

Tracking Emerging Issues

Carollo is able to meet clients' planning and regulatory needs through our awareness and experience at the forefront of environmental science, policy and regulation. Today's fast-moving regulatory climate leads to abrupt turnover in the understanding of environmental issues. Revised science can advance environmental policy and regulations, as well as create the potential for alternate strategies for regulatory compliance. Carollo has an extensive and relevant knowledge base on current and emerging environmental issues.

Awareness of the potential impacts of emerging science, policy, and regulatory issues results in significant benefits for our clients. The ability to foresee future demands, on both water quantity and water quality, allows proper long-term preparation and planning. Additional benefits include anticipation of revised requirements, improved regulatory compliance, increased reliability of public health protection, and long-term cost savings.

Emerging Science and Research

Much effort continues to be applied to investigate the acute and chronic effects of many potential contaminants of concern. Trace metals, synthetic organics, nutrients, and unidentified toxicity are pollutants of growing significance. A range of compounds known as endocrine disruptors, which may include such diverse pollutants as pesticides, pharmaceuticals and personal care products, dioxins and furans, mercury, and polybrominated diphenyl ethers (PBDEs), may be present in wastewater at concentrations of concern.

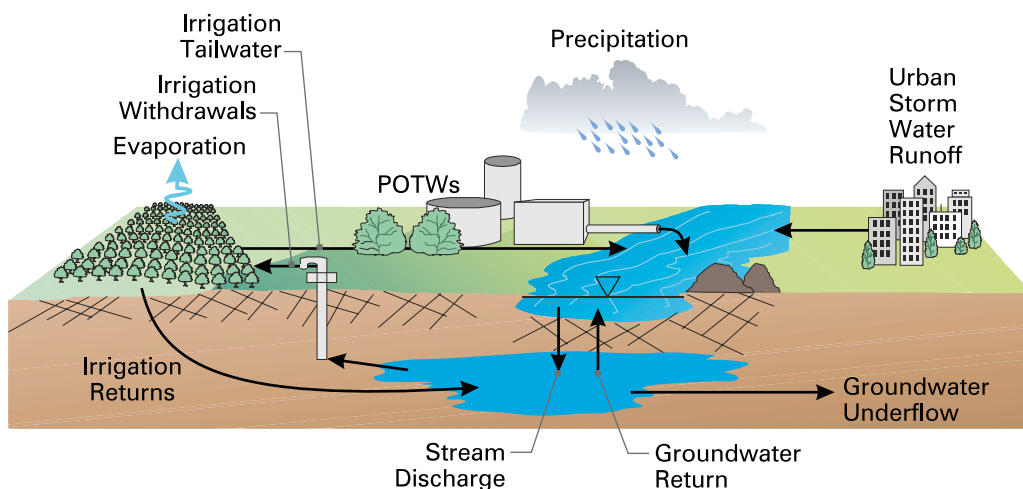


Effluent dominated waterbody dischargers are faced with meeting strict regulations.

Advanced wastewater treatment processes can be selected and designed to achieve removal of many pollutants of heightened concern. Carollo has compiled a database of references on the effectiveness of various wastewater treatment processes at removing a wide variety of contaminants. The reference database can be used to assess removal efficiencies of current and proposed treatment trains.

Carollo also maintains personal and working relationships with leading researchers at the university level. These contacts collaborate with our staff on bench-scale and research studies to advance our understanding and to ascertain process effectiveness and reliability.

Knowledge of emerging science allows Carollo to utilize innovative solutions to anticipate clients' needs and achieve their goals.



Carollo modeled the Calleguas Creek Watershed, linking surface and groundwater interactions for the proposed chloride TMDL.

"Dedicated to creative, responsive, quality solutions for those we serve."



Emerging Policy and Regulatory Issues

Carollo monitors policy and regulations at the federal, state, and local levels. Regular updates and revisions to EPA policy and regulations, Basin Plans, 303(d) impaired water bodies listings, California Title 22 water reuse standards, and NPDES permits are monitored to anticipate potential impacts to clients.

The shifting emphasis towards a watershed approach for meeting water-quality objectives presents both implications and opportunities for our clients. As water quality planning takes on a wider perspective, total maximum daily loads (TMDLs) have become a valuable tool in translating water quality standards to a combination of point and nonpoint source controls needed to achieve in-stream goals. TMDLs include waste load allocations (WLAs) that limit the total mass quantity of a pollutant that can be discharged. The WLA can potentially limit the flow that a plant can discharge.

As part of the TMDL program, pollutant trading has become a potential method for maximizing increases in flows and loads. Controlling nonpoint sources may be more cost effective than imposing additional point source controls. Therefore, there is the opportunity for point source dischargers to save money, while improving in-stream water quality, by funding non-point source reductions.

Carollo recognizes that there are key decision makers at regulatory agencies who are relied on to make critical decisions. Our staff has successfully developed relationships with these key decision makers at all levels, allowing personal input and interpretation of new and upcoming regulatory actions.

Dedicated, comprehensive efforts to maintain awareness of upcoming policy and regulatory issues allow Carollo to “predict the future” for our clients.

Recent and ongoing experience includes:

Contaminant Removal Database. Development and maintenance of a current database of references and removal efficiencies of metals and other contaminants of concern by wastewater treatment processes.

Endocrine Disruptor Research. Monitor ongoing endocrine disruption research and chronicle the potential impacts to the water and wastewater management industry.

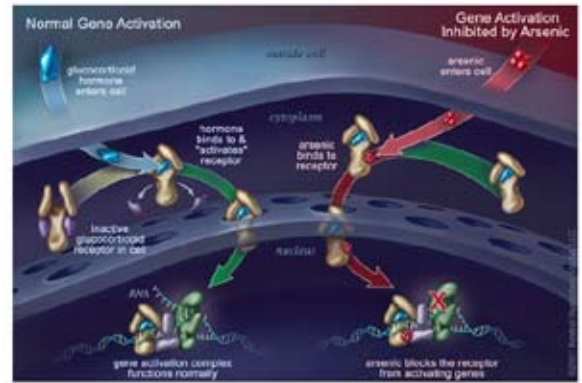


Illustration by William Scavone is reproduced courtesy of Joshua W. Hamilton Ph.D., Center for Environmental Health Sciences, Dartmouth College (<http://www.dartmouth.edu/~cehs/>) and is based on original research reported in: RC Kaltreider, AM Davis, JP Lariviere and JW Hamilton, "Arsenic alters the function of the glucocorticoid receptor as a transcription factor," *Environmental Health Perspectives* 109:245-251, 2001.

Endocrine disrupting compounds can cause adverse effects. (Center for Environmental Health Sciences at Dartmouth © 2001)

Effluent Dominated Waterbodies. Wastewater discharges into ephemeral streams can result in effluent dominated waterbodies (EDWs). Due to the lack of dilution, strict criteria promulgated for the protection of downstream beneficial uses may be applied as end-of-pipe effluent limits. Carollo can assist EDW dischargers in obtaining more practicable permit limits through application of water quality modeling and impact assessment studies.

Total Maximum Daily Loads. Developed TMDLs for the Cities of Reno/Sparks and Washoe County, Nevada; the City of Winston, Oregon; Park City, Utah; and a treatment plan to meet TMDL-imposed chloride WLAs for agencies in the Calleguas Creek watershed in California.

The Calleguas Creek project modeled surface water and groundwater linkages for the first TMDL in the country to address the protection of agricultural designated uses.

Mercury Source Control. Evaluated the effectiveness of industrial, commercial, and residential mercury source control for the Sacramento Regional Wastewater Treatment Plant.

Disinfection Regulations. Assessed current and upcoming disinfection regulations to assist the City of Roseville, California, in selection of a disinfection process to meet short-term and long-term goals.