Резюмета на трудовете

B4. Хабилитационен труд - Научни публикации (не по-малко от 10) в издания, които са реферирани и индексирани в световноизвестни бази данни с научна информация Scopus, Web of Science, ERIH+

B4.1 Srebrov,B., L. Pashova (2012) Study of the ionospheric state over Sofia area during the geomagnetic storm in October 2003 using measured and modelled parameters, Comptes Rendus de L'Academie Bulgare des Sciences, Vol. 65 (10), 1419-1426, (WoS, Scopus) SJR(2021) = 0.19; Q2 Comptes rendus de l'Academie bulgare des Sciences (bas.bg)

ABSTRACT

The paper deals with studying the ionosphere irregularities over Sofia area during the very strong geomagnetic storm in October 2003. A comparison between the variations of the planetary geomagnetic indexes Dst and Kp, H-component of the geomagnetic field in PAG observatory, and critical frequency f0F2 at the ionospheric station in Sofia SQ143 is performed. The differences between GPS derived and the model TEC-values predicted by the IRI2007 in quiet and active geomagnetic condition periods are analyzed.

B4.2 Srebrov, B., Orlyuk, M., Pashova, L., Makarenko, I., Marchenko, A., Savchenko, A. (2013) Gravity and magnetic data inventory for investigation of the Black Sea region, Geodynamics, 15, 332-334, ISSN/eISSN: 1992-142X / 2519-2663, (WoS), JCR (2021)= 0.12, tyt1.doc (lpnu.ua)

ABSTRACT

The paper presents an inventory of the available gravity and geomagnetic data for studying geological structures and geodynamical processes in the Black Sea region. A short analysis of the compiled free-air gravity anomaly map from *in situ* data of the sea is performed. The geomagnetic data acquisition over the Bulgarian territory and western part of the Black sea is presented. Some new sources of the gravity and geomagnetic data from satellite missions are indicated.

B4.3 Pashova, L., Koprinkova-Hristova, P.,Popova, S. (2013) Gap Filling of Daily Sea Levels by Artificial Neural Networks, TransNav-international journal on marine navigation and safety of sea transportation, Vol. 7 (2), 225-232, DOI10.12716/1001.07.02.10; ISSN / eISSN:2083-6473 / 2083-6481 (WoS), JCR (2021)= 0.18, https://www.transnav.eu/Article_Gap_Filling_of_Daily_Sea_Levels_ Pashova,26,431.html

ABSTRACT

In the recent years, intelligent methods as artificial neural networks are successfully applied for data analysis from different fields of the geosciences. One of the encountered practical problems is the availability of gaps in the time series that prevent their comprehensive usage for the scientific and practical purposes. The article briefly describes two types of the artificial neural network (ANN) architectures - Feed-Forward Backpropagation (FFBP) and recurrent Echo state network (ESN). In some cases, the ANN can be used as an alternative on the traditional methods, to fill in missing values in the time series. We have been conducted several experiments to fill the missing values of daily sea levels spanning a 5-years period using both ANN architectures. A multiple

linear regression for the same purpose has been also applied. The sea level data are derived from the records of the tide gauge Burgas, which is located on the western Black Sea coast. The achieved results have shown that the performance of ANN models is better than that of the classical one and they are very promising for the real-time interpolation of missing data in the time series.

B4.4 Mukhtarov, P., Pancheva, D. Andonov, B., Pashova, L. (2013a) Global TEC maps based on GNSS data: 1. Empirical background TEC model, Journal of Geophysical Research - Space Physics, Vol. 118 (7), 4594-4608, DOI: 10.1002/jgra.50413. (WoS, Scopus), SJR(2021)= 0.872; Q2, https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/jgra.50413

ABSTRACT

A global background total electron content (TEC) model is built by using the Center for Orbit Determination of Europe (CODE) TEC data for full 13 years, 1999–2011. It describes the climatological behavior of the ionosphere under both its primary external driver, i.e., the direct photo-ionization by incident solar radiation, and regular wave particularly tidal forcing from the lower atmosphere. The model construction is based on the very different time scales of the solar cycle, seasonal, and diurnal TEC variabilities (at least an order of magnitude); this leads to modulations of shorter-period variabilities with periods of the longer ones. Then the TEC spatial-temporal variability is presented as a multiplication of three separable functions. The solar activity is described by both parameters: F10.7 and its linear rate of change KF while the seasonal variability is presented by sine functions including four subharmonics of the year. The diurnal variability of the TEC model is described by 2D (longitude-time) sine functions with zonal wave numbers up to 4 and 4 subharmonics of the solar day. The model offers TEC maps which depend on geographic coordinates (5°_5° in latitude and longitude) and UT at given solar activity and day of the year. The presented background model fits to the CODE TEC input data with a zero systematic error and an RMS error of 3.387 TECU. It is able to reproduce the well-known ionospheric structures as Weddell Sea Anomaly and some longitudinal wave-like structures.

B4.5 Mukhtarov, P., Pancheva, D. Andonov, B., Pashova, L. (2013b) Global TEC maps based on GNNS data: 2. Model evaluation, Journal of Geophysical Research - Space Physics, Vol. 118 (7), 4609-4617, DOI10.1002/jgra.50412. (WoS, Scopus), SJR(2021)= 0.872; Q2, https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/jgra.50412

ABSTRACT

The present paper presents a detailed statistical evaluation of the global empirical background TEC model built by using the CODE TEC data for full 13 years, 1999-2011, and described in Part 1. It has been found that the empirical probability density distribution resembles more the Laplace than the Gaussian distribution. A further insight into the nature and sources of the model's error variable led up to building of a new error model. It has been constructed by using a similar approach to that of the background TEC model. The spatial-temporal variability of the RMSE (root mean squares error) is presented as a multiplication of three separable functions which describe solar cycle, seasonal and LT dependences. The error model contains 486 constants that have been determined by least squares fitting techniques. The overall standard deviation of the predicted RMSE with respect to the empirical one is 0.7 TECU. The error model could offer a prediction approach on the basis of which the RMSE depending on the solar activity, season and LT is predicted.

B4.6 . Bandrova, T., Kouteva, M., Pashova, L. Savova, D., Marinova, S. (2015) Conceptual framework for educational disaster centre “Save the children life”, ISPRS International Archives

of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-3/W3, 2015, pp.225-234, DOI:10.5194/isprsarchives-XL-3-W3-225-2015, (WoS, Scopus), SJR (2021) = 0.31, https://www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XL-3-W3/225/2015/

ABSTRACT

Millions of people are affected by natural and man-made disasters each year, among which women, children, elderly persons, people with disabilities or special needs, prisoners, certain members of ethnic minorities, people with language barriers, and the impoverished are the most vulnerable population groups in case of emergencies. Many national and international organizations are involved in Early Warning and Crisis Management training, particularly focused on the special target to safe children and improve their knowledge about disasters. The success of these efforts is based on providing the specific information about disaster preparedness and emergency in adapted for children educational materials, accompanied with simple illustrative explanations for easy and fast understanding of the disasters. The active participation of the children in the educational activities through appropriate presenting the information, short training seminars and entertaining games will increase their resilience and will contribute significantly to their preparedness and adequate response in emergency situations. This paper aims to present the conceptual framework of a project for establishing an Educational Disaster Centre (EDC) “Save the children life” at University of Architecture, Civil Engineering and Geodesy (UACEG), providing relevant justification of the necessity to organize such centre in Bulgaria and discussing good practices in Europe and worldwide for children' education and training in case of disastrous event. General concepts for educational materials and children training are shared. Appropriate equipment for the EDC is shortly described.

B4.7 Pashova, L., T. Bandrova (2017) A brief overview of the current status of European spatial data infrastructures - relevant developments and perspectives for Bulgaria, Journal Geo-spatial Information Science, 20 (2), 97-108, (WoS, Scopus), SJR(2021)=0.910, Q2 (2021), https://doi.org/10.1080/10095020.2017.1323524

ABSTRACT

The paper aims to present a concise overview of the current status of the national spatial data infrastructures (SDI) of the European Union (EU) member states combined with specific peculiarities for Bulgaria. Some major challenges within the progress of the EU SDIs establishing, which is regulated by the European Directive INSPIRE (Infrastructure for spatial information in Europe) toward establishment of a SDI for environmental policies and activities, are marked out. Available comparative analyses of the main indicators for metadata, data-sets, and data services provided by EU member states are briefly discussed as a special attention is given to the Bulgarian progress. Recent achievements on accelerating the process of implementing the recommendations of the INSPIRE Directive in Bulgaria are outlined.

B4.8 Pashova, L., A. Kortcheva, V. Galabov (2017) On the necessity of improving the research infrastructure in the western Black Sea for the purposes of flood risk management, NATO Science for Peace and Security Series C: Environmental Security, 2017, pp. 31–46, DOI: 10.1007/978-94-024-1071-6_7, (WoS, Scopus), SJR(2020) = 0.109, https://link.springer.com/chapter/10.1007/978-94-024-1071-6_7

ABSTRACT

This paper aims to emphasize the necessity to improve the Bulgarian research infrastructure in the western part of the Black Sea region, which can enhance the capability for more effective flood hazard assessment and risk management in the coastal area. To fulfill the requirements of the Directive 2007/60/EC flood hazard and risk maps of the Areas with Potential Significant Flood Risk (APSFR) for coastal zone have to be prepared. Short overview of the approaches for compiling such maps has been presented as well as all parameters' evaluations needed and their uncertainties based on the available information and models. Still existing obstacles to the provision of timely geospatial information from monitoring stations along the coastal area are discussed, and some suggestions for improving the research infrastructure in the western part of the Bulgarian Black Sea coast are listed.

B4.9 Srebrov, B., Pashova, L., Kounchev, O. (2018) Study of local manifestations of G5 – extreme geomagnetic storms (29–31 October, 2003) in mid-latitudes using geomagnetic data by continuous wavelet transforms, Comptes Rendus de L'Academie Bulgare des Sciences, 71(6), 803–811 (WoS, Scopus), SJR(2021) = 0.19; Q2 (2018), DOI: 10.7546/CRABS.2018.06.11, Comptes rendus de l'Academie bulgare des Sciences (bas.bg)

ABSTRACT

The paper presents results of analysis using continuous Wavelet Transform to the local manifestation of Halloween geomagnetic storm in the middle latitude using in situ geomagnetic minute data. The case study analyses are performed for three Geomagnetic Observatories (GOs): Ebro EBR (Spain), Surlary SUA (Romania), and Beijing Ming Tombs BMT (China). A comparative analysis of the variations of H-component of the geomagnetic field registered at three GOs during the three-day storm run from 29 to 31 October, 2003 is performed. As a result of the present study, for the first time to our knowledge, the Wavelet Analysis permits to distinguish subtle features of the ionospheric influence from the ring current influence on the geomagnetic DS index in the relatively high frequency domain.

B4.10 Ghawana T; Pashova L; Zlatanova S. (2021) Geospatial data tilization in national disaster management frameworks and the priorities of multilateral disaster management frameworks: Case studies of India and Bulgaria', ISPRS International Journal of Geo-Information, vol. 10, http://dx.doi.org/10.3390/ijgi10090610 (WoS, Scopus) SJR(2021) = 0.72; Q1, https://www.mdpi.com/2220-9964/10/9/610/htm

ABSTRACT

Facing the increased frequency of disasters and resulting in massive damages, many countries have developed their frameworks for Disaster Risk Management (DRM). However, these frameworks may differ concerning legal, policy, planning and rganisational arrangements. We argue that geospatial data is a crucial binding element in each national framework for different stages of the disaster management cycle. The multilateral DRM frameworks, like the Sendai Framework 2015–2030 and the United Nations Committee of Experts on Global Geospatial Information Management (UNGGIM) Strategic Framework on Geospatial Information and Services for Disasters, provide the strategic direction, but they are too generic to compare geospatial data in national DRM frameworks. This study investigates the two frameworks and suggests criteria for evaluating the utilisation of geospatial data for DRM. The derived criteria are validated for the comparative analysis of India and Bulgaria's National Disaster Management Frameworks. The validation proves that the criteria can be used for a general comparison across national DRM.

B4.11 Idrizi, B., Pashova, L., Nikolli, P. (2021) Lifelong training program on QGIS tools for Earth observation sciences in South-East Europe, European Journal of Geography, Vol.12 (3), 88 – 102, DOI: 10.48088/ejg.b.idr.12.3.88.102 (Scopus), SJR(2021) = 0.22; Q3, 06_EJG_2021_08_04_A_IDRIZI_61.pdf (eurogeojournal.eu)

ABSTRACT

Earth Observation (EO) data are an indispensable source of useful geospatial information, which can be efficiently combined with other data within the latest released open-source QGIS software. This paper aims: i) to present a general overview of the QGIS EO plugins; ii) to promote the Lifelong Learning (LLL) courses for open-source QGIS software tools provided by the Geo-SEE Institute from Skopje; iii) to appreciate the advantages of open-source QGIS for developing and improving EO applications. The training objectives are to enhance the research, development tools and technologies of QGIS and stimulate the obtaining and disseminating knowledge to utilize the open-source GIS software. Furthermore, there is a growing need to increase the number of well-educated professionals on issues related to the EO sciences in South-East Europe (SEE), who are better prepared for the labor market in today's digital revolution by using QGIS tools and plugins combined with other related GIS software platforms provided by the OSGeo family.

B4.12 Dimitrova, L., E. Oynakov, L. Pashova, D. Dragomirov (2021) Assessment of the historical and recent seismicity of the Black Sea region. Proceedings of 21th International Multidisciplinary Scientific GeoConference SGEM 2021, 21, Issue 1.1, 21st International Multidisciplinary Scientific GeoConference SGEM 2021, 2022, ISBN:ISBN 978-619-7603-20-0, ISSN:1314-2704, DOI:10.5593/sgem2021/1.1/s05.078, 645-652. (Scopus), SJR (2021)=0.14, https://www.sgem.org/index.php/elibrary-research-areas?view= publication& task=show&id=7807

ABSTRACT

The study of seismicity in the Black Sea region is of particular interest for assessing the vulnerability of the surrounding coastal zones to strong earthquakes and their consequences. The seismicity pattern in the area is determined by the geodynamic processes along the boundaries of the Eurasian, Anatolian and Arabian tectonic plates. The paper presents an approach to assessing the seismic activity of the Black Sea and the surrounding region covering historical and recent seismicity. The historical events since after Christ are included in the catalogue compiled in our previous study, which contains 6468 de-clustered events from 1905 to 2021 with a magnitude $M \geq 3$. All catalogue data are processed by ZMAP, which is routinely applied in the seismological practice to evaluate catalogue quality and in routine network operations. Based on the Frequency-Magnitude Distribution of the overall catalogue, we compiled the magnitude of completeness Mc, b-value and probability maps with their error evaluations for the two periods: recent seismicity (1977-2021) and including historical events, respectively. The catalogue data show a significant increase in small to moderate ($3.0 \leq M < 5.0$) earthquakes after 1980. The considerable increase in the number of seismic stations installed in the countries bordering the Black Sea increases the sensitivity to earthquake detection capability. The seismic events are clustered to the strongest ($M \geq 6$) earthquakes and outlined the main seismic zones: Shabla-Kaliakra, the Crimean peninsula, three clusters located on the eastern shores of the Black Sea, and one on the southern coast near

Bartin, Turkey. These seismic zones outline tectonic units, with specific seismicity patterns in the locations of the clusters.

Г7. Научна публикация в издания, които са реферирани и индексирани в световноизвестни бази данни с научна информация

Г7.1 Pashova, L. (2014) Cartographic design of coastal flood risk maps: case studies for the Black Sea region, 5thInternational Conference on Cartography and GIS, e-Proceedings, publisher: Bulgarian Cartographic Association, 2014, Riviera, Bulgaria, 726-737, ISSN 1314-0604. (WoS), https://cartography-gis.com/docsbca/5ICCandGIS_Proceedings.pdf

ABSTRACT

The Black Sea coast is susceptible to a variety of natural hazards, including sea level rise, land subsidence, landslides, storm surges, flooding, and coastal erosion and abrasion. In this paper, the recent progress in cartographic design of the coastal flood hazard and flood risk mapping is presented. The cartographical elements of different sets of small- and large-scale maps in respect to their spatial and temporal scale based on worldwide “good practice” are discussed. In order to meet the demands of the European Flood Risk Directive 2007/60/EC, the European Member States (MS) have to create flood hazard and flood risk maps. Bulgaria and Romania as EU MS have already started a three-stage process of the risk management according to the Flood Risk Directive. Currently, both countries are carrying out the second stage of the process and produce flood hazard and flood risk maps. The rest four Black Sea countries - Ukraine, Russia, Georgia and Turkey - prepared such maps using their own standards. Specific examples of coastal flood risk maps from the six coastal countries are represented and some comments about users’ needs are done. Additional information that may be included for improving cartographical design is outlined, and thus the accessibility and effectiveness of the flood hazard and flood risk maps could be increased.

Г7.2. Pashova, L., M. Kouteva-Guentcheva, T. Bandrova (2016) Towards mapping multi-hazard vulnerability of natural disasters for the Bulgarian territory, Proceedings, 6th International Conference on Cartography and GIS, 13-17 June 2016, Albena, Bulgaria, Eds: Bandrova T., Konecny M., 798-807, ISSN: 1314-0604. (WoS), ICCGIS2016-85.pdf (cartography-gis.com)

ABSTRACT

Multi-hazard, multi-sectoral and multi-level mapping of natural disasters contributing to the risk assessment is one of the high-priority areas for the international cartographic community. Natural disasters do not affect evenly the territory of Bulgaria and some of them have a trans-boundary impact. Different natural threats to the Bulgarian territory are separately mapped and various specialized thematic maps are available. In this paper an approach for mapping the multi-hazard vulnerability at national scale is outlined. This effort for vulnerability mapping is binded with freely available demographic and social information, industry, business and communications assets and building stock statistics. Vulnerability maps indicate the location of sites where people, the natural environment or property are at risk due to a potentially catastrophic event that could result in death, injury, pollution or other destruction. Being at early stage of development, this elaboration demonstrates a set of sequential methodological steps towards preparing vulnerability maps that can be used in all phases of disaster management.

Γ7.3 Pashova, L., T. Bandrova, M. Kouteva-Guentcheva (2018) Usage of geo-data for educational purposes to improve disaster preparedness, In: Proceedings, 7th International Conference on Cartography and GIS, 18-23 June 2018, Sozopol, Bulgaria, 916-924, ISSN: 1314-0604, Eds: Bandrova T., Konečný M. (WoS), 7th International Conference on Cartography and GIS (cartography-gis.com)

ABSTRACT

This paper discusses available geo-data sets and their use for disaster preparedness education in Bulgaria, which should be adapted to school and university education using advanced mapping and visualization methods. The younger generation of different ages can be included in process of data collection before, during and after disasters, as well in design and elaboration of cartographic products. Based on previous experience and achievements in preparation of educational materials for different children groups, geo-data characteristics and their expedient usage for disaster preparedness are outlined. Getting children involved in making 2D and 3D maps contributes to acquire the knowledge and skills how to use different maps for particular purposes. These syllabus development aims to support the openended model for educational and training centre "Save the Children's Life". The main purpose of such type of centre is to build a disaster prevention culture of the younger generation. An opportunity to involve the young people in carrying out a scientific and experimental researches, which provoking their interest to access to real geo-data and modern mapping methods related to DRR, as well some changes of the school curriculum in this direction, is also discussed.

Γ7.4 Ilieva M., L. Filchev, L. Pashova (2018) Preliminary analysis of Copernicus data for natural hazards monitoring of the Bulgarian Black Sea coastal zone. Proceedings, 7th International Conference on Cartography and GIS, Vol.1, Bulgarian Cartographic Association, 2018, ISSN:1314-0604, 384-392 (WoS), 7th International Conference on Cartography and GIS (cartography-gis.com)

ABSTRACT

The Bulgarian coastal zone is exposed to wide variety of natural hazards, where their complex impact may cause negative social and economic consequences and environmental changes. To improve the understanding of such dangerous and destructive processes, a new knowledge and techniques are required. Satellite imagery is critical to deliver a clear picture on the extent of devastation after any disaster that is happening on Bulgarian territory. In recent years, with becoming operational, Copernicus data and products become as well freely available to the scientific community and end users. To address the national needs and priorities, set out in the National Strategy for Disaster Risk Reduction 2017–2030, this paper provides a systematic analysis of the Copernicus data for the purposes of compiling different cartographic products and maps for monitoring of equatorial and adjacent terrestrial ecosystems. A comparative review of optical and radar satellite images comprising the data archive since the beginning of 90th and data from Copernicus initiative till now covering the western Black Sea area is presented. The data analysis will contribute to develop wide-range monitoring of the potential endangered areas, detection of slow surface movements and delineation of destructive natural hazard events. We complimented the analysis with tracking time changes of the coastal area for the last three decades for the test risk region of northern Bulgarian coast. This region is undergone on the recent vertical crustal movements, active landslide processes, and coastal abrasion; it is one of the regions in

Bulgaria with a high seismic risk. The importance of Sentinel data for monitoring in Bulgaria is discussed, taking into account that the Bulgarian National program for disasters preparedness and risk mitigation is harmonized with the EU policy of natural hazard risk mitigation.

Γ7.5 Pashova, L., Srebrov, B., Kounchev, O. (2019) Investigation of Strong Geomagnetic Storms Using Multidisciplinary Big Data Sets, Big Data, Knowledge and Control Systems Engineering, BdKCSE 2019, 2019, 9010611 (WoS, Scopus), Investigation of Strong Geomagnetic Storms Using Multidisciplinary Big Data Sets | IEEE Conference Publication | IEEE Xplore

ABSTRACT

The paper contains an overview of world data centres as INETMAGNET, SWS, DIAS, IGS, and EUREF, which are repositories of scientific Big Data sets for studying geomagnetic storms, by the means of the available geomagnetic, ionospheric and GNSS data. As an example, the results of a study based on Wavelet Analysis of the local manifestation of the geomagnetic storm on September 7-8, 2017, using time series of observed geophysical parameters obtained from different stations in the Balkans and from satellite observations, are presented. These data include global geomagnetic indexes and local data, in which the H-component of the geomagnetic field, critical frequency foF2 of the ionospheric F2 layer, and VTEC from GPS observations at a separate measuring station are included too. Specific features of the local manifestation of this storm event are outlined, based on the performed joint analysis and comparison of the geophysical parameters.

Γ7.6 Filchev, L., L. Pashova, V Kolev, S Frye (2020) Chapter 6: Surveys, catalogues, databases/archives, and state-of-the-art methods for geoscience data processing, In: Knowledge Discovery in Big Data from Astronomy and Earth Observation. AstroGeoinformatics, P. Škoda & A. Fathalrahman (Eds.) pp. 103-136, ISBN 9780128191545, (Scopus) Chapter 6 - Surveys, Catalogues, Databases/Archives, and State-of-the-Art Methods for Geoscience Data Processing | Elsevier Enhanced Reader

ABSTRACT

CHAPTER 6

Surveys, Catalogues, Databases/Archives, and State-of-the-Art Methods for Geoscience Data Processing

6.1 GEOSPATIAL SURVEYING

6.1.1 Collecting Geospatial Data Through in Situ, Aerial, and Satellite Surveying

During the 2000s and 2010s, among the many modern applications of big datasets, their number in the field of Earth sciences has grown extremely worldwide thanks to the development of industrial technologies and the space programs of the leading countries in space explorations. The precise and cutting-edge data provided by geospatial technologies empowered modern society to tackle environmental and climate change issues. In the digital age, the rapid growth of processing power and global connectivity of geosensor networks allow to collect, share, and analyze the vast amount of Earth observations (EO) data from geospatial surveying.

Г8 Научна публикация в нереферирани списания с научно рецензиране или в редактирани колективни томове

Г8.1 Zlateva, P and L. Pashova (2011) Fuzzy logic application for assessment of the environmental risk in SW Bulgaria, Proc. of the Fourth International Scientific Conference - FMNS2011, 8 - 11 June 2011, Faculty of Mathematics and Natural Science, Vol. 1, SW University "N. Rilski" Blagoevgrad, 509-515.

ABSTRACT

Assessing the environmental risk can be considered as a fundamental factor for the responsible management and the sustainable regional development of southwestern Bulgaria. The paper presents a fuzzy logic approach for complex estimation of the environmental risk, based on the available information sources and the expert knowledge. The risk assessment problem is defined as a multicriterial task that evaluates several input variables (indicators). A hierarchical system is developed, which generates a complex estimation of the environmental risk. The system is designed in the MATLAB environment using Fuzzy Logic Toolbox and Simulink. The simulation investigations are done.

Г8.2 Srebrov, B. and L. Pashova (2012) Investigation of the influence of strong geomagnetic storms on the signal parameters in GNSS station SOFI, Seventh Scientific Conference with International Participation SPACE, ECOLOGY, SAFETY, 29 November – 1 December 2011, Sofia, Bulgaria, 214-221, ISSN 1313-3888

ABSTRACT

Abstract: The paper presents the first results obtained from analysis of the strong geomagnetic storms' effect upon the GPS signals in IGS/EPN permanent site SOFI, Bulgaria. As an example, a geomagnetic storm in 2004 is considered. For the period 7-12 Nov. 2004 the geomagnetic indexes D_s, and K_p, variations of the geomagnetic field components in PAG observatory are analyzed simultaneously with the GPS data. The interplanetary medium and interplanetary magnetic filed changes influence on the local variations of the ionosphere parameters above Sofia, it is shown that this strong geomagnetic storm is registered by the geomagnetic indexes D_{st} and K_p, as well with the horizontal H-component of the geomagnetic field and the total electron content (TEC). The established maximum TEC value is 47 TECU or ~4.9 m errors in the measured pseudoranges using two-frequency ground-based GPS receiver on 10 Nov. 2004.

Г8.3 Pashova,L., D. Grozdev, S. Popova (2012) Multivariate analysis of sea levels and meteorological parameters using copula approach, Proceedings of Third international scientific congress, 4-6 October, 2012, TU Varna, Bulgaria, Vol. VII,18 – 25, ISBN 978-954-20-0556-8

ABSTRACT

The relationship between sea level variability and meteorological parameters for a local region in the Varna bay is investigated. The data sets, used in this study, are maximum and minimum sea levels determined from the tide gauge observations and meteorological parameters: air temperature, atmosphere pressure, precipitation, and humidity, obtained from the synoptic station. The time series are averaged monthly values spanning the period 1970-1997. Describing these

parameters as multivariate random variables, temporal nonlinear dependencies between them are investigated applying Kendall's tau and Spearman's rho rank correlation coefficients and copula approach. Conducting a multivariate analysis of the available data, possibilities and limitations of copulas to establish the nature of the interdependence between oceanographic and meteorological parameters are discussed.

Г8.4 Пашова, Л., П. Копринкова-Христова, С. Попова (2012) Приложение на интелигентни методи за обработка и анализ на геодезически данни, Сборник доклади от Международна юбилейна научно-приложна конференция УАСГ 2012, 487-492, ISBN978-954-724-049-0

РЕЗЮМЕ

В последните години интелигентни методи се прилагат успешно за анализ и интерпретация на данни от различни области на геонауките. В статията са представени накратко геодезически приложения на интелигентни методи, като изкуствени невронни мрежи, размита логика, генетични алгоритми и дърво на решенията. Разгледан е пример за попълване на липсващи стойности във временен ред на среднодневни морски нива за мареографна станция Бургас с използване на невронни мрежи. Резултатите от прилагане на изкуствена невронна мрежа са сравнени с тези от метода на експоненциално изглаждане и е направена оценка на точността.

Г8.5 Пашова, Л., Г. Герова, К. Гръков, Р. Петков (2012) Приложение на глобалните спътникови навигационни системи за сондиране на атмосферата, Сборник доклади от Международна юбилейна научно-приложна конференция УАСГ 2012, 623-628, ISBN 978-954-724-049-0

РЕЗЮМЕ

В статията се представят съвременните тенденции в използване на Глобалните навигационни спътникови системи (ГНСС) за анализ и оценка на атмосферни и йоносферни параметри. Разгледани са два примера за използване на данни от перманентни станции в България за изследване съдържанието на водни пари в тропосферата и за оценяване на тоталното електронно съдържание в йоносферата.

Г8.6 Димитров Д, И. Няголов, С. Балабанова, Н. Лисев, Г. Кошинчанов, А. Корчева, Й. Маргински, Л. Пашова, Д. Гроздев, В. Василев, Б. Божилов, Н. Цветкова (2013) Методика за оценка на заплахата и риска от наводнения, съгласно изискванията на Директива 2007/60/ЕС. НИМХ-БАН, МОСВ, 2013, 357 стр., Планове за управление на риска от наводнения (ПУРН) - Планове за управление – Води, МОСВ (government.bg)

РЕЗЮМЕ

Основните раздели на настоящият III-ти междинен доклад по изпълнение на договор N. Д-30-62/18.04.2012г. за изпълнение на обществена поръчка с предмет, „Методика за оценка на заплахата и риска от наводнения, съгласно изискванията на Директива 2007/60/ЕС" са следните:

- Част 1. Обща част с използваните термини и съкращения
- Част 2. Методически указания за оценка на заплахата от наводнения;
    - Пример за прилагане на Методиката за оценка и картиране на заплахата от наводнения при липса на хидрометрични станции в зоната на моделиране (гр. Плевен и неговите околности);
    - о Пример за прилагане на Методиката за оценка и картиране на заплахата от наводнения при наличие на хидрометрични станции в зоната на моделиране (Района между Пловдив и Първомай);
- Част 3. Методически указания за оценка на заплахата и риска от предизвикани от Черно море наводнения на крайбрежните райони]
    - Пример за изготвяне на карта на заплаха от морски наводнения при висока, средна и малка вероятност на настъпване за района на Китен]
- Част 4. Методика за оценка и картиране на риска от наводнения]
    - Приложение на методология за картиране риска от наводнения за района на гр. Плевен (речни наводнения)] о Приложение на методология за картиране риска от наводнения за района на гр. Китен (морски наводнения)]

Г8.7 Пашова, Л., Д. Гроздев, Й. Маримски, А. Корчева (2013) Устойчивото развитие на Българското Черноморие в условията на климатичнти промени и назаплахата и риска от наводнения в бреговата зона, сп. Устойчиво развитие, бр.6, 38 – 44, ISSN1314-4138

РЕЗЮМЕ

Устойчивото развитие на Българското Черноморско крайбрежие е свързано с анализ и оценка на промените в бреговата зона в условията на климатични промени. Накратко са представени Европейските директиви, националното законодателство и предприетите мерки за предотвратяване и борба с наводненията, като един от рисковите природни процеси в този район от страната. В доклада са разгледани очакваните промени, въздействия и обхвата на възможните средства за намаляване риска от тези явления. На основата на изследвания от световния и европейски опит са посочени фактори, които следва да се отчитат при оценка на заплахата и риска от наводнения в бреговата зона. Подчертава се необходимостта от целенасочени научни изследвания и изграждане на мониторингови системи и мрежи, които да подпомагат разработването на стратегии за устойчиво развитие на Черноморския регион. Те следва да са насочени към интегрирано управление на крайбрежните зони и да водят като крайна цел до опазване и защита на околната среда.

Г8.8 Pashova, L., Kastreva, P., Idrizi, B. (2013) Enhancing cooperation between Bulgaria and FYROM through developing Web Geo-Services - Proceedings of the 5th International Scientific Conference - FMNS2013, 12 - 16 June, 2013, SWU,Blagoevgrad, Vol.7, 3-9, ISSN 1314-0272, Paper title (swu.bg)

ABSTRACT

The cross-border cooperation between Bulgaria and FYROM should be fostered through developing new Web Geo-Services. They may contribute to economic growth by promoting the public access by using Geoportals and their tools. One of the prerequisite for cross-border compliant Geo-services is the implementation of INSPIRE Directive which can provides

interoperable resources of spatial information. An overview of present state of its implementation in Bulgaria and the Republic of Macedonia is presented. Some important issues related to establishing the infrastructure for spatial information to support cross-border cooperation between two countries are discussed.

Г8.9 Pashova, L., Bandrova T., Kastreva P., Idrizi B. (2013) Prospects for the development of Web Geo-Services between Bulgaria and FYROM by applying the INSPIRE directive - INSPIRE and integrated land & water management scientific workshop. SDI Days2013, Proceedings, Shibenik, 26/27. Sept. 2013, 71-78. ISBN 978-953-293-519-6 (printed), ISBN 978-953-293-520-2 (digital), publisher: State Geodetic Administration, Croatia, https://www.bib.irb.hr/648040/download/648040.Hecimovic_Cetl_Ed_Proceedings_SDI_DAYS_2013.pdf

ABSTRACT

In this paper the process of Inspire Directive implementation and establishing the national Spatial Data Infra¬structure (SDI) in Bulgaria and the Former Yugoslav Republic of Macedonia (FYROM) is considered. One of the prerequisites for cross-border compliant Geo-services is the practical fulfilment of Directive recommendations, which can provide interoperable resources of spatial information. An overview of several completed and ongoing projects in the framework of the international and national programs is presented. The most recent project for creating a Geo-portal in Bulgaria is described. Important issues related to the SDI establishing on a regional level are discussed and problems in this area are marked. Some proposals to overcome obstacles for following the INSPIRE directive road map in both countries, which can support the cross-border coopera¬tion are given. Sustainable development of the region could be achieved by promoting the public access to Geoportals and their tools by developing SDI and new Web Geo-Services.

Г8.10 Pashova L., Bandrova T. (2013) INSPIRE Directive in Bulgaria until 2013 – results, problems and perspectives, In: Proceedings of SDI & SIM 2013 – International Conference, Skopje, FYRoM, 13-16 November, 2013, Y. Doytsher, B. Idrizi and C. Potsiou (eds.) 149 - 161. ISBN: 978-9989-936-43-2, COBISS.MK-ID 94982410

ABSTRACT

A review of the process of INSPIRE Directive implementation and establishing a national Spatial Data Infrastructure (NSDI) in Bulgaria is presented. Some of the recent ongoing projects related to building the NSDI and creating of Geo-portals are discussed. The present organizational structure on national level is not enough efficient to overcome the lagging in this field comparing to the achieved results by other countries. Based on the European and worldwide experience in establishing NSDI, concrete measures in the short and longer term according to the national specifics are recommended, which should be included in the Bulgarian “Road map” tor the INSPIRE Directive implementation. After comparative analyses of good practices for successful fulfillment of the INSPIRE Directive requirements in some European Union (EU) countries, several proposals aiming improvement of the organizational structure are made. New institutions and slate bodies with interest to SDI have been suggested to take part in the process on Directive applying. Some of these institutions responsible for gathering of spatial information and data infrastructure for the Bulgarian territory should involved more actively in all NSDI activities in the new organizational structure and take responsibilities according to their competences. For all

proposals related to the INSPIRE Directive implementation in Bulgaria, a governmental support is required as well some changes of the national legislation are needed.

Г8.11 Пашова Л, Бандрова Т. (2014) Дали България постига Европейски измерими резултати при прилагане на Директивата INSPIRE. Геомедия, 1, ISSN:1313-3365, 38-45. https://www.geomedia.bg/geodesia/dali-balgariya-postiga-evropejski-izm/

РЕЗЮМЕ

България, като пълноправен член на Европейския съюз (ЕС), трябва да изпълнява изискванията и препоръките на Директивата 2007/2/EOINSPIRE (INfrastructureforSPatialInfoRmationinEurope). В статията е направен кратък преглед на дейностите на държавни институции и организации, които имат отношение към създаването на национална инфраструктура за пространствени данни (НИПД) и осигуряването на достъп до тях чрез изграждане на геопортали. Сравнени са индикатори на трите приложения на Директивата от националните доклади за 2013 г. на България, Чешка република, Гърция и Румъния. Авторите констатират сериозно изоставане на България в изпълнението на отделните етапи, посочени в Европейската пътна карта. Направено е предложение за промяна на организационната структура в страната, която цели преодоляване на съществуващите проблеми, ангажирането и по-активното участие на всички заинтересовани в областта на геопространствените данни (ГД), съобразно техните компетенции и възможности.

Г8.12 Кутева, М., Л. Пашова (2014) Използване на информационни системи в процеса на оценка и управление на сеизмичния риск, Сб. Доклади от първа научно-приложна конференция „Управление на проекти в строителството", 4-5 декември 2014 г., УАСГ, 239-245, ISSN 2367-6752.

РЕЗЮМЕ

В настоящия доклад са разгледани възможности за използване на различни типове информационни системи в помощ на управлението на сеизмичния риск. Представена е част от работата по научно-изследователски проект БН 164/14 при ЦНИП-УАСГ свързан с използване на информационни системи за експертна оценка на риска на големи територии, изложени на сеизмични въздействия. Представени са някои резултати от проучването и анализа на свободно достъпните данни, свързани с идентификацията и описанието на източниците и елементите на сеизмичния риск на територията на България.

Г8.13 L. Pashova, M. Kouteva T. Bandrova (2015) Review and Systematization of the Available Data for Earthquake Risk Mitigation in Bulgaria Using GIS, In: Proceedings of FIG Working Week, 17-21 May 2015, Sofia, Bulgaria, ISBN 978-87-92853-35-6, ISSN 2307-4086 http://www.fig.net/resources/proceedings/fig_proceedings/fig2015/papers/ts03d/TS03D_pashova_kouteva-guentcheva_et_al_7807.pdf

ABSTRACT

The territory of Bulgaria is exposed to numerous natural hazards. Among the various strong geological hazards (landslides, earthquakes, erosion and sea processes, loess collapsibility due to

shallow ground water and liquefaction sands) manifested and mapped for the territory of Bulgaria, a key role is assigned to the earthquake risk mitigation in the National Natural Disasters Mitigation Strategy. Seismic hazard reflects unpredictable natural process that could cause significant negative consequences, even fatalities among the population, property and infrastructure damages. Reliable risk assessment due to seismic hazard and its relevant reduction require an adequate disaster risk management approach. The integration of the numerous data sources and tools that are available at various levels of government authorities, academia and the private sector is one of the major tasks in conducting the earthquake risk estimation and a major component of the multi-hazard risk assessment towards natural hazard mitigation. Following the priorities stated in the Bulgarian Disaster risk reduction strategy (2014-2020), which is closely related to the European Horizons 2020 program priorities, this paper aims to illustrate the use of an integrated approach for systematization of the freely available information for earthquake risk mitigation in Bulgaria. Results of a comparative overview of the data (digital and hard copy maps, statistics, etc.) that might be used for earthquake risk mitigation using GIS are presented. This effort has been a part of the university UACEG-CNIP research project dealing with a conceptual model for information system for express expert evaluation of the earthquake risk over the Bulgarian territory using GIS. Selected GIS layers will be the initially set of collected maps describing the earthquake hazard available from various sources and maps of different elements exposed to risk, particularly created maps related to the building stock, population in major cities, health institutions, construction business statistics, and infrastructure. Major challenge within this effort has been combining the heterogeneous data necessary for further estimation of the earthquake disaster indices. These data have been collected from various available sources with different formats, size, standards and precision. Wide-ranging data sets are gathered to be used by risk estimation procedure, relying on a holistic indices based approach for express expert seismic risk assessment. Further development of this idea as hopefully spread out at smaller scale of Administrative territorial units in collaboration with local administrations and the potential provided by technological web-based GIS innovation platforms, that increases the utility and importance of all data to allow a better decision-making at all management levels, are discussed too.

Г8.14 Kouteva M., Pashova., L., Bandrova T., Marinova S., Bonchev S., Markov M (2015) Conceptual Model of Information System for Expert Earthquake Risk Estimation for the BulgarianTerritory Using GIS Environment – Building Relevant Data Sets - CMDR COE Proceedings 2014-2015,15-35, Published by Crisis Management and Disaster Response Centre of Excellence, CMDR COE, ISSN 2367-766X, https://www.cmdrcoe.org/download.php?id=1459

ABSTRACT

Major purpose of this study has been to explore the possibility of using public data for the purpose of earthquake risk estimates. The acquired data sets and some intermediate results are discussed related to general basic statements regarding earthquake hazard and risk assessments. Further plan for action and potential areas of collaboration with CMDR are also shared in brief.

Г8.15 Пашова, Л. (2015) Принос на геоинформационните науки и наблюденията на Земята за управление на риска от природни бедствия и аварии, Сб. Доклади от втора научно-приложна конференция с международно участие „Управление на проекти в строителството” (УПС2015), 5-6 ноември 2015 г., УАСГ, 126-131, ISSN 2367-6752

РЕЗЮМЕ

Процесите за управление на риска от природни бедствия и технологични аварии са интер- и мултидисциплинарни, за чието навременно и ефективно обезпечаване с информация съществен принос имат геоинформационните науки и наблюденията на Земята. Докладът разглежда възможностите, които предоставя международната инициатива Група за наблюдение на Земята (GEO) и изградената инфраструктура "Глобална система от системи за наблюдение на Земята" (GEOSS) при формирането на стратегии и политики, разработването на иновативни решения и предоставянето на услуги за мониторинг и управление на риска при природни и предизвикани от човешката дейност бедствени ситуации. Представени са накратко изградени в рамките на европейския континент оперативни центрове за управление на риска при такива събития и някои примери за конкретни приложения на наблюденията на Земята за територията на страната.

Г8.16 Кутева–Генчева, М., Кр. Бошнаков, Л. Пашова, Ф. Рангелова (2015) Съвременни възможности за управление на риска от природни бедствия и аварии, Сб. Доклади от втора научно-приложна конференция с международно участие „Управление на проекти в строителството" (УПС2015), 5-6 ноември 2015 г., УАСГ, 140-147, ISSN 2367-6752

РЕЗЮМЕ

Природните бедствия и различните аварийни ситуации са сериозен рисков фактор в икономически и социален аспект, особено в условията на бързо развиваща се съвременна урбанизация и нарастваща силна зависимост от устойчивостта на критичната инфраструктура. Осигуряването на безопасна експлоатация и/или функционалност на застроената околна среда при форсмажорни обстоятелства е от особено важно значение за превенция на риска като неотменен елемент на устойчивото развитие на съвременното общество. Настоящият доклад има за цел да обърне внимание на съществената разлика между риск и опасност като източник на риск; да посочи основни опасности за територията на нашата страна, свързани с природни бедствия и да идентифицира критични елементи на околната среда, изложени на съответните рискове. Накратко са представени някои съвременни технологии за управление на риска от природни бедствия и аварии. В заключение авторите дискутират накратко необходимостта и възможностите за интеграция на тази тематика в обучението на студентите от УАСГ.

Г8.17 Kouteva-Guentcheva M., L. Pashova, Boshnakov K. (2016) Comments on civil engineering coupling with IT for NDR mitigation in Bulgaria, CMDR COEProceeding 2016, Vol. 2, 125-146, ISSN 2367-766X, https://www.cmdrcoe.org/download.php?id=1458

ABSTRACT

Natural disasters occurrence is difficult, even in many cases, impossible to be forecasted, but their impact surely can be mitigated taking proper measures in the all disaster cycle - pre-disaster phase, response during disaster, post disaster phase and long-term risk management. Contemporary engineers have at disposal advanced scientific and applied tools for preliminary estimation of the disaster consequences and proper planning and performance of various activities to ensure gradual lowering of the natural disaster risk. This paper deals with the overall picture of natural disasters documented over the Bulgarian territory in the aspect of the running NATO SfP Project "Decision Making Support and Data Analysis Platform for CMDR and Climate changes", coordinated by the CMDR COE. Floods, droughts, wood fire, earthquakes and landslides have been recurrent natural

phenomena in our country. Major reasons for potential damages due to such hazardous events are set out. Brief review of the involved institutions in the activities related to Natural Disaster Risk Mitigation (NDRM) and emergency situations and relevant legislation at national level is provided. International and local good practices coupling the civil engineering with the information technologies (IT) for NDRM are discussed.

Г8.18 Pashova, L., A. Kortcheva, V.Galabov, M. Dimitrova (2017) Advantages of GIS-integrated maritime data in the Black Sea region for multipurpose use, CMRDCOE Proceeding, O. Nikolov et al. (Eds), Sofia, 218-233, ISSN 2367-766X, https://www.cmdrcoe.org/download.php?id=1457

ABSTRACT

Nowadays, the role and significance of geospatial data are of vital importance for marine/maritime environment management in the Black Sea region at all government levels. An appropriate data organization, systematization and interoperability of marine data sets with in GIS environment allow their efficient managing and usage for different operational needs. This paper address the issues related to: international standards and recommended practices and procedures for the representation of spatial data and associated metadata; an effective integration and visualization of available marine multisource data provided by research organizations in Bulgaria; online access to marine data using recognized standards; developing marine geoportals and services, which have to meet requirements of the Marine Spatial Data Infrastructure (SDI) considered as a part of National SDI according to the INSPIRE Directive 2007/2/EC/. Capabilities of a web GIS-based information system for the Black Sea, that is elaborated in the framework of the project "Monitoring and Information System of the Black Sea" (MISBS) coordinated by the Bulgarian Ports Infrastructure Company will be demonstrated by visualization in near real-time of the sea state for the Black Sea area. The wave parameters calculated by means of the SWAN wave model and wave forecast are provided by the National Institute of Meteorology and Hydrology - Bulgarian Academy of Sciences. Potential applications of geospatial maritime data integrated into GIS environment are discussed; e.g., for the purposes of Early Warning & Crisis Management (EW & CM), for operations the European Border and Coast Guard Agency FRONTEX to prevent irregular migration at the external EU borders, and for NATO naval operations in the Black Sea.

Г8.19 Пашова, Л., Б. Сребров (2017) Определяне границата на Мохоровичич за територията на България по спътникови гравиметрични данни, Сб. доклади ог 12 научна конференция с международно участие „Космос, екология, сигурност" SES 2016, София, 2 – 4 ноември 2016 г., 151- 156. ISSN 1313-3888, http://space.bas.bg/SES/archive/SES%202016_DOKLADI/3_Remote%20Sensing/1_Pashova.pdf

РЕЗЮМЕ

В статията са представени резултати от определяне на границата на Мохоровичич за територията на България по спътникови гравиметрични данни. Изчисленията са извършени чрез итеративния подход на Parker–Oldenburg метода, като е приложен нискочестотен филтър при анализа на гравиметричните данни за постигане сходимост на окончателното решение. Получените в настоящето изследване резултати са анализирани и сравнени с такива от предходни изследвания, свързани с определяне долната граница на земната кора за територията на страната.

Г8.20 Idrizi B., L. Pashova, I. Kabashi, M. Mulic, D. Krdzalic, D. Tutic, N. Vucetic, K. Kevic, G. Nikolic, R. Djurovic (2018) Study of length differences from topography to map projection within the state coordinate systems for some countries on the Balkan Peninsula. Proceedings, FIG Congress 2018, Turkey, International Federation of Surveyors, 2018, ISBN:978-87-92853-78-3, ISSN:2308-3441, https://www.fig.net/resources/proceedings/fig_proceedings/fig2018/papers/ts08e/TS08E_idrizi_pashova_et_al_9602.pdf

ABSTRACT

All geodetic measured quantities from the physical surface of the Earth are reduced to the geoid and surface of adopted reference ellipsoid through applying corrections on the measured values, as well projected to the map projection. Before calculating the Cartesian coordinates of points in a formal state geodetic coordinate system, the horizontal lengths between points on the topography surface first should to be reduced from the topography to the mean see level (geoid), then from the geoid to the reference ellipsoid, and after that projected from the ellipsoid into the map projection. Up to now, within the research analyses have been performed for defining of most appropriate State Plane coordinate system, the choice of most suitable national map projection is based on the requirements of accurate representation of the earth surface on the plane with minimum distortions. This choice is usually based on the research analyses performed for defining of most appropriate State Plane coordinate system. During the literature review, analyses of the length changes between points within successive projections from the earth surface to the chosen state map projection were not found. Recognition of the length differences for whole country areas mapped on the State Plane coordinate system are very important data for many geodetic and cartographic applications. This research aims to develop and provide national GIS datasets of lengths' differences on a grid with cells 1x1 km covering national territories of seven Balkan countries - Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosova, FYRo Macedonia and Montenegro. Assessment and comparison of successive length differences between four surfaces (from the Earth surface, through geoid and ellipsoid, to the map projection) have been realized through calculation of mean linear deformations of 1km lengths, dispersion, maximum and minimum values, as well as their positive, negative or zero values. The differences between the real length on earth surface and on a map projection due to elevation factor were evaluated, that gave an impression on the quality of state geodetic coordinate systems, of the seven analyzed countries.

Г8.21 Пашова, Л., Г. Николов (2018) Тестване на цифрови модели на релефа за ЮЗ България с ГНСС измервания, Годишник на УАСГ, София, Том 51, бр.9, 97-107. ISSN 1310-814X – печатно издание, ISSN 2534-9759, https://uacg.bg/UserFiles/File/UACEG_Annual/2018/%D0%91%D1%80%D0%BE%D0%B9%209/8--500.pdf

РЕЗЮМЕ

След реализиране на Satellite Radar Topography Mission (SRTM) през 2000 г., по-настоящем за територията на България има свободно достъпни високоточни цифрови модели на релефа (Digital elevation model – DEM) с размери на клетката (пиксел) от порядъка на 1" (~30 m). Цифровите модели на земната повърхност намират широко приложение в научните изследвания, индустриални, оперативни, военни и други области. В статията са разгледани глобалните модели SRTM DEM v4.1 и ASTER GDEM v2. Проведено е изследване на

качествата на двата цифрови модела за тестови високопланински район в ЮЗ България в граници 41°30' ≤ φ ≤ 42°30', 23°00' ≤ λ ≤ 24°00'. Направена е оценка на точността на надморските височини при сравнение с цифров топографски модел с размер на клетката от ~3,8" (~114 m), предоставен от Военно-географската служба на Българската армия (ВГС на БА) и с данни от GPS/нивелачни измервания на геодезически точки. Получените резултати в определяните височини от трите цифрови модела за тестовия район показват разлики от порядъка на няколко десетки метра, включително и при сравнение с данните от геодезическите измервания. Направени са някои препоръки относно приложимостта на разгледаните цифрови модели на релефа за различни цели.

Г8.22 Kounchev O., Pashova L., L. Filchev, D. Kalaglarski, V. Craciunescu, V. Galabov, E. Peneva, M. Ilieva, B. Srebrov, Z. Bibov (2018) SatWebMare products and services in support of the sustainable management of the Bulgarian coastal zone. Black Sea 2018 PROCEEDINGS, Varna Scientific and Technical Unions and Institute of Oceanology - BAS, 2018, ISSN:1314 – 0957, DOI:https://doi.org/10.7546/IO.BAS.2018.3, http://www.io-bas.bg/publications/proceedings/BS2018_PROCEEDINGS.pdf

ABSTRACT

The coastal zones have important ecological, social, and economic impact on the human life and are undergoing the severe anthropogenic degradation that is happening against the backdrop of environmental alterations due to climate change. To address the challenges of present and future environmental changes in coastal areas, this article aims to represent a prototype of Web-based integrated system SatWebMare designed to provide through geo-portal innovative products and services for integrated coastal zone management of the Bulgarian coastal zone, inline with the nowadays concepts of Big Data. The SatWebMare prototype system will combine geo-database sets from different sources, which will be used for improving a spatial and temporal accuracy of modeling the air-land-sea interaction processes and their forecast. An overview of the system architecture consisting of three main modules will be presented. The SatWebMare geo-portal aims to provide an access to products and services with added-value information for ministries, agencies, local authorities, and other stakeholders in support of the integrated coastal zone management.

Г8.23 Craciunescu, V., O. Kounchev, D. Kalaglarski, L. Pashova, L. Filchev, V. Galabov, M. Ilieva, B. Srebrov (2020) SatWebMare interactive web-mapping system in support of the sustainable management of the Bulgarian coastal zone, Varna Medical Forum, 9 (1), 78-83, ISSN 1314-8338 (Print), ISSN 2367-5519 (Online) https://journals.mu-varna.bg/index.php/vmf/article/view/7294

ABSTRACT

The article aims to represent a general overview of the prototype web-mapping interactive system SatWebMare for the Bulgarian coastal zone. The interactive system is designed to provide through geo-portal innovative products and services for integrated coastal zone management. The web-mapping system combines geo-databases from different sources such as satellite imagery, maps, vector layers and other datasets. The content of the SatWebMare Geo-Portal is briefly outlined. The web-interface system will provide access to applications and products with an improved spatial and temporal resolution for three areas of interest - sea waves, natural hazards and geomagnetism in the Area of Interest (AOI). The web-mapping system is developing based on the

free and open-source software, OGS standards and following the EU INSPIRE Directive recommendations. Once the prototype system is fully developed, it will enable to provide access to value-added products and services that are useful to ministries, agencies, local authorities and other stakeholders in support of the decision making.

Γ8.24 Filchev, L., Pashova, L. (2020) Analysis of the dynamics of built-up areas and artificial impervious surfaces of the Bulgarian coastal municipalities using GHSL and GAIA data. Proceedings of 8th International Conference on Cartography and GIS, 1, Bulgarian Cartographic Association, 2020, ISSN:1314-0604, 352-361, https://iccgis2020.cartography-gis.com/8ICCGIS-Vol1/8ICCGIS_Proceedings_Vol1_(38).pdf

ABSTRACT

Socio-economic development and intensive urbanisation in coastal areas in many parts of the world in recent decades have led to a rapid increase in built-up areas. These activities have negatively affected the environment and upset the balance in the vulnerable coastal ecosystems. The Global Artificial Impervious Areas (GAIA) data analysis indicates an Artificial Impervious Surfaces (AIS) increase of 1.5 times since 1990. Since the 1960s, AIS has been dynamically expanded along the Bulgarian coastal zone. The main factors contributing to increasing AIS are urbanisation, industrialisation and tourism development processes. This study aims to assess the dynamics of impervious surface Bulgarian coastal region in the period 1975-2018, the not studied in detail so far. The analysis is carried out for the Black Sea coastal municipalities using Google Earth Engine platform of the Global Man-made Impervious Surface (GMIS), GHSL (JRC-EC) and GAIA data. Some inferences about the temporal trend of growing and spreading of AIS for fourdecadal changes are made. Furthermore, recommendations for national spatial planning for responsible national authorities are provided.

Γ8.25 Bandrova T., Pashova L. (2020) A conceptual framework for using geospatial Big Data for web mapping, In: 8th International Conference on Cartography and GIS. Proceedings Vol. 1, 2020, Nessebar, Bulgaria T. Bandrova, M. Konečný, S. Marinova Eds.), Publisher: Bulgarian Cartographic Association, Vol.1, pp. 521-534, ISSN: 1314-0604. https://iccgis2020.cartography-gis.com/proceedings-vol-1

ABSTRACT

In cartography, the term “Big Data” (BD) has been started to use in the last decade. The recent development of GIS and web technologies have expanded and empowered cartography by providing actual, steadily growing and complex data and information, increasing the spatial and thematic accuracy of the contemporary maps. The primary purpose of the cartographic approach is to maximize the value of a user-oriented map rendering of the web map content. Based on this approach and taking into account the technological advances, the authors describe which part of BD can be utilized for new mapping products and services. A conceptual framework encompassed several stages of multi-source data handling, separate stages of data management and data analytics, as well as data transformations from the real world into the map is described following the web-map creation process. The potential to use commercial web GIS platforms and free and open-source software solutions for Web mapping (WM) are discussed. The challenges that faced the modern cartography for creating better and cheaper cartographical multi-dimensional and multi-layered map products for less time on different map scales are shortly outlined. Some

examples of good and imperfect web map productions are shown in the context of BD visualization. Existing obstacles in the automatisation process of map production, more in-depth understanding of the visualized map content adding Virtual Reality / Augmented Reality (VR/ AR), usage of cloud technologies and supercomputers with software platforms for map creation are also recognized.

Г8.26 Пашова, Л. (2020) Анализ на времеви редове от регистрации на морско ниво в мареографна станция Бургас чрез уейвлет преобразуване, Сборник доклади от XXX Юбилеен международен симпозиум на СГЗБ, София, 5-6.11.2020 г., 10 стр., CD ISSN 2367-6051, http://symp2020.geodesy-union.org/reports-bg/

РЕЗЮМЕ

Нивото на Черно море, определяно по крайбрежието чрез мареографни измервания, се влияе от комплексното въздействие на процеси с различни пространствено-времеви измерения. Настоящото изследване представя резултати от анализ на данни за морско ниво във времево-честотната област, получени от измервания в мареографна станция Бургас чрез уейвлет преобразование. Използвани са два времеви периода от мареографни наблюдения, за които са приложени уейвлет функции на Haar, Daubechies, Morlet и Gauss. Установено е нестационарно поведение в енергийния спектър на основни нискочестотни периоди в осредненото морско ниво, изчислено при определена времева стъпка – дневна, месечна и годишна стойност. Чрез уейвлет анализа са оценени специфични периодични съставящи и е проследена тяхната вариация във времето. Получените от изследването резултати са сравнени с подобни проучвания на нивото на Черно море.

Г8.27 Idrizi B, Maliqi E, Pashova L (2021) Spatial Database Designing for Environmental Monitoring and Decision Making in Mitrovica Region, The Republic of Kosovo, GEOSFERA INDONESIA, Vol. 6, No. 2, 189-204, ISSN 2598-9723, e-ISSN 2614-8528 DOI: https://doi.org/10.19184/geosi.v6i2.23934

ABSTRACT

The integration of spatial data analysis methods and thematic map models is an approach to reduce the negative impact of anthropogenic pressure on the environment due to mining and waste generation. The large amounts of industrial waste from mining in the Mitrovica region in northern Kosovo lead to serious environmental problems with organic and inorganic water and soil pollution. This study aims to design and establish a geospatial database for long-term environmental monitoring, provide analytical tools, and support appropriate management decisions by local authorities and agencies. The database contains topographical elements and ecological parameters collected from different national and open access international sources. All collected data have been analyzed, standardized and harmonized within the open-source QGIS ver.3 software. The results showed that in developed datasets were organized in different GIS layers and compiled several thematic maps. The designed database is unique by its architecture, providing an opportunity for periodical monitoring of the environment near the mining areas.

Г8.28 Александров, Б., Пашова Л. (2021) Геодезически изследвания на БАБ „Св. Кл. Охридски“ на о-в Ливингстън и приносът им за изучаване на съвременни геофизични процеси, X Национална конференция по геофизика, 4 юни 2021г., ISSN 1314 – 2518, https://doi.org/10.48368/bgs-2021.1.N1

ABSTRACT

The report briefly presents modern geodetic surveys of Livingston Island, conducted after 1998 at the Bulgarian Antarctic Base “St. Kliment Ohridski”. Activities for mapping the topography of the island and the seabed are summarized. The main results of the processing and analysis of the data collected from measurements performed during the 28th National Antarctic Expedition, season 2019-2020 are considered. In the context of global changes and the growing anthropic pressure on the environment, geodetic observations and research contribute to clarifying the mechanisms of interaction of complex processes in the BAB region.

Г8.29 Пашова, Л. (2021) Използване на данни от регистрации на черноморското ниво за изследване на цунами, Сб. доклади XXXI Международен симпозиум на СГЗБ, София, 04 - 05 ноември 2021 г., CD ISSN 2367-6051, http://sym2021.geodesy-union.org/wp-content/uploads/2021/11/XXXI-Symp2021-25.pdf

РЕЗЮМЕ

Наблюденията на морското ниво предоставят важна информация за физически процеси, протичащи в различни времеви и пространствени мащаби, които могат да водят до възникване на бедствени ситуации в бреговата зона заради силни екстремни хидро-метеорологични явления, земетресения и др. Сред източниците на данни за изследване на вълни цунами най-често срещани са наблюдения на вариациите на морското ниво, регистрирани от изградени по крайбрежията мареографни станции. Непрекъснатите регистрации на черноморското ниво са засега единствените инструментални данни за регистрирани вълни цунами през изминалото столетие. В доклада са разгледани накратко източниците за възникване на вълни цунами и регистрирани такива събития в района на Черно море, дължащи се на различни източници. Представен е пример за регистрирано метеоцунами в края на м. юни 2014 год., включително от геодезическите мареографни станции във Варна и Бургас, което засяга няколко южноевропейски страни от Испания до Украйна. Регистрациите на морското ниво са анализирани съвместно с метеорологични данни от синоптични станции, разположени по българското крайбрежие. Обоснована е необходимостта от извършване на непрекъснати наблюдения на черноморското ниво, които са незаменими за мултидисциплинарни изследвания и редица инженерни приложения в бреговата зона.

Г8.30 Александров Б., Пашова Л. (2021) Геодезически изследвания на БАБ „Св. Климент Охридски“ в Антарктика и приносът им за проследяване на глобалните климатични промени, Сб. доклади XXXI Международен симпозиум на СГЗБ, София, 04 - 05 ноември 2021 г., CD ISSN 2367-6051. http://sym2021.geodesy-union.org/wp-content/uploads/2021/11/XXXI-Symp2021-26.pdf

РЕЗЮМЕ

Докладът представя накратко геодезическите дейности, извършени в района на Българската антарктическа база „Св. Климент Охридски“ на о-в Ливингстън от 1998 г. до днешни дни. Обобщени са резултати от изследвания на динамиката на океанското ниво, картографирането на крайбрежния район и топографията около БАБ. Накратко са разгледани комплексните геодезически измервания, извършени по време на 28-та национална антарктическа експедиция през сезон 2019-2020 г., които включват и

първоначални данни за някои основни параметри от състава и свойствата на океанската вода в близост до крайбрежието. В контекста на глобалните климатични промени и нарастващия антропогенен натиск върху околната среда, геодезическите изследвания и резултатите от тях допринасят за изясняване на механизмите на взаимодействие на сложните климатични процеси, както в района на БАБ и Антарктика, така и за останалите континенти.

Г8.31 Pashova L., Alexandrov B. (2021) Estimation of tidal constituents from sea level registrations in BAB "St. Kliment Ohridski", Livingston Island. Proceedings of 3rd IGD2021, Book 3, Mersin University, Turkey, 2021, ISBN:978-625-44303-7-4, 50-53, https://igd.mersin.edu.tr/wp-content/uploads/2021/12/IGD3.pdf

ABSTRACT

The report presents the first results of the tidal analysis from sea level records obtained from TG installed in the aquatory of the Bulgarian Antarctic base "St. Kliment Ohridski" (BAB) on Livingston Island, Antarctica. Sea level data are available from two Antarctic Expeditions, 26-st during 2017/2018 with more than 83-daily 15-minutes records and 28-th in the period January-December 2019. The tides in the aquatory of the BAB vary in the range of 2.4 m, and about 30 tidal constituents are determined to be significant using UTide software. The obtained results show that tides are mixed with semi-diurnal behaviour and a daily inequality between high and low waters. Comparisons have been made with the results of tidal regime analyzes from other studies for the Livingston Island area. The planned geodetic research activities in the area of BAB are briefly described.

Г8.32 Pashova L., Filchev L. (2021) Review of Bulgarian Space-Related Activities within the GEO initiative and the EU Copernicus program. 101, Publ. Astron. Obs. Belgrade, DOI: 10.5281/zenodo.5645459, 147-167, https://publications.aob.rs/101/pdf/147-167.pdf

ABSTRACT

The free and open data policy of the Group on Earth Observation (GEO) and the EU Copernicus program helps many Bulgarian scientists, start-ups, and SMEs to choose Earth Observation (EO) data as a core for their research projects, development of applied products and services. This review summarizes the organizational activities undertaken at different levels to coordinate the efforts of stakeholders for technological development and innovation in the field of space in Bulgaria, directly or indirectly related to the use of EO over the past three decades from a scientific point of view. Bulgarian participation in GEO and ESA Plan for European Cooperative State (PECS) Agreement is also discussed. A review of normative documents, international agreements, the country's participation in spacerelated programs, research and applied projects, organizational activities, educational initiatives, and training is carried out. The main challenges facing the scientific community in Bulgaria and its efforts to participate actively in space-related international programs, projects and initiatives are outlined. Finally, opportunities for future cooperation within the global initiatives and programs with special consideration such as GEO, EuroGEO, Galileo, Copernicus, EGNOS, and others are given.

Г8.33 Atanasova-Zlatareva M., Nikolov H., Pashova L. (2021) Application of InSAR satellite method for mapping of active landslides in Bulgaria – opportunities and perspectives. Proc. Int. Cartogr. Assoc.;30th International Cartographic Conference (ICC 2021;)14–18 December 2021, Florence, Italy, Vol.4, 10, Copernicus Publications, https://doi.org/10.5194/ica-proc-4-10-2021

ABSTRACT

Landslides are geological phenomena that are spread on Bulgarian territory mainly along the northern Black Sea coast and on the right banks of the Danube in the western part of the country. Mitigation of the negative effects of these destructive geological phenomena is the compilation of inventory maps of their distribution and registers with the main characteristics of the individual landslides. Conventional methods for making such maps are time-consuming and resource-intensive. Modern satellite, air and ground-based remote sensing technologies facilitate the production of landslide maps, reducing the time and resources required to compile and systematically update them. In this paper, we demonstrate the applicability of Differential Sentinel-1A satellite SAR interferometry (DInSAR) to assess the movement activity and use the information for further updating the national landslide inventories in Bulgaria. We perform several analyses based on multi-temporal InSAR techniques of Sentinel-1A data over selected areas prone to landslides. The use of new opportunities for free access to satellite images, which can be applied in conjunction with other methods, greatly facilitates the processes of inventory, mapping and study of landslides.

Г8.34 Pashova L., Atanasova M., Nikolov H., Nikolov G. (2021) Application of UAS for the purposes of landslide mapping in Bulgaria - a case study of the Thracian Cliff landslide, northern Bulgarian coastal zone. Abstracts of the International Cartographic Association, 30th International Cartographic Conference (ICC 2021), 14–18 December 2021, Florence, Italy., 3, 232, Copernicus Publications, 2021, https://doi.org/10.5194/ica-abs-3-232-2021

ABSTRACT

We present a preliminary analysis of DSM/DTM from a UAS survey conducted in 2020 of the recently activated Thracian Cliff landslide located in the northern Bulgarian coastal zone. The 3D models have been generated by Px4D mapper software using the Structure-from-motion (SfM) method. The resulting high-resolution digital models can be used to map and inventory landslides and, in addition, to compile digital maps of the hazards and risks of such events across the country.

Г8.35 Пашова Л., Димитрова Л., Ойнаков Е., Драгомиров Д., Николов Г. (2021) Съвременни методи и подходи за оценка на опасността от цунами по българското черноморско крайбрежие. Сборник доклади от Годишната университетска научна конференция 2021 на НВУ “Васил Левски” В.Търново, 3, НВУ “Васил Левски”, В.Търново, 27-28 май 2021, том 1, ISSN:1314-1937, 98-108, ISSN (print):1314-1937.

ABSTRACT

Tsunami waves are a rare occurrence in the Black Sea. The report summarizes a research project funded by the Bulgarian NSF that will improve scientific knowledge about tsunami waves on a regional scale and achieve the objectives of COST Action CA18109 AGITHAR. Modern methods for studying past events, numerical methods for tsunami modelling, technological solutions for

registration and early warning, and holistic approaches for analysis of the hazard and risk of tsunamis and related uncertainties are discussed.

Г8.36 Dechev, H., L. Pashova, B. Alexandrov, S. Lyubenova (2022) Development of a web-based information system for polar research conducted in the region of the Bulgarian Antarctic Base "St. Kliment Ohridski", Livingston island, In: 8th International Conference on Cartography and GIS. Proceedings Vol. 2, Nessebar, Bulgaria T. Bandrova, M. Konečný, S. Marinova (Eds.), Publisher: Bulgarian Cartographic Association, pp. 81-94, ISSN:1314-0604, https://iccgis2020.cartography-gis.com/8ICCGIS-Vol2/8ICCGIS_Proceedings_Vol2_(10).pdf

ABSTRACT

The article presents a test version of the Integrated Information Environment for Polar Research (IIEPR), developed under the Bulgarian Antarctic Institute's "Polar Research - 2018" project. IIEPR is a web-based information system in Bulgarian designed to consolidate structured data from all polar expeditions conducted at BAB. It combines several components: i) a database of research projects implemented during the Bulgarian Antarctic expeditions, results, published articles and participation in conferences; (ii) a database of geological surveys, soil and vegetation cover, geochemistry and geodetic measurements; iii) developed software modules that ensure the integration of components and functionality of the web-based platform. The database is implemented with PostgreSQL, spatial data is entered with PostGIS geometry, and information is published with the Map server. All software products used are of the general public license type. In addition, a relatively independent module of the GIS interface of the web-based system of IIEPR has been developed, which is available at http://anta.nat.bg and is available after registration.

Г8.37 Dinkov, D. and L. Pashova (2022) Combination of GNSS and UAV observations for studying landslide processes – a case study of the Botanical garden in Sofia, In: 8th International Conference on Cartography and GIS. Proceedings Vol. 2, Nessebar, Bulgaria T. Bandrova, M. Konečný, S. Marinova (Eds.), Publisher: Bulgarian Cartographic Association, pp. 220-228, ISSN:1314-0604, https://iccgis2020.cartography-gis.com/8ICCGIS-Vol2/8ICCGIS_Proceedings_Vol2_(25).pdf

ABSTRACT

Terrestrial surveying and mapping of hard-to-reach or inaccessible areas are challenging tasks. In addition to classical geodetic methods, remotely piloted aircraft systems (RPAS), also known as uncrewed aerial vehicles (UAVs), can be used as an alternative method to solve similar research and application problems. In the last two decades, GNSS and UAV measurements have been increasingly exploited to monitor and analyze landslide activity. This report presents the results of pilot studies of the landslide in the area of the Sofia Botanical Garden, combining data from GNSS and UAV measurements. Three optical sensors are used for test purpose analyses during the UAVs surveying. The conducted experiments have two main goals: to evaluate the UAV systems' qualities and establish the presence of movements in the studied landslide. In particular, we try to identify the geodetic pillars belonging to the geodetic network established in 1988 with forced centring instruments (pillars) in the precise point clouds generated during the processing of images using photogrammetric software Pix4D. The accuracy and precision of ground-based control points (GCPs) have been evaluated to determine the limits within which possible movements from measurements in different epochs can be determined using GNSS and UAV. Based on a

comparative analysis of both types of data, the next step of the future analysis will be to identify the local stable and deformed areas from the whole observational period. A qualitative and quantitative evaluation of the factors that impact the geospatial data accuracy, such as the geodetic coordinates of the geodetic control pillars, cloud points, digital surface model and orthophoto images, is also provided.

Г9. Публикувана глава от колективна монография

9.1 Динков, Д., Р. Вацева, Л. Пашова, М. Върбанов, И. Анева, П. Янков (2020) Академия „Моят зелен град“, Монография, Изд-во „Проф. М. Дринов“, БАН, 185 стр., https://educationwithscience.online/wp-content/uploads/2019/11/Akademia_Moi-zelen-grad_e-book_-Cover.pdf

РЕЗЮМЕ

В монографията се обобщават основните резултати от изпълнението на научно-образователния проект „Академия „Моят зелен град“ на Националния институт по геофизика, геодезия и география при Българска академия на науките, финансиран по програма „Образование с наука“ на Министерство на образованието и науката. Целта на книгата е да подпомогне образователния процес в часовете по природни науки на средните училища в страната, както и да запознае читателите с научни методи и подходи за работа с данни и информация за околната среда. Основен акцент е поставен на методите за изследване и визуализация на елементи от градската среда чрез географска информационна система (ГИС). Систематизирани са базови теоретични и практически указания за работа с QGIS – ГИС с отворен код. Фокусът е върху три компонента на градската среда – въздух, води и градски зелени площи, които заемат важно място в изучаването на околната среда и нейното опазване. Представени са на общодостъпен език научни методи за изследване на основни параметри на качеството на атмосферния въздух, водите и зелените площи на примера на гр. София. Отделено е място и на обекти на културно-историческото наследство на столицата във връзка с разработването на образователни маршрути. Основните резултати са демонстрирани с изготвянето на тематични карти за територията на гр. София. Монографията е предназначена за специалисти в областта на природните науки, учители, ученици и всички, които проявяват интерес към съвременните геоинформационни технологии и учене през целия живот.