Thermal Aerial Survey of Water Objects Using Unmanned Aircraft System Ptero

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Thermal aerial survey along with some other methods of remote sensing is an important source of information about terrain, including water objects. The use of UAV-borne thermal cameras based on uncooled microbolometers opens up new possibilities for environmental monitoring, mapping and exploration of water objects.

Obtained thermal aerial survey data and results of theirphotogrammetric processingcan be usedfor the following tasks:

- mapping of water objects;
- identification water protection zonesrules violations;
- evaluation of water objects pollutiondegree, pollution source identification and their localization;
- determination of motion path of contaminated sediment; pollution expansion forecast;
- determinationof the ice covercondition;
- identification of water supply sources;
- thermal waters search;
- boundaries determinationof wetland forests, river flood plains, wetlands and upland areas;
- monitoring of power plants cooling ponds;
- monitoring and mapping of flooded areas (including temporary water bodies formed during high water, flooded fields, tailing dumps, sludge storages, etc.);
- identification of objects that are difficult for interpretation by the visible wavelength imagery;
- space survey data validation.

The reportdescribes the features ofthermalaerial surveycarried out by PteroUAS, including preparations for thewater objects survey, and the influence of external factors on thefinal result. Also, it provides examples of photogrammetric processing of thermograms using PHOTOMOD software.