

DEM/DTM is a digital model or 3D representation of a terrain's surface and most versatile examples of raster data. It contains locations with elevation which can be used in numerous topographical applications. It may be represented as Grid data which includes raster format, interpolated values and have large storage for network analysis or in TIN (Triangulated irregular network) data which includes-

- irregularly distributed nodes and lines with three dimensional coordinates (x, y, and z)
- arranged in a network of non overlapping triangles (triangular tessellation)
- Based on Delaunay triangulation
- Density of points \propto variation in surface heights
- (+) points provide accurate representation of terrain
- (+) fewer points are needed
- (-) less suited for analysis of surface slope, aspect and network analysis.

Following Digital elevation Model can be obtained by users for their work:

Low-medium resolution

SRTM
ASTER
GTOP030
ETOP05
HYDRO01k
Gridded Global Topography

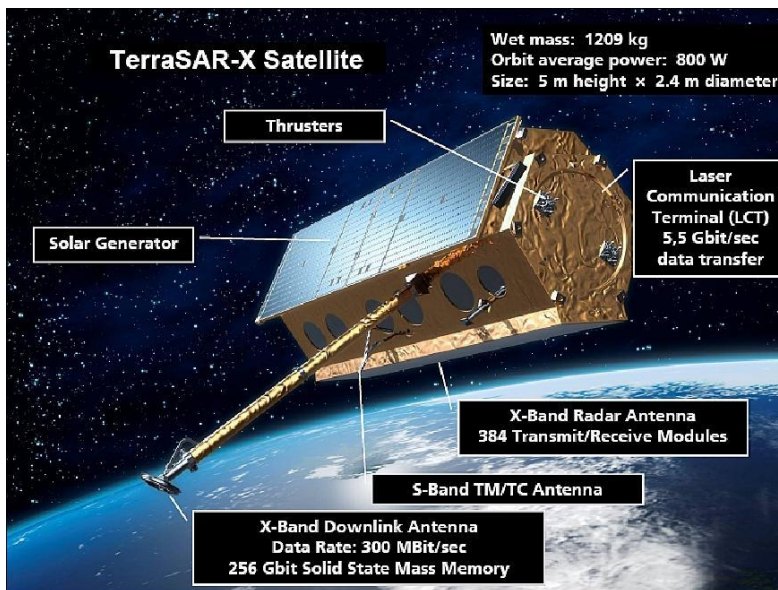
High resolution

WorldDEM™
ALOS World 3D
Vricon

WorldDEM™

WorldDEM™ is a high resolution elevation data provided by the two partners i.e. German Aerospace centre (DLR) and Airbus Defense and Space. It is generated by TerraSAR-X's twin satellite. TanDEM-X is the TerraSAR-X's twin satellite and name of satellite mission flying the two satellites in a closely controlled formation with typical distances between 250 and 500 m and generates WorldDEM™. WorldDEM™ has following diagnostic features –

- Pole-to-pole coverage: Homogenous standardised DEM for any spot on Earth
- Unique quality: Superior elevation information anywhere on Earth
- Unrivalled accuracy: 2m (relative) / 4m (absolute) vertical accuracy in a 12m x 12m raster
- Digital Surface Models and Terrain Models available
- Easy access



WorldDEM™ provides three types of products-

WorldDEMcore: This Digital Surface Model (DSM) represents the surface of the Earth including buildings, infrastructure and vegetation. This unedited DSM is output of the interferometric processing without any refinement (editing). This product usually contains radar specific artefacts, voids and can include processing artefacts.

WorldDEM™: This product is a refined DSM ensuring hydrological consistency, i.e. flattening of water bodies and consistent flow of rivers, and includes editing of shore-and coastlines.. Ideal for defence and security mission, oil & gas applications.

WorldDEM DTM: Digital Terrain Model representing the bare Earth terrain (vegetation and man-made objects are removed). ideal for mapping, hydrological modelling or terrain analysis.

Specification

Accuracy:	2m (relative) / 4m (absolute)
Pixel Spacing:	0.4 arc seconds in latitude
File Format:	GeoTIFF
Data Type:	32 Bit, floating

NoData Value: -32767.0
Projection: Geographic Coordinates
Coordinate Reference System: Horizontal WGS84-G1150
Vertical EGM2008
Vertical Unit: Meter

For accurate representation the editing of the data is required. Due to the acquisition geometry and radar characteristics, relief-dependent effects such as layover, foreshortening or shadow may appear in the data represented as voids or artefacts. The WorldDEM™ editing process is performed in two major steps-

Terrain Editing: Spike/Well Removal
Void Filling
Editing of Noise
Raising of Implausible Negative Elevations

Hydrology Editing: The editing of water bodies (hydro-enforcement) is an important processing step to achieve a high quality elevation model. The hydro editing process consists mainly extraction, classification, implementation of water body features.

Some applications:

- Satellite image Orthorectification
- Military and civil aviation
- Management of oil and gas fields
- Defence and security related missions
- Watershed analysis

WorldDEM provides a superior level of detail and accuracy compared to SRTM data.

