



Project website

Patrick Fitzsimons, Kate Cole and Uwe Dornbusch have been working on an update of the BAR project website. You can now find a new "Wildlife and coastal habitats" section plus all of the Phase I reports.

www.geog.sussex.ac.uk/BAR

Biodiversity team

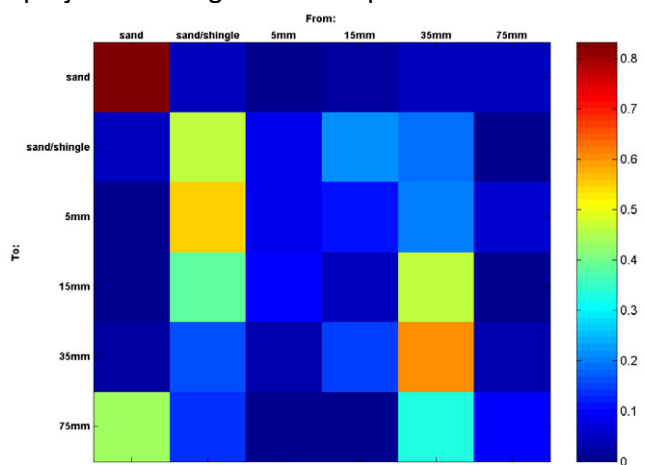
On Saturday 4th February Kate Cole met with Andy Dinsdale from the RSPCA Mallydams to explore the intertidal zone at Pett Level, and to undertake a Shore Search Survey. Despite the early start, a number of volunteers braved the cold and were rewarded with everything from sand mason worms to necklace shells. The records will be entered on to the Marine Recorder database held at the Booth Museum in Brighton and are to be uploaded onto the National Biodiversity Network, helping to map the distribution of species around the UK coastline.

Elinor Low has been working on an analysis of the many invertebrates, trapped during the course of her year-long study on coastal vegetated shingle at Cuckmere Haven (Seven Sisters Country Park). Invertebrate findings indicate an array of life styles from coastal specialists to common wide-ranging species. The new fly species found recently by Dr. Barry Yates at Rye Harbour crops up frequently in her traps, as does a coastal shingle specialist, the blind beetle *Trechus fulvus*. However many more common woodlice, beetles and spiders are crawling through the shingle interstices. Elinor's work will be presented at the next BAR project meeting in Dunkerque on 10th March.

Geomorphology team

Tamsin Watt's investigation into the morphodynamic and sedimentary response of mixed beaches along the coast of south east England is in the final stages of analysis. Her novel approach uses Markov chains in coastal research and tests for Markovian inheritance within mixed beach behaviour and response.

Part of her analyses involves measuring transitional probabilities of both surface sediment and profile response in relation to forcing wave conditions. Initial conclusions demonstrate that despite very large differences in management regimes, mixed beaches respond in a similar manner on large (holistic) scales. However seasonal and event (storm, recovery) responses demonstrate clear patterns and trends in both sediment and profile behaviour. Her work will be presented at the next BAR project meeting in Dunkerque.

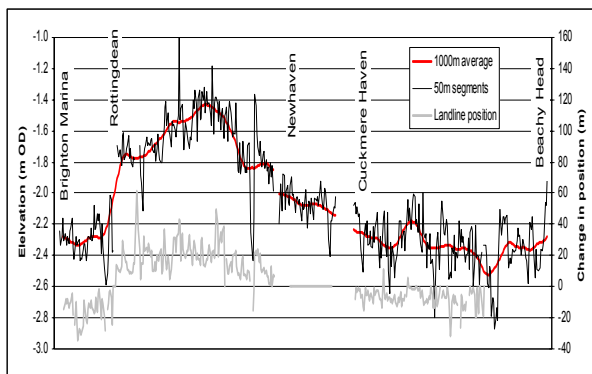


Transition Probability Matrix for Pevensey Grain Size Data

The colour matrix above demonstrates size transitions of sediment over time on a natural beach section at Pevensey Bay. What is initially obvious is that many of the size fractions actually show very few transitions with 'self to self' transitions being quite common. Therefore from a more holistic point of view, mixed beaches seem to demonstrate quite stable behaviour, at least in terms of surface sediment distribution.

Uwe Dornbusch has conducted a study into the positional changes of mean high water and mean low water lines (LWL), shown on the 1st edition "Six inches to the mile" Ordnance Survey maps and the Landline data. For most of the coast between Brighton and Margate the line on the 1st edition map has been drawn too far seaward (possibly showing the mean low water of spring tides rather than of ordinary tides). In addition the Landline data has a tendency to

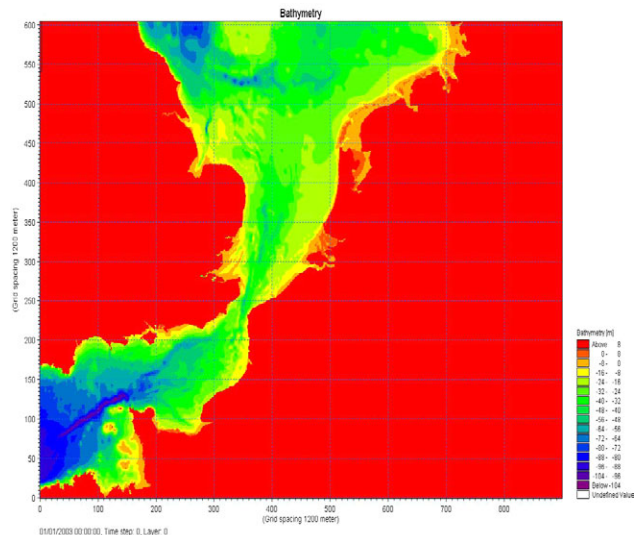
show the LWL too far landward, seemingly due to different assumptions about the elevation of mean low water. This is illustrated in the figure below, based on the Environment Agency Lidar data flown in January 2005. Excluding data spikes, the elevation of the LWL varies between -2.6 m and -1.4 m while the mean water level, measured at the Newhaven Tide gauge is -2.1 m. Based on the position of the contour line of that elevation the Landline LWL is located ~20 m landwards between Saltdean and Newhaven, approximately the right position between Newhaven and Cuckmere Haven, ~5 - 10 m seaward east of Cuckmere Haven and 10 - 30 m seaward between Brighton and Saltdean.



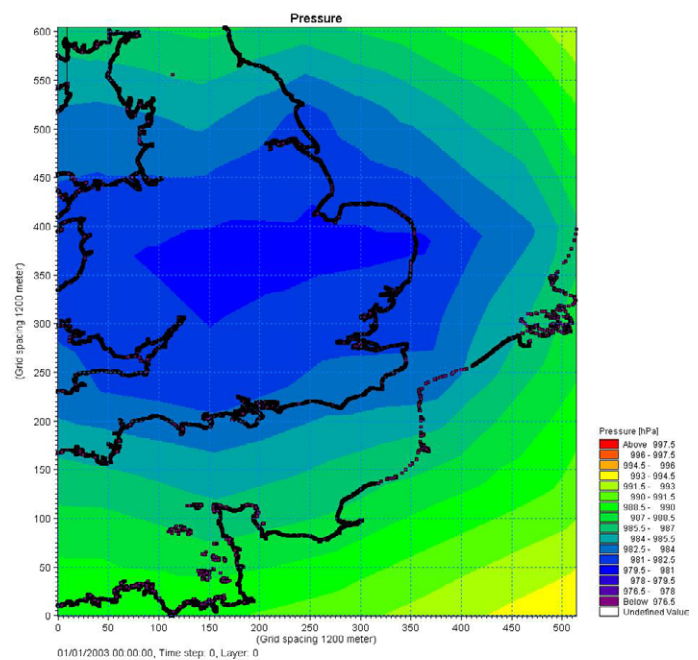
Elevation of the Landline LWL based on LIDAR data between Brighton and Beachy Head and the resulting difference in position compared to the -2.1 m contour.

News from project partners ABPmer

BAR project partners ABPmer have been working upon surge modelling and tidal analysis of the BAR coastline. Their work to date has focused on rebuilding the existing model of the English Channel and extending it to cover the entire BAR project study area, as shown below.



The model has been calibrated against tidal data at gauge locations along both the English and French coasts and data for use in this project was supplied by the UK Meteorological Office. ABPmer report that their model shows good agreement against the UKHO predictions. The current priority is to create pressure maps that can simulate the large storm of October 1987 and a 1 in 10 years return event in January 1996. ABPmer are in discussions with Proudman Oceanographic Laboratory to obtain the external surge component to apply along the western and northern water level boundaries of the model, corresponding to these chosen simulation periods. The figure below shows a sample of a pressure map over the study area for 15th October 1987 at 00:00.



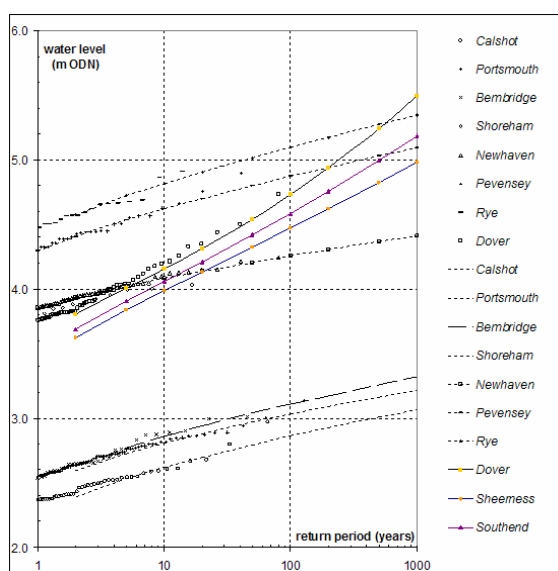
Pressure map, October 1987 00:00 (derived from UK Met. Office supplied data).

In addition to tidal surge modelling, ABPmer is undertaking detailed analysis of tidal data across the study area. Analysis of extreme water level records along the English south coast indicates uniformity in the growth rate of trends between Portsmouth and the Rye-Pevensy area. However, further east at Dover, the form of the extreme growth rate changes and the Dover records bear more resemblance to those of east coast locations, than to the Channel sites.

At frequent return periods Dover resembles south coast data, while during more extreme events it behaves as an east coast site. This is thought to be due to the propagation of

westerly surges at the frequent return periods being replaced by contributions from large east coast surges entering the Strait of Dover under more extreme conditions.

The switching of surge dominance from westerly to easterly is a characteristic of the BAR coastline and is one of the subjects that ABPmer is considering in more detail in its tide-surge modelling of the eastern end of the Channel and the southern North Sea.



Predictions made by ABPmer using data from BODC, UKHO and EA.

French team

David Aernout's Ph.D. thesis "*Le rôle des changements bathymétriques à l'avant-côte sur l'évolution des littoraux meubles du Cap Gris-Nez à Dunkerque, Côte d'Opale, Nord de la France*" was completed on December 7th, 2005.

His work focused on nearshore bathymetric changes during the 20th century at Wissant Bay and Calais. He found strong relationships between these areas and the evolution of adjacent coastlines, highlighting the importance of the nearshore sediment budget for understanding coastline behaviour. He also carried out wave propagation modelling over different bathymetries, using representative offshore wave characteristics. His work demonstrated that bathymetric changes significantly modify the spatial variations in wave energy at the coast, which strongly control the

patterns of erosion and accumulation along the shoreline.

Announcements

The BAR project team would like to send their congratulations to Faye Gillespie and her new family! Roman Miles MacKenzie was born at 12.56 pm on Friday 20th of January, weighing in at a healthy 7 lbs 2 ounces. We wish them all the best for the future.

BAR project meeting

Colleagues are warmly invited to attend the next BAR meeting on 10th and 11th March 2006, hosted by Professor Arnaud Hequette at the Université du Littoral's Laboratoire Géomorphologie Dynamique et Aménagement des Littoraux (GEODAL) in Dunkerque. The meeting provides a good opportunity to meet with project partners, French officials and coastal managers. On the morning of Friday 10th March the programme's aims and work packages will be presented and in the afternoon interim scientific results. Saturday 11th March will be run by the project ecologists and in the morning there will be a Vegetation Survey Workshop, in which colleagues will share expertise on approaches to and methods of collecting ecological data specific to coastal habitats. In the afternoon there will be an opportunity to see how this can be put into practice with a field trip to Les Dunes Flamandes. For further details please contact Dr Caroline Rufin (rufin@univ-littoral.fr).

Contacts

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