

Project title: Research-led Investigations of Coastal Processes 0000963F

Details of project team: Prof Jon Williams¹, Dr Luciana Esteves² School of Geography, UoP and Professors Alverinho Dias, Dr Oscar Ferreira, Dr Ana Matias and Mr Andre Pecheco, University of Algarve, Portugal.

Summary of the aims of the project: The project targeted students wishing to develop their knowledge and acquire understanding of **the research process**. Contemporary research activities were used to inform teaching during the project and contributed to the students understanding of how research is done. Specifically the project aimed to: (a) develop student appreciation of research in coastal science; (b) develop of student research skills; (c) involve students in assignments which incorporate elements of the research processes; (d) provide students with an opportunity to work on research projects alongside staff; and (e) give students firsthand experience of collaborative multi-disciplinary research endeavours. The project exposed students to the **very latest research** into coastal morphodynamics at an active field site in Portugal. It focused both on natural coastal processes and the anthropogenic issues at dynamic coastal locations. It also examined a wide spectrum of coastal subjects encompassing: water quality, aquaculture; tourism; coastal erosion; coastal zone management; and sustainability.

Methods used: The methods adopted were designed to ensure that the students experienced a **truly research orientated teaching environment** and actively engaged with research staff and students. They were involved in the design of field experiments and were acquainted with various methods of data collection, analysis and interpretation. Through this approach in the laboratory and the field student were made aware of the latest research findings and how these impact upon more generic understanding of coastal systems. The work was designed to challenge the students and to help develop their research skills and their capacity to apply these skills to practical situations. A key element in the approach was to show how the students work contributed to a joint Portuguese/UK research effort in the Algarve and demonstrated the benefits of **international collaboration** in science.

Specific methods used included:

- Evening presentations of local research activities and findings.
- Devising a rotation scheme to ensure each student sub-group had an opportunity to work with and understand the field equipment.
- Keeping an annotated and detailed diary of all fieldwork activities.
- Giving responsibility to groups of three students to collect, process and archive specified field data sets.
- A requirement of each student group to produce a short summary report at the end of the visit.

Fig. 1 shows a montage of photographs taken during the fieldwork week in Portugal. Appendix A provides a diary of all activities during the project in Portugal.

Number of students involved

¹ <http://www.plymouth.ac.uk/pages/dynamic.asp?page=staffdetails&id=jjwilliams2>

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The project involved 12 students from the SoG module GGP3155, Morphodynamics of Barriers and Beaches.

Findings/ outcomes/ impacts

The students taking part in this project reported considerable benefits. On returning to Plymouth they informed other students of the good learning experience. A survey of the student's experiences and impressions was undertaken after the project using a questionnaire. The quotations below reflect the **positive views** of the students.

"I found both physical and analytical sides of the fieldtrip very beneficial. The field work which we undertook made me understand the physical aspects of beach and barrier geomorphology in the field as well as the processes which immediately affect them and on a longer scale".

"The most beneficial aspects of the field work was being in the field collecting the data which added weight to the introductory days as well as making clearer what had been learnt in the lectures before the trip. This has made subsequent lectures and reading easier to understand".

"It was good to hear about the study area from people who work there and have researched the area in detail. It added a valuable insight into the complex processes along the whole island system".

"I feel I have benefited from the expertise of the Portuguese researchers and that it helped my team working abilities especially in light of different mother tongue languages (although the Portuguese spoke very good English)".

"All of the evening events provided time to wind down from the day's activities but also the opportunity to get to know peers, lecturers (Plymouth & CIACOMAR) and technicians on a non-professional basis. It also provided a chance to sample some of the local culture that might otherwise have remained undiscovered".

"I found the field trip a valuable addition to the current module, making all aspects of the module easy to relate to as I have seen examples of the landforms and features first hand and have been able to study them in depth, thereby providing a frame of reference for my future study and revision".

There were very few negative comments received. Typically these reflected some technical issues. For example:

"The lengthy run through of GPS software and set up as some of it seemed irrelevant in the field. However I really enjoyed the practical application of the GPS equipment".

Other issues concerned the local organisation of work. For example:

"Only time tables or improved organisation during field work as there were times when some people had nothing to do or were just standing around while others where working hard".

Continuation/ dissemination plans

The primary outcome is the conversion of this pilot project into a fieldwork module offered Level 3 SoG students in 2009. This module is now fully approved and will take 19 students to Portugal in October 2009.

Regarding dissemination, a poster has been prepared and informal discussions have been held with colleagues interested in the outcome of this project. In addition, the experiences from this project, together with the detailed results from the student survey add to a body of data to be published in Williams et al. (2009).

Fig. 1 Images from the project in Portugal



Appendix A: FARO FIELD TRIP DIARY, 21st to 28th October 2007

Sunday 21st October: Travel from UK. Unload and check all equipment. Programme hydrodynamic instruments and check functionality. Collected students from airport and checked into Ibis Hotel, Faro. Evening briefing on the weeks work given by Jon Williams.

Monday 22nd October 2007: Field trip to the western end of the Ria Formosa led by Óscar Ferreira (UAlg – Universidade do Algarve) visiting: Quarteira breakwater system; Vale do Lobo Resort; Praia de Faro, Peninsula do Ancão, Barra do Ancão (Faro Beach, Ancão Península, Ancão Inlet). Lunch taken on Praia de Faro before travelling to CIACOMAR Research Centre (UAlg). Presentations given on: *CIACOMAR* Research Activities; and a technical description of the fieldwork equipment to be used during the surveys by Richard Hartley (UoP). Here the main focus of the work was the RTK DGPS equipment to be used in a number of subsequent surveys. Following dinner students were given a side show in the Hotel about Ria Formosa Barrier Island System by Jon Williams.

Tuesday 23rd October 2007: A lecture entitled “Application of streamer traps on sediment transport studies” was given to the students by Luciana Esteves at the CIACOMAR Research Centre. This was followed by a second field trip to the barrier island of the eastern Ria Formosa with CIACOMAR Researchers. The visit included visits to Barra de Cacela / Peninsula de Cacela; and Ilha da Culatra.

Wednesday 24th October 2007: The ADCP survey planned for the Ramalhete and Ancão channels by CIACOMAR Researchers was abandoned early in the morning due to equipment malfunction in rainy conditions. Inlet and beach process studies for UoP students was led by Jon Williams assisted by Luciana Esteves and Richard Hartley. The students worked with an RTK-DGPS and a total station measuring beach profiles and barrier island topography. Students examined morphological structures, perform visual wave height and period estimations, collected sediment samples, used streamer traps to measured alongshore sediment flux and measured the alongshore currents. UoP student were joined by UAlg students. Instruments deployed included the Valeport ECM and Level Troll 300 Pressure sensors. At low water in the evening UoP and – CIACOMAR staff and researcher installed three scaffold poles at locations in the Barra Nova inlet in preparation for the work the following day.

Thursday 25th October 2007: A Sontek Ocean Probe ADV and two Level Troll 300 pressure sensors were deployed at low water early in the morning by UoP and CIACOMAR staff. The work was assisted by UoP student volunteers. UoP student spent the morning studying overwash dynamics and barrier topography with Ana Matias (UAlg), Rita Carrasco (UAlg), Carlos Loureiro (UAlg), Pedro Almeida (UAlg) and Richard Hartley (UoP). The group was responsible for performing a complete topography of the west area of Barreta Island using the RTK-DGPS and total stations. In the afternoon work continued with further studies of inlet and beach processes supervised by Jon Williams (UoP), Luciana Esteves (UoP) and André Pacheco (UAlg). The main focus of this work was data acquisition for alongshore sediment transport studies. UoP and CIACOMAR staff returned to the Barra Nova at the evening low water to recover the ADV and the pressure sensors. A boat was

used to transport the heavy items of equipment. UoP student volunteers assisted with this work.

Friday 26th October 2007: Supervised by Rita Carrasco (UAlg) and André Pacheco (UAlg), UoP students assisted with a survey of micro topography of the *BERNA* study site. The group performed a complete micro topography of the BERNA area using RTK-DGPS and a total station. In addition UoP students assisted in the collection of superficial sediment samples. A group barbeque was held at the house of André Pacheco. This social event included all UoP students and staff with staff and students from UAlg.

Saturday 27th October 2007: UoP students and staff spent the entire day at the CIACOMAR Research Centre. Data were downloaded from instruments and examined. Sediment samples were dried, weighed and sieved. All field data was documented and collated into various Excel spreadsheets by the UoP students in preparation for further analysis by UoP and UAlg researchers. An end of field trip group dinner was held at a Portuguese restaurant in Faro City. Students were too exhausted to experience Faro Night Life and returned to the hotel early.

Sunday 28th October 2007: Return to UK.



Research-led Investigations of Coastal Processes

Dr Jon Williams and Dr Luciana Esteves, School of Geography



Location of the field site, Algarve, Portugal



Praia do Faro, Algarve, Portugal



Península do Anão from Boreia



Our home in Faro for the week

Aims and Rationale

The project involved students in the very latest research into coastal morphodynamics at a field site in Portugal. The work was designed to challenge students and help to develop students' research skills and their capacity to apply skills to practical situations. It focussed both on natural coastal processes and the anthropogenic issues encompassing:

- coastal erosion
- coastal zone management
- climate change
- water quality
- aquaculture
- tourism

Outcomes

The project targeted students wishing to develop their knowledge and acquire understanding of the research process. Contemporary research informed teaching and

contributed to student understanding of how research is done.

It was judged to be successful in the following areas:

- developing student appreciation of research in coastal science
- developing student research skills in data collection, analysis and interpretation
- involving students in the research processes through

involvement in the design of field experiments

- providing an opportunity for students to work alongside staff
- awareness of the latest research findings and how these impact upon generic understanding of coastal systems
- contribution to the joint Portuguese/UK research effort in the Algarve
- demonstration of the benefits of international collaboration in science



Teaching field measurement techniques



Getting to grips with beach surveying



Field visit to the eastern Ria Formosa



Party with our Portuguese friends