

Progress Report on the First Meeting/Workshop

EVREST Project

(21-23 September 2016 – Faro Portugal)

1. MEETING OUTLINE AND ATTENDANTS

Day 1 (21/9):

- Geomorphological field trip to Ria Formosa - Culatra Island and Barreta Island
(A. Matias, K. Kombiadou, R. Carrasco, Ó. Ferreira, S. Costas, T. Plomatitis, R. Taborda, C. Antunes, R. Borges, A. Moura, L. Moore, D. Roelvink, Fig. 1) + skipper Argel (Passeios Ria Formosa)

Day 2 (22/9):

- Meeting/workshop presentations
- Scientific discussion
- Administrative meeting
(A. Matias, K. Kombiadou, R. Carrasco, Ó. Ferreira, S. Costas, T. Plomatitis, R. Taborda, C. Antunes, R. Borges, A. Moura, L. Moore, D. Roelvink) + MSc student G. Vieira

Day 3 (23/9):

- Dissemination meeting
- Ecological field trip to Tavira Island (Barril)
(A. Matias, K. Kombiadou, R. Carrasco, T. Plomatitis, R. Taborda, R. Borges, A. Moura, L. Moore, D. Roelvink)



Fig. 1 – Fieldtrip attendants on September 21, 2016.

From left to right: D. Roelvink, A. Moura, R. Borges, R. Carrasco, R. Taborda, L. Moore, Ó. Ferreira, S. Costas, C. Antunes, Irene, A. Matias, T. Plomaritis, K. Kombiadou.

2. GEOMORPHOLOGICAL FIELDTRIP

10h30: Meeting in Olhão Marina

10h45: Stop 1: Inside the boat, middle of the Faro-Olhão channel, between groins.

Brief explanation of the Ria Formosa barrier island system, including location, orientation, and wave exposure.

Description of the engineering works to open and stabilize the Faro-Olhão Inlet. Explanation about direct and indirect consequences of these engineering structures.

11h30: Stop 2: Culatra village, next to “Centro Social”

Description of Culatra Island evolution, including longshore growth, spit morphology, dune development, salt-marsh development.

Walk along the path until the oceanic beach to observe tidal channels, foredune morphology, beach rhythmic features, etc.

13h15: Stop 3: Farol, restaurant “Associação da Ilha do Farol”.

15h15: Stop 4: Farol, next to the lighthouse.

Description of changes in shoreline position on both sides of the inlet and artificial beach nourishment.

15h45: Stop 5: Barreta Island, next to the jetty

Description of dune growth and shoreline change.

Walk from the beach to the restaurant to observe foredune morphology and vegetation (embryo-dunes) and dune ridges and back-dune vegetation.

17h00: Arrival at Olhão Marina



Fig. 2 – Fieldtrip explanations on board and at the barrier islands; fieldtrip group and consultants and several field sites on September 21, 2016.

3. MEETING/WORKSHOP PRESENTATIONS

All presentations took place in Universidade do Algarve, on room 2.57, Building 7, except L. Moore lecture which took place on amphitheatre A, Building Complexo Pedagógico.

09h30: EVREST project in brief

A. Matias

10h00: The Ria Formosa barrier islands

Óscar Ferreira

10h30: Dunes and barrier of the past

Susana Costas



Fig. 3 – Meeting/workshop presentations.

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| 11h00: Modelling on the West Frisian barrier islands | Dano Roelvink |
| 11h30: The sea-level records of Portugal | Carlos Antunes & Rui Taborda |
| 12h00: Modelling storm and sea-level rise impacts on barriers | Haris Plomaritis & Rita Carrasco |
| 14h00: Barrier island ecomorphodynamics and response to changing climate | Laura Moore |

4. SCIENTIFIC DISCUSSION

In the following part, a synthesis of the main issues discussed, the proposed measures and the future steps decided to achieve the project objectives during the meeting is provided, analysed for each specific project task. It is noted that tasks 1 and 2 are discussed in conjunction due to overlapping of activities/ objectives.

Tasks 1 & 2 - Data collection and GIS integration & Quantification of hydrodynamic and morphological variables

The types of available data were discussed during the meeting, including aerial photographs, LIDAR surveys, wave recording and hindcasting simulation and Sea Level Height (SLH) datasets.

Regarding the availability, spatial coverage and quality of aerial photographs, aspects that can be problematic for the earliest available photograph sets (i.e. prior to 1990), the scientific team decided to utilize all the available sources of photographic data, complementing them with any other available source(s), such as land-use maps and/or satellite photographs (to be investigated within the next period). The data handling process of all collected data was also discussed, as well as the main aspects of the GIS platform, emphasising on the metadata included in the project database for each kind of dataset collected.

Available tide-gauge data were presented and analysed by the FCUL members, along with the validation, error identification and correction, calculation of significant existing SLR trends etc. Regarding waves, wave data-series from the Faro Buoy will be complemented with related hindcasting time-series to complete any existing gaps and, if necessary, to estimate the local wave climate in areas of interest along the west and/or the east flanks of Ria Formosa. New hindcast results are available.

The LIDAR survey data, apart from coastline evolution, will provide invaluable information on the evolution of subaerial beaches, dunes and mudflats and the spatial coverage of vegetation. The collection of related information for periods in which LIDAR data are unavailable will be complemented by any other available source (when and where possible).

The proposed study areas on which EVREST will focus was another topic extensively discussed during the meeting; environmental, hydrodynamic forcing and anthropogenic factors that have affected and continue to affect each area were analysed, so as to include all the distinct and characteristic environments, morphologic features, forcing conditions and evolutionary patterns present in Ria Formosa. As outcome of all the activities and discussions of the meeting, EVREST is proposed to include, at least, the following four study areas: **(a) Culatra Island**, focussing on overall morphological evolution of the island (shoreline, dunes and sand spits), as well as on development of mudflats, dune and dune vegetation, **(b) Barreta Island**, focussing mainly on the eastern part of the island and dune development (presence of slow seaward progradation with relatively low dune fields and uniform dune vegetation), **(c) Tavira Island**, focusing on intertidal mudflats and aquatic vegetation, dune development and dune vegetation and **(d) Cabanas Island**, focusing on coastal evolution with relation to inlet (Cacela Inlet) dynamics and overwash events. It is noted, however, that, in case of unavailability or scarcity of data for one or more of the selected case studies, the selection of case studies will be re-evaluated.

Task 3 - Analysis of geomorphological evolution and comparison between timescales

Even though task 3 will commence on the 3rd year, the determination of long-term geo-morphodynamic evolution of the study areas and the determination of resilience mechanisms and indicators were also discussed, on the basis of existing knowledge and expertise of the research team regarding the long-term evolution and trends of the system, the areas prone to coastal hazards and the ones showing an overall long-term stability. Vulnerability Indices from areas of Ria Formosa were also presented and discussed.

Task 4 - Modelling barrier island and lagoon system

The discussion on the modelling aspects included in the project lead to the identification of two possible ways to achieve the project objectives: (a) to construct conceptual models that can describe the evolution of the various parts of the system (i.e. dunes, marshes, coastline) and explain the related spatio-temporal variabilities and (b) to use more detailed models (hydrodynamics, morphodynamics, aeolian transport) to simulate specific periods and specific case study areas. Their difference is related to modelling complexity, computational load and data availability; in case of insufficient data availability (temporally and spatially), formulating very detailed modelling approaches could result counterproductive and even impossible to calibrate. On the other hand, highly complex processes and interactions might prove impossible to oversimplify, while a combination of the two modelling approaches is also feasible (1st approach used for the short-term evolution and the 2nd for the short-term changes). In every case the exact extent of modelling analysis and complexity of models used has not been decided and will depend on the results of tasks 1 and 2.

For the modelling of salt-marsh evolution and response to SLR it was found an important gap in the available dataset, which is fine sediment sedimentation rate. Some recent results from other colleagues at UAAlg will be requested; however it may still be necessary surficial core sampling and dating from selected salt-marsh sites.

Task 5 – Integration of results and quantification of resilience

This task is highly integrated and will combine all the outcomes of the project in the determination of the past and future (various scenarios) resilience of Ria Formosa. However, this initial project meeting provided the team with important guidelines and suggestions, mainly through the open discussion that took place and the guidance of the project consultants, regarding resilience indicators and self-organisation capacity of similar coastal systems.

5. ADMINISTRATIVE MEETING

The administrative meeting was attended by A. Matias, R. Borges, C. Antunes and R. Taborda. The meeting was focused on the two following points:

1) Grant holder and contract

UAAlg has the grant holder hired since the beginning of September. FCUL is in the process of selecting the best candidate, which should start in the beginning of October. CCV-T contract person will be hired next year, when more dissemination actions are foreseen.

2) Budget progress

All institutions have 15% of budget available.

Expenses already made and the ones predicted for the next two months are pointing barely to the requested 10% budget execution by the end of November. FCUL will accomplish their budget once the grant holder is hired. However, UAAlg and CCV-T will need to pay attention and follow closely budget execution to achieve the budget deadlines. The 10% budget execution that should be achieved in November 30, 2016, is 15'718.80€ including overheads, from which 11'500.03€ is UAAlg budget, 2'093.90€ is FCUL budget and 2'124.60 € is CCV-T budget.

6. DISSEMINATION MEETING

The dissemination meeting took place during the final day of the project meeting, at the facilities of CCV-T in Tavira. The participants had the opportunity to visit the Centre, explore the permanent and temporary exhibitions, as well as receive information on the various activities of CCV-T. This visit was an opportunity to discuss the project dissemination to the local community through the development of new and innovative hands-on activities to complement the permanent exhibition of CCV and through the contribution of the scientific partners to dissemination activities organized by CCV-T.

The proposals for the hands-on activities, mainly directed to children, include installations on aeolian formation and evolution of dune systems and on the participation of hydrodynamic forcing (waves, tides, sea level height) to the evolution of barrier island systems; the portability of the installations constructed will depend on their final size and weight.

The design and capabilities of the project website and the use of social networks to disseminate results and upcoming EVREST events were also discussed in the meeting. CCV-T will soon present a first version of the project website to the partners and the approved version is expected to be online by the end of October 2016.