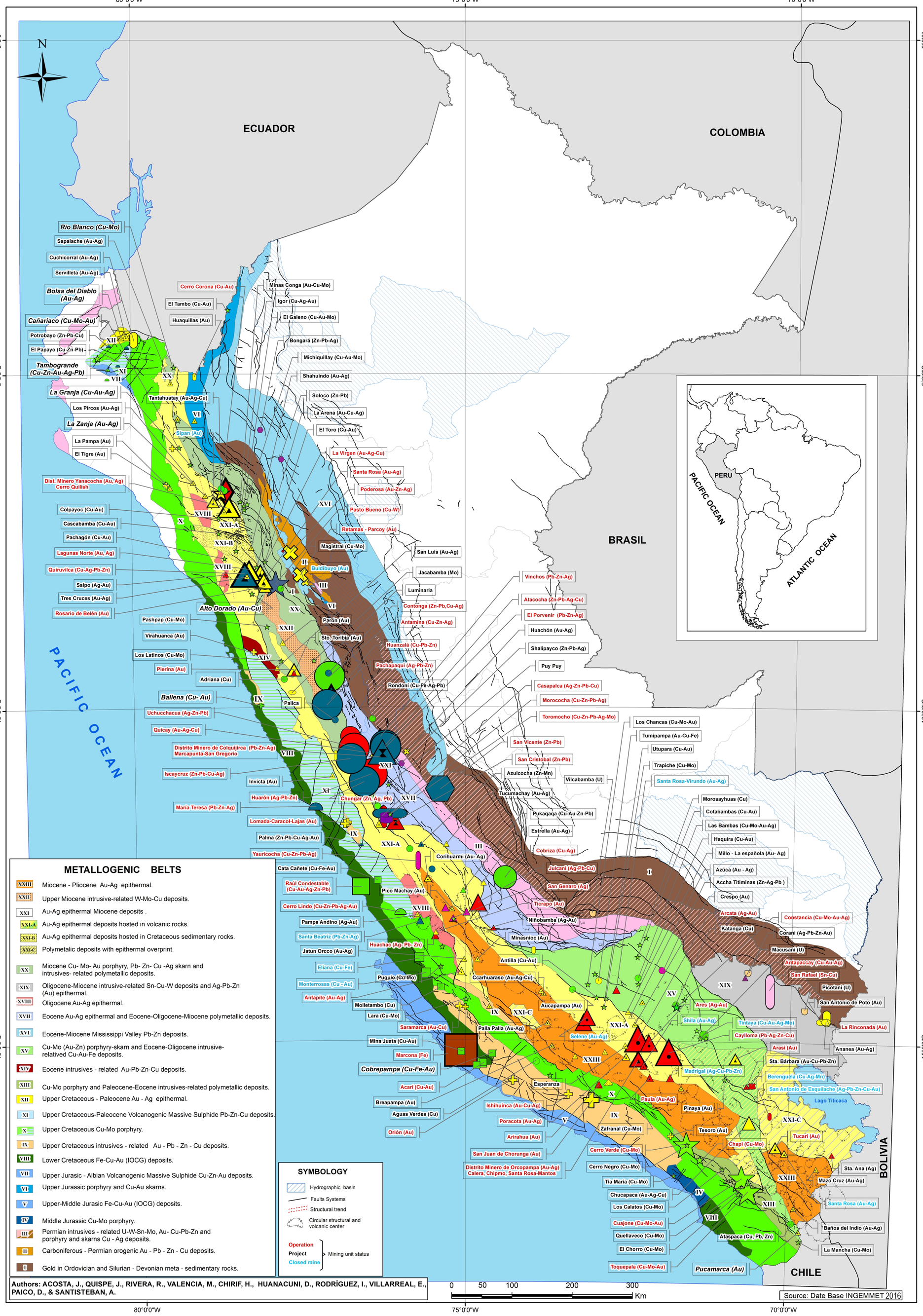
METALLOGENIC MAP OF PERU: MINING OPERATIONS AND PROJECTS

PERU Energy and Mining Sector

INGEMMET — ENERGY AND MINING SECTOR — GEOLOGICAL, MINING AND METALLURGICAL INSTITUTE



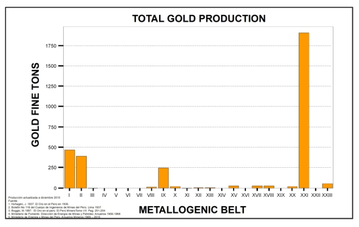
METALLOGENIC BELTS

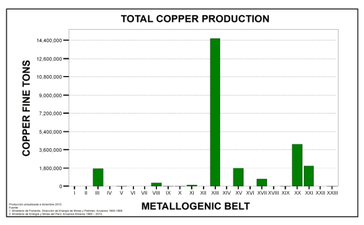
- XXIII — Miocene - Pliocene Au-Ag epithermal.
- XXII — Upper Miocene intrusive-related W-Mo-Cu deposits.
- XXI — Au-Ag epithermal Miocene deposits .
- XXI-A — Au-Ag epithermal deposits hosted in volcanic rocks.
- XXI-B — Au-Ag epithermal deposits hosted in Cretaceous sedimentary rocks.
- XXI-C — Polymetalic deposits with epithermal overprint.
- XX — Miocene Cu- Mo- Au porphyry, Pb- Zn- Cu -Ag skarn and intrusives- related polymetallic deposits.
- XIX — Oligocene-Miocene intrusive-related Sn-Cu-W deposits and Ag-Pb-Zn (Au) epithermal.
- XVIII — Oligocene Au-Ag epithermal.
- XVII — Eocene Au-Ag epithermal and Eocene-Oligocene-Miocene polymetallic deposits.
- XVI — Eocene-Miocene Mississippi Valley Pb-Zn deposits.
- XV — Cu-Mo (Au-Zn) porphyry-skarn and Eocene-Oligocene intrusive-relatived Cu-Au-Fe deposits.
- XIV — Eocene intrusives - related Au-Pb-Zn-Cu deposits.
- XIII — Cu-Mo porphyry and Paleocene-Eocene intrusives-related polymetallic deposits.
- XII — Upper Cretaceous - Paleocene Au - Ag epithermal.
- XI — Upper Cretaceous-Paleocene Volcanogenic Massive Sulphide Pb-Zn-Cu deposits.
- X — Upper Cretaceous Cu-Mo porphyry.
- IX — Upper Cretaceous intrusives - related Au - Pb - Zn - Cu deposits.
- VIII — Lower Cretaceous Fe-Cu-Au (IOCG) deposits.
- VII — Upper Jurasic - Albian Volcanogenic Massive Sulphide Cu-Zn-Au deposits.
- VI — Upper Jurassic porphyry and Cu-Au skarns.
- V — Upper-Middle Jurasic Fe-Cu-Au (IOCG) deposits.
- IV — Middle Jurassic Cu-Mo porphyry.
- III — Permian intrusives - related U-W-Sn-Mo, Au- Cu-Pb-Zn and porphyry and skarns Cu - Ag deposits.
- II — Carboniferous - Permian orogenic Au - Pb - Zn - Cu deposits.
- I — Gold in Ordovician and Silurian - Devonian meta - sedimentary rocks.

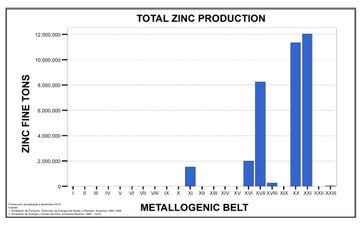
SYMBOLOGY

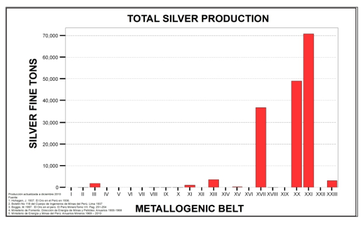
- Hydrographic basin
- Faults Systems
- Structural trend
- Circular structural and volcanic center
- Operation / Project / Closed mine — Mining unit status

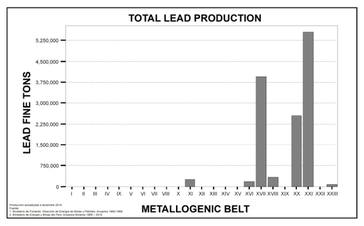
Authors: ACOSTA, J., QUISPE, J., RIVERA, R., VALENCIA, M., CHIRIF, H., HUANACUNI, D., RODRÍGUEZ, I., VILLARREAL, E., PAICO, D., & SANTISTEBAN, A.











SIZE OF MINERAL DEPOSITS (TONS)

Element	Project	Small	Medium	Large	Giant-World class
Au	-----	< 25	25 - 250	250 - 5 000	> 5 000
Ag	-----	< 250	250 - 5 000	5 000 - 10 000	> 10 000
Cu	-----	< 50 000	50 000 - 1 000 000	1 000 000 - 10 000 000	> 10 000 000
Mo	-----	< 2 000	2 000 - 200 000	200 000 - 500 000	> 500 000
Pb	-----	< 50 000	50 000 - 1 000 000	1 000 000 - 5 000 000	> 5 000 000
Zn	-----	< 50 000	50 000 - 1 000 000	1 000 000 - 5 000 000	> 5 000 000
Fe	-----	$< 10^7$	$10^7 - 10^8$	$10^8 - 10^9$	$> 10^9$
Sn	-----	< 5 000	5 000 - 50 000	50 000 - 500 000	> 500 000
W	-----	< 500	500 - 10 000	10 000 - 50 000	> 50 000
U	-----	< 1 000	1000 - 5 000	5 000 - 50 000	> 50 000

SYMBOLOGY OF MINERAL DEPOSIT TYPES

I.-Magmatic
- Ni-Cu / Cr-Ni-Cu Alpine sulphide

II.-Pegmatitic
- Veins

III.-Hydrothermal
- Epithermals deposits not differentiated
- High Sulfidation epithermals
- Low Sulfidation epithermals
- Intermediate Sulfidation epithermals
- Polymetallic deposit with epithermal overprint.
- Skarn
- Iron Oxide Copper Gold deposits (IOCG)
- Porphyry
- Orogenic Au-Pb-Zn-Cu deposits
- Intrusives-related Au (Pb-Zn-Cu) deposits

IV.-Estratabound Hydrothermal
- Volcanogenic Massive Sulphide (VMS)

V.-Estratabound Sedex
- Sedex

VI.-Estratabound sediments
- Mississippi Valley Type (MVT)
- Red bed

VIII.-Metamorphic
- Metamorphogenic Deposits

IX.- Exotics
- Placer
- Alluvial

X.- Hydrothermal deposits without genetic classification
- Stratabound
- Vein
- Body
- Disseminated

XI.- Uranium deposits
- Uranium

METALS

Au-Pb-Zn	Pb-Ag
Ag-Pb-Zn	Pb-Zn
Cu-Au-Fe	Pb-Cu
Cu-Mo-Au	Fe-Zn-Cu
Cu-Pb-Zn	Sn-Cu
Cu-Zn-Ag	Sb-Ag-Au
Cu-W-Zn	Mg
Cu-Ag-Au	U
Zn-Pb-Ag	Ti
Zn-Cu-Au	Zn-Fe

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Metallogenic Map of Peru 1:3 000 000

The Metallogenic Map of Peru displays: (1) 23 mineralized belts of base and precious metals (2) location of major mines and mining exploration projects shown by a symbol (3) size of ore mineral deposit (4) main metal content by association.

This map portrays mines with a known metal endowment (past production and global resources) and main exploration projects (global resources) classified by small, medium, large and giant.

Ore mineral deposits generally occur in clusters or districts that reflect a common geological setting, source, age and origin. Some areas contain primary deposits formed by fundamentally different mineralizing processes.These have been differentiated into separate with each being represented by symbol according to ore deposit types.

For more information on the development of this map please see: Acosta et al 2009. Memoria del Mapa Metalogenético del Perú. Development of the 1:3 000 000 scale. INGEMMET.

Credits

Bibliographical reference: Acosta, J., Quispe, J., River, R., Valencia, M., Chirif, H., Huanacuni, D., Rodriguez, I., Villarreal, E., Paico, D. and Santisteban, A. (2009) Memoria del Mapa metalogenético del Perú. INGEMMET.

Metallogenic belts and mineral deposits data base can be accessed online via http://geocatminapp.ingemmet.gob.pe/apps/geocatmin/

Disclaimer

The information in this publication is based on knowledge and understanding at time of writing (2009). However because of advances in knowledge, users are reminded of the need to insure that information upon which they rely is up to date.

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This map can be downloaded from http://www.ingemet.gob.pe/metalogenicos

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GEOCATMIN — INGEMMET

Geological and Mining Cadastre Information System

GEOCATMIN is an upgraded version of the multi-source geo-spatial data management and cadastre information (multiple – targeting version), researched and developed independently by the Geological Survey of Peru (INGEMMET). With the technical system based on ArcGis Server by ESRI, it is a professional Gis software system integrating the processing, analysis, transformation and charting of the information on geography, geology, cadastral mining, restricted areas to mining activities, geophysics, geochemistry, hydrogeology, ore deposit types, technical reports and etc. (more than 130 layers of information). The research and development of GEOCATMIN has not only improved the original system´s ability of solving the geological problems and mining cadastre location, upgraded and perfected the software function, but also has the research and development of a multilingual software version realized, built an international platform for geo-data processing, and met the users demand.

- It has the function of managing, processing and analyzing the multi-source geological data and mining cadastre.
- It can produce the reports of mining records and mining rights.
- It supports a variety of data formats at home and abroad (MAPGIS/ArcGIS/AutoCAD/MapInfo/Bmp/TIFF) and transformations of map projection globally.
- It covers geochemical exploration data processing and the geo-scientific GIS spatial analysis and application.
- It can produces a variety of thematic maps including contour maps, profile in plan, profile charts, symbol maps and maps recording the degree of geological works.
- It supports the switches of multilingual user interface.

Viewed in more than 200 countries over the 5 continent
It can be used in smartphones and tablets off line edition
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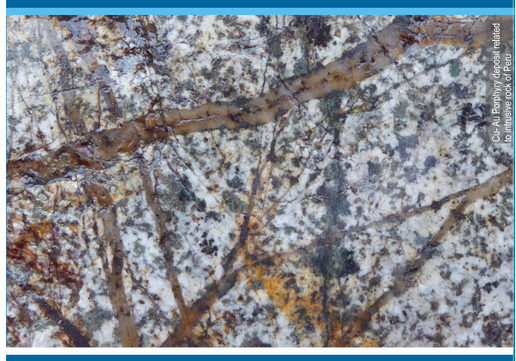
METALLOGENIC MAP OF PERU: MINING OPERATIONS AND PROJECTS 1: 3 000 000



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