

EGU21-331, updated on 12 Jun 2021

<https://doi.org/10.5194/egusphere-egu21-331>

EGU General Assembly 2021

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Estimation of Sediment Concentration in the Pearl River Estuary Based on Remote Sensing

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The estimation of Suspended Sediment Concentration (SSC) on the surface of the Pearl River is of great significance to the management of water and soil erosion and water quality in the Pearl River. Previous studies lack of measured reflectance data and enough field samples and the distribution of sediment-concentration field samples were uneven. In response to the above problems, we combined the sediment concentration data (proceed by filtered weighing method) collected on the spot, high-precision ground measured spectral data (obtained by ASD) with multi-source remote sensing satellite images (MODIS and Sentinel-2), employing simple linear regression model (single logarithmic transformation) and neural network learning algorithm to fit the relationship model between SSC and surface reflectance (Surface Reflectance, SR). The preliminary results showed that SSC and the surface SR based on the red band (wavelength=665 nm) had a stable correlation ($R^2 > 0.83$), and the red band of Sentinel 2 was appropriate for the estimation of SSC. Compared with previous studies, this study synthesized higher-precision spectrum measured data and higher-resolution remote sensing satellite data to improve the estimation accuracy of SSC. In addition, based on the SSC model under study, we will couple long-time series of satellite data to explore the spatiotemporal variation characteristics of SSC in the Pearl River, so as to provide a reference for soil erosion monitoring and water resources management in the Pearl River Basin.