

Kalińska-Nartiša, E., Lamsters, K., Karušs, J., Krievāns, M., Rečs, A., Meija, R., 2017. Fine-grained quartz from cryoconite holes of the Russell Glacier, southwest Greenland – a scanning electron microscopy study. *Baltica*, 2017, 30 (2), 63–73. Vilnius. ISSN 0067-3064. <http://dx.doi.org/10.5200/baltica.2017.30.08>

The western ablation zone of the Greenland ice sheet is darker than the surrounding ice, because a higher amount of fine-grained particles, known as a cryoconite, occur. To date, biotic cryoconite components have gained a lot of attention, in contrast with mineral components, which have been studied to a limited extent. In this study, fine-grained quartz grains from the cryoconite holes of the Russell Glacier, southwest Greenland are, therefore, examined. Authors use scanning electron microscope to elucidate shape, surface character and origin of these mineral quartz particles. Triangular-faceted, sharp-edged grains dominate in most of the investigated samples, and originate from local sources, where grain-to-grain contact in the ice prevail. Grains with smooth corners and edges result from chemical weathering in meltwater of alkaline pH, in which quartz solubility significantly increases. However, part of these rounded grains is due to mechanical abrasion by wind action. Postsedimentary frost action is visible through grains entirely or partially covered by scaly-grained encrustation. Local processes and sources are largely responsible for aforementioned grain outlines. However, few grains with bulbous silica precipitation argue for a dry and warm climate, and distant, out-of-Greenland origin.

Rukšėnienė, V., Dailidienė, I., Kelpšaitė-Rimkienė, L., Soomere, T., 2017. Sea surface temperature variations in the south-eastern Baltic Sea in 1960–2015. *Baltica*, 2017, 30 (2), 75–85. Vilnius. ISSN 0067-3064. <http://dx.doi.org/10.5200/baltica.2017.30.09>

This study focuses on time scales and spatial variations of interrelations between average weather conditions and sea surface temperature (SST), and long-term changes in the SST in south-eastern Baltic Sea. The analysis relies on SST samples measured in situ four times a year in up to 17 open sea monitoring stations in Lithuanian waters in 1960–2015. A joint application of non-metric multi-dimensional scaling and cluster analysis reveals four distinct SST regimes and associated sub-regions in the study area. The increase in SST has occurred during both winter and summer seasons in 1960–2015 whereas the switch from relatively warm summer to colder autumn temperatures has been shifted by 4–6 weeks over this time in all sub-regions. The annual average air temperature and SST have increased by $0.03^{\circ}\text{C yr}^{-1}$ and $0.02^{\circ}\text{C yr}^{-1}$, respectively, from 1960 till 2015. These data are compared with air temperatures measured in coastal meteorological stations and averaged over time intervals from 1 to 9 weeks. Statistically significant positive correlation exists between the SST and the average air temperature. This correlation is strongest for the averaging interval of 35 days.

Lapinskas, J. 2017. Coastal sediment balance in the eastern part of the Gulf of Riga (2005–2016). *Baltica*, 2017, 30 (2), 87–95. Vilnius. ISSN 0067-3064. <http://dx.doi.org/10.5200/baltica.2017.30.10>

A hurricane known as Ervin or Gudrun travelled over Latvia in 8-9 January, 2005. As a result of severe SW and W winds, as well as lack of sea ice, clearly pronounced changes in the distribution of coastal sediment has been induced. Cross-shore profile leveling at various time instants was used to obtain quantitative estimates of the amount of accumulated sediments. The total volume of sediments eroded from the subaerial part of coastal slope reached 0.8 million m^3 . This paper represents assessment of consequent changes and coastal slope “rebuilding” success after this storm event. The data indicates lack of significant overall net loss of subaerial sediment volume along the most part of the eastern coast of the Gulf of Riga. Significant primary dune growth and beach accumulation is mostly limited to southernmost part of assessed coastal stretch. Total volume of fine sediments in beach and primary dunes still is 5 % lower than before erosion event of 2005. Erosion vulnerability and total length of coastal sections that are expected to be a subject to future coastal retreat is increasing.

Tylkowski, J., 2017. The temporal and spatial variability of coastal dune erosion in the Polish Baltic coastal zone. *Baltica*, 2017, 30 (2), 97–106. Vilnius. ISSN 0067-3064. <http://dx.doi.org/10.5200/baltica.2017.30.11>

The study looked at the temporal and spatial variability of dune erosion in the Polish Baltic coastal zone in the period 1972–2008. The dynamics of coastal dune erosion in the area are presented in relationship to the main hydro-meteorological factors: storm surges and types of atmospheric circulation. The greatest destruction of the coastal dunes in Poland was observed on sandbar sections, where the erosion was over $100,000 \text{ m}^3$ per 1 km, causing dune baseline retreat by several tens of meters. The main causes of this considerable coastal erosion are the sudden rise of the sea level and the waves during extreme storm surges, when the loss of dune sediment across the entire Polish Baltic Sea coastal zone can reach about $400,000 \text{ m}^3$. These extremely erosive storm surges are particularly generated by cyclonic atmospheric circulation, which accounts for more than 52% of such surges from the north-west, north, and west. It was also found that sea level increases of more than 1 meter (about 602 cm) above the mean sea level (about 500 cm) can result in significant erosion of coastal dunes in Poland ($>100,000 \text{ m}^3$). However, there is a relationship between the intensity of the dune erosion and sea level. The results of the present study could be applied to studies of Baltic coastal dunes functioning in the lagoon-spit coastline, especially in the stretch from Estonia to Germany.

Cieśliński, R., Chlost, I., , 2017. Water balance characteristics of the Vistula Lagoon coastal area along the southern Baltic Sea. *Baltica*, 2017, 30 (2), 107–117. Vilnius. ISSN 0067-3064. <http://dx.doi.org/10.5200/baltica.2017.30.12>

The purpose of the paper is to provide some calculations on the current water balance for the Vistula Lagoon, which is exceptionally valuable in terms of biology and hydrology. It is located along the southern coast of the Baltic Sea in both Poland and Russia. In the era of marked climate change, but first and foremost the plans of the Polish side of the cross-cutting of the Vistula Spit, there has been a need to update the balance data of the Vistula Lagoon. In the near future, they may be an excellent comparative material to changes in the proportions of individual water circulation components in the Vistula Lagoon and changes in its entire ecosystem, caused by the implementation of the project. In the literature on the subject, balance sheet data from 50 years ago are used (these data were compiled in the initial part of the study), hence the concept of attempting to update them has appeared. Due to the lack of data from the Russian part of the catchment area, the main emphasis in the work was put on the completion and modernization of the components of the balance sheet of the Polish catchment. A novelty at work is the refinement of the potamical inflow to the Vistula Lagoon with small but numerous streams flowing from the Elbląg Upland, as well as the inflow forced by polder discharges. Climate water balance data are shown based on data available from IMGW in Warsaw and include monthly precipitation totals for the period 1996 – 2010 obtained at six gauging sites located near the Vistula Lagoon. Evaporation was calculated using Tichomirov's formula. River water influx was determined based on data available in Kruk (2011), data from IMGW (Pasłęka River) and data from papers Bogdanowicz (2007, 2009) and documents associated with the Program for biological passages in rivers in Warmińsko-Mazurskie Province (2007). Raw data were also obtained from the Office of Water Management in the city of Elbląg for the period 2006 – 2011. These data covered water flow moving from the polders. Groundwater influx was estimated using values provided by Silicz (1975). The volume of seawater influx was estimated using the data provided by Silicz (1975) and Chubarenko and Chubarenko (2002). The study confirms that water exchange in coastal lagoons is quite complex due to the presence of several different sources of recharge and several different places where water is lost. The complexity of water cycle is enhanced by a complex hydrographic system of lagoon catchments and a complicated system of water exchange with the sea. The total water volume involved in circulation in the Vistula Lagoon is estimated to be 24,225 mln m³ per year. The largest part of the water received by a coastal lagoon comes from the sea. In this case, it is about 77% (18,130 mln m³ per year). In addition, an array of catchment sources yields about 21% of the studied lagoon's water. Its catchment provides an additional 4,974 mln m³ of water. The Pregolya River produces 55% of the catchment influx. The volume of water forcibly produced by area polders is so small that it does not produce an observable effect on the water balance in the Lagoon (about 0.04% of total influx). The precipitation constitutes 2.3% of the power supply source of the Vistula Lagoon. On the other hand, the Strait of Baltiysk constitutes the main outflow pathway for water exiting the Vistula Lagoon – close to 98% of all outflow (23,694 mln m³). The remaining 2% is lost due to evaporation.

Baltranaitė E., Jurkus, E., Povilanskas, R., 2017. Impact of physical geographical factors on sustainable planning of South Baltic seaside resorts. *Baltica*, 2017, 30 (2), 119–131. Vilnius. ISSN 0067-3064. <http://dx.doi.org/10.5200/baltica.2017.30.13>

The objective of the article is to give a comprehensive assessment of the impact that physical geographical factors of the coastal environment have on the South Baltic seaside resorts in the way it is reflected in planning documents (comprehensive plans, regional and tourism development strategies) of South Baltic seaside territorial entities. The seaside resorts and the adjacent coastal protected nature areas, particularly coastal national parks and UNESCO biosphere reserves, are the main focus of this study. The contents of 141 valid documents of spatial planning, management and development has been analysed. The studied comprehensive development plans, tourism strategies and other documents demonstrate that virtually all seaside municipalities in the South Baltic Region express a strong concern in increasing risk of coastal erosion and sea level rise related to the global climate change.
