

VALIDATION OF SATELLITE DERIVED TOTAL SUSPENDED MATTER IN
INLAND WATERS

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ABSTRACT

Lake Constance is located in central Europe and is the third largest fresh water system after Lake Geneva and Lake Balaton. Lake Constance has a surface area approximately 571km² and a total volume of 10x10⁹m³. Due to the geographical and political location of Lake Constance situated between the countries of Austria, Germany, Liechtenstein and Switzerland, there is intrinsic human value for water quality and lake health.

During the spring and summer season of 2012, several institutes specializing in biogeochemical aquatic research were sponsored by the European Union who came together to conduct research at Lake Constance. With water quality and lake health in mind, research regarding the physical characteristics between absorption and scattering of monochromatic light and the concentrations of suspended particles were tested *in-situ* and layered with satellite-derived data. In addition, the relationship between light attenuation and the mass or volume concentrations of particles through the water column were studied to look for signatures of lake health.

The validity and suitability of measuring total suspended matter and chlorophyll with *in-situ* and ground-truthing instruments were accurate and interchangeable. The investigation of specific water types provided realistic results for suspended matter. For understanding lake biogeochemical processes, the validity of *in-situ*, ground-truthing and satellite measurement interchangeability showed promising results. However, additional manipulation of the data show satellite-derived measurements at low particulate concentrations break down, yielding sporadic results with low R-values. The field campaigns from May 3rd, May 4th and May 25th 2012, were studied in greater detail in an attempt to resolve the low-value satellite measurements captured by the 250 m medium-resolution MODIS sensors.