Recent Research on Oil Spill Dispersants

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Summary

- What is dispersant research
- Research since 2010
- Effect of the Deepwater Horizon
- Some findings
- Better directions?
Possible Dispersant Research Areas

- Toxicity and effects
- Basic physical behavior
- Effects on oil behavior
- Longevity of dispersion
- Biodegradation
- Monitoring
- New dispersants
- Effectiveness
- Human health

- Interaction with sediment
- Application
- Fate of dispersed oil
- Molecular interactions
- Benefits vs. effects
Since 2010 – e.g. since Deepwater Horizon

Found 92 research projects carried out and published in scholarly journals

The only topics covered were toxicity and effects, physical, monitoring, others, biodegradation, and human health

40% were related to the Deepwater Horizon
Division of Research

- Biodegradation: 9%
- Physical: 10%
- Other: 10%
- Health: 11%
- Monitoring: 12%
- Effects: 48%
What this says .......

- Half of the research carried out studying toxicity and effects of dispersants
- Less than half of research carried out as a result or in response to the Deepwater Horizon
- Half of research divided equally between other areas studied
- Most research areas not studied
Some results of selected areas

- Results are about the same as previous findings
Effects studies

- Effects studies largely finding out that dispersed oil is more toxic than undispersed, because of the large increase in PAHs in the water column.
- This depends on life stage of the target organism, eggs, smolts etc. are much more susceptible.
- (Of course one cannot really get a high concentration of naturally dispersed oil in a test solution.)
Physical Research

- Has largely focused on effects of sediment interaction with oil
- Sediment interaction is increased with dispersant and results in increased sedimentation
What is not studied

• The fact that dispersions are de-stabilized with time, is not being studied

• This fact is also largely ignored in other studies – usually because it is difficult to incorporate into studies

• Many other aspects not studied as well, e.g. application, effectiveness, etc. etc
Many studies on monitoring the dispersant application on Deepwater Horizon

No real conclusions, effectiveness not really determined on both surface and sub-surface applications
Biodegradation

• Scientific studies are again showing that oil biodegradation is about the same or slower with the application of dispersants
Human Health Studies

- Extensive studies conducted on effects of dispersant application on human health
- Results mixed – high doses may have an effect – most research showed that low doses do not have an effect
- Yes, more research needed
Retrospect

• Much of the research in past 3 years was in response to the Deepwater Horizon and addressed immediate situations
• No doubt that the research in this area will decline in coming years
• Hopefully it will be balanced and focus on some of the areas missed
• A burst of dispersant research occurred after the Deepwater Horizon spill – much of this research directed at finding the effects or toxicity on certain species
New Directions

• For the first time there was research on the effects of dispersants on human health – no real results yet