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## A National Soil Profile Database Developed for Brazil: Description and Suggested Applications

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### Abstract

The increasing accessibility to computational technology is improving the use of mathematical modeling in natural sciences. Several examples of this trend can also be observed in soil science. Also, large scale phenomena and impacts, discussed on a global scale under a multi-perspective analysis are increasingly on society's agenda. Examples directly related to soil science are the expansion of agriculture on tropical forest; contamination of water resources with residues of pesticides, phosphate and nitrate used in agriculture and the degradation of soils through soil erosion. Additionally, soil scientists are increasingly concerned about global climate changes, where soil organic carbon is also a key issue. To analyze global phenomena related to soil science by modeling we need comprehensive, consistent, georeferenced and quantitative databases on national or continental scales. Robust information available in a timely manner is often more important for the improvement of the decision-making process than comprehensiveness is an important aspect for discussion. The existence of complex models, quantitatively validated in controlled experimental conditions, is not a guarantee that they will be applicable in practical conditions, if the adequate input database is not available in scale and format required for the model. The objective of this research was to create and make available a quantitative georeferenced soil database covering the total Brazilian territory. Several variables reflecting soil chemical, physical, mineralogical, morphological and pedogenetic features were included, useful for a wide range of topics related to soil science. A total of 4.000 soil profile descriptions were included in this database. The analytical description of soil properties was consisted and organized in a standard format. The multi-user aspect of this database was a major concern in defining its structure, organization and format. This database is expected to improve constantly, by inclusion of new sources of surveys and is designed to have free electronic access for any external user.

**Keywords:** Brazil, georeferenced, land use planning, soil database