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RPAS application for analysis of fishponds storage volumes and dam shapes

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Fishponds are an important part of the landscape in the Czech Republic and they play an important role in the runoff processes and water retention in the landscape. These water structures are mostly very old and exist often more than five hundred years. Through the ages, fishponds became an integral part of the landscape and the important ecosystems in many cases. However, there are many problems resulting from the age of the fishponds. The main problems consist in the seepage through the dams and in the sedimentation of the storage volume. The seepage is often connected to the shape of historical ponds which have much steeper slopes compared to current practice which results in shorter flowpaths. Hence, it is desirable to have sufficient information about the shape of pond dams and about the volume available for water storage. It is also useful to have detailed information about the bottom elevations/depths within the storage volume which could be needed besides others for the calculation of energy balance and heat fluxes. Remote sensing methods can be very helpful in all mentioned cases. This contribution focuses on the application of RPAS for the analysis of both dam shapes and the storage volume. These characteristics can be analysed using detail elevation data of both dams and bottoms. The digital relief was prepared based on the evaluation of images captured by the RPAS Phantom 4 in a regular grid. In the next step, the digital relief was compared to other types of elevation data available for dams to assess the reliability of such data and a model of fishpond was built to map the fishpond bottom and a dam. The results indicate a very good applicability of this modern technology despite some limitations which are related to vegetation cover on the dams.