

IMPACT MONITORING OF MINERAL RESOURCES EXPLOITATION

www.impactmin.eu



Newsletter

3RD ISSUE

Table of contents

Editorial note	1
ImpactMin final event – International Symposium, Lulea	2
News from GEO and GEOSS	3
e-Training	4
Stakeholder events and recent workshops	5
Research roadmap and upcoming projects	7

Editorial note

What matters for people the most? What happens to their lives, their health? What happens in their environment? Mining is a disruptive activity that induces different perceptions amongst people affected by it. The European Commission, in light of the fact that we need up-to-date information on how mineral resources exploitation can be monitored and managed in a more innovative and efficient way, provided a grant for the Impact Monitoring of Mineral Resources Exploitation (ImpactMin) project. Over three years between 2010 and 2013, the ImpactMin project aimed to enhance our knowledge on the state of play in recent social-administrative and physical environment with regards to impact monitoring of mining. The project's Consortium has completed its mandate and reflected appropriately on the challenge that made its work. This last Newsletter of ImpactMin summarizes the outcomes of the project and its main outreach.

IMPACTMIN FINAL SYMPOSIUM

LULEÅ, Sweden, 27-28 November, 2012

Impact Monitoring of Mineral Resources Exploitation is one of the most exciting topics of raw materials and mineral resources sector. Two projects (ImpactMin and EO-miners, supported under the same FP7 call) have investigated the state-of-the-art methods for demonstrating best practices and revealed recent methodological and technical advancements in this field. ImpactMin and EO-miners consortia surfaced the current issues about how the environmental and social impacts interact and what kind of legislative aspects are in force this field.

In Europe, there are older and newer deposits and mining activities (extracting, processing) are ongoing with varying intensity.

Also, mine wastes and abandoned mining sites are still impacting their surroundings and



their future management is still to face proper regulation and reclamation actions. Recent research has shown that Europe, with a proper strategy, will continue mineral extraction at several old and new locations, thus research and legislative actions are needed for supporting the future sustainable raw material exploitation.

ImpactMin project presented showcase results how different mining environments (abandoned, pre-operational etc.) represents challenges from environmental and socio-economic point of view. The 48 registered participants at the ImpactMin's Final Symposium were able to hear more about research pathways from science and technology, responsible mining – in particular socio-economic survey results and implications and the



legislative aspects were highlighted from a pan-European perspective (Mining Waste Directive and Inventory) to national perspective (how environment legislation affects the competitiveness of the mining industry in Sweden).

New and cutting edge geochemical, geophysical and remote sensing tools and methods were presented on the second day of the Symposium. Furthermore, the audience could improve their view on how the intergovernmental coordination of Global Earth Observation System of Systems (GEOSS) is managed by the Group on Earth Observations (GEO). The Point of Contact, Mr. Stephane Chevrel (BRGM) discussed the actual mineral related task "Energy and Geo-resources Management" by GEO (more information later).

The Exhibition and Poster session of the Symposium was a great opportunity to share and discuss technological and methodological innovation from the Earth Observation and geospatial modeling sector.



[The presentations of the event are available to download from the ImpactMin project official website.](#)



ImpactMin project has been co-funded by the European Union's Seventh Framework Programme (FP7).

THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS (GEOSS)



Energy and Geo-Resources Management

The actual GEO (Group on Earth Observations) work plan has several new or restructured elements compared to the 2009-2011 WP. Currently, 26 tasks cover the previous 36 tasks in a new structure where significant steps to achieve the targets need to be taken along three main themes:

1. Infrastructure
2. Institution and Development
3. Information for Societal Benefits

In the “Infrastructure” part, the interoperability aspects got the emphasis whereas in the second theme “Institution and Development” the target is to raise awareness among the various scientific communities, engage them and also mobilize available resources in several means. In the “Information for Societal Benefits” theme the main concern is to consolidate and finalize the end-to-end information service systems to exploit the full benefits of GEOSS and its infrastructure.

As a result of intensive work, the programme partners from the EO-Miners consortium managed to achieve that “geo-resources” and “mining” currently are key words in the GEO WP 2012-2015.

This gave the opportunity for the ImpactMin project to appropriately contribute to this target driven work plan. The grand theme of “Impact Assessment of Human Activities” now contains the component “Impact Monitoring Systems for Geo-Resource Exploration and Exploitation”. Generally the focus under this component will be to aid the extractive industry in monitoring their activities with integrated space-borne, airborne and ground based EO data sets.

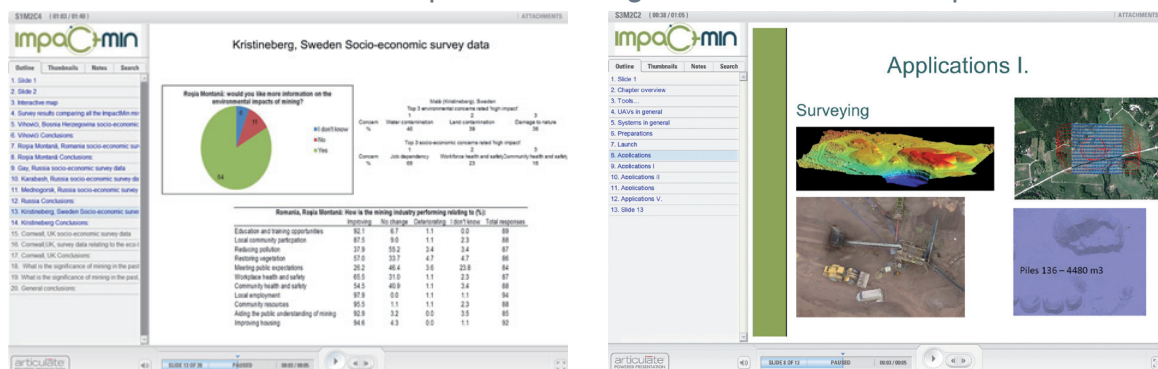
PRIORITY ACTIONS

- Develop new tools for impact monitoring of mining operations using Earth observations
- Integrate information from in-situ, airborne and satellite observation (through data assimilation) to provide impact diagnostics
- Identify and implement strategic measures for the competitive, reliable and sustainable management of geo-resources exploitation and treatment of re-usable materials, based on innovative monitoring and accounting methodologies
- Integrate often-sectoral monitoring approaches (and corresponding impact analysis) into a coherent approach, based on innovative Earth observation techniques (related to space-borne, airborne and ground-based sensor systems)

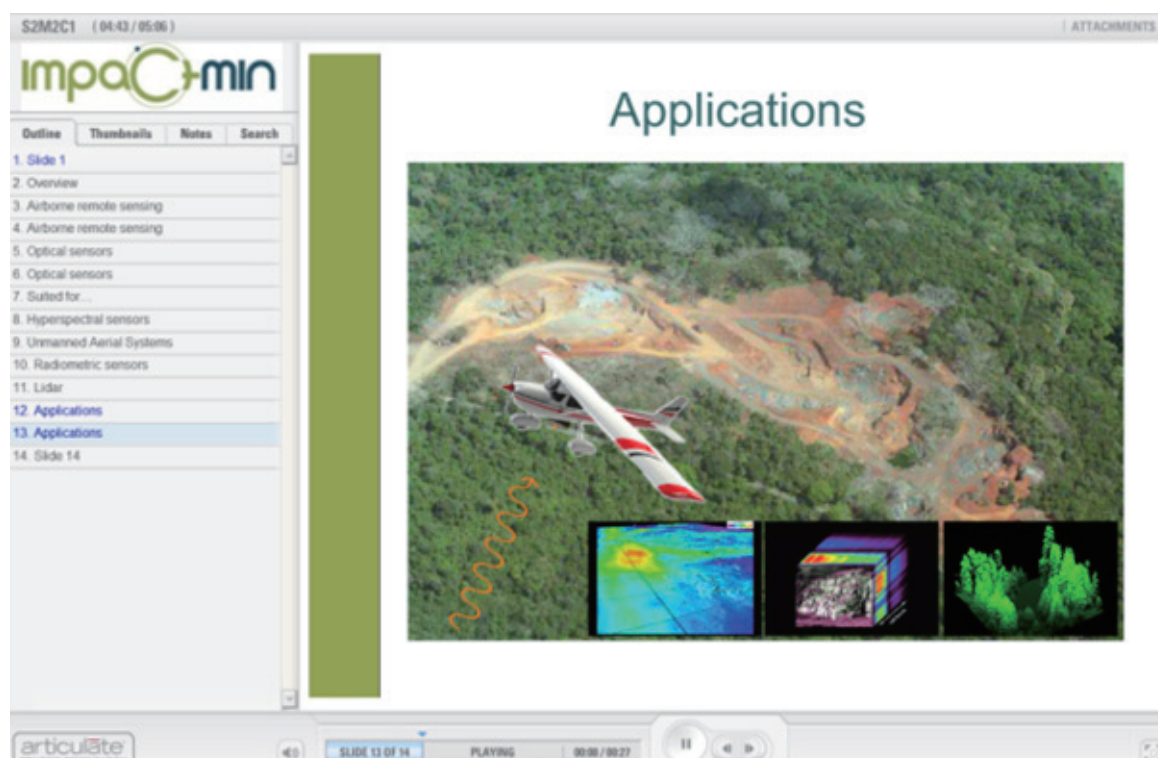
Point of Contact

Stephane Chevrel (BRGM)
e-mail: s.chevrel@brgm.fr

ImpactMin partners converted the accumulated research knowledge (background and foreground) into a digestible scientific learning material in electronic format. Different project outputs were addressed in the e-learning curriculum to remote sensing specialists and mining experts, so that these two groups can both learn something new. ImpactMin e-training facility is not only giving insight information on remote sensing and in-situ data acquisition and handling, but also shows the operational framework in which data is handled (e.g. INSPIRE on metadata, QA4EO on data documentary and GEOSS on data interoperability and sharing). Furthermore, Corporate Social Responsibility (CSR) is shown via real-life examples as well as socio-economic impacts of mining activities and their implications.



In order to make the training service and the ImpactMin info base up-to-date even after the finalisation of the project, the Project Coordinator keeps track of the feedback and requests concerning the websites and their contents. Maintenance includes distribution of passive curriculum and the update of the training material with upcoming research results.



STAKEHOLDER EVENTS AND WORKSHOPS

MOSTAR & ROSIA MONTANA



Workshop settings at the Faculty of Civil Engineering, University of Mostar, 2012



Presentation of GEO(SS) and ImpactMin by Roko Andricevic (Photon)

In Bosnia and Herzegovina the activities and results of ImpactMin project generated interest since the rehabilitation of the Vihovici mine site (one of the demonstration sites of the Project) and adjacent territories are still ongoing. On the 9th of November 2012, public authorities (Grad Mostar - PIU Projekt Vihovići), third party environment management organizations (Zagrebinspekt d. o. o., Ecoplan d. o. o. – Mostar), local industrial representatives (Aluminij Mostar, EPHZHB) and university participants (University of Mostar, Faculty of Civil Engineering) – students and lecturers attended a workshop where the general concept of ImpactMin project, information on GEO and GEOSS were disseminated by Prof. Roko Andricevic.



Amer Smailbegovic (Photon) presenting the Mostar case study



ImpactMin project has been co-funded by the European Union's Seventh Framework Programme (FP7).

Amer Smailbegovic held a presentation about Earth Observation techniques (in particular satellite and airborne remote sensing) that aided the investigations of geohazards mapping (Vihovici mine) and environmental impact monitoring of mining related activity (red mud depot, electronic supplier company).

End-user workshop - Rosa Montana, 18 February, 2013

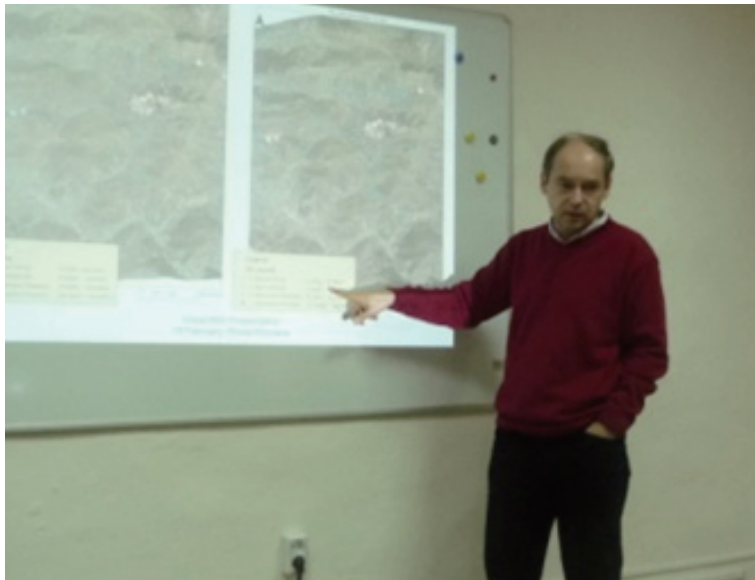
Project partners the Babes Bolyai University and Geonardo met with the representatives of Rosia Montana Gold Corporation (RMGC). This meeting was focused on sharing the project results and informing the representatives of the mining industry on the current EU research activities in the field of mineral resources exploitation monitoring.



Peter Gyuris is giving the presentation of ImpactMin project and its overall results



A photo with the representatives of RMGC



Calin Baciú: Presentation and conclusion of the socio-economic study, Presentation of Rosia Montana site investigations

During ImpactMin project a mutually beneficial cooperation has been developed between RMGC and ImpactMin Consortium. ImpactMin project performed independent surveys on both social and environmental impacts of current mining related status and the Gold Corporation was assisting in accessing the sites and datasets that were needed for successful investigations. The cooperation was good and the two groups could exchange useful information and learn from each other (methodologies, concepts etc.).



ImpactMin project has been co-funded by the European Union's Seventh Framework Programme (FP7).

RESEARCH ROADMAP

With the Research Roadmap, our goal was to overview the main aspects of what type of environmental Earth Observation is defined by political aspiration and what are the upcoming technical capabilities. By doing this the basic direction for EO supported environmental monitoring is highlighted and here it is a short overview of this report.

MINING AND EFFECTS

– the environmental context of ImpactMin

This section summarizes the literature study and the end user need monitoring performed during ImpactMin project in order to give the environmental and technical context to this document.

ENVIRONMENT

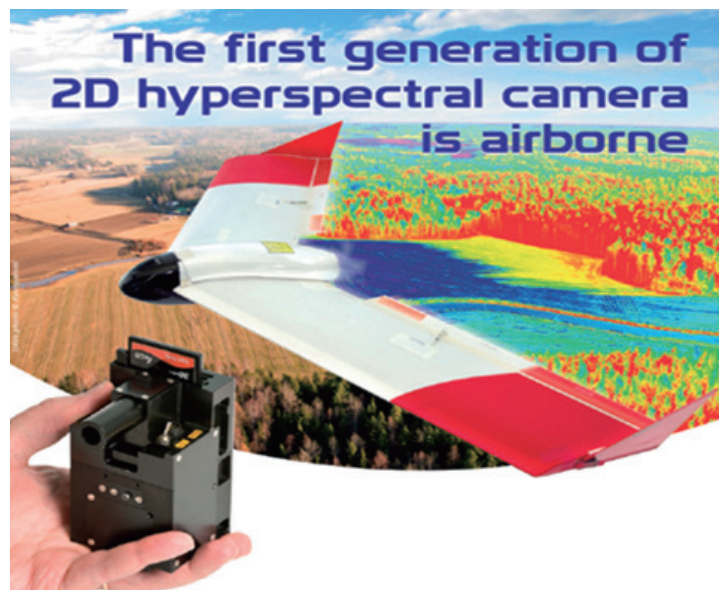
– legislative issues

The current European legislation, which is specifically related to mining impact monitoring and data management practices, requires a certain technological and data infrastructure (mine waste inventory). Also the requirements of the directives and initiatives (INSPIRE, SEIS) are adjusted to recent info-communication/observational infrastructure and thus there is a potential to develop synergies with new methods and tools that can - upon proper demonstration and validation – become useful future products and provide reasonable services in this arena.

MONITORING TOOLS

– EO techniques foresight

The previous and parallel project work packages and reports showed that there are basic requirements that apply for monitoring assets in order to be capable to observe the relevant parameters and environmental variables applicable for mineral



resources exploitation monitoring. Geographic and temporal coverage can be equally important in recognizing environmental phenomena on the top of the precision of data acquisition. Here is to mention the airborne data acquisition techniques. Airborne sensors and their capabilities to capture environmental variables on a more advanced way is continuing. This is a very fast growing industry with rapid technological advancement. During the implementation of ImpactMin this airborne mission in 2012 was also stand alone in a sense that the data was acquired at an extreme low altitude (<700m AGL) in a very mountainous area and resulted an extreme high spatial resolution hyperspectral imagery (0.5 m). Even in the beginning of ImpactMin project the combination of hyperspectral data acquisition via an unmanned aerial platform was not a realistic option. However Rikola Ltd (www.rikola.fi/site) presented a brand new solution for image acquisition in the VIS-VNIR electro-magnetic spectrum. Similar upcoming inventions are likely to happen in the next years too, that can support more innovation in environment monitoring supported by earth observations/remote sensing.



ImpactMin project has been co-funded by the European Union's Seventh Framework Programme (FP7).

OTHER PROJECTS

The importance of the currently finalised ImpactMin project and other similar running research projects in this field, e.g. EO-Miners and GMES4MINING, will be fully valued when future mineral exploitation will be boosted in Europe with the support of the European Commission, for instance with the proper functioning of the European Innovation Partnership on Raw Materials. Observing the environment status and specifically mining areas is of great interest of citizens of the EU. Upon the innovation of PROMINE, I2MINE and further upcoming NMP project such as EURARE and Minerals4EU, the European resources can be used more effectively and intensively, and consequently the social and environmental implications of the mining activities in Europe should be followed up appropriately. ImpactMin and other ongoing research demonstrated innovative and novel tools and we can build on the results of best practices.

With this third and last newsletter from the ImpactMin consortium hopes that many of the interested parties and the wider scientific community could benefit from the information and dissemination activities that were carried out over the past three years. More insight into the Project's results and outcomes can be found at the ImpactMin official webpage (www.impactmin.eu).

On behalf of the ImpactMin Consortium

Best Wishes



ImpactMin Coordinator

Peter Gyuris

Geonardo Environmental Technologies Ltd.

GENERAL INFORMATION

Coordinator:

Mr. Peter Gyuris, Geonardo,
coordinator@impactmin.eu

Project Officer:

Dr. Efthimios Zagorianakos
DG Research, European Commission

Partners:



Geonardo Ltd. – GEO



Geosense – GEOS



University of Exeter – UNEXE



Lulea University of Technology – LTU



Photon LLC – Photon



University of Mostar – GFMO



Institute of Mineralogy, Russian Academy of Science – IMIN



Babes-Bolyai University – UBB



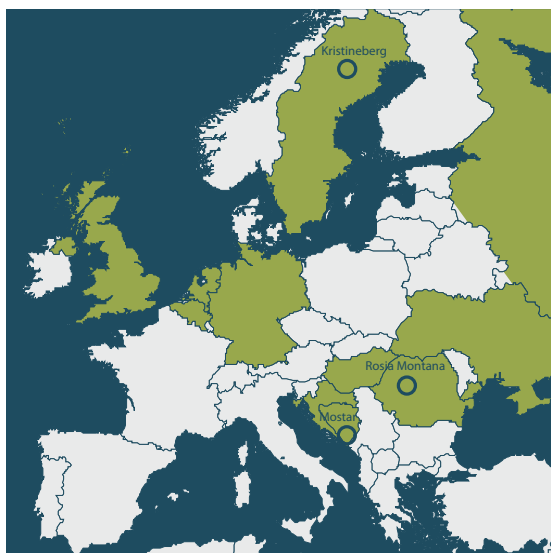
Ukrainian Land and Resource Management Center – ULRMC



DMT GmbH & Co.KG – DMT



Flemish Institute for Technological Research – VITO



ImpactMin project has been co-funded by the European Union's Seventh Framework Programme (FP7).