SEG 2017 Conference

Data driven predictive prospectivity mapping for epithermal gold, Dashui district, central China

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The Dashui gold district is located between the West Qinling Orogen and the Songpan-Ganzi Basin, central China, with an indicated reserve of >100 t of gold. Recently, a detailed survey was conducted in this area for exploration of potential gold resources. Based on collected data, which consisted of surface geologic data, surface geochemical data, and surface geophysical data, a predictive model for epithermal gold potential in the Dashui district was proposed using a machine learning technique. suggest. The following procedure is suggested for building a machine learning predictive model: (1) understanding geologic setting of the study area from regional scale to deposit scale and generating spatial data layers based on the conceptual model and geology setting; (2) preparation of the collected and generated data to a uniform format; (3) selection of features based on spatial relationship between data layers and targets, with the selected data layers subsequently being used as input data for building the machine learning model; (4) training and testing of a machine learning algorithm to fit the purpose of mineral exploration; and (5) result visualization and model deployment. The final potential GIS map yielded high prediction values for most known epithermal gold mineralization occurrences, as well as highlighting new targets for exploration. We suggest the results of the predictive model presented can be used to guide mineral exploration in the Dashui district and other areas within similar geological settings.