and basal area. Lastly, the models were assessed according to their coefficient of determination (R^2) and RF variable importance. The results indicated the variable performance of the models for estimating these parameters. For example, the model for height index explained 55.7% of the validation dataset, and 66.6% of the calibration dataset, while the model for basal area explained 4.7% of the validation dataset and 10.3% of the calibration dataset. The results suggest that drone data is adequate for estimating tree canopy data, but further research must be conducted for improving under-canopy metrics. In conclusion, 3D information showed good predictive performance when estimating forest parameters, suggesting that forest management can be carried out using consumer-grade cameras. On the other hand, the traditional NDVI was not a good index for modeling stand parameters, indicating the need for selecting a more appropriate index for forest evaluations. Altogether, we demonstrated that drones are useful tools for supporting collection and prediction of some parameters, but it may provide better and more meaningful results when applied synergistically within other tools and approaches.

DEVELOPMENT OF TOOLS FOR FORECASTING OF MAXIMUM SPRING RUNOFF TO THE BLACK SEA ESTUARIES REQUIRED FOR DECISION-MAKING

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The possibility of assessing the filling degree surface water from melting snow and rainfall every year of the closed estuaries- reservoirs of the Black Sea areas' was reviewed.

To accomplish the task proposed by the scientific method of the long-term forecasting revenue of spring water in the reservoirs of the Black Sea estuaries. The main problem of scientific study was that the hydrological observation network in the basins of the estuaries, and rivers in the whole north-western Black Sea region were basically absent. Therefore, the methodological framework forecasting of the characteristics of spring floods and rain floods hardly developed. No recommendations, on how to estimate the probability of forecasting values in the long-term perspective.

Sequence of forecasting of the layer of the spring flood.

1) Typification of spring floods in accordance with their water content according to the model – discriminant function *DF*, which takes account of the complex of factors having an influence upon conditions of spring flood formation.

2) Determination of the forecast modular coefficient of the spring flood.

3) Setting the probability of occurrence of the forecasting flow layers in the long -term period.

4) Derivation of the forecasting value for flow layers of the spring flood.

The income of surface waters at the Hadzhibeysky and Kuyalnitsky estuaries in the spring, are determined by:

a) the initial water level in the pond at the date of the forecast;
b) the volume of the curve set the initial volume of water in the estuary;
c) determining the volume of water flow into the pond during the period of the spring flood;
g) calculating the expected volume of water in the reservoirs for the spring flood according to the water balance equation of the lake.

It is assumed that the rainfall in the water area of the estuary offset evaporation with its water surface;

e) the largest forecasting volume of water in the estuary during the period of the spring flood W ' curve volume is set to the maximum level of water.

Diagram of the convergence between the calculated and observed values of volumes of water of the spring flood Hadzhibeysky and Kuyalnitsky estuaries (2005-2020) showed satisfactory results (correlation coefficient r = 0,95). The accuracy of testing forecasting maximum spring water levels in estuaries is about P= 93%.

Conclusions:

- For the first time, the method of the long-term forecast of surface water during the spring period for the closed estuaries in North -West area of the Black Sea was substantiated.
- This method was realized by the authors in operational work at the Hydrometeorological Center of the Black and Azov Seas.