

37th INTERNATIONAL GEOLOGICAL CONGRESS, AUGUST 2024, Busan, Republic of Korea.

### **The South America Map of Orogens**

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The South America Map of the Orogens is part of the project IGCP–667 World Map of the Orogens of Unesco and the International Union of Geological Sciences (IUGS). It is led by the Commission for the Geological Map of the World (CGMW). This project aims to design a digital global map for geological time layers that shows the mountain ranges formed through the Earth's geological history. The map then constitutes a tool to visualize the evolution of continents and, therefore, the distribution of earth resources, seismic hazards, and global change. Orogens develop in convergent settings and, generally, involve two or more continental and/or oceanic plates or blocks. For their representation on the global map, four types of orogenic systems were defined: (i) Type I, ocean–continent convergence accommodated by subduction (e.g., Andean Cordillera); (ii) Type II, accretion/collision of crustal elements derived from subduction (island arc or back–arc basin), a microcontinent, an oceanic shelf, or a ridge (e.g., North American Cordillera); (iii) Type III, continental collision, often after subduction (e.g., Himalayas), and (iv) Type IV, shortening of an intracontinental sedimentary basin and continental crustal material (inverted rift) (e.g., Atlas Mountains). The South American Map of the Orogens corresponds to one of the continental maps that make up the global map. It was carried out based on the Geological Map of South America 2019 and filtering the Tectonic Map of South America 2016 by orogenic tectonic setting and geological time. Also, sourcebooks on South American geology and scientific papers were reviewed. Databases and different CGMW maps allowed for identifying deformation features (folding, faulting), regional metamorphism indicators (high and ultra–high pressure rocks and high to ultra–high temperature rocks), magmatism, ophiolites, and molassic basins. All indicators of orogenic events. The South American map is presented in 11 layers showing the orogens identified for the Paleoproterozoic, Mesoproterozoic, Neoproterozoic, Cambrian–Ordovician–Silurian, Devonian–Carboniferous, Permian–Triassic, Jurassic, Cretaceous, Paleogene, and Neogene–Quaternary. Because the beginning for modern–style plate tectonics and therefore orogens (according to the defined typology) at or following 2.5 Ga is considered, for the Archean only cratons are presented. For South America, the Trans–Amazonian, Sunsás, Putumayo, Brasiliano, Famatinian, Alleghanian, Gondwanide, and Andean orogens were represented, among others. One of the great challenges for the construction of the map in South America was the overlapping of orogenies from the Ordovician to the present, since the most recent events have masked the features of previous deformation. Another limitation was the deficiency in the characterization and period of activity of lineaments, folds, and faults that can be used as indicators for the boundaries of orogenic events and, therefore, limits of the polygons on the map. This map of South America, along with the rest of the continents, was built with an educational approach. It was designed as a geoscientific knowledge product that can be explained simply to non–specialized audiences. It is expected to be an input for other world maps. The goal is that it can then be presented in paleogeographic reconstructions using 3D tools.