

Subsidence Monitoring

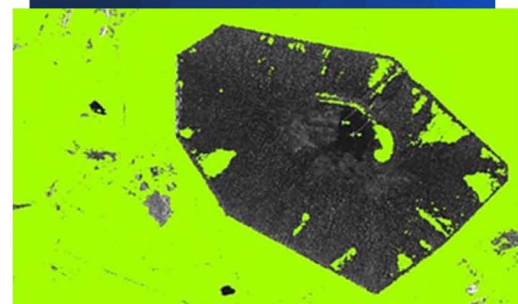
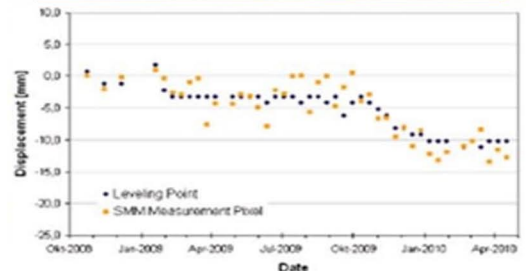
Mines need to prevent damage to infrastructure, damage to the environment and to loss of life or injury due to unexpected surface movement. The mining industry has long been plagued by subsidence on actively mined areas as well as dormant and rehabilitated areas. One of the major causes of damage and injury at mines has been unnoticed or unexpected ground subsidence. Although ground measurements provide unrivalled, absolute and relatively accurate point information in areas of concern, it is not realistic to take these measurements over the entire mine area. A significant proportion of the responsible mine area may therefore not be monitored.

The possible failure or collapse of underground support pillars have become a focus of the Department of Mineral Resources due to recent failures, and they have tasked mines to come up with a system to monitor and prevent this. Space-based synthetic aperture radar (SAR) is an active sensor which emits a radar signal and subsequently measures the signal response from which the distance to earth can be calculated. As regular acquisitions are done over the area of interest, changes in the signal response at each acquisition correlate to a vertical change of the surface of the earth (i.e., uplift or subsidence).

SAR provides regular, reliable information as it is minimally affected by clouds. It can detect vertical changes on the earth's surface at relative accuracy in the order of 3-6 mm in areas with smooth or man-made objects. With multiple data captured at regular intervals, it is possible to model progression of subsidence over time. This is ideal for early detection to allow for mitigation of potential hazards. The space-based platform also allows for significant areas to be covered at a very high point density to enable simultaneous monitoring of the complete mining area.

About Southern Mapping

Southern Mapping, a Woolpert Company, is based in Johannesburg, South Africa. Southern Mapping offers extensive high-accuracy lidar, imagery and remote sensing experience, as well as airborne topographic, hyperspectral, and thermal survey and mapping. We provide mapping services for engineering, infrastructure, mining, mapping, agriculture and environmental sectors in more than 45 African countries. Together with our parent company, Woolpert, our talent includes a deep bench of worldwide, industry-leading experts that acquire, process and evaluate aerial, terrestrial, and bathymetric lidar and survey data. Through that alignment, we employ our own fleet of manned and unmanned aircraft and cutting-edge sensors for both public and private applications. Southern Mapping is proud to be part of this powerful geospatial team and apply a wealth of unparalleled services throughout Africa and across the globe.



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