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THE USE OF REMOTE SENSING IN ENVRIONMENTAL LEGAL PROCEEDINGS

Abstract

Remote sensing, the attainment of information regarding specific features, is an extremely powerful tool which can be employed in the field of environmental compliance. Specifically, it can be used for the detection and monitoring of important environmental concerns such as deliberate oil leaks, illegal vegetation clearance, crop subsidy issues, and other criminal activities. Remote sensing can be used in the prosecution of persons involved in the aforementioned illegal activities through the generation of images that illustrate and highlight features vital to their prosecution. However, in the process of generating these images, the initial satellite data is modified to produce a useful image for the specific context and as such, there are a number of issues surrounding the authenticity of remote sensing images as evidence in legal procedures. Differences in the legal processes and the interpretation of evidence raises questions regarding the level of evidential legitimacy within individual governments and countries. As a result of these questions, many court proceedings using remote sensing images as evidence require the presence of a remote sensing expert. This paper reviews technical aspects of satellite imagery, with a focus on the Australian legal system, and provides recommendations to prevent questions about the authenticity and reliability of remote sensing data in court. Specifically, a number of factors will be explored to ensure the evidential legitimacy of remote sensing images including what the definition of evidence is within different countries, the implementation of evidence within the legal system, why and how data is changed to produce different images in remote sensing, satellite calibration and validation, and the current chains of custody involved in image generation. Additionally, the current uses of images in legal proceedings are examined in a number of case studies to highlight the gap between the legal and technical systems. Finally, an authentication system is recommended to resolve issues in the current processes and to help limit questions of legitimacy in regards to environmental compliance. This authentication system provides a method to fulfill chain of custody requirements whilst limiting the need for the presence of remote sensing specialists in the majority of court proceedings. This will prevent the remote sensing data being disregarded as evidence due to questions of its legitimacy. As this data is invaluable to the apprehension of individuals engaged in illegal and harmful environmental activities, such systems are crucial to the continued use of these techniques in legal proceedings.