WRITTEN TESTIMONY OF
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HEARING ON
Discharges Incidental to the Normal Operation of a Commercial Vessel

BEFORE THE
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT
UNITED STATES HOUSE OF REPRESENTATIVES

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Introduction

Good morning Chairperson Johnson, Ranking Member Boozman and members of the Subcommittee. Thank you for the opportunity to speak with you today on discharges incidental to the normal operation of a commercial vessel. My name is Chris Reddy, and I am a scientist at the Woods Hole Oceanographic Institution in Woods Hole, MA. As an organic chemist, my research focuses on marine pollution. I have published more than 70 peer-reviewed scientific journal articles and several book chapters on this and related subjects. I am currently studying the aftermaths of five oil spills that have occurred from 1969 to eight months ago as well as petroleum contamination in some of the busiest harbors in the United States.

For today's hearing, you have asked me to give an overview of oil inputs to the ocean from human activities with an emphasis on those released by commercial vessels.

Petroleum Inputs and effects

Petroleum or oil is a complex mixture of molecules formed from organic debris acted on by geologic processes over millions of years[1]. The thousands of molecules that compose oil can have widely different properties. Microbes can eat some, others are very toxic and then some can dissolve in water at appreciable levels.

Worldwide, about 190 million gallons of crude oil or its refined products enter the coastal waterways or oceans due to human activity. It is either released by extreme, accidental events like oil spills (19% of the total spilled) or via chronic discharges. These include jettisoned fuel from airplanes (1%), activities associated with the extraction of petroleum (6%), air pollution (8%), runoff from land sources like automobile motor oil (21%), and then shipping operations (46%)[2]. Hence, it is the latter, chronic inputs by shipping operations, which release more oil into the ocean than accidents like the recent

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Cosco Busan oil spill in San Francisco Bay in November 2007. However, these estimates come with a high level of uncertainty.

Our best knowledge about oil inputs is from the National Research Council's *Oil in the Sea III*[2].This book and its predecessors have represented the state of our knowledge about oil's inputs and fates as well as effects on the ocean.

In *Oil in the Sea III*, it was estimated that worldwide operational discharge by vessels greater than 100 gross tonnes was 23 to 210 million gallons per year with a best estimate of 70 million gallons. Therefore, it is possible that there is at least a factor of ten difference of what we estimate and what is released into the oceans by these vessels annually. This range is so broad because it is difficult to measure the amount of oil released from each vessel, to estimate the number of vessels at sea, and what percent are in compliance with proper handling of their waste. For example, the panelists preparing *Oil in the Sea III* argued that 5 to 15% of the vessels are non-compliant and, if so, discharge 100% of their fuel sludge. Based on select studies employing aerial surveillance, non-compliance is commonplace[3]. Since the publication of *Oil in the Sea III*, I do know of any concerted effort to improve such estimates. However, these values are lower that earlier estimates likely resulting from better technology, education, and enforcement.

Our interest in understanding how much oil is released plays a crucial role on understanding its effects on oceanic ecosystems. While oil has short-term immediate ecological impacts like those often seen on television with birds coated with black viscous oil following spills, there are also less visually arresting, but more chronic and persistent effects that are more difficult to investigate[4].

Numerous studies have shown that mixtures of lubrication, machinery, crude, and fuel oils leaked or discharged from ocean-going vessels kill thousands of seabirds annually[5-7]. Canadian researchers have estimated that 300,000 seabirds die annually from chronic oil pollution in the North Atlantic Ocean off the coast of Newfoundland. These highest incidents of bird deaths in the world are attributed to the close proximity of the feeding grounds of the birds and the dense shipping routes traveled between North America and Europe. Most often, the oiling of the bird's feathers leads to death by their diminished capacity to waterproof, insulate, and retain buoyancy.

With shipping increasing and rapidly industrializing countries adding to more international trade[8], oil discharges from the normal operation of a vessel still remains a threat. Additional studies on constraining such input terms and their effects are necessary before a clearer picture of this problem can be achieved.

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