

# High levels of toxic compounds found on coasts of West Africa

April 6 2011

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This is the ship graveyard in Nouadhibou, Mauritania. Credit: Slosada

An international team of scientists has found very high levels of polychlorinated biphenyls (PCBs) along the coasts of West Africa. Production of these extremely toxic compounds has been banned in Europe and the United States for years. These harmful substances could come from the illegal dumping of waste or from an enormous ship breaking yard in Mauritania.

"We were not expecting to find such high levels of PCBs, highly [toxic compounds](#) that are considered as priority compounds by European legislation, in a region such as the western coast of Africa", Ailette Prieto, a researcher at the University of the Basque Country (UPV/EHU-Spain) and co-author of a study published in the journal *Environmental Science & Technology*, tells SINC.

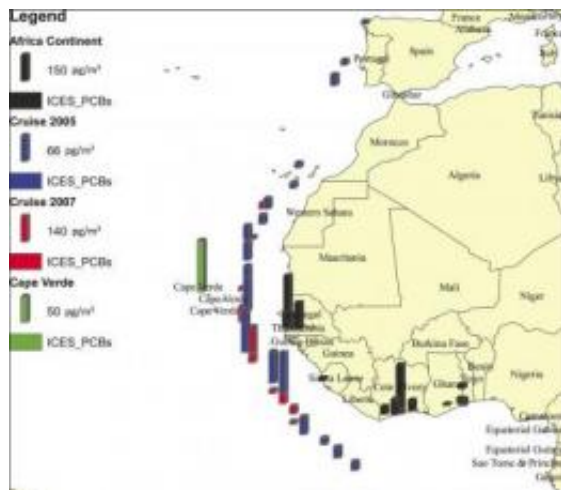
PCBs, which some studies have shown to be carcinogenic compounds, were used years ago as dielectric fluids in transformers, condensers and coolants for various devices. However, their production was banned in the United States in 1979 due to their toxicity and persistence in the environment, and they were banned from 2001 onwards in countries such as [Spain](#) that signed up to the Stockholm Convention on Persistent Organic Compounds.

Now, the team led by researcher Rosalinda Gioia at Lancaster University (United Kingdom), has shown that high concentrations of PCBs (between 10 and 360 picograms/m<sup>3</sup>) are found in some countries in West Africa, such as the Gambia and Ivory Coast, and all along this coast.

For this study, the scientists have carried out several years of research campaigns throughout the region over recent years, taking air samples from the German ship RV Polastern. They also gathered samples from land-based stations (Gambia, Sierra Leone, Ivory Coast and Ghana), and used particle dispersion models to seek the possible sources of the contamination.

## **Illegal dumping and ship graveyards**

Gioia explains that the high levels of PCBs could come from more than one potential source – "the illegal dumping of waste containing these compounds – they can be released through volatilisation and uncontrolled burning – as well as the storage and scrapping of old ships". The study points particularly to the large ships' graveyard in the bay of Nuadibú (Mauritania), which is one of the largest in the world.



This graphic shows PCB concentrations on coasts of West Africa. Credit: R. Gioia et al./ *Envir. Sci. & Tech.*

"Another possible source could be the burning of organic material from forest fires in the region, but we have ruled this out because such cases also release other contaminants (PAHs, polycyclic aromatic hydrocarbons), and we hardly detected any of these", Prieto adds.

The data for the study -that has also appeared in *Nature News*- were collected in 2007 during the ship *RV Polastern*'s scientific expedition of the from Germany to South Africa. The samples were collected using "sponges" that substances in the air stick to. Subsequently, these samples were frozen and examined in European laboratories, including the Department of Analytical Chemistry at the UPV in Bilbao. The team repeated the expedition in November 2010, and the latest samples are currently being analysed.

**More information:** Rosalinda Gioia, Sabine Eckhardt, Knut Breivik, Foday Jaward, Ailette Prieto, Luca Nizzeto y Kevin C. Jones. "Evidence for Major Emissions of PCBs in the West African Region".

*Environmental Science & Technology* 45 (4): 1349-1355, 2011. [DOI:](#)

[10.1021/es1025239](https://doi.org/10.1021/es1025239)

Provided by FECYT - Spanish Foundation for Science and Technology

Citation: High levels of toxic compounds found on coasts of West Africa (2011, April 6)  
retrieved 26 April 2024 from

<https://phys.org/news/2011-04-high-toxic-compounds-coasts-west.html>

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