

Interactive comment on “Optical remote sensing of the Gulf of Gabès – relation between turbidity, Secchi depth and total suspended matter” by R. Katlane Essersi et al.

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Received and published: 19 March 2011

The responses are mentioned after each comment of Anonymous Referee #1
use of citation managers could be very useful see Journal guidelines bibliography
needs to be validated with the manuscript citations and if paper is another language
besides english please indicate this as suggested in the last review.

Response: All reference list and short citation are corrected as Copernicus publications
Reference Types

(3) on page 1, line 35, why but?(4) line 39, 'in addition...' not clear

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Response: Corrected as suggested

(5)line 41, do you mean illustrated?

Response: Yes corrected as suggested

(6) Page 2, line 5, relationships with what?

Response: This sentence was revised.

(8) line 9-11, which previous studies are being referenced here?

Response: This section was modified following your recommendations.

(9)line 12 - systematic use of capitals in the sensor MODIS

Response: Corrected as suggested

(11)last paragraph of introduction line 22-26, what are the implications for improvements? To simply apply method a, at site b, is not very innovative, maybe add something

Response: For site b it is the first time that optical remote sensing has been used. We recognise that it is not innovative in terms of a new methodology. However, we have shown that for a site with no previously established monitoring program and very limited local resources (a simple hand held turbidimeter instrument and a limited number of TSM measurements) it is possible to reliably map spatial variability of turbidity and TSM. Some comments are added in the discussion.

(12) in line 36 do you mean Level 1 and Atmosphere Archive and Distribution System (LAADS)?

Response: Yes corrected as suggested

(13)line 42 add described by (Nechad, XXXX) and check referencing guidelines

Response: Corrected as advised

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(14) is it 667 nm or 667 μ m? see introduction page 2 line 15, 19

Response: Sorry corrected

(15) page 3 line 27 did you mean 'test' instead of 'tried'?

Response: This part of the text has been deleted as it doesn't provide any additional information and it's a source of confusions in the paper.

(16)Equation 1, 2 suggest that TSM and TU are both based on R_{RS} 667 alone is this true?if so then correlation is expected

Response: The correlation between TU and TSM data that is shown in Figure 2 was based on in-situ and not from satellite data.

(17) section 2.1.1 can be combined with section 2.1 as both pertain to MODIS

Response: Corrected as suggested

(18) page 3 line 22 to 24 'For example...' you can show it or maybe delete the statement

Response: Reformulated for a better understanding

(20)line 39 given the maximum observed value of 3.88NTU this looks like a large interval. Please provide the accuracy of measurmeent/event,line 42 quite a lot isnt it 19% and 29%? maybe explain why? line 44 it not necessary to give reference to inventor (Secchi) and you need to provide the disc specification, diameter and quote a procedure.

Response: While 0-1000 NTU is a large range, the instrument uses auto-ranging to adapt to give optimal measurement of the turbidity actually recorded. 19% and 29% are the standard deviations we recorded for these measurements. We are not sure of the precise reasons for this variability although we suspect a combination of the following: natural variability within the turbidimeter sample jar (occasional large particles going through the beam), slight imperfections of the sample glass jar (despite oiling),

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imperfect homogeneity of the sample from which the before/after subsamples were taken (despite mixing).

(21) page 4- line 2 do you mean pre-washed? or does it mean combustion of organic material? again reference style here –(Tilstone et al., 2002) check!

Response: It is a protocol to Filter preparation GF/F filters (0.7 μm) are pre-ashed at 450°C for 1 hr and then pre-washed in milli-Q water to remove friable fractions.

(22)line 18 to 20, so what does that mean ? connection of this sentence to the previous? please explain

Response: It's the phosphogypse issue. In fact, the Gannouche area and especially near the industrial port, the variation of the optical measurements is due essentially to the industrial wastes. The recent wastes of phosphogypse creates an opaque layer at the surface of the water, which induces a high turbidity and suspended matter; however these latest could be dissolved or decanted at a certain distance from the wasting area. Referring to the work of Bjaoui (2004), the expansion of the phosphogypse is mainly related to the current intensity and also to the bathymetry of the area of the waste. In fact, the pollution could be spread and dissolved progressively when the water depth is important and the water current of the area is not important. On the other hand, if the water current is very important and in small water depth area, the phosphogypse fall in the bottom very quickly and will be trapped there.

(23) line 33, what units represent the AOT 0.142??

Response :AOT The optical depth due to aerosols within the atmosphere is dimensionless <http://oceancolor.gsfc.nasa.gov/cgi/algorithms.cgi>
http://disc.sci.gsfc.nasa.gov/data-holdings/PIP/aerosol_optical_thickness_or_depth.shtml

line 6 page 5 better quantify '...majority...'

Response: Clarified as suggested

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since Table 1 gives in situ statistics maybe better to give also for satellite data used

Response: I think that the maps in figures 3-5 and 6 are sufficient to know the turbidity value for each area. A table with the values of satellite data will induce a misunderstanding because the greater number of locations covered by the satellite gives a greater range. In addition, the plot of TU in-situ and TU coming from the MODIS data show the degree of efficacy of the used algorithm.

(24)suggest 'seaborne' instead of 'sea borne'

Response: Corrected as suggested

(25) 'Conclusions' instead of 'Summary and Recommendation'

Response: Corrected as suggested

(26)In this paper a critical discussion is missing i.e. few reference is made along the lines 'This corresponds to measurmeents by...' or 'our findings agree well with ...'

(27)Yes this is right – line 5 -6 on page 6

Response: There are no extensive measurements in this area of TSM, which is precisely why we think that this new optical remote sensing method is worth reporting here.

Technical corrections (1) In this paper, is R^2 different from correlation coefficient and regression coefficient? if so please be uniform throughout the manuscript (2) space between numerical values and units or operators e.g. 2m is better presented as 2 m. (3) combine paragraphs to limit number of paragraphs in the whole manuscript (4)R_RS the RS in caps and italics (5) page 3 equation 1 and 2 too many brackets check this (6)page 3 line 34 , please be consistent 5th or 5th ? (7)page 4 line 22 to line 42 check for spaces between units and numeral and also on line 28 add : after (Fig. 3.b) and better 'contains' not 'contain' (8) equations are better placed in a new line and follow the guidelines of journal (9) Figures need to be resized they are just too small (10) the plots need to have the outer borderlines removed, and add top and right

axis resize to fit page see guidelines of the journal

Response: Technical correction are corrected as suggested and follow the guidelines of journal

Please also note the supplement to this comment:

<http://www.ocean-sci-discuss.net/7/C816/2011/osd-7-C816-2011-supplement.pdf>

Interactive comment on Ocean Sci. Discuss., 7, 1767, 2010.

OSD

7, C816–C827, 2011

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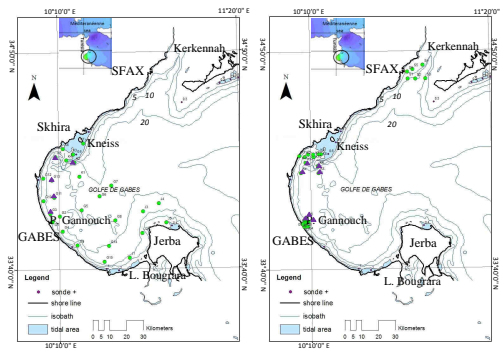


Fig. 1.

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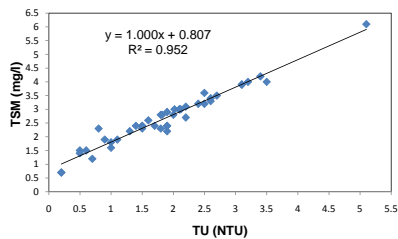


Fig. 2.

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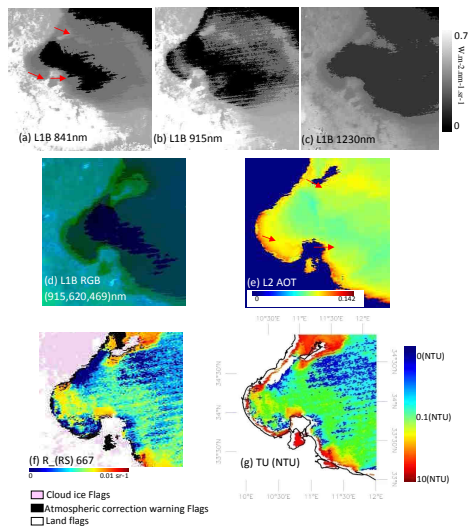


Fig. 3.

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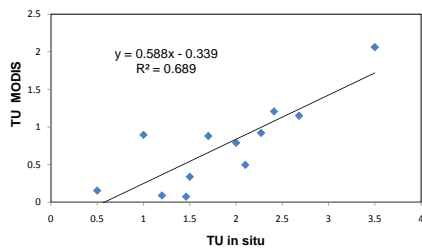


Fig. 4.

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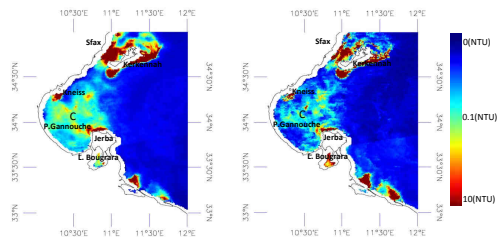


Fig. 5.

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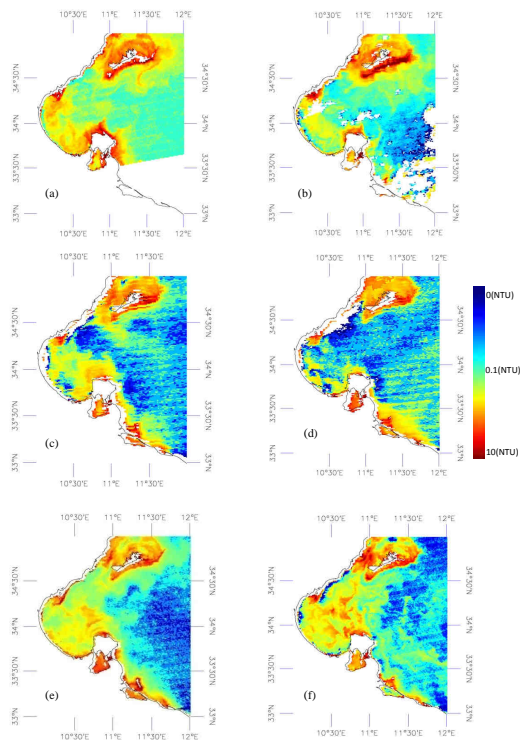
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Fig. 6.

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