

Analysis of the development index of Epikarst in the region of Karst Lagoa Santa Protection Unit, Minas Gerais, Brazil.

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The study area of approximately 505 km² is located 35 km north of Belo Horizonte, and contains the municipalities of Confins, Funilândia, Lagoa Santa, Matozinhos, Pedro Leopoldo, Prudente de Morais and Vespasiano. In this region, overlapping the gneissic-migmatitic base, are the metalimestone of the Sete Lagoas Formation, divided into Pedro Leopoldo member, with intercalations of metasiltstone and above it a purer member, Lagoa Santa; and the Serra de Santa Helena Formation, at the top, composed of pelitic rocks. Cenozoic coverings are represented by detrital-lateritic cover and alluvial deposits. This region contains karst and fissural karst aquifers which are essential sources of supply. The region is quite populated, which contributes to the vulnerability of aquifers, bringing risks to both water quality and supply to reservoirs. The presence of limestone rocks promotes the appearance of features that are important areas for recharging the aquifer. This paper aims to evaluate this area's development index of the epikarst that includes Karst Lagoa Santa Protection Unit. This analysis was based on one of the parameters of the EPIK method of intrinsic vulnerability classification. Three development indexes are established: *highly*, if there are caves, sinkholes or dolines and outcrops with high fracturing; *moderately* to intermediate zones in the alignment of dolines and outcrops with medium fracturing; and *poorly or absent* for areas without karst morphology or with low fracturing density. For the characterization, the behavior of the karst depressions and the delimitation of the rocky outcrops were analyzed. The outcrop fracturing index assessment was obtained by consulting tables describing locations visited on field and also considered the presence of cavities. Where there were outcrops not visited, their lithology was also evaluated. The alignment zones between dolines were delimited around lineaments that interconnected these structures and their width was determined by the diameter of the interconnected dolines. All of these data were valued based on the indices for the EPIK method's epikarst map. As a result, a map was obtained where 112.35 km² corresponded to the highly developed, located mainly in the center and north of the area where the Lagoa Santa member is found, the purest metalimestone; 21.54 km² moderately developed, which is bounded by some outcrops in the east, west and south regions, under the other lithological units, and by the alignment between dolines; and the remainder of the area, 371.11 km², poorly developed or absent, located mainly south of the area, the most populated region, which probably had many of its karst features suppressed. It is concluded that the greatest development of the epikarst occurs in the region where the Lagoa Santa member emerges, being the main recharge zone and, therefore, the one that should receive more attention towards the aquifer's preservation.

Keywords: Vulnerability mapping, Groundwater protection, Karst.