

Channel Coast News

Issue 13 - May 2004

The newsletter for the Southeast Strategic Regional Coastal Monitoring Programme www.channelcoast.org

Regional News

South East Coastal Group

The Spring topographic profile campaign has now been completed with all data received and undergoing quality checking before being uploaded into SANDS.

Andrews Surveys have completed the Hydrographic Survey of Management Units 4bUnit8A to 4cMU17. Data has been received and is awaiting checking. Gardline have re-commenced the remainder of the hydrographic surveys, which are progressing well.

South Downs Coastal Group

Following some processing problems, Gardline Environmental are scheduled to deliver the hydrographic data by 28 May at the very latest. The data will then be quality checked and delivered to project partners.

Kampsax were finally gifted with favourable tide and weather conditions on the morning of 23 April, allowing the 1:3000 Aerial Survey (scheduled for March) to be completed.

SCOPAC

The recent good weather has allowed Titan Surveys to complete their bathymetric survey of the Isle of Wight – the photograph below shows the Titan Surveyor just passing the Needles, as she began the survey of Freshwater Bay.



photo: Titan Environmental Surveys Ltd.

Environment Agency (Southern Region)

Evaluation of the LiDAR tenders is now almost completed and a pre-contract meeting with the most successful bidder will take place shortly.

Following the poor flying conditions throughout March, a short spell of good weather at the end of April enabled Kampsax to recommence their flights. In addition to the 1:3000 flight from Selsey Bill to Beachy Head mentioned above, they have flown part of the SCOPAC 1:5000 flight (Swanage to Barton-on-Sea).

We have also recently submitted a bid to the EU for Interreg funding, to collect ecological data as part of the coastal monitoring programme. We hope to receive a positive result to our submission by the end of June.

Channel Coastal Observatory

The new data processing software for the Datawell Directional WaveRiders has been loaded at all stations. The buoy at Pevensey Bay was cut loose at around 0400 on Friday 14 May, and was recovered later that morning. It is now in Sovereign Harbour, by kind permission of the Harbour Master, awaiting re-deployment shortly.

Contacts

If you have any queries about the Strategic Regional Coastal Monitoring Programme, or would like a personal copy of this newsletter by email, please contact your area representative:

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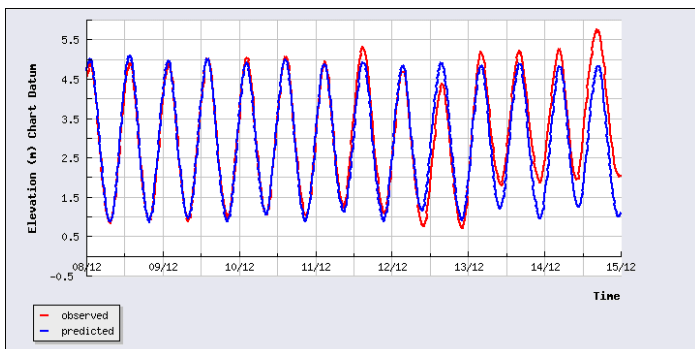
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Tidal Analysis

A prime objective of the Regional Monitoring Programme's network of tide gauges is to provide water levels for coastal flood warnings. This need is fulfilled by real-time measurements displayed on the web site, and with a facility for text messages warning engineers of high tide levels and/or high waves. Measured data are shown together with tidal predictions. The predicted tides are the expected tidal elevations due purely to astronomical forcing *i.e.* in average weather conditions. The "residual" is the portion of tide height which is forced by the weather conditions, such as low barometric pressure or strong winds. The residual is calculated as:

$$\text{Observed elevation} - \text{Predicted elevation}$$

so that a positive value (a positive surge) means that tide levels are higher than predicted. Conversely, a negative surge means tides lower than predicted – important for navigation but usually less so for coastal engineering.



Tidal surge at Herne Bay in December 2003, caused primarily by strong onshore winds.

The tidal data can also be used to produce annual statistics. Each year, the Regional Monitoring Programme will produce a report for each of their tide gauges, containing the annual statistics in a form which will be of most use to coastal engineers and planners. However, to produce this report, the data must be run through a number of stages.

Firstly, the data are quality-checked and any spikes removed. Harmonic analysis of data is carried out using the well-established TASK2000 software, which has kindly been provided by Proudman Oceanographic Laboratory. TASK2000 calculates the tidal constituents for one year's worth of data, then applies the constituents to the same input time series to derive the residuals. The advantage of

obtaining residuals from the measured data (rather than using the constituents calculated from a different year's data) is that they will be the most accurate, so that the surge levels can be thought of as "real" and not as a possible artefact of the analysis.

Statistical analysis includes deriving the date and time of the highest surge each month and the highest water level each month, as shown in the example from the Herne Bay tide gauge for 2003. In addition, the 10 highest surges and extreme water levels each year can be derived. This sort of information will be invaluable to tidal modellers and for further statistical analysis to see if/when the maximum surges coincide with spring tides.

Month	Surge maxima	
	Value (m)	Date/Time
January	1.607	30-Jan 18:00
February	1.050	04-Feb 22:00
March	0.740	12-Mar 13:20
April	1.035	02-Apr 21:00
May	0.598	09-May 01:10
June	0.540	19-Jun 11:30
July	0.521	02-Jul 09:40
August	0.608	29-Aug 21:40
September	0.773	23-Sep 04:40
October	1.286	07-Oct 18:30
November	0.475	23-Nov 06:40
December	1.454	21-Dec 16:50

Month	Extreme maxima	
	Elevation (OD)	Date/Time
January	2.98	03-Jan 00:00
February	2.70	20-Feb 14:50
March	2.79	21-Mar 02:00
April	3.06	02-Apr 13:00
May	2.75	19-May 02:00
June	2.74	16-Jun 01:10
July	2.68	16-Jul 01:50
August	2.96	30-Aug 01:50
September	3.04	27-Sep 00:40
October	3.14	08-Oct 23:30
November	2.93	23-Nov 23:40
December	3.12	21-Dec 10:20

Note that elevations are relative to OD, rather than the more traditional CD.

Next, the highest surge and extreme water level for the year is derived, as well as an annual Mean Sea Level. Such values can be projected into the future although, as with all statistics, the longer the data set the more reliable the predictions.

Finally, the gauges are checked for some sort of regional consistency, by comparing the levels and residuals with nearby gauges. In this task, we are aided greatly by the recent production of reports on the National Network tide gauges (including those at Weymouth, Bournemouth, Portsmouth, Newhaven, Dover and Sheerness), on which our tidal analysis and reporting has been closely modelled.