Proceedings for a Workshop on Deposit Modeling, Mineral Resource Assessment, and Their Role in Sustainable Development

Edited by Joseph A. Briskey and Klaus J. Schulz

Prepared in cooperation with the
Deposit Modeling Program,
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Preface

The world's use of nonfuel mineral resources continues to increase to support a growing population and increasing standards of living. The ability to meet this increasing demand is affected especially by concerns about possible environmental degradation associated with minerals production and by competing land uses. What information does the world need to support global minerals development in a sustainable way?

Informed planning and decisions concerning sustainability and future mineral resource supply require a long-term perspective and an integrated approach to resource, land use, economic, and environmental management worldwide. Such perspective and approach require unbiased information on the global distribution of identified and especially undiscovered resources, the economic and political factors influencing their development, and the potential environmental consequences of their exploitation.

The U.S. Geological Survey and the former Deposit Modeling Program of the International Union of Geological Sciences (IUGS) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) sponsored a workshop on "Deposit Modeling, Mineral Resource Assessment, and Their Role in Sustainable Development" at the 31st International Geological Congress (IGC) in Rio de Janeiro, Brazil, on August 18–19, 2000. The purpose of the workshop was to review the state-of-the-art in mineral deposit modeling and resource assessment and to examine the role of global assessments of nonfuel mineral resources in sustainable development.

The workshop addressed questions such as the following: Which of the available mineral deposit models and assessment methods are best suited for predicting the locations, deposit types, and amounts of undiscovered nonfuel mineral resources remaining in the world? What is the availability of global geologic, mineral deposit, and mineral exploration information? How can mineral resource assessments be used to address economic and environmental issues? Presentations included overviews of assessment methods applied in previous national and other small-scale assessments of large regions and of the resulting assessment products and their uses.

Twenty-seven people from Canada, China, Finland, Germany, Japan, Peru, Slovenia, South Africa, United States, and Venezuela participated in the 2-day post-Congress workshop. The attendees represented academia, government, environmental organizations, and the mining industry.

The workshop agenda, extended abstracts, and participant biographies were published previously in the following report:

Briskey, J.A., and Schulz, K.J, eds., 2002, Agenda, extended abstracts, and bibliographies for a Workshop on Deposit Modeling, Mineral Resource Assessment, and Their Role in Sustainable Development—31st International Geological Congress [Rio de Janeiro, Brazil, August 18–19, 2000]: U.S. Geological Survey Open-File Report 02–423, 85 p. on one CD–ROM. (Available online at http://pubs.usgs.gov/of/2002/of02-423/.)

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Conversion Factors and Notes

[Papers in this Circular use a variety of units according to the preferences of the authors. Conversion factors are provided below]

Multiply	By	To obtain
	Length	
millimeter (mm)	0.03937	inch (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
hectare (ha)	2.471	acre
hectare (ha)	0.003861	square mile (mi^2)
square kilometer (km^2)	247.1	acre
square kilometer (km^2)	0.3861	square mile (mi^2)
acre	0.4047	hectare (ha)
acre	0.004047	square kilometer (km^2)
square mile (mi^2)	259.0	hectare (ha)
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
cubic meter (m^3)	35.31	cubic foot (ft^3)
	Mass	
milligram (mg)	0.00003527	ounce, avoirdupois (oz)
gram (g)	0.03527	ounce, avoirdupois (oz)
kilogram (kg)	2.205	pound avoirdupois (lb)
megagram (Mg) = metric ton (t)	1.102	ton, short (2,000 lb)
megagram (Mg) = metric ton (t)	0.9842	ton, long (2,240 lb)
metric ton per annum (t/a)	1.102	ton per year (ton/yr)
ounce, avoirdupois (oz)	28.35	gram (g)
pound, avoirdupois (lb)	0.4536	kilogram (kg)
ton, short (2,000 lb)	0.9072	metric ton (t)
ton, long (2,240 lb)	1.016	metric ton (t)
	Energy	
joule (J)	2.778×10^{-7}	kilowatthour (kWh)
gigajoule (GJ)	2.778×10^{2}	kilowatthour (kWh)
petajoule (PJ)	2.778×10^{8}	kilowatthour (kWh)
kilowatthour (kWh)	3.600×10^{6}	joule (J)
	Ore grade	
gram per metric ton (g/t)	0.032	ounce, avoirdupois, per ton (oz/ton)

The time of a geologic event is expressed as Ma (mega-annum, 10^6 years ago, meaning before A.D. 1950) or Ga (giga-annum, 10^9 years ago).

In this Circular, “million” is used for 10^6, “billion” is used for 10^9, and “trillion” is used for 10^{12}.

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