



Susan C. Paulsen, Ph.D., P.E.
Principal Scientist & Practice Director

Professional Profile

Dr. Susan Paulsen is a Principal Scientist and the Director of Exponent's Environmental and Earth Sciences practice. Dr. Paulsen has 24 years of experience with projects involving hydrodynamics, aquatic chemistry, and the environmental fate of a range of constituents. She has provided expert testimony on matters involving the Clean Water Act and state water quality regulations, and she also provides scientific and strategic consultation on matters involving Superfund (CERCLA) and Natural Resources Damages (NRD). She has expertise designing and implementing field and modeling studies of dilution and analyzing the fate and transport of organic and inorganic pollutants, including DDT, PCBs, PAHs, copper, lead, and selenium, in surface and groundwater and in sediments.

Dr. Paulsen has designed and implemented field studies in reservoir, river, estuarine, and ocean environments using dye and elemental tracers to evaluate the impact of pollutant releases and treated wastewater, thermal, and agricultural discharges on receiving waters and drinking-water intakes. Dr. Paulsen has designed and managed modeling studies to evaluate transport and mixing, including the siting and design of diffusers, and has evaluated water quality impacts of stormwater runoff, irrigation, wastewater and industrial process water treatment facilities, and desalination brines. Dr. Paulsen has extensive knowledge of California water supply issues, including expertise in California's Bay-Delta estuary, the development of alternative water supplies, and integration of groundwater basins into supply and storage projects.

Dr. Paulsen has designed studies using one-dimensional hydrodynamic models (including DSM2 and DYRESM), three-dimensional CFD modeling, longitudinal dispersion modeling, and Monte Carlo analysis. Dr. Paulsen has participated in multi-disciplinary studies of the fate and transport of organic and inorganic pollutants, including DDT, PCBs, PAHs, copper, lead, selenium, and indicator bacteria in surface waters, groundwaters, and/or sediments. She has worked on matters involving both CERCLA and NRDA, including several involving the fate and transport of legacy pollutants, and she has evaluated the impacts of oil-field operations on drinking-water aquifers.

Dr. Paulsen has broad expertise with water quality regulation through the Clean Water Act and state regulations in California, Washington, Hawaii, and other states, and has worked on temperature compliance models, NPDES permitting, permit compliance and appeals, third-party citizens' suits, and TMDL development. She has evaluated the importance of background and natural sources on stormwater and receiving-water quality and the development of numeric limits for storm flows and process-water discharges. Dr. Paulsen is the author of multiple reports describing the history and development of water quality regulations and has provided testimony on regulatory issues, water quality, and water rights.

Academic Credentials and Professional Honors

Ph.D., Environmental Engineering Science, California Institute of Technology, 1997
 M.S., Civil Engineering, California Institute of Technology, 1993
 B.S., Civil Engineering, Stanford University (with honors), 1991

Licenses and Certifications

Registered Professional Civil Engineer, California, #66554

Languages

Italian (Conversational)
 German (Conversational)

Selected Publications and Presentations

Byard JL, Paulsen SC, Tjeerdema RS, Chiavelli D. DDT, Chlordane, Toxaphene and PCB Residues in Newport Bay and Watershed: Assessment of Hazard to Wildlife and Human Health. *Reviews of Environmental Contamination and Toxicology* 2015; 235.

California Council for Environmental and Economic Balance (CCEEB); authored by Paulsen SC. *A Clear Path to Cleaner Water: Implementing the vision of the State Water Board for improving performance and outcomes at the State Water Boards.* CCEEB: San Francisco, CA. 2013. Available at www.cceeb.org.

South Orange Coastal Ocean Desalination (SOCOD) Project; authored by Expert Panel Member Paulsen SC. *Expert Panel Report: Offshore Hydrogeology/Water Quality Investigation Scoping, Utilization of Slant Beach Intake Wells for Feedwater Supply.* Municipal Water District of Orange County (MWDOC): Fountain Valley, CA. 2012. Available at http://www.mwdoc.com/filesgallery/FINAL_Expert_Panel_Rept_10_9_2012.pdf.

Paulsen SC, Goteti G, Kelly BK, Yoon VK. Automated flow-weighted composite sampling of stormwater runoff in Ventura County, CA. *Proceedings, Water Environment Federation* 2011.12 (2011): 4186-4203. Also published as automated flow-weighted composite sampling of stormwater runoff. *Water Environment Laboratory Solutions* 2012; 19(2):1-6.

Paulsen SC, List EJ, Kavanagh KB, Mead AM, Seyfried R, Nebozuk S. Dynamic modeling and field verification studies to determine water quality and effluent limits downstream of a POTW discharge to the Sacramento River, California. *Proceedings, Water Environment Federation* 2007; 12:5695-5721.

Paulsen SC, List EJ. Potential background constituent levels in storm water at Boeing's Santa Susana Field Laboratory. Report to Expert Panel convened by The Boeing Company and Regional Water Quality Control Board, Los Angeles Region, 2007. Available at

http://www.boeing.com/assets/pdf/aboutus/environment/santa_susana/water_quality/tech_reports/2007_background/2007_background_report.pdf.

Paulsen SC, List EJ, Santschi PH. Modeling variability in ²¹⁰Pb and sediment fluxes near the Whites Point Outfalls, Palos Verdes Shelf, California. *Environmental Science & Technology* 1999; 33:3077–3085.

Paulsen SC, List EJ, Santschi PH. Comment on “In situ measurements of chlorinated hydrocarbons off the Palos Verdes Peninsula, California.” *Environmental Science & Technology* 1999; 33:3927–3928.

Paulsen SC, List EJ. A study of transport and mixing in natural waters using ICP-MS: Water-particle interactions. *Water, Air, and Soil Pollution* 1997; 99:149–156.

Paulsen SC, List EJ. Tracing discharges in ocean environments using a rare earth tracer. Presented at the 27th IAHR Congress, San Francisco, CA, August 1997.

Prior Experience

- Various positions including President, Flow Science Incorporated, Pasadena, California, 1997–2014
- Consultant to Flow Science Incorporated, Pasadena, California, 1994–1997
- Staff Engineer, Dames & Moore, Civil Design Group, San Francisco, California, 1990-1992
- Graduate Research and Teaching Assistant, Hydrologic Transport Processes and Fluid Mechanics, California Institute of Technology, Pasadena, California, 1993–1997
- Research Engineer, Fraunhofer Institute for Atmospheric Environmental Research, Garmisch-Partenkirchen, Germany (West), 1989
- Instructor, Technical Communications Program (joint Business School/School of Engineering program), Stanford University, Stanford, CA, 1989–1990

Professional Affiliations

- American Society of Civil Engineers—ASCE
- Member, National Ground Water Association

Depositions (last 4 years)

Robert Bruncati and Maureen Bruncati v. Billy Wayne Andrews, Jr., et al., Case No. CIVDS1309044, in the Superior Court of the State of California, County of San Bernardino, San Bernardino District. August 24, 2015, and September 8, 2015.

City of Cerritos, et al., v. Water Replenishment District of Southern California, Case No. BS128136, in the Superior Court of the State of California, County of Los Angeles. November 24, 2014.

The Boeing Company et al. v. State of Washington, Department of Ecology, Appeal of the 2010 Industrial Stormwater General Permit, Pollution Control Hearings Board, State of Washington. Case No. 09-140. 2011.

Puget Soundkeeper Alliance v. BNSF Railway Co., Case No. C09-1087-JCC, in the United States District Court, Western District of Washington at Seattle. 2011.

Trials and Hearings (last 4 years)

Robert Bruncati and Maureen Bruncati v. Billy Wayne Andrews, Jr., et al., Case No. CIVDS1309044, in the Superior Court of the State of California, County of San Bernardino, San Bernardino District. 2015.

The Boeing Company et al. v. State of Washington, Department of Ecology, Appeal of the 2010 Industrial Stormwater General Permit, Pollution Control Hearings Board, State of Washington. Case No. 09-140. 2011.