ABSTRACTS – BALTICA Volume 27 Number 1 June 2014

Gerok, D., Gelumbauskaitė, L. Ž., Flodén, T., Grigelis, A., Bitinas, A., 2014. New data on the palaeo–incisions network of the south–eastern Baltic Sea. *Baltica, 27 (1), 1–14.* Vilnius. ISSN 0067-3064. doi: 10.5200/baltica.2014.27.01

Abstract The present study area is located within the south–eastern segment of the Baltic Sea framed by 55°30'–56°30' N and 19°00'–21°15'E. The area is re-visited with the aim to describe in more detail the geologic prerequisite and development of the palaeo–incisions as well as the timing of their subsequent infillings. The channels form distinctive features in the sedimentary bedrock along the outer limits of pre–Weichselian ice sheets, on average reaching depths into the bedrock of 50 m in the nearshore zone of Lithuania to 100 m along the slope to the Gotland depression in the west. The development of palaeo–incisions systems is governed by the easily eroded late Palaeozoic to Mesozoic bedrock of the present area. Only rare ocurrences of channels have been reported from the middle and lower parts of the Palaeozoic further west in the Baltic Sea. The present investigation supports a mechanism that the channels formed below the ice near the ice sheet margin by melt water erosion under high pressure. The channels start at random where a fracture in the ice develops forming outlet of water contained below the central part of the ice sheet. The channels often merge together in the direction of the ice margin, possibly gradually adapting to previous fracture systems in the bedrock. The investigated incisions were infilled prior to the advance of the Weichselian ice sheet and some have been reopened and repeatedly infilled.

Grudzinska, I., Saarse, L., Vassiljev, J., Heinsalu, A., 2014. Biostratigraphy, shoreline changes and origin of the Limnea Sea lagoons in northern Estonia: a case study of Lake Harku. *Baltica, 27 (1), 15–24.* Vilnius. ISSN 0067-3064. doi: 10.5200/baltica.2014.27.02

Abstract The paper presents diatom, loss-on-ignition, magnetic susceptibility, and radiocarbon data to reconstruct the depositional history and evolution of Lake Harku, a former Limnea Sea lagoon. Harku is one of the youngest isolated lakes that has been studied bio- and chronostratigraphically in Estonia to date. Based on changes in diatom assemblages, four evolutionary stages in basin development have been recognized (lagoon, semi-enclosed lagoon, transitional and closed lake). Shoreline positions at 2000, 1500, 1000 and 800 cal BP have been reconstructed and displayed on 3D palaeogeographic maps. Lake Harku became isolated from the Limnea Sea at ~800 cal BP, followed by occasional seawater incursions over the next 300 years. Plain landscape, low-lying sill threshold, and proximity to the sea contributed to extended basin isolation.

Uścinowicz, G., 2014. Impact craters and the extraterrestrial matter in their surroundings: case of Morasko (Poland) and Kaali (Estonia). *Baltica, 27 (1), 25–32.* Vilnius. ISSN 0067-3064. doi: 10.5200/baltica.2014.27.03

Abstract Investigations have been carried out in the area of meteorite impact craters within the Quaternary deposits in Morasko and the Silurian bedrock in Kaali. Both surface destructions occurred during the fall of cosmic bodies that induced formation of magnetic fine-grained material. The presence of extraterrestrial spherules in Morasko and Kaali and their cosmic origin state prove such a composition and character of the surface. Moreover, the amount of magnetic fraction is increased in the sediments in the environs of craters in relation to their surroundings. However, impact of similar meteorites under similar environmental conditions can generate various morphological, mineralogical and natural effects. Common features of the described areas are the occurrence of collateral craters, their formation in sedimentary rocks and presence of high amounts of extraterrestrial spherules in their environs.

Skuodis Š., Markauskas D., Norkus A., Žaržojus G., Dirgėlienė N., 2014. Testing and numerical simulation of Holocene marine sand uniaxial compression along the Lithuanian coast. *Baltica, 27 (1), 33–44.* Vilnius. ISSN 0067-3064. doi: 10.5200/baltica.2014.27.04

Abstract Compressibility of quartz sand from the Lithuanian coastal area in Klaipėda environs is investigated by testing and numerical simulation, with validation of obtained results. The shape of sand grains has been analysed with a scanning electronic microscope (SEM). The determined morphological parameters of sand grains are employed to create discrete models (particle models of grains) subsequently used for sand compression test numerical simulation via discrete element method (DEM) techniques. The background version of DEM and a numerical time–integration algorithm are implemented in original DEMMAT code. Compression tests have been realised by an oedometer ??? device. Test versus numerical simulation results have revealed a dependence of significant compression curve character on the discretised shape of sand grains and Young's modulus of particles.

Tomczyk, A. M., Bednorz, E., 2014. Heat and cold waves on the southern coast of the Baltic Sea. *Baltica, 27 (1), 45–54.* Vilnius. ISSN 0067-3064. doi: 10.5200/baltica.2014.27.05

Abstract The objective of this study was to describe the characteristics of heat and cold waves on the southern coast of the Baltic Sea, and determine synoptic situations causing the occurrence of the waves. The analysis included six stations located on the southern coast of the Baltic Sea. In the study, an extreme warm day was defined as a day with the maximum temperature over the 95^{th} annual percentile, while an extreme cold day as a day with the maximum temperature below the 5^{th} annual percentile. A sequence of at least five extreme warm and cold days was considered, i.e. heat or cold waves, respectively. In the analysed multiannual period, on the southern coast of the Baltic Sea, there were from 11 (Świnoujście) to 28 (Arkona) heat waves recorded, while the number of cold waves was from 34 (Świnoujście) to 43 (Kołobrzeg). The occurrence of extreme warm and cold days creating

heat and cold days was connected with positive anomalies of sea level pressure and isobaric surface 500 hPa, which showed the presence of the high pressure systems.

Gadeikis, S., Dundulis, K., Gadeikytė, S., Urbaitis, D., Gribulis, D., 2014. Geotechnical properties of compacted clays as buffer and backfill. *Baltica, 27 (1), 55–62.* Vilnius. ISSN 0067-3064. doi: 10.5200/baltica.2014.27.06

Abstract The purpose of the investigation is to assess local clay soils of different composition, physical state and mechanical properties as a base and construction material for establishment of landfills for radioactive waste. The investigations have been carried out for three clay soil types of different age and origin in order to assess the potential of this clay to be used for the establishment of engineering barriers, as well as the base and slopes of landfills. The investigations have been performed by laboratory and field methods for both the natural as well as the disturbed and compacted soils. In order to assess the soil to be used for fill-ins (aggregate), field investigations have been performed at a special test site. Changes in geotechnical features of the soils were observed at the test site in autumn and spring. Seasonal investigations enabled to assess the compacted clay soils according to changes of their features over time.

Hojan, M., Więcław, M., 2014. Influence of meteorological conditions on aeolian processes along the Polish cliff coast. *Baltica, 27 (1), 63–74.* Vilnius. ISSN 0067-3064. doi: 10.5200/baltica.2014.27.07

Abstract This article presents aeolian landforms and meteorological parameters affecting aeolian processes on the south Baltic coastal cliffs of Poland. The analysis was conducted for two weather stations at different locations. The bluffs in the vicinity of the stations have similar geological structure, but differ in height. Velocity and direction of the wind, as well as precipitation, are of dominating importance. Dispelling the cliff starts at wind speeds of two–three ms^{-1}. At this speed, the distance at which the material is transported is short and is only a few meters, while for the transport of fine sand and dust on the top of the bluff the wind speed must be over 10 ms^{-1}. It was observed that such speeds of the wind or gust are characteristic of days with an average wind velocity of at least six ms^{-1}. The number of days with potential deflation on the bluff is four times higher in the area of Ustka than in the Świnoujście region. On average, the bluff in Ustka can be dispersed by wind throughout 33 days in a year, while the one in Wolin in less than eight days. Erosive and accumulative eolian forms are small, their sizes are generally less than one meter, only with rhythmic swelling to the size of several meters.