Change Detection: Rapid Assessment Services

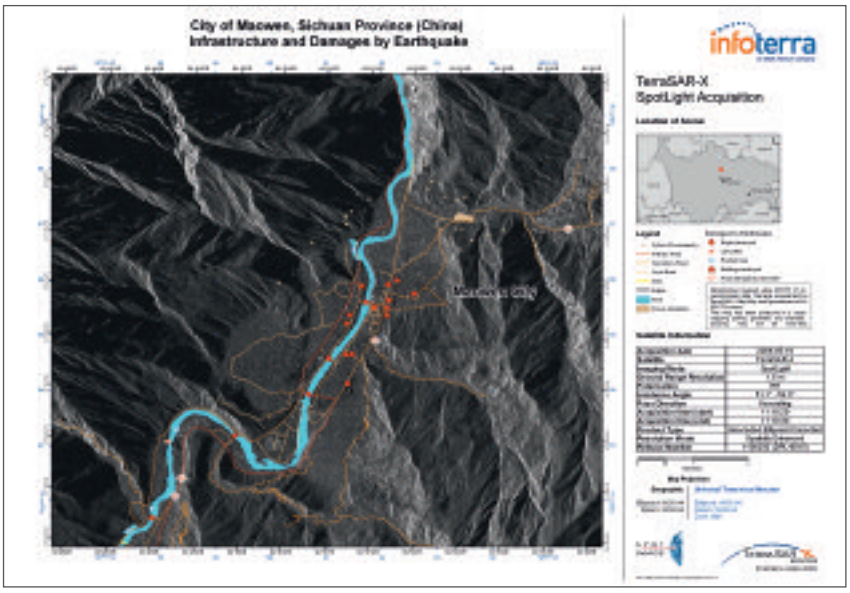
TerraSAR-X: Rapid Site Access – Reliable Situation Analysis

The devastating effects of severe natural disasters such as wildfires, earthquakes, tornadoes, floods, or the impacts of man-made catastrophes like industrial accidents, terror attacks or large traffic incidents: when disaster strikes, a rapid and reliable provision of precise information is crucial for effective response actions.

Further, the continuous conservation and protection of our planet's environment requires information such as reliable status assessments to check on the conditions of e.g. forests or natural resources.

The high-resolution radar satellite TerraSAR-X is particularly useful for (rapid) assessments that require a detailed situation analyses: The spacecraft's flexible SAR-sensor can reach virtually any point on Earth within a maximum of 2.5 days, acquiring data independent of weather conditions, cloud cover or haze.

- **quick: site access in 2.5 days**
- **rapid processing and interpretation**
- **reliable: weather-independent sensor**
- **sound: visual interpretation confirms rapid results**



Infrastructure assessment for the City of Maowen (Sichuan Province, China), following the severe earthquake that struck the province in May 2008. This detailed infrastructure and image analyses based on a TerraSAR-X SpotLight acquisition was available within one day after data reception on ground.

Infoterra's experts are available 24/7 for visual interpretation and analysis, ensuring a **near-real time emergency response capacity:**

- while the rapid acquisitions are arranged and processed, any **reference data** available for the area in question is researched and prepared;
- automated change detection processes allow a **rapid preliminary damage assessment within mere hours** after data reception on ground;
- a more **detailed damage assessment** including a visual interpretation and cross-check can be performed within the first day;
- depending on the severity of changes/damages, area size, and terrain characteristics, **detailed situation analysis** become available within 2-3 days following data reception.

The same interpretation processes can be applied for less time critical one-off change assessments required e.g. for status analyses and reporting of environmental issues.

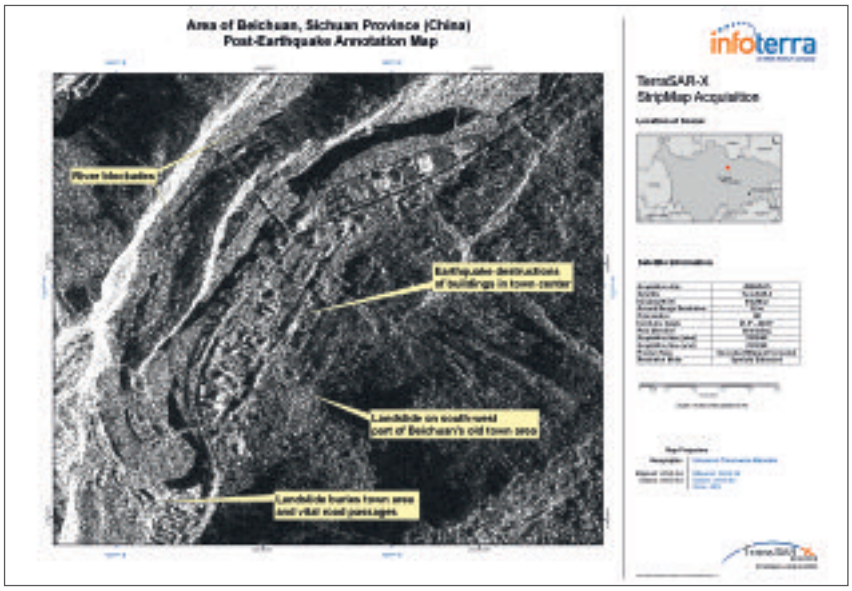
Application Areas

The rapid emergency response capabilities were successfully proven following major natural disasters such as the Sichuan earthquake, severe flooding in Europe and Latin America, wildfires in Australia, and many more.

On-site response forces, local, national and international rescue organisations, and responsible government agencies benefit from precise information provided as quickly and reliably as possible.

Imagery and maps are used for the recognition and assessment of damages, identification of focus areas, resource scheduling and route planning, or an efficient set-up of coordination centers and camps.

Change detection is further a key source for identifying environmental issues such as deforestation and desertification, as well as a reliable basis for map updates.



Identification of significant landslides in a TerraSAR-X StripMap acquisition of Beichuan (Sichuan Province, China): One landslide hit Beichuan's old town, burying buildings and taking the lives of hundreds of people in the aftermath of the earthquake. Another landslide blocks a river, imposing a severe danger of flooding the remainder of the town in case this natural dam should break.

Technical Specifications:	
Thematic content	changes yes/no identification of nature of changes/damages
Geometric resolution/scale	1m, 3m or 18m (TerraSAR-X imaging modes)
Positional accuracy	< 1m
Format of delivery	geotiff (raster), shape file (vector)
Type of data delivered	annotated images, change/damage assessment maps (usually multi-year)
Data sources used	TerraSAR-X (for change detection), TerraSAR-X archive data, optical satellite data or any other available reference data (as basis)

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