MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

CENTRO DE ESTUDIOS AVANZADOS
DE BLANES (CEAB)

DELIVERABLE A3 LIFE BLUE NATURA: RESULTS OF THE SAMPLING DURING THE FIELD MISSION IN ANDALUSIAN COASTAL SALTMARSHES

ENTREGABLE A3 LIFE BLUE NATURA: RESULTADOS DE LOS MUESTREOS DE CAMPO EN MARISMAS DE MAREA DE ANDALUCÍA

LIFE BLUE NATURA

Life

GAME
GROUP OF AQUATIC MACROPHYTE ECOLOGY

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

INTRODUCTION

The field mission in Andalusian saltmarshes took place between September the 30th and October the 5th 2016. The main objective was to obtain the samples planned in order to capture the natural spatial variability of carbon stocks and fluxes at Odiel and Cadiz Bay saltmarshes, as well as the effects on those stocks and fluxes of saltmarsh degradation through desiccation, and of saltmarsh recovery through rewetting and re-vegetation. We obtained all the samples planned at both sites. A secondary objective was to disseminate the importance of saltmarshes in climate change mitigation and adaptation. This objective was also fulfilled.

SALTMARSH BLUE CARBON SAMPLING STRATEGY

The immersion gradient (saltmarsh height), was identified by vegetation changes. Odiel (OD) and Toruños (TOR), were sampled at vegetated, mid saltmarshes (stations ODE.M and TOR.M, respectively) and high saltmarshes (stations ODE.H, and TOR.H). At the low marsh we sampled in vegetated (ODM.L, TOR.L) and un-vegetated (ODM.L-C, TOR.L-C) sediments. Additionally, at Odiel, we also sampled in a station degraded by disconnection from the tidal regime (ODN.D), an area rewetted by reconnection to the tidal regime (ODB.Z), and an area re-vegetated after sediment movements to install a pipe (ODL.R).

Most of the blue carbon in saltmarshes is accumulated in their sediments. Nevertheless, the IPCC protocols for carbon sinks and emissions always include the evaluation of the carbon pool sequestered in the plant standing stocks (above and belowground plant biomass). Therefore, at each selected station we obtained a minimum of 3 replicate cores (21 to 159 cm long) and 3 replicate biomass samples (within quadrats of 20x20cm, up to 2 cm thick belowground, Fig. 1).

In total, we collected 37 cores on emerged saltmarshes, as well as 13 cores at the low intertidal and subtidal area of Santibañez lagoon, covered or not by small seagrasses. These latter samples will be used to characterize the carbon stocks and fluxes at the low intertidal and subtidal areas of saltmarshes. Finally, one core was collected with HyT partner, for dissemination purposes in action E1. Globally, 51 cores were collected in action A3.

We also took samples of the various dominant plant species growing in each area, in order to document the flora and to measure the primary producers isotopic signal (to try establishing the main particulate organic carbon – POC – contributors to the sink; Fig. 2).

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Fig. 1. Hole left in the mid-marsh after biomass sampling.

Fig. 2. Some plant samples collected at ODL.R station for analysing the primary producers ^{14}C and ^{15}N isotopic signals.

Cores were taken as described in the following **protocol**:

Material:

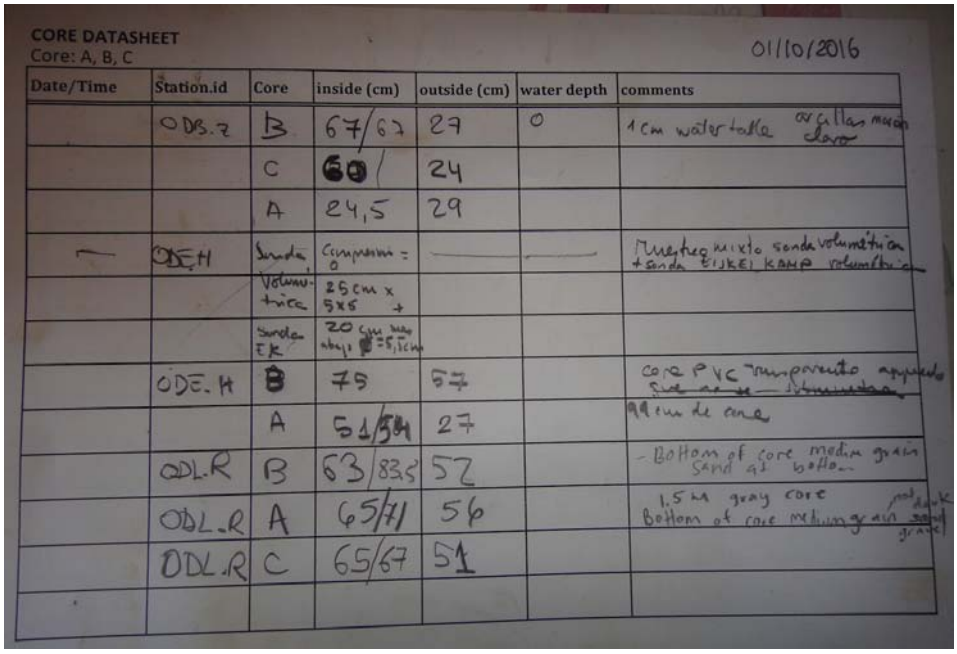
- 1.5m /3m-long strong PVC pipe, of at least 5cm diameter and 0.5cm thick walls with a sharpened attacking edge. A core-catcher is also fitted to the corer bottom to minimize sediment loss during corer lifting.
- 1 metal rode
- 1 large mace with a heavy metallic head

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

- One strong metal cap, with holes in order to let air circulate, or a wooden piece, in order to receive the mace hits
- A folding meter, in order to measure core compression and penetration
- 2 caps to close the corer at the bottom and the top
- Waterproof tape to seal the corer ends
- Two 3.4 meters-long, 1.5 cm-diameter rope
- 1 4-legs ladder
- In unconsolidated sediments, a large plate and special saltmarsh shoes, in order the sampler and/or the ladder not to sink in the sediment are highly recommended.

Coring Procedure (minimum 2 people):

-Select the place. Write down the station, core label and pipe length in the field data sheet, as well as any pertinent field observation (Fig. 3).



CORE DATASHEET
Core: A, B, C
01/10/2016

Date/Time	Station.id	Core	inside (cm)	outside (cm)	water depth	comments
	ODS.2	B	67/67	29	0	1 cm water table arcillas muy claro
		C	60/	24		
		A	24,5	29		
	ODE.H	Sonda Volumétrica	Compresión = 0 / 25cm x 5x5 +			Muestreo mixto sonda volumétrica + sonda EIJKELKAMP volumétrica
		Sonda EK	20 cm max aboja Ø = 5,1 cm			
	ODE.H	B	75	57		core PVC transparente apoyado sobre arena
		A	51/54	27		99 cm de core
	ODL.R	B	63/83,5	52		Bottom of core medium grain Sand at bottom
	ODL.R	A	65/71	56		1.5 M gray core Bottom of core medium grain
	ODL.R	C	65/67	51		

Fig. 3. Example of field data sheet

- Present the pipe perpendicular to the soil surface, insert the rode and place the metal cap/ wood plate on the core top. One person hammers on the core top, and the second person maintains the core vertical, and twirls it (around 180ºC) between 2 hammer hits, in order to help the sediment enter the pipe, as it penetrates in the soil (Fig. 4).

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Fig. 4. Introducing a PVC pipe in the sediment, and ODN.DV station.

- When the pipe has entered to the desired depth (leave at least 10cm below the rode, in order to facilitate core recovery), measure and write down the distance of the pipe top to the soil surface at both sides of the pipe wall (Fig. 5), in order to measure sediment compaction inside the pipe (core compression)[1].

Fig. 5. Measuring distance of the pipe top to the sediment surface inside and outside the core at Cadiz bay.

1. There are other methods, like piston coring, vibrocoring, or Eijkelkamp coring which help minimizing core compression. We used the universal gravity core approach, which may produce some core compression (sediment compaction inside the pipe) or nail effects (loss of some soil layers). Only in one station did we obtain a core with an Eijkelkamp device.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

- - Remove the rode, place a cap on the pipe top and seal it, as well as the holes for the rode, in order to prevent air pressure to push the sediment outside the pipe while lifting it out.

- Make a clove hitch knot with the rope around the pipe. Each person holds one rope end around their waist in squat position. Then, at the same time, both people pull-up, by lifting their legs. Repeat the process until the pipe bottom near the soil surface (Fig. 6).

Fig. 6. Recovering a core from the sediment at ODB.Z station

-When the core bottom is outside, place immediately the bottom cap, in order to prevent sediment loss, and seal it well placing waterproof tape around.

- Open the pipe top, measure again the inside distance of the top sediment to the pipe top in order to note if there has been any sediment loss or compaction during core lift.

- If the core is to be transported whole to the laboratory, cut the pipe top 2-4cm from the sediment top (Fig. 7). Cut a piece of foam or sponge to fill the remaining space between the sediment top and the top pipe border. Place again the core cap at the pipe top and seal again with waterproof tape. In doing so, the core sediment is immobilized and can be transported horizontally to the lab, where it will be open and subsampled.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Fig. 7. Pipe cut near the core top, in order to maintain it compacted for transporting horizontally.

-If the core is to be subsampled in the field, open the selected pre-drilled holes along the cores, taking into account where the top sediment surface is placed. Insert pre-cut 3cm wide syringes in the sediment while pulling out the syringe piston. Place the desired sediment volume in a subsample vial, and note the volume taken (Fig. 8).

Fig. 8. Core subsampling at the camping. The cores were transported vertically.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Whenever possible (when a suitable escarpment was present), core subsamples were taken directly in the field from vertical sediment profiles. For that, the escarpment surface was removed, in order to access to fresh, horizontally accumulated sediment (Fig. 9).

Fig. 9. Trace of the subsamples directly taken on a vertical profile (escarpment) at ODN.DV.

Core opening and subsampling

The detailed core opening and subsampling protocol, is available in annex C1-C2.2.

The whole cores were cut (Fig. 10) and the hemicores α were subsampled, usually in 2-cm slices (Fig. 11). Some where cut and subsampled every cm..

Each subsample collected in the field or in the lab was placed in a pre-weighted and labelled plastic vial (Fig. 11), weighted, dried, and weighted again (in order to measure sediment water content and bulk density obtained). In our experience, when sediment samples are rich in silt and clay, as it is usually the case in saltmarshes, it is better to freeze-dry them, instead of drying them at the stove, in order to disaggregate them later with less difficulty.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Fig. 10. Opening a core at UB corelab.

Fig. 11. Subsampling hemicore ODB.Z_A-α in 2 cm wide slices.

As a general rule, all of the subsamples from the top 30 cm entered in the treatment and analysis phase, while for the rest of the core, only alternate subsamples were treated and analysed. Some cores were analysed in more detail.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

SALTMARSH SAMPLING RESULTS AND INVENTORY

The sample code:

Each subsample is labelled and stored with a code, which helps to identify it in all analyses. This code indicates the site, subsite (if there are subsites), the station, the core, and the core depth, in centimeters (Fig. 12).

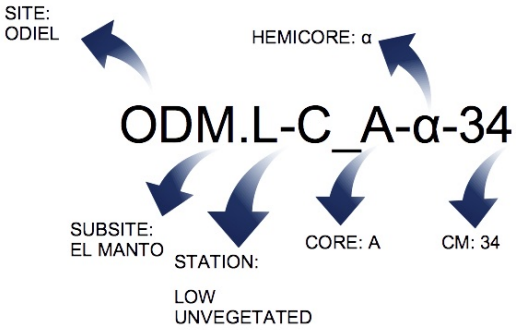


Fig. 12. Example of sample code, and its meaning. When the subsample belongs to a vertical profile taken directly in the field, the core name is a P, followed by the profile number, and the sample depth (in cm). For example: ODE.H.P1-20.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

SITE
SALTMARSH: MARISMAS DEL ODIEL

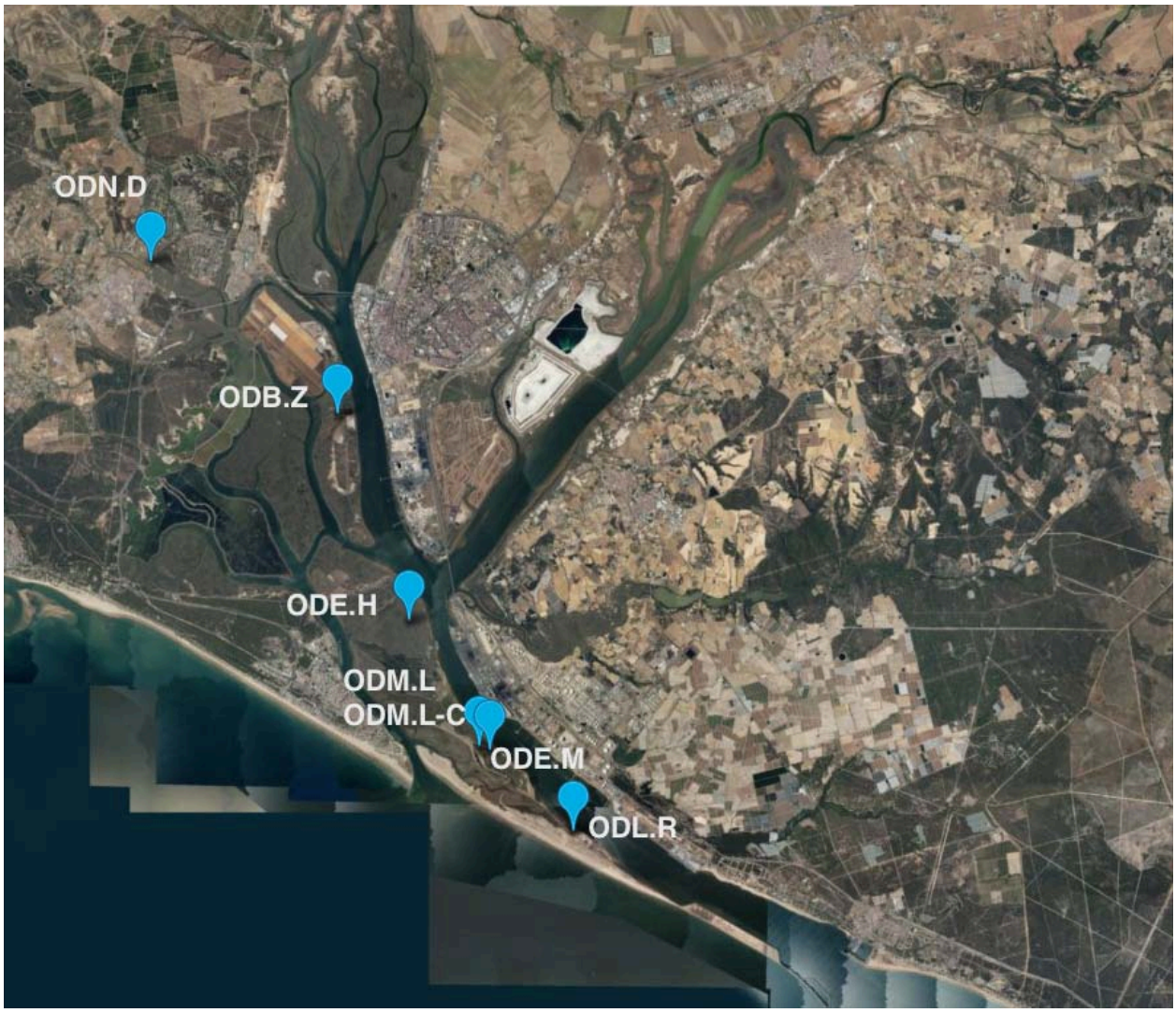


Fig. 11. Aerial view of the marismas del Odiel site, and location of the sampling stations

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

STATIONS ODM.L AND ODM.L-C

Low saltmarsh, vegetated (*Spartina maritima*) and un-vegetated, at Odiel, in El Manto Isle. Low intertidal area, inundated every day.

- Geographic coordinates (WGS84):
  37º 10,460`N 6º 55,865'W
- Sampling date: 30/9/16
- Total number of cores: 6
- Total number of sediment subsamples: 163
- Biomass samples: 3
- Plant bags for isotopes: 5

- Data in: ODM_L.xlsx
  ODM_L-C.xlsx

Fig. 12: view of the ODM.L (vegetated) and ODM.L-C (unvegetated) stations

Core ODM.L_A:
Compressed length: 76 cm section I (Fig. 13), 83 cm section 2 (Fig. 14).
Number of subsamples: 78
Core taken on vegetated (*Spartina maritima*) low saltmarsh. Open and subsampled each 2 cm in the lab.

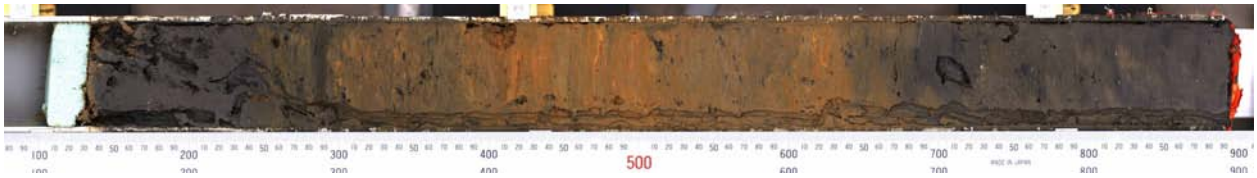


Fig. 13. Hemicore ODM.L_A-β, section I

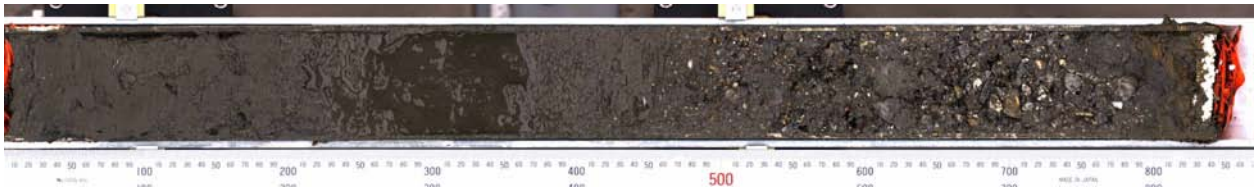


Fig. 14. Hemicore ODM.L_A-β, section II, the basement of the saltmarsh at El Manto isle has been reached

Core ODM.L_B:
Compressed length: 80 cm
Number of subsamples: 7

Core ODM.L_C:
Compressed length: 100 cm
Number of subsamples: 8

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Subsampled in the field mission

Subsampled in the field mission.

Core ODM.L-C_A:
Compressed length: 110 cm (Figs. 15 and 16).
Number of subsamples: 56

Fig. 15. Hemicore ODM.L-C_A-β.

Fig. 16. The hemicore ODM.L-C_A-α had less "gaps".

Core ODM.L-C_B
Compressed length: 80 cm
Number of subsamples: 6
Subsampled in the field mission

Core ODM.L-C_C
Compressed length: 90 cm
Number of subsamples: 8
Subsampled in the field mission

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

STATION ODE.M

Medium saltmarsh at Odiel, also in El Manto isle. It is in front of the Huelva industrial pole and near the main river current. Intertidal area, daily inundated, dominated by *Salicornia* and *Sarcocornia sp*. plants.

- Geographic coordinates:
  37º 10,373'N 6º 55,690'W
- Sampling date: 30/9/16

- Total number of cores: 3
- Total number of sediment subsamples: 60
- Biomass samples: 3
- Plant bags for isotopes: 2

- Data in: ODE_M.xlsx

Fig. 17. Sampling at ODE.M station at high tide

Core ODE.M_A
Compressed length: 107 cm (Fig. 18)
Number of subsamples: 46

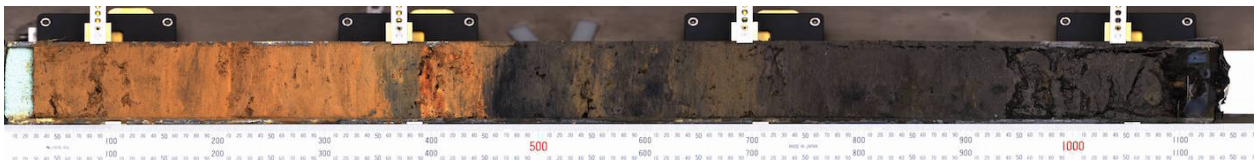


Fig. 18. Hemicore ODE.M_A-β.

Core ODE.M_B
Compressed length: 70 cm
Number of subsamples: 7
Subsampled in the field mission

Core ODE.M_C
Compressed length: 80 cm
Number of subsamples: 7
Subsampled in the field mission

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Station ODE.H
High saltmarsh station at El Saltés isle.

- Geographic coordinates (WGS84):
  37º 12,228' 6º 57,081'
- Sampling date: 1/10/17

- Total number of cores: 3 + 2 profiles
- Total number of sediment subsamples: 73
- Biomass samples: 3 (one in 2 bags)
- Plant bags for isotopes: 4

- Data in: ODE_H.xlsx


Fig. 19. Panoramic view of the station ODE.H

Core ODE.H_A
Compressed length: 96 cm (Fig. 20)
Number of subsamples: 48


Fig. 20. Hemicore ODE.H_A-β.

Core ODE.H_B
Compressed length: 75 cm
Number of subsamples: 7
Subsampled in the field mission

Profile ODE.H_P1
Length: 33 cm
Number of subsamples: 11

Profile ODE.H_P2
Length: 21 cm
Number of subsamples: 7
Fig. 21


Fig. 21. Profile at ODE.H

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

STATION ODB.Z

Llanos de Bacuta station, at Bacuta South isle, an area of natural recolonization after rewetting management. The vegetation is similar to that found at natural medium saltmarsh, although less tall (Fig. 22).

Geographic coordinates:
37.24160ºN 6.96730ºW
Sampling date: 1/10/17

Total number of cores: 3
Total number of sediment subsamples: 74
Biomass samples: 3
Plant bags for isotopes: 2

Data in: ODB_Z.xlsx

Fig. 22. Panoramic view of ODB.Z station (Llanos de Bacuta).

Core ODB.Z_A:
Compressed length: 120 cm (Fig. 23)
Number of subsamples: 60

Fig. 23. Hemicore ODB.Z_A-β.

Core ODB.Z_B
Compressed length: 70 cm
Number of subsamples: 7
Subsampled in the field mission

Core ODB.Z_C
Compressed length: 70 cm
Number of subsamples: 7
Subsampled in the field mission

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

STATION ODL.R

At the end of the El Manto isle, near the river mouth, restored station by revegetation, after coastal works to introduce a petrol pipeline (sealine). Vegetation similar to that of natural medium saltmarsh, although we detected more species. Daily cycles of inundation (Fig. 24).

Geographic coordinates (WGS84):
37º 09,310'N 6º 54,357'W
Sampling date: 1/10/17

Total number of cores: 3
Total number of sediment subsamples: 110
Biomass samples: 3 (one in 2 bags)
Plant bags for isotopes: 14

Data in: ODL_R.xlsx

Fig. 24. Panoramic view of ODL.R (Sealine restored station).

Core ODL.R_A:
Compressed length: 79 cm (Fig. 25)
Number of subsamples: 36

Fig. 25. Hemicore ODL.R_A-β.

Core ODL.R_B:
Compressed length: 67 cm (Fig. 26)
Number of subsamples: 34

Fig. 26. Hemicore ODL.R_B-β.

Core ODL.R_C:
Compressed length: 80 cm (Fig. 27)
Number of subsamples: 40

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Fig. 27. Hemicore ODL.R_C-β.

STATIONS ODN.D-C AND ODN.D-V

Area in the Northern part of Odiel saltmarshes, degraded by disconnection from the tidal dynamics, surrounded by 2 roads. There are, nevertheless, freshwater inputs from canalizations and rainfall, and part of the area had stagnant water (Figs. 28 and 29). ODN.D-C cores correspond to the un-vegetated sub-station. ODN.D-V cores and profile belong to the vegetated sub-station.

- Geographic coordinates:
  37.27347ºN 7.01543ºW
- Sampling date: 2/10/17

- Total number of cores: 4 + 1 profile
- Total number of sediment subsamples: 183
- Biomass samples: 3
- Plant bags for isotopes: 5

Data in: ODN_D.xlsx

Fig. 28. Panoramic view of the vegetated and un-vegetated areas of ODN stations (Odiel North).

Fig. 29 Another panoramic view of ODN, which shows stagnant waters.

Core ODN.D-C_A:

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Compressed length: In 3 sections of 54 cm (I), 8cm (II) and 52 cm (III), 114 cm in total (Figs. 30 and 31).
Number of subsamples: 54

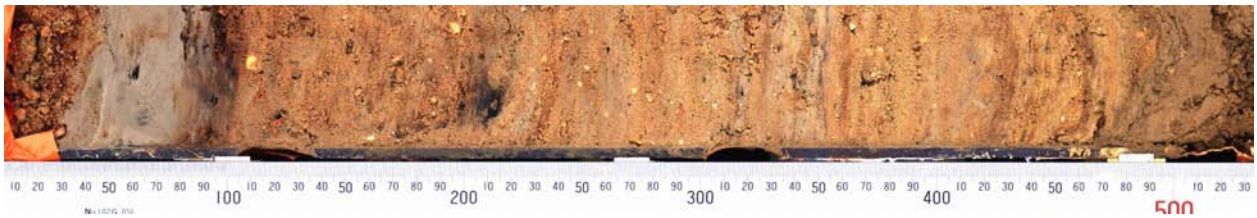


Fig. 30. Hemicore ODN.D-C_A-I

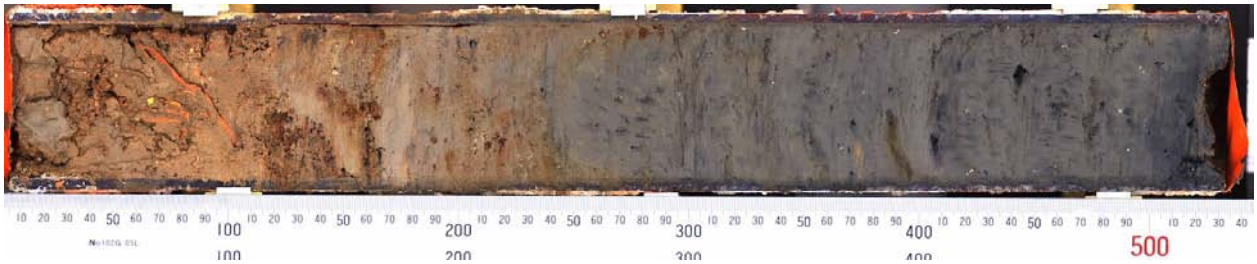


Fig. 31. Hemicore ODN.D-C_A-III

Core ODN.D-C_EK:
Eijkelkamp core Length: 29 cm
Number of subsamples: 18 (from cm 12 to 29)

Profile ODN.D-V_P1:
Length: 60 (Fig. 9)
Number of subsamples: 20
Plant species from high-marsh

Core ODN.D-V_A:
Compressed length: 86 cm
Number of subsamples: 43

Fig. 32. Hemicore ODN.D-V_A

Core ODN.D-V_MID (plant species from mid-marsh):
Compressed length: 115 cm
Number of subsamples: 58

Fig. 33. Hemicore ODN.D-V_MID

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

SITE

SALTMARSH: PARQUE NATURAL MARISMAS DE LA BAHÍA DE CÁDIZ, AREA OF LOS TORUÑOS

The stations are separated by a few hundred meters. The vegetation, very similar to that found at Odiel, serves as a clue to distinguish low, mid and high marsh.

FIG. 34. Situation and aerial view of the area of Los Toruños, and disposition of the stations.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

STATIONS TOR.L AND TOR.L-C

Low saltmarsh, vegetated (*Spartina maritima*) and un-vegetated, at Los Toruños (Bay of Cadiz Natural Park. Low intertidal area, at río San Pedro. Inundated every day.

Geographic coordinates (WGS84):
36º 32,923'N 6º 12,597'W
Sampling date: 5/10/17

Total nº of cores: 6
Total nº of sediment subsamples: 91 + 54

Biomass samples: 3
Plant bags for isotopes: 1

Data in: TOR_L.xlsx
TOR_L-C.xlsx

Fig. 35. View of the low-saltmarsh stations at Bahía de Cádiz, vegetated ((TOR.L) and un-vegetated (TOR.L-C)

Core TOR.L_A:
Compressed length: 79 cm (Fig. 36)
Number of subsamples: 39
Subsampled the hemicore α.

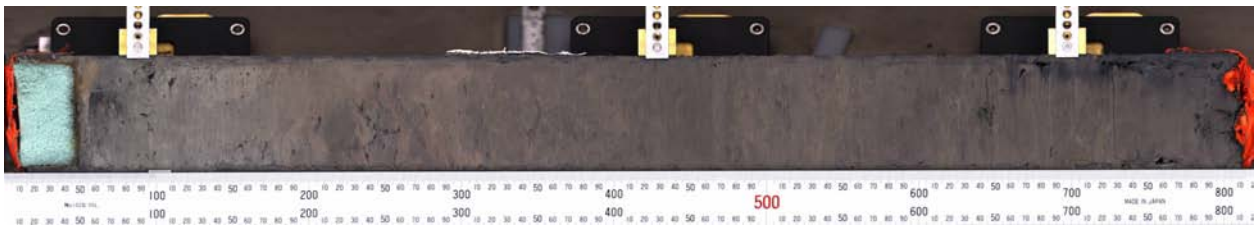


Fig. 36. Hemicore TOR.L_A-β.

Core TOR.L_B
Compressed length: 94 cm (Fig. 37)
Number of subsamples: 47
Subsampled the hemicore α.

Fig. 37. Hemicore TOR.L_B-β.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

Core TOR.L_C
Compressed length: 107 cm
Number of subsamples: 7
Subsampled in the field mission

Core TOR.L-C_A
Compressed length: 106 cm (Fig. 38)
Number of subsamples: 39
Subsampled the hemicore α.

Fig. 38. Hemicore TOR.L-C_A-β.

Core TOR.L-C_B
Compressed length: 80 cm
Number of subsamples: 7
Subsampled in the field mission

Core TOR.L-C_C
Compressed length: 95 cm
Number of subsamples: 8
Subsampled in the field mission

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

STATION TOR.M

Midmarsh at Los Toruños (Cadiz Bay Natural Park). With vegetation dominated by *Salicornia sp*. Intertidal, inundated each day.

Geographic coordinates (WGS84):
36º 32,923'N 6º 12,600'W
Sampling date: 5/10/17

Total nº of cores: 3
Total nº of sediment subsamples: 77

Biomass samples: 3
Plant bags for isotopes: 6

Data in: TOR_M.xlsx

Fig. 39. View of the intermediate saltmarsh station TOR.M

Core TOR.M_A
Comepressed core length: 108 cm
Number of subsamples: 62
Subsampled the hemicore α

Fig. 40. Hemicore TOR.M_A-β.

Core TOR.M_B
Compressed length: 80 cm
Number of subsamples: 7
Subsampled in the field mission

Core TOR.M_C
Compressed length: 100 cm
Number of subsamples: 8
Subsampled in the field mission

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806

STATION TOR.H

High saltmarsh at Los Toruños (Cadiz-Bay Natural Park). Only inundated at strong tides.

Geographic coordinates (WGS84):
36º 32,919'N 6º 12,613'W
Sampling date: 5/10/17

Total nº of cores: 3
Total nº of sediment subsamples: 50

Biomass samples: 3
Plant bags for isotopes: 6

Data in: TOR_H.xlsx

Fig. 41. View of the high saltmarsh station in Los Toruños (TOR.H).

Core TOR.H_A
Comepressed core length: 97 cm
Number of subsamples: 37
Subsampled the hemicore α

Fig. 42. Hemicore TOR.H_A-β.

Core TOR.H_B
Compressed length: 80 cm
Number of subsamples: 7
Subsampled in the field mission

Core TOR.H_C
Compressed length: 80 cm
Number of subsamples: 6
Subsampled in the field mission.

Elena Diaz Almela
e.diazalmela@ceab.csic.es
www.game-csic.com
ACCÉS A LA CALA
ST. FRANCESC, 14
17300 BLANES, ESPAÑA
TEL. +34972336101
FAX.+34972337806