

# TrendAMaT

## Trend analysis for beach & sea-bed management

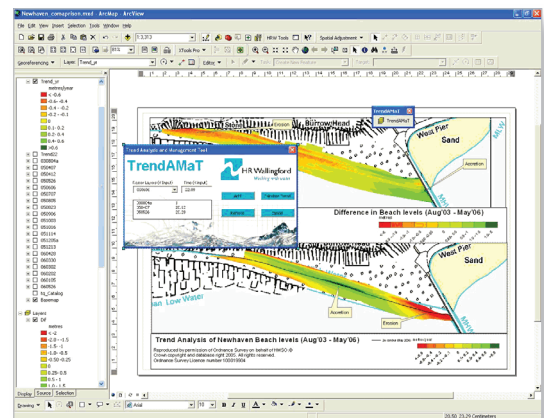
Improving our understanding of beach and nearshore sea-bed evolution often involves the collection of very large amounts of data. This inevitably covers large areas, and necessitates frequent and repeated surveys. Responding to the need to present this information in a form that is quickly understandable and can readily inform decision making about possible interventions, TrendAMaT (Trend Analysis and Management Tool) is a GIS Trend Analysis software recently developed by HR Wallingford.

GIS is commonly used by coastal managers to manage, display and analyse coastal, estuarine and riverine data. It is an ideal tool to deal with the spatial variability of the data. However most landforms within these environments also experience temporal variation, and this makes time trend analysis an important requisite if coastal landform evolution is to be understood. However, GIS techniques have not traditionally been able to calculate the change in values over time; and instead a simple but perhaps misleading technique has been used (This is where a Digital Terrain Model (DTM) created for a given survey is subtracted from an earlier one). The net result of this calculation is purely the difference in levels between two "snapshots" of bathymetries or beaches in time. It gives no indication of the variation of the levels between these two snapshots, and yet is often misinterpreted to illustrate the time trend of the data. One way to avoid this problem

is to extract the levels for each DTM at each individual cell, plot them in a graph and perform a linear regression analysis on them. Clearly this is very time-consuming, particularly since many DTM's consist of over 10,000 data cells; also this method does not indicate the spatial distribution of the time trends.

The new trend tool combines time trend analysis with the GIS spatial distribution and shows the changes in bed-level (or any other parameter) both spatially and temporally. This provides new information on coastal landform evolution, as shown in the figure below.

TrendAMaT tool uses colours to map the trends it has calculated for tens of thousands of individual data points across the area of interest. Whilst this indicates the areas of high variability, the tool actually calculates the rate at which the levels are changing. Designed for use by coastal practitioners, it provides a time-saving, analytical means of processing datasets of ever increasing size.



Trend analysis for a Newhaven shingle beach