Microarchaeology and the Use of Space at the Late Neolithic Farmstead of Tabaqat al-Bûma

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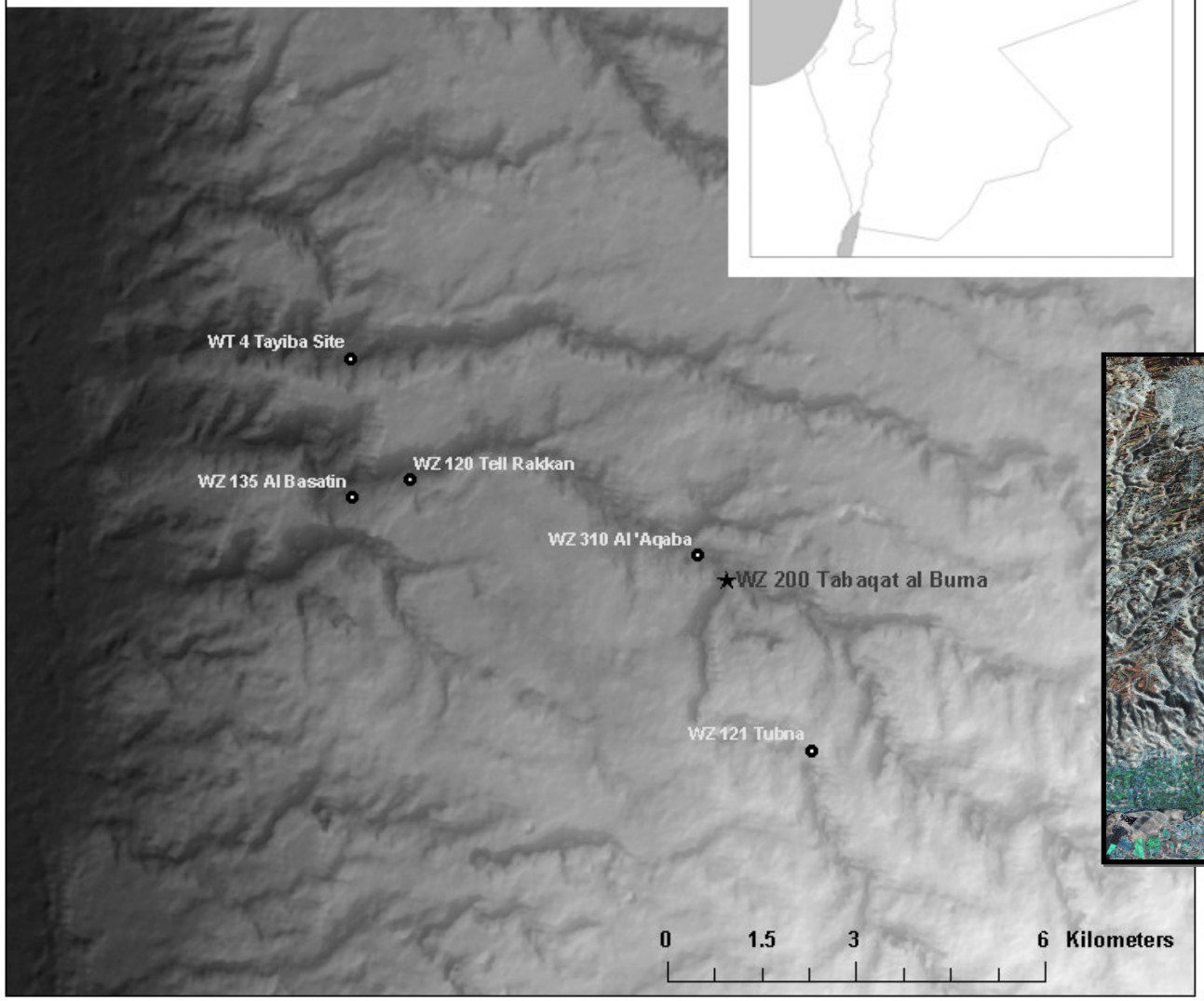
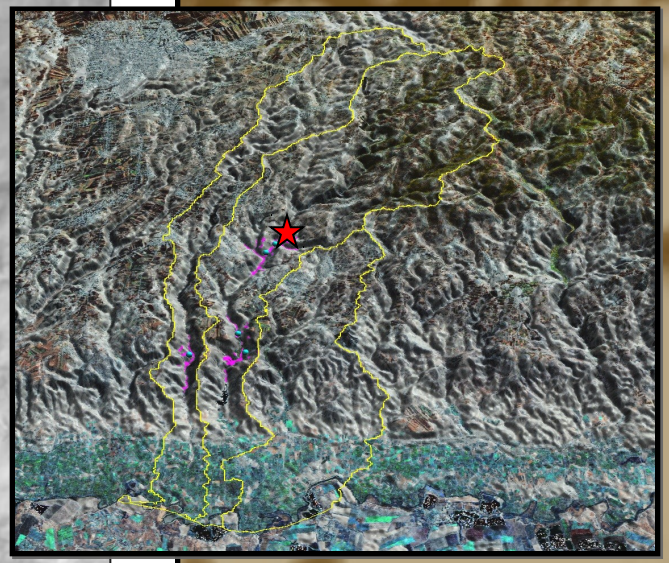
Characteristics of Microrefuse

- Microrefuse is any artifact smaller than 0.5cm
  - The actual size limits can and should vary by context.
- Site formation processes have different impacts
  - Comparison of the spatial patterning of Macro- to Microrefuse may show less impact
- May more accurately reflect daily practice at the site
  - Differential use of space should be reflected in artifact composition and density
- Can be simply and efficiently analyzed
  - Proper sampling strategies: Grid-based, Cluster sampling, Multiple analysts
  - New GIS techniques: Interpolation of density probability maps, Z-score transformation and filtering, Cluster analysis

Site Location

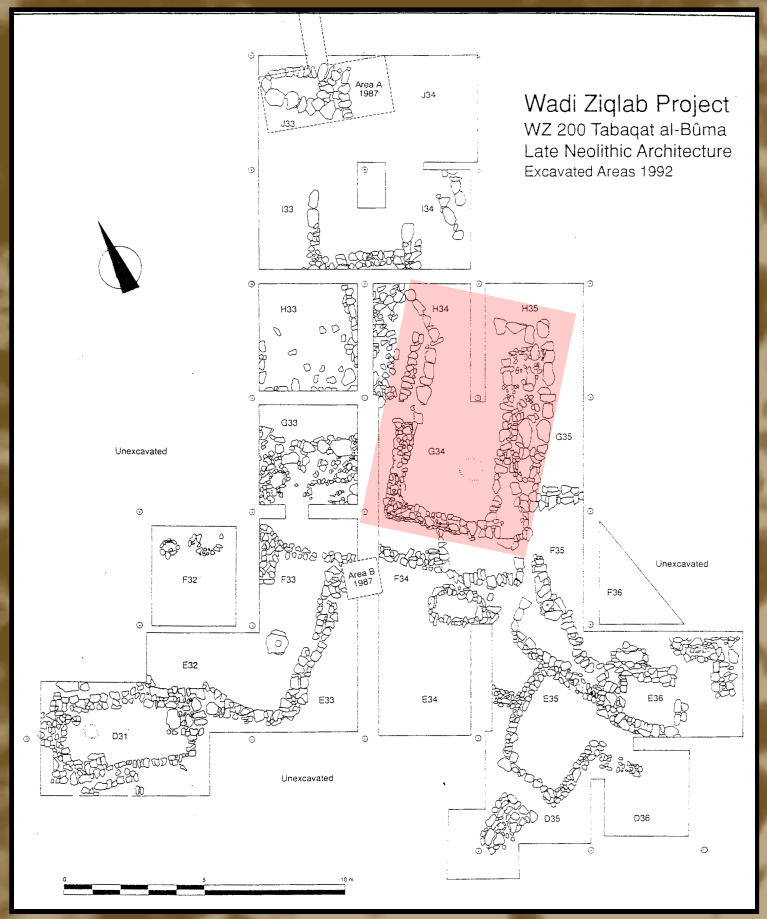




Late Neolithic of Northern Jordan

- The transition from the PPN to the Late Neolithic in Northern Jordan is marked by a change in settlement patterns--from villages in the PPN to isolated farmsteads or hamlets in the LN.
- This coincides with major changes in technology.
  - **Pottery becomes common**
  - **Stone tools become less standardized, especially blades**
  - **Naviform bladecores disappear.**
  - **Stone tools are less formal in general—expedient flake tools are the most common tool type.**
  - **Sickles remain important, and are still standardized, but most are made on flakes rather than blades.**
  - **Sickles are mostly denticulated and highly retouched.**
- Farming of cereals and goat/sheep pastoralism remain central to the LN economy, though the patterns of landuse are probably different.

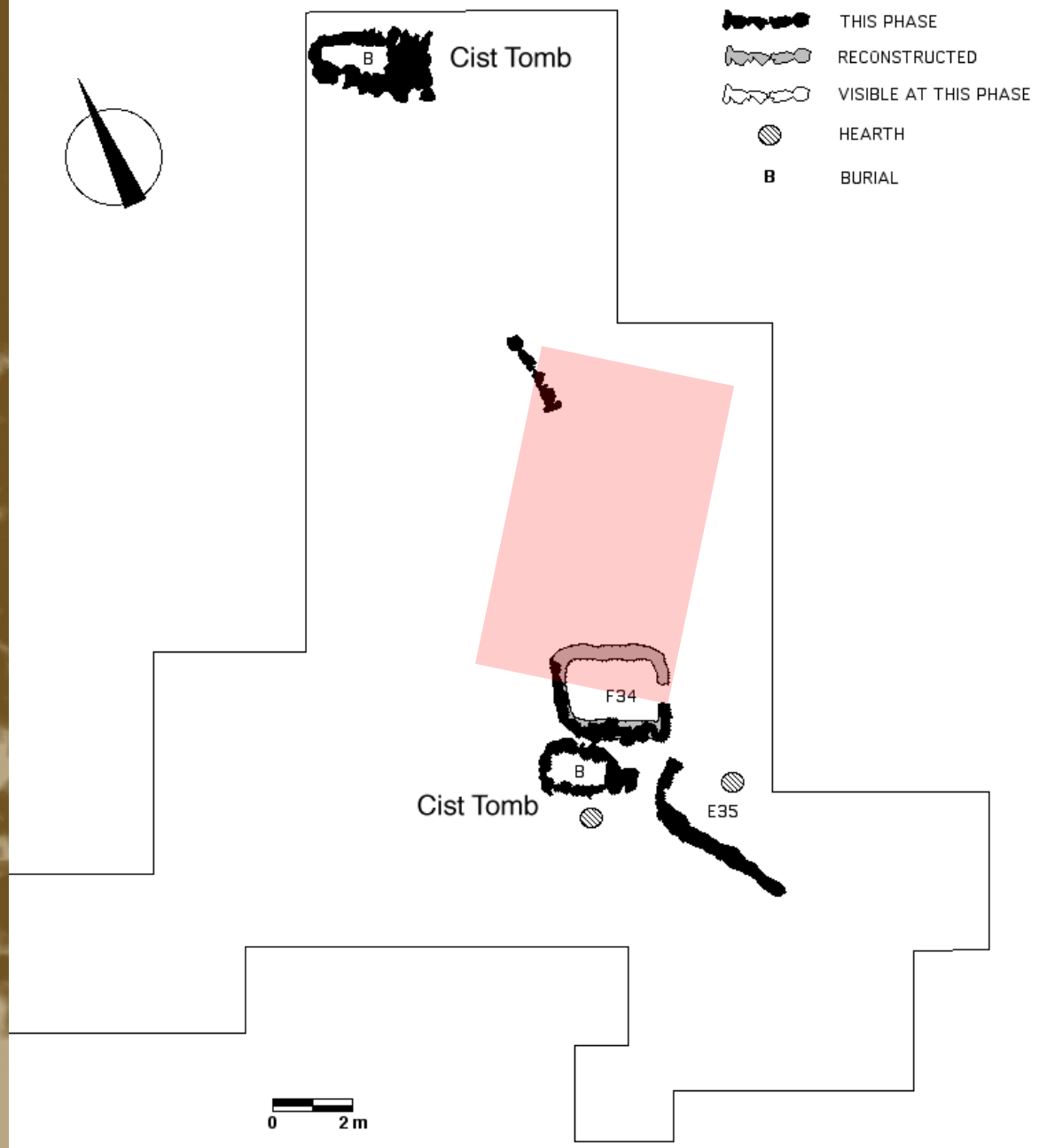
Site Overview



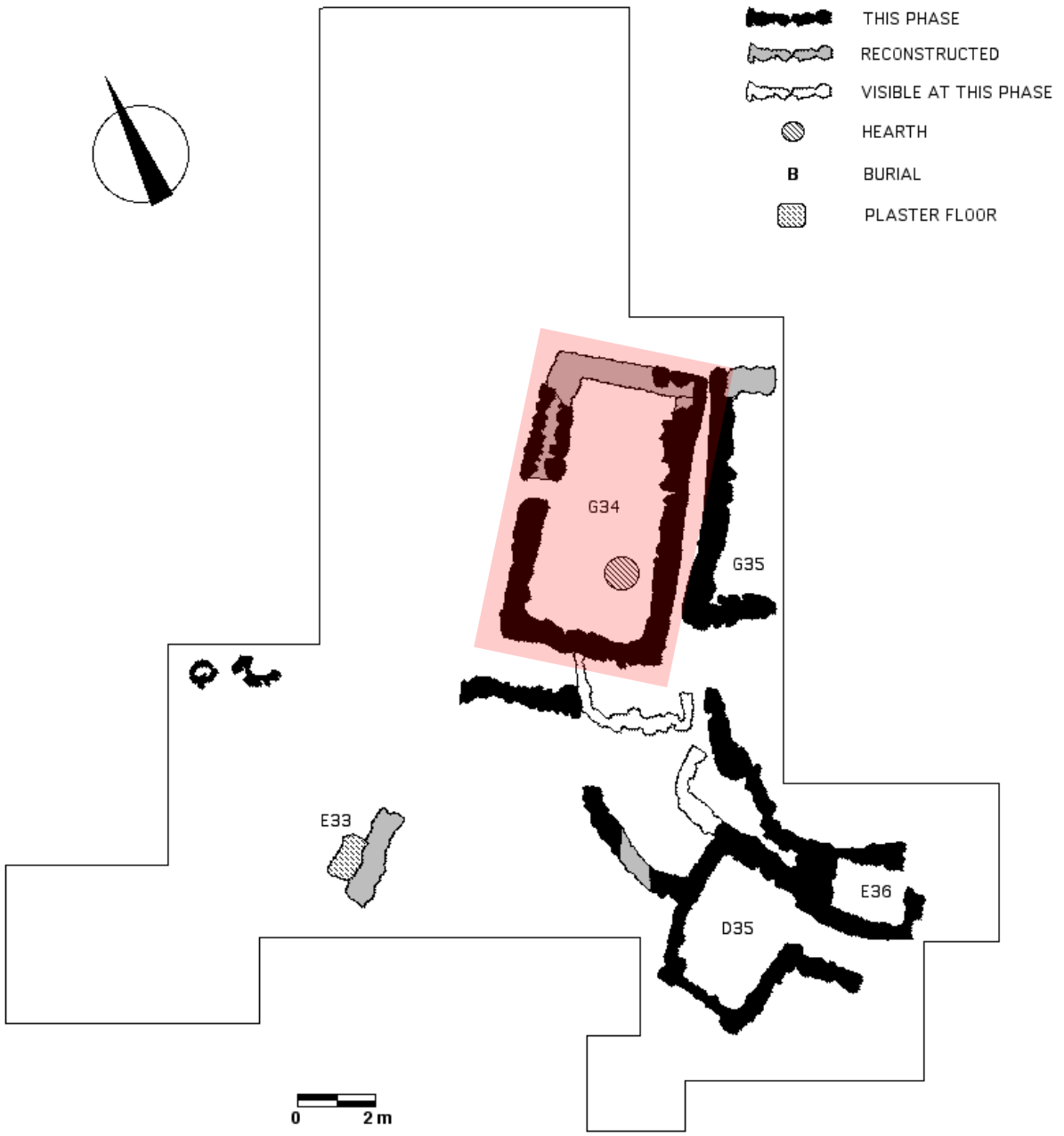
Tabaqat al-Bûma

- Tabaqat al-Bûma has four Late Neolithic phases from ca. 7700-6200 cal BP.
- Each phase has more than one occupied structure, and living surfaces were identified in houses of every phase.
- It is probable that no structure was lived in for more than one phase
- Although some structures were reused for other purposes in subsequent phases.
- Intrusive burials, modern road construction, and landslides/mass wasting have disturbed some parts of the site.

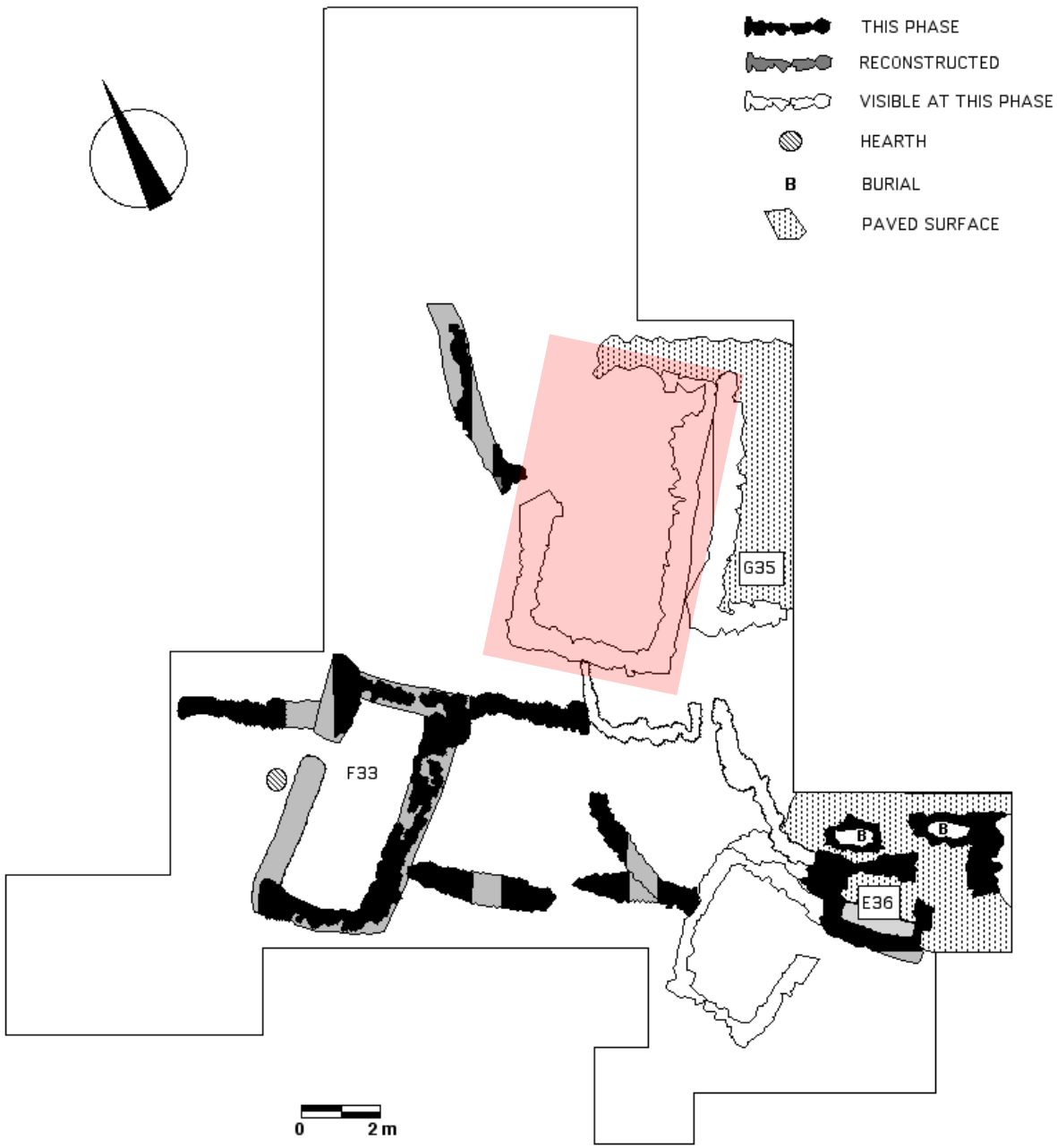
Late Neolithic 1



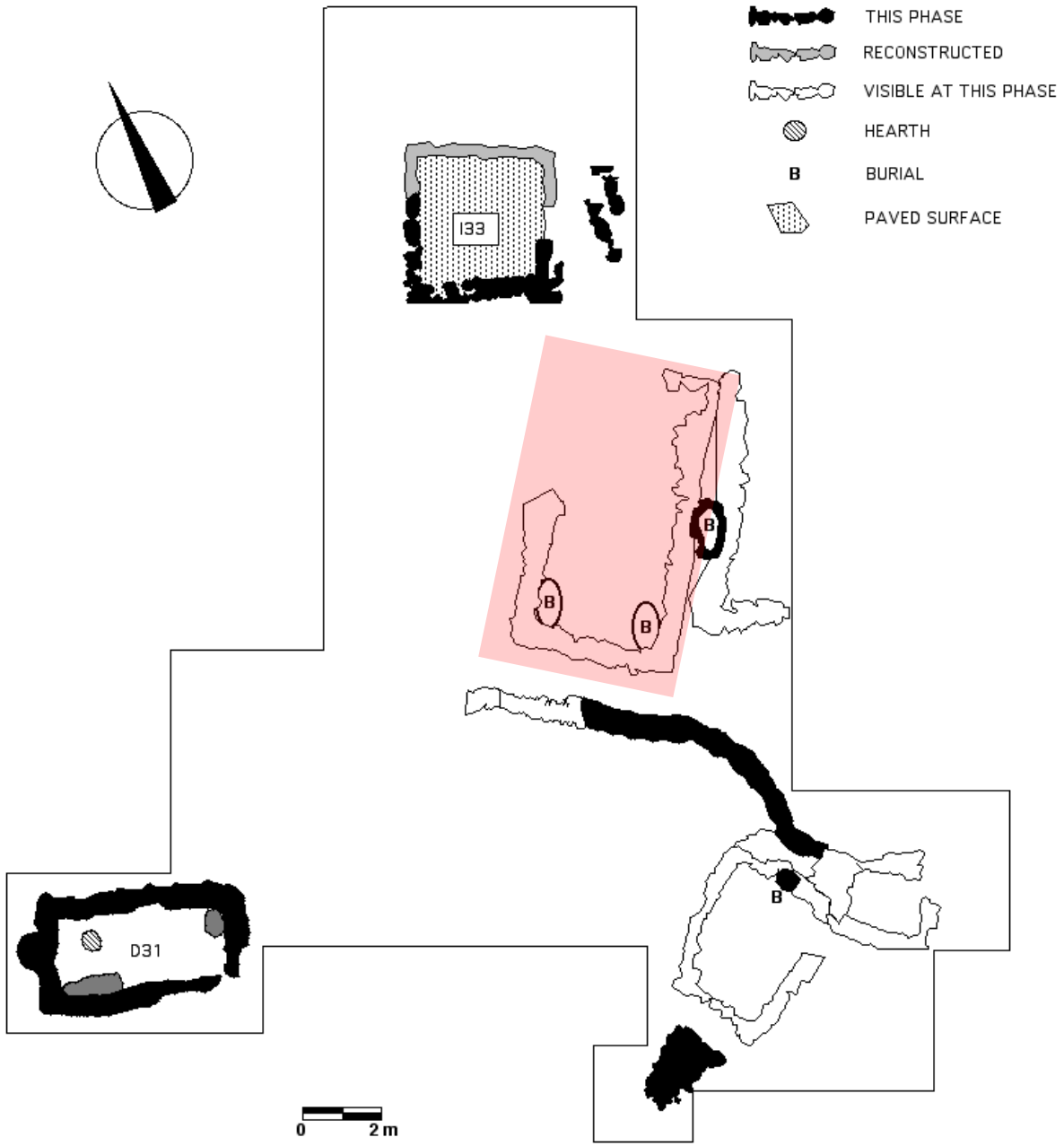
Late Neolithic 2



Late Neolithic 3

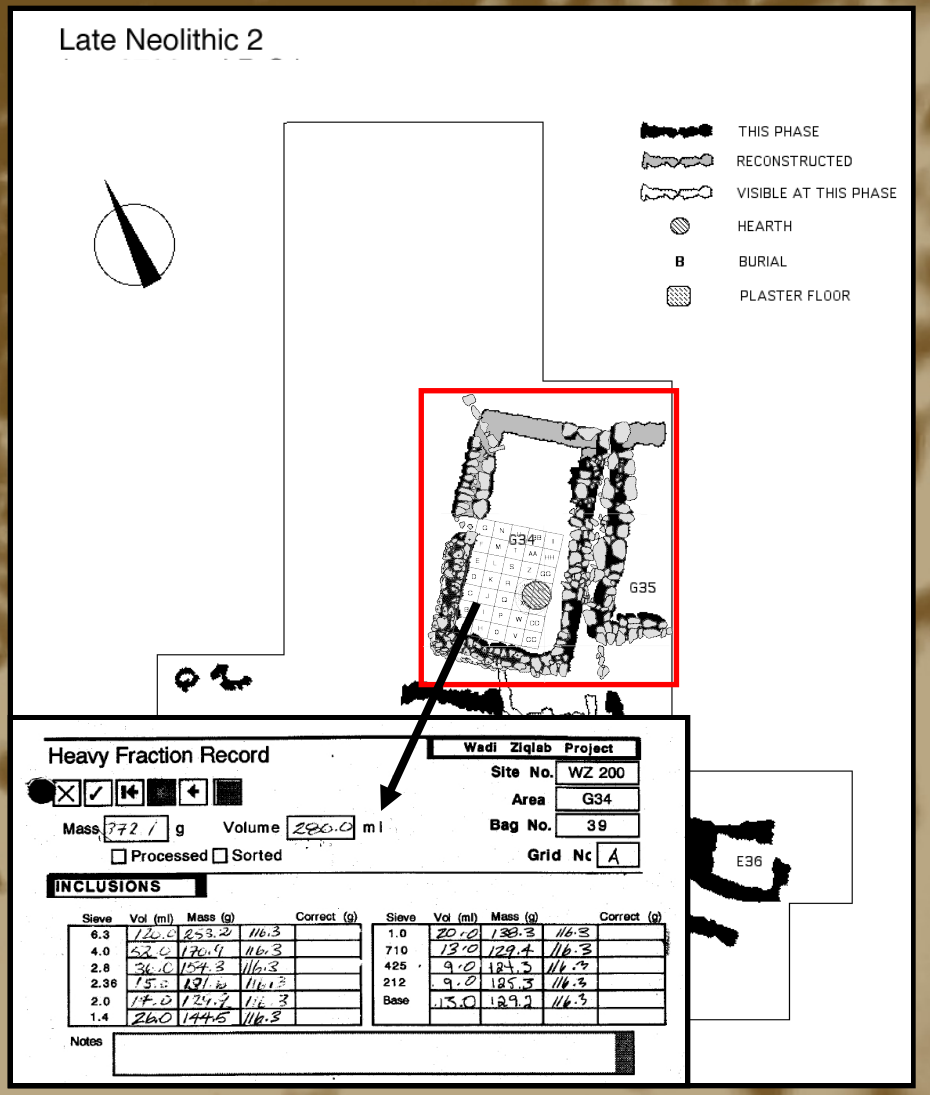


Late Neolithic 4



Field Collection

- **More than half of the floor of structure G34 from phase LN2 remained intact and sealed by a layer of clay, so it was chosen for sampling.**
- **0.5 m² cells were laid out across the house floor.**
- **Only the southern half was gridded as the floor layer was compromised in the northern half.**
- **All sediments from approximately 2cm above the surface and from between cobbles in the floor were collected from each grid square, floted and size-sorted.**



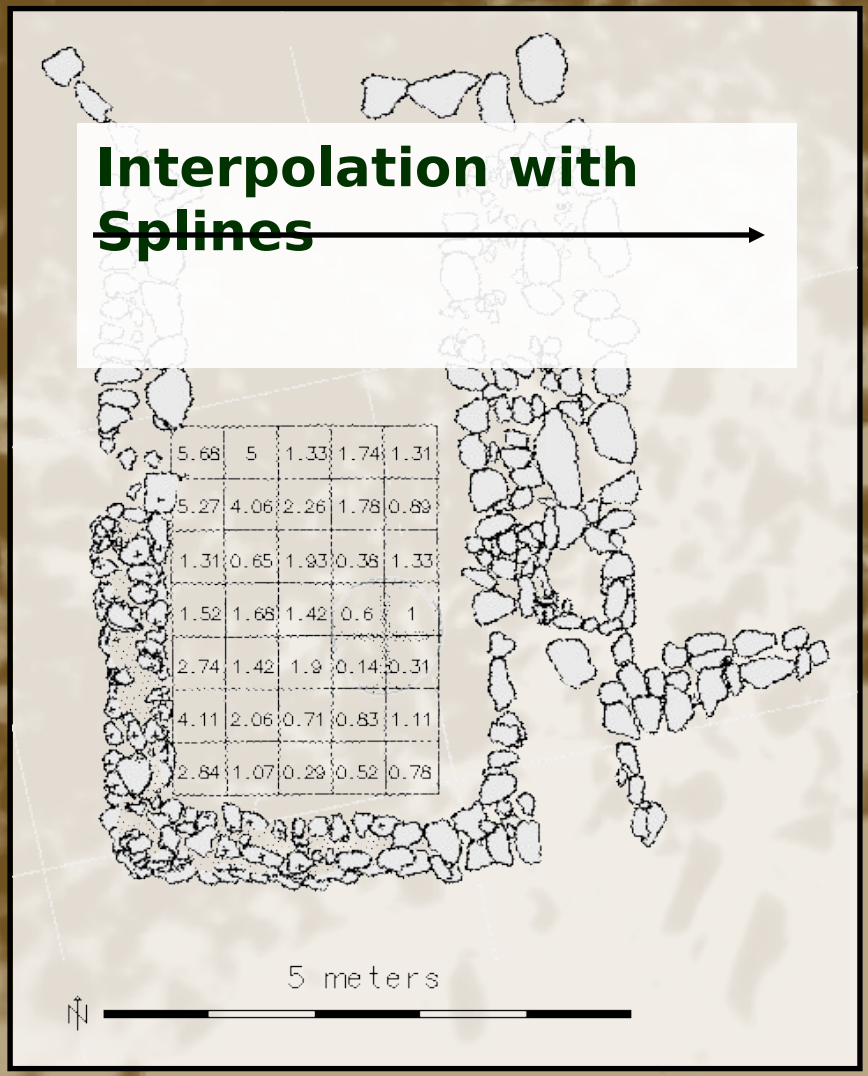
Sampling

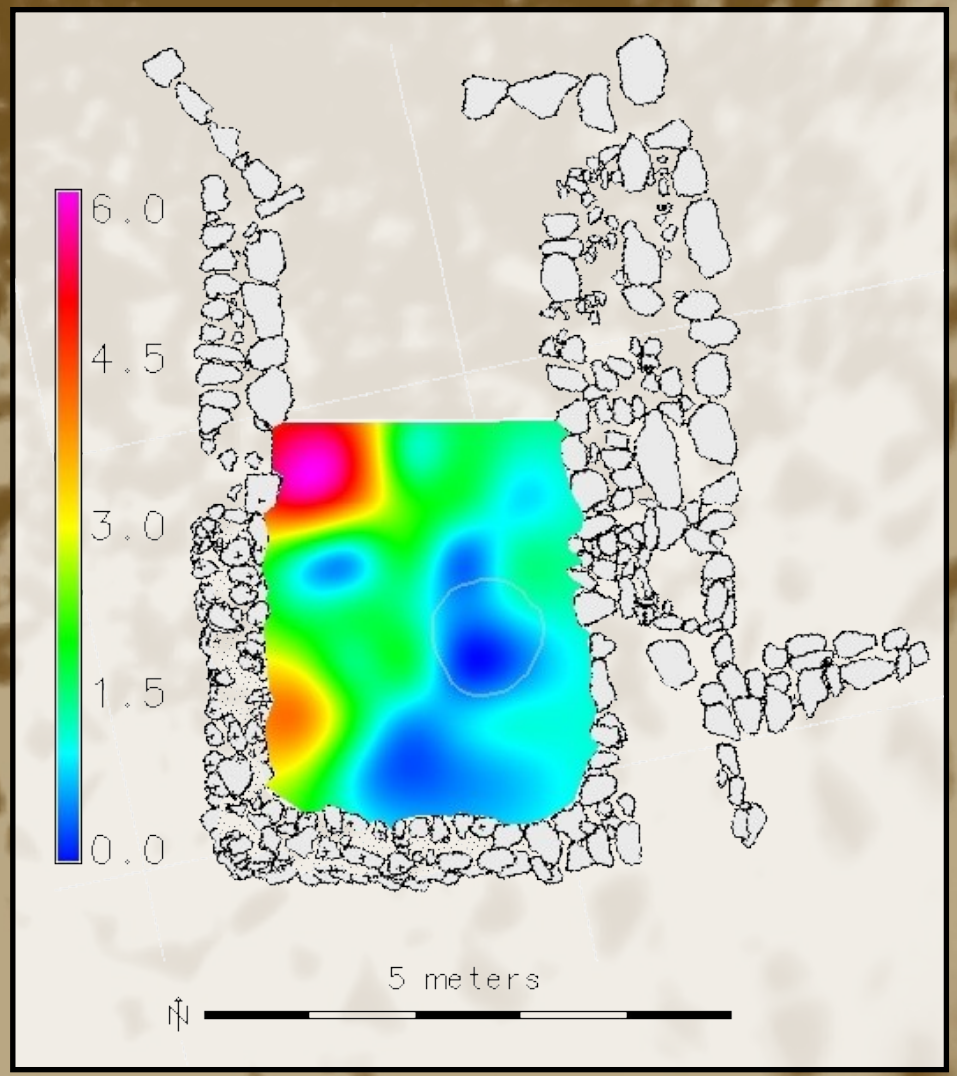
- **1.4 – 2 mm size class chosen for analysis.**
- **Multiple 0.3 cm² cluster samples taken by many analysts until standard error was less than 10% and no significant difference between 3 cluster samples at 90% confidence interval.**
- **Analyst initials allowed us to remove data from analysts who systematically over or under-counted.**
- **Sample means were then calculated for each grid square.**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
1																																			
2	Lithics	7	9	11	1	4	6	8	2	6	5	4	5	6	4	6	6	1	4	6	5	26	4	4	0	2	9	4	26	8	7	20	4	12	1
3	Basalt	0	0	0	0	1	0	1	0	1	0	0	0	2	1	1	0	0	0	3	0	5	2	2	0	2	0	1	2	2	0	3	3	1	1
4	Pottery	0	0	0	1	1	0	1	2	5	2	2	2	1	0	0	0	0	3	0	0	0	3	0	1	0	0	0	1	0	0	0	0	1	0
5	Bone	1	0	2	0	1	2	1	1	0	1	1	1	4	1	0	0	0	0	3	0	0	0	1	0	0	1	1	0	1	1	0	1	0	2
6	Shell	1	1	1	0	0	3	0	2	0	0	1	1	2	0	0	3	2	1	2	1	0	0	2	0	0	0	1	0	3	0	0	1	2	0
7	Charcoal	1	0	0	1	0	2	0	1	2	1	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	1	2	1	0	0	2	0	1
8	Botanicals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
9	Coprolites	0	4	0	0	4	2	1	1	0	1	0	0	1	0	0	1	0	1	1	0	1	1	0	0	1	0	0	0	0	0	2	0	1
10	Insect Parts	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Fossil shell	1	3	4	2	2	4	5	3	1	1	1	0	2	1	1	1	0	2	1	0	1	3	1	1	0	3	0	2	5	2	4	4	2	2
12	plaster (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
13	Red Ochre																									Y									
14	Pottery-red slip																										Y								
15	Initial	MP	MP	MP	TP	JS	SH	AR	AR	AR	AR	AR	AR	SM	NA	NA	CG	CM	HC	NA	KAR	MB	SB	KB	HC	SD	BD	DB	HG	DH	DK	SK	ML	KM	JM
16																																			
17																																			

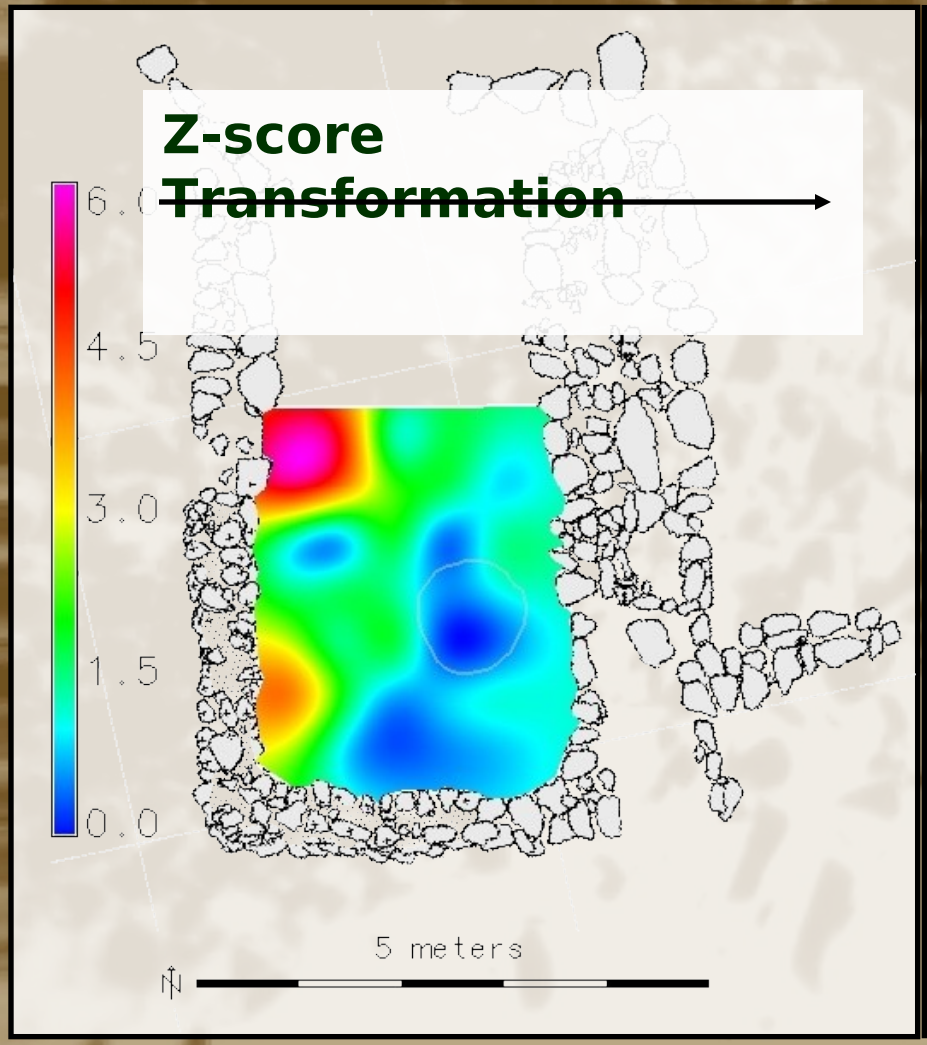
Methods: Density Maps

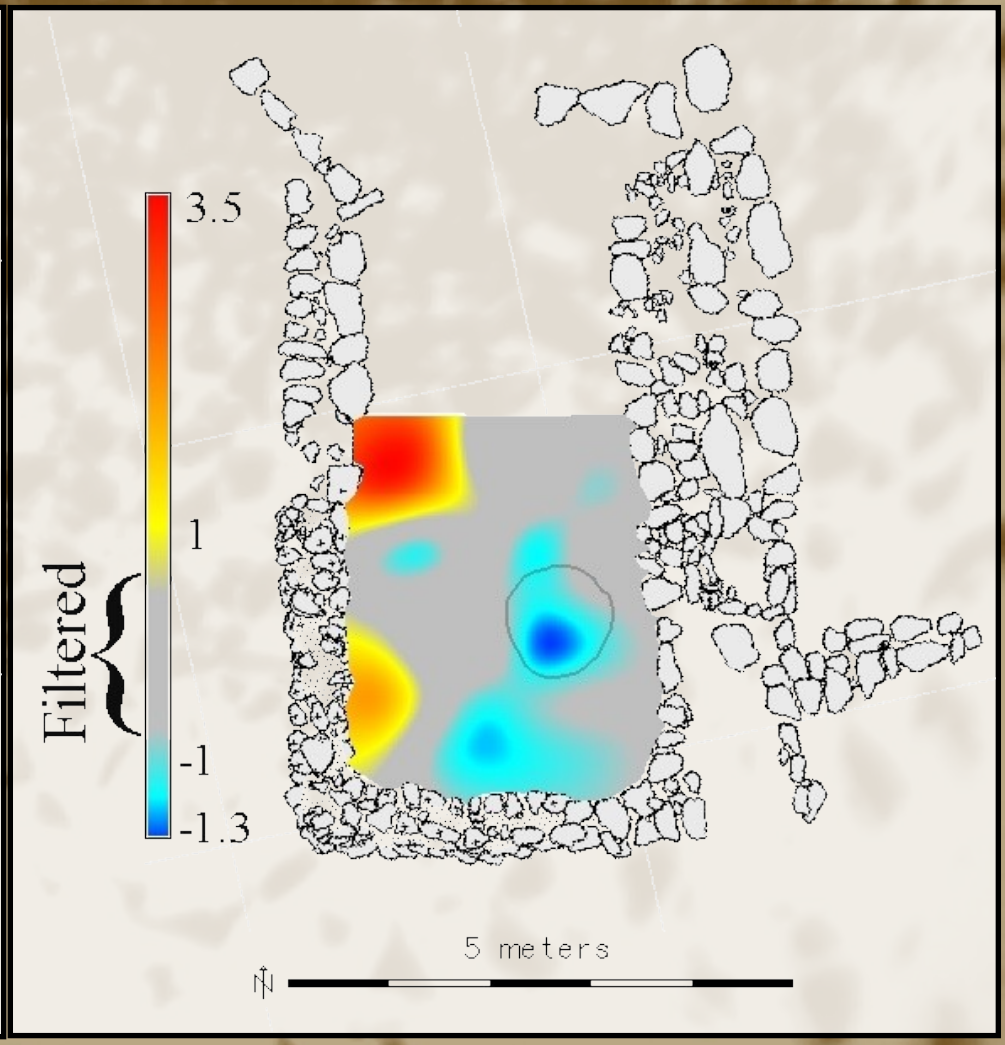
Interpolation with ~~Splines~~





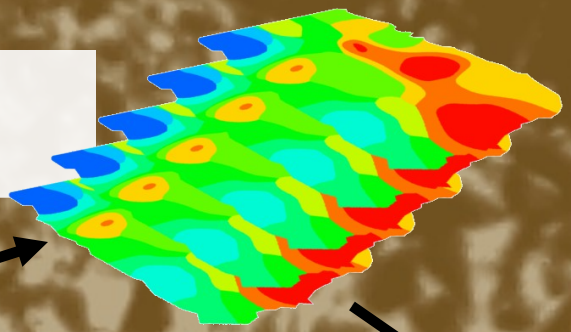
Methods: Z-score Maps

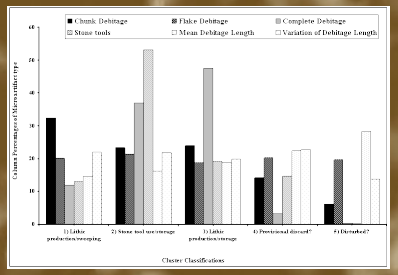


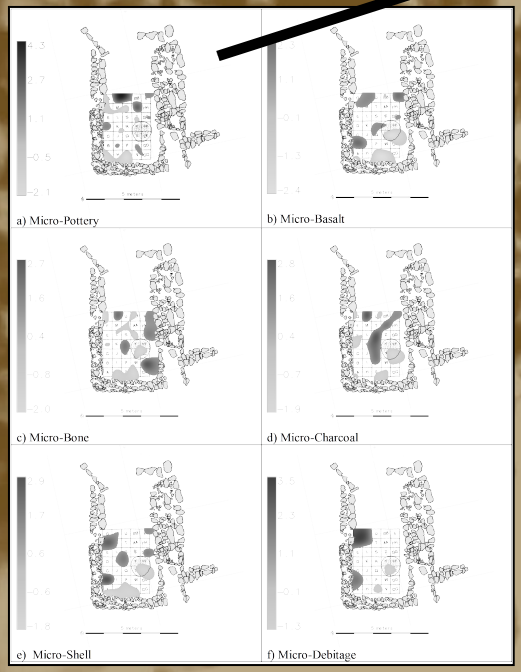


Methods: Cluster Analysis

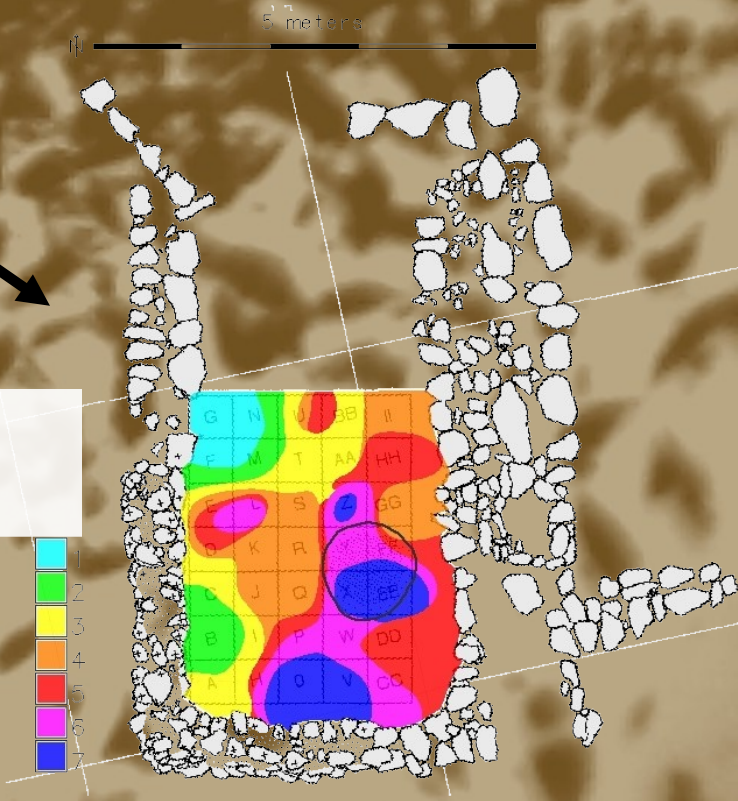
Create Multiband Image



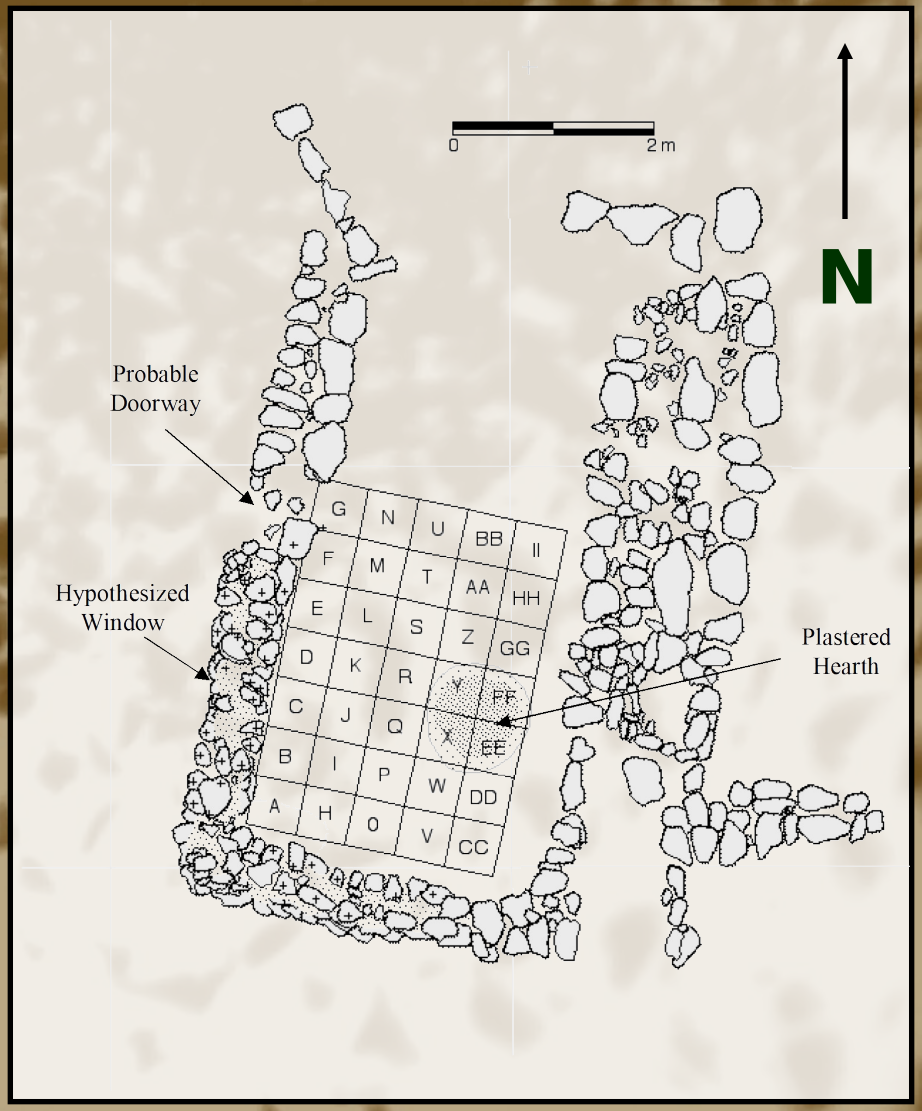




Cluster Analysis



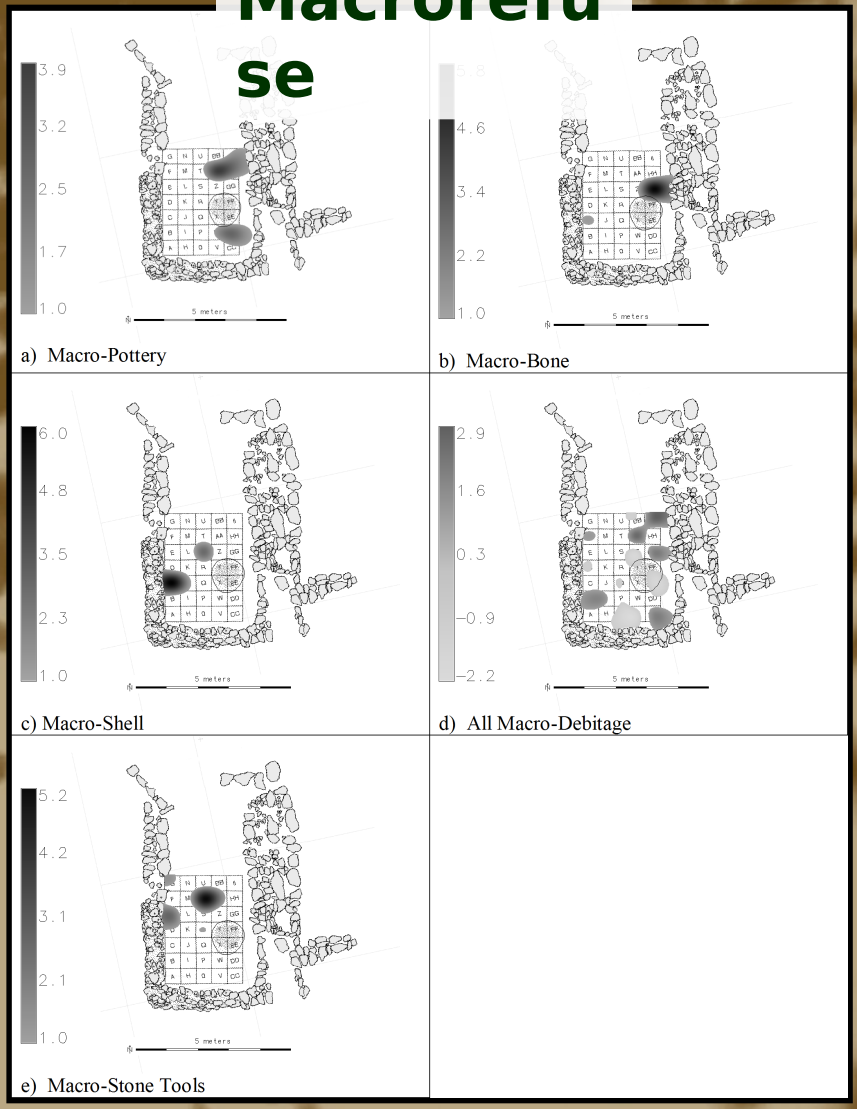
Architectural Hypotheses



Results: Z-scores

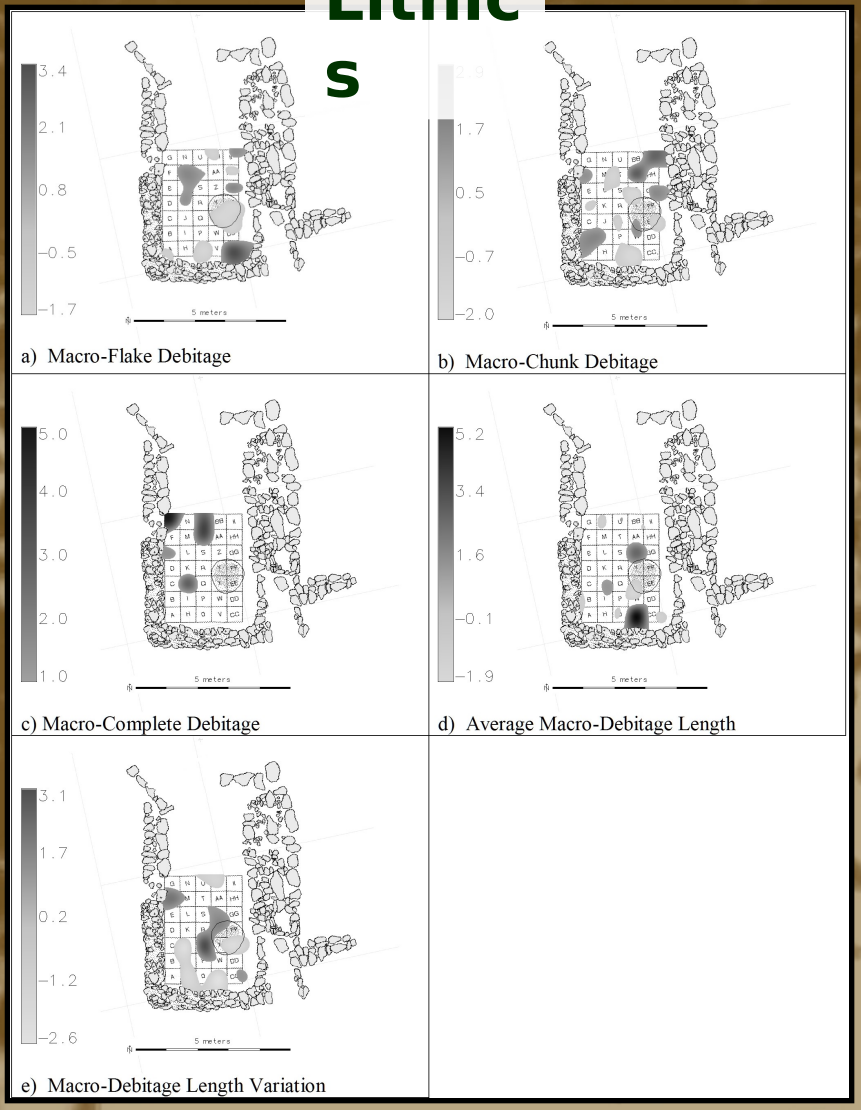
Microrefuse

Macrorefuse

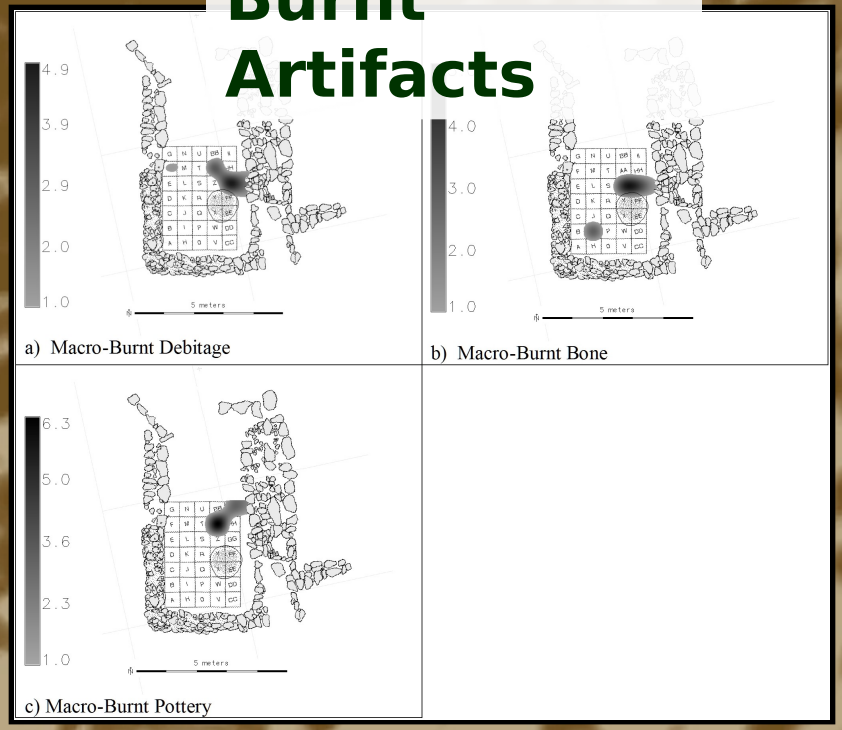


Results: Z-scores

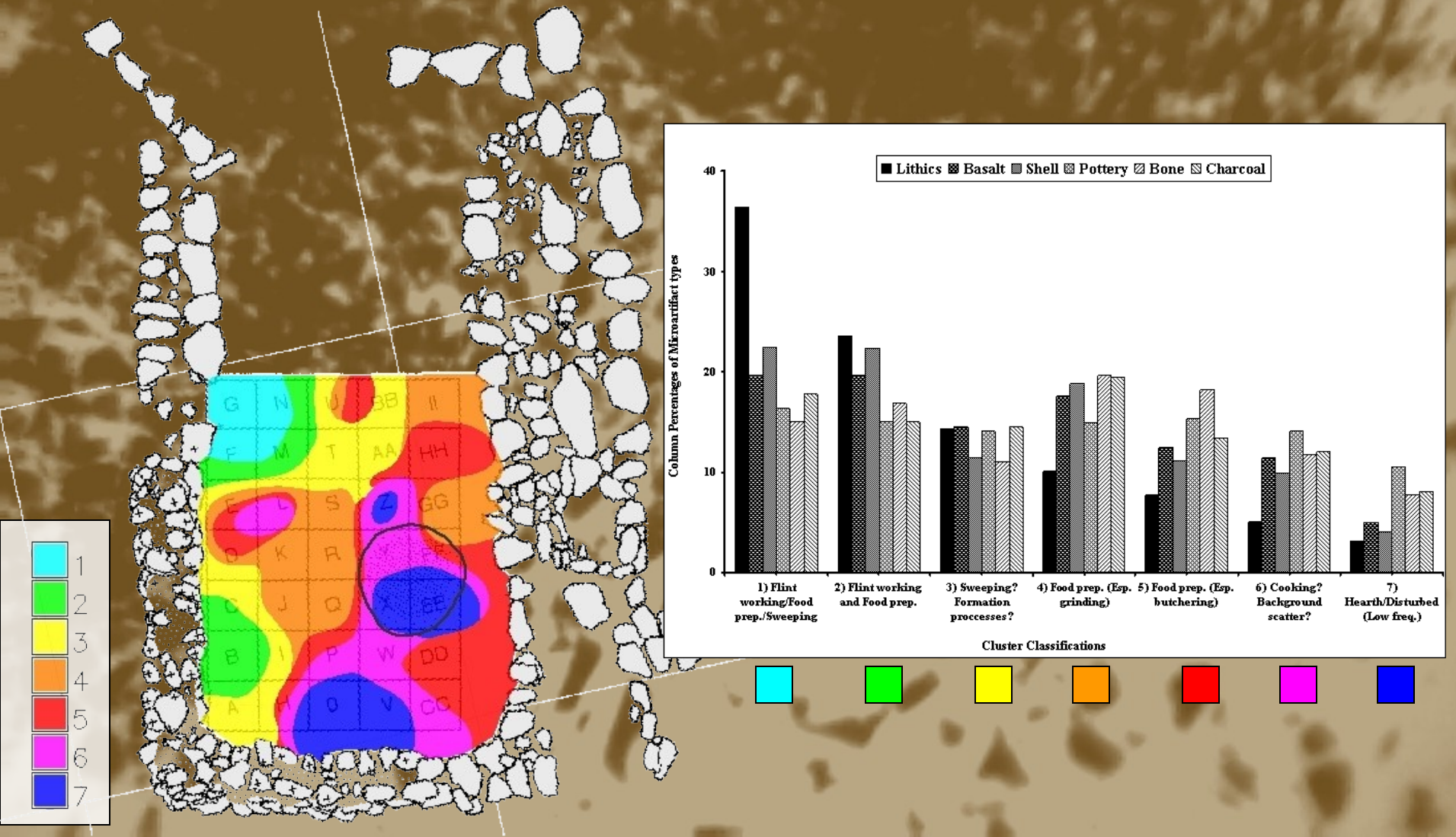
Lithics



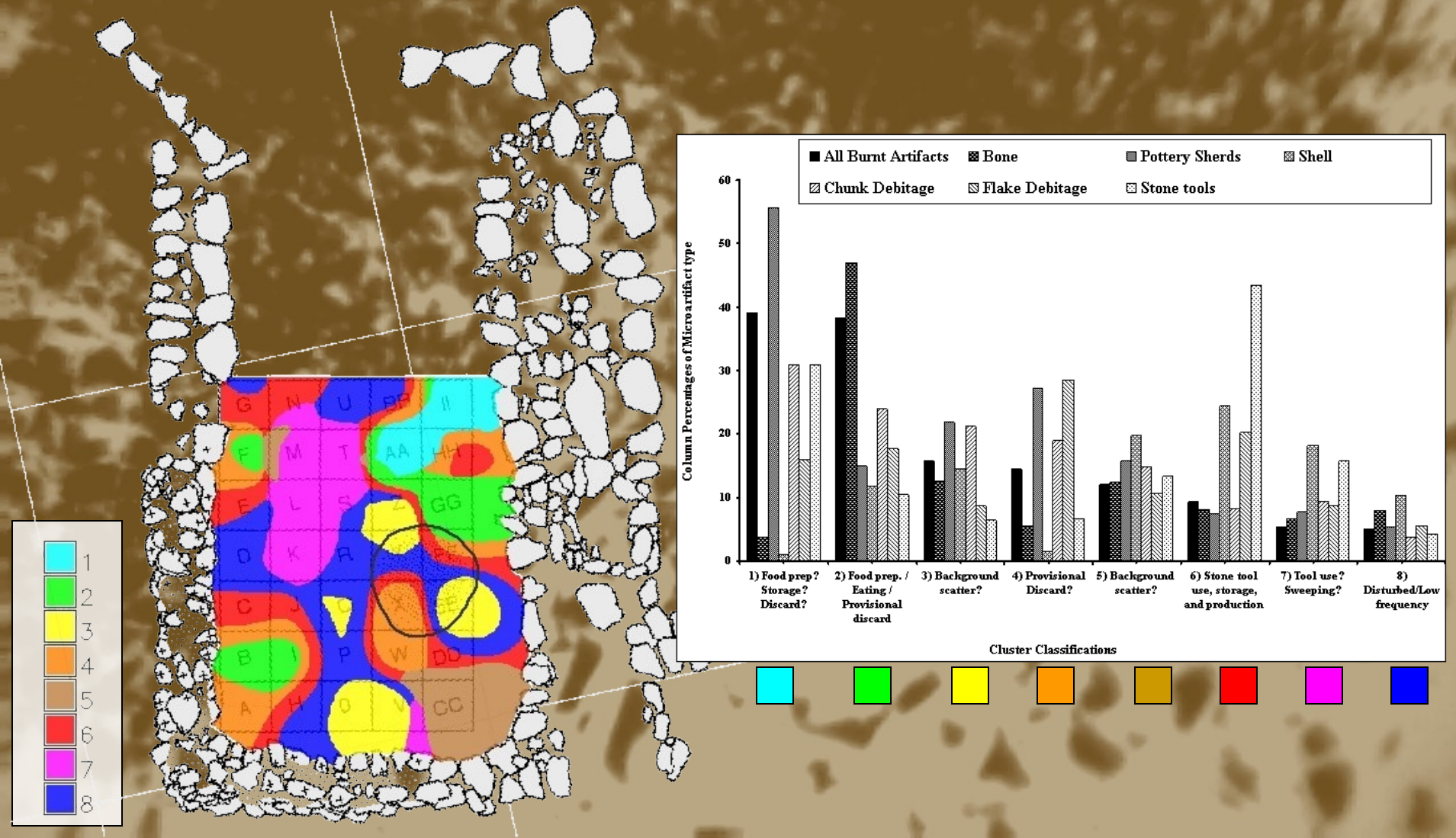
Burnt Artifacts



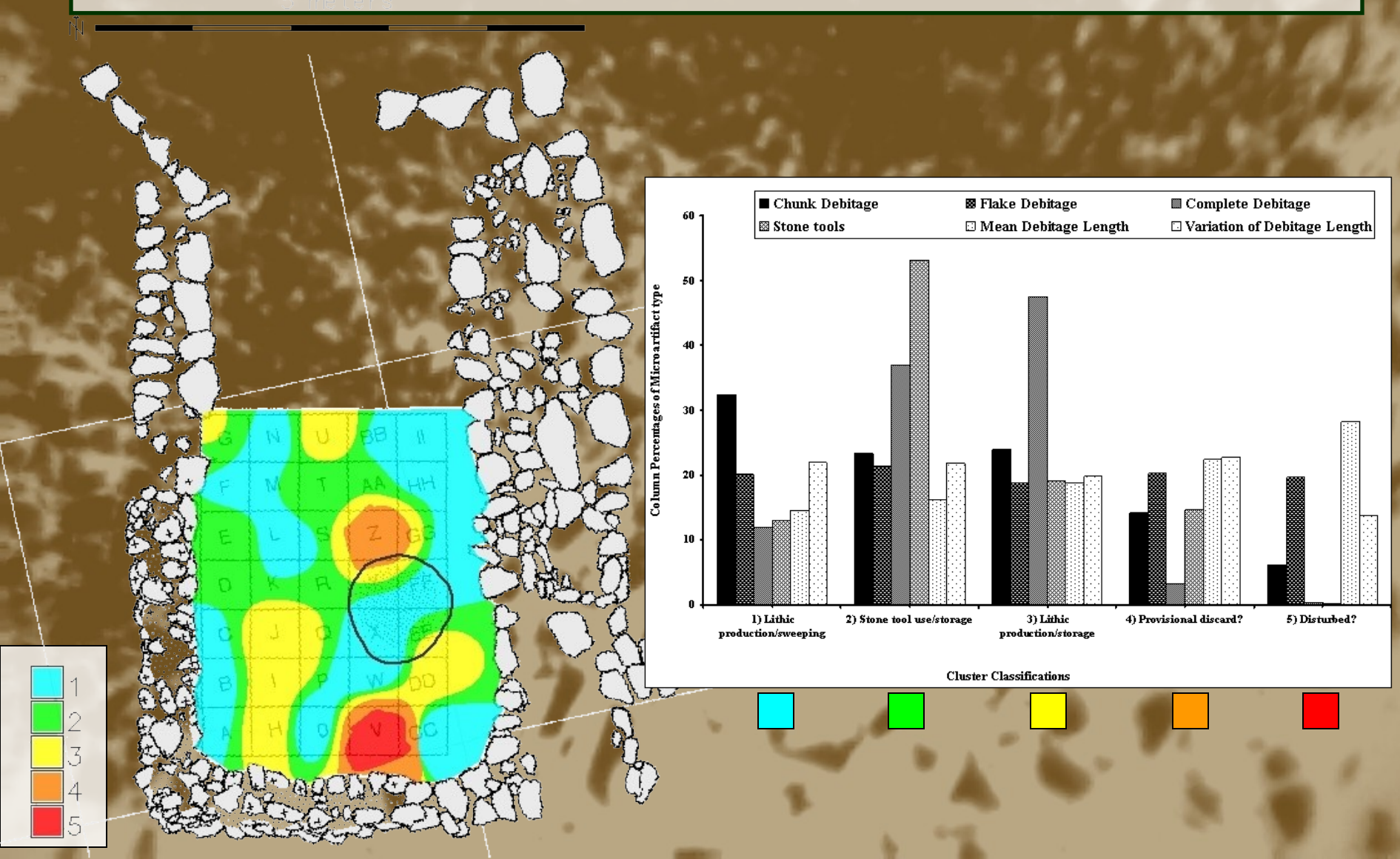
Results: Microrefuse Clusters



Results: Macrorefuse Clusters



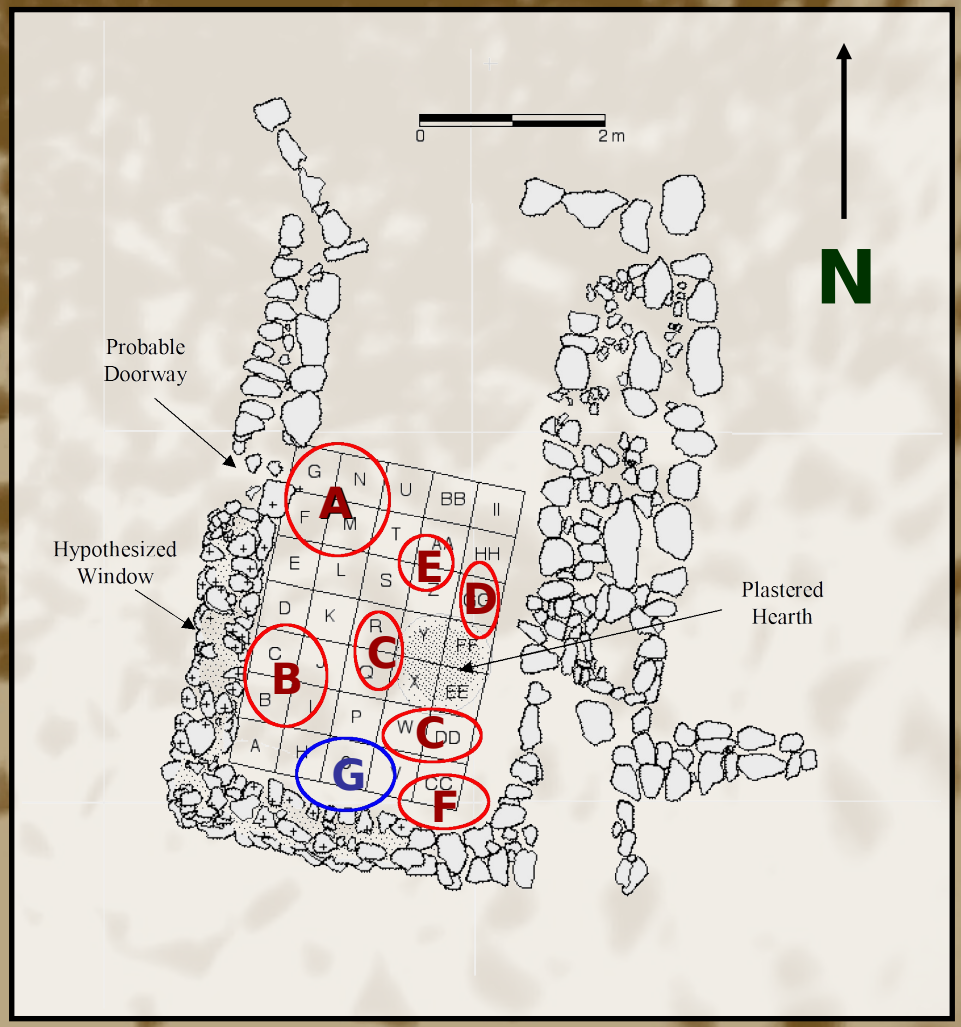
Results: Lithics Clusters



Activity Area Identifications

A. Flint tool manufacture/use, Tool caching, Groundstone manufacture/use, Sweeping
B. Flint tool manufacture/use, Groundstone manufacture/use, Shellfish processing
C. Processing of animal remains, Grinding, Cooking
D. Shellfish processing, Grinding, Cooking
E. Provisional discard of hearth debris
F. Flint flake storage/provisional discard
G. Highly Disturbed Area

Everywhere else is mainly “noise” associated with site formation processes.



Conclusions

- The residents of Late Neolithic Tabaqat al-Bûma organized their domestic space with respect to the constraints of architecture.
- Flint tools were manufactured, used, and/or maintained inside, especially near the door and under the probable window.
- Food stuffs were prepared near the hearth and different food items may have had special processing areas.
- Flakes and tools were stored by the door and in the corners of the house.
- The hearth was periodically cleaned out, and the contents provisionally discarded in the house before being removed
- The house floor was swept with debris directed out the doorway

The End!

Thanks to:

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