

Global uranium deposits – past, present and future

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ABSTRACT

One of the several ways that the International Atomic Energy Agency (IAEA) supports its Member States is by providing information and data necessary for a framework for sustainable development of uranium exploration and resource development. One of the important outputs is the jointly produced Organisation for Economic Co-operation and Development/Nuclear Energy Agency-IAEA “Red Book” spanning over half a century of publication constituting a unique record of temporal variation of uranium raw material data for analysis. This includes insights into historical changes in exploration expenditure, cost categories, resource categories and total resources.

However, Red Book information analysis is dominantly aspatial, with a global to country-scale degree of granularity and little emphasis on geological information. IAEA has therefore recently provided valuable complementary data to address the latter two aspects. Recent publication of the World Distribution of Uranium Deposits map (IAEA, 2018a) derived from the UDEPO database (2018b) provides a global spatial representation of different deposit types, as defined by IAEA (2018c, d) as well as deposit sizes. The map provides basic visualisation functions as well as simple querying functions. More sophisticated data visualisation requires additional data inputs for the purposes of, for example, predictive studies on uranium resources.

Quantitative and spatial evaluations of uranium resources, particularly for the purposes of undiscovered resource assessments requires not only appropriate techniques as outlined in IAEA, (2018e), but suitable data from UDEPO and uranium provinces (in preparation) and grade tonnage characterisation of different deposit types and provinces (also in preparation). Coupled with temporal Red Book data to compare, for example, produced resources vs predicted resources, there is a powerful integrated approach to assessing sustainability of uranium resources.

References

- International Atomic Energy Agency (2018a), World Distribution of Uranium Deposits, Map. IAEA-STI-PUB-1800 IAEA, Vienna.
- International Atomic Energy Agency (2018b), World Distribution of Uranium Deposits, IAEA-TECDOC-1843, IAEA, Vienna.
- International Atomic Energy Agency (2018c), Geological Classification of Uranium Deposits and Description of Selected Examples, IAEA-TECDOC-1842, IAEA, Vienna.
- International Atomic Energy Agency (2018d), Unconformity-related Uranium Deposits, IAEA-TECDOC-1857, IAEA, Vienna.
- International Atomic Energy Agency (2018e), Quantitative and Spatial Evaluations of Undiscovered Uranium Resources, IAEA-TECDOC-1861, IAEA, Vienna.