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Retrieval of water quality algorithms from airborne HySpex camera for oxbow lakes in north-eastern Poland

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The aim of this study was to retrieve empirical formulas for water quality of oxbow lakes in Lower Biebrza Basin (river located in NE Poland) using HySpex airborne imaging spectrometer.
Biebrza River is one of the biggest wetland in Europe. It is characterised by low contamination level and small human influence. Because of those characteristics Biebrza River can be treated as a reference area for other floodplains and fen ecosystem in Europe. Oxbow lakes are important part of Lower Biebrza Basin due to their retention and habitat function.
Hyperspectral remote sensing data were acquired by the HySpex sensor (which covers the range of 400-2500 nm) on 01-02.08.2015 with the ground measurements campaign conducted 03-04.08.2015. The ground measurements consisted of two parts. First part included spectral reflectance sampling with spectroradiometer ASD FieldSpec 3, which covered the wavelength range of 350-2500 nm at 1 nm intervals. In situ data were collected both for water and for specific objects within the area. Second part of the campaign included water parameters such as Secchi disc depth (SDD), electric conductivity (EC), pH, temperature and phytoplankton.
Measured reflectance enabled empirical line atmospheric correction which was conducted for the HySpex data. Our results indicated that proper atmospheric correction was very important for further data analysis. The empirical formulas for our water parameters were retrieved based on reflecatance data. This study confirmed applicability of HySpex camera to retrieve water quality.