

Pacific States/BC Oil Spill Task Force Research and Development Workgroup

SUMMARY NOTES

January 5, 2016 Annual Conference Call

PARTICIPANTS:

Carl Brown – Environment Canada

Lori Medley - BSEE

Mark Miller – NOAA

Steve Lehmann – NOAA

Kurt Hansen – USCG R&D Center

Richard Knudsen – FL Fish and Wildlife Research Institute

Ellen Faurot-Daniels – CA Department of Fish and Wildlife - OSPR

Judd Muskat – CA Department of Fish and Wildlife - OSPR

Bruce Joab -- CA Department of Fish and Wildlife - OSPR

Nancy Kinner – UNH, Center for Spills in the Environment/ Coastal Response Research Center

Rick Bernhardt – AK Department of Environmental Conservation

Sonja Larsen – WA Department of Ecology

Don Pettit – OR Department of Environmental Quality

Curtis Martin – HI Department of Health

Sarah Brace – Pacific States/B.C. Oil Spill Task Force

ROUNDTABLE UPDATES

Nancy Kinner – UNH - CRRC

Mark Miller, New Co-Director of CRRC -- A partnership that has been going on since early 2000's between NOAA and UNH. Funding for CRRC research is from NOAA. The mission of CRRC is R&D. The 'sister' organization Nancy leads is the Center for Spills in the Environment, which is funded from a variety of others sources.

State of the science of dispersant use in the arctic. Initiative started last fall funded by NOAA and EPA: result of the SONS exercise regarding response to an Oil Spill in the Arctic. Working this project since last year. Topics are:

- Efficacy and effects
- Physical transport and chemical behavior
- Transportation and fate
- Toxicity
- Public health and food security

Drafts of topic papers (with a database) will be released to community throughout Alaska and CRRC contact lists – not a public review process. Folks will be able to present written comments and input.

Environmental disaster data management. Held a 3-day workshop in 2014 to consider the kinds of data quality and standards might be applicable. Amy Merten of NOAA and Russ Spear of ocean data group. Three working groups working on the following topics:

- Data management
- Field protocols
- Gold standards

Documents will be posted on CRRC website when they are completed.

Oil observing tool workshop October 2015. Workshop was held at the Disaster Response Center. 70 folks participated. Lots of information out there on oil observing. Some techniques that are available but not many opportunities to use all these tools effectively. A report will be released in the next few months.

Food security, food safety related to oil spills. Nancy's group has been talking with folks at the AK RRT about work in this area. Dates have not been nailed down yet.

Regional Preparedness Training Workshops. Currently working with NOAA on 3 trainings: one will be in Galveston TX in conjunction with TX RRT. What would a spill response look like if it impacted a marine sanctuary? Another in Mobile AL: number of topics including storm impacts, phosphate piles and other.

Gulf of Mexico Oil Spill and Ecosystem Science Conference, Feb 1-4 2016

Three-hour session on the implications of the NRDA settlement for the Gulf of Mexico. Many of the folks don't know what the settlement means. Conference website: <https://event.crowdcompass.com/gulfconference2016>

State of Florida: FL: working with them on possible scenario might be there.

Kurt Hanson, USCG Research and Development Center, New London.

Response to oil on ice – Great Lakes demonstration planned for Spring 2016. Temporary on-deck storage, personnel decontamination, and ice management being addressed on CG Buoytender. Summary of what they've been work on over the past 4 years will be released in 2017.

Water column assessment – Exploring two new 2 approaches to get oil out of the water column. 1) bubbles 2) new absorbents

In-situ burning. API working group just released a training manual <http://www.oilspillprevention.org/oil-spill-research-and-development-center>

No new technology has been developed; Kurt's group is hoping to address this. Burn pan in Mobile, AL is being refurbished for use.

Oil Sands Products spill response – general assessment last fall to address some of the issues. Oil Sands sampling system is being developed. Grab a sample of sand and process it on-site (not send it to a lab).

Skimmers -- Testing some skimmers at Ohmsett in fresh water with oil sands products.

Strike team project – Small robot that can handle the majority of Strike team requirements for assessments and spill mitigation. Mostly addressing chemical and biological incidents.

Shale preparedness and response – Starting up a program to examine shale oil and also the waste water. What's in it, what are we dealing with for response issues.

Airborne remote sensing and reporting – Conducted overflights of natural seeps in Santa Barbara while happened to coincide with pipeline spill. Data collected of seeps and pipeline oil using infrared and visible light.

Q: Is the imagery available from Santa B?

A: Some of it is, some is considered official use only.

Mobile Asset Tracking and Reporting: Exploring expanding the use of tablets etc.

Q: Tracking on Boom? Has USCG considered this?

A: Yes, BSEE projects 1051 and 1052

Arctic operations support: search and rescue exercise in 2015. Unmanned aerial systems deployed from offshore and land. Plan to go back in 2016 to use other unmanned systems in arctic. Possible using a scenario this summer using dye.

Carl Brown, Environment Canada, Ottawa

Diluted bitumen studies – Studying the chemical/physical properties of fresh and weathered dilbits, fate and behavior studies, buoyancy, oil-sediment interactions, spill countermeasure effectiveness, shoreline characterization and dilbit penetration and retention studies, spill modeling studies on dilbit-sediment formation with/without dispersants, dilbit/brine interfacial tensions.

Studies of oil photo-degradation – summer and winter exposures of dilbit and reference crude/heavy oils.

Rapid fingerprinting to identify oils - fluorescence spectroscopy evaluation samples with minimal treatment. Studied a mixture of American and Canadian crude products plus heavy, bitumen, etc. in different weathering states.

Surveys along the northern B.C. coast (3 surveys, summer) shoreline characterization, collected substrate and sediment samples for dilbit penetration/retention studies, collected intertidal sediment samples to help evaluate background hydrocarbon levels along Dixon Channel, and a number of coastal islands.

Toxicity of various oils - the potential toxicity of different oils in the water phase with and without oil-sediment interaction was evaluated by analyzing total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs) and their alkylated congeners (APAHs). Evaporative studies. As they are released into the environment

some will be released into the air. Impact not known.

Effects of dispersants on dilbit – evaluated the effectiveness of dispersants on fresh and weathered diluted bitumen samples, to estimate the window of opportunity for possible response countermeasure.

Detection and monitoring of oil (including dilbit) - on shorelines and in the nearshore water column with towed fluorometers, video systems.

Unconventional crudes – Conducting some studies on these. Partially to do with forensic identification of these materials in case they are released in the environment.

The 39th AMOP Technical Seminar on Environmental Contamination and Response will take place June 7 to 9, 2016 in Halifax, Nova Scotia, Canada.

Q: Grants from Natural Resources Canada – what’s the status?

A: \$5M over 3 years, Oil Spill Response Science (OSRS) Program for research, development and demonstration (RD&D) projects focused on improving current mechanical recovery technologies and processes for the cleanup of heavy oil products spilled in marine environments. Peer-review of letters of interest completed.

Richard Knudsen, State SSC - Florida Fish and Wildlife Research Institute (FWRI), Saint Petersburg, Florida

Higher Resolution Ocean Surface Currents -- Working with the USGS out of Woods Hole Mass in developing a 1-click map Interface for TIDAL surface current velocity and direction predictions. Most models in FL are at a coarse resolution in the nearshore ocean/estuary regions. This capability taps into the ADCIRC VDATUM unstructured model mesh, which is a very high resolution model NOAA uses for tide height predictions. In this case, tidal currents will be the prediction target. This should allow us to gain some insight into tidal current velocities through tidal inlets, the gateways between oceans and estuaries, for better contingency planning and development of better Tidal Inlet Protection Strategies for Oil Spill Response.

TerriaJS and CESIUM for 3D Oceanographic Model Visualization and Integration with GIS Map Services (Scientific GeoPortal) – We are currently working on development of TerriaJS and CESIUM, an open-source software developed by National Information Communications Technology Australia (NICTA) <http://www.nicta.com.au/about-nicta/> and Data61 (part of Commonwealth Scientific and Industrial Research Organization (CSIRO) <http://www.csiro.au/en/Research/D61> with the USGS, NOAA, and a non-profit (metanomy.org) on “Evaluating a new open-source, standards-based framework for web portal development in the geosciences” with a focus on oil spill-related informatics. A long-standing problem has been the integration of model and model-derived (3D + time) spatial information products WITH static geographic information systems data (2D – no time). This effort was inspired by Post-DWH investigations into the use of oceanographic models and model data used in predicting the locations of submerged tarballs and tarmats in the very nearshore regions of coastal Alabama and Panhandle Florida (Plant & Dalyander, USGS)(DWH OSAT3) as well as investigations into nearshore

oceanographic model grid (mesh) resolutions in comparison to GIS mapped shorelines used for Shoreline Cleanup Assessment Technique (SCAT) efforts in the response. It became apparent that viewing these data types within the same geospatial framework was very technically challenging, time-consuming, and difficult due to differences within the data themselves as well as with methods that each data type was shared via map services. These same challenges persist with relation to oil spill trajectory model forecast products, such as those produced by NOAA using GNOME (the General NOAA Operational Modeling Environment). Cesium is a JavaScript library for creating 3D globes and 2D maps in a web browser without a plugin. It uses WebGL for hardware-accelerated graphics, and is cross-platform, cross-browser, and tuned for dynamic-data visualization. The dynamic 3D (+ time) visualization capabilities of Cesium make it a strong candidate for use in visualizing oceanic and atmospheric model results. With the added benefit of easily connecting to and displaying a broad range of web map services (both ESRI REST and several types of Open Geospatial Consortium (OGC) services, this application could be a game changer in the geosciences and spill response and planning communities. These are just initial steps to test, evaluate, and report on this promising new infrastructure for scientific geoportal development.

EDDM project with UHN and Kinner – FWRI is also pursuing an “event response” framework that will broadly integrate with the EDDM framework. Fish kills, marine mammal mass-strandings, animal/human pathogens, etc. More than just oil spills.

State of FL Environmental Sensitivity Index (ESI) GIS data updates in 2016 -- At least one, but perhaps two ESI Atlases will be updated in Florida in 2016. West Peninsular Florida II will be under contract shortly and West Pennisular Florida I should be following after. West Peninsular Florida is the region of the Gulf Coast of Florida that is NOT the Florida Panhandle. These updates will be GIS data ONLY. NO CARTOGRAPHIC PRODUCTS are under contract at this time.

WebGNOME (General NOAA Operational Modeling Environment) – Collaborating with NOAA on WebGNOME (beta), a fully online interface into GNOME to allow oil spill trajectory modeling for drills and exercises using only a web browser and pre-established GNOME Location Files. This is versus downloading and installing desktop GNOME, downloading a Location File, and running the simulation in a desktop environment. Regions of Florida currently available: Tampa Bay, Port Everglades (Fort Lauderdale), St Johns River (Jacksonville).

Net Environmental Benefit Analysis (NEBA) tool for the Gulf of Mexico for a common geospatial environment – This is a desire and a need for a comprehensive geoportal that would allow for a map polygon drill-down spatial query and report on ALL resources to be considered in a NEBA analysis that can be performed quickly for evaluation by a scientific support team for dispersant decision-making. Much like USFWS IPAC Query, but for NOAA trust and marine resources (in-water and benthic).

Government-led PREP exercise – Will take place this Spring in Jacksonville, FL. Drifter deployments by the CARTE Consortium a possibility.

General news -- FL is pretty discombobulated with regards to oil spill response. The state lead (DEP) has left and there remains a leadership and funding vacuum. FWRI is no longer being funded to develop Geographic Response Plans around USCG District 7 (at least for FY 2016/2016) but FWRI continues to maintain and host the map services produced from the last 15 years' worth of work and these are shared with NOAA's ERMA through map service connections

Lori Medley, BSEE

Ohmsett – Major renovation completed Summer 2015. Future storm mitigation projects completed December 2015. Storage building re-construction complete January 2016. (It was destroyed during Super Storm Sandy.) We are exploring the use of Ohmsett as a venue for large-scale bioremediation research.

During FY 2015 BSEE's Oil Spill Response Research program funded new projects with approximately \$14M. Our emphasis was on Arctic oil spill response preparedness, dispersant effectiveness, and remote sensing of crude oil on the surface of the water and in the water column. We implemented our Peer Review Process and currently have 4 projects under peer review. We made presentations at Clean Gulf, Clean Pacific, AMOP, and Interspill.

Potentially, no BAA posted this year. Research projects will be solicited via individual RFP's, or conducted internally.

Previously briefed Arctic Prize Challenge is not moving forward at this time.

2015 completed projects - See our website: <http://www.bsee.gov/Technology-and-Research/Research/>.

Navy Research Lab – State of the art assessment of remote sensing technology. Should be on BSEE website soon.

Peer review program -- Up and running.

Oil spill response gap in the Arctic – BSEE working with NUKA Research in estimating the gap in oil spill response in the Beaufort and Chukchi seas. In situ burn response the best year-around option in that region.

Dispersant comparative study #1016. Comparison of several dispersants in cold water. Very interesting that some of the products did not perform well in cold weather. One product that did worse than control (wave maker w/out compound).

Several in situ burn projects

45 projects next year -- See Lori's handout.

Ellen F-Daniels, CA Department of Fish and Wildlife OSPR

New position coming at OSPR for best achievable technology.

Next Technology workshop -- Feb 2017

Response technology review during Refugio. Use of shoreline cleaning agents. Looked at several products.

- In-situ tests in kiddie pools of removal of products
- Looked at high pressure, water temps, surface scrubbers. A peat-based sorbent. Got permission to use the product. Fixed boulders and sandy cliffs were cleaned by scraping.
- Dry ice approach – no waste, ice sublimates. Good feedback, looks like a promising technique.
- Parachute skimmer – offered up but didn't use. Good for shallow water (hand-towed).
- Lots of sorbents were offered up – some new, some common.
- This spill led to the idea of using spills as science of opportunity.

Judd Muskat, CA Department of Fish and Wildlife OSPR

Streamlining field data collection.

OSPR is moving forward with in-house development of custom Apps in the iOS environment for field data collection. OSPR has been using high end GPS receivers (Trimble GeoXM and Juno) running customized field data collection applications. Over time it became hard to keep up with evolving hardware, software, firmware and operating systems (ArcGIS, windows mobile, etc.), and end user training. The switch to tablet/smart phone applications will give the end user a more familiar platform for data collection. The choice of the iOS environment is driven by CDFW policy.

The first App to go operational is for Wildlife Search and Recovery for the iPhone. Worked with the Oil Wildlife Care Network responders on the development. This App documents the coordinates from where stranded wildlife are collected or captured, their condition (live/dead, oiled, etc.), georeferenced field photos, and has provision for ad hoc field observations. The collected information is sent to a password protected FTP site. First used at the Refugio Spill. Hoping that will continue throughout CA for all responses. Available now in the App store. Here's how to get it:

Requirements: iPad (with GPS) or iPhone

On your iPad*/iPhone.

1. Go to the "App Store".
2. In the upper right had corner, type: "cdfw wildlife" in the Search
3. Tap, Search
4. Tap, the download icon
(you may have to sign in to the app store)

When you start the Wildlife Recovery app, you will need to accept the prompt to allow the Wildlife Recovery app to obtain location via the GPS.

-* iPads come with or without GPS. An iPad with GPS is an iPad that is cellular capable, but does not necessarily need a cell sim card installed.

-* iPads that are WiFi Only do not have an onboard GPS.

Data collection during Refugio Oil Spill

OSPR field staff decided to collect SCAT data using paper forms rather than our Trimble based SCAT software. Paper forms were transcribed and entered into NOAA's MS Access SCAT database. This was sufficient as far as managing the data and generating the required daily reports but, transcribing and entering the data is very cumbersome. OSPR's current GIS priority is developing a simplified SCAT App. We had started working with NOAA and USEPA on this but the project got bogged down and died. OSPR is now forging ahead on our own on the development of a California centric SCAT App.

Southwest ERMA, Planning tool and COP

- Continuing to populate with California response planning data.
- New inland California GRP's will be integrated into ERMA as they are developed.
- ERMA was used as the Common Operating Picture for Refugio. A GIS sever was brought into Incident Command post to manage the data. The server worked fine but it comes with additional overhead in server administration. Trying to develop a more mobile setup using redundant Network Additional Storage (NAS) devices for GIS data storage and backup.

ERMA site: <https://erma.noaa.gov/southwest/erma.html#/x=-122.61673&y=38.78743&z=11&layers=12+13854>.

Response to massive wildfires in CA – OSPR was involved in the post fire ash and debris removal project. Currently using ERMA as the COP for that project. The ERMA site is open to the public so local residents can check the progress. Responders and demolition crews in the field are using ERMA to get current info on the various parcels they trying to restore.

Bruce Joab – CA Department of Fish and Wildlife OSPR

Request for proposals coming out soon. \$200K available for research projects. Inclusive of inland mandate and coastal response technologies

Sonya Larsen, WA Department of Ecology

Spills Mapping Tools – Last year our program staff began working with the agency GIS folks to develop online interactive mapping tools. We are calling the maps **"Spills**

Story Maps.” Through these interactive maps we were able to combine narrative text, images, and multimedia content to engage the public. The Spills story maps also enhance our oil spill preparedness and support rapid and aggressive and well-coordinated responses to actual spill incidents when they occur.

These interactive maps provide information on:

- Reported Spills in Washington state
- Crude by rail oil trains moving through Washington State
- Statewide Geographic Response Plan (GRP) Strategies
- Restoration projects funded through natural resources damage assessments
- Locations of oil spill response equipment
- Emergency response towing vessel response locations
- Locations of regulated facilities and pipelines
- Oil transfer information by county

The Maps are available online at this link

https://fortress.wa.gov/ecy/coastalatlus/storymaps/spills/spills_sm.html

Best Achievable Protection -- We are in year four of implementing our five year BAP cycle for vessels. Details for how we are implementing our BAP cycle can be viewed at our website <http://www.ecy.wa.gov/programs/spills/preparedness/BAP.html>

This past year we held the first Washington State Best Achievable Protection Technology Conference. Conference areas of focus:

- Common Operational Picture (COP) tools
- Alternatives to EDRC
- Submerged oil response (case studies and tools)—marine induced polarization technology (submerged oil detection and mapping)

<http://www.ecy.wa.gov/programs/spills/preparedness/Wynn.pdf>

- Remote Sensing tools

Conference details and presentations can be viewed on our website at

<http://www.ecy.wa.gov/programs/spills/preparedness/BAPConference.html>

We are starting to look at ways to support effective field data collection- pursuing this for support of GRP fieldwork, equipment verifications and SCAT.

Also hoping to get HF Radar in Washington... this is a project being led by Tribes and Legislature

R&D – “Regulations and Drills” -- We were recently given new regulatory authorities to require contingency plans for railroads and to apply Best Achievable Protection to Facilities (this includes pipelines and railroads) previously BAP applied only to Vessels.

Current Spills Rulemaking Activity in WA:

- WA initiated a new rulemaking for Chapter 173-182 WAC, Oil Spill Contingency Plan Rule. After several years of implementing the rule, we have identified the need to update our standards to ensure that required oil spill response

equipment is appropriate for the pipeline risks and operating environments (marine and inland). We are also incorporating requirements for BAP and a new geo-referenced data planning standard.

- Another new rulemaking for Chapter 173-185 WAC, Oil Movement by Rail and Pipeline Notification. The proposed rule will create reporting standards for facilities that receive crude oil by rail, and pipelines that transport crude oil through the state. Additionally, the rule would identify reporting standards for Ecology to share information with emergency responders, local governments, tribes, and the public. We intend to use the new spills story maps as a platform for sharing the collected data with the public.
- Finally another new rulemaking... Chapter 173-186 WAC, Oil Spill Contingency Plan – Railroad. Increased crude by rail transport has changed the risk picture for oil spills in Washington State. During the 2015 legislative session, RCW 88.46.010 and RCW 90.56.010 were amended to include railroads (not owned by the state) that transport bulk oil as cargo in the definition of “facility”, and RCW 90.56.210 was amended to expand Ecology’s authority to require state contingency plans for rail.

Rick Bernhardt, AK Department of Environmental Conservation

Exploring unmanned aerial systems (UAS) technology on the North Slope. UAS to vessel, vessel to shore, shore to Anchorage. Have used these in drills. Sometimes the images and videos 5-6 hours later. Trying to refine those capabilities.

Oil spill simulants – sawdust, other products to validate the test. Looking at approval process now.

Oil Spill Research Institute – enzyme-based remediation product testing. Three years of funding to research enzymes.

ART – food security scope of work. Most likely sources of vulnerability for marine and terrestrial spills. Subsistence food supplies are a concern. How long would those hydrocarbons linger in blueberries? Be transferred to caribou, etc.

Don Pettit, OR Department of Environmental Quality

Streamline and standardize attribute booming strategies in COP – such as in ERMA. Part of the NW Area Committee Task Force. Connor Keen from WA ECY involved. They are working on getting the data into good enough shape to integrate into several COPs.

Published lower and middle Columbia River GRPs—available in digital info and now transposed into this COP scheme. Hope to begin field work to update the coastal GRPs. Also update the methodology for the GRPs so when we have data ready, we’ll have stab at publishing in a newer format.

Steve Lehmann, NOAA

Enzyme work -- Database to respond to researchers, contact folks. In the infancy – something off the ground this year hopefully.

Please contact Sarah (sarah@vedaenv.com) if you have an questions or updates to this information.