Oil Spills in Mangroves

PLANNING & RESPONSE CONSIDERATIONS

National Oceanic and Atmospheric Administration • NOAA Ocean Service • Office of Response and Restoration

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INTRODUCTION

This report is intended to assist those who work in spill response and planning in regions where mangrove ecosystems are an important part of the coastline. By understanding the basics of the ecology of these forests and learning from past oil spills in mangroves, we can better plan for, protect, and respond to spills that may threaten them. Mangroves often border coastlines where coral reefs live offshore, and these two ecosystems are closely linked. Mangroves filter and trap excess sediment that could harm coral, and coral reefs protect shorelines where mangroves grow from excessive wave energy. Both habitats can be adversely impacted by oil spills, and spill responders must often consider tradeoffs between land-based and offshore resources during a response. This guide is a companion to *Oil Spills in Coral Reefs: Planning and Response Considerations*.

This is not intended to be a specific guide for choosing cleanup methods, as many comprehensive versions of these exist already. Rather, we summarize current research on mangroves from the perspective of those who may need to make decisions about response in mangroves and present the information in an accessible format for people with some science or response background. Experienced responders unfamiliar with mangroves may want background on mangrove ecology, while biologists may want an overview of oil toxicity and mangroves and response and cleanup applied to mangrove ecosystems. We have organized the topics by chapters, each of which can be read as a standalone, with additional references provided at the end of each chapter. A glossary defines specialized terms.

Chapter 1, mangrove ecology, provides an overview of mangrove forests, their associated communities, and how they respond to various natural and human stresses. Chapter 2, oil toxicity to mangroves, reviews the research available on oil toxicity and impacts to mangroves. In Chapter 3, we discuss general guidance for responding to spills in mangroves and provide specific considerations for cleanup measures. Chapter 4 discusses long-term recovery of mangroves from oil spill impacts and restoration techniques and approaches. Lastly, in Chapter 5 we have compiled several case studies that illustrate a range of issues from oil spills impacting various regions.

Though mangrove forests are in many ways very adaptable ecosystems, and are inherently able to respond to physical changes in their environment, they are highly vulnerable to oil toxicity and can be further damaged by many types of cleanup activities. Thus, we must approach any type of response or restoration activities in mangroves with knowledge and caution. The information in this document will, we hope, help to minimize environmental impacts in mangroves when oil spills threaten them.