



The new geological map of Gondwana scale 1:5,000 and its tectonic evolution

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Abstract

Gondwana lasted as a merged landmass ca. 320 m.y, from the Cambrian (ca. 500 Ma) until the Jurassic (ca. 180 Ma), comprising more than 60% of today's continental crust, including five major continents (South America, India, Africa, Antarctica, Australia) and smaller fragments widespread in Asia, Europe and North America. On the 30th year anniversary of the geological map of Gondwana scale 1:10M by De Wit et al. (1988), an updated map will be launched as a major product from the IGCP-628 "The Gondwana Map Project– the geological map and the tectonic evolution of Gondwana". The pre-1st edition of this new geological map of Gondwana scale 1:5M is presented at the 16th Gondwana Conference in Bangkok. This map emerges from a 7-year working group at the Gondwana Digital Center of Geoprocessing (GDCG), in UFRJ, Rio de Janeiro (Brazil), with collaboration of more than one hundred scientists from all over the world. This pre-1st edition is exhibited here aiming a feedback from the Gondwana scientific community, one year before the publication of its first edition. Several improvements are shown reflecting the scientific and technologic evolution since the 80's. The digital database is an important product since it is totally manageable to generate other maps and to be modified as the geological knowledge evolves. The map has large dimensions (3 x 3 meters) and displays the following geological attributes: (a) age of rock formation (protolith); (b) type of rock; (c) geochemical nature of igneous rocks; (d) metamorphic grade; (e) age of the last tectonic event that affected the metamorphic rock; (f) crustal scale structures with kinematic indicators. This simple legend allowed the harmonization of a diverse geological database source that was consulted through the years. The goal is to show the three main evolutionary stages of Gondwana, amalgamation (670-480 Ma), development (480-180 Ma) and fragmentation (180- 85 Ma), through the map. The more detailed scale made possible to bring the last up to date scientific data from all fragments that provided a better fit in a new reconstruction model for ca. 180 Ma. Offshore data also improved the Gondwana mosaic, bringing clues to regions that the geology is still poorly known. Another issue is the detailed Precambrian data that enriched Gondwana amalgamation history, providing at least two periods of convergent stages, but also enlightening the cratonic areas that might have similar evolutions for pre-Gondwana supercontinents. All comments and collaborations are more than welcome (www.gondwana.geologia.ufrj.br).

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