Abstract

Highly variable water resource systems often give rise to substantial fluctuations in the costs and revenues accruing to water-related activities in both the public and private sectors. The financial instability that results can be very disruptive and can therefore influence decision making in a number of ways. Understanding the nature of the financial risks posed in terms of both their frequency and severity requires integrated modeling of the natural and human systems involved. Once these risks have been characterized, financial instruments (e.g., index insurance) can be designed to mitigate them. Example analyses from several different economic sectors will be presented, including urban water utilities, hydropower generators and commercial (inland) shipping. Our research suggests that environmental financial risks can often be substantially reduced through the use of innovative financial instruments, and that this risk reduction has the potential to lead to reduced environmental impacts, as well as more efficient management of climate-related uncertainties.