

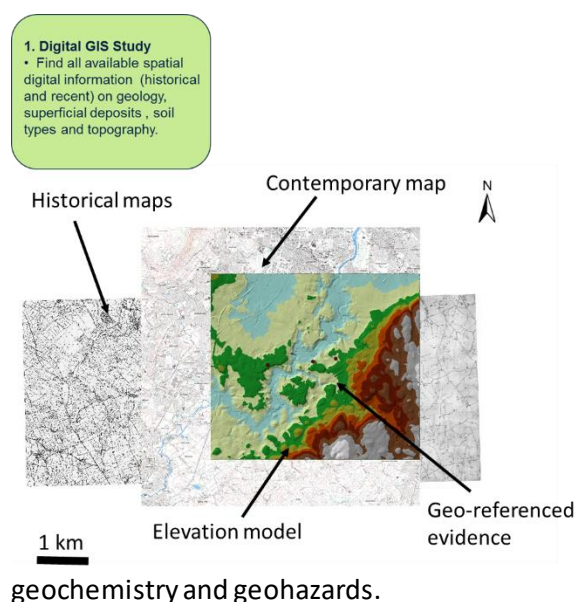
Paper Number: 3649

A GIS-based landscape approach to Forensic Search Strategies and RAG mapping

McKinley J.M.¹ and Ruffell A¹

¹ School of Geography, Archaeology and Palaeoecology, Queen's University Belfast, BT7 1NN, UK, j.mckinley@qub.ac.uk

Geographical Information Science (GIS) has the potential to be used effectively in managing and recording search strategies for missing persons, homicide graves or other objects buried in the ground. This paper outlines a landscape approach that uses GIS to integrate and analyse different types of georeferenced data useful to forensic investigations. The usefulness is to inform and focus time spent in the field on a search, reduce redundancy in effort and increase the potential for a higher degree of quality assurance and success in search operations. GIS can be used to reduce significantly the search area for 'open area searches'. The aim of the paper is to demonstrate the integration of information as geo-referenced spatial layers and to illustrate the potential to query and extract information to inform police, search and forensic investigators at different stages in a search operation (Figure 1).



A staged GIS-based landscape approach is presented starting with a digital desk-based study integrating information from traditional reconnaissance walk-over surveys and leading to the creation of the GIS-based digital RAG maps to prioritise potential search areas (Donnelly & Harrison, 2013). A number of case studies are used to example the approach. A case study is described involving a missing person in an open rural environment in the West of Ireland. (McKinley et al., 2009). GIS is used to integrate historical and contemporary aerial imagery with other data layers and information such as geomorphology, solid geology, drift geology, topography, geophysical properties of the ground, geochemistry and geohazards.

Figure 1: A GIS digital desk-based study © Crown copyright and database rights Memorandum of Understanding (MOU203). It is important to acknowledge that police/case intelligence in addition to the baseline geological and topographic information is required at an early stage of the search and when the raw data (metadata) for the GIS is being compiled.

A GIS-based approach is used to initially define areas of interest based on for example reconnaissance walk-over surveys and a hydrological study. GIS is then employed for digital RAG (Red-Amber-Green) mapping. The second example integrates information from an ongoing missing person investigation on a lowland, lagoonal environment. This study investigates the case where other behavioural factors

outweigh traditional search strategies. A GIS-based approach is demonstrated to incorporate these complexities for forensic search strategies.

References:

- [1] Donnelly LJ and Harrison M (2013) In: *Environmental and Criminal Geoforensics*: Geological Society London, Special Publications 384:173-194
- [2] McKinley et al. (2009) In: *Criminal and Environmental Soil Forensics*: Springer: 285-302.

