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Retrieval of suspended sediment concentration in near-shore coastal waters using MODIS data

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Abstract:

This study focuses on using remote sensing satellite data to retrieve water suspended sediment concentration (SSC) of near-shore coastal waters. Aqua/Terra Satellite MODIS 250m data of the south-western coast of the North Island, New Zealand was used. Two methods of analysis are used in this study to obtain an SSC map; non-linear optimisation and quasi-analytical.

The non-linear optimisation method was used to fit an exponential function between reflectance and SSC, with SSC replaced by a linear relationship between SSC and reflectance in the near infrared domain. The optimisation result was used to convert Aqua/Terra MODIS images to SSC maps.

The quasi-analytical method, a backscattering coefficient at 645nm is first derived from Aqua/Terra MODIS 250m Band 1 data using a quasi-analytical algorithm after applying a simple atmospheric correction routine. An empirical relationship was derived from laboratory experiments. Finally SSC maps were obtained by applying the empirical relationship to convert the backscattering coefficient to SSC.

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Table of Contents

1 Introduction.....	1
1.1 Atmospheric Correction	5
1.2 Remote Sensing Satellite.....	6
1.2.1 Terra Satellite	6
1.2.2 Aqua Satellite	7
1.3 MODIS	8
1.4 Literature Review	9
1.4.1 Empirical Approach.....	10
1.4.2 Analytical Approach.....	12
1.4.3 Non-linear Optimisation Approach	16
1.5 Rivers	17
1.6 Horizons Regional Council	18
2 Method	19
2.1 Study Area.....	19
2.2 Data Download.....	19
2.3 Georeferencing and Bow Tie Effect Correction	21
2.4 Atmospheric Correction	22
2.5 SSC Retrieve	23
2.5.1 Non-linear Optimisation	23
2.5.2 Quasi-analytical	27
2.6 Laboratory Experiments	33
2.6.1 Instruments:	33
2.6.2 Instruments Set Up	34
2.6.3 Spectral Measurements.....	35
3 Results and Discussion:	36
3.1 Laboratory Experiments	36
3.2 SSC Retrieval	44
3.2.1 SSC Map.....	45
3.2.2 Total Sediment Calculation	59
4 Conclusion and future work.....	66
5 References.....	67

List of Tables

Table 1.1 SSC retrieval methods.....	4
Table 1.3.1 MODIS Band 1 & 2.....	9
Table 2.5.2.1 Relationship between the backscattering coefficient and SSC.....	30
Table 3.2.1.1 Daily mean flow data (l/s) of four river monitoring stations	45
Table 3.2.1.2 Sediment Load (Kg/m ³) of four river monitoring stations.....	45
Table 3.2.1.3 Daily mean flow data (l/s) of four river monitoring stations.....	46
Table 3.2.1.4 Sediment Load (Kg/m ³) of four river monitoring stations.....	46
Table 3.2.1.5 Daily mean flow data (l/s) of four river monitoring stations.....	48
Table 3.2.1.6 Sediment Load (Kg/m ³) of four river monitoring stations.....	48
Table 3.2.1.7 Daily mean flow data (l/s) of four river monitoring stations.....	49
Table 3.2.1.8 Sediment Load (Kg/m ³) of four river monitoring stations.....	49
Table 3.2.1.9 Daily mean flow data (l/s) of four river monitoring stations.....	52
Table 3.2.1.10 Sediment Load (Kg/m ³) of four river monitoring stations.....	52
Table 3.2.1.11 Daily mean flow data (l/s) of four river monitoring stations.....	54
Table 3.2.1.12 Sediment Load (Kg/m ³) of four river monitoring stations.....	54
Table 3.2.1.13 Daily mean flow data (l/s) of four river monitoring stations.....	55
Table 3.2.1.14 Sediment Load (Kg/m ³) of four river monitoring stations.....	55
Table 3.2.1.15 Daily mean flow data (l/s) of four river monitoring stations.....	56
Table 3.2.1.16 Sediment Load (Kg/m ³) of four river monitoring stations.....	56
Table 3.2.1.17 Daily mean flow data (l/s) of four river monitoring stations.....	57
Table 3.2.1.18 Sediment Load (Kg/m ³) of four river monitoring stations.....	57
Table 3.2.2.1 High suspended sediment area 11 April 2011.....	62
Table 3.2.2.2 High suspended sediment area 24 January 2011.....	64
Table 3.2.2.3 High suspended sediment area 29 April 2011.....	65

List of Figures

Figure 1.4.1 General SSC retrieving scheme.....	10
Figure 1.4.1.1 Location map of the three study areas (Lake Pontchartrain, Mississippi River Delta, and Mississippi Sound) in the northern Gulf of Mexico.....	11
Figure 1.4.1.2 Empirical relation between total suspended matter (TSM) and reflectance of Terra MODIS 250m band 1 (O) Mississippi Sound 16 May 2001; (●) Mississippi River Delta 17 March 2002; (□)Mississippi River Delta 15 July 2003; (■) Lake Pontchartrain 19 May 2002; (Δ) Lake Pontchartrain 23 May 2002; (▲)Mississippi River Delta 20 October 2003.....	12
Figure 1.4.2.1 The average SIOP of Teluk Banten	14
Figure 1.4.2.2 (a) Algorithm based on SPOT HRV; (b) algorithm based on LandSat TM5.....	15
Figure 1.4.3.1: Comparison of simulated and in-situ measurements of suspended sediment concentrations.....	16
Figure 1.6.1 Four river monitoring stations.....	18
Figure 2.1.1 Satellite image of South West coast of North Island, New Zealand	19
Figure 2.2.1 LAADS Product Selection.....	20
Figure 2.2.2 Select download region.....	21
Figure 2.3.1 Georeferencing and bow tie effect correction.....	22
Figure 2.4.1 FLAASH Atmospheric Correction Model Input Parameters.....	23
Figure 2.5.1.1 Optimizing Excel worksheet.....	26
Figure 2.5.2.1 Absorption coefficient variations at different wavelengths.....	29
Figure 2.2.2.2 Empirical relation between backscattering coefficient and SSC.....	31
Figure 2.6.2.1 Instruments set up.....	35
Figure 3.1.1 Reflectance spectra of different papers.....	36
Figure 3.1.2 Reflectance spectra of different containers on black background.....	37
Figure 3.1.3 Reflectance spectra of different depths of pure water (white container on the black background).....	38

Figure 3.1.4 Reflectance spectra of different depths of salt water (30g/l) (white container on the black background).....	39
Figure 3.1.5 Reflectance spectra of different depths of salt water (30g/l) (white container on the white background).....	40
Figure 3.1.6 Reflectance spectra of different light angle (pure water 20cm water height, white container on the white background).....	41
Figure 3.1.7 Reflectance spectra of different light angle (pure water 15cm height, white container on the white background).....	42
Figure 3.1.8 Reflectance spectra of different SSC (salt water 20cm height, white container on the black background).....	43
Figure 3.2.1.1 Terra 18 January.....	45
Figure 3.2.1.2 Aqua 19 January.....	46
Figure 3.2.1.3 Terra 24 January.....	48
Figure 3.2.1.5 Daily mean flow	50
Figure 3.2.1.6 Sediment Load.....	50
Figure 3.2.1.7 Terra 28 January.....	51
Figure 3.2.1.8 Daily mean flow.....	53
Figure 3.2.1.9 Sediment Load.....	53
Figure 3.2.1.10 Terra 11 April.....	54
Figure 3.2.1.11 Aqua 12 April.....	55
Figure 3.2.1.12 Terra 28 April.....	56
Figure 3.2.1.13 Aqua 29 April.....	57
Figure 3.2.2.1 From contour maps to DEM.....	59
Figure 3.2.2.2 Contour maps (a) Wanganui river mouth; (b) Whangaehu river mouth; (c) Rangitikei river mouth; (d) Manawatu river mouth.....	60
Figure 3.2.2.3 TIN of the study area.....	60
Figure 3.2.2.4 DEM of the study area.....	61
Figure 3.2.2.5 Near-shore high SSC area (within the red line) 11 April 2011.....	62
Figure 3.2.2.6 Near-shore high SSC area (within the red line) 24 January 2011.....	64

Figure 3.2.2.7 Near-shore high SSC area (within the red line) 29 April 2011.....65