



## The Challenges of Making a Gondwana Legend and a Digital Base

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### Abstract

After circa 200 m. y. of convergent and collisional tectonic processes among Neoproterozoic and pre-Neoproterozoic terranes, Gondwana consolidated into one of the most long-lasting supercontinents on Earth's history, influencing tectonic plates and surficial processes for more than 300 m. y., from the Cambrian to the Jurassic. The new Geological Map of Gondwana (1:5M) is focused on presenting three different phases of its evolution: the amalgamation, development and break-up, shown within its tectonic entities. A diverse database was consulted and incorporated into our digital base, from vector to raster data, aiming to present an up-to-date product. To illustrate the tectonic evolution of this paleocontinent through a geological map, a homogenous and unified legend was designed on simple assumptions in order to represent its geological history. The color of the geological units denote the age of the rock formation, if metamorphosed, the protolith's age. Warm colors (pink, red, brown and other nuances) configure Pre-Neoproterozoic units. Orange and dark yellow constitute rocks from the Neoproterozoic and transition to the Cambrian. This color mosaic exhibits the Pre-Neoproterozoic continents and the mobile belts indirectly and directly related to Gondwana amalgamation. Cool colors (blue, green, lilac and other nuances) represent Paleozoic and Mesozoic geological units, responding to intracontinental and marginal Gondwanan basins, pre break-up. Symbols indicate type of rock for igneous (if volcanic or plutonic origin plus geochemical nature) and metamorphic (with the metamorphic grade) lithotypes. Sedimentary rocks do not have any pattern. In order to add a tectonic element to the geological map, metamorphic units point out the age of the tectonic event in the symbol color. Pre-Neoproterozoic metamorphic events are represented by black symbol, displaying the continents that preceded Gondwana. The Tonian (1000-720 Ma) tectonic events, in great part related to Rodinia's fragmentation, are represented in white. From a compilation of 55 orogens, recording the final amalgamation, two main subsequent tectonic intervals were classified: the Cryogenian-Ediacaran (720-585 Ma) and the Ediacaran-Cambrian (585-485 Ma). The former was responsible for the Gondwana's core consolidation. The last stage comprises the construction of the continent's rim and also some intracontinental orogens. Gondwana marginal orogenies occurred throughout the Paleozoic and Mesozoic. To distinguish in between the Lower- and the Upper-Paleozoic orogenic events the "Ordovician-Silurian" and "Devonian-Permian" classification is defined. Some orogenic events took place early to Gondwana's break-up, and for those a Triassic-Jurassic orogenic interval was created. A lot of controversial issues arose from this unification that are being evaluated and might evolve for a legend adaptation.

**Keywords:** Gondwana, Geological Map; legend; tectonic event, digital database