reaction (100 mM H_2O_2, 1.5 mM Fe (II)) and biofiltration (Image 2). The removals were: TOC (83%), COD and color (94%) and total detoxification. The economic cost of the treatment was 7.23 \$/m^3, and was mainly due to that of the peroxide. Though the price is still high for local standards, the treated effluent meets the Ecuadorian National and European discharge limits.

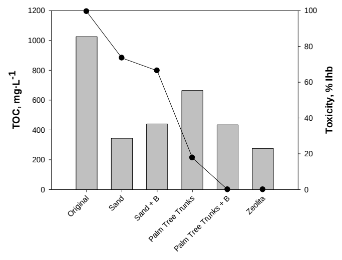

Image 1. Picture of the sample after different treatments

Image 2. Complete toxicity removal with biofilters.

Thermal Resources of the Climate of West Polesie, Belarus

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1. Introduction – Nowadays thermal resources of climate can be regarded as a means of energy security of a country. Heat supplied by nature itself is relevant for the development of the economies where heat-power engineering, agriculture, transportation, building and construction are priority activities.

2. Experimental – The research is based on the data of climate monitoring in the Republic of Belarus from 1945 to 2014.

3. Results and Discussion – The main thermal resources of the climate in West Polesie (Belarus) are the following: shortwave solar radiation reaching the land surface (R+); positive constituent of turbulent heat transfer in the above-ground atmosphere (P+); heat coming from the deep layers of the ground (B+); heat that the land surface gets from condensation of vapor. (LC). Heat content on the land surface is reduced considerably by expenses of heat on total evaporation (LZ), long-wavelength radiation (R^-), air masses with lower heat content that come from neighboring regions (P^-), and negative constituent of heat transfer in the ground (B^-). The climate of West Polesie is characterized by a lot of phase transitions of water in winter (more than 20-25 times in certain years), which results in local release or absorption of heat. The number of melting-freezing cycles is equal that is why the heat from phase transfers is not included in calculating heat energy balance for a year.

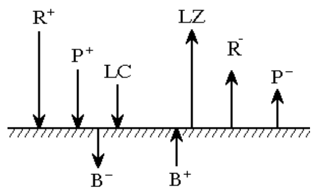

Image 1. Diagram of vectors of heat transfer

Solar radiation absorbed in the area during the year is 2950-2995 MJ/m^2, which is more than in Eastern Belarus by 300 MJ/m^2. Long-wavelength radiation is within 1195-1210 MJ/m^2. Radiation balance is positive from May to October, its maximum being in June-July. The research [1] reveals that the negative constituent of turbulent heat transfer in the above-ground atmosphere predominates in heat energy balance of the land surface of the area during the year (205-305 MJ/m^2), while its positive part doesn't exceed 139-143 MJ/m^2. The amount of heat spent on the process of total evaporation is 1974-2165 MJ/m^2. An important factor that predetermines opportunities to use solar energy is sunshine duration. At Brest met station it numbers 1824 hours per year on average during the observed period, with its maximum in July being 260 hours and its minimum in December being 38 hours. The beginning of the XXI century shows a considerable growth of sunshine duration over this area, for instance, in Brest it was 2137 hours in 2003.

The longest possible sunshine duration in this area is 4510±5 hours per year, which proves good possibilities for solar energy development in the region.

4. Conclusions – The results obtained allow for differentiated assessment of thermal resources needed for the development of alternative energy supplies (such as solar energy) and taking into account the amount of heat spent on the process of total evaporation including the water used by crops. Thus, it becomes possible to assess the amount of water necessary for crops.

5. References
[1] Muhavets: Encyclopedia of a Small River / A.A. Volchak [and others]. – Brest: Academia, 2006. – 344 p.

River Flow in Belarusian Polesie and its Climate Change Adaptation

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1. Introduction – Climate change issue is one of top-priority directions for research especially of such vulnerable areas as Belarusian Polesie (BP). The purpose of this report is to provide scientific estimation of river flow change in BP taking into account adaptation to climate fluctuations.

2. Experimental – The data used in the report come from meteorological and hydrological observation data over the catchment areas in BP, the results of the research done previously, information from pertinent literature and archive sources. Scenario A1B B1 [1] is used to forecast changes in the climate and the river flow.

3. Results and Discussion – The analysis of the river flow change in BP from 1961 to 2015 shows the following results:

- average annual flow has slightly changed, with its maximum decrease by 9 %;
- flow of spring flood has decreased by 42 %, with its peak coming earlier;
- winter flow has increased by 20 %;
- summer-autumn flow hasn't changed significantly but for the last years (2014, 2015) the flow has reduced considerably.

Climate change scenarios until 2035 are obtained with the use of data from "Atlas of global and regional climate forecast" with further adjustment for BP's rivers taking into consideration regional estimation of climate and flow changes from 1961 to 2015.
Hydrological-climatic modeling of BP's river flows until 2035 makes it possible to forecast future flow changes:

- insignificant increase in the flow of most rivers in winter time is on the average by 2.1 % for the catchments, maximum by 25 %, moreover in several rivers the flow change will be insignificant or even reduced;
- in spring, with rare exception, flow decrease is possible by 5.5 % on the average, maximum – by 25 %;
- in summer the most significant and maximal for all seasons decrease in flow is forecast by 20 % on the average, maximum by 40 %;
- in autumn (especially by mid-October) the flow most often reduces by 8.5 % on the average, maximum by 35 %, in the rest time the flow will change insignificantly.