

## Accepted Manuscript

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PII: S0169-1368(16)30668-0

DOI: <http://dx.doi.org/10.1016/j.oregeorev.2017.01.011>

Reference: OREGEO 2080

To appear in: *Ore Geology Reviews*

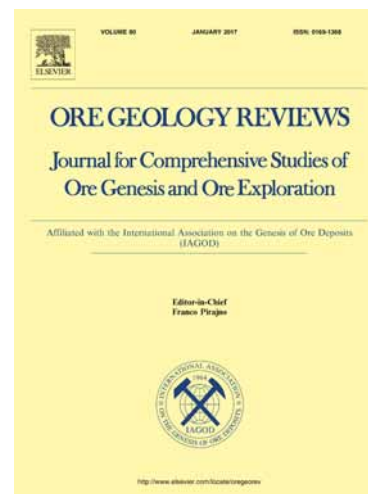
Received Date: 4 November 2016

Revised Date: 9 January 2017

Accepted Date: 11 January 2017

Please cite this article as: D. Du, X. Ren, S. Yan, X. Shi, Y. Liu, G. He, An Integrated Method for the Quantitative Evaluation of Mineral Resources of Cobalt-rich Crusts on Seamounts, *Ore Geology Reviews* (2017), doi: <http://dx.doi.org/10.1016/j.oregeorev.2017.01.011>

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## An Integrated Method for the Quantitative Evaluation of Mineral Resources of Cobalt-rich Crusts on Seamounts

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### Abstract:

Cobalt-rich crusts on seamounts potentially have the economic value of multiple metals. In the field of exploration, it is important to perform quantitative evaluations of mineral resources and delineate promising areas in survey regions for future mining. Accordingly, this study, based on prior knowledge, develops an integrated method to quantitatively evaluate mineral resources of cobalt-rich crusts on seamounts and gives an application example to demonstrate this method. The method includes four steps: first, defining units with certain areas and shapes on the target seamount (a 20km<sup>2</sup> square block in the application example) and estimating characteristic values of the cobalt-rich crust for each unit with known geological survey data using a space interpolation method such as Kriging; second, presenting several model algorithms, i.e. Regional Coverage of Crusts, Suitable Slope Percentage for Mining and Fitting Area on Slopes, to extract the corresponding regional metallogenic factors for each unit by inputting regional surveying data (such as bathymetry data) into these models; third, considering both the features and regional metallogenic factors of cobalt-rich crusts in each unit to estimate their distribution of mineral resources on the entire seamount; and last, according to the distribution of the mineral resources and international social and economic requirements (such as the regulations of the International Seabed Authority), delineating a promising area for future mining.

### Keywords:

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