

TerraSAR-X Applications Guide

Extract: Topographic Mapping

April 2015

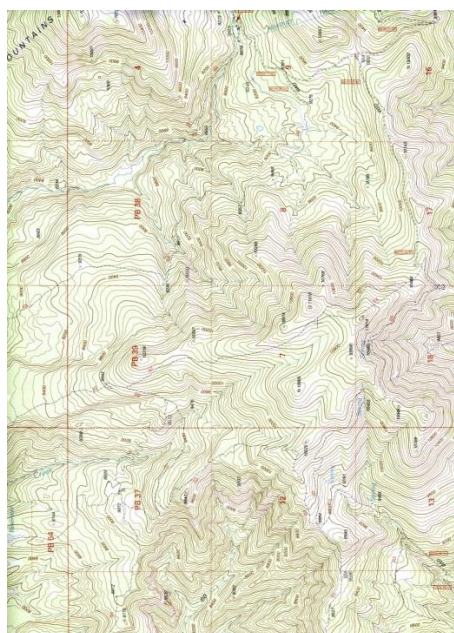
Topographic Mapping

Issue

The need for precise and up-to-date topographic maps comes up, whenever larger operations like construction, exploration and production or military activities are planned. Nevertheless, still in many regions of Africa, South-East Asia and South America large scale topographic maps (i.e. 1:50,000 and bigger) are not existing or are outdated.

Markets

Defence, Oil and Gas, Civil Commercial, Civil Institutions



Achievements

TerraSAR-X provides topographic maps with scales from 1:25,000/1:50,000/1:100,000 with best location accuracy in the market, contour lines of heights can also be achieved.

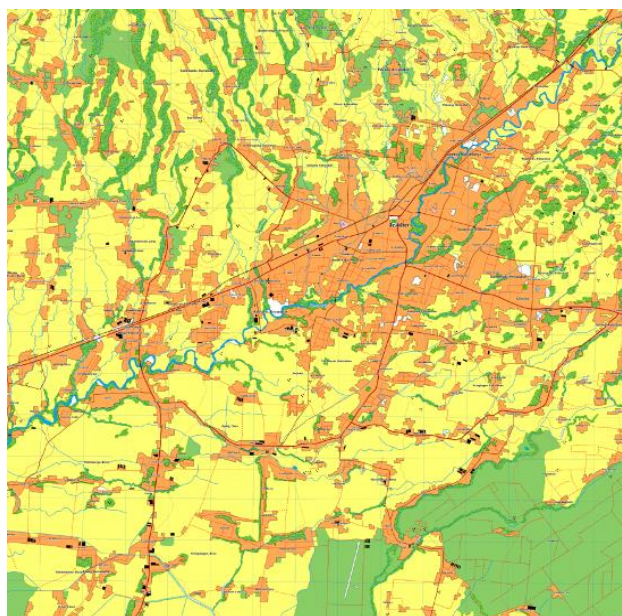


Figure 1: TerraSAR-X sample for a topographic map

Benefits of using TerraSAR-X

The all-weather capabilities and the skills of experienced interpreters allow the creation of topographic maps in scales up to 1:25,000 or 1:50,000 at any place on Earth - very quickly and with high thematic quality. Planimetric as well as elevation information can be derived

utilising TerraSAR-X (see also chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).

This results in an accurate match of DEM, image and reference data, the acquisition of different parameters at the same date, a reduced administrative work (e.g. data search and negotiation with other providers) as well as a calculable budget.

Furthermore, TerraSAR-X offers high geolocation location accuracy, no terrestrial ground control points are needed which reduces processing or production failures.

Flexible resolution and coverage of TerraSAR-X enables a choice of most appropriate resolution and coverage for mapping.

Relevant Data Specifications

Table 1: Recommended Image Specification

Image Modes:	ScanSAR, StripMap, SpotLight	
Assumed Analysis Approach:	Visual Interpretation	
System Settings:	Polarization	HH
	Incidence Angle [Degree]	20 – 30
	Orbit	Ascending and / or Descending depending on terrain
TerraSAR- Image Product	Basic Image Product:	MGD, GEC, preferable EEC
	Resolution Mode:	Spatially Enhanced (SE)
	File Format:	GEOTIFF

Note: Recommended image specification is an indication only. It may vary depending on the software used. Airbus Defence and Space, Geo-Intelligence does not guarantee relevant capability.

Relevant Products and Services available from Airbus Defence and Space, Geo-Intelligence

- Topographic Mapping Service
- Elevation10 and WorldDEM™

Related Publications

Frank Teufel, Fahrland, E., Schrader, H.: “3D Topographic Mapping using TerraSAR-X Elevation”, Advances in Cartography and GIScience. Volume 2, Lecture Notes in Geoinformation and Cartography2011, pp 333-354

(http://link.springer.com/chapter/10.1007%2F978-3-642-19214-2_23#)

Related Sample Datasets

- 1 x StripMap Bordeaux, France (EEC, SE, HH)

Suitable Software

Application	Company Name								
	BAE Systems	Exelis	GAMMA Remote Sensing AG	Hexagon Geospatial/ GEOSYSTEMS GmbH	Joanneum Research	PCI Geomatics	Racurs	Textron Geospatial Solutions	Trimble
	Provided Software								
	SOCET GXP	ENVI SARscape	GAMMA MSP,ISP,DIFF&GE O,LAT, IPTA	ERDAS IMAGINE	RSG - Remote Sensing Software Package Graz	Geomatica and GXL	Photomod Radar	RemoteView, ELT5500, and Global ImageViewer	eCognition
Mapping									
•Topographic Mapping	X	X	X	X	X	X	X	X	

Note: Information provided by Software Providers, Airbus Defence and Space, Geo-Intelligence does not guarantee relevant capability.

Contact

For feedback or further inquiry please contact the Airbus Defence and Space Customer Service Centre via telephone at +49 7545 8 4344 / eMail: terrasar@astrium-geo.com or visit <http://www.geo-airbusds.com/terrasar-x/>

List of Abbreviations

ACD	Amplitude Change Detection
CCD	Coherence Change Detection
DEM	Digital Elevation Model
DInSAR	Differential Interferometry
DSM	Digital Surface Model
DTM	Digital Terrain Model
EEC	Enhanced Ellipsoid Corrected (Basic Image Product)
EGR	Enhanced Gas Recovery
EMSA	European Maritime Safety Agency
EOR	Enhanced Oil Recovery
EU	European Union
EEZ	Exclusive Economic Zone
GCP	Ground Control Points
GEC	Geocoded Ellipsoid Corrected (Basic Image Product)
GEO	Airbus Defence & Space, Geo-Intelligence
HS	High Resolution SpotLight (imaging mode)
IMINT	Image Intelligence
InSAR	Interferometric SAR
IWS	Interferometric Wide Swath (Sentinel-1 imaging mode)
MGD	Multi Look Ground Range Detected (Basic Image Product)
NRT	Near-Real-Time
PSI	Persistent Scatterer Interferometry (PSI)
RE	Radiometrically Enhanced
REED+	Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
SAR	Synthetic Aperture Radar
SBAS	Small Baseline Subset Interferometry
SC	ScanSAR (imaging mode, 4-beam ScanSAR)
SE	Spatially Enhanced
SL	SpotLight (imaging mode)
SM	StripMap (imaging mode)
SSC	Single Look Slant Range Complex (Basic Image Product)

SRTM	Shuttle Radar Topography Mission
ST	Staring SpotLight (imaging mode)
WS	Wide ScanSAR (imaging mode, 6-beam Scan SAR)