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The ERA-MIN2 AUREOLE (ANR-19-MIN2-0002, https://aureole.brgm.fr) project, funding this Ph.D research work, aims at better understanding controls of Sb deposits during the Variscan orogeny. In that frame, this work is based on the analysis of Sb prospectivity maps computed throughout the Ibero-Armorican arc (West European Variscan Range) to outline areas with the highest likelihood to host mineralization, at multiple scales. Based on a data-driven approach, the methodology we developed also allows (i) quantifying the specific and systematic associations between deposits and geological features s.l and (ii) distinguishing several possible metallotects at the origin of Sb deposits in the study area, which are compared to the metallogenic models traditionally proposed for Sb deposits. We infer this new multiscale and multidomains data-driven study will help understanding metallogenic processes controlling Sb concentrations within the Variscan crust. In particular, recent results from the Armorican Massif show that Sb deposits must result from at least two distinct metallogenic events during early and late collisional phase; our study allows testing this at diverse scale and for diverse domains through the Ibero-Armorican Arc. The use of a data-driven approach implies heavy reliance on statistical and spatial analysis applied on geological features and known mineral occurrences – while minimizing as much as possible the expert inputs in the model – to determine the likelihood of hosting Sb mineralization. Most predictive models relies on finding associations between mineralization and specific geological formations, despite the problems related to geological maps, such as the precision of the geological features displayed or the presence of superficial formations. To overcome this problems, we develop here the "Disc-Based Association" (DBA) method to identify geological environments by discretizing the study area in a regular node grid. A Random Forest approach is then applied to recognize systematic and specific associations between map features and known Sb deposits.