A COMMUNITY-BASED ASSESSMENT OF THE EXPOSURE TO ENVIRONMENTAL CHANGE AND EXTREME EVENTS IN THE BANAT PLAIN (ROMANIA)

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ABSTRACT

The Banat Plain is currently exposed to multiple pressures associated to anthropogenic environmental changes, climate change related signals and extreme events with significant impact at local scale (floods, storms, hail). All these factors are jeopardizing the livelihoods of the local communities. Recently, a participatory assessment of the exposure to the above mentioned stressors was carried out, in a broader framework, focused on assessing the vulnerability of human communities to environmental change and extreme events in the Banat Plain. The research, conducted in May 2013, directly involved local stakeholders, through a questionnaire-based survey, applied in about 100 households from 15 villages, and through structured interviews with local decision makers. Results showed that local people perceive landscape changes as consequences of human intervention and of socio-economic changes produced after the collapse of the communist regime, in 1989 (e.g. the emergence of agricultural associations; degradation of drainage infrastructure; and upgrading settlements as a result of financial investments). Regarding the awareness of exposure to floods, the local population does not perceive flooding as a significant threat to the region, although the most recent event occurred 9 years ago. This attitude is highly harmful in terms of individual adaptation to flooding and it can be explained by the sense of security offered by institutional measures implemented post-event.

Keywords: Banat Plain, questionnaire-based survey, environmental change, extreme events

AN ECOLOGICAL PERSPECTIVE THE USE OF METALLURGICAL WASTE

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ABSTRACT

Czech Republic is one of the typical process states without their own raw material resources. Production of pig iron requires a piece of the charge – lump iron ore or metal-bearing material (from agglomeration and pelletization) and metallurgical wastes. Ecological recovery and recycling of metallurgical waste is an increasingly important factor not only in the Czech Republic. The legislation Waste Management in the European Union puts emphasis on reduction of waste. For industrial regions in the Czech Republic, the ecological use of metallurgical wastes increasingly important factor. This issue is solved in Centre ENET at VSB – Technical University of Ostrava within project CZ 1.05/2.1.00/030069.

Keywords: metallurgical waste, recycling, environment

ANALYSE OF DUSTS ORIGIN IN THE SINGLE STEPS OF CASTINGS PRODUCTION

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ABSTRACT

Metal casting is a shape obtained by pouring liquid metal into a mould or cavity and allowing it to freeze and thus to take the form of the mould. Each step in foundry process is followed by wastes generation, especially dusts.

During the casts production the huge quantity of dusts is generated, which have different physical and chemical properties. These dusts come from handling; preparation of raw materials, from melting; treating of molten metal, from preparation of sand mixture; core mixture, from casting of molten metal, casts cooling; shaking out from moulds and finishing operations of the raw cast. Quantity if different kinds of dusts is about 3,4% of all wastes. Producing of 1 tonne of cast iron creates about 61,4 kg dust with different chemical composition, granulometry and physical properties.

The single steps of castings production create next quantities of the dust : scrap and charge handling, heating – 0.3 kg/tone, sand handling and preparation – 20 kg/tone, core making, baking – 0.6 kg/tone, pouring – 2.5 kg/tone, cooling – 5 kg/tone, shakeout – 16 kg/tone, cleaning, finishing – 8.5 kg/tone, cupola furnace – 8.5 kg/tone.

The article shows the steps in foundry process that generate the highest quantity of the dust and there are described the sources of foundry dust origin.

Keywords: dust, particulate emission, moulding, melting, castings cleaning.

APPLICATION OF SILICA FUME AS WASTE MATERIAL IN CEMENT COMPOSITES EXPOSED TO HYDROCHLORIC ACID

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ABSTRACT

The use supplementary cementing composite materials have been reported to increase the resistance of concrete to deterioration by aggressive chemicals such as chlorides. Silica fume, a very fine solid material generated during silicon metal production, has historically been considered a waste product and due to its high pozzolanicity and its extreme fineness, is considered to produce low permeability concrete and extends construction life, resulting in resource savings. The use of silica fume converts a waste product into a useful, marketable product.

The paper is aimed at comparative study of resistance of Portland cement composites with addition of silica fume as durability increasing factor in various environments (hydrochloric acid with pH 5.06, rain water with pH 6.65 and distilled water as reference medium).

Effect of hydrochloric acid attack on the silica fume based cement composites and cement composites of ordinary CEM I Portland cement without any additives was investigated during 90 days under model laboratory conditions. The calcium and silicon contents in leachates were evaluated during the experiments using X – ray fluorescence method (XRF).

Silica fume based concrete samples were found to have better performance in terms of calcium and silicon ions leaching for all environments except for distilled water environment.

Keywords: silica fume, chloride attack, concrete, leaching.

APPLYING OF THE UMBRELLA SPECIES CONSERVATION CONCEPT TO THE ENVIRONMENTAL IMPACT ASSESSMENT

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ABSTRACT

This paper deals with theory, legislative framework and practical experience of the authorized expert in assessment the environmental impacts on bird areas of the Natura 2000 European network. The method of presented case study is based on applying of the concept of umbrella species in conservation biology. The case study presents the results of assessment of the international transport project of proposed water channel Danube – Oder – Elbe in Central Europe. Responses to this special type of environmental assessment in the landscape are discussed in the context of the EU Habitats Directive requirements.

Keywords: birds, ecosystems, environmental impacts, Natura 2000, water transport.

APPROACH TO DESIGN OF ENERGY SAVING ILLUMINATION IN INDUSTRY PLANTS

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ABSTRACT

The project of a lighting system is a complex and laborious task that requires not only technical knowledge, but also knowledge of architecture, production, and the physiology of vision. The role of the designer is not only to select the type of solution, this task is often complex and might be of a research character, leading to the development and manufacture of the lighting systems testing, analysis, and finding the optimum lighting conditions of the workplace and the area as a whole. This paper describes new trends to design of lighting systems that enable lighting control, the use of progressive light sources based on LEDs thereby achieving significant energy savings, which is not negligible from environmental as well as economic reasons.

Keywords: lighting, environment, energy saving, illumination.

APPROACH TO VALUATION OF ACOUSTICAL MATERIAL PROPERTIES

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ABSTRACT

One of the most frequent problems faced by noise control engineers is how to design sound absorbers that provide the desirable sound absorption coefficient that minimizes the size and cost, does not introduce any environmental hazards, and stands up to hostile environments. The designers of sound absorbers must know how to choose the proper sound absorbing materials, its geometry and the protective facing. Porous sound-absorbing materials are utilized in almost all areas of noise control engineering. This paper deals with the acoustical parameters of porous materials and their measurement.

Keywords: porosity, flow resistivity, tortuosity, measurement

INTRODUCTION

A small part of the acoustical parameters used to describe the visco-inertial and thermal behavior of acoustical porous materials are directly measurable. This is the case for the open porosity, the static air flow resistivity and the high frequency limit of the dynamic tortuosity.

ASSESSING INVASIVE TERRESTRIAL PLANT SPECIES IN THE MUREŞ FLOODPLAIN NATURAL PARK. ROMANIA

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ABSTRACT

The Mureş Floodplain Natural Park is a natural protected area located in the western part of Romania in the Panonic biogeographical region. It is a typical wetland ecosystem hosting riparian habitats with plant and animal species of great scientific value. The park falls into V IUCN category, also designated as RAMSAR and Natura 2000 sites. The paper is focusing on some of the most damaging Invasive Terrestrial Plant Species – ITPS (*Amorpha fruticosa*, *Acer negundo* and *Fallopia japonica*) ranked among the most disturbing species in Europe, as they penetrate into natural vegetation irreversibly changing its structure, in relation to the main driving factors of change. The authors also related relevant biological indicators (abundance, frequency, coverage and ecological significance) with the most important natural (climate, hydrology, soil etc.) and human-induced (transport network, built-up areas etc.) driving forces in order to identify species occurrence and spread. The research was undertaken in the framework of the EU FP7 – Building Capacity for Black Sea Catchment Observation and Assessment System supporting Sustainable Development (EnviroGRIDS).

Keywords: Invasive Terrestrial Plant Species (ITPS), Romanian protected areas, biological indicators, Mureş Floodplain Natural Park

ASSESSMENT AND ANALYSIS OF ECOLOGICAL CONDITIONS OF THE COASTAL ZONE ON THE AZERBAIJAN SECTOR OF THE CASPIAN SEA USING SATELLITE INFORMATION

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ABSTRACT

Expeditious monitoring is presented in article with use of modern space radar filming which is now the most effective remedy for the solution of tasks in research of oil pollution on the example of the Caspian Sea. The received pictures confirm about need of use of this method for detection of oil slicks.

Keywords: Caspian Sea, geoinformation technologies, oil slicks, space radars

ASSESSMENT OF ANTHROPOGENIC LOAD IN THE SOUTH OF WEST SIBERIA (THE OB PLATEAU AS A CASE STUDY)

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ABSTRACT

Assessment and mapping are the main tools for studying human impact on the environment. Anthropogenic load was evaluated for the most economically developed territories of the south of West Siberia (the Ob plateau as a case study). The assessment is based on the modified method by A. Isachenko (2001, Ecological Geography of Russia, Saint Petersburg University Press, Saint Petersburg). For calculation, the regions and towns were selected as territorial units. Altogether, six indicators were used to characterize residential, industrial, agricultural, and traffic loads. A 5-point scale was chosen for indicators estimate. The analysis of the constructed map allowed us to determine the intensity and regularities of spatial distribution of anthropogenic load on the Ob plateau.

Keywords: assessment of anthropogenic load, indicators, a 5-point scale of anthropogenic load, the Ob plateau

ASSESSMENT OF ARSENIC AND HEAVY METALS POLLUTION IN STREAM SEDIMENTS AFFECTED BY MINING USING GEOACCUMULATION INDEX

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ABSTRACT

The objectives of this study were to determine the total concentrations of heavy metals and arsenic in stream sediments contaminated by a tin-tungsten mining operation (Vale das Gatas old mine, northern Portugal) and quantify the impact of the mining activity on the quality of sediments. In this study, a possible sediment enrichment of metals was evaluated in terms of the "index of geoaccumulation" (I_{geo}) values. This quantitative measure of metal pollution in sediments allows for the classification of the quality of sediments, from "unpolluted" (class 0) to "very highly polluted" (class 6). In this study, the geochemical stream sediment data highlight some anomalies associated with the old mine influence. Given the variations in total concentrations of trace elements along the stream and the I_{geo} values, it was possible to distinguish three individual sectors: 1) the sector upstream of mines and tailings was characterized by values corresponding to class 0 (non-polluted sediments) for almost all elements investigated; 2) the sector under the influence of the mines, but upstream of tailings showed a marked increase in the levels of Zn, Cu, Cd, As and Pb due to acid drainages from mines; 3) the sector downstream of tailings was characterized by a marked increase in Zn, Cu, Cd, As and Pb. The index of geoaccumulation values confirms that the sectors in the mine area and downstream the tailings are the most polluted, mainly with Cd, Cu, Pb and As.

Keywords: Abandoned mine, Acid Mine Drainage, Tailings, Vale das Gatas mine

ASSESSMENT OF MERCURY IN FISH IN THE MOUTH OF THE NORTHERN DVINA RIVER AND THE DVINA BAY OF THE WHITE SEA

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ABSTRACT

A substantial portion of Northern Russia is waterlogged. Consequently, the high content of humic substances and hydrogen ions contribute to the formation of bioavailable forms of mercury. In such circumstances, even low levels of mercury concentration in water can pose a serious threat to aquatic life. The consumption of fish in Northern Russia is on average 2.6 times higher than in the rests of the country. It is therefore important to investigate characteristics of accumulation and distribution of mercury in the fish tissues.

Samples were collected during 3 years in different seasons and water regimes of the Northern Dvina River, and in the Dvina Bay of the White Sea. A total of 50 samples of aquatic organisms were selected: whitefish, bream, flounder, Siberian roach, rainbow smelt and perch.

Samples of fish tissues were preserved in a solution made of K2Cr2O7 4% and pure nitric acid. They were analyzed at the Laboratory of the Southern Federal University (Rostov-on-Don) using cold-vapor atomic-absorption spectroscopy. The detection limit ranged 0.004-0.005 μg g^{-1}. The accuracy fall in the range of a 30-laboratory AMOS-proficiency intercomparison in which the Laboratory of the Southern Federal University (Rostov-on-Don). Replicates were also analyzed at the Regional Laboratory Center of the Yuzhgeologiya Federal State Unitary Geological Enterprise and gave reproducible results.

Concentrations of mercury varied from 0.009 to 0.57 μg g^{-1} in muscle, from 0.038 to 0.765 μg g^{-1} in liver, from 0.013 to 0.15 μg g^{-1} in gills.

Keywords: mercury in fish, Northern Dvina River, White Sea, assessment

ASSESSMENT OF THE IMPACT OF PHYSICAL FACTORS ON HUMAN HEALTH IN WORKING WITH CHAINSAW

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ABSTRACT

The article deals with the assessment of the effects of noise and vibration on health of employees in forestry. The introduction describes a statistical overview of occupational diseases in Slovakia and forestry. Article also analysis the individual technological activities in the extraction and wood processing, analysis equipment in use and identifying critical points machinery and negative factors affecting the health of employees at work. In the end of the article are presented results of experimental measurements of exposure to noise and vibration implemented in actual conditions of practice.

Keywords: noise, vibration, timber harvesting, health

BIOCHEMICAL CHANGES INDUCED BY LEAD CONTAMINATION OF BIOLOGICAL SAMPLES MULBERRY (MORUS SP.)

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ABSTRACT

Research conducted on pollution / contamination of soils with heavy metals revealed several remedial options including cultivation of high capacity to absorb pollutants such as mulberry (Morus sp.)

Heavy metals can affect the germination and development of mulberry plants (Morus sp.) and can induce biochemical changes on lipids and antioxidant enzymes. Therefore this paper aims: -highlighting the impact of lead contamination processes mulberry plant germination and development. Seeds of mulberry were germinated in an aqueous medium with the addition of 0.4 mg Pb /100 ml solution of Pb $(NO_3)_2$ and 0, 04 mg Pb / 100ml solution compared to the control. Were used mulberry seedlings pricking out of which the growth substrate has been contaminated with lead the same concentrations as in the case of seed.

- investigate the lipid peroxidation level and antioxidant enzymes activity superoxide dismutase-SOD, glutathione peroxidase -GPX and catalase-CAT influenced by the accumulation of lead in plant mulberry leaf biomass.

Experimental results have shown that the ex-situ conditions, Pb accumulation of contaminants influence the germination of seeds in terms of its blocking at concentrations greater than 0.4 mg% ml Pb solution. Concentration range from 0.0 to 0.04 mg Pb% ml did not influence germination and mulberry plants has no phenotypic changes. The degree of lipid peroxidation was significantly increased and the activity of antioxidant enzymes SOD, CAT and GPX decreased significantly ($P < 0.05$) in version with the addition of 0.4 mg Pb / 100ml solution, compared to treatment with the addition of 0.04 mg Pb/100 ml and the control group. Lead concentrations greater than 0.4 mg Pb/100ml lead nitrate solution causes blocking the germination of seedlings visible phenotypic changes with poor prognosis and significant biochemical changes.

Keywords: lead contamination, Morus sp., lipid peroxidation, superoxide dismutase

BIODIVERSITY OF THE PLANT COMMUNITIES AND INCREMENT OF THE WOODY SPECIES IN THE INDUSTRIAL AREAS

(MORAVIAN-SILESIAN REGION, CZECH REPUBLIC)

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ABSTRACT

The article deals with the basic problem of biodiversity and growth of forest woody species and plant communities in Ostrava and Karviná which belong to industrial cities influenced by black coal mining. Presented contribution describes results of research focused on phytosociological and dendrological data in the area of interest. There was committed evaluation of plant communities in various stages of spontaneous succession during years 2009 and 2011. For the evaluation of growth a new method of measuring linear growth on reclaimed and unreclaimed spoil heaps had been applied. The results of this research prove that the highest species biodiversity is connected with areas not affected by technical-biological reclamation. The lowest biodiversity was found in the case of areas reclaimed technically and biologically with soiling. Research has shown the influence of environment on the development increment of trees. In the early stages of the spoil heaps thrived better pioneer woody species; other species have been shown to lower the initial increment.

Keywords: Biodiversity, Growth, Woody species, Spoil heap, Reclamation

CALCULUS METHOD OF THE FLUSHING OUT DYNAMICS THROUGH FLOODING OF THE INDUSTRIAL POLLUTED SOILS

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ABSTRACT

The flushing of the soils in order to decontaminate them is a method which, upon the time, proved its technical efficiency in a great number of situations. Worldwide spread of this decontamination method has, as a principle, two explications: first of all it consists of having a great number of flushing agents (water, solutions, solvents) which can correspond to different soil situations and of contaminants and the second one it consists of having the possibility of using it "in situ" (relative reduce costs towards of the ones "ex situ" and "on situ"). Towards the flushing "in situ" the paper presents a simple and efficient method to evaluate the main technical elements of the contaminated soils flushing: calculus of the total flushing liquid and of the contaminant dynamics under the flushing influence. As a method of flushing for which we determine the calculus equations it is the flood case. In the paper, it is mark out that between the necessary volume of water for the effective flushing of the soil (percolation - solubilisation – convection – transport) and the volume of flushing liquid that must be brought to the situ surface, in order to flood it, it exists, according to the climatic conditions, significant differences. Because of that it is proposed that, for the drawn up of the decontamination design projects period, the evaluation of the necessary decontamination liquid should be done using the equations presented in the paper and also for a climatic period when the precipations are determine by statistic data analysis, with the probability of 80% overflow. In the paper, inside of "results and discussions" chapter it is amplified the application method of the proposed methodic for a cadmium polluted situ from Romania. It is proposed that the flushing of the soil profile should be done with water that comes from a surface source, being considered that the water has a low level of loading with cadmium. Also, in the case study, it is taken in consideration the phreatic input which also has a low level of cadmium ions. The carried out and presented in the paper studies point out, extremely evident, the manner how the abatement of the contamination level is produced to cadmium concentration values that are normal considered.

Keywords*:* flushing out, soils, flooding, pollution, liquid balance, contaminants.

CAST IRON PRODUCTION AND ITS IMPACT ON THE ENVIRONMENT

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ABSTRACT

Foundry industry is a branch of industry which generates a huge quantity of wastes. Increase of raw materials prices (cast iron scrap, sand, energy resources) and cost for dumping load, it follows that the economical factors become very important arguments in the process of minimizing of wastes generation.

Cast iron is a still very used material for castings production. On the present 44 millions of tons of grey cast irons castings are produced (it is around 48% of world production of castings) and around 23 millions of tons of castings from nodular cast iron (25% of world production) In Slovakia the castings from grey cast iron and nodular cast iron are produced. Cast iron production is connected with emissions origin (gasses and particulates), with slag origin, with water pollution and with wastes generation.

Typical foundry can creates 8 – 40 kinds of different wastes (used sand mixtures, slags, mud from scrubers, dusts from air cleaning, dust from castings cleaning and from grinding etc. 88% of all wastes from cast iron foundry presents used sand mixture, slag from melting operations creates 3,28%, the dusts from dedusting of furnaces and dusts from cleaning present 3,20%, mud from dust cleaning – 1,8% and the waste from refractory materials -0,16%.

The article analyses the impact of cast iron castings production on environment.

Keywords: cast iron, environment, waste, scrap

CHANGE OF TECHNOLOGY FOR COLLECTING, TRANSPORT AND STORAGE OF SLAG AND ASH RESULTING FROM FOSSIL FUEL COMBUSTION WITHIN ELECTROCENTRALE DEVA

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ABSTRACT

In order to line up with the European requirements regarding environmental and energy efficiency as a result of Romania's accession to the European Union, it is required the technological rehabilitation of coal plants, namely the fulfilment of installations for flue gas desulphurization and the review of the existing disposal, transport and storage systems of products resulting from the combustion of coal in power units' boilers.

For further proper operation, Electrocentrale Deva (Mintia Thermal Power Plant) is required to make investments to reduce the environmental impact of ash and slag deposits, this being possible through the implementation of new technologies, such as dense slurry technology.

This paper shows the concerns of Electrocentrale Deva on environmental impact in terms of air, water and soil, by implementing a new technology for disposal and transport of waste coming from the combustion of fossil fuels.

Changing this technology will provide the reduction of "excess water" volume, seeking to reduce the content of the hydro-mixture: 1 part slag - ash - 10 parts water, used in the old technology (1:10) at a ratio of 1:1.1 using the dense slurry technology.

By implementing this technology and building a new storage, starting with 01.01.2016, it shall be observed the current European legislation (Directive 1999/31/EC on waste discharge and storage) which will make possible the continuous operation of Mintia thermal power plant.

Keywords: fossil fuels, combustion process, environment, collecting slag and ash, dense slurry, hydro-mixture, desulphurization installation, large combustion plants.

CHANGES IN THE CULTURAL LANDSCAPE

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ABSTRACT

We have worked on the development of cultural landscapes in the Vráž u Písku cadastre which is situated in the South Bohemia. Cadastre is interesting because there is a castle area with a park landscape, on which we placed the main emphasis. The park and castle are currently used as a spa area for guests with mobility disabilities.

We concentrated on archival collection of written and visual data, which were then put into the context of land use. Data that we have collected went through the digitization in three time series (Stable Cadastre - 1942, 50 years of the 20th century and the present day). Thus we found out where there were landscape changes and where the landscape is stable. Based on these results, we evaluate existing hiking trails and proposed new walking trail in the park.

Keywords: land use, Vráž u Písku, castle Park, hiking trails

CLIMATIC CONDITIONS AND BIOLOGICAL DIVERSITY IN A NATURA 2000 SITE: ROSCI0260 CEPELOR VALLEY. ROMANIA

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ABSTRACT

The European Natura 2000 Network of protected areas is the leading EU instrument aiming to protect and preserve areas with species and habitats of greatest European interest. In view of that, the paper is aiming to assess the fragile interactions between the key climatic conditions and the biological diversity of the main natural habitats in a Natura 2000 site: ROSCI0260 Cepelor Valley. The site is overlapping the Alpine biogeographical region in the Biharia Massif, Western Carpathians and it has been established for the protection of eight Natura 2000 habitats and four species. The authors processed relevant climatic parameters (temperature, relative humidity, rainfall, wind) from Băişoara weather station in order to draw up the key climatic features in relation to the requirements of the main habitat types and endangered species hosted by this Natura 2000 site. The main outcome of the current research consists in providing a complex assessment of the most significant climatic driving forces and their impact on the biological diversity and ecological balance of ROSCI0260 Cepelor Valley**.**

Keywords: climatic conditions, Natura 2000 network, biological diversity, ROSCI0260 Cepelor Valley, Romania.

COMPETITIVE, SUSTAINABLE, INNOVATIVE AND IDENTITARY IN DEFINING OLTENIA TOURIST DESTINATION

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ABSTRACT

Competitiveness is a rather broad concept and can be analyzed from several perspectives: of the products, of companies or various economic sectors in the short or long term, being included in various fields - economics, management, politics and culture, each of them with their own perspective.

According to OECD (The World Competitiveness Report, 1994) competitiveness is defined as "the ability of a state or a company to generate proportionately higher revenue than the competitors on the world market."

From the tourism sector perspective "the competitiveness of a tourist destination is closely related to the ability of a place to optimize its attractiveness for residents and non-residents, to provide qualitative, innovative and attractive travel services to consumers and to attract some of the domestic and global market, while ensuring that available resources underpinning tourism development are used efficiently and sustainably "(OECD, 2013).

The competitiveness of European tourism is closely related to sustainability, as the quality of the tourist destination is strongly influenced by the natural and cultural environment and by the way it is integrated into the local community (ec.europa.eu / enterprise/Sectors/tourism/sustainable-tourism).

In order to express the viability, competitiveness and international visibility as a tourist destination, a region must highlight its defining elements, the recreational, curative and cultural activities in which it is specialized [1].

The South -West Oltenia Region has important tourism resources, but despite this, the importance of tourism in the local economy is relatively low, its contribution to the regional GDP being only of 1%. The tourism can be a key vector in the development of many areas and in the increasing employment in the region where there are still not too many alternatives.

The paper highlights the opportunities for positioning the tourism in Oltenia so as to generate added value inherent in an economic, social, cultural and artistic revival (urban revitalization, urban renewal), by building a competitive advantage in the targeted markets. The main areas approached in the paper are the development of joint regional programs and packages, complex and coherent to capitalize the touristic resources of the entire region, not just punctually, for a city or an area, but to lead to the increased number of tourists, length of stay, and the receipts (direct and indirect) from tourism; the development of new forms of tourism/ tourism products that will also involve the tourists, thus promoting, but preserving the traditions and lifestyle of the local community; and developing a regional brand that should be the basis and added value for all the future actions of tourism promotion.

Keywords: tourist destination, competitiveness, innovative tourism, sustainability, Oltenia

CONCEPT OF ENVIRONMENTAL MONITORING IN THE RUSSIAN ARCTIC COASTAL REGIONS

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ABSTRACT

Insufficient information on the Arctic environmental systems and underestimation of human activities in the Arctic region can lead to environmental degradation and undermine of industries development. The creation of a network of the environmental monitoring observations in that coastal zone and environmental impact assessment, in addition with significantly growing economic activity, will contribute to improving nature conservation and sustainable development in the Russian Arctic taking into account regional specifics. The main threats, possible risks and hazards to environment, human activity and industry in the Arctic coastal regions are presented. The general concept of environmental monitoring in the Russian Arctic coastal regions is considered on the base of national Strategy of the Russian Arctic development and international cooperation. Development of the "Cloud" technology in application to the Arctic monitoring will promote to better assessment of the environmental conditions in the region. The Ministry of education and science of Russia provided financial support for this research with the state order 2014/166 and state contract 14.515.11.0002.

Keywords: environmental monitoring, Arctic coastal region, nature conservation and sustainable use, environmental impact assessment

CONSIDERATIONS ON THE CET TURCENI FUNCTIONING AND ITS INFLUENCE OF THE CEPLEA VALLEY AREA

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ABSTRACT

Industrial landfills and ash and slag landfills from coal combustion in Turceni power plant represent important building which have a significant environmental impact. These landfills occupy significant area, such as the Ceplea Valley which is developed on an area about 150 ha without taking into account the slopes. Slag and ash from combustion energy groups as that collected and then mixes water transported through hydro mechanization and lodged dams of local materials. From the structural point of view these deposit fall within hydraulic structures serving to retain mixture of water and fine solids particulate, while controlling discarge water and ensure its recovery. Alternations in groundwater regime of river basin Ceplea Valley and adiacent areas by arranging the deposit of ash and slag of CET Turceni, is the main negative impact of these arrangements on the environment. High water infiltration ocurred in ash and slag deposit throughout the valley slope, surface springs, especially flooding of important areas of Turceni town. This paper represent a study of industrial landfills and ash and slag landfills from coal combustion in Turceni power plant and its functioning influence of the Ceplea Valley area.

Keywords: ash, slag, infiltration, water, landslides, power plant.

DEFORESTATIONS IMPACT ON EXTREME HYDROLOGICAL PHENOMENON

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ABSTRACT

The aim of this paper is to analyze the interactions between the forest and local and regional climate changes on Romanian territory. This is a present-day concept which has deep roots in the past. The main roles of the forest are recognized and appreciated at a large scale. Forests provide excellent soil protection by maintaining high rates of evapotranspiration, interception and infiltration and generate only small quantities of runoff. If the forest can provide resources as timber, fuel, fruits, in terms of environmental protection the forests has an important role in keeping the biodiversity, consumption of CO_2 and temperatures control. The forested belt in the neighborhood of agricultural land has direct effect on leaching nutrients consumption.
At the beginning of 19th century, the forests covered about 60% of Romanian territory while in present days this surface decreased to about 27%. Deforestations have an important effect on the peak values of the hydrological cycle, droughts, heavy rains and storms. As a response to these natural phenomena, the forested surface reduces continuously. This could be an ever-changing-never-ending chain which has *to be broken down*.
Romanian people consider the forest as a valuable natural resource, as a true splendor of the country. The forests assured the survival of the first communities and numerous citadels and monasteries were built in the forest as a protective measure.

Key words: Climate Change, Deforestation, Impact

DETERMINATION OF POWDER IMISSIONS DEPOSITED FROM ROVINARI AREA WHICH COME FROM THE ACTIVITIES OF DEPOSING THE COAL AND PREVENTION MEASURES

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ABSTRACT

Coal deposits constitute the main source of pollution with coal powder for Rovinari town and its neighbourhood. The exceeding of the maximum admissible concentration of the powder takes place due to the bad spreading of the coal from deposits.

The coal powder is made at the spreading of the coal with the vehicles for loading, unloading, crushing and transport on the transporting bands.

Starting from that point this paper presents the results of researches made at the determination of sedimentary powders and in suspension come from Rosia coal deposit and technical solution of reducing the coal powder made at the loading of coal from deposit by using the water as an agent for retaining.

Keywords: powder imissions, Rovinari, coal.

DETERMINATION OF THE AGE OF LIME IN MASKOVICE (CZECH REPUBLIC)

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ABSTRACT

People are fascinated by trees since ancient times, by their grandiosity, age and aesthetic beauty. The age of trees is one of the most discussed variables. It is for two reasons. The first reason is the issue of determination of the age of trees itself. The second one is, how old they can be. In general, a method with universal application does not exist. Exact age of only a few trees is known from historical documents. Thus, to determine the age of the tree some of the analytical methods which is based on a measurable attribute must be used. The aim of this work is to determine the age of small-leaved lime (Tilia cordata), which grows in the village Maskovice in the Czech Republic. Opinions on the age of this tree varies widely, ranging between 350 and 900 years. Different non-invasive methods and measurements of the circumference of a tree trunk reported in literature were used for age determination of the tree.

Keywords: age of trees, tree protection, monumental trees, ancient trees

DETERMINING THE BEST USE OF LAND MINED - CASE STUDY - PAROSENI ASH DEPOSIT

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ABSTRACT

Mining are human activities affecting both the basement and the environment and buildings at ground surface by creating underground voids and soil, air and steppes from the surface.

This paper aims to determine the best use of land that is stored ashes from Thermal Paroseni within Hunedoara Energy Complex. In this paper we intend to try to determine the factors that influence land use change affected by the ash from the power plant and to determine the advantages and disadvantages of each type of use of this land both in terms of protecting the environment as and in terms of costs that result from these changes of use.

Keywords: mining activity, environmental protection, thermal plant, ground surface

DIVERSITY OF GRASSLANDS IN CONDITION OF SUSTAINABLE LAND USE

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ABSTRACT

The basic principle of the philosophy of sustainable land use is its protection against any degradation of natural and human-induced impacts. Survey on the current state and changes in biodiversity, habitats of endangered and protected species of plants and animals as well as changes in landscape ecological stability are also important part of evaluation of the agricultural landscape. Ecological stability increases with increasing diversity of ecosystem and species. Higher biodiversity leads to interspecific interactions, enabling more effective self-regulation of population dynamics of different ecosystem populations. Grasslands are essential for the maintenance of the diversity. They belong to the biologically most active and most productive plant communities with rapid exchange cycle and with high ability to move chemical elements in the biosphere. They represent mostly poly-dominant phytocenosis. Over the growing seasons of 2010 – 2013, grassland was monitored at grasslands' in the cadaster of Liptov Teplička (48° 57' N; 20° 05' E), where ecological farming system on the land is applied. The aim of this work was based on the results of field research to assess the diversity of vascular flora of grasslands. Diversity of flora was assessed by Shannon index *H´* and Equatibility index. Grasslands in area of environmental management were by diversity index species varied and balanced rich. Species diversity during the reporting period did not change significantly. Dominated by families *Rosaceae, Poaceae, Asteraceae.*

Keywords: grassland, flora, index species

DYNAMIC NOISE VISUALIZATION METHODS FOR IDENTIFICATION OF NOISE SOURCES

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ABSTRACT

First noise visualization measurement tools joined the field of acoustic a few years ago. During last year producers develop new visualization tools by using different principles. After a few minutes only, you get the first acoustic images on your computer screen. The software allows a clear, exact and fast analysis of noise sources. These tools are now used in a variety of industries and has a growing customer base worldwide. One of the most important advantage is exact noise localization and identification.

Keywords: camera, noise, visualization

ECO-ENVIRONMENTAL RESEARCH OF PORAC CREEK CATCHMENT AREA AT THE AREA INFLUENCED BY ENVIRONMENTAL LOADS

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ABSTRACT

Pollution of water environment by heavy metals became very serious in localities influenced by long-term mining and processing activities. Pollution of Porac creek by heavy metals is caused by heaps of waste material stored along the creek the same as by atmospheric deposition coming from mercury processing plant. Total content of heavy metals (Cu, As, Pb, Zn, Hg), some chemical properties (pH) and biological properties (only in sediment samples – urease, acid phosphatase, alkaline phosphatase) were determined in soil and water samples. Correlation relationships between soil and sediment properties were calculated using Spearman's correlation coefficient. Species composition of flora at the bank of the creek was evaluated according to the Braun – Blanquet´scale. Content of heavy metals was also determined in the plant samples.

Water pollution was evaluated as less serious than pollution of sediments, where toxic elements were accumulated in higher levels relative to the limit values. Extremely high value of copper, zinc and mercury was determined at first locality, which was proved as the most polluted because of presence the heaps of waste material. With the increasing distance of sampling point from the village, the activity of soil enzymes increased while the metal content decreased. Significant positive correlation was found between heavy metals themselves and between soil enzymes. Urease gave significant negative correlation with all heavy metals, acid and alkaline phosphatases were significantly negatively influenced by copper, arsenic and lead. Predominantly hydrophobic plant species as *Petasites hybridus, Mentha longifolia, Geranium sylvaticum* were found. Analysis of plant samples showed elevated levels of heavy metals especially Zn and Cu.

Keywords: copper, mercury, enzyme activity, flora composition, mining activity

ECOLOGICAL CORRIDORS AND SPATIAL ORGANIZATION FOR PROTECTED AREAS OF THE SMALL CAUCASUS, GEORGIA

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ABSTRACT

Establishment a system of protected areas is very important direction in addressing of problem conservation the landscape biodiversity and in general, of the integrity of ecosystems. Great attention is paid to ecological corridors, which in a unified system organize a network of protected areas. The paper considers problems and methods of conservation geography, which allowed the development of potentially possible route of ecological corridors in Central part of Lesser Caucasus. The conducted landscape analysis made it possible to identify the unique landscapes, because of their location at the limits of its location. Through this approach the network of ecological corridors was proposed linking the East and West Georgia. This network has three main branches. An important aspect for their identification is the analysis of existing barriers to wildlife corridors. Among the barriers contributing to the isolation of individual populations include natural barriers and barriers created as a result of human activities. GIS analysis of the territory shows geographical barriers, buffer zones around settlements, roads, etc. The question of ecological corridors can become particularly relevant in establishing of transboundary protected areas, i.e. common to neighboring countries, such as protected areas shared between Georgia–Russia, Georgia–Azerbaijan, Georgia–Turkey, Georgia–Armenia. Biological and landscape diversity – one of the most important potential riches of Georgia, the conservation and rational use of which can bring considerable economic benefits.

Keywords: Protected Areas, Ecological Corridors, Conservation Geography, Landscape Diversity, Small Caucasus

ECOLOGICAL REHABILITATION OF A TERRAIN OCCUPIED BY A WASTE DEPOSIT FROM MANUFACTURING OF THE SUGAR

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ABSTRACT

In the paper it is presented first of all the investigations and the carried out studies for founding the rehabilitation solutions of the decantation pond made from washing out, transport and carbonation of the sugar beet which has the code 02 04 01 in the European Catalogue of wastes. There are presented, shortly, the results towards the possibility of flooding the terrain, the hydrogeological conditions, the pedological conditions and the most important issue the dates towards the pollution with heavy metals, organohalogen compounds, polycyclic aromatic hydrocarbons and polychlorinated biphenyls. In order to evaluate the pollution it were taking soil assays from three points of the location and they were chemical and physical analyzed. The carried out determinations showed that the Romanian limit values are not gone beyond the limit towards the pollution containing substances for the agriculture. On the other hand, it were made investigation towards the fertility level of the soil from the location. On these lines, it is also presented the reliability study made for the evaluation of the fertility and of the favorable conditions for using the surface of the lake as an agricultural terrain. The studies shows that there are some limitations towards using it as an agricultural terrain most of all towards pedological and fertility reasons. Having all these studies as a starting point in the paper it is presented the set of measures in order to use the terrain in agriculture. The proposed measures are enduring measures (it is estimated the period of rehabilitation 3… 4 years) which include: the degrease of the soil humidity throughout temporally works: leveling and modeling of the surface, making a ploughing for turning the soil, discing of the ploughed surface, the amelioration of the soil fertility and of the soil structure throughout the cultivation of fertility plants which are covered during the autumn by the ploughing.

Keywords*:* waste, deposit, rehabilitation, ecology, sugar, pollution, soils.

ENERGY-EFFICIENT GREEN TECHNOLOGY (PHYTOTECHNOLOGY) OF WASTEWATER TREATMENT FROM OIL PRODUCTION SITES

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ABSTRACT

Recently phytotechnologies have been more often used in practice of implementation ecobioprotective technologies providing environmental protection. This term denotes protective and rehabilitative measures for environments with the use of plants. They are used to protect atmospheric air of residential areas from coal and gas emissions of industrial enterprises by means of tree and shrubbery planting of a certain width along highway and railway roads as well as creation of sanitary protection zone. These plantings localize and purify exhausted transport emissions; however plants with a high absorptive capacity in respect to dust and toxic gas are used.

Keywords: phytotechnology, ecobioprotective technologies, hydrophytes, hydatophytes, filter bioplateau.

ENVIRONMENT PROTECTION VERSUS A CORRECT TAXATION

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ABSTRACT

Environmental taxes generates a price increase resources to their true cost includes the cost in terms of pollution and damage to human health. Also, these fees make it possible to collect the necessary resources to finance projects that target combating the harmful effects of human activities on the environment. Such a goal can't be achieved without effective policy for environmental protection; But these are dependent on the existence of an environmental fair taxation. Taxes can't be placed in dissonance with European standards. Otherwise, like the car tax introduced in early 2012 in Romania, by a recent decision of the Court of Justice of the European Union has determined that it is a situation of illegality and require repayment of amounts drawn in this way.

Keywords: taxes, pollution, resources, goal, standards.

ENVIRONMENTAL FACTORS AFFECTED BY MINING PERIMETER AVRAM IANCU, BIHOR COUNTY, ROMANIA

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ABSTRACT

On the Romanian territory exploration, mining and milling of radioactive ore deposits, appeared for the first time 65 years ago in Bihor county. Thus in 1949 have been identified more deposits of uranium, some fully exploited (Baita, Avram Iancu) others insufficient known through research works carried out and was suspended. To achieve these objectives have been carried out, hundreds of miles of underground galleries and other works which resulted millions of tons of tailings stored in dozens of dumps, usually located in forested areas, on the banks of the mountain streams, hundreds of meters of underground or surface drilling, thousands of square meters of unveiling ,etc., that changed the landscape of the region , partially affecting other environmental factors like water, soil, vegetation, fauna, etc. For diminution of environmental impact in the region, at the time of mine closing, were carried out several studies and programs for the restoration of the environment damaged by mining activities, but now some areas still require special attention. The present paper shows an assessment of areas affected by the exploitation of uranium ore deposit , 10 years after closing, taking into consideration the additional ecological restoration works.

Keywords: radioactive ore deposits, mining perimeter, environmental impact, ecological restoration

ENVIRONMENTAL PHYTOTECHNOLOGIES IN EASTERN SIBERIA AND SOUTH URAL

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ABSTRACT

Phytotechnologies of wastewater treatment are considered with the use of higher aquatic plants and algae. In respect to the climate of Eastern Siberia carrying capacity of basic types of water plants is calculated towards basic organic and inorganic components of industrial wastewaters at Baikal region. Methods of environmental control are developed on the basis of medical and environmental phytodesign. The results of plant remediation of polluted soil and bottom deposits, principles of accumulation and reallocation of carcinogenic substances such as polyaromatic hydrocarbon – benzapyrene in the system soil-plants are given.

Keywords: phytotechnology, plant remediation, environmental phytodesign, aquatic plants, algae, wastewater treatment, working zone air cleaning, polluted soil.

ENVIRONMENTAL VALORISATION OF MINERAL DEPOSITS

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ABSTRACT

Valorisation of mineral deposits is a tool to achieve a balance between the requirements of spatial planning and the protection of non-renewable natural resources. It is the basis to determine the most valuable deposits whose protection should be a priority.

The purpose of this paper is to present the environmental valorisation of documented mineral deposits and areas of forecasting their occurrence in selected municipalities of Malopolska province, the southern Poland. The subject of valorisation will be common mineral deposits: sands, gravels and clays of building ceramics. Based on the analysis of cartographic materials, documentation and testing of land will be performed environment valorisation based on the occurrence of protected areas and facilities, and existing and planned land use of the area above the deposits of minerals. This assessment will help to determine the attractiveness of the areas studied in terms of environmental conditions and the extent of possible operating restrictions. The results of valorisation should be helpful and used in the preparation of planning documentation of analysed area sites, defining the destiny.

Keywords: environmental – planning valorisation, mineral deposits, areas of forecasting their occurrence, planning documentation

IDENTIFICATION OF IMPORTANT ENVIRONMENTAL ASPECTS OF FOUNDRY HRONEC

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ABSTRACT

This submission deals with an identifications od environmental aspects and their environmental assessment of gray cast iron foundry operations using the LCA method, with emphasis on the use of waste materials. Casting with its outputs has a significant impact on the environment. This type of industry is dependent on the amount of natural resources, raw materials and energy that are consumed and used.

Method of Life Cycle Assessment (LCA), is one of the management techniques. For this method are created a series of standards ISO 14040:2006 and ISO 14044:2006.

Foundry is a typical ferrous metal foundry with a production capacity exceeding 20 tones/day. System boundaries shall be as set gate to gate. The overall results of the impact assessment gives an overview of the overall environmental impact of the production of 1 ton casting of gray and ductile iron. These results show that the greatest impact on the desired category and group impacts have processes associated with melting of metals on the opinion melting shop and 64.59%. This effect is mainly due to the intensity of the main extraction and processing of raw materials. Important role and contribution of foundry Hronec is its action-recovery of scrap metal. Recovery of scrap metal in the melting process 1 t casting represents mitigate smelter by 49.6%, thus foundry Hronec contributes significantly to saving so demanding entry, such as pig iron.

With this contribution we are highlighting the factors that most contribute to the burden pos. Unit processes in the foundry production are the main contributors to the consumption of resources. This research may serve as the basis for further research on the impact of foundry industry on the environment.

Keywords: LCA, Environmental Assessment, Foundry, Slovakia

ESTIMATION OF SOIL LOSS BY WATER EROSION DEPENDING ON LAND USE MANAGEMENT USING GIS

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ABSTRACT

Soil erosion is recognized as one of the most important soil degradation process worldwide, which can be effectively controlled by the implementation of erosion control practices, such as conservation tillage, crop rotation, residue management, vegetative filter strips, terraces, and grassed waterways. One of the easiest and simplest conservation practices is crop rotation.

In order to assess the soil erosion risk, soil erosion modelling at the watershed scale are needed to be undertaken. Geographic information systems are a useful and efficient tool for evaluating and mapping soil erosion risk in watershed. Modelling of water erosion intensity using geographic information systems can establish in which parts of the watershed limit values of soil loss are exceeded and thereby it is necessary to change crop rotation or design and implement another suitable erosion control practices.

The purpose of this paper is to apply raster GIS methods to a soil erosion model for the Tisovec (Slovakia) watershed displaying varying types of land use conditions.

Keywords: USLE, reservoir, GIS, crop rotation

EVALUATION OF THE MOUNTAIN MASSIF OSTRY (BESKYDY MTS.) ON THE BASIS OF SELECTED ECOLOGICAL FACTORS AND HISTORICAL MANAGEMENT

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ABSTRACT

The paper deals with the study of forest habitats based on an analysis of selected ecological factors, changes of land management, development of plant communities and communities of land molluscs - important bioindicator group of animals, which are sensitive to changes in habitat conditions.

The research was conducted on 10 study areas located on the slopes of Ostrý Mt., which lies in the Beskydy PLA. On each area was evaluated continuum of biotope development in terms of forest management, data from phytosociological survey, from inventory of malacofauna and from measurement of selected soil conditions (pH, humidity). Phytosociological data was processed in the TURBOVEG for WINDOWS [2] and evaluated in JUICE [9], attention has been focused on data about diversity (Shannon - Wiener index, evenness) and Ellenberg indicator values [1]. Survey of molluscs was focused on data of species richness; important information was the number of individuals in the various areas. The botanical and malacozoological data together with the data on land use (with an emphasis on the presence of fallen wood) and measured environmental factors were processed using gradient analysis in R 3.1.0. [8].

Keywords: forest management, biotope development, change of habitat conditions, molluscs, plant communities, multivariate analysis of ecological data

EXPLOITATION OF SHALE GAS BY HYDRAULIC FRACTURING - A METHOD WITH POSSIBLE MIDDLE AND LONG TERM CATASTROPHIC CONSEQUENSES

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ABSTRACT

In the hydraulic fracturing method the main quantity of fracking fluid (50-90%, waters with noxious additives) remains in the underground of the exploited areas, at various depths. The exploitation is more advantageous as the quantity of fracking fluid refluxed at surface is smaller. But in the same time, the greater the quantity of this fluid remained underground, the greater the possibility of a future contamination. These toxic fluids are quartered in the mother rocks affected by fracturing, represented by argillaceous rocks rich in organic matter. Nevertheless the fracking fluids can reach the surface during medium or long periods of time by various ways and because of various causes. For this reason it is important to stress on the fact that the hydraulic fracturing surely disturbs the dynamic equilibrium of the rocks covering the mother rocks attacked by fracturing, especially in the case of unconsolidated rocks (sands) and carbonaceous rocks (limestone). This disturbance is caused mainly by the great number of microseisms resulted from the fracturing process. Subsequently, after the end of the exploitation, surface instability phenomena become probable because of large quantities of gas or oil extracted from underground. These phenomena are well-known even after classical oil or gas exploitations. One way for the contaminated waters to reach the surface is the natural fault systems existent in the deposits above the exploited productive horizons. These faults are sometimes very difficult to detect, but they are always present, even in the platform areas in which the productive formations generally are to be found. Along these faults the toxic solutions and the methane gradually enter the permeable rocks i.e. deep aquifers and, closing to the surface, the phreatic waters and finally the hydrographic network. The natural seismic activity produced after the ending of exploitation can facilitate the access of the contaminated waters or methane towards the surface, especially in the situation of powerful seisms. After various periods of time, at surface, in the areas previously exploited by this method, it can appear contaminated waters springs which can more or less directly put in danger human, animal and vegetal life on large or even huge areas if the hydrographic network is contaminated. Also the closed wells, previously used for this type of exploitation, become contamination sources because of the continuous degradation in time of the cement isolation. All in all this method is dangerous for the natural resources of drinking and industrial waters (as strategic resources), connected with deep aquifers, phreatic waters or stream systems. In many zones there are valuable natural resources of mineral or geothermal waters that can be compromised. It is also important to mention that in the areas exploited with this method, the future drillings (whatever their purpose is) can be dangerous no matter if they reach the productive horizon or remain in the formations above. If they will open aquifers above the productive horizon they may find already contaminated waters and may facilitate their access to surface. From this perspective we consider the aggressive exploitation of the underground deposits by hydraulic fracturing as a planting of an ecological

GEOECOLOGICAL TYPIFICATION OF CENTRAL SPIS LANDSCAPE (SLOVAKIA) AND THE NATURE PROTECTION

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ABSTRACT

The region of Central Spiš in Slovakia is the area of several contrasts from the ecological and geographical point of view. On the one hand, there are varied and appropriate natural conditions and there are also deposits of minerals that influenced the development of mining and metallurgical industry. On the other hand, the long-time impact of these anthropogenic activities had and nowadays still has a negative impact on the all components of environment and on the health of the people living in this region; as a result, this region belongs among the 9 most environmentally loaded-polluted regions of Slovakia. Even though this region is so anthropogenic influenced and degraded, it is still possible, because of the variety of natural conditions, to find localities that have appropriate criteria for insertion to the national network of the protected areas as well as to the network of the programme NATURA 2000. The aim of this article is to characterize geoecological structure of this area through the classification of geoecological types of the landscape. The main criteria for the classification are geological and geomorfological conditions of the area in a relation to the soil and climatic conditions. Knowing of the spatial differentiation of geoecological types of the landscape is important because of the reconstruction of geoecological structure of the area that is markedly anthropogenic affected, changed and degraded in the most of the area. In the particular geoecological types of landscape, we also evaluate the occurrence of special protected territories that should be the basis of ecological stability in this environmentally loaded area.

Keywords: geoecological typification, Central Spiš, protected area, environmental loading

GEOGRAPHICAL CONSIDERATIONS ON TOURISM POTENTIAL. COMPARATIVE ANALYSIS BETWEEN BISTRITA VALLEY (ROMANIA) AND REPUBLIC OF MOLDOVA

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ABSTRACT

Tourism is a permanent activity of modern man, with implications at many levels (natural, economic, social-cultural and political. The article illustrates a geographical approach to the tourism phenomenon, with an emphasis on aspects of the tourism potential of a territory. From an economic perspective, the main components of tourism are tourism potential, workforce involved, tourism infrastructure, facilities and equipment manufacturing, tourism services, tourist consumption goods and organizational touristic structures. The tourism potential of a territory implies all natural and anthropogenic elements, which may make the subject of tourist attractions. From a geographical point of view, the notion of tourism offer refers to the planned tourism potential transformed into tourism product. Tourism planning is a dynamic and complex process of scientific organization of the touristic site (design of new tourist facilities, refurbishment of the existing ones, their increasing or reducing according to the tourism demand) and the economic viability of the tourism activity, by taking into account the relationships between the environment and human communities, as well as the factors influencing these relationships. Tourism potential of a territory assumes a complex tourism infrastructure, diversified, consisting of public and private companies to effectively organize tourist market.
Comparative analysis of two areas - Bistrita Valley and Republic of Moldova - illustrates the existence of a rich and diverse heritage tourism, but insufficiently capitalized in terms of tourism. In this context, for a better capitalization of tourism of these regions, is necessary diversification and modernization of accommodation and recreation, transport infrastructure and tourism products based on current tourists demands. The conclusions of this comparative study aims to sharing information and experiences of good practice relating to the exploiting opportunities of the potential of tourism, to boost cooperation in tourism decision makers, through the development of common touristic programs.

Keywords: tourism potential, protected natural area, tourism product, tourism infrastructure, tourism planning, tourism recovery

GEOPARK "ALONG THE FOOTPRINTS OF OLD ORE MINING" AS AN INNOVATIVE PROJECT AND NEW GEOTOURISM ATTRACTION IN POLAND

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ABSTRACT

The article presents issues concerning the adaptation of survived remains of former mining works for industrial tourism and geotourism purposes, based on the example of the geopark "Along the footprints of old ore mining" opened in 2013 in Lower Silesia in Poland. Environmental and socio-economic benefits are emphasized as a result of such project.

Keywords: mining heritage, geoparks, enviromental protection

GEOTOURISM AND MINING HERITAGE

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ABSTRACT

Geotourism is an extended form of tourism with the continuing growth of interest in general and professional public. Originally focused on aspects of the interpretation of geological and geomorphological objects, so-called geosites. Also was focused on providing services that would allow tourists access to information and knowledge on geology and geomorphology. Geotourism explores and offers in addition to science and the beauty of nature and anthropogenic activities. Geotourism also explore technical monuments associated with mining activities such as mining works, mining museums, archives mining, trade routes of transporting commodities obtained from collectors and mining activity (historic trade routes across Europe in goods such as obsidian, salt, copper and the like.), and the technical and cultural heritage associated with historical mining activities, which could be included under the term mining tourism. In historical mining countries, like those in central Europe, mining tourism is based on mining artefacts

Keywords: Geotourism, mining tourism, mining heritage, geosite, geopark

HEAVY METALS ACCUMULATION IN SOIL AND PLANTS IN A LEAD OLD MINE: PROSPECTS FOR PHYTOREMEDIATION

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ABSTRACT

The potential for colonization of highly contaminated soils revealed by native species can be very interesting because it constitutes a natural attenuation of contamination until they are taken advanced decontamination processes.This study aimed to assess the phytoremediation potential of the flora found growing on lead (Pb) enriched soils in an abandoned Pb mine in Central Portugal. In mineralized veins zone the soil Pb concentrations averaging 2380 mg/kg and reaching 9330 mg/kg. Lead concentrations in plants ranged from 1.11 to 548 mg/kg. Significant accumulation of Pb was seen in *Cistus salvifolius*, *Lonicera periclymenum*, *Anarrhinum bellidifolium*, *Phytolacca americana*, *Digitalis purpurea*, *Mentha suaveolens*, *Polystichum setiferum*, *Pteridium aquilinum*, and *Asplenium onopteris*. In non mineralized zone, Pb content was not significant, ranging from 0.94 to 11.6 mg/kg. However, concentrations higher than toxic level in some species like *C. salvifolius*, *D. purpurea*, *L. periclymenum*, *A. bellidifolium*, *P. americana* indicate that internal detoxification metal tolerance mechanisms might also exist; therefore, their utility for phytoremediation is possible. Though at first glance maximum Pb content observed in trees like *Acacia dealbata*, *Olea europaea*, and *Quercus suber* from mineralized zone is not very promising compared to that of smaller plants mentioned above, nevertheless these trees can be very effective due to their enormous biomass.

Keywords: Abandoned mine, Barbadalhos mine, Bioaccumulation, Phytoextraction

HEAVY METALS IN VEGETABLES AS A RISK FACTOR FOR HEALTH OF CONSUMERS

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ABSTRACT

The problem of chemical soil pollution of agricultural areas is topical one. The concentrations of chemical elements (Be, Sc, Mn, Ni, Cu, Zn, Sr, Mo, Ag, Ba, Hg, Pb, U) in soil and grown vegetables in Tomsk rural areas were determined by atomic adsorbtion spectroscopy (AAS) method. Tomsk is an industrial city in West Siberia.

The risk assessment for human health at consumption of grown vegetables was performed in accordance with generally accepted methodology. Calculated living average daily doses of element intake were considered as safe ones.

The values of carcinogenic risks are calculated based on average concentrations of pollutants in the vegetables with the use of standard factors of exposure. The values of carcinogenic risks are in the interval 10^{-7}-10^{-6} and in accordance with the criteria for the risk acceptability is approached normal and not causing concern. However when the content of lead in the potato exceeds maximum permissible concentration by factor of 2.7 the average daily dose of lead receipt is beyond the scope of the safety (danger index is equal to 1.4-1.8, carcinogenic risk of $8.7*10^{-6}$). Special attention in the analysis of risk is paid to the lead which carcinogenic properties are not sufficiently studied. A danger to human health is raised by regular consumption of these vegetables or along increasing the frequency of the samples occurrence of a higher content of lead.

Keywords: Risk Assessment, Heavy Metals, Evaluation of health risks, Vegetables

IMPACT ANALYSIS OF THE ELECTROMAGNETIC FIELDS OF TRANSFORMER STATIONS CLOSE TO RESIDENTIAL BUILDINGS

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ABSTRACT

This article focuses on the area of electromagnetic fields that are emitted by transformers and distribution lines placed near the residential areas. This is a high voltage device for transforming AC voltage from 22 kV to 400 V and 230 V. These devices are placed in an brick buildings to avoid the negative effects of electromagnetism on human health. In the paper is analyzed and evaluated the electric field strength E and the magnetic flux density B. In terms of hygiene and health, values were evaluated with legislation in the Slovak Republic, relating to objectification and evaluation of electromagnetic fields. Slovak legislation is based on documents issued by the ICNIRP (International commission on non-ionizing radiation protection). For measurements was used EFA 300 analyzer and probes for electric and magnetic fields, manufactured by Narda.

Keywords: impact, electromagnetic fields, transformer stations

IMPACT OF CHEMICAL AND MECHANICAL WEED CONTROL ON THE FLORISTIC COMPOSITION AND BIOMASS PRODUCTION IN MAIZE CROP

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ABSTRACT

The research was conducted on a vertisol soil at the Didactic Research Farm, Faculty of Agriculture and Veterinary, in the region of Prishtina in 2012. The main aim was to investigate the impacts of chemical and mechanical weed control on the floristic composition of the weed vegetation and on the aboveground biomass production in maize crop. Three different herbicides were tested, Merlin flexx SC (a.i. isoxaflutole) at the pre- and post-emergence stage, Equip OD (a.i. foramsulfuron + isoxadifen-ethyl, safener) and Maister OD (a.i. foramsulfuron + iodosulfuron-methyl-sodium + isoxadifen-ethyl, safener) at the post-emergence stage, and two additionally treatments included mechanical weed control and the control treatment (without herbicide and mechanical weed control) in the maize variety NSC 444. The experiment was set in a randomized block design with four repetitions and elementary plots of 10 m^2. The estimation of the weeds and the aboveground dry biomass of weeds and maize crop were conducted per 1m^2. Forty days after the herbicide application or the mechanical weed control, we recorded the floristic composition (weed vegetation) and estimated the number of species, the number of individuals, and the plant life-forms. At the end of the vegetation period, we harvested the aboveground biomass of the crop and the weed vegetation, and determined the weight of the dry biomass. A total number of 19 weed species was documented in the experiment. Most numerous were broadleaved species (18), and only one species belonged to the grasses. In the control plots, the highest number of individuals was recorded for *Stachys annua* (14.5 plants/m^2), *Chenopodium album* (13.8 plants/m^2), *Amaranthus retroflexus* (4.5 plants/m^2), *Echinochloa crus-galli* (3.8 plants/m^2), *Fallopia convolvulus,* and *Polygonum aviculare* (3.3 plants/m^2). Regarding the plant life-forms, therophytes prevailed with 60.5 %, and hemicryptophytes (23.7 %) and geophytes (15.8 %) were also comparatively frequent. Finally, a high aboveground dry biomass of weeds went hand in hand with a low aboveground dry biomass of maize. In all treated plots, herbicides and mechanical weed control considerably reduced the weed species number in comparison to the control treatment (without herbicide and mechanical weed control).

Keywords: arable weed, herbicide, ecology, Kosovo

IMPACT OF DROUGHTS ON INSECT POPULATIONS: A REVIEW

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ABSTRACT

Climate change is not only linked with increase of mean temperature, but also with higher probability of the weather extremes like heavy rains, late frosts, heat waves and droughts. It is crucial to understand how these events can influence populations of insects. In this review we provided overview of direct and indirect effects of droughts on insect populations around the world. We studied how droughts are influencing populations (immigration, emigration, growth and population structure) and interactions between different trophic levels (plant/herbivore, herbivore/predator-parasitoid). Special attention is dedicated to interaction of different feeding guilds like foliar feeders and root feeders. We think that most endangered species by droughts are specialized species and species with smaller distribution areas or spatially cornered species (species living on islands, mountains tops and glacial relicts). Size can also play a role in surviving the droughts, because smaller species are more sensitive to higher temperatures (low thermal inertia), but bigger species are losing water much faster through respiration. This could lead to exclusion of both extremes. Empirical studies of local impact of droughts are needed together with local definition of droughts.

Keywords: insect, droughts, weather extremes, climate change

IMPACT OF GEOTOURISM ON LIVING NATURE

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ABSTRACT

The paper deals with some issues concerning geotourism and its impact on living nature. It is necessary that the development of Geotourism goes hand in hand with increasing of the environmental protection. Work gives some point of view on the devastation of living nature into attractive geosite – such as Drevenik, the locality which connects attractive geology with the valuable natural and also Mass tourism, resulting from visiting cultural sights - Spiš Castle. Work also identifies the sources of living nature devastation resulting from mass attendance and adrenalin activities, their categorization according to the degree of impairment and consequently it is looking for the steps to eliminate them.

Keywords: geotourism, nature, geology, environmental protection

INFLUENCE OF THE BUCHIM COPPER LEACHING FACTORY ON THE ENVIRON AROUND THE ACTIVE BUCHIM COPPER MINE

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ABSTRACT

Within this paper we are going to present a review of results for some particular contaminants such are: Co, Cu, Cd, Al, Fe, U etc., until the 2011 as well as review of results of monitoring (2012-2013) following the construction of the copper leaching facility. For the period covering period 1979-2011, in marked contrast, the water from the mine used to be acidic (pH <5) and had some dramatically high concentrations of particular elements: 75 mg/L Al, 1.16 mg/L Co, 140 mg/L Cu, 61 mg/L Mn, 0.905 mg/L U and etc. These very high values occurred within about 3 km of the mine but the influence of the mine extends downstream. For instance, the Cu concentrations used to be elevated (>0.5 mg/L) 24 km downstream, where the River Madenska joins the River Bregalnica. Positive effects in regards to environmental pollution following the construction of the leaching facility were confirmed by the results of the 2012 monitoring and especially by the results of the 2013 monitoring. According to the monitoring in 2013, copper values ranged from <0.01 to 1.6 mg/L Cu, silver in the range 0.001÷0.02 mg/L Ag, ammonia 0.006÷0.90 mg/L NH_4 as well as pH 4.58÷7.86, which itself speaks about the positive effects achieved with constructions of the leaching facility and engulfed drainage waters.

Keywords: leaching, Buchim copper mine, oxide ore, monitoring, contamination.

INNOVATIVE APPROACH IN WASTE MANAGEMENT

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ABSTRACT

Currently there is an effort put on waste recovery, recycling, yet neither of EU-28 countries including Norway and Switzerland cannot exist without tipping their waste. In Slovakia, there are only 2 communal waste incinerations and for this reason, most of the solid waste is going to landfill. All together there are 118 landfills in Slovakia, which are divided into three classes of landfill. Their uneven distribution in the territory is reflected in the so-called illegal dumps. Because all landfills have in compliance with waste management determined its period of activity and several landfills will be closed in the upcoming years, it is necessary to ensure that new landfills are built in such places that the entire territory of Slovakia will be evenly covered. This paper provides an analysis of existing landfills and proposed optimal completion of various categories of landfills including their location, by which the requirements of waste management will be met.

Keywords: landfills, waste, waste management.

ISOLATION AND IDENTIFICATION OF BACTERIA ISOLATES FROM ARSENIC CONTAMINATED ANTHROPOSOILS

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ABSTRACT

This study aims to isolate and identify autochthonous bacteria from arsenic-contaminated soils collected in the locality of Zemianske Kostoľany. After the coal ash pond spill in 1965, soils, sediments, and ground water were all significantly contaminated with arsenic exceeding 1500 ppm and with other potentially toxic elements. Firstly, sixty-three morphologically different bacterial isolates were obtained from samples of contaminated substrates. Consequently, identification of 16S rRNA sequences showed identities to genus *Pseudomonas, Rhodococcus, Bacillus, Streptomyces* and *Chryseobacterium*. Out of these, *Pseudomonas* was the genus of the greatest proportion of isolates in the studied ashy-soil substrates (62.5 %). The genus was represented by the species *Pseudomonas* sp., *P. chlororaphis, P. putida, P. baetica* and *P. reinekei*. The results showed that the genus *Bacillus* had the second highest abundance (20.83 %) and was represented by species *B. cereus* and *B. pumilus*. Two isolates of the genus *Bacillus* were classified as uncultured soil bacterium clone. There were further recorded two isolates of the genus *Chryseobacterium.* The genus *Streptomyces* and *Rhodococcus* were represented by only one species. Last but not least, 20 % of isolates were not identified to their genus. Results of studied bacterial species diversity, which was able to adapt to living in contaminated environment, are the basis for the application of selected indigenous bacterial species in bioleaching process as one of the potential methods for bioremediation of arsenic-contaminated soils.

Keywords: arsenic, bacterial species diversity, bioremediation, contamination

LAND USE AND LAND COVER CHANGE IN DÂMBOVIŢA COUNTY, ROMANIA (1990-2012)

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ABSTRACT

Dâmboviţa County (4054 sq km, 527000 inhabitants in 2013) is located in the south-central part of Romania. The high share of rural population (69%), the population density (130 inhabitants/sq km), as well as the dominance of intensely humanized plains and hills, are creating the premises of significant anthropogenic pressures, likely to put their mark on land use and vegetation cover. These factors are completed with socio-economic, political and legislative changes that affected Romania after 1990, such as: urban industry restructuring; migration of redundant labour force towards villages; restitution of agricultural and forestry land; and abandonment of agricultural land, due to low income level.

In this context, we investigated the changes occurred in land use and land cover in Dâmboviţa County, during the last two decades. The changes have been highlighted by analyzing statistical data and also through field observations and analysis of Corine Land Cover data for 1990, 2000 and 2006. Statistical analysis did not reveal significant changes in land use within 1990-2012, in the main categories of surfaces (agricultural and non-agricultural land). Within these categories, the most significant changes are found in the areas occupied by pastures (increase of approx. 19%), vineyards (decrease by 70%) and orchards (19% reduction). Analysis of Corine Land Cover data (level 1) emphasized small-scale changes in the sense of transfers from one category to another. Significant changes occurred generally within the same category (e.g. reducing of orchards and vineyards in favour of pastures and meadows).

In terms of land cover changes, a real threat is the loss of biodiversity due to natural factors (e.g. oak drying tendency; warping of some lakes; the decrease of swampy areas) and anthropogenic factors (e.g. issues of land ownership; the lack of an effective security system of protected areas, so that some reserves have been severely affected by poaching, grazing in forests or illegal cutting of trees). Also, phenomena of vegetation degradation occurred, as well as the replacement of some species by others. The last phenomenon was generally accompanied by a decrease in forest productivity and sometimes a worsening of stationary conditions.

Keywords: land use, land cover, post-communist changes, Dâmboviţa, Romania

LEACHING OF CONCRETE COMPOSITES CAUSED BY CHEMICAL CORROSION MODELING

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ABSTRACT

The problem of durability of concrete with cement as binding material comes more and more to the fore with the increased use of concrete, with the changed production and utilization conditions, and with the further development and adaptation of concrete properties by changing concrete composition. The major problem, however, is the concrete exposition to aggressive environments, which can lead to material corrosion. Chemical corrosion can be caused due to attack of aggressive media naturally existing in environment such as hydrogen sulphide and its derivatives.

In this paper the prepared concrete samples of different mixtures were investigated by modeling the chemical corrosion using H_2SO_4 and $Al_2(SO_4)_3$ solutions. The concrete leaching in different acidic environments as well as in distilled water, representing reference medium, was investigated by pH changes of liquid media. The concrete deterioration study in model conditions shows the course of impact of chemical processes, whereby the protection of concrete against aggressive environment can be proposed, but confrontation with in-situ experiments are needed.

Keywords: deterioration, concrete, leachate

LOCAL SPECIFICITY IN ENVIRONMENTAL IMPACT ASSESSMENT - END-POINT LOCAL EVALUATION INDICATORS

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ABSTRACT

The LCA is regarded as fundamental approach for environmental impact analysis. Usually it refers to different impact categories which are defined in various methods in different way but usually are related to end-point damage categories - like resource depletion, human health, ecological quality and climate change. Unfortunately evaluation process doesn't include local specificity of the terrain effected by the negative impact from the system under analyze.

Generally impact categories could be divided into two major groups – which could be called local and global. The most important local-type impact categories are human health, acidification and eutrophication.

The new approach proposed in the manuscript is based on the assumption that local type categories should include vulnerability of terrain affected. Methodology of description of sensitivity of the particular area in different impact categories is described in the manuscript. The additional indicator – which enriches standard LCA methodology – is defined. It is a measure of the quality of the selection of the location of the system in relation to the average reference areas. In the decision-making process it could therefore play a significant role. The proposed indicator can be calculated for all local type impact categories.

Keywords: environmental impact, LCA

MEASUREMENT OF NOISE EMITTED BY THE VACUUM CLEANERS NOZZLES BY THE DYNAMIC NOISE VISUALIZATION METHODS

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ABSTRACT

Noise reduction of home appliances is important role of the development process for new products and their parts. Vacuum cleaners are one of the equipment in the household that produce noise. Noise is factor that can affect human health. Producer due this reason reduce their noise. Noise reduction of the products also provides competitive advantage for the producers. One of the critical part of vacuum cleaners is suction nozzle that also produce noise.

Keywords: assessment, measure, noise, vacuum cleaners

MERCURY TOXICITY OF SEDIMENTS IN MINING-AFFECTED AREA RUDŇANY (SLOVAKIA)

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ABSTRACT

Ecotoxicological tests have been successfully applied to monitor the contamination and bioremediation efficiencies of soils and these tests are important in the ecological assessment of hazardous waste sites and in supporting management decisions for subsequent remediation. Harmful effects of contaminants on the ecosystems and humans are characterized by their environmental toxicity. Mercury compounds are considered to be one of the most important pollutants of environment. One of the mercury polluted area is sludge bed Rudňany in Eastern Slovakia, which is contaminated from the former mining activities. The article deals with phytoxicity of mercury in sediments of the sludge bed and creek Rudňany by using Phytotoxkit tests (MicroBioTests Inc., Belgium). The current measured concentrations of mercury were compared with the results obtained in years 1993 and 2005. The sediment phytotoxicity was evaluated based on the germination of seeds and decrease in the root growth of the plant *Sinapis alba.* Subsequently phytotoxicity tests with model solutions of metal Hg^{2+} ($HgCl_2$) were carried out and used in solution concentrations: 0.1, 0.2, 0.3, 0.5, 1, 3, 5, 10, 20, 30, 40 mg /l, which were embedded in test tubs with the reference soil. Model experiments were carried out for the purpose to determine the effective concentration ($72/EC_{50}$) of the reference element, i.e. in which the element causes toxically on ground biotope and consequently, evaluate the sediment ecotoxicity. In the sediment samples potential phytotoxic effects using the parameters percentage inhibition of seed germination (ISG) and percentage inhibition of root growth (IRG) were evaluated.

Keywords: Phytotoxicity tests, *Sinapis alba*, $72/EC_{50}$, sediment, mercury, Rudňany

METHOD FOR THE ESTIMATION OF LOSS OF LIFE DUE TO FLOODS AND SOCIAL RISK

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ABSTRACT

Obviously, loss of life is only one of the vast numbers of consequences that together make up the personal and social impact of a large-scale flood. In an international context, various methods have been developed for the estimation of loss of life for different types of floods: coastal flooding, river flooding, but also tsunami including dam breaks floods and coastal storm surges.

In this paper we solve of loss of life of river flooding. A comprehensive analysis of historical flood cases (1997-2012) and the factors determining loss of life have been undertaken. We developed a model for loss of life estimation for river floods. By combination of the loss of life estimates with available information regarding the probability of occurrence of flood scenarios, the societal risk is estimated. These results can be used as input for the decision-making regarding flood protection levels and strategies.

Keywords: flood, loss of life, social risk, factors

MODERN APPROACH FOR DETERMINATION OF ABSOLUTE CLIMATE EUSTASY

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ABSTRACT

A statistical method of the absolute eustasy (E_{Ca}) calculation, one of the major parameters of World Ocean (WO) level fluctuation, caused by climate change, is used. This parameter specifies to a sea level fluctuation relatively to its starting position and numerically is equal to sum of relative eustasy (Ec_r mm/year) and the value of "geological trend", i.e. the velocity of shore secular vertical *movement (±C mm/year)*

The starting position of sea level is its value at the beginning of the current global warming, which changes according to latitudes. Therefore, if level statistical series (LCS) covers the periods before and after the current climate fluctuation (so-called "long statistical series), it should be split into two fragments and Ec_a value calculation make by the second of them, using the equality $E_{Ca} = Ec_r \pm C$.

As along the WO shores geological trend varies widely (glacioizostatic processis, tectonics, ground' subsiding, etc.), where $C > Ec_r$, the sea level is reduced relatively to shore ($Ec_r<0$), but not relative to its starting value ($Ec_a > 0$). Throughout the WO regions $Ec_a > 0$, but has different values depending on the coefficient of thermal expansion of sea water and incoming discharge to WO, from the long-term stocks of land water. The main features of the $E_{Ca} = f\ (Ec_r, C)$, as well as Ec_a calculation are presented in table and conclusions.

Keywords: eustasy, level series, climate, subsiding.

MODERN EXPERIENCE OF NATURAL CLAY USE AT RECLAMATION OF DISTURBED SOIL

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ABSTRACT

Modern industrial landscapes have negative environmental effect on environment, being responsible for a chain of inconvertible and disastrous effects for all living things in the Earth. Basic reason for a long-run crisis in disturbed soil reclamation is a lack of scientifically proved and economically efficient technologies providing high environmental and social effect.

Keywords: soil disturbance, mine workings, herbaceous covering, buffer sand layer.

MYCOCOENOSES OF MINING AFFECTED ENVIRONMENTS

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ABSTRACT

The paper deals with identifying of mycocoenoses in two different environmental systems such as river sediment and technogenic substrates. Both types of substrates are heavily affected by old mining activities resulting in high contents of various toxic elements, which exceed limit values, and in extreme pH values of strongly acidic (pH = 5.4) in the river sediment and of strongly alkaline (pH = 8.6) in the technogenic substrate. From 46 species of identified microscopic fungi, 24 species were identified in river sediment samples in comparison with technogenic substrates, in which only 9 and 6 species were identified. Dominant species of mycocoenosis include *Penicillium* and *Aspergillus* species. Mucoromycotina (*Mortierella alpina* and *Rhizopus stolonifer* var. *stolonifer*) are poorly represented because of a lack of organic nutrients. The distinct ecological factor affecting mycocoenosis in all studied substrates was high content of various chemical elements such as Al, As, Cu, Fe, Mg, Mn, Pb a Zn.

Keywords: old environmental burdens, river sediment, technogenic substrate, toxic elements, microscopic fungi

NETWORK OF POSSIBLE INDUSTRIAL HERITAGE CULTURAL ROUTES IN CENTRAL EUROPEAN AREA

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ABSTRACT

There are some projects meeting the criteria to be a cultural route which passes through the Central European area. Some of them are recognized like national projects, some of them cross borders and connect same cultural, religious and industrial commonalities in certain historical periods in the area. Central European mining and trading of commodities such as copper, iron and salt is an ideal example of movement of specialists - miners, metallurgists and merchants. All of them spread religion, law (mining and municipial), custom, as well as word of mouth dissemination of culture - e.g. rumors and superstition in the Middle Ages. This sounds like it was declared by the Council of Europe in 1987: Objective of cultural route is to demonstrate, by means of a journey through space and time, how the heritage of the different countries and cultures of Europe contributes to a shared cultural heritage. In February 2007, the Route of Iron in Central Europe was recognised as a ‘‘Cultural Route of the Council of Europe’’. It falls within the scope of the theme of industrial heritage. We are sure, we can find more industrial heritage cultural routes in Central European area e.g.: Mediaval Salt route and Upper Hungarian Mining route.

Keywords: cultural route, Central Europe, heritage

NOISE POLLUTION IN MINING OPERATIONS: PREDICTION OF NOISE IMPACT ON ENVIRONMENT CAUSED BY MINING MACHINERY

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ABSTRACT

Mining operations are, by their nature, potential sources of environmental impacts. Before starting the development of the mine is mandatory to carry out an Environmental Impact Assessment containing all the changes in the environment and its proper removal, minimization or management, in the case that cannot be removed. One of the impacts that may occur is the increase of noise pollution in the surrounding areas of mines. There are several sources of noise such as processing plants, blasting and machinery among others. This paper develops a methodology to predict the noise impact of mining operations, collecting existent standards, guidelines and technical procedures with the objective of estimating the maximum level of noise and the range of that impact outwards mining activities, focusing in how machinery contributes to noise pollution. Numerous environmental factors determine the level of sound in a particular point of reception. These factors include, among others, the distance from the sound source to the receiver; surrounding terrain, ambient sound level, time of day, wind direction, temperature gradient and humidity. The characteristics of machinery sound are also important factors to consider when impact assessment is developed in the stage of seeking noise generating points. This paper shows a review of usual machinery used in mining, remarking which machinery causes more impact on the environment. It has to be considered that the produced depends on mine planning and the operational phase carried out. This paper follows the structure of Environmental Impact Assessment approaching and identifies sources of impact; predicts the maximum impact and propose mitigation measures. Once the generating sources of impact have been identified, the values perceived in sensitive areas under study should be established. To do this the attenuation models sound propagation outdoors should be taken into account. The methodology described could be useful to predict noise impact of ongoing projects or planned ones.

Keywords: noise pollution, environmental impact, mining, noise prediction, machinery.

NOISE POLLUTION LEVEL DUE TO MINING AND ENERGETICALLY ACTIVITIES IN OLTENIA AREAS

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ABSTRACT

Romanian legislation on the structure and content of the study to assess the impact on the environment due to mining and energy activities, forecasts and analyze the potential impact from noise and vibration generated as a result of such activities. Management of impact generated by noise and vibration on workers and residents of surrounding communities, is a key factor in the design, planning and implementation of any modern mining and also power plants because they can harm the employability of workers and residents of settlements comfort close and in situations where induce vibrations, physical integrity of potentially sensitive buildings. In this paper it is realized a *classification of sound sources* producing noise through mechanical action (collision and abrasion), through aerodynamic action (laminar discharge of fluid through the nozzle or those turbulent) and through thermal action, explosions or electric discharges. As the protection of own personnel with individual acoustic protection cannot be extended to the population in the nearby areas, and the control of the noise from the source is limited to the complexity of the devices, the reduction of the noise level produced by sound sources in the studied area can be realized on its way of propagation. For exemplification, we have elected Turceni steam power plant and mining quarries Jilt North and Jilt South, servicing this. Finnaly we presented experimental measurements of noise levels in terms of knowledge of the causes that produced it and the influence factors of the region. Finally we present some possible solutions for noise reduction.

Keywords: noise level, mining and energy activities, noise reduction

OPPORTUNITIES FOR RURAL DEVELOPMENT OF OLT COUNTY THROUGHOUT AGRITOURISM

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ABSTRACT

The present study is based on the growing importance of tourism in the rural area and the purpose is to highlight the agritourism potential that exist in Olt County, based on the implementation of one questionnaire implement in nine communes Călui, Curtișoara, Gârcov, Gura Padinii, Leleasca, Oboga, Orlea, Pleșoiu and Sâmburești, the communes being chosen by the landforms criteria: meadow, plain and hill. In order to point out the potential and the exploitation opportunities of the county, we have been adress to the decision makers from each commun based on hierarchy of agritourism development factors importance and the development of the area.

Keywords: Agritourism, Olt county, questionnaire

OPTIMIZE THE AMOUNT OF NATURAL ZEOLITE ADDITION TO THE SUB BASE ASPHALT LAYERS

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ABSTRACT

In recent years, warm mix asphalt (WMA) is becoming more and more used in the asphalt industry. WMA provide a whole range of benefits, whether economic, environmental and ecological. Lower energy consumption and less pollution is the most advantages of this asphalt mixture. Paper deals with the addition of natural zeolite into the sub base asphalt layers, which is the essential constituent in the construction of the road. Measurement is focused on basic physic – mechanical properties declared according to the catalog data sheets. Aim of this article is to demonstrate the ability of addition the natural zeolite into the all asphalt layers of asphalt pavement. All asphalt mixtures were compared with reference asphalt mixture, which was prepared in reference temperature.

Keywords: natural zeolite, warm mix asphalt, temperature

ORGANIC SUBSTANCES IN COASTAL MARINE WATERS OF RECREATION ZONE OF SEMBA PENINSULA

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ABSTRACT

Input of anthropogenic organic contaminants in coastal marine zone of Semba peninsula from Zelenogradsk to Svetlogorsk (Lesnoye) was analyzed during 2009-2013. Statistically-valid upper confidence bound of possible mean values of oil concentrations calculated for the most unfavorable hydrological conditions or the most adverse water quality period in the annual cycle (p = 0.95) has been used as a water pollution index of small rivers.

The content of organic substances in watercourses that are not included in the area of economic and recreational activity (use of tourist complexes, open car parks etc.) was significantly reduced during the observation period (from 1.5 to 0.5 MAC). At the same time some rivers flowing through the resort towns Svetlogorsk and Zelenogradsk are contaminated to a higher degree. Statistically- valid mean values of oil-concentration in those rivers went up from 0.8 to 3.0 MAC respectively.

Oil content in sea water in a recreational coastal zone does not exceed acceptable levels. However, high values of chemical oxygen demand (COD) (4-9 MAC), nitrogen-and phosphorus-containing compounds are indicative of untreated sewage from uncontrolled sources

Keywords: organic and oil contaminants, waste waters, coastal waters, monitoring

POSSIBILITIES OF UTILIZATION OF EQUIPMENT USING IR PRINCIPLES FOR MONITORING SOLID AEROSOLS IN REAL CONDITIONS

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ABSTRACT

Several factors influence the effects of solid aerosols in working environment. These effects include particle size, chemical composition, concentration and exposure of the particles. In this article we will focus on just one of these factors – the concentration of particles. We will focus on monitoring the concentration of inhalable fraction. We will use the device MicroDust Pro. The main advantage of this equipment is that it allows the real-time detection of airborne dusts. This ability will be used during the experimental measurements to identify the main sources of solid aerosols.

Keywords: solid aerosol, real-time monitoring, optical principles.

POSSIBILITY OF USE OF ZEOLITES AND GAIZE IN REMEDIATION TECHNOLOGIES

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ABSTRACT

The analysis of minerals that are widely used as sorbent agents is performed. A group of amorphous natural sorbent agents is considered in the form of sedimentary opal cristobalite rocks. Sorbent characteristics of gaize and clinoptilolite are studied in the article; and sorbent exchange capacity is revealed in terms of static and dynamic conditions.

Keywords: ion-exchange properties, zeolites, adsorption, anthropogenic territories, rate of filtration.

POTENTIAL IMPACTS OF WIND POWER PLANTS ON HUMAN HEALTH

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ABSTRACT

In relation with the development of renewable sources of energy investors suggest in many locations the construction of wind power plants. One of the regulating factors is the impacts of the wind power plants on the environment and human health. During long-term operation of wind power plants the habitat can be loaded with increased noise, which may affect the psychological well-being of citizens, and in some cases even it can physiological damage the hearing. The paper describes the specific parameters that are used in the evaluation of the impact of wind power plants on the exposed population. The influence is evaluated on the basis of a mathematical model of noise spreading from facility operations and practical terrain measurement of noise, taking into account the background noise at the site prior to the implementation plan. On a model example were evaluated potential effects on human health in the area and the expression of specific health injury symptoms, which may be caused with the operating of wind power plant. The paper also contains a relationship between dose and effect of damage to individual acts of public health.

Keywords: Wind energy, human health risk, noise, noise distribution modelling.

PRACTICAL MEASURES TO REDUCE ENVIRONMENTAL POLLUTION WITHIN DEVA - MINTIA THERMAL POWER PLANT

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ABSTRACT

This paper presents the main measures taken to reduce environmental pollution from THERMAL POWER DEVA - MINTIA, namely environmental factor - air. Through the burning of fossil fuels (coal energy), large combustion plants, emit energy in the atmosphere of total dust and gaseous pollutants (PM 2.5 and PM 10). In order to reduce dust emissions from the plant, Mintia is currently implementing a program of refurbishment, which includes energy groups 3 and 4, Large Combustion Plant belonging to no. 2) and consisting of a de NO_x installation and desulphurization of flue gases, as well as the related electrostatic precipitators includes rehabilitation of the two energy groups, measures taken to reduce SO_2, NO_x and dust discharged onto the chimney. These works are aimed at reducing these emissions and their classification in the limit values laid down by European legislation, namely Council directive 2010/75/E.U. industrial emissions (I.E.D.) and protecting the environment. By taking these measures, in addition to protecting the environment, and protect the health of the population in the surrounding area of the site and the station's staff worker.

Keywords: environmental pollution, electricity, national power System, Large Combustion Plants, air pollutants, industrial emissions, retrofitting works/modernizer.

PROPERTIES OF GEOPOLYMER TYPE BINDER FORMED IN SITU IN THE DISPERSION SYSTEM OF CALCIUM SILICATE SLAG

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ABSTRACT

The geopolymer type binders could be an alternative binders to cementitious binders. These are materials doped with various alkali precursors. The role of these precursors is to initialize and propagate polymerization of the matrix, to trigger solidification. Various precursors behave differently in the matrix. They affect ongoing processes, especially solidification of dispersion, rate of polymerization, final strength of solidified material [1], etc. Therefore, in this work the effects of the aluminum modified precursor on some parameters of castings made from lime-silica slag dispersion and this precursor were experimentally studied. Main parameters studied were volume changes during solidification and final strengthof castings after 7 days of curing. In this work original results are presented, discussed and processed into table and graphical form.

Keywords: slag, binder, geo-polymer, modified water glasses, hardness

PROPOSAL TO CREATE AN ALTERNATIVE CULTURAL ROUTE ON EXAMPLE OF ECOVILLAGE

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ABSTRACT

Creating cultural route serve to support specific cultural, industrial or other kind of excellence, its protection and assistance for its development. Culture, used technology, or change in environmental conditions through the human intervention is a process of transformation in timeline. In a case of emerging subculture: eco-village, we can follow birth of new community units across the planet on the same natural and pro-ecological principles.

Keywords: ecovillage, cultural route, new values, sustainable development, local development, ecology, emerging subculture, global movement, transition culture, network,

QUANTIFYING THE CHANGES IN LANDSCAPE CONFIGURATION USING OPEN SOURCE GIS. CASE STUDY: BISTRITA SUBCARPATHIAN VALLEY, ROMANIA

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ABSTRACT

Gradually, the study of the landscape became a core topic of environmental studies, due to its interdisciplinary research methods, integrating both natural and socio-economic data. The goal of the study is to quantify the structural evolution of Bistrita subcarpathian valley landscape, by using several GIS applications, having an important role in highlighting its functionality. The applications were realized for the extended area limit of Bistrita subcarpathian valley, which presents a complex landscape morphology, with features ranging from forested mountains to densely populated lowlands. The analysis was based on the two land cover maps resulted from the extraction of the spatial layers from the 1986 cadastral plans, 1:10.000 scale, respectively the 2005/2006 ortophotomaps, 1:5.000 scale. For completing the study, were calculated for the two periods a series of specific indicators, called landscape metrics, which contain quantitative information about the structure and features of the landscape. The results of the analysis proved the utility of these indicators in quantifying the structural evolution of the landscape, and also highlighted the capabilities of using Open Source software for complex spatial analysis. This type of analysis has a great importance for the authorities and other decision making factors regarding the territorial planning processes.

Keywords: landscape metrics, Open Source GIS, Bistrita subcarpathian valley

REGIONAL CLUSTERS AS AN INSTRUMENT OF ENVIRONMENTAL POLICY

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ABSTRACT

Growing demands for the implementation of environmental rules in enterprises force these companies to look for solutions that are appropriate for their structure and market segment. Times, when companies were focused on maximizing their profits without building environmental policy are now history. Environmental policy of companies and their implementation in practice has become a benchmark for quality assessment of the company and its brands. Difficulty and complexity of solved issue represents a special framework for defining tasks and objectives which cannot be resolved by their own expert groups. This assumption creates platform for forming specialized clusters, which in interaction with the public and private sector creates competitive advantages in the market. Such networking is an important element in the development of professional background in the market and linking theory with practice in solving specific tasks in the field of environment.

Keywords: cluster, networking, environment, innovation

ROLE AND FUNCTIONS OF THE GREEN AREAS IN THE PLAIN REGION OF DÂMBOVIŢA COUNTY

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ABSTRACT

The present work aims to illustrate a case study, carried out based on theoretical and methodological grounds, which analyzes the spatial distribution, the features, and the functions of the green areas of the plain units of Dâmboviţa County. The different categories of green areas present in the zone under analysis accomplish multiple functions (ecological, social, esthetic, economic). The ecological function has a major role in the protection and improvement of the environment (the improvement of the urban microclimate - moderation of the excessive heat and attenuation of the temperature variations during the day and during the night, atmospheric ionization; purification of the atmosphere – through important contributions as far as the chemical, physical and bacteriological purification of the atmosphere is concerned; lowering of the phonic pollution, improvement of the land's water retention capacity, preservation and perpetuation of the biodiversity).

The green areas of Târgovişte Plain are represented by the parks: *Chindia*, *Mitropolie*, *Mihai Bravu* – in Târgovişte, *Dalles* – in Bucşani, *Cantacuzino* – in Ciocăneşti, *Văcăreşti* - in the homonymous locality. In statistics, the forests contained by the green area have been introduced in the total surface of the green area (the forests of Nucet, Priseaca, Boteni, Bucşani). In the zone under analysis, numerous secular trees have been identified, which have been declared natural monuments (oak, walnut tree, locust tree, plane tree, larch tree, spruce fir, chestnut tree, ash tree).

Keywords: green areas, biodiversity, plain

ROLE OF LEAFY MOSSES IN WASTEWATER TREATMENT

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ABSTRACT

The use of plant-technologies to reclaim disturbed lands is analyzed in the article. The analysis of leafy mosses of Scorpidium (Schimp.) Limpr. type is performed to develop plant-technologies. Dynamics of arsenic reclamation from wastewater with Scorpidium (Schimp.) Limpr leafy mosses as well as its accumulation in the plant are considered.

Keywords: plant technologies, heavy metals, biota, pollutants, macrophytes, concentration of metals.

RURAL WASTE GENERATION: A GEOGRAPHICAL SURVEY AT LOCAL SCALE

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ABSTRACT

The paper examines the per capita waste generation rates from from rural areas of Neamț County (Romania) using thematic cartography. Geographical approach of this issue is difficult because the lack of a geostatistic database at commune scale. Spatial analysis of waste indicators reveals several disparities between localities. Comparability of data between communes located in various geographical conditions must be carrefully made according to local waste management systems. Several dysfunctionalities are outlined in order to compare these results, on the one hand, between localities and on the one hand, between recent years. Geographical analysis of waste generation rates is imperative for a proper monitoring of this sector. Data from 2009, 2010 and 2012 shows that rural waste management is in a full process of change towards a more organized, stable and efficient system.

Keywords: waste generation, rural areas, local disparities, geography of waste

SIGNIFICANCE OF THE ENVIRONMENTAL INDICATORS

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ABSTRACT

Environmental, economic and social indicators are used world-wide to report on the condition of human, natural and combined human-natural systems. A wide variety of environmental indicators is presently in use. Indicators provide practical and economical way to track the state of the environment. An environmental indicator is a numerical value that helps provide insight into the state of the environment or human health. These indicators reflect trends in the environment and monitor the progress made in realising environmental policy targets. As such, environmental indicators have become indispensable to policy-makers. However, it is becoming more and more difficult for policy-makers to grasp the relevance and meaning of the existing environmental indicators, given the number and diversity of indicators presently in use. The OECD, with the support of its Member countries, has long been a pioneer in the field of environmental indicators. It has developed and published the first international sets of environmental indicators and uses them regularly in its country environmental performance reviews and other policy analysis work. This paper focuses mainly on environmental indicators.

Keywords: indicators, green growth, production

SNOW POLLUTION REGRESSION MODEL FOR KARABASH CITY OF RUSSIA

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ABSTRACT

Land-use regression (LUR) models are successfully used in Europe and United States of America in recent 10-15 years for atmospheric air pollution description. The models provide getting the air pollution maps on a large area with high spatial resolution (~ 10 m) and relatively small financial and time costs. The paper is devoted to assessment of the land-use regression (LUR) method applicability for description of snow cover's pollution. Snow may be used as a good indicator of air pollution in many Russian regions where snow lies about 4-6 months a year and accumulates all substances coming from atmosphere. The assessment was done for Karabash city, which is one of the most polluted Russian cities due to long activity of «Karabashmed» copper smelting plant. The study showed that the LUR method can be successfully applied for description the dust deposition density from atmosphere and further use as a part of environmental monitoring systems.

Keywords: dust deposition, Karabash city of Russia, land-use regression, snow pollution.

SOLUTION APPROACH TO HISTORICAL POLLUTION AND ACCUMULATED PRODUCTION WASTES

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ABSTRACT

The questions of old accumulated waste and environmental pollution as a result of past economic activity which followed the socio-economic transformations in the country are considered in the context of the problem of comprehensive development of the technogenic mineral resources. The analysis of publications has shown a growing relevance of the large-capacity waste management problem not only in Russia, but also in all CIS countries. The study explains the concept of solving the problem, main scientific and practical tasks.

Keywords*:* modern waste, accumulated waste, historical waste, technogenic mineral resources, historical pollution, the liquidation of old (historical) pollution.

SOLUTIONS FOR REDUCTION OF POLLUTANT EMISSIONS RESULTING FROM FOSSIL FUELS COMBUSTION INSIDE THE BOILERS OF MINTIA THERMAL POWER PLANT

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ABSTRACT

This paper describes the main measures taken to reduce environmental pollution within MINTIA - DEVA power plant, part of Complexul Energetic Hunedoara S.A.

By burning fossil fuels (hard coal), the Large Combustion Plants respectively the power units discharge large quantities of pollutants into the atmosphere, such as dust (under the form of suspensions or particulate matter) and flue gas (SO_2, NO_X, CO/CO_2).

In order to reduce such pollutants emission, Mintia Thermal Power Plant is in progress of implementing a rehabilitation program for two power units within the Large Combustion Plant, no. 2 (LCP 2), respectively power unit no. 3 and power unit no.4.

This rehabilitation program involves:

- Accomplishment of the flue gas desulphurization system for power units 3 and 4;

- Fulfillment of a NO_X reduction installation from flue gas at boilers 3A, 3B and 4A, 4B, pertaining to power units no.3 and no.4;

- ESP rehabilitation works at power unit no.3 and no.4 for reduction of dust discharged into the atmosphere through the stack;

- Technological rehabilitation of power unit 4.

All these measures actually represents the short-term priorities of Complexul Energetic Hunedoara S.A which have as final purpose the environment protection as well as the protection of the operational personnel's health working in the power plant and of the population residing next to the facility.

Keywords: Large combustion plant (LCP), National Power System, industrial emissions, electricity, air pollutants.

SOME APPROACHES TO GEOECOLOGICAL EVALUATION OF REGIONAL GEOSYSTEMS OF THE REPUBLIC OF TATARSTAN

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ABSTRACT

Seven regional geosystems varying in their ecological-and-faunistic peculiarities have been defined based on the following parameters: landscape features of the territory of the Republic of Tatarstan, demographic situation, the degree of economic transformations of the territory, the distribution pattern of the regional bird fauna population. The evaluation of the geoecological condition of the regional level geosystems has been given based on the indicators of the correlation of the geosystems with various size and functional purpose forming the territorial areolas and possessing various quality characteristics. The differentiation of geosystems according to the degree of their ecological and economic condition has been carried out based on the calculated coefficients of the anthropogenic development and natural protection of the geosystems. A bio-ecological characteristic of the bird fauna of the defined natural territorial complexes has been given on the basis of the landscape and areolar analysis. An attempt has been made to identify direct or inverse dependence between the indicators of the bird fauna population and the ecological and economic condition of the territory.

Keywords: geosystem, anthropogenic transformation, natural protection, bird fauna, natural and territorial complex.

SORPTION OF HEXAVALENT CHROMIUM ONTO DIVERSE SORBENTS

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ABSTRACT

This paper focuses on sorption of hexavalent chromium onto biosorbents prepared from different biological materials and clay minerals. It describes their characteristics, mechanism of sorption and chemical pretreatment. It further characterizes sorption capability and capacity of the sorbent. The aim of the article is to evaluate the sorption process in removing hexavalent chromium from aqueous solutions as an alternative to the commercial and commonly used methods.

Keywords: hexavalent chromium, adsorption, algae, cyanobacteria, clay minerals

STUDY OF HEAVY METALS RELEASING FROM CONCRETE COMPOSITES

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ABSTRACT

The paper is aimed at the study of selected heavy metals releasing from the concrete materials based on the waste utilization. In spite of the solidification process, trace concentrations of metals are released from the concrete materials depending on the environment which is building material exposed to. To study the leachability of heavy metals from cement composites the concrete samples containing 95% special additive based on slag as a replacement of Portland cement as well as samples without this special additive have been studied. the analysed samples were exposed to various liquid media (distilled water, rain water and Britton-Robinson buffer) during 30 days. Leachates composition was analysed by using colorimetric method in terms of chromium and barium ions concentrations. The pH value and conductivity of leachates at the beginning and after the 30-day experiment were determined.

Keywords: heavy metals, cement composite, chromium, barium

THE ASSESSMENT ANALYSIS OF OLTENIAN REGION TOURISM AND AGRITOURISM POTENTIAL

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ABSTRACT

This paper aims is to analyze how the oltenian tourism and agritourism may be valorized and give an overall perspective for the region, in which we include the component counties Dolj, Gorj, Mehedinți, Olt and Vâlcea, for the year 2011, by using a number of tourism indicators, related to tourism offer: structure of authorized tourist units and structure of tourist accommodation units. The study reflects that the main county of the South-West Oltenian Region is Vâlcea county with a total of 279 units, from a total of 547 at the regional level, whitch represents more than fifty percent and regarding accommodation, Vâlcea county being also in the lead, with 10.536 number of beds out from 20.046 at the regional level.

Keywords: agritourism, South-West Oltenia, accommodation units

THE ASSESSMENT OF RECLAMATION SUCCESS WITHIN POSTMINING LANDSCAPE OF UPPER SILESIA

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ABSTRACT

This article aims to evaluate the reclamation of the mine *František 1* (Horní Suchá, Karviná district, Czech Republic) in terms of restoration of landscape features in the area significantly affected both by coal deep mining and coal treatment technologies. Reclaimed area was divided into 6 segments based on habitat conditions (including occurrence of specially protected species of animals and plants) each of which was subjected to another method of reclamation and restoration of functional potential of the territory. Segments with technological tanks for storing flotation tailings were reclaimed to grasslands with future potential for industrial use, the segment of natural values - especially with the presence of protected species of plants and animals have been treated as non-intervention in order to use natural succession, respectively controlled ecosystem succession, water pond was reclaimed with purpose of recreational fishing. Within the biotechnical phase of reclamation domestic tree species were used, group and strip plantings followed the close-to-nature design. Generally, it is possible to evaluate the rehabilitation work carried out as very successful and as a model approach to the solution of functional recovery potential of the mining affected areas.

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Keywords: post-mining landscape reclamation, controlled ecosystem succession.

THE BISTRITA VALLEY RAFTING BETWEEN TOURISTIC POTENTIAL AND VALORIFICATION

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ABSTRACT

The economic purpose occupation of the rafting have at least several centuries old in Romania. The communist period had a negative role on this level occupations produced by breaking traditions, habits. Practiced only sporadically, this activity has important touristic meanings today, many tourists are willing to do this kind of tourism with the specific secular tradition. Obviously today, the old rafting has many followers, the transported wood before being replaced by tourists. The request is high, especially from foreign tourists, being able to organize touristic halts in the most representative locations throughout the Bistrița Valley. The translation of rafting from an occupation and a craft to a touristic form that generating profit would value the whole Bistrița Valley, economically speaking. Reestablishment of traditional wood processing facilities for the museum purpose would whole tourist attractiveness of the valley.
This paper aims to review the main points of this activity on Bistrița Valley and build a complex tourism product, based on rafting.

Keywords: rafting, valorification, touristic potential, Bistrița, Romania

THE BUFFALO -PART OF ANIMAL BIODIVERSITY IN ROMANIA AND THE IMPORTANCE FOR THE BIOECONOMY

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ABSTRACT

Generally buffalos (*Bubalus bubalis*) are widespread in tropical and subtropical areas, warm and humid climates. In the world, there are 182 million buffalo heads, and 95% of total population is in Asia. In Europe, there are 459 000 buffalo heads (0.25% on world population), of which in Italy are 370 000 buffalos. In the last period the trend has been declining, especially in the Balkan countries (Romania, Bulgaria, Macedonia, Greece, Albania and Serbia). In Romania, the last 30 years the number has dropped from 228 000 to 22 400 buffalo heads. This decrease in the number of buffalos in Romania was caused by the unfavorable agricultural policy for buffalo species.

This study was conducted in Transylvania (central Romania)) and the Romanian Plain, along the Danube River. The working method was to analyze statistical data on 100 years, the chemical analyzes performing with Ecomilk device and performing body measurements. Data were processed by mathematical methods, and the results were compared to the literature.

From the results it was found that in Romania there are ecotypes of river buffalos, adapted ecological zone. Each population is characterized by adaptation to a particular habitat, specific resistance to certain diseases. We analyzed the reproductive indicators and we observed that the population from southern Romania, in the Danube valley is precocious (the age of first mating is 31.33 days, and the age of first calving is 41.82 days). Buffaloes population from Transylvania is belated (the age of first mating is 38.16 days and the first calving age 48 days). The calving interval was also variable, ranging from 478.06 days in buffaloes population from Transylvania and 509.93 days in buffaloes from Danube Valley ($p<0.01$). In both populations analyzed the birth rate ranged from 87.24 to 91.41% and the fecundity rate from 73.32 to 75%.

The body development of buffaloes in Romania is variable depending on the ecological area. Thus, in the South of Romania the animals have the body development smaller (the size of withers 132.17 cm, the oblique length of trunk 138.04 cm, the thoracic perimeter 198. 14 cm, the body weight 622.30 kg) in Transylvania the body development of buffaloes is larger (the size of withers 136 cm, the oblique length of trunk 141 cm, the thoracic perimeter 193.14 cm, the body weight 638 kg) ($p <0.01$).

Regarding of milk production, buffaloes analyzed from Romania realized 1669.03 kg milk in 274.74 days of lactation with 7.65% fat and 4.30% protein. This species is suitable for organic farms, obtaining organic food with high nutritional value.

Keywords: active conservation, biodiversity, bio-economy, buffalo, meet, milk

THE CAUSES ANALYSIS AND COLLISIONS PREVENTION OF THE WILDLIFE WITH MOTOR VEHICLES THE EASTERN PART OF THE CENTRAL REGION DISTRICT OF THE CZECH REPUBLIC

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ABSTRACT

This research deals with analysis and prevention of vehicles conflicts with animals in the Eastern part of the central region of the Czech republic. In this work various factors are taken into consideration, such as annual weather factor and weather conditions, type of vehicle, visibility in a different time of day and others.

Further the work deals with possible prevention and measures for these conflicts through various means that are either currently in use but are not effective or already exist but are not used. The work will describe the effectiveness of all the means in the Czech republic that prevents conflicts.

The work is mainly focused on the large animals starting with hare or fox, smaller animals are not mentioned as vehicles conflict with them are very rare and go unreported or drivers even don't noticed them. In work will also quantified the total damage which was in conflicts.

Keywords: animal, conflict, road safety, landscape, migration, prevention

THE COMMUNITIES OF WATER MOLLUSCA IN THE FLOODED SUBSIDENCE RESERVOIRS IN UPPER SILESIA

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ABSTRACT

The contribution deals with the inventory of aquatic molluscs in flooded subsidence reservoirs of Upper Silesia, which are formed as a side effect of deep mining of coal. During the 8 months were conducted inventory survey of 8 sites that differ from each other mainly in area, depth, altitude, type of bottom sediment, species composition of the littoral vegetation and hydrochemical parameters such as pH, temperature, conductivity. The totals of 12 aquatic species were found of the phylum Mollusca (10 gastropods and 2 bivalves) in the study area. Only one species of *Hippeutis complanatus* (Linnaeus, 1758) has not been found compared to inventory survey, which was conducted during 2011 and 2012 by Kašovská (2012). The positive results we classify the occurrence of a rich population of *Aplexa hypnorum* (Linnaeus, 1758) in a research station called the U skládky, which provide a refuge for the nearly endangered species. The smallest flooded mine subsidence is located in a heavily anthropogenically affected area not only in terms of undermining, but also the storage of municipal solid waste. Exploration of aquatic molluscs also confirmed the expansion of non-native species *Physella cf. acuta* (Draparnaud, 1805) and *Potamopyrgus antipodarum* (Gray, 1843), specifically the area Barbara. Executed malacological research will continue also in 2014 and will serve as a model group of animals to assess the ecological functions of flooded subsidence reservoirs of Upper Silesia.

The article was prepared with the support of the project PL.3.22/2.3.00/12.03351 "Education of professionals to the care of post mining areas at the Polish-Czech border region".

Keywords: Upper Silesia, aquatic molluscs, flooded subsidence reservoirs, littoral vegetation, coal mining

THE ECO-TECHNOLOGIES BASED ON EXTENSIVELY NATURAL TREATMENT WASTEWATER IN RURAL AND SUBURBAN AREAS THE PURPOSE OF RECOVERING THE ENERGY AND NUTRIENTS

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ABSTRACT

The paper proposes the study of eco-technologies in pilot scale wastewater treatment plants that can be used for sustainable and efficient treatment systems sewage from rural and suburban communities. The technologies that will be studied will consist of extensively treatment based on microalgae culture and natural biological processes of wastewater filtration. The purpose is to finding solutions for the transforming domestic waste water into green energy resource, irrigation water, biofuel and compost.

Keywords: eco-technologies, wastewater treatment plants, microalgae, green energy

THE ECOLOGICAL STABILITY EVALUATION OF THE LANDSCAPE

(CASE STUDY FROM THE EASTERN SLOVAKIA)

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ABSTRACT

This paper focuses on the evaluation of the level of ecological stability of the landscape and on the degree of anthropogenic impact on the landscape in a regular square of grid (real size squares 0.25 km ²) in an ArcView GIS 3.2. Model area represents the cadastral territory of the Bardejov city (72.8 km²), which is located in the northern part of the Eastern Slovakia. First method which we have used in this contribution is based on the evaluation the meaning of the land cover classes in the meaning the work of [11]. The second method was based on the exploring the variation the coefficient of ecological stability of the landscape within the relations of the anthropogenic interference into the landscape structure [8]. The underlays for monitoring the intensity of anthropogenic intervention of, as well as the degree of eco-stabilizing ability of the country have become the layers of a secondary landscape structure (land cover classes). Since that the anthropogenic interference in landscape may cause irreversible changes in the landscape structure, these changes were recorded in the time-spatial context (time horizons 1985, 2009). The importance of the work is in the comparison of two methods of research and its results. The importance of the work is in the comparison of two methods of research and its results with a focus on the fluctuation the index of ecological stability in the square of grid with minimal surfaces. Represents possibility efficiency of research based on the use of homogenous spatial units.

Keywords: ecological stability, land cover, anthropogenic influence, evaluation

THE ECOLOGICAL VALUE ASSESSMENT OF THE AREA AFFECTED BY INDUSTRY ACTIVITIES (MORAVIAN-SILESIAN REGION, CZECH REPUBLIC)

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ABSTRACT

The presented contribution deals with the former ash pond from coal power plant study in the Třinec city which is one of the most important industrial cities in the Czech Republic. The paper describes results of research focused on long-term biotopes mapping of this area. For more accurate statement of time changes of vegetation and ecological value assessment were used aerial orthophotomaps of 1958, 2000, 2003, 2006 and 2009 years (1:7500). Scientific benefit of the contribution is to draw attention to the possibility using today's air orthophotomaps and introduce a method for evaluating the ecological and monetary value of habitats which is based on the method of Hessian for financial statements of environmental damage area. Recently, Hessian method is also recommended by the European Commission White Paper of Environmental Liability, for assessment of damage to biodiversity. The results of this research refer to the highest ecological value for the year 1958 ie. before building the pond and lowest value for the year 1970 when the pond was fully functional and its area is occupied almost with 80% of the total surveyed area and 20% were terraces with spontaneous vegetation.

Keywords: Orthophotomap, Hessian method, Natural succession, Biotopes evaluation, Ash pond

THE ECONOMIC COMPLEX TOURISM RELATIONSHIP

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ABSTRACT

Tourism increases local reliance upon a global economy, leaking many economic benefits outside of the community back to the companies and countries that control most of the travel infrastructure. At the same time, tourism decreases dependence on local resources, as technologies, food, and health services are imported. Local people may also be pushed out or sell out, and local prices for commodities and services rise, as do taxes.

Globalization of tourism activities, the application of information technologies in tourism firms and the changes in tourism demand and attitudes, all create a dynamic sector where innovation has become of central importance. Innovation in tourism has been in the recent past secondary and capital scarce and for this reason was excluded from the scope of government interest and actions. However, there has been a shift, with European Union leading the way but also national governments following suite. Given the complexity and dynamics of the society's current development process, it is difficult to give a clear, accurate and comprehensive definition of the concept of globalization to remove any ambiguities caused by subjective factors.

Globalization has become a term that goes beyond the strictly academic sphere and is frequently used by the media and public. The latter has many reservations about the concept, which could be a cover of the diffusion of Western-European and especially American culture, of the new forms of contemporary capitalism. Many authors have attempted to define synthetically globalization in all its scale and complexity, but they almost always resort to a dominant empiricist spirit. Most often, globalization means the constant integration process of material, financial, monetary and information flows globally in a single market, with specialized areas. Achieving this market involves removing all obstacles from population flows' way, of protectionism of any kind, of technology transfer, of political interferences in the dynamics of global economic life. This necessarily implies a reduction of the importance of states, the creation of local political structures that have as target the sustainable development of the planetary space, increasing the role of the United Nations in securing peace, stability and global equity. Thus defined globalization, of course, also has many elements of utopian character, which make it vulnerable including conceptually, not to mention applicative.

This article, using a geographical methodology for research makes a diagnosis of the major relations between globalization and Romanian tourism in order to obtain a prognosis and trends in the evolution of the Romanian tourism within the European context.

Keywords: tourism, globalization, trends, policy prospects, sustainability

THE EFFECTIVENESS OF ENVIRONMENTAL IMPACT ASSESSMENT PRACTICE IN SLOVAKIA

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ABSTRACT

Environmental impact assessment (EIA) was first introduced in Slovakia based on the Environment Law of 1992. The practice in EIA started developing shortly after the Law No. 127/1994 Coll. came into force. The first group of experts was certified as being EIA/SEA professionally qualified persons. Subsequently, EIA processes have been strengthened by Ministry of Environment through a series of amendments. The current practice adheres to EIA Law No. 408/2011 Coll. and its amendments. In the paper the views of professional qualified persons are examined closely, using a questionnaire survey. The objective of this study was to assess the potential for improving the effectiveness of EIA in Slovakia, and finally the main weak points are disclosed and recommendations for improvement presented. Data from the questionnaires are analysed to find information relating to current EIA practice and the future for EIA. The results of this research suggest that the use of new legislation should be extended in Slovakia in order to improve EIA effectiveness.

Keywords: environmental impact assessment, Slovakia, effectiveness, legislation.

THE INFLUENCE OF CONDITIONS ON THE DEGRADATION OF SODIUM N-CHLORO-BENZENESULPHONAMIDE AND SODIUM P-TOLUENESULPHONAMIDE FROM INDUSTRIAL WASTEWATERS

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ABSTRACT

The article describes the optimization of the purification process of industrial waste waters containing sodium N-chloro-benzenesulphonamide (ChBSA) and sodium p-toluenesulphonamide (TSA). The article presents the results of an experimental research dealing with the retention period of industrial waste water in waste-water treatment plant, the potential of biological degradation of industrial waste waters from the production of ChBSA and TSA and the choice of a suitable substrate for activated sludge supporting the biodegradation of ChBSA and TSA. The results of the experiment clearly show that the ideal contact time of activated sludge in the biological section of an industrial waste-water treatment plant and the waste water from the production ChBSA is 6-7 hours. The suitable ratio for biodegradation of industrial waste water from the production of ChBSA and TSA is 75% ChBSA: 25 % TSA.

Keywords: industrial waste water, treatment, sodium N-chlorobenzenesulphonamide, chloramine B, sodium p-toluenesulphonchloramide, chloramine T

THE INFLUENCE OF NATURAL AND ANTHROPOGENIC FACTORS ON THE DEGRADATION OF WATER IN "GRLISTE" RESERVOIR

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ABSTRACT

The quality of surface waters is a very important problem incorporated in the environment protection. Water reservoir "Grliste" was formed with the aim of water supplies of Zajecar and surrounding villages in Eastern Serbia. In this paper, the measured values of nutrient concentrations, were analysed in the water reservoir and its tributaries Lenovacka and Lasovacka river. The influence of anthropogenic factors of degradation on the water reservoir, during the exploitation was analysed. Sampling was performed in according to seasonal changes, and results were analyzed for the period (May - October). Defined by the law of areas sanitary protection, the basis for the purpose of prevention of the degradation (organic and other pollutants) of the water reservoir was formed. Special attention is given to the structural characteristics of the geological terrain, mineral occurrences and mines in the hydro accumulation basin. The research results will be shown with tables, charts and maps.

Keywords: water reservoir, "Grliste", water quality, nutrients, anthropogenic factors, geology, mineral resources

THE JIU VALLEY AND FACTORS AFFECTING LICHEN GROWTH

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ABSTRACT

Specific search tools, which are more sensitive to determining accurate values regarding the increasing amount of toxic substance, in the environment that affects human life, are needed to control pollution. Air pollution is a highly variable phenomenon, influenced by several factors – space and time. Automatic detectors in monitoring stations, for the monitoring of air pollution is essential for areas such as large urban centres, it is a complex action due to a series of reasons. In the Jiu Valley, biomonitoring the air quality is based on the altering of components of normal ecosystems from pollution, the combined effects of multiple pollutants on the biotic component can be estimated. Identifying the vulnerabilities in the Jiu Valley is the aim of this paper, determining appropriate measures to reduce pollution through bioindicators.

Keywords: lichen, biomonitoring, ecosystems, pollution, bioindicators

THE MINING LANDSCAPE OF TESCHEN SILESIA REGION – STRUCTURE AND DEVELOPLMENT

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ABSTRACT

Teschen Silesia (in czech Těšínské Slezsko, in polish Śląsk Cieszyński) is situated on the left bank (Czech part) and the right bank (Polish part) river Olza, between Ostravice river and Odra river in the west, eastern boundary at the river Biala, municipalities Jaworzynka and Nýdek on the south and the confluence of the rivers Odra and Olse and Goczalkowicke lake is in the north.

The northern part of Teschen Silesia is mainly known for its coal mining and major devastation of the natural elements of the landscape. Despite this fact, however, the significant part of the area retained a unique character of natural biotopes.

In the paper we want to consider the potential of the landscape by the natural values, historical settlement and different approach in land use on Polish and Czech territory, which is reflected in the structure of the landscape of Teschen Silesia.

Keywords: landscape, mining, structure of landscape, natural conditions, cultural conditions

THE POTENTIAL OF NORTHEASTERN CARPATHIANS IN TERMS OF THE GEOTOURISM PROGRESS IN THIS AREA

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ABSTRACT

Article deals with the evaluation of the development potential of Geotourism in Northeastern Carpathians area. This development in mentioned region could be controlled by suitable regional policy and by various marketing practices that have set realistic goals. In the easternmost region of Slovakia, in Bukovské Hills area, is located Poloniny National Park, which has a unique natural wealth. On the territory of the National Park is the largest concentration of beech forests in Slovakia. The article characterizes tourist infrastructure in the primary forests country of Outer Eastern Carpathians, within the International Biospheric Reservations East Carpathians. In article are depicted possible measures for tourism development

Keywords: Geotourism, natural wealth, Poloniny National Park

THE REMOVAL OF OIL SUBSTANCES USING LABORATORY PREPARED ABSORPTION BOOMS

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ABSTRACT

The article deals with the removal of oil substances from the water surface and solid surface by means of laboratory-prepared sorbents in the form of booms. The shell or the surface of the boom is made of hydrophobic polypropylene fabric, produced using the meltblown technology; the filling is a hydrophobic sorbent, made of ash from combusting plant biomass, polyurethane foam and hydrophobic agent, which was developed at the Institute of Environmental Engineering, Faculty of Mining and Geology at VŠB-Technical University in Ostrava. The sorption capacity of the prepared sorbent was compared with the sorption capacity of a conventional, commercial sorbent on peat base. In the course of the experiments the sorption capacity in the removal of diesel oil, engine oil and petrol was observed. One sorption boom, which is 23cm in length, 12cm in diameter and weighs 120g, absorbed about 400ml of diesel oil and 385ml of petrol from the water surface; and from the solid surface it was 485ml of diesel oil and 530ml of petrol. However, the boom's capacity to absorb engine oil was not satisfactory. The sorption capacity of all tested sorbents was analogous.

Keywords: oil substances, water surface, solid surface, absorption boom, polyurethane foam, biomass ash

THE ROLE OF HYDROGEOCHEMISTRY IN DEFINING GEOPATHOGENIC ZONES OF NATURAL RADIONUCLIDES INFLUENCE IN THE LIVING ENVIRONMENT OF RURAL SETTLEMENTS

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ABSTRACT

In accordance to geological-structural characteristics of the terrain, in the phase of regional researches of uranium, different methods of geochemical prospection were applied. By hydrogeochemical prospection areas of natural radionuclides influence on living environment of rural settlements were defined. The locations were selected in which contents of U, ^{226}Ra and ^{222}Rn were increased in underground and ground water.
The locations were selected in different geological environments:
- Area of Vršac mountains which is built of crystalline schists with traces of granite. In them using Monte Carlo method geochemical radiation burden and cancer incidence were calculated per 100000 inhabitants.
- In the area of tertiary sediments of Zaplanjski and Barbeški basins, anomalous concentrations of U, ^{226}Ra and ^{222}Rn were detected in springs, wells and surface flows.
The determined secondary scattering halos of uranium, radium and radon in underground and surface water define radio ecological halos of rural settlements at selected locations. Research results contribute to the identification of geopathogenic zones of natural radionuclides influence on human population in living environment. The prospected area within regional researches includes the area of over 1000 km2. Several thousand samples were collected in which: contents of U, Ra and Rn, anionic-cationic composition, content of gases and microelements, pH, Eh, Ep, mineralization, firmness, were determined in the purpose of monitoring natural radionuclides distribution and their deposition at favorable geochemical barriers.
In accordance to World Health Organization criteria (WHO) for radionuclides concentrations in drinking water in radio ecological halos, water check points were isolated in which U, ^{226}Ra and ^{222}Rn contents exceed allowed concentrations, which is shown in: tables, diagrams and hydrogeochemical maps (1:50000).

Keywords: geopathogenic zones, hydrogeochemical prospecting, crystalline schists, tertiary sediments, uranium (U), radium (^{226}Ra) and radone (^{222}Rn).

THERMAL TREATMENT OF WASTE WITH THE USE OF PLASMA

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ABSTRACT

Waste with organic content that are generated in the industrial and municipal sectors, can be an important source of energy. According to the origin and composition of the waste different possibilities are chosen for thermal processing. This paper describes combined technology for thermal treatment of waste, using the combination of reduction and plasma methods. The experiment was carried out with the use of plasma reactor, which was built in the laboratories IET VŠB Technical University of Ostrava and partial experience are commented of the first measurements in processing of selected organic wastes.

Keywords: plasma, pyrolysis, waste, thermal treatment,

UNUSUAL MINING HERITAGE OF LOWER SILESIA, POLAND

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ABSTRACT

The article presents issues concerning the history of several-century-old mining activity in the area of Lower Silesia (in Poland) and its remains, especially including studies conducted in the scope of mining history and its heritage (including mining archaeology). It is emphasized that further intensive, interdisciplinary work is required in order to identify, protect and secure the survived post-mining objects in the described area.
Keywords: mining heritage, geoturism, Poland

UPPER HUNGARIAN MINING ROUTE

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ABSTRACT

Defining Upper Hungarian Mining Route as cultural industrial mining route is the result of Hungary - Slovakia cross-border project solved at two universities in Slovakia and Hungary. Cultural route offers tourists a trip inside the area, which was a source of fabulous wealth of Hungarian kings in the Middle Ages. Mining activity in Upper Hungary started in the 12th century and significantly developed with settlement of German miners after the Tartar invasion in 1241. Most important mining towns in Upper Hungary (nowadays predominantly Eastern Slovakia) were Gelnica, Smolnik, Jasov, Rožňava, Spišská Nová Ves, Telkibánya and Rudabánya . These seven mining towns, which were granted royal privileges, established the Association of Upper Hungarian Mining Towns. They had self -government and earlier constituted a type of association with own mining law. Defined Upper Hungarian Mining Route passes two states (Slovakia and Hungary) and offers rich mining and cultural heritage experiences present in Mediaval mining towns, along with the beauty of the Western Carpathians through which it passes.

Keywords: Upper Hungarian Mining Route, Mining, Upper Hungarian Mining towns, history of mining, Middle Ages, Medieval salt route, Association of Upper Hungarian Mining Towns

VARIOUS APPROACHES TO EVALUATION OF ECOLOGICAL STABILITY

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ABSTRACT

Nowadays, the landscape is under a heavy pressure that comes from a rising human needs. The landscape changes reflect the cooperation of influence of the human needs, but the ecological stability of landscape is often destabilized. The first step in finding out the solution of this problem is the evaluation of landscape ecological stability, however it is a complicated process.

The evaluation of this process is based on various mathematical methods. At the beginning, the calculation of the ecological stability is done by determination of landscape elements and categorization them into predefined categories. The predefined categories vary for different methodologies, nevertheless the methodologies have similar point of view on eco-stabilization value of landscape elements.

There are many methodologies that are used in Slovakia. Some of them have been presented in Muchova et al. (2009), Rehackova – Pauditsova (2007), Low et al. (1984) and Michal (1982). First two mentioned methodologies have been designed to be used in Land Consolidation (LC) and the Territorial System of Ecological Stability (TSES).

This paper deals with the comparison of two methodologies. The first methodology was presented in Low et al. (1984) and the second methodology that has been compared is according to Michal (1982). These two referred methodologies were used to determine the coefficient of landscape ecological stability in cadastral area Bielovce. Data used in presented work have been prepared in GIS environment.

Keywords: Territorial System of Ecological Stability (TSES), ecological stability, coefficient of ecological stability

VERIFYING THE ADVANTAGES OF CONCRETE ROAD PAVEMENT BASED ON FLY ASH USING THROUGH THE LCA METHOD

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ABSTRACT

For globally significant products such as cement, environmental life cycle assessment (LCA) is a valuable tool for improving our understanding of the environmental hazards posed by a product's life stages. In addition, LCA allows cement producers to optimize the manufacturing process by reducing adverse environmental impacts. The paper points to the advantages of using fly ash in the road construction. It presents results obtained by optimization components of concrete mixture using 15 % wt. fly ash as cement replacement through the method LCA. The calculated LCA values were normalized to 1km (4m of width x 0.25m of thickness) of concrete road. Concluding results the optimized fly ash concrete road pavement were as follows: GWP values 16.7xE5 kg CO_2eq/kg; PEI: 26.1xE5 MJ/kg; AP: 3.2 kg SO_2eq/kg; ODP: 8.4E-3 kg CFC-11eq/kg; POCP: 1.9E2 kg C_2H_2eq/kg, and NP: 8.1xE2 kg $(PO_4)^{-3}$eq/kg. In comparison with standard concrete road, the results values were reduced by 6-10% on the average. The environmental impacts of 25 and 50% wt. of cement replacement by fly ash were also analyzed.

Keywords: environmental protection, fly ash, LCA, green concrete

WASTEWATER TREATMENT BY FLOTATION WITH MODERN SYSTEM OF AERATION

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ABSTRACT

Flotation is widely used for wastewater treatment. The main part of flotation process is a system of aeration. The objective of this work is to study a modern one which is a combination of classic dissolved air flotation (DAF) and pneumo-hydraulic (or nozzle) systems. The systems were compared by two main parameters: energy consumption for producing 1 m^3 of air bubbles and their mean diameter. A multi-stage model of flotation was used to describe a flotation process. Firstly several experiments were held in a laboratory flotator with the described system of aeration to obtain some components of model constants. And treatment efficiency was estimated using the model. Then prepared synthetic wastewater was treated in the laboratory flotator. The results showed relatively a good correspondence between the experimental and predicted values of treatment efficiencies.

Keywords: flotation, wastewater treatment, system of aeration

XRPD, FTIR INVESTIGATION AND THERMAL DECOMPOSITION KINETICS OF POLLUTED SEDIMENT FROM SLUDGE BED RUDŇANY (EASTERN SLOVAKIA)

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ABSTRACT

The study area, sludge bed Rudňany (Eastern Slovakia) was formed by the silting-up of the tailings coming from the processing of complex siderite-sulphidic and barite-sulphidic ores exploited in the Rudňany in 1963-2003. This area was studied by many authors from different perspectives. Our research was focused on XRPD, FTIR investigation and thermal decomposition kinetics. From particle size analysis it was found, that sediment particle size is in the range 1-30 μm, the main phases are barite, siderite and other found phases are quartz and illite. High contamination of sediment with elements (Cu, Zn, As, Pb, Cr, Ni, Cd) was confirmed by XRF spectrometry. Thermal analysis was used to study thermal behaviors of sediment. Knowledge about thermal behavior of sediment was obtained using thermal analysis. This could be interesting for the related environmental considerations. Also, information about activation energy of thermal decomposition processes could be useful for further utilization of sediment. Activation energy was calculated using Kissinger method under non-isothermal conditions.

Keywords: contaminated sediment, XRPD and FTIR-characteristics, kinetics