Using GIS in Forensic Search Strategies

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Although the use of Geographical Information Systems (GIS) is well established in crime density mapping, identifying hot spots and patterns over time (Chainey and Ratcliffe 2005), GIS capability is still not routinely used in the collection of trace evidence and in search strategies for missing persons, homicide graves or other objects buried in the ground. This presentation outlines a GIS-based methodological approach to collect, integrate and analyse different types of georeferenced data useful in forensic investigations to increase the potential for a higher degree of success in search operations. The aim is to demonstrate the integration of information as geo-referenced spatial layers 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 number of case studies are used to show the use of GIS, as an essential part of the traditional ‘desktop’ study and reconnaissance walk-over surveys, leading to the creation of the RAG maps to prioritise potential search areas (Donnelly & Harrison, 2013). The first case study uses a missing person case in an open rural environment in the West of Ireland. (McKinley et al., 2009). GIS is used to create a 2D desktop study that allows historical and contemporary aerial imagery to be integrated with geological and soil information. Domains of interest are created based on reconnaissance walk-over surveys and a hydrological study. The imagery is draped over a digital elevation model (DEM) to create a 3D model that allows the environment to be viewed from different perspectives. Two further case studies are presented based on the International Union of Geological Sciences (IUGS) Initiative on Forensic Geology (IFG) supported training workshops. The first was held in Brisbane, Australia (August 2012) in collaboration with the Australia Federal Police and more recently the first Masters Course in Forensic Geology, University of Messina, Sicily (June 2015). These examples demonstrate a GIS-based approach for forensic search strategies.

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Reference

