Ocean Sci. Discuss., 8, C74–C76, 2011
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Ocean Science
Discussions

Interactive comment on "Quality control of automated hyperspectral remote sensing measurements from a seaborne platform" *by* S. P. Garaba et al.

Anonymous Referee #1

Received and published: 30 March 2011

This paper is concerned with improvements in processing automatically collected, near-surface measurements of ocean colour. The data presented emphasise the fact that rigorous quality control is required before useful data can be extracted from measurements of this type. Innovative aspects of the work include the use of a dual-field security camera to capture sea surface and sky images coincident with spectral acquisition and the development of a sun-glint 'flag' that makes use of intrinsic features of the acquired spectra. The data presented is certainly interesting, simply as a quantitative illustration of the difficulties encountered in near-surface marine radiometry. There appear to be a number of weaknesses, however, in the presentation of the work. The authors may care to respond to the following comments:

1. The use of camera images to divide the data set according to its degree of susceptibility to sun glint is a novel feature of the paper – it should be mentioned in the abstract.

2. Page 6 lines 5-7: how was the sea surface image assessment conducted: by visual inspection, or more objectively? This is important because the classification carried out at this stage affects the analysis of the rest of the paper. A related point is the question of how such a clean binary classification of the images was produced – were there no intermediate cases?

3. Page 6 lines 18-25: It appears that the presence of sun glint results in greatly enhanced Lw values : 'at least 10 times higher' according to the text. In that case, why was this information removed by normalisation before the development of a new sun glint flag was undertaken?

4. Page 6 line 26 (and associated Figures): nLw (normalised water leaving radiance) is a standard term in ocean colour radiometry. It is used to describe water-leaving radiances that have been adjusted to compensate for atmospheric effects and solar angle. In this paper, nLw appears to be used to designated spectra that have been normalised relative to their own maximum value. This is confusing, and an alternative term should be employed.

5. page 7 line 10: this reads as if the absorption of chromophoric dissolved organic material was confined to discrete bands rather than occurring as a continuum from the UV to the red end of the spectrum.

6. Page 7 line s 19 to 23: The adjustment of thresholds to optimise their discriminatory performance for one set of data may mean that they perform sub-optimally for a different data set. The obvious way to guard against this is to test classification algorithms using data sets which are independent of the one for which they were developed. The absence of validation using independent data is a significant methodological weakness of this paper.

7. page 8 lines 24-25: These lines may over-state the case. The fact that spectra free of sun glint were collected over a very wide range of angles does not necessarily mean that they were 'valid'. The validity would depend on whether the correction procedure embedded in equation (1) was effective over such a wide range of angles. The high NIR reflectance values in Figure 7 may indicate that some surface-reflected skylight is present in the 'valid' spectra.

8. The legend for Figure 1 implies that for some stations, in situ measurements were made in support of the above-surface measurements. Why does the paper make no use of the in situ data for validation purposes?

8. Page 9 lines 24-27: This criticism of the radiometric setup recommended by Mueller et al., and sold as a commercial product by at least one instrument manufacturer, is important. If the authors think their data backs it up, it could be given more prominence – maybe in the abstract?

Interactive comment on Ocean Sci. Discuss., 8, 613, 2011.