



# **Identification of indicators suitable to be applied to the coastal environmental assessment in the Canary Islands.**

## **OMARCOST Project**

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## STRATEGY FOR THE ENVIRONMENTAL SUSTAINABILITY OF THE LITORAL BORDER



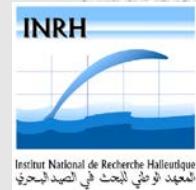
Unión Europea  
Fondo Europeo de Desarrollo Regional  
*Invertimos en su futuro*



### UE Beneficiaries



### Moroccan partners (Region Souss Massa Dràa)



## Objective:

To define and implement a Strategy for the Environmental Sustainability of the coastal zones of environmental, recreational and productive interest of the cross-border territory through an integrated management of the coastal areas and its socio-economic valuation



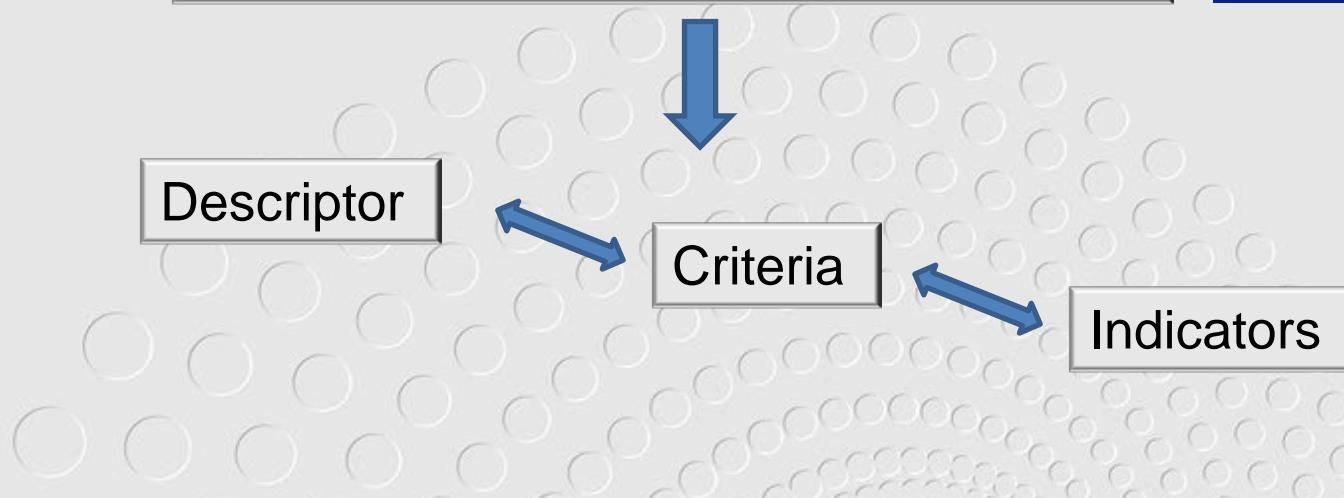
**ACTIVITY 2:** Identification of indicators of the ecological state of coastal zones of environmental, recreational and productive interest.



1. Definition of coastal zones of environmental, recreational and productive interest to establish units of environmental management.
2. **The application of the ecosystem approach to identify indicators in the environmental evaluation of coastal zones.**
3. The use of Multicriteria Analysis (MCA) techniques in order to establish the environmental state of the coastal zones

# Indicators?

## Marine Strategies Framework Directive

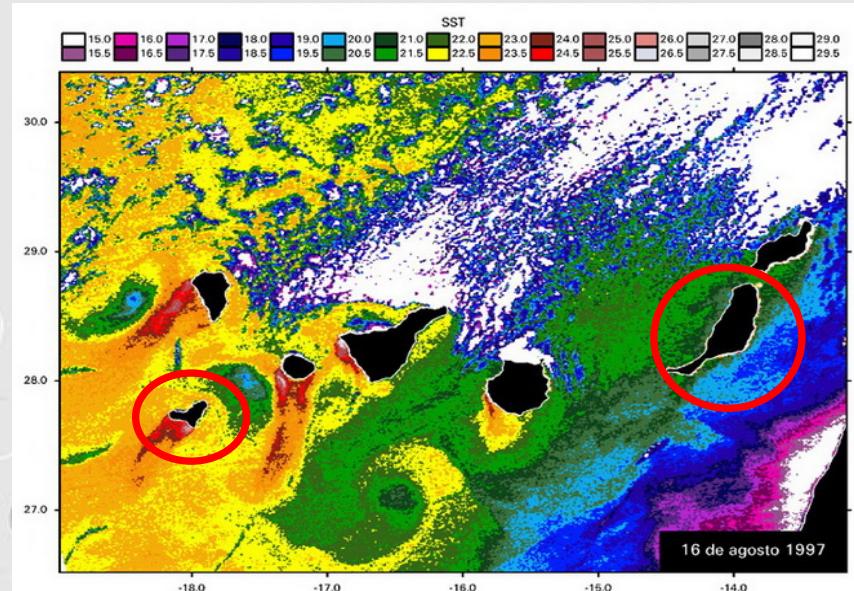


An **indicator** is a parameter chosen to represent (indicate) a certain situation or aspect and to simplify a complex reality. In the context of the implementation of the MSFD, indicators are specific attributes of each GES criterion that can be measured to make such criteria operational and which allow subsequent change in the attribute to be followed over time.

Generally, there is a variety of indicators falling under three types: state, pressure and impact<sup>1</sup>.

<sup>1</sup>Claussen U, Connor D, de Vrees L, Leppänen JM, Percelay J, Kapari M, Mihail O, Ejdung G, Rendell J. 2011. Common Understanding of (Initial) Assessment, 639 Determination of Good Environmental Status (GES) and Establishment of Environmental Targets (Art. 8, 9 & 10 640 MSFD). WG GES EU MSFD.

## Levels of biodiversity + Regional representativeness



Initial evaluation of the environmental status (MSFD)



Detected lagoons of information and needs for research with a temporal continuity

## Endangered species



*Patella candei*

## Structural species + communities



*Cystoseira abies-marina*



*Panulirus echinatus*



Seagrass meadows  
(*Cymodocea nodosa*)

# Indicators



- Distribution
- Population structure: abundance, length



Structural species:

- Distribution
  - Population structure: abundance, length
- Communities:
- Species richness
  - Diversity



## Anthropogenic pressures or environmental impacts

Fishing activity artisanal fleet



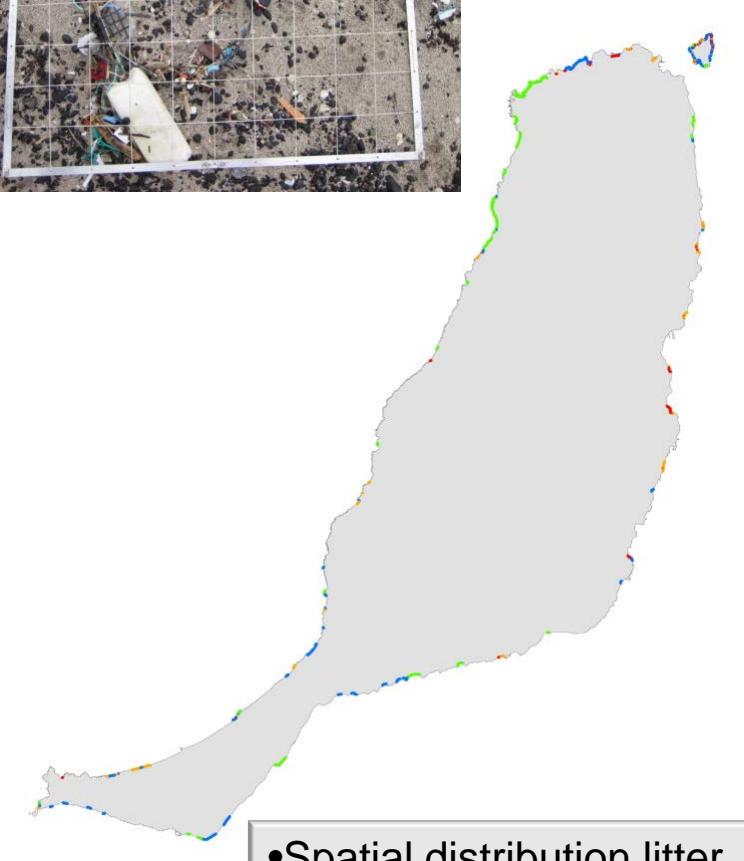
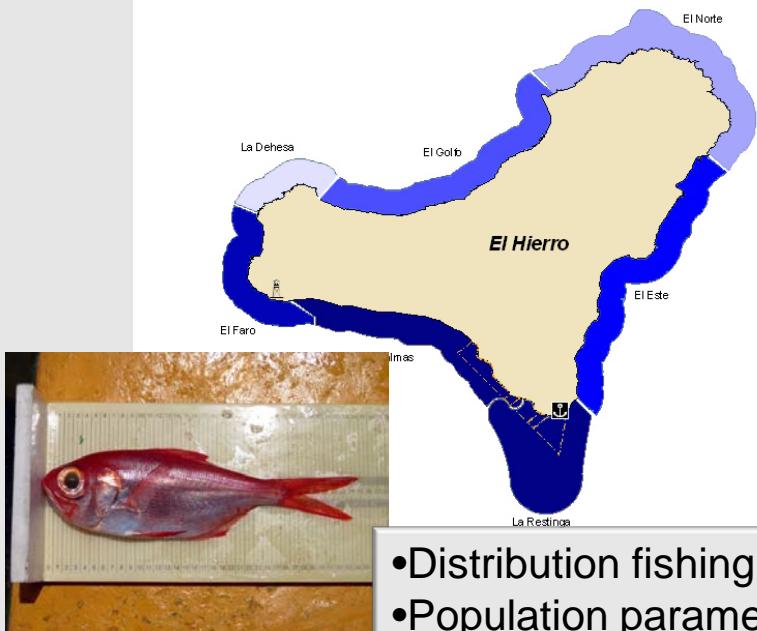
Boat anchoring impacts



Marine debris accumulation

# Indicators

## Fishing operations x zone



# *Cystoseira abies-marina*

Fixed monitoring stations

New recorded point



# *Panulirus echinatus*

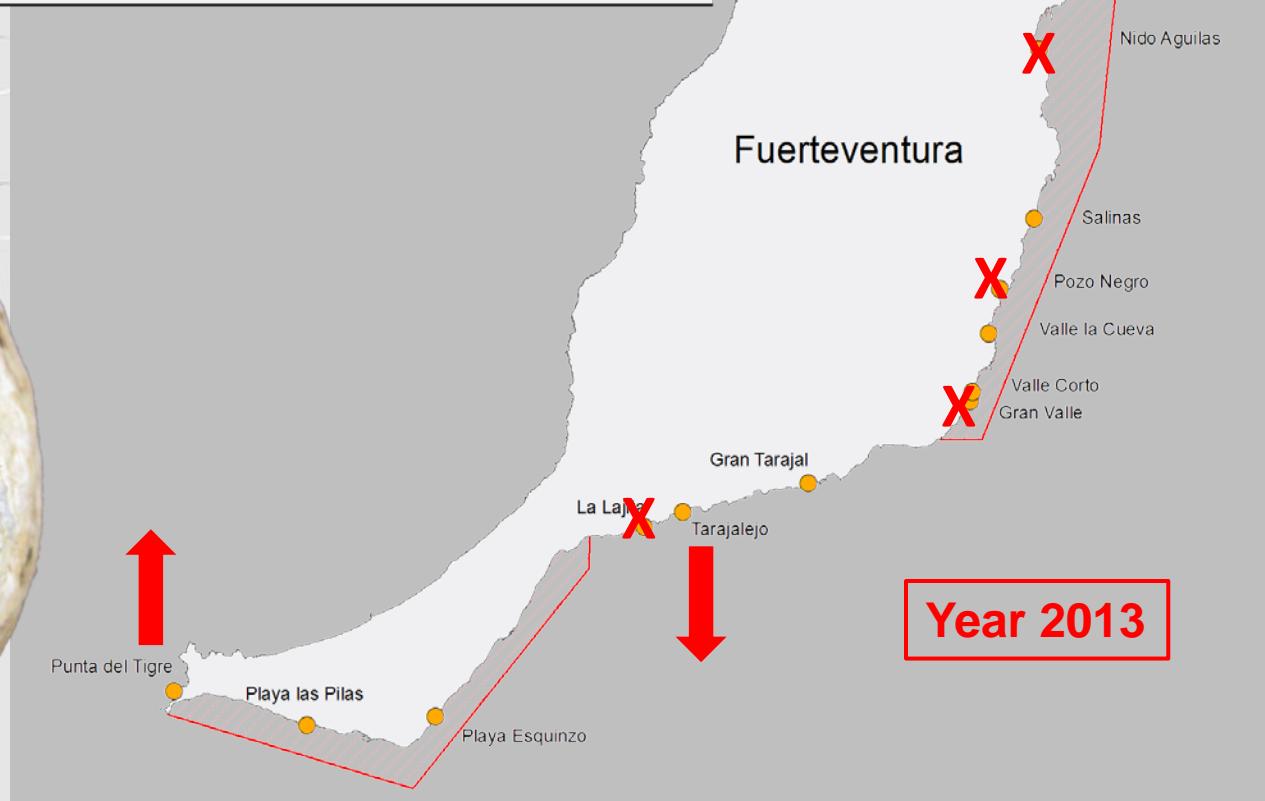


ESTACIÓN	JUN 2013	OCT 2013	SEGA 2008
Cueva del Diablo	0	0	0
Punta los Frailes	4	6	1
Cueva del Salto	0	0	0
El Rincón	0	-	-
El Río	0	1	-
Puerto de La Restinga	0	0	0
Puerto Naos	10	8	1
Punta del Miradero	-	3	0
Punta las Cañas	0	0	1
Punta Restinga (dentro)	2	5	8
Punta Restinga (fuera)	1	2	-
Roque Joraditos	3	8	2

# *Patella candei*

Permanova: Year + Protection + Location(Protection)

Source	df	SS	MS	Pseudo-F	P(perm)
Year	1	7,974E-2	7,974E-2	1,7326E-3	0,9686
Protection	1	16,431	16,431	0,11132	0,7504
location(Protection)	15	2214,5	147,63	23,526	0,0002
Year x Protection	1	49,069	49,069	1,0662	0,3264
Year x location(Protection)	15	690,5	46,033	7,3356	0,0002
Res	139	872,27	6,2753		
Total	172	3841,5			





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