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# Natural and anthropogenic factors influencing the groundwater chemical composition of the upstream part of the Oredezh river valley (St.Petersburg Region, Russia)

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The studied area is located in the Northwestern part of the Russian Platform. The sedimentary cover is formed by 500 m thick Paleozoic and Quaternary rocks. There are three main aquifers: the Mid-Devonian and Quaternary (QIII-IV+D2st) unconfined aquifer used for local water supply of the villages; the Mid-Devonian (D2nr) confined aquifer of no practical importance, and the Ordovician (O1-3) confined aquifer used for public water supply of the bigger settlements and towns.
Groundwater chemical composition of the studied area is rather well investigated due to the annual summer fieldworks carried out by lecturers and students during the field training on geology and hydrogeology. Data on major component composition and contents of nitrogen compounds for three aquifers have been collected and analyzed since 2005. ANOVA, regression and correlation analyses have been applied for the description of long-term variations of the groundwater quality.
Variety in the groundwater chemical composition of the Mid-Devonian and Quaternary aquifer (QIII-IV+D2st) is partly caused by the host rock composition, which is different due to the complicated geological history of the area. Climatic factors, especially amount of precipitation, are also of great importance. One more significant factor is agricultural activity of the local people and presence of the poultry factory in the close proximity from the studied area. This factor mainly influences the presence of groundwater contaminants, such as nitrates, nitrites and ammonium.
The chemical composition of two deeper confined aquifers remains more stable in time and mostly depends on the host rock types. The initial degree of nitrate contamination is sometimes observed in the Ordovician aquifer, probably, due to the poor isolation of the well heads.
In 2018, samples of different kinds of Quaternary host rocks were collected and analyzed to understand the origin of the groundwater natural composition. Results obtained were processed by statistical methods. Water samples have also been collected and analyzed to supplement the existing database and to continue the row of the regime observations. Thus, influence of water-rock interaction, amount of precipitation and human activity to the groundwater chemical composition will be shown.

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