Gis-based Datasets Of Mineral Resources Maps - A Valuable Exploration Tool For Discovering Potential Ore Deposits In Greece

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Sustainable Development In The Minerals Industry

6th International Conference

Milos Island, Greece 30 June – 3 July, 2013

Structure

- ProMine project
  - Structure of the databases (Mineral Database & Anthropogenic Concentration Database)
  - Greek Mineral Database
  - Mineral Commodities & Critical Raw Materials
  - Metallogenetic districts based on PROMINE classification
  - “Hot” metallic commodities for Greece
  - Greek Anthropogenic Concentration Database
  - Mining waste deposits in Greece upon PROMINE classification

The ProMine project

Nano-particle products from new mineral resources in Europe

Total budget: 17 M €
Requested EU contribution 11 M €
28 partners*
11 EU countries
2009-2013

Sound and objective driven INDUSTRIAL project with huge exploitation potential
THE FLAGSHIP project of the European mineral industry in the area of mineral supply for the high added value products

***Greek partners involved: IGME, Hellas Gold, Grecian Magnesite**

PROMINE project

Objectives

•develop a Pan-EU GIS data management and visualization system for mineral resources

• develop the first ever 3D/ 4D mineral exploration geomodels in Fennoscandian shield (Sweden), Forsudetic belt (Poland-Germany), Iberian pyrite belt (Portugal and Spain), Hellenic belt (Greece)

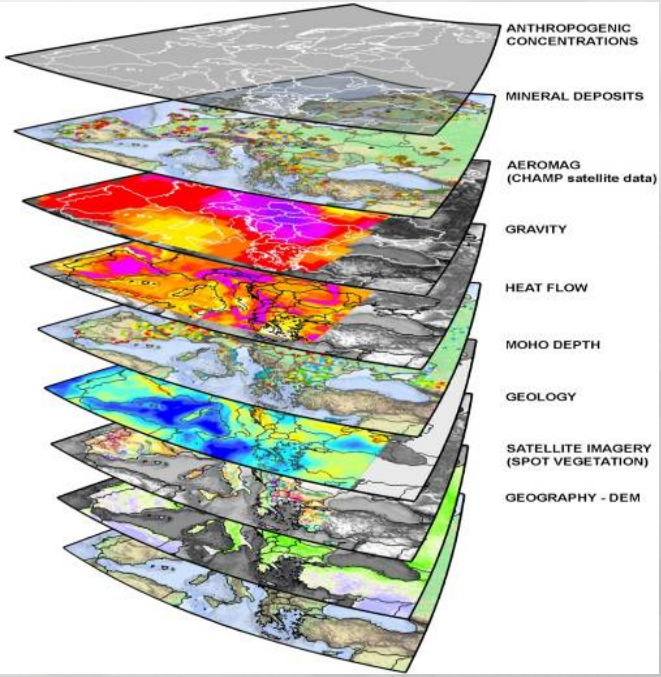
• calculate the volumes of potentially strategic metals

• develop five new, high value, mineral-based (nano) products

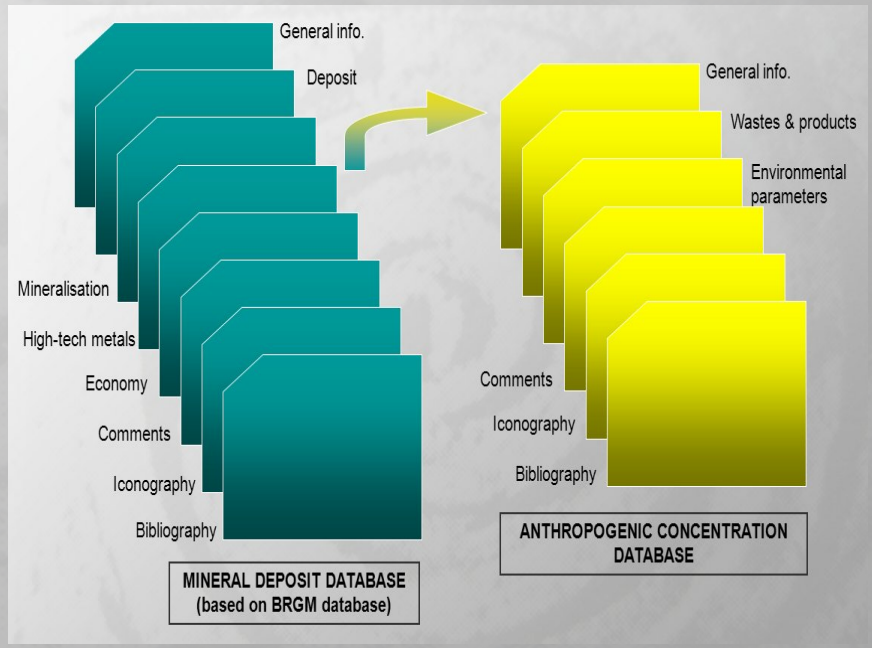
• develop modern eco-efficient mineral processing and metal recovery methods

Methodology

Using existing and new data of Greece territory, a multi-layer Geographical Information System was created. The system includes databases on mineral deposits, and anthropogenic / mining and metallurgical residues along with relevant geological, structural, geochemical, geophysical layers and other information from a diverse range of sources.

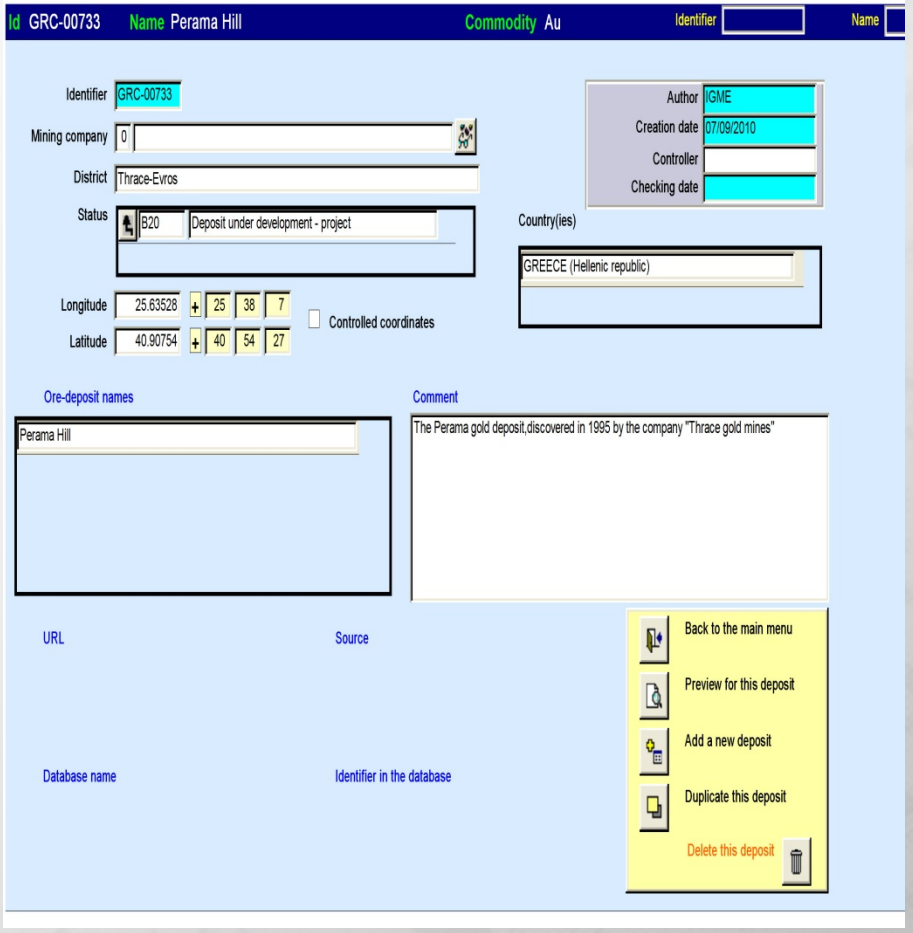


The GIS multi-layer information system.

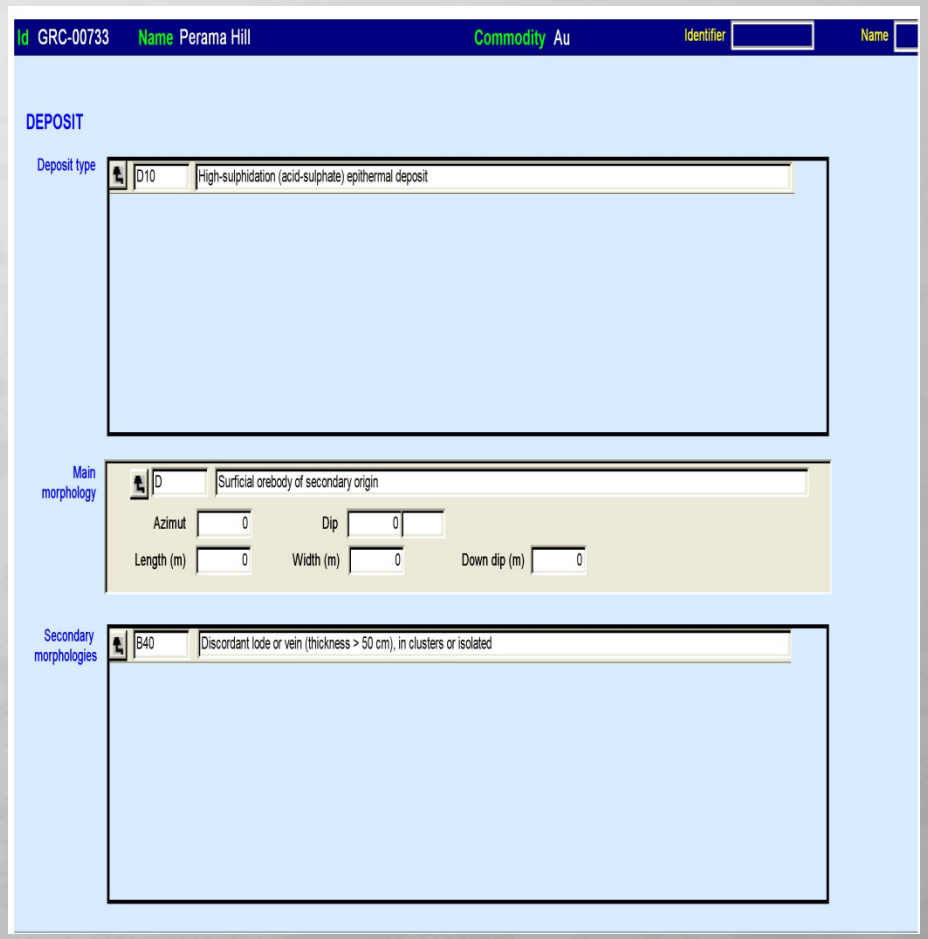


Interconnecting evaluation of MD and AC databases.

Mineral Database

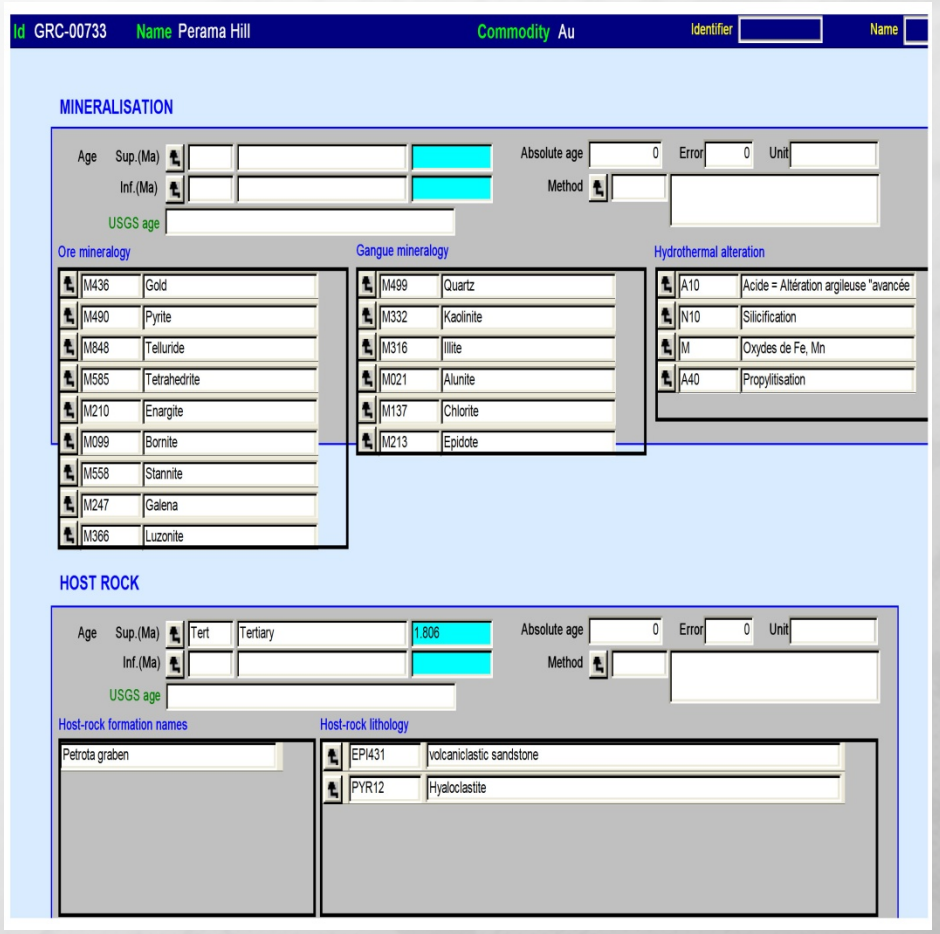


General Information

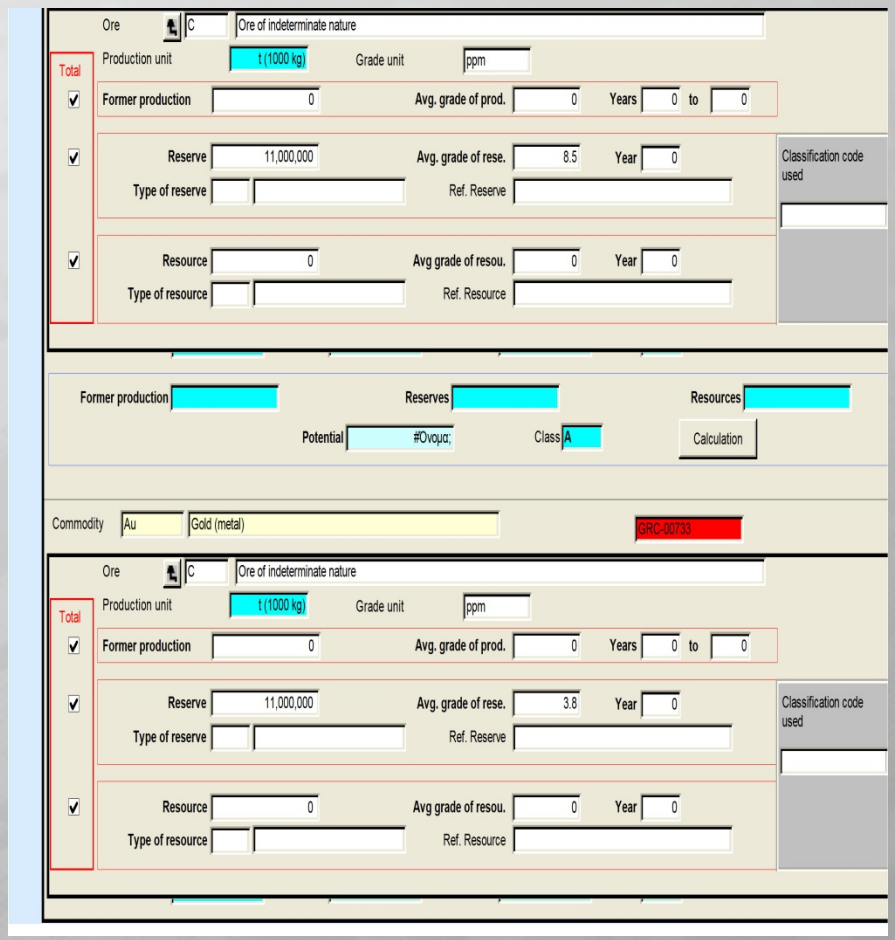


Deposit

Mineral Database



Mineralization / Rocks



Economy

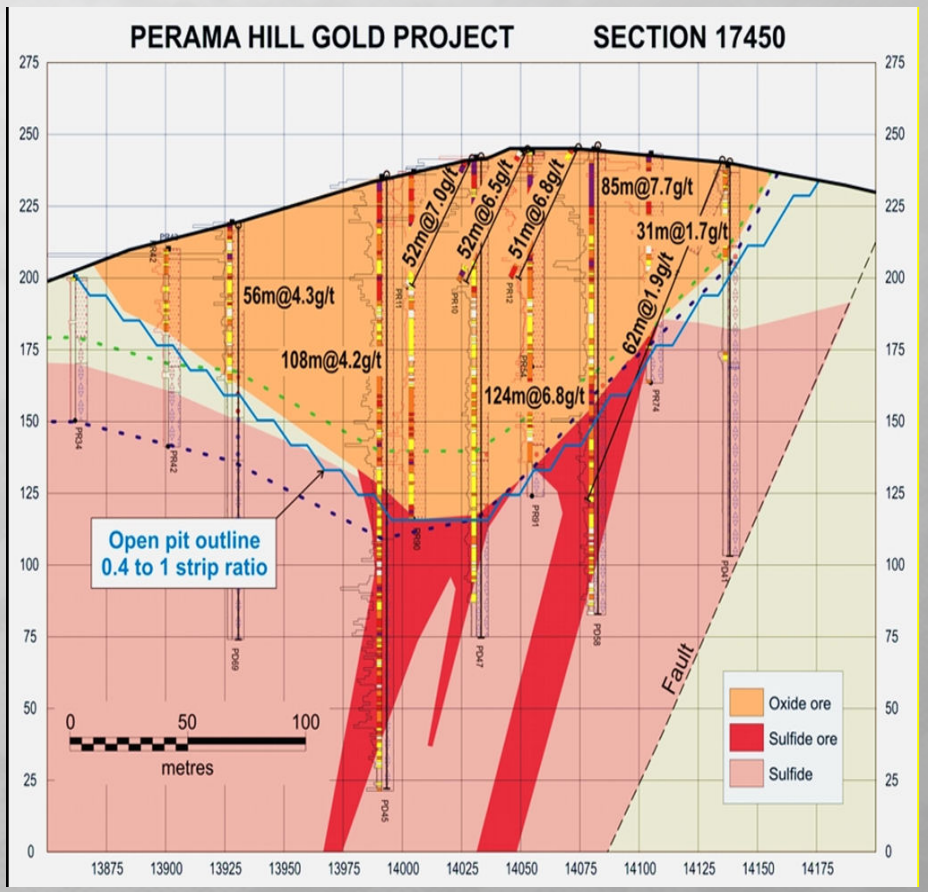
Mineral Database

Id GRC-00733 Name Perama Hill Commodity Au Identifier Name

Details about geology (free text)

Perama Hill is a high sulphidation deposit hosted by tertiary sandstones (Lescuyer J.L.et.al. 2003) and is located on the east margin of Petrota graben.Perama gold mineralisation is related the late Eocene-Oligocene volcanism in the Rhodope massif.Gold mineralisation is associated with a series of wide (>1,5m) to narrow (few cm) milky quartz-barite veins and stockwork veining in the vuggy silica block.Gold in microsized was also found disseminated in the surrounding altered (oxide mineralisation) epiclastic sandstones (Lescuyer J.L.et.al. 2003)
After Michael C. 2004 Perama gold deposit occurs at the intersection of NS and NW trending epithermal zones.These structures represent the higher grade "feeder" system.
After Lescuyer J.L.et.al. 2003 the Perama Hill deposit is "mushroom shaped" oxide ore with 700m length (N-S) and up to 120m depth sandstone-filled depression.Beneath the oxide ore the deposit contain sulphide mineralisation by pyritised andesite breccia.

Details about economy (free text)

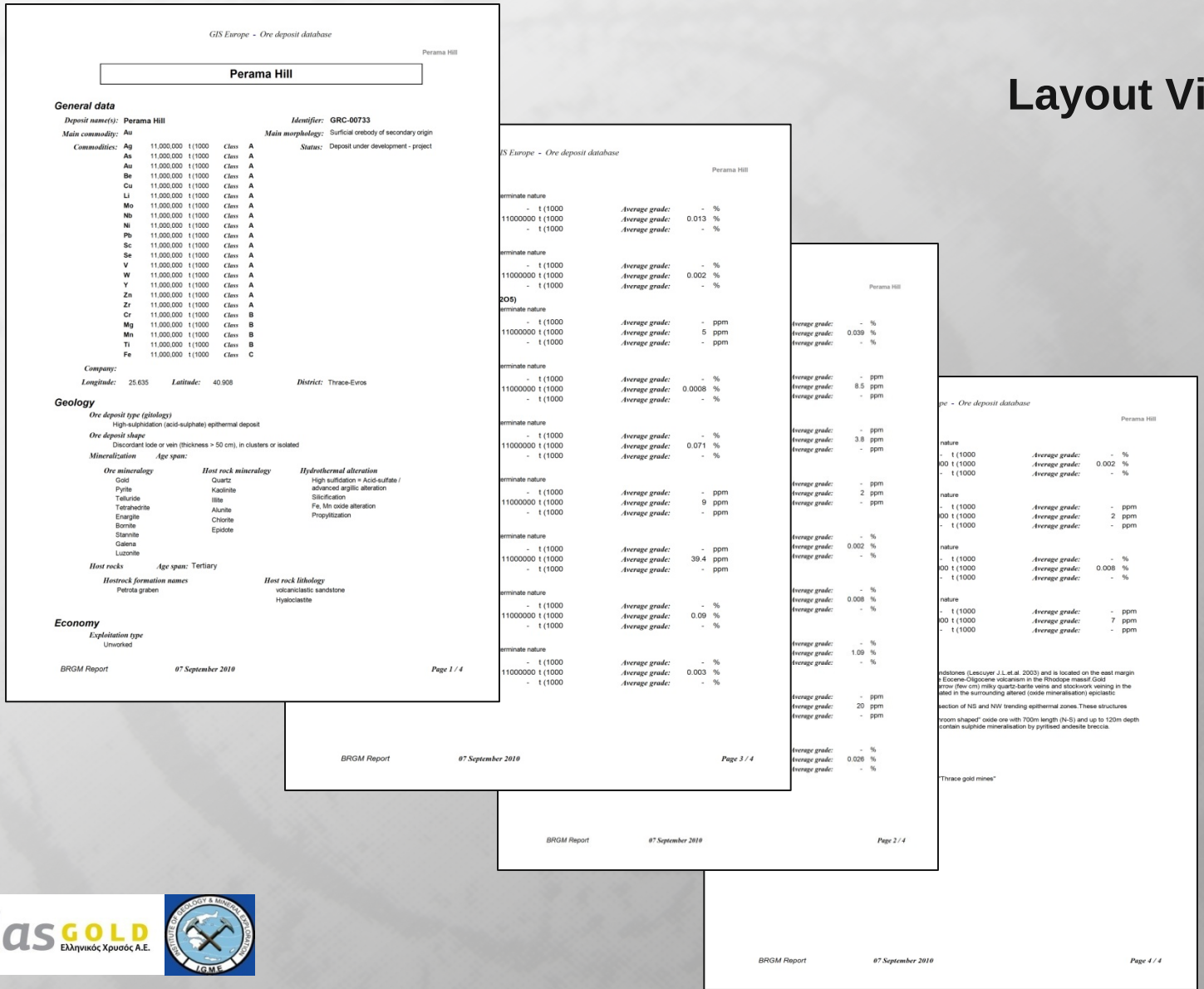


Comments

Iconography

Mineral Database

Layout View



GIS Europe - Ore deposit database

Perama Hill

Perama Hill

General data

Deposit name(s): Perama Hill
Identifier: GRC-00733
Main commodity: Au
Main morphology: Surficial orebody of secondary origin
Commodities: Ag 11,000,000 t (1000 Class A; As 11,000,000 t (1000 Class A; Au 11,000,000 t (1000 Class A; Be 11,000,000 t (1000 Class A; Cu 11,000,000 t (1000 Class A; Li 11,000,000 t (1000 Class A; Mo 11,000,000 t (1000 Class A; Nb 11,000,000 t (1000 Class A; Ni 11,000,000 t (1000 Class A; Pb 11,000,000 t (1000 Class A; Sc 11,000,000 t (1000 Class A; Se 11,000,000 t (1000 Class A; V 11,000,000 t (1000 Class A; W 11,000,000 t (1000 Class A; Y 11,000,000 t (1000 Class A; Zn 11,000,000 t (1000 Class A; Zr 11,000,000 t (1000 Class A; Cr 11,000,000 t (1000 Class B; Mg 11,000,000 t (1000 Class B; Mn 11,000,000 t (1000 Class B; Ti 11,000,000 t (1000 Class B; Fe 11,000,000 t (1000 Class C
Status: Deposit under development - project
Company:
Longitude: 25.635 *Latitude:* 40.908 *District:* Thrace-Evros

Geology

Ore deposit type (gitology)
High-sulphidation (acid-sulphate) epithermal deposit
Ore deposit shape
Discordant lode or vein (thickness > 50 cm), in clusters or isolated
Mineralization *Age span:*

Ore mineralogy	Host rock mineralogy	Hydrothermal alteration
Gold	Quartz	High sulfidation = Acid-sulfate / advanced argillic alteration
Pyrite	Kaolinite	Silicification
Telluride	Illite	Fe, Mn oxide alteration
Tetrahedrite	Alunite	Propylitization
Enargite	Chlorite	
Bornite	Epidote	
Stannite		
Galena		
Luzonite		

Host rocks *Age span:* Tertiary

Hostrock formation names
Petrota graben

Host rock lithology
volcaniclastic sandstone
Hyaloclastite

Economy

Exploitation type
Unworked

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GIS Europe - Ore deposit database

Perama Hill

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Perama Hill

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GIS Europe - Ore deposit database

Perama Hill

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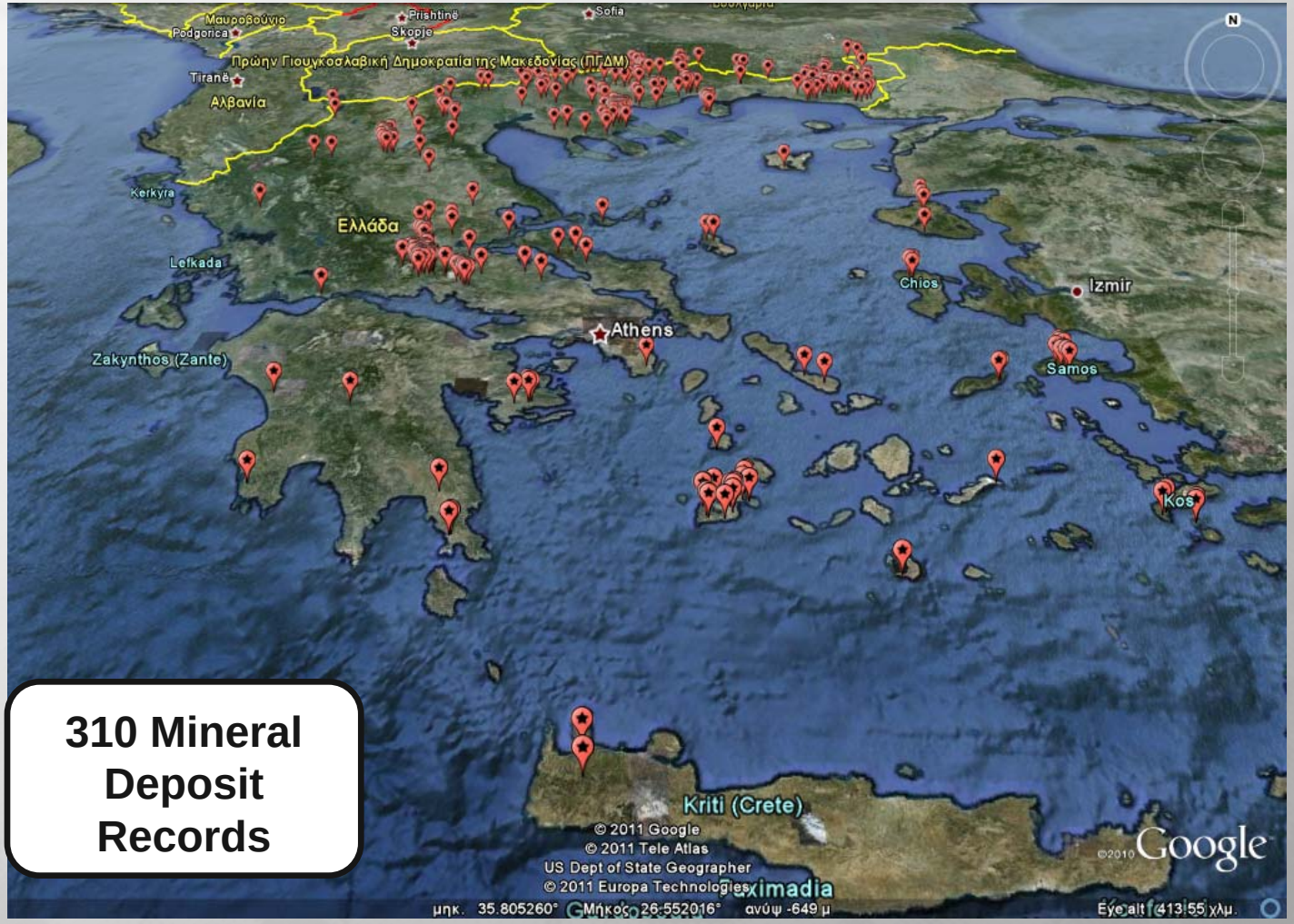
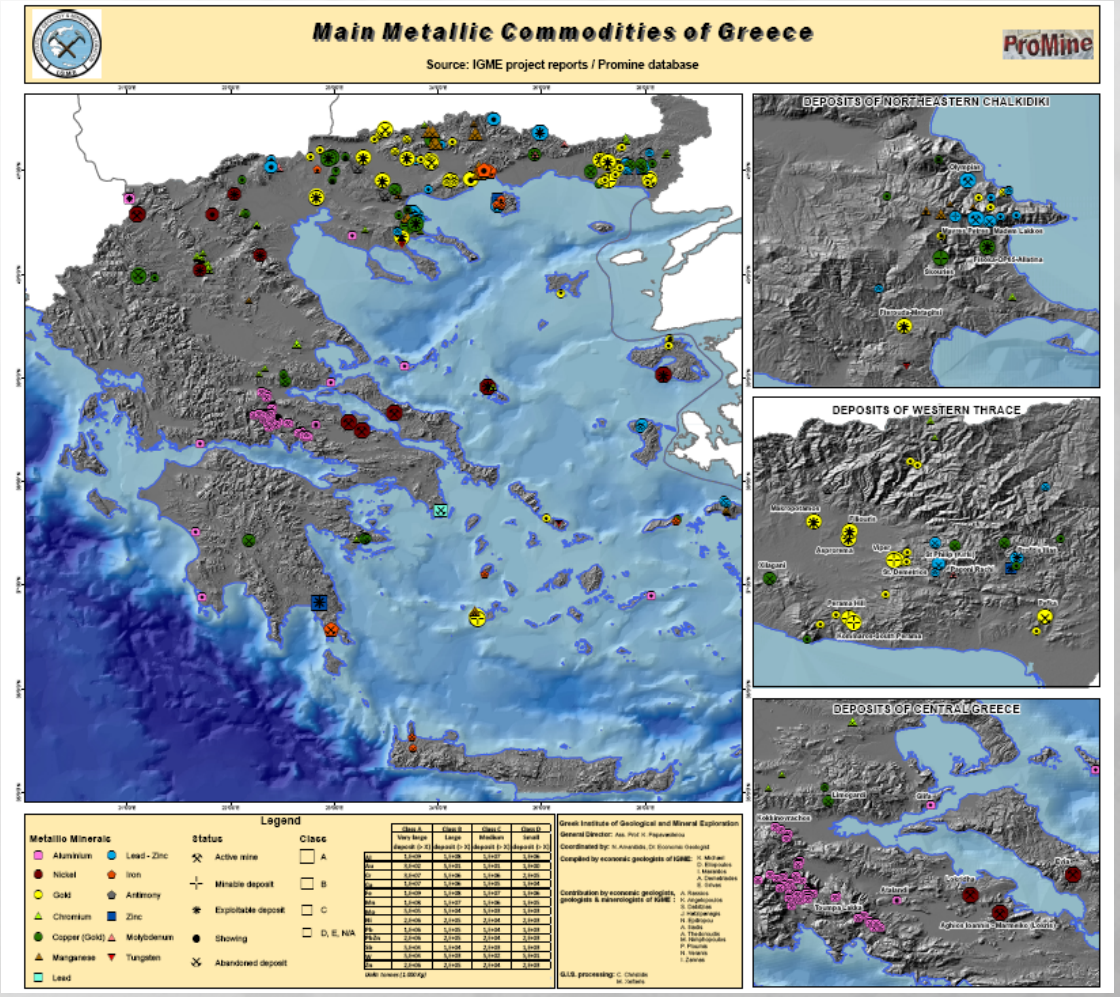
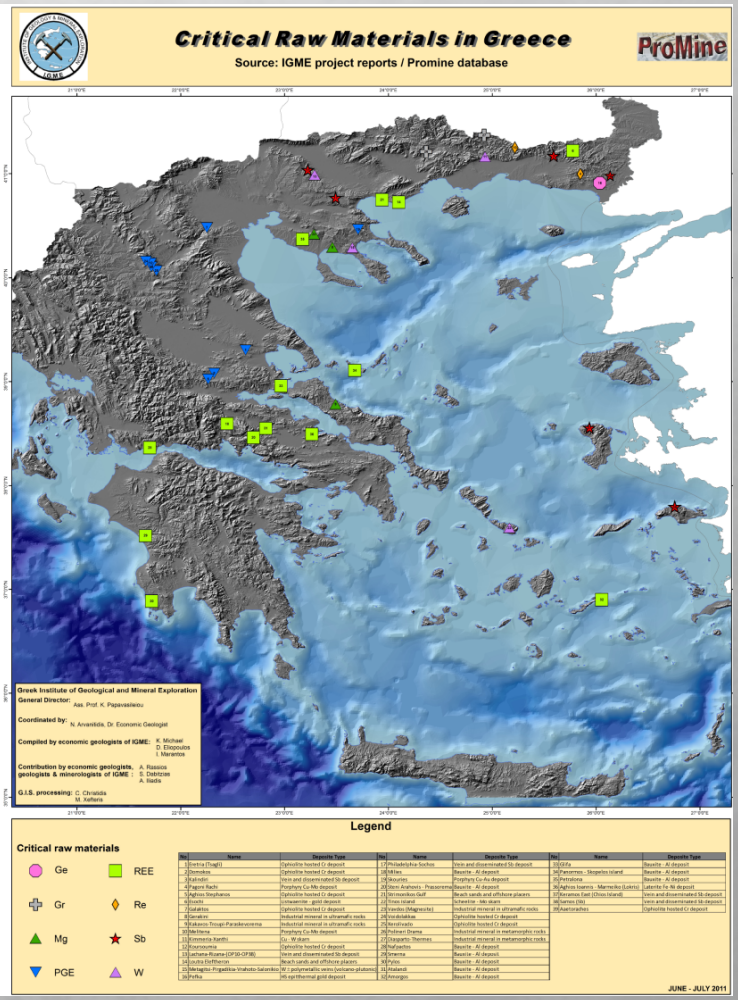
Total database inputs



310 Mineral Deposit Records

Mineral Commodities & Critical Raw Materials





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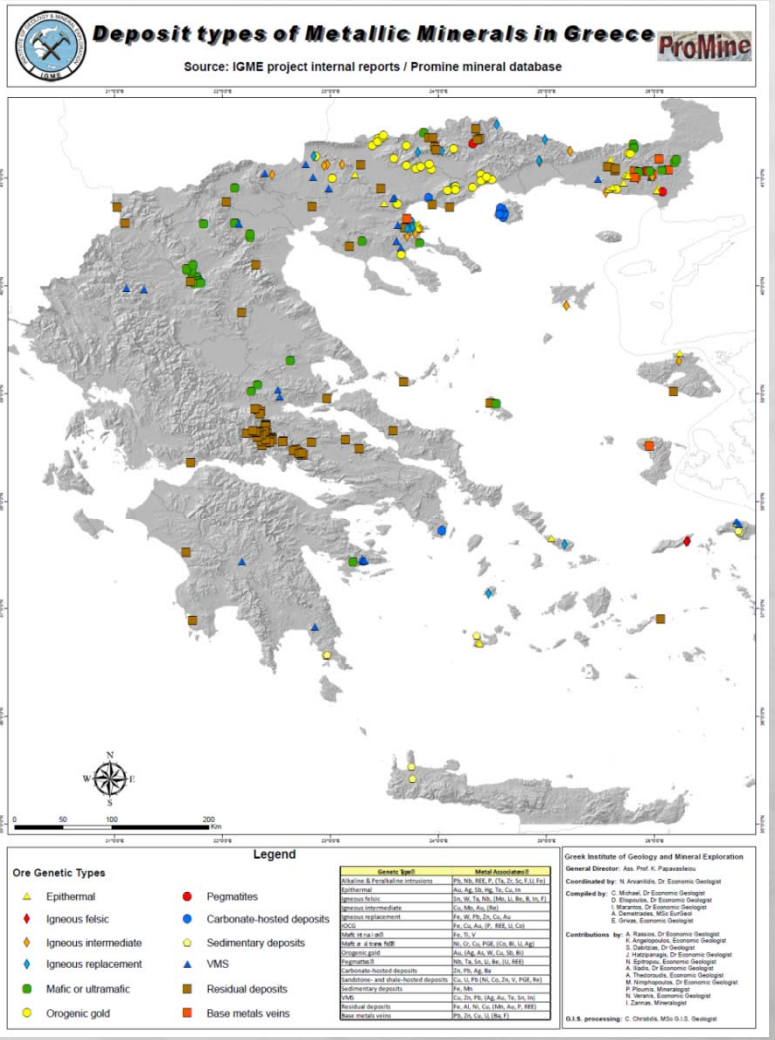
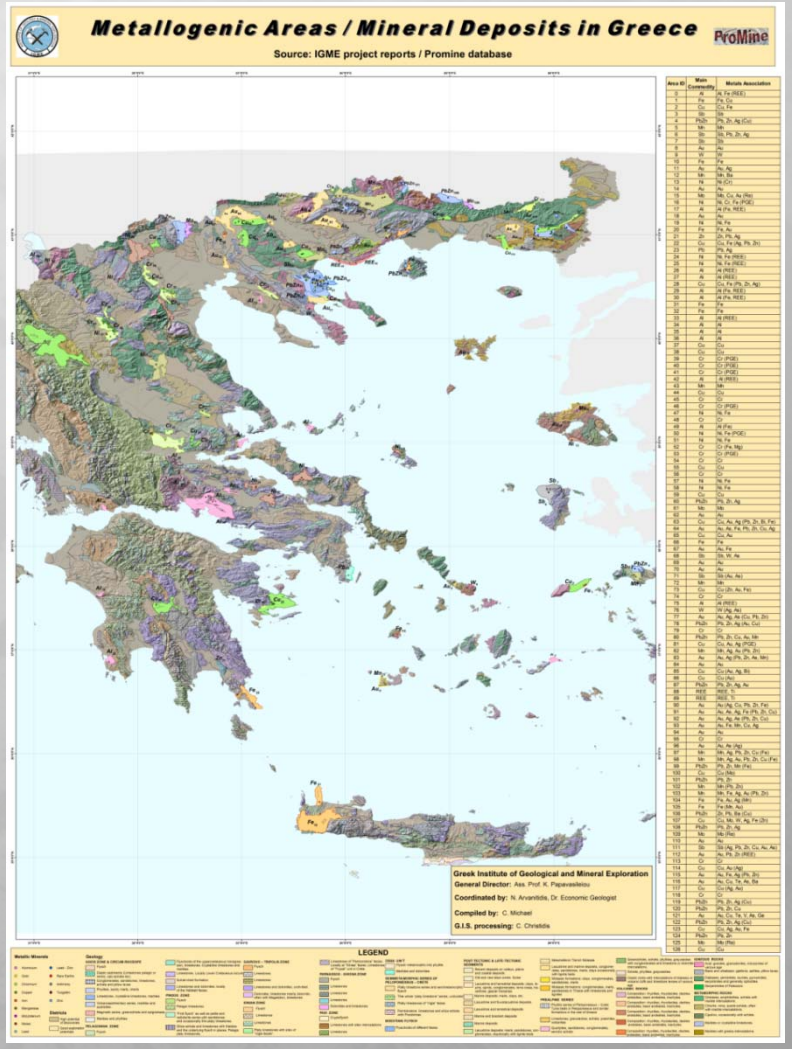
IGME

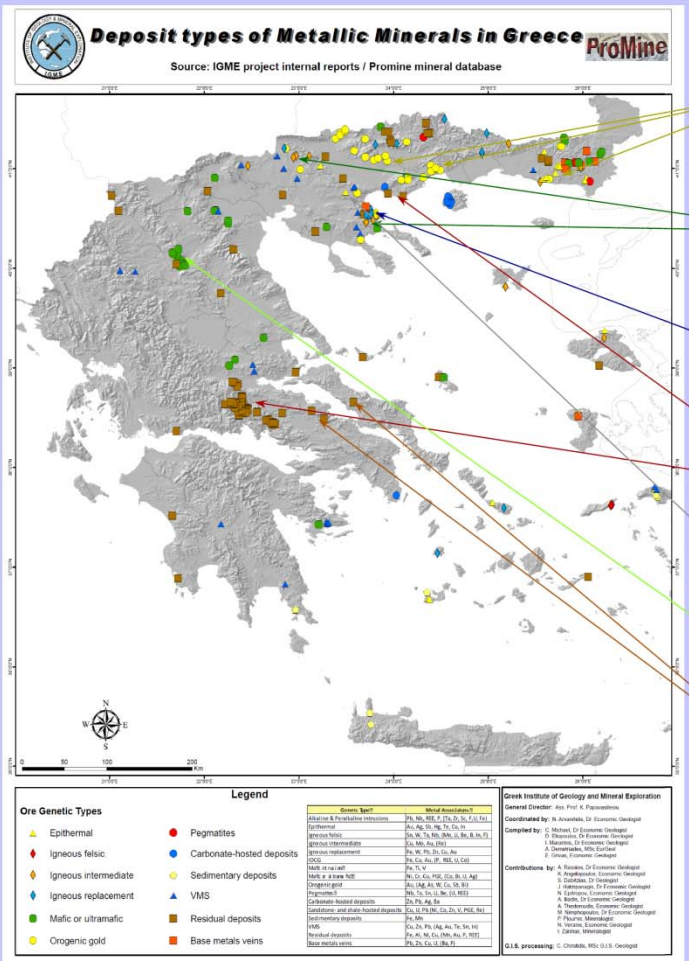
SEVENTH FRAMEWORK PROGRAMME

Metallogenetic districts based on PROMINE classification





“Hot” metallic commodities for Greece



High potential areas for Au discoveries

High potential areas for Cu discoveries

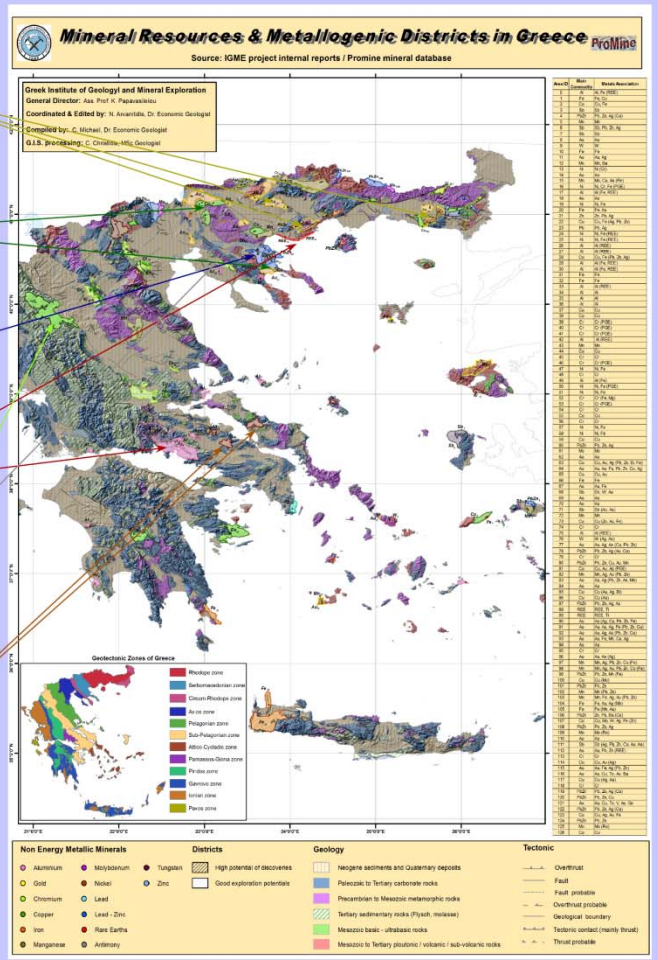
High potential areas for Pb, Zn, Ag discoveries

High potential areas for REE discoveries

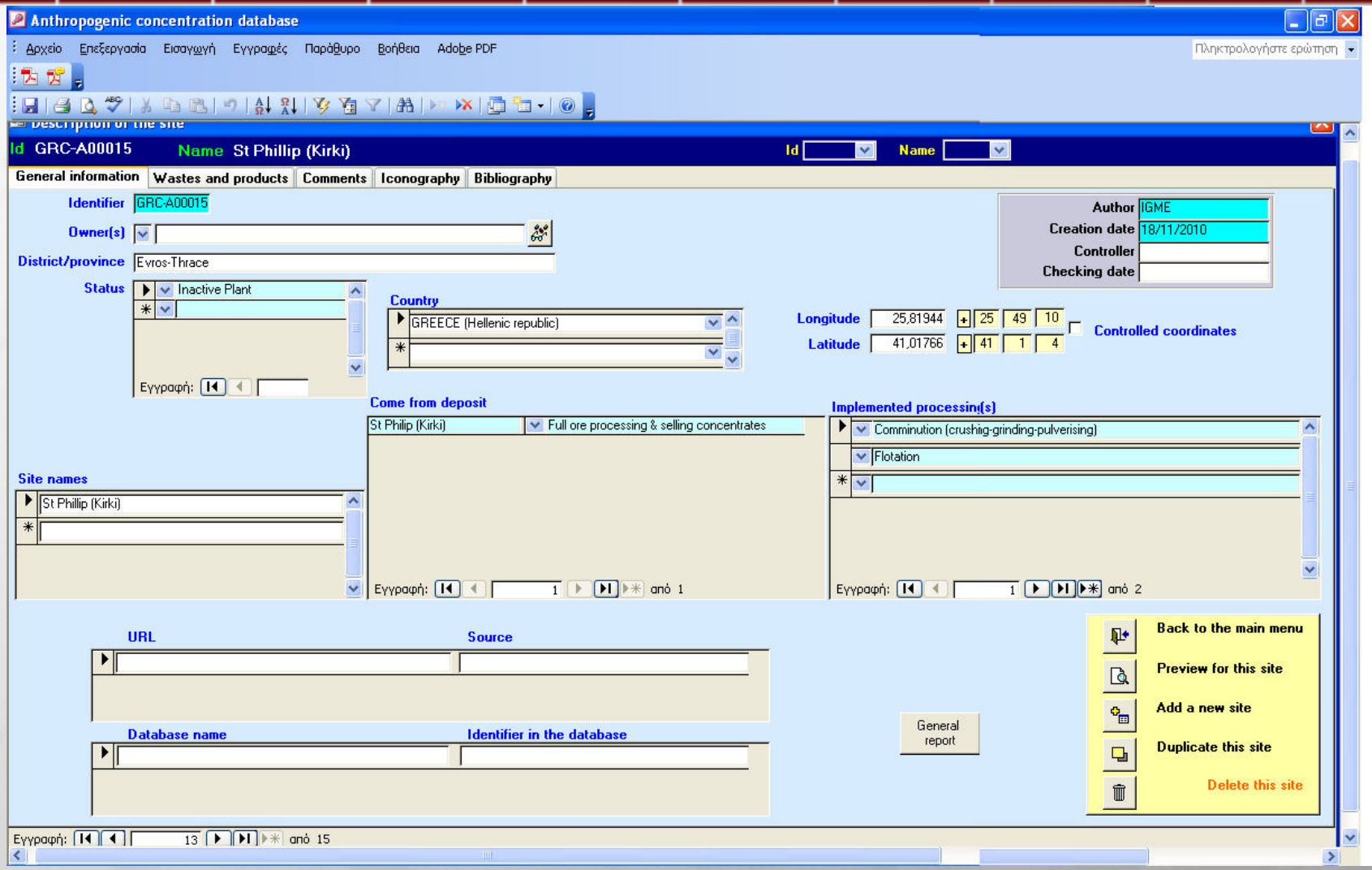
High potential areas for Sb discoveries

High potential areas for Cr discoveries

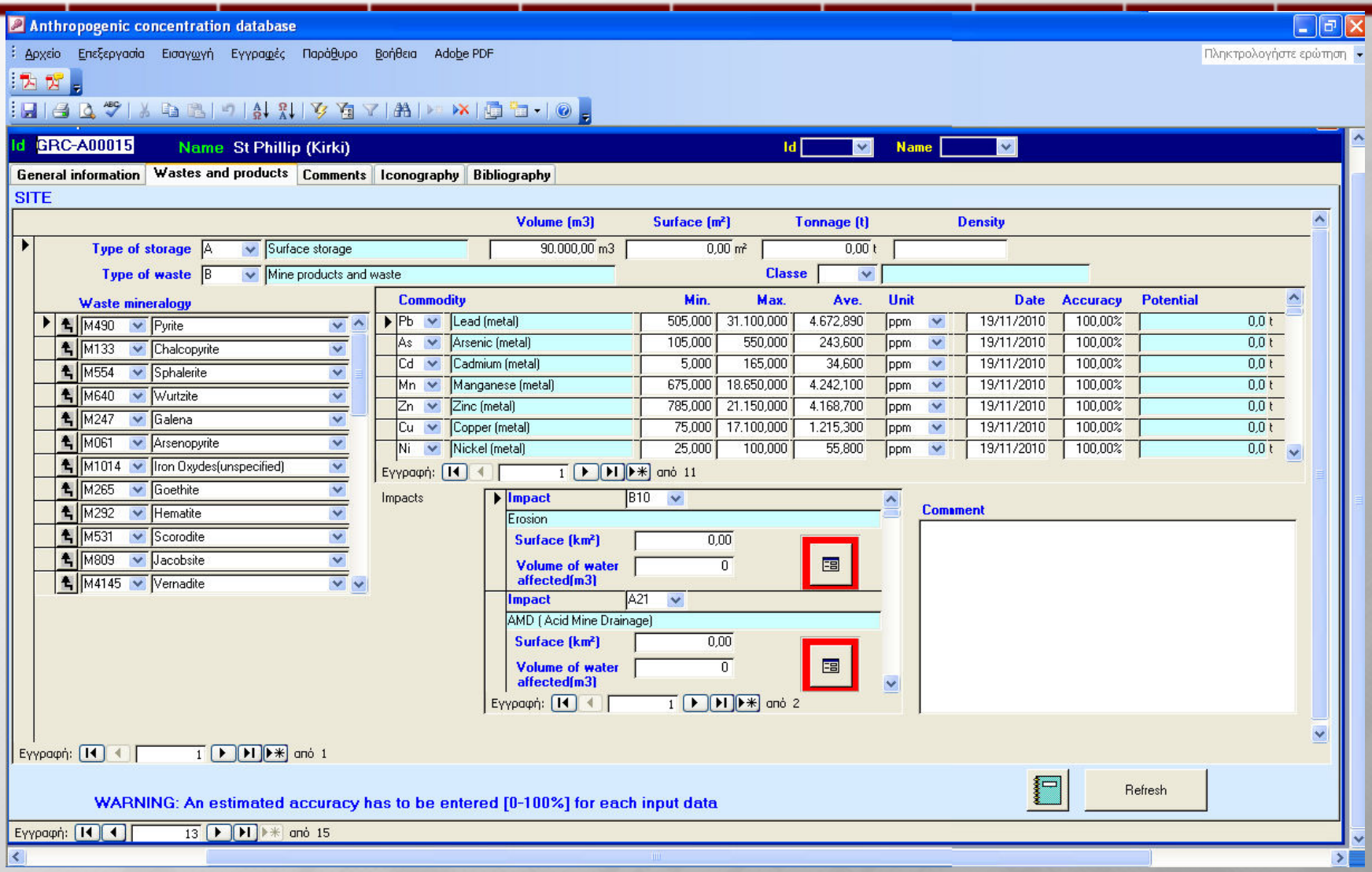
High potential areas for Ni discoveries



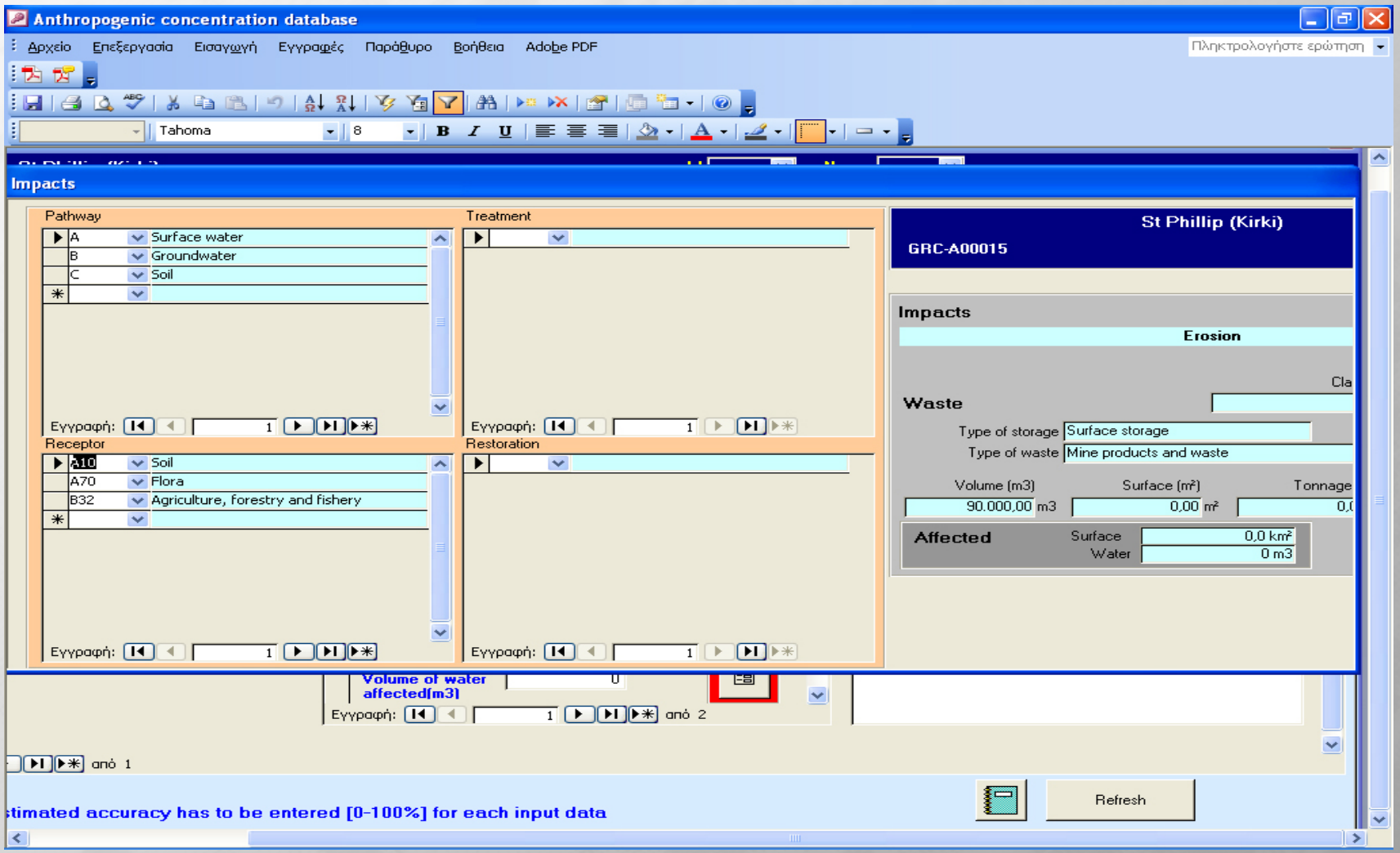
Anthropogenic Database



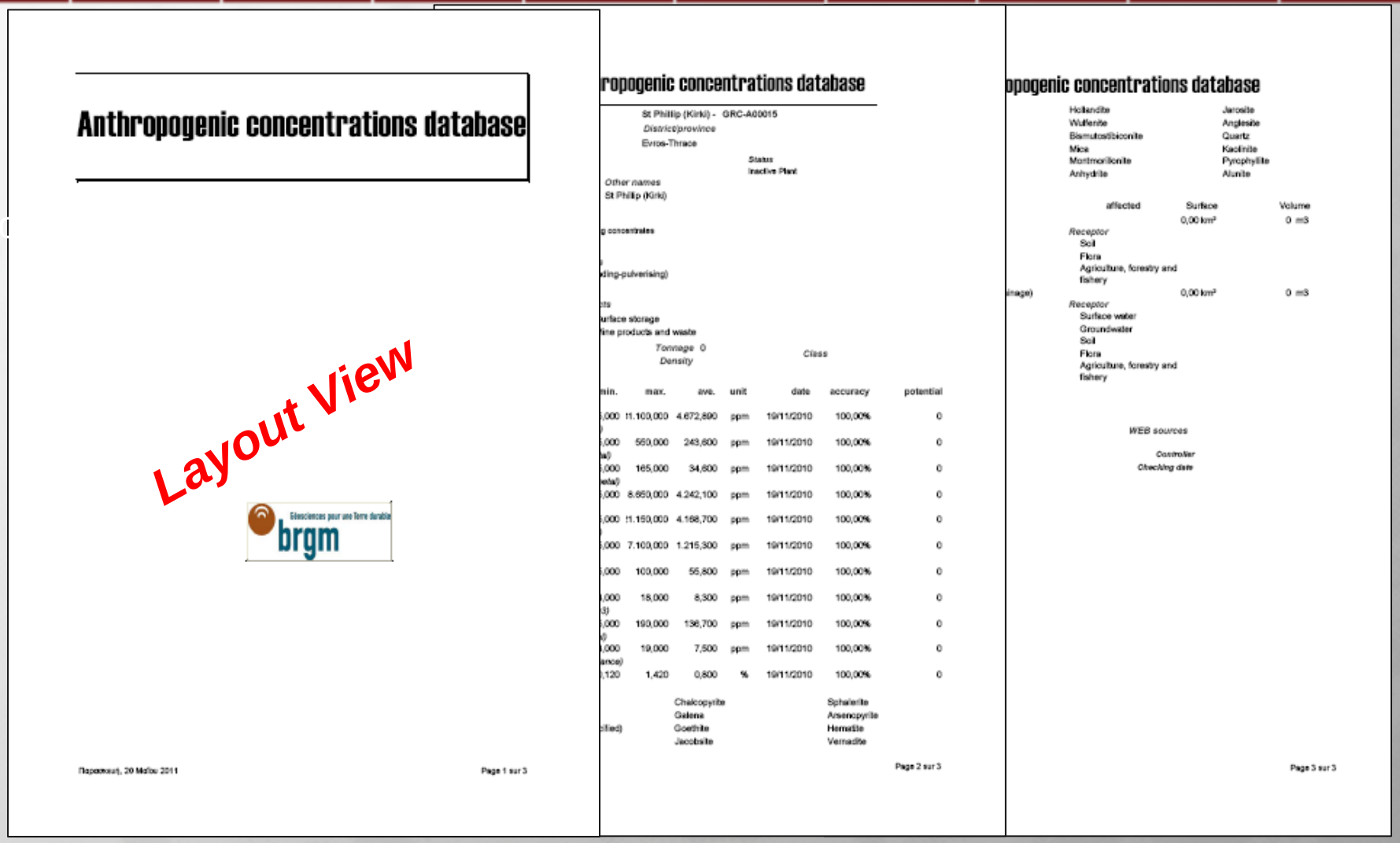
Anthropogenic Database



Anthropogenic Database



Anthropogenic Database



Anthropogenic concentrations database

Layout View

brgm

Παρασκευή, 20 Μαΐου 2011

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ropogenic concentrations database

St Phillip (Kirki) - GRC-A00015

District/province

Evros-Thrace

Status

Inactive Plant

Other names

St Phillip (Kirki)

	min.	max.	ave.	unit	date	accuracy	potential
	,000	11.100,000	4.672,890	ppm	19/11/2010	100,00%	0
	,000	550,000	243,600	ppm	19/11/2010	100,00%	0
	,000	165,000	34,800	ppm	19/11/2010	100,00%	0
	,000	8.860,000	4.242,100	ppm	19/11/2010	100,00%	0
	,000	11.150,000	4.168,700	ppm	19/11/2010	100,00%	0
	,000	7.100,000	1.215,300	ppm	19/11/2010	100,00%	0
	,000	100,000	55,800	ppm	19/11/2010	100,00%	0
	,000	18,000	8,300	ppm	19/11/2010	100,00%	0
	,000	193,000	138,700	ppm	19/11/2010	100,00%	0
	,000	19,000	7,500	ppm	19/11/2010	100,00%	0
	,120	1,420	0,800	%	19/11/2010	100,00%	0

Chalcopyrite, Galena, Goethite, Jacobsite, Sphalerite, Arsenopyrite, Hematite, Vernadite

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opogenic concentrations database

Hollandite, Wulfenite, Bismutostibiconite, Mica, Montmorillonite, Anhydrite, Jarosite, Anglesite, Quartz, Kaolinite, Pyrophyllite, Alunite

	affected	Surface	Volume
		0,00 km²	0 m3
Receptor			
Soil			
Flora			
Agriculture, forestry and fishery			
		0,00 km²	0 m3
Receptor			
Surface water			
Groundwater			
Soil			
Flora			
Agriculture, forestry and fishery			

WEB sources

Controller

Checking date

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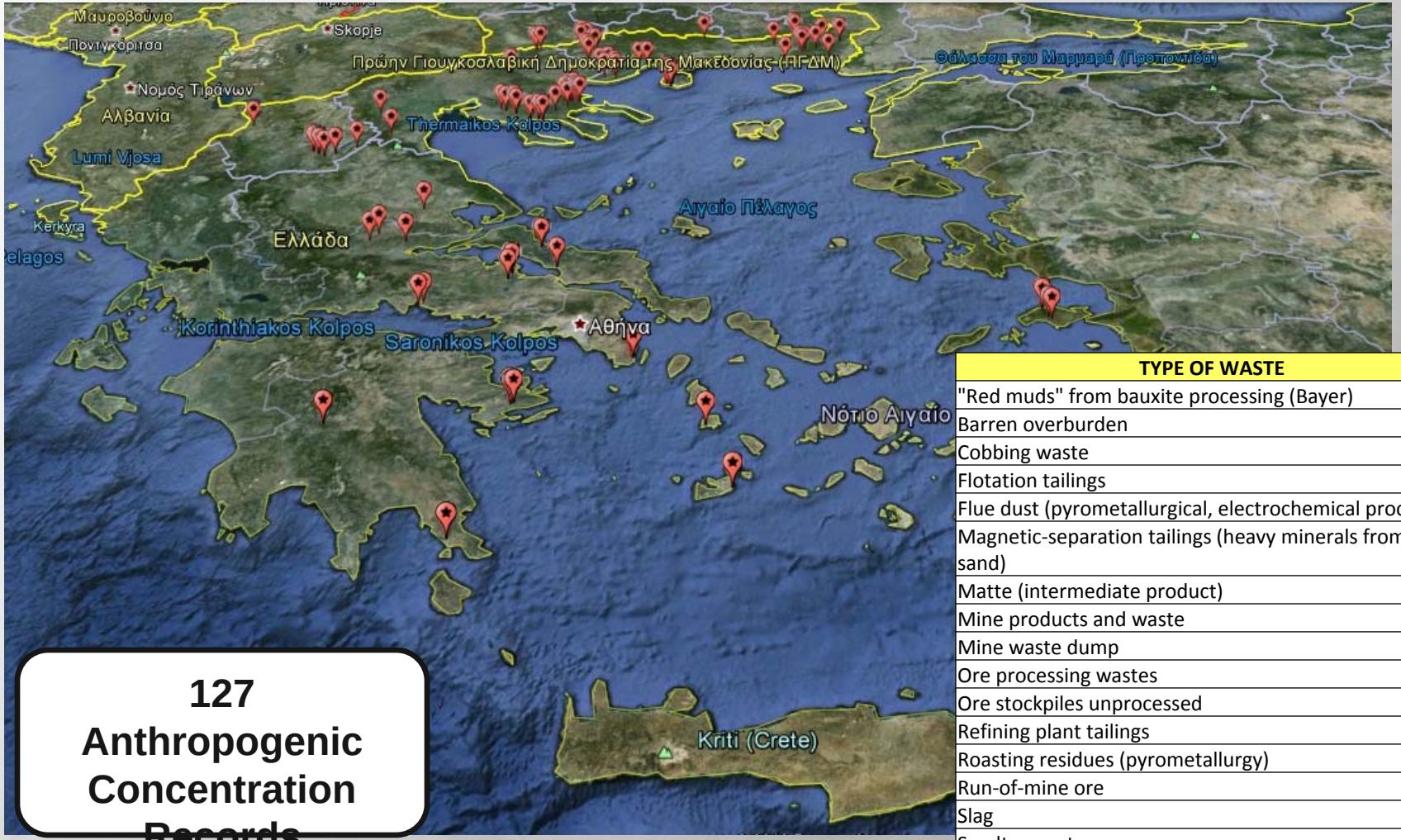
I.G.M.E.

SEVENTH FRAMEWORK PROGRAMME

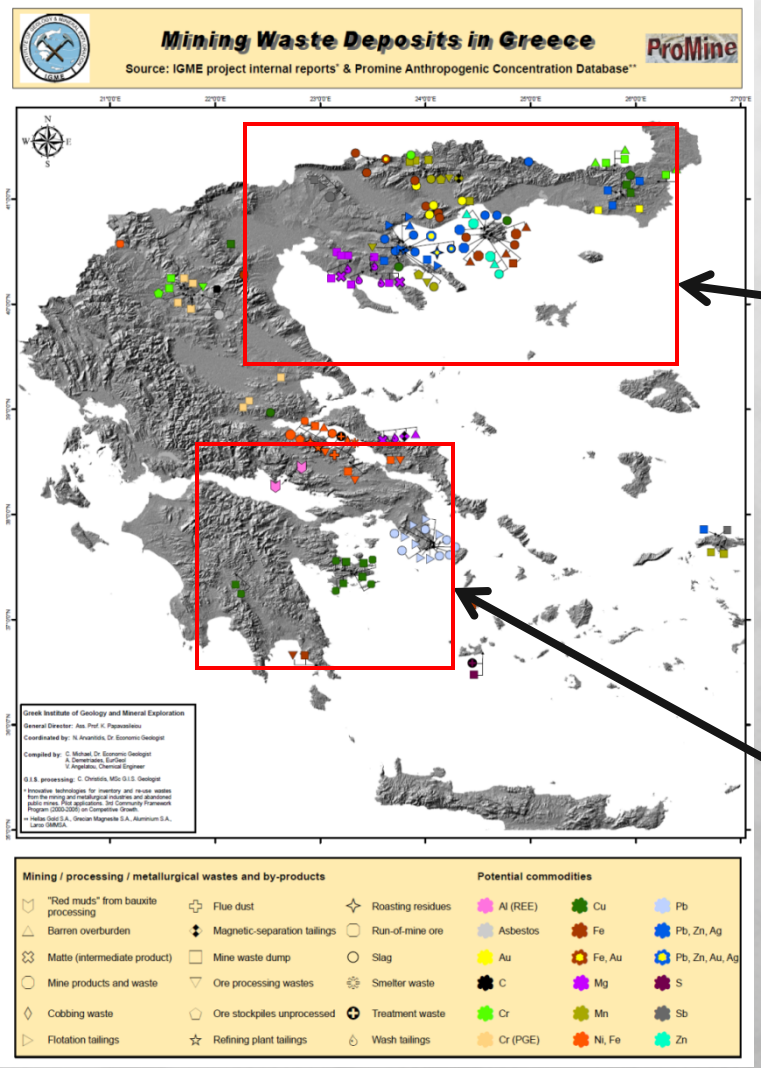
Total AC database inputs

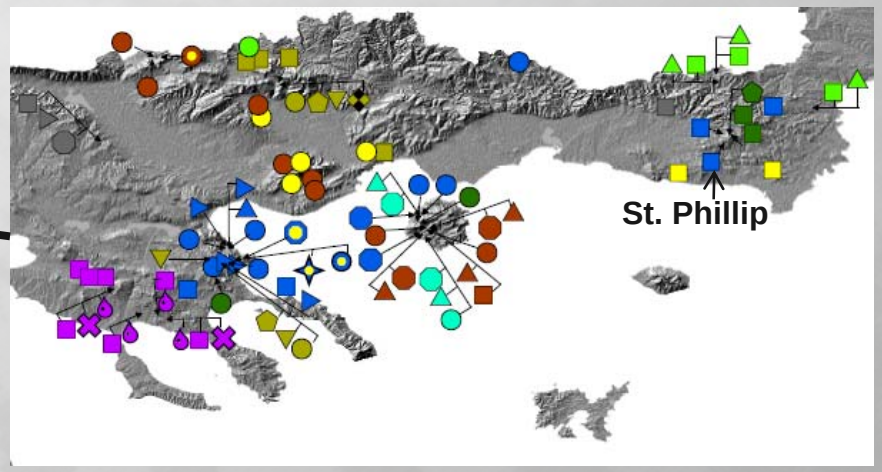


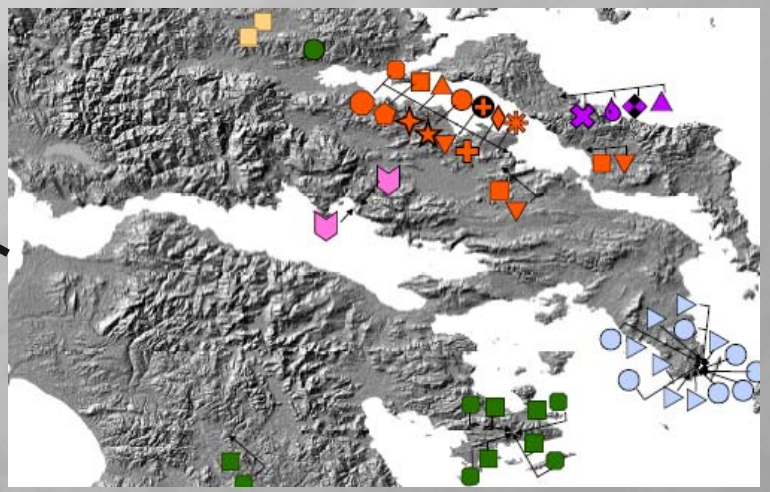
127 Anthropogenic Concentration Records

TYPE OF WASTE	NUMBER
"Red muds" from bauxite processing (Bayer)	2
Barren overburden	12
Cobbing waste	1
Flotation tailings	15
Flue dust (pyrometallurgical, electrochemical processes)	1
Magnetic-separation tailings (heavy minerals from glass sand)	2
Matte (intermediate product)	3
Mine products and waste	10
Mine waste dump	57
Ore processing wastes	8
Ore stockpiles unprocessed	5
Refining plant tailings	1
Roasting residues (pyrometallurgy)	2
Run-of-mine ore	8
Slag	38
Smelter waste	1
Treatment waste (metallurgical residues & slags, etc.)	2
Wash tailings	5
Total	**173**

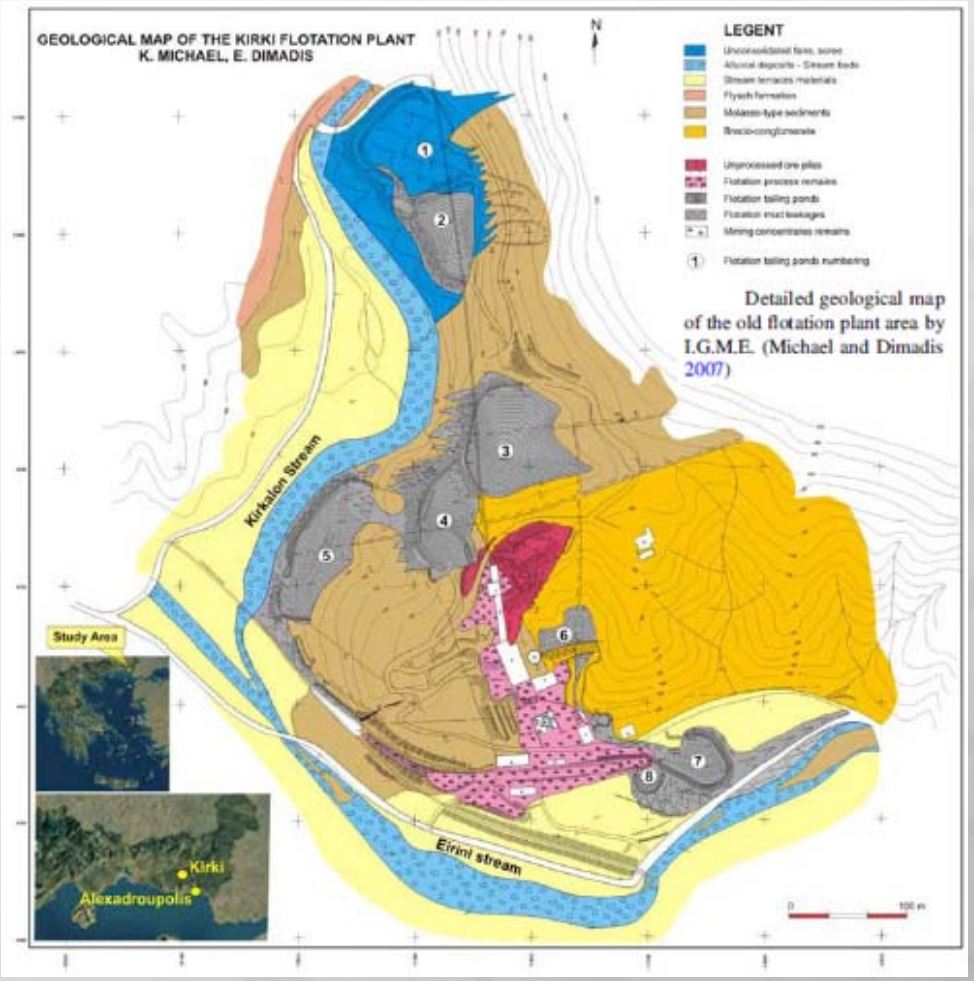
Mining waste deposits in Greece upon PROMINE classification







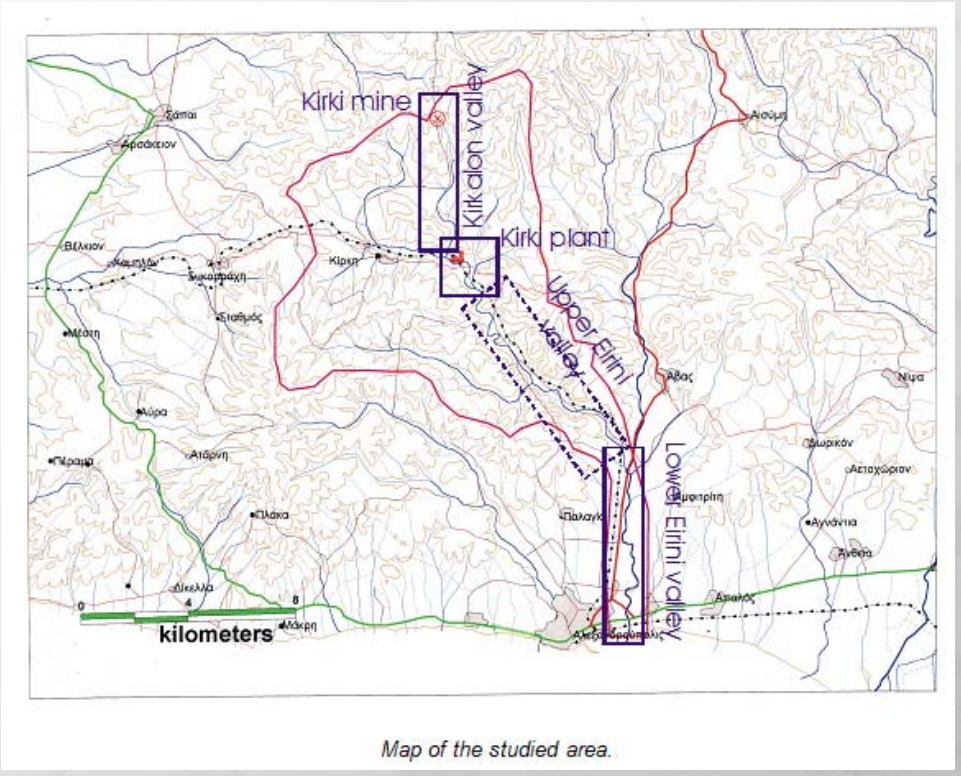
AD – St. Phillip



Detailed geological map of the old flotation plant area by I.G.M.E. (Michael and Dimadis 2007)

Mud overflowing from tailings pond extending to pond

AC database – St. Phillip

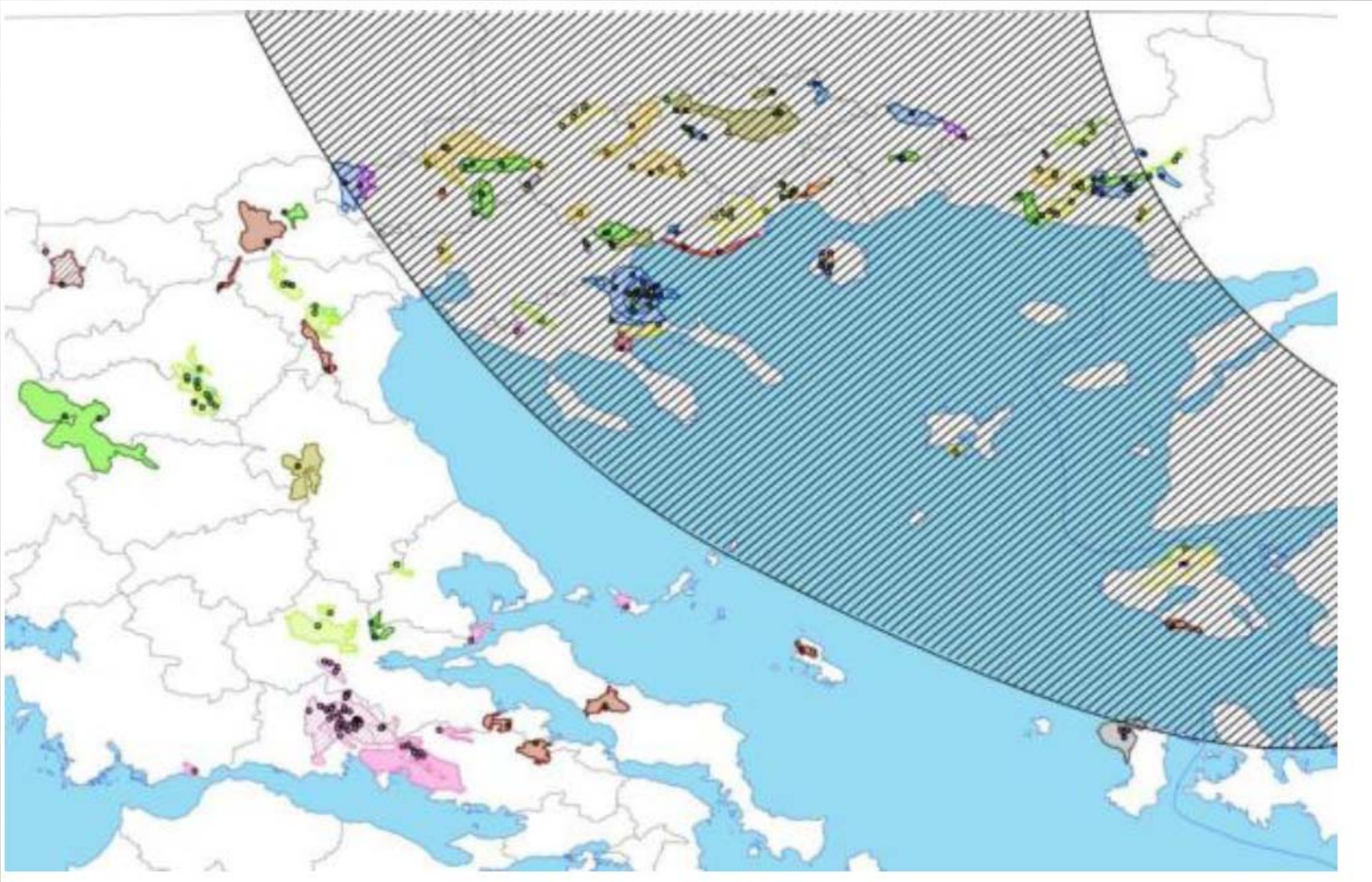


Map of the studied area.

St. Phillip mining area showing the location of open pit

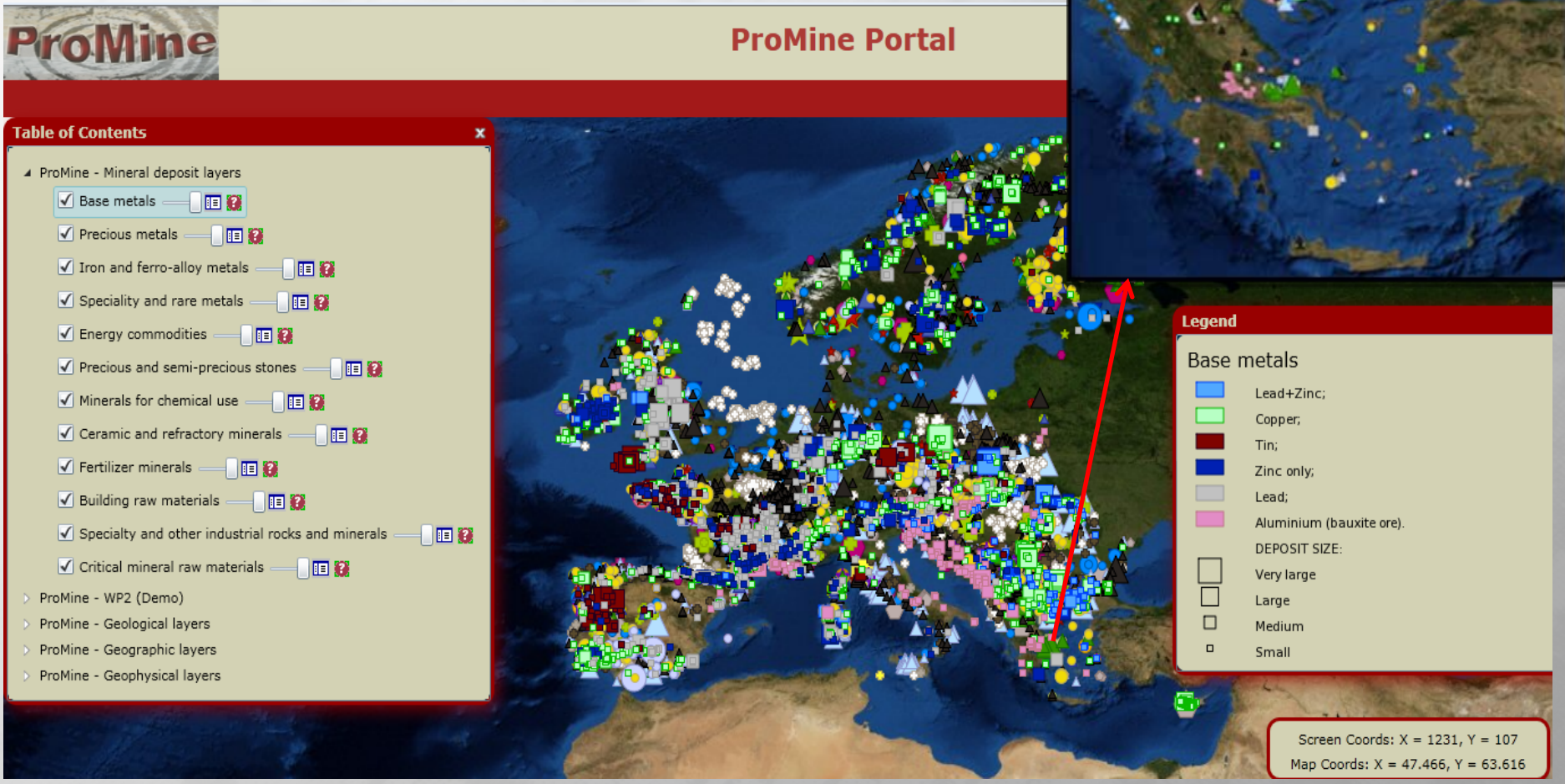
Mining waste pile dumped downstream

PREDICTIVE MODELLING

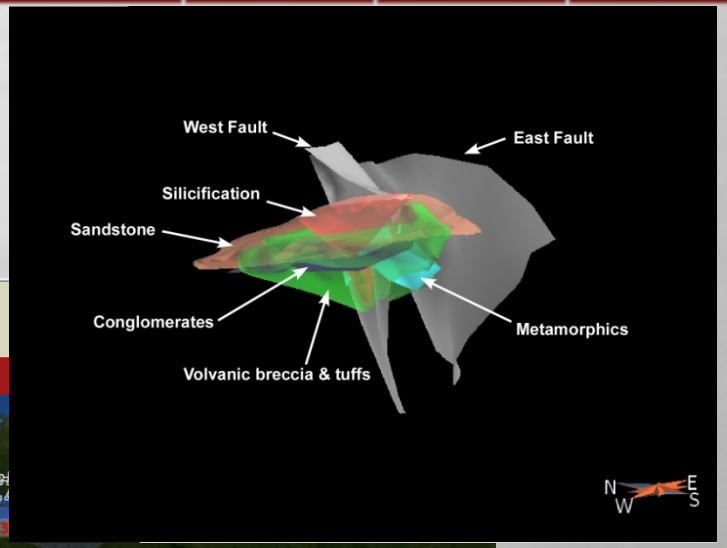


PROMINE Portal

http://ptrarc.gtk.fi/ProMine/default.aspx



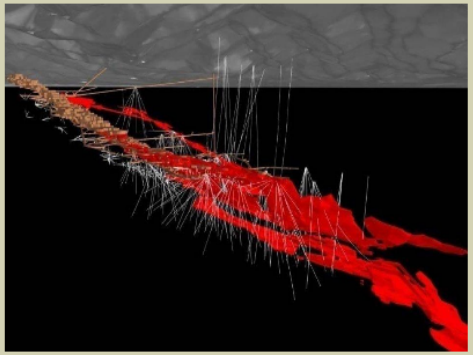
PROMINE Portal



ProMine Portal

GetFeatureInfo results

Southeastern Europe – The Balkans



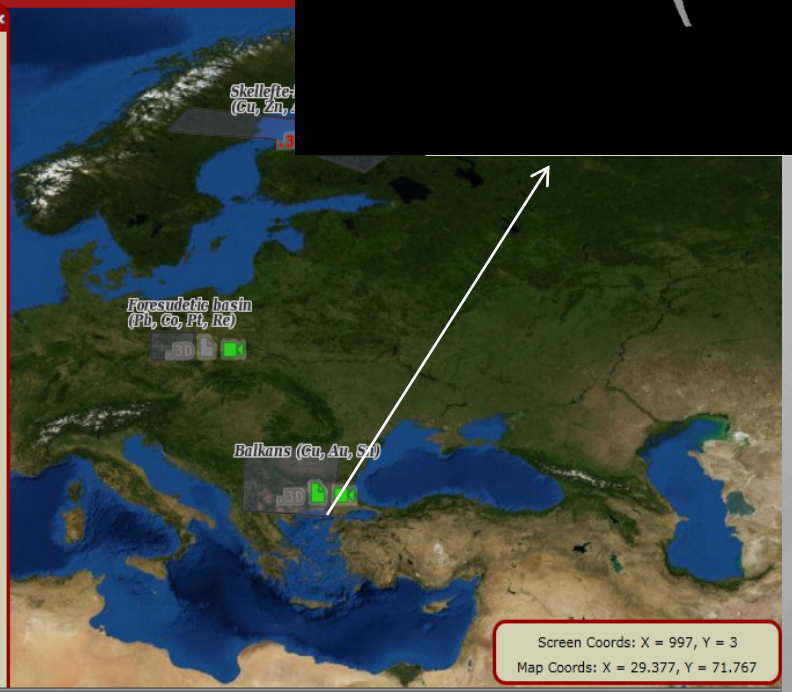
Place a text here to briefly present the belt/district, it's general geological descritpion, mining activity and history.

A short description of the work done within the framework of ProMine, should be presented, with list of available 3D/4D models and some basic information on each of them.

Data download

Link to public access data

Link to restricted access data (login and password required)



Thank you for your attention

thes.igme.gr

www.igme.gr

www.hellas-gold.com

In memory of Gabor Gaal