

Analysis of the use of remote sensing for monitoring algal weed mats at the Ythan estuary

Executive summary

The Environment Agency was commissioned by the Ythan Project to develop a method of quantifying algal mat biomass in the Ythan estuary, Aberdeenshire using remote sensing and comparing this to standard aerial photography.

The Compact Airborne Spectrographic imager (CASI), an airborne imager and a digital camera were used to gather data of the Ythan on 2nd August 2003. Ground biomass data were also gathered and these data were used to determine models for extracting biomass information from the CASI data. Six models were derived for determining algal dry-weight biomass. These models were tested and the most accurate used to generate biomass imagery. The most accurate model for biomass measurement using CASI produced a strong correlation with an r^2 of 0.88 and a root mean squared error of approximately 26gm^{-2} .

The digital photographs were manually interpreted, resulting in a map that contained two classes:

1. No algae or low algal biomass
2. Moderate or high algal biomass

A comparison of the two techniques was carried out. Though the digital photography method was cheaper than using CASI it was less suitable for monitoring, as there were problems with repeatability.