



## BIOREMEDIATION OF THE PRESTIGE FUEL OIL SPILL

Heavy fuel oil spilled from the oil tanker Prestige in November 2002 affected hundreds of km of Spanish shoreline. We carried out a two year study at two highly contaminated sites in order to monitor natural attenuation of the residues coating shore rocks and to test the effectiveness of bioremediation with an oleophilic fertilizer (S200). The methodology included an innovative approach for oil load calculation (based on image analysis techniques), the analysis of the fate of hydrocarbons by means of chemical biomarkers and different microbiological techniques for isolating and examining hydrocarbon degraders.

Considerable hydrocarbon depletion from shorelines (100% for light-medium linear alkanes and 35% for aromatics such as pyrene) was observed within the first months after the spill. However, this natural attenuation effect dramatically slowed down in the following year, although partial enhancement (especially for the aromatic fraction) was attained as a result of the application of S200 to stimulate indigenous microorganisms. In addition, one of the main outcomes of this work concerns the remarkable hydrocarbon depletion achieved at points where fresh water flowed through the shore rocks.

The study of samples collected where this natural attenuation phenomenon took place made it possible to isolate heterotrophic bacteria and fungi that are likely to cooperate with cyanobacteria in hydrocarbon biodegradation. The overall results strongly advocate the implementation of new bioremediation approaches, including alternatives such as the use of natural fresh water to irrigate polluted areas.