Release of a 10-m-resolution DEM for the whole Italian territory: a new, freely available resource for research purposes

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Digital elevation models (DEMs) are fundamental in any kind of environmental or morphological study. DEMs are obtained from a variety of sources and generated in several ways. Nowadays, a few global-coverage elevation datasets are available for free (e.g., SRTM, http://www.jpl.nasa.gov/srtm; ASTER, http://asterweb.jpl.nasa.gov/). When the matrix of a DEM is used also for computational purposes, the choice of the elevation dataset which better suits the target of the study is crucial. Recently, the increasing use of DEM-based numerical simulation tools (e.g. for gravity driven mass flows), would largely benefit from the use of a higher resolution/higher accuracy topography than those available at planetary scale. Similar elevation datasets are neither easily nor freely available for all countries worldwide. Here we introduce a new web resource which made available for free (for research purposes only) a 10 m-resolution DEM for the whole Italian territory. The creation of this elevation dataset was presented by Tarquini et al. (2007). This DEM was obtained in triangular irregular network (TIN) format starting from heterogeneous vector datasets, mostly consisting in elevation contour lines and elevation points derived from several sources. The input vector database was carefully cleaned up to obtain an improved seamless TIN refined by using the DEST algorithm, thus improving the Delaunay tessellation. The whole TINITALY/01 DEM was converted in grid format (10-m cell size) according to a tiled structure composed of 193, 50-km side square elements. The grid database consists of more than 3 billions of cells and occupies almost 12 GB of disk memory. A web-GIS has been created (http://tinitaly.pi.ingv.it/) where a seamless layer of images in full resolution (10 m) obtained from the whole DEM (both in color-shaded and anaglyph mode) is open for browsing. Accredited navigators are allowed to download the elevation dataset.

References:
Tarquini S., Isola I., Favalli M., Mazzarini F., Bisson M., Pareschi M. T., Boschi E. (2007). TINITALY/01: a new Triangular Irregular Network of Italy, Annals of Geophysics 50, 407 - 425.