



## Using Real-World Case Studies to Advance Hydrology Education in a Changing World

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Hydrology originated as an engineering discipline mainly concerned with the estimation of floods and droughts. Since then, hydrology has evolved into one of the earth sciences and deals with water related issues in complex environmental systems at scales ranging from local to global. Current and future water issues, however, require new inter-disciplinary scientific approaches to provide solutions to engineering problems, often including significant social components. Climate and land use change introduce non-stationarities into the environment that many of the current engineering tools cannot consider, while a growing population continuously increase the stress on available water resources, particularly in less developed countries. Hydrology therefore remains an important part of the general civil and environmental engineering curriculum. However, the changes in the science of hydrology have not yet fully propagated into a changed approach to teaching this important subject in many engineering departments. We present the results of a three-semester long study in which we introduced real world case studies into a large (70-90 students) civil engineering undergraduate class to achieve this change. Over the past several semesters, students have expressed overwhelmingly positive thoughts on the course adjustments made, including the cases and other active learning elements utilized. We show and discuss evidence of the positive impact on student learning due to the closer link between the course material and real-world examples of a changing world.