

Bridgette R. DeShields

Principal



Education and Credentials

M.S., Environmental Management, University of San Francisco, San Francisco, California, 1998

B.S., Biochemistry, University of California, Davis, California, 1986

Continuing Education and Training

Hazardous Waste Operations and Emergency Response 40-Hour Certification (1994; refreshers 1995–present)

Loss Prevention System

Certified Project Manager

Professional Affiliations

Society for Environmental Toxicology and Chemistry

Bay Planning Coalition

Western Dredging Association

Professional Profile

Ms. Bridgette DeShields has 27 years of experience and is a specialist in regulatory strategy, site investigation, site remediation, sediment and water quality management, and environmental toxicology. She has managed programs ranging from large site investigations to screening and quantitative ecological and human health risk assessments. She also designed and participated in dredging program management, field evaluations, bioaccumulation studies, literature reviews, and specially designed study programs. Her work has been focused on sediment assessments and waterfront projects with natural resource components and complex regulatory frameworks. She also has technical expertise in the area of bioaccumulation and bioavailability.

Ms. DeShields has developed excellent working relationships with regulatory agency staff, including the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), NOAA, California State Water Resources Control Board and regional boards (RWQCBs), California Environmental Protection Agency (Cal/EPA), California Department of Toxic Substances Control (DTSC), California Coastal Commission (CCC), California Department of Fish and Wildlife (CDFW), and other agencies. She has extensive experience in navigating California regulatory and permitting programs.

Ms. DeShields represents the interests of the Bay Area refineries on San Francisco Bay water and sediment quality issues as a representative for the Western States Petroleum Association, serving as chair of the Regional Monitoring Program (RMP) Technical Review Committee since January 2000. Her responsibilities include technical review of RMP documents and attending technical meetings. She also has led the dioxin strategy for San Francisco Bay.

Relevant Experience

Remedial Investigation and Feasibility Study

Environmental Investigation, Feasibility Study, Risk Assessment, and Related Services at a Former Industrial Facility, San Francisco Bay Area, California—Led the investigation, risk assessment, and feasibility study for a 10-acre parcel containing two freshwater lagoons adjacent to San Francisco Bay. Constituents of concern



include metals and thiocarbamate and organochlorine pesticides (OCPs). Assessment included a treatability study to evaluate the effectiveness of carbon amendment to reduce leachability and bioavailability of constituents. Lead agency is DTSC. Also conducted human and ecological risk assessments and developed a feasibility study that included a combination of excavation, treatment, and capping/cover. Several natural resource trustee agencies were also involved in the project due to the proximity to sensitive habitats that support special-status species, including California clapper rail. Led the regulatory and permitting strategy efforts for the project as well.

Engineering Evaluation and Cost Analysis (EE/CA) for Yosemite Slough, San Francisco, California—Supporting the PRP group in coordinating with the EPA Region 9 effort to develop an EE/CA for this site. Assisting EPA's consultant by developing work plans and reports to support the EE/CA and assisting in the development of cleanup goals and permitting strategies. Also involved with risk evaluations, source investigations, and historical data evaluations, as well as the development of remedial alternatives. Studies conducted include geotechnical assessments, evaluations of the biologically active zone, and natural attenuation.

Site Assessment, Remediation and Facility Closure at a Former Chemical Plant, Elk Grove Area, California—Led a team in conducting site investigation and developing plans and implementing remedial activities at a former resin manufacturing facility. Chemicals of concern included phenolics, toluene, ethylbenzene and xylenes. Developed site-specific cleanup goals protective of groundwater, soil vapor, and human exposure. Developed a remedial action plan, as well as a facility closure plan and report, and managed the excavation activities. Negotiated entrance into DTSC's voluntary cleanup program and achieved closure from both DTSC and Sacramento County with no land use restrictions by demonstrating acceptable post-remedial conditions.

Environmental Investigation, Remediation, Risk Assessment, and Related Services at a Former Sawmill in Northern California, Fort Bragg, California—Managed a multiyear, multisite investigation and remediation project at a former sawmill site in northern California. Primary constituents of concern were dioxins/furans and petroleum hydrocarbons. The assessment included both the 415-acre mill site as well as a ranch area offsite. Tasks included site investigations at five operable units (including sediments within a complex of ponds) and offshore sediments, risk assessment (human and ecological), background evaluations, dioxin characterization, pond and offshore sediment sampling, remedial planning, construction, demolition, and oversight, and negotiations with multiple regulatory agencies. The site is a high profile project managed by DTSC, but with input from RWQCB, CDFW, USFWS, NOAA, city and county agencies, and CCC. The project included multiple regulatory and permitting requirements specific to the coastal zone of California that require integration of archaeologists, Native American monitors, biologists, botanists, marine mammal specialists, and geotechnical and other engineering disciplines. Completed multiple investigation and monitoring reports, a remedial investigation, two remedial action plans (RAPs), and a risk assessment. Implemented 3 years of remedial actions for soil and groundwater including bioremediation of the petroleum-impacted soils. Also conducted a complex quantitative analysis to develop background levels for dioxins as well as a method for source identification. Conducted site-specific bioaccumulation assessments for metals and dioxins/furans in upland soils and pond sediments. Successes to date include a no further



action for large areas of the site and the offshore sediments, implementation of various remedial measures, and a strategy to address pond sediments and the jurisdictional dam. Also achieved site certification for the offsite ranch and coastal portion. The coastal portion was sold/transferred to the city to create a coastal trail.

Comprehensive Investigation and Remedial Planning and Implementation, Antioch, California— Served as project manager for a comprehensive investigation and remediation project at a closed paper mill. Developed work plans and technical reports in support of investigation activities under the AB2061 program. In addition, risk-based screening levels (RBSLs) were developed and presented in a report as were background levels. The background level report developed upper-bound background concentrations for metals using DTSC guidance but also presented an approach and rationale for determining whether dioxins/furans detected onsite were due to ubiquitous anthropogenic sources or site-related sources. Site investigations were conducted at eight properties. Chemicals evaluated included metals, dioxins/furans, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PAHs, OCPs, and herbicides. Risk evaluations were conducted for each of the subject properties based on an unrestricted land use scenario to support sale/transfer of the properties. Completed an RI/FS work plan to assess soil and groundwater and an underground utility investigation. Also, developed an RAP and a California Environmental Quality Act document and completed activities pursuant to DTSC's Public Participation Guidance Manual. These activities included developing a mailing list and an initial fact sheet and community survey distributed to the mailing list; interviewing community members and local officials; developing a public participation plan (which included a community profile); and conducting a public meeting and responsiveness summary.

Waterfront Sediment and Upland Area Remedial Action Planning and Permitting, Eureka, California— Led a team for a remedial action planning program to address offshore sediments and upland soils contaminated with metals and PCBs. Developed risk-based cleanup goals, an RAP, and an implementation plan, as well as mitigation plans for avian species and eelgrass. Successfully negotiated approval of the RAP with the North Coast RWQCB and worked with various permitting agencies including the city of Eureka, USACE, CCC, the local Harbor District, CDFW, USFWS, and NOAA to issue project permits. Also, completed California Environmental Quality Act documents. Oversaw the development of bid and specifications documents and provided contractor oversight and project coordination.

Dredging Program Management

Maintenance Dredging Project, Port of San Francisco, California— Managed the port's dredging program for 3 years, including designing and implementing sampling and analysis plans (SAPs), applying for and negotiating permits, designing and managing upland disposal of sediment, managing and inspecting dredging contractors, and conducting water-quality and circulation studies. Represented the port at meetings of local stakeholder working groups, including the long-term management strategy for San Francisco Bay meetings and the sediment quality guidelines working group. Negotiated dredged material suitability and permit conditions with the Division Material Management Office (DMMO), consisting of USACE, EPA, the Bay Conservation and Development Commission, RWQCB, CDFW, and the National Marine Fisheries Service. Prepared



budgets, evaluated alternatives for dredged material disposal, and managed a project to design an upland rehandling facility for PAH-contaminated sediments.

Maintenance Dredging Program, Moss Landing Harbor District, California—Managed the maintenance dredging program for Moss Landing Harbor, the largest fishing port between San Francisco and Los Angeles, for more than 4 years, including the successful preparation and implementation of SAPs, dredging plans, testing reports, and post-dredge reports. Worked with USACE, CCC, and RWQCB in establishing a multiyear permit. Also responsible for designing, constructing, and operating an upland disposal site and restoring the site into a visitor-serving recreational area, including restoration of native coastal dune habitats, and working with USFWS pursuant to designation of the area as critical habitat. Gave presentations at public meetings, interfaced with the press, and worked with a local congressman, as well as EPA’s congressional liaison. An assessment was conducted to support a dredged material management plan for navigational dredging of Moss Landing Harbor. Developed a work plan, summarized background information, and conducted a screening-level modeling analysis to estimate concentrations of pesticides in offshore sediments following a hypothetical set of dredging events. The results of the model were used to estimate ecological effects of dredged material placement over time. Analysis included a review and compilation of available information and literature for the site, evaluation of transport dynamics in the highly complex canyon environment, screening-level modeling of the mixing conditions at the disposal location (DCORMIX), transport and deposition of the suspended material plume (SSFATE), and recovery analysis (RECOVERY). The preliminary risk assessment and the supporting screening-level modeling analysis were summarized in a draft report and submitted for independent peer review. Peer review findings recommended additional data collection and modeling work to further support the conclusions of the screening-level study. Revisions to the report were in response to requests by the peer review panel. The conclusions of the report support the continued dredging and aquatic disposal of the dredged material, with no unacceptable risks.

San Mateo-Hayward Bridge Seismic Retrofit Project, San Mateo, California—Assisted with environmental review and permitting. Key environmental issues included potential contamination of bay sediments; associated water-quality impacts; impacts to seasonal wetland habitat; temporary alteration or closure of public facilities; potential entrainment of steelhead trout during hydraulic dredging; and potential impacts to fish and marine mammals from noise, vibrations, and turbidity during construction. Conducted studies to assess the level of contamination of bay sediments to be dredged as part of the construction. Consulted with member agencies of the DMMO, investigated on-land and aquatic disposal options, and developed detailed cost estimates for these options. In addition, reviewed environmental databases, California Department of Transportation (Caltrans) maintenance records, and effluent data from outfalls in the vicinity of the bridge to investigate the potential for sediment contamination. Prepared a SAP for sampling and testing sediments in accordance with DMMO requirements (Tier II), which was approved by the DMMO and Caltrans. The results of the sediment testing were incorporated into agency permit application packages. Assisted in preparing the public notice to support an individual permit application from USACE under Section 404 of the federal Clean Water Act.



Risk Evaluation for Placement of Dredged Sediments at Winter Island, Winter Island Reclamation District, Sacramento Delta, California—Developed “acceptability” criteria for placing contaminated sediments along levees at Winter Island. The Winter Island Reclamation District needed 500,000 yd³ of sediments to rehabilitate levees and, particularly, needs silty material to “cap” the levees and prevent erosion. Worked with the San Francisco RWQCB to develop levels of contaminants acceptable for material placed on levees, and also developed management and engineering practices to prevent erosion and migration of placed material to a nearby wetland. Contaminants evaluated included metals, PAHs, PCBs, and DDT.

Risk Assessment

Sediment Investigations and Ecological Risk Assessment, Oakland Army Base, Oakland, California—Managed a program to evaluate potential risks to ecological receptors from contaminants in offshore marine sediments and a small freshwater marsh habitat. Developed an ecological risk assessment work plan and sediment SAP, including a tiered chemical and biological testing program designed to focus the investigation on the areas and chemicals of most concern, thus reducing costs. Conducted bioassay and bioaccumulation tests at 12 stormwater outfalls to evaluate potential impacts to aquatic receptors, amphibians, birds, mammals, and plants potentially exposed to chemicals. Risks from ubiquitous anthropogenic contamination were factored out. Successfully negotiated approval of these plans, as well as the risk assessment results, with EPA, DTSC, RWQCB, and resources agencies including CDFW, USFWS, and NOAA.

Fort Ord Ecological Risk Assessments, Monterey, California—Performed quantitative human health and ecological risk assessment at 41 sites. Human receptors included residential, commercial/industrial, and recreational users. Ecological receptors included aquatic life, mammals, birds, reptiles, insects, and plants. Developed toxicity reference values (TRVs) and site-specific exposure assessments. Evaluated the results of bioassays on aquatic organisms and plants. Assessed possible impacts to special status species, characterized sites, conducted fate and transport analyses, and modeled exposure and effects. Site-specific studies included butterfly and lizard population surveys; collection and analysis of site-specific plant, reptile, and mammal tissues; a plant health and condition study; a leaf litter study; and an enhanced preliminary assessment for the offshore marine environment. Primary contaminants of concern were lead and other heavy metals associated with small arms, dioxins in burn-pit areas, petroleum hydrocarbons from motor pools (a site-specific total petroleum hydrocarbon [TPH] cleanup level was developed), and explosive compounds. Pesticides and PCBs were also found at some of the sites. Worked with the regulatory agencies (mainly EPA and DTSC, but with selected and focused involvement of USFWS, CDFW, and NOAA for specific aspects) in a cooperative manner, such that the agencies have been very supportive of innovative techniques for site characterization and risk assessment. Made presentations at public and technical group meetings and have presented data jointly with agency at scientific meetings. Worked with U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) to develop methods to evaluate the bioavailability of lead and site-specific conditions at small arms firing ranges. The record of decision has been signed for all sites at Fort Ord. Additional work was undertaken at the unexploded ordnance range site, where the risk evaluation was conducted. Site-specific field studies on lead uptake into plants,



insects, lizards, and small mammals have been conducted as well as site-specific bioavailability jointly with USACHPPM. The risk assessment included using this site-specific data and an approach aimed at balancing site cleanup, risk reduction, and preservation of rare and declining habitats is being used. This analysis was used to develop site-wide cleanup levels and a site-wide cleanup approach for this 8,000-acre area.

Human Health and Ecological Risk Assessment at a Former Petroleum Refinery, Lawrenceville, Illinois—Prepared work plans for the human health and ecological risk assessment, including a problem formulation document. Conducted a baseline ecological risk assessment and baseline human health risk assessment (BHHRA) using the data collected as part of the remedial investigation. Provided strategic consulting related to the remedial investigation and risk drivers for remediation. Participated in agency meetings with Illinois EPA regarding risk assessment tasks. Several unique and innovative approaches were used, including use of area-weighting with Thiessen polygons to estimate exposure point concentrations, which overall improved risk estimates; site-specific prey tissue data; site-specific bioassays; and lead bioavailability testing, which also provided more site-specific estimates of bioavailability and risks and overall lower risk estimates. The risk assessment assumed a presumptive remedy area that also resulted in an overall more favorable impression of residual site risks. A site-specific assessment of lead bioavailability was also conducted.

Ecological Risk Assessment in a Desert Environment, Topock, California—Technical lead for an ecological risk assessment for several dry wash areas in the Mohave Desert near an operating facility. Main chemical of interest is chromium (total and hexavalent) as well as a number of other metals. Developed a conceptual site model and risk assessment work plan and contributed to site characterization work. Completed a groundwater risk assessment.

Ecological Risk Assessment for Sulphur Bank Mercury Mine, Clear Lake Oaks, California—Conducted a terrestrial ecological risk assessment for the upland portions of the mine site. Mercury is the main contaminant of concern, although other metals with elevated levels were evaluated as well. Evaluation included assessing spatial scale of risks in relation to native plant populations and balancing restoration goals with cleanup efforts. Developed risk-based action levels for seven receptors and incorporating information about speciation/bioavailability of metals onsite. An assessment of cultural issues (ceremonial uses of plants and ingestion of game animals) important to the adjacent tribe was included. Tribe members participated in the scoping process, and the ultimate remedy was negotiated with EPA and the tribe representatives.

Risk Assessments for Perchlorate at Space and Missile Propulsion System Test Facility, California—Performed three risk assessments to assess potential perchlorate exposures in late 2003. The first risk assessment, submitted to DTSC, was conducted to provide support for the Resource Conservation and Recovery Act post-closure permit application process for a former onsite station and three surface impoundments. Human health-based screening levels (HBSLs) for perchlorate in soil were developed based on a range of regulatory recommended provisional toxicity criteria for various exposure scenarios. The second risk assessment was submitted to the California RWQCB and consisted of both human health and ecological risk evaluations of potential exposures to



perchlorate in soil and groundwater at three onsite areas. HBSLs for perchlorate in soil were developed based on direct contact exposures; protection of groundwater; and provisional toxicity criteria recommended by both Cal/EPA's Office of Environmental Health Hazard Assessment and EPA. The third risk assessment was conducted to support potential compliance issues associated with the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Risk assessment methodologies were used to characterize and assess potential releases of perchlorate from onsite operations in order to evaluate notification responsibilities specified under Proposition 65 regulations. RBSLs were developed for ecological and human health receptors to support a site-wide RAP. Supported real-time decision-making during remediation and conducted a post-remedial risk assessment for this 5,000-acre site. The sitewide risk assessment assessed excavation and regarded areas and included land use restrictions where necessary to specify acceptable future uses. Assessed both human and ecological receptors, soil, groundwater, and surface water.

Ecological Risk Assessment, Presidio of San Francisco, California—Conducted a basewide study to develop cleanup levels for aquatic and terrestrial receptors for the feasibility study. Developed cleanup levels for metals, pesticides, PCBs, VOCs, and SVOCs as well TPH constituents. Negotiated the approach with the regulatory agencies and presented the cleanup levels at public meetings (restoration advisory board and other community work groups). Provided technical review and oversight of other contractors' assessments, including other ecological risk evaluations and several studies to develop action levels for TPH. Conducted an evaluation to develop site-specific cleanup levels for TPH diesel and fuel oil in the freshwater riparian zone.

Crissy Field Area: Conducted an HHRA for recreational receptors theoretically exposed to soil excavated from one area onsite to create a wetland, and disposed of at areas on site slated for future recreational use. Chemicals of concern included metals and PAHs. Used information from the risk assessment to finalize construction plans for the wetland.

Lobos Creek Area: Conducted a data review and remedial investigation that recommended no further action for the creek and watershed.

Extended Site Sediment Investigation, Sausalito, California—Developed both a work plan and a sampling and analysis/quality assurance plan for the collection of Horseshoe Bay sediment data as part of an extended site inspection in support of the base realignment, closure of the U.S. Army East Fort Baker Facility, and transfer of the property to the National Park Service. Managed sampling efforts and conducted aquatic bioassays and chemical analyses of sediments. The study was designed to determine if historical East Fort Baker operational practices had caused any adverse impact to the adjacent Horseshoe Bay sediments of sufficient magnitude to warrant dredging. Assessed the data to describe the presence and extent of sediment contamination and associated risks to aquatic biota and wildlife, and presented an extended site investigation report. Risks were shown to be minimal and no action was concluded based on the risk evaluation.



Site Remediation Project, Casmalia, California—Developed work plans, developed biological and endangered species reports, and negotiated an ecological risk assessment approach for the Casmalia Site Remediation Project, a former hazardous waste landfill site in central California. Conducted a multipathway, multispecies ecological risk assessment to address residual contamination from closed ponds and pads and areas around multiple capped landfills that held metals, solvents, PCBs, pesticides, sludges, and oily wastes. Species of concern at the site included red-legged frogs, western spadefoot toad, southwestern pond turtle, and other threatened and endangered species in both upland and aquatic areas. The ecological remedial assessment is designed to focus on areas that will not undergo presumptive remedies (i.e., landfill caps), mainly the liquid impoundments and some upland portions of the site used for disposal of waste. The approach focused on functional groups of receptors representing important components of the food web and will be conducted on a site-wide basis and in a phased manner. Participated in subcommittee meetings with the regulatory agencies and with the technical committee. Assisted the PRP group with issues related to natural resource damages and habitat restoration/mitigation. Produced a biological species and habitat survey report and an assessment of risks to burrowing mammals through inhalation of burrow air as part of the interim progress report for the RI/FS. Site-specific background levels, selection of chemicals of potential concern, and the ecological risk assessment have been completed and approved. A site-specific study of bioaccumulation and bioavailability was conducted. Following approval of the remedial investigation, developed cleanup goals and provided input to the Feasibility Study and selection of remedial alternatives.

Risk-Based Assessment at a Former Tannery Site, Santa Cruz, California—Conducted a risk assessment for former tannery based on specific site development plans. Evaluated potential exposures to chemicals in soil and groundwater for future residents and office and construction workers. Chemicals of concern included chromium(VI) and arsenic as well as VOCs and TPH. Provided target cleanup levels for soil and participated in public outreach programs, including presentations at city planning and city council meetings. Lead agency was the California DTSC.

Development of Approach for Assessing Risks to Livestock for Petroleum Hydrocarbons, Nationwide—Developed a framework to determine when livestock should be included in a risk evaluation, and estimated risks of petroleum hydrocarbon exposure to livestock. A conceptual site model was developed to assess whether complete and significant exposure pathways exist at a given site. To estimate potential risks, TRVs, and drinking water and soil, RBSLs for petroleum hydrocarbons, including crude oil, benzene, toluene, ethylbenzene, and xylene, and PAHs were developed for a variety of livestock receptors. The TRVs and RBSLs developed for this framework were comparable to human health RBSLs and other published livestock guidelines. The approach can be adapted for assessing other chemicals (i.e., metals, PCBs, pesticides).

Ecological Assessment of Petroleum Hydrocarbons, San Francisco, California—Provided technical review of Tier 1 and Tier 2 screening levels for ecological receptors in the marine ecological protection zone of the San Francisco Airport developed by RWQCB. Reviewed and commented on the 3-dimensional migration models and bioassay tests used to develop TPH cleanup levels. Reevaluated the likelihood of petroleum hydrocarbons (TPH-diesel and benzene) in groundwater and soil detected near terminals at San Francisco Airport to migrate to San Francisco Bay.



Estimated effects of TPH and benzene on aquatic receptors in the bay using site-specific information. Revised cleanup developed based on the results of this evaluation.

Ecological Assessment of Stormwater Runoff to a Freshwater Marsh, Fairfield, California—

Conducted a screening ecological assessment to evaluate the effects of metals and organic compounds in stormwater runoff and seepage from a natural spring on aquatic and terrestrial receptors at a freshwater marsh. Conducted a biological inventory to select indicator species for the assessment. Developed screening criteria based on applicable state and federal freshwater sediment and surface-water criteria. Identified areas of concern and recommended additional site characterization.

Milepost 68 Oil Spill, Utah—Conducted an ecological risk assessment to evaluate potential effects on aquatic and wildlife receptors potentially exposed to petroleum products in freshwater marsh sediments due to a pipeline break. A cleanup level of 20,000 parts per billion for total PAH was negotiated with EPA, USFWS, and the State of Utah.

Environmental Toxicology

Sediment Investigation and Bioavailability Assessment, Kansas—Led an effort to characterize sediments in drainage channels leading from a former smelter site to a river in Kansas. Chemicals of concern included arsenic, cadmium, lead, and zinc. The field program included bulk sediment and porewater, including measures of acid volatile sulfide and simultaneously extracted metals and other parameters that were used in a weigh-of-evidence approach to assess risks to human and aquatic receptors. Successfully applied the approach to limit the findings of impacts to areas just downstream from the former facility.

Sediment Investigation, Pittsburg, California—Conducted a sediment sampling and analysis program to evaluate potential risks to aquatic receptors offshore of a petroleum coke loading terminal. Sediment cores were collected, examined for the presence of coke, segmented, and analyzed for metals and PAHs. Used the results to evaluate whether aquatic communities exposed to offshore sediments were at risk from the presence of coke, and whether any remedial activities were needed. Conducted solid-phase bioassays on the samples with elevated coke content. Showed that the sediment, although containing high levels of coke, were not toxic to aquatic life and that chemical contaminant levels were at or below screening level. No remedial activities were deemed necessary.

Portland Harbor Superfund Site Investigations, Portland, Oregon—Represented a client on the Portland Harbor Light Products Study Group. This group is investigating the distribution and potential effects on PAHs and other petroleum-related compounds in sediments within Portland Harbor as part of the Portland Harbor Superfund site investigations. Conducted a spatial analysis of the extent of PAH contamination within Portland Harbor to evaluate whether elevated levels of PAHs could be associated with light petroleum products terminals.



Baypoint Oil Spill, Pittsburg, California—Compiled data on the nature and extent of PAH and petroleum contaminants in sediment and surface water resulting from the spill. Staff conducted a toxicological and spatial analysis to determine the degree and spatial extent of the impacts. In addition, used PAH profiling (i.e., expanded PAH analysis) to evaluate the source of PAHs detected at various locations to distinguish impacts from the spill material from ambient conditions and other potential sources. Identified two distinct source materials.

Mercury Total Maximum Daily Load (TMDL) Review, San Francisco Bay, California—Reviewed the draft TMDL for mercury document prepared by the San Francisco RWQCB and provided review comments relative to technical approach and evaluations as well as implementation issues. Issues of concern identified included bioaccumulation into fish tissues and research required to adequately characterize the levels and processes associated with methylmercury content in bay sediments, surface water, and fish/shellfish tissues. Source characterization and control was also an issue of concern.

Shell Mounds Project, Ventura, California—Reviewed technical reports regarding shell mounds offshore that remained after removal of drilling rigs. The public and the Coastal Commission want the structures removed. Assessed chemical and biological data and provided recommendations.

Selected Publications

Hagström, E.L., C. Lyles, M. Pattanayek, B. DeShields, and M.P. Berkman. 2016. Produced water—Emerging challenges, risks, and opportunities. *Environmental Claims Journal* 28(2):122–139.

Pattanayek, M., and B.R. DeShields. 2003. Characterizing risks to livestock from petroleum hydrocarbons. Proceedings from the Integrated Petroleum Environmental Consortium (IPEC) Conference. November.

DiMundo, G.M., and B.R. DeShields. 2002. Development of area-weighted EPCs for lead at small arms firing ranges in a risk assessment. *Soil and Sediment Contamination* 11(3).

DeShields, B.R., R. Meredith, D. Griffin, T. Laughlin, and B. Collins. 1998. The use of field methods to evaluate the toxicity of lead to plants at a small arms firing range. pp. 166–183. In: *Environmental Toxicology and Risk Assessment: Seventh Volume*. E.E. Little, B.M. Greenberg, and A.J. DeLonay (eds). ASTM Stock #: STP1333. American Society for Testing and Materials, West Conshohocken, PA.

Selected Presentations/Posters

DeShields, B., B. Kellems, and K. Purcell. 2019. Investigation and design considerations for active harbors with contaminated sediments. Platform presentation at Tenth International Conference on the Remediation and Management of Contaminated Sediments, New Orleans, LA. February 11–14.

DeShields, B., P. Trowbridge, and J. Davis. 2018. The value of regional monitoring data for remedial investigation, design, and performance. Poster presented at Sediment Management Work Group, Spring Symposium, San Diego, CA. April.



Pattanayek, M., and B. DeShields. 2017. Value in refining risk assessments for remedial design. Poster presentation. 38th Annual Meeting of the Society of Environmental Toxicology and Chemistry, Minneapolis, MN. November 12–16.

DeShields, B., and F. Wolf. 2015. Let them eat fish: Addressing conservatism in environmental risk assessment. Presented at the Eighth International Conference on Remediation of Contaminated Sediments in New Orleans, LA.

DeShields, B., M. Pattanayek, P. Spadaro, and N. van Aelstyn. 2015. The perfect is the enemy of the good: A rational approach to PCB cleanup goals and source control for San Francisco Bay. Presented at the Eighth International Conference on Remediation of Contaminated Sediments in New Orleans, LA.

Wolf, F., and B. DeShields. 2015. An assessment of the lower Willamette coupled sediment and food web model: Predicting future concentrations of total PCBs in fish tissue. Presented at the Eighth International Conference on Remediation of Contaminated Sediments in New Orleans, LA.

Pattanayek, M., and B. DeShields. 2011. Using a multiple line of evidence approach for determining a remedial footprint for sediment. Presented at the 32nd Annual Society of Environmental Toxicology and Chemistry Conference in Boston, MA.

Bonnevie, N., D. Rigg, J. Gravenmier, M. Beauchemin, T. Iannuzzi, B. DeShields, and P. Doody. 2011. An integrated evaluation of methods and approaches for assessing bioavailability of contaminants in sediments. Presented at the 32nd Annual Society of Environmental Toxicology and Chemistry Conference in Boston, MA.

DeShields, B., L. Brouwer, D. Edge, and J. Raming. 2010. Uptake of dioxins/furans from pond sediments into plants and benthic invertebrates. Presented at the Dioxin 2010 Conference in San Antonio, TX.

Orr, T., D. Maffett, M. Pattanayek and B. DeShields. 2010. Development of tissue-based mammalian toxicity reference values for use in ecological risk assessment. Presented at the 31st Annual Society of Environmental Toxicology and Chemistry Conference in Portland, OR.

DeShields, B., T. Iannuzzi, K. Jenkins, N. Bonnevie, D. Edge and P. Krause. 2009. The importance and application of background and reference data/information in risk assessment and management—critical issues and case studies. Presented at the Fall 2009 Sediment Management Work Group Meeting in Saratoga Springs, NY.

Meyer, C., N. Bonnevie, K. Jenkins, and B. DeShields. 2008. How do you define exposure areas that are relevant to the biology of populations? Presented at the 29th Annual Society of Environmental Toxicology and Chemistry Conference in Tampa, FL.



Amweg, E., S.L. Huntley, B.R. DeShields, and S.E. Holm. 2007. Determination of site-specific ambient PCDD/PCDF concentrations at a fly ash/wood combustion site by polytopic vector analysis (PVA). Presented at the 28th Annual Society of Environmental Toxicology and Chemistry Conference in Milwaukee, WI.

Orr, T., M. Pattanayek, B. DeShields, and C. Baker. 2007. Reducing uncertainty in ecological risk assessment using site-specific measures of bioavailability. Presented at the 28th Annual Society of Environmental Toxicology and Chemistry Conference in Milwaukee, WI.

Goodrum, P.E., M. Kohberger, T. Negley, T. Orr, B. DeShields, and J. Gleason. 2007. A practical decision process for calculating exposure point concentrations for spatially explicit risk assessments. Presented at the 28th Annual Society of Environmental Toxicology and Chemistry Conference in Milwaukee, WI.

DeShields, B.R., S. Huntley, M. Pattanayek, J. Nedoff, M. Noble, and M. Bartee. 2006. Evaluation of burrow air and development of soil gas screening levels for ecological receptors. Presented at the 27th Annual Society of Environmental Toxicology and Chemistry Conference in Montreal, QC.

DeShields, B.R., M. Pattanayek, J. Nedoff, and K. Walsh. 2006. A comparison of lead bioavailability data by the *in vitro* method. Presented at the 27th Annual Society of Environmental Toxicology and Chemistry Conference in Montreal, QC.

DeShields, B.R. 2005. Food chain modeling of lead in soil for ecological risk assessment at Fort Ord, California: adaptation of the physiologically-based extraction test for lead in soil and plants. Presented at the Cal/EPA Workshop on Bioavailability of Lead and Arsenic Using In Vivo and In Vitro Measurements.

DeShields, B.R., M. Pattanayek, G.M. DiMundo, and N. Navarro. 2004. Uptake of antimony, copper, and lead into plants, invertebrates, reptiles and mammals at a small arms firing range in central California. Presented at the 25th Annual Society of Environmental Toxicology and Chemistry Conference, Portland, OR.

DiMundo, G.M., B.R. DeShields, and N. Navarro. 2002. Heavy metal uptake into plants, lizards, and mammals from soil at a small arms firing range. Presented at the 24th Annual Society of Environmental Toxicology and Chemistry Conference, Austin, TX.

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