Structured Decision Making in Water Resources Planning and Management: A Case Study Using Bayesian Network Model for the Santa Ana Watershed Project Authority

Abstract

Fundamentally, SDM (structured decision making) reframes management challenges as choices. As part of any water resources planning study, a goal is to evaluate alternatives or scenarios that typically combine a multitude of competing drivers. A general approach to evaluating alternatives/scenarios in water resources planning and management is to make specific model runs using a river system model specifying the construct of a given scenario or to evaluate scenarios probabilistically through multiple runs using this river system model. Though river system models generally exist for the large Western US river basins such as the Columbia, Missouri headwaters, Colorado and the Rio Grande among others, there are water entities distributed throughout the West who do not have system specific water resources decision making models. Though these water entities have a broad reliance on these major river basins for municipal, industrial or agricultural water supplies, they have a desire to understand and manage their local water supplies - surface and groundwater objectively. This talk will provide a proof of concept as how this can be achieved using the SDM framework that uses a Bayesian Network Model as its computational engine. These concepts will be demonstrated through a case study presentation for the Santa Ana Watershed located in Southern California.