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# Geoarchaeological survey in the Wadi al-Kabir Basin, Wilayat Ibri, Oman

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The authors carried out a geoarchaeological survey in the Wadi al-Kabir basin to the northeast of Ibri, Oman, from December 2012 to March 2013. The goal of the survey was to understand the spatial patterns of human occupation of the region during the Late Pleistocene and Holocene, paying special attention to the development of landscape and topography. The survey comprised archaeological and geomorphological explorations. Both approaches employed satellite remote sensing and GIS-based mapping of surface features.

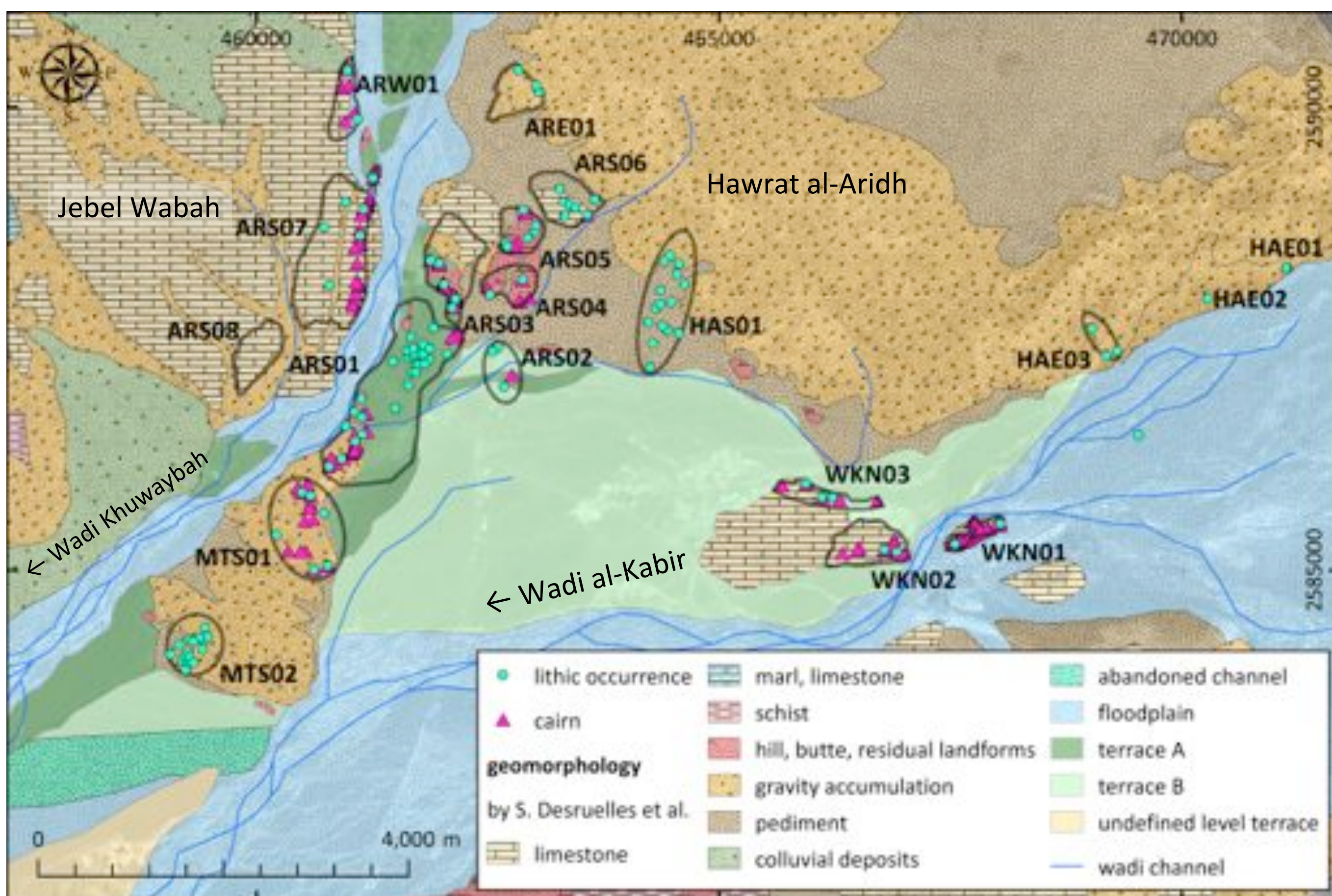


The survey area is located in the southern piedmont of the Hajar mountains, where is a geographical interface with the Rub al-Khali desert.



The wadi al-Kabir basin is just north of the Bronze Age necropolis at Bat.

## Mapping geomorphological and archaeological features



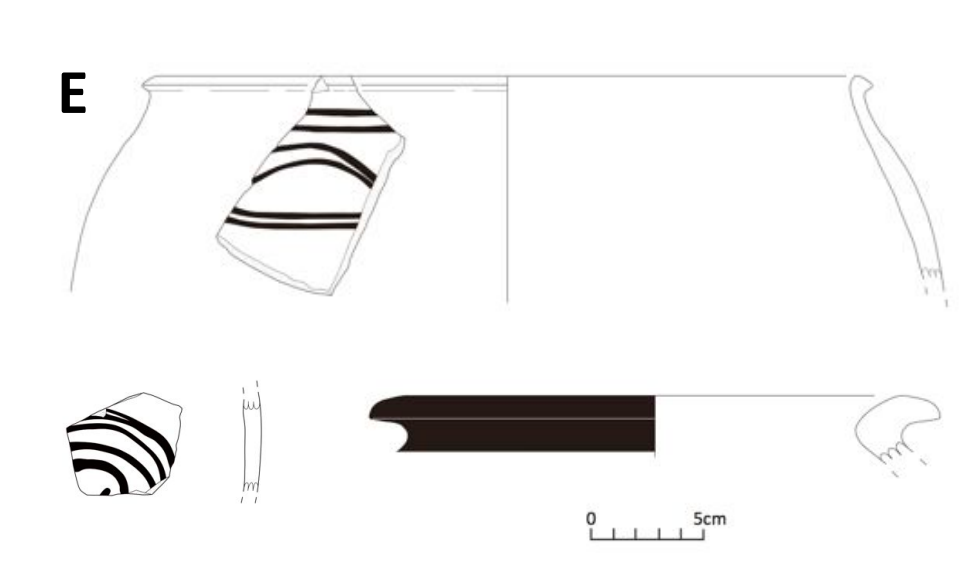
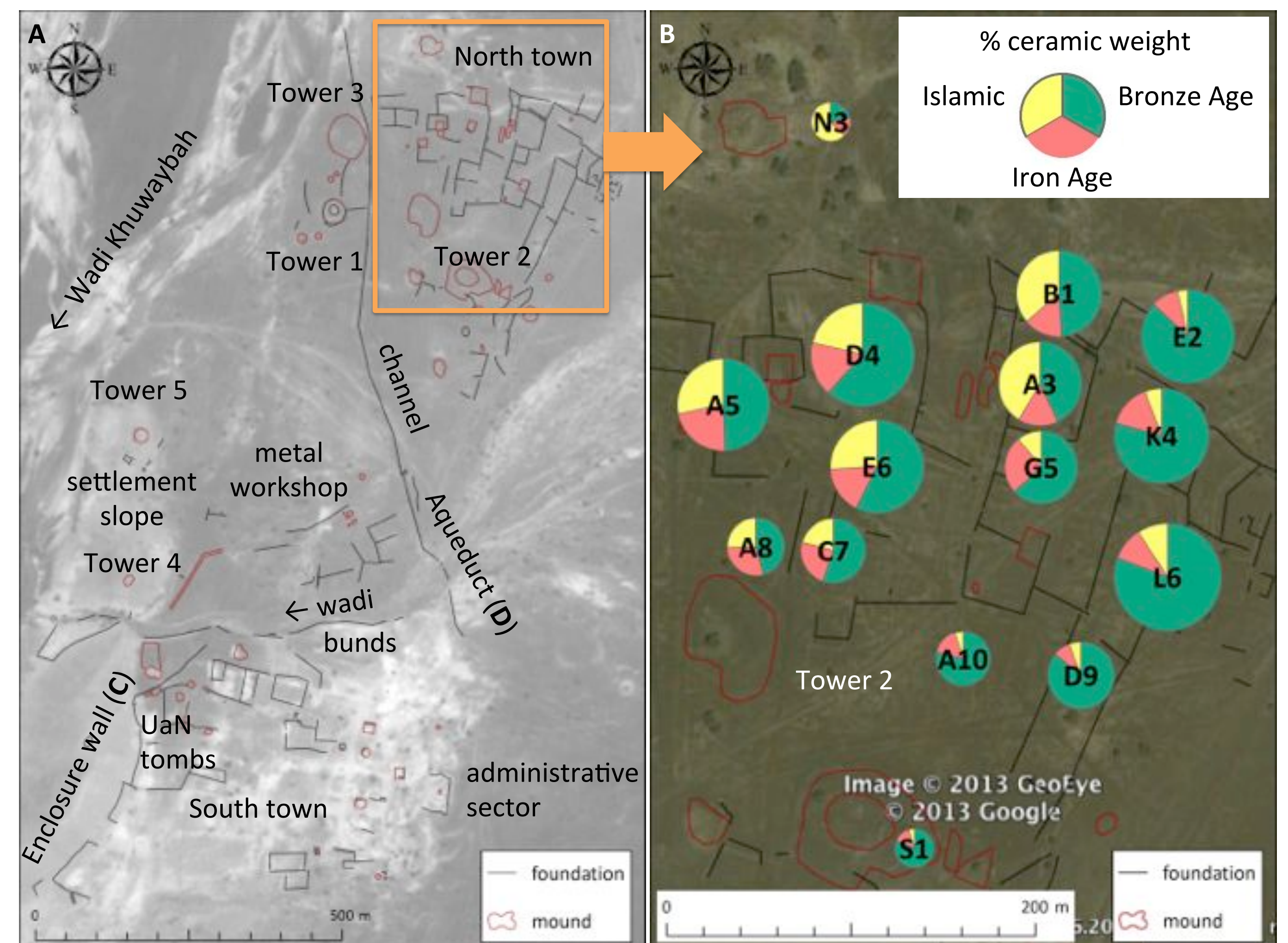
### Geomorphological settings

The Wadi al-Kabir area consists of an alluvial plain that is located between the limestone massif of Jebel Wabah (864m a.s.l) on the western side, the Jebel Wahrah (630m) on the eastern side, and Hawrat al-Aridh (680m) on the north. Several hills, buttes, and other residual landforms, mainly composed of conglomeratic formations, are visible in the northern area of the plain. Those mountains formed between the Triassic and the Paleocene era, and have become typical structural landforms of the desert due to extended erosion and weathering, as conspicuous rocky crest and slopes covered by coarse and angular debris have. Resistant layers of rock, such as chert or silicified limestone, are visible particularly in Jebel Wahrah, where siliceous outcrops are well exposed. In this area, slope dynamics comprise mainly accumulation of rock debris, sometimes organized in conical shape. Additionally, two generations of sub-recent alluvial deposits have been identified in the Wadi al-Kabir alluvial plain, forming terraces (defined as levels A and B) of one to two meters above the present level of the water course. Terrace A is higher than B and is considered antecedent. At the present time, terrace B is occasionally covered, while A is not. Our preliminary results proposed the hypothesis that those two terraces formed during the humid period of the first part of the Holocene (10.5 – 6 ka).

### Archaeological settings

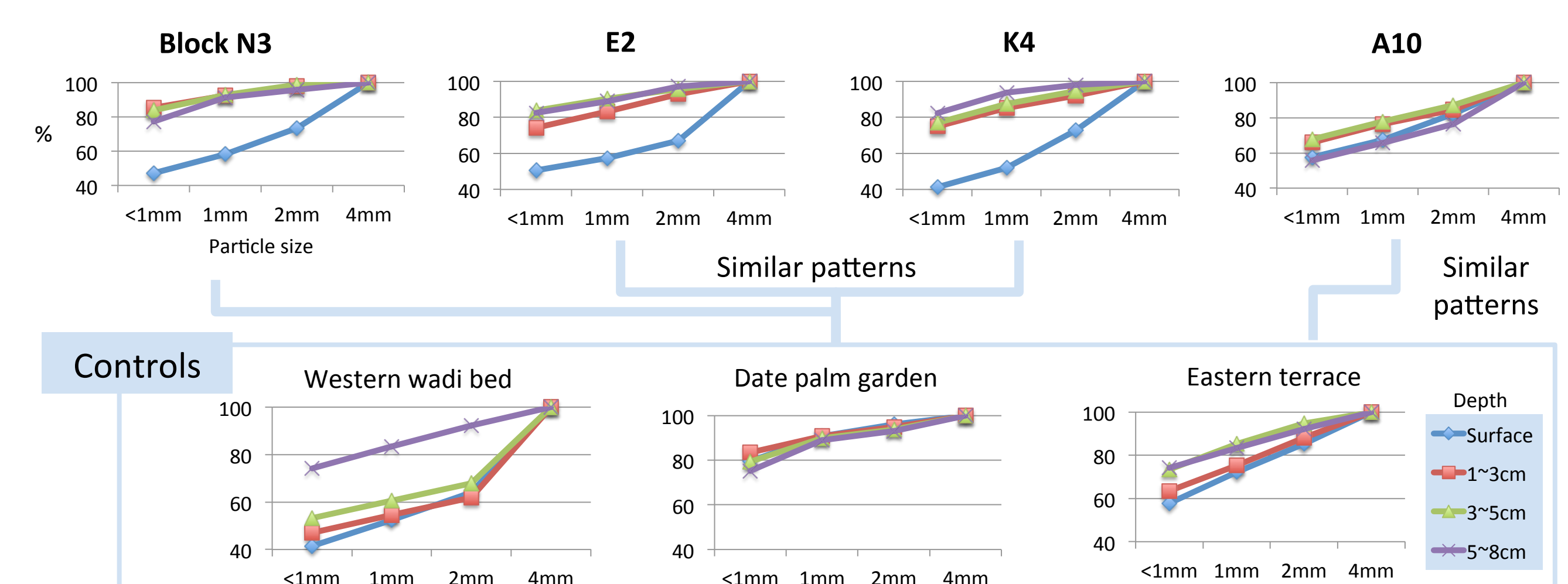
In this area, 23 archaeological sites and scatters were discovered. Middle to Late Palaeolithic artefacts were identified in the piedmont areas, particularly at ARS06, ARS07, HAS01, HAE01, and MTS02, while Holocene lithics, characterised by Fasad points, end-scrapers and drills, were scattered on residual hills and terraces, exemplified by ARS02. The team identified a total of 246 cairns, most of which look like Hafit-type truncated-cone-shape tombs. There were relatively small number of Wadi Suq-type stone-paved tombs. Some of the cairns were associated with lithic concentrations. A rock shelter with pre-modern occupations were found at ARE02. The southern part of the survey area was heavily disturbed by the modern constructions.

## Bronze Age & Islamic settlement at Al-Hāsi



There was a Bronze Age and Islamic settlement on the terrace A between the two wadis. At that site, called al-Hāsi (ARS01), the team mapped at least five Bronze Age towers, two Umm an-Nar graves, enclosure walls (see plate C), irrigation channels with an aqueduct bridge (D), bunds for preventing floods, and biface stone foundations that were probably crop field boundaries and/or building walls (A). Most of the structures seem to belong to the Islamic town, while Bronze Age sherds were substantially scattered in the northern sector (B & E).

## Soil sampling at the northern sector of Al-Hāsi



A systematic surface collection and soil sampling were carried out in the northern sector. Fifteen blocks were selected for intensive artefact collection and four 0.3 x 0.3m test pits were made in different blocks. 1mm, 2mm, and 4mm-mesh high-quality screens were used for sieving soils. The results suggest that the surface artefacts were derived from wadi floods and that a Bronze Age settlement is probably present beneath the crop fields of the Islamic period.

## Summary: landscape development of the Wadi al-Kabir basin

Palaeolithic	Neolithic (Pre-Hafit)	Bronze Age			Iron Age	Islamic
		Hafit	Umm an-Nar	Wadi Suq		
120 – 12 ka	12 – 5.2 ka	5.2 – 4.75 ka	4.75 – 4.0 ka	4.0 – 3.0 ka	3.0 – 1.4 ka	1.4 – 0.05 ka
Lithic scatters at the base of mountains and hills; mobile economy	Lithic scatters on terrace A and residual landforms; subsistence economy T.B.D.	Cairns on the hilltops; Oasis formation in this period?	Towers (circular platforms) and oasis settlements on terrace A	Small number of tombs on the hilltops	Enclosure walls at Al-Hāsi possibly date to this period	Oasis town on terrace A; Location of the town was affected by the change of drainage

### Related paper in this seminar

C. M. Cable "Results of the 2010-2011 Survey of the Wadi al-Hijr, Ibri, Oman" at 11:45 Friday