

Pacific States/BC Oil Spill Task Force

Research and Development Workgroup
Annual Conference Call - February 20, 2018

SUMMARY NOTES

Participants

Don Pettit, OR DEQ
Judd Muskat, CA OSPR
Annie Nelson, CA OSPR
Bryand Duke, CA OSPR
Ellen Faurot-Daniels CA OSPR (sent notes)
Alex Balsley, USCG R&D Center
Kurt Hansen, USCG R&D Center
Karen Stone, BSEE
Sonja Larson, WA Ecology
Carl Brown, Environment and Climate Change Canada
Amy Merten, NOAA
Sarah Brace, Pacific States/B.C. Oil Spill Task Force

Don Pettit, OR DEQ

- **GRPs** -- Working on automation of GRP (Geographic Response Plans) production. Many GRPs need to be updated and scant resources to do this. Working on a project to streamline this process. NOAA Coastal Mgt fellow assigned to DEQ about 6 months ago, and he will be there another 18 months to update and prepare all coastal GRPs for OR.

Judd Muskat, CA OSPR

- **SCATatalogue** – The SCATatalogue App is a creation of OSPR designed for the iPad mini. The app simplifies the collection of Shoreline Cleanup Assessment Technique (SCAT) data during a spill response. Survey data attributes are based upon the NOAA Standard Shoreline Oiling Summary (SOS) form. SCATatalogue is designed to support SCAT data collection in the marine environment. Survey data is transferred from the field via email, iTunes or other methods if available. Search for “CDFW” . OSPR GIS staff processes the output from SCATatalogue in the ICP to create current SCAT segment maps and hardcopy SOS Forms.
- **Wildlife app** -- iPhone-based app. The app records location, photos, animal status, and other incidental data. A QR code allows investigators and recovery experts to track the animal from collection through the care system. Data output includes spreadsheet tables, photos and KML files for viewing location data on Google Earth© or other supported viewers. The App is offered free in the Apple Apps store.

- **Otter-Spotter** – An app for the larger iPad PRO. OSPR biologists can use it during airborne surveys to record animal locations, counts and other attribute information. *End product is a GIS file* for all three of these apps.
- **ACPs and GRPs**—Currently updating the Area Contingency Plan (ACP) for Sector San Diego, also developing Geographic Response Plans (GRPs) for inland CA as required by OSPR’s new inland authority. Currently developing six GRPs on designated “high risk” rivers/watersheds. Field staff are using Esri’s Survey 1,2,3 for GRP field data collection. OSPR is adding one more GIS staff to bring us up to five GIS professionals plus the GIS Coordinator..
- **ERMA SW** – OSPR displays its response data in the Environmental Response Management Application® (ERMA) ERMA is OSPR’s forum for managing and sharing planning and response information, It is also a repository for California’s oil spill response strategies from the coastal Area Contingency Plans (ACP) to the inland GRPs. Used as a Common Operational Picture (COP) during emergency response, ERMA provides several levels of access to secure some datasets which can only be viewed through a NOAA requested user account.
- **Drones** – Recently received research funding to build a “Proof of Concept” SCAT reconnaissance drone. This has since become a two-drone project. One drone with HD video for a quick look, and. a larger multi-motor drone equipped a multi-spectral camera in combo with a thermal camera, useful for spotting oil. Parts haven’t arrived yet – high hopes for it.

Q: How are you dealing with FAA regs for unmanned aircraft in testing?

A: Must be a license pilot and have an official observer. FAA does have provisions for emergency response. Can conduct test flights within the state’s park system. Certain restricted areas where they can fly. Working with Chevron on their drone project. Have filed for permission to fly in Southern CA around Vandenburg Air Force base.

Braynd Duke, CA OSPR

- **Cal Oil Spill Study and Evaluation Project (COSSEP)**. Funding for research projects over the next few years: \$100K 2017-2018, \$200K 2018-2019; and \$150-200K for 2020. Also. Research studies include:
 - Exposure routes PAHs to beach hoppers. Critical part of the food chain
 - Relationship between PAH’s and metabolites in bile.
 - Drone project (that Judd mentioned)
 - Dispersants: impacts of dispersants on different species.
 - Ephemeral streams in desert areas and looking at the macroinvertebrates species sensitivities to PAHs.

Annie Nelson, CA OSPR

- **NFO workshop** – Meeting held last November on non-floating oils. Exploring what resources CA has available, what tools they have, etc. On the website (<https://www.wildlife.ca.gov/OSPR/Public-Meetings/Technical-Advisory-Committee/Non-Floating-Oils>): technical advisory committee page – link to workshop materials, presentations, plus a series of videos. Responding to NFO comes with different and a variety of challenges compared to floating oils. Especially with detection, containment, and recovery.
- **Response Technology Evaluation Program**: OSPR is working on a mechanism for taking new technologies and doing an evaluation of them – testing. Collect enough data in order to have enough data to determine the best response technology needed for a spill. Currently they are developing the intake form for the information – identifying what data to collect.
- **Chevron/OSPR 2019 technology workshop** – Will be held the week of Feb 25th 2019 in partnership with Chevron. San Ramon, CA

Ellen Faurot-Daniels, CA OSPR

OSPR awarded a COSSEP (California Oil Spill Study and Evaluation Program) contract to conduct further studies of dispersed oil toxicity if using Corexit EC9500A. The UC Davis Granite Canyon Marine Pollution Studies Laboratory will be conducting the work; I am the OSPR sponsor for the project. The Granite Canyon lab conducted most (all?) of the previously-funded OSPR work on Corexit dispersant and dispersed oil toxicity. This project will re-evaluate dispersed oil toxicity using the protocols established by EPA in their proposed updates to National Contingency Plan Subpart J. Please refer to the attached for more information. The study will not include new tests of toxicity of the dispersant alone, as those data are already available from previous work.

- **Continuing to work on all ART plan updates** (dispersants, in-situ burn, non-dispersant oil spill cleanup agents) on behalf of RRT IX. Hope to have the draft updates of the dispersant plan ready for informal agency review by mid-year. Unlike with the 2008 plan, the 2018 dispersant plan will remain in “draft final” form and not signed off by the RRT IX or posted on any website until all consultations have been completed and included. Still awaiting NMFS Section 7 letter, and the Coastal Zone Management Act review that will follow receipt of all Section 7 review findings. With RRT IX approval, I continue to offer my draft version for use in drills. Those interested in more detail of how the updated plan is laid out are welcome to contact me directly.
- **The ISB and non-dispersant OSCA plan** updates are slated for later in 2018.
- **Updates to California OSCA licensing program** will follow in 2019, even if EPA has not finalized their updates to Subpart J. None of the California updates will be inconsistent or incompatible with the federal approach, although California may continue to impose more rigorous efficacy and toxicity testing standards and thresholds for all OSCAs, even if EPA for some reason cannot.

- **2019 OSPR-Chevron Response Technology workshop** -- The meeting room has been secured for the Workshop to be held week of February 25, 2019, at the (former) Chevron conference room in San Ramon, CA. Annie Nelson, Judd Muskat and Greg McGowan will also be major planners of the upcoming workshop
- **OSPR Response Technology Evaluation system** -- Annie Nelson and I have begun work on this – see Annie’s update.

Sonja Larson, WA Ecology

- **State of the science of dispersant use** – WA Ecology worked with San Juan County emergency management on a dispersant workshop and literature review conducted under direction of the. The NWACP dispersant policy map was created a few years ago. Initially the community did not support being in a case-by-case decision area for dispersants. The recent review from Friday Harbor Laboratories suggests that, based on the best-available science, San Juan County should remain “case-by-case” for dispersant use.

More details:

NWACP Dispersants Policy Map

<https://waecy.maps.arcgis.com/apps/webappviewer/index.html?id=ff1d0cd00e6641209e25b9ee56df46fc>

The Journal of the San Juan Islands article

<http://www.sanjuanjournal.com/opinion/dispersants-a-controversial-oil-spill-response-guest-column/>

Study link <https://www.eopugetsound.org/articles/oil-dispersant-effectiveness-and-ecological-consequences-san-juan-county-marine-waters>

- **Updates to In-Situ burning** --Our policy has a directive to collect burn residue. NOAA continuing to look at the risk of burn residue.
- **Best Achievable Technology Conference** – WA Ecology is co-hosting another Best Achievable Protection BAP Technology Conference in October 2019. The 2-day event is modeled after CA’s technology conference. Lot of new work coming out of Transboundary efforts many presentations planned to discuss new preparedness investments that improve preparedness in our shared waters. The dates are not finalized yet. I will share additional details about the conference as I have them. We will also post details of our BAP review at <https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Best-Achievable-Protection>
- **Non-Floating Oils (NFO)**-- In the process of trying to get money for study on NFO – bill in leg for funding this.
- **NFO Research vessel** – Ecology has a research vessel that could support identification of non-floating oil. Has multi beam sonar, FLIR, and other equipment on board to that

could visualize water on the surface at night, in the water column and subsurface , etc. Ecology is trying to operationalize this asset for spill response.

- **Greys Harbor Risk Assessment Study** -- Looking at cascading of equipment into this area (outer coast of WA) and building out all the response systems. This study is unique in that it's looking at preparedness, not only response. Use response calculator to establish current capability compared to projected risk in the area. Details at <https://www.ecology.wa.gov/Spills-Cleanup/Spills/Oil-spill-prevention/Oil-transportation-in-Washington>
- **Air quality Monitoring in Community Response** – Our new contingency planning regulations which apply to railroads have a planning requirement for community air monitoring (CAM). The EPA worked to develop a CAM plan as a new tool in our area contingency plan. This tool is available at <https://rrt10nwac.com/Files/NWACP/2018/Section%209418%20v19.pdf>
- **Drone policy:** Working on a policy out of Ecology. Northwest Area Plan also working to update our regional contingency plan to include the use of drones.
- **Surface Washing Agents** –Recent spill on the Columbia River – very heavy sticky product on pilings. The use of surface washing agents was approved by our RRT but they were not effective. Working this year to create tools that facilitate discussion around use of surface washing agents and documenting the approval. We have a structure for dispersant use and documenting decisions in our area plan but nothing for surface washing agents. If anyone has forms/tools please point me in the right direction.

Q: Does CA have an approval process, documents and forms for using washing agents?

CARL: Canada has surface washing agent protocols. Looking at something that can simulate tidal action. See AMOP paper with some details on the Inclined Trough Test (ITT) and the new Rotary Mixture Method (RMM).

Karen Stone, BSEE

The link to BSEE's oil spill preparedness research is as follows: <https://www.bsee.gov/what-we-do/research/oil-spill-preparedness/oil-spill-response-research>

- **\$12M on Research in 2018** -- Large portion to operate OHMSETT.
- **In-situ Burning Study** -- Pushback from producers saying that CA Crude emulsifies so quickly that it cannot burn that easily. Looking at how readily different crudes ignite and combust. Also looking at emissions and burn residues.
- **Technology Readiness Levels** -- Maturity of a technique. Advance technology from proof of contract to be used and certified. On any BSEE product, you'll see note of the technology readiness levels.

Current projects:

Project No.	Title	Organization(s)
1013	Enhanced Oil Spill Detection Sensors in Low-light Environments	US Army Research Development and Engineering Command
1027	Development of a ROV Deployed Video Analysis Tool for Rapid Measurement of Submerged Oil/Gas Leaks	National Energy Technology Laboratory
1029	Environmentally Benign Oil Simulants to Mimic the Behavior of Oil Droplets in the Ocean	EPA
1038	Biodegradation Following Dispersant Usage in a Cold, Stratified, Deep Sea Setting	Pacific Northwest National Laboratory
1046	Leveraging Offshore Hydrocarbon Risk Assessment Models and Datasets to Support the Evaluation and Ranking of Worst Case Discharge Scenarios	National Energy Technology Laboratory
1061	Low-Emission Spray Combustor	Naval Research Laboratory (NRL)
1062	Software Development in Support of Preparedness Activities Regulated by BSEE	NOAA
1063	Preliminary Technical Guidance and Literature Review to Assist in Evaluation of Wellhead Burning as a Blowout Response	Naval Research Laboratory (NRL)
1066	Analysis of How Environmental Conditions Affect Dispersant Performance During Deep Ocean Applications	Pacific Northwest National Laboratories
1067	Characterizing Dispersant Effectiveness of Crude Oil at High Salinities: Implications for Subsea Spill Preparedness	EPA
1071	Multifunctional Herding-Sorbent Agents for Use In Icy Water	Pacific Northwest National Laboratories
1072	Diminishing Slick Testing of Skimmers - former project number was 7018	BSEE

1073	Dispersibility and Oil Composition	Applied Research Associates, Inc. (ARA)
1074	Quantifying In-Situ Burns	Applied Research Associates, Inc. (ARA)
1075	Operational Limits of Herders	Applied Research Associates, Inc. (ARA)
1076	NOAA WebGNOME Trajectories and Oil Libraries	NOAA
1077	GOM Oil Spill Response Viability Analysis	Nuka Research and Planning Group, LLC.
1078	Development of an Oil Thickness Sensor	American University of Beirut
1079	Deepwater Horizon Lessons Learned - Methodology and Operational Tools to Assess Future Oil Spills	NOAA
1081	Advancing ICEHORSE proof-of-concept to make it more useful in an operational environment	Alion Science and Technology Corporation
1082	Methods to Enhance Mechanical Recovery in Arctic Conditions	Cold Regions Research and Engineering Center (CRREL)
1083	Development of an Oil Recovery Efficiency Sensor	Battelle Memorial Institute
1084	Optical Monitoring of Subsea Blowout Droplets and Subsea Dispersant Efficacy	Exponent/SINTEF
1085	In Situ Test Burning of California Crude Oils	Naval Research Laboratory (NRL)
1087	Geo-Referencing Identification (GRID) Tag Testing in Barrow, Alaska	AECOM
1088	Assessment of Oil Demulsification and Separation Technologies	Nuka Research and Planning Group
1090	Dispersant Delivery Systems Effectiveness and Efficiency	SwRI
1091	Estimating Oil Slick Thickness with LiDAR Remote Sensing Technology	U.S. Naval Research Laboratory

1092	Autonomous Underwater Vehicle Deployable Oil Spill Igniter	Phoenix International
1093	Fuel and Fire Configurations	CRREL
1094	Fire Whirl Fundamentals	University of Maryland (UMD)
1095	Research and Develop Interface Insulation Systems and Vigorous Burn Inducer to Increase ISB Burn Efficiency and Reduce Residue	SL Ross
1096	Measurements of In Situ Burn Emissions and Residues	EPA
1097	Slick Thickness Characterization Based on Low Noise, Polarized Synthetic Aperture Radar	NASA / Jet Propulsion Laboratory
1098	System and Algorithm Development to Estimate Oil Thickness and Emulsification Through an UAS Platform	Water Mapping, LLC
1101	Ice Management System for Skimmers:	CRREL

Alex Balsley, USCG R&D Center

- **Oil on Ice Studies** – (Project 4701) Completed the research, and still working on report for all 4 oil on ice demonstrations that the RDC has carried out since 2011.
- **Oil in the water column** – (Project 4702) Completed the research; studied approaches to mitigate oil in the water column. Air bubbles and adsorbents. Prototypes tested at Ohmsett in January 2017. Report available at: <http://www.dtic.mil/docs/citations/AD1038360>
- **Dispersants** -- Worked on a white paper to monitor the effectiveness of dispersants in remote locations. White paper to be available in March/April 2018.
- **Burn Tests** – (Project 4704) Tested a metal mesh wool blanket that makes fire hotter and increases the field burning. (BSEE project #1068). Worked with Pacific National Lab on oil herding. (BSEE Project #1071). Installed a wave-maker at the Joint Maritime Test Facility in Mobile, AL. Still working on other infrastructure improvements. Burn time is typically in the fall.
- **Oil Sands Products Response** – (Project 4705) Tested two skimmers for dilbit. Will test underwater barrier systems that were developed by Alion. Will attempt to deflect sunken oil to a collection site. Underwater barrier system tests will take place at Kalamazoo River and Lake Huron in March/April 2018.

- **Shale oil and shale gas extraction waste water** – (Project 4707) Completed the research; gathered available information for handling shale oil and shale gas extraction waste water. Chemical composition of shale oil and water. White paper used to advise policy on shale oil and shale waste water.
- **Oil Spill Emerging Technology Assessment** – (Project 4708) Developing an evaluation guidance for oil spill response technologies during times of non-emergencies. Focused on analyzing submittals with Technology Readiness Level of 7 or above. Information collected from equipment vendors will be used to inform Federal On-Scene Coordinators of emerging technologies or be used to conduct trend analyses over time. Project expected to be completed in early 2018.
- **Estimated Recovery System Potential (ESRSP) Calculator** – (Project 4710) BSEE developed this for off-shore environments. Being examined for nearshore and inland contexts. Current calculator can be used nearshore, but would need to be modified for inland spills.
- **Arctic testing** -- Every summer, test equipment in Arctic environments. AquaGuard Triton Roto X skimmer was demonstrated in Summer 2017. More information about this is available at: http://www.dcms.uscg.mil/Portals/10/CG-9/RDTE/RDTE%20PDFs/ATE17%20Pub_Final.pdf?ver=2017-07-24-160942-423. RDC does not expect oil spill response technologies to be demonstrated this summer, aiming to do something in 2019.

Q: Is there a report available for your study of the ERSP calculator for inland applications?

A: Workshop results are FOUO at this time but next report discussing the development of the inland ERSP calculator should be made available to the public. Expected release date is 2019.

Carl Brown, Environment and Climate Change Canada

- **Diluted Bitumen Studies** – Measuring the physical and chemical properties of diluted bitumen and comparing with heavy fuel oils and conventional crudes. Learning a lot about fate and behavior of fresh and weathered diluted bitumen. Weathering studies included; evaporation, solar irradiation, interaction with sediments, etc. ECCC's physicochemical properties of petroleum products are available on the Government of Canada's Open government data portal. You can download information on individual oils, or a comma separated variable (csv) spreadsheet file for all oils in the database.

<https://open.canada.ca/data/en/dataset/53c38f91-35c8-49a6-a437-b311703db8c5>

- Here are some studies that ECCC has undertaken:
 - Looking at ways to rapidly analyze oil samples in the field during a spill response. Using Excitation/Emission/Matrix fluorescence spectroscopy and have built a database containing over 130 oil products Light to medium crudes, heavy fuel

oils, etc. Principal component analysis and parallel factor analysis -- to group them into classes.

- Field instruments: calibrate fluorometers to identify what fraction of the oil is in the water column. Correlate response of field instruments with lab bench instruments. Have done this with crudes, dilbits, and some heavy fuel oils.
- Dilbit: study how the components of dilbits change with solar irradiation, poly-aromatic hydrocarbons (PAHs) are the components that change more rapidly.
- Baseline petroleum hydrocarbon samples collected and analyzed for northern and coastal BC. Background levels are very low; only see minor contamination in small harbors. Similar studies undertaken on the East Coast. Also looking at the site of the Liberian tanker Arrow that sank in 1970.
- Bay of Fundy – shoreline classification and baseline studies.
- Dilbit (fresh and weathered samples) meso-scale penetration and retention studies on sand, pebbles, cobble, etc. These results, along with video and photographs that allowed for shoreline classification can be used to predict dilbit penetration and retention depending on the type of shoreline impacted.

Comment: Check out ShoreZone for photos of shorelines across the West Coast:

<http://www.shorezone.org/>

- **Experimental Lakes** – In freshwater lake study, installed some mesoscale columns, released some dilbit and looked at the impacts on some of the species (chemical analysis). Bioassays, fish and small amphibians, and other ecosystem components.
- **Guidance materials** – How to respond to marine spills and marine shorelines. Published a SCAT manual with new guidance added.
- **New funding from OPP** – Exploring alternative response measures. Currently, they are not allowed to use chemical dispersants or washing agents. May be possible through OPP to change legislation to be able to use alternatives:
 - spill treating agents, herders, dispersants.
 - In-situ burning
 - Natural attenuation
 - Decanting

Q: Does Canada have approval for dispersants?

A: Only from spills from offshore facilities. With OPP, also looking at ship and shore sources as well. COREXIT 9500 and 9580 are the approved for offshore use.

- **Dilbit bibliography** – EC has compiled a bibliography of dilbit publications from Canada and around the globe. I will send separately, I am finishing a recent update.

Amy Merten -- NOAA

- **New role at NOAA** -- Amy has moved positions and is now the Regional Manager for PNW and Great Lakes for Assessment and Restoration. Yes, still part of OR&R as are Ben and Lisa. Ben Shorr has Amy's old job as Chief of the Spatial Data Branch. Lisa DiPinto

OR&R's Chief Scientist and it would be beneficial to add her to this group. See OR&R's R&D priorities.

- **Offshore spills in the Gulf of Mexico.** Getting a better handle on how to use remote sensing and use it across other platforms. On water, in water, modeling and understanding fate and effects in water. Come up with a better estimate of long-term effects and restoration. BSEE and NOAA funding. Trying to develop a better model from the injury point of view.
- **In-Situ Biototoxicity Testing** – Looking at early life stages in the natural environments. Conceptual stages now. Something they'll talk about more in the coming 1-2 years.
- **Electronic Data Capture** – Trying to improve data collection. Sending the data to Common Operating System of interest (ERMA) and other systems. Want to be able to move data more quickly, know where it is, send to the labs, to users, etc., while maintaining chains of custody.
- **Firewall issues** – Looking to ESRI solution for overcoming this issue. Sharing among agencies – continues to get harder and harder.
- **Small spills in PNW and Great Lakes** – NOAA would be interested in some on-going discussions about how to deal with the smaller spills from an injury point of view. Are folks seeing more of these lately where small spills are having larger impacts because of the environments in which the spills are occurring?