

EVALUATION OF THE POTENTIAL IMPACT OF AN OIL POLLUTION IN A MEDITERRANEAN ISLAND MITIGATION COUNTERMEASURES AND RESTORATION PLAN

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Introduction

OBJECTIVES

This study aims to analyze the three main impacts of an incidental spill on a Mediterranean island: the environmental impact, the social impact over its population and the economic consequences. A real spill that occurred in summer 2007 in Ibiza is used to carry out the simulations.

THE SPILL

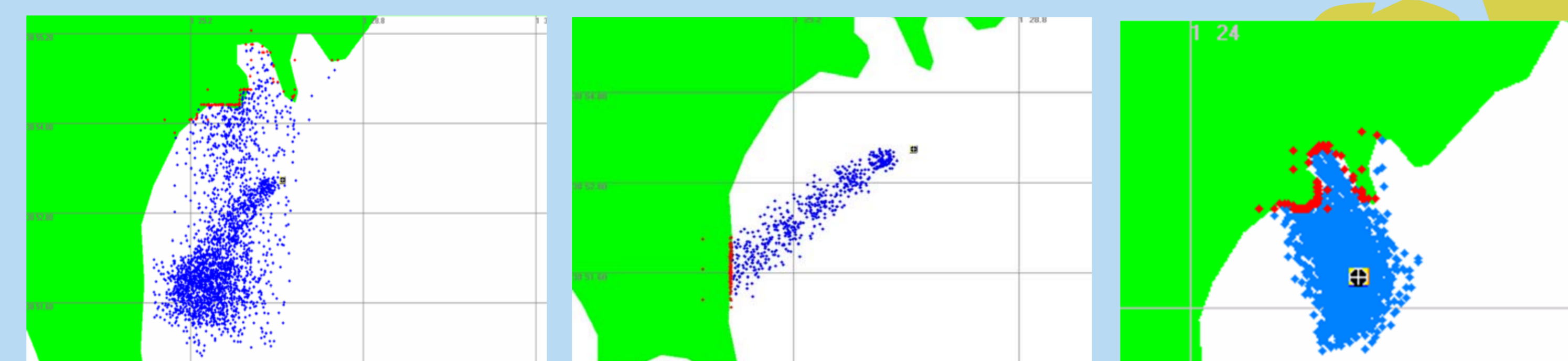
The sinking of the cargo ship Don Pedro, on 11 July 2007, at only one mile off Ibiza's port resulted in an oil spill involving potentially 173 m³ of fuel oil and 76 m³ of diesel.

The single hull Spanish tanker Don Pedro, owned by Iscomar Company, departed from Ibiza's port at 2.50 a.m. heading Valencia, transporting load, lorries and cars. At 4.05 a.m., the ship grounded on the Dzdo Grande rocks. Those rocks had been accurately reported on the national charts. However, the tanker hit them in the early morning, which eventually caused a perforation under the water line and made the vessel sink in 43 metres depth.



Methodology

By means of the model OILMAP, 3 fuel oil trajectories are simulated by UIB researchers under the effect of predominant winds in the port for 14 days after the spill [INM, 2007].



By means of the model ADIOS2, Diesel Oil evaporation is simulated by UIB researchers under the effect of predominant winds, wave conditions and temperature in the port during the 2 days after the spill [INM, 2007].

Using the simulation model «V. I. C. EN. C.», the Vulnerability, Resilience and induced Recovery were estimated at the docks and piers of the port of Ibiza.

By means of the simulation model IN.CO.TUR, the economic impact on tourism that a diesel oil spill arriving on Formentera coastline was estimated.

Modelisation Results

ENVIRONMENTAL IMPACT

In two days, the spill had reached the shoreline. About 70% of the affected beaches consisted of fine-grain sand beaches, while the rest were pebble beaches. As sandy beaches, they tended to retain oil on the surface. In addition, animals whose lives depend on regular contact with water surface, such as bivalves, and light dependent plants, such as Posidonia, were seriously threatened.

Vulnerability		Resilience			Induced recovery		
Index	Level	Index	Level	Time (years)	By mechanical means	By chemical means	By biological means
2	Slightly vulnerable	9	Very high	A few months	7	9	6

SOCIAL IMPACT

The Don Pedro incident resulted in the pollution of 8 km of coastline and the temporary closure of three beaches in Ibiza. Furthermore, the Natural Park of Ses Salines and the Marine Reserve of Freus were at risk for ten days after the spill. It is during this period that the social impact appears: fears and speculations from which the general public will draw their own conclusions.

ECONOMIC IMPACT

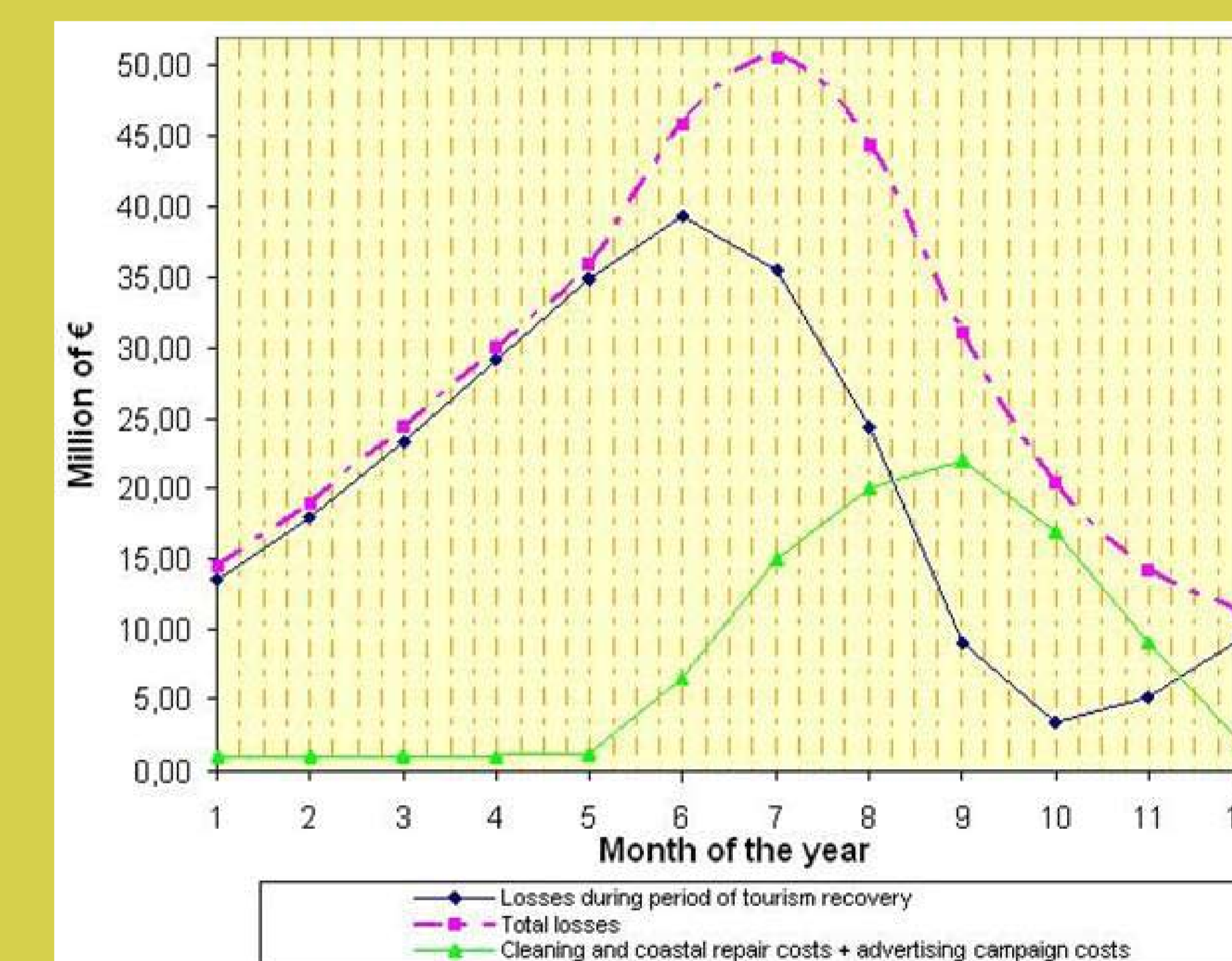
Tourism is the main source of benefits for the Balearic Islands. Since tourist activity is largely located along the islands coastline, any pollution due to oil spills can have an important economic impact.

If an oil spill involving 10 m³ of diesel occurs in July, the maximum total losses affecting Formentera Island economy are 50 million of euros.

The total cost can be estimated at 2,380,000 €, using the model COSTES and taking into account time, number of operators and cost of cleaning and restoration. It represents 34 working days of 868 people.

COMFRONTATION WITH REALITY

Ideally, the modelization results above should now be confronted with the actual impacts, so as to improve the model. However, that confrontation is far from easy.



Discussion

1) An oil spill generates a triple impact: an environmental impact as well as economic and social impacts. Quantity and type of oil spilled, circumstances and season of spil play and important role on impact. Those elements can be and have been modelized.

3) By means of the model OILMAP, 3 fuel oil trajectories were simulated under the effect of predominant winds in the port for 14 days after the Don Pedro spill. The results are quite comparable with what actually happened.

4) By means of the model ADIOS2, Diesel Oil evaporation is simulated under the effect of predominant winds, wave conditions and temperature during the 2 days after the Don Pedro spill. Environmental Impact is evaluated using the simulation model «V. I. C. EN. C.». Thus, the Vulnerability, Resilience and induced Recovery were estimated. Actual environmental impact studies being still underway, confrontation with the results of modelization is still to come.

6) Economic impact on tourism caused by a diesel oil spill arriving to Formentera coastline was estimated by means of the IN.CO.TUR model. That estimation seems to be globally in line with the claims presented by economic operators. However, those claims are presently being assessed and the accepted damage may be consistently below that claimed.

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