



## **Managing Tradeoffs between Hydropower and the Environment in the Mekong River Basin**

Daniel P. Loucks and Thomas B. Wild

Department of Civil and Environmental Engineering, Cornell University, Ithaca, NY, USA

Hydropower dams are being designed and constructed at a rapid pace in the Mekong/Lancang River basin in Southeast Asia. These reservoirs are expected to trap significant amounts sediment, decreasing much of the river's capability to transport nutrients and maintain its geomorphology and habitats. We apply a simulation model for identifying and evaluating alternative dam siting, design and operating policy (SDO) options that could help maintain more natural sediment regimes downstream of dams and for evaluating the effect of these sediment-focused SDO strategies on hydropower production and reliability. We apply this approach to the planned reservoirs that would prevent a significant source of sediment from reaching critical Mekong ecosystems such as Cambodia's Tonle Sap Lake and the Mekong delta in Vietnam. Model results suggest that various SDO modifications could increase sediment discharge from this site by 300-450% compared to current plans, but a 30-55% loss in short-term annual energy production depending on various configurations of upstream reservoirs. Simulation results also suggest that sediment management-focused reservoir operating policies could cause ecological damage if they are not properly implemented.