

Extended Abstract

The Issue of Non-Oil spills: Hydrophobic Substances Discharged Into the Marine Environment and the Effects on Marine Wildlife

C. J. Camphuysen¹ and J. W. de Leeuw²

¹Royal Netherlands Institute for Sea Research (NIOZ), P.O. box 59, 1790AB Den Burg, Texel, The Netherlands; ²Department of Earth Sciences – Geochemistry, Faculty of Geosciences, Utrecht University, P.O. Box 80.021, 3508 TA Utrecht, The Netherlands

Mineral oil spills¹, including accidental spills and chronic oil pollution (illegal discharges and unreported small spills), can cause considerable damage in the marine environment and usually involve wildlife casualties. Within Europe, there is a long history of marine mineral oil pollution, but in recent decades, the amount of mineral oil released into the marine environment has fallen substantially. Even though, there are still at least thousands of spills detected per annum in European waters and mineral oil-related mass mortality events affecting marine wildlife still occur on an annual basis.

While wildlife hazards due to mineral oil incidents are widely recognised and frequently published, little factual information is available on the effects of 'other noxious liquid substances' on the marine environment. Next to chemicals released from land-based facilities, entering the marine environment through atmospheric or freshwater input, are direct releases from shipping. In the past decades, however, discharges and strandings of hydrophobic substances other than mineral oil or mineral oil products, many listed under MARPOL Annex II, and their effects on marine wildlife have become more prominent than before. This prominence either indicates an increase in discharges of these substances, or could indicate that discharges and strandings of such substances have received more attention following a steady decline in chronic mineral oil pollution of our seas and oceans. Most important, however, is that our understanding of the source(s) of these pollutants and their environmental impacts are far from complete. The relative contributions of non-mineral oil substances affecting marine wildlife, their chemical composition, as well as their impacts on the marine environment and wildlife are not well understood and, as shown hereafter, has rarely been studied.

The aim of this presentation is to provide an overview of observed and anticipated impacts of hydrophobic and insoluble chemicals on European marine ecosystems and wildlife from (merchant) shipping. MARPOL Annex II is briefly introduced and the hydrophobic and insoluble substances that are currently listed (IBC, GESAMP/BHS) and are recognised as more or less hazardous to the environment are evaluated. Several case studies regarding the effects of these substances on the marine environment are provided and discussed.

¹ Mineral oil: crude oil and all mineral oil products

Apparent trends in the frequency and/or scale of releases of hydrophobic and insoluble chemicals in European seas and the possibilities for efficient spill responses are investigated.

The regulations under MARPOL 73/78 Annex II are such that spills of 'unwanted' noxious substances into the marine environment are either strictly prohibited or essentially very small, distant from the nearest coast and in very low concentrations. Discharges in low concentrations cannot be fully prevented, however, and some permitted discharges are still likely to have impact on the marine environment. The quantities reported in each of the above case studies reported in this presentation studies suggest that discharges took place well above permitted levels, and they have to be regarded as illegal spills. The case studies show that the effect of discharges of noxious liquid substances on the marine environment *can* be substantial. They also clearly highlight the fact that substantial discharges do occur frequently, despite international regulations and conventions. Most case studies reported effects of noxious substances on marine wildlife that are superficially similar to the effects of mineral oil spills on marine biota. Sometimes the effects were aggravated due to immediate toxic effects, or due to the aggressive nature of components of the substances released (some were additives to a substance of lesser concern). Some of the main problems of these and similar spills are listed:

- uncertainties about the origin, nature and chemical composition of the substances spilled or their environmentally transformed products (at least for those involved in clean-up and response; including scientific investigations of the casualties),
- the absence of a monitoring protocol in which all details about cause and effects are logged, and
- the absence of a final publication reviewing all details and accumulated information.

With regard to the impact assessment of hydrophobic and insoluble chemicals, the situation within Europe is even worse than with mineral oil. The case studies listed earlier in this chapter mostly originate from reports produced in countries bordering the southern North Sea. While this area is widely known as a relatively polluted area, there is no reason to believe that other, similar sea areas are any better off. Because most vegetable oils are edible their potential danger to aquatic birds, fish, or marine mammals may go unnoticed and sites of storage and transshipment of vegetable oils may be overlooked in oil spill contingency planning. What is reflected in this presentation, is the absence of systematic studies and monitoring programmes elsewhere in Europe, other than monitoring projects to study the effects of mineral oil pollution and projects to study the effects of litter. New initiatives to raise preparedness for mineral oil spills in Europe and to develop protocols on how to handle affected wildlife (dead or alive; including scientific impact assessments of spill), all refer to the effects of mineral oil and seldom, if at all, mention noxious liquids such as addressed under MARPOL Annex II. Given the nature of some of the noxious liquid substances and the potential effects on human health, guidelines for spill responses should be provided also outside the context of shipping and harbour authorities. Each of the case studies presented here were dealt with by the general public, and clear-cut information on

the nature of substances involved was either absent or available rather late, despite the obvious risks for human health involved.



Common Guillemot *Uria aalge*, fresh but smothered in an unidentified green substance and with loosening skin and dissolving soft parts, Texel, January 2007 (C.J. Camphuysen).