

PREFACE

As the largest offshore oil spill in U.S. history, the *Deepwater Horizon* incident in spring–summer 2010 presented a significant threat to the coastline and the marine ecosystems of the Gulf of Mexico. Aiming to help and guide mitigation efforts, scientists from operational agencies, the academic community, and the private sector responded rapidly by making use of ocean-observing and ocean-modeling resources as well as oil spill detection technologies. The monitoring and modeling conducted over the following months was unprecedented in the amount of oceanographic and oil spill observations collected, the number of numerical models employed, and the number of scientists and agencies involved in the effort. It was the most intensive oceanographic and oil spill research enterprise ever performed.

The contents of this book were primarily derived from three special sessions (OS33C, OS41D, and OS42A) organized by the editors at the American Geophysical Union 2010 Fall Meeting, “Lessons Learned From the *Deepwater Horizon* Oil Spill: Physical Oceanography.” The sessions brought together many of the scientific leaders in the field. A total of 23 presentations on the “experiences and lessons learned” were contributed by the oil spill first responders from academic institutions, the private sector, and governmental agencies. The presentations covered observing and modeling of the oil spill and provided state-of-the-art overviews on the science and technology of this field. This broad-based approach exposed for the participants the need for a synthesis. Along with the meeting participants we also invited several scientists with expertise in Gulf of Mexico oceanography to contribute to this book.

Effective oil spill monitoring and modeling systems were critical to the rapid responses achieved for the *Deepwater Horizon* event. Now in the aftermath, accurate hindcast modeling systems remain essential for damage assessment and improved understanding and prediction of long-term impacts. With the increasing demand for energy resources, gas and oil production has shifted to deeper-water regions in recent years, highlighting the need for continued knowledge

to support rapid and effective responses to any subsequent deepwater oil spill. The scientific response to the *Deepwater Horizon* oil spill was timely, and the lessons learned may be beneficial going forward. It is our hope that this book will provide a basis for motivating additional marine research in the Gulf of Mexico and on the potential long-term consequences of the *Deepwater Horizon* oil spill.

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