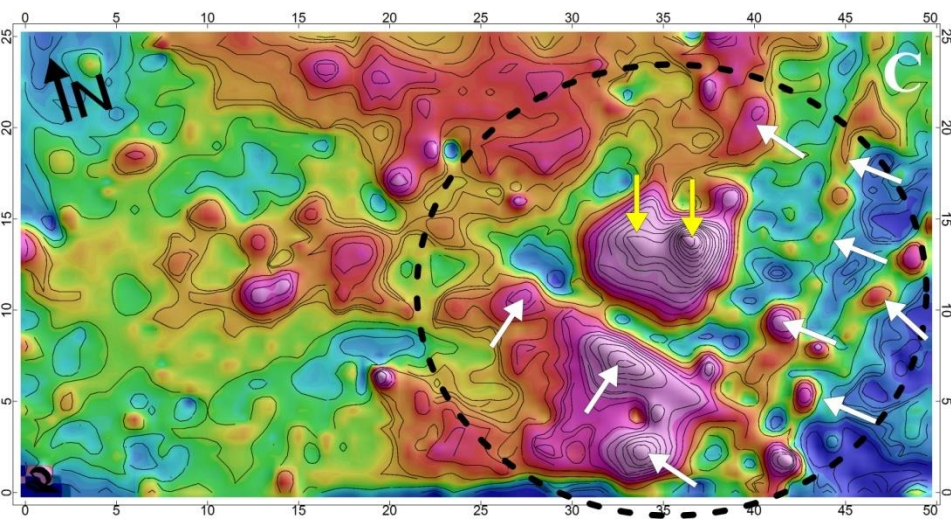
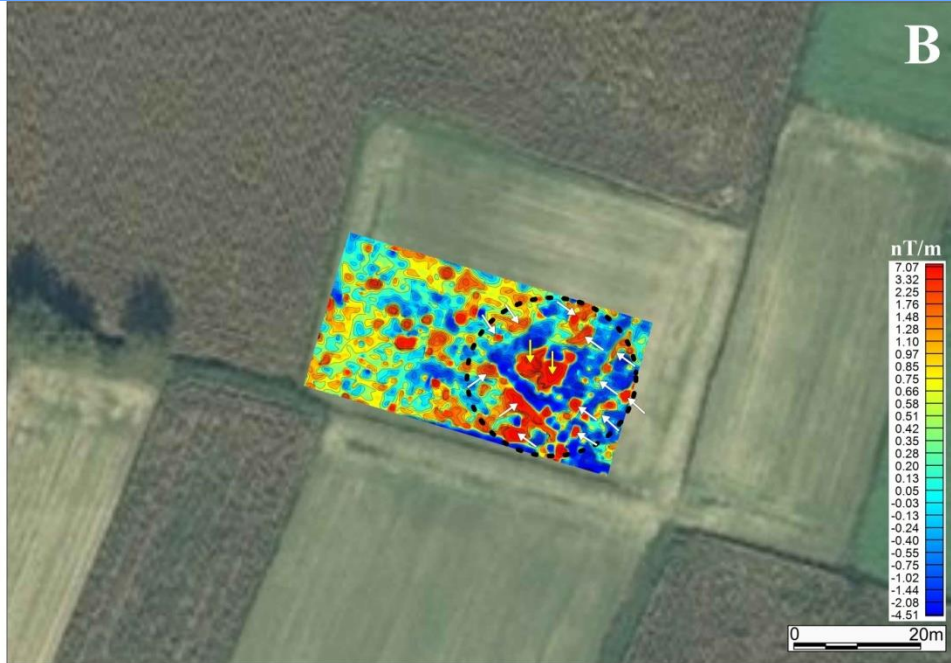




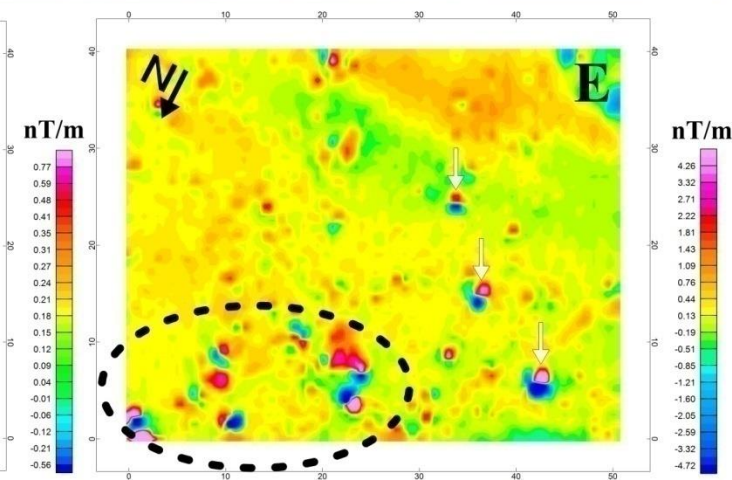
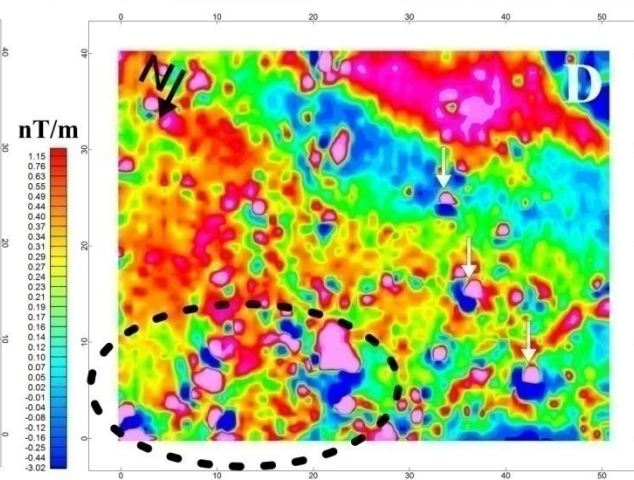
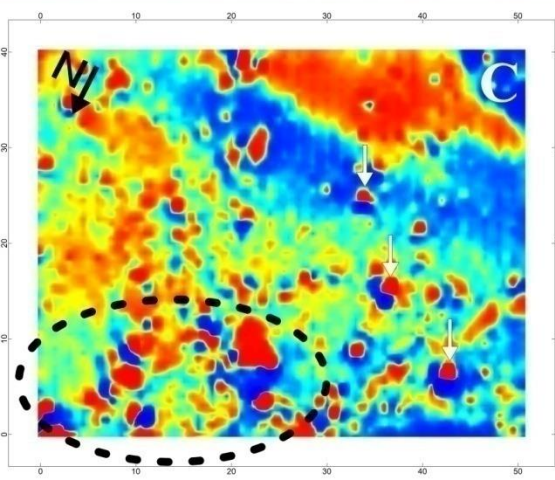
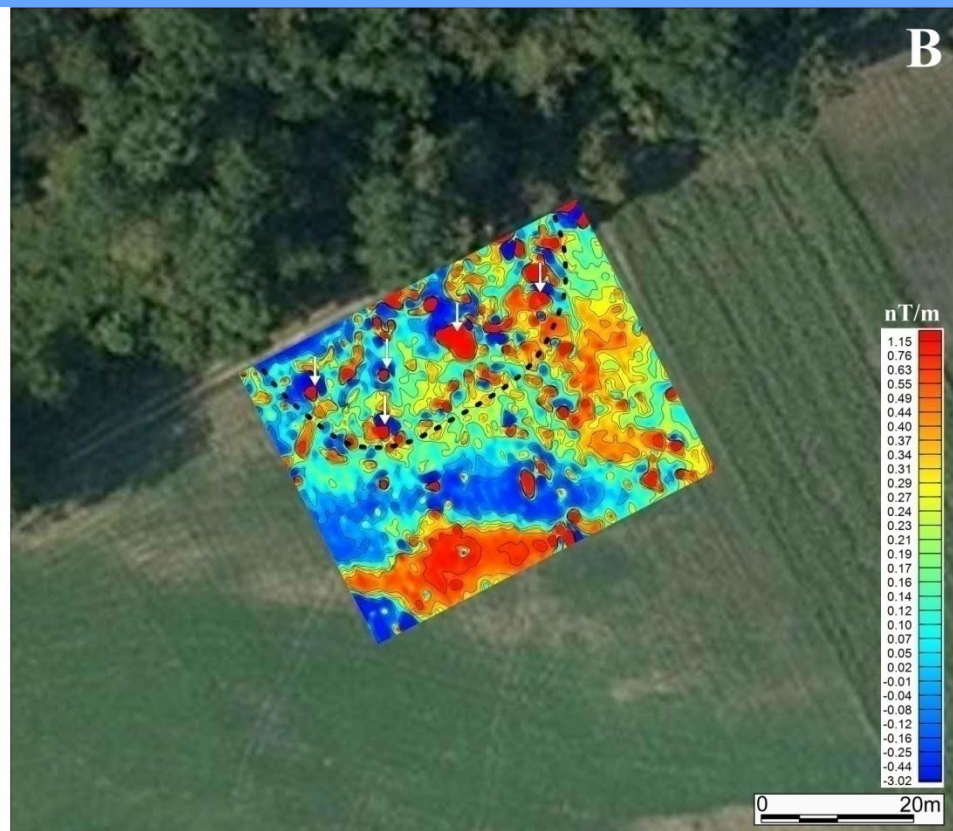


Bakovčice-Velike livade



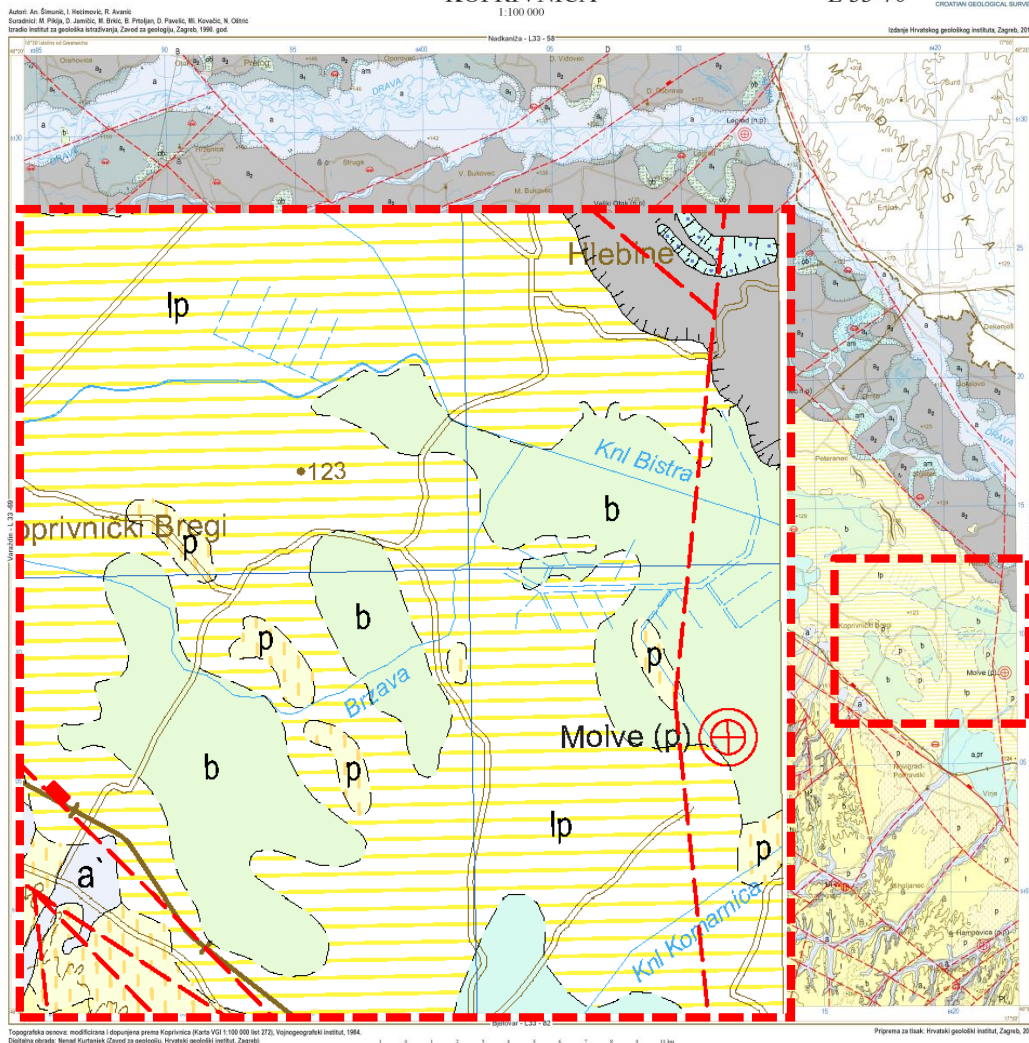


Ždala-ZD1 (TP: Telek 2A)



LEGENDA KARTIRANIH JEDINICA

- | | |
|-----------------------|--|
| | Organično baršasti sedimenti: pijesak i gline pomislano s ostacima bilja |
| b | Baršasti sedimenti: glinoviti siltovi i gline |
| p | Estujski sedimenti: pijesci i siltovi |
| aj,pr | Akumulativno-progradivni sedimenti: kričje različite stepene pomislano s gradovitim silinama |
| a,aj | Akumulativni (travnjaci, šljunak) pijesci
a: / akumulativni (šljunak) pijesci
aj: / akumulativni (šljunak) pijesci i gline |
| am | Aluvij: mrtvačka pijesci, siltovi i gline |
| h | Aluvij I: drvene trske: šljunak i pijesci |
| h₁ | Aluvij II: drvene trske: šljunak i pijesci |
| pr | Progradivni: kričje i kričje stepena s prodolazima trske |
| lp | Lanecinski sedimenti: pijesci, siltovi i gline |
| l | Lanec: prelazni i glinoviti siltovi |
| h₂ | Aluvij III: drvene trske: krupni šljunak i pijesci (vremu u stupu i profilu) |
| h₃ | Aluvij IV: drvene trske: krupni šljunak i pijesci |
| aj₁ | Fluvijalni: pejsinski sedimenti: šljunak, pijesci i gline |
| aj₂ | Fluvijalni: pejsinski sedimenti: šljunak, pijesci i gline |
| M₁ | Gornji: pionir: pijesci i siltovi i lapori |
| M₂ | Gornji: pionir: glinoviti siltovi i pijesci |
| M₃ | Gornji: pionir: lapori, pijesci i pejsoljerci |
| M₄ | Gornji: pionir: plućasti vapnenici i lapori |
| M₅ | Sarmati: ložljivi vapnenici, lapori i pejsoljerci |
| M₆ | Gornji: bradeci: vapneničko-dolomitne bradeci, vapnenici i lapori |
| M₇ | Gornji: mironi: pijesci, šljunak, lapori, andoliti, tufovi i gline, smeđi uglj. |
| E | Ecotoni: vapneničko-dolomitne bradeci (štraneke bradeci) |
| S₁ | Serpentin i serpentinika bradeci |
| S₂ | Dolomiti, apiti, bazalti i lave |
| K₁ | Šajlovi, pejsoljerci, vapnenici i nričaji i tufovi |
| J₁K | Šajlovnati, plućasti vapnenici i nričaji (samo u stupu i profilu) |
| T₁ | Dolomiti, vapnenici i dolomitne bradeci (samo u stupu i profilu) |
| T₂ | Pejsoljerci, šajlovi i plućasti vapnenici (samo u stupu i profilu) |
| Pz | Konglomerati, pejsoljerci, gipsoljci i kvarci: štraneke (samo u stupu i profilu) |



LEGENDA STANDARDNIH OZNAKA

-  Norma horizontalna, uvertura, polimerizacija
-  Enkliza ili inkludacija enkliza, polimerizacija
-  Elementi poklopački, normalni, horizontalni
-  Prepostavljenost osi artikula i artikula
-  Torganje osi čelne
-  Relativno spojeni blok
-  Raspod vertikalni, odnosen, pokiveni i fotografski uvertura
-  Raspod nagnuti, odnosen, pokiveni
-  Čelo navikla
-  Materijalna materija, bradavica, stativna
-  Mirostava, mirostava
- Legenda** Ležbište u eksploziji (n - nafa, p - pila)
-  Pijava kausobila (n - nafa, p - pila)
-  Ležbište kausobila (n - nafa, p - pila)
-  Pijava gila
-  Ležbište kamenski građevinski kamena
-  Ležbište gila, gila
-  Ležbište bjelica, bjelica
-  Javni rad, rogoviti
-  Javni
-  Dubina buduća, predhodna
-  Vile budućih buduća
-  Vile kila
-  Dvor mizari
-  Teren odgaj
-  Dvor

GEOLOŠKI STUP
1:20.000 (na listovima 1 & 2)

		HOLOCEN		GRAFIČKI FIZIKAL		TEKSTURNI FIZIKAL	
		HOLOCEN		GRAFIČKI FIZIKAL		TEKSTURNI FIZIKAL	
		HOLOCEN		GRAFIČKI FIZIKAL		TEKSTURNI FIZIKAL	
PLEISTOCEN	Duga	A ₁		P ₁		P ₁	
	Staza	A ₂		P ₂		P ₂	
	Grupa	A ₃		P ₃		P ₃	
	Grupa	A ₄		P ₄		P ₄	
NEOGEN	M ₁ - M ₁₀	A ₁		P ₁		P ₁	
		A ₂		P ₂		P ₂	
		A ₃		P ₃		P ₃	
		A ₄		P ₄		P ₄	
		A ₅		P ₅		P ₅	
		A ₆		P ₆		P ₆	
		A ₇		P ₇		P ₇	
		A ₈		P ₈		P ₈	
		A ₉		P ₉		P ₉	
		A ₁₀		P ₁₀		P ₁₀	
PALEOGEN	E	A ₁		P ₁		P ₁	
		A ₂		P ₂		P ₂	
		A ₃		P ₃		P ₃	
		A ₄		P ₄		P ₄	
KREDA	C	A ₁		P ₁		P ₁	
		A ₂		P ₂		P ₂	
TRIAS	T	A ₁		P ₁		P ₁	
		A ₂		P ₂		P ₂	
PALEOZOI	Pz	A ₁		P ₁		P ₁	
		A ₂		P ₂		P ₂	

LEGENDA TOPOGRAFSKIH OZNAKA

- ♂ Krkva
 ♀ Kapela
 — Normalna željeznica
 — Automobilski put
 - - - - - Kaki put
 —+— Željeznički kolodvor, željeznička stanica
 — Stijena (izopisaj) 100m
 — Stijena (izopisaj) 50m
 — Državna granica
 • 152 Kote
 ♀ Izvor, vrelko
 ~~~~~ Veća rijeka  
 ~~~~~ Rijeka  
 ~~~~~ Potok  
 ~~~~~ Sotica  
 — Kanal
 — Jezero
 — Mrtvace
 — Lokva, bara

Koprivnica

VELIKE HLEBINE I DEDANOVICE

Hlebine

Koprivnički Bregi

Bakovčice

NOVIGRAD PODRAVSKI - MILAKOV BEREK



Molve

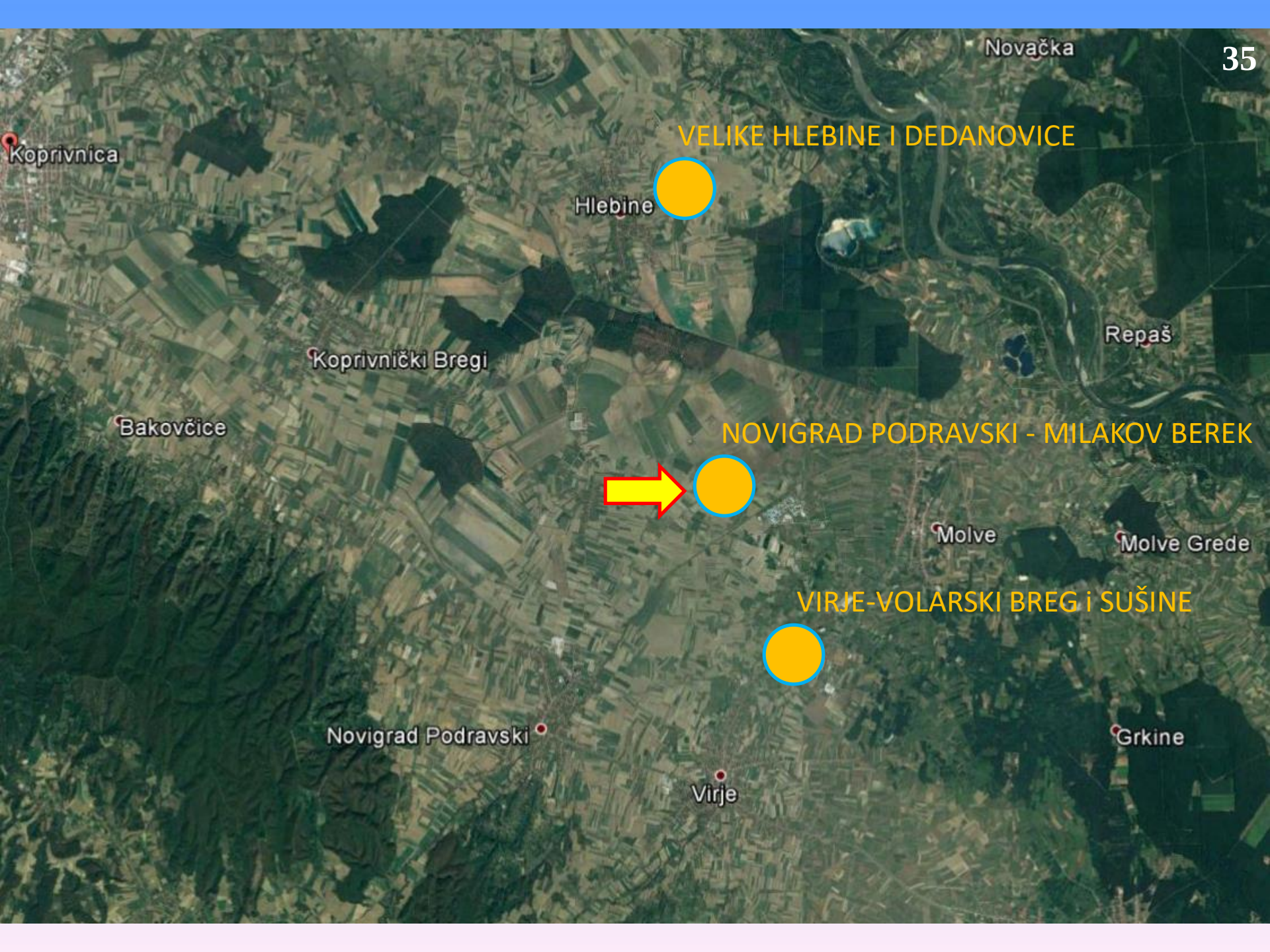
Molve Grede

VIRJE-VOLARSKI BREG I SUŠINE

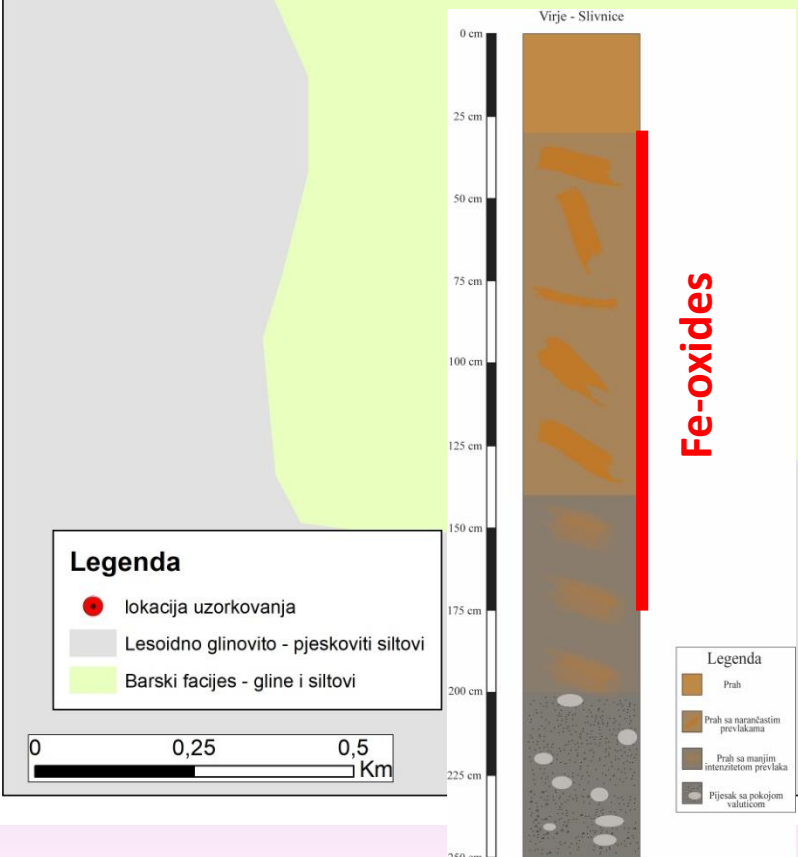
Novigrad Podravski

Virje

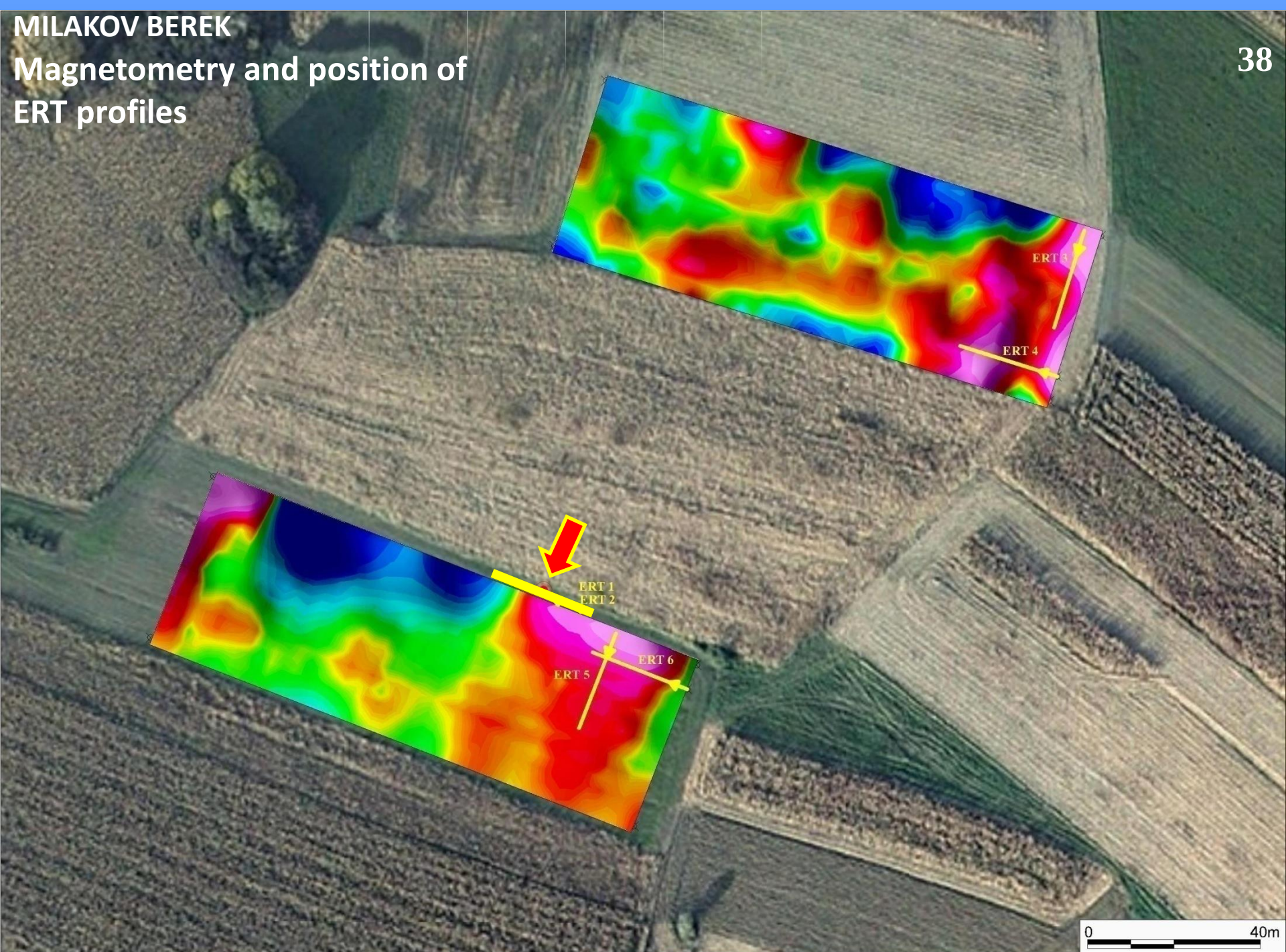
Grkine

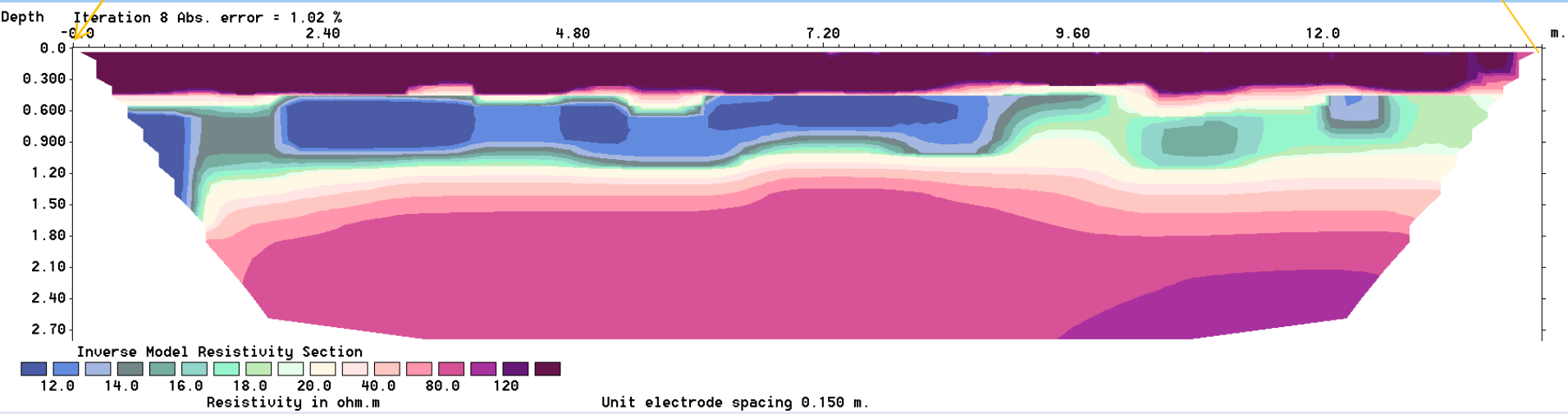
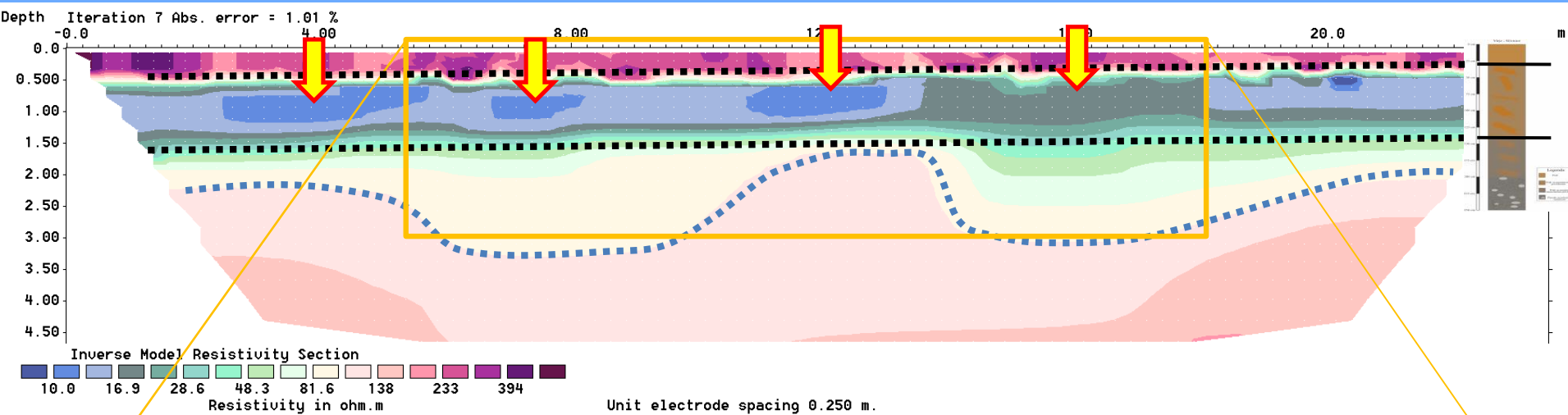


b









2D resistivity tomography (ERT)

