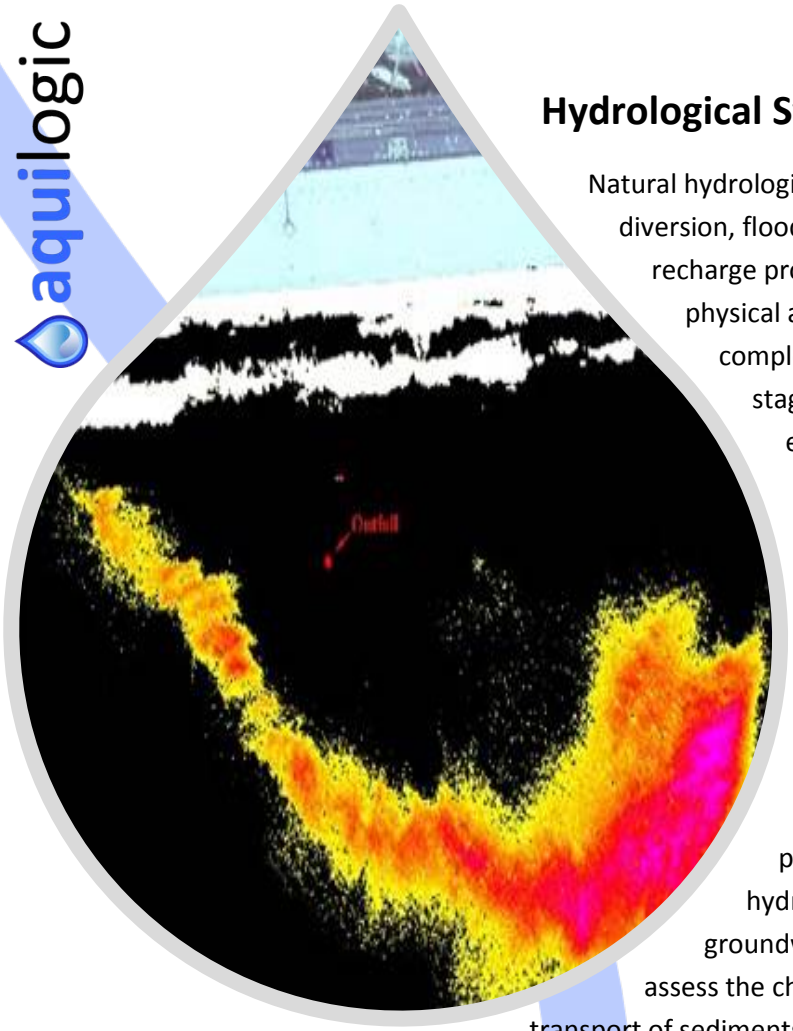
aquilogic

Hydrological System Modeling



Modeling of power plant outfall, Orange County, California

Natural hydrologic systems are complex and large. Water diversion, flood control, water supply abstraction, and recharge programs further complicate such systems. The physical and chemical aspects of these systems are complex with interaction between water at various stages in the hydrological cycle and the environment and media it contacts.

Given such complexity, hydrologic models are often developed to simulate the natural system and interactions within the system. These mathematical simulations allow for a more complete understanding of the system, and allow certain "what if" scenarios to be evaluated rapidly and more effectively. Hydrologic models can simply evaluate the physical movement of water, such as stream hydraulic models, flood control system models, or groundwater flow models. They can also be used to assess the chemical character of the water, and evaluate the transport of sediments or solutes within the water.

Hydrologic models use complex mathematical algorithms to simulate natural systems, and they are powerful tools when used appropriately. However, they are only as good as the data used to construct the model and the conceptual understanding of the system. If the data is poor, or the conceptual understanding weak, the model will be flawed. If the data and the conceptual understanding are good, then the model will effectively simulate the natural system.

Aquilogic staff has extensive experience developing hydrologic models, particularly groundwater flow and solute transport models. These models have been used to improve understanding of a complex natural system, determine safe yield for a water resource, site and design water supply wells, optimize water resource development, design aquifer recharge programs, and evaluate surface water-groundwater interactions. In addition, these models have been used to evaluate the fate and transport of a contaminant, identify release locations for known contaminant plumes, allocate responsibility between releases for a co-mingled plume, and more effectively design contaminant remediation systems and potable water treatment systems.