

Dispersants Working Group

May 16th, 2017

IOSC, Long Beach, CA

Meeting Notes

Participants: Steve Buschang (TGLO), Victoria Broje (Shell), Ivan Caldez (CEDRE), Suzanne Chang (BSEE), Ellen Faurot-Daniels (CDFW-OSPR), David Fritz (Consultant), Ken Lee (DFO), Scott Lundgren (NOAA ORR ERD), Philippe Lemaire (Total), Nancy Kinner, Kathy Mandsager, Melissa Gloekler, Jesse Ross (UNH, CRRC)

🔥 Overview and Introductions:

- Main Function: make sure dispersant research is well shared amongst different groups.
- List of projects, specific to dispersants, that have occurred over the years (known through working groups).
 - Double check links/pdfs to update CRRC website

🔥 NOAA (Scott Lundgren):

- Authorized appropriated funds
- Make connections/build upon research
- State of the Science Work: three year focus, CRRC/NOAA, arctic dispersant and dispersed oil.
 - Broken into knowns and uncertainties of arctic dispersants science
 - 3 documents now finalized: Efficacy and Effectiveness, Degradation and Fate, and Physical Transport and Chemical Behavior
 - 1 currently out for public input: Ecotoxicity and Sublethal Impacts
 - Public Health and Human Safety will be coming up for public input
- Gulf of Mexico (GOMRI): countermeasures
 - Dispersant issues (10 topics)
- Emergency response division, in review of publications of SeaGrant to help broaden deeper issues of spill science
- NOAA research
 - National Centers for Coastal and Oceans Science: dispersant chemical toxicity, mesocosms, standard lab and toxicity measurements, salt marsh conditions
- Input to IMO to dispersant guidelines (chat with coast guard)- PDR, Volume 4
- Not sponsor of NAS on dispersants but provided info on dispersants and analysis
- Regional dispersion engagements (Region 6- regular exercises), flower garden,
- Finalized smart job aid- are dispersants working with fluorimetry?

🔥 Shell (Victoria Broje):

- CCA (Clean Caribbean and Americas) is funding a study at Nova Southeastern University (by D. Abigail Renegar) on dispersant and dispersed oil toxicity on coral reefs. Will be completed next year.
- CCA: New effort to summarize and publish data on dispersants toxicity to various organisms generated by BP, GOMRI, Industry associations and others (done by Mary McKinley of Exponent and Adriana Bejarano of RPI). ** This data not in DIVER, some studies have been

- conducted, but never published. This information/data is to be published to keep information alive. ** Paul Schuler is contact at CCA.
- University of Alaska Fairbanks JIP: Dr. McFarlin graduated. Last paper on how microbiological communities change in presence of dispersed oil, near shore and offshore was published.
 - API JIP on subsea dispersants: Toxicity to deep water species (coral, fish, shrimp)
 - Testing one-component hydrocarbons to generate species sensitivities curves
 - Deep water species not any more uniquely sensitive than regular species
 - Finishing this year
 - API JIP on subsea dispersants: CRA Workshop done for Subsea in Gulf of Mexico
 - Comprehensive modeling and NEBA analysis for cases of offshore blowout in GOM with and without subsea dispersants.
 - Extensive participation from regulators in this project
 - Papers and presentation and IOSC. Will be presented at Clean Gulf
 - Finishing this year
 - API JIP on subsea dispersants: Modeling of effect of subsea dispersants on VOC at surface (source control responder safety)
 - Presented at the IOSC and will be published this year.
 - Subsea dispersants reduce VOC concentration at the surface allowing for safer working conditions.
 - Will be presented at Clean Gulf
 - API JIP on subsea dispersants: Comparison of biodegradation algorithms used in main oil spill models
 - Using information generated after DWH on realistic degradation rates of hydrocarbons at sea
 - Choice of biodegradation algorithm in the model affects predicted oil fate, especially for cases with subsea dispersants when oil is most affected by biodegradation
 - API JIP on subsea dispersants: Effectiveness of subsea dispersants
 - API JIP on subsea dispersants: Industry Guidelines for seeking regulatory approval for subsea dispersants is published as API report.
 - API JIP on subsea dispersants: New paper to summarize available information from BP, GOMRI and others on toxicity of dispersed oil (complimentary to CCA effort)
 - API JIP on subsea dispersants project reports will be published here
https://urldefense.proofpoint.com/v2/url?u=http-3A_www.oilspillprevention.org_oil-2Dspill-2Dresearch-2Dand-2Ddevelopment-2Dcent&d=DwIFAg&c=c6MrceVCY5m5A_KAUkrdoA&r=AJRaZ2qBGdCZeRaRP-hH0GSmInAQ0uUdh6qTMuXtPV4&m=80icKHivIPqZGzLHdbKji0wmShMh9m1PbBe1EOQKdR Y&s=rK75ggrkoN7Rf7lZw9pWLYF2Mg_8m4oc6U8tSmBymLk&e=
 - OGP JIP. Environmental impacts project
 - Database with 3000 reference documents on fate and impacts of oil, dispersants, dispersed oil, and burning in Arctic
 - Data from field experiments are based on dispersed oil frozen into ice sheet- represents not effectively dispersed oil in arctic (oil frozen into ice)

- Reports will be available here https://urldefense.proofpoint.com/v2/url?u=http-3A_www.arcticresponsetechnology.org_&d=DwIFAg&c=c6MrceVCY5m5A_KAUkrdoA&r=AJRaZ2qBGdCZeRaRP-hH0GSmInAQ0uUdh6qTMuXtPV4&m=80icKHivIPqZGzLHdbKji0wmShMh9m1PbBe1EQQkdRY&s=tcrRM1ousx70XGgaQpENbAsKxEBv8FOZltp3oNRVXw&e= (web site is currently off and being updated)
 - OGP JIP. Dispersants project
 - Modeling of subsea dispersants injection in shallow waters
 - Several papers to be published on population impacts of dispersed oil on cod, drum and snapper. Translating toxicity LC50 data to population impacts.
 - Summary paper on various aspects of dispersants use in Arctic is being finalized (Alun Lewis and Roger Prince)
 - Report on effectiveness of dispersants in cold water and ice
 - Report with predicting resurfacing potential of dispersed plume under ice
 - OSRL published fact sheets on 3 most used dispersants (Corexit 9500, Dasic Slikgone NS, Finasol OSR52)
 - Toxicity, effectiveness and biodegradation info based on regulatory testing internationally
 - IMO subsea dispersant injection guide is being finalized
- 🔥 TOTAL (Philippe Lemaire):
 - Dispersant OSR 52
 - Examining effect of pressure and toxicity
 - Box to increase pressure (hyperbaric) chamber with fish/shrimp to see effects on fish eggs with oil and oil dispersant together.
 - **Published (he will send)**
 - Toxicity and effectiveness with CEDRE
 - ITOPF
 - **PAGTC???**, heart impact and to see how fish can recover after crude oil and dispersant together (**Published**)- **SEND**
 - CEDRE, IFMA, ITOPF
- 🔥 Fisheries & Oceans (Ken Lee):
 - COOGER (Centre for Offshore Oil, Gas and Energy Research – Fisheries and Oceans Canada) has a significant research program to enhance our understanding of oil fate and behavior. In addition, they are also evaluating the use of dispersants on spills involving diluted bitumen (e.g. Dilbit).
 - Initial response seems to show that there is a small window of opportunity
 - Consideration is also given to the use of dispersants for spills in the Arctic (primarily ship and pipeline spills)
 - Under Canada's Ocean Protection Plan (OPP) the federal government has initiated a strategy to build a world-leading marine safety system to protect Canada's marine ecosystems, while enabling inclusive economic growth. The OPP will include:
 - Leading-edge research on oil spill clean-up technologies;
 - Enhanced oil spill preparedness and response through area-based planning;

- A greater role for Indigenous groups in the marine safety regime (training for prevention and response operations and shared decision making); and
 - Support for research partnerships at a national/international level to improve our understanding of how oil spills behave and what impacts they may have, alternative response strategies, how best to mitigate impacts and how to ensure ecological recovery after an incident.
- Ken Lee has been appointed National Senior Science Advisor for Oil Spill Research, Preparedness and Response for Fisheries and Oceans Canada.
 - He will be leading a national multi-partner research initiative (CCG, TC, ECCC, NRCan) to foster national/international collaborations involving industry, government and academia to provide science for decision making in spill response operations (5-year program).
 - A “Technical Workshop” will be hosted to identify key knowledge gaps and research priorities for funding.
 - DFO also has a toxicity research program led by the National Contaminants Advisory Group –NCAG) that will fund toxicity studies (e.g., dispersant studies) conducted by external agencies including universities and private (contact: Cecilia Lougheed, DFO HQ).
 - The Government of Canada will be establishing a new website for oil spills.
- BSEE (Susan Chang):
 - Dispersant Biodegradation & Dispersant use in Deep Ocean Conditions (Sept release)
 - PN&L
 - Dispersant effectiveness at high salinities
 - EPA
 - Oil Composition vs. Dispersant Effectiveness
 - Viscosity as biggest driver for dispersant release (effectiveness)
 - Three distinct temperature ranges
 - Looking at surface tension
 - Done by ARA-app
 - Chemical herders vs. oil composition (weathered oil)
 - Abstract on Website
 - Dispersant Delivery Systems (under review)- White paper
- CA Fish & Wildlife (Ellen Faurot-Daniels)
 - CDFW-OSPR still does not have any research monies for dispersant or other ART work, so most work of the past several years has focused on policy updates for the RRT IX Regional Contingency Plan (RCP). All ART plans within the RCP will undergo updates (dispersants, ISB, sorbents/solidifiers, bioremediants)
 - ART- best achievable technology report now on OSPR website: <https://www.wildlife.ca.gov/OSPR/OSRO/Oil-Spill-Cleanup-Agents>
 - Section 7 consultations under endangered species act- half way there, USCG and EPA in process of getting feedback from NMFS and USFWS
 - OSPR program for licensing of oil spill cleanup agents will undergo revision, consistent with and pending updates to EPA’s Subpart J
 - Response technology workshop. Very well received. Highlights:

- SINTEF proposed alternative to chemical dispersants, instead using high pressure water. May provide effective alternative for use on heavy CA crude oils (which are not currently amenable to chemical dispersion), or for use in deeper bay waters where use of chemical dispersants next to human populations is problematic. OSPR continuing to work with SINTEF of sourcing CA crude oil samples for additional testing, may consider in-field testing on CA seep oils.
 - Fluideon- AUV glider, remote water sampling models
 - Water column sampling, which is missing from SCAT
 - Supportive of NRDA and fishery closure
 - Many of the remote sensing technologies were of interest for baseline and inland sensitive resource identification and mapping
 - On the legislative side, OSPR also working to address adequacy of CA response technologies to respond to spills of sunken and submerged oil.
- Cedre (Ivan Calvez/Res. Dept.): Reminder of recent/ongoing activities at CEDRE on dispersants
 - Dispersants in the arctic
 - Through *Sintef*, in the framework of Task 2 of the IOGP Arctic Oil Spill Response Technology JIP project "*Dispersant testing under realistic conditions*":
 - test program at lab and pilot (flume tank) scale to assess the efficiency of adding mineral fines to dispersed crude oils under arctic conditions:
 - different mixing and energy, mineral and oil ratio, mineral concentrations
 - Efficiency of chemically dispersed oil vs. mineral fines with chemically dispersed
 - Paper in prep. (*Evaluating the addition of mineral fines to enhance oil dispersion under arctic condition*) by R. Jezequel, J. Receveur and S. Le Floch (Cedre); Draft submitted to IOGP in April 2017.
 - *Mesocosms in Ice*, in the framework of the IOGP Arctic Oil Spill Response Technology JIP project "*Environmental Impacts From Arctic Oil Spills and Arctic Oil Spill Response Technologies*":
 - Technical aspects (most notably: eight mesocosms fabricated and installed in the sea ice of Van Mijen Fjord, Svea, Svalbard);
 - Chemical hydrocarbons analysis: field and lab work ; Report submitted to IOGP for review;
 - Also:
 - Lab looking for bacterial communities ; Degradation of oil encapsulated in ice;
 - Assessment of dispersibility of oil that was encapsulated in ice (untreated oil, oil treated with dispersants after the melt, and oil pre-mixed with dispersant prior to being frozen into ice); Duration: 3 months; Paper submitted for AMOP 2017 (coll. T. Nedwed/ExxonMobil Upstream Research Co., V. Broje/Shell Exploration & Production Co. & S. Le Floch/Cedre Research Dept.)
 - Other recent dispersant related studies:

- *BLOWOUT* project (2011-2013), partnership with Alyotech Technologies (FR):
 - Model behavior of gas and oil eruption to see how it affects surface;
 - Funded by French CITEPH program (collaborative technological innovations in energy domains);
 - Used Cedre's "water column" to assess behavior of gas bubbles and oil droplets.
 - Newly developed equipment: *Water counterflow column*
 - Coll. Cedre/EMA/Ylec Consultants
 - Column simulating extended/ending rising of liquid or gaseous particles (bubbles, droplets)
 - Aim : e.g. study of behavior/fate of dispersed oil droplets (erosion, dissolution...) during rising over high water depth;
 - Demo @: <https://www.youtube.com/watch?v=Syj-98afkFQ>;
<https://www.youtube.com/watch?v=Efs6Gqxc0vQ...>
 - Assessing oil viscosity limits for *in situ* dispersant application:
 - Funded by Total & French Ministry of Environment;
 - Content: assess reliability of using emulsified/viscous oils "dispersibility" thresholds, as established @ lab scale using IFP and MNS dispersants effectiveness tests, for decision-making (i.e. application in the field);
 - Measurements of efficiency through lab and pilot scale (flume tank) experiments (same temperature, dispersant, oil, DOR...);
 - Qualitative analysis of the dispersion through oil droplets size distributions;
 - Changes in abovementioned quantitative (efficiency) and qualitative (droplets size distrib.) parameters for a wide range of viscosities;
 - Review/confirmation of "dispersibility" threshold values
 - Paper presented at AMOP 2016 "*Determination of Limits of Viscosity for Dispersant Use: Quantitative and qualitative assessment of the dispersibility of water-in-oil emulsions at the laboratory (IFP and MNS tests) and in the Polludrome*" (Chever F., Duboscq K., Receveur J., Audegond C. & Guyomarch J.)
- TX State Office (Steve Buschang)
 - Dispersant use on crab larvae project
 - R&D Program: RFP is out. No money from legislature.
 - This RFP is for Texas institutions only.
 - RRT6: Dr. Page Doelling is working on Flower Gardens response plan
 - NOAA ORR, funded
 - Guidance document for Flower Gardens Plan
 - Money through Baylor to add bottom sensor (tilt to measure current)
 - Only reef system gaining in volume
 - Work group already published with CRRC, and Central TX coastal Zone
 - Dispersant exclusionary zone (applied to in-situ burning): what is real science of whether or not can disperse over flower garden

- Report is available here>> https://crrc.unh.edu/NRPT_Texas

🔥 Consulting (David Fritz):

- No updates

🔥 Meeting Adjourned

DRAFT