

HAZARDOUS SUBSTANCES

OSPAR's QUALITY STATUS REPORT 2023 BRIEFING NOTE SERIES

Since 1998 OSPAR's objective for Hazardous Substances has been "to prevent pollution of the OSPAR Maritime Area by continuously reducing discharges, emissions and losses of hazardous substances, with the ultimate aim to achieve concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances". OSPAR also aimed to move towards the cessation of discharges, emissions and losses of hazardous substances by the year 2020.

Concentrations of many of the most serious hazardous substances, such as PCBs, PAHs and organochlorine insecticides, have decreased substantially compared with the 1980s-1990s. Nevertheless, we find that most OSPAR sub-regions (ten out of twelve) have a poor status for hazardous substances in marine animals (fish, mussels and oysters). This is mainly caused by excessive concentrations of mercury and PCB118 (a dioxin-like polychlorinated biphenyl). Moreover, current trends indicate that only one of the sub-regions may improve substantially during the next 10-20 years. For hazardous substances in sediment, the situation is somewhat better, as approximately half of OSPAR's sub-regions have a good status. Again, mercury is the main culprit. One Region may be expected to go from poor to good environmental status during the next 10-20

years, but no Regions are expected to go from good to poor. The ban on TBT, a highly toxic biocide, in antifouling paints from 2008, however, seems to have worked. There has been a general reduction in imposex levels, a condition which affects reproductivity, in gastropods. It should be noted that gastropods are not the most sensitive species, as some fish larvae are hampered in their development at even lower TBT concentrations, so we are on the right track but good status for all waters is still a distant target.

Thus, while society has made considerable progress in reducing many hazardous substances, from high levels in the early 1980s to more moderate levels over the past decade, further progress towards OSPAR's objective of cessation of discharges and emissions is considerably slower. This is because of the high chemical stability of hazardous chemicals and their re-release from marine sediment, which acts as storage for past contamination. This re-release is caused by both natural (e.g., hydrodynamic and biogenic) and anthropogenic processes (e.g., bottom trawling, anchoring, dredging, and dumping operations). Also, there is continued discharge from sources both within and outside the OSPAR area. For animals at high trophic levels such as predatory whales, even PCBs, which were mostly banned decades ago, are a real threat to survival. In recent years, there has also been more focus on emerging contaminants such as PFAS (a large group of fluorinated substances), pharmaceuticals, and chemicals in personal care products (e.g., cosmetics, hygiene products and sunscreens). The diversity of these substances exposes marine organisms to a "cocktail" of chemicals. Owing to the complexity of this issue there is still quite limited knowledge on the cumulative impact of this mixture of chemicals.

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