71. The military terrain lexicon at El Alamein: a Vision- Language Model analysis of the multi-national WWII cartographic corpus

Aldino Bondesan,2, Maria Petriccione and Leonardo Mora

1 Department of Historical, Geographical and Ancient World Sciences (DiSSGeA), University of Padova, Via del Santo 26, 35123 Padova, Italy, , , 2 Department of Military Geography, Faculty of Military Science, Stellenbosch University, Saldanha, South Africa * Corresponding author

The El Alamein battlefield (Western Desert, Egypt) was mapped between July and November 1942 by every belligerent, and its cartography offers an unusual opportunity to compare how different armies described the same desert terrain. This paper analyses a corpus of 21 German, British and Commonwealth, Italian and post-war US maps through a workflow based on multimodal Vision-Language Models. The maps were cut into 679 tiles and processed with a fixed prompt returning every terrain term in structured form; the reliability of the extraction was measured against a model-assisted reference set of 342 terms from six maps, checked blind by one of the authors. Claude Opus 5.5 reached an F1 score of 0.94 with a character error rate of 3%, and two independent runs agreed on 94% of the terms, while Claude Sonnet 5.5, a lowertier model of the same family, came close with an F1 of 0.91. The 4,277 terms extracted from the corpus show that a single descriptive repertoire, inherited from the Survey of Egypt and from Arabic geomorphological vocabulary, circulated among the armies through captured base maps, reprints and translations, and that German cartography enriched it with observations by its military geologists. A georeferencing of three sheets and a comparison with the geomorphological map show that depression and ridge terms fall near the corresponding landforms about six and four times more often than expected from their area.