



UNIVERSITY of NEW HAMPSHIRE

Dispersant Working Group

November 29, 2011

(In conjunction with Clean Gulf, San Antonio, TX)

Meeting Notes

Attendees:

Nancy Kinner, CRRC

Joe Banta, PWS RCAC (call)

Matt Dean, Chevron

John French, PWS RCAC (call)

David Fritz, BP

Doug Helton, NOAA

Ken Lee, DFO Canada

Lori Medley, BSEE

Francois Merlin, CEDRE

Jacqui Michel, Research Planning

Eric Miller, U.S. Coast Guard (call)

Jim Myers, Chevron

Hung Nguyen, BOEM

Debbie Payton, NOAA

Kelly Schnapp, BSEE

Will Slaughter, Chevron

Mark Swanson, PWSRCAC

John Tarpley, NOAA

This meeting was to review and update the status of Funded Research Projects specifically on Dispersants.

- **Francois Merlin (CEDRE)**

- Discobiol study is ending and a report summary will be available soon. As a global conclusion, generally speaking all observation on bio-indicators (stress, immunology, physiology...) did not show significant differences on sub-lethal effect between animals exposed to chemically and mechanically dispersed oil; when differences were observed, these were back to the background level after 2 weeks recovery; in other words no observed effects or reversible observed effects.
- The last experiment consisted to monitor on a long term (several months) fish previously exposed to chemically and mechanically dispersed oil, and observing the resistance of these fish to an additional stress (e.g.; anoxic stress); we observed no difference on survival, but fish exposed to chemically dispersed oil, were less resistant to an additional stress (e.g. anoxic stress). The big question is: What is the difference in the real world?
- IMO Guidelines (proposition to divide the guideline into 3 independent documents to address different issues and target different end-users => BASIC INFORMATION ON DISPERSANTS AND THEIR APPLICATION : scientific, => TEMPLATE FOR NATIONAL POLICY FOR THE USE OF DISPERSANTS : regulator => OPERATIONAL AND TECHNICAL SHEETS FOR SURFACE APPLICATION OF DISPERSANTS operational consideration will also be given the need for a 4th document dealing with the sub-sea dispersant application in light of the recent Macondo incident experience. Projected date of draft: Feb/March 2012.

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- Toxicity and Sediment project with Ken Lee: Combining Mineral Fines with Chemical Dispersants to Disperse Oil in Low Temperature and Low Mixing Energy Environments, Including the Arctic
- New Project: effects on mudflats of oil, and especially the effect of the bioturbation by worms; in this project it is considered to add an additional test condition on dispersed oil;
- A new thesis just started in Cedre which deals with : physiology and ecotoxicology of sea bass exposed to chemically dispersed oil (to some extent, this a continuation of Discobiol study) ; thesis conducted with the University of Bretagne Occidentale

- **Ken Lee** (Bedford Institute of Oceanography, DFO, Canada)
 - Toxicity project (DISCOBIOL) with CEDRE to evaluate the toxicity of both physically and chemically dispersed oil.
 - IMO Guidelines (co-chair with Francois Merlin, Cedre - for revision of oil dispersant use guidelines)
 - Oil dispersants & biodegradation (covering some of the needs from our last workshop) – arctic and east coast in collaboration with Dr. Charles Greer (Biotechnology Research Institute, National Research Council of Canada). Using the application of advanced genomics techniques to monitor changes in the structure and function of microbial communities as a means to monitor the impact of oil, the efficacy of countermeasures and habitat recovery
 - Studies on oil mineral aggregates in the presence and absence of chemical oil dispersants
 - Plume analysis including the characterization of oil droplet formation from sub-sea injection of dispersants by the modification of the BIO/USEPA wave tank to include sub-surface dispersant injection (operation of the tank in continuous flow to avoid saturation and tracking of plume transport in currents)
 - Gulf of Mexico (field and laboratory studies on oil biodegradation rates and the interaction of chemically dispersed oil with suspended sediment in nearshore waters - in collaboration with NRC).
 - Arctic research – field trials and dispersant testing in ocean and ice. Funded by PERD (Panel of Energy Research and Development) and the Environmental Studies Research Fund (ESRF)
 - Collaboration with PWSRCAC on the toxicity of chemically dispersed oil on fish (herring embryos, salmon smolts, and juvenile cod).
 - A collaborative research agreement has just been signed with the State Oceanic Administration of China. Development of proposals is underway. I anticipate the possibility of field trials off the coast of China to study oil toxicity, biodegradation and the evaluation of spill treating agents.

- **Joe Banta, John French, Mark Swanson** (PWS RCAC)
 - Two recently initiated projects:
 - Toxicity of dispersed oil on whales (with University of Southern Maine)
 - Synthesis on Uptake and Effects of Dispersed Oil Droplets by Zooplankton, (Skidaway Institute of Oceanography)



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- Two ongoing projects that are nearing completion:
 - Work with Department of Fisheries and Oceans Canada on salmon, cod and herring exposure to dispersed oil
 - Work with National Marine Fisheries Service Auke Bay Lab on pink salmon and herring exposure to dispersed oil
- Recent and Planned Publications/Presentations:
 - Burridge, L.E., Lyons, M.C., Wong, D.K.H., Li, Z and Lee, K., ATW 2010, Toronto ON; The Effects of WAF and CEWAF on EROD Activity in Juvenile Atlantic Cod
 - Burridge, L.E., PWSRCAC meeting, Anchorage AK 2010: Centre for Offshore Oil, Gas and Energy Research (COOGER): Investigations Into Potential Effects Of Oil, Oil Dispersants And Mixtures On Various Life Stages Of Marine Fish
 - Johnson, S., Boudreau, M., Lee, K., King, T., Wong, D.K.H., Hodson, P., Courtenay, S., AMOP 2010 Halifax NS: Environmental Factors affecting the toxicity of dispersed oil for herring embryos (*Clupea* sp.). Poster presentation.
 - Johnson, S., Courtenay, S., Boudreau, M., Lee, K., Comparison of the sensitivity of early-life stages of herring (*Clupea* sp.) species and stocks to the toxicity of three crude oils. (in Prep).
 - Johnson, S., Courtenay, S., Boudreau, M., Lee, K., Effect of salinity and temperature on the toxicity of dispersed oil to Atlantic herring (*Clupea harengus*) embryos exposed to Arabian light crude oil (in prep).
 - Johnson, S., Courtenay, S., Boudreau, M., Lee, K., SETAC Europe 2011, Milan, Italy: Environmental Factors affecting the toxicity of dispersed oil for herring embryos (*Clupea* sp.). Poster presentation.
 - Johnson, S., Courtenay, S., Boudreau, M., Lee, K., AMOP 2011, Calgary, AB: Environmental Factors affecting the toxicity of dispersed oil for herring embryos (*Clupea* sp.). Platform presentation.
 - Johnson, S., Courtenay, S., Boudreau, M., Lee, K., ACCESS 2011 Antigonish NS: Environmental Factors affecting the toxicity of dispersed oil for herring embryos (*Clupea* sp.). Poster presentation.
 - Lee, K., King, T., Robinson, B., Li, Z., Burridge, L.E., Lyons, M.C., Wong, D.K.H., MacKeigan, K., Courtenay, S., Johnson, S., Hodson, P., Greer, C., Venosa, A.; Toxicity Effects of Chemically-Dispersed Crude Oil on Fish. In: Proceedings of the International Oil Spill Conference, 2011. In Press; Accepted January 2011
 - Lyons, M.C., Wong, D.K.H., Mulder, I., Lee, K., Burridge, L.E., The Influence of Water Temperature on Induced Liver EROD Activity in Atlantic Cod (*Gadus morhua*) Exposed to Crude Oil and Oil Dispersants; Ecotoxicology and Environmental Safety (in Press).
- Available:
 - An annually updated bibliography (through January 2011, in Excel spreadsheet form) of recent dispersant articles
http://www.pwsrcac.org/projects/EnvMonitor/dispers_bib.html



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- **Jim Myers, Will Slaughter, Matt Dean (Chevron)**
 - Lyman Young's retirement
 - Unable to share the specifics of their project, but they will have report available soon: chemical surfactants, different conditions on different crude oil, room temperatures or greater (not tested in cold water); high pressure issue i.e., Macondo, discussion of bubble point

- **Dave Fritz (BP)**
 - Lots of research going on, but litigation and NRDA prevents him from discussing

- **API**
 - Risk communication (audience regulators and public). Led by Tom Coolbaugh and Ann Hayward Walker
 - CRRC workshop of all GRI collaborators and industry upcoming in January 2012 in Baton Rouge
 - Tim Nedwed – subsea field test (EM&A is managing this project)
 - Evaluate aerial application of dispersants (Bruce Johnson). Robust year in the Gulf and flights and documentation and institutionalized this information (Charlie Huber).
 - Dispersant Use Policy – working jointly with federal agencies
 - Joint Industry task force (JITF) – no subsea because so much is already being done
 - IPIECA – risk communication from international standpoint. Replacement for c130's not many of these planes left
 - Arctic JIP has a dispersant aspect associated with it. Building on ExxonMobil in past. Just getting underway, no contracts yet (OGP). Follow-up to SINTEF previous research
 - Manual produced that SL Ross underwrites on the State of the Knowledge
 - Final dispersant JIP – with Jack Word, Newfields and UAF (smaller funded project.
 - The JIPS are 3 distinct: API (U.S.); IPIECA (international but similar to U.S.); Arctic (dispersant effect); OGP – arctic led, \$21.5M, much larger than dispersant, has several work groups

- **Hung Nguyen (BSEE)**
 - No report

- **Eric Miller (USCG)**
 - ICCOPR – Steve Lehmann is collaborating dispersant research. CRRC hosted workshop in Mobile in September 2011 was of great help to coordinate research gaps
 - No dispersant research projects this year

- **Doug Helton (NOAA)**
 - Dispersant Initiative – workshop in Mobile, white papers are almost completed and workshop report forthcoming



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- GAO is doing a report on dispersants use: required by Congressman Markey, they attended the Mobile workshop

- Please check for project updates on the CRRC website. Let Kathy know of edits, changes, completions and where to locate final reports.
<http://crrc.unh.edu/dwg/research.htm>

- Next meeting: **Clean Gulf**, November 13-15, 2012 in New Orleans

DRAFT