

Breaking down barriers to successful fieldwork

Colin describes how he used the North Norfolk coastline and local contacts to devise a new low-cost fieldwork programme.



For many years, Fakenham College had run very successful residential A level fieldwork trips, but these were becoming prohibitively expensive. I had to find a cheaper approach. I needed something that would stretch my students' abilities and provide an outstanding fieldwork experience.

Fakenham is within 30 minutes of the stretch of the North Norfolk coast between Salthouse and Sheringham. Not only is this area accessible, but considerable research into the management of coastal erosion has taken place here. Prior to becoming a teacher I had worked as a coastal geomorphologist on the North Norfolk coast, so already had experience of coastal process and management and knew I could develop a programme of challenging coastal fieldwork.

The first obstacle I had to overcome was that we lacked the necessary equipment for students to undertake accurate beach surveying work. We needed professional surveying equipment – using tape measures and clinometers would not give students a fixed vertical datum or fixed horizontal locations, so we would not be able to make accurate comparisons between different data sets at the same sites. So I took my ideas to the Sheringham Shoal Offshore Wind Farm, who have

88 operational wind turbines off the North Norfolk coast. Developing links with the wind farm has provided many useful educational opportunities for our students to see the practical application of their geographical studies, and I was delighted when they kindly agreed to fund five sets of surveying equipment and GPS units (Figure 1).

Developing a hypothesis

Making students responsible for their own geographical investigations is the key to effective fieldwork, although this poses risks and challenges. It should be about individual students designing their own fieldwork, not all students following the same set of pre-determined procedures. Prior to the field trip, the students reviewed the academic literature to help them understand the complexities of the processes operating along the coastline. They learned about the long-term movement of beach material along the East Coast in the work of Hardy (1964) and Clayton, Mc Cave and Vincent (1983). They found general concepts of coastal forms and processes in Pethick (1984), and work on the impact of the 1953 floods in Steers (1971). Their reviews were combined with a differentiated fieldwork experience to meet their individual needs and abilities. This involved a programme of skills development, piloting group work and independent fieldwork investigations. In designing this new fieldwork approach, I also made sure that literacy, numeracy and ICT skills were included, while still meeting the requirements of our examination specification.

In the field

My plan was that the students would build up a bank of data over several years. Measuring from the same points each year was essential for the data's accuracy and value. Students worked in groups at three sites: Sheringham, Weybourne and Salthouse (Figure 2 and 3). Using the professional surveying equipment and fixed datums from survey markers, students could assess the accuracy of individual surveys down to the nearest millimetre. For a fixed horizontal location I used trigonometry and Google Earth to develop a grid of fixed survey points, allowing longitude and latitudes of the fixed points to be located. These were imported into global positioning system (GPS) units which students used to locate and mark the points with ranging rods on the beach within one metre accuracy. The basics of levelling to a fixed datum, including the recording of survey data in level books and reducing levels to work out final levels related to a fixed datum, had been taught during lesson time.



Figure 1: Surveying equipment funded by the Sheringham Shoal Offshore Wind Farm. **Photo:** Colin Bye.



Figure 2: Fakenham College students use the surveying equipment on the North Norfolk coast. **Photo:** Colin Bye.



Figure 3: Students build up a bank of data by measuring from the same points each year. These measurements are used to monitor coastal change. **Photo:** Colin Bye.

Back in the classroom

We undertook an initial review of the data collected and evaluated the success of the surveys, with students going on to design independent fieldwork investigations based upon their group fieldwork experiences. The form of the data analysis – a Spearman’s rank correlation – had been determined before the start of the fieldwork, so they needed to collect x variable independent data and y variable dependent data. Groups of students were given one of three targeted sets of possible x and y variable data pairs, with the exact choice of specific combinations of x and y variables being left to them. The sampling structure and frequencies were also left to the students to finalise, based upon the experience of their pilot group-based studies.

The initial group fieldwork became a set of secondary data which could be used by all the students, along with the new primary data set collected. As the surveys produced beach levels, basic trigonometry converted these beach levels into beach profile angles to be used in the students’ investigations. Finally, students analysed the data.

The fieldwork is completed both in February of year 12 and February of year 13; comparing the two data sets and studying the change in the beach over several years allows trends to be identified. Revisiting the sites to see what has changed maintains the students’ interest, and the ongoing nature of the fieldwork keeps the investigations alive.

The thrill of the unexpected

None of us could foresee that the fieldwork completed in February 2013 and February 2014 would take place before and after the massive storm surge which hit the North Norfolk coast on the evening of 5 December 2013. It gave the students a real-life data set, measured to

References

- Clayton, K.M., McCave, I.N. and Vincent, C.E (1983) ‘The establishment of a sand budget for the East Anglian coast and its implications for coastal stability’, in *Shoreline Protection*. Thomas Telford Ltd, University of Southampton. pp. 91–96.
- Hardy, J.R. (1964) ‘The movement of beach material and wave action near Blakeney Point, Norfolk’, *Transactions of the Institute of British Geographers*, 34, pp. 53–69.
- Pethick, J. (1984) *An Introduction to Coastal Geomorphology*. London: Edward Arnold. pp. 92–101.
- Steers, J.A. (1971) ‘The East Coast Floods, 31 January–1 February 1953’ in Steers, J.A. (ed) *Applied Coastal Geomorphology*. London: Macmillan.

fixed datums and at fixed locations, showing the impact of the storm surge. Beaches were thrown out of a long-term equilibrium. Changes in beach levels were dramatic, measured in metres, not millimetres. Suddenly, my students were not just collecting fieldwork data for A level geography: they were also contributing to a long-term coastal monitoring project.

Into the future

To capture students’ interest and have a long-term value, fieldwork investigations need to have a practical application. Coastal management on the North Norfolk coast depends upon ongoing analyses of changing landforms and understanding of coastal processes. This allows my students to consider the long-term value of fieldwork data, not only to academic research but also in terms of the management of this length of coast.

Our in-house fieldwork programme now consists of two days of fieldwork in year 12 and two in year 13. It involves a literature review, detailed numerical analyses, and the use of GPS, GIS and ICT. It is now being further developed using the Google Drive platform, to allow seamless sharing and recorded commenting on investigative data and research portfolios between students and teachers. With the requirements of the new A level Geography specifications to be taught from September 2016, I will be developing of the human geography element of the fieldwork through further research on the implementation of Shoreline Management Plans.

Successful fieldwork can be carried out cheaply if you have local access to suitable sites. All the fieldwork described was undertaken within the college teaching day, at a cost of less than £15 per student per two days. However, to develop students’ thirst for knowledge, it needs to be challenging, memorable, relevant and applicable to their everyday lives in the communities in which they live. | **TG**

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