

Mapping of suspended sediment in the Tamar estuary

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Project:

High spatial resolution airborne remote sensing of suspended particulate material in river Tamar

Objectives :

- Develop a CASI above water atmospheric correction.
- Apply the AC to CASI overflights of the Tamar.
- Develop a SPM algorithm for CASI imagery of the Tamar.
- Apply the SPM algorithm to the CASI imagery.



CASI technical Specifications:

Channel	Centre Wavelength (nm)	Channel	Centre Wavelength (nm)
1	412.197	8	682.472
2	442.747	9	704.454
3	490.284	10	755.197
4	509.963	11	761.906
5	555.148	12	775.328
6	620.526	13	865.486
7	664.336		
Quantization bits		10 bits	
Altitude		5640 feet	
FOV		53.2 degrees	
Swath		512 pixels	



Atmospheric correction for turbid waters

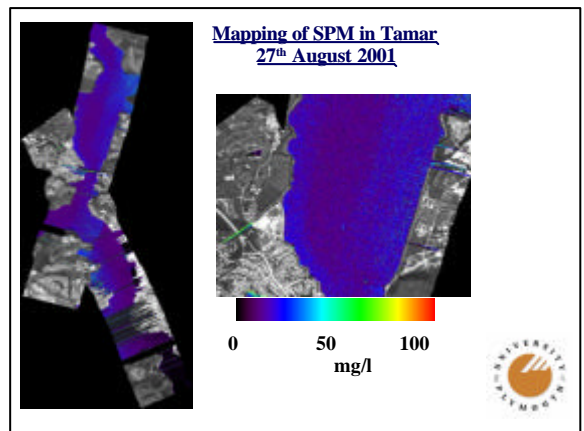
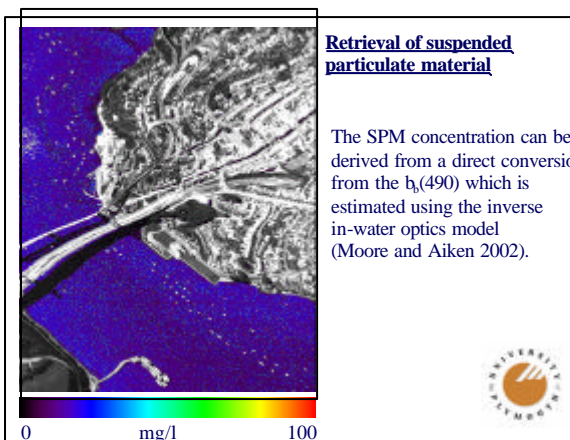
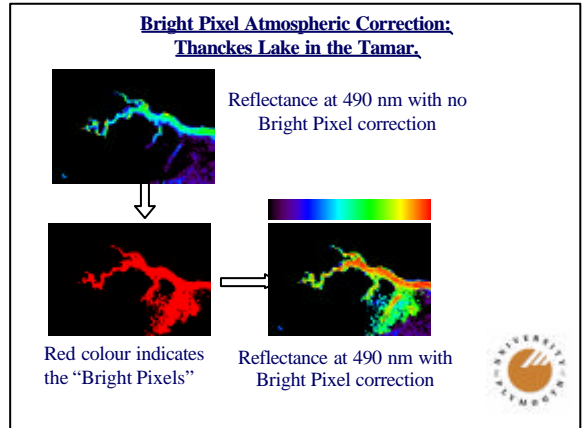
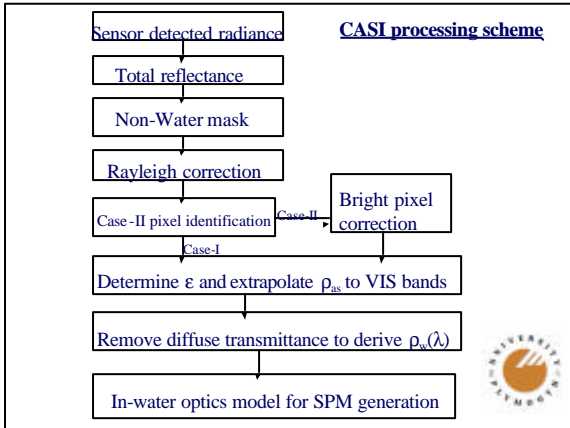
SPM algorithms work on the general principle that the sensor detected signal can first be corrected for atmospheric affects.

Case-I AC procedures rely on signals from NIR part of the spectrum, where the water leaving radiance is typically negligible.

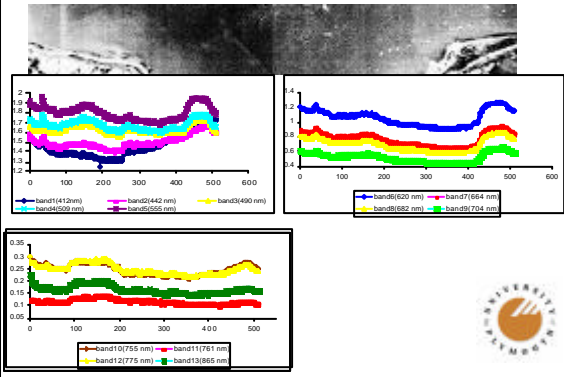
Non-zero water leaving radiance in the NIR is due to the presence of highly scattering SPM, makes such AC procedures to breakdown in turbid waters

Geo-biophysical algorithms will only be successful after addressing such issues in non case-I waters

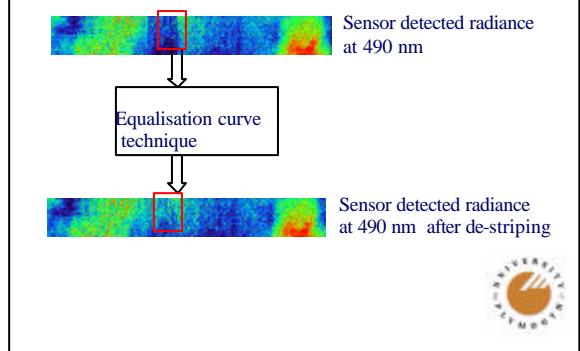




Non-uniformity in the across image calibration



Preliminary de-stripping technique for CASI data



Conclusion:

The principal outcomes of the research are:

- Implementation of BP Case-II AC for CASI.
- Inverse in-water optics model to estimate SPM concentrations.
- Development of CASIDAS software .
- Mapping of SPM in Tamar.

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