



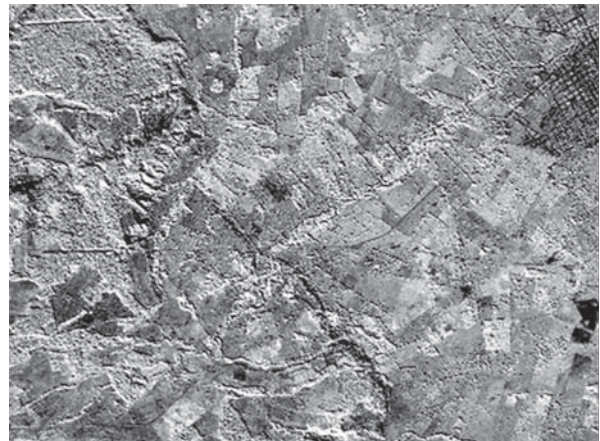
GeoSAR Mapping Solutions



GeoSAR: the system of choice for high resolution, large area 3D terrain mapping. Mapping through clouds and beneath foliage, Fugro's airborne GeoSAR radar mapping system efficiently delivers comprehensive, high accuracy elevation and image data to support varied customer applications.

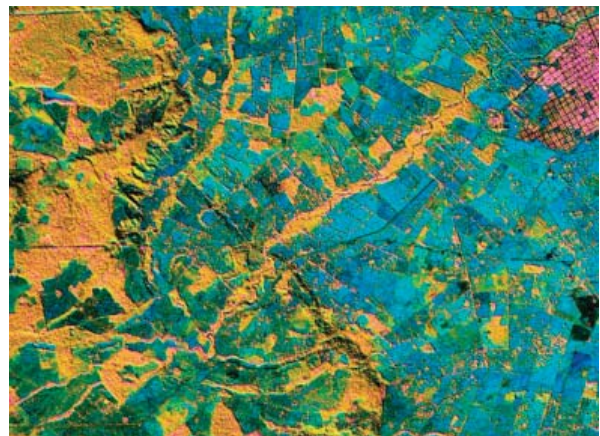
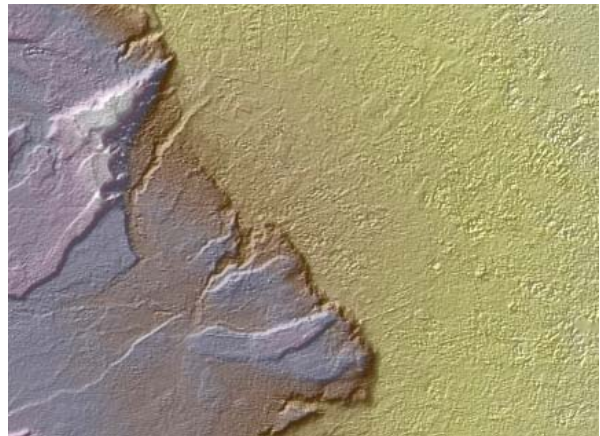
Mapping the Impossible

GeoSAR is a unique airborne mapping system that rapidly collects high resolution 3D terrain data and radar imagery for efficient generation of topographic maps and other derived products. GeoSAR penetrates clouds and foliage to map the ground beneath the canopy, as well as surface features above the terrain, in a single pass. This makes GeoSAR an ideal tool for large-area mapping over regions previously considered inaccessible due to persistent cloud cover, dense vegetation, and/or rugged terrain.



GeoSAR Advantages

- Complete high-resolution data over large areas, acquired in a short time frame
- Mapping data above and below the foliage, no matter the density
- Topographic and thematic maps at 1:50,000 and 1:25,000 scale
- Multi-band, single-pass collections with up to eight looks of every ground point
- Integrated LiDAR terrain profile data for improved quality control
- Targeted circular collects for very high resolution imagery and tomography
- Customer-owned data with no license restrictions



The three GeoSAR images to the right illustrate the variety of information collected in a single pass over the same area in Colombia. Top: X-band orthorectified radar imagery reveals a variety of surface features through clouds. Middle: Colorized P-band elevation data shows terrain details beneath the vegetation. Right: combined X- and P-band orthorectified imagery produces a "multispectral" color image for enhanced interpretation and classification.

GeoSAR Mapping Solutions

GeoSAR Applications

- **Topographic Mapping.** Achieve efficient topographic mapping at 1:50,000-1:25,000 scale and greater with up to 1 meter elevation accuracy, even in difficult-to-map areas; ideal for regions with missing or outdated coverage.
- **Defense/Intelligence.** Map beneath trees and dense vegetation to obtain detailed data valuable to counter-narcotics and counter-insurgency, reconnaissance, and mission planning.
- **Oil and Gas Exploration/Production.** Understand potential exploration blocks and plan exploration and production logistics with detailed terrain, land-cover, and infrastructure mapping for faster and more cost-effective solutions to upstream and midstream activities.
- **Flood Risk Mapping.** Manage hydrology studies for accurate watershed delineations and flood assessment mapping over entire regions; create 3D visualizations for scenario planning and evacuation routing.
- **Mining.** Perform preliminary geological and environmental interpretation and direct exploration activities using radar imagery and elevation data in areas obscured by dense vegetation and/or dense terrain.
- **Agriculture.** Identify and monitor crops over large areas accurately and efficiently with GeoSAR-specific, semi-automated classification routines. High accuracy elevation data also supports run-off analysis and irrigation planning.
- **Forestry.** Obtain accurate inventory counts and estimate tree heights and crown diameter for efficient forest harvest management; examine spatial distribution and forest type for accurate fuel maps and fire modeling.
- **Archaeology.** Uncover cultural heritage and archaeological features hidden by centuries of vegetative growth; GeoSAR's foliage penetration enables a zero-impact exploration of existing or potential historical sites.
- **Spatial Data Infrastructure.** Obtain detailed imagery containing features such as roads, structures, and waterways necessary for developing an accurate spatial data infrastructure.



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