WORLD SALT SYMPOSIUM

June 19-21, 2018 Park City UT, USA

Is all *Fleur de sel* the same? Experience from artisanal saltworks in Portugal

Education and Culture
Erasmus Mundus

Noa Sainz López
PhD. student

UCA
Universidad de Cádiz

Tomasz Boski

UAlg CIMA
UNIVERSITY OF ALGARVE
CENTRE FOR MARINE AND ENVIRONMENTAL RESEARCH

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I. Fleur de sel (FS)

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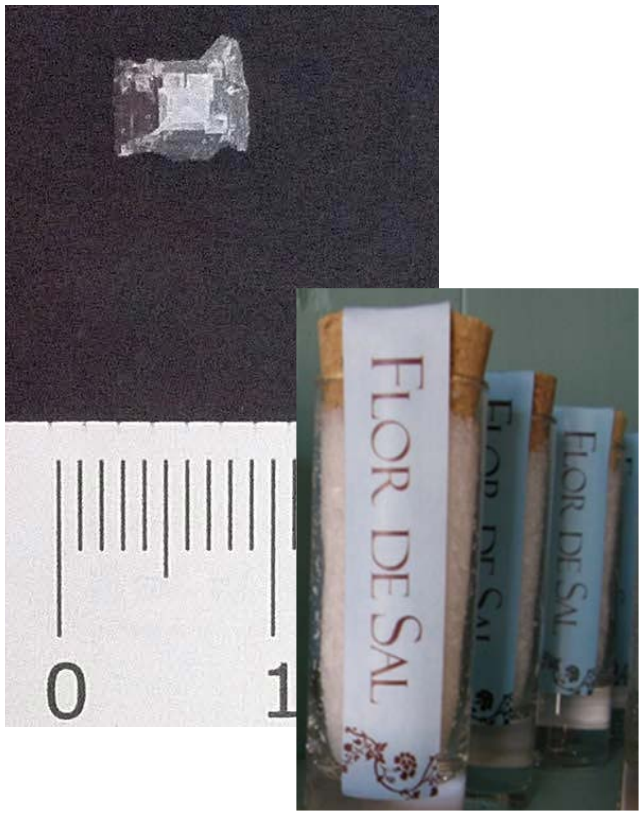
FS, added value to traditional sea salt production

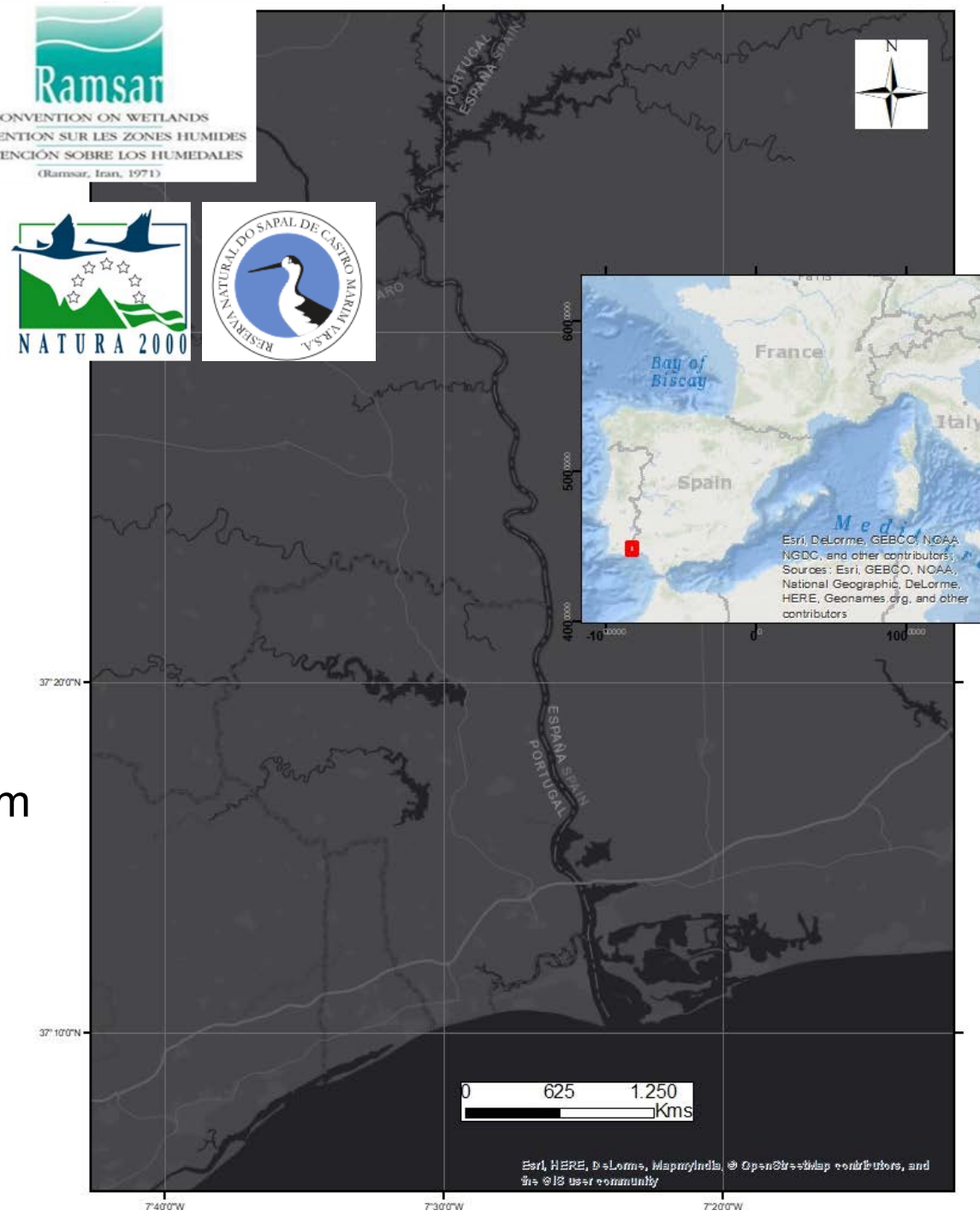


Objectives:

- Characterization of FS to define its varieties
- Feed literature scarcity on FS formation and description

Study area

- Guadiana river: 800 km
- Mediterranean weather: dry summers
- PET/Precipitation: 3
- Mesotidal estuary, tidal amplitudes range: 1.3 to 3.5 m
- National and international protected areas



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Portuguese side

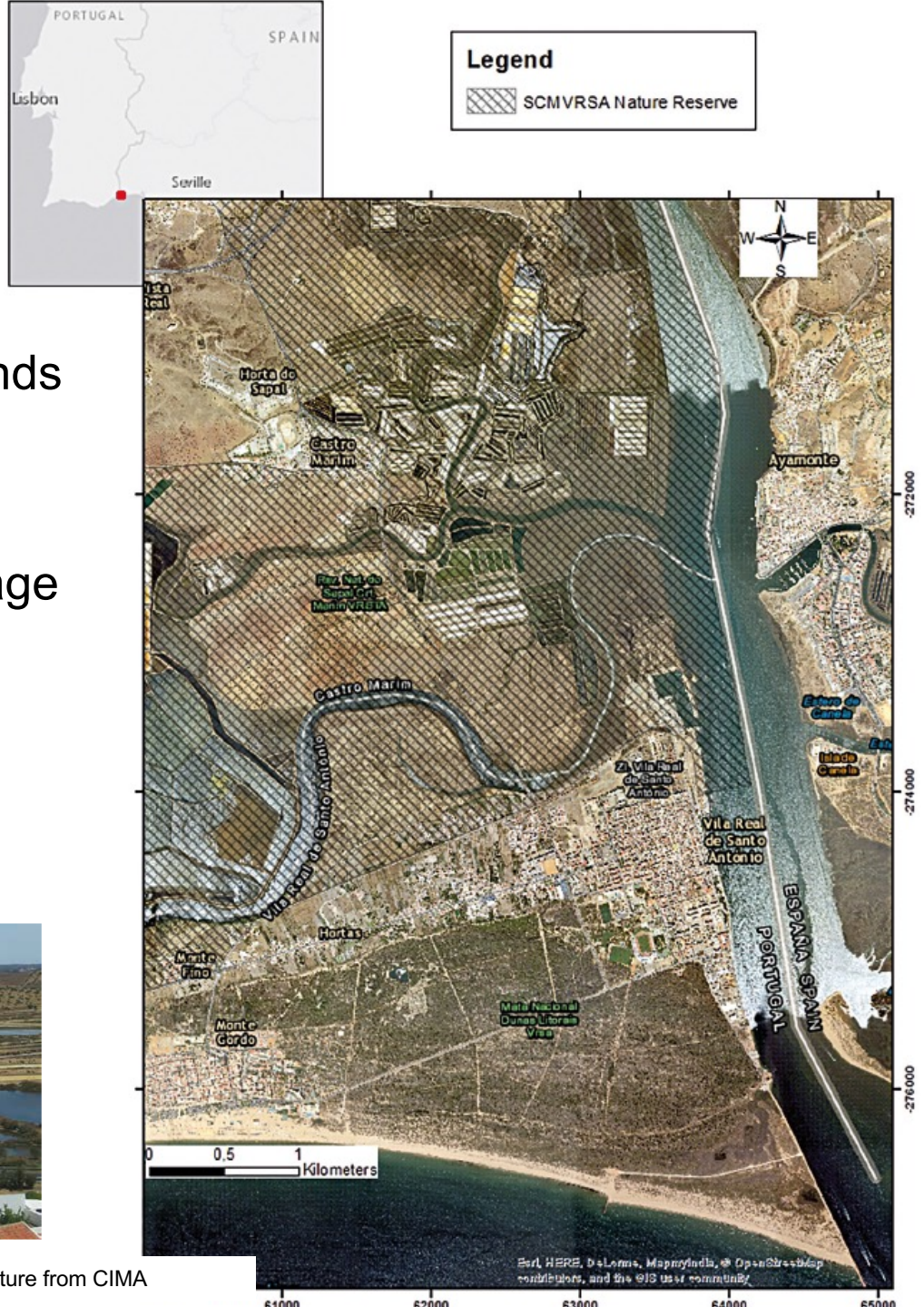
- Abandonment of traditional salt ponds
- Economic activities

  - Tourism: birdwatching, SPA, heritage

  - Agriculture

  - Aquaculture

  - Coarse salt production



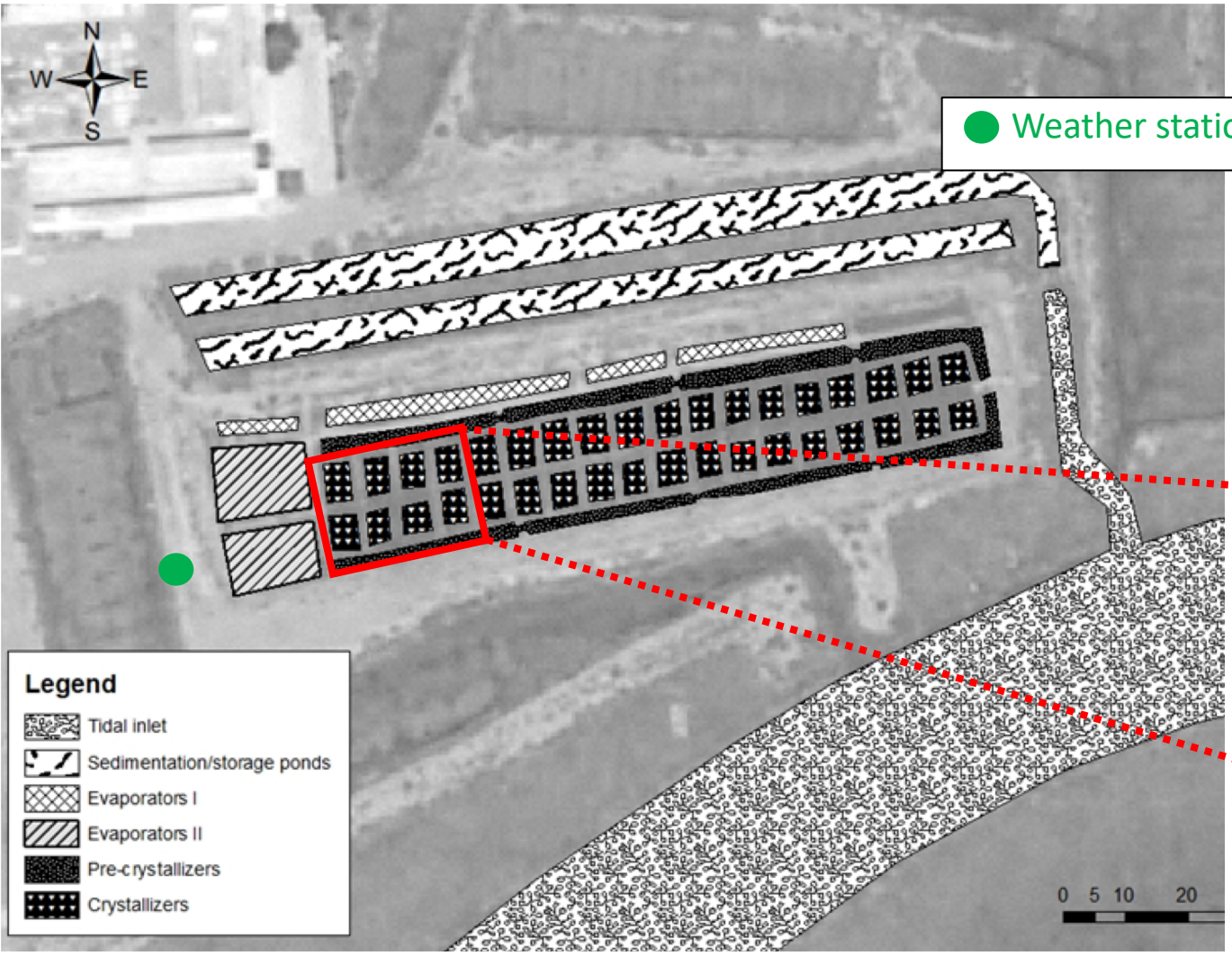
Credits: NR layer from ICNF; Picture from CIMA

II. Methods

IN THE FIELD (I)

1. **Monitoring**:

1.a. Weather



+

ipma
instituto português do mar e da atmosfera

1.b. Brine

Sampling points

II. Methods

IN THE FIELD (II)

2. **Samples collection:**

2.a. FS daily collection

2.b. FS dry process

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II. Methods

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IN THE LAB

162 pictures

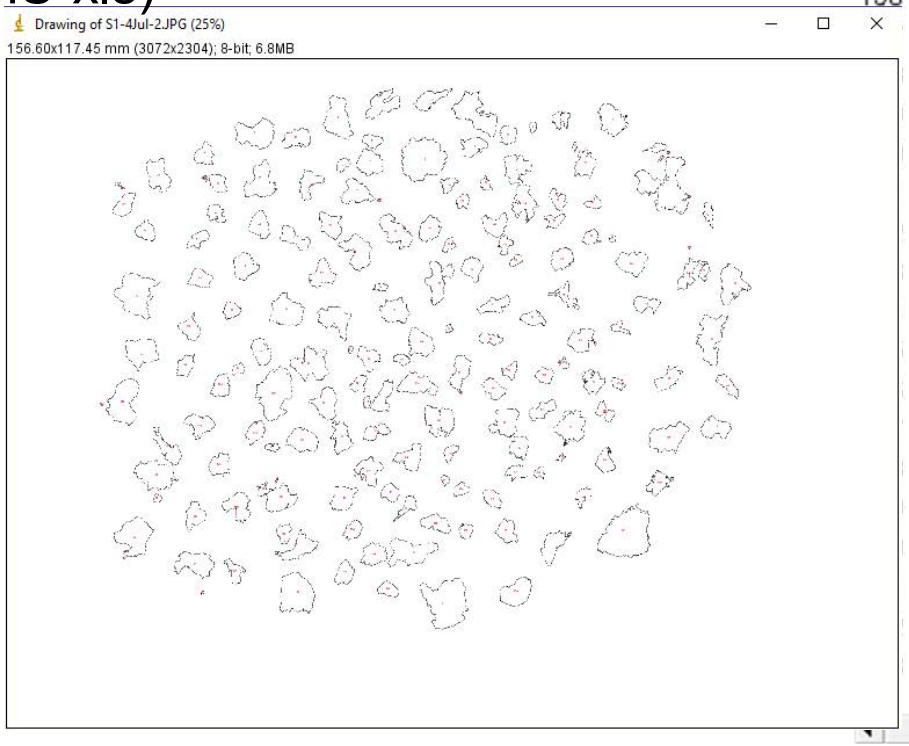
(3 replicates of 1gr of the 54 samples)

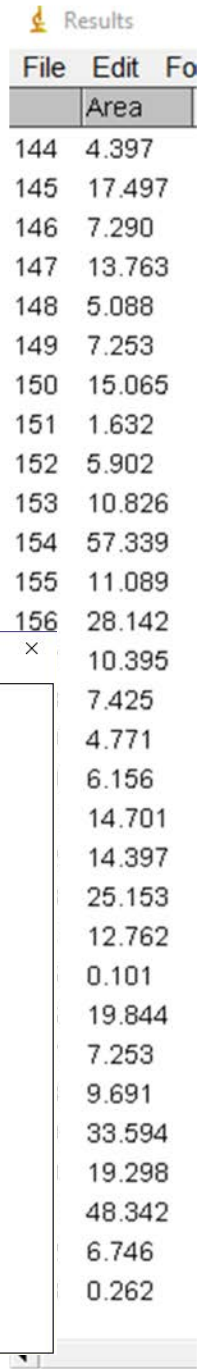
www.kern-sohn.com

IN THE OFFICE

1. Pictures analysis for counting and size measuring (ImageJ)

2. Descriptive statistical analysis (MS-xls)





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III. Results

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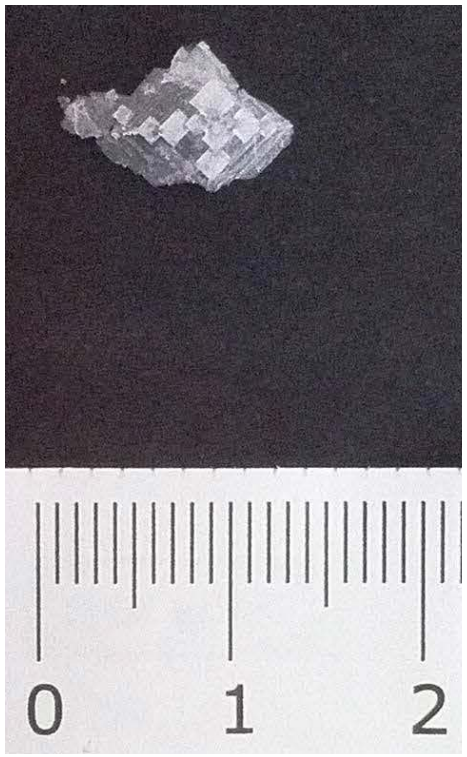
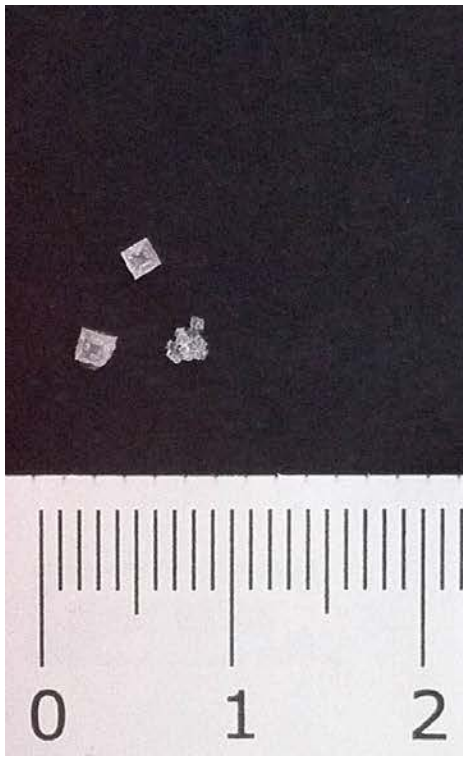
Crystals categories (MARKET)

- Category A
  18 to 24 mm^2



- Category C
  7 to 13 mm^2



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III. Results

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Relation to weather variables

	Crystals C	Crystals B	Crystals A
Mean temperature (ºC)	29.8	30.0	29.6
Mean Relative Humidity (%)	40.4	39.3	40.3
Mean wind direction (º)	222.2	210.3	184.8
Mean wind speed (m/s)	4.5	4.3	3.1
Solar radiation (KJ/m^2)	29,297.8	29,356.1	31,226.9

III. Results

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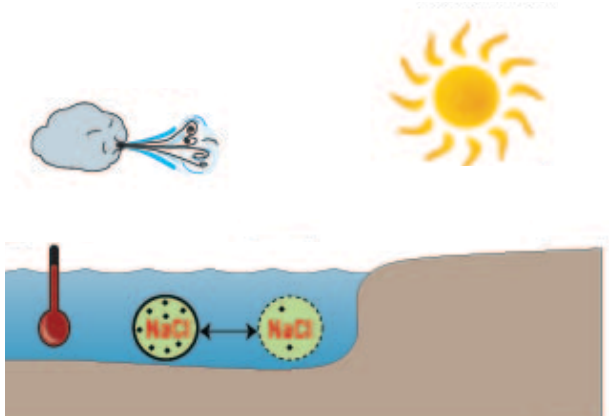
Relation to brine parameters

	Crystals C	Crystals B	Crystals A
Surface EC (mS/cm)	200.2	203.9	215.3
Surface temperature (ºC)	32.5	33.7	37.2
Bottom EC (mS/cm)	196.9	202.7	216.8
Bottom temperature (ºC)	32.8	33.9	37.3
EC difference (mS/cm)	3.3	1.2	-1.5
Temperature difference (ºC)	-0.30	-0.25	-0.12

IV. Discussion

Category A

- South winds
- Lowest wind speed
- Highest EC, brine temperature & radiation



Symbols from http://ian.umces.edu/symbols

Category C

- SW winds
- Highest wind speed
- Lowest EC, brine temperature & radiation

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V. Conclusions

3 market-oriented crystals sizes of Fleur de sel could be described according to different weather parameters and brine physicochemical characteristics in a traditional saltwork

Credits: www.flordesaldestrenc.com

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VI. References

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Hydrology & Earth System Sciences

Hydrological impacts of climate change on the Tejo and Guadiana Rivers

C.G. Kilsby, S.S. Tellier*, H.J. Fowler and T.R. Howels**

Estuarine, Coastal and Shelf Science 70 (2006) 85–97

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Contents lists available at ScienceDirect

Food Research International

journal homepage: www.elsevier.com/locate/foodres

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Chronology of the sedimentary processes during the postglacial sea level rise in two estuaries of the Algarve coast, Southern Portugal

T. Boski [a,*], S. Camacho [a], D. Moura [a], W. Fletcher [b], A. Wilamowski [c],
C. Veiga-Pires [a], V. Correia [a], C. Loureiro [a], P. Santana [a]

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Aknowledgements

PhD thesis title: “Physicochemical, environmental and socio-economic framework of marine salt production in Southern Europe”

BECAS IBEROAMÉRICA
Jóvenes Profesores e investigadores

Santander UNIVERSIDADES

UCA Universidad de Cádiz

UCA internacional POSGRADO

CIMA
Centro de Investigação Marinha e Ambiental
UNIVERSIDADE DO ALGARVE

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European Commission
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JUNTA DE ANDALUCIA

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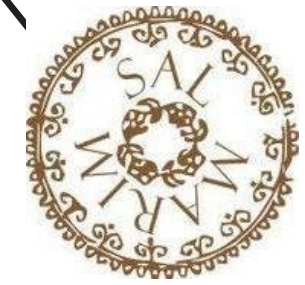

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THANK YOU

OBRIGADA **GRACIAS** **MERCI**

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