



Engineering projects in a coastal environment

Helping manage and deliver baseline monitoring surveys for port and coastal developments: a case study.

Organisations involved in offshore and coastal developments are required under legislation to assess the environmental impact of their proposals prior, during and post construction. This is driving the need to acquire, use and manage better information to underpin improved decision making and to ensure licensing conditions and mitigation measures are being met.

Collection of multi-disciplinary data ranging in time and space such as tide, current and wave datasets together with oceanographic, hydrographic and meteorological information provides new challenges to organisations needing to handle and use this data effectively and efficiently.

Titan Environmental Surveys Ltd is a specialist contractor providing metocean, geophysical and hydrographic survey services in coastal and estuarine waters. The company offers a diverse range of expertise across many specialist areas, enabling provision of cost effective services on all engineering projects associated with the coastal environment.

Project Profile

Titan were commissioned by a client involved in a major new port development in the UK and were required to undertake the collection of baseline monitoring data including wave, tide and current conditions, suspended sediment and other key water quality parameters as functions of seasonal, tidal and non-tidal forcing.

The data were compared against numerical predictions to examine the impacts of a dredging campaign planned as part of the port's development proposals. This work allowed appropriate thresholds to

be set for dissolved oxygen and suspended sediment concentration levels to minimise disturbance and control environmental impacts. All dredging operations are to be monitored against these thresholds and need to operate within set limits.

Titan's Approach

To meet project requirements Titan has deployed a diverse array of oceanographic current meters, wave gauges and other water quality sensors in a variety of locations, with data collected and reported over a full seasonal cycle.

Given the wide array of sensor types, data formats, measured parameters and sheer volume of data collection it was clear that data processing, reporting and management would be a big challenge in the successful completion of the project.

Various options for managing the data were considered by Titan, including existing 'off the shelf products' which were discounted due to limitations in input, analysis and presentation of data from such a variety of instrumentation and formats. Inevitably, some form of database would be necessary to store the data and, although in-house software development was considered, it was deemed impractical in terms of time, resource and cost.

In discussions with SeaZone, Titan recognised that GeoTemporal Editor could offer the ideal solution to resolve its data management needs. Titan together with a number of other customers became early adopters of the software and has used the software extensively throughout the project period.



Titan Business Benefits

Rapid turn around and reporting of baseline field data ensuring high level of control and quality.

Transfer to client of baseline dataset as a single database with a clearly organised and well documented structure rather than as a series of disparate ascii listings and binary files.

Onward benefits to client's environmental team to maximise use and benefits gained from this major data collection effort, with the database easily extendable over the five year construction phase and beyond.

Key Applications

GeoTemporal Editor has provided Titan with a powerful and flexible platform to store, visualize, analyse, report and disseminate on a wide variety of data collected on behalf of its client. The SeaZone software has provided Titan with:

- Data management capability within a single environment using GeoTemporal wizard import regimes (e.g. simple data types from devices such as tide gauges and water quality sondes as well as the more specialised oceanographic sensors such as Current Profilers and Wave Gauges).
- Tools for the cleaning, checking, analysis and characterisation of data (e.g. current meter and wave gauge time-series) for the rapid inspection and generation of datasets.
- Additional data analysis options through more conventional software tools such as Geographic Information Systems (GIS), Matlab etc, through the GeoTemporal data model, export regimes and database links.
- Customisable graphical interface for construction of reports and specialised plots (e.g. frequency distribution of directional and non directional wave parameters), previously only possible through costly, specialist and in-house software development.
- Export regimes delivering data in a variety of simple ASCII export formats alongside essential and publishable metadata describing each dataset collected.

Following its initial success, Titan is using SeaZone GeoTemporal Editor in other customer work and the majority of their routine data processing and reporting tasks. The software's highly flexible and extendable interface and it's associated data model provides improved management of spatially based field datasets, such as moving vessel ADCP surveys and the analysis of CTD sections, and enables these to be delivered in smarter and more efficient ways.

Alison Smith, Marketing Manager, SeaZone Solutions Ltd. The case study was written on with/behalf of Titan Environmental Survey's, John Taylor, Survey Manager.

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