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The Future of Oil Spills and Oil Dispersants: A Q&A with Ronald J. Kendall

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By Abbie Stutzer

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From April 20, 2010, until September 20, 2010, the Gulf of Mexico's water, wildlife and shorelines were damaged by oil spilled as a result of an explosion on BP's Deepwater Horizon.

Many decisions concerning how the Gulf spill could be stopped, how the spill would affect every thing and body it came in contact with, and how the oil could and should be cleaned up before the oil well was officially declared dead, were difficult to make. Although the oil well is now dead, the answers to the questions concerning how the spilled oil and oil

dispersant, Corexit, will affect the Gulf of Mexico is still unknown.

Was it smart to use Corexit?

Now that the oil is dispersed, how can we collect it?

How will the oil and dispersant affect those who have come in contact with it?

While there's no way any person can know what will happen to the Gulf's environment as a result of the spill and use of the oil dispersant Corexit, professors, scientists and environmentalists are working overtime to find answers.



MOTHER EARTH NEWS recently spoke with expert Ronald J. Kendall, director of the Institute of Environmental and Human Health at Texas Tech University, to find out his thoughts on the spill. Kendall was one of the experts who testified before the U.S. Senate Committee on Environment and Public Works on the effects chemical dispersants, such as Corexit, could have on the environments in the Gulf of Mexico.

MEN: What new information about oil dispersants, in general, have you discovered since you testified in August?

Kendall: Well, we know that the dispersants are mixtures of surfactant and solvent compounds and each of those components has unique physical and chemical properties. When you add the petroleum in water, the surfactants interact with the petroleum compounds to form what we call micelles, and the micelles are able to mix with the water and gradually disperse the hydrocarbons throughout the water column.

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The environmental behavior of dispersant components, in general, after they form micelles with petroleum compounds or their specific environmental behavior is still a big question related to associated physical chemical properties, but it does appear that the oil may not necessarily get dispersed with the formation of micelles; does not necessarily mean it will stay in the water column. And what appears to be happening, at least to some extent, the oil is sinking to the bottom. And there have been recent revelations of extensive oil contamination on the bottom of the Gulf that appears to be associated with Deepwater Horizon.

Do you think the dispersant testing was comprehensive enough to know if it was a good idea to use?

Well, initially we knew almost nothing about the dispersant. We didn't know the ingredients, they were a trade secret, and there was almost no information related to environmental behavior and effects. So in essence, we knew almost nothing. And that's why I've consistently said if we're going to use this kind of compound, which has inherent toxicity itself, we need to understand its environmental consequences.

Has there been any recent research concerning dispersants? I know some universities were trying to research the dispersant Corexit, and they couldn't necessarily get a hold of it. So, has there been any research and are people able to test it now?

Yes. The producer of it was not releasing it to the academic scientific community, and I assume that by various discussions of these issues and with the outpouring of interests from particularly the academic side of the scientific community, they ultimately did release it. And I know our team at Texas Tech is heavily involved with dispersant research right now, as are probably other universities.

I'd imagine so. Do you have any predictions as to how long it will take the Gulf sea life to recover from the spill? I heard a story recently that discussed how the spill was not as catastrophic as it could have been to some parts of the environment, such as it didn't enter the loop current and some species of animals were not as negatively impacted as people had previously thought. Why is that perceived as better? Isn't it just as dangerous that it's sitting on the ocean floor?

Yes. I mean, it's really difficult to categorize all of the environments in the Gulf and their exposure to the oil in the context of how catastrophic each environment impacted would be. We know that visually oiled pelicans on the coast with oil coming to the shoreline was very graphic and therefore was perceived as being terrible, which it was; a lot of birds died. And on the other side, that oil that may have existed in plumes or on the bottom could be exerting a more chronic, out-of-sight kind of impact that is more like an insidious cancer versus being a very dramatic effect, such as an oil covered bird that you see right there on that shore and you can take a picture of it. I think that any time you release 200 million gallons of oil into a water body, there are going to be consequences, and some of them we may see now, some of them we may see in the months to come; I think some of them we'll see in the years to come because when you affect, say, age classes of particularly endangered species, this plays out maybe over years. And all of a sudden you see species that may be nearing threatened status all of a sudden become endangered or you see species that may be endangered all of a sudden are at risk of becoming extremely endangered. So I think it's premature to assess the degree of catastrophic consequence. I think we need to do the science to figure out what level of impact, how diverse and what might be the future consequence, and personally, as a scientist, it worries me that we're finding miles and miles of oil on the sea floor. I think that's going to have some consequences in the years to come and months to come.

Is there any way the oil on the ocean floor can be removed or is the oil going to have to remain on the ocean floor?

If you try to remove it there would be an extensive impact to the sea floor even if the technology was available. You'd have to suck it up or something.

Because the eco-system is very delicate on the sea floor, right?

Exactly. And in those kinds of environments, which are, you know, harsh to say the least, it's cold and dark, and you've got to be a real specialist of an organism to exist in those environments. You've got to be able to handle extreme situations and usually specialists do that, as an organism. So that's why they can be, their impact could be caused from just delicate deviations from the norm, which could occur with oiling. So, you know, how that's going to play out is yet to be determined, but we do know this, I think more and more evidence is coming forward that the oil didn't just evaporate. It went somewhere, and like I said, going back to my original couple of comments, I mean, these micelles, with the dispersant use, apparently can sink, and now, I think some pretty good evidence is starting to come forward that says a lot of that oil is on the

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sea floor.

This question goes back to the toxicity of the dispersant. I know it's unknown what could happen to the marine life when it comes into contact with the dispersant, but does anyone have any idea what could happen to people who live near the Gulf when they come in contact with the dispersant?

Well, we don't really know. I think we do know that heavy aerial application did occur with oil approaching the shoreline. We know that very heavy, deep water application occurred at the well head with oil exiting the damaged well, so, those scenarios create two different extremes as to how the dispersant, and the oil, and the mixture could exert effects. And we're continuing to do research on how the dispersant affects the oil, particularly as to how it may facilitate the release of the toxic components of the oil because when you disperse the oil, you don't change the volume, you just change the droplet size, and the droplet size is smaller; it increases the surface to volume ratio in the water, such that release of toxics in the oil, which is a mixture of thousands of compounds, oil that is, could be facilitated in their release. Therefore exposure could be occurring to people and/or wildlife. And we don't know a lot about that yet except that dispersion does increase hydrocarbon loading in the water column, and it also appears now to increase oil settling to the bottom because oil, if left alone at the well head, would have surfaced.

Why, in your opinion, was Corexit chosen? Why wasn't another dispersant chosen? Down the road, will we find a dispersant that perhaps is less toxic or has a better effect? I assume that's unknown.

That's a good question. I mean, it's just like, even if you want to use a pesticide, you try to pick the one that's going to cause the least negative impact and the most positive impact in controlling the pest. Whether it's an insect on your rose bush or your grass or whatever. It's the same point here. We want to find the best dispersant selection and we have very little information on these dispersants in terms of their comparative toxicity and their comparative effectiveness, so that's why to me it's like with pesticides, when you've got a basic data set, you can take a look at that on the toxicity of the various organisms or the environmental chemistry, and make some decisions from a comparative basis. Where would I want to use that product to control that pest in the case of pesticides? We don't have that database with dispersants. Therefore, it's kind of like, well, let's try to make the best decision we can with a little bit of information. And if this is going to be in our tool bag in the future for oil spills, which will occur again, I mean, it's just part of the process. We need to be ready to answer the environmental issues with the dispersant as well as the oil.

This is an odd question, but one I must ask. Kevin Costner's oil clean-up: why was it mentioned? Was it ever used? Was it experimented with? Did it help at all?

I don't really know much about that technology except that it was reported to be able to collect the oil off the water and separate it from the water and be able to recover the oil and so on, so that's what I heard it could do. I guess that's the value of being a movie star in that you can attract attention, and in today's society, apparently attention and visibility on TV creates opportunity. I'm not going to defend the technology. I don't understand exactly how it was going to operate, so they said it worked, that's what Kevin Costner said, so that's the most I know about it.

Yeah. I think that's the most anyone knows about it, so understandable.

Yeah, good point.

So, my last question. Any idea as to how this kind of spill should be handled in the future based on this one, and was this spill handled this way because of BP? Or if it was another company, would it have been handled differently, maybe more efficiently? Any idea as to what to do during future spills?

Well, I think we need to be prepared for future deep water release of oil as well as surface release. And I think that we need to be better prepared from a risk assessment and risk management perspective. In other words, don't use the risk assessments done in Alaska to apply to the Gulf of Mexico. Totally different environments; and it needs to be site specific in terms of assessment of potential risk, threatening endangered species. And also, what are we going to do if this happens, and what technologies will be available? And another thing too, I think we do need to improve our technologies and boons and dispersants and strategies. That is parallel and coexistent with our improvement of technologies to drill in the deep water.

Thanks so much.

It was my pleasure.

Photo courtesy of the Environmental Protection Agency; Texas Tech University, Artie Limmer

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