Boletín Geológico

SERVICIO GEOLÓGICO COLOMBIANO

EDITORIAL

Boletín Geológico publishes Issue 49(1), June 2022, with the following articles (Figure 1):

Rodríguez et al. describe the macroscopic, microscopic, and chemical characteristics, as well as the crystallization age, of the Onzaga Metarhyolite unit. The spatiotemporal relationships among the magmatic events that occurred during the Ordovician in the Santander, La Floresta and Quetame massifs and in the Mérida Mountain range are analyzed. Additionally, a correlation is made with plutonic bodies that have crystallization ages within this same period. The analytical results indicate crystallization ages that vary between 450.9 ± 2.5 Ma and 449.9 ± 5.9 Ma, with a second population between 475.9 ± 5.4 Ma and 469.8 ± 4.0 Ma. These ages are interpreted as magmatic zircons inherited from a lower to middle Ordovician igneous event.

Sánchez et al. analyze electrical logs from twelve wells located in the Upper Magdalena Valley to obtain a correlation between the area of interest located in the Monserrate Formation and each of the wells under study. The petrophysical properties are calculated by using gamma ray, resistivity, neutron, and density logs to determine the shale volume, effective porosity, total porosity, water saturation and permeability in each well. Additionally, the production history of each of the wells and the calculations are used to suggest a new site where hydraulic fracturing could also be successful.

Esquivel et al. analyze seismostratigraphic sequences, gamma ray well logs, and seismic interpretation of possible geological structures at depth using a seismic cube, four 2D seismic lines, and four wells. The results suggest a possible shallow marine depositional environment in the Ordovician and a slightly deeper shallow marine environment in the Cambrian. The information is integrated and analyzed to generate maps of geoforms corresponding to the Middle Ordovician, Lower Ordovician and Cambrian sequences.

Pedraza et al. perform a gravity study at the Cerro Machin volcano, Colombia. Bouguer anomalies range between -87 mGal and -29 mGal. The Oasis Montaj density model reveals an elongated dacitic complex at the top of the distribution with a mean density of 2300 kg/m^3, with the presence of a volcanic conduit of 2400 kg/m^3 at the base. The seismicity in the area suggests that the gravimetric anomaly caused by the dome and its surrounding materials may be related to a weakened zone at the interface between the volcanic edifice and the metamorphic basement, provoked by fault activity, interaction with the hydrothermal system and the ascent of hot fluid material to the surface.

Palacio et al. evaluate the hydrogeological potential in tropical dry forest areas associated with the Cauca River Canyon, Antioquia, Colombia. Based on the lithostructural evaluation of the area, hypotheses are established by which conditions of greater or lesser aquifer potential are assigned according to the diverse types of geological materials present. This finding provides new

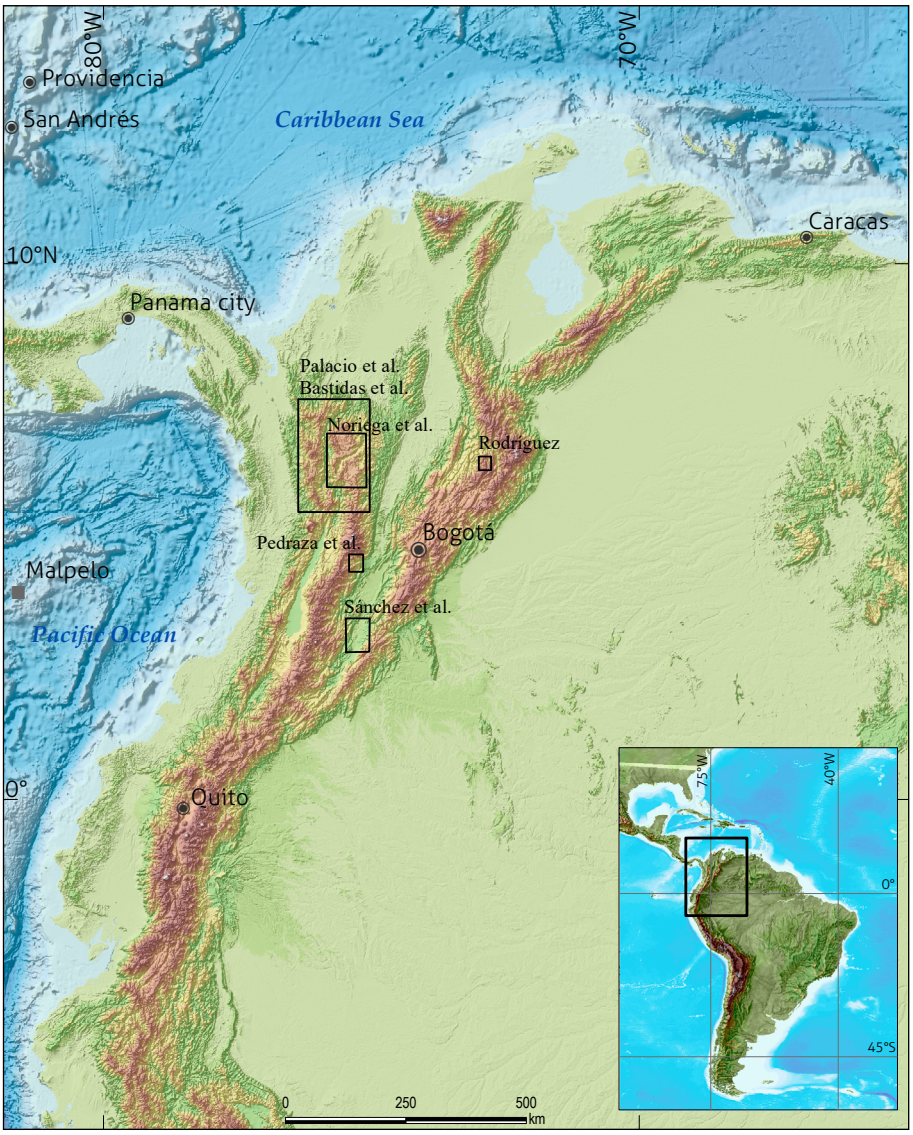

Figure 1. Locations of the areas with contributions presented in *Boletín Geológico*, 49(1), 2022.

research perspectives on fractured environments and presents groundwater as a main and alternative source to meet the needs of the population, in addition to playing a fundamental role in terms of the ecosystem sustainability of the tropical dry forest.

Bastidas et al. estimate recharge through a distributed soil water balance model at a daily time step, which efficiently incorporates the spatiotemporal variability of the meteorological conditions of the region, as well as the spatial variability of the surface properties, such as soils, land cover and topography. The recharge behavior in the area favors regional flows between hydrogeological units and confirms the considerable hydrogeological potential of various units of fractured hard rocks.

Noriega et al. contribute to the understanding of the Aburrá Valley Neotectonic framework using the anisotropy of magnetic susceptibility and structural analysis. The authors measure the magnetic fabric ellipsoid shape of faulted sediments and compare them with the geometry and kinematics of fault planes to determine their relationship with the present-day stress field and the regional fault architecture. This work identifies the AMS technique as a powerful tool for understanding the neotectonic framework along urban areas and surrounding areas.

Boletín Geológico acknowledges the collaboration of the following reviewers and their commitment to the peer-review process involved in this issue:

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