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Remote Monitoring of Chlorophyll Concentrations in Productive Turbid Waters [ABSTRACT]

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Gitelson, Anatoly A. and Rundquist, Donald C., "Remote Monitoring of Chlorophyll Concentrations in Productive Turbid Waters [ABSTRACT]" (2005). *Papers in Natural Resources.* Paper 246.
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Abstract from 31st International Symposium on Remote Sensing of Environment (June 20-24, 2005, St. Petersburg, Russia)

Remote Monitoring Chlorophyll Concentrations in Productive Turbid Waters

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For case 2 turbid productive waters, we describe an algorithm to retrieve chlorophyll-a (Chla) from reflectance spectra. The model developed uses reflectance at three wavelengths: the first one in the red spectral region (around 670 nm); the second one in the red edge spectral region (around 715 nm); and the third one in the near-infrared (NIR) spectral region (around 740 nm). To calibrate and validate the model, a large dataset, containing reflectance spectra and ancillary data, was collected in order to cover an as wide as possible range of optically active constituents. Through sensitivity analysis and calibration we show how to increase the accuracy of Chla prediction by minimizing interferences due to variations in quantum yield of sun-induced Chla fluorescence and in Chla specific absorption coefficient. The validation results obtained using an independent dataset (r2=0.94 and mean percent error < 35%, for a Chla range spanning from 7 to 194 mg m-3) corroborate the soundness of our initial hypothesis and the reliability of the model. Uncertaintes of Chla assessment using SeaWiFS and MODIS sensors is presented.