MINING SOLUTIONS WITH SATELLITE IMAGERY

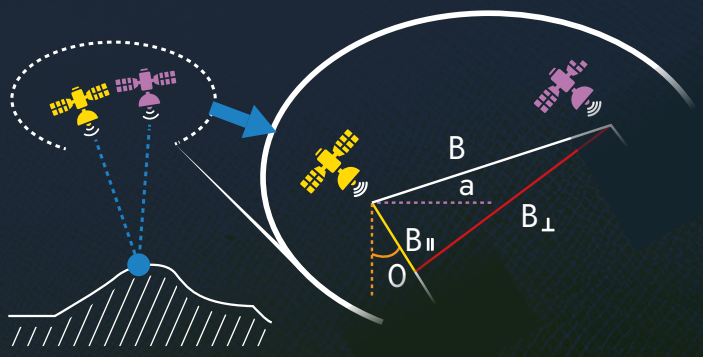
At VENG, we are developing various solutions aimed at improving safety, operational efficiency, and environmental management in projects related to uranium mining and processing. Here are some of the applications that can add value to these types of operations:

HEAP LEACHING
Early Detection of Potential Leaks

The combination of radar data from SAOCOM satellites and advanced moisture analysis techniques enables the monitoring of heap leaching piles used in uranium recovery processes and the early identification of potential leaks of process solutions. By tracking moisture anomalies spatially and over time—especially in perimeter areas or outside the expected infiltration zones—it is possible to detect signs of failures in waterproofing, drainage, or containment systems. This capability helps minimize environmental risks, optimize inspection programs, and strengthen operational controls related to the handling of leaching solutions. Thanks to SAOCOM's L-band radar, monitoring can be conducted regardless of weather or lighting conditions.

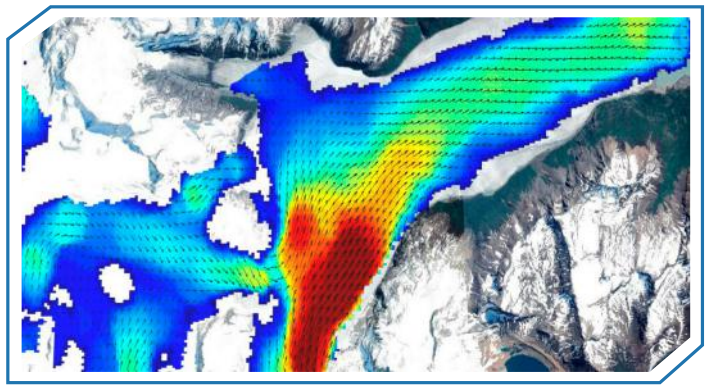
INTERFEROMETRY & CHANGE DETECTION SERVICES

Multitemporal analysis of radar images allows for the identification of surface changes, material movements, new excavations, facility expansions, or alterations to infrastructure associated with uranium mining and processing. This information facilitates the monitoring of operational developments and the verification of changes in areas of interest.



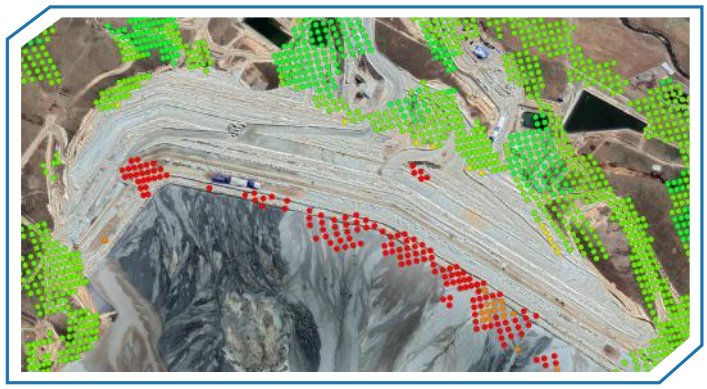
Displacement Velocity Maps

Displacement velocity maps, obtained through differential interferometry (InSAR), allow for the quantification of ground movements with sub-centimeter precision and the analysis of their temporal evolution. In uranium projects, this information is particularly useful for monitoring deformations associated with excavations, material stockpiles, processing areas, and critical infrastructure.



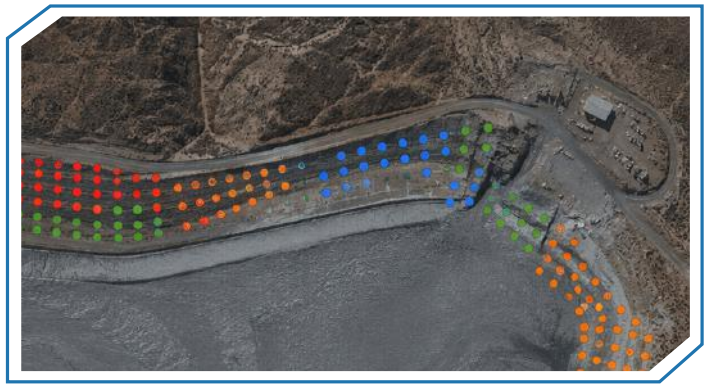
Slope Monitoring

Interferometric monitoring of slopes makes it possible to identify differential deformations at mining fronts, benches, and stockpile areas, providing relevant information for geotechnical management and operational safety. The systematic measurement of displacements allows for the identification of acceleration patterns and complements the instrumentation installed in the field.

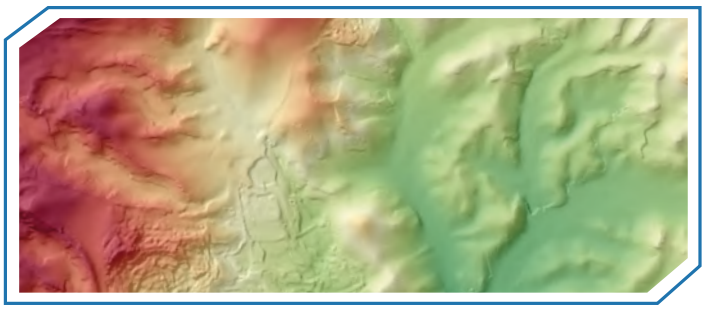


Tailings Dam and Waste Management Facility Monitoring

Using InSAR techniques, it is possible to evaluate the structural behavior of tailings dams, waste storage facilities, and other storage facilities associated with uranium processing. Continuous monitoring allows for the detection of differential settlements or displacements that may require a detailed assessment, thereby strengthening risk management and compliance with safety standards.



Digital Elevation and Terrain Models
(DEM & DTM)



Using radar data, it is possible to generate high-precision Digital Elevation Models to analyze slopes, runoff, drainage, and volumes. These products are useful for mine planning, infrastructure design, environmental management, and the evaluation of material disposal areas.

Monitoring of Operational Roads and Access Routes

Interferometric analysis applied to haul roads and access routes enables the detection of differential settlements and progressive deformations that could affect the logistics and safety of operations. This information facilitates preventive maintenance planning and resource optimization.

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