

Extent and Degree of Shoreline Oiling: *Deepwater Horizon* Oil Spill, Gulf of Mexico, USA

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Abstract

The oil from the 2010 *Deepwater Horizon* spill in the Gulf of Mexico was documented by shoreline assessment teams as stranding on 1,773 km of shoreline. Beaches comprised 50.8%, marshes 44.9%, and other shoreline types 4.3% of the oiled shoreline. Shoreline cleanup activities were authorized on 660 km, or 73.3% of oiled beaches and up to 71 km, or 8.9% of oiled marshes and associated habitats. One year after the spill began, oil remained on 847 km; two years later, oil remained on 687 km, though at much lesser degrees of oiling. For example, shorelines characterized as heavily oiled went from a maximum of 360 km, to 22.4 km one year later, and to 6.4 km two years later. Shoreline cleanup has been conducted to meet habitat-specific cleanup endpoints and will continue until all oiled shoreline segments meet endpoints. The entire shoreline cleanup program has been managed under the Shoreline Cleanup Assessment Technique (SCAT) Program, which is a systematic, objective, and inclusive process to collect data on shoreline oiling conditions and support decision making on appropriate cleanup methods and endpoints. It was a particularly valuable and effective process during such a complex spill.

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Introduction

The *Deepwater Horizon* spill released a U.S. Government-estimated 4.9 million barrels of oil into the Gulf of Mexico over an 87-day period, from 20 April to 15 July 2010 [1] [2]. The fate of the oil included direct recovery from the wellhead, containment, offshore skimming, controlled in-situ burning, natural and chemical dispersion (both subsea and on the surface), and other pathways, including stranding on the shoreline.

In anticipation of shoreline oiling, the Unified Command managing the emergency response (lead by the Federal On-Scene Coordinator [U.S. Coast Guard] in consultation with the State On-Scene Coordinators from each State, and BP) established a Shoreline Cleanup Assessment Technique (SCAT) Program on 28 April 2010. The SCAT process is a well-established and internationally recognized component of spill response in use since the *Exxon Valdez* spill, where a standard methodology for documentation, terminology, and decision making for shoreline

assessment and treatment was first applied [3]. Once oil strands on shorelines, responders survey the affected areas to determine the appropriate response. There are many general guidelines for how to best remove the oil from different shoreline habitats and specific cleanup recommendations integrate field data on shoreline habitats, type and degree of shoreline oiling, site-specific physical processes, and resources at risk. Every oil spill is a unique combination of conditions that have to be factored into the development of effective treatment guidelines. During the *Deepwater Horizon* response, oil came ashore over an extended period of time, requiring response activities to be spread over four states over multiple years.

The objectives of this paper are to provide information on the maximum extent and degree of shoreline oiling from the *Deepwater Horizon* oil spill as observed and characterized through methodologies applied for response purposes, as well as shoreline oiling conditions at one and two years post-release, and to describe some of the unique factors of this spill as they pertain to how oil stranded