Constraining the Potential Nickel Laterite Area Using Geographic Information System-Based Multi-Criteria Rating in Surigao Del Sur

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Abstract : The traditional method of classifying the potential mineral resources requires a significant amount of time and money. In this paper, an alternative way to classify potential mineral resources with GIS application in Surigao del Sur. The three (3) analog map data inputs integrated to GIS are geologic map, topographic map, and land cover/vegetation map. The indicators used in the classification of potential nickel laterite integrated from the analog map data inputs are a geologic indicator, which is the presence of ultramafic rock from the geologic map; slope indicator and the presence of plateau edges from the topographic map; areas of forest land, grassland, and shrublands from the land cover/vegetation map. The potential mineral of the area was classified from low up to very high potential. The produced mineral potential classification map of Surigao del Sur has an estimated 4.63% low nickel laterite potential, 42.15% medium nickel laterite potential, 43.34% high nickel laterite potential, and 9.88% very high nickel laterite from its ultramafic terrains. For the validation of the produced map, it was compared with known occurrences of nickel laterite in the area using a nickel mining tenement map from the area with the application of remote sensing. Three (3) prominent nickel mining companies were delineated in the study area. The generated potential classification map of nickel-laterite in Surigao Del Sur may be of aid to the mining companies which are currently in the exploration phase in the study area. Also, the currently operating nickel mines in the study area can help to validate the reliability of the mineral classification map produced.

Keywords : mineral potential classification, nickel laterites, GIS, remote sensing, Surigao del Sur
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