

Chapter 7

SUMMARY

7.1. Conclusion

In this thesis, a methodology for the retrieval of oceanic constituents from ocean colour in Case I and Case II waters has been derived. The retrieval method is derived by applying ANN techniques to a set of reflectance spectra typical of Case I and Case II waters, which have been obtained from RT simulations. The results show that this method is a promising technique for the retrieval of oceanic constituents in Case I or Case II waters from ocean colour measurements at sea level or at TOA. The conclusions may be summarised as follows:

- (1). The method is successfully applied to derive the pigment concentration in Case I waters from remote sensing reflectances just above the sea surface. It compares favourably with commonly used empirical pigment retrieval schemes.
- (2). A bio-optical model of the back scattering probability of marine particles in Case II waters is proposed in order to simulate the light field in Case II waters with sufficient accuracy for the development of retrieval schemes for oceanic constituents.
- (3). The method is successfully applied to derive oceanic constituents concentrations (CHL, SPM, and CDOM) in European Case II waters from hemispherical reflectances just below the sea surface.
- (4). When the method is applied to derive oceanic constituents concentrations (CHL, SPM, and CDOM) from the MERIS imagery at TOA above the North sea and the China Seas, plausible results are obtained. However, more work is required to validate the method for this specific application.

7.2. Future Work

- (1). With more accurate knowledge about the IOPs of oceanic constituents, the IOP models of oceanic constituents used in RT simulations of this thesis should be updated to increase the retrieval accuracy, especially for Case II waters.
- (2). More information on the IOPs in the China Seas should be obtained to solve the problems which have been met when applying the algorithm to the MERIS imagery above the China Seas.
- (3). The algorithm developed in Chapter 5 should be applied to more areas (outside the European waters) to check its performance for a global scale.
- (4). The algorithm developed in Chapter 6 for MERIS imagery will be widely validated in different areas with the simultaneous *in situ* measurements.

- (5). Since the variation of the IOPs in the different areas in Case II waters are large, specific algorithms for individual areas should be developed to increase the retrieval accuracy.