



**Earth Observation for Monitoring and Observing
Environmental and Societal Impacts of Mineral Resources
Exploration and Exploitation
EO-Miners**

WP3 work progress
EO data acquisition planning

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- project status
 - open questions
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- WP3
 - field work on the test sites
 - coordination
 - EO data
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- CAIAG / Kyrgyz Altyn are new project partner – DLR provided necessary information for update of the consortium agreement
- DLR supported the management and scientific activities by
 - organized conjointly with partners 3 workshops to support close interaction between WP1 (WP5) and WP2/WP3 (July, September, December)
 - support of BRGM to find new project partner, tight contacts to GFZ and CAIAG, joint travel with BRGM to CAIAG / Altyn in Bishkek in July 2010
 - DLR budget reduction: about 62,000 € in total
 - additional budget reduction about 9,000 € (EU contrib.) for soil lab analysis to be done by CzechGS for the Sokolov test site
- CAIAG will bring in another 46 personal months within WP3 – detailed work plan currently under discussions with experts from CAIAG
- led of task 3.5 (capacity building) now done by MIRO



- There are still some communicational needs with industrial partner
- Sokolovska Uhelna (CZ):
 - need for a meeting with the management to explain benefits and advantages within the project partnership
 - SU has strong interest in RS data and corresponding data analysis techniques, including software tools for their own use later on. DLR has suggested to give support and training for appointed staff member
 - DLR has strong interest in this meeting to get acceptance for the planned TIR flight campaign in July 2011.
- Anglo Coal (ZA):
 - up to now it is not clear, if Anglo will play an active role within the project.
 - important open question: data access (strong impact on project work schedule, as work load, eventually needed for re-preprocessing of existing data, is not clear yet)
 - interests and expected results are not clear defined
 - general availability of data, decisive meeting with Anglo representatives planned for Friday, 18.02.2011

- Field work in ZA in Febr. 2011
 - reflectance measurements on specific sites
 - soils and mineral information (incl. lab analysis to be done by CGS)
 - information about vegetation status on agricultural land
 - river bank sediment analysis (CGS)
 - Information about active and abandoned mine sites
 - topographic impacts (information needed for planned DEM generation)
 - emitting & reception of direct and diffuse material displacement (AMD)
 - problems related to existing coal fires

- field work in KS in June 2011
 - reflectance measurements on soils in the vicinity of the tailing
 - main problem in Karzaman: cyanide leachate from the tailing – thus a geo-environmental model is needed for risk assessment. Strong input from the Geological Surveys (WP3.4) is needed.
 - CAIAG / Altyn plan to install ground based sensor systems to measure climate variables and plan a regular monitoring of the downstream water flows – details have to be developed until June



- TIR flight campaign in Sokolov in July 2011 using the Spanish AHS sensor system
 - external funding through a joint proposal prepared by CzechGS, TAU and DLR within the framework of EUFAR
 - Flight and sensor costs, travel support covered
 - DLR will additionally support these activities by
 - installation of a ground sensor station, in a time frame before during and after the overflight on site (details about a secure location have to be discussed with SU during spring time), this include transport, installation, maintenance, additional man power, etc.
 - autonomous measurements of radiance budget, albedo, temperature, wind speed, air humidity, etc.
 - soil temperature measurements on different location within the mine site – if possible and accepted by SU



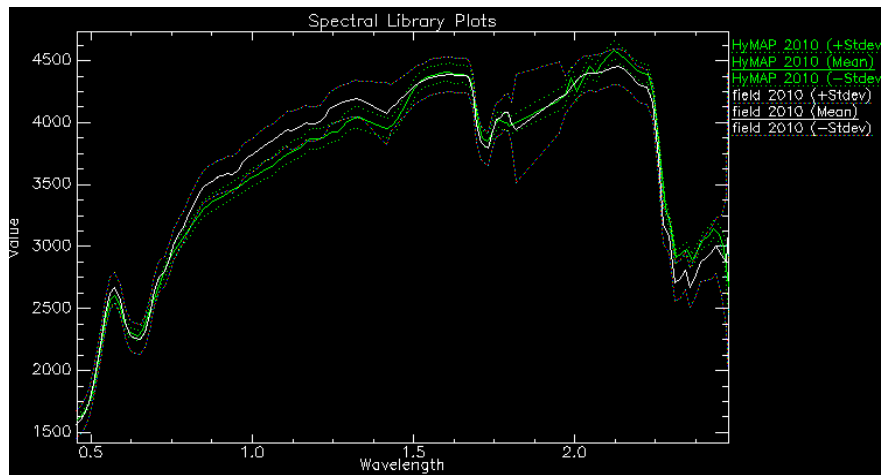
- Coordination of WP3 work items
 - currently two different levels are under consideration “local” and “non-local”, on a “local” level, possible impacts on environment and society have to be described. A “non-local” level addresses possible measures that can be used on a national or supra-national level to describe mining related impacts and flows. These are two different approaches !!
 - on the “local” level for each test site different impacts can be described, based on the individual conceptual site models already established (except for KS)
 - close cooperation with Wuppertal Institute (WI) about possible coupling of EO data analysis and Material Flow Analysis (MFA)
 - WI prefers MFA to analyze direct and hidden flows of mining activities
 - possible approach: linkage between topographic analysis with statistical information of mining activities. Possible delineation of volumetric information by use of a high resolution DHM
 - aspects could be supported by a workshop with different parties EU-stakeholder (DG, JRC, EEA and others), under discussion WI/GeoZS/DLR
 - Important open question: how to generalize the information from the test sites to a national approach ?

- Coordination of WP3 work items
 - task 3.4: urgent need to address a generic “risk assessment” methodology for the different site’s – methodology and concepts directly forces feedback to the needed data and associated information
 - WP 4
 - there is a need to define data sets and relevant meta-information that have to be generated for WP4
 - DLR already suggested to define data sets, corresponding information about meta-data, accuracy information, interface definition, etc. conjointly with BGS (and interested partner). This should start as soon as possible, as WP4 has started in 2011.

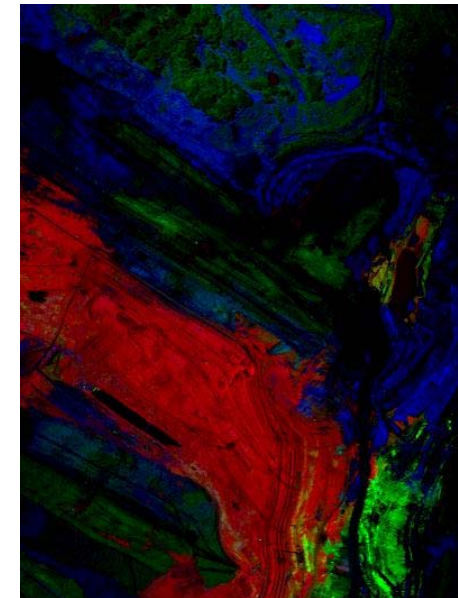
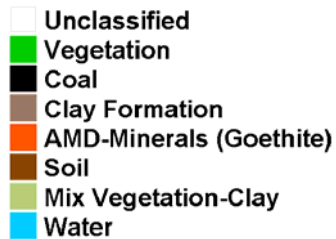
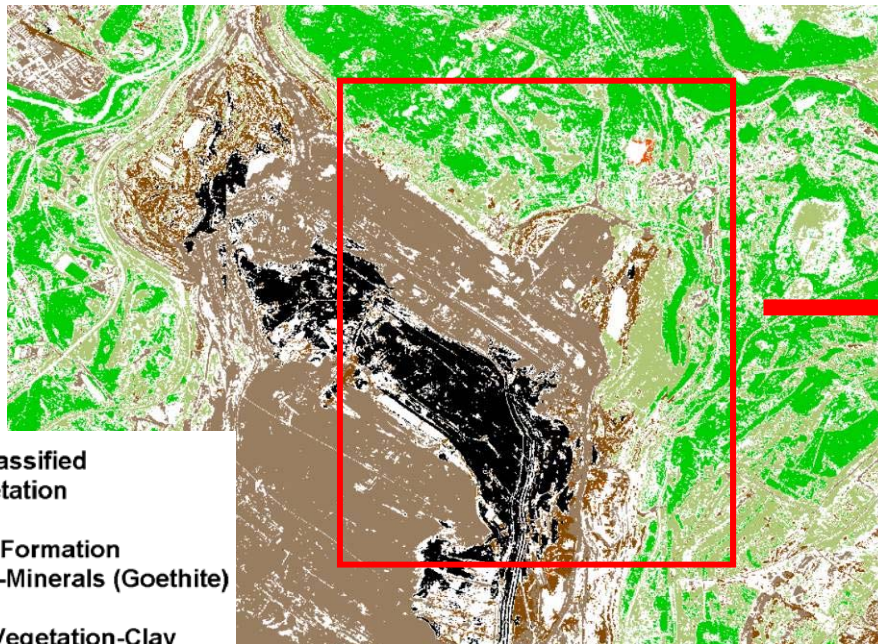


- Sokolov (CZ)
 - Reference information from CzechGS and BRGM have been collected (data archive accessible via ftp-server)
 - pre-processing of HyMap 2009 and 2010 data. For both data sets comparable processing schemes have been used. Data sets are ready to be distributed within the team, special focus are now on further aspects, e.g. mosaicking (approach to compare the data sets pre-processed by different organization – already discussed with TAU and CzechGlobe [Jan Hanus])
 - DEM based on CartoSAT data are available for 2009 and 2010, another DEM can be processed for 2011 as well – if needed for the AHS data sets
- Witbank (ZA)
 - BRGM will order WV-II stereo data (DEM generation done by DLR)
 - DLR/CGS/TAU applied for Chris data
 - different archived data sets are available (TM, ALI; Hyperion)
 - open question: time series needed (e.g. based on SPOT ?)
- Karzaman (KS)
 - BRGM will order WV-II stereo data (DEM generation done by DLR)
 - additional data sets have to be ordered (RapidEye data set might be available by GFZ/CAIAG)

- improvement of pre-processing routines (calibration, atmospheric correction) of the data using calibration / validation ground measurements
 - standardized routines used at DLR, based on the software ATCOR
 - radiance based approach developed by TAU
 - derived quality indicators
- ➔ datasets of 2009 and 2010 processed, documentation and dispatch imminent



- detection and mapping of minerals using various approaches
 - automated endmember extraction
 - SAM classification
 - linear spectral unmixing
- results of ENVI standard tools not fully satisfying



- hot anomalies detected in mining area (coal fires) and nearby industry
- estimation of surface temperature
- one aspect for thermal flight campaign

