**AL-FARABI KAZAKH NATIONAL UNIVERSITY**

# INFORMATION
## about publication activity
## DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL SCIENCES

| № | Наименование публикации | Выходные данные *(doi статьи)* | Аннотация статьи | Ссылка для цитирования *(Ф.И.О., название статьи, название, номер и/или выпуск, том журнала, страницы, doi статьи)* |
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| 1 | Calculation of bed load discharge for coarse sand | Journal of ecological engineering | At present, during the period of intensive climatic changes, it is important to thoroughly take into account the hydrological regimes of water bodies. One of the major conditions of ensuring hydrological safety of territories is a reliable forecast of stream-channel deformations and channel-related processes in the case of water bodies and their separate sections. This paper reviews different methods of calculating bed load discharge. Thus, a new technique of calculation of bed load discharge was developed with consideration of the probabilistic estimate of the beginning of bed load motion. The method shows satisfactory results compared to previous techniques in use | Myrzakhmetov, A., Duskayev, K., Tursunova, A., Dostayeva, A. Calculation of bed load discharge for coarse sand - Том 23, Выпуск 9, Страницы 13 – 17, 2022 DOI 0.12911/22998993/149857 |
| 2 | Monitoring of accumulation of polychlorinated biphenyls in the snow cover in the | News of the National Academy of Sciences of the Republic of Kazakhstan, Series of | here are presented results of the accumulation of polychlorinated biphenyls (PCBs) – the most toxic compounds among persistent organic pollutants (POPS) in the snow cover (SC) study (2018 and 2020) in the Almaty agglomeration (AA). Protection of the | Amirgaliyev, N., Askarova, M., Kulbekova, R., Ismukhanova, L., Madibekov, A. Monitoring of accumulation of polychlorinated |

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| | Almaty agglomeration | Geology and Technical Sciences | natural environment and the population from the efects of POPs, including PCBs, is one of the most acute problems for Kazakhstan. The territory of AA is experiencing a serious technogenic load, the concentration of a number of pollutants in its natural objects exceeds the permissible standards. Snow cover among natural objects, is one of the informative indicators of pollution of the natural environment, including the air basin, and reflects the main trends in the spread of pollutants in the region. For the first time, studies of the level of PCBs contamination of the SC of the vast AA, by taking snow samples at a large number of points, using modern chromatographic methods and instruments, established the contamination of its territory with these dangerous toxicants. Up to 22 individual PCBs congeners were identified in the SC of the agglomeration. Strictly controlled «marker» (indicator) and highly toxic dioxin-like congeners were registered in snow samples with a wide range of PCBs congener composition. The analysis of analytical data and the container composition of PCBs allows us to note that the SC of the agglomeration is polluted by regional sources. The results of the study can be used by government agencies and scientific institutions in assessing the level of pollution of the SC territory of Kazakhstan, including urban agglomerations. | biphenyls in the snow cover in the Almaty agglomeration // News of the National Academy of Sciences of the Republic of Kazakhstan, Series of Geology and Technical Sciences, 2022 (4), pp. 28-43 DOI10.32014/2022.2518-170X.198 |
| 3 | Polychlorinated Biphenyls in the Snow Cover of South-Eastern Kazakhstan | Applied Sciences (Switzerland) | The presence of large sources of environmental pollution due to persistent organic pollutants (POPs), in particular, polychlorinated biphenyls (PCBs), in Kazakhstan necessitates the assessment of pollution as a result of these toxicants. For this purpose, we chose snow cover as an indicator for assessing pollution status in the study area. An assessment of the PCB accumulation level included in the list of POPs was carried out for a snow cover (SC) study in south-east Kazakhstan. The content of PCBs with a wide congener composition was determined using the chromatographic analysis method. During the winter periods of 2014, 2015, 2018–2020 and 2021, the SC | Amirgaliyev, N.A., Medeu, A.R., Opp, C., Madibekov A.S. Ismukhanova, L., Zhadi, A. Polychlorinated Biphenyls in the Snow Cover of South-Eastern Kazakhstan // Applied Sciences (Switzerland) - Том 12, Выпуск 17 September 2022 Номер статьи 8660 DOI 10.3390/app12178660 |

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| | | | pollution of the study area from up to 25 individual PCB congeners was identified. These congeners included highly toxic dioxin-like congener PCBs 105; 108; 114; 118 and “marker” PCBs 52; 101; 138; 153. These congeners were mainly found in snow samples with a wide range of PCB congener compositions. The main PCB pollution sources were indicated. The analysis of the obtained results and structure of the congener composition of PCBs show that the SC contamination in this territory occurs under the influence of local and regional sources. © 2022 by the authors. | |
| 4 | Accumulation of Heavy Metals in Bottom Sediment and Their Migration in the Water Ecosystem of Kapshagay Reservoir in Kazakhstan | | The bottom sediment of reservoirs has many functions. Among them, matter sorption is a very important one, and results in many side-effects on the reservoir sediment forming the water–bottom sediment system. As a result, bottom sediment can also be an indicator of anthropogenic water pollution. There is only very little knowledge of this situation in the study area. The main objective was the analysis of heavy metal accumulation in bottom sediment, as well as their ability to migrate throughout the water–bottom sediment system and their spatial distribution in the Kapshagay Reservoir in Kazakhstan. Heavy metal concentrations, in the both water samples and the bottom sediment, were determined using the atomic absorption spectrophotometric method. Surfer software was used to visualize the processes of migration and accumulation. Another objective was the development of model maps of the spatial distribution of metals in the reservoir water area, which indicated significant anthropogenic loads. It is obvious that both the transboundary inflow of the Ili River and the inflow from small rivers in the territory of Kazakhstan are the reasons for the anthropogenic water and sediment load. The results of the spectrometric analysis verify the water pollution in the reservoir, revealing increased concentrations of zinc reaching up to 10.8 µg/L and lead up to 32.7 µg/L, transported by the transboundary runoff of the Ili River and by the small rivers on the left bank | Madibekov, A., Ismukhanova, L., Mussakulkyzy, A., Kulbekova, R., Zhadi, A. Accumulation of Heavy Metals in Bottom Sediment and Their Migration in the Water Ecosystem of Kapshagay Reservoir in Kazakhstan // Applied Sciences (Switzerland) - Том 12, Выпуск 22November 2022 Номер статьи 11474<br><br>DOI10.3390/app122211474 |

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| | | | into the Kapshagay Reservoir. Sediment concentrations close to the central part and dam zone of the reservoir reached the following values: zinc up to 37.0 mg/kg and lead up to 8.8 mg/kg. The results of this study indicate a significant anthropogenic load of the ecological conditions of the Kapshagay Reservoir. This is discussed and compared with other relevant studies. | |
| 5 | Results of AAS-measurements of atmospheric deposition of copper and lead in the snow cover of Almaty agglomeration | Pure and Applied Chemistry | he article presents the results of the study conducted on the territory of the Almaty agglomeration (AA) in the first half of 2019. During the expeditionary studies, sampling was carried out at 30 permanent points established taking into account the degree of anthropogenic load and sources of technogenic pollution. The content of trace elements (TE) in the snow was determined by a flame atomic absorption spectrometric method using an AA-7000 spectrophotometer with a hollow cathode lamp and with a nozzle burner operating on an acetylene-air mixture. The paper considers the amount of content of copper and lead in the snow, as well as the nature of their distribution over the study area. Calculations were carried out on the number of depositions of the TE in question per unit area over the territory of the agglomeration, with the allocation of zones experiencing the highest technogenic load. © 2021 IUPAC & De Gruyter. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. For more information, please visit: http://creativecommons.org/licenses/by-nc-nd/4.0/. | Madibekov, A., Ismukhanova, L., Mussakulkyzy, A. Kulbekova, R., Zhadi, A. Results of AAS-measurements of atmospheric deposition of copper and lead in the snow cover of Almaty agglomeration Pure and Applied Chemistry - Том 94, Выпуск 3, Страницы 275 – 280 DOI10.1515/pac-2021-0203 |
| 6 | Seasonal variations and effect of covid-19 lockdown restrictions on the air quality in the cities of Kazakhstan | Environmental Processes | The objective of this study was to investigate the impact of COVID-19 lockdown on different air pollutants in eight cities of Kazakhstan by employing the data from the National Air Quality Monitoring Network. We selected eight cities located in different regions of the country with varied climatic and geographic conditions and emissions sources, providing good conditions for studying the differences in responses of air quality to COVID-19. Due to severe winters, the heating season | Baimatova, N., Omarova, A., Muratuly, A., Tursumbayeva M,.Bukenov, B., Kerimray, A. Seasonal variations and effect of covid-19 lockdown restrictions on the air quality in the cities of Kazakhstan //Environmental Processes - Том 9, Выпуск 3September 2022 Номер статьи 48 |

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| | | | in Kazakhstan has a significant impact on air quality; therefore, annual winter/spring changes in air quality were also compared. The positive effect of the COVID-19 lockdown (spring 2020) on $NO_2$ and CO levels was observed in 5 and 3 cities, respectively (out of 8). Total Suspended Particles and $SO_2$ exhibited a more complicated response to COVID-19 lockdown: cities had a varying effect. No impact of lockdown measures was observed in industrial cities (Ust-Kamenegorsk and Karagandy), but seasonal changes were significant. In addition, despite some improvements during the lockdown period, the air quality in seven out of eight cities was still below the safety levels. The atmospheric quality in urban areas of Kazakhstan has not improved significantly due to the lockdown measures. This study underscores the importance of imposing stricter air quality emission control over industrial enterprises and coal-fired power plants | DOI10.1007/s40710-022-00603-w |
| 7 | Planetary Boundary Layer and its Relationship with PM2.5 Concentrations in Almaty, Kazakhstan | Aerosol and Air Quality Research | Air pollution is a severe problem in Almaty (Kazakhstan), especially during the cold half of the year (October-March). Almaty is one of the most polluted cities in Kazakhstan and Central Asia, with average winter $PM_{2.5}$ (particulate matter with aerodynamic diameter ≤ 2.5 μm) concentration of 94.0 μg $m^{-3}$. High pollution in the wintertime in Almaty could be caused by emissions from coal combustion for power and heat generation (at power plants and small-scale heating), which could also be worsened by poor dispersion of air pollutants due to certain atmospheric conditions. Based on one-year radiosonde data, the characteristics of the planetary boundary layer height (PBLH) and its effect on ground-level $PM_{2.5}$ concentrations in Almaty were analyzed in this study using the bulk Richardson number (Ri) and potential temperature increase (PT) methods. During an annual cycle, the concentrations of $PM_{2.5}$ were highest in the winter months when the daily concentrations were above 100 μg $m^{-3}$ for 38 days during this period. The results show a clear negative relationship between the daily average $PM_{2.5}$ | Tursumbayeva, M., Kerimray, A., Karaca, F., Permadi, D.A. Planetary Boundary Layer and its Relationship with PM2.5 Concentrations in Almaty, Kazakhstan - Aerosol and Air Quality Research - Том 22, Выпуск 8August 2022 Номер статьи 210294<br><br>DOI 10.4209/aaqr.210294 |

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| | | | concentrations and PBLH at 12.00 UTC. For instance, high $PM_{2.5}$ concentrations in winter months (94.0 μg $m^{-3}$) corresponded to a lower PBLH (393 m), and low $PM_{2.5}$ concentrations in summer months (9.9 μg $m^{-3}$) corresponded to a higher PBLH (1970 m). During the cold half of the year, the top 20% of $PM_{2.5}$ concentrations were associated with a lower PBLH and calm wind conditions (lower average wind speeds within the PBL and a lower ventilation coefficient). The results show that PBLH variations during the year have a significant effect on $PM_{2.5}$ concentrations; however, further analysis is needed with a more substantial amount of observational data to understand this interaction further and to investigate the role of synoptic processes that lead to a shallow PBLH | |
| 8 | The importance of conducting research methods to assess the state of glacial-moraine lakes | News of the National Academy of Sciences of the Republic of Kazakhstan, Series of Geology and Technical Sciences | The article analyzes the importance of ongoing long-term observations and field research in assessing the state of glacial-moraine lakes. Since the second half of the XX century, 87 mudflows of glacial genesis have been recorded in the northern slope of the Ile Alatau. Mudflows of glacial genesis are considered as catastrophic phenomena, preventing or reducing their damage is possible only taking into account the experience of the past 80-90 years or through comprehensive measures, such as continuous survey, monitoring and evaluation of the areas. Long-term observations and field research of lake surveys of the glacial-moraine complex are essential for Almaty city with a population of 2 million people and economically important facilities located at the foot of the Ile Alatau. During the conducting research the comparative assessment of the scale of mudflow activity and mudflow hazard of different mudflow basins is carried out, the mudflow basins with the highest activity or threatening the facilities of techno-, eco-, and socio-sphere. In order to protect this area from social and economic losses, 3 different methods of preventive measures are carried out to prevent the moraine lakes outburst floods. Therefore, timely and prompt | Mussina A.K., Abdullayeva A.S. *, Barandun M. The importance of conducting research methods to assess the state of glacial-moraine lakes // News of the National Academy of Sciences of the Republic of Kazakhstan, Series of Geology and Technical Sciences - Том 6, Выпуск 456, Страницы 147 – 1552022<br><br>DOI 10.32014/2518-170X.245 |

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| | | | assessment of the state of the lakes, obtained on the basis of research methods, is especially important for prevention and warning of catastrophic mudflows, mudflow hazard forecasting and mudflow risk management | |
| 9 | Monitoring climate change, drought conditions and wheat production in Eurasia: the case study of Kazakhstan | ***Heliyon*** | Wheat is an important global food security commodity. Kazakhstan is currently a producer and exporter of high-quality wheat to global markets. The most important wheat-growing regions, which lie in the northern part of Kazakhstan, are based on spring-sown rain-fed cultivation and are susceptible to climate change and drought. Using the monthly surface air temperature and precipitation data from 1950 to 2020 from 110 meteorological stations over Kazakhstan and in addition wheat cultivation data, the research aims to analyze climate change, drought occurrence, and wheat cultivation trends in Kazakhstan in recent 70 years and investigate relationships between wheat productivity and drought. The linear method and two drought indices (Standardized Precipitation Index and Standardized Precipitation Evapotranspiration Index) and in addition, Pearson's correlation coefficient have been used to characterise the climate change trends and vulnerability of agriculture in Kazakhstan to drought. The geographic information system (GIS) was applied to display climate change, drought, and wheat referenced information. The research has shown that the 70-year (1950–2020) linear rates of annual mean surface temperature in Kazakhstan have significantly increased (on average 0.31 °C per decade) with the precipitation trends are not obvious and fluctuated trends of drought. The wheat yield demonstrates strong internal variability and wheat yields were significantly correlated with 3-month June and July drought indices over the period of 1950–2020. The results underline the potential susceptibility of wheat yields in Kazakhstan to any future reductions in precipitation and increase in drought occurrence and intensity | Karatayev, M., Clarke, M., Salnikov, V. and 2 more Monitoring climate change, drought conditions and wheat production in Eurasia: the case study of Kazakhstan<br>***Heliyon*** - Том 8, Выпуск 1January 2022 Номер статьи e08660<br><br>DOI 10.1016/j.heliyon.2021.e08660 |

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| 10 | Investigation of environmental determinants for agritourism development in Almaty region of Kazakhstan | 10.30892/gtg.41203-837 | This study aims to comprehend relations between environmental determinants and agritourism by example of the Almaty region of Kazakhstan. As a basis for the research of this specific content the representation about agrarian recreational-tourist complexes (ARTCs) was developed and applied (ARTCs are special territorial and intersectoral integrities which largely depend on environmental determinants). Agritourism development is presented as the most important prerequisite for different successful tourism activities in Kazakhstan. With use of the developed instruments, information of different types and cartographical data 15 ARTCs were identified within the Almaty region as well as the influence of the environmental determinants for agritourism was studied. In bare outlines, the methods of functional agritourism and ecological agritourism analysis of the ARTCs' territory based on analysis of the environmental determinants are described. The results of the research can be used for the establishment of prospects for agritourism development within the ARTCs as well as for the development of address recommendation system. | Plokhikh R., Fodor G., Shaken A., Berghauer S., Aktymbayeva A., Tóth A., Mika M., Dávid L.D. Investigation of environmental determinants for agritourism development in Almaty region of Kazakhstan // Geojournal of Tourism and Geosites. – 2022. – Vol. 41, Is. 2. – P. 354–361. DOI: 10.30892/gtg.41203-837 |
| 11 | Selecting a Rational Scheme of Delivery by Road Transport: A Case Study of Goods Deliveries from China to Russia through Kazakhstan | 10.3390/su14094954 | Road transport is in most cases the only available transport option in rural regions with undeveloped railway infrastructure. The problem of choosing the structure of the logistics chain is one of the most important ones that forwarding companies must solve when planning freight transportation. Due to political peculiarities, transportation of goods by road through the territory of Kazakhstan must be carried out by national forwarders, which results in centralizing the decision-making process and shifting the tasks of designing the structure of supply chains to the Kazakh forwarding companies. In this paper, we develop a mathematical model to solve the problem of choosing the right structure for a logistics chain. The proposed model considers the existing legal constraints in the region. Based on a simulated demand for cargo deliveries from China to Russia, we use a numerical example to show how to justify the structure of the logistics chain characterized by minimal total costs of the companies involved in the delivery process. | Naumov V., Zhumatayeva G., Taran I., Bazarbekova M., Kenzhegaliyev B. Selecting a Rational Scheme of Delivery by Road Transport: A Case Study of Goods Deliveries from China to Russia through Kazakhstan // Sustainability (Switzerland). – 2022. – Vol. 14, Is. 9. – ID Article 4954. DOI: 10.3390/su14094954 |

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| 12 | Sustainability of the community-based ecotourism development in the Aksu-Zhabagly nature reserve, Kazakhstan: an evaluation through local residents' perception | 10.18335/region.v9i1.335 | The development of community-based ecotourism (CBE) has the potential to preserve biodiversity and protect the environment, as well as play an important role in the socio-cultural, economic and politically sustainable development of the community. This paper assesses the implementation of CBE development and compares the sustainability of ecotourism development between the Zhabagly community and the Abaiyl community. The data is obtained mainly through the household questionnaire survey, field observations, in-depth interviews and focus group discussions. 222 representative families were surveyed with 5-point Likert scale questions in this paper including 166 Zhabagly and 56 Abaiyl participants. The study used 18 indicators based on 4 dimensions: environmental, socio-cultural, economic and political. Results from this analysis indicate that the sustainability of CBE development in two communities is slightly different in all 4 dimensions. Zhabagly community is more successful in achieving sustainable CBE development than the Abaiyl community. The results reveal that the overall evaluation of the two communities on sustainability is moderate. However, both communities demonstrate that, potentially, they are politically unsustainable. As a result, we initially assert that the sustainability of CBE development in the Aksu-Zhabagly nature reserve (NR) is far from perfect. In particular, the positive economic and political impact of tourism development is not obvious. To address this shortcoming, tourism development organizations need to jointly develop a design policy for the sustainable development of CBE. | Akbar Imanaly; Maksatovna Sergeyeva Aigul; Kazbekkyzy Myrzaliyeva Zabira; Zhaksybekkyzy Tazhekova Akmaral; Tagabayevich Saulembaev Altynbai; Mominov Serik Abdukarimovich. Sustainability of the community-based ecotourism development in the Aksu-Zhabagly nature reserve, Kazakhstan: an evaluation through local residents' perception // Region. – 2022. – Vol. 9, Is. 1. – P. 69–82.<br>DOI: 10.18335/region.v9i1.335 |
| 13 | Current problems in the tourism and hotel industry taking the world's tourist cities as an example | 10.30892/gtg.43301-895 | Chinese tourism companies are facing problems such as over-exploitation of tourism resources, severe homogeneity of tourism service products, and gradual decline in corporate competitiveness. The article aims to provide the theoretical basis and experience for Chinese tourism to go abroad and develop international operations. This article uses a combination of qualitative and quantitative analysis methods. This article analyzes Singapore's tourism investment environment in many aspects, based on the existing theories of tourism transnational management, starting from relevant | Kulakhmetova G., Aktymbayeva A., Assipova Z., Baoleer B., Koshkimbayeva U. Current problems in the tourism and hotel industry taking the world's tourist cities as an example // Geojournal of Tourism and Geosites. – 2022. – Vol. 43, Is. 3. – P. 841–849.<br>DOI: 10.30892/gtg.43301-895 |

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| | | | research results outside China. The results demonstrate that the tourism industry in Singapore is the highest among Asian countries. | |
| 14 | The role of knowledge structures in reconfiguring rural tourism in response to the covid-19 pandemic: an exploratory study of rural tourism in Italy and Kazakhstan | 10.30892/gtg.41229-863 | The aim of this paper is to analyze changes in the notion and role of rural tourism provoked by the COVID-19 pandemic. The paper examines how rural tourism in the pandemic year 2020 has accommodated human needs for well-being: which touristic resources have been mobilized and what knowledge structures have contributed to mobilization of touristic resources. The authors use a qualitative multimethod approach to develop insights about the impact of the COVID-19 pandemic on changing roles played by rural tourism in Italy and Kazakhstan. The theoretical novelty of the research is that it conceptualizes tourism resource mobilization strategies as a result of the historical and emerging knowledge structures. It was found that while both geographical and ethno-cultural resources form the basis for rural tourism development, knowledge structures play a critical role in setting both the interpretative and institutional frames defining rural tourism forms and directions of development. | Grandi S., Macdonald S., Tankibayeva A. The role of knowledge structures in reconfiguring rural tourism in response to the covid-19 pandemic: an exploratory study of rural tourism in Italy and Kazakhstan // Geojournal of Tourism and Geosites. – 2022. – Vol. 41, Is. 2. – P. 555–563.<br>DOI: 10.30892/gtg.41229-863 |
| 15 | Women entrepreneurs in tourism in a time of a life event crisis | 10.1080/09669582.2022.2091142 | Female entrepreneurship drives tourism development in resource-scarce destinations but little is known about why local women engage in business and what determines their success in a time of a life event crisis. This knowledge is important as it can support policies on regional regeneration and poverty alleviation. This study draws upon the Bourdieu's model of practice with its notions of capital, agents, field, and habitus to examine the experiences of women running tourism enterprises in a destination with the legacy of an anthropogenic environmental disaster, the Aral Sea region. Semi-structured interviews with women entrepreneurs in Uzbekistan (n = 18) and Kazakhstan (n = 15) showcase prevalence of the necessity-based and extrinsic motivations in a time of crisis. Interviews also demonstrate the importance of social capital women entrepreneurs built with such agents of entrepreneurial practice as family, friends, policymakers, employees, and competitors. The original contribution of the study is in revealing how local | Filimonau Viachaslau, Matyakubov Umidjon; Matniyozov Murodjon; Shaken Aiman; Mika Mirosław. Women entrepreneurs in tourism in a time of a life event crisis // Journal of Sustainable Tourism. – 2022.<br>DOI: 10.1080/09669582.2022.2091142 |

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| | | | cultural traditions reinforce various types of capital, strengthen the field of knowledge, and shape habitus of women entrepreneurs in critical times. Another original contribution is in highlighting how the experience of past life event crises has aided in psychological coping of women tourism entrepreneurs during COVID-19. | |
| 16 | Mutual Influence of Innovation and Human Capital on Regional Growth in Neighboring Countries: The Case of Russia and Kazakhstan | 10.1134/S2079970522700216 | The aim is to assess the impact on regional growth of spending on R&D, technological innovation, healthcare, education, and socioeconomic conditions, their spillovers between the country regions, and, primarily, from the neighboring country regions. In existing studies, the authors examined other regions' impact on regional growth. However, this approach does not reveal the effect the neighboring country's regions had on the regions' economic growth. Our approach novelty is that we assessed the impact of regional growth factors from the country and the neighboring country separately. The panel data analysis method applied to the endogenous growth model made it possible to assess these effects on regional economic growth and identify regional convergence. Our results are consistent with other studies regarding regional drivers and their spillovers to other regions within each country. Moreover, our results confirmed the technological innovation cost stream hypothesis in the Russian regions from Kazakhstan regions. And they confirmed the hypothesis that R&D costs flow to the Kazakhstan regions from the Russian regions. Thus, the study revealed a synergistic effect from the regional growth in spending on R&D and technological innovation between Russia and Kazakhstan, which is asymmetric. The proposed approach to analyzing interregional mutual influence is also applicable to three or more countries. | Mukhamediyev B.M., Spankulova L.S. Mutual Influence of Innovation and Human Capital on Regional Growth in Neighboring Countries: The Case of Russia and Kazakhstan // Regional Research of Russia. – 2022. – Vol. 12, Is. 3. – P. 350–364. DOI: 10.1134/S2079970522700216 |
| 17 | The relationship between logistics and information and communication technologies and their impact on the economy of Kazakhstan | 10.21511/ppm.20(4).2022.26 | This study aims to analyze the impact of logistics and information and communication technologies (ICT) on Kazakhstan's economic growth, which requires rethinking search and management tools. The study used the methods of descriptive data statistics, checking the data for the normality of the distribution, and Spearman's correlation analysis. The information database comprised the National Bank, the World Development Bank, and the national statistics of the | Anna Kredina, Mirey Akhtanova, Makpal Bekturganova, Alexander Tsoy and Lazat Spankulova. The relationship between logistics and information and communication technologies and their impact on the economy of Kazakhstan // Problems and Perspectives in Management. – 2022. – Vol. 20, Is. 4. – P. 344–355. |

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| | | | Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. The paper determined the dynamics of GDP per capita and logistics, including export and import, for 2005–2020. The construction of the correlation model was carried out in SPSS. Interestingly, the most significant negative relationship was revealed between database-related services and the population and the volume of communication services. On the other hand, the results show a positive impact of ICT's strong relationship with Kazakhstan's logistics system. A close relationship was revealed between the volume of postal and courier activities and GDP per capita, and foreign trade turnover and exports and imports. Furthermore, the correlation analysis showed that the cost of investments in developing data processing services decreases with an increase in GDP and the volume of communication services. The findings of this study are relevant for governmental bodies operating in the field of logistics and transportation. Moreover, they are valuable for the digitalization of existing and designing new logistics systems as a factor in the development of the economy. | DOI: 10.21511/ppm.20(4).2022.26 |

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| 18 | The geodetic monitoring of deformations of a high-rise building using ground-based laser scanning technology | DOI 10.5937/jaes0-37001 | The article justifies the use of laser-scanning systems for geodetic monitoring of high-rise buildings and structures. Contemporary methods allow solving comprehensively the main tasks of geodetic monitoring. During the monitoring of high-rise objects, not only the main geometric parameters of the objects should be taken into account. The main importance should be given to the mutual arrangement of individual building elements, which is especially important for identifying and predicting deformation processes. Laser scanning coordinate measuring systems are designed to measure the object coordinate points to determine the object's geometric dimensions. The principle of GLS operation is to measure the point coordinates in space by the polar method. Distance is measured by a laser rangefinder using a pulse method with | Madimarova, G., Suleimenova, D., Pentayev, T., Khalykov, Yerkebulan, Tumazhanova, S., Stankova, H. The geodetic monitoring of deformations of a high-rise building using ground-based laser scanning technology. Journal of Applied Engineering Science, 2022, 20(4), pp. 1083–1092. DOI 10.5937/jaes0-37001 |

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| | | | signal digitization technology. The advantage of this approach is a smaller amount of time spent on the creation of a primary survey network. At that, the laying of scanner ray paths is most effective when carrying out ground-based laser scanning of linear structures. But it is advisable to apply its construction elements within the framework of the developed methodology. The development and implementation of new technologies for geodetic work performance, supported by an appropriate level of automation, is always carried out to reduce the time required for data collection and processing. The RiSCAN PRO program is a project-oriented product, i.e. the entire volume of data obtained as a part of a single measurement project is structured and stored according to the RiSCAN PRO project structure. | |
| 19 | Impact of the Tengiz Oil Field on the State of Land Cover | DOI 10.2478/quageo-2022-0022 | The study of the transformation of natural complexes in areas with a developed infrastructure for oil subsurface use is a prerequisite condition for solving the environmental problems of oil-producing regions. Located in the territory of the Atyrau Region in Western Kazakhstan, the Tengiz oil field is one of the largest oil fields in the world. The field has been under intensive development for more than 40 years and is characterised by a large volume of anthropogenic load, which contributes to a significant transformation of the landscape complex. The purpose of this study is to investigate the dynamics of landscape changes in the territory of the Tengiz field and to assess its ecological condition. Based on the materials from many years of research, the features of the Tengiz field and the main technogenic sources affecting the landscape complex were identified. Several quantitative indicators characterising the anthropogenic load were calculated based on satellite images. On the basis of Landsat-5 TM, 7 ETM+ and 8 OLI and Sentinel-2A (S2A) data, the vegetation index of land cover was calculated using normalised difference vegetation index (NDVI), demonstrating the dynamics of landscape changes in the period from 1990 to 2020. The obtained results show that the areas of some | Koshim, A.G., Sergeyeva, A.M., Yegizbayeva, A. Impact of the Tengiz Oil Field on the State of Land Cover. Quaestiones Geographicae, 2022, 41(2), pp. 83–93. DOI 10.2478/quageo-2022-0022 |

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| | | | landscape components continue to deteriorate. For example, the area of open soil in 2020 decreased due to the withdrawal of these areas for industrial facilities, which increased by 2.2 times by 2020 due to intensive field development. This study demonstrates the importance of monitoring and studying desert landscape complexes under active anthropogenic impact to ensure the sustainable development of territories. | |
| 20 | Protection of the geological heritage of the Aktobe oblast and its use for the development of geotourism | DOI 10.30892/GTG.40113-809 | The purpose of the article is to study the geological objects of the Aktobe oblast and their use for the development of geotourism in the region. The analysis of published materials and field research data shows that the geological objects of the Aktobe oblast have all the properties and have much possibility to actively develop geotourism which depends on the level of local management and investments. The GAM method was used to assess geological objects. This method presents various estimates of main values (MV) and additional values (AV), which are very useful to preserve and develop the territory. As a result, the method provided different estimates in the development of geotourism. | Sergeyeva, A.M., Abdullina, A.G., Akhmet, G.Zh., Koshim, Asima G., Saparov, K.T., Yeginbayeva, A.Y. Protection of the geological heritage of the Aktobe oblast and its use for the development of geotourism. Geojournal of Tourism and Geosites, 2022, 40(1), pp. 111–119. DOI 10.30892/GTG.40113-809. |
| 21 | The Sacred Geography of Central Asia in the Works of Joseph-Antoine Castagnier. Сакральная география Центральной Азии в трудах Жозефа-Антуана Кастанье | DOI 10.13187/BG.2022.2.789 | The article presents an analysis of the scientific heritage of the French researcher of Central Asia, an active member of two pre-revolutionary scientific societies - of the Orenburg Scientific Archive Commission, the Turkestan circle of archeology amateurs. The amateur researcher has done an enormous amount of work to describe the objects of the sacred geography of Central Asia, archaeological sites, study of local lore of the Kazakh steppe, and ethnographic research. Scientific heritage of J.A. Castagnier is currently of undoubted interest for archaeologists, historians, ethnographers, geographers. At present, the results of Castagnier's research are of great scientific and practical importance. For a long time, the personality of Castagnier was a “default figure”, since he was considered a foreign agent and spy without good reason in previous historiography. The analysis of the content of the works of J.-A. Castagne, published in the in «Proceedings» of | Uderbaeva, S., Sagatov, A., Kakimzhanov, E. The Sacred Geography of Central Asia in the Works of Joseph-Antoine Castagnier. Bylye Gody, 2022, 17(2), pp. 789–799. DOI 10.13187/BG.2022.2.789 |

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| | | | the Orenburg Scientific Archival Commission, made it possible to determine their high value. The works of Castagnier are distinguished by a wide source base, including the works of famous orientalists, rare manuscripts from the OUAC funds, saturation with author's photographs, engravings, drawings of the objects described, tables, an accurate topographic and cartographic description, indicating geographical coordinates, distances in sazhens and versts. Detailed geographic coordinates are very valuable for modern scientists, for example, for compiling digital maps of sacred objects. Of particular interest are legends, legends about ancient cities, burial places, detailed descriptions of shrines recorded by Castagne. | |
| 22 | Development of an Application for Monitoring and Analyzing the Dynamics of the Tuyuk Su Mountain Glacier | DOI: 10.1109/SIST54437.2022.9945749 | The Tuyuk Su glacier is a source of fresh water and is of crucial importance for the Almaty region from both an environmental and social point of view. However, the Tuyuk Su glacier continues to shrink at an alarming rate, and this will reduce the inflow of fresh water. This article presents an application for monitoring this glacier. Our approach is based on digital mapping from Landsat 7 and 8 satellite images. Remote sensing allows estimation of parameters such as snow cover, glacier height and ice index on large geographic and temporal scales. Tabular data on the area of the glacier and the balance of snowfall and melting on the glacier are also given. The result is published in a web application that allows you to visualize, select the desired boundaries of the glacier and build a graph based on the received data. The application is not yet able to automatically select the desired areas of the glacier, so the polygon tool is used here. With the help of the Timelapse tool in the application, an animated visualization of the change in the glacier has been added, which once again confirms the reduction of the glacier every year. | Madina, M., Assel, O., Kakimzhanov, Y., Boris, R., Daniyar, T. Development of an Application for Monitoring and Analyzing the Dynamics of the Tuyuk Su Mountain Glacier. SIST 2022 - 2022 International Conference on Smart Information Systems and Technologies, Proceedings, 2022. DOI: 10.1109/SIST54437.2022.9945749 |
| 23 | Application of the wavelet transformation | DOI 10.33271/nvngu/2022-4/123 | Purpose. To investigate the interaction of geodesic and normal altitude indicators according to quasigeoid data, the joint use of space measurements and those performed on the Earth's surface | Turekhanova, V., Saliy, S., Kudaibergenov, M., Zhalgasbekov, Y., Jangulova, G. |

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| | theory in the algorithm for constructing a quasigeoid model \| Застосування теорії вейвлет-перетворення в алгоритмі побудови моделі квазігеоїду | | in the implementation of geodetic tasks. In this article, the task is to create a calculation algorithm for further research on the quasigeoid model and the application of the model in solving geodetic problems. Methodology. Reliable determination of the height anomaly requires great accuracy, therefore, the theory of wavelet-transformation was used in the model of the variant of space technologies as an alternative to the laborious leveling of the Earth's surface, which characterizes the actual fluctuations from the normal of the Earth's gravitational field, when calculating the mean square deviations of the plumb line is an urgent task. Findings. A block diagram of the calculation algorithm has been compiled using a software package to solve the boundary problem of physical geodesy, in which the Earth's surface is subject to modern space measurements. Originality. The use of wavelet analysis for processing information from satellite data in geodesy improves the results of image classification, and the coefficients of the wavelet transformation can be used as indicators for recognizing the coordinates of points with high accuracy. Practical value. Application of the theory of wavelet transformations as a powerful mathematical tool for solving problems of geodetic information, data compression and recovery, increasing computing performance, encoding information. | Application of the wavelet transformation theory in the algorithm for constructing a quasigeoid model \| Застосування теорії вейвлет-перетворення в алгоритмі побудови моделі квазігеоїду. Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu, 2022, (4), pp. 123–129. DOI 10.33271/nvngu/2022-4/123 |
| 24 | Applicability of manmade bottoms in extraction panels toward sustainable stoping with caving at deep levels in mines | DOI 10.1088/1755-1315/991/1/012047 | The authors discuss applicability of manmade bottoms (MB) in extraction panels, with fast reinforced-concrete support platform at the ore drawing and haulage level in stoping with caving. The structural components of the proposed-design MB capable to stand high overburden pressure in mining of thick ore bodies using the systems of stoping with caving in the conditions of unstable ore and enclosing rocks, including deep-level mining. | Bekbergenov, D.K., Jangulova, G.K., Nasyrov, R.Sh., Bektur, B.K., Abakanov, A.T. Applicability of manmade bottoms in extraction panels toward sustainable stoping with caving at deep levels in mines. IOP Conference Series: Earth and Environmental Science, 2022, 991(1), 012047. DOI 10.1088/1755-1315/991/1/012047. |

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| 25 | Ensuring operational reliability of overpass on Almaty-Kapshagai highway section in Kazakhstan | DOI 10.26552/COM.C.2022.1.D23-D36 | The article presents results of the overpass condition survey, technical survey, static tests and assessment of the structure operational reliability, a doubledecker overpass on Almaty-Kapshagai highway section in Kazakhstan. Technical survey determined the dimensions of the overpass, the camber of reinforced concrete superstructures main beams and checked the values of the overpass roadway actual transverse and longitudinal slopes. The calculation and analytical assessment of the overpass load-bearing structures, for the strength of the bending moment, are performed. Static tests of the overpass split beam superstructure of a length of 33.0 m were conducted. Trucks loaded with ballast were accepted as a test load. | Jalairov, A., Kumar, D., Kassymkanova, K.-K., Murzalina, G., Jangulova, G. Ensuring operational reliability of overpass on Almaty-Kapshagai highway section in Kazakhstan. Communications - Scientific Letters of the University of Žilina, 2022, 24(1), pp. D23–D36. DOI 10.26552/COM.C.2022.1.D23-D36 |
| 26 | Inspection and preparation for testing of the road overpass of the Almaty-Kapshagai highway after the vehicular impacts | DOI 10.26552/com.C.2022.4.D160-D173 | The 33.0m long reinforced concrete bridge beams of the overpass superstructure after vehicular impacts were taken as a research object. The overpass consists of 14 beams, six of which were repaired by restoring the widened lower part with EMACO FAST TIXO, manufactured by BASF. The remaining 8 beams were completely dismantled and replaced with new ones. The new beams have been fully tested for the perception of vehicular loads. The fully reconstructed span structure showed compliance with the design loads of A14, NK-120 and NK-180 based on test results. | Jalairov, A., Kumar, D., Nuruldaeva, G., Kassymkanova, Khaini-Kamal, Kumar, B., Zhalgasbekov, Y. Inspection and preparation for testing of the road overpass of the Almaty-Kapshagai highway after the vehicular impacts. Communications - Scientific Letters of the University of Žilina, 2022, 24(4), pp. D160–D173. DOI 10.26552/com.C.2022.4.D160-D173 |
| 27 | Structural behavior of prestressed concrete bridge girder with monolithic joint | DOI 10.26552/com.C.2022.4.D150-D159 | The paper presents the results of a test on a composite bridge girder of a length of 42.0m, which was performed to assess its resistance, stiffness and crack resistance. Composite reinforced concrete beam with three blocks is joined by the two monolithic joints. When testing a beam with monolithic joint in terms of stiffness, crack resistance and strength, a load of 943.5 kN was | Jalairov, A., Kumar, D., Kassymkanova, K.-K., Nuruldaeva, G., Imankulova, A. Structural behavior of prestressed concrete bridge girder with monolithic joint |

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| | | | achieved without cracking, which is 26.8% higher than the required one. | Communications - Scientific Letters of the University of Žilina, 2022, 24(4), pp. D150–D159. DOI 10.26552/com.C.2022.4.D150-D159 |
| 28 | Assessment of the Soil Cover in the Dried Aral Seabed in Kazakhstan and Climate Change in the Region | DOI 10.1007/s11270-022-05966-2 | The dried Aral seabed is a newly developed anthropogenic salty desert (Aralkum). It is a catastrophic region for all of Central Asia, including Kazakhstan. This research allows us to obtain a better understanding of the transported material properties from the dried seabed during soil deflation caused by storms. The seabed is mainly flat plains and undulating ridge plains. The main soil types of the desert are saline soils, including different kinds of solonchaks and sands. The soil texture is sandy loam, and the soils are calcareous and alkaline (pH 7.7–8.6). Carbonates in the soils range from 4.86 to 8.51%, and the soils are susceptible to deflation processes. The humus content in soils is very low (< 2%). The soil cover is contaminated with heavy metals such as Cd, Zn, Cu, and Mn, which can lead to air/water pollution and vegetation/soil degradation. The monitoring of climatic parameters has indicated aridification in the region. The mean monthly temperature and potential evaporation in the region increased by 2 °C (23.81%) and 76 kg m−2 (7.81%), respectively, from 1986 to 2020. | Issanova, G., Abuduwaili, J., Tynybayeva, K., Tanirbergenov, S., Ge, Y. Assessment of the Soil Cover in the Dried Aral Seabed in Kazakhstan and Climate Change in the Region. Water, Air, and Soil Pollution, 2022, 233(12), 525. DOI 10.1007/s11270-022-05966-2 |
| 29 | The First Inventory of Rock Glaciers in the Zhetysu Alatau: The Aksu and Lepsy River Basins | DOI 10.3390/rs15010197 | While rock glaciers (RGs) are widespread in the Zhetysu Alatau mountain range of Tien Shan (Kazakhstan), they have not yet been systematically investigated. In this study, we present the first rock glacier inventory of this region containing 256 rock glaciers with quantitative information about their locations, geomorphic parameters, and downslope velocities, as established using a method that combines SAR interferometry and optical images from Google Earth. Our inventory shows that most of the RGs are talus-derived (61%). The maximum downslope velocity of the active rock glaciers | Kaldybayev, A., Sydyk, N., Yelisseyeva, A., Issanova, G., Chen, Y. The First Inventory of Rock Glaciers in the Zhetysu Alatau: The Aksu and Lepsy River Basins. Remote Sensing, 2023, 15(1), 197. DOI 10.3390/rs15010197 |

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| | | | (ARGs) was 252 mm yr−1. The average lower height of rock glaciers in this part of the Zhetysu Alatau was 3036 m above sea level (ASL). The largest area of rock glaciers was located between 2800 and 3400 m ASL and covered almost 86% of the total area. Most rock glaciers had a northern (northern, northeastern, and northwestern) orientation, which indicated the important role of solar insolation in their formation and preservation. | |
| 30 | An innovative way of underground mining | DOI 10.17580/em.2022.01.07 | All engineering solutions in ore mining have their starting point, when the very idea of development of a new deposit appears. The creation of the required market for one or another com-mercial product extracted from the subsoil remains one of the most significant factors in development of civilization in the 21st century and, therefore, needs effective and preventive management of the condition and evolution of the production framework for the mining and metallurgical sector. Based on the foregoing, the conclusions have been made, that make it possible to create optimal conditions for the use of mineral raw materials in the development of the economy of the future, including modification of underground mining technologies which should radically change both from the standpoint of maintaining the natural balance of the subsoil and ecological cleanliness, as well as the comprehensive and maximum possible extraction completeness. One of the most optimal factors that effectively influence creation of a modern mine image is the underground mining technology and organization. The article shows the advantages of using the bottom-up method of mining, when mining operations create a bottom-up stoping front not within one horizon as in the traditional concept, but conditions accessing of an ore body to the full depth and subsequent stoping in ascending series from the lower boundaries of the ore body (or whole deposit). The proposed method can be successfully applied in the hybrid technology with simultane-ous and / or sequential use of open-pit and underground methods. Accessing via haulage ramps | Oryngozhin, Y.S., Bitimbaev, M.Zh., Miletenko, N.A., Alisheva, Z.N. An innovative way of underground mining. Eurasian Mining, 2022, 37(1), pp. 38–40. DOI 10.17580/em.2022.01.07. |

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| | | | using self-propelled equipment in case of the bottom-up mining method enjoys a new application domain since it simultaneously takes on the role of ubiqui-tous operational exploration, because the ramps can be cut in ore, which allows stoping already during mine construction. At the same time, the volumes of waste rock excavation are significantly reduced. The proposed method of mining solves the important problems of reducing losses and dilution, increasing economic efficiency, including decrease in the capital costs and in the time of capital return, while ensuring mining safety and maintaining the natural balance of the subsoil. | |
| 31 | Drought Characteri-sation of Syrdarya River Basin in Central Asia Using Reconnaissance Drought Index | DOI 10.1109/IGARSS46834.2022.9883653 | This study provides a comprehensive analysis of drought characteristics in Syrdarya River Basin (SRB) of Central Asia (CA) by using meteorological and environmental variables derived from reanalyzed information database. Drought Intensity and Frequency (DIF) curves were identified based on precipitation deficit and evapotranspiration rates by using Reconnaissance Drought Index (RDI). Climatic variables for the study period of 1985-2015 were derived from Climate Research Unit (CRU) database. The frequency and duration of events appearing from April to September of each year, and drought severity was calculated as the sum of an integral period from severe to the extreme range defined with RDI varied between-1.5 and-3, respectively. Several drought events, ranging between moderate, severe and extreme in past 30 years period, were revealed over the basin in this study. A significant decreasing trend at high elevations in contrast to obvious increasing trends at lower elevations of the river basin has been observed. The dynamic variations of drought events over the SRB indicates the variation patterns of climatic impacts on drought occurrences in the mountainous regions. | Yegizbayeva, A., Ilyas, S., Berdimbetov, T. Drought Characterisation of Syrdarya River Basin in Central Asia Using Reconnaissance Drought Index. International Geoscience and Remote Sensing Symposium (IGARSS), 2022, 2022-July, pp. 6356–6359. DOI 10.1109/IGARSS46834.2022.9883653 |
| 32 | A comprehensive review of template-assisted porous carbons: Modern | https://doi.org/10.1016/j.mser.2022.100682 | Carbons with hierarchical pores in the range of few nanometers obtained via template-assisted methods offer a great control over structure and geometry of pores, keeping them uniformly distributed and better connected. Another advantage is the easy | Pavlenko V.V., Khosravi H.S., Zoltowska S., Haruna A.B., Zahid M., Mansurov Z., Supiyeva Z., Galal A., |

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| | preparation methods and advanced applications | | functionalization of templated porous carbons (TPCs) by various dopants, which makes them excellent materials for catalysis, energy storage and conversion, sensors and environmental applications. Herein, beyond zeolite-templated carbons, key methodologies based on the template material such as organic and metal oxides, silica, polymers, metal-organic framework (MOFs) and bio-originated materials used for the preparation of porous carbons possessing predetermined structure and composition, have been reviewed. The effects of precursor material on the textural and structural properties of TPCs have been described. In scope of applying novel methods such as evaporation induced self-assembling (EISA), the influence of different templates on the properties of resulting materials has been discussed. Further, advances on the template-induced synthesis of self-supporting metal-organic frameworks and their utilization as advanced templates have been described. Moreover, self-templates are especially emphasized, application of which in our opinion can provide a sustainable large-scale production of TPCs. The recent progress in the study of the diffusional processes, energy and biomedical applications as well as the confinement effects of different liquids and proteins within the porous matrices of template-derived carbons, have been reviewed. | Ozoemena K. A comprehensive review of template-assisted porous carbons: Modern preparation methods and advanced applications // Materials Science and Engineering R: Reports, Volume 149, 2022, P. 1-46. |
| 33 | Revisiting the carbon mesopore contribution towards improved performance of ionic liquid–based edlcs at sub-zero temperatures | https://doi.org/10.1007/s11581-021-04354-w | The important role of mesopores has been investigated in electric double-layer capacitors (EDLCs) operating from 24 °C down to − 40 °C by using two in-house synthesized carbons with hierarchical porosity. These carbons were prepared from colloidal nanoparticles of $SiO_2$ as the template and D-glucose as the carbon source. A decrease in the average diameter of the nanoparticles from 12 to 8 nm results in increased surface area and offers a perfect match between ions of binary mixture of imidazolium-based fluorinated ionic liquids and the pores of carbon. Short-range graphene layers produced with 8-nm silica nanoparticles lead to the creation of transport channels which | Pavlenko V.V., Kalybekkyzy S., Knez D., Abbas Q. Mansurov Z., Bakenov Z., Ng A. Revisiting the carbon mesopore contribution towards improved performance of ionic liquid–based edlcs at sub-zero temperatures // Ionics, 28(2), P. 893-901. |

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| | | | better accommodate ions. We explain these findings per coulombic interactions among the ions and between the pore wall and the ionic species under confinement and electrochemical polarization conditions. Further, it is shown that a microporous carbon (another in-house produced rice-husk carbon $S_{BET} = 1800$ $m^2 \cdot g^{-1}$) performs better than hierarchical carbons at room temperature; however, thanks to the large fraction of mesopores, the latter exhibit far higher capacitance down to $-40$ °C. While the ordering of ions in confinement is more critical at room temperature and dictated by the micropores, low temperature performance of supercapacitors is determined by the mesopores that provide channels for facile ion movement and keep the bulk ionic liquid–like properties. | |
| 34 | Advances of Biowaste - Derived Porous Carbon and Carbon Manganese Dioxide Composite in Supercapacitors a Review | https://doi.org/10.3844/ojbsci.2022.46.57 | One of the global problems is environmental pollution by different biowaste. To solve the problem, biowaste must be recycled. Waste-free technology is also a way of saving exhaustible raw materials. Research on electrochemical energy sources is currently the most dynamically developing area of off-grid energy. Electrochemical capacitors can operate for a long time without changing performance, they have smaller dimensions, high mechanical strength, and a wide operating temperature range. These properties are effective energy-saving devices. Therefore, supercapacitors are widely used in various industries. This review discussed the methods of obtaining and the characteristics of biowaste-derived activated carbon and carbon–manganese oxide (AC-$MnO_2$)-based supercapacitor electrodes. | Zekenova A., Nazhipkyzy M., Wanlu Li., Kalybayeva A., Zhumanova G., Zubova O. Advances of Biowaste - Derived Porous Carbon and Carbon Manganese Dioxide Composite in Supercapacitors a Review // Inorganics, Volume 10, P. 160. |
| 35 | Opportunities to use mobile gis applications in the formation of tourist and local lore competencies in students: case study | https://doi.org/10.3390/inorganics10100160 | Since the use of mobile GIS-applications in the formation of tourist and local lore competencies of students affects the knowledge and professional competence of future teachers, it is very important to first determine the attitude of teachers and professors to the use of mobile GIS-applications and assess the level of use of mobile applications by students. Therefore, this article provides for the possibility of using mobile GIS | Issakov E., Laiskhanov Sh., Mazbayev O., Ussenov N., Zheldibayev A., Kamelkhan G., David, Loran Denes Opportunities to use mobile gis applications in the formation of tourist and local lore |

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| | in Almaty, Kazakhstan | | applications in the organization of tourist and local lore activities of students of the educational program "Geography". The effectiveness of organizing tourist and local lore events using mobile GIS applications was determined by conducting interviews and questionnaires. The survey consisted of two parts, and a total of 72 students took part in it voluntarily. In the course of the study, we studied the formation of tourist and local lore competencies from mobile GIS applications as a result of the study: 1) "Road navigation" from mobile GIS applications - 2GIS (79.1%); 2) "For viewing and studying" from mobile applications - ArcGIS QuickCapture (56.9%); 3) Google planet Earth "Virtual globe" (52.8%); 4) based on the mobile applications "Cartography and Navigation", we determined the efficiency of using the GIS4MOBILE-x (41.7%) and 5) the City bus for "GPS monitoring" (100%). In this regard, we are confident that the use of these mobile applications will be effective in organizing tourist and local lore events. The use of these technologies in teaching makes it possible to update educational approaches, introduce new pedagogical technologies and form competencies. | competencies in students: case study in Almaty, Kazakhstan // Geojournal of Tourism and Geosites, 41(2), P. 597-605. |
| 36 | Research of thermodynamic characteristics of a gas-generating composition based on ammonium perchlorate | https://doi.org/10.25892/res.35234-868 | The thermodynamic characteristics of combustion processes of a gas-<br>generating composition based on ammonium perchlorate have been investigated. Polyethylene was chosen as a fuel, the choice in favor of this component is due to the fact that ammonium perchlorate readily interacts with polyethylene, and this fuel contributes to the rapid decomposition of ammonium perchlorate. The optimal composition of the mixture was found. It has been established that the highest efficiency and specific gas production are observed in the area of stoichiometric ratio of the initial components of gas generator compositions. The influence of the oxidizing agent ammonium perchlorate on the energy release of composite energetic materials, the thermal decomposition | Amir Zh.A., Kudyarova Zh.B., Sassykova L.R., Golovchenko O.Y., Tulepov M.I., Orazbayev A.Ye., Baiseitov D.A., Gabdrashova Sh.E., Aknazarov S.Kh. Research of thermodynamic characteristics of a gas-generating composition based on ammonium perchlorate // ARPN journal of Engineering and Applied Sciences, 17(10), P. 1040-1046. |

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| | | | of ammonium perchlorate and ammonium perchlorate with polyethylene was studied by thermogravimetry and differential scanning calorimetry. In research for simultaneous thermal analysis of the ammonium perchlorate samples and the mixture of ammonium perchlorate with polyethylene (the portion of mixture was 8.6 mg, pure ammonium perchlorate was 10 mg, and the heating rate was 10°C / min.) was found that at temperatures around 514 K, an endothermic peak is observed corresponding to a polymorphic transition in the crystal structure of ammonium perchlorate, in both cases the peaks coincide. At a temperature of about 645.3 K, an exothermic peak can be observed, at which the oxidation of polyethylene occurs with a large release of energy. The peak at 702.2 K corresponds to the decomposition of ammonium perchlorate. The<br>developed gas generator composition based on ammonium per chlorate can be used for open pit mining for splitting block stone in a gentle mode or breaking hard mineral rocks. This composition is safe from an environmental point of view, there are no toxic gases such as carbon monoxide and nitrogen oxides in the products. | |
| 37 | Use of the Pyrocomposition Energy based on the Ammonium Nitrate for Safe Destruction of the Concrete Blocks | https://doi.org/10.24000/0409-2961-2022-3-14-19 | The article is devoted to the development and research of the py-rocompositions on the for of the ` was chosen as the oxidizer for the pyrocompositions. The choice is primarily due to its low cost and low sensitivity to the mechanical and detonation effects. In addition, has a significantly lower content of harmful compounds in combustion products compared to the analogues. Waste polyethylene was used as a fuel. Its use contributes to arranging processing of the synthetic waste, which occupies vast areas and pollutes the environment on the research results, the was developed from 91 % of and 9 % of polyethylene. Composition can be used for directed of the or rocks of medium strength with a coefficient of 3.5–4 on the Protodyakonov scale. Thermodynamic characteristics were studied related to the combustion processes | Amir Zh.A.,Baiseitov D.A., Akhinzhanova A.S.,Aysarova T.A., Prikhodko A.A. Use of the Pyrocomposition Energy based on the Ammonium Nitrate for Safe Destruction of the Concrete Blocks // Bezopasnost' Truda v Promyshlennosti, 2022, (3), P. 14-19. |

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| | | | of a binary mixture of and polyethylene. It is established that the maximum combustion temperature and gas density are achieved when the stoichiometry is observed. Using thermodynamic modeling in the TDS program, the gas composition of the reaction products was calculated. The main components are carbon di-oxide, water vapor and nitrogen. Poisonous gases such as carbon monoxide and nitrogen oxides are practically absent. Field experiments on of the were carried out. Performed studies and practical tests showed high efficiency and safety of the use of the developed pyrotechnical compositions. | |
| 38 | Assessing the Influence of Electrode Polarity on the Treatment of Poultry Slaughterhouse Wastewater | https://doi.org/10.3390/molecules27031014 | Electrochemical methods have been increasingly gaining popularity in the field of wastewater treatment. However, the performance of these methods can be highly affected by the polarity direction as determined by the electrodes arrangement (anode to cathode or cathode to anode); as well as the characteristics of the wastewater to be treated as determined by the type of wastewater. The presented research work investigated the relationship between polarity direction and the removal of pollutants from poultry slaughterhouse wastewater using titanium and aluminium electrode materials. In the first case, the wastewater was exposed to the Ti (anode)-Al (cathode) combination, whereas in the second case the wastewater was subjected to the Al (anode)-Ti (cathode) arrangement. The two cases were designed to see if the polarity direction of the chosen electrode materials affected the removal of pollutants. The removal efficiencies were computed as a ratio of the remaining concentration in the treated effluent to the concentration before treatment. It was observed that the production processes generate highly fluctuating wastewater in terms of pollution loading; for instance, 422 to 5340 Pt-Co (minimum to maximum) were recorded from color, 126 to 2264 mg/L were recorded from total dissolved solids, and 358 to 5998 mg/L from chemical oxygen demand. Also, the research results after 40 min of retention time showed that both electrode | Meiramkulova K., Orynbassar R., Tleukulov A., Nabiollina M., Mashan T., Apendina A., Nurmukhanbetova N., Bazarbayeva.T.A., Akubayeva D.M. Assessing the Influence of Electrode Polarity on the Treatment of Poultry Slaughterhouse Wastewater // Molecules, 27(3), 2022, P.1014. |

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| | | | arrangements achieved relatively high removal efficiencies; Whereby, the aluminium to titanium polarity achieved up to 100% removal efficiency from turbidity while the titanium to aluminium polarity achieved a maximum of 99.95% removal efficiency from turbidty. Also, a similar phenomenon was observed from total dissolved solids; whereby, on average 0 mg/L was achieved when the wastewater was purified using the aluminium to titanium arrangement, while on average 2 mg/L was achieved from the titanium to aluminium arrangement. A little higher removal efficiency discrepancy was observed from ammonia; whereby, the aluminium to titanium arrangement outperformed the titanium to aluminium arrangement with average removal efficiencies of 82.27% and 64.11%, respectively. | |
| 39 | Catalytic Decomposition of Methane to Hydrogen over $Al_2O_3$ Supported Mono- and Bimetallic Catalysts | https://doi.org/10.1007/s11696-022-02420-9 | Decomposition of methane is the most efficient method for obtaining pure hydrogen. As catalysts for decomposition of methane, in this work, Ni-foam and Ni–Fe composites obtained by the electrochemical method were used for the first time. Thin iron films were electrochemically grown by potential cycling on the Ni-foam surface. The obtained catalysts were tested for decomposition of methane in the temperature range of 650–850 °C and characterized using XRD, RAMAN, SEM, TGA/DTA, $H_2$-TPR and BET analysis of specific surface area and pore size. The effect of cycles (75, 150, and 250) of iron deposition on Ni-foam on its activity in methane decomposition was studied. It has been determined that the highest catalytic activity is observed for the composite, where the iron deposition cycle on nickel foam is 150. The Ni-Fe150 catalyst showed an initial methane conversion of 91% at a temperature of 850 °C, which increased from 60 min to 96.7% and from 180 min to 98.6%, and was stable for 540 min, while the hydrogen yield was 76%. It has been stated that graphite-like carbon is formed on all catalysts, and the largest amount (32%) is formed on Ni-Fe150. The data obtained in the work indicate that the increase in the activity of Ni-Fe150 in the | Gaukhar E. Ergazieva N. M., Shaimerden Z., Sergiy O. Soloviev, Telbayeva M., Ahmetova F., Akkazin E.A. Catalytic Decomposition of Methane to Hydrogen over $Al_2O_3$ Supported Mono- and Bimetallic Catalysts // Bulletin of Chemical Reaction Engineering & Catalysis, 76(12), P. 7405-7417. |

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| | | | decomposition of methane is associated with the formation of a Ni–Fe alloy and an increase in the reducibility of iron cations in the composition of the Ni–Fe alloy. In addition, the formation of graphite-like carbon with a high defectiveness on the surface of the Ni-Fe150 catalyst promotes the decomposition of methane in areas not covered with carbon. | |
| 40 | Features Resistance of Sugar Sorgo (Sorghum Saccharatum (L.) Pers.) Varieties to Environmental Stress Factors | https://doi.org/10.1002/prep.200600007 | The thermodynamic characteristics of combustion processes of a gas-<br>generating composition based on ammonium perchlorate have been investigated. Polyethylene was chosen as a fuel, the choice in favor of this component is due to the fact that ammonium perchlorate readily interacts with polyethylene, and this fuel contributes to the rapid decomposition of ammonium perchlorate. The optimal composition of the mixture was found. It has been established that the highest efficiency and specific gas production are observed in the area of stoichiometric ratio of the initial components of gas generator compositions. The influence of the oxidizing agent ammonium perchlorate on the energy release of composite energetic materials, the thermal decomposition of ammonium perchlorate and ammonium perchlorate with polyethylene was studied by thermogravimetry and differential scanning calorimetry. In research for simultaneous thermal analysis of the ammonium perchlorate samples and the mixture of ammonium perchlorate with polyethylene (the portion of mixture was 8.6 mg, pure ammonium perchlorate was 10 mg, and the heating rate was 10°C / min.) was found that at temperatures around 514 K, an endothermic peak is observed corresponding to a polymorphic transition in the crystal structure of ammonium perchlorate, in both cases the peaks coincide. At a temperature of about 645.3 K, an exothermic peak can be observed, at which the oxidation of polyethylene occurs with a large release of energy. The peak at 702.2 K corresponds to the decomposition of ammonium perchlorate. | Mukasheva D., Kirshibayev Y. A., Baiseitova G., Admanova G., Orazbayev A.Ye. Features Resistance of Sugar Sorgo (Sorghum Saccharatum (L.) Pers.) Varieties to Environmental Stress Factors // OnLine Journal of Biological Sciences, 17(10), P. 1040-1046. |

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| | | | The developed gas generator composition based on ammonium per chlorate can be used for open pit mining for splitting block stone in a gentle mode or breaking hard mineral rocks. This composition is safe from an environmental point of view, there are no toxic gases such as carbon monoxide and nitrogen oxides in the products | |
| 41 | The Use of Diatomite as a Catalyst Carrier for the Synthesis of Carbon Nanotubes | https://doi.org/10.3390/nano12111817 | In this article, multiwalled carbon nanotubes (MWCNTs) have been synthesized on the surface of a diatomite mineral impregnated with transition metal salts using a propane-butane mixture in a chemical vapor deposition reactor at atmospheric pressure. The catalyst concentration and synthesis temperature have been varied in order to understand their effects on the formation of MWCNTs and their morphology. Diatomite was chosen as a catalyst carrier due to its elemental composition. It is mainly composed of amorphous silica, quartz and also contains such metals as Fe, K, Ca, Mn, Cr, Ti, and Zn, which makes it a promising material for use as a catalyst carrier when synthesizing carbon nanotubes (CNTs) by catalytic chemical vapor deposition (C-CVD). For the synthesis of carbon nanotubes by C-CVD on the surface of the diatomite, the following salts were used as a catalyst: $CoCl_2 \cdot 6H_2O$; $Ni(NO_3)_2 \cdot 6H_2O$, and the concentrations of the solutions were 0.5; 1.0 and 1.5 M. Natural diatomite was characterized by X-ray diffraction analysis (XRD) and Scanning Electron Microscopy (SEM) analysis. | Nazhipkyzy M., Nemkaeva R., Nurgain A., Seitkazinova A., Dinistanova B., Issanbekova A., Zhylybayeva N., Bergeneva N., Mamatova G. The Use of Diatomite as a Catalyst Carrier for the Synthesis of Carbon Nanotubes // Nanomaterials, 12(11), 2022, P. 1817. |
| 42 | Structural Characteristics of Rosa Iliensis Chrshan. under Conditions of the Floodplains of the Rivers Ili and Sharyn | https://doi.org/10.12911/22998993/143943 | The article provides brief geobotanical characteristics of plant communities of three populations of R. iliensis Chrshan. found in the floodplains of the Ili and Sharyn rivers, and also presents the morpho-anatomical structure of vegetative organs (stem and leaf) of the species under study. R. iliensis Chrshan. is undoubtedly a rare, endangered species of the flora of Kazakhstan. Its distribution area is shrinking from year to year as a result of anthropogenic pressure on the environment. Biometric indicators of vegetative organs in samples collected | Childibayeva A., Ametov A., Kurbatova N.V., Akhmetova A., Tynybekov B.M., Mukanova G.A. Structural Characteristics of Rosa Iliensis Chrshan. under Conditions of the Floodplains of the Rivers Ili and Sharyn // Journal of Ecological |

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| | | | from populations 1 and 2 were approximately the same. The indicators of samples collected from population 3 differed substantially. This is a completely natural process, since there are substantial differences in the climatic conditions of the upper and lower parts of the basin where the Ili River flows: a sharp increase in temperature and a decrease in precipitation from high to low hypsometric levels of the basin. Moreover, there is a gradual aridization of the territory from east to west. Naturally, this entails a change in both soil and vegetation cover and leaves its mark on the morpho-anatomical structure of vegetative organs. With this in mind, the authors recommend continuous monitoring of the state of the populations at the three sites where R. iliensis Chrshan. was found. | Engineering, 23(1), 2022, P. 296-304. |
| 43 | Effect of Preparation Method on the Activity of $Fe_2O_3$-NiO/γ-$Al_2O_3$ Catalyst in Decomposition of Methane | https://doi.org/10.18321/ectj1435 | The effect of method preparation on the activity of $Fe_2O_3$-NiO/?-$Al_2O_3$ catalyst was investigated in process decomposition of methane. $Fe_2O_3$-NiO/?-$Al_2O_3$ catalyst was prepared by impregnation and solution combustion methods. The samples were characterized by X-ray phase analysis (XRD), temperature-programmed hydrogen reduction (TPR-$H_2$), BET and Raman spectroscopy. It has been shown that the method of preparation plays an important role in regulating the textural and morphological properties of catalysts and provides a difference in their catalytic activity. The synthesis of the $Fe_2O_3$-NiO/?-$Al_2O_3$ catalyst by the solution combustion method, in comparison with the capillary impregnation method, leads to the formation of a large amount of FeNi and $FeAl_2O_4$ solid solutions, which ensured good catalytic activity at high temperatures. The $Fe_2O_3$-NiO/?-$Al_2O_3$ catalyst synthesized by the solution combustion method demonstrated good activity with a hydrogen yield of 52% within 150 min of the reaction without any deactivation. According to the results of Raman spectroscopy, graphene-like carbon was obtained on the surface of the catalysts. On the catalyst of $Fe_2O_3$-NiO/?-$Al_2O_3$ (?I) synthesized by capillary impregnation, 4?5 layer | Yergazieva G., Makayeva N., Anissova M., Dossumov K., Mambetova M., Shaimerden Z., Niyazbayeva A., Akkazin E. Effect of Preparation Method on the Activity of $Fe_2O_3$-NiO/γ-$Al_2O_3$ Catalyst in Decomposition of Methane // Eurasian Chemico-Technological Journal, 24(3), 2022, P. 221-227. |

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| | | | graphene on $Fe_2O_3$-NiO/?-$Al_2O_3$ (SC)-6-7 layer graphene is formed. | |
| 44 | Pore Size in the Removal of Phosphorus and Nitrogen from Poultry Slaughterhouse Wastewater Using Polymeric Nanofiltration Membranes | https://doi.org/10.3390/w14182929 | Nutrients (nitrogen and phosphorus) are among the water quality parameters that cannot be easily removed from wastewater. Unfortunately, the excessive accumulation of nutrients in water can lead to numerous health issues for humans and the environment in general (including aquatic life). This study looked into the potential use of polymeric nanofiltration membranes to remove total phosphorus, ammonia, nitrate, and nitrite from poultry slaughterhouse wastewater. The wastewater samples were subjected to three different treatment systems determined by pore sizes (0.4, 0.6, and 0.8 nm) as well as an integrated system composed of ultrafiltration and nanofiltration as the main units. The results of the study showed that pore size can significantly affect a nanofiltration system's overall performance for removing nutrients from poultry slaughterhouse wastewater. The phenomenon was supported by the analysis of variance (ANOVA) results, which showed that the treated effluent's concentrations of the investigated water quality parameters at different pore sizes produced p-values that were less than 0.01 (statistically significant). According to the results of the removal efficiency analysis, the combination of ammonia and a 0.8 nm pore size demonstrated the lowest removal efficiency, with a removal rate of around 54.57%. However, the combination of nitrate and a 0.4 nm pore size showed the best removal efficiency of about 90.5%. On the other hand, the integrated treatment was observed to be highly effective in the removal of the investigated parameters with a removal efficiency ranging from 97.8 to 99.71%. The study's findings offer useful information about the potential use of nanofiltration treatment systems for wastewater from poultry slaughterhouses. | Mkilima T., Bazarbayeva T., Kydyrbekova A., Nurmukhanbetova N., Ostresova L., Khamitova A., Makhanova S., Sergazina S. Pore Size in the Removal of Phosphorus and Nitrogen from Poultry Slaughterhouse Wastewater Using Polymeric Nanofiltration Membranes // Water (Switzerland), 14(18), 2022, P.2929. |
| 45 | Mathematical description of the | https://doi.org/10.31788/RJC.2022.1536741 | The paper presents an analysis of the mathematical description of the process of film condensation of vapors from steam-gas | Golubev V.G., Filin A.E., Agabekova A.B., Taimasov |

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| | process of film condensation of vapors from steam-gas mixtures | | mixtures, taking into account the dependence of the processes of heat transfer and the hydrodynamics of the condensate film. It is established that the presence of an insignificant fraction of non-condensing gases sharply reduces the surface temperature of the condensate film. The numerical experiment has confirmed that the loss of stability of the film and its deceleration are associated with the temperature gradient on its surface. It is established that the influence of non-isothermicity on the characteristics of transfer processes can significantly change their flow mode even with small fluctuations in functional parameters. The influence of temperature on the condensate density leads to a certain increase in the average and local Nusselt numbers. As a result of the conducted studies, it was found that the dependence of the condensate density on temperature contributes to an increase in the average and local Nusselt number. This is confirmed by its fundamentally small effect on heat exchange under condensation conditions for liquids in the following range $\gamma \sim 10\ 10 - - 4\ 2 -$ . | B.T., Jaipanazova V.M., Kenzhibayeva G.S., Kutzhanova A.N. Mathematical description of the process of film condensation of vapors from steam-gas mixtures // Rasayan Journal of Chemistry, 15(3), 2022, P. 1894-1904. |
| 46 | Past, current and future of fish diversity in the alakol lakes (Central asia: Kazakhstan) | https://doi.org/10.3390/d14010011 | The aboriginal ichthyofauna of the Balkhash basin consists mainly of endemic fish species. By the end of the last century, indigenous fish species were driven out of Lake Balkhash and the Alakol Lakes remain the largest refuges of aboriginal fish fauna. Knowledge of regularities of the modern distribution of the indigenous fishes is crucial for biodiversity conservation as well as restoring aquatic ecosystems. The modern diversity of fish species was investigated there in this study. Significant changes for the indigenous and some alien fish distributions were revealed in contrast with earlier known data. Canonical correspondence analysis (CCA) was used to study the relationships between habitat characteristics and species abundance. Water mineralization and maximal observed water temperatures were estimated as the main environmental variables in fish distribution at the local scale. Habitat change leads to fish fauna homogenization as a result of rare species extinction and alien penetration. Growing human population | Mamilov N., Sharakhmetov S., Amirbekova F., Bekkozhayeva D., Sapargaliyeva N., Kegenova G., Tanybayeva A.K. Past, current and future of fish diversity in the alakol lakes (Central asia: Kazakhstan) // Diversity, 14(1), 2022, P.11. |

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| | | | and poor water management make the future of the indigenous fishes unpredictable. | |
| 47 | Electrochemical synthesis of Fe-containing composite for decomposition of methane into COx-free hydrogen and nano-carbon | https://doi.org/10.1016/j.ijhydene.2009.11.036 | Decomposition of methane is the most efficient method for obtaining pure hydrogen. As catalysts for decomposition of methane, in this work, Ni-foam and Ni–Fe composites obtained by the electrochemical method were used for the first time. Thin iron films were electrochemically grown by potential cycling on the Ni-foam surface. The obtained catalysts were tested for decomposition of methane in the temperature range of 650–850 °C and characterized using XRD, RAMAN, SEM, TGA/DTA, $H_2$-TPR and BET analysis of specific surface area and pore size. The effect of cycles (75, 150, and 250) of iron deposition on Ni-foam on its activity in methane decomposition was studied. It has been determined that the highest catalytic activity is observed for the composite, where the iron deposition cycle on nickel foam is 150. The Ni-Fe150 catalyst showed an initial methane conversion of 91% at a temperature of 850 °C, which increased from 60 min to 96.7% and from 180 min to 98.6%, and was stable for 540 min, while the hydrogen yield was 76%. It has been stated that graphite-like carbon is formed on all catalysts, and the largest amount (32%) is formed on Ni-Fe150. The data obtained in the work indicate that the increase in the activity of Ni-Fe150 in the decomposition of methane is associated with the formation of a Ni–Fe alloy and an increase in the reducibility of iron cations in the composition of the Ni–Fe alloy. In addition, the formation of graphite-like carbon with a high defectiveness on the surface of the Ni-Fe150 catalyst promotes the decomposition of methane in areas not covered with carbon. | Yergazieva G., Makayeva N., Abdisattar A., Yeleuov M., Soloviev S., Anissova M., Taurbekov N., Dossumov K., Akkazin A., Daulbayev C. Electrochemical synthesis of Fe-containing composite for decomposition of methane into COx-free hydrogen and nano-carbon // Chemical Papers, 76(12), P. 7405-7417. |
| 48 | Occupational Safety and Risk Management in the Production of Nanomaterials | https://doi.org/10.24000/0409-2961-2022-9-46-52 | The modern world, nanotechnologies are used almost all the areas of the national economy: industry, agriculture, electronics, mechanics, medicine (nanocapsules), food industry (packaging materials, food enrichment with micronutrients), ecology (water treatment, oil well treatment). The market for carbon is constantly evolving, which leads to questions about | Akhmetzhanova D.N., Khamitova K.K., Nemkayeva R.R., Ismailov D.V. Occupational Safety and Risk Management in the Production |

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| | | | the problems of exposure to nanoparticles for personnel the working areas of facilities. Products of the powder formation can enter the environment at all the stages of their. It is also known that a nanoscale substance can behave differently than the same material a larger bulk form. With a decrease size, the melting point of the material, color, strength, chemical activity, and other parameters can change the existing regulatory and legal framework the field insufficient attention is paid to the issues of and health of the nanotechnological laboratories personnel. This is due to the lack of unified international norms, and the insuffi-ciently studied problem of the nanoparticle toxicity. Therefore, it is necessary to assess the impact of on people, which should be carried out dynamics and cove-ring various groups of the population, as well as conducting scientific studies of the effect of the on plants and animals. The aim of the research was a comprehensive study of the effect of chemical pollutants on the development of plants. Modern methods of analysis were used the work: atomic absorption spectrometry, energy dispersive X-ray spectroscopy, and scanning electron microscopy, which allows to determine the accumulation of carbon plants through the soil medium. The experiment showed that at the initial stage, have a beneficial effect on plant growth, but the future, they have a depressing character. On the obtained micrographs, a violation of the cellular structure is observed. | of Nanomaterials // Bezopasnost' Truda v Promyshlennosti, 2022, (9), P. 46-52. |
| 49 | Modified carbon sor bents based on waln ut shell for sorption of toxic gases | https://doi.org/10.1007/s10891-022-02607-7 | The results of synthesis on the basis of nanocarbon for protection against a broad range of toxic chemical substances are presented. The analysis of the specimens' structure shows that activation contributes to the formation of a great number of small pores and the development of a porous texture of sorbents, which leads to an increase in the specific surface. Activated specimens have a micromesoporosity confirmed by appropriate isotherms of low-temperature adsorption of nitrogen. It is shown that the procedure of activation results in specimens with various acidity, and this surface property has a | Mansurov Z.A., Velasco L.F., Lodewyckx P., Doszhanov E.O., Azat S. Modified carbon sorbents based on walnut shell for sorption of t oxic gases // Journal of Engineering Physics and Thermophysics, 95(6), 2022, P. 1383-1392. |

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| | | | marked effect on the characteristics of materials. The results of investigation of the breakthrough time for vapors of inorganic and organic substances show that Cu and Co ion impregnations are the most suitable for the production of a universal sorbent. Due to this, this paper presents the technology of obtaining activated charcoals impregnated with ions of various metals that can surpass sorption properties of commercial reference materials. | |
| 50 | The influence of fertilisation on the water-salt regime in the conditions of the mugan-salyan massif, Azerbaijan | https://doi.org/10.24425/jwld.2022.142330 | The article presents research data on the amount of salts in the irrigated soils of the Mughan-Salyan massif, their composition, water-salt regime, and their forecast. It was found that the soils on the territory of the massif were saline to varying degrees. In general, the area of non-saline soils in the massif is 125,650 ha, mildly – 272,070 ha, moderately – 210,560 ha, highly – 125,850 ha, very highly – 109,450 ha and saline soils – 27,520 ha. The absorbed bases in the soils of the massif were studied, and it was determined that they change depending on the amount of salts as follows: in mildly saline soils, Ca – 57.82–68.31%, Mg – 25.26–36.28%, Na – 5.49–6.43%; in moderately saline soils – 56.77–65.76%, 27.03–35.58%, 7.12–7.94%, respectively; in highly saline areas – 54.05–64.75%, 24.94–43.67% and 9.19– 14.42%. As you can see, the soils are mildly and moderately saline. The soils in the surveyed areas are saline to varying degrees (i.e., the average value of salts in the 0–100 cm layer of the soil varies between 0.25 and 1.00%). The biological product used in these soils contains a wide range of macro and microelements, humic acids, fulvic acids, amino acids, vitamins and enzymes that do not contain BioEcoGum mineral fertilisers. This biological product was used for the first time and one of the main goals was to study the improvement of water-physical properties of soils after its use. Therefore, the water-salt regime of the soils of the study area was studied on three experimental sites selected for the area, the number of irrigations for different plants, and their norms were determined taking into account the depth of groundwater in the soils and | Mustafa Mustafayev, Zulfiya Tukenova, Mereke Alimzhanov Kazhybek Ashimuly, Farid Mustafayev The influence of fertilisation on the water-salt regime in the conditions of the mugan-salyan massif, azerbaijan // Journal of water and land development, 55, 2022, P. 276-285. |

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| | | | shown in tabular form. They are widely used in farms and these regions, taking into account the proposed irrigation norms and their quantity. | |
| 51 | Use of vegetable raw materials as electrode materials for liion batteries | https://doi.org/10.3390/nano12111817 | In this article, multiwalled carbon nanotubes (MWCNTs) have been synthesized on the surface of a diatomite mineral impregnated with transition metal salts using a propane-butane mixture in a chemical vapor deposition reactor at atmospheric pressure. The catalyst concentration and synthesis temperature have been varied in order to understand their effects on the formation of MWCNTs and their morphology. Diatomite was chosen as a catalyst carrier due to its elemental composition. It is mainly composed of amorphous silica, quartz and also contains such metals as Fe, K, Ca, Mn, Cr, Ti, and Zn, which makes it a promising material for use as a catalyst carrier when synthesizing carbon nanotubes (CNTs) by catalytic chemical vapor deposition (C-CVD). For the synthesis of carbon nanotubes by C-CVD on the surface of the diatomite, the following salts were used as a catalyst: $CoCl_2 \cdot 6H_2O$; $Ni(NO_3)_2 \cdot 6H_2O$, and the concentrations of the solutions were 0.5; 1.0 and 1.5 M. Natural diatomite was characterized by X-ray diffraction analysis (XRD) and Scanning Electron Microscopy (SEM) analysis. | M. Nazhipkyzya, D. Assylkhanova, A. Maltay, B. Dinistanova, G. Tureshova, A. Issanbekova, Z. Kudyarova Use of vegetable raw materials as electrode materials for liion batteries // Chemical engineering transactions, 12(11), 2022, P. 1817. |
| 52 | Proučevanje trajnostnega razvoja mest: primer večjih mest v Kazahstanu | Urbani Izziv | Measuring the comparative level of urban sustainability is an important part of creating a sustainable urban future. This article assesses the sustainable development of the seventeen largest cities in Kazakhstan for 2007–2019 using a geodatabase on a GIS platform. The results show that none of the cities have reached a level of sustainability greater than or equal to a sustainable urban development index (SUDI) of 0.750, and no cities have an unsustainable level of development with a SUDI below 0.300. Therefore, all seventeen cities are classified as moderately sustainable. In future studies, the authors will look for ways to further improve the system for assessing the sustainability of cities in Kazakhstan. | Nyussupova, G., Kenespayeva, L., Tazhiyeva, D., Kadylbekov, M.<br>Proučevanje trajnostnega razvoja mest: primer večjih mest v Kazahstanu<br>(2022) Urbani Izziv, 33 (1), pp. 5-16.<br><br>DOI: 10.5379/urbani-izziv-2022-33-01-01 |

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| 53 | Analysis of Human Capital in the Republic of Kazakhstan through GIS: Regional Aspect | International Journal of Geoinformatics | Currently,human capital is one of the key factors in the socio-economic development of regions and countries. However, the distribution of the population and, as a consequence, human capital across the territory of the Republic of Kazakhstan is extremely heterogeneous and subject to constant changes. The purpose of this article is to identify regional specifics of the indicators of human capital in the Republic of Kazakhstan. The article provides an analysis and assessment of the main indicators of human capital in the regions of Kazakhstan for the period 2010-2019. A typology of regions has been developed on the basis of the index method for assessing the level of human capital of the regions of the Republic of Kazakhstan. The created spatial geodatabase of the human capital includes demographic, socio-economic and environmental indicators of human capital. As a result of the research, the relationship between the development of human capital and the level of socio-economic development of the Republic of Kazakhstan regions was revealed. | Nyussupova, G., Aidarkhanova, G., Kenespayeva, L., Kelinbayeva, R.<br>Analysis of Human Capital in the Republic of Kazakhstan through GIS: Regional Aspect<br>(2022) International Journal of Geoinformatics, 18 (1 Special Issue), pp. 15-25.<br><br>DOI: 10.52939/ijg.v18i1.2099 |
| 54 | ANALYSIS OF THE STATE OF PUBLIC TRANSPORT IN ALMATY | Geojournal of Tourism and Geosites | Public transport today is again gaining relevance as a means of transportation in connection with the personal cars that have flooded urban spaces. The city of Almaty is no exception and since the beginning of the last decade has taken a course to organize pilot projects to create a priority for the movement of public transport. The difficulty of implementing such innovations is the public, accustomed to crossing long distances by private vehicles, and in most cases city streets are loaded from nearby agglomerations. The emergence of such a trend is directly related to the expansion of the city in breadth, i.e. from east to west, because the natural uniqueness of the urban area in the south is limited by the mountain ranges of the Trans-Ili Alatau. This paper is presented taking into account the existing initial data for the study of public transport issues through the introduction of the GTFS scientific methodology, which can give a new angle of view on the current situation with the organization of bus and trolleybus routes. This paper focuses | Kosherbay, K., Mussagaliyeva, A., Nyussupova, G., Strobl, J.<br>ANALYSIS OF THE STATE OF PUBLIC TRANSPORT IN ALMATY<br>(2022) Geojournal of Tourism and Geosites, 45 (4), pp. 1534-1542.<br><br>DOI: 10.30892/gtg.454spl01-972 |

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| | | | on studying the potential of public transport in Almaty for consistent growth, because with the help of the restructuring of route networks and the creation of a priority traffic network, there is a chance to achieve an increase in capacity and an increase in the number of users. The aim of this article is to provide information about the current state of the public transport network and to discuss the potential of geographic information systems (GIS) within the urban space, which are guided by spatial analysis approaches related to the processing of General Transit Feed Specification data (GTFS), since statistical data are based on providing a complete picture of the existing transport network, and afterwards can become the basis for subsequent optimization of public transport traffic. This paper creates new perspectives for future development of public transport and restructuring of the understanding how to create public network according to necessity in Almaty city. | |
| 55 | The technology of criterion assessment of students' knowledge in geography lessons | World Journal on Educational Technology: Current Issues | The study aims to get the views of teachers about the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology. This research was designed in the qualitative research method and the data were evaluated following the qualitative method. The sample group of the research consisted of 80 geography teachers who teach geography at various high schools in Almaty, Kazakhstan. The researchers developed a semi-structured interview form to consult the opinions of teachers about the difficulties encountered in online education. As a result of the research, Geography teachers found measurement and evaluation opportunities in face-to-face education more advantageous than in online education. In line with the findings obtained from the research, it has emerged that it is necessary to make improvements for the healthy application of criterion evaluation technology in online measurement and evaluation. | Kalkashev, S., Nurbol, U., Abdimanapov, B., Kaimuldinova, K., Ayapbekova, A., Nurhanov, M.<br>The technology of criterion assessment of students' knowledge in geography lessons (2022) World Journal on Educational Technology: Current Issues, 14 (2), pp. 414-425.<br><br>DOI: 10.18844/wjet.v14i2.6727 |

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| 56 | Evaluation of students' views on teaching the subject of migration through distance education in Kazakhstan geography course | World Journal on Educational Technology: Current Issues | The aim of this study is to determine the important and methodological aspect of examining the population migration patterns of distance education and university students' geography course. 420 university students who continue their education in Kazakhstan participated in the research in the spring term of 2020-2021. Scanning method was used in the research. In the research, a measurement tool called the general opinion measurement tool for the geography lesson, which was developed by the researchers and collected by taking expert opinion in the field of geography, was used. In the research, a 4-week online seminar was organized to increase the views of university students about the geography lesson, and training was given over Microsoft Teams, the interview form was collected with electronic forms after the seminar. The collected data were analyzed using spss program. According to the results of the study, it was concluded that university students' inclination to geography course is higher than male students, university students are familiar with the system for 1-3 years, their inclination to distance education systems is high and population migration patterns are learned well with this system. © 2022 Birlesik Dunya Yenilik Arastirma ve Yayincilik Merkezi. | Nurbol, U., Shakhislam, L., Kulyash, K., Bakhadurkhan, A., Sholpan, K., Kairat, Z.<br>Evaluation of students' views on teaching the subject of migration through distance education in Kazakhstan geography course<br>(2022) World Journal on Educational Technology: Current Issues, 14 (1), pp. 294-305.<br><br>DOI: 10.18844/wjet.v14i1.6260 |
| 57 | A Study of the Effects of Soil Salinity on the Growth and Development of Maize (Zea Mays L.) by using Sentinel-2 Imagery<br>(2022) | OnLine Journal of Biological Sciences | Salinization of soil cover and the constant increase in their area have become one of the most pressing problems year after year for irrigated agriculture regions. The degradation processes caused by the salinity of soils negatively affect the growth and development of food crops. Therefore, this study focused on the effects of soil salinity in the midstream of the Syrdarya on the growth and development of maize where the climate is continental and mostly arid, and the cultivation of crops is possible under irrigation conditions. The study made harmonious use of remote sensing and field survey methods based on modern and traditional approaches in terms of time and space. Based on Sentinel-2 satellite images, regression analysis was carried out to determine the dependency of | Laiskhanov, S.U., Smanov, Z.M., Kaimuldinova, K.D., Myrzaly, N.B., Ussenov, N.E., Poshanov, M.N., Azimkhanov, B.<br>A Study of the Effects of Soil Salinity on the Growth and Development of Maize (Zea Mays L.) by using Sentinel-2 Imagery<br>(2022) OnLine Journal of Biological Sciences, 22 (3), pp. 323-332. |

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| | | | vegetation indices on soil electronegativity and maize biomass from 73 sampling points in the representative area. As a result, in the study of the growth and development of maize, it was found that the dependence of the Normalized Difference Vegetation Index (NDVI) on maize biomass within 18 vegetation indices was "high" (R2 = 0.76) in spring. The dynamics of maize biomass grown on soils of different salinity levels were developed. NDVI dynamics, which covers the entire growth phases of corn, showed that compared to corn grown in unsalted soils, it slows down the growth of corn in slightly saline soils-up to 11 days, in moderately saline soils-35 days, and in heavily (highly) saline soils-45 days. Characterization of soil salinity and other factors having a positive and negative influence on the growth and development of maize yield in the studied object is also given. © 2022 Shakhislam Uzakbaevich Laiskhanov, Zhassulan Maratuly Smanov, Kulyash Duisenbaevna Kaimuldinova, Nazira Berdigulovna Myrzaly, Nurbol Ergeshovich Ussenov, Maksat Nurbaiuly Poshanov and Bakdaulet Azimkhanov. | DOI: 10.3844/ojbsci.2022.323.332 |
| 58 | Opportunities to use mobile gis applications in the formation of tourist and local lore competencies in students: case study in Almaty, Kazakhstan | Geojournal of Tourism and Geosites | Since the use of mobile GIS-applications in the formation of tourist and local lore competencies of students affects the knowledge and professional competence of future teachers, it is very important to first determine the attitude of teachers and professors to the use of mobile GIS-applications and assess the level of use of mobile applications by students. Therefore, this article provides for the possibility of using mobile GIS applications in the organization of tourist and local lore activities of students of the educational program "Geography". The effectiveness of organizing tourist and local lore events using mobile GIS applications was determined by conducting interviews and questionnaires. The survey consisted of two parts, and a total of 72 students took part in it voluntarily. In the course of the study, we studied the formation of tourist and local lore competencies from mobile GIS applications as a result of the study: 1) "Road navigation" from mobile GIS | Issakov, Y., Laiskhanov, S., Mazbayev, O., Ussenov, N., Zheldibayev, A., Kamelkhan, G., Dávid, L.D. OPPORTUNITIES TO USE MOBILE GIS APPLICATIONS IN THE FORMATION OF TOURIST AND LOCAL LORE COMPETENCIES IN STUDENTS: CASE STUDY IN ALMATY, KAZAKHSTAN (2022) Geojournal of Tourism and Geosites, 41 (2), pp. 597-605. |

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| | | | applications - 2GIS (79.1%); 2) "For viewing and studying" from mobile applications - ArcGIS QuickCapture (56.9%); 3) Google planet Earth "Virtual globe" (52.8%); 4) based on the mobile applications "Cartography and Navigation", we determined the efficiency of using the GIS4MOBILE-x (41.7%) and 5) the City bus for "GPS monitoring" (100%). In this regard, we are confident that the use of these mobile applications will be effective in organizing tourist and local lore events. The use of these technologies in teaching makes it possible to update educational approaches, introduce new pedagogical technologies and form competencies. | DOI: 10.30892/GTG.41234-868 |
| 59 | The Effects of the Degree of Soil Salinity and the Biopreparation on Productivity of Maize in the Shaulder Irrigated Massif | OnLine Journal of Biological Sciences | During the study on the Shaulder irrigated massif, the soil salinity maps with different degrees of salinity were compiled at the large-scale 1:10000 in the GIS environment. It was found that the area of saline soils increases with depth. In the upper 0-20 cm layer, 29% is salted and in the 50-100 cm layer, up to 44% is salted. The theory of soil reclamation shows a close relationship between the level of concentration of salts accumulating in the soil and the state of the current crop. Determination of the effect of biopreparation was carried out in field studies. Pre-sowing treatment of maize seeds was carried out using a working solution of C-1-1 adaptogen-preparations in optimal technological modes developed by U.U. Uspanov Kazakh Research Institute of Soil Science and Agrochemistry. Maize sowing was carried out in May to a depth of 6-8 cm in a common way with row spacing of 70 cm at the rate of 18-20 kg of seeds per 1 ha. Maize plants were sprayed in the phase of 4-5 leaves and 6-7 leaves; when corn forms the first and second tier of nodal roots, plants were sprayed with a biological product “BioEkoGum” with an aqueous solution. The study's findings showed that depending on the degree of soil salinity, the maize yield for grain increased on non-saline soils to 40.0% compared to the control of 71.1 c/ha. In lightly and medium-saline soils - 81.2-83.9 c/ha at the control treatment (62.5-63.5 C/ha), the | Poshanov, M.N., Laiskhanov, S.U., Smanov, Z.M., Kenenbayev, S.B., Aliaskarov, D.T., Abikbayev, Y.R., Vyrakhmanova, A.S., Askanbek, A.<br>The Effects of the Degree of Soil Salinity and the Biopreparation on Productivity of Maize in the Shaulder Irrigated Massif<br>(2022) OnLine Journal of Biological Sciences, 22 (1), pp. 58-67.<br><br>DOI: 10.3844/ojbsci.2022.58.67 |

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| | | | addition to yield was 30.0 - 32.1%, respectively. In highly saline soils, the yield of maize grain was 11.4%, with the yield under control - 47.1 C/ha. Application of biological preparation in the conditions of Shaulder irrigated massif allows making an income from 162.6 to 884.2 $ per 1 ha.. | |
| 60 | Subsidence control method by inversely-inclined slicing and upward mining for ultra-thick steep seams | International Journal of Mining Science and Technology | Ultra-thick steep coal seam mining will inevitably lead to the increase of greater and violent ground subsidence and deformation. A subsidence control method by inversely-inclined slicing and upward mining is proposed in this paper. By this method, the sequence of collapse of overlying strata and the direction of propagation of strata movement are changed, the extent of roof-side deformation thereby is lessened, and boundary angle of roof-side subsidence is reduced by 5°–10°. The mechanism of this mining method for control of strata movement has been evidenced by numerical simulation and experiments with similarity materials. A subsidence prediction model based on the variation of mining influence propagation angle can be used to evaluate the surface movement and deformation of the mining method. The application of the method in No.3 Mine in Yaojie mining area has yielded the expected result. | Dai, H., Li, P., Marzhan, N., Yan, Y., Yuan, C., Serik, T., Guo, J., Zhakypbek, Y., Seituly, K.<br>Subsidence control method by inversely-inclined slicing and upward mining for ultra-thick steep seams<br>(2022) International Journal of Mining Science and Technology, 32 (1), pp. 103-112.<br><br>DOI: 10.1016/j.ijmst.2021.10.003 |
| 61 | Interannual Variability of Snowiness and Avalanche Activity in the Ile Alatau Ridge, Northern Tien Shan | Water (Switzerland) | Snowiness and avalanche activity are very important natural characteristics of mountain areas. They have a great influence on the possibility of areas' development, especially regarding winter recreation. This article considers the interannual variability of snowiness and avalanche activity in the Ile Alatau Ridge (Northern Tien Shan), which belongs to the areas with a continental snow climate. The sum of winter precipitation and snow depth are used as snowiness indices, and the indices of avalanche activity are the total avalanche volume, maximum avalanche volume and number of avalanches. The work uses archival data for the period from 1966 to 2022. Interannual variability of snowiness and avalanche activity indices and long-term temporal trends were assessed, correlation between | Medeu, A., Blagovechshenskiy, V., Gulyayeva, T., Zhdanov, V., Ranova, S.<br>Interannual Variability of Snowiness and Avalanche Activity in the Ile Alatau Ridge, Northern Tien Shan<br>(2022) Water (Switzerland), 14 (18), статья № 2936, .<br><br>DOI: 10.3390/w14182936 |

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| | | | these indices was studied, and extreme values with different return periods were calculated. The relationship between years with a high snowiness and years with a high avalanche activity, as well as years with a high avalanche activity and years with a large number of avalanche victims and high avalanche damage has been studied. Similar studies have not been previously carried out for the areas with a continental snow climate. Snowiness indices have weak, non-significant, increasing temporal trends. The total avalanche volume has a non-significant decreasing temporal trend, and the maximum avalanche volume has a significant decreasing one. The number of avalanches has a significant increasing temporal trend. This study could be relevant for understanding the features of temporal variability of snowiness and avalanche activity in the mountainous regions with a continental snow climate. | |
| 62 | Polychlorinated Biphenyls in the Snow Cover of South-Eastern Kazakhstan | Applied Sciences (Switzerland) | The presence of large sources of environmental pollution due to persistent organic pollutants (POPs), in particular, polychlorinated biphenyls (PCBs), in Kazakhstan necessitates the assessment of pollution as a result of these toxicants. For this purpose, we chose snow cover as an indicator for assessing pollution status in the study area. An assessment of the PCB accumulation level included in the list of POPs was carried out for a snow cover (SC) study in south-east Kazakhstan. The content of PCBs with a wide congener composition was determined using the chromatographic analysis method. During the winter periods of 2014, 2015, 2018–2020 and 2021, the SC pollution of the study area from up to 25 individual PCB congeners was identified. These congeners included highly toxic dioxin-like congener PCBs 105; 108; 114; 118 and “marker” PCBs 52; 101; 138; 153. These congeners were mainly found in snow samples with a wide range of PCB congener compositions. The main PCB pollution sources were indicated. The analysis of the obtained results and structure of the congener composition of PCBs show that the SC | Amirgaliyev, N.A., Medeu, A.R., Opp, C., Madibekov, A., Kulbekova, R., Ismukhanova, L., Zhadi, A. Polychlorinated Biphenyls in the Snow Cover of South-Eastern Kazakhstan (2022) Applied Sciences (Switzerland), 12 (17), статья № 8660, .<br><br>DOI: 10.3390/app12178660 |

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| | | | contamination in this territory occurs under the influence of local and regional sources. | |
| 63 | Application of Mathematical Statistics to Assess the Avalanche Danger Level in the Ile Alatau Mountains | Russian Meteorology and Hydrology | The Institute of Geography and Water Safety adapted the world experience in assessing the avalanche danger level to the conditions of Kazakhstan. This work is based on the five-point scale method of danger level classification recommended by the WSL Institute for Snow and Avalanche Research (SLF). The methods of mathematical statistics are used to analyze data on weather conditions and avalanches. The analysis identified the main statistical parameters of data series. The cluster analysis revealed five similar groups (clusters) in the distribution of snow water equivalent and air temperature and three clusters in the distribution of precipitation amounts. The spectral analysis showed that the duration of avalanche periods is basically 2–3 days. The distribution of the number of days with different levels of avalanche danger, total volumes of avalanches and heavy precipitation obeys the Pareto law. The results are statistically significant according to the Kolmogorov–Smirnov test ($\alpha$-level = 10%, $p < 0.01$). | Medeu, A.R., Blagovechshenskiy, V.P., Zhdanov, V.V., Ranova, S.U. Application of Mathematical Statistics to Assess the Avalanche Danger Level in the Ile Alatau Mountains (2022) Russian Meteorology and Hydrology, 47 (8), pp. 596-603.<br><br>DOI: 10.3103/S1068373922080052 |
| 64 | Moraine-dammed glacial lakes and threat of glacial debris flows in South-East Kazakhstan | Earth-Science Reviews | Glacier retreat has caused the emergence of numerous moraine-dammed glacial lakes (MGL) over the last century which have become research foci in many mountain regions of the world. Outbursts of MGLs have caused destructive floods and debris flows, leading to numerous human casualties and significant material damage. The mountains of South-Eastern Kazakhstan have also become prone to lake outburst floods and related debris flows, specifically in the second half of the 20th century. This paper presents and reviews existing surveys and knowledge along with results of own investigations on the formation of MGLs and the characteristics of lake outburst floods and debris flows in the Kazakh part of Tien Shan. We suggest a workflow to identify the most dangerous types of lakes and provide information about their morphogenetic features and hazard criteria. The number of MGLs increased since the 1970s with more than 160 existing in 2018. Forty were | Medeu, A.R., Popov, N.V., Blagovechshenskiy, V.P., Askarova, M.A., Medeu, A.A., Ranova, S.U., Kamalbekova, A., Bolch, T. Moraine-dammed glacial lakes and threat of glacial debris flows in South-East Kazakhstan (2022) Earth-Science Reviews, 229, статья № 103999, .<br><br>DOI: 10.1016/j.earscirev.2022.103999 |

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| | | | identified as being dangerous. Forty-eight lake outbursts occurred since 1950 with all the documented events happened between end of June and end of August. The most dangerous outbursts were caused by ruptures in ice-cored moraine dams. Outbursts of nine MGLs caused disastrous debris flows, with some occurring repeatedly. The number of outbursts decreased since the year 2000 compared to 1970–2000. However, due to ongoing glacier retreat new lakes are forming at higher altitudes. Their greater potential energy makes possible future outbursts more dangerous. Re-evaluation of existing methods to calculate the water volume and peak discharge based on bathymetric measurements and observed outbursts revealed that the applied equations provide suitable approximations and allow supporting mitigation and prevention measures. Finally, the presentation of implemented measures to lower the water level using siphons or artificial flow channels shows that they can reduce the lake outburst hazards. However, they are associated with risks and financial costs and it needs to be carefully considered whether protection measures of the endangered areas are more cost effective. | |
| 65 | Analysis and Assessment of the Ecological Security Level of the Transboundary Ural-Caspian Basin of the Republic of Kazakhstan | Applied Sciences (Switzerland) | Both the insufficiency of water resources and the contamination of even transboundary water bodies are serious problems. Water quality analyses of the transboundary (between Russia and Kazakhstan) Ural River and the Kazakh sector of the Caspian Sea, and their assessment are the main research questions of this study. It is shown that the Ural River is heavily contaminated by polychlorinated biphenyls, heavy metals, oil contaminants, and pesticides, arising from industrial enterprises and agricultural objects. The results show that these toxicants are not only present in water, but they are also accumulated in the muscular tissues of all fish (Abramis brama, Sander lucioperca, Aspius aspius). The Caspian Sea is heavily contaminated by petroleum hydrocarbons due to off shore oil production. A sufficiently high level of accumulation of petroleum hydrocarbons, organochlo-rine pesticides and heavy | Amirgaliev, N.A., Askarova, M., Opp, C., Medeu, A., Kulbekova, R., Medeu, A.R. Water Quality Problems Analysis and Assessment of the Ecological Security Level of the Transboundary Ural-Caspian Basin of the Republic of Kazakhstan (2022) Applied Sciences (Switzerland), 12 (4), статья № 2059, .<br><br>DOI: 10.3390/app12042059 |

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| | | | metals was determined in the muscles of Caspian fish. All these contaminations lead to the loss of biodiversity and bio-productivity of the Caspian Sea. The authors pro-pose a methodology for a quantitative assessment of the environmental safety level in relation to the Kazakh part of the Caspian Sea, based on bioindication methods. Recommendations, aimed for maintaining acceptable values of water resources quality, are suggested. | |
| 66 | Water resources of Kazakhstan in conditions of uncertainty | Journal of Water and Land Development | The exceptionally high spatial-temporal variability of the river runoff and the significance of its transboundary component considerably worsen the problem of the water supply of the republic. Due to the disadvantageous geographical location in the lower reaches of transboundary river basins, the Republic of Kazakhstan is largely dependent on water economy activities taking place in neighbouring countries. In the article the modern change of the resources of river runoff in Kazakhstan, taking into account climatic and anthropogenic influences is considered. For the assessment of the impact of economic activities on the river runoff and changes in climatic-related runoff, the complex of integral methods was used, and appropriate methodologies were developed. The obtained results of the modern influence of a complex of factors, as well as their significance for the future (till 2030), can be used for the development of scientifically based solutions for sustainable management and protection of water resources. An assessment of the anthropogenic activity of this study shows that the water resources of the river runoff of the Republic of Kazakhstan have decreased by 16.0 $km^3 \cdot y^{-1}$. According to our forecasts, there will be a further decrease in the water resources of the republic due to the expected decrease in transboundary flow to 87.1 $km^3 \cdot y^{-1}$ by 2030, in dry years less than 50.0 $km^3 \cdot y^{-1}$. We propose a set of measures to prevent the negative impact of possible reduction of river runoff resources in the future in the water basins of Kazakhstan. | Tursunova, A., Medeu, A., Alimkulov, S., Saparova, A., Baspakova, G.<br>Water resources of Kazakhstan in conditions of uncertainty (2022) Journal of Water and Land Development, 54, pp. 138-149.<br><br>DOI: 10.24425/jwld.2022.141565 |

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| 67 | The drivers of financial vulnerability and profitability: evidence from conventional and Islamic banks in Islamic finance-oriented countries | Journal of Islamic Accounting and Business Research | Purpose: This study aims to investigate the determinants of banking stability in the case of QISMUT + 3 countries (Qatar, Indonesia, Malaysia, United Arab Emirates, Turkey, Pakistan, Kuwait and Bahrain). Both profitability of banks and non-performing loans were treated as dependent variables. Three variations are examined, the sample as a whole and separated to conventional banks (CBs) and Islamic banks (IBs). Design/methodology/approach: Data from 208 banks, both IBs and CBs, were used from 2011 to 2018, after global financial crisis period. Two-step system generalized methods of moments and both feasible least squares and panel-corrected standard error models were used to ensure test the data. Findings: Results suggest that both financial vulnerability and profitability affect each other in both banking systems. In addition, capital adequacy has a positive link with both dependent variables. Corruption varied and followed expectations but for the case of CBs alone with an unexpected negative relationship with profitability. Practical implications: The findings are expected to help bankers, investors, academics and policymakers gain a better understanding of Islamic banking. The findings would be useful in developing policy for the development of the banking industries in these countries. Originality/value: This study contributes to existing literature in three ways. First, this study investigates the factors influencing banking non-performing loans for a new class of countries – QISMUT + 3 within 2011–2018 period. Second, only a few studies use such a period, which is after the global financial crisis period. Finally, new indicators are used to determine the non-performing loans and profitability of both types of banks, such as Muslim Share and Share of IBs. | Parmankulova, I., Issakhova, P., Zhanabayeva, Z., Faizulayev, A., Orazymbetova, K. The drivers of financial vulnerability and profitability: evidence from conventional and Islamic banks in Islamic finance-oriented countries (2022) Journal of Islamic Accounting and Business Research, 13 (6), pp. 902-919.<br><br>DOI: 10.1108/JIABR-06-2021-0155 |
| 68 | Prospects of ecotourism development in central Kazakhstan | Geojournal of Tourism and Geosites | The ecotourism development in Central Kazakhstan, especially in the Karkaraly region is relevant, because the geosystems of Karkaraly lowlands have a diverse landscape and numerous attractions. The purpose of this work is to popularize the eco-route described in the article, as well as to provide | Keukenov, Y., Dzhanaleeva, K., Ataeva, G., Ozgeldinova, Z., Orazymbetova, K. PROSPECTS OF ECOTOURISM |

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| | | | recommendations and suggestions for the ecotourism development in Central Kazakhstan on the example of the Karkaraly Mountains geosystem. Research methods are field, descriptive, cartographic. The optimal route was identified on the basis of stock materials and also as a result of expedition research, and a map of the two-day eco-route was developed. Conclusions are made about the prospects of ecotourism development in the Karkaraly lowlands geosystems | DEVELOPMENT IN CENTRAL KAZAKHSTAN (2022) Geojournal of Tourism and Geosites, 42, pp. 664-670.<br><br>DOI: 10.30892/gtg.422spl04-875 |
| 69 | Level regime of Balkhash Lake as the indicator of the state of the environmental ecosystems of the region | Paddy and Water Environment | The article presents the results of studies of the level regime of Lake Balkhash, which has a characteristic, consisting in the change in the average lake horizon, the changes in the magnitudes of the seasonal and inter-annual amplitudes of the levels, as well as their annual and long-term ones. All this involves the change in the lake table area and its outline on the map. The results of full-scale data of modern morphometric characteristics are presented, on the basis of which the actual map of the lake depths is presented. The impact of economic activity on the fluctuations of the long-term annual average water level in the lake is observed, and the analysis of the changes in the hydro chemical composition of the water depending on the level of the lake is given. | Myrzakhmetov, A., Dostay, Z., Alimkulov, S., Tursunova, A., Sarsenova, I.<br>Level regime of Balkhash Lake as the indicator of the state of the environmental ecosystems of the region<br>(2022) Paddy and Water Environment, 20 (3), pp. 315-323.<br><br>DOI: 10.1007/s10333-022-00890-x |
| 70 | Calculation of Bed Load Discharge for Coarse Sand | Journal of Ecological Engineering | At present, during the period of intensive climatic changes, it is important to thoroughly take into account the hydrological regimes of water bodies. One of the major conditions of ensuring hydrological safety of territories is a reliable forecast of stream-channel deformations and channel-related processes in the case of water bodies and their separate sections. This paper reviews different methods of calculating bed load discharge. Thus, a new technique of calculation of bed load discharge was developed with consideration of the probabilistic estimate of the beginning of bed load motion. The method shows satisfactory results compared to previous techniques in use. | Myrzakhmetov, A., Duskayev, K., Tursunova, A., Dostayeva, A.<br>Calculation of Bed Load Discharge for Coarse Sand<br>(2022) Journal of Ecological Engineering, 23 (9), pp. 13-17.<br><br>DOI: 10.12911/22998993/149857 |

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| 71 | Rock mass management to ensure safe deposit development based on comprehensive research within the framework of the geomechanical model development | Mining of Mineral Deposits | Purpose. To create and study a three-dimensional geomechanical model in order to determine the parameters of the open-pit walls and benches, ensuring safe and economically feasible mining, as well as predicting unstable zones within the open pit. Methods. A comprehensive methodological approach is used, including a systematic analysis of scientific, normative and methodological literature; analyzing the results of previously performed studies on the object; engineering-geological surveys in the near-edge rock mass of the Kurzhunkul' deposit; laboratory testing of rock strength properties; determining the rock mass rating according to the MRMR classification; kinematic analysis of bench faces; calculating the stability of the Kur-zhunkul' deposit final boundary using the limit equilibrium method; numerical modeling of the rock mass stress-strain state at the Kurzhunkul' deposit using the finite element method. Findings. The paper represents the results of data collection and analysis for the development of a geomechanical model of an operating iron-ore open pit in the Republic of Kazakhstan. Comprehensive geomechanical studies to substantiate the optimal parameters of the Kurzhunkul' deposit walls and benches on the limiting contour, as well as calculations to determine the degree of the open-pit walls and benches stability have been performed. Based on the results of studying the geological-structural configuration of the deposit, as well the mathematical modeling data of stability and acting stresses, subsequently entered into a unified digital database, weakened zones have been identified. Originality. For the first time, the geomechanical model has been created for the conditions of the Kurzhunkul' deposit, which makes it possible to combine in one database all the parameters that affect the safety of mining operations. The model takes into account structural disturbances of the rock mass that have an adverse impact on stability. Practical implications. The developed model gives a visual representation of the rock mass state at various sites of the de- | Sedina, S., Altayeva, A., Shamganova, L., Abdykarimova, G.<br>Rock mass management to ensure safe deposit development based on comprehensive research within the framework of the geomechanical model development<br>(2022) Mining of Mineral Deposits, 16 (2), pp. 103-109.<br><br>DOI: 10.33271/mining16.02.103 |

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| | | | posit, simplifies the selection of design sections for stability calculations, facilitates the choice of optimal technical solutions and analysis, especially for complex geological structures with multiple geotechnical or geological units with different tex-turing and inclination. | |
| 72 | Management of Recreational Areas. The Impact of Management of the Development of Shchuchinsko-Borovsky Resort Area on the Improvement of the Level of Financial and Economic Sustainability in the Region | Journal of Environmental Management and Tourism | The formation and development of the recreation system generate a range of problems associated with the need to manage the development of recreational areas, which demonstrate the properties of complex environmental and economic systems. For this reason, it is critically important to improve the environmental and economic efficiency of recreational areas through the formation of an effective management system, especially in the aspect of the balanced spatial development of regions. The paper presents an analysis of various methodological approaches to the management of recreational areas, defines the stages of implementation of recreational area management, and offers a recommended recreational area zoning scheme and the corresponding recreational area management structure based on the example of the Shchuchinsko-Borovsky resort area. The results of the study suggest that recreational area management should be considered as an activity of public authorities to create conditions for the rational and effective use of the recreational potential of the region, and the adoption of rational and balanced managerial decisions can only be ensured by the establishment of a cadastre of recreational resources. | Bokenchin, K.K., Altay, M., Shaimerdenova, A., Bokenchina, L.K., Dabylova, B. Management of Recreational Areas. The Impact of Management of the Development of Shchuchinsko-Borovsky Resort Area on the Improvement of the Level of Financial and Economic Sustainability in the Region (2022) Journal of Environmental Management and Tourism, 13 (6), pp. 1565-1573.<br><br>DOI: 10.14505/jemt.v13.6(62).05 |