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TITLE: Impacts of the Deepwater Horizon oil spill on deep-sea coral-associated sediment communities

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ABSTRACT:

MEPS Marine Ecology Progress Series Contact the journal Facebook Twitter RSS Mailing List Subscribe to our mailing list via Mailchimp HomeLatest VolumeAbout the JournalEditorsTheme Sections MEPS 561:51-68 (2016) - DOI: https://doi.org/10.3354/meps11905 Impacts of the Deepwater Horizon oil spill on deep-sea coral-associated sediment communities Amanda W. J. Demopoulos1,*, Jill R. Bourque1, Erik Cordes2, Katherine M. Stamler3 1US Geological Survey, Wetland and Aquatic Research Center, Gainesville, FL 32653, USA 2Temple University, Philadelphia, PA 19122, USA 3Cherokee Nation Technology Solutions, contracted to the US Geological Survey, Wetland and Aquatic Research Center, Gainesville, FL32653, USA *Corresponding author: ademopoulos@usgs.gov ABSTRACT: Cold-water corals support distinct populations of infauna within surrounding sediments that provide vital ecosystem functions and services in the deep sea. Yet due to their sedentary existence, infauna are vulnerable to perturbation and contaminant exposure because they are unable to escape disturbance events. While multiple deep-sea coral habitats were injured by the 2010 Deepwater Horizon (DWH) oil spill, the extent of adverse effects on coral-associated sediment communities is unknown. In 2011, sediments were collected adjacent to several coral habitats located 6 to 183 km from the wellhead in order to quantify the extent of impact of the DWH spill on infaunal communities. Higher variance in macrofaunal abundance and diversity, and different community structure (higher multivariate dispersion) were associated with elevated hydrocarbon concentrations and contaminants at sites closest to the wellhead (MC294, MC297, and MC344), consistent with impacts from the spill. In contrast, variance in meiofaunal diversity was not significantly related to distance from the wellhead and no other community metric (e.g. density or multivariate dispersion) was correlated with contaminants or hydrocarbon concentrations. Concentrations of polycyclic aromatic hydrocarbons (PAH) provided the best statistical explanation for observed macrofaunal community structure, while depth and presence of fine-grained mud best explained meiofaunal community patterns. Impacts associated with contaminants from the DWH spill resulted in a patchwork pattern of infaunal community composition, diversity, and abundance, highlighting the role of variability as an indicator of disturbance. These data represent a useful baseline for tracking post-spill recovery of these deep-sea communities. KEY WORDS: Cold-water corals · Oil spill · Sediment communities · Deepwater Horizon · Macrofauna · Meiofauna Full text in pdf format Supplementary material PreviousNextCite this article as: Demopoulos AWJ, Bourque JR, Cordes E, Stamler KM (2016) Impacts of the Deepwater Horizon oil spill on deep-sea coral-associated sediment communities. Mar Ecol Prog Ser 561:51-68. https://doi.org/10.3354/meps11905 Export citation RSS - Facebook - Tweet - linkedIn Cited by Published in MEPS Vol. 561. Online publication date: December 15, 2016 Print ISSN: 0171-8630; Online ISSN: 1616-1599 

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