



An information system for documentation and analysis of terrestrial heat flux

P. Chiozzi, V. Pasquale, and M. Verdoya

Dip. Te. Ris., Settore di Geofisica, Università di Genova, Viale Benedetto XV 5, I-16132
Genoa, Italy (pasquale@dipteris.unige.it / Fax: +39 010-352169)

Energy for fundamental processes, such as uplift, subduction, rifting and subsidence, is supplied by internal heat sources whose unique measurable evidence is the terrestrial heat flux. Knowledge of the terrestrial heat flux is not only an important constraint for the subsurface thermal field but also for the assessment of geothermal resources of a region. In principle, the determination of heat flux is straightforward, but in tectonic studies care is necessary in the choice of the measurement sites, which should be far from anomalous areas affected by volcanism, geothermal systems and lacking in terrain problems. The form of the so far used databases generally mixes text and tabular data in irregular fields and requires users to write specific computer programs to extract information in a useful format. This reduces the flexibility of the databases and impedes accessing to most of the scientific community.

In order to store and to simplify the access to all the information on the surface heat flux, an appropriate data model has to be established, according to the requirements of the application at hand, as well as to the further analysis problems that might rise. An applicative example is presented for the Tyrrhenian-Northern Apennines region. Terrestrial heat-flux data have been divided into subsets, based on the measurement techniques: determinations in boreholes, mine shafts and tunnels, petroleum exploration wells, sea and lake bottom sediments. The main corrections for drilling disturbance, topographic relief, sedimentation and erosion, climate and nearby bodies of water were included. Based on the main geological features, the dataset was sorted into various groups, each belonging to a different tectonic province. We compiled the current data into a relational database and developed subsets of retrievable data and derivative maps. The data subsets are accessible in a variety of forms, e.g., tables, colour contour maps, location maps, borehole sections, etc., and include text descriptions that enable

non-specialists to understand the strengths and limitations of the resource. The data are currently accessible in spreadsheet format.