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Natural hazard impact on the infrastructure in large cities: the case study of Moscow and St.Petersburg

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According to all forecasts, the severity of natural hazard impact on the cities of Russia is expected to increase in coming years and decades due to climate changes, on the one hand, and due to many social, economic and technical causes that reduce their protection and increase vulnerability, on the other hand. In particular, the frequency and severity of various natural-technological accidents will multiply. The highest damage from natural hazard impact will affect large densely populated cities with many technologically sophisticated objects, especially with dangerous ones. Moscow and St.Petersburg have the highest number of natural-technological accidents among all Russian cities. Moscow is prone to influence of various natural hazards such as strong winds, floods, landslides, karst, heavy rainfalls and snowfalls, heatwave, wild fires, storms and lightning, and others. These natural hazards cause many traffic accidents and disruptions in transportation, blackouts, breakdowns of communication lines, collapses of buildings, etc. The climatic and topographic conditions of St.Petersburg contribute to manifestation of many natural hazard types such as floods, storms, strong winds, extreme heat and frost, snowfalls, heavy rains, hale, etc. Hydro-meteorological phenomena occur the most often among them; more than 50 per cent are caused by storms and strong winds and about 25 per cent by floods. This situation can have serious consequences because a nuclear power plant and many chemical plants and other dangerous objects are located in this region. Power failures and transportation problems are the most frequent among all natural-technological accidents in St.Petersburg. The statistical analysis of data about natural-technological accidents in both large Russian cities have been done using information collected in data base that was created by author. Power lines and other infrastructure objects are especially vulrerable to the impacts of natural hazards both in Moscow and St.Petersburg. Critical infrastructure facilities located in these regions need a special protection and modernization.