



British Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

Gateway to the Earth

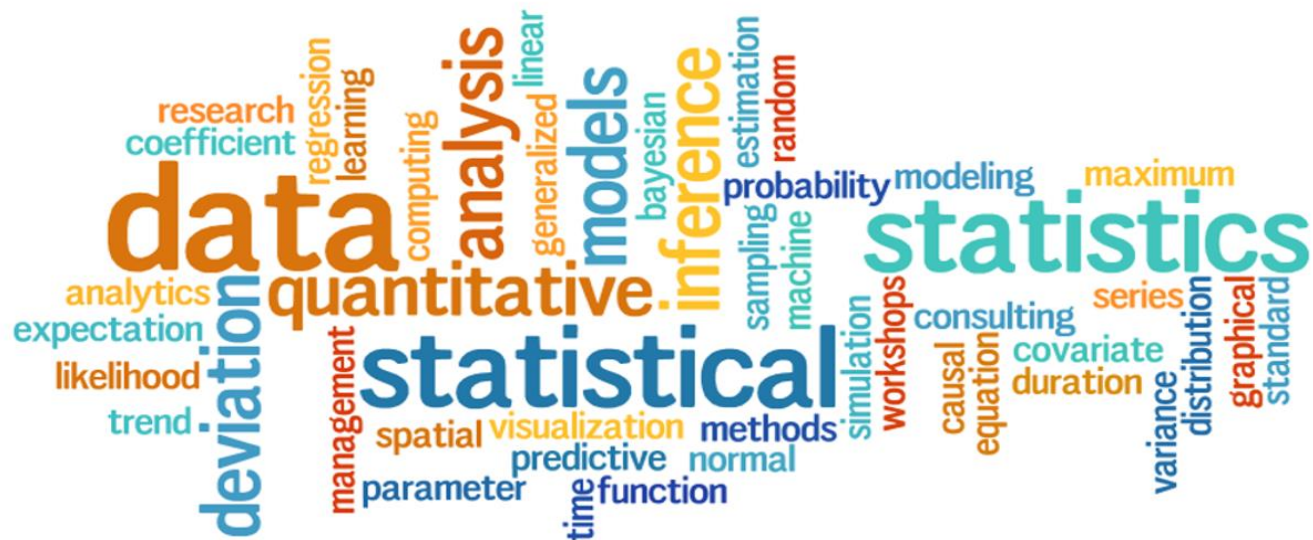
# BGS Mineral Statistics

Dr Evi Petavratzi



# Content

- BGS datasets
- Mineral Statistics production process
- Specific challenges
- Conclusions



# Why do we need mineral statistics?

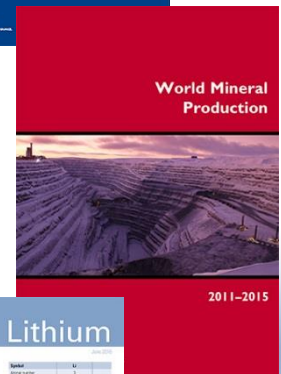
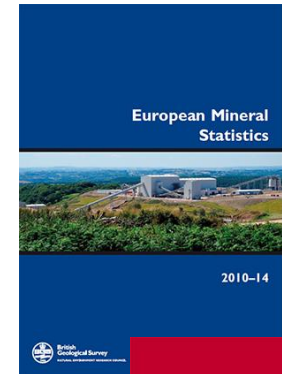
- Monitor of the physical economy requires data on where in the world valuable raw materials are produced, traded AND where resources exist.
- Data needs include: production, trade, resources and reserves, exploration and waste; related to primary and secondary raw materials

BUT

- Is data availability adequate to cover our needs? **Yes and No**
- Is data readily available? **Yes and No**
- Is our understanding of raw materials comprehensive and supported by evidence? **Yes and No**

# British Geological Survey

- Part of the United Kingdom's Natural Environment Research Council (NERC)
- **A world leader in the compilation, provision and analysis of Mineral Statistics**
- The UK national provider of spatial and statistical minerals information
- Carries out research in areas such as metallogenesis, land-use impacts of mineral extraction, material flow analysis and resource security.
- Delivery of information via the website [www.mineralsUK.com](http://www.mineralsUK.com)

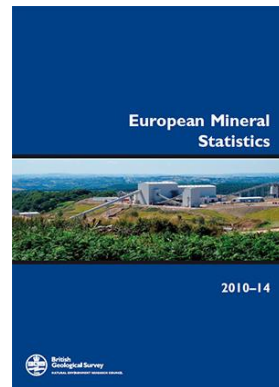
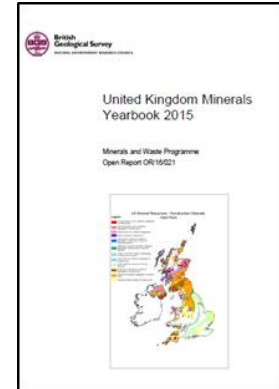
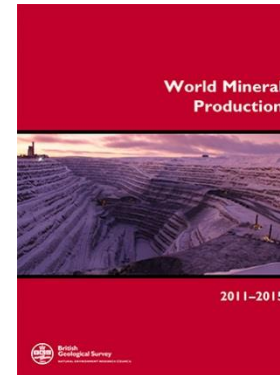


# Scope of BGS mineral statistics activities

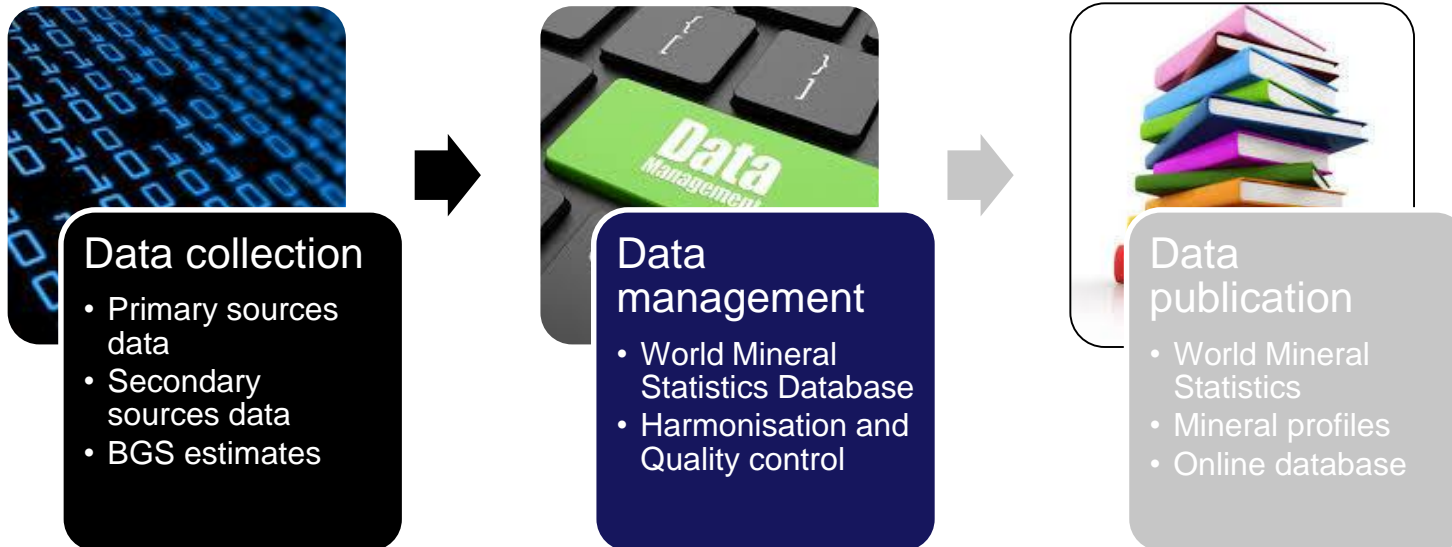
- Commenced in 1913, with ~40 commodities

## Current statistical publications:

- World Mineral Production*
  - approx 70 commodities
  - approx 180 countries
  - production statistics only
- European Mineral Statistics*
  - more than 70 commodities & sub-commodities
  - 36 European countries
  - production, import and export statistics
  - presented by country and commodity
- United Kingdom Minerals Yearbook*
  - approx 100 commodities
  - greater detail, time trends, regional statistics for some



# Data process



# Data collection



# Data collection

## Production data (WMP & EMS)

- National level aggregated figures
- Survey questionnaires and data download from online databases
- Data request for multiple years
- Data collection from multiple sources
- Responses archived following the BGS data collection protocol

### Primary sources:

- Ministries, Statistics Offices, Geological Surveys, Companies, Associations and Trading bodies

### Secondary sources:

- Trade associations, USGS, ICG etc

### BGS estimates

- Time series data, expert knowledge, desk review

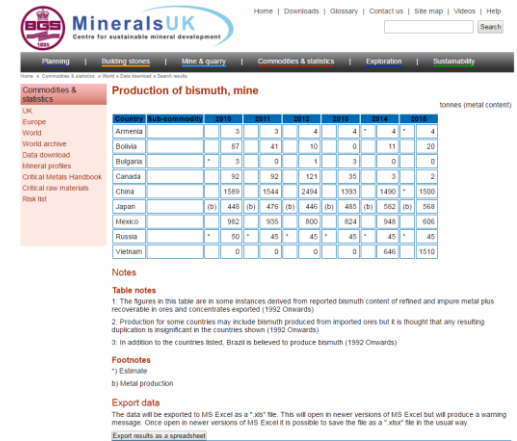
## Trade data (EMS only)

- Only used for our European Mineral Statistics
- Data bought from an Agency, as we required a large number and specific format.
- UN trade data were used for checking and as a secondary source



# Data management

- World Mineral Statistics Database.
- Analysis, interpretation and harmonisation
- QC steps :
  - ✓ Units, commodities, forms, content, years, data status, country names etc are checked in each data return
  - ✓ Checks between data provided by different country data providers
  - ✓ Data comparison with existing data in our database (e.g. from previous years) and with data reported by other sources



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### Production of bismuth, mine

(tonnes (metal content))

Country	2010	2011	2012	2013	2014	2015
Armenia	3	3	4	4	4	4
Bolivia	87	41	10	0	11	20
Bulgaria	3	0	1	3	0	0
Canada	92	92	121	35	3	2
China	1589	1544	2494	1393	1490	1500
Japan	(b) 448	(b) 476	(b) 446	(b) 485	(b) 582	(b) 568
Mexico	982	935	800	824	945	606
Russia	50	45	45	45	45	45
Vietnam	0	0	0	0	646	1510

**Notes**

**Table notes**

1. The figures in this table are in some instances derived from reported bismuth content of refined and impure metal plus recoverable fines and concentrates exported (1992 onwards)
2. Production for some countries may include bismuth produced from imported ores but it is thought that any resulting application is insignificant in the countries shown (1992 onwards)
3. In addition to the countries listed, Brazil is believed to produce bismuth (1992 onwards)

**Footnotes**

(\*) Estimate  
(b) Metal production

**Export data**

The data will be exported to MS Excel as a \*.xls\* file. This will open in newer versions of MS Excel but will produce a warning message. Once open in newer versions of MS Excel it is possible to save the file as a \*.xlsx\* file in the usual way.

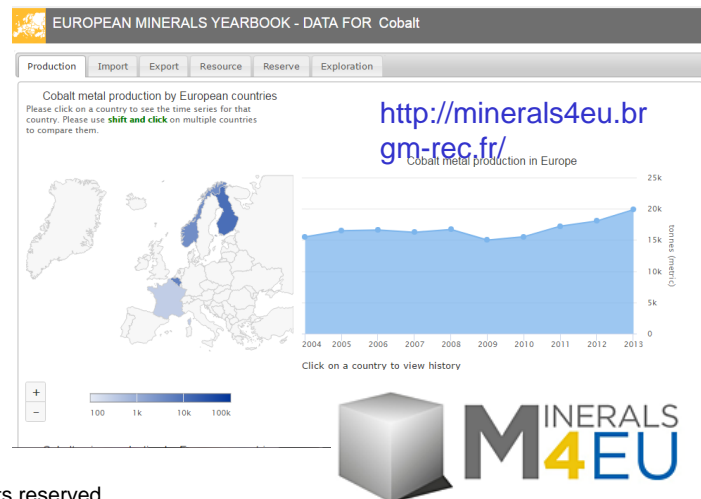
Export results as a spreadsheet

<http://www.bgs.ac.uk/mineralsuk/statistics/home.html>



# Data publication

- Data published in a 'simple' way (tables, footnotes)
- Annual publication of WMP.
- EMS and UKMY are not produced anymore
- Online database with data download (data since 1970)
- Data in context in the BGS Mineral profiles, MPFs etc
- Use of our data in the European Minerals Yearbook (Minerals4EU project)



Mine production of antimony

Country	2011	2012	2013	2014	2015
Russia	6 348	* 6 400	* 6 520	* 6 400	7 420
Turkey	2 340	7 119	4 512	3 013	1 917
Morocco	1 570	710	—	—	—
South Africa	2 391	3 044	2 332	816	* 100
Canada	100	100	177	5	1
Guatemala	—	52	159	—	—
Mexico	105	169	294	266	90
Bolivia	3 947	5 081	5 053	4 186	3 843
Burma	* 5 600	* 5 900	* 7 400	* 3 300	* 3 000
China	123 900	135 600	152 104	140 389	111 400
Iran	600	—	400	432	* 400
Kazakhstan	800	600	900	800	700
Kyrgyzstan	892	924	* 900	* 2 450	* 2 000
Laos	728	521	804	620	1 100
Pakistan (a)	—	12	99	127	114
Tajikistan	6 642	6 645	7 307	* 6 500	* 5 400
Thailand	442	672	488	706	* 700
Vietnam	286	480	990	1 098	996
Australia (a)	1 548	1 753	2 883	3 484	3 737
World total	158 000	176 000	193 000	175 000	143 000

Note(s)

(1) This table includes antimony content of antimonial lead alloys  
(2) In addition to the countries listed, antimony may be produced in Honduras but available information is insufficient to make a reliable estimate.

(a) Years ended 30 June of that stated

# Challenge 1: Data collation

Inherent uncertainty in reported data

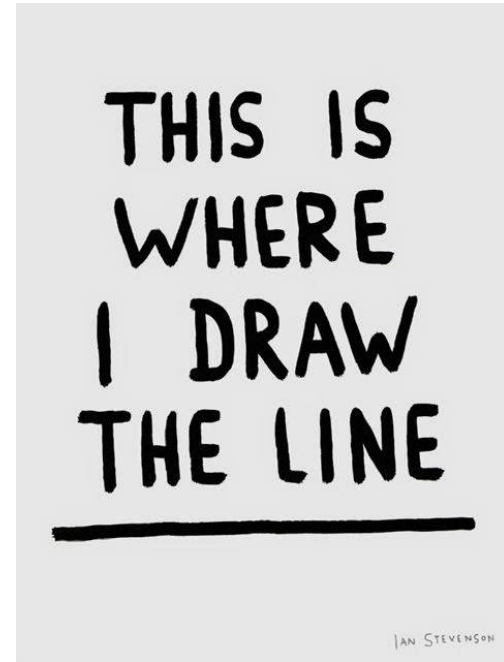
False interpretation of survey questionnaire

Assumptions during the QC stage

Random errors in data analysis / missing data.

# Challenge 2: Understanding data

- The majority of production data reflect what comes out of the mine, but what does this mean?
  - sold production or total production?
  - ore concentrate, but at what processing stage exactly, in what form, content etc?



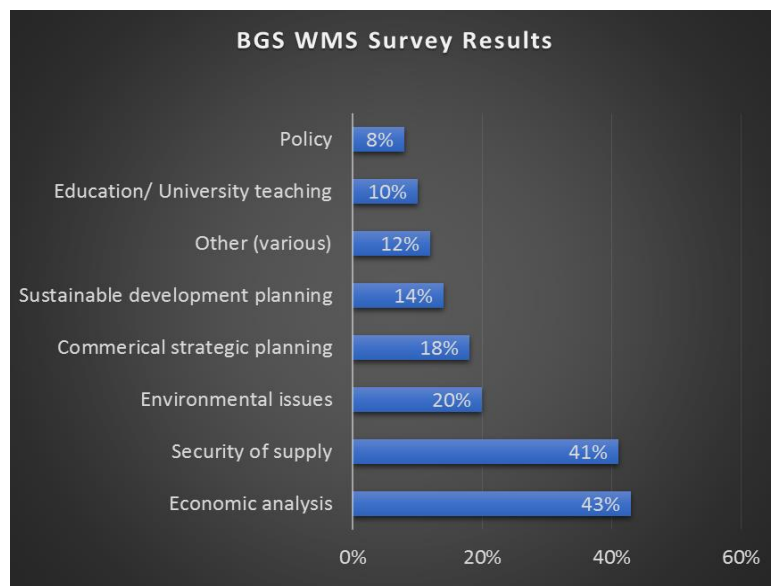
No clear boundaries on what data actually represent.

Resolution only by directing the questions back to producers.

# Challenge 3: Understanding data needs

- Data providers are often apart from data users and do not understand their needs.
- We do not make any assumptions about how data are potentially used.

But we are getting better!



# Challenge 4: Resource constraints

## Funding

- Reduced access to funding
- Limited funding continuation from other sources

## Staff

- Only 7 staff, not full time
- Only 4 scientists

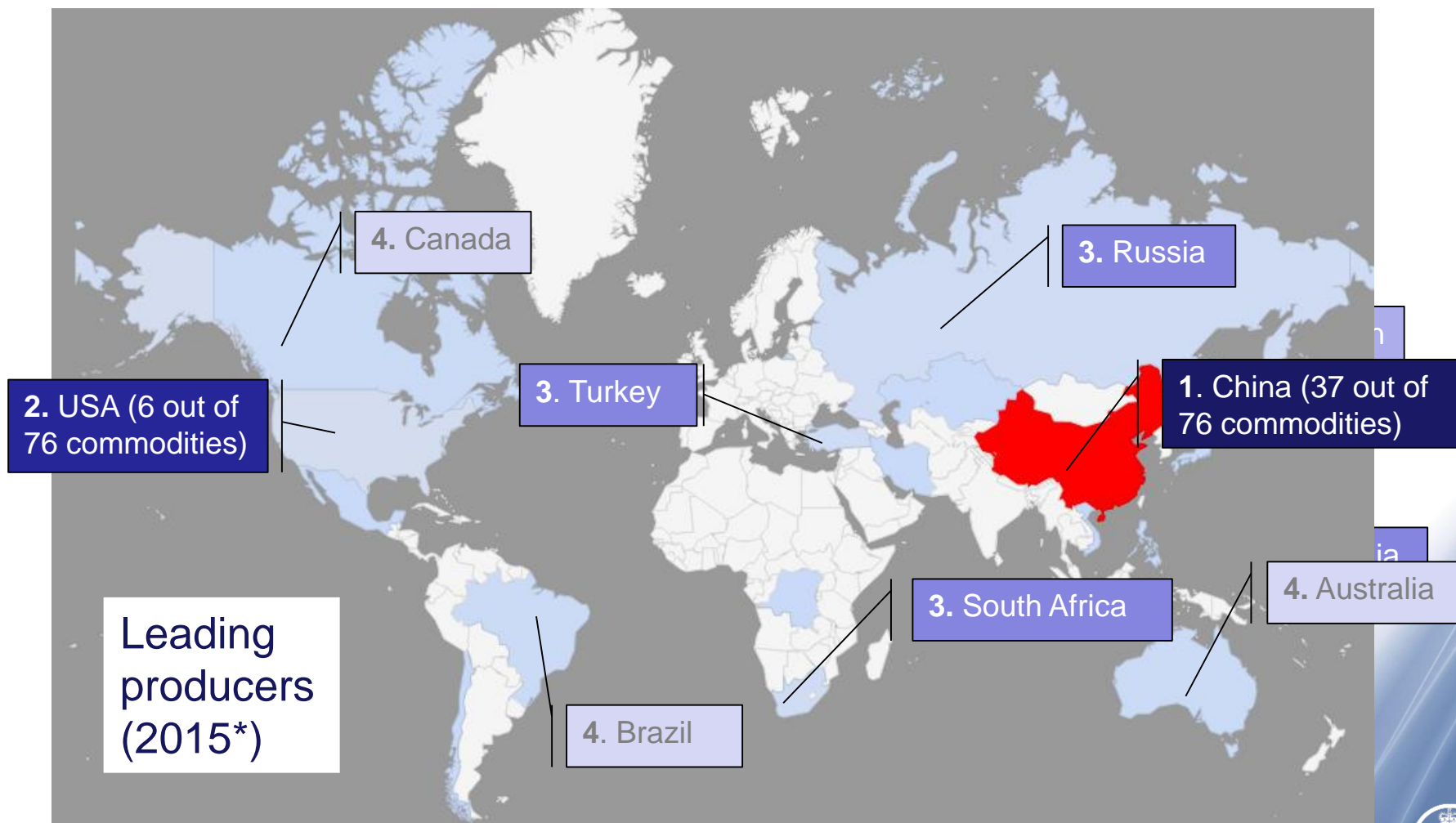
## Interest

- Low interest in developing/improving datasets
- Continuation in funding e.g. EU projects is an issue

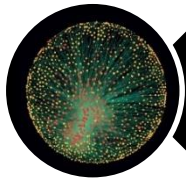
## Future of WMS uncertain

- EMS and UKMY have already been stopped

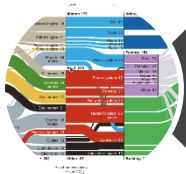
# Challenge 5: How good are the data?



# Conclusions - Mitigation



Develop a global network in Mineral Statistics



Work closer with all stakeholders to develop system definitions



Minimise data uncertainty



Access to adequate funding support



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## Welcome to MineralsUK

MineralsUK is the British Geological Survey's Centre for Sustainable Mineral Development. This website has a wealth of information on mineral resources, mineral planning, policy and legislation, sustainable development, statistics and exploration.

### Minerals & you

Economic minerals – here you will find out what they are, where they come from and why they are important.

### What's new

- United Kingdom Minerals Yearbook 2015
- Risk List 2015
- European Mineral Statistics

### //Digital maps

A web-based Geographical Information System (GIS) has been produced to provide access to a range of Minerals Information Online.

[more info](#)



### //Downloads

**World Mineral Production 2011-2015**  
The latest edition of this long running series is now available.

[more info](#)



### //Downloads

**Mineral profile – Lithium**  
A new addition to the series of mineral profiles has been released.

[more info](#)



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