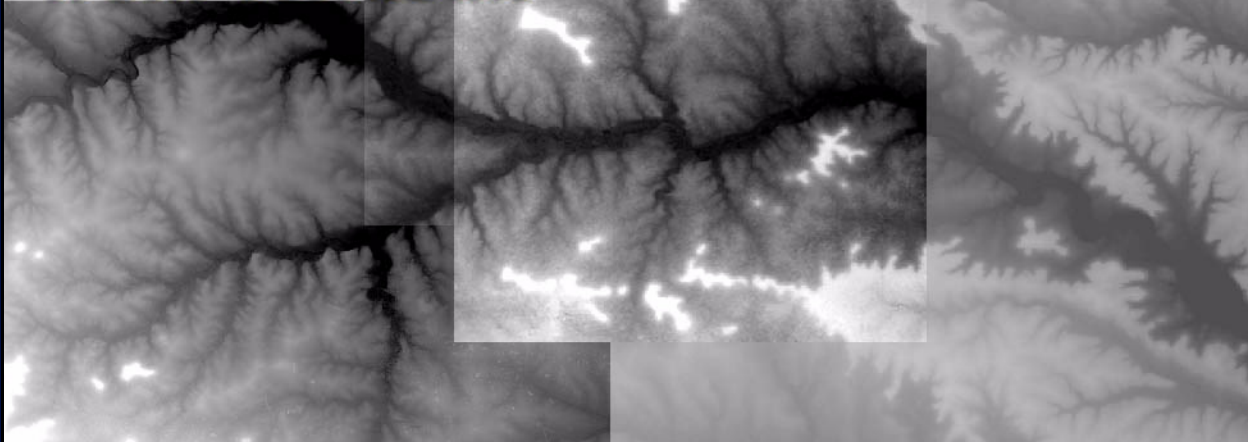


# DEMTOOLS from TerraSim®



DEMTools from TerraSim®, the latest addition to the TerraSim product line, is a digital elevation model (DEM) management toolset enabling rapid and accurate fusion of multiple DEMs from a variety of sources that cover an area of interest, producing a single composite DEM. DEMTools gives you complete control over DEM extent, post spacing, and the coordinate system of the composite DEM. This product is available as a plug-in to all versions of the ESRI ArcGIS Desktop (ArcView®, ArcEditor®, ArcInfo®) family.

Building upon the import and export capabilities found in ESRI's ArcGIS® Desktop suite, DEMTools greatly simplifies the process of producing a single DEM for your project area. For example, DEMTools can be used to embed high-resolution LIDAR or photogrammetric collections into a single composite DEM file, which includes all available DEM sources, regardless of the original collection of data, map projections, or post spacings.

Together, these capabilities can cover a wide range of DEM construction problem situations, and allow users to rapidly correct, edit, and refine multiple source DEMs into an improved single DEM to more accurately support downstream analysis.

## DEMTools: Advanced Features and Applications

- **Fusion of multiple DEMs with different blending options**
  - Use highest-resolution elevation data available in areas of overlap
  - Use metadata (vertical accuracy) to intelligently blend overlapping elevations
  - Provide confidence updates on a post-by-post basis for downstream processing
- **Holes and gaps are filled automatically in DEM data as a by-product of DEM blending**
  - Merge SRTM imagery (containing holes) with a lower-resolution "backdrop" DEM to fill holes
  - Fall through holes to other datasets where unknown elevation posts are recorded
- **Fully automated for DEM registration**
  - Bring two DEMs into alignment with one another using computer-generated tie-points
  - Add additional DEMs into overall alignment solution incrementally
  - Use manually chosen tie-points to improve or override an automatic solution
- **Special processing for bathymetric data**
  - Seamlessly combine land and bathymetric elevation data into a composite DEM
- **DEM data are flattened in user-defined polygonal regions**
  - Create and use ocean or lake polygons to flatten water-covered areas of a DEM
  - Create elevation values that are consistent with the perimeter's elevation profile
- **DEM data can be controlled for consistency with your project's requirements**
  - Define output post spacing, coordinate system, horizontal and vertical datums and units
- **DEM metadata utilities**
  - Define vertical precision for DEM formats which do not contain embedded precision metadata
  - Define unknown elevation value(s) for DEM formats which do not explicitly represent unknown posts

## The DEMTools Utilities

### Fusion of Multiple Digital Elevation Models (DEM)

Using an arbitrary number of DEMs, DEMTools from TerraSim® merges them into a single DEM, performing automatic hole filling and DEM reprojection as necessary. Options for controlling DEM bounds, post spacing, coordinate system, and choice of blending techniques are also available.

### Conversion of Coastlines to Polygons

If you are working with ocean or lake shoreline areas, DEMTools will convert coastline vector data into an areal polygon covering the lake/ocean, using a DEM as the basis for determining the extent of the polygon. DEMTools provides a simple way to utilize coastlines to flatten DEMs in areas with water.

### Flattening of Areal Regions

Using an arbitrary number of areal shapefiles and a source DEM, DEMTools will flatten the DEM elevation posts to a constant value for each areal region.

### Combination of Two DEMs Using Polygons

DEMTools will combine two DEMs that cover the same region, using an areal shapefile as a binary mask to decide which of the two DEMs to use for each elevation post. This tool is useful for blending land and bathymetry into a seamless composite DEM.

### Automated Registration of Two DEMs

DEMTools automatically identifies key matchable points in each source DEM, saving users from time-consuming manual selection and measurement. However, users can refine, remove, or add match points as a part of the selection process.

DEM registration applies a novel least-squares matching algorithm for attributed point matching to bring one user-selected DEM into registration with respect to the second DEM. This procedure is useful for aligning DEMs of widely differing resolution, an increasingly common case since the emergence of IFSAR/LIDAR datasets.

## System Requirements

ESRI ArcGIS 8.3 or ArcGIS 9.0 Desktop family and a minimal hardware configuration on a Windows 2000/XP machine:

- OpenGL compliant graphics card
- Pentium III processor, 700Mhz or higher
- 20GB hard disk
- 512MB RAM

## About TerraSim

TerraSim is a geospatial technology company that provides software solutions and services for advanced visualization of complex environments utilizing imagery, GIS, and CAD design data. TerraTools, TerraSim's synthetic environment construction toolkit, incorporates the widest variety of source data import and processing functionality. TerraTours® is a 3D viewer with interactive query capability to interrogate relevant data and files from the visualization in real-time.

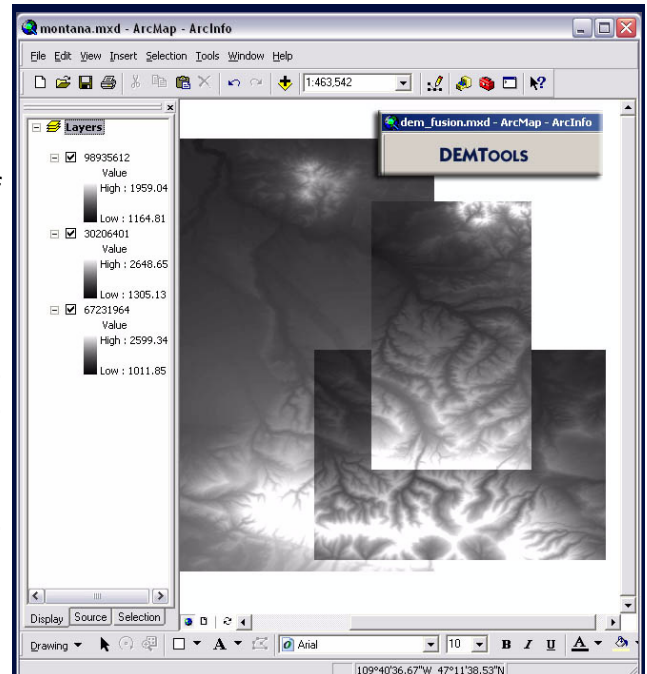
For more information on our TerraSim product line and related database construction services, please contact us at:



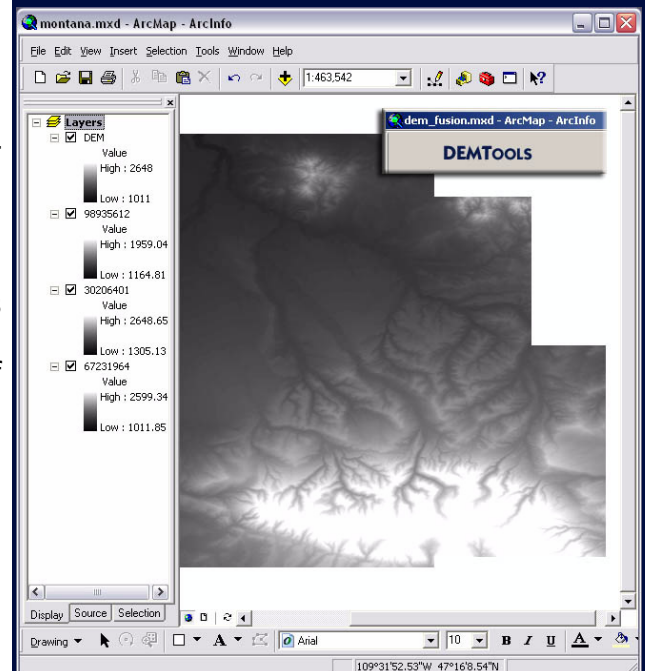
One Gateway Center, Suite 2050  
420 Fort Duquesne Blvd.  
Pittsburgh, PA 15222

(412) 232-3646  
(412) 232-3649 FAX  
www.terrasim.com

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ArcGIS Display of Uncorrected DEMs in DEMTools



Composite DEM Display After DEMTools Fusion