

**John S. Brown**  
**Senior Managing Scientist**

**Professional Profile**

Mr. John Brown is a Senior Managing Scientist in Exponent's Environmental Sciences practice and is based in Boston, Massachusetts. He is responsible for overall program management and the technical supervision of environmental monitoring, analytical chemistry, and environmental forensics projects. Mr. Brown has over 25 years of experience in the design, conduct, and synthesis of marine environmental monitoring programs. His extensive experience on the chemical processes associated with petroleum in the environment includes work on the Baffin Island oil spill study, the Shell Martinez Bay oil spill investigation, Shell Gasconade River oil spill, the Marathon Newton Lake oil spill, the *Exxon Valdez* oil spill, the Haven oil spill, the Gulf War oil spill, the North Cape oil spill, the Julie N oil spill, the Kure oil spill, the New Carissa oil spill, and many others. Mr. Brown has developed new analytical and interpretive techniques for the chemical fingerprinting and allocation of hydrocarbon contamination in the environment. Mr. Brown has developed analytical and field techniques for a wide variety of matrices, including sediments, water, air, crude oil and refined petroleum products, oilfield production water, drilling fluids, animal tissues, and semi-permeable membrane devices (SPMDs). The chemical analyses of these matrices have included trace-level and forensic determinations of saturated and aromatic hydrocarbons, heterocyclic compounds, biomarkers (steranes and triterpanes), polychlorinated biphenyls (PCBs), chlorinated pesticides, and sterols. Mr. Brown has extensive experience in managing field programs and field sampling in the marine environment. He also has experience in the set up and QA/QC evaluation of mobile laboratory and fixed laboratory operations as part of environmental site investigations in the United States and the former Soviet Union.

**Academic Credentials and Professional honors**

B.S., Biology, Hobart College (*high honors*), 1980

## **Selected Publications and Reports**

Boehm PD, Page DS, Brown JS, Neff JM, Bragg JR, Atlas RM. Distribution and weathering of crude oil residues on shorelines 18 years after the Exxon Valdez spill. *Environ Sci Technol* 2008; 42:9210–9216.

Brannon EL, Collins KM, Brown JS, Neff JM, Parker KR, Stubblefield WA. Toxicity of weathered *Exxon Valdez* crude oil to pink salmon embryos. *Environ Toxicol Chem* 2006; 25:962–972.

Huggett RJ, Neff JM, Stegeman JJ, Woodin B, Parker KR, Brown JS. Biomarkers of PAH exposure in an intertidal fish species from Prince William Sound, Alaska: 2004–2005. *Environ Sci Technol* 2006.

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Boehm PD, Maxon CL, Newton FC, Brown JS, Galperin Y. Aspects of polycyclic aromatic hydrocarbons in offshore sediments in the Azeri sector of the Caspian Sea. In: *Offshore Oil and Gas Environmental Effects Monitoring: Approaches and Technologies*. Armsworthy SL, Cranford PJ, Lee K (eds), Battelle Press, Columbus, OH, 2005.

Boehm PD, Page DS, Brown JS, Neff JM, Bence AE. Comparison of mussels and semi-permeable membrane devices as intertidal monitors of polycyclic aromatic hydrocarbons at oil spill sites. *Mar Pollut Bull* 2005; 50:740–750.

Murphy BL, Brown JS. Environmental forensics aspects of PAHs from wood treatment with creosote compounds. *Environ Foren* 2005; 6(2):151–159.

Page DS, Boehm PD, Brown JS, Neff JM, Burns WA, Bence AE. Mussels document loss of bioavailable polycyclic aromatic hydrocarbons and the return to baseline conditions for oiled shorelines in Prince William Sound, Alaska. *Mar Environ Res* 2005; 60:422–436.

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Boehm PD, Neff JM, Brown JS, Page DS, Burns WA, Maki AW, Bence AE. The chemical baseline as a key to defining continuing injury and recovery of Prince William Sound. *Proceedings, 2003 Oil Spill Conference, American Petroleum Institute Publication No. I 4730 B*, pp. 275–283, API, Washington, DC, 2003.

Huggett RJ, Stegeman JJ, Page DS, Parker KR, Woodin B, Brown JS. Biomarkers in fish from Prince William Sound and the Gulf of Alaska: 1999–2000. *Environ Sci Technol* 2003; 37:4043–4051.

Page DS, Bence AE, Burns WA, Boehm PD, Brown JS, Douglas GS. The role of petroleum geochemistry in defining oil spill recovery: Examples from the Exxon Valdez spill in Prince William Sound, Alaska. *Proceedings, International Oil Spill Conference, American Petroleum Institute Publication No. I 4730 B*, pp. 291–298, API, Washington, DC, 2003.

Boehm PD, Burns WA, Page DS, Bence AE, Mankiewicz PJ, Brown JS, Douglas GS. Total organic carbon, an important tool in a holistic approach to hydrocarbon fingerprinting. *J Environ Foren* 2002; 3:243–250.

Owens EH, Mauseth GS, Martin CA, Lamarche A, Brown JS. 2002. Tarball frequency data and analytical results from a long-term beach monitoring program. *Mar Pollut Bull* 2002; 44:770–780.

Page DS, Bence AE, Burns WA, Boehm PD, Brown JS, Douglas GS. A holistic approach to hydrocarbon source allocation in the subtidal sediments of Prince William Sound, Alaska, embayments. *J Environ Foren* 2002; 3:331–340.

Boehm PD, Page DS, Burns WA, Bence AE, Mankiewicz PJ, Brown JS. Resolving the origin of the petrogenic hydrocarbon background in Prince William Sound, Alaska. *Environ Sci Technol* 2001; 35:471–479.

Brown JS, Boehm PD, Cook L, Trefry J, Trocine R, Rember R, Smith W. ANIMIDA Phase I: Arctic nearshore characterization and monitoring of the physical environment in the Northstar and Liberty development areas. *OCS Study MMS 2001. Final Report to U.S. Department of Interior, Minerals Management Service, Anchorage, AK*, 2001.

Emsbo-Mattingly S, Uhler A, Stout SA, McCarthy KS, Douglas GS, Brown JS, Boehm PD. Polycyclic aromatic hydrocarbon (PAH) chemistry of MGP tar and source identification in sediment, pp. 1-1 to 1-41. In: *Sediments Guidance Compendium, Report No. 1005216. Electric Power Research Institute, Palo Alto, CA*, 2001.

Page DS, Boehm PD, Douglas GS, Brown JS, Bence AE, Burns WA, Mankiewicz PJ. Mass balance constraints on the sources of the petrogenic hydrocarbon background in offshore sediments of Prince William Sound and the Gulf of Alaska. *Proceedings, 23<sup>rd</sup> Arctic and Marine Oil Spill Program (AMOP) Technical Seminar, Environment Canada*, pp. 1–9, Vancouver, 2000.

Brown JS, Boehm PB, Douglas GS. Approaches to chemical fingerprinting of fossil fuel residues in tissues. *Proceedings, 21<sup>st</sup> Annual Conference on Analysis of Pollutants in the Environment. U.S. Environmental Protection Agency, Washington, DC*, 1998.

Brown JS, Camp WH, Wong WMC. Evaluation of analytical methods for the determination of petroleum contaminants at a former strategic rocket force base, Republic of Belarus. Trans. 3rd International Technical Practical Conference, Productive Reuse of Former Military Sites: Environmental and Economic Aspects of Demilitarization. Defense Special Weapons Agency, U.S. Department of Defense, Washington, DC, 1996.

Brown JS, Costa HJ, Sauer TC. Summary of produced water toxicity identification evaluation research. American Petroleum Institute Publication Number 4641. Under contract to API Health and Environmental Sciences Department, Washington, DC, 1996.

Boehm PD, Douglas GS, Brown JS. Advanced chemical fingerprinting for oil spill identification and natural resource damage assessments. Proceedings, 1995 International Oil Spill Conference, American Petroleum Institute, Washington, DC, 1995.

Brown JS, Hutchinson EA, Boehm PD, Gamble PD. Phase 11 of an overall program entitled Design and Implementation of a Prototype Environmental Sampling Program for Cook Inlet, Alaska. Final Report to Cook Inlet Regional Citizens Advisory Council, Kenai, AK, 1995.

Brown JS, Boehm PD. The use of double ratio plots of polynuclear aromatic hydrocarbons (PAH) alkyl homologues for petroleum source identification. Proceedings, 1993 International Oil Spill Conference, American Petroleum Institute, Washington, DC, 1993.

Sauer TC, Brown JS, Boehm PD, Aurand DV, Michel J, Hayes M. Hydrocarbon source identification and weathering characteristics of intertidal and subtidal sediments along the Saudi Arabian coast after the Gulf War oil spill. *Mar Pollut Bull* 1993; 27:117–134.

Sauer TC, Brown JS, Rigatti MJ, Bleczynski CF, Kronick AT, Gamble PD, Boehm PD. ROPME Sea oil spill nearshore geochemical processes study. Volume 2: Hydrocarbon chemistry analytical results for year 1 (1992). MSRC Technical Report Series 93-002.2. Marine Spill Response Corporation, Washington, DC, 1993.

Brown JS, Sauer TC, Wade MJ, Neff JM. Chemical and toxicological characterization of produced water Freon extracts. In: *Produced Water Technological/Environmental Issues and Solutions*. Ray JP and Engelhardt FR (eds), Plenum Press, New York, NY, 1992.

Requejo AG, Brown JS, Boehm PD, Sauer TC. Lignin geochemistry of North American coastal and continental shelf sediments. *Org Geochem* 1991; 17:649–662.

Sauer TC, Jr., Brown JS, Coogan TS. Environmental studies at Newton Lake, Illinois: First year chemical results. Submitted to Marathon Oil Company, Arthur D. Little, Inc., 1990.

Boehm PD, Brown JS, Coogan T, Sauer TC, Jr. Spilled oil weathering study: A study element of pilot and reconnaissance study for the shell oil spill assessment and recovery monitoring environmental effects program. Final Report submitted to ENTRIX, Inc. Arthur D. Little, Inc., 1989.

Boehm PD, Brown JS, Sauer TC, Jr. Physical and chemical characterization of San Joaquin Valley crude oil. Final Report submitted to ENTRIX, Inc., Arthur D. Little, Inc., 1989.

Sauer TC, Jr., Brown JS, Requejo AG, Boehm PD. Evaluation of an organic chemical method for drilling fluid determination in Outer Continental Shelf sediments. pp. 775–796. In: *Drilling Wastes*. Engelhardt FR, Ray JP, Gillam AH (eds), Elsevier Applied Science, New York, NY, 1989.

Sauer TC, Jr., Durell GS, Brown JS, Redford DF, Boehm PD. Concentrations of chlorinated pesticides and PCBs in microlayer and seawater samples in open-ocean waters off the U.S. East Coast and Gulf of Mexico. *Mar Chem* 1989; 27:235–257.

Boehm PD, Brown J, Requejo AG. The fate and partitioning of hydrocarbon additives to drilling muds as determined in laboratory studies. pp. 545–575. In: *Drilling WASTES IN THE ENVIRONMENT*. Engelhardt et al. (eds), Elsevier Science, Ltd., London, 1988.

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Sauer TC, Jr., Brown JS, Durell GS, Smolski EM, Buck J, Lewis DA, Trulli HK, Droppo J, Hardy J, Boehm PD, Werme CE. Analytical results of samples and data collected during the baseline survey to the existing and alternative Gulf of Mexico Incineration Sites. Final Report submitted to U.S. Environmental Protection Agency, Office of Marine and Estuarine Protection, Washington, DC, 1988.

Brown JS, Boehm PD. Organic chemical characterization of diesel and mineral oils used as drilling mud additives. Final Report, Offshore Operators Committee, Environmental Subcommittee, Houston, TX, 1987.

Sauer TC, Jr., Requejo AG, Brown JS, Ayers RC, Jr., Boehm PD. Application of analytical pyrolysis and cupric oxide oxidation to characterization of nonextractable organic constituents on drilling fluids and sediments. Proceedings, Symposium on Chemical and Biological Characterization of Sludges, Sediments, Dredge Spoils, and Drilling Muds, Philadelphia, PA, 1987.

Requejo AG, Brown JS, Boehm PD. Lignin geochemistry of sediments from the Narragansett Bay estuary. *Geochim Cosmochim Acta* 1986; 50:2707–2717.

Requejo AG, Brown JS, Boehm PD. Thermal degradation products of nonvolatile organic matter as indicators of anthropogenic inputs to estuarine and coastal sediments. In: *Marine and Estuarine Geochemistry*. Siglec AC, Hattori A (eds), Lewis Publishers, Chelsea, MI, 1985.

## **Prior Experience**

Senior Program Manager, Battelle Ocean Sciences, 2001–2004

Principal, Arthur D. Little, Inc., 1989–2001

Researcher, Battelle Ocean Sciences, 1982–1989

## **Project Experience**

Principal Investigator for the Minerals Management Service (MMS) Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA) Program. Managed a complex multidisciplinary chemical and biological investigation on the effects of oil production activities in the nearshore Beaufort Sea, Alaska. Served as Chief Scientist for the 1999–2002 field surveys, had responsibility for multiple subcontractors, and is responsible for interfacing with a diverse group of public and corporate stakeholders, and for the overall delivery of reports and other milestone deliverables associated with the program. Concurrently serving as a Principal Investigator for the continuation of the sediment task for this program (Continuation of Arctic Nearshore Impact Monitoring in Development Area, or “cANIMIDA”).

Principal scientist and analytical leader for the Exxon Valdez Natural Resources Damage Assessment Oil Spill Investigation. Responsible for the management of chemical and biological analyses for multidisciplinary studies of the fate of spilled oil in Prince William Sound and the Gulf of Alaska. Studies have included identification and allocation of petroleum hydrocarbons in shoreline habitats and in nearshore and offshore marine sediments, investigation of petroleum residues in salmon eggs and birds, and examination of biological and chemical markers for PAH exposure in fish and SPMDs. Served as Chief Scientist for field surveys in Prince William Sound and the Gulf of Alaska in 1989–2007.

Project Manager for the Minerals Management Service (MMS) Sediment Quality in the Shelikof and Outermost Cook Inlet Program. Managed a complex multidisciplinary chemical and biological investigation on the effects of oil and gas exploration and production activities on the coastal areas of Alaska. Served as the Chief Scientist for the 1997 and 1998 field surveys, managed multiple subcontractors, and is responsible for reports and deliverables associated with the program.

Principal Investigator for chemical fingerprinting and environmental forensic studies using PAHs, saturated hydrocarbons, heterocyclics, steranes and triterpanes, and fatty acids to identify the sources of petroleum hydrocarbon contamination in marine, estuarine, and terrestrial environments. Provided depositions and expert testimony in the states of New Jersey and Washington.

Chief Scientist for the Offshore Baseline Survey for an international Nigerian Oil Company environmental impact assessment in the Escravos Terminal area of Nigeria. Mr. Brown also provided technical guidance on the field and chemical analyses conducted as part of the overall program.

Chief Scientist on field surveys in the Beaufort Sea, Prince William Sound, Cook Inlet, the Shelikof Strait, the Gulf of Alaska, and the Gulf of Guinea, and participated as Field Chemist on MMS, API, EPA, and NOAA cruises collecting samples in the U.S. Mid, North, and South Atlantic Slope and Rise, the California outer continental shelf, and the Gulf of Mexico.

Lead Chemist for an environmental restoration program in the Republic of Belarus. Responsible for the set up of a mobile laboratory at a former strategic missile base for the analysis of volatile and semivolatile organic compounds and trace metals, training of Belarus scientists in laboratory methods, and overall supervision of analytical chemistry operations for the site investigation.

Project Manager for an analytical chemistry study to measure petroleum hydrocarbons in marine sediments from Sakhalin Island, Russia, to evaluate potential inputs from exploratory petroleum drilling operations.

Project Manager for the chemical analysis of produced water, seawater, and fish and shellfish tissues for the Offshore Operators Committee Gulf of Mexico Produced Water Bioaccumulation Study.

Project Manager for the Cook Inlet Regional Citizens Advisory Committee Pilot Monitoring Program in 1994. Work included managing the overall program and field logistics, performance of field sampling, oversight of chemical and toxicological measurements, data analysis/interpretation, and generation of the Final Report.

Principal Investigator in the detailed chemical analysis of oil and gas platform production water chemical composition for a consortium of oil industry clients.

Chemistry Leader for an environmental impact assessment of the Karachaganak Gas Field in the Republic of Kazakhstan. Responsible for the conduct of all field and laboratory chemistry activities in Kazakhstan, design of field chemistry program, coordination and supervision of Russian and German subcontractors, and field and laboratory chemistry quality assurance.

Conducted field programs and related analytical work in the Beaufort Sea and Alaska National Wildlife Refuge, the Pacific and Atlantic Oceans, the Gulf of Mexico, the Gulf of Alaska, and coastal areas such as Boston Harbor/Massachusetts Bay, Prince William Sound, and the Hudson-Raritan estuary system.

Served as the analytical task leader for EPA ocean incineration work assignments and has been the project manager for projects to study drilling muds and produced waters discharged from offshore drilling platforms.

Developed automated HPLC methods for the fractionation of petroleum and sample extracts into saturated and aromatic hydrocarbon fractions. Developed methods for the extraction and GC/MS analysis of phenols, and the identification of sulfur-containing compounds by Hall ECD, in diesel fuels, mineral oils, and crude oils.

Participated in studies that developed techniques to analyze pyrolysis products as indicators of anthropogenic inputs in estuarine and coastal sediments. Developed techniques that use lignin oxidation products as tracers of offshore drilling activities in marine sediments.

Developed methods for the extraction and GC/MS analysis of phenols, and the identification of sulfur-containing compounds by Hall ECD, in diesel fuels, mineral oils, and crude oils.

Participated in projects involving analyses of trace PCBs in Hudson-Raritan sewage effluent, sewage sludge, and estuarine waters by GC/ECD.

### **Advisory Boards**

- Minerals Management Service Workshop on Chukchi Offshore Monitoring in Drilling Area (COMIDA), November 2006 (advisory panel member)
- International Journal of Environmental Forensics (peer reviewer)

### **Professional Affiliations**

- American Chemical Society
- Society of Environmental Toxicology and Chemistry

### **Deposition/Trial Testimony**

Mr. Brown has given numerous depositions and has testified as an expert witness in state court. Details are available on request.