The Contribution of Remote Sensing to Sustainable Mining Development in South Africa

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Abstract

Regulatory as well as business drivers and including triple bottom-line accounting have resulted in increased environmental requirements opening thus an opportunity for remote sensing to contribute to sustainable mining development in South Africa.

Remote sensing is typically seen as a tool to monitor and characterise the environment through the use of instruments mounted on ground systems, on aeroplanes or on satellites collecting surface, near-surface and sub-surface signals. The failure of solutions in the management of environmental and thus sustainable parameters has highlighted weaknesses in other areas. The increased environmental requirements include a need for baseline information, monitoring, measurement of cumulative effects and quality assurance. Cumulative effects to be measured include the impacts on wetlands, biodiversity, soil, water and closure plans.

Many studies have been carried out, sophisticated methods evolved and successfully demonstrated. However, these methods were primarily designed from a data-driven rather than solution-driven point of view.

This paper reports on a summary of the benefits of remote sensing and specifically, its inputs to monitoring and planning strategies and value-add to environmental investigations. Further, its limitations are also highlighted and suggestions for a change of focus in the direction of research are made in order to make the use of these remote sensing technologies more widespread in the mining industry.