

SGLI  
Algorithm Theoretical Basis Document

Total suspended matter concentration

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## 1. Introduction

This document presents a method for estimating total suspended matter concentration for SGLI. The total suspended matter concentration is a combination of both organic and inorganic matter concentration. The method for estimating total suspended matter concentration for SGLI Ver.1 has a error in the range of low suspended matter concentration, such as in the open sea. Therefore, we reviewed the method.

## 2. Estimation of total suspended matter concentration

The remote sensing reflectance ( $R_{rs}$ ) at 490 and 565nm is used to estimate total suspended matter concentration. In developing algorithm, the effects of organic and inorganic suspended solids were separated. The ratio of  $R_{rs}(490)$  to  $R_{rs}(565)$  was used as a variable that is related to the concentration of organic suspended matter.  $R_{rs}(565)$  was used as a variable that is related to the inorganic suspended matter. The following multiple regression equation was created using in-situ observation data around Japan. The least squares error (RMSE) on the log scale of this multiple regression equation is 0.349 (-55 to +124 %) and a correlation coefficient of 0.862.

$$\log_{10}(TSM) = -1.5831 \times \log_{10}\left(\frac{R_{rs}(490)}{R_{rs}(565)}\right) + 0.3626 \times \log_{10}(R_{rs}(565)) + 1.2096$$

A comparison of the estimated and measured concentrations of total suspended matter concentration is shown in Fig. 1.

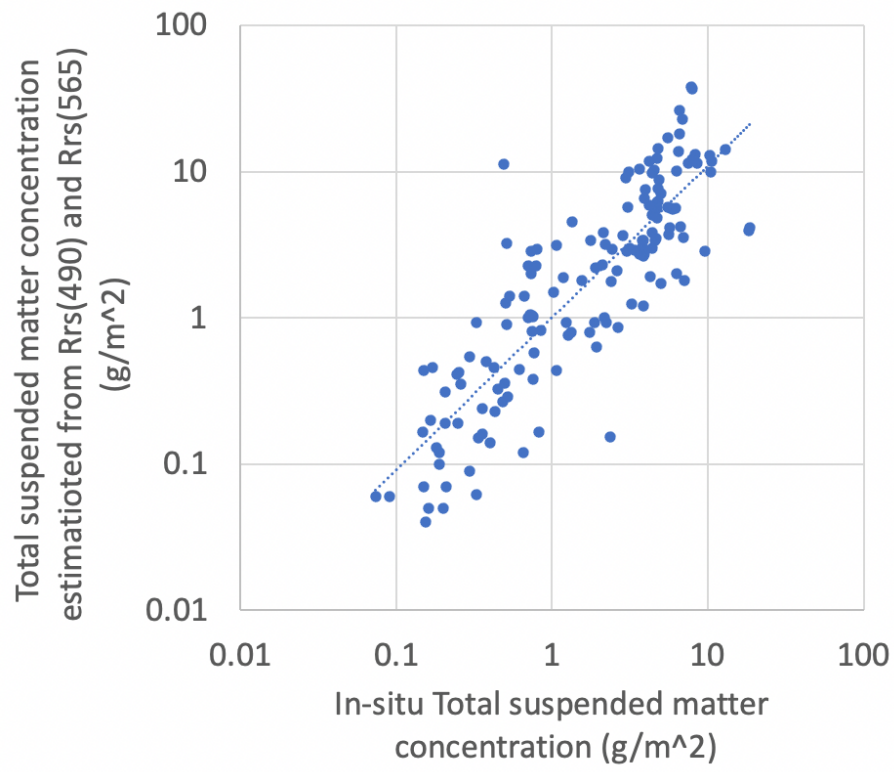


Fig.1 Comparison of estimated and actual total suspended matter concentrations