



DANUBE CONFERENCE 2019

**XXVIII CONFERENCE  
OF THE DANUBIAN  
COUNTRIES ON HYDROLOGICAL  
FORECASTING AND HYDROLOGICAL  
BASES OF WATER MANAGEMENT**

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**BOOK OF ABSTRACTS**

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## WATER RESOURCE MANAGEMENT OF FLOODPLAIN LAKES IN DANUBE REGION (ON EXAMPLE YALPUG-KUHURLUY)

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The Ukrainian Danube Region is characterized by its unique natural resource potential. The presence of significant water resources of the Danube and the Danube lakes in arid climate conditions of the region largely determined the history of the Ukrainian Danube region and the socio-economic prospects of the region at present. The system of lakes Yalpug-Kugurluy is the largest natural freshwater reservoir in Ukraine. Water management activities undertaken in the late 60s of the last century, caused significant changes in the hydrological regime of lakes and negatively impacted on its hydrochemical state. At present, the quality of water in the lakes in most cases does not meet the requirements water state standards for irrigation. The important task is the restoration and rational use of natural resources lakes Yalpug-Kugurluy, by improving its hydrological and hydrochemical regimes.

The main cause of the unsatisfactory water quality in the lake can be considered low water exchange and the inconformity of water levels in the lake, those that were designed in the 80s of the last century. It is necessary to note that one of the main factors that determine the ecological state of the lake Yalpug is the impact water of small rivers with high mineralization and significantly contaminated, especially r. Yalpug (by the way 90% of the basin is in Moldova).

Justification scientific and methodological basis to determine the components of the water and salt balance can be used to model the optimal regime of functioning of Lakes Yalpug – Kugurluy. Water balance of Lake Yalpug mainly determined by the inflow of water through: precipitation (29 to 60%), free circulation water of the Danube River (35 to 68%) and by the outflow through evaporation from water surface (39 to 86%). The water exchange with the river Danube is the main source of water exchange and maintains water quality.

The greatest impact on the mineralization system of lakes Yalpug -Kuhurluy have the inflow of salt water from small rivers, rain water and from Danube. Influx of salts with Danube waters, for the period from 2006 to 2014 ranges from 33% to 67%. Influx salt water from small rivers varies from 10 to 41%, slightly lower values with precipitation; they vary from 15% to 33%. In the outflow part of salt balance during calculating period (2006 to 2014) the highest percentage discharges of salt with filtered water into the banks - its vary from 21 to 91%. The loss of salts along with discharges to the Danube varies from 0.0 (in the years 2007, 2011, 2012, 2014 when there were not discharges) to 85%. The loss of salts along with the water intake is varying from 3 to 15%.

For further operation of the lakes Yalpug-Kugurluy can recommend the following measures:

- To support the water salinity in lakes - reservoirs at 1.0 g/dm<sup>3</sup> need to restore irrigation and filling its water from Danube
- Need to clear the natural branches to restore water circulation with the Danube River
- The strengthening work within an international agreement between the Government of Ukraine and Moldova on cooperation to improve the condition of water bodies
- The development at national and regional and possibly international level a comprehensive program for rehabilitation of lakes Yalpug and development of measures for improvement of both the waters of lake and its basin

**Keywords:** water and salt balance, Ukrainian Danube Region, floodplain lakes.