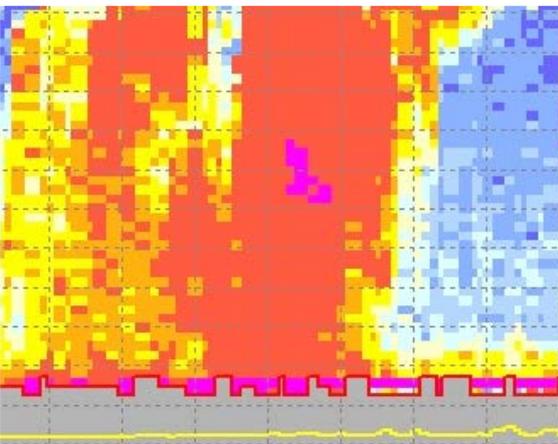


Sediview software



The Sediview Method is used to measure suspended solids concentrations using acoustic backscatter data collected by Acoustic Doppler Current Profilers (ADCPs) manufactured by Teledyne RD instruments (TRDI), San Diego, CA. Data can be obtained rapidly and with high spatial and temporal resolution.

The combination of detailed sediment and current data permits the measurement and analysis of dynamic and large-scale sediment distribution and transport processes with a high degree of confidence. Solids concentrations can be measured with an accuracy comparable with conventional techniques. The method has been applied successfully, even in locations characterised by variable particle size and by periodic flocculation of fine sediments.

Features

- > simultaneous measurement of suspended solids and current speed and direction
- > very rapid data acquisition through most of water column
- > vertical resolution as little as 0.1m
- > can be deployed on a moving survey boat
- > concentration measurement range from <1 mg/L to >2,000 mg/L
- > permits detailed study of solids concentration and flux
- > powerful software for computation of concentrations and for analysis and presentation of current and sediment data

Applications

The benefits of Sediview are greatest where a large amount of data is required to study dynamic sediment transport processes, particularly over large areas.

- > Environmental baseline and monitoring surveys.
- > Calibration of water and sediment movement models.
- > Investigation of estuarine processes.
- > Studies of coastal erosion, drilling mud losses and scour.
- > Investigation of sediment loss and transport from dredging and dredged material disposal operations.
- > Establishing sediment circulation and siltation patterns in harbour basins.
- > Studies of dispersion and dilution from outfalls.

Sediview software

Sediview is a powerful software package developed to assist with ADCP calibration, to process backscatter data and derive concentrations. It includes a wide variety of tools which can be used to analyse and output current, concentration, discharge and solids flux data. Options include time, depth and split-depth averaging, colour contour plots, vector plots, and numeric output (ASCII) for use with other applications.

Deployment options and equipment requirements

Sediview software is designed to be used with TRDI ADCPs which are operated using TRDI's WinRiver or WavesMon data collection software.

- > Fixed installations on the bed or on structures for long-term monitoring.
- > Deployment from a moving survey vessel.
- > Coastal and open-sea.
- > Rivers and lakes.
- > Ports and harbours.

Equipment requirements include water temperature and salinity sensors, water sampling equipment and regulated power supply to the ADCP. Sediview software accepts both bottom-track and external (e.g. dGPS) navigation data. The software also includes data error detection and correction facilities designed to eliminate spurious data and to overcome problems associated with bottom detection and loss of bottom track.

The Sediview package provided by HR Wallingford includes:

- > Sediview Data Processing, Analysis and Presentation Software.
- > Detailed, fully illustrated Procedure and User Software Manuals.
- > A comprehensive Technical and Software Support Service.
- > (Optional) A training course held on the Client's survey vessel and in the office.

For more information on Sediview contact:
Sediview@hrwallingford.com

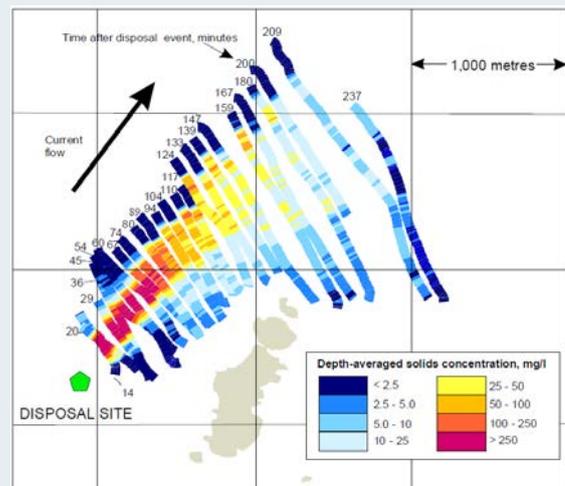
Example applications

Tracking sediment plumes

This sediment plume was formed by the discharge of dredged mud from a 8,000 m³ trailing suction hopper dredger. It was tracked, by sailing repeated lines past a drogue released at the discharge site, over a distance of about 2km to establish its rate of decay and the extent of the affected area.

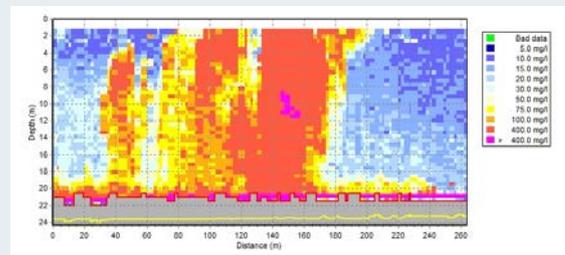
The plot shows the suspended solids concentration, depth-averaged over the lower part of the water column (about 15 metres).

With the permission of the Geotechnical Engineering Office, Hong Kong, China



Measurement of sediment release rates to the environment

The image shows suspended sediment concentration estimates for a sediment plume generated during dredged material disposal operations. Estimates are derived via analysis of ADCP data using the Sediview software. By acquiring such data sets close to the working plant release rates can be calculated from the measured fluxes after removal of the natural background sediment signal.



Measurement of flow discharge and suspended solids flux

The ADCP's ability to measure water currents throughout the water column, combined with the simultaneous measurement of suspended solids concentration permits measurement of large-scale sediment transport at a very detailed level.

These data were obtained during surveys undertaken at Harwich Haven and show the river discharge and sediment flux during spring and neap tidal cycles. Because the distribution of sediment in the river cross section is invariably non uniform and because the highest concentrations are not located in the areas of the fastest current, accurate measurement of sediment flux can only be achieved using simultaneous measurements of both current and concentration. They must be obtained rapidly, with a high degree of spatial resolution and minimal data averaging. For this application, Sediview in combination with TRDI's Broadband ADCPs, is ideal.

