# Seven years of macroinfauna monitoring at Ladeira beach (Corrubedo Bay, NW Spain) after the *Prestige* oil spill*

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**Abstract**

The exposed sandy beach of Ladeira (Corrubedo Bay, NW Spain) was sampled during seven years (2003–2009) after the *Prestige* oil spill (winter 2002–03), to determine interannual variations in the macroinfaunal community in two ways: (i) through ecological indices (species richness and abundances, Shannon's diversity and Pielou's evenness) and (ii) through the density of the most representative species. A clear zonation pattern was found, consisting of two zones: (i) the supralittoral, occupied by talitrid amphipods, isopods and insects, and (ii) the intertidal, where marine crustaceans and polychaetes prevailed. The amphipods *Talitrus saltator* and *Talorchestia deshayesii* dominated from the drift line upwards, and isopods (*Eurydice* spp.), polychaetes (*Scolelepis* spp.) and the amphipod *Pontocrates arenarius* dominated the intertidal. Univariate indices remained constant throughout the study period in the supralittoral, but they varied widely in the intertidal zone. Multivariate analysis showed that the *Prestige* oil spill scarcely affected the macroinfaunal community structure during the study period (2003–2009) and its effect was limited just to the first campaign (2003), six months after the *Prestige* accident.

## 1. Introduction

The *Prestige* oil tanker sank 133 miles off the Galician coast in November 2002. Its cargo, 70 000 tons of fuel oil, spread onto the NW Spanish coast and even to some areas of France. It affected $>300$ km of rocky shores and sandy beaches, giving rise to one of the largest oil spills in recent decades (de la Huz et al. 2005, Junoy et al. 2005, Rodríguez et al. 2007, Puente et al. 2009). By May 2003, six months after the oil spill, most of the Galician beaches (98.3%) were clean (Xunta de Galicia 2003), the sediments on many of them were not especially toxic (Fernández Méijome et al. 2006), and clean-up activities (removal of fuel and underlying sand) were limited to removing tar balls that occasionally turned up on the beaches (Junoy et al. 2005). The Ladeira beach is regarded as the one with the highest macroinfauna abundance and diversity of all the Galician beaches as well as the one that was the most seriously impacted by the *Prestige* oil spill (De la Huz et al. 2005, Junoy et al. 2005, Lastra et al. 2006).

Oil spills are the most destructive pollution source impacting sandy beaches (Defeo et al. 2009), causing a significant toxic effect that results in a decrease of many ecological parameters and in the reduction or local extinction of benthic species (Peterson 2001, Kingston 2002, Gómez Gesteira & Dauvin 2005, Veiga et al. 2009). Several studies have analysed their impact on beach macrofauna worldwide (Sanders et al. 1980, Elmgren et al. 1983, Kingston et al. 1995, Gómez Gesteira et al. 2003, de la Huz et al. 2005, Junoy et al. 2005, Fernández Méijome et al. 2006, Viéitez 2007, Puente et al. 2009, Veiga et al. 2009). However, it has been