

Access to raw materials



EARTH OBSERVATION FOR RAW MATERIALS: ACTIVITIES OF EOEG

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Earth Observation and Geohazards Expert Group

40 Years Listening to the Beat of the Earth



- 1. Earth Observation and Geohazards Expert Group (EOEG)
- 2. Earth Observation for Raw materials
 - Mineral /geological mapping
 - Mining monitoring
- 3. Potential research and development needs, EGS community building



1. Earth Observation and Geohazards Expert Group

Mission and vision

28 GSs

- Apply Earth Observation technology to improve delivery of geoscience information on geohazards and raw materials
- Deliver harmonized Earth Observation based geo-information improving/increasing the operational capacity and economic capabilities of governments, institutions, organizations, businesses and individuals.





Morocco & Algeria 17-23 October 2016



2. Earth Observation and Geohazards Expert Group

TWO MAIN ACTIVITIES:

- Geohazards: subsidence and landslide WG
- Earth Observation and raw materials/minerals WG











Mining waste mapping derived from hyperspectral data and field meaurements







Mineral mapping



Mineral thematic map showing surface geological materials from hyperspectral data

Sokolov Lignite Open-Pit Mines, Czech Republic



HigherQuartz content

Notesco, G. – Kopačková V. – Rojík, P. – Schwartz, G. – Livne, I. – Ben-Dor, E. (2014): Mineral Classification of Land Surface Using Multispectral LWIR and Hyperspectral SWIR Remote-Sensing Data. A Case Study over the Sokolov Lignite Open-Pit Mines, the Czech Republic. – Remote Sensing 6, 8, 7005-7025. ISSN 2072-4292 (on line). DOI 10.3390/rs6087005.



HigherPhyllosilicatescontent







Soil pH map derived from mineral association using hyperspectral imagery





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Sentinel-2 data preliminar evaluation for mineral mapping – partially successful









Simulation of EnMap data to test mineral mapping potential of the future hyperspectral satellite - EnMap





lignite

lignite



Geological mapping





Angola Geology map 1:250,000, Landsat 8, lineaments











Detection of underground coal mining subsidence in urban areas using Radar Interferometry: USCB (Poland, Bytom city)



Przyłucka, M.; Herrera, G.; Graniczny, M.; Colombo, D.; Béjar-Pizarro, M. Combination of Conventional and Advanced DInSAR to Monitor Very Fast Mining Subsidence with TerraSAR-X Data: Bytom City (Poland). Remote Sens. 2015, 7, 5300-5328.







Detection and monitoring of ground instabilities related to mining tailing dumps based on satellite radar interferometry



Herrera et al. Mapping ground movements in open pit mining areas using differential SAR interferometry. *International Journal of Rock Mechanics and Mining Sciences*, 2010, vol. 47, no 7, p. 1114-1125.







Monitoring mining activity every 12-6 days is possible Target: active mines, abandoned mines, mining waste and induced anthropogenic hazards











Acumulated displacement April – November 2015 of a waste dam









EOEG is contributing to build a community of remote sensing users and service developers in the industry of raw

materials and extractive industries, through:

- GEO-Cradle
- PanAfGeo collaboration with OAGS (Geological Surveys Africa)
- LATAM MOU with ASGMI (Geological Surveys Latinamerica)
- New Geo Community of Activity



