

Application of Territorial Information Systems and GIS technology in legal investigation and environmental justice

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A Red-Amber-Green (RAG) prioritization system achieved by means of Territorial Information System (TIS) and GIS technology is here presented to assist law enforcements and magistrates in solving serious and environmental crimes. The GIS-based approach may allow to define different search scenarios for ground searches of illicit activities in which high-(Red), medium-(Amber), and low-(Green) priority areas are reported.

An innovative GIS-based approach was recently implemented by some of the Authors for the ground searches for clandestine graves. For the first time RAG maps of all entities influencing the burial site choice were cross-referenced in order to gain cumulative suitability factors and the consequent GIS-based search scenarios. For efficient ground searches it is fundamental to produce more search scenarios; depending on offender's modus operandi and behavior, one of them is more suitable than the others. As a matter of facts, the search scenario without considering the visibility factor will be the most appropriate one if the offender accomplishes the illicit activity at night; whereas the search scenario elaborated considering the viewshed analysis by means of the Digital Surface Model-based visibility will be most effective if the offense occurs in daylight. In this case, the cover effect of the landscape, vegetation and buildings is fundamental in influencing the burial site choice.

The GIS-based quantitative approach for the search of clandestine graves may be also planned to assist law enforcements in solving different forensic sciences cases. As a matter of facts, GIS and TIS are fundamental methods in legal investigation and environmental justice to be used for the control of the landscape and to detect environmental crimes such as illegal burial of wastes, environmental contamination or unauthorized quarries.

Finally, GIS and TIS approaches allow to verify the veracity of statements of offenders and/or eyewitnesses, cross-referencing the GIS-based search scenarios with offender's confessions and eyewitnesses' testimonies.