U.S. Geological Survey Minerals Information - Introduction and Background

overview for the
US-EU Workshop on
Raw Materials Flow and Data

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Acting Director
USGS National Minerals Information Center
Reston, VA ~ 6 Nov 13
Minerals Information in the U.S. Government

- What (is meant by minerals information)?
- Who (is and has been providing it)?
- Why (do minerals information activities take place)?
- When (is the information provided)?
- How (has the collection, publication, and content changed with time and)
- Where is USGS minerals information going?
What (is meant by minerals information)?

Core Mission

To collect, analyze, and disseminate information on the domestic and international supply of and demand for minerals and materials essential to the U.S. economy and national security.
What (is meant by minerals information)?

MINERAL COMMODITY SUMMARIES 2013

Abrasives  Aluminum  Gallium  Gold  Mercury  Silver
Ammonium  Gallium  Garnet  Germanium  Mica  Soda Ash
Arsenic  Gallium  Garnet  Germanium  Molybdenum  Sodium Sulfate
Asbestos  Gallium  Garnet  Germanium  Nickel  Stone
Barite  Gallium  Garnet  Germanium  Manganese  Strontium
Bauxite  Gallium  Garnet  Germanium  Molybdenum  Sulfur
Beryl  Gallium  Garnet  Germanium  Molybdenum  Sulfur
Beryllium  Gallium  Garnet  Germanium  Molybdenum  Sulfur
Byproduct Mineral Commodities Used for the Production of Photovoltaic Cells

Current Core Publications
Who (is and has been providing it)?

1803—Thomas Jefferson letter to Meriwether Lewis

1866—U.S. Treasury established Office of Commissioner of Mining Statistics
Who (is and has been providing it)?

1879—U.S. Geological Survey created in Department of the Interior

1910—U.S. Bureau of Mines (USBM) created to address mining safety issues

1925—USBM and mineral statistics function of USGS transferred from Interior Dept. to Commerce Dept.

1934—USBM transferred to U.S. Department of the Interior

1977—Energy function transferred to Department of Energy

1977—Energy function transferred to Department of Energy

1977—Energy function transferred to Department of Energy

1995—Minerals information function transferred from USBM to U.S. Geological Survey
Why (do minerals information activities take place)?

1880–1915
Geographic expansion and national development of western territories

Why (do minerals information activities take place)?

1915–1950
Global strategy

Photo source: Photos of the Great War—Image Archive
Why (do minerals information activities take place)?

1945–1965
1980–1990
2005–present

National security
Why (do minerals information activities take place)?

1965–1980
1990–2000
2005–present

Land use and stewardship; Environmental concerns
Why (do minerals information activities take place)?

Homeland security

2001–present

Minerals Information for a Changed World

Find the statistical information you need in these and other offerings from the U.S. Geological Survey:

- Minerals and Materials Information CD-ROM
- Minerals Yearbook
- Mineral Industry Surveys: Mining and Quarrying Trends
- Mineral Industry Surveys: Statistical Summary
- Mineral Commodity Summaries 2001
- Metal Prices in the United States Through 1998


Source: Mining Voice, (National Mining Association Journal), September/October 2001
Why (do minerals information activities take place)?

2005–present
Global economic competition
<table>
<thead>
<tr>
<th>Report Type</th>
<th>Count/Subjects</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minerals Yearbook</td>
<td>6 books (3 vol.)</td>
<td>Annually (throughout)</td>
</tr>
<tr>
<td>Mineral Commodity Summaries</td>
<td>1 book</td>
<td>Annually (January)</td>
</tr>
<tr>
<td>Mineral Industry Surveys</td>
<td>31 commodities</td>
<td>Monthly and quarterly</td>
</tr>
<tr>
<td>Directories</td>
<td>3 subjects</td>
<td>Annually (varies)</td>
</tr>
<tr>
<td>Indicator Reports</td>
<td>2 subjects</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Minerals Yearbook</td>
<td>6 books (3 vol.)</td>
<td>281 chapters</td>
</tr>
<tr>
<td>Mineral Commodity Summaries</td>
<td>1 book</td>
<td>91 chapters</td>
</tr>
<tr>
<td>Mineral Industry Surveys</td>
<td>31 commodities</td>
<td>293 reports</td>
</tr>
<tr>
<td>Directories</td>
<td>15 commodities</td>
<td>3 reports</td>
</tr>
<tr>
<td>Indicator Reports</td>
<td>2 subjects</td>
<td>36 reports</td>
</tr>
<tr>
<td>Type</td>
<td>Number of Items</td>
<td></td>
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<tr>
<td>----------------------------------</td>
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<td></td>
</tr>
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<td>Minerals Yearbook</td>
<td>6 books (3 vol.)</td>
<td></td>
</tr>
<tr>
<td>Mineral Commodity Summaries</td>
<td>1 book</td>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Directories</td>
<td>15 commodities</td>
<td></td>
</tr>
<tr>
<td>Indicator Reports</td>
<td>2 subjects</td>
<td></td>
</tr>
</tbody>
</table>

**Total individual reports prepared annually**: 704!
How (has the collection, publication, and content changed with time)?

Site visits
How (has the collection, publication, and content changed with time)?

Periodical statistical surveys

More than 140 surveys conducted each year

Surveys span the entire mineral economics cycle

• Production
• Consumption
• Recycling
• Stocks
• Shipments
How (has the collection, publication, and content changed with time)?

Paper forms
How (has the collection, publication, and content changed with time)?

Electronic reporting option
How (has the collection, publication, and content changed with time)?

International Data Acquisition

- Literature review: 35%
- Mineral questionnaires: 25%
- Travel: 20%
- Embassy reports: 20%
How (has the collection, publication, and content changed with time)?
How (has the collection, publication, and content changed with time)?

### Annual publications

<table>
<thead>
<tr>
<th>Approximate Years</th>
<th>Title</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1866-1877</td>
<td>Mineral Resources of the United States West of the Rocky Mountains</td>
<td>Treasury</td>
</tr>
<tr>
<td>1878-1881</td>
<td>No reports</td>
<td></td>
</tr>
<tr>
<td>1882-1923</td>
<td>Mineral Resources of the United States (1894-1899 as part of USGS Annual Report)</td>
<td>USGS</td>
</tr>
<tr>
<td>1924-1931</td>
<td>Mineral Resources of the United States</td>
<td>USBM (Commerce)</td>
</tr>
<tr>
<td>1932-1994</td>
<td>Minerals Yearbook</td>
<td>USBM (Interior)</td>
</tr>
<tr>
<td>1995-present</td>
<td>Minerals Yearbook</td>
<td>USGS</td>
</tr>
</tbody>
</table>
How (has the collection, publication, and content changed with time)?

Volume I, Domestic Reports:
Commodities expanded, enhanced analysis, Outlook sections

Volume II, State Reports (added in 1952):
USGS/State partnerships

Volume III, International Reports (added in 1963):
Enhanced industry structure tables (1981), georeferenced data, Outlook sections, out-year production estimates (2001)
How (has the collection, publication, and content changed with time)?

**TABLE 2**

**BHUTAN AND NEPAL: STRUCTURE OF THE MINERAL INDUSTRIES IN 2009**

(Thousand metric tons unless otherwise specified)

<table>
<thead>
<tr>
<th>Country and commodity</th>
<th>Major operating companies and major equity owners</th>
<th>Location of main facilities</th>
<th>Annual capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BHUTAN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement</td>
<td>Penden Cement Authority Ltd.</td>
<td>Gomtu, Samtse District</td>
<td>100</td>
</tr>
<tr>
<td>Dolomite</td>
<td>Jigme Mining Corp. Ltd.</td>
<td>do.</td>
<td>900</td>
</tr>
<tr>
<td>Ferrosilicon</td>
<td>Bhutan Ferro Alloys Ltd.</td>
<td>Phuentsholing</td>
<td>34</td>
</tr>
<tr>
<td><strong>NEPAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement</td>
<td>Hetauda Cement Industries Ltd.</td>
<td>Hetauda</td>
<td>260</td>
</tr>
<tr>
<td>Do.</td>
<td>Himal Cement Co. Ltd.</td>
<td>Chobhar</td>
<td>130</td>
</tr>
<tr>
<td>Do.</td>
<td>Manasa Cement Industry</td>
<td>Chandragadhi, Jhapa</td>
<td>37</td>
</tr>
<tr>
<td>Lead and zinc</td>
<td>Nepal Metal Co. Ltd.</td>
<td>Lari</td>
<td>NA</td>
</tr>
<tr>
<td>Magnesite</td>
<td>metric tons Nepal Orinda Magnesite Ltd.</td>
<td>Dolkha</td>
<td>50</td>
</tr>
<tr>
<td>Marble</td>
<td>Godavari Marble Industries Ltd.</td>
<td>Latipur</td>
<td>1</td>
</tr>
</tbody>
</table>

*Estimated. Do., do. Ditto. NA Not available.*

USGS/State partnerships

Volume III, International Reports (added in 1963):
Enhanced industry structure tables (1981), georeferenced data, Outlook sections, out-year production estimates (2001)
How (has the collection, publication, and content changed with time)?

### Volume I, Domestic Reports:
- Commodities expanded, enhanced analysis, Outlook sections

### Volume II, State Reports (added in 1952):
- USGS/State partnerships

### Volume III, International Reports (added in 1963):

---

**Table 7**

**Asia and the Pacific: Historic and Projected Copper Mine Production, 1995-2015\(^1\)**

(Metal content in thousand metric tons)

<table>
<thead>
<tr>
<th>Country</th>
<th>1995</th>
<th>2000</th>
<th>2005</th>
<th>2008</th>
<th>2011(^e)</th>
<th>2013(^e)</th>
<th>2015(^e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>398</td>
<td>829</td>
<td>930</td>
<td>885</td>
<td>970</td>
<td>1,000</td>
<td>1,100</td>
</tr>
<tr>
<td>China</td>
<td>445</td>
<td>593</td>
<td>762</td>
<td>940</td>
<td>1,000</td>
<td>1,100</td>
<td>1,200</td>
</tr>
<tr>
<td>India</td>
<td>47</td>
<td>32</td>
<td>27</td>
<td>31</td>
<td>37</td>
<td>39</td>
<td>42</td>
</tr>
<tr>
<td>Indonesia</td>
<td>444</td>
<td>1,010</td>
<td>1,064</td>
<td>651</td>
<td>1,000</td>
<td>1,300</td>
<td>1,200</td>
</tr>
<tr>
<td>Mongolia</td>
<td>122</td>
<td>125</td>
<td>127</td>
<td>127</td>
<td>130</td>
<td>160</td>
<td>200</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>213</td>
<td>203</td>
<td>193</td>
<td>187</td>
<td>120</td>
<td>130</td>
<td>200</td>
</tr>
<tr>
<td>Philippines</td>
<td>108</td>
<td>130</td>
<td>16</td>
<td>21</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
<td>44</td>
<td>95</td>
<td>135</td>
<td>210</td>
<td>220</td>
<td>220</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,800</td>
<td>2,970</td>
<td>3,210</td>
<td>2,980</td>
<td>3,500</td>
<td>4,000</td>
<td>4,200</td>
</tr>
</tbody>
</table>

\(^e\)Estimated.

\(^1\)Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.
How (has the collection, publication, and content changed with time)?

Breaking News: Georeferenced data just released!
How (has the collection, publication, and content changed with time)?

- Bound volumes, preprints
- Mines Faxback (Fax delivery system, 1993-2001)
- World Wide Web (1996-present)
- Publication list services (E-mail notification of new reports, 2002-present)
- RSS Feeds (Really Simple Syndication, 2007-present)
- Twitter (July 2013 – present)
How (has the collection, publication, and content changed with time)?

Internet Publication Accesses (PDF/XLS)

Faxback

r/ Revised. * Estimated.
Where is USGS minerals information going?

Data collection and processing

Revising statistical and data standards (NAICS)

Rewriting the domestic data collection, storage, and processing system. Goals—

- Increase digital reporting
- Increase efficiency of storage and processing
- Reduce system costs
Where is USGS minerals information going?

Collection of core minerals information

Continue publication of MCS, MYB (3 vols.), and MISs

Add historical statistics on global mineral production and consumption for selected mineral commodities

Increase analysis combining core minerals information and data on global mineral production facilities
USGS data indicate that the area affected by the March 11, 2011, earthquake and tsunami is home to:
- 9 cement plants
- 8 iodine plants
- 4 iron and steel plants
- 4 limestone mines
- 3 copper refineries
- 2 gold refineries
- 2 lead refineries
- 2 zinc refineries
- 1 titanium dioxide plant
- 1 titanium sponge processing facility.

These facilities had the capacity to produce:
- 25% of world iodine
- 3% of world refined zinc
- 2.5% of world refined copper
- 1.4% of world steel
- 30% of Japan’s cement production
Where is USGS minerals information going?
Special studies of inputs to mineral production and transport

Recently, USGS has completed studies of key inputs to mineral production, such as electricity and water.

USGS is currently studying major ports that export minerals.
Where is USGS minerals information going?
Studies of critical minerals and supply chains


Soto-Viruet, Yadira, and others, 2013, An exploration in mineral supply chain mapping using tantalum as an example (USGS Open-File Report 2013-1239)

Tse, Pui-Kwan, 2011, China’s rare-earth industry (USGS Open-File Report 2011-1042)

Where is USGS minerals information going? Increased Materials Flow Studies

USGS has completed:

recycling studies for copper, lead, nickel, rare earths, selenium, titanium, and vanadium

reports on materials in photovoltaic cells, wind turbines, batteries, LEDs, and catalytic converters

materials flow studies of aluminum and indium
National Minerals Information Center

data access

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- Country
- State

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- General Interest
- Materials Flow
- Mineral Commodity Profiles
- Recycling
- Historical Statistics
- Historical Events
- Minerals Yearbook (1932-1993)

Featured Publications:
- Mineral Commodity Summaries
- Mineral Industry Surveys
- Minerals Yearbook
- Metal Industry Indicators
- Nonmetallic Mineral Products Industry Indexes

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Minerals Information

Statistics and information on the worldwide supply of, demand for, and flow of minerals and materials essential to the U.S. economy, the national security, and protection of the environment.

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  - http://minerals.usgs.gov/
Introductions and Breakout Session

Lori Apodaca & Shonta Osborne—Domestic Data Collection

Ken Beckman—Software System

Joyce Ober—Mineral Commodities

Omayra Bermúdez-Lugo & Steve Textoris—International Data

Michael Baker—Mineral Facilities Digital Data

JJ Barry & Grecia Matos—Materials Flow

Robert Callaghan—NMIC Web Site