

Abstract

In Search of the Source: Oil Fingerprinting in African Penguins

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Oil fingerprinting enhances our ability to identify oil types and compare various samples to determine whether they originated from the same or different sources. It is a valuable tool to support enforcement of illegally discharged bilge oil or other fuel in the environment through forensic analysis; to determine the source of the oil; to determine if there may be more than one spill; and/or to determine the type of oil to help inspectors or investigators narrow the search for a vessel. While this process may be cost prohibitive for every spill, it serves as another tool to aid in the identification and subsequent enforcement of polluters.

In collaboration with the Ontario Veterinary College at the University of Guelph, Environment Canada, and the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB), oil from 171 African Penguins (*Spheniscus demersus*) admitted to SANCCOB for rehabilitation was analyzed using gas chromatography. Twenty-five different sources of oil were identified. In several cases, oil spread over time and place likely originated from the same source, which suggests a sunken ship or a natural seep as the cause. Additionally, 20 samples were unique in place but not time, which speaks to the ongoing discussion of the prevalence of oil dumping in the region. Similarities between the oil from African Penguins and oil analyzed from Magellanic penguins in South America and seabirds in Canada are discussed.