Tenth Biennial

OSPR/Chevron Oil Spill Response Technology Workshop

Estuary & Ocean Science Center

3152 Paradise Drive

Tiburon, CA 94920

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ABSTRACTS, SPEAKER BIOGRAPHIES AND CONTACT INFORMATION

Speaker Name	**Dr. Benedette Adewale** (co-presenting with Alex Balsley)
Presentation Title	**USCG Research and Development Center Oil Spill Response Research Update**
Abstract	The United States Coast Guard (USCG) Research and Development Center (RDC) is currently working on five oil spill response projects in FY23. They are: Behavior of Diluted Bitumen (Dilbit) in Fresh Water, Nearshore and Inland Evaluation of the Estimated Recovery System Potential (ERSP) Calculator, Emerging Pollution Response Technology Evaluation, Hazardous Substance Pollution Response Technology Analysis, and Marine Environmental Response Common Operating Picture.
	Organization: United States Coast Guard Research and Development Center Mailing Address: 1 Chelsea Street; New London, CT 06320 Email Address: Benedette.S.Adewale@uscg.mil Website Address: https://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Research-Development-Test-and-Evaluation/Research-and-Development-Center Office Phone: 860-271-2849 Cell Phone:
Speaker Biography	Benedette Adewale is a Chemist and Project Manager at the United States Coast Guard Research and Development Center (RDC) in the Environment and Waterways branch since 2018, where she is involved in oil spill response research. She graduated from Stony Brook University with a Doctor of Philosophy degree in Chemistry, (a focus on Environment and Analytical Chemistry), a Master of Science degree in Chemistry from the City University of New York (CUNY), City College of New York (NY) and a Bachelor of Science degree in Chemistry from the CUNY, College of Staten Island, NY.

Speaker Name	**Kesavalu M. Bagawandoss, Ph.D., J.D.**
Presentation Title	**Identification of Spilled Oil using Alkyl PAH Isomer Ratios from the MV Marathassa (Vancouver, Canada, 2015) —A Case Study**
Abstract	On the morning of April 9, 2015, citizens in Vancouver (British Columbia, Canada) awoke to the sight and smell of oil on the shores of popular downtown beaches. Because the oil also had spread over the shallow seawater intakes for the Vancouver Aquarium, a preliminary screening of samples was performed as a prompt, first response to assess the risks to the Aquarium collection and guide the emergency operational response. A subsequent, more detailed examination for the presence of spilled oil in sediment, biota and water samples from the Vancouver Harbour region was then conducted based on the analysis of a large suite of alkanes, petroleum biomarkers, parent polycyclic aromatic hydrocarbons (PAHs) and alkyl PAH isomers. Most of the commonly applied biomarker ratios exhibit similar values for the spilled oil, Alberta oil (the main petroleum source for British Columbia), and pre-spill and un-oiled sediment samples. In contrast, alkyl PAH isomer ratios showed a clear distinction between the spilled oil and pre-spill samples, with the largest differences shown by isomers of the methyl fluoranthene/pyrene alkyl PAH series. This novel use of alkyl PAH isomers for fingerprinting petroleum helped to confirm the grain carrier MV Marathassa as the source of the oil that affected beach and mussel samples to document definitively the spread of the oil and to establish which samples contained a mix of the oil and hydrocarbons linked to historical activities. Finally, an initial evaluation of the biological risks of the MV Marathassa oil spill in Vancouver Harbour showed that oiled beach sediments had priority parent PAH concentrations that are likely to harm marine life. The analytical data for the determination was provided by SGS Axys.
Speaker Contact Information	Organization: SGS North America, Inc. Mailing Address: 10175, Harwin Drive, Suite 107, Houston, TX 77036 Email Address: dr.doss@sgs.com Website Address: www.sgs.com Office Phone: 713-271-4700, X 14467 Cell Phone: 281-881-1457
Speaker Biography	Kesavalu Bagawandoss (Dr. Doss) has spent more than 40 years in the analytical chemistry arena. His expertise spans chemistry, environmental analysis, hydrocarbon chemistry (gas, liquids, fuels), forensics, industrial hygiene laboratory services (American Industrial Hygiene Association [AIHA] accredited), air analyses (TO compendium methods), biota analyses, hazardous waste management, client services, management of laboratories, laboratory construction and setup, data validation, data management, sampling, laboratory audits and litigation support. Dr. Doss received his Juris Doctorate from Southern University Law Center and was a Law Review Editor. He is licensed to practice law in Louisiana. He earned his Ph.D., Engineering (Environmental Science) from the University of Oklahoma, his M.S., Chemistry from Wichita State University and his B.S., Chemistry from Loyola College, University of Madras.

Speaker Name	**Alexander Balsley, P.E.** (co-presenting with Benedette Adewale)
Presentation Title	**USCG Research and Development Center Oil Spill Response Research Update**
Abstract	The United States Coast Guard (USCG) Research and Development Center (RDC) is currently working on five oil spill response projects in FY23. They are: Behavior of Diluted Bitumen (Dilbit) in Fresh Water, Nearshore and Inland Evaluation of the Estimated Recovery System Potential (ERSP) Calculator, Emerging Pollution Response Technology Evaluation, Hazardous Substance Pollution Response Technology Analysis, and Marine Environmental Response Common Operating Picture.
Speaker Contact Information	Organization: United States Coast Guard Research and Development Center Mailing Address: 1 Chelsea Street; New London, CT 06320 Email Address: Alexander.Balsley@uscg.mil Website Address: https://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Research-Development-Test-and-Evaluation/Research-and-Development-Center/ Office Phone: 860-865-0474 Cell Phone: 413-358-0122 (text only)
Speaker Biography	Mr. Balsley has been a Project Manager at the U.S. Coast Guard Research and Development Center since 2010 and is primarily involved with oil spill response research. He has a B.S. degree in Civil and Environmental Engineering from Northeastern University and a M.S. degree from Worcester Polytechnic Institute. He is also a registered Professional Engineer with the state of Massachusetts.

2023 OSPR-Chevron Oil Spill Response Technology Workshop – Speaker Abstracts

Speaker Name	**Nita Barve/Zachary Floerke**
Presentation Title	**Dashboards**
Abstract	This is an example of how we would produce a dashboard when a spill happens. The dashboard we are showcasing for this workshop shows the Huntington Beach spill data, which is comprised of the Shoreline Cleanup and Assessment Technique (SCAT) and the Wildlife recovery data. This is just a sample to show what can we achieved using an ESRI application which is the dashboard.
Speaker Contact Information	Organization: California Department of Fish & Wildlife, Office of Spill Prevention and Response Mailing Address: Email Address: OSPRGIS@wildlife.ca.gov Website Address: https://wildlife.ca.gov/OSPR Office Phone: Cell Phone: 916-704-4761
Speaker Biography	Nita Barve is the GIS Supervisor for OSPR with the CDFW. She has a Bachelor's degree in Applied Mathematics and Master's degree in Environmental Studies. She enjoys working in the realm of Natural Resource Management, and likes to find out ways for better mapping techniques for the field staff. Outside work, she enjoys spending time with her 2 kids and husband, travelling, reading, hiking, and watching sports. Zachary Floerke is an RDA II at OSPR in West Sacramento with a Bachelor's degree in Geographic Information Systems and Analysis from California State University – Sacramento. In his free time he enjoys travelling and hopes to go to Antarctica someday.

Speaker Name	Dr. James Behrens
Presentation Title	**CDIP: Monitoring and Modeling Waves on the California Coast**
Abstract	The Coastal Data Information Program (CDIP), based at Scripps Institution of Oceanography, University of California, San Diego, provides wave data free to the public in near real-time, maintains an operational wave model for the California coast, and is engaged in ocean wave research on a global scale. With primary funding from the U.S. Army Corps of Engineers, and sponsorship from CA State Parks, the U.S. Navy, and other partners private and public, the CDIP wave monitoring array has grown to include 85+ stations instrumented with Datawell Waverider directional wave buoys, in U.S. and territorial waters worldwide, with 25+ stations in CA. Established in 1975, CDIP generates and curates a vast database of publicly-accessible environmental data for use by coastal engineers and planners, scientists, mariners, and marine enthusiasts. Working in collaboration with coastal processes researchers, CDIP continues a legacy of developing numerous innovations in instrumentation, system control and management, computer hardware and software, field equipment, and installation techniques. CDIP buoy data, and CDIP's operational California coastal wave model, reliably provide precise, quality-controlled information on nearshore conditions to mariners and port operators. Benefits include increased situational awareness and risk reduction. Under Keel Clearance (UKC) protocols for supertankers transiting the Port of Long Beach rely on real-time CDIP data and model output.. In another collaboration, CDIP maintains a buoy station for Chevron near El Segundo, and provides wave condition alerts related to their lightering and offloading operations. CDIP data reduce the risk of oil-related incidents on the west coast, by reducing the number of required ship-to-ship transfers, ensuring these transfers occur in known safe offshore conditions, and by increasing the amount of oil that can be brought safely ashore per vessel movement. CDIP Website: http://cdip.ucsd.edu/ CDIP California Wave Model: http://cdip.ucsd.edu/m/nowcast/?wave_model=ca&layer=waveHs Port of Long Beach Dashboard: http://cdip.ucsd.edu/custom_pages/marine_exchange/ Under Keel Clearance Project: https://www.slc.ca.gov/wp-content/uploads/2018/10/Emerging-Dynamic.pdf
Speaker Contact Information	Organization: Coastal Data Information Program (CDIP) Mailing Address: 9500 Gilman Drive, La Jolla, CA 92093-0214 Email Address: jbehrens@ucsd.edu Website Address: http://cdip.ucsd.edu/ Office Phone: (858) 534-3034 Cell Phone: (858) 972-1923
Speaker Biography	James Behrens joined CDIP in 2016 and serves as principal engineer and program manager. A specialist in oceanographic and geophysical instrumentation and field operations, he has logged over 1,000 days of sea time on research and exploration projects spanning the globe, plus two years of Antarctic deep field expeditions. He studied physics at Purdue University, and completed his Ph.D. in marine geophysics at the Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, UC San Diego. Prior to joining CDIP, he worked as an independent offshore client representative in the oil and gas exploration industry, and as field operations manager for a geophysical prospecting company.

2023 OSPR-Chevron Oil Spill Response Technology Workshop – Speaker Abstracts

Speaker Name	**Sandy Borthwick**
Presentation Title	**The Use of Multibeam Water Column Data for NFO Detection and Quantification**
Abstract	This presentation will discuss the technological advancements in processing the water column data from multibeam echosounders for use in the detection and quantification of Oil or Gas leaks and seeps, including data and analysis from a recent Oil leak investigation project in Summerland CA.
Speaker Contact Information	Organization: T&T Survey LLC Mailing Address: 4020 Flowserve Way, Pasadena, Texas 77503 Email Address: sborthwick@ttgroup-survey.com Website Address: www.teichmangroup.com Office Phone: 409-356-9672 Ext 212 Cell Phone: 832-876-8034
Speaker Biography	Sandy Borthwick, General Manager, T&T Survey, LLC Sandy Borthwick serves as Vice President and Lead Hydrographic Surveyor for T&T Survey Sandy developed an innovative non-floating oil (NFO) detection system recognized for U.S. Coast Guard NFO OSRO classification and served as lead hydrographic surveyor on the M/V GOLDEN RAY wreck removal project, recognized by the Coast Guard as the largest wreck removal project in US history. With over 30-years in the hydrographic survey industry, he is routinely sought out by governments and the oil and gas industry to conduct subsea investigations and assessments for subsea oil. Sandy earned a BEng Electrical and Electronic Engineering, HND and HNC Electrical and Electronic Engineering, and completed thousands of hours of technical training on hydrographic survey systems.

Speaker Name	**John Brinkman**
Presentation Title	**Benefits of Use for Oil-Sensitive Super-Absorbent Polymers**
Abstract	Confusion is quite prevalent within the Hazardous Materials response industry concerning the use of absorbents, adsorbents, solidifiers and various treating agents. The presentation will provide a quick history and overview of what can be expected in the way of performance with various sorbent materials through ASTM Performance Standard definitions. Accordingly, Imbiber Beads® ranks as the only absorbent currently available in the world for dealing with oil, fuels and solvent releases. They bring to the environmental services industry a unique set of Features & Benefits within spill response, pollution prevention and water filtration applications that cannot be attained via traditional sorbent products, which will be presented.
Speaker Contact Information	Organization: Imbibitive Technologies Corporation Mailing Address: 1131 Niagara Street N – Suite #2, Welland, Ontario, Canada, L3C 5N5 Email Address: jsb@imbiberbeads.com Website Address: www.imbiberbeads.com Office Phone: 905-735-2323 or 888-843-2323. Cell Phone: 905-328-6627
Speaker Biography	Mr. Brinkman is the President/CEO of Imbibitive Technologies Corporation (IMBTEC), a State of Delaware, USA Corporation, since 1994. IMBTEC operates a purpose-built manufacturing facility, Imbibitive Manufacturing, Inc, located in Maumelle, Arkansas, and produces oil-sensitive, absorbent polymers under the US Registered Trade Imbiber Beads®. Mr. Brinkman has successfully filed, and been awarded several US and International Patents for innovations brought to market, featuring Imbiber Beads®. Mr. Brinkman played an active role as a delegate on the IMO (London, UK) Hazardous & Noxious Substance Protocol Technical Committee, and has been invited as a guest speaker at international oil and chemical conferences due to his expertise within the absorbent polymer industry.

Speaker Name	**Chris R Chase**
Presentation Title	**Slick Sleuth Update: Is it Really an Accident if Event Could've, Should've Been Prevented?**
Abstract	"Accidents do happen" and "an ounce of prevention is worth a pound of cure". These are not age-old clichés, they're absolute truths. Oil spills and accidental releases of crude oil and refined-products happen every day, around the globe. Even in an era of rapidly-evolving technology, increased environmental awareness, and zero-tolerance, oil spills remain a major issue and mother nature suffers the results. Rather than perpetuating the current mindset of accepting spill risks as a given, or continuing to focus industry resources on response and environmental cleanup/mitigation, our collective mindset should be much more prevention-focused. Practical, proven, affordable early-warning spill sensor technology is now readily available. Used in conjunction with best practices, these detection systems can be installed to significantly reduce risk and prevent a high percentage of accidental leaks and spills from otherwise reaching the environment. This presentation highlights how real-time monitoring and automated containment are accomplished using strategically placed early-warning detection sensors at industrial plants (point sources), inland waterways, municipalities, terminal piers, offshore rigs, etc. Lessons learned from two decades of successful Slick Sleuth installations makes for a convincing argument that spill sensors are a highly-effective method of oil spill prevention and control (SPCC), for facilities/locations where petroleum products are produced, refined, blended, transported, transferred, stored, and consumed.
Speaker Contact Information	Organization: InterOcean Systems, LLC Mailing Address: 9201 Isaac St, Santee, CA 92071 Email Address: chrisc@interoceansystems.com Website Address: www.InterOceanSystems.com Office Phone: +1 (858) 565-8400 Cell Phone: +1 (619) 847 7858
Speaker Biography	Chris Chase is General Manager of InterOcean Systems, located in San Diego CA. A graduate of San Diego State University with International Business and MBA degrees, Mr. Chase has worked for InterOcean since1999, and has been closely involved with development of InterOcean's "Slick Sleuth" line of oil spill detection sensors and systems. Over the past decade-plus, Slick Sleuth evolved into the world's most widely used product technology for remote real-time oil spill monitoring, with over 1,500 systems installed worldwide. A lifelong Californian and outdoors enthusiast, Chris supports numerous environmental causes aimed at keeping our waterways and oceans pristine.

Speaker Name	**David Chenault, David Yoel (Co-author)**
Presentation Title	**Update on Pyxis Polarized IR Camera**
Abstract	Timely response to an oil spill benefits from wide area surveillance around a known spill and from continuous monitoring of the water surface around processing facilities or near sensitive sites. Infrared Polarimetric imaging leverages the different polarization signatures that result from material differences, surface roughness quality, and geometry and provides more robust detection day and night. The Pyxis system has now been deployed as an autonomous monitoring system on a Floating Production Storage and Offloading (FPSO) and at a land-based processing site. Further, the IR polarimetric camera has been integrated into a gimbalized payload. Previous flights have demonstrated detection of oil on a beach resulting in significant reductions in response time. In this presentation, we briefly describe the technology and give details about the FPSO deployment and the integration onto an SUAS including results showing detection of tar balls on a beach.
Speaker Contact Information	Organization: David Chenault Mailing Address: 200 Westside Square, Suite 320, Huntsville, AL 35801 Email Address: david.chenault@polarissensor.com Website Address: www.PolarisSensor.com Office Phone: (256) 562-0087 ext. 2436 Cell Phone: (256) 603-7904
Speaker Biography	David Chenault is president of Polaris Sensor Technologies, Inc. where he is leading a team of engineers and scientists developing next generation sensors including a suite of one-of-a-kind polarization imaging systems. Dr. Chenault and his team support federal government programs and commercial customers for defense, intelligence, safety, and environmental applications. He received his BS in Physics from Vanderbilt University and MS and PhD in Physics from the University of Alabama in Huntsville. He pursued research and development in a variety of optical systems with several defense contractors before founding Polaris. He has directly developed a variety of optical system in the visible and the infrared along with the data reduction and calibration routines to support them and has overseen development of many others. Dr. Chenault was co-editor for 1995, 2002, and 2019 Special Sections on Polarization in optical peer-reviewed journals. He is an SPIE Fellow.

Speaker Name	**Tom Coolbaugh**
Presentation Title	**Ohmsett Overview, Recent Activities, and Future Plans**
Abstract	This presentation will provide an update on recent oil spill response-related activities at the Ohmsett wave tank facility. This will include an overview of recently acquired laboratory testing equipment, evaluation of standard spill response equipment testing protocols, spill response training, and enhanced capabilities such as a water spray-based oil slick corralling system and an updated data acquisition system. Recent work at the Ohmsett facility has included the use of a high-speed oil containment and recovery system, dispersant use and evaluation of effectiveness, comparison of vessel-based skimming systems, laser light scattering analysis of oil droplet size distributions, etc. A brief highlight of the work that was undertaken in 2021-2022 as part of a major tank refurbishment will be provided.
Speaker Contact Information	Organization: Applied Research Associates Mailing Address: PO Box 150, Leonardo, NJ 07737 Email Address: tcoolbaugh@ara.com Website Address: https://ohmsett.bsee.gov/facility.html Office Phone: 215-518-4417 Cell Phone: 215-518-4417
Speaker Biography	Thomas S. Coolbaugh, Ph.D. Program / Facility Manager | Ohmsett Applied Research Associates Dr. Thomas Coolbaugh works for Applied Research Associates as the Program/Facility Manager of BSEE's Ohmsett wave tank. He retired from ExxonMobil after more than 32 years where he was the Technology and Advocacy Advisor for the Emergency Preparedness and Response organization. At Ohmsett he continues to focus on the science of oil spill response. He was a member of National Academies of Science, Engineering and Medicine committees for Responding to Oil Spills in the U.S. Arctic Marine Environment, and The Evaluation of the Use of Chemical Dispersants in Oil Spill Response. Tom received his B.A. in chemistry from Amherst College, a Ph.D. in chemistry from Caltech, and an M.S. in the Management of Technology from NYU.

Speaker Name	**Samantha Cope**
Presentation Title	**Marine Monitor (M2): Ocean Conservation Technology**
Abstract	The ProtectedSeas Marine Monitor (M2) is a shore-based monitoring platform that uses commercial off-the-shelf marine radar to continuously and autonomously track vessels of all types. M2 can be useful for monitoring coastal areas 24 hours a day, 7 days a week during and following an oil spill event. Radar provides a series of advantages for independent observation, specifically the ability to monitor vessels in real-time, day and night, and in most weather conditions. M2 systems integrate additional sensors, such as pan-tilt-zoom cameras that follow vessel pathways and capture still photographs. The M2 hardware can be integrated into existing infrastructure, such as an office or field station, or installed in a mobile off-grid trailer system, the Mobile Marine Monitor (M3). Weather stations, high frequency (HF) radar antennas, and other cameras, such as infrared (IR), have been integrated with M3 trailers depending on monitoring needs. Both real-time and historical data have been used to support monitoring of maritime events and response efforts, such as a container ship adrift near oil platforms off the coast of southern California and a diesel spill following a fishing vessel sinking in Washington state. M2 is ideal for monitoring nearshore events, and the utility of the mobile trailer is useful for rapidly relocating the system as response efforts evolve over time or other events arise. M2 is an efficient and effective shore-based asset for monitoring marine areas. Since 2015, over thirty M2 systems have been deployed to twelve countries, including more than ten systems in California.
Speaker Contact Information	Organization: ProtectedSeas Mailing Address: 2475 Hanover St STE 100, Palo Alto, CA, 94304 Email Address: samantha@anthinst.org brendan@anthinst.org Website Address: M2marinemonitor.com Office Phone: 937-367-6791 Cell Phone: 937-367-6791
Speaker Biography	Sam manages Data and Applications for the Marine Monitor (M2). Beyond supporting day-to-day operations of M2 sites around the world, she conducts research using data collected by M2 and helps support external projects. Collaborating with site partners, Sam has presented at numerous international conferences and authored peer-reviewed publications using M2 to address research questions related to human activity on the water, previously unanswerable by traditional data streams. Sam holds a Master of Marine Science degree from San Francisco State University. The M2 Team is a dynamic group with over twenty years of combined experience working in marine conservation, science, and technology with expertise in project management, community outreach, full stack software development, environmental management, geographic information systems, business, and data analysis. By deploying systems around the world, M2 is now used by over seventy different state and federal agencies, NGOs, research institutions, and other groups.

Speaker Name	**James Elliott and Sandy Borthwick**
Presentation Title	**Advancements in Non-Floating Oil (NFO) Detection and Recovery Operations**
Abstract	This presentation will provide an overview of the non-floating oil (NFO) regulatory framework, basics of underwater oil spill response operations, case studies in NFO detection and recovery, and an analysis of recent technological advances available to detect and recover oil at depth. A State of California subsea oil investigation that led to the discovery of leaking abandoned offshore pipelines historically characterized as natural seeps will be presented, including a demonstration of the NFO detection system and associated hydrographic imagery.
Speaker Contact Information	Organization: Teichman Group of Companies (Jim), T&T Braveheart (Sandy) Mailing Address: 4020 Flowserve Way Email Address: jim.elliott@teichmangroup.com, sborthwick@ttbraveheart.com Website Address: www.teichmangroup.com Office Phone: 409-744-1222 (Jim), 832-876-8034 (Sandy) Cell Phone: 409-692-4611
Speaker Biography	Jim Elliott, Chief Operating Officer, Teichman Group LLC Jim Elliott is Chief Operating Officer of the Teichman Group of Companies, including T&T Salvage, T&T Subsea and T&T Survey. He is responsible for managing worldwide marine salvage, heavy lift, commercial diving and emergency response operations. With three decades of leadership experience in maritime operations, he has served as a senior Coast Guard Officer, Incident Commander, Salvage Master, Commercial Diver and Project Manager on salvage and oil spill operations from the Equator to the Arctic. He holds a Bachelor of Science in Environment Management with distinction, a Master of Environmental Policy with honors, Master of Arts in National Security and Strategic Studies with highest distinction from the U.S. Naval War College and an MBA with merit from the University of London. A Past-President of the American Salvage Association, Mr. Elliott also served as an author of the American Petroleum Institute (API) Report and Operations Guide on Submerged Oil Detection and Recovery that serves as the foundational document for the U.S. Coast Guard's non-floating oil detection and recovery policies. Additionally, he has served in senior leadership roles on multiple non-floating oil response operations, including the ARGO, ATHOS I, DBL-152, BOW MARINER, and DEEPWATER HORIZON, among others. Sandy Borthwick, General Manager, T&T Survey, LLC Sandy Borthwick serves as Vice President and Lead Hydrographic Surveyor for T&T Survey Sandy developed an innovative non-floating oil (NFO) detection system recognized for U.S. Coast Guard NFO OSRO classification and served as lead hydrographic surveyor on the M/V GOLDEN RAY wreck removal project, recognized by the Coast Guard as the largest wreck removal project in US history. With over 30-years in the hydrographic survey industry, he is routinely sought out by governments and the oil and gas industry to conduct subsea investigations and assessments for subsea oil. Sandy earned a BEng Electrical and Electronic Engineering, HND and HNC Electrical and Electronic Engineering, and completed thousands of hours of technical training on hydrographic survey systems.

Speaker Name	**David Fraser**
Presentation Title	**Micro ROVs, a Low Logistics Tool used for First Touch Information Gathering, for Emergency Response & Visual Inspection**
Abstract	The last 5 years have seen a dramatic shift in how in water robotics have increased in capability and reduced in cost. This has enabled inspection at will capabilities and first eyes on an issue to quickly and accurately determine if escalation is required. In the marine environment, an initial damage assessment used to require long lead times and may put human divers at risk. Time is an expensive commodity that is always lacking in emergency events/incidents and most costly in the first 24 hours.
Speaker Contact Information	Organization: Chevron Mailing Address: 1400 Smith Street, Houston Texas, 77002 Email Address: dfraser@chevron.com Website Address: Office Phone: Cell Phone: 832-341-9476
Speaker Biography	As part of Chevron Technology Center's Subsea, Civil and Marine Engineering Unit, David Fraser has been Chevron's Subject Matter Expert on Remotely Operated Vehicles (ROV) for the past 12 years. In addition to supporting daily deepwater ROV operations, he has a proven record of progressing new technologies and processes from conceptual models to field proven state in support of both offshore and onshore robotics operations. David's prior experience includes over 15 years in the offshore construction and survey industries.

Speaker Name	**Oscar Garcia**
Presentation Title	**Operationalization of UAS System for Oil Spill Response Operations in Arctic Environment**
Abstract	With the objective of testing multiple UAS platforms and sensors for the operationalization of UAS in the arctic environment, NOAA, USCG, Alaska Clean Seas, Canadian Coast Guard, University of New Hampshire, and Water Mapping LLC participated on a series of experiments on shore and off shore Alaska during the summer of 2022 in which we tested detection, mapping, and reporting protocols and Standard Operating Procedures (SOP) that would be utilized in the case of an emergency event. In this presentation we show the experiment design and the results obtained by the multiple UAS systems.
Speaker Contact Information	Organization: Water Mapping LLC Mailing Address: 479 Deer Point Dr. Gulf Breeze, FL Email Address: Oscar.garcia@watermapping.com Website Address: www.watermapping.com Office Phone: 361-244-6575 Cell Phone:
Speaker Biography	Dr. Oscar Garcia is a geoscientist and founder of Water Mapping LLC. His work has been focused on advancing remote sensing science of oil spills using in-situ, aerial, and satellite platforms with all kind of active and passive sensing technology.

Speaker Name	**Dr. Jessica Garron,** CDR Jereme Altendorf, LCDR Matt Richards
Presentation Title	**Coproducing Operational Drone Solutions for USCG Planning and Response in Alaska**
Abstract	The University of Alaska Fairbanks (UAF) and USCG Sector Anchorage have been partnered since 2017 to improve maritime domain awareness by integrating drones into oil spill planning and response operations in Alaska. This work interleaves drone-based 2D and 3D maps and models into infrastructure inspections, planning activities, and Geographic Response Strategies (GRSs), the pre-approved response equipment deployment strategies tailored to specific locations that first responders use to immediately prevent and/or mitigate environmental damage following an oil spill. Critical to the success of this effort is building the human capacity needed to sustain these modernization efforts. To meet this need, a program was designed between UAF, Sector Anchorage, and the Native Village of Unalakleet to train a set of drone pilots in this remote, coastal, hub community to fly small UAS in support of local decision-making and USCG mission support. In late August of 2022, this multi-agency team conducted a proof-of-concept deployment which validated the efficacy of GRSs created over a decade ago while simultaneously creating a high resolution, publicly available, orthomosaic data layer of critical portions of the Seward Peninsula coast. On the 17th of September 2022, the first documented typhoon to hit Western Alaska made landfall, impacting over more than 900 miles of Alaskan coastline and 35 communities accessible only by airplane or boat. The NVU was the only typhoon impacted community of Western Alaska with UAS pilots trained on the scientific-grade UAS hardware and software that was also staged within the community for planning and emergency response scenarios. At the conclusion of the storm, the NVU UAS team deployed immediately to collect post-storm assessments of critical infrastructure in the community which were then processed as orthomosaics for delivery to the state emergency operations center within 24-hours of collection and provided to local leaders for immediate decision-making for the community's storm response. This process was carried out by the trained pilots from UAF and NVU across the entire storm-impacted region in partnership with USCG Sector Anchorage and FEMA and provided the emergency operations center with the only UAS data for Typhon Merbok response assessments. This preliminary dataset tested and solidified UAS protocols developed specifically for emergency response planning and assessment scenarios, while simultaneously increasing the capacity for self-governance through greater information access across Western Alaska. This model is an example of successful collaboration among academics, communities and agencies, and a roadmap for successful integration of UAS technology at the local, regional, and statewide level, worldwide.
Speaker Contact Information	Organization: International Arctic Research Center, University of Alaska Fairbanks Mailing Address: 2160 Koyukuk Dr Fairbanks, Alaska 99775-7340 Email Address: jigarron@alaska.edu Website Address: https://uaf-iarc.org/ Office Phone: 907-474-6410 Cell Phone:
Speaker Biography	Dr. Jessica Garron is the Deputy Director of the Alaska Climate Adaptation Science Center and a member of the Research Faculty at the University of Alaska Fairbanks International Arctic Research Center. She works with a broad spectrum of scientists, community members, and agency partners to integrate actionable, geospatial, and model-based science information into climate adaptation decision-making in Arctic and sub-Arctic communities.

Speaker Name	**LCDR Cliff Graham**
Presentation Title	**U.S. Coast Guard, Office of Marine Environmental Response Policy Update**
Abstract	This presentation will feature updates from Coast Guard's Office of Marine Environmental Response Policy (CG-MER) to include a brief on the establishment of the new Coast Guard Great Lakes Oil Spill Center of Expertise (GLCOE), and their role as Chair of the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR). The brief will cover background and purpose of ICCOPR, and updates to the recently published 2022-2027 Research and Technology Plan (R&T Plan).
Speaker Contact Information	Organization: U.S coast Guard, Headquarters Mailing Address: 2703 Martin Luther King, Jr. Ave SE, Washington, DC 20593 Email Address: clifton.j.graham@uscg.mil Website Address: Office Phone: 202-372-2247 Cell Phone: 413-454-5737
Speaker Biography	Lieutenant Commander (LCDR) Clifton Graham, United States Coast Guard, Office of Marine Environmental Response Policy LCDR Graham currently serves as the Interagency Coordination Division Officer at U.S. Coast Guard Headquarters, Office of Marine Environmental Response Policy (CG-MER). He is the acting Executive Director of Interagency Coordinating Committee of Oil Pollution Research (ICCOPR), and provides oversight of the Spills of National Significance (SONS) Program. Additionally, he serves as Preparedness Chair, for the Preparedness Committee on the National Response Team, coordinates the Research and Development Program for CG-MER, and provides support to interagency programs, and advises on CG-MER policy. In his career in the Coast Guard, LCDR Graham served in various capacities within the Response Ashore mission to include Command Center Chief, of Coast Guard Rescue Sub-Center Guam, District Seventeen Response Advisory Team member in Juneau, AK, and as Contingency Planning and Force Readiness Assistant Chief, and then Chief of the Incident Management Division at Sector Mobile, AL. LCDR Graham earned a Master's Degree in Environmental Science and Management, at the University of Rhode Island, and Bachelors in Science from Massachusetts Maritime Academy in Marine Safety and Environmental Protection. LCDR Graham currently lives with his wife Sarah and dogs, Mango and Waylon, in Annapolis, MD.

Speaker Name	**H. Gary Greene**
Presentation Title	**Oil Spill Assessment Maps of the Central Salish Sea - Marine and Coastal Habitats of Concern - A Tool for Oil Spill Mitigation Applicable to California**
Abstract	The potential for oil spills within the San Juan Archipelago of the central Salish Sea of Washington State, as well as elsewhere including San Francisco Bay, LA-Long Beach, and San Diego urban areas of California, has been an increasing concern for some time. Within these regions, shipping, including tanker traffic to and from refineries and bunkering facilities, is expanding due to global changes in the demand for energy. Many of these port areas harbor diverse biological resources that provide sustenance for many, supports valuable tourist industries, and are transshipment hubs that underpins regional economies – all of which can be adversely impacted by an oil spill. The present plans to ship more hydrocarbon products, including diluted bitumen (dilbit), from transfer sites located along the coastline of mainland British Columbia, Canada, has the potential to increase tanker vessel traffic seven-fold through the San Juan Archipelago (Seattle Times, June 22, 2019). This, along with other types of marine traffic such as cruise ships, tug-and-tow barges, articulated tank barges, bulk carriers, freighters, and general cargo shipping will increase the risk of a collision, grounding, or other events that may lead to a significant oil spill. Thus, a need exists to stage equipment for the mitigation of an oil spill event if critical marine habitats are to be protected. To strategically locate or assemble any mitigation apparatus for a rapid response to an oil spill, maps showing critical marine habitats in the sub-tidal environment is a necessity if proper mitigation of a sinkable, heavy persistent oil spill is to be efficiently mitigated. Such maps have been constructed for the most critical habitats along the marine transportation corridors within the central Salish Sea, as well as the relatively isolated sounds that could act as depocenters for oil accumulation. This presentation illustrates the usefulness for such maps, as no longer can it be said that what lies beneath the sea's surface is "out-of-sight", and thus "out-of-mind". For Washington State, these maps are critical to the development of realistic Natural Resources Damage Assessment (NRDA) settlements and can be used to inform developments of future Geographic Response Plans (GRPs). The process described here is not unique to the central Salish Sea and can be used as a template in California and elsewhere for NRDA's and other protective measures after being modified to account for specific habitats deemed critical to those areas.
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Speaker Biography	H. Gary Greene is a marine geologist/geophysicist specializing in seafloor mapping, geohazards assessment, and marine benthic habitat characterization with over 65 years of professional experience. After serving in the US Coast Guard, Gary obtained his undergraduate degree in paleontology at Long Beach State University, a Master of Science degree in geophysics at San Jose State University (Moss Landing Marine Labs), and a PhD in marine geology at Stanford University. He was a research geologist at the U.S. Geological Survey in Menlo Park, California for 28 years after which he retired to become the Director of Moss Landing Marine Labs (MLML), San Jose State University where he established the Center for Habitat Studies and taught geological oceanography and marine benthic habitat mapping techniques for over 12 years. While at the USGS, Gary prospected for gold in the arctic, undertook investigations associated with a major oil spill in Santa Barbara, California, and investigated the marine deformation associated with the 1964 Anchorage, Alaska earthquake. He conceived, organized, and managed a major marine program by the USGS in the South Pacific and the Pacific Pole-to-Pole cruise of the S.P. Lee that spanned a decade of research. In collaboration with US NOAA's National Marine Fisheries Service (NMFS) and the Alaska Dept. of Fish & Game, Gary pioneered the classification of benthic habitat types and mapping techniques. In addition, he participated in two major ocean drilling legs of the Ocean Drilling Program (ODP) as onboard geophysicist for Leg 55 to validate the Hawaiian Hot Spot theory of seafloor spreading, and Co-Chief Scientist for Leg 134 of the Deep-Sea Drilling Program (DSDP) for Leg 134 to investigate the collisional tectonics and off-scrapping at the New Hebrides subduction zone. Gary is Emeritus Professor at MLML and Director of its Center for Habitat Studies and a small research institute on Orcas Island called Tombolo Mapping Lab, and a Research Faculty Member at Friday Harbor Labs of the University of Washington. For the past 40 years Gary has been mapping the seafloor of Alaska, California and the Salish Sea including British Columbia, Canada for the purpose of characterizing benthic habitats, extending land and island geology to the offshore, and assessing marine geohazards such as submarine landslides, tsunami generation sites, and active faults. These investigations entailed the high-resolution geophysical mapping of the Queen Charlotte transform fault zone that bounds the Pacific and North American plates as well as investigating the upper plate in the forearc region of the Cascadia Subduction Zone that forms the Salish Sea physiological and ecological system. Recently, Gary has been focusing characterizing the Salish and other marginal seas as Urban Seas in addressing the UN Decade of Ocean Science for Sustainable Development, 2021-2030. This focus has led to the analyses of all influences that contribute to the alteration of urban sea regions. Gary is also President of the Circum-Pacific Council for Energy and Mineral Resources and a Founding Member/Executive Director of GeoHab.

Speaker Name	**Benjamin Hart**
Presentation Title	**sUAS-borne Oil Spill Detector Using Fluorescence**
Abstract	A small, light-weight fluorescence-based sensor has been developed to aid in the detection and tracking of oil spills. Based on a backside illuminated (BI) CMOS imaging sensor for increased low-light sensitivity, the device also has an embedded CPU for control and processing, SSD for data storage, GPS, an optical altimeter, UV LEDs to induce fluorescence, and a battery. Weighing under 2 kg, the package can be carried by a group-1 UAS, and operates at altitudes between 20m and 40m. The operator will fly the sensor over a region of interest and upon landing a map will be generated and displayed. The images are processed using custom Python code, and results are displayed using a Google Maps Javascript API.
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Speaker Biography	Mr. Hart is an Assistant Research Engineer at Michigan Tech Research Institute with 8 years of experience in sensor platform development for scientific and military remote sensing applications. Benjamin earned a BS (2008) in Electrical Engineering and an MBA (2014) from Michigan Technological University. Benjamin has developed custom sensor suites for scientific monitoring and UAV applications through integration of individual components such as cameras, spectrometers, sensors, SDR (software defined radio), etc. using a variety of embedded controller platforms, both commercial and custom. Sensor packages built by Mr. Hart have been deployed on Arctic sea ice, glaciers, and on lighthouses in the Great Lakes. He assisted in the design, development. integration, and deployment of sensors on autonomous underwater vehicles (AUVs) for use by the USGS in investigating invasive benthic species in the Great Lakes.

Speaker Name	**William Hazel**
Presentation Title	**SeaCOP: Enhanced Situational Awareness Capacity for Environmental Monitoring, Maritime Security and Navigation Safety**
Abstract	The SeaCOP system is a modern and feature rich situational awareness system, operating in both 2D and 3D, is flexible and scalable to suit application needs, and allows for sensor fusion and data sharing across a wide range of telemetry sources. From a console/control station mounted on a vessel bridge, installed on a platform control room, or in a land-based facility, system technicians can review, interpret and control a diverse array of information (high-definition daylight and I/R visual, radar (including oil detecting radar), sonar, GIS mapping layers, AIS sources, air-monitoring equipment, etc.) delivered from various platforms including manned aircraft, satellites, UAS, AUVs, ROVs, and fixed installations. The developers have outfitted SeaCOP with Workflow, an AI-informed and integrated process flow and event management module. This decision support system that further enhances the technician's ability to monitor, act upon, and document events and conditions in an intuitive and meaningful manner. In this presentation we will learn about the features and equipment that SeaCOP works with, review case studies and installations to understand its intrinsic value for enhanced situational awareness, and communicate live with a SeaCOP control room.
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Speaker Biography	Bill Hazel is Vice President of Marine Services at Detroit-based Marine Pollution Control, founded in 1968 by David Usher. Mr. Hazel has been in the oil and hazardous materials response industry for 32 years, and has participated in a number of incidents of national significance and during response operations overseas. He has served as the Principal Investigator during several U.S. Coast Guard Research and Development projects (submerged oil recovery, oil in ice response), and serves as a trainer to the U.S. Coast Guard National Strike Force on behalf of the American Salvage Association. Recently, he has served as the Program Administrator for a SeaCOP installation in the United States. In that role he participated in the design, installation and operation of aseven-camera array integrating radar systems and providing maritime domain safety protecting critical infrastructure.

Speaker Name	**Nancy Kinner**
Presentation Title	**Comparing Recent Advance in Estimating and Measuring Oil Slick Thickness**
Abstract	Understanding floating oil thickness can guide response efforts and natural resource damage assessments. The major goal of this Canadian Multi Partner Research Initiative-funded project was to obtain information on existing oil sensors and their capabilities. Testing protocols were developed that are reproducible and can be used for future testing and sensor/sampler validation, to evaluate different oils or other products, and to help train other operators with sensor packages to characterize oil. Sensors were evaluated based on the relationship between the estimated slick thickness created and the sensor-reported thickness (i.e., the factor difference (FD)). Of the sensors evaluated under controlled conditions in a highbay, the acoustic and multispectral sensors, photometer, tube sampler, and sorbent pads all gave results with an FD of <|2 | over their operating range and the test conditions (10 – 1,000 µm; except 200 – 1,500 µm for the acoustic sensor). Of the sensors evaluated at Ohmsett, the multispectral sensor, tube sampler and sorbent pads all yielded results within an FD = |2| for the slicks applied for 200, 500 and 1,000 µm. This is remarkable considering that the oil was often patchy due to the winds. The results for the 50 µm slicks were higher FD<|3-5|. These results can help decision makers understand the potential reliability of sensor data received during a response.
Speaker Contact Information	Organization: Coastal Response Research Center Mailing Address: 216 Gregg Hall ; University of New Hampshire; Durham, NH 03824 Email Address: Nancy.kinner@unh.edu Website Address: https://crrc.unh.edu/ Office Phone: 603-862-1545 Cell Phone: 603-479-3777
Speaker Biography	Nancy Kinner is the UNH Co-Director of the Coastal Response Research Center (CRRC) at the University of New Hampshire (UNH). She is also a research faculty member in the Department of Civil and Environmental Engineering. CRRC is a partnership between UNH and NOAA's Office of Response and Restoration (ORR).

Speaker Name	**Joe Korpi**
Presentation Title	**Biodiesel and Renewable Diesel – What is it, Where Does it Come From, and How is it Transported?**
Abstract	Learn about biodiesel and renewable diesel fuels (along with some of the co-products that are created in the process). We will explain what biodiesel and renewable diesel are, some of the common feedstocks that are used to create them, the different processes that are followed to create them, and the common ways they are shipped around the country.
Speaker Contact Information	Organization: Chevron Renewable Energy Group Mailing Address: 416 S. Bell Ave, Ames, IA 50010 Email Address: joe.korpi@chevron.com Website Address: Office Phone: 515-239-8028 Cell Phone: 515-766-8411
Speaker Biography	Originally a professional radio broadcaster, Joe Korpi brings energy, humor and colorful storytelling to passionately make safety concepts real, pertinent, and impactful. His goal is to translate OSHA regulations and industry standards into the language workers understand. Joe completed a Bachelors Degree in Occupational Safety and Health from Columbia Southern University and attained the Certified Safety Professional designation from the BCSP. He has also completed OSHA train-the-trainer courses for General Industry, Construction, (along with the HazWoper 40 hour training), lead numerous OSHA 30 hour training sessions, is active on the board of the ASSP Hawkeye Chapter in Central Iowa (now serving as Past-President), serves on the ANSI Z490.1 committee, led numerous safety presentations for regional and national conferences, and currently is a Senior Manager of Safety and Health at Chevron Renewable Fuels (Renewable Energy Group, Inc.) in Ames, IA.

Speaker Name	**Sonja Larson**
Presentation Title	**Deep River Derelict Barge Sunken Oil Spill Response**
Abstract	Non-floating, submerged, and sunken oil continues to be an emerging oil spill response challenge. In addition to identifying effective methods for detection and delineation, developing cleanup guidelines and endpoints present a separate set of issues. Significant progress has been made in the development of Shoreline Cleanup Assessment Technique (SCAT) for shorelines with oil impacts above the intertidal zone. However, lessons learned and best practices are still being developed for submerged environments with sediments impacted by sunken oil. Using the Deep River Derelict Barge Spill Response in Wahkiakum County, Washington as a small-scale case study, we will present the process and procedures we implemented to: • Mitigate the continued release of a heavy oil product from the derelict barge • Detect and delineate the extent of sediments impacted by a release of highly weathered diesel and lube oil into a tidally influenced riverine environment • Recover the sunken oil contaminated sediments • Establish and validate cleanup end points Our case study will additionally discuss the importance of coordinated response efforts to establish agreed upon cleanup endpoints using a combination of qualitative, quantitative, and analytical criteria and our lessons learned. Co-contributors: Alison Meyers, Dept of Ecology and Matt Bissell, Dept of Ecology
Speaker Contact Information	Organization: Department of Ecology - Spill Prevention, Preparedness and Response Program Mailing Address: c/o Sonja Larson, P.O. Box 47600, Olympia, WA 98504-7600 Email Address: sonja.larson@ecy.wa.gov Website Address: https://ecology.wa.gov/Spills-Cleanup/Spills/Spill-preparedness-response Office Phone: 360-480-2263 Cell Phone: 360-480-2263
Speaker Biography	Sonja Larson is a Response Technology Specialist for the Washington State Department of Ecology Spills Prevention Preparedness and Response Program. The statewide position ensures that Washington achieves the highest standards of protection through requiring Best Achievable Protection (BAP) in oil spill preparedness for regulated entities. Her role includes reviewing Primary Response Contractor, Spill Management Team, and Wildlife Response Service Provider applications for approval to be cited in regulated entity oil spill contingency plans. Supporting responses as an Environmental Unit Leader and studying new response technologies, operational methods, and training procedures with the goal of updating the state planning regulations at five year intervals to ensure the maintenance of BAP in contingency plans.

Speaker Name	**Kenneth Lee**
Presentation Title	**The Multi-Partner Research Initiative: A Scientific Research Network under Canada's Oceans Protection Plan to Support Decision Making in Oil Spill Response**
Abstract	The Multi-Partner Research Initiative (MPRI) with a goal to establish an integrated, global research network to advance Canada's level of oil spill research, preparedness and response capability had its funding renewed ($30.3M over 5 years) in 2022. Phase II of this program under the management of Natural Resources Canada (NRCan) will have an expanded scope beyond its previous activities focused on ship-sourced spills that now include oil spills on onshore (e.g., releases from pipelines into freshwaters) and offshore (e.g., releases associated with offshore oil and gas exploration, production and transport). This presentation will provide an overview of research priorities funded under Phase II of the MPRI program that will advance scientific knowledge and technological advances for use in future oil spill response operations.
Speaker Contact Information	Organization: Fisheries and Oceans Canada / Natural Resources Canada Mailing Address: 1820 Armview Terrace, Halifax, Nova Scotia, Canada, B3H 4H4 Email Address: ken.lee@dfo-mpo.gc.ca Website Address: https://natural-resources.canada.ca/energy/energy-offices-and-labs/canmetenergy/canmetenergy-devon/multi-partner-research-initiative/multi-partner-research-initiative-call-for-proposal/24790 Office Phone: Cell Phone: 1-902-414-4546
Speaker Biography	Dr. Kenneth Lee is Research Scientist Emeritus and National Senior Science Advisor for Oil Spill Research, Preparedness and Response for Fisheries and Oceans Canada (DFO). Recognized as a world expert in the development, evaluation and application of oil spill countermeasure technologies, with a record of more than 550 academic and technical publications, Dr. Lee was appointed Chair of the Royal Society of Canada's Expert Panel on the Behaviour and Environmental Impacts of Crude Oil Released into Aqueous Environments. International recognition of his knowledge in the field of oil spill research include four appointments on US National Academies of Sciences, Engineering, and Medicine (the Academies) Committees on the effects of the Deepwater Horizon oil spill on ecosystem services; Arctic oil spill response; the use of chemical oil dispersants; and review of the 2022 – 2027 Research and Technology Plan of the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR).

Speaker Name	**Ira Leifer**
Presentation Title	**News Alert: Floating Oil Emits Toxic Gases: Can We Remote Sense It? Preliminary Studies at Coal Oil Point**
Abstract	Petroleum is one of the most complex chemical mixtures on earth, with many components that are volatile at typical ambient temperatures posing a serious health and safety hazard to oil spill responders and the local community. To understand these risks, SIS-OVER (Standard Instrumentation Suite - Offshore Vessel Enabled for Response), a boat/truck/trailer science package was fielded in the Coal Oil Point seep field to characterize the chemical composition of emissions and identify their health implications, atmospheric pollution implications, potential for a direct remote sensing approach, and the need for remote sensing-based maps of oil slick thickness to initialize numerical model calculations of a health hazard map.
Speaker Contact Information	Organization: Bubbleology Research International Mailing Address: 1642 Elm Ave, Solvang CA 93463 Email Address: Ira.Leifer@bubbleology.com Website Address: www.bubbleology.com Office Phone: 805-683-3333 Cell Phone: 805-252-3636
Speaker Biography	Dr. Leifer, CEO and chief scientist of Bubbleology Research International has worked for several decades on natural and unnatural hydrocarbon detection by in situ and remote sensing, is well published (131 peer-reviewed), is an editor for Remote Sensing, focused on oil remote sensing. Dr. Leifer has developed and validated field approaches for quantification of oil slick thickness from in situ and airborne platforms, SeaSpires™, and for satellite. Dr. Leifer has developed an in situ mobile truck-based system, SISTER™, for leak detection and quantification, satellite validation, and comprehensive air quality characterization, using real time trace gas, meteorology and aerosol measurements. BRI is developing trailer-able solutions to monitor environmental conditions for disaster response.

Speaker Name	**Greg McGowan**
Presentation Title	**Spill Response Considerations for Renewable Fuels**
Abstract	This presentation will provide an overview of key information for response to renewable fuel spills such as physical properties, persistence in the environment, ecotoxicity, similarities and differences from its petroleum counterpart, and other factors that guide response tactics.
Speaker Contact Information	Organization: CDFW Office of Spill Prevention & Response Mailing Address: 1010 Riverside Pkwy, W. Sacramento, CA, 95605 Email Address: greg.mcgowan@wildlife.ca.gov Website Address: https://wildlife.ca.gov/OSPR Office Phone: 916-508-2863 Cell Phone: 916-508-2863
Speaker Biography	Mr. McGowan is the Chief of the Spill Response Technology & Support Branch at the California Department of Fish and Wildlife, Office of Spill Prevention and Response (OSPR). His technical teams include: Oiled Wildlife, Safety, the Marine Wildlife Veterinary Care and Research Center, Best Achievable Technology, Applied Response Technology, Fisheries Closure, and Geographic Information Systems (GIS). He oversees a diverse group of technical experts including spill response professionals, industrial hygienists, spatial analysts and programmers, veterinarians, and wildlife care experts. He has responded to emergency incidents across the U.S. and abroad for more than 28 years, typically serving in the EU (RAR/wildlife planning. SCAT, ART), Operations (Wildlife Branch), and NRDA.

Speaker Name	**Rob Moniz**
Presentation Title	**The Emerging Environmental Co-Risk of Firefighting Foam Applications at Petroleum or Renewable Fuel Release Sites**
Abstract	There is a growing awareness of the risk that firefighting foam constituents, particularly Per- and Polyfluoroalkyl Substances (PFAS), pose to human health and the environment. These products continue to be the most effective method for dealing with petroleum and renewable fuel fires or to mitigate risk of fires through vapor suppression applications. These foams are often applied liberally, in the interest of safety, and can impact storm water features, natural drainage areas, or necessitate the active management of fire-fighting water to prevent additional pollution. These mixtures of fire-fighting foams and released petroleum or renewable fuels should be contained and managed appropriately to avoid potential PFAS-related contamination as a secondary result of emergency response efforts. This presentation is designed to share awareness with California's oil spill response community of the combined risk of managing petroleum or renewable fuel releases at which fire-fighting foam has been applied. The presentation will provide a brief overview of PFAS-related environmental concerns using case-studies from a railroad derailment, a warehouse fire, and a bulk petroleum terminal fire to highlight this emerging risk and to share best practices and lessons learned from actual incidents.
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Speaker Biography	Rob Moniz leads Arcadis' Incident Response and Recovery Program, West Coast Region. Rob has been providing technical consulting services for environmental emergency responses for over 13 years. H e has led or supported the response, recovery, and/or remediation of hundreds of crude oil, refined petroleum products, and renewable fuel releases and supports the forward-looking and closure-focused planning associated with the ever increasing list of "emerging contaminants" such as PFAS.

Speaker Name	**Tim Nedwed / Michel Boufadel**
Presentation Title	**Enhancing the Mechanical Recovery of Oil from Marine and Freshwater Environments**
Abstract	Removing oil from the environment by mechanical recovery is the most accepted response option for oil spilled to water. We are studying two concepts to improve the efficiency of mechanical recovery. First, we are developing a semi-permeable boom that allows faster towing speeds with less towing force. Second, we are developing a more efficient shear-thinning skimmer that makes oil flow faster with potentially less water content. To enhance the efficiency of booms, we are evaluating a semipermeable boom skirt that will significantly advance mechanical recovery collection rates. The maximum tow speed of standard curtain booms is limited to less than a knot (0.5 m/s) to avoid entrainment failure. Further, towing large ocean booms requires two large vessels because the potentially >1 m deep boom skirt faces major resistance from water as it moves. The semipermeable boom skirt consists of a mesh-like screen coated with a material that makes it highly permeable to water flow (hydrophilic) and essentially impermeable to oil flow (oleophobic). We've completed experiments that found that coated mesh screens allow water to pass through them with a pressure drop over 20 times lower than when we attempted to pass oil through the screen. In a 0.5 m long laboratory flume, the semipermeable boom was as effective in capturing oil as an impermeable boom while letting water pass through it easily. To increase the efficiency of skimmers, we are developing a skimmer that places oil slicks surrounding the skimmer under shear stress. Many oils, especially weathered and emulsified oils, have non-Newtonian behavior – they are thixotropic or shear thinning. Literature and our research indicate that the viscosity of oil emulsions can be reduced by over a factor of ten when they encounter shear stress. This reduction in viscosity has two benefits for skimmers. First, it allows viscous emulsified oil slicks to flow into a skimmer more quickly. The second benefit is that a significant reduction in oil viscosity could break emulsions. Our concept is to outfit conventional skimmer systems with a method of placing the floating oil slicks adjacent to the skimmer under shear stress by vibrating the skimmer to send physical waves radially away from the skimmer or by sending sonic waves radially away from the skimmer and into the adjacent oil slick. This presentation will describe the research we've conducted evaluating each of these concepts.
Speaker Contact Information	Organization: ExxonMobil Upstream Research Company / New Jersey Institute of Technology Mailing Address: 22777 Springwoods Village Parkway Email Address: tim.j.nedwed@exxonmobil.com Website Address: Office Phone: 832-633-0365
Speaker Biography	Tim Nedwed, Ph.D., P.E., has led the Oil Spill Response Research Program at ExxonMobil Upstream Research Company for 19 years. Currently he is ExxonMobil's Oil Spill Response Principal Advisor. Dr. Nedwed earned a Bachelor of Science in Chemical Engineering in 1987 and M.S. and Ph.D. degrees in Environmental Engineering in 1992 and 1996. He joined ExxonMobil in 1998. As team lead for ExxonMobil's oil spill response research program, Dr. Nedwed supports joint industry research efforts on oil spill fate and effects and conceives and develops novel oil spill response techniques. He has over 75 publications and 19 patents related to his research.

Speaker Name	**Aaron Parker, Chief of Emergency Response**
Presentation Title	**NOAA Agency Update**
Abstract	An update on current & emerging priorities for NOAA's Office of Response & Restoration (OR&R). Topics span a wide range of scientific & technical disciplines including remote sensing, oceanography, chemistry, modeling, data management, and mapping tools. Updates include preparedness efforts (such as incidents, training and in-house tool development), responses, as well as OR&R research.
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Speaker Biography	Aaron Parker joined NOAA's National Ocean Service in 2021 and serves as the Division Chief for the Emergency Response Division within the Office of Response and Recovery. Before coming to NOAA, Mr. Parker served in various civilian positions in the Federal and local government. He most recently served in the National Pollution Funds Center at the U.S. Coast Guard. He also worked as an emergency response and recovery planner and a national security policy analyst at U.S. DOT's Office of Intelligence, Security, and Emergency Response. In these positions, he was responsible for national response and recovery activities, Mission Assignments, and Disaster Relief Funds for the Department, representing the Department with FEMA and standing watch in FEMA's NRCC, as well as reviewing and evaluating national security strategy and policy in coordination with DOT agencies and the National Security Council. Other roles include performance management and strategic planning for EPA's CFO & Office of Land and Emergency Management, Chief Operations Officer and Lead Administrator for an oil spill response company, program manager for the Smithsonian Institution's Office of Protection Services, and over 7 years in various higher education administration positions. Before Federal civilian service, Aaron was a commissioned officer in the U.S. Coast Guard, conducting emergency response in the maritime environment. Aaron has over 19 years of Federal service. He graduated from the U.S. Coast Guard Academy with a B.S. in Marine and Environmental Science, has an M.Ed. in Teaching and Learning, and is all-but-dissertation complete for a Ph.D. in Organizational Leadership.

Speaker Name	**Kenny Rhame**
Presentation Title	**Managing Your PQS (Performance Qualification Standard) Program**
Abstract	Effectively managing a PQS program can be time consuming and overwhelming. From establishing the program framework to building your historical documentation for each team member. This presentation will discuss best practices for establishing your PQS program and show how software tools can help with overall management.
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Speaker Biography	Kenny provides technical leadership as the Chief Information Officer (CIO) at The Response Group. His experience includes over 30 years in Information Technology and Security specializing in Geographic Information Systems (GIS) and Emergency Response. His role gives overall direction for all software development, support, and information systems at The Response Group. Kenny is an active member of The Response Group's Emergency Response Team and has filled many key roles supporting all-hazard incident and crisis management events.

Speaker Name	**Hunter Ross and Mingheng Li**
Presentation Title	**Filter Modified with a Hydrophilic and Oleophobic Coating for Affordable and Efficient Oil/Seawater Separation**
Abstract	To mitigate the damage of the oil spills, a filter modified with a hydrophilic and oleophobic coating is proposed for affordable and efficient oil separation and recovery from seawater. The sol-gel method was chosen to produce a colloidal suspension of titanium dioxide particles for its ease of production and its versatility in application to many different substrates, including paper and cotton fabric. After immersing the substrates into a titanium-containing solution, three methods were used to enhance the performance of the coating - microwave assisted, refrigeration, and ultra-sonication. Contact angle tests were done to investigate the change in the filter's oleophobicity. The titanium dioxide present on the surface of the filter was not anatase phase, but all treatment methods showed an improvement in oleophobicity, as well as improved oil filtration performance. The filters isolated oil from a mixture while allowing water to pass through (demos have been uploaded to YouTube: https://www.youtube.com/watch?v=Bmf3GVzEWfw and https://www.youtube.com/watch?v=sNzAfq_LDYU). The coated filters also displayed photocatalytic activity, by degrading methylene blue on its surface when exposed to sunlight, demonstrating the filter's self-cleaning ability. For real-world applications, the filter can be supported by a stainless mesh for enhanced strength and durability. While being dragged through the water, the filters collect the surface oil while allowing seawater to go through easily by gravity.
Speaker Contact Information	Organization: California State Polytechnic University, Pomona Mailing Address: Department of Chemical and Materials Engineering, 3801 W. Temple Ave., Pomona, CA 91768 Email Address: Hunter T. Ross htross@cpp.edu, Mingheng Li minghengli@cpp.edu Website Address: http://www.cpp.edu/faculty/minghengli Office Phone: 909-869-3668 Cell Phone:
Speaker Biography	Hunter Ross is a senior chemical engineering undergraduate student at Cal Poly Pomona. During his studies at the university, he has focused on research pertaining to new solutions to environmental relief efforts. He has recently published a journal paper alongside his team of undergraduate students regarding a modified titania coated filter that may be used to assist in oil spill cleanup efforts. Mingheng Li obtained Ph.D. in chemical engineering in 2004 and worked for PPG Industries for 3 years before joining Cal Poly Pomona, where he is currently a full professor. His research lies in systems engineering for energy, water and environmental applications. He has published 65 peer-reviewed journal papers and 2 books on membrane processes and energy systems.

Speaker Name	**Brad Rutledge**
Presentation Title	**Balaena's New Technology Mitigating Waterborne Debris**
Abstract	The Balaena OSRV is a new and innovative design with a demonstrated potential to substantively improve spill response. Balaena employs high-capacity pumps to draw water and oil into the vessel via an Input Flow Regulator (IFR), which significantly enhances the ingested oil/water ratio. Between the IFR and pumps is a 1000+ gallon (3785+ liter) collection chamber that separates water and oil in real-time, entrapping the oil while discharging clean water. The vessel can advance through a spill at 1-2 knots (0.5-1.0 m/s), ingesting its bow wave to capture the spill rather than pushing it aside. Derivative technologies include shallow water pods to enable spill collection in shallow pools and/or marshes, and containerized versions for fixed installations or deployment from existing OSR vessels. The full-scale Balaena Proof of Concept (POC) vessel demonstrated its viability in an operational environment to Technology Readiness Level (TRL) 7. Initial exercises in the Ohmsett Test Facility demonstrated collection rates over 150 gallons per minute (>9 liters per second), with measured oil/water transfer ratios up to 98%, and clean water discharge with <5 ppm oil on average. All Balaena products a) actively draw surface contaminants (e.g., oil) for recovery through significant movement of water; b) require no consumable pads, belts or chemicals/agents; c) have no dependency on cohesion or oleophilic properties, mitigating the challenges of collecting weathered oil; d) avoid emulsification of recovered oil to eliminate significant wait-time spent decanting; e) exhibit extremely high, sustainable, real-time oil/water ratios up to 98% to significantly reduce the volume for transportation and disposal; f) include storage/buffer capacity as well as the capability to discharge/offload continuously for, in effect, unlimited capacity. Our solutions work effectively across the entire timeline of spill clean-up operations. For protected waters, a second generation, <30' model (slightly smaller than the Balaena POC) is in late stages of design that can be trailered/towed without permits on highways by non-commercial vehicles and is designed to be compatible with a C130 transport aircraft for deployment into remote areas. A 60-foot model is contemplated for more open water applications. Common features include rapid mobilization and transit; the ability to detect and mitigate small spills or patches with or without boom containment; compatibility with existing oil spill removal infrastructure. Containerized/modularized OSRs can be used for fixed or semi-permanent installations or deployments from the decks of existing response vessels. Modularized solutions are scalable from person-portable (cooler sized) to the size of a 40' container, and are functionally equivalent to the OSRV in operations. Shallow water pods can be used in shallow pools, marshes and bayous with limited access and water depth. The recovered product is connected o either a collection vessel that is standing off in deeper water or a containerized solution on deck, on land, or in the water nearby.
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Speaker Biography	Brad Rutledge has 21 years creating, building, operating and managing businesses, including real estate development, offshore pipeline construction services and support, industrial equipment and machinery companies servicing shipyards, levee construction, and storage tank assets and pipeline meters. He was appointed by the Governor of Texas as commissioner for Sabine Pilots Association and is the founder of a 501C3 scholarship program intended to build community involvement/awareness and promote students to accelerate in higher education learning.

Speaker Name	**Ben Shorr**
Presentation Title	**Mapping and Visualization in NOAA's Environmental Response Management Application (v. 5.0)**
Abstract	NOAA's Environmental Response Management Application (ERMA), a mapping and visualization application, is often used for spill response planning and preparedness and as a Common Operational Picture during a real event. ERMA is a robust spill response tool that provides users access to up-to-date spatial data layers, remote sensing imagery and a wide range of base layers in a simple platform. ERMA was recently updated with several new tools including dashboard capabilities, the ability to quickly add data, enhanced query functionality and a multiple layer swipe tool. The updated application is also functional on handheld devices including phones and tablets. The Office of Response and Restoration has over a decade of experience collaborating with California Department of Fish and Wildlife's Office of Spill Prevention and Response building and maintaining Southwest ERMA with current and relevant spatial data layers.
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Speaker Biography	Ben Shorr is a Physical Scientist with NOAA's Office of Response and Restoration. Ben has over 20 years of experience building data warehouse and data query tools and applying GIS and environmental data analysis to oil spill response and Natural Resource Damage Assessment (NRDA). Ben is a lead for the Southwest Environmental Response Management Application (ERMA), and the NRDA Oil Spill Coordinator for California for NOAA's Damage Assessment Remediation and Restoration Program (DARRP).

Speaker Name	**Scott Smith**
Presentation Title	**Sustainable Open-Cell Polyolefin Sorbent Foams for Oil and Chemical Spills, and Results of Tests Conducted at Ohmsett and in Real World Spills as Endorsed by BP and the API**
Abstract	AquaFlex®, formerly Opflex, is an Open-Cell foam manufactured from an elastomeric, medical grade polymer. Its key performance attributes are that it attracts oil (and chemicals), repels water, and can act like a sponge to release the oil upon wringing/squeezing. Unlike Single-Use polyurethane foams and Single-Use Polypropylene (PP) sorbents, AquaFlex does not contain any harmful plasticizers and/or chemicals that can leach into water in sensitive ecosystems. Additionally, when AquaFlex is re-used as a sponge, as proven and endorsed by BP in the 2010 Deepwater Horizon Oil Spill, the cost of cleaning up a spill is reduced dramatically. AquaFlex first went to Ohmsett in 2014 for independent, validation testing. In attendance in 2014 to witness AquaFlex testing in the outdoor tank at Ohmsett from the United States Coast Guard's (USCG) Atlantic Strike Team were Craig Coburn, Hazmat Response Officer, USCG Atlantic Strike Team and Michael Giglio, Response Officer, USCG Atlantic Strike Team. The US Bureau of Safety and Environmental Enforcement (BSEE) at its Ohmsett facility in New Jersey, independently evaluated AquaFlex products. Ohmsett found that over 80% of spilled oil was recovered from water. Additionally, during the testing the recovered oil was removed (squeezed out through a wringer) to safely dispose of and/or reuse the oil. Industry experts state that legacy technologies recover less than 20% when spills occur. Short videos of the Ohmsett tests along with some real world deployment as recently as 2020 will be presented. We suggest that the time is auspicious for all government agencies and public officials to take notice, on how best to direct "best practices" for total environmental protection and sustainability. Responsible parties (usually major oil producers and pipeline companies) need to be involved to specify standards of performance not only for cleanup activities but also disposal. It is conventional wisdom within the industry that we can no longer allow excessive disposal of Single-Use oil sorbent PP pads/booms in landfills. To inefficiently remove oil from waterways only to dispose of Single-Use sorbents in landfills is not sustainable.
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Speaker Biography	Scott Smith is the Founder and CEO of AquaFlex Holdings LLC (AquaFlex), Chief Sustainability Officer of ECO Integrated Technologies, Inc., and President of ECO AquaFlex, LLC. ECO AquaFlex specializes in developing and commercializing proprietary Intellectual Property (IP) to detect/remove contaminants (e.g. oil, metals, bacteria) from water. AquaFlex's strategy is to test and prove its cutting-edge technologies in real-world conditions, which enhances its ability to achieve efficacy and IP patent protection. Smith has 6 issued patents and 14 patent-pending applications relating to Open-Cell foam for testing/remediation of water contaminated from harmful algal blooms, bacteria/viruses, oil, and chemicals. In 2008, Smith received the Small Business Administration Phoenix Award for Small Business Disaster Recovery after he turned around his manufacturing business which was interrupted by a devastating "500-year" flood in 2006. Cleaning the factory of oil-contaminated water became the impetus for Smith's inventions using Open-Cell foams for testing/remediating polluted water. Smith has been to most major water contamination events since 2010 – more than 60 in the US and abroad. These real-world disasters have been his laboratory along with 3rd party testing and data from these disasters incorporated into his patent filings. In 2019, Ohmsett, part of the US Bureau of Safety and Environmental Enforcement ("BSEE") was engaged to conduct 3rd party testing of Continuous Open-Cell polyolefin foam rolls versus other Open-Cell foam sorbents, and single use polypropylene sorbents. The Ohmsett study showed that Open-Cell foam rolls not only exceed the performance of other Open-Cell foam sorbents, but also single use plastic non-foam typical polypropylene sorbents. Smith holds degrees from Baylor University and Harvard Business School (MBA).

Speaker Name	**Gordon Staples**
Presentation Title	**Estimation of Minimum Oil Slick Detection Area using RADARSAT-1/2**
Abstract	Spaceborne SAR has been used for decades to support oil spill response. Notable events such as the Deepwater Horizon (DWH) incident spanned months with a spatial extent estimated to be greater than 100,000 km2. The duration and extent lent itself naturally to the use of spaceborne SAR. Other spill events such as the MV Wakashio, illegal bilge dumping, accidental discharge from offshore platforms, or sunken vessels such as the USS Joseph M. Cudahy, do not, in general, have the same duration or spatial extent as the DWH incident, but are still important from a monitoring and response perspective. To answer the question of minimum oil slick area, the approach was to use archived RADARSAT-1/2 ScanSAR Narrow imagery acquired over the Gulf of Mexico. ScanSAR is characterized by a swath width of 300 km and a nominal resolution of 50 m. The RADARSAT-1/2 images were initially screened based on the wind speed extracted from the SAR image. Based on the well-known relationship between wind speed and slick detection, wind speeds between approximately 2.5 m/s to 12 m/s were selected. Approximately 250 images were analyzed for the presence of slicks and slick look-alikes. The slicks were classified into four categories: oil seeps, pollution, uncategorized, and anomaly. For the oil seep and pollution categories, a confidence level of High, Medium, or Low was assigned. In addition to wind speed, the detection of slicks depends on the radar incidence angle and polarization. For these reasons, the analysis focused on incidence angles less than about 40° and the use of either HH or VV polarization. When the seep and pollution categories were combined, the minimum detectable area for High confidence was 1.2 km2. Using the High confidence area as a beak-point, the minimum detectable area for Medium and Low confidence was based on average detected areas less than ~1 km2. For Medium confidence, the average detected area was 0.6 km2 and for Low confidence, the average detected area was 0.07 km2. When the seep and pollution categories were separated, the minimum detectable areas were similar to the combined results, albeit with a small dependence on slick morphological features such as shape. The results suggest an inverse relationship between minimum detectable area and confidence level. This relationship makes sense because the radar can detect a relatively small slick, but the slick has to be large enough to extract spatial characteristics to assign the appropriate confidence level.
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Speaker Biography	Gordon Staples received the M.Sc. degree in ocean physics and the B.Sc. degree in honours physics and oceanography from the University of British Columbia. He joined MDA in 1993 and is currently Senior Radar Applications Scientist and Project Manager. In this role he is a technical director for development of radar applications, manages projects, develops and delivers radar training, and provides scientific expertise for business development. He has extensive experience in radar polarimetry and the development of maritime and terrestrial radar applications.

Speaker Name	**Andrea Steffke**
Presentation Title	**Utilizing Planet Imagery for Oil Spill Response: Current and Future Monitoring Solutions**
Abstract	The space industry is undergoing a radical transformation, allowing incidents to be monitored in a way that wasn't possible before. Planet is an integrated aerospace and data analytics company that operates history's largest commercial fleet of satellites, collecting imagery of the entire global on a near daily basis. Planet's 8-band multispectral medium resolution (~ 4 m) and 4-band high resolution (~ 50 cm) imagery currently aids in oil spill response and recovery. Additional capabilities will be available soon with the launch of Planet's hyperspectral satellites. We will share details on our current and upcoming suite of solutions and examples of how Planet imagery can provide useful information in response efforts.
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Speaker Biography	Andrea Steffke is a Customer Success Manager with Planet. She works with Energy Customers helping them realize the full value from Planet products. Prior to joining Planet, she worked for a large integrated energy company, serving as internal remote sensing subject matter expert, supporting global business units use of remote sensing and geospatial technologies to improve environmental performance and create efficiencies in upstream, midstream and downstream operations. Andrea is a remote sensing scientist in education and training, receiving her Ph.D. in Geophysics from the University of Hawai'i, Manoa.

Speaker Name	**Karen Stone**
Presentation Title	**Bureau of Safety and Environmental Enforcement (BSEE) Oil Spill Response Research Update**
Abstract	The Bureau of Safety and Environmental Enforcement (BSEE) Oil Spill Response Research team will be introduced and an overview of current Oil Spill Response Research efforts highlighting several recent initiatives including test objectives for dispersant and combustion projects slated for Canada's Multi-Partner Research Initiative (MPRI) field trials will be presented. BSEE's Oil Spill Response Research section currently has over 30 active research initiatives across seven distinct research areas including decision-making, chemical treatments, in situ burning, remote sensing & detection, mechanical containment & recovery, shoreline, and renewable energies.
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Speaker Biography	Karen Stone serves as Chief of the Response Research Branch within BSEE's Oil Spill Preparedness Division (OSPD). The Branch has two sections: Oil Spill Response Research and the Ohmsett Facility. The Oil Spill Response research section strives to shape the landscape of offshore oil spill response focusing on mechanical recovery and containment, chemical treatments such as dispersants, shoreline cleanup, remote sensing, *in situ* burning, and most recently, spill mitigation measures for oils associated with renewable energy systems such as dielectric fluid from wind turbines. Ohmsett, the National Oil Spill Response Research and Renewable Energy Test Facility, is the largest outdoor test/tow tank facility in North America, and provides training and performance testing of full scale oil spill response equipment and marine renewable energy systems in support of the oil spill response community. Prior to her current role as Branch Chief, Ms. Stone served as a Program Manager and Oil Spill Response Engineer within OSPD focusing on combustion and in situ burning (ISB) of oil as a response technique and the science of water-in-oil emulsions. Ms. Stone's research includes a Joint Industry Program to develop a remotely operated jet ski for herding and burning operations, a novel heat feedback system to improve burn efficiencies and the low-emission spray burner known as the "BSEE Burner." Additionally, she pursued research and development of a reconfigured fire boom system known as the "Restricted Burning Tongue" where oil is burned in a long narrow length of boom, rather than the standard catenary geometry, to increase combustion efficiency. Ms. Stone has published multiple technical and conference papers on *in situ* burning as well as her research in water-in-oil emulsions. Prior to accepting her appointment with BSEE, she worked for refined petroleum products pipelines focusing on emergency preparedness plans required under OPA90. She also was a secondary educator in Earth & Space Science and Geographic Information System (GIS) instructor. Ms. Stone is a graduate of Marietta College with a Bachelor of Science Petroleum Engineering degree and holds a Master's degree in Technology from George Mason University. She lives in Virginia and teaches a masters soils and geology course in her spare time.

Speaker Name	**Alex Tardy and Casey Oswant**
Presentation Title	**NWS San Diego Provides Enhanced Weather Support Services for Pipeline Oil Spill Recovery**
Abstract	On Saturday October 1, 2021 oil and odors were discovered at Huntington Beach, California while the large Pacific Air Show was ongoing. NWS San Diego was already onsite on Friday September 30 providing weather briefing support to Huntington Beach Fire Department emergency management and participating pilots. The briefings began September 28 for inclusion in the Incident Action Plan. The Air Show had daily attendance estimated at 1 million persons from Seal Beach to Newport Beach. This year it included US Navy Blue Angels, US Air Force Thunderbirds and Canadian Snowbirds for the first time and was broadcast in entirety live on Hulu. Late in the day on Saturday October 1, NWS San Diego was contacted about changing weather support to possible oil spill response. NWS reached out to the NOAA Emergency Response Division and informed Huntington Beach to work with US Coast Guard and to request NOAA oil spill Emergency Response Management Application (ERMA) modeling once the source was determined. NWS Oxnard visited the Command Post in Long Beach, California on Wednesday, October 6 to determine needs for weather support. They visited with Situational Unit Leader staff as well as with Jordan Stout, who was first on scene from NOAA. Since the response area included both WFO Los Angeles (coastal waters off Orange County) and WFO San Diego (land and beach areas), it was initially agreed that the support would alternate on a weekly basis between the two offices for the duration of the incident response. Daily written forecasts were initially supplied by WFO Los Angeles and collaborated with WFO San Diego. The forecast support transferred to NWS San Diego starting Monday, October 11 and WCM Alex Tardy and Lead Forecaster Dan Gregoria deployed on site both Monday and Tuesday at the relocated Unified Command Post at Orange Coast College in Costa Mesa, CA (NWS San Diego CWA). The two day deployment led to strong relationships with Unified Command and the inclusion of the NWS daily forecasts into the Incident Action Plan and the daily Situational Reports and ICS 209 forms. Alex and Dan also provided in person briefings to the Command Staff and full onsite support for both days while attending several meetings. Senator Alex Padilla, USCG Commander Michael McAllister and Attorney General Rob Bonta attended a special briefing later Monday morning. Based on onsite discussions, the forecast issuance time shifted to 6 am daily issuance for direct support of the SItuational Leader. The tidal forecast was also very important to beach clean up safety as operations expanded south across San Diego County. On October 4, 2021 widespread thunderstorms produced around 2000 cloud to ground lightning strikes and heavy rain over the coastal waters and coastal cities which caused most oil recovery operations to be suspended after 3 pm Monday. After the weather event, the Unified Command rapidly spun up to nearly 1500 persons on the ground for beach clean up efforts, flew several aircraft on daily surveys, operated oil skimmer equipment, placed thousands of feet of boom at sensitive lagoons and bays, and staffed up to 200 personnel at the Command Post. On Monday October 11, a strong cold front brought wind gusts over 40 mph over the waters and to coastal cities and seas reached 11 feet Monday evening across the oil spill recovery area. Based on observations the following two days, additional significant oil tarballs and patties were discovered in San Diego County. It was determined by extensive analysis that about 25,000 gallons (595 barrels) of crude oil leaked from a damaged 16 inch diameter pipe line off of Huntington Beach. NWS San Diego continued to provide daily weather support remotely to the Unified Command through early January 2022.
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Speaker Biography	Alex Tardy is a manager and the Warning Coordination Meteorologist at the National Weather Service office in San Diego. During the past 28 years he has worked at 6 locations across the country including Vermont, Virginia, Texas and Utah. He is in charge of the outreach, education and preparedness programs working directly with emergency managers, media and public. Casey Oswant is a forecaster at NWS San Diego and in charge of the marine services program. Casey has worked at the NWS for 4 years.

Speaker Name	**Martice Vasquez, Ph.D.**
Presentation Title	**Analytical Tools for Renewable Fuel Spill Response**
Abstract	Renewable diesel is a non-petroleum based alternative fuel type with increasing usage in California as a drop-in replacement for petroleum diesel and petroleum diesel/biodiesel mixtures. When a petroleum-based spill occurs in California, CDFW OSPR is often the lead response organization in charge of protecting the state's natural resources. Part of the spill response process is confirming, characterizing, and fingerprinting the spilled product to determine if the product is petroleum, the extent of the spill, and the source of the oil. With the increasing use of renewable diesel, traditional chemistry approaches may not be sufficient to perform similar characterizations for spilled renewable diesel. The laboratory is currently working to develop an analytical approach for characterizing, confirming, and fingerprinting renewable diesel using gas chromatography coupled with mass spectrometry (GCMS). Limitations of the traditional GCMS approached are discussed and two-dimensional gas chromatography (GCxGC) is investigated to provide adequate signal resolution to potentially differentiate samples from each other based on quantification of individual product components.
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Speaker Biography	Dr. Vasquez is currently a senior environmental scientist supervisor with OSPR's pollution response unit of the laboratory program. She supervises the chemistry functions at both the Petroleum Chemistry Laboratory and the Water Pollution Laboratory in Rancho Cordova as well as the non-petroleum spill response functions. She began working at the Water Pollution Control Laboratory in 2001 and returned to the lab program in 2013 after receiving her doctorate in Agricultural and Environmental Chemistry at UC Davis in 2010.