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Research Note

Hurricanes and Oil Spills

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Applicable Sectors: Emergency Services, Disaster Management.

Introduction

The Deepwater Horizon Spill (also known as BP Spill, the Gulf of Mexico Spill) is a massive ongoing oil spill in the Gulf of Mexico that is the largest offshore spill in U.S. history. This spill has an extensive environmental impact already apparent on the marine and wildlife habitats. As the hurricane season is here, and the Deepwater Horizon Spill is still discharging a geyser of oil into the Gulf of Mexico, we anticipate a hurricane agitating through the largest accidental oil spill in history.

Possible Effects of Hurricane on Gulf Oil Spill

There are lots of unknowns about what could be the possible effect of a hurricane on the natural ecosystem. The closest call came in 1979, after the greatest accidental oil spill in history, the massive Ixtoc I blowout. That catastrophe dumped 3 million barrels (126 million gallons) of oil into the Southern Gulf of Mexico between June 1979 and March 1980. Category 1 Hurricane Henri passed just north of the main portion of the oil spill on September 16 and 17, generating 15 foot seas and southwest winds of 15 - 25 knots over the spill region on the 16th.

Interestingly, the NOAA/AOML report on the spill found that the winds did not blow long enough or strongly enough to control the direction of oil flow, as evidenced by the fact that the wind direction was often 180° to the direction of plume flow. The main impact of the wind was to dilute the oil and weather it, converting it to a thick "mousse".¹

James H. Cowan, a biological oceanographer at Louisiana State University, said a hurricane could push oil inland, possibly affecting rice and sugar cane crops. A hurricane could also delay

¹ <http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=1492>

attempts to close the well and could spread/dilute the oil further or deeper in the ocean.

Jeff Masters, founder of Weather Underground, pointed out the possibility of more widespread damage to coastal areas, airborne oil droplets immersed in hurricane winds, and a chance that the oil spill could cause explosive deepening of hurricanes in the Gulf.

Larry Crowder, a professor of marine biology at Duke University, said that if the spill continues for a couple more months, then oil almost certainly would get into the Loop Current that flows clockwise around the Gulf. It then would be a week to 10 days before it got to the Florida Keys, and a couple of weeks more before the Gulf Stream carried it to North Carolina.²

NOAA's position is that the oil spill would have a "minimal" effect on a hurricane's behavior, as long as the spill is small in comparison to the storm. Also, the high winds and rough seas would aid in the weathering process of the oil slick, and the agency discarded the possibility of petroleum being embedded in the hurricane's precipitation. However, NOAA stressed that the direction of any spreading of oil due to the passage of a tropical cyclone depends on the

² <http://www.thesunnews.com/2010/05/31/1505058/gulfs-future-looks-grim.html>

exact track of the storm, and cautioned that the hurricane's storm surge may carry oil inland.

Hurricanes also could disperse the oil farther and wider - or roil the waters so that oil at the surface plunges to great depths and poisons the deepwater ecosystem.

Recently, the hurricane Alex, with winds of 85 mph, was headed for the northeastern Mexico and South Texas coasts late on Wednesday, June 30, according to the National Hurricane Center. That is far from the oil spill site off the coast of Louisiana.³

Shores that are already fouled by oil will probably benefit from a hurricane, but the oil cleaned off of those shores then becomes someone else's problem. The strong winds and powerful ocean currents that a hurricane's winds drive will bring oil to large stretches of coast that otherwise would not have gotten oil. This is the major concern regarding a hurricane moving through the Deepwater Horizon oil spill. Let's consider the case of the Exxon Valdez disaster in 1989. The ill-fated tanker split open in Prince William Sound on March 24, and oil spill response crews were initially able to contain the spill behind

³ <http://fromtheold.com/news/alex-wind-speeds-now-85-mph-or-135-kmhr-2010063018763.html>

booms and make good progress removing it. However, two days later, a powerful Gulf of Alaska storm with 70 mph winds roared through, overwhelming the containment booms and distributing the oil along a 90-mile stretch of coast. The oil went on to foul over 400 miles of Alaska coast, a far larger disaster than would have occurred than if the storm had not passed by. Similarly, a hurricane moving through the Gulf of Mexico spill will very likely make the disaster much worse, spreading out the oil over a larger region, and bringing the oil to shores that otherwise might not have seen oil. It is true that the oil will be diluted some by being spread out over a larger area, so some shores will not see a substantial oiling. But overall, a hurricane passing through the oil spill is likely to result in much higher damage to the coast. Similarly, Katrina's storm surge destroyed an oil tank at Chevron's Empire facility, releasing oil into a retention pond in a region surrounded by marshland. Three and half weeks later, Hurricane Rita's storm surge hit the oily mess in the retention pond, washing 4,000 - 8,000 gallons of oil into nearby marshlands, which were heavily or moderately oiled. The oiled marshlands were set on fire six weeks after the spill, resulting in 80-90% removal of the oil and contaminated vegetation.¹ The marshland recovered fairly quickly, though oil still remained in the

roots, affecting burrowing crabs and the wildlife that feed on them. So, oiled marshes can recover somewhat from a storm-surge driven oiling, but it is uncertain if burning could be successfully used to restore a 100+ square mile region of marshland oiled by the storm surge from a major hurricane.

Therefore, the Deepwater Oil Spill already had severe consequences for BP. To add to it, the occurrence of a hurricane would create havoc for BP, U.S. Government and cause a threat to natural ecosystem.

References

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