Oil spill causes massive harm to microscopic creatures

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(Phys.org) -- Oiled seabirds and turtles may have been the dominant images of the Deepwater Horizon oil spill, but new research indicates there was also massive harm to microscopic creatures in coastal sands, lasting months after beaches appeared superficially clean.

Ken Halanych, professor of Biological Sciences at Auburn University and co-author of the study explained that communities of small organisms that live in the sediment and between sand grains underwent dramatic shifts after the 2010 Deepwater Horizon Oil spill, research by Auburn University's Molette Biology Laboratory for Environmental and Climate Change Studies has shown. Analysis of five sites along the Alabama Coast before, and several months after, oiling, is reported in the June 6, 2012 issue of the journal PLoS ONE (dx.plos.org/10.1371/journal.pone.0038550).

These communities are particularly important at the base of the food chain and serve to couple energy flow and nutrients between the water column and sediment. Typically, these communities are filled with a diversity of small organisms including various bacteria, nematodes, copepods and protists. However, samples collected in September 2010, after the oil spill, were dominated by fungi, which are often associated with decomposition, and showed reduced overall organismal diversity. In particular, the fungal species found have previously been associated with hydrocarbons, suggesting that oiling may have been more significant than was noticeable to the eye.

"Because these environments looked relatively normal after the spill, the data suggests that many impacts of the spill were potentially hidden from plain view," Halanych said. "Small perturbations to the environment or food web can often have unexpected effects a long time after the initial event."

Research for this multi-institutional project was funded through the National Science Foundation's RAPID program for quick-response research. Collaborators included: postdoctoral fellow at the University of California, Davis Genome Center and co-author of the study, Holly Bik; Professor Kelly Thomas of the University of New Hampshire; and Jyotsna Sharma of the University of Texas at San Antonio. The collaborative effort employed cutting-edge environmental sequencing approaches and morphological taxonomy to assess changes in diversity.

"What struck me was that you wouldn't have known there was an oil spill – most of our sample sites looked like normal beaches. But when we analyzed the genomic data, there seemed to be all these biological repercussions going on," Bik said.

The team is continuing research on these sites to assess potential ecological impacts of hydrocarbons over longer time scales.

Provided by Auburn University