Pacific States/BC Oil Spill Task Force

Research and Development Workgroup

SUMMARY NOTES

January 10, 2017 Annual Conference Call

PARTICIPANTS:

Kurt Hansen – USCG R&D Center
Carl Brown – Environment and Climate Change Canada
Lori Medley - BSEE
Suzanne Chang – BSEE
Judd Muskat – CA Department of Fish and Wildlife - OSPR
Annie Nelson -- CA Department of Fish and Wildlife - OSPR
Curtis Martin – HI Department of Health
Rick Bernhardt – AK Department of Environmental Conservation
Don Pettit – OR Department of Environmental Quality (via email)
Sonja Larson – WA Department of Ecology (via email)
Nancy Kinner – UHN Coastal Response Research Center (via conversation)
Sarah Brace – Pacific States/B.C. Oil Spill Task Force

Kurt Hansen, USCG Research and Development Center

Search tool for USCG's reports – Defense Technical Information Center: http://www.dtic.mil/dtic/. Search for topics, report numbers, etc. Search carefully, you'll eventually find them if you get right key word.

Project Updates:

- **Oil and Ice Response**: Great lakes and Arctic. Final field integration test in Newport RI. Putting together an ice cage system, storage of oil/ice on vessels, etc. Final report will be released in February.
- **Oil in the water column** (in collab. with BSEE). Trying to figure out how to protect and mitigate. Increasing sorbents for surface treatment. Testing an air curtain system at Ohmsett now. Final report later i 2017
- **Off-shore in situ burn**. Also with BSEE. Working with the NW National Labs – open air facility with wave maker. Next test with Worcestor Polytech Institute/BSEE
- **Response to oil sands products**. Oil on bottom studies underway of how to mitigate.
- **Shale oil preparedness and response**. How we'll respond, and waste water. Reports identify potential research will be out in 2017.
- **Airborne remote sensing (radar)** – capability to look with new perspectives using CG radars -- sideways on planes. Classified but available in the event of a spill via OFSC

- **Equipment surge** -- stakeholder interviews. Try to figure out what the issues were/are. Resulting in model and decision tools.
- **Evaluating technology when not dealing with a spill**. Using BSEE's readiness ITAP (Interagency Technology Alternative Program). This is a brand-new start
- **EDRC** – calculation for how much equipment you need. Effective Recovery Potential. Adapt to inland spills. Need ideas from folks on how to do this. Probably a workshop in April This is a brand-new start
- **Arctic operations** – 4th year in a row. Near arctic circle. Skimmers, communications efforts, unmanned surface vehicle, play around with it, see what we can do.
- **No Spills Conference in Michigan** – different in the Great Lakes. Lot of talk about lead in pipes, pipelines, runoff; different frame of reference.

Submerged Oil Reports:
http://www.dtic.mil/docs/citations/ADA587502

http://www.dtic.mil/docs/citations/ADA622113

http://www.dtic.mil/docs/citations/ADA567516

http://www.dtic.mil/docs/citations/ADA506377

Carl Brown, Environment and Climate Change Canada

Diluted Bitumen work: Diluted bitumen studies still a major emphasis at Environment and Climate Change Canada (ECCC). Number of publications have been presented at AMOP and federal gov't reports. (He'll send links). Environment Canada's done a lot of work themselves and also with Fisheries and Oceans Canada (DFO) and Natural Resources Canada (NRCan).

Testing dilbit samples from products that are currently being shipped in the highest quantities. Chemical composition and character, fate and transport, weathering, mixing with sediments. Big focus on the west coast. Work reported in federal gov't technical reports.

Several phases of the dilbit work:
Phase 1:

1. Mapped the shorelines along the Pacific coast including along the Dixon and Grenville Channels (several 1000 km of shorelines) to collect high resolution photos and videos that can be replayed in real time on an ECCC GIS system
2. Portable instrument evaluations for on-site detection, also for nearshore waters
3. Mesoscale shoreline penetration and adhesion studies. Substrates typically found along the shorelines. Study reports due at end of March this year (2017).
4. Dilbit droplet formation, with/without dispersant, suspended sediment particles, etc.
5. Effectiveness of spill treating agents, countermeasures, and dispersants (currently in the marketplace) on dilbit and other heaver oils.

Phase 2:

- Looked at another 4-6 diluted bitumen products, fate and effects
- Feasibility study on advanced weathering
- Spill modeling: physical/chemical propertites data for 8 dilbits for various weathering states, to be incorporated in oil spill fate, behaviour and trajectory model

Phase 3.

- Developing a comprehensive plan for a major freshwater spill research program. Spills of Opportunity can be used to get some experience with these products. Dilbit and Synbit. (North Saskatchewan River spill in July 2016 was a heavy crude diluted with a condensate). Some good studies relevant to the Kalamazoo spill.

Additional work:

- Studies on representative oil products in 4 pilot areas: certain ports or areas in the country where a certain type of product is being transported. Chedabucto Bay, Nova Scotia and Bay of Fundy, New Brunswick, Gulf of St. Lawrence, and returning to B.C. in summer.
- Trials with canine Shoreline Cleanup Assessment Technique (SCAT) team. A group in the U.S. that has trained dogs to find oil. These dogs were used in response to the North Saskatchewan River spill this past summer. Can cover a lot of ground in a short period of time. River levels can rise quickly, so important to find the oil quickly and verify (could be covered with silt/sediment during high water).
- Longer-duration weathering studies. Building Next Generation Environmental Simulator (NGES) under Phase 2 – using a "race track" test tank in a temperature controlled room (including the ability to freeze water). Can test various temperature scenarios. Weathering of oil over extended periods of time for weeks or months.
- Exploring the possibility of a Network of Expertise on oil spill R&D (some of the folks on the phone involved in this).

Ocean Protection Plan

- Funding from new CAN govt. Focus on oil spill treating agents (STAs) and other alternative response measures (ARMs). Moving ahead with legislative and regulatory changes required for an enhanced regime and delivering the science to support the ARMs use decisions. Spill Treating Agents, bioremediation agents, in-situ burning, etc.
- **Toxicology** –of interest to several departments. Participating in a controlled release of dilbit into a microcosm in a lake in CAN (in the Experimental Lakes Area (ELA) under controlled conditions. May take place next summer (2017).

Q: Kurt: There is a proposal to build a research facility Alberta – are you following this? C-FER that's organizing this.

A: Carl: following it along with different proposals for building similar facilities in CAN. Oil spill response training is considered as one of the services. This one involves InnoTech Alberta and C-FER Technologies proposing a 'Facility for Oilfield Release Testing and Training' (FORTT).

Also:
University of Manitoba and University of Alberta: A genomic research program that got funding to focus on the arctic, looking at indigenous microbes. Researching which microbes are degrading what fractions of the oil.

Lori Medley, BSEE

Vacancy announcement out -- Lori retiring in April 2017. Vacancy Announcement open through Friday 1/13/17. Only federal folks (limitations on applicant eligibility).

- Ohmsett 25th year anniversary. Open to suggestions for what to do for the event. New URL for OMSETT: https://www.bsee.gov/what-we-do/oil-spill-preparedness/ohmsett
- New project on operational limitations of chemical herders - testing different types of oils, different conditions including temp, chemical composition of crude on herding effectiveness. https://www.bsee.gov/research-record/osrr-1075-operational-limits-of-chemical-herders
- Completed Arctic oil spill response gap analysis: meteorological and oceanographic conditions that would impact a spill response. Now starting a similar one for the Gulf of Mexico. https://www.bsee.gov/research-record/gulf-of-mexico-oil-spill-response-viability-analysis
- Trying to ground-truth and validate satellite data and remote sensing system. https://www.bsee.gov/research-record/osrr-1079-deepwater-horizon-lessons-learned-methodology-and-operational-tools-to
    - Phase 1: Testing oil on tank then drones, helicopters, planes, surface sampling, etc. to find out how thick the oil was. Way to test the accuracy of these remote sensing tools. Thickness and water content of emulsions.
    - Phase 2: Visited Taylor Energy site in Gulf of Mexico Did the same thing: satellite, remote sensing etc. on surface oil in open water.
- Worked with AECOM to develop tracking hardware, to detect where a piece of equipment is, particularly where there is limited connectivity. Now adding ability to measure ocean waves, other conditions. https://www.bsee.gov/research-record/equip-grid-and-gridsat-tags-with-accelerometers-to-measure-ocean-waves
- Worked with Alion to develop a submersible skimmer. Pop up in different pockets of oil, then submerge. (Kurt also involved in a project like this). Maneuverability and recovery efficiency). https://www.bsee.gov/research-record/advancing-icehorse-proof-of-concept-to-make-it-more-useful-in-an-operational
- Corps of Engineers – ways to enhance mechanical recovery in arctic conditions. Using heat to make the oil flow easier through recovery systems.

https://www.bsee.gov/research-record/osrr-1082-methods-to-enhance-mechanical-recovery-in-arctic-conditions

- Looking at the CA crudes to figure out if they are actually combustible. Operators don't want to maintain burn boom in inventory. https://www.bsee.gov/research-record/in-situ-burn-testing-of-california-crude-oils

Some project that are not on the website yet:

- **Evaluation of skimmers on decreasing oil thickness** – recovery rates and efficiencies as the thickness changes from 3 inches down to 1 inch.
- **Stable emulsions** – produced 400 gallon crude oil emulsion on Ohmsett tank for BSEE/NOAA remote sensing test.
- **Acoustic noise impacts of recovery equipment**. Making noise during recovery drills and exercises – can't violate wildlife protection requirements. Gathering data on noise generated by various pieces of response equipment.
- **Just finished 12 projects** – all on their website. https://www.bsee.gov/what-we-do/oil-spill-preparedness/oil-spill-response-research
- **Developing new technology** – out of the box. In-Situ burn is much more effective if you insert a rod into the flame and recirculate the heat back into the oil, reduces soot, much more efficient in burning emulsions. https://www.bsee.gov/research-record/osrr-1068-offshore-oil-burn-enhanced-floating-immersed-objects
- **Different Systems remote sensing** – what would be the best system based on your needs. Studied this. https://www.bsee.gov/research-record/osrr-1058-remote-sensing-systems-detect-and-analyze-oil-spills-us-outer-continental
- **Dispersant research at Ohmsett** – Are chlorine and zinc influencing the studies? Turns out the Ohmsett water is "soft". That is the key variable in dispersant effectiveness test at Ohmsett versus tests conducted in a lab setting. NJIT did a study to examine this (comparing different waters). https://www.bsee.gov/research-record/osrr-1044-solidifying-scientific-capabilities-ohmsett-effect-ambient-chemical-levels
- **In Situ Burn Emissions** -- Working for several years with the Navy Research Lab to reduce emissions from in situ burn. System under development requires recovery of oil into some kind of tank. Plan to set up a listening session at IOSC to invite OSROS to see what we are doing now, what's next to make this operational? https://www.bsee.gov/research-record/osrr-1061-development-low-emission-spray-combustor-emulsified-crude-oil
- **2017 Project funding** -- Should be starting 2017 solicitation for projects.
- **IOSC in May**: leading a technology demonstration. A walking tour around the lagoon. Nine different stations through a response. Health and safety, burning, shoreline response, wildlife recovery, etc. Goal: inform media, VIP, congress, etc. on how we have progressed. Where we were (at Exxon Valdez) and where we are now. Also new research trends that we look forward to utilizing in the future. http://iosc2017.org/participate/activities

Rick Bernhardt, AK DEC

- In central AK, an analysis facility at Poker Flats. Looking to do more in situ burning. Will follow up with Lori about this.
- **AK DEC – R&D budget** pretty close to non-existent.
- **Biggest challenges** – residential oil tanks, limited resources to do remediation. Some communities don't even have excavators. Which new soil amendment products are promising? Find colleagues in our other 49 states, which amendments have been successful in treating oil contaminated soil stockpiles your areas. Which products are promising? Testing with soil stock piles. Also trying compost enhancements to address oiled soil. Also aeration studies comparted to compost additions -- seeing if compost additions significantly enhance remediation rates, compared to simple aeration.
- **ShoreZone imagery** – Collecting/analyzing the last bits of imagery for those areas that have not yet been characterized.
- **Oil Spill Recovery Institute (OSRI)**: working with UA Fairbanks to test enzymatic treatment. When they revamped their dispersant plan, they received lots of public input saying dispersants were bad and other products, like Oil Spill Eater II, were less harmful to the environment. The end product of this enzymatic treatment are promoted to be CO_2 and water. Not much data though to support manufacturer's claim, though. Recieved about $300K to do a 3-year study to find out if this is a viable product or not. Grant has been awarded. Grad student assigned to the project. Testing starts in March 2017.
- Also through OSRI, **emergency response field guide** will be updated in the next year or so. Pocket guide for field response in cold weather conditions.
- **Star manual vs. Field Guide**: latter provides more details on logistics, places more emphasis on seasonal response issues, and characterizes arctic environmental challenges in much more detail.
- **Oil Spill Technology Symposium in AK** – next one will be in 2018. Bi-annual schedule.

Judd Muscat/Annie Nelson – CA OSPR

- **GIS** – several years ago adopted NOAA's ERMA updated all GRP and situational awareness. Responsible party will come in with their own COP, now trying to set up a way to exchange information behind the scenes. An agreement signed up front. Everyone who signs has access to the data. Meet a lot of resistance from industry. Working with Industry and USCG. Inserted into our Area Cont. Plans.
- **Improving field data collection**. Using forms for years for scat data. Currently in the beta development for Apple IOS SCATalogue) for tablet use. Different screens for NOAA's standard SCAT forms. Can transfer to command post via emial or Wifi. Etc.
- **iOS based wildlife collection and transport app**. Teams looking for injured or oiled wildlife. Location + attributes about the animal. Helps bring this information into the COP in real time. (Demonstration at IOSC – will be in command booth. NOAA will be

there to show ERMA as COP; OSPR showing how they use this as a planning tool. Also will be show the data coming out of remotes sense. Data automation big focus now)

- **Annie Nelson:** new position, environmental science for BAT. Drills and exercises and NRDA background.
- **IOSC participation**: Many OSPR folks have submitted posters and papers.
- **Chevron/OSPR Technology workshop** taking place Feb 27-Mar 2. Map, hotel info is on OSPR's website. Contact Annie Nelson to register for the conference: mailto:Annie.Nelson@wildlife.ca.gov
- **Best Achievable Technology** – reviewing reports that are being submitted to leg. For senate bill 414. Mechanical response, prevention, Remote sensing, and Applied Response Technology (ART). Full ART report complete and on the website (see ART page on website).
- **Scientific Studies and Evaluations Program** at OSPR has been shelved for a while. Hoping to get this off the ground. See reports that were funded through this.

Q: Curtis: Sinking oil/bottom oils – where was this done?
A: Kurt: At Ohmsett. No experiments carried out in open ocean.

Kurt: There will be a cold weather session at IOSC, and a herding station.

Also: BSEE Technology presentations at IOSC – Paul Meyer on Ohmsett. Kristi McKinney on Mechanical recovery, Karen Stone on in situ burns, Tim Steffek on dispersant effectiveness testing etc.

Nancy Kinner – CRRC

- **Workshop on SCAT in January**. NOAA OR&R has a guideline for data standards for SCAT, something we'll be talking about there.
- Continuing to work on **dispersant studies**.
- CRRC is doing a conference on **data management for DWH** going forward. Cross-walking the data. High-level stuff but access to pre-data during spills.
- **IOSC**: CRRC will have a poster on dispersants. Also giving 2 talks:
    - submerged oil and bitumen;
    - interactions with Russia over the arctic.
- **3 working groups are meeting at IOSC** hosted and facilitated by CRRC:
    - Dispersants working group
    - Submerged oil working group
    - Environmental disaster data working group.

Don Pettit, OR DEQ

- **Mapping**: Working with NOAA to add the capability to quickly generate maps during a response by creating editable layers with appropriate symbology for Operational Divisions, Ordered/Installed Booming Strategies, Etc.
- **Pre-Identifying Operational Divisions** for parts of the Columbia River in a workshop being led by USCG and Clean Rivers Cooperative
- Conducting a project with UW Student GIS Team to **Pre-Segment the Oregon Coast for SCAT/SAR** and other related types of operations.
- Working through the NW Area Committee to develop a **96-hour Tool Box** (initially focusing on items needed within the Env. Unit) that will aid in implementing the recently adopted 96-hour Plan.
- DEQ is working with a state partner (Oregon Coastal Management Program) to obtain a NOAA Coastal Fellowship to work on the development of **Geographic Response Plan development system**, and an update of outdated GRPs in the Oregon Coastal Zone.
- **DEQ is providing GIS information** to a great many customers (state/local/private) for a variety of emergency response planning efforts and response tools…all based on the Oregon Incident Response Information System geodatabase that was updated and published in late 2015/early 2016.

Sonja Larson – WA Ecology Spills Program

- We drafted **new regulations last year** to require oil spill contingency plans for railroads and oil transportation notification information requirements for railroads and pipelines.
- **Updated our pipeline contingency planning regulations** to require Best Achievable Protection be applied to facilities; including pipelines and railroads. Previously the concept of BAP applied only to regulated vessel contingency plan holders. BAP is defined as requiring best technology, staffing levels, training procedures and operational methods in covered vessel oil spill plans.
    - The updated pipeline requirements include a georeferenced-data planning standard. This new requirement is driving pipelines to create and maintain a geographic information planning tool that supports the plan holder in mapping and tracking spilled oil, and enhancing the recovery and removal operations that are described in the plan. We will be holding a pipeline workshop to discuss data sources for the development of these new tools.
    - We are currently working to define our areas of BAP focus for the next five year cycle 2018-2022.
- **Working on a paper for IOSC** with USCG, Genwest, NJR, and MSRC about oil spill response equipment “kind” and “type” lexicon for resource tracking in drills and spills.
- Ongoing work in the development of our Spills Program Story Maps https://fortress.wa.gov/ecy/coastalatlas/storymaps/spills/spills_sm.html

- Several **Geographic Response Plans** will be published this year. We are working on the development of "Mini" GRPs to be published next year to address areas at risk from crude by rail spills where GRPs have not been developed.
- Last year we developed an **interactive Northwest Area Contingency Plan** dispersants policy map working on similar map of the in-situ burn policy this year.
- Last year we had our first **Multi-Plan Holder/Multi Primary Response Contractor drill**. The drill was an opportunity to test multiple simultaneous operations --GRPs, Vessels of Opportunity (VOO), aerial surveillance (AeroEnvironment PUMA), skimming in shallow nearshore environment, and open water recovery systems using high encounter rate devices (NOFI Current Buster & Desmi Speed Sweep). We also incorporated a VIP tour.