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Initial analysis of the status of the galician subtidal seabed after the Prestige oil-tanker accident carried out by direct observations from divers

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ABSTRACT

As a result of the disorder in the management of the catastrophe in the weeks following the sinking of the Prestige, the *Federación Gallega de Actividades Subacuáticas* came up with the need to find out the initial state of the subtidal seabeds of Galicia. For this purpose it coordinated the collection of standardised information by visual sampling procedures designed to that effect and performed by volunteer divers. The obtained results stablished the method used could be considered as a valuable tool to find out the initial degree of pollution in a black tide. Moreover, they were able to stablish that the most affected subtidal areas were the *Parque Nacional Marítimo-Terrestre de las Islas Atlánticas de Galicia* and the *Costa da Morte*.

1. INTRODUCTION

On the 14th of November 2002, the oil–tanker Prestige, with a cargo of 77000 tons of oil, sunk 120 miles off *Islas Cies*.

During the shipwreck of the tanker, outstanding political and social circumstances took place which have greatly influenced the effects derived from the oil spill, bringing on the uninterrupted emission of oil in the consecutive black tides to an unusually large scale in regards to space and time.

The *Federación Gallega de Actividades Subacuáticas* (FEGAS), a private organisation concerned with the integral protection of the environmental value of the galician coastline, was to stablish the initial degree of pollution by hydrocarbons in a series of coastal seabeds at a time when the disorder and the mismanagement of the authorities highlighted the value of individual iniciatives.

A total of 50 scuba and free divers, all of them voluntaries, coordinated by FEGAS made a considerable sampling effort of 4500 m of underwater transects, covering a sampling area of 25500 m^2 of seabed during the 9 months the field data collection lasted (10/12/2002 to 5/08/2003).

2. RESULTS AND DISCUSSION

The galician coast was divided in 10 sections, each under the supervision of one diving club subscribed to FEGAS in charge of collecting the information generated by the divers operating in his area. Each diver covered a 10 minutes constant deep transect, collecting, amongst others, standardised data about observed pollution (number of balls in water column; number of masses in water column; number of small masses -less than 1m lengh or diameter- on seabed; number of big masses -more than 1m lengh or diameter- on seabed). Results were aproximated to simple geometric forms with the aim of obtainig their volume (balls in water column to the volumen of a 0.5 radius sphere; masses in water column to a 100 cm radius and 5 height cylinder; small masses on seabed to a 2 cm radius and 30 height cylinder; big masses on seabed to a 75 cm radius and 4 height cylinder). Estimation of hydrocarbons mass followed

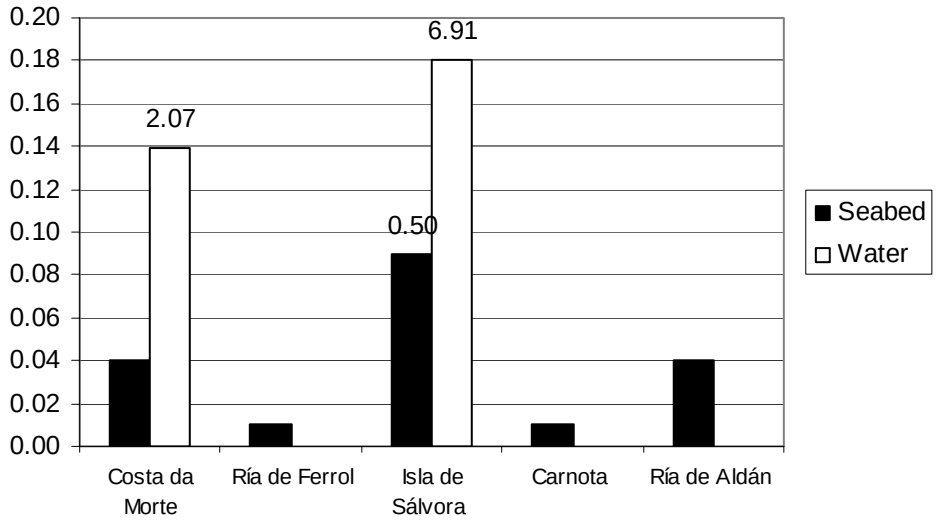
CSIC (2003) data (0.99 $g.cm^{-3}$). Samlping areas were calculated by a variable wide band for each transect, deducted from the estimated visibility by the diver and 75 m medium lenght by transect.

For all the sampling stations, the total oil found was 6064.44 kg. This quantity, estimating a medium average of 3.15 metres visibility, would supose a 0.80 $kg.m^{-2}$ of hydrocarbons both in water column as on the seabeds of the sampling stations in which the presence of oil was noticed.

It could be concluded that the most affected area correspond to the *Parque Nacional Marítimo-Terrestre de las Islas Atlánticas de Galicia*, particularly *Isla de Sálvora*, *Islas Cíes* and *Isla de Ons,* sites. It is also true that the dives performed in the south island of *Cies* and in the *Viños* islets showed negative results of presence of hydrocarbons. The quantitative results obtained in *Bajos de Punta Castillo* (*Isla de Sálvora*) were specially alarming (0.48 $kg.m^{-2}$ and 0.50 $kg.m^{-2}$ of oil on the bottom, 6.91 $kg.m^{-2}$ in water column) (see Fig.1). The dives performed in *Costa da Morte* showed high amounts of oil in water column, with 2.07 $kg.m^{-2}$ measured in *Pelouro de Diante*, and on seabeds: 0.04 $kg.m^{-2}$, 0.04 $kg.m^{-2}$, 0.03 $kg.m^{-2}$ and 0.01 $kg.m^{-2}$ stablished in *Punta Lobeiras*, *Pelouro de Detrás*, *Pelouro de Diante* and *Punta Gentín* respectively, which agrees with several pieces of information which point out that the area of *Costa da Morte* is the most affected continental area (Fig.1). Considerable quantities of oil have been obtained in the *Caldebarcos* beach, near *Carnota* (*A Coruña*), and in the *Ferrol* and *Aldán* rias (Fig.1).

Although it is not the aim of this work, it can be noted that among the organisms affected by the acute phase of the black tide, we should highlight the high number of specimens of spider crab (*Maja squinado*) observed during the various dives and considerable extesions of *Zostera marina*, a habitat protected by the current legislation.

Figure 1: Maximun quantities of oil measured in $kg.m^{-2}$ present on the sediments and in the water column of the most representative stations.



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