

CEC SCIENCE ADVISORY PANEL
FOR COASTAL & MARINE ECOSYSTEMS IN CALIFORNIA
SCIENCE ADVISORY PANEL MEMBER BIOGRAPHIES

HUMAN HEALTH TOXICOLOGIST

Dr. Paul Anderson

Vice President and Technical Director, Risk Assessment
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Education:

Postdoctoral Fellowship, Harvard School of Public Health, Interdisciplinary Programs in Health
Postdoctoral Fellowship, Harvard University, Biology Department

Ph.D., Biology, Harvard University

M.A., Biology, Harvard University

B.A., Biology, Boston University

Dr. Anderson has over 20 years of experience in human health and ecological risk assessment. Since 2000, Dr. Anderson has led several research efforts investigating the potential presence and effects of active pharmaceutical ingredients (APIs) and personal care products in surface water as well as other environmental media. His research in the area of constituents of emerging concern (CECs) began with the development of a screening level model (the Pharmaceutical Assessment and Transport Evaluation (or *PhATE*TM) model) that predicts the concentration in surface water of human-use pharmaceuticals and other compounds released from sewage treatment plants across the United States (including the Sacramento and Lower Colorado Rivers). The model has since been corroborated and was published in *Environmental Science and Technology* in 2004. Additionally, Dr. Anderson helped develop and continues to oversee the use of a database that summarizes the English language peer-reviewed literature on aquatic toxicity, environmental fate in surface water and treatment plant removal of pharmaceuticals. The database is designed to make all historical information easily accessible to users as well as providing them with up-to-date information. Dr. Anderson and his colleagues have used these tools to conduct several evaluations, including an assessment of the potential human health effects of several therapeutic classes of pharmaceuticals in US surface waters; the development of a predicted no effect concentration for protection of aquatic receptors from ethinyl estradiol (EE2); a comparison of predicted to measured concentrations of EE2 in surface water to establish the range of likely EE2 concentrations (submitted for publication); an evaluation of the potential for estrogens (both prescribed and naturally occurring) in drinking water to pose a potential risk to humans in the United States (submitted for publication); and characterization of the potential ecological risk associated with EE2 in surface water (manuscript in preparation). More recently, Dr. Anderson has expanded his research in the area of trace compounds in surface waters to include two comprehensive reviews of existing information and ongoing research efforts. The first was a review of the state-of-the-science of endocrine disrupting compounds (EDCs) and the implications of the presence of such compounds for wastewater treatment, published by the Water Environment Research Foundation in 2005. It described the sources of EDCs in

wastewater, their fate in wastewater treatment plants, and impacts in the environment as a result of discharges. The second project, published in 2008, updated and expanded the 2005 work on EDCs to include the full range of organic compounds that may occur at trace levels in wastewater treatment plant effluents. The research included: a review of the different sources and categories of trace organic compounds; how they are measured; their removal in treatment plants; an introduction to the potential ecological and human health effects associated with trace organics in treated wastewater, reclaimed water, and receiving streams; and an overview of current research needs including a summary of web-links describing major current research initiatives. Dr. Anderson is also an adjunct professor in the Center for Energy and Environmental Studies within Boston University's Geography Department.