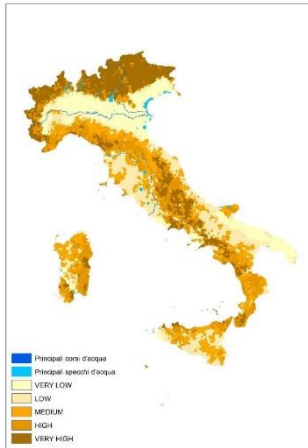


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Morphometric indices to describe Italian territory



To enrich the information assets of the geographic layers produced by Istat, it is proposed an experimentation based on the calculation of some statistical indices useful to describe the entire Italian territory according to its morphometric characterization.

In fact, most of the physical and biological processes that occur on the environment are highly correlated to the topographic position of the zone on which they are occurring: top of the mountain, inside a valley, on an exposed ridge, on a lowland, and so on.

Some examples of these processes include erosion and deposition of soil, balance and hydrogeological response, exposure in windy areas. These biophysical characteristics represent some fundamental parameters to identify optimal habitat, composition, distribution and abundance of the animal and plant species.

The statistics calculation task of the morphometric indices is carried out through automated procedures starting from raster layers (images based on a rectangular grid of pixels) using GIS (Geographic Information System) tools.

Moreover, this kind of indices are very useful to publish territorial statistics on the base of Eurostat-wide 1km square grid, included in the TERCET regulation: <https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX%3A32017R2391>.

Reference layers are both raster and vector type; among these the most important is surely the NASADEM DTM (Digital Terrain Model), fundamental to extract all the indices values that are the basis of morphometric statistic of the Italy.

After having used the EU-DEM (European Digital elevation Model) v1.1 as an example of DSM (Digital Surface Model), a COPERNICUS product of the European Environment Agency and three different DTM (NASADEM HGT, ASTER V3 and Tinitaly) the choice went on NASADEM which proved to be the most suitable for the purpose.

The morphometric indices are the product of mathematical elaborations that, starting from the DEM, return values that are not influenced by geomorphology; morphometric indices represent a quantitative study of landform shapes aimed at associating measurements or numerical indices with physical forms

In addition to the Italian territorial partitions classification based on slope classes

(steepness), in this experimentation two roughness indices are proposed:

- Roughness index: as standard deviation of the slope;
- Standard deviation of the Topographic Ruggedness Index (TRI.)